CITY of CLOVIS

AGENDA • CITY COUNCIL MEETING

Council Chamber, 1033 Fifth Street, Clovis, CA 93612 (559) 324-2060
www.cityofclovis.com

April 5, 2021 6:00 PM Council Chamber

In compliance with the Americans with Disabilities Act, if you need special assistance to access the City Council Chamber to participate at this meeting, please contact the City Clerk or General Services Director at (559) 324-2060 (TTY – 711). Notification 48 hours prior to the meeting will enable the City to make reasonable arrangements to ensure accessibility to the Council Chamber.

SPECIAL NOTICE REGARDING PUBLIC PARTICIPATION DUE TO COVID-19

Given the current Shelter-in-Place Order covering the State of California and the Social Distance Guidelines issued by Federal, State, and Local Authorities, the City is implementing the following changes to participate in Council meetings until notified otherwise. The Council chambers will be open to the public but we will be implementing social distancing policies and will limit the number of people who may be in the Council chambers. Face masks are required to attend. We are encouraging residents to participate virtually following the directions below. If you are sick, please do not attend the meeting. Any member of the City Council may participate from a remote location by teleconference.

- The meeting will be webcast and accessed at: https://cityofclovis.com/government/city-council/city-council-agendas/

Written Comments

- Members of the public are encouraged to submit written comments at: https://cityofclovis.com/government/city-council/city-council-agendas/ at least two (2) hours before the meeting (4:00 p.m.). You will be prompted to provide:
  - Council Meeting Date
  - Item Number
  - Name
  - Email
  - Comment
- Please submit a separate form for each item you are commenting on.

SCAN ME

- A copy of your written comment will be provided to the City Council noting the item number. If you wish to make a verbal comment, please see instructions below.
- Please be aware that any written comments received that do not specify a particular agenda item will be marked for the general public comment portion of the agenda.

- If a written comment is received after 4:00 p.m. on the day of the meeting, efforts will be made to provide the comment to the City Council during the meeting. However, staff cannot guarantee that written comments received after 4:00 p.m. will be provided to City Council during the meeting. All written comments received prior to the end of the meeting will be made part of the record of proceedings.

Verbal Comments

- If you wish to speak to the Council on an item by telephone, you should contact the City Clerk at (559) 324-2060 no later than 4:00 p.m. the day of the meeting.

- You will be asked to provide your name, phone number, and your email. You will be emailed instructions to log into Webex to participate in the meeting. Staff recommends participants log into the Webex at 5:30 p.m. the day of the meeting to perform an audio check.

- All callers will be placed on mute, and at the appropriate time for your comment your microphone will be unmuted.

- You will be able to speak to the Council for up to three (3) minutes.

Webex Participation

- Reasonable efforts will be made to allow written and verbal comment from a participant communicating with the host of the virtual meeting. To do so, a participant will need to chat with the host and request to make a written or verbal comment. The host will make reasonable efforts to make written and verbal comments available to the City Council. Due to the new untested format of these meetings, the City cannot guarantee that these written and verbal comments initiated via chat will occur. Participants desiring to make a verbal comment via chat will need to ensure that they accessed the meeting with audio transmission capabilities.

CALL TO ORDER

FLAG SALUTE - Councilmember Ashbeck

ROLL CALL

PRESENTATIONS/PROCLAMATIONS

1. Presentation – Update on Clovis Culinary Center Activity.

Public Comments - This is an opportunity for the members of the public to address the City Council on any matter within the City Council's jurisdiction that is not listed on the Agenda. In order for everyone to be heard, please limit your comments to 5 minutes or less, or 10 minutes per topic. Anyone wishing to be placed on the Agenda for a specific topic should contact the City Manager's office and submit correspondence at least 10 days before the desired date of appearance.

ORDINANCES AND RESOLUTIONS - With respect to the approval of resolutions and ordinances, the reading of the title shall be deemed a motion to waive a reading of the complete resolution or ordinance and unless there is a request by a Councilmember that the resolution or ordinance be read in full, further reading of the resolution or ordinance shall be deemed waived by unanimous consent of the Council.

CONSENT CALENDAR - Items considered routine in nature are to be placed upon the Consent Calendar. They will all be considered and voted upon in one vote as one item unless a Councilmember requests individual consideration. A Councilmember's vote in favor of the Consent Calendar is considered and recorded as a separate affirmative vote in favor of each action listed. Motions in favor of adoption of the Consent Calendar are deemed to include a motion to waive the reading of any ordinance or resolution on the Consent Calendar. For adoption of ordinances, only those that have received a unanimous vote upon introduction are considered Consent items.

2. Administration - Approval - Minutes from the March 15, 2021 and March 22, 2021 Council Meetings.
3. Administration - Approval – Award the Request for Proposals and Approve the Purchase of the Microsoft Enterprise Agreement to Dell.
4. Administration - Approval – Request From Business Organization Of Old Town For Temporary Street Closure of Various Old Town Streets to Hold the Annual Car Show on May 15, 2021.
5. Administration - Receive and File – Community and Economic Development Department July 2020 – December 2020 Report and Department Overview.
6. Finance – Receive and File – Investment Report for the Month of January 2021.
7. Finance – Receive and File – Treasurer's Report for the Month of January 2021.
8. Fire - Approval – Authorizing the City Manager to sign the contractual services agreement with Fresno County Emergency Medical Services Agency for the provision of Fire Department Dispatch Services.
9. General Services – Approval – Res. 21-___, Amending the City's Classification Plan by Revising the Bus Driver and Lead Bus Driver Classifications.
10. General Services - Approval – Res. 21-___, Amending the City's FY 2020-2021 Position Allocation Plan by Deleting One (1) Business Workflow Specialist Position and Adding One (1) Business Workflow Analyst Position.
11. General Services - Approval – Extension of Workers' Compensation Claims Administration Services Contract to Acclamation Insurance Management Services, Inc. (AIMS); and Authorizing City Manager to Execute the Agreement.
12. General Services - Approval – Res. 21-____, Amending the FY2020-21 Transit Budget to add $159,242.48 to purchase Three (3) Braun Vans using State Transit Assistance funds; and Approval - Waive the City's Usual Purchasing Procedures and Authorize the Purchase of Three (3) Braun Vans utilizing the CalACT Competitive Bid Award.
13. General Services - Approval – Res. 21-___, Approving a Side Letter Agreement with Clovis Employees Association to Adjust the Salary Schedule for Recreation Leader; and Authorizing City Manager to Execute Agreement.
14. Planning and Development Services - Approval - Bid Award for CIP 21-01, Rubberized Cape Seal 2021, and; Authorize the City Manager to execute the contract on behalf of the City.

15. Planning and Development Services - Approval – Authorizing City Manager to sign Consultant Service Agreement between Toole Design Group, LLC and the City of Clovis for the 2021 Active Transportation Plan Update.

16. Public Utilities – Approval – Waive formal bidding requirements and authorize the purchase of a Landfill service truck from Pape Kenworth using the Sourcewell Purchasing Contract.

17. Public Utilities – Approval – Waive formal bidding requirements and authorize the purchase of a replacement Streets paint striper from EZ Liner using the Sourcewell Purchasing Contract.

18. Public Utilities – Approval – Bid Award for CIP 20-04 Pasa Tiempo Park Pour-In-Place Rubber Surfacing; Authorize the City Manager to execute the contract on behalf of the City; and Approval – Res. 21-___, amending the 2020-2021 Parks budget to allocate funds for the project.

19. Public Utilities – Approval – Waive formal bidding requirements and authorize the purchase of two commercial front loading refuse trucks and one residential side loading refuse truck from E.M. Tharp Inc., DBA Golden State Peterbilt Western, using the Sourcewell Purchasing Contract.

20. Public Utilities – Approval – Res. 21-___, Declaring the City's Intent to Reimburse Expenditures Related to the Purchase of Police Vehicles from Tax Exempt Lease Purchase Financing; and Authorize the City Manager to Sign the Lease Purchase Agreement and Related Documents.

ADMINISTRATIVE ITEMS- Administrative Items are matters on the regular City Council Agenda other than Public Hearings.

21. Consider Various Actions associated with an existing consultant agreement between the City of Clovis and Kittelson and Associates, Inc. related to analysis and assessment of Vehicle Miles Traveled (VMT).

    a. Consider Approval - Res. 21-___, A request authorizing the City Manager to execute an amendment to an existing consultant agreement between the City of Clovis and Kittelson and Associates, Inc. for additional analysis related to Vehicle Miles Traveled and environmental assessment pursuant to the California Environmental Quality Act.

    b. Consider Approval - Res. 21-___, A request to initiate an amendment to the Circulation Element of the 2014 Clovis General Plan to modify, add, and/or edit policies to ensure compliance with VMT guidelines.

    Staff: Ricky Caperton, Senior Planner / Sean Smith, Supervising Civil Engineer
    Recommendation: Approve

22. Consider Approval – Res. 21-___, Approving the Contract for Harold Eidal as a Contract Extra Help Business Workflow Analyst in Accordance with Government Code Section 21224.

    Staff: Lori Shively, Personnel/Risk Manager
    Recommendation: Approve

COUNCIL ITEMS

23. Consider Approval – Reappointment of Planning Commissioner

Staff: Luke Serpa, City Manager
Recommendation: Approve

24. Consider Approval – Various City Council Committee Appointments.

Staff: Luke Serpa, City Manager
Recommendation: Approve

25. Consider Approval – Change of Council Meeting Schedule.

Staff: Luke Serpa, City Manager
Recommendation: Approve

26. Consider – Authorizing a Letter of Opposition to Proposed Legislation - SB 556 (Dodd) Regarding Attachments to Street Light Poles, Traffic Signal Poles, Utility Poles, and Support Structures.

Staff: Luke Serpa, City Manager
Recommendation: Consider

WORKSHOP - For the Clovis City Council to conduct a workshop to discuss the impact on ongoing City operations during the COVID-19 State of Emergency as declared by the Federal Government, State of California, County of Fresno, and City of Clovis; and to explore actions the City may take in response to the crisis.

27. Update on the American Rescue Plan Act of 2021.

Staff: Andrew Haussler, Community and Economic Development Director
Recommendation: Receive Update

CITY MANAGER COMMENTS

COUNCIL COMMENTS

ADJOURNMENT

MEETINGS AND KEY ISSUES

Regular City Council Meetings are held at 6:00 P.M. in the Council Chamber. The following are future meeting dates:

April 12, 2021 (Mon.) (To Be Cancelled)
April 19, 2021 (Mon.)
May 3, 2021 (Mon.)
May 10, 2021 (Mon.)
May 17, 2021 (Mon.)

CLOVIS CITY COUNCIL MEETING

March 15, 2021 **6:00 P.M.** **Council Chamber**

Meeting called to order by Mayor Bessinger
Flag Salute led by Councilmember Mouanoutoua

Roll Call: Present: Councilmembers Ashbeck, Flores, Mouanoutoua, Whalen
Mayor Bessinger
Absent:

PRESENTATION

6:05 - ITEM 1 - PRESENTATION OF PROCLAMATION DECLARING MARCH 17, 2021 AS SMALL BUSINESS DEVELOPMENT DAY.

Councilmember Mouanoutoua presented a proclamation declaring March 17, 2021 as Small Business Development Day (SBDC) to Rich Mostert, Director, Valley Community SBDC.

6:09 – ITEM 2 - PRESENTATION OF PROCLAMATION DECLARING MARCH 18, 2021 AS TRANSIT WORKER APPRECIATION DAY.

Councilmember Ashbeck presented a proclamation declaring March 18, 2021 as Transit Worker Appreciation Day to Transit Division Staff.

PUBLIC COMMENTS – 6:16

Ashley Chanthaphuang, representing United Health Centers, commented on providing support to the City for either COVID testing or vaccines.

CONSENT CALENDAR – 6:22

Motion by Councilmember Ashbeck, seconded by Councilmember Flores, that the items on the Consent Calendar, except item 8, be approved. Motion carried by unanimous vote.

3. Administration - Approved - Minutes from the March 1, 2021 Council Meeting.
4. Finance – Received and Filed – Investment Report for the Month of December 2020
5. Finance – Received and Filed – Treasurer's Report for the Month of December 2020
6. Finance - Approved - **Res. 21-33**, A Resolution of Intention (ROI) to Annex Territory (Annexation #68) (T6304-Southeast Corner of Barstow and Agua Dulce), to the Community Facilities District (CFD) 2004-1 and to Authorize the Levy of Special Taxes Therein and Setting the Public Hearing for April 19, 2021.
7. General Services – Approved – **Res. 21-34**, Authorizing the Execution of the Certificates of Assurances for the Low Carbon Transit Operations Program (LCTOP), and Submittal of One (1) Project for Fiscal Year 2020-2021.
9. Public Utilities – Received and Filed – Public Utilities Report for January – March 2020.

10. Public Utilities – Received and Filed – Public Utilities Report for April – June 2020.
11. Public Utilities – Received and Filed – Public Utilities Report for July – September 2020.

6:23 - CONSENT CALENDAR ITEM 8 - PLANNING AND DEVELOPMENT SERVICES - APPROVED – FINAL ACCEPTANCE FOR CIP 19-10, SIDEWALK IMPROVEMENTS – W. RIALTO AND VILLA AVENUE.

Assistant City Manager John Holt indicated that there was clerical error on the original staff report and a revised staff report was at the dais. He indicated that staff had used "Bid Award" in the subject line of the staff report when it should have been "Final Acceptance" and that the remainder of the report was correct. There being no public comment, Mayor Bessinger closed the public portion. Discussion by the Council. Motion by Councilmember Ashbeck, seconded by Councilmember Flores, for the Council to approve the final acceptance for CIP 19-10, Sidewalk Improvements – W. Rialto and Villa Avenue. Motion carried by unanimous vote.

PUBLIC HEARINGS

6:26 – ITEM 12 – CONTINUED - ITEMS ASSOCIATED WITH THE ESTABLISHMENT OF OBJECTIVE STANDARDS FOR SINGLE FAMILY RESIDENTIAL DEVELOPMENT. (CONTINUED FROM THE MARCH 1, 2021 MEETING. STAFF IS RECOMMENDING THIS ITEM BE CONTINUED TO A DATE UNCERTAIN TO ALLOW FURTHER REVIEW) - ITEM 12a. CONTINUED – RES 21-XX, A REQUEST TO ADOPT OBJECTIVE SINGLE FAMILY RESIDENTIAL DESIGN AND DEVELOPMENT STANDARDS; AND ITEM 12b. CONTINUED – ORD 21-XX, A REQUEST TO AMEND THE STANDARDS OF THE R-1-MD (SINGLE FAMILY RESIDENTIAL MEDIUM DENSITY) ZONE DISTRICT AND THE GENERAL PROPERTY DEVELOPMENT AND USE STANDARDS RELATED TO PARKING FOR SINGLE FAMILY RESIDENTIAL USES.

Mayor Bessinger indicated that this item was continued from the March 1, 2021 council meeting, and staff is recommending that this item be continued to a date uncertain. Mike Prandini, representing the Building Industry Association, spoke in support of the continuance. Discussion by the Council. Motion by Councilmember Ashbeck, seconded by Councilmember Flores, for the Council to continue the item to a date uncertain. Motion carried by unanimous vote.

6:28 ITEM 13 - APPROVED - **RES. 21-35**, A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CLOVIS APPROVING THE ISSUANCE AND SALE OF LEASE REVENUE BONDS BY THE CLOVIS PUBLIC FINANCING AUTHORITY TO PROVIDE FINANCING FOR THE LANDMARK SQUARE PROJECT GENERALLY LOCATED ON THE NORTHEAST CORNER OF CLOVIS AVENUE AND THIRD STREET, AND APPROVING RELATED DOCUMENTS AND OFFICIAL ACTIONS.

Councilmember Flores indicated that he owns property adjacent the project and would abstain from consideration of the item and left the dais at 6:28.

Finance Director Jay Schengel presented a report on a request to approve a resolution authorizing documents and official actions relating to authorizing the Clovis Public Financing Authority to issue and sell lease revenue bonds to provide financing for the Landmark Square Project. The City of Clovis is in the process of constructing a senior activity center building, transit station building, and all utilities and surface improvements onsite and offsite related to the Landmark Square Project located at 735 and 785 Third Street in Clovis (located generally on the northeast corner of Clovis Avenue and Third Street). The site work completed with this project will also accommodate the future development of a new Clovis Branch of the Fresno County Library. Total estimated cost of the Landmark Square Project is $20 million, of which $14 million will be bond financed. This action approves the financing of these improvements through the sale of lease revenue bonds. Annual debt service from the general fund is approximately $716,000. The lease revenue bonds are payable over a term of 30 years. Estimated total payment amount calculated to the final maturity of the lease revenue bonds is approximately $21.2 million.

There being no public comment, Mayor Bessinger closed the public portion. Discussion by the Council. Motion by Councilmember Ashbeck, seconded by Councilmember Mouanoutoua, for the Council to approve a resolution authorizing documents and official actions relating to authorizing the Clovis Public Financing Authority to issue and sell lease revenue bonds to provide financing for the Landmark Square Project. Motion carried 3-1-0-1 with Councilmember Whalen voting no, and Councilmember Flores abstaining.

ADJOURNMENT TO THE CLOVIS PUBLIC FINANCING AUTHORITY MEETING

Mayor Bessinger adjourned to the Clovis Public Financing Authority at 6:53.

14. AGENDA ITEM 14 WAS HEARD CONCURRENTLY WITH ITEM 13 ABOVE. PLEASE REFER TO SEPARATE AGENDA ATTACHED FOR THE CLOVIS PUBLIC FINANCE AUTHORITY.

ADJOURNMENT TO THE CLOVIS CITY COUNCIL MEETING

ADMINISTRATIVE ITEMS

7:08 ITEM 15 - APPROVED – **RES. 21-36**, APPROVING THE CONTRACT EXTENSION FOR SHELLI VINSON AS A CONTRACT EXTRA HELP FIRE INSPECTOR II IN ACCORDANCE WITH GOVERNMENT CODE SECTION 21224. (CONTINUED FROM THE MARCH 1, 2021 MEETING)

General Services Director Shonna Halterman presented a report on a request to approve extending the contract of Shelli Vinson, a CalPERS retired annuitant, in accordance with Government Code Section 21224 as a contract extra-help Fire Inspector II for state-mandated inspections, new construction evaluations and Prevention Bureau projects. The General Services Department requests authority to utilize the exception provided in Government Code Section 21224 to extend the contract for a retired CalPERS employee for a limited duration, not to exceed one additional year, to fulfill the state requirement for mandated inspections, assist in new construction evaluation and other prevention related projects within the Fire Department.

There being no public comment, Mayor Bessinger closed the public portion. Discussion by the Council. Motion by Councilmember Whalen, seconded by Councilmember Flores, for the Council to approve a resolution extending the contract of Shelli Vinson, a CalPERS retired annuitant, in accordance with Government Code Section 21224 as a contract extra-help Fire Inspector II for state-mandated inspections, new construction evaluations and Prevention Bureau projects. Motion carried by unanimous vote.

7:11 ITEM 16 - APPROVED - **RES. 21-37**, A RESOLUTION ACCEPTING AND AUTHORIZING THE SUBMISSION OF THE 2020 GENERAL PLAN ANNUAL REPORT, INCLUDING THE 2020 HOUSING ELEMENT ANNUAL PROGRESS REPORT TO THE GOVERNOR'S OFFICE OF PLANNING AND RESEARCH AND THE CALIFORNIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

City Planner Dave Merchen and Associate Planner Lily Cha presented a report for the City Council consider approval of a resolution to accept the 2020 General Plan Annual Progress Report, including the Housing Element Annual Progress Report, and provide authorization to submit the report to the California Department of Housing and Community Development (HCD) and the Governor's Office of Planning and Research (OPR). Each year the City is required to submit an annual progress report (APR) reflecting its progress in implementing the General Plan (California Government Code Section 65400). The key component of the APR is the Housing Element portion, which must include specific data in a specific format defined by HCD. This Housing Element Annual Report documents the progress made by the City in implementing policies adopted as part of the 2015-2023 Housing Element. While the APR for the remainder of the General Plan must be submitted, there are no mandatory evaluation or submittal requirements. The State requires jurisdictions to consider the APR at a public meeting of the City Council and to accept written and oral comments prior to submitting its APR.

There being no public comment, Mayor Bessinger closed the public portion. Discussion by the Council. Motion by Councilmember Whalen, seconded by Councilmember Ashbeck, for the Council to approve a resolution to accept the 2020 General Plan Annual Progress Report, including the Housing Element Annual Progress Report, and provide authorization to submit the report to the California Department of Housing and Community Development and the Governor's Office of Planning and Research. Motion carried by unanimous vote.

7:44 – ITEM 17 - APPROVED – RES. 21-38, A RESOLUTION APPROVING THE ANNUAL REVIEW AND UPDATE TO THE REGIONAL HOUSING NEEDS (RHN) OVERLAY DISTRICT MAP OF PARCELS AND ASSOCIATED LIST REFLECTING THOSE PARCELS THAT QUALIFY FOR DEVELOPMENT AS AN RHN OVERLAY PROJECT

Councilmembers Ashbeck and Mouanoutoua indicated they would recuse themselves from consideration on this item due to a potential conflict of interest based on their personal property being located adjacent some of the sites under consideration and left the dais at 7:44.

City Planner Dave Merchen presented a report to the Council to consider adopting a resolution approving the annual review and update to the RHN Overlay District. In November of 2018, the City Council adopted Ordinance Amendment 2018-03 establishing

the RHN (Regional Housing Needs) Overlay District to the Clovis Municipal Code to address requirements from State Department of Housing and Community Development (HCD) with regard to the City's Regional Housing Needs Allocation (RHNA). In November of 2019, the Council adopted revisions and clarifications to the RHN Overlay District ordinance, including language stating that the RHN Overlay map and list of sites will be reviewed and updated annually in conjunction with the Council's consideration of the Housing Element Annual Progress Report. In conjunction with the annual review, staff has identified five (5) sites which should be removed because they have been built or are under construction for non-RHN qualifying projects. Several additional sites are at some stage of the entitlement process for non-RHN qualifying projects. The addition of six (6) new sites is recommended to ensure that the City's RNHA obligation will continue to be met.

There being no public comment, Mayor Bessinger closed the public portion. Discussion by the Council. Motion by Councilmember Whalen, seconded by Councilmember Flores, for the Council to approve a resolution approving the annual review and update to the Regional Housing Needs (RHN) Overlay District map of parcels and associated list reflecting those parcels that qualify for development as an RHN Overlay project. Motion carried 3-0-0-2 with Councilmembers Ashbeck and Mouanoutoua abstaining.

WORKSHOP 8:14

City Manager Luke Serpa updated council on recent numbers from the state and county regarding the pandemic.

Mayor Bessinger adjourned the meeting of the Council to March 22, 2021

Meeting adjourned: 8:25 p.m.

_____ Mayor

_____ City Clerk

CLOVIS PUBLIC FINANCING AUTHORITY

Meeting called to order by Chairperson Bessinger at 6:50.

ADMINISTRATIVE ITEMS- Administrative Items are matters on the regular Clovis Public Finance Authority (CPFA) Agenda other than Public Hearings.

1. CONSIDER APPROVAL – **CPFA RES. 21-01**, A RESOLUTION OF THE BOARD OF DIRECTORS OF THE CLOVIS PUBLIC FINANCING AUTHORITY AUTHORIZING THE ISSUANCE AND SALE OF LEASE REVENUE BONDS TO PROVIDE FINANCING FOR THE LANDMARK SQUARE PROJECT GENERALLY LOCATED ON THE NORTHEAST CORNER OF CLOVIS AVENUE AND THIRD STREET, AND APPROVING RELATED DOCUMENTS AND OFFICIAL ACTIONS.

   Finance Director Jay Schengel presented a report on a request to approve a resolution of the Board of Directors of the Clovis Public Financing Authority authorizing the issuance and sale of lease revenue bonds to provide financing for the Landmark Square Project generally located on the northeast corner of Clovis Avenue and Third Street, and approving related documents and official actions. The City of Clovis is in the process of constructing a senior activity center building, transit station building, and all utilities and surface improvements onsite and offsite related to the Landmark Square Project located at 735 and 785 Third Street in Clovis. The site work completed with this project will also accommodate the future development of a new Clovis Branch of the Fresno County Library. Total estimated cost of the Landmark Square Project is $20 million, of which $14 million will be bond financed. This action approves the financing of these improvements through the sale of lease revenue bonds. Annual debt service from the general fund is approximately $716,000. The lease revenue bonds are payable over a term of 30 years. Estimated total payment amount calculated to the final maturity of the lease revenue bonds is approximately $21.2 million.

   There being no public comment, Chairperson Bessinger closed the public portion. Discussion by the Board. Motion by Boardmember Ashbeck, seconded by Boardmember Mouanoutoua, for the Board to approve a resolution of the Board of Directors of the Clovis Public Financing Authority authorizing the issuance and sale of lease revenue bonds to provide financing for the Landmark Square Project generally located on the northeast corner of Clovis Avenue and Third Street, and approving related documents and official actions. Motion carried 3-1-0-1 with Boardmember Whalen voting no, and Boardmember Flores abstaining.

ADJOURNMENT TO THE CLOVIS CITY COUNCIL MEETING
7:53

CLOVIS CITY COUNCIL SPECIAL MEETING

March 22, 2021 **6:00 P.M.** **Council Chamber**

Meeting called to order by Mayor Bessinger
Flag Salute led by Councilmember Whalen

Roll Call: Present: Councilmembers Ashbeck, Flores, Mouanoutoua, Whalen
Mayor Bessinger
Absent: None

1a. 6:01 p.m. - APPROVED – **RES. 21-39**, DECLARING THE RESULTS OF THE MARCH 2, 2021 ELECTION

City Clerk John Holt presented a report on a request to approve a resolution declaring the results of the March 2, 2021 Election. The official canvass of ballots for the March 2, 2021 City of Clovis General Municipal Election was conducted March 2 – 17, 2021 by the Fresno County Registrar of Voters. The canvass has been completed in accordance with the California Elections Code. Attached to the staff report was a resolution declaring the results of the election and a copy of the Fresno County Registrar of Voters Statement of Votes Cast certifying the results. There being no public comment, Mayor Bessinger closed the public portion. Discussion by the Council. Motion by Councilmember Whalen, seconded by Councilmember Flores, for the Council to approve a resolution declaring the results of the March 2, 2021 Election. Motion carried by unanimous vote.

1b. 6:12 - OATH OF OFFICE: COUNCILMEMBERS ASHBECK AND MOUANOUTOUA BY CITY CLERK

City Clerk John Holt swore in Councilmembers Ashbeck and Mouanoutoua.

1c. 6:15 - ELECTION OF MAYOR BY CITY COUNCIL.

Motion by Councilmember Ashbeck, seconded by Councilmember Mouanoutoua, for the Council to select Mayor Pro Tem Flores as Mayor. Motion carried by unanimous vote.

1d. 6:25 - ELECTION OF MAYOR PRO TEM BY CITY COUNCIL.

Motion by Councilmember Ashbeck, seconded by Councilmember Bessinger, for the Council to select Councilmember Ashbeck as Mayor Pro Tem. Motion carried by unanimous vote.

1e. 6:40 - PRESENTATION OF GAVEL TO OUTGOING MAYOR WHALEN

Mayor Flores presented outgoing Mayor Bessinger with a plaque.

1f. 6:44 - COUNCIL COMMENTS / INTRODUCTIONS BY MAYOR AND COUNCILMEMBERS

All councilmembers commented on the election and vision for the future of Clovis.

Mayor Flores adjourned the meeting of the Council to April 5, 2021

Meeting adjourned: 6:55 p.m.

_____ _____

Mayor City Clerk

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Administration

DATE: April 5, 2021

SUBJECT: Administration - Approval – Award the Request for Proposals and Approve the Purchase of the Microsoft Enterprise Agreement to Dell.

CONFLICT OF INTEREST
None

RECOMMENDATION
That the Council award the RFP and approve the purchase of the Microsoft Enterprise Agreement to Dell Marketing L.P. for $236,803.27.

EXECUTIVE SUMMARY
In order to remain in compliance with federal and state licensing laws, the City must renew its Microsoft Client Access Licensing Agreement. Microsoft offers Enterprise Agreement (EA) levels of licensing for three-year terms through specified vendors. The three-year term provides for a more flexible, consistent and overall lower-cost option for Microsoft licensing.

There are ten (10) vendors certified by Microsoft as Large Volume Resellers (LVR) for California State and Local Government from which the City could purchase from. Staff requested proposals from the vendors using the City's online bidding system and received four (4) responses. Staff is recommending that the City Council approve the purchase of the Microsoft Enterprise Agreement to Dell Marketing L.P.

BACKGROUND
As computer systems were introduced into the City, the decision was made to standardize on the Microsoft operating system and Microsoft-compliant applications. This has allowed the City to take advantage of the industry-standard applications that have been developed for the Microsoft platform.

As systems become more complex and integrated into the City's processes, managing the various support agreements and licensing requirements also becomes more complex. With the number of users and computers City-wide, the City qualifies for the volume licensing levels Microsoft offers with three-year Enterprise Agreements (EA) through specific vendors certified

as Large Volume Resellers (LVR) for California State and Local Government. These agreements provide for more flexible and lower-cost solutions than purchasing licenses individually, as well as help to manage Microsoft licensing and assurance that the City will remain in compliance through a single agreement.

Staff developed and issued a Request for Proposals for Microsoft Enterprise Agreement (EA) that would cover legal requirements for each employee with the Microsoft Office 365 Client Access License (CAL) as well as other core CALs/system licensing for Windows Server Data Center, Windows Desktop Enterprise edition and SQL Server to cover the City's use of these systems in our environment.

A total of four (4) proposals were received as follows:

Vendor Name	Year 1 Amount	Three-year Total (with no changes)
Dell Marketing L.P.	$236,803.27	$710,409.81
Crayon Software Experts	$237,799.81	$713,399.43
Software House International (SHI) Corp.	$244,716.23	$734,148.69
Zones, Inc.	$302,611.52	$907,834.56

The cost of purchasing the Microsoft EA volume licenses has increased since our last three-year renewal due to Microsoft moving to a subscription model for most of its software. This change to subscriptions is consistent with the enterprise software industry as a whole. Staff is recommending the City enter into the three-year Microsoft Enterprise Licensing Agreement with Dell Marketing L.P for $236,803.27 per year for three years.

FISCAL IMPACT
The cost of purchasing the Microsoft EA volume licenses is included in the I.T. Division budget for fiscal year 2020-2021.

REASON FOR RECOMMENDATION
The City is required by State and Federal law to properly license the software used on City desktop computers and servers. The Microsoft EA volume license is the most appropriate and cost effective program. Dell Marketing L.P. submitted the lowest cost proposal.

ACTIONS FOLLOWING APPROVAL
The City will enter into a contract with Dell to provide Microsoft EA licensing and coverage.

Prepared by: Jesse Velez, Deputy Director, Information Technology

Reviewed by: City Manager JH

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Administration

DATE: April 5, 2021

SUBJECT: Administration - Approval – Request From Business Organization Of Old Town For Temporary Street Closure of Various Old Town Streets to Hold the Annual Car Show on May 15, 2021.

ATTACHMENTS: None

CONFLICT OF INTEREST
None

RECOMMENDATION
That the City Council approve the request from Business Organization of Old Town (BOOT) for temporary street closure of various Old Town streets to hold the annual car show on May 15, 2021.

EXECUTIVE SUMMARY
This event was originally scheduled for April 17 and was approved by Council as part of the annual street closure request on February 8, 2021. Due to the restrictions related to COVID-19, the organizers of this event found it necessary to reschedule the event to a later date. The street closure request is conditioned upon both state and county health departments allowance for such events for the planned May 15, 2021 event.

BACKGROUND
As part of the 2021 street closure request, Council approved the ability for the approval of street closures with less than 60-days' notice, as required in section 5.20.04 of the Clovis Municipal Code (Old Town Special Events). Since all other advanced processing has been completed, staff is confident that this should not cause unnecessary issues.

FISCAL IMPACT
The City of Clovis is positively impacted by the proposed events. Local businesses benefit from large numbers of people visiting their neighborhood and the City of Clovis benefits from the increased tax revenue.

REASON FOR RECOMMENDATION
On February 8, 2021, City Council approved the 2021 street closures as related to special events. As part of this, Council approved the ability for staff to reschedule an event and request alternate dates for closure. Requests of this nature may be made with less than 60-days' notice, as required in section 5.20.04 of the Clovis Municipal Code (Old Town Special Events). Since all other advanced processing will have been completed, staff is confident that this should not cause unnecessary issues. These changes are only considered for the events approved on February 8. This event was part of that list.

ACTIONS FOLLOWING APPROVAL
1. Staff will notify the applicant following of the Council's decision.

2. Staff will work with the applicant to assure that adequate security and cleanup of the event is provided.

3. Staff will notify all residents, business owners and property owners of the date change.

Prepared by: Shawn Miller, Business Development Manager

Reviewed by: City Manager

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Administration

DATE: April 5, 2021

SUBJECT: Administration - Receive and File – Community and Economic Development Department July 2020 – December 2020 Report and Department Overview.

ATTACHMENTS: 1. Economic Indicators Summary
2. Economic Development Metrics

The Community and Economic Development Department has had an odd year thus far for fiscal year 2020-21. The economy in Clovis saw continued growth and affordable housing programs moved forward. The City had the significant economic expansion continue from 2018-19 while the COVID-19 pandemic caused unprecedented economic disruptions. Many projects that staff began working on in 2014-15 are now coming to fruition with construction being completed. During the continued hospital expansion, a new factory was completed, one hotel neared completion, vacant big retail space was filled by Hobby Lobby, and numerous other small businesses moved forward in Clovis Industrial Parks. While this is a banner year for growth in Clovis, the COVID-19 pandemic brought with it an unprecedented challenge and impacted our economy in many ways. An economic indicator snapshot is included as Attachment 1 and details the best of times and worst of times reality that the Clovis economy is experiencing.

Economic Development Division

The full Economic Development Metrics showing the results of the Department's economic development efforts are attached as Attachment 2. These metrics are used by staff to manage and allocate resources to ensure that the City is engaging in a robust economic development effort. Below are highlights during the reporting period.

Business Retention and Expansion Efforts

Staff continued efforts to reach out and visit our local businesses. Staff responded to at least 2,000 e-mails and took an estimated 1,000 phone calls answering business related questions on the COVID-19 restrictions during the time period. Staff also increased engagement on-site to help businesses manage and ensure that every business understood the requirements. Visits increased to a point that it is hard to quantify how much time and effort was spent supporting businesses during the various shelter in place orders and subsequent reopening/closing orders. Staff also quickly shifted to communicate in mass and started developing interactions with businesses through various digital means, seeing 800% increases in these mediums, the digital e-mail medium had 30,706 businesses open, read, and engaged on news updates from the City during the time frame. This equated to almost a 40% open/click rate, much above industry average of 10%, showing the value of the communication to the business community. The economic development website also became a critical tool to communicate with 2,849 visits to the page. In order to be effective, staff leaned on deep relationships developed over the years with the business community which created an environment of trust and partnership. Below are a few examples of the work completed.

California Health Sciences University Expands Retained

Staff has been working with the California Health Sciences University on its decision to permanently locate in Clovis. The School purchased 80+/- acres in the Clovis Research and Technology Park and announced its decision to construct a school to serve 2,000 students with approximately 400 staff in the spring of 2016. The School also announced the establishment of a full medical school and broke ground on the first 90,000 square foot building in 2018 that was completed in the spring of 2020.

COVID-19 Information Portal Consistently Updated

Staff developed a website to share information on the status of COVID-19 and its impact on businesses in Clovis as well as resources to assist. This website increased traffic by 1,000% on the City's economic development website and digital newsletters had such a huge increase in subscribers as well as the actual use of those newsletters was astounding. Staff worked hard to provide concise, timely, and accurate information so business owners could make decisions, adjust, and access resources. It has become a go-to resource for clear and simple guidance in a very confusing set of operating conditions. Over 30,706 e-mails from the City with details on changes in restrictions and aid programs have been read thus far.

Business Pivot Program Launched and Supported

When it became apparent many businesses would not survive unless they were allowed to operate outdoors, a program was developed to allow outdoor uses that are not typical. Staff supported businesses in doing this safely and even provided equipment when needed to make it happen. Staff has heard from the business community of the appreciation of the support they received in figuring out how to survive during this time as many types of businesses were forced outside. Staff also partnered with the Clovis Chamber of Commerce to distribute free PPE items to local businesses, and staff presented at various digital venues on help and opportunities available.

Business Attraction Efforts

Staff leaned on deep relationships made in previous years to continue attraction efforts while travel and in-person meetings were not available. These relationships are critical to better understanding the market and getting brokers the information needed to sell Clovis.

The City is actively working with the real estate community to understand rapidly changing demands in the market due to the recession and major disruption the community has experienced in order to best position the City for future growth as markets begin to recover. Despite the difficult conditions, success was due to these efforts. Some examples and updates are below:

Retail – Hobby Lobby & Raising Cane's

At ICSC Los Angeles in the Fall of 2019, staff met with retail property managers and built relationships with them. Strategies were discussed on how to fill vacancies and how the City could assist in the effort. Staff met with Hobby Lobby representatives and used the relationships with property owners to connect the retailer to opportunities in Clovis. The store took over a closed Toys-R-Us and opened in the Summer of 2020. In addition, a reuse of the closed Pier One was connected with a new user, Raising Cane's. The restaurant will begin improvements in the Spring of 2021.

Professional/Industrial

The Dry Creek Industrial Park, Phase II continues to enjoy significant demand. About 70% of the lots have sold and the first group of offices have opened with more under construction.

At the Clovis Industrial Park, it was announced that the County of Fresno will be taking over some of the Schneider Electric buildings and increasing the number of employees in the park. Cook Land Company pulled permits in a very expeditious manner to improve building 7 and the first County employees began moving into the park. In addition, Diversified Development Group received entitlements to construct nearly 400,000 square of industrial space in the park and is now going through improvements. The old Winery property at Clovis and Dakota Avenues has been marketed and is receiving interest from job producing uses. Entitlements were approved during the time frame and construction is set to begin in the Fall of 2021.

Tourism

Tourism took a major hit during the pandemic and staff is monitoring and supporting large scale events so they can come back when it is safe. Staff will continue working with the Clovis Chamber of Commerce, BOOT, and CUSD to bolster the major events they manage. These events bring a significant number of additional tourists to showcase Clovis and a focus on bringing them back when safe will be a focus.

Housing and Grants Division

The City's affordable housing programs are providing a critical resource for our community. Below are some highlights from the division. Clovis received an additional $1,200,000 in CDBG-CV funds for the purpose of addressing COVID-related issues in the community. Staff in multiple departments were consulted as to how to best utilize these funds. After consultation and approval by City Council, two new programs were implemented for low-income households affected by COVID, as follows:

- A budget of $300,000 was allocated and was fully expended by the Clovis Cares for Seniors Program. The program provides one meal per week from a local restaurant to seniors isolating at home because they are at risk of contracting COVID-19. This program not only provides assistance to seniors, but as a secondary benefit, it provides payment for service to local restaurants at a time when they have had a sharp decrease in business due to COVID.

- A budget of $1,000,000 was allocated and fully expended by the Emergency Housing Payment Program. The program provides rent/mortgage payment assistance to low-income households that have suffered a COVID-19-related income loss. This program not only provides much needed financial assistance to low-income households who have had a COVID-related income loss and are struggling to afford their monthly rent or mortgage payments, it also provides (through the tenants) landlords and property owners with the funds necessary to continue paying the costs associated with the home.

These programs have been fully implemented 220 households with served with emergency rental assistance as well as over 20,000 seniors were served with meals.

Home Rehabilitation Grant Program:

Before having to temporarily suspend the program due to COVID, staff was able to assist 15 households through the program.

First-Time Homebuyer Programs

Clovis received a new award of $1,000,000 from CA HCD to continue funding the First-Time Homebuyer Program, and staff is awaiting the award contract from HCD. The state has provided set-up documents and it is expected this program will launch in the summer of 2021.

Affordable Housing Development

Clovis provided $1,000,000 through the City's Affordable Housing Production Impact Fee Reduction program to the Fresno Housing Authority for their 60-unit apartment complex being constructed in Clovis at the NEC of Willow and Alluvial Avenues. The apartments will be reserved for low-income households and is expected to be complete in Spring of 2021.

Training
Staff took advantage of virtual training during the time period and achieved several certifications or are currently working towards them. This course work requires testing and peer reviews to ensure that the expertise being certified has been obtained. This effort positions staff to be nimble in responding to the changing conditions and guiding Clovis through this disruptive time. These include:

- Shawn Miller
    - *Revitalization Professional Credential* from the Main Street America Institute (underway).
    - *Entrepreneurship-led Economic Development Certificate* from the International Economic Development Council (underway).

- Andy Haussler
    - Achieved the *Accredited California Economic Developer* from the California Association for Local Economic Development. Only 60 professionals in the state have this designation.
    - Achieved the *Certified Economic Developer Accreditation* from the International Economic Development Council. Only 1,100 professionals globally have this designation.

Prepared by: Andy Haussler, Community and Economic Development Director

Reviewed by: City Manager

ATTACHMENT 1
Overall Economic Indicators:

One of the largest economic shocks to hit the United States' economy in March of 2020. The Covid-19 pandemic required many if not most businesses to shut-down for an extended period of time and at the writing of this it is uncertain when all businesses will be able to reopen. This report represents a time period of some the hardest closures and deepest impacts on the economy to date in addition ti a historic natural disaster of the Creek Fire impacting the region. There are many unknowns at this time as to the depths of the impact and what economic activity will return to previous levels, the impact has been extremely varied with many businesses have strong results and many having disastrous results during the reporting period.

The City's economy was robust in January of 2020 with record low unemployment, wage gains being made, and job generating development continuing at a robust pace. The sudden nature of the economic downturn leaves no playbook or historical events to understand what the impacts will be on a global, national, and local level. Clovis businesses have been creative and innovative in coming up with ways to survive while keeping the community safe and the City has played a critical role in providing accurate information to assist. In addition the Clovis as a community to help those in need during the Creek Fire as Clovis became a place of refuge during this heart breaking event. The long-term impact of the Creek Fire on the area remains to be seen as impacts on tourism and other industries are assessed.

Job Market

The City continued to enjoy higher per capita income than Fresno County as a whole with $38,165 compared to $25,260 in Fresno County. This was an increase over 2019-20 of $7,175 likely due to a stimulus provided during the time frame and a change in methodology by the U.S. Census . This results in a median household income of $89,398. The City also maintained higher education levels with 93% of the City's adult residents having a high school diploma or higher (a 2% increase over the prior year), this is 15% higher than Fresno County and 12% higher the State of California.

Total payroll for the City of Clovis reached $1.42 billion with 35337 35,621 total employees on payroll in the City in 2020-21. The number of jobs decreased by 284 from 2019-20 but this is less than was expected due to layoffs and furloughs associated with the pandemic. The jobs-housing balance is .80 jobs per a residence. Most of the jobs lost during this have been in the service sector and it is hoped they will be recovered. During the time period a number of professional and manufacturing jobs were added helping to offset overall job losses. More jobs need to be added to the community to reach the 1:1 goal for the jobs-housing balance.

The City has issued 338 new business licenses, this is on track with our historic average of 700 new business licenses per a year.

The unemployment rate dropped to 6.7% in December of 2020 from 12.2% in June of 2020 12.2% but in context the rate was 3.2% in February of 2020. Clovis is still better than the County (10.4%) but and has dropped below the Nation (8.8%).

Development

Commercial construction has dropped off significantly. The total permits pulled for construction or improvement of commercial and industrial space was $9,709,635 in valuation. The square footage constructed or improved equaled 203,558. This outs the City on track to only reach 20% of levels seen in 2018-19. Much of this drop can be attributed to COVID-1 but the City did have historic highs as many projects came to fruition in that year. Interest in commercial is growing and beginning to show signs of life but will take time to recover as projects take years to develop and credit markets are more confident in financing these projects. 565 housing units were added to the City. Despite the closures residential construction has increased and several more projects are on the horizon.

Tax Revenue

Sales tax revenues increased slightly in comparison to 2019-20, a key indicator of the retail sector's health. The shelter in place orders inject volatility into to the retail market due to both shelter in place limitations, national level closures, and supply chain disruptions. Some retailers have thrived during this time and have had historic levels of growth producing a very uneven results. It is expected without the recent additions of Cabinet Connections factory, Costco, At Home, Hobby Lobby, and other retailers the City will be able to see retail grow in the City but it will be evolving rapidly. The shelter-in-place orders pushed the on-line market transformation further and faster than expected. Sales tax will be a very volatile revenue stream for the City with employment, stimulus, on-line shifts, and retail investments all making impacts at the same time, and changing daily.

Summary

The indicators represent a City that had a robust economy growing at historic rates and then a crash that could have never been imagined. It is hoped that a rebound in economy will occur but it will take time to recover from this level of shock. This is out of the City's control and the City has done everything possible to support businesses while ensuring the safety of its residents. In every economic downturn or disruption opportunities for a new business to start will present themselves, this time will be no different. The City has jumped into the gap in as many was as possible with credible information, purchasing meals to support seniors and restaurants, and assistance with residents' rent or mortgages payments, and getting the word out that Clovis businesses need support now more than ever. With the opportunities coming in the future and the resiliency of our community the Clovis economy will recover and once again thrive.

ATTACHMENT 2

ED Strategy Metrics
RESULTS JULY 1, 2020 – December 30, 2020

Strategy 1: Business Retention and Expansion

Action	Measurement	Results (July 2020 – December 2020)
Create and maintain relationships		

Business Visitations – Goal is 25 businesses per month (300 per year)	• Number of businesses visited
	• Content of contact
	  ○ Number for problem solving
	  ○ Number for site visit
	  ○ Number for information sharing
		225
		
		2,849 (via digital means)
		225
		2,849 (via digital means)

Provide information & education		
• Quarterly e-newsletter	• Number of businesses on mailing list • Number of opened newsletters	2,849 30,706
• Workshops/Trainings	• Number of trainings made available	6
• Clovis4business.com	• Use metrics	2,612 Visits
Recognize and appreciate businesses		

• Annual event	• Event held
	  ○ Number of businesses in attendance
	  ○ Report media coverage
		Conducted one-on-one meetings 9 times, numerous phone conversations, presented at Chamber events larger events planned cancelled due to COVID-19.

Strategies 2, 3, 4, and 5: Business Attraction (Industrial, Commercial Retail, Commercial Office)

Action	Measurement	Results (July 2020 – December 2020
Market Clovis to attract new businesses – Goal is to contact 20 businesses per cluster per year (100 prospective businesses total per year)	• Number of marketing pieces distribute per cluster/Number of Conversations • Number of new businesses in Clovis	Cluster Contact Conversation Health 3 3 Manufacturing 2 2 Information 0 0 Tourism 2 2 Water Tech 0 0 Education 4 4 Retail 4 4 Total 15 15=30 338 new business licenses
Develop relationships with commercial/industrial brokers	• Host annual broker meeting o Number of brokers in attendance • Number of conversations with brokers • Staff attendance at brokerage company meetings	Conducted one-on-one meetings 9 times. Also sponsored Clovis Chamber of Commerce virtual events on a monthly basis.
Maintain an adequate supply of commercial and industrial available property	• Benchmark and measure commercial and industrial site acreage/square footage o Available o Utilized ▪ Business type and number of jobs ▪ Commercial building permits ▪ Valuation	Commercial SQ Ft 52,051 Commercial Acreage 53 Industrial SQ Ft 30,000 Industrial Acreage 2.47 Com/Ind Permit Value: $9,709,635 Com/Ind Permit SQ FT: 213,558
Achieve and maintain a Jobs/Housing Balance ratio of 1:1	Calculate the Jobs Housing/Balance annually	.80 jobs per a residence

Strategy 2: Business Start-ups

Action	Measurement	Results (July 2020 – December 2020
Assist in the development of new businesses	• Website metrics • Number of business licenses for new businesses	2,612 Visits visits 338 new business licenses
Host events for entrepreneurs	• Events held ○ Number of attendees	Commercial Kitchen (20)

Strategy 6: Tourism

Action	Measurement	Results (July 2020 – December 2020
Host events that bring people to Clovis	Track attendance for all major events	0
Work with hotels to increase the number of travelers who stay overnight in Clovis	Track TOT and occupancy rates for all hotels	50% Occupancy 5% TOT Increase
Provide information to visitors to Clovis and those thinking about visiting	Benchmark and report statistics from Tarpey Depot • Number of visitors • Number of fulfillment packets • Number of groups	 0 0 0
Use visitclovis.com as the information portal for visiting Clovis	Metrics from VisitClovis.com	5,725 visitors

Strategy 7: Workforce

Action	Measurement	Results (July 2020 – December 2020
Identify workforce needs of Clovis businesses	• Use EDD Data to benchmark and monitor number of jobs in Clovis by industry	Jobs data analyzed by employer and sector. Significant growth in professional services, medical, and construction.
Conduct employer survey of training needs	• Number of businesses surveyed ○ Number of businesses connected to employee training opportunity	Staff has met with major employers and is working to make connections with programs to assist in training
Seek higher education programs to meet employer need	• Number of meetings with educational facilities	4

Affordable Housing Programs

Program	Goal	Results (July 2020 – December 2020
Home Rehabilitation Grant Program	Assist 50 low-income owner-occupants	58 completed
Emergency Housing Assistance	Provide funds to impacted families	Assisted 220 households with COVID-related income loss with 3 months of rent.
Affordable Housing Development	2 additional lots for sold to Habitat for Humanity in the Stanford Addition. 60-unit apartment complex at Willow and Alluvial for the Fresno Housing Authority. 75 Unit Supportive Housing complex at Willow and Holland	2 homes under construction $1,000,000 in impact fee credits were provided to the Housing Authority. Construction has begun and is estimated to be completed in spring 2021. 59 of the 60 units will be rented to low-income households. Assisting with permits and financing. Expected to begin construction in the spring of 2021.

Grants Status

Program	Amount	Status
CDBG 2018-19	$744,970	Completed
CDBG 2019-20	$741,062	Underway
CDBG 2019-20 CARES ACT - COVID	$1,100,000	Completed
CDBG 2020-21	$750,024	Underway
HOME First-Time Homebuyer Program	$1,000,000	Awarded
CALHOME Rehabilitation Funds	$5,000,000	Applied
Total	$8,236,056	

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Finance Department

DATE: April 5, 2021

SUBJECT: Finance – Receive and File – Investment Report for the Month of January 2021.

ATTACHMENTS:
1. Distribution of Investments
2. Monthly Investment Transactions
3. Certificates of Deposit
4. Municipal Securities
5. Graph of January 31, 2021 Treasury Rates

Attached is the Investment Report for the month of January 2021. Shown in Attachment 1 is the distribution of investments which lists all the individual securities owned by the City with the book and market values. Book value is the actual price paid for the investment. Market value is the amount that the investment is worth if sold in the open market. The market value (which fluctuates daily) that is used in the report is as of the last working day of the month. Attachment 2 reflects the monthly investment transactions for the month of January 2021. Attachment 3 lists the certificates of deposit. Attachment 4 lists the municipal securities. Attachment 5 is a graph of Treasury rates on January 31, 2021.

The investment of the City's funds is performed in accordance with the adopted Investment Policy. Funds are invested with the following objectives in mind:

1. Assets are invested in adherence with the safeguards and diversity of a prudent investor.

2. The portfolio is invested in a manner consistent with the primary emphasis on preservation of the principal, while attaining a high rate of return consistent with this guideline. Trading of securities for the sole purpose of realizing trading profits is prohibited.

3. Sufficient liquidity is maintained to provide a source for anticipated financial obligations as they become due.

4. Investments may be made, consistent with the Investment Policy Guidelines, in fixed income securities maturing in three years or less and can be extended to five years with the City Manager's approval.

The Finance Department invests the City's assets with an expectation of achieving a total rate of return at a level that exceeds the annualized rate of return on short-term government guaranteed or insured obligations (90-day Treasury bills) and to assure that the principal is preserved with minimal risk of depreciation or loss. In periods of rising interest rates, the City of Clovis portfolio return may be less than that of the annualized 90-day Treasury bill. In periods of decreasing interest rates, the City of Clovis portfolio return may be greater than the annualized 90-day Treasury bill. The current 90-day Treasury bill rate (annualized) is 0.32%. The rate of return for the City of Clovis portfolio is 1.27%. The goal for the City of Clovis investment return is 120% of the 90-day Treasury bill rate. The current rate of return is 397% of the Treasury bill rate.

In accordance with the Investment Policy, the investment period on each investment does not exceed three years and can be extended to five years with the City Manager's approval. As of January 2021 the average investment life of the City's investment portfolio is 0.79 years.

Current Investment Environment and Philosophy

During the month of January 2021, the federal funds rate remained at 0.00%-0.25%. On January 31, 2021, the Treasury yield curve increased from 3-month to 10-year notes.

Certificates of Deposit (CD's)

The City purchases both negotiable and non-negotiable Certificates of Deposit (CD's). Although negotiable CD's can be traded, it is the City's policy to buy and hold all CD's. Negotiable CD's are held by U.S. Bank, a third party custodian. Non-negotiable CD's are held in the City's safe.

Purchases and Maturities

- 0 government securities were purchased.
- 0 government securities were called or matured.
- 0 certificates of deposit were purchased.
- 0 certificates of deposit were called or matured.
- 1 municipal security totaling $775,000 was purchased.

Market Environment

- During January, the federal funds rate remained at 0.00%-0.25%.
- On January 31, the yield curve increased from 3-month to 10-year notes. See Attachment 5, Graph of Treasury Rates on January 31, 2021.

Prepared by: Jeffrey Blanks, Deputy Finance Director

Reviewed by: City Manager JH

City of Clovis
Distribution of Investments
As of January 31, 2021

	COST	NET BOOK VALUE	MARKET VALUE *	YIELD TO MATURITY	STATED INTEREST RATE	INVEST DATE	MATURITY DATE	DAYS TO MATURITY FROM 1/31/2021
GOV'T SECURITIES								
FHLMCMTN	2,477,875	2,494,499	2,502,400	2.375%	2.375%	08/02/18	02/16/21	16
FAMCMTN	2,502,236	2,500,639	2,513,925	2.650%	2.650%	06/28/18	04/19/21	78
FHLB	2,568,983	2,522,121	2,531,875	3.625%	3.625%	06/28/18	06/11/21	131
FAMCMTN	3,000,000	3,000,000	3,043,740	2.750%	2.750%	09/06/18	08/17/21	198
FFCB	1,998,520	1,999,424	2,029,920	2.700%	2.700%	09/06/18	08/27/21	208
FFCB	2,490,878	2,496,228	2,543,700	2.850%	2.850%	10/05/18	09/20/21	232
FFCB	2,500,200	2,500,098	2,559,475	2.800%	2.800%	12/17/18	12/17/21	320
FAMCMTN	2,999,400	2,999,533	3,039,660	1.520%	1.520%	01/23/20	01/10/22	344
FHLMCMTN	6,129,600	6,084,008	6,129,840	2.375%	2.375%	08/30/19	01/13/22	347
FHLB	12,110,520	12,065,092	12,316,680	2.500%	2.500%	04/25/19	03/11/22	404
FFCB	5,979,668	5,971,413	6,108,702	2.280%	2.280%	03/28/19	03/28/22	421
FFCB	6,017,400	6,011,471	6,142,260	1.875%	1.875%	06/27/19	06/14/22	499
FAMCMTN	6,024,900	6,016,905	6,151,380	1.950%	1.950%	07/25/19	06/21/22	506
FFCB	3,005,250	3,004,115	3,070,380	1.625%	1.625%	11/27/19	08/22/22	568
FHLB	6,065,100	6,049,947	6,181,920	2.000%	2.000%	10/31/19	09/09/22	586
FFCB	2,984,460	2,987,660	3,063,360	1.375%	1.375%	11/27/19	10/11/22	618
FFCB	5,008,500	5,007,140	5,125,050	1.600%	1.600%	01/23/20	10/13/22	620
FHLB	8,045,600	8,037,454	6,709,560	1.875%	1.875%	12/19/19	12/09/22	677
FHLB	5,047,500	5,040,314	6,709,560	1.875%	1.875%	01/23/20	12/09/22	677
FAMCMTN	8,544,965	8,539,878	8,713,860	1.350%	1.350%	02/27/20	02/27/23	757
FHLB	13,579,800	13,528,214	13,520,894	2.125%	2.125%	03/26/20	03/10/23	768
FHLB	5,255,000	5,240,101	5,237,266	2.125%	2.125%	04/30/20	03/10/23	768
SECURITIES TOTAL	$ 114,336,354	$ 114,096,254	$115,945,407					
LAIF		$ 74,223,185	$ 74,223,185					
Municipal Issuance		$ 4,150,000	$ 4,158,932					
Sweep Account (Union Bank)		$ 41,240,917	$ 41,240,917					
TOTAL CD'S		$ 9,990,000	$ 10,233,895					
TOTAL INVESTMENTS		$ 243,700,356	$ 245,802,336					

* Market values for securities obtained from US Bank.

ATTACHMENT 1

City of Clovis
Monthly Investment Transactions
As of January 31, 2021

Institution	Description	Activity	Amount	Market Value	Rate	Activity Date	Maturity Date
San Jose CA USD	Municipal Security	Purchase	775,000	775,000	0.221%	01/20/21	08/01/23

PORTFOLIO DATA

Current Month (01/21)

	Book	Market
CD'S	$ 9,990,000	$ 10,233,895
Gov't Securities*	114,096,254	115,945,407
Municipal Securities	4,150,000	4,158,932
LAIF	74,223,185	74,223,185
Sweep Account (Union Bank)	41,240,917	41,240,917
TOTAL	$ 243,700,356	$ 245,802,336

Prior Month (12/20)

	Book	Market
CD'S	$ 9,990,000	$ 10,250,158
Gov't Securities*	114,096,254	116,092,636
Municipal Securities	3,375,000	3,382,339
LAIF	74,106,014	74,106,014
Sweep Account (Union Bank)	31,601,453	31,601,453
TOTAL	$ 233,168,721	$ 235,432,600

Three Months Previous (10/20)

	Book	Market
CD'S	$ 9,990,000	$ 10,278,669
Gov't Securities*	114,096,254	116,371,092
Municipal Securities	2,025,000	2,022,630
LAIF	74,106,014	74,106,014
Sweep Account (Union Bank)	24,081,485	24,081,485
TOTAL	$ 224,298,753	$ 226,859,890

Six Months Previous (07/20)

	Book	Market
CD'S	$ 10,990,000	$ 11,321,401
Gov't Securities*	114,096,254	116,866,232
Municipal Securities	-	-
LAIF	73,948,977	73,948,977
Sweep Account (Union Bank)	21,300,109	21,300,109
TOTAL	$ 220,335,340	$ 223,436,719

One Year Previous (01/20)

	Book	Market
CD'S	$ 11,460,000	$ 11,560,852
Gov't Securities*	118,737,540	119,729,256
Municipal Securities	-	-
LAIF	65,373,805	65,373,805
Sweep Account (Union Bank)	21,889,541	21,889,541
TOTAL	$ 217,460,886	$ 218,553,454

*Adjusted Quarterly for Premium/Discount Amortization

City of Clovis
Certificates of Deposit
As of January 31, 2021

AGENDA ITEM NO. 6.

Negotiable CDs	COST	MARKET PRICE	INTEREST RATE	INVEST DATE	MATURITY DATE	MATURITY FROM 01/31/21	INTEREST FREQUENCY
Merrick Bank	250,000	250,710.00	2.550%	03/09/18	03/09/21	37	MONTHLY
Towne Bank	250,000	251,625.00	2.700%	04/27/18	04/27/21	86	MONTHLY
Citibank	250,000	252,287.50	2.900%	05/22/18	05/24/21	113	MONTHLY
University Of Iowa Cmnty Fcu	250,000	252,387.50	2.900%	05/24/18	05/28/21	117	MONTHLY
BMW Bank North America	250,000	252,820.00	3.000%	06/15/18	06/15/21	135	MONTHLY
Connectone Bk Englewood Cliffs	250,000	252,820.00	3.000%	06/15/18	06/15/21	135	MONTHLY
Bar Harbor Bank Trust	250,000	253,130.00	3.000%	06/29/18	06/29/21	149	MONTHLY
Keesler Fed Cr Un	250,000	254,442.50	3.050%	02/20/19	08/30/21	211	QUARTERLY
Ubs Bank Usa	250,000	256,145.00	3.200%	11/07/18	11/08/21	281	MONTHLY
Mountain America Fd Credit	250,000	256,295.00	3.200%	11/15/18	11/15/21	288	MONTHLY
Wells Fargo	250,000	257,157.50	3.000%	01/18/19	01/18/22	352	MONTHLY
Goldman Sachs Bk USA Ny	245,000	252,156.35	2.800%	02/20/19	02/22/22	387	QUARTERLY
Tiaa FSB Jacksonville Fla	245,000	252,286.30	2.850%	02/28/19	02/22/22	387	QUARTERLY
Comenity Capital Bank	250,000	257,762.50	2.550%	04/30/19	04/29/22	453	QUARTERLY
Synchrony Bank	250,000	257,720.00	2.450%	05/17/19	05/17/22	471	QUARTERLY
First State Bank of Dequeen	250,000	256,390.00	2.000%	07/26/19	05/26/22	480	QUARTERLY
Flagstar Bank	250,000	258,322.50	2.500%	06/12/19	06/13/22	498	QUARTERLY
Capital One Bank	250,000	257,915.00	2.350%	06/19/19	06/20/22	505	QUARTERLY
Morgan Stanley Bk	250,000	257,515.00	2.100%	07/25/19	07/25/22	540	QUARTERLY
Capital One Bank	250,000	257,880.00	2.150%	08/07/19	08/08/22	554	QUARTERLY
Everbanke USA Salt Lake City	250,000	257,497.50	2.050%	08/07/19	08/08/22	554	QUARTERLY
Raymond James Bank	250,000	257,105.00	1.900%	08/23/19	08/23/22	569	QUARTERLY
Ally Bank	250,000	257,185.00	1.850%	09/19/19	09/19/22	596	QUARTERLY
Usalliance Federal Credit Union	250,000	257,745.00	2.850%	09/30/19	09/30/22	607	QUARTERLY
Morgan Stanley Bank	250,000	257,522.50	2.100%	10/17/19	10/17/22	624	MONTHLY
Lafayette Fed Cr Un	250,000	257,255.00	1.700%	11/22/19	11/22/22	660	MONTHLY
Live Oak Banking Co.	250,000	257,697.50	1.750%	12/11/19	12/12/22	680	QUARTERLY
Wells Fargo Natl Bk West	250,000	257,942.50	1.800%	12/13/19	12/13/22	681	QUARTERLY
Valley Cent Svgs Bk	250,000	257,822.50	1.700%	01/15/20	01/17/23	716	QUARTERLY
Sallie Mae Bank	250,000	258,875.00	1.900%	01/23/20	01/23/23	722	QUARTERLY
Servisfirst Bank	250,000	257,645.00	1.600%	02/21/20	02/21/23	751	MONTHLY
Celtic Bank	250,000	257,580.00	1.550%	03/13/20	03/13/23	771	MONTHLY
Axos Bank	250,000	257,702.50	1.550%	03/26/20	03/27/23	785	MONTHLY
Nicolet Natl Bank	250,000	255,000.00	0.900%	03/27/20	03/27/23	785	MONTHLY
Centerstate Bank	250,000	254,200.00	0.900%	03/30/20	03/30/23	788	MONTHLY
Bank Leumi	250,000	257,172.50	1.450%	03/31/20	03/31/23	789	MONTHLY
Discover Bank	250,000	257,195.00	1.350%	04/02/20	04/03/23	792	MONTHLY
Berkshire Bank	250,000	256,417.50	1.300%	04/08/20	04/06/23	795	MONTHLY
American Express	250,000	255,390.00	1.100%	04/21/20	04/21/23	810	MONTHLY
New York Cmnty Bank	250,000	251,177.50	0.350%	12/11/20	12/11/23	1,044	QUARTERLY
Negotiable CD TOTAL	$ 9,990,000	$ 10,233,895					
CD TOTAL	$ 9,990,000	$ 10,233,895					

ATTACHMENT 3

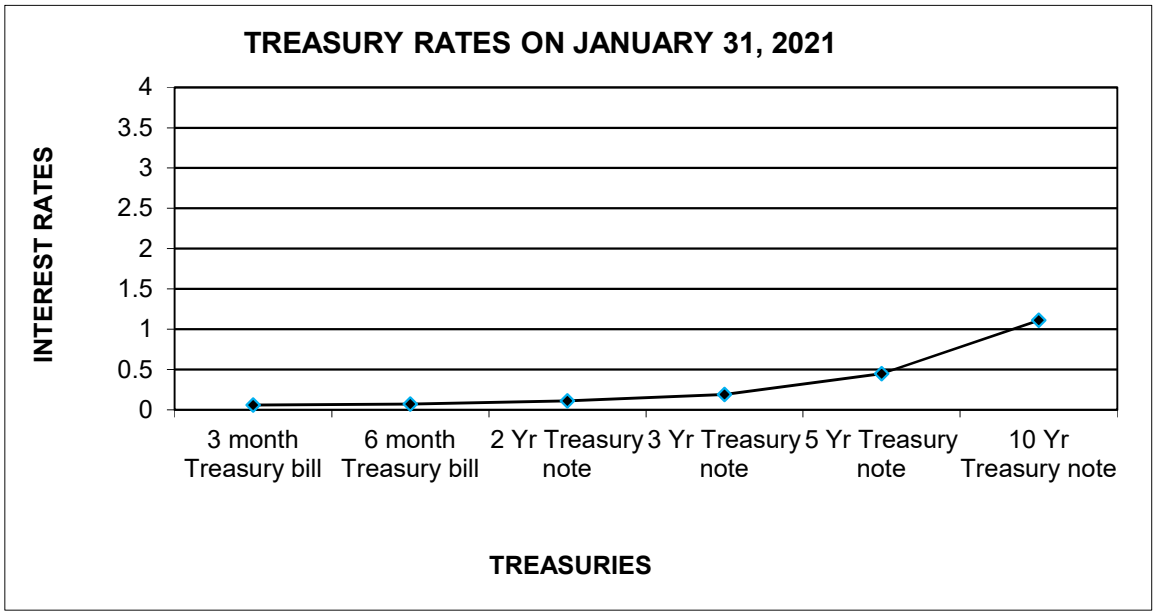
City of Clovis
Municipal Securities
As of January 31, 2021

Municipal Securities	COST	MARKET PRICE	INTEREST RATE	INVEST DATE	MATURITY DATE	MATURITY FROM 01/31/21	INTEREST FREQUENCY
Fresno Unified Taxable Go Ref Bond	500,000	500,850.00	0.462%	09/30/20	08/01/23	912	QUARTERLY
Pomona Cali Uni Sch Dist Go Bond	815,000	817,241.25	0.534%	10/20/20	08/01/23	912	QUARTERLY
William Hart Cali HS Go Bond	1,000,000	1,001,310.00	0.366%	12/23/20	08/01/23	912	QUARTERLY
San Jose CA USD Ref Bond	775,000	775,728.50	0.221%	01/20/21	08/01/23	912	QUARTERLY
Jefferson Cali Elem Sch Dist Go Bond	710,000	711,831.80	0.399%	10/27/20	09/01/23	943	QUARTERLY
Santa Rosa Calif Watr Ref Bond	350,000	351,970.50	0.578%	12/01/20	09/01/23	943	QUARTERLY
Municipal Securities TOTAL	$ 4,150,000	$ 4,158,932					
Municipal Securities TOTAL	$ 4,150,000	$ 4,158,932					

CITY OF CLOVIS
FINANCE DEPARTMENT
JANUARY 31, 2021 TREASURY RATES

Treasury Rates as of January 31, 2021

3 month Treasury bill	0.06
6 month Treasury bill	0.07
2 Yr Treasury note	0.11
3 Yr Treasury note	0.19
5 Yr Treasury note	0.45
10 Yr Treasury note	1.11



As indicated in the above graph, treasuries increase from 3-month to 10-year notes.

ATTACHMENT 5

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Finance Department

DATE: April 5, 2021

SUBJECT: Finance – Receive and File – Treasurer's Report for the Month of January 2021.

ATTACHMENTS:
1. Summary of Cash Balances
2. Summary of Investment Activity
3. Investments with Original Maturities Exceeding One Year

Attached for the Council's information is the Treasurer's Report for the month ended January 31, 2021.

Pursuant to Section 41004 of the Government Code of the State of California, the City Treasurer is required to submit a monthly report of all receipts, disbursements and fund balances. Attachment 1 provides a summary of the beginning balance, total receipts, total disbursements, ending balance for all funds, and a listing, by fund, of all month end fund balances. Attachment 2 summarizes the investment activity for the month and distribution, by type of investment, held by the City. Attachment 3 lists all investments with original maturities exceeding one year as of the month ended January 31, 2021.

Prepared by: Jeffrey Blanks, Deputy Finance Director

Reviewed by: City Manager JH

City of Clovis
Statement of Cash Balances
As of January 31, 2021

	Previous Balance	$	1,289,421.02
	Deposits		36,731,866.36
	Disbursements		(33,093,546.57)
	Current Balance	$	4,927,740.81

FUNDS			**BALANCE**
100	General Fund	$	11,634,607.38
201	Local Transportation		16,082,403.08
202	Parking and Business Improvements		99,872.58
203	Off Highway Use		70,224.56
204	Off Highway Use		32,959.07
205	Senior Citizen Memorial Trust		54,001.34
207	Landscape Assessment District		5,877,651.94
208	Blackhorse III (95-1) Assessment District		149,863.76
301	Park & Recreation Acquisition		9,000,827.41
305	Refuse Equipment Reserve		1,581,853.28
310	Special Street Deposit Fund		27,805,851.35
313	Successor Agency		241,587.28
314	Housing Successor Agency		1,256,944.73
402	1976 Fire Bond Redemption		25,475.23
404	1976 Sewer Bond Redemption Fund		405,154.63
501	Community Sanitation Fund		14,950,397.11
502	Sewer Service Fund		34,643,396.49
504	Sewer Capital Projects-Users		1,117,270.84
506	Sewer Capital Projects-Developer		1,319,818.87
507	Water Service Fund		49,879,450.28
508	Water Capital Projects-Users		6,447,328.70
509	Water Capital Projects-Developer		7,666,812.64
515	Transit Fund		816,839.66
540	Planning & Development Services		15,936,364.21
601	Property & Liability Insurance		1,408,926.96
602	Fleet Maintenance		14,385,487.86
603	Employee Benefit Fund		6,988,742.70
604	General Government Services		17,144,135.71
701	Curb & Gutter Fund		160,179.36
703	Payroll Tax & Withholding Fund		1,392,802.32
712	Temperance/Barstow Assmt Dist (98-1)		75,599.55
713	Shepherd/Temperance Assmt Dist (2000-1)		5,721.00
715	Supp Law Enforcement Serv		199,366.09
716	Asset Forfeiture		134,924.65
720	Measure A-Public Safety Facility Tax		412.79
736	SA Admin Trust Fund		1,421.40
741	SA Debt Service Trust Fund		(367,719.19)
747	Housing Successor Trust Fund		1,137.98
	SUBTOTALS	$	248,628,095.60
999	Invested Funds		(243,700,354.79)
	TOTAL	$	4,927,740.81

ATTACHMENT 1

City of Clovis
Summary of Investment Activity
For the month of January 31, 2021

Balance of Investments Previous Month End		$233,168,719.45
Time Certificates of Deposit Transactions		
Investments	0.00	
Withdrawals	0.00	
Total CD Changes		0.00
Other Changes		
Government Securities	0.00	
Local Agency Investment Fund	117,171.01	
Municipal Securities	775,000.00	
Sweep Account	9,639,464.33	
Total Other Changes		10,531,635.34
Balance of Investments Current Month End		$ 243,700,354.79

City of Clovis
Distribution of Investments
As of January 31, 2021

Insured CD's	9,990,000.00
Government Securities	114,096,253.25
US Treasury Notes	0.00
Local Agency Investment Fund	74,223,184.57
Municipal Securities	4,150,000.00
Sweep Account	41,240,916.97
Investment Total	$ 243,700,354.79

ATTACHMENT 2

City of Clovis
Original Maturities Exceeding One Year
As of January 31, 2021

Institution	Face Value	Investment Balance At Amortized Cost	Maturity	Stated Rate
FHLMCMTN	2,500,000.00	2,494,499.00	2/16/2021	2.375%
FAMCMTN	2,500,000.00	2,500,639.00	4/19/2021	2.650%
FHLB	2,500,000.00	2,522,121.00	6/11/2021	3.625%
FAMCMTN	3,000,000.00	3,000,000.00	8/17/2021	2.750%
FFCB	2,000,000.00	1,999,424.00	8/27/2021	2.700%
FFCB	2,500,000.00	2,496,228.00	9/20/2021	2.850%
FFCB	2,500,000.00	2,500,098.00	12/17/2021	2.800%
FAMCMTN	3,000,000.00	2,999,533.00	1/10/2022	1.520%
FHLMCMTN	6,000,000.00	6,084,008.00	1/13/2022	2.375%
FHLB	12,000,000.00	12,065,092.00	3/11/2022	2.500%
FFCB	5,960,000.00	5,971,413.00	3/28/2022	2.280%
FFCB	6,000,000.00	6,011,471.00	6/14/2022	1.875%
FAMCMTN	6,000,000.00	6,016,905.00	6/21/2022	1.950%
FFCB	3,000,000.00	3,004,115.00	8/22/2022	1.625%
FHLB	6,000,000.00	6,049,947.00	9/9/2022	2.000%
FFCB	3,000,000.00	2,987,660.00	10/11/2022	1.375%
FFCB	5,000,000.00	5,007,140.00	10/13/2022	1.600%
FHLB	8,000,000.00	8,037,454.00	12/9/2022	1.875%
FHLB	5,000,000.00	5,040,314.00	12/9/2022	1.875%
FAMCMTN	8,500,000.00	8,539,878.00	2/27/2023	1.350%
FHLB	5,000,000.00	5,240,101.00	3/10/2023	2.125%
FHLB	13,000,000.00	13,528,214.00	3/10/2023	2.125%

ATTACHMENT 3

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Fire Department

DATE: April 5, 2021

SUBJECT: Fire - Approval – Authorizing the City Manager to sign the contractual services agreement with Fresno County Emergency Medical Services Agency for the provision of Fire Department Dispatch Services.

ATTACHMENTS: 1. Contract for Dispatch Services

CONFLICT OF INTEREST
None

RECOMMENDATION
For the City Council to approve the proposal of Fresno County Emergency Medical Services Agency for Fire Department emergency communication dispatch services and authorize the City Manager to sign a contract based on the proposal.

EXECUTIVE SUMMARY
Since May of 2007, the Fire Department has contracted with Fresno County Central California Emergency Medical Services Agency (CCEMSA) to provide emergency communication dispatch services. Fire Department dispatch services have been provided or extended via three consecutive contracts with Fresno County Emergency Medical Services Agency. FCEMSA subcontracts dispatch services to the current Exclusive Operating Area/EMS transport provider, which currently is American Ambulance. The current existing contract expires June 30, 2021. The proposed contract is for an initial three-year term, with a two-year extension if mutually agreed upon by both parties.

BACKGROUND
In August 2006, the Clovis Fire Department sought out solutions to emergency communication problems that were overloading the Clovis Police Department's Communications Center and to improve community and responder safety through a more regionalized dispatch system. On March 19, 2007, the City Council approved a one-year contract with CCEMSA to provide emergency communication/dispatch services to the Clovis Fire Department. Since 2007 the Fire Department has contracted with CCEMSA for dispatch

services. This agreement has been renewed several times with the last renewal in 2016. The current agreement terminates on June 30, 2020.

CCEMSA subcontracts the labor for this service to American Ambulance, who is the local ambulance provider for Fresno County. One of American Ambulance's primary roles as the exclusive ambulance provider to Fresno County is to staff and operate the Fresno County EMS Communications Center. In this relationship, American Ambulance provides personnel, supervision and management. The County of Fresno is responsible for the infrastructure and equipment, which includes IT/GIS support, maintenance and support of radios, telephones, computer-aided dispatch systems, dispatch consoles, workstations, paging/alerting systems and the oversight of dispatch policy and procedures for the EMS Communications Center. The City of Clovis remains responsible for our own radios, IT/GIS, telephone, mobile data computers and related policies. In March of 2021, the EMS Communications Center was moved from the City of Fresno to the City of Clovis. Having the dispatch center within the city limits enables Fire department staff to attend meetings with their staff while still being available for emergency response locally.

Provisions within the new contract provide the following additional benefits to the City of Clovis:

1. The new contract includes performance measures that must be met each month in order to receive full payment. These measurements include call processing and dispatch processing time standards to ensure the best possible service to the citizens of Clovis. Service that does not meet performance standards will result in a credit back to the City of Clovis.

2. Cost of the service will not exceed $347,565 per year for the next three years (i.e., there is no cost of living adjustment). This is a significant increase from the $289,000 we are currently paying for this service, but the contract price has not been raised in over seven years and this price will be in effect for another three years. So assuming a 2% CPI per year for 10 years, the current contract pricing is in alignment.

3. The contract provides for a two year extension of the contract if both parties are agreeable to the terms and pricing. This language which will save staff time in subsequent years if continuing the partnership is in the best interest of both parties.

FISCAL IMPACT

The annual cost for this service will increase to $347,565 for the next three years and will be included in the 2021/22 Fire Department budget request.

REASON FOR RECOMMENDATION

Clovis Fire Department has evaluated local emergency communications options and determined Fresno County EMS provides the best value to the City of Clovis at this time.

ACTIONS FOLLOWING APPROVAL
Prepare contract for signature by the City Manager.

Prepared by: John Binaski, Fire Chief

Reviewed by: City Manager

AGREEMENT

THIS AGREEMENT is made and entered into this _____ day of _____, 2021, by and between the COUNTY OF FRESNO, a Political Subdivision of the State of California, hereinafter referred to as "COUNTY," and the **CITY OF CLOVIS**, a Municipal Corporation, whose address is 1033 Fifth Street, Clovis, California 93612, hereinafter referred to as "CITY".

W I T N E S S E T H:

WHEREAS, CITY receives calls requesting CITY's Fire Department ("CITY FIRE") for emergency services and emergency medical first responder services ("EMS"); and

WHEREAS, CITY transfers those calls for EMS to COUNTY's EMS Communications Center for dispatching the appropriate emergency ambulances and equipment; and

WHEREAS, CITY FIRE continues to desire to receive dispatching services for fire suppression calls, which may include dispatching of non-transport first responder services, (collectively, "CITY FIRE Dispatching Services") from COUNTY's EMS Communications Center; and

WHEREAS, since May 1, 2007, COUNTY has provided dispatching services for CITY; and

WHEREAS, it is to the mutual benefit and in the best interest of the parties hereto to have a combined EMS and CITY FIRE Dispatching Service for the purpose of providing improved services to the public; and

WHEREAS, it is a goal of COUNTY and CITY to maintain consolidated dispatching services in Fresno County; and

WHEREAS, it has been determined by CITY and COUNTY that there is a need to provide EMS dispatching services and CITY FIRE Dispatching Services through a centralized and combined effort by COUNTY's EMS Communications Center and CITY FIRE; and

WHEREAS, COUNTY's EMS Communications Center is staffed and operated by K.W.P.H. Enterprises, doing business as American Ambulance, a California corporation ("PROVIDER") through that certain Emergency Medical Services Provider Agreement for Emergency Ambulance Services and Advanced Life Support (Paramedic) Services, dated May 16, 2017 (COUNTY Agreement No. 17-218, "EMS PROVIDER Agreement"), including amendments, by and between COUNTY and PROVIDER.

NOW, THEREFORE, in consideration of their mutual covenants and conditions, the parties hereto agree as follows:

1. SERVICES

A. Subject to CITY timely paying COUNTY for CITY FIRE Dispatching Services (as defined in Section 4. herein), COUNTY shall perform the following functions and services:

(1) COUNTY shall maintain dispatching equipment, hardware, software (including software licenses), and other technologies, which will be utilized for the triage and entry of information for CITY FIRE Dispatching Services in COUNTY's EMS Communications Center computer aided dispatch ("CAD") system, in connection with COUNTY's performance of its CITY FIRE Dispatching Services under this Agreement; and

(2) COUNTY shall be responsible for selection, configuration, installation, and maintenance of all dispatching equipment, hardware, software and other technologies associated with this Agreement (excluding radio infrastructure purchased by the CITY). All dispatching equipment, hardware, software (including software licenses), and other technologies purchased and/or obtained through this Agreement shall be the sole property of COUNTY; and

(3) COUNTY shall provide CITY FIRE Dispatching Services requiring responses by CITY FIRE apparatuses as follows:

(a) COUNTY's EMS Communication Center shall provide all CITY FIRE Dispatching Services in accordance with CITY FIRE's Policies and Procedures affecting CITY FIRE Dispatching Services under this Agreement to the extent that they relate only to dispatch (hereinafter referred to as "CITY FIRE's Policies and Procedures"). CITY FIRE's Policies and Procedures shall be subject to review by COUNTY's EMS Director, or designee (the "COUNTY's Representative"), as provided in Section 1.C.(2) herein.

(b) COUNTY's EMS Communication Center shall dispatch CITY FIRE's apparatuses through CITY FIRE's radios and electronic communications, and in accordance with CITY FIRE's Policies and Procedures (to the extent that they relate only to dispatch), which shall be subject to review by COUNTY's Representative, as provided in Section 1.C.(2) herein.

(c) COUNTY's EMS Communications Center shall provide EMS

approved pre-arrival instructions to callers requesting CITY FIRE Dispatch Services.

(d) COUNTY's EMS Communications Center shall provide inter-agency coordination regarding requests for fire suppression service, mutual aid and auto aid services, and order specialized fire equipment from CITY or other agencies (*e.g.,* hazardous materials equipment, or "jaws of life") which may be needed to manage an incident, and perform other related duties, all in accordance with CITY FIRE's Policies and Procedures (to the extent that they relate only to dispatch), which shall be subject to review by COUNTY's Representative, as provided in Section 1.C.(2) herein.

(e) COUNTY's EMS Communications Center shall track all activity of CITY FIRE's apparatuses utilizing the COUNTY's EMS Communications Center computer aided dispatch (CAD) system.

(f) COUNTY's EMS Communications Center shall develop and maintain processes which assist in dispatching signatories to CITY automatic aid agreements to include those agencies outside the COUNTY's EMS Communications Center.

(g) Processes which assist in dispatching other agencies are to include Automatic Vehicle Location (AVL), unit status and some form of CAD to CAD process where call information is automatically shared between agencies regardless of dispatch center location. In the event an automatic aid agency outside EMS Communications is unable to provide unit AVL and unit status, both the COUNTY and CITY agree to mutually agree on how to implement and determine cost sharing to receive this information.

(h) COUNTY shall provide notification to chief officers and duty officers as needed for applicable emergency incidents using phone, email, text or other contemporary method of messaging according to dispatch policy.

(i) COUNTY will provide CAD software which is capable of tracking CITY'S closest Fire unit, real-time call data/updates, GIS, radio channel, incident location, and resources.

(j) COUNTY will provide the ability to send response-time data or additional required CAD data to the FIRE reporting software known as Fire RMS. This data shall

include date and time call received in the secondary PSAP (EMS Communications phone pickup), unit alert, unit enroute, unit arrival and unit available, for all units assigned to the call. In addition, it shall send incident location, grid and call nature.

(k) COUNTY shall record all telephone and radio transmissions and provide instant playback as needed. COUNTY shall retain recordings for a minimum of four (4) years.

(l) COUNTY shall provide reports to CITY, as requested. COUNTY must be given sufficient time to develop custom adhoc reports or reports that are not already developed.

(m) COUNTY shall provide a radio operator, who is able to dispatch CITY FIRE's apparatuses twenty-four (24) hours a day, seven (7) days a week meeting the one hundred and twenty (120) second total Alarm Handling (TAH) as outlined below. In addition, the goal is for the CLOVIS radio channel to be answered in no more than two attempts. During specific CITY events (i.e., Fourth of July, times of local disaster, or a large scale emergency), CITY FIRE may assign a Command Officer to serve as a Temporary Dispatch Liaison to direct the assignment of CITY FIRE resources, at which time deviation from routine dispatch procedures outlined herein will be granted. COUNTY shall ensure that dispatch staff shall be trained in the National Academy of Emergency Dispatch at the Emergency Fire Dispatcher level or substitute training with approval of CITY FIRE. COUNTY shall coordinate emergency services with other public safety answering points (PSAP).

(n) COUNTY shall provide that a minimum of one (1) dispatch supervisor who shall be on duty at COUNTY's EMS Communications Center twenty-four (24) hours a day, seven (7) days a week. The supervisor shall be available to CITY's on-duty fire administration as needed.

(o) COUNTY shall maintain an up-to-date manual of CITY FIRE's Policies and Procedures (subject to review by COUNTY's Representative, as provided in Section 1.C.(2) herein) for all dispatch staff, and shall provide for training and continuing education of dispatch staff as needed.

(p) The goal is for the immediate dispatch of a fire apparatus in accordance with CITY FIRE approved dispatch protocols and the National Fire Protection Administration (NFPA) Standard 1221. The Total Alarm Handling (TAH) time will be measured from the time the telephone is answered by the call taker in EMS Communications to the time that the first fire apparatus is alerted to the incident either by radio, telephone, station alerting device or any other mutually agreed upon method of alerting. The TAH times shall be one hundred and twenty (120) seconds or less in a minimum of ninety percent (90%) of incidents. The TAH time measurement will exclude reassigned responses and other situations beyond the COUNTY's EMS Communications Center control. A review shall occur for all cases in which dispatches are over one hundred and twenty (120) seconds, and results will be evaluated for improvement opportunities by the Fire Dispatch Continuous Quality Improvement (CQI) Committee.

(q) COUNTY shall provide monthly reports on CITY key performance measures and other areas as agreed upon by the CITY and COUNTY.

(r) COUNTY shall provide necessary support staff to provide responsiveness ,within ten [10] days, to CITY requests for changes in CAD system, including GIS updates, response criteria, update of street layers, CAD/mobile software updates, protocols and CAD/RMS interface(s).

(s) COUNTY will integrate a formal quality improvement process that identifies problems by the field, formalizes a tracking mechanism, provides feedback to the sender, determines solutions, establishes timelines for correction, shares the information with all dispatch personnel and formalizes a Continuous Quality Improvement (CQI) review of dispatcher performance.

(t) COUNTY and CITY will work together with the State of California-CAL OES 911 Emergency Communications Branch in order to maintain a secondary Public Safety Answering Point (PSAP) designation for FIRE.

(u) COUNTY will track all 9-1-1 call data related to FIRE operations (fire/EMS/rescue/hazmat, etc.), that would qualify for State of California-CAL OES 911 Emergency Communications Branch funding as a secondary PSAP.

(v) If 9-1-1 funds are received by State of California-CAL OES 911 Emergency Communications Branch for the FIRE secondary PSAP designation, the CITY agrees to allow COUNTY to use said funds to enhance FIRE dispatch operations in accordance with the State of California-CAL OES 911 Emergency Communications Branch funding guidelines.

Throughout the life of this Agreement, CITY FIRE and COUNTY will continue to discuss refinement of the list of situations stated hereinabove where one hundred and twenty (120)-second call processing may not be achievable. Modifications may be made to said list of situations upon written mutual agreement between COUNTY's EMS Director, or designee, and CITY"s Fire Chief, or designee.

B. It is understood by the parties hereto that COUNTY's provision of CITY FIRE Dispatching Services herein does not include any COUNTY provision of fire suppression services, and that COUNTY is providing CITY FIRE Dispatching Services herein to CITY on a non-exclusive basis.

C. CITY shall perform the following functions:

(1) CITY FIRE shall provide all fire suppression services for all fire suppression calls dispatched by COUNTY's EMS Communications Center requiring CITY FIRE apparatuses.

(2) CITY FIRE shall consult with COUNTY's Representative in developing CITY FIRE's Policies and Procedures relating to dispatch only. CITY shall provide CITY FIRE's Policies and Procedures relating to dispatch to COUNTY for review thereof by COUNTY's Representative. CITY shall not approve CITY FIRE's Policies and Procedures relating to dispatch until first having conferred with COUNTY's Representative and such representative agrees that such policies and procedures are not inconsistent with the COUNTY's EMS Communication Center's Policies and Procedures, and that CITY FIRE's Policies and Procedures do not create additional workload for staff or impact other programs in the COUNTY's EMS Communications Center. COUNTY's Representative shall have neither the right nor the duty to approve the number of CITY FIRE apparatuses or personnel, or amount of CITY FIRE equipment or other resources, that CITY FIRE deems sufficient to respond to any calls for CITY FIRE Dispatching Services, or other CITY FIRE Policies and Procedures unrelated to dispatch. CITY FIRE shall be reasonable in developing

CITY FIRE's Policies and Procedures relating to dispatch such that those policies and procedures are substantially consistent with COUNTY's EMS Communication Center's Policies and Procedures.

(3) CITY shall provide continuing education and training to COUNTY's EMS Communications Center radio operators and staff regarding the dispatching and management of CITY FIRE resources.

(4) CITY shall assure that all calls to CITY for CITY FIRE calls for service are immediately transferred to COUNTY's EMS Communications Center.

(5) CITY shall provide COUNTY with data that includes the exact times that EMS and CITY FIRE calls for service are received at CITY's Police Department Communications Center (or other point of CITY contact, if any) and transferred to COUNTY's EMS Communications Center.

(6) CITY agrees to participate in an internal quality improvement program, which includes the participation of COUNTY and PROVIDER.

(7) CITY shall be responsible for the provision and maintenance of all radio and computer equipment in CITY FIRE apparatuses and fire stations.

2. TERM

A. The term of this Agreement shall be for a period of three (3) years, commencing on July 1, 2021 through and including June 30, 2024. This Agreement may be extended for two (2) additional consecutive twenty-four (24) month periods upon written approval by both parties no later than ninety (90) days prior to the first day of the next twenty-four (24) month period. The Director of Public Health or his or her designee is authorized to execute such written approval on behalf of COUNTY based on satisfactory performance, and the City Manager or his or her designee is authorized to execute such written approval on behalf of CITY based on satisfactory performance.

B. Upon the termination of this Agreement, COUNTY shall promptly provide CITY FIRE with the data generated through the CITY FIRE Dispatching Services provided herein in a commonly usable electronic format.

3. TERMINATION

A. Non-Allocation of Funds - The terms of this Agreement, and the services to be

provided hereunder, are contingent on the approval of funds by the appropriating governmental agency, provided however, should sufficient funds not be allocated, (i) the services provided may be modified at any time upon the parties' mutual written agreement, or (ii) this Agreement may be terminated at any time by CITY giving at least ninety (90) days advance written notice of an intention to terminate to the other party.

B. Without Cause - Under circumstances other than those set forth above, this Agreement may be terminated by CITY or COUNTY upon the giving of at least ninety (90) days advance written notice of an intention to terminate to the other party.

C. Material Breach - Either party may terminate this Agreement at any time for cause for the other party's material breach of its obligations herein if not less than thirty (30) days advance, written notice has been given to the other party and such breach remains uncured within that thirty (30) day period. The party receiving such notice may respond to said notice and any charges contained therein within that thirty (30) day period.

D. CITY shall compensate or provide funding to COUNTY for any services performed or costs incurred under this Agreement prior to any termination of this Agreement.

4. COMPENSATION FOR SERVICES

A. For COUNTY's performance of CITY FIRE Dispatching Services herein, CITY agrees to pay COUNTY and COUNTY agrees to receive a quarterly lump-payment of Eighty Six Thousand Eight Hundred Ninety-One and 25/100 Dollars ($86,891.25) pursuant to Schedule A, attached hereto and incorporated herein by this reference.

B. In the event COUNTY fails to comply with the performance standards identified within this Agreement, CITY may begin to withhold Two Hundred Fifty and No/100 Dollars ($250.00) per day until such time as the non-compliance has been corrected to the satisfaction of the CITY Fire Chief and the COUNTY EMS Director. CITY must provide COUNTY EMS Director with a written notice of non-compliance. Said withholdings may begin thirty (30) days after receipt of notice if non-compliance has not been cured.

C. Payments by CITY shall be in arrears, for services provided during the preceding quarter, within forty-five (45) days after receipt and verification of COUNTY's invoices by CITY

FIRE. All payments shall be remitted to COUNTY at the following address: County of Fresno, Department of Public Health – Emergency Medical Services Division, P.O. Box 11867, Fresno, California, 93775.

D. COUNTY may propose pricing revisions to City at least 120 days prior to the beginning of a twenty-four (24) month extension, which shall be subject to negotiation by CITY and COUNTY

E. COUNTY must submit adequate documentation to substantiate any requested change in compensation.

5. INVOICING

COUNTY shall invoice CITY quarterly, addressed to the City of Clovis, Fire Department, 1233 Fifth Street, Clovis, California, 93612, Attention: Fire Chief.

6. INDEPENDENT CONTRACTOR

In performance of the work, duties, and obligations assumed by COUNTY under this Agreement, it is mutually understood and agreed that COUNTY, including any and all of COUNTY's officers, agents, and employees will at all times be acting and performing as an independent contractor, and shall act in an independent capacity and not as an officer, agent, servant, employee, joint venture, partner, or associate of CITY. Furthermore, CITY shall have no right to control or supervise or direct the manner or method by which COUNTY shall perform its work and function, except for COUNTY's compliance with CITY FIRE's Policies and Procedures, herein, and as described in Section 1.A.(3)(o) of this Agreement. However, CITY shall retain the right to administer this Agreement so as to verify that COUNTY is performing its obligations in accordance with the terms and conditions thereof. COUNTY and CITY shall comply with all applicable provisions of law and the rules and regulations, if any, of governmental authorities having jurisdiction over matters which are directly or indirectly the subject of this Agreement.

Because of its status as an independent contractor, COUNTY shall have absolutely no right to employment rights and benefits available to CITY employees. COUNTY shall be solely liable and responsible for providing to, or on behalf of, its employees all legally-required employee benefits. In addition, COUNTY shall be solely responsible and save CITY harmless from all matters relating to

payment of COUNTY's employees, including compliance with Social Security, withholding, and all other regulations governing such matters. It is acknowledged that during the term of this Agreement, COUNTY may be providing services to others unrelated to CITY or to this Agreement.

7. MODIFICATION

Any matters of this Agreement may be modified from time to time by the written consent of all the parties hereto without, in any way, affecting the remainder.

8. HOLD-HARMLESS

A. CITY agrees to indemnify, save, hold harmless, and at COUNTY's request, defend COUNTY, including its officers, agents, and employees, from any and all costs and expenses (including attorneys' fees and costs), damages, liabilities, claims, and losses occurring or resulting to COUNTY in connection with the performance, or failure to perform, by CITY, including its officers, agents, or employees under this Agreement, and from any and all costs and expenses (including attorneys' fees and costs), damages, liabilities, claims, and losses occurring or resulting to any person, firm, or corporation who may be injured or damaged by the performance, or failure to perform, of CITY, including its officers, agents, or employees under this Agreement.

B. COUNTY agrees to indemnify, save, hold harmless, and at CITY's request, defend CITY, including its officers, agents, and employees from any and all costs and expenses (including attorneys' fees and costs), damages, liabilities, claims, and losses occurring or resulting to CITY in connection with the performance, or failure to perform, by COUNTY, including its officers, agents, or employees, or PROVIDER, under this Agreement, and from any and all costs and expenses (including attorneys' fees and costs), damages, liabilities, claims, and losses occurring or resulting to any person, firm, or corporation who may be injured or damaged by the performance, or failure to perform, of COUNTY, including its officers, agents, or employees, or PROVIDER under this Agreement including, but not limited to, the COUNTY's selection, configuration, installation, and maintenance of all dispatching equipment, hardware, software, and other technologies, as well as the operation of the COUNTY's EMS Communication Center.

C. In the event of concurrent negligence on the part of COUNTY or any of its officers, agents or employees, or PROVIDER, and of CITY or any of its officers, agents, or

employees, the liability for any and all such claims, demands and actions in law or equity for such costs and expenses (including attorneys' fees and costs), damages, and losses shall be apportioned under the State of California's theory of comparative negligence as presently established or as may be modified hereafter.

D. This Section 8 shall survive termination or expiration of this Agreement.

9. INSURANCE

Without limiting the indemnification of each party as stated in Section 8 above, it is understood and agreed that CITY and COUNTY shall each maintain, at their sole expense, insurance policies or self-insurance programs including, but not limited to, an insurance pooling arrangement and/or Joint Powers Agreement to fund their respective liabilities throughout the term of this agreement. Coverage shall be provided for commercial general liability, automobile liability, professional liability, and workers' compensation exposure. Evidence of Insurance, Certificates of Insurance or other similar documentation shall not be required of either party under this Agreement, except for the Commercial General Liability coverage and the sexual abuse/molestation liability coverage described below. Each party will provide the other party with an appropriate Commercial General Liability insurance certificate with limits of not less than Two Million Dollars ($2,000,000) per occurrence and an annual aggregate of Four Million Dollars ($4,000,000) along with an appropriate endorsement naming the other party as an additional insured on the Commercial General Liability policy. Such coverage for additional insured shall apply as primary insurance and any other insurance, or self-insurance, maintained by COUNTY, its officers, agents and employees shall be excess only and not contributing with insurance provided under CITY's policies herein. This insurance shall not be cancelled or changed without a minimum of thirty (30) days advance written notice given to COUNTY. City shall maintain Sexual abuse / molestation liability insurance with limits of not less than One Million Dollars ($1,000,000.00) per occurrence, Two Million Dollars ($2,000,000.00) annual aggregate is required. This policy shall be issued on a per occurrence basis.

COUNTY shall cause PROVIDER to maintain insurance coverage that is consistent with the current EMS PROVIDER Agreement between COUNTY and PROVIDER.

Additional Requirements Relating to Insurance:

CITY hereby waives its right to recover from COUNTY, its officers, agents, and employees any amounts paid by the policy of worker's compensation insurance required by this Agreement. CITY is solely responsible to obtain any endorsement to such policy that may be necessary to accomplish such waiver of subrogation, but CITYS's waiver of subrogation under this paragraph is effective whether or not CITY obtains such an endorsement.

Within Thirty (30) days from the date CITY signs and executes this Agreement, CITY shall provide certificates of Commercial General Liability insurance, and Sexual abuse / molestation liability insurance and endorsement as stated above, as required herein, to the County of Fresno, Attention: Daniel Lynch, 1221 Fulton Street, Fresno, CA 93721, stating that such insurance coverage has been obtained and are in full force; that the County of Fresno, its officers, agents and employees will not be responsible for any premiums on the policies; that such Commercial General Liability insurance names the County of Fresno, its officers, agents and employees, individually and collectively, as additional insured, but only insofar as the operations under this Agreement are concerned; that such coverage for additional insured shall apply as primary insurance and any other insurance, or self-insurance, maintained by COUNTY, its officers, agents and employees, shall be excess only and not contributing with insurance provided under CITY's policies herein; and that this insurance shall not be cancelled or changed without a minimum of thirty (30) days advance, written notice given to COUNTY.

In the event CITY fails to keep in effect at all times insurance coverage as herein provided, the COUNTY may, in addition to other remedies it may have, suspend or terminate this Agreement upon the occurrence of such event.

All policies shall be issued by admitted insurers licensed to do business in the State of California, and such insurance shall be purchased from companies possessing a current A.M. Best, Inc. rating of A FSC VII or better.

10. <u>CONFIDENTIALITY</u>

All services performed by COUNTY under this Agreement shall be in strict conformance with all applicable Federal, State of California and/or local laws and regulations relating to confidentiality.

11. NON-DISCRIMINATION

During the performance of this Agreement, CONTRACTOR shall not unlawfully discriminate against any employee or applicant for employment, or recipient of services, because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military or veteran status pursuant to all applicable State of California and Federal statutes and regulations.

12. RECORDS

Each party shall maintain its records in connection with the respective services referred to under this Agreement. Such records must be maintained for a minimum of three (3) years. Records must also be maintained a minimum of three (3) years after the termination of this Agreement. The party generating the records shall maintain ownership of the records upon termination of this Agreement.

13. AUDITS AND INSPECTIONS

Each party shall at any time during business hours, and as often as the other party may deem necessary, make available to the other party for examination all of the former party's records and data with respect to the matters covered by this Agreement. Each party shall, upon request by the other party, permit the other party to audit and inspect all such records and data necessary to ensure the former party's compliance with the terms of this Agreement.

If this Agreement exceeds Ten Thousand and No/100 Dollars ($10,000.00), COUNTY shall be subject to the examination and audit of the State Auditor for a period of three (3) years after final payment under contract (Government Code Section 8546.7).

14. PROVIDER

The parties hereto acknowledge that PROVIDER, or its replacement, if any during the term of the PROVIDER Agreement, will carry out COUNTY's provision of dispatching services herein. In the event of any such replacement of PROVIDER, the replacement EMS Provider Agreement will be on substantially the same terms as the EMS Provider Agreement to the extent that it concerns this Agreement, as provided herein.

15. FORCE MAJEURE

A. If either party hereto is rendered unable, wholly or in part, by Force Majeure to carry out its obligations under this Agreement, that party shall give to the other party hereto prompt written notice of the Force Majeure with full particulars relating thereto. Thereupon, the obligations of the party giving the notice, so far as they are affected by the Force Majeure, shall be suspended during, but no longer than, the continuance of the Force Majeure, except for a reasonable time thereafter required to resume performance.

B. During any period in which either party hereto is excused from performance by reason of the occurrence of an event of Force Majeure, the party so excused shall promptly, diligently, and in good faith take all reasonable action required in order for it to be able to promptly commence or resume performance of its obligations under this Agreement. Without limiting the generality of the foregoing, the party so excused from performance shall, during any such period of Force Majeure, take all reasonable action necessary to terminate any temporary restraining order or preliminary or permanent injunctions to enable it to so commence or resume performance of its obligations under this Agreement.

C. The party whose performance is excused due to the occurrence of an event of Force Majeure shall, during such period, keep the other party hereto notified of all such actions required in order for it to be able to commence or resume performance of its obligations under this Agreement.

D. "Force Majeure" is defined as an Act of God, act of public enemy, war, and other extraordinary causes not reasonably within the control of either of the parties hereto.

16. NOTICES

The persons having authority to give and receive notices under this Agreement and their addresses include the following:

COUNTY	CITY
Director, County of Fresno	City of Clovis
Department of Public Health	Attn: City Manager
P.O. Box 11867	1033 Fifth Street
Fresno, CA 93775	Clovis, CA 93612

Any and all notices between COUNTY and CITY provided for or permitted under this Agreement or by law shall be in writing and shall be deemed duly served when personally delivered to one of the parties hereto, or in lieu of such personal service, when deposited in the United States Mail, postage prepaid, addressed to such party, except for notices of termination, which are effective upon receipt. Notices under this Agreement are not modifications to this Agreement.

17. GOVERNING LAW

The parties hereto agree, that for the purposes of venue, performance under this Agreement is to be in Fresno County, California.

The rights and obligations of the parties hereto and all interpretation and performance of this Agreement shall be governed in all respects by the laws of the State of California.

18. SEVERABILITY

The provisions of this Agreement are severable. The invalidity or unenforceability of any one provision in the Agreement shall not affect the other provisions.

19. ENTIRE AGREEMENT

This Agreement constitutes the entire agreement between CITY and COUNTY with respect to the subject matter hereof and supersedes all previous agreement negotiations, proposals, commitments, writings, advertisements, publications, and understandings of any nature whatsoever unless expressly included in this Agreement. This Agreement may be executed in several counterparts by the parties hereto, in which case, all of such executed duplicate counterpart originals thereof, taken together, shall be deemed to be one and the same legal instrument.

20. NO THIRD PARTY BENEFICIARIES

Notwithstanding anything stated to the contrary in this Agreement, there shall not be any intended third party beneficiaries to this Agreement.

///

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first hereinabove written.

CITY OF CLOVIS

Luke Serpa
City Manager

Date: _____

John Holt, City Clerk

_____

Date: _____

APPROVED AS TO FORM:
Scott Cross, City Attorney

By _____

Date: _____

Mailing Address:
1033 Fifth Street
Clovis, CA 93612
Phone #: (559) 324-2060
Fax #: (559) 324-2840
Contact: City Manager

COUNTY OF FRESNO

_____

Steve Brandau, Chairman of the
Board of Supervisors of the County of Fresno

ATTEST:
Bernice E. Seidel,
Clerk of the Board of Supervisors
County of Fresno, State of California
By _____

Fund/Subclass: 0001/10000
Organization #: 56201693
Account #: 5039

SCHEDULE A

Payment	Date	Payment Amount
1	Oct-21	$86,891.25
2	Jan-22	$86,891.25
3	Apr-22	$86,891.25
4	Jul-22	$86,891.25
5	Oct-22	$86,891.25
6	Jan-23	$86,891.25
7	Apr-23	$86,891.25
8	Jul-23	$86,891.25
9	Oct-23	$86,891.25
10	Jan-24	$86,891.25
11	Apr-24	$86,891.25
12	Jul-24	$86,891.25

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: General Services Department

DATE: April 5, 2021

SUBJECT: General Services – Approval – Res. 21-___ , Amending the City's Classification Plan by Revising the Bus Driver and Lead Bus Driver Classifications.

ATTACHMENTS: 1. Resolution

CONFLICT OF INTEREST
None

RECOMMENDATION
For City Council to Approve Resolution 21-___ Amending the City's Classification Plan by revising the Bus Driver and Lead Bus Driver Classifications.

EXECUTIVE SUMMARY
It is necessary to update the Bus Driver and Lead Bus Driver classification specifications in order to reflect the current licensing and certification requirements that Bus Drivers and Lead Bus Drivers must possess to be hired into each of the classifications. In addition, it is recommended that both the Bus Driver and Lead Bus Driver classifications be updated to reflect the current duties that are required for each position. Modification of the City's Classification Plan requires the City Council's approval.

BACKGROUND
An analysis of both the Bus Driver and Lead Bus Driver classifications recently conducted identified a need to revise both classifications. The analysis also identified that both of the classifications are in need of revision in order to accurately depict current license, certification, and the current scope of duties that will be required of each classification. California recently revised the driver's license requirement for Bus Drivers to include a Commercial Class C license. Previously, a Class B license was required. These recommended changes also include the addition of clarifying verbiage regarding each classification definition, class characteristics, and current duties needed to perform in each

of the classifications. The revisions would result in the need to modify the current City's Classification Plan, which requires Council approval.

The proposed classification revisions and impacts of the revisions have been reviewed with the Transit Employees Bargaining Unit (TEBU) representatives and they are in agreement with the proposed changes.

FISCAL IMPACT
There will be no fiscal impact since the salary will not change for both classifications.

REASON FOR RECOMMENDATION
In order to attract a qualified applicant pool, the Bus Driver and Lead Bus Driver classifications require updating to specify current licensing, certifications and duty requirements. Modification of the City's Classification Plan requires the City Council's approval.

ACTIONS FOLLOWING APPROVAL
The City's Classification Plan will be updated to reflect the changes. The classification plan will be modified as noted in Attachment A of Attachment 1 attached.

Prepared by: Lori Shively, Personnel/Risk Manager

Reviewed by: City Manager

RESOLUTION 21-

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CLOVIS APPROVING AMENDMENTS TO THE CITY'S CLASSIFICATION PLAN FOR THE BUS DRIVER AND THE LEAD BUS DRIVER CLASSIFICATIONS

The City Council of the City of Clovis resolves as follows**:**

WHEREAS, it has been determined that the Bus Driver and Lead Bus Driver Classifications be revised. Amendments to each of the classifications' definition, class characteristics, duties, and license required are necessary in order to accurately depict the current scope of duties; and,

WHEREAS, modification of the City's Classification Plan requires authorization by the City Council.

NOW THEREFORE, BE IT RESOLVED by the City Council of the City of Clovis that the City's Classification Plan shall be modified to include the revised Bus Driver and Lead Bus Driver classification Attachment A of Attachment 1.

* * * * * * * * * * *

The foregoing Resolution was introduced and adopted at a regular meeting of the City Council of the City of Clovis held on April 5, 2021, by the following vote to wit:

AYES:
NOES:
ABSENT:
ABSTAIN:

Dated: April 5, 2021

_____ Mayor

_____ City Clerk

ATTACHMENT 1

CITY OF CLOVIS
BUS DRIVER

DEFINITION

Under general supervision, to operate a public transit vehicle (passenger coach/bus) to provide public transportation by fixed-route service and/or demand-response service; and to perform related work as required.

CLASS CHARACTERISTICS

Positions in this class represent the entry level and drive a passenger coach to provide public transportation in fixed-route service and/or demand-response service transit systems. Incumbents pickup, transport, and drop off riders at locations based on fixed time and location schedule or by appointment. They provide special assistance to elderly, disabled or other special needs citizens. Incumbents are expected to maintain the time and/or appointment schedules of their route. Positions in this class perform work which has some variation and which allows or requires a limited range of choice in the application of defined methods or procedures. Incumbents work with independence in the field, making decisions in accordance with established ~~instructions~~ policies and procedures. Incumbents receive thorough instructions when tasks are initially assigned and after training are expected to perform duties and exercise good judgment without constant supervision. ~~Work performance is reviewed periodically. Incumbents are expected to refer to the supervisor for instruction those matters, which do not fit a clear pattern.~~ Incumbents are to refer to Lead Bus Drivers, Dispatchers or management for instruction in matters that do not fit a clear pattern.

EXAMPLES OF DUTIES

~~Drives a motor coach on general public fixed-route system and/or the demand response system transporting the general public, elderly, disabled, and other special needs citizens as authorized to various locations from their homes or on a fixed route; selects effective routes; meets departure and arrival times as scheduled; provides for passenger comfort and safety including fastening safety belts; performs small errands including carrying packages, opening and locking doors and escorting passenger to their destination. Assists riders with route, fare and transfer information. Inspects motor coach prior to operation, fuels motor coach as needed daily, observes that all fares are put into the farebox and deposits farebox at the end of the work day; operate lift equipment as needed, operates a mobile radio, utilizes transit specific on-board technology including but not limited to electronic fareboxes, passenger counters, mapping systems, scheduling software, and electronic pre-trip system, provides for passenger comfort and assists with safety measures if necessary; keeps vehicles clean and reports any mechanical defects; keeps necessary records and reports, performs minor vehicle maintenance; receive and dispatch calls for service, reacts appropriately to cerebral palsy movements, epileptic seizures, hearing loss deficiencies, blind and limited sight constraints, and orthopedic limitations; assists the dispatcher with paperwork as needed.~~

Operates passenger coach on an assigned route to meet a designated schedule; picks up and discharges passengers at various locations and stops; counts riders; assists passengers when needed; provides information to the public concerning routes,

schedules and transfer points; reports and accounts for lost articles; completes various reports, such as daily operation and incident reports; performs pre and post inspections of coaches, including damage or defects in body, tires, lights, mirrors, instruments, brakes and other equipment for rider and driver safety and convenience; reports all defects and deficiencies found during such inspections; monitors passenger behavior and contacts appropriate personnel as necessary concerning transportation problems and concerns in a reasonable, timely manner to provide high quality services to passengers; operates passenger coaches on special routes; assists passengers with special needs; loads and secures wheelchairs and related medical equipment to meet the needs of passengers; performs assigns duties with a pleasant and congenial personality; performs related duties as required.

TYPICAL QUALIFICATIONS
LICENSE REQUIRED

- Possession of a valid ~~Class B~~ California Commercial Driver's License with Passenger (P) endorsement and good driving record ~~and current First Aid and CPR certificates~~;
- Possession of a First Aid/CPR/AED certificate, General Public Paratransit Vehicle (GPPV) certificate or higher, ~~and~~ Verification of Transit Training (VTT) certificate and ~~an~~ Air Brake ~~certificate~~ certification are desirable, but not required. Incumbents are required to obtain First Aid/CPR/AED, GPPV, VTT and Air Brake certification within six (6) months, following completion of City provided training.

EDUCATION and EXPERIENCE

Education:

- Completion of formal or informal education sufficient to ensure the ability to read and write at the level required for successful job performance.

Experience:

- Three (3) years of licensed experience in the operations of motor vehicles, and one (1) year of work experience and/or training involving public transportation.

QUALIFICATIONS

Knowledge of:

- Provisions of the California Motor Vehicle Code applicable to the operation of vehicles used in transporting people;
- Knowledge of the safety requirements and hazards involved in operating a bus;
- Operation of a passenger coach;
- Common physical limitations of the aged and disabled people;
- Excellent customer service skills using tact, patience and courtesy;
- Simple record-keeping;
- Basic math and English usage;
- Touch screens and basic data entry technology;
- Workplace and driving safety precautions and procedures.

Ability to:

- Enforce regulations and deal tactfully, courteously and effectively with general public;
- Detect operating defects in transit vehicles;
- Apply integrity and trustworthiness in all situations;
- ~~Deal effectively and courteously with the general public;~~
- Maintain vehicles in clean and safe condition;
- Maintain ~~simple records;~~ accurate records, prepare clear and concise reports, and communicate effectively in oral and written form;
- Communicate with clients having oral and auditory disabilities;
- Operate a vehicle observing legal and defensive driving practices;
- Understand and carry out oral and written instructions;
- Establish and maintain effective relationships with those contacted in the course of work;
- Assist the physically disabled with independent living skills.

SUPPLEMENTAL INFORMATION
PHYSICAL DEMANDS AND WORKING CONDITIONS

- Strength: Medium Work-Lifting, carrying and/or pushing 75 pounds maximum with frequents lifting and/or carrying objects weighing up to 50 pounds.
- Physical activities include: bending, stooping, reaching, standing, walking, up to and including the possibility of climbing a ladder to reach high windows for cleaning/defogging, assisting elderly and disabled riders on the bus, pushing wheelchair riders to/from their home/destination as needed, securing the wheelchairs in the bus and carrying in multiple bags of groceries if necessary.

CITY OF CLOVIS
LEAD BUS DRIVER

DEFINITION
Under general supervision, operate a public transit vehicle to provide public transportation by fixed-route service and/or demand-response service; maintain drivers training records; provide technical training and evaluation of drivers to maintain their certifications; attend regional training meetings; maintain terminal records for certification by Department of Motor Vehicles (DMV) and California Highway Patrol (CHP); act as a relief transit dispatcher; and perform related work as required.

CLASS CHARACTERISTICS
Positions in this class drive a public transit vehicle to provide public transportation in fixed-route service and/or demand-response service transit systems. Incumbents pickup, transport, and drop off riders at locations based on fixed time and location schedule or by appointment. They provide special assistance to elderly, disabled, or other special needs riders. Incumbents are expected to maintain the time and/or appointment schedules of their route. Positions in this class perform work which has some variation and which allows or requires a limited range of choice in the application of defined methods or procedures. Incumbents work with independence in the field making decisions in accordance with established instructions. Incumbents receive thorough instructions when tasks are initially assigned and after training are expected to perform duties and exercise good judgment without constant supervision. Work performance is reviewed periodically. Incumbents are expected to refer to the supervisor for instruction in those matters which do not fit a clear pattern. Incumbents are responsible for driver training and technical evaluations of transit drivers, maintaining training records and developing education curriculum to meet relevant state and federal regulations.

EXAMPLES OF DUTIES
~~Drives a motor coach on a general public fixed-route system and/or the demand response system transporting the general public, elderly, disabled, and other special needs riders as authorized to various locations from their homes or on a fixed route; selects effective routes; meets departure and arrival times as scheduled; provides for passenger comfort and safety including fastening safety belts; performs small errands including carrying packages, opening and locking doors, and escorting passengers to their destination; assists riders with route, fare, and transfer information; pre & post trips transit vehicles; fuels motor coach as needed/daily; observes that all fares are put into the farebox and deposits farebox at the end of the work day; operates lift equipment; operates a mobile radio:, utilizes transit specific on-board technology including but not limited to electronic fareboxes, passenger counters, mapping systems, scheduling software, and electronic pre-trip system, provides for passenger comfort and assists with safety measures; keeps vehicles clean and reports any mechanical defects; keeps necessary records and reports, and performs minor vehicle maintenance; receives and dispatches calls for service; reacts appropriately to passengers with physical challenges including cerebral palsy movements, epileptic seizures, hearing loss deficiencies, blind and limited sight constraints, and orthopedic limitations;~~

Operates passenger coach on an assigned route to meet a designated schedule; picks up and discharges passengers at various locations and stops; counts riders; assists passengers when needed; provides information to the public concerning routes, schedules and transfer points; reports and accounts for lost articles; completes various reports, such as daily operation and incident reports; performs pre and post inspections of coaches, including damage or defects in body, tires, lights, mirrors, instruments, brakes and other equipment for rider and driver safety and convenience; reports all defects and deficiencies found during such inspections; monitors passenger behavior and contacts appropriate personnel as necessary concerning transportation problems and concerns in a reasonable, timely manner to provide high quality services to passengers; operates passenger coaches on special routes; assists passengers with special needs; loads and secures wheelchairs and related medical equipment to meet the needs of passengers; performs assigns duties with a pleasant and congenial personality; assists and relieves the transit dispatcher as needed; supervises at transit accident scenes and completes required paperwork; maintains driver training records to ~~assure~~ ensure current licensing and certifications; provides technical training and evaluation of transit drivers, and attends regional training meeting; maintains terminal records for certification by DMV and CHP, and assists in the annual audit by DMV and annual CHP vehicle inspection; ~~remove funds from vehicle fare box systems and~~ replenishes supplies needed in each bus, such as maps and cleaning supplies~~, and transfer slips~~; performs related duties as required.

TYPICAL QUALIFICATIONS
LICENSE AND CERTIFICATES REQUIRED

- Possession of a valid ~~Class B~~ California Commercial Driver's License with Passenger (P) endorsement;
- Possession of Vehicle Transit Training (VTT) certificate and General Public Paratransit Vehicle certificate (GPPV) or higher, good driving record and current First Aid and CPR certificates;
- Completion of TSI Train the Trainer course or ability to obtain the certification within six (6) months of hire.

EDUCATION and EXPERIENCE

Education:

- Completion of formal or informal education sufficient to ~~assure~~ ensure the ability to read and write at the level required for successful job performance.

Experience:

- Three (3) years of licensed experience in the operations of motor vehicles, and
- Two (2) years of transit driver work experience and
- Completion of the TSI Train the Trainer course or the ability to obtain the certification within six (6) months of hire.

QUALIFICATIONS

Knowledge of:

- Provisions of the California Motor Vehicle Code applicable to the operation of vehicles used in transporting people;
- Knowledge of the safety requirements and hazards involved in operating a transit vehicle;
- Operation of various transit vehicles;
- Common physical limitations of the aged and disabled people;
- Excellent customer service skills using tact, patience and courtesy;
- Basic computer terminal office methods and office software;
- Simple record-keeping as a driver and trainer;
- Basic math and English usage;
- Workplace and driving safety precautions and procedures;
- Training techniques sufficient to provide technical driving skills and to evaluate drivers;
- Basic vehicle accident investigation techniques.

Ability to:

- Enforce regulations and deal tactfully, courteously and effectively with general public;
- Detect operating defects in transit vehicles;
- Apply integrity and trustworthiness in all situations;
- Maintain vehicles in clean and safe condition;
- Maintain ~~simple records;~~ accurate records, prepare clear and concise reports, and communicate effectively in oral and written form;
- Design, create and deliver training sessions to bus operators, individually and as a group;
- Communicate with clients having oral and auditory disabilities;
- Operate a vehicle observing legal and defensive driving practices;
- Understand and carry out oral and written instructions;
- Establish and maintain effective relationships with those contacted in the course of work;
- Assist the physically disabled with independent living skills;
- Provide technical assistance, training, evaluation and certification of public transit drivers to meet state and federal regulations.

SUPPLEMENTAL INFORMATION

PHYSICAL DEMANDS AND WORKING CONDITIONS

- Strength: Medium work-lifting, carrying and/or pushing 75 pounds maximum with frequent lifting and/or carrying objects weighing up to 50 pounds.
- Physical activities include: kneeling, bending, stooping, reaching, standing, walking, up to and including the possibility of climbing a ladder to reach high windows for cleaning/defogging, assisting elderly and disabled riders on the bus, pushing wheelchair riders to/from their home/destination as needed, securing the wheelchairs in the bus, and carrying multiple bags of groceries if necessary.

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: General Services Department

DATE: April 5, 2021

SUBJECT: General Services - Approval – Res. 21-___, Amending the City's FY 2020-2021 Position Allocation Plan by Deleting One (1) Business Workflow Specialist Position and Adding One (1) Business Workflow Analyst Position.

ATTACHMENTS: 1. Resolution

CONFLICT OF INTEREST
None

RECOMMENDATION
For the City Council to approve Resolution 21- ___; Amending the Position Allocation Plan by deleting one (1) Business Workflow Specialist Position and adding one (1) Business Workflow Analyst Position within the Planning and Development Services Department.

EXECUTIVE SUMMARY
Currently, the Planning and Development Department is authorized two (2) Business Workflow Specialist Positions. Following an assessment of work assignment needs in the department, it is recommended that the City's Position Allocation Plan be amended by deleting one (1) Business Workflow Specialist Position and replacing the position with one (1) Business Workflow Analyst Position. Council approval is required for changes to the Position Allocation Plan.

BACKGROUND
The Planning and Development Services Department has recently evaluated the work assignments in the department and has determined that the addition of one (1) Business Workflow Analyst Position and the elimination of one (1) Business Workflow Specialist Position will more efficiently support the current needs of the department. The analyst position is comprised of more advanced duties than the specialist position. The desired change results in the need to modify the City's Position Allocation Plan which requires Council approval.

FISCAL IMPACT
The recommended change in the City's Position Allocation Plan would be an increased cost for the fiscal year of approximately $4,500 in FY 2020-2021. There are adequate funds in the Planning and Development Services Department budget to cover the costs of this position.

REASON FOR RECOMMENDATION
The addition of one (1) Business Workflow Analyst and the elimination of one (1) Business Workflow Specialist better suits the staffing need of the Planning and Development Services Department. The change must be reflected in the authorized FY 2020-2021 Planning and Development Services Department position allocation. Modification of the Position Allocation Plan requires Council Approval.

ACTIONS FOLLOWING APPROVAL
The FY 2020-2021 Position Allocation Plan in the Planning and Development Services Department will be modified as noted in Attachment A of Attachment 1. A recruitment will then be conducted to establish an eligibility list that will be used to select a Business Workflow Analyst.

Prepared by: Lori Shively, Personnel/Risk Manager

Reviewed by: City Manager

RESOLUTION 21-__

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CLOVIS APPROVING AMENDMENTS TO THE CITY'S FY 2020-2021 POSITION ALLOCATION PLAN

The City Council of the City of Clovis resolves as follows:

WHEREAS, the FY 2020-2021 Position Allocation Plan in the Planning and Development Services Department was approved as part of the FY 2020-2021 City budget adoption process; and

WHEREAS, a review of the staffing needs of the City indicates that the addition of one (1) Business Workflow Analyst position and the deletion of one (1) Business Workflow Specialist position is necessary in order to provide the advanced workflow duties necessary for the Planning and Development Services Department; and

WHEREAS, amending the City's adopted FY 2020-2021 Position Allocation Plan requires City Council authorization.

NOW THEREFORE, BE IT RESOLVED by the City Council of the City of Clovis that the City's FY 2020-2021 Position Allocation Plan shall be amended as noted in Attachment A of Attachment 1 attached.

* * * * *

The foregoing Resolution was introduced and adopted at a regular meeting of the City Council of the City of Clovis held on April 5, 2021 by the following vote to wit:

AYES:
NOES:
ABSENT:
ABSTAIN:

DATED: April 5, 2021

_____ _____
Mayor City Clerk

ATTACHMENT 1

POSITION ALLOCATION ADJUSTMENT BY DEPARTMENT FY 2020-2021

DEPARTMENT		NUMBER OF POSITIONS
Planning and Development Services Department		
Add:	Business Workflow Analyst	1.0
Delete:	Business Workflow Specialist	1.0

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: General Services Department

DATE: April 5, 2021

SUBJECT: General Services - Approval – Extension of Workers' Compensation Claims Administration Services Contract to Acclamation Insurance Management Services, Inc. (AIMS); and Authorizing City Manager to Execute the Agreement.

ATTACHMENTS: 1. Current Contract
2. Contract Extension

CONFLICT OF INTEREST
None

RECOMMENDATION
For City Council to approve the proposed two (2) year contract extension submitted by Acclamation Insurance Management Services (AIMS) for provision of Workers' Compensation claims administration services with a one percent (1.0%) fee increase for a two (2) year period from July 1, 2021 through June 30, 2023; and, authorize the City Manager to execute an extension agreement with AIMS.

EXECUTIVE SUMMARY
On July 1, 2018, the City of Clovis entered into a three (3) year contract with AIMS to administer the City's workers' compensation claims program. The contract, which is scheduled to expire on June 30, 2021, contains an option to extend up to an additional two (2) years. In anticipation of the contract expiration, staff met with AIMS to discuss the terms of a two (2) year extension. AIMS provided a quote for an additional two (2) year term with a total fee increase of one percent (1.0%).

BACKGROUND
Since 1979, the City has utilized the services of a third party administrator (TPA) to manage its self-funded workers' compensation program. The program currently operates with a self-insured retention of $250,000 with losses beyond this amount covered through the City's participation in the Local Agency Workers Compensation Excess Joint Powers Authority

(LAWCX). On July 1, 2018, the City entered into an agreement with AIMS for a three (3) year period with an option to extend the contract on a year to year basis for two (2) additional years.

AIMS has successfully administered the City's claims, and in conjunction with City staff, has reduced program expenses through proper implementation of workers' compensation reform, results-driven claims administration and aggressive bill review. The bill review savings for 2020 was $988,962.00. AIMS is committed to maintaining a local office, the assignment of experienced examiners on the City's account, and providing excellent quality of service. As a result, staff recommends exercising the option to extend the current agreement for an additional two (2) years.

FISCAL IMPACT

By extending the contract for two (2) additional years we were able to negotiate a contract extension with a one percent (1.0%) increase for the period of July 1, 2021 through June 30, 2022, and no fee increase for the period of July 1, 2022 through June 30, 2023. The contracted costs for administrative and bill review services over the next two (2) years is $438,156. The Personnel/Risk Management Division will budget accordingly for this service.

REASON FOR RECOMMENDATION

AIMS is a well-established firm and has provided excellent administrative and cost containment services to the City. In addition, AIMS is contracted with many public entities throughout the state and has the necessary experience to administer the City's workers' compensation program. The proposal submitted by AIMS is reasonable.

ACTIONS FOLLOWING APPROVAL

Staff will prepare a two (2) year agreement extension with AIMS for the City Manager's signature.

Prepared by: Lori Shively, Personnel/Risk Manager

Reviewed by: Luke Serpa, City Manager

CLAIM ADMINISTRATOR AGREEMENT

THIS AGREEMENT FOR SERVICES (this "Agreement") is made and entered into as of this 1st day of July, 2018, between the City of Clovis, (the "Client"), and ACCLAMATION INSURANCE MANAGEMENT SERVICES, INC. ("Claim Administrator" and/or "AIMS") for Claim Administrator to provide to Client medical and disability management services necessary to achieve the purposes of this Agreement ("Services"). The City of Clovis and Acclamation Insurance Management Services, Inc. may each be referred to herein as a "Party", or collectively as "Parties".

In consideration of the mutual covenants herein contained, the Parties hereto agree as follows:

I. APPOINTMENT AND AUTHORITY

A. Subject to the express limitations of authority set forth herein and in accordance with the provisions of this Agreement, the Client hereby appoints AIMS to adjust and administer claims, and AIMS accepts such appointment, for such class(es) of business and in such territories as are set forth in Schedule A attached to this Agreement. AIMS and its employees, in their performance of their duties under this Agreement shall do so as independent contractors, and shall act in compliance with such rules, regulations, or instructions as the Client may prescribe in writing.

B. In executing the Services contemplated under this Agreement, the Claim Administrator agrees and is hereby authorized:

1. To investigate, adjust, settle, resist or otherwise process all submitted claims, pursuant to the procedures and within the authority granted by the Client as set forth in Schedule B attached to this Agreement.

2. To investigate, adjust, settle, resist, or otherwise handle all submitted claims in excess of the authority granted or in variance of the procedures only with the prior approval of the Client.

3. To make payment on claims approved for settlement in accordance with the procedures set forth in Schedule B attached.

4. To handle all submitted claims according to the requirements of any appropriate legislative and/or regulatory authority.

5. To file any reports, maintain any licenses or any other authorization necessary or required by law to carry out the Claim Administrator's obligations and duties under this Agreement.

C. The Claim Administrator has the authority to do whatever is reasonably necessary, legal and proper to administer claims within the Claim Administrator's settlement authority limit and in accordance with the procedures established under this Agreement. The Claim Administrator shall, in connection with such claims, exercise its own judgment unless the Client specifically advises otherwise.

II. RECORDS AND REPORTS

A. Prior to the start of this Agreement, at a date to be mutually agreed to by both Parties, Claim Administrator shall retrieve, at its own expense, all open claim files from the Client or the Client's designated representative. It is understood that AIMS shall not be responsible for any expenses related to the retrieval of the Client's closed claims from the Client or the Client's designated representative. All claim files, both open and closed, remain the property of the Client no matter where they are held or stored.

B. The Claim Administrator shall keep accurate, complete and separate records of all claims handled pursuant to this Agreement on a timely basis and for the duration set forth herein, or as required by law and/or regulation. The claim files and records shall be established and maintained in accordance with the terms of this Agreement and any applicable law and/or regulation and shall at

a minimum contain all documents, notes, and work papers that reasonably pertain to each claim in such detail that pertinent events and the dates of the events can be reconstructed and the Claim Administrator's actions pertaining to the claim can be ascertained.

C. The Client, or its duly authorized representative, and any state insurance regulatory official may at all reasonable times inspect and copy any and all files, records, books, and bank account records maintained by the Claim Administrator pursuant to this Agreement. This right to inspect and copy records, books and bank account records shall survive the cancellation, suspension or termination of this Agreement and shall continue until all claims under this Agreement have been closed or returned to the Client, and all regulatory requirements have been met.

D. The Claim Administrator shall furnish the Client and/or its designee(s) with standard loss run reports on a periodic and timely basis. The reports shall contain such information, in such form, and on such schedule as is reflected in Schedule B attached to this Agreement.

E. It is understood that the Claim Administrator operates in a paperless environment, and that it is standard policy to destroy physical mail thirty (30) days after receipt. All physical mail is electronically scanned and maintained in the Claim Administrator's systems and may be accessed at any time.

F. The Claim Administrator shall not be responsible for any State Mandated Reporting of Medical Payments, unless the Client uses the Bill Review services offered by Allied Managed Care. Inc.

III. SERVICE FEES AND EXPENSES

A. Subject to compliance by the Claim Administrator with the terms and conditions of this Agreement, the Client will pay and the Claim Administrator will accept as full compensation for the Services provided under this Agreement the service fees as set out in Schedule C attached to this Agreement.

B. AIMS shall send monthly invoices to the Client for Services contemplated in this Agreement. Client shall pay Contractor undisputed charges within thirty (30) days of receipt of the invoice. If any charges are disputed, the Client shall pay the undisputed charges, if any, within thirty (30) days of receipt of the invoice. Client and the Claim Administrator shall engage in good faith negotiations to attempt to resolve any disputed charges.

C. In the event that Client has a good faith basis to dispute a portion or all of an invoice, it will notify the Claim Administrator in writing with the specific reasons for such dispute within fifteen (15) days of receiving such invoice and pay the remaining undisputed amounts as provided herein.

D. The Client shall also be responsible for and shall pay all Allocated Loss Expenses, as defined herein, in addition to the Service fees as provided for in this Agreement. For the purposes of this contract, Allocated Loss Expenses include but are not limited to the following:

1. Fees for medical examinations of claimants, including the reasonable and necessary transportation expenses of claimants.
2. Costs of reports from attending or examining physicians.
3. Attorneys fees and disbursements.
4. Costs of court report services and transcripts.
5. Costs of stenographic services and transcripts.
6. Witness attendance fees.
7. Court costs.

8. Appeal bonds.
9. Printing costs related to trials and appeals.
10. Fees associated with the procuring of testimony, opinions, appraisals, reports, surveys and analyses of professionals and experts.
11. The costs of automobile and property appraisals.
12. Trial and hearing attendance fees.
13. The costs of reports from government agencies or branches.
14. The costs of credit bureau reports.
15. The costs of private investigators.
16. The costs of photographs.
17. Medical or vocational rehabilitation costs.
18. Charges for medical costs containment services, i.e., utilization review, pre-admission authorization, hospital bill audit, provider bill audit and medical case management.
19. Extraordinary claim investigation and/or travel expense incurred at the request of the Client.
20. The costs of any similar service related to the investigation and defense of a particular claim, or the protection of and collection of the subrogation rights of the Client, for which the Client shall have given prior approval.
21. All fees associated with field adjuster activities where personal contact, investigation and/or litigation involvement is necessary.
22. Mediation and arbitration costs.
23. Medicare Lien negotiation.

Such Allocated Loss Expenses are limited to reasonable, customary and necessary expenses incurred by the Claim Administrator in the course of the performance of its duties under this Agreement.

IV. COMPLIANCE WITH STATE INSURANCE CODES

A. The Claim Administrator agrees to operate at all times in compliance with the terms of this Agreement, including all Schedules attached hereto, and in all material respects with applicable federal, state, and local statutes, regulations, codes and ordinances, including those applicable to unfair trade and claim practices, complaint handling, and records retention pertaining to the services contemplated under this Agreement.

B. The Claim Administrator agrees to implement appropriate measures to ensure the security and confidentiality of non-public personal information provided by the Client. The Claim Administrator further agrees, upon request by the Client, to provide confirmation that such measures have been implemented.

V. TERM AND TERMINATION

A. The term of this Agreement shall be for a period of three (3) years commencing on the date first written above. During the term of this Agreement the Claim Administrator is the Client's only Claims Administrator in connection with claims outlined on Schedule A attached. All new notices of such claims that the Client or its designee(s) first receive during the term of this Agreement will be forwarded only to the Claim Administrator for the purposes of providing the Services as set out herein. Upon mutual agreement, confirmed in writing by both parties AIMS and the Client may extend this Agreement on a year to year basis for no more than two years.

B. Either Party may cancel this Agreement by giving the other party sixty (60) days advance written notice of its intention to do so.

C. The Claim Administrator warrants that it and its adjuster employees now have all licenses necessary to conduct the business described in this Agreement. The Claim Administrator agrees it and specifically the adjusting employees who are assigned to the Client's account will maintain during the term of this Agreement any such necessary licenses. In the event that any such license expires or terminates, for any reason, the Claim Administrator shall notify the Client no later than fifteen (15) days after the date of the license expiration or termination, and shall make commercially reasonable efforts to renew or acquire new and necessary licenses within forty five (45) days of such notice. If AIMS is unable to acquire such licenses, this Agreement shall automatically terminate unless the Client agrees, in writing, to modify the provisions set forth in this Paragraph.

D. This Agreement covers the initial period stated above unless cancelled pursuant to the provisions of this Agreement. Any continuation or renewal shall be the subject of further negotiations between the parties. If the Agreement is not renewed, the Client shall exercise one of the following options within thirty (30) days prior to the date of termination:

1. Require the Claim Administrator to conclude the handling of all open claims as provided herein, subject to all the terms and conditions of this Agreement.

2. Require the Claim Administrator, at the termination of the Agreement, to deliver all files to the Client or a destination identified in writing by Client. Any time and expense incurred by the Claim Administrator in the delivery of such files will be billed to the Client, with supporting documentation for such billing, and the Client shall pay such billing to the Claim Administrator within thirty (30) days from the billing date. The Claim Administrator shall be entitled to payment for all undisputed Services rendered up to that time according to the terms of this Agreement.

VI. INSURANCE AND INDEMNITY

A. The Claim Administrator is required to maintain in full force and effect during the term of this Agreement a policy of errors and omissions insurance coverage, which affords coverage in the minimum amount of $5,000,000 for each claim or occurrence, with a per claim or occurrence deductible not to exceed $25,000. Such errors and omission insurance shall be maintained by the Claim Administrator at its sole cost and expense, and shall be primary and non-contributing coverage over any other valid and collectible insurance available to the Client. The Claim Administrator shall furnish proof of such insurance to the Client prior to initiation of this Agreement and each renewal thereof, and shall provide notification to the Client in the event of lapse of such coverage.

B. The Claim Administrator is required to maintain in full force and effect during the term of this Agreement policies naming the City of Clovis, its officials, employees and volunteers as Additional Insureds and providing public liability which afford coverage in the minimum amount of $2,000,000. Automobile liability insurance which afford coverage in a minimum amount of $1,000,000. Such public liability and automobile insurance, including but not limited to Bodily Injury and Property Damage, shall be maintained by the Claim Administrator at its sole cost and expense, and shall be primary and non-contributing coverage over any other valid and collectible insurance available to the Client. The Claim Administrator shall furnish proof of such insurance to the Client prior to initiation of this Agreement and each renewal thereof, and shall provide notification to the Client in the event of lapse of such coverage.

C. The Claim Administrator hereby agrees to, at all times hereafter, defend, indemnify and hold the Client harmless from all claims, liability or loss which result from real or alleged, negligent or willful acts, or errors or omissions of the Claim Administrator, or the servants, agents or employees of the Claim Administrator, in the performance of duties under this Agreement. Included are all costs,

expenses, attorney fees and other legal fees, penalties, fines, direct or consequential damages, assessments, verdicts (including punitive damages to the extent permissible under the law of the state where the Claim Administrator maintains its principal office) and any other expense or expenditure incurred by Client as a result of the Claim Administrator's performance or lack of performance under the terms of this Agreement.

D. AIMS agrees to the Insurance requirements that are in accordance with the procedures set forth in Schedule D attached.

VII. DISPUTE RESOLUTION

A. Disputes arising out of or relating to this Agreement, other agreements between the parties, or any other relationship involving Client and AIMS (whether occurring prior to, as part of, or after the signing of this Agreement) shall first be resolved by good faith negotiations between representatives of the parties with decision-making authority. If either party determines that the dispute cannot be resolved through informal negotiation then the dispute shall be submitted to non-binding mediation. The site of the mediation and the selection of a mediator shall be determined by mutual agreement of the parties. Enforcement of any remedy available to either Party, shall be brought in the appropriate court in the State of California, City and County of Fresno, or in the United States District Court for the Eastern District of California, and each of the Parties submits and consents to the non-exclusive jurisdiction of either of such courts for the purpose of any such suit, action or proceeding. Process in any suit, action or proceeding may be served by registered or certified mail addressed to the Party at its last known address.

VIII. CONFIDENTIALITY

A. Maintaining confidentiality of documents

During the performance of this Agreement, a Party may provide to the other Party information orally, in writing or by electronic means (whether through secured access through their respective internal websites, systems networks, and/or databases or otherwise), that is confidential and/or proprietary information ("Confidential Information") (for purposes of this Section VIII, the Party providing Confidential Information is referred to as the "Disclosing Party" and the Party receiving Confidential Information is referred to as the "Receiving Party"), including, but not limited to: (i) business and financial data, technical data, manuals, forms, records, methods, product information, strategic plans, potential and existing strategic partner information, sales and marketing information, and other information necessary for Claim Administrator to perform its duties; (ii) trade secrets and other intellectual property, and software applications or components thereof, including the source code, whether developed in- house or otherwise owned by either of the Parties; and (iii) personally identifiable consumer information and nonpublic personal information of the Client's employees, customers, and consumers. The Receiving Party shall maintain such information as confidential and shall use reasonable efforts to ensure that such information shall be used only for the purposes contemplated in this Agreement. The Receiving Party shall implement and maintain appropriate information security policies and procedures with the same care as used by a reasonable person in protecting his or her own confidential information, which policies and procedures shall include administrative, technical and physical safeguards designed to: (1) ensure the security and confidentiality of Confidential Information; (2) protect against any anticipated threats or hazards to the security or integrity of Confidential Information; and (3) protect against unauthorized access to or use of Confidential Information. The Receiving Party shall immediately notify the Disclosing Party of any breach of confidentiality, and shall cooperate with Disclosing Party to remedy any such breach. Any compilation, aggregations, reports, studies, or analyses generated by AIMS may be used internally by AIMS solely to assist in making assessments pursuant to this Agreement, and shall not be disseminated.

B. Strict limits on release of Confidential Information

Claim Administrator shall not release any Confidential Information to any entity or person other than the Client's employees and Claim Administrator's representatives on an as-needed basis without the express written consent of the Client or as the Claim Administrator may be required by law to disclose.

C. Court-Ordered disclosure of Confidential Information

If the Claim Administrator is served with a subpoena, court order, or other legal document demanding or requiring the release of Confidential Information, Claim Administrator shall immediately give notice to the Client. The Client shall decide whether to take any legal action in response to any such subpoena, court order, or other legal document and Claim Administrator shall cooperate with and assist the Client (at no cost or expense to the Claim Administrator) in seeking a protective order, moving to quash the subpoena, or otherwise obtaining relief from disclosing Confidential Information.

IX. SEVERABILITY

A. If any term or provision of this Agreement, or the application of any term or provision of this Agreement to a particular situation, shall be finally found to be void, invalid, illegal or unenforceable by a court, then notwithstanding that determination, the term or provision shall remain in force and effect to the extent allowed by such ruling and all other terms and provisions of the Agreement or the application of this Agreement to other situations shall remain in full force and effect.

B. Notwithstanding the foregoing, if any material term or provision of this agreement or the application of such material term or condition to a particular situation is finally found to be void, invalid, illegal or unenforceable by a court, then the Parties agree to work in good faith and fully cooperate with each other to amend this Agreement to carry out its intent.

X. SPECIAL PROVISIONS

A. Special provisions, to this Agreement are specified in Schedule E, which is attached hereto and incorporated by reference herein.

XI. GENERAL PROVISIONS

A. This Agreement supersedes all prior agreements of any type whatsoever by and between the Client and the Claim Administrator.

B. The Claim Administrator's rights under this Agreement are not assignable, unless otherwise agreed upon in writing by an authorized officer of the Client.

C. The captions of the various provisions of this Agreement shall not be deemed a part of this Agreement and shall not be construed in any way to limit the content thereof but are inserted herein only for reference and for the convenience of the parties.

D. This Agreement may be executed in two or more counterparts, each of which will be deemed an original, but all of which together will constitute but one and the same Agreement.

E. This Agreement shall in all respects be interpreted, enforced and governed under the laws of the State of California, exclusive of its choice of law rules.

F. This Agreement shall be effective as of the date first written above.

G. All notices, requests, demands and other communications hereunder must be in writing, unless specified otherwise, and shall be deemed to have been duly given if delivery by hand or mailed first class, registered mail, return receipt requested, postage and registry fees prepared, or by telex, facsimile, e-mail(if confirmed by the receiver), or cable and addressed as follows:

If to the Client:
City of Clovis
1033 5th Street
Clovis, CA 93612
Phone: (559) 324-2725
Fax: (559) 324-2865
E-mail: loris@cityofclovis.com
Attn: Personnel/Risk Manager

If to the Claim Administrator
Acclamation Insurance Management Services, Inc.
10445 Old Placerville Road
Sacramento, CA 95827
Phone: {916} 563-1900
Fax: (916) 563-1919
Attn: President & Chief Executive Officer

Notices sent by fax will be effective upon date of fax receipt if a confirming copy is subsequently received by one of the other above methods. Addresses may be changed by notice to all Parties, in writing, signed by the addressee. Electronic mail shall be deemed received upon delivery if there is confirmation by the receiver.

Written notice provided via first class registered mail shall be deemed received three days after the date it was sent, overnight mail shall be deemed received the day after it was sent, certified mail and hand-delivered notice shall be deemed received the date it was delivered.

IN WITNESS WHEREOF the Parties hereto have caused this Agreement to be executed by their duly authorized representative recorded below.

Dated: 4/27/2018

CITY OF CLOVIS

By: _____

Name: Luke Serpa

Title: City Manager

Dated: 5/9/18

ACCLAMATION INSURANCE MANAGEMENT SERVICES, INC.

By: _____

Name: Dominic Russo

Title: President & CEO

LIST OF SCHEDULES

SCHEDULE A

SCOPE AND TERRITORY

Program Administrator: Acclamation Insurance Management Services, Inc.

Class of Business: Workers' Compensation, Cost Containment and Bill Review Cost Containment

Territory: California

1. Subject to the terms and conditions set forth in the AGREEMENT, AIMS shall provide the Client professional services as contained within this AGREEMENT. AIMS shall ensure that all claims are processed in accordance with California law, codes, rules, and regulations as promulgated by the Administrative Director and the Manager of the Department of Self Insurance Plans.

2. AIMS agrees to initiate prompt processing of all claims presented to AIMS upon notification in writing, facsimile transmission, e-mail, or by telephone from Client.

3. Penalties:

   A. Any penalties assessed by the Division of Workers' Compensation for delays in benefits that are the direct result of delay by AIMS shall be the responsibility of AIMS. Conversely, those penalties that are assessed as of the direct result of delay by the Client shall be the responsibility of the Client.

   B. Any penalties assessed by the Division of Workers' Compensation, Audit Unit for which AIMS made negligent error as identified by a State auditor shall be the responsibility of AIMS. The Client shall be responsible for paying penalties for which the Client has made a negligent error as identified by a State auditor.

   C. AIMS shall be responsible for any and all penalties that are the result of late payments pursuant to the statutory requirements for timely payments. If the penalties are paid from the trust fund as an add-on to a bill or benefit, AIMS shall reimburse the Client on a quarterly basis.

4. Licenses, Permits, etc.: AIMS represents and warrants to the Client that it has all professional licenses, permits, qualifications, and approvals of whatsoever nature which are legally required for AIMS to practice its profession. AIMS represents and warrants to City that it shall, at its sole cost and expense, keep in effect at all times during the term of the AGREEMENT any licenses, permits, and approvals which are legally required for AIMS to practice its profession.

5. Standard of Performance: AIMS shall perform all services required pursuant to the AGREEMENT in a manner and according to the standards identified in Schedule B, and if not specified in Schedule B or elsewhere in the AGREEMENT, then the standards of performance shall be consistent with those observed by a competent practitioner of the profession in which AIMS is engaged. All products and services of any nature that AIMS provides to Client pursuant to this AGREEMENT shall conform to the standards of quality normally observed by licensed, competent professionals practicing in AIMS profession.

6. Cooperation by Client: Client shall, to the extent reasonable and practicable, assist and cooperate with AIMS in the performance of its services hereunder. Such assistance and cooperation may include, as reasonably necessary, providing initial claim information and other material available from Client's files as may be necessary.

SCHEDULE B

CLAIM ADMINISTRATION PROCEDURES AND AUTHORITY

1. Caseload

Each examiner assigned to the account shall have a caseload not to exceed 175 open indemnity claims. Each claim assistant assigned to the account shall have a caseload not to exceed 300 open medical only claims. In situations where caseloads include future medical and medical only claims, these claims shall be counted as 2:1 in the caseload limit. For example, if a claims examiner has 200 total claims and 50 claims are medical only, future medical care or a combination thereof, the caseload would be counted as 175 claims.

The supervisor shall not have a case load but may handle specific issues.

2. Forms

AIMS shall provide all forms necessary for the processing of benefits or claims information including but not limited to: the Employer's Report of Injury, DWC Form 1, medical service orders, return to work slips, lost time information reports, vouchers, checks, and other related forms.

3. Claim File Set-Up and Diary Review

Upon receipt of the Employer's Report of Injury, the AIMS will prepare an individual claim file within one (1} working day for each claim. All claim files shall be reviewed at least every thirty (30) days for active claims and at least every six (6) months for claims that have settled but are open for the employee's future medical care. The examiner shall distinguish the regular diary review from routine file documentation in the computer notepad. The supervisor shall monitor the diary reviews not less than every ninety (90) days with a note to the file reviewing the examiners plan of action, providing any necessary direction or by printing and providing the Client with a "No Activity" report each month to identify any files that have fallen off the diary system. The plan of action, shall include, but not limited to, the employee's current work status, medical status, review of reserves, and future activity to move the claims toward resolution.

4. Claim Creation - Three Point Contact

AIMS shall conduct a three-point contact process for reported claims. Contact will be made with the non-represented injured worker within twenty-four (24} hours of receipt of a claim. Contact with the Client representative and treating physician shall be contacted within three (3) working days of receipt of a claim. If a nurse case manager is assigned to the claim, initial physician contact may be conducted by either the claims examiner or the nurse case manager. This initial contact should be substantive and clearly documented in the claim file. In the event a party is non-responsive, there should be evidence of at least three (3) documented attempts by AIMS to reach the individual. Medical-only claims shall have this three (3) point contact requirement as well.

5. Communication

a. Telephone Inquiries:

Return calls shall be made within one (1) working day of the original telephone inquiry. All documentation shall reflect these efforts.

b. Incoming Correspondence:

All correspondence received shall be clearly stamped with the date of receipt.

c. Return Correspondence:

All correspondence requiring a written response shall have such response completed and transmitted within five (5) working days of receipt.

d. Ongoing Claimant Contact:

For cases involving unrepresented injured workers who are off work, telephone contact shall be made at a minimum of once every forty-five (45) days and within three (3) working days after a scheduled surgical procedure. This requirement is in addition to nurse case management involvement for claims where nurse case managers are assigned.

6. AOE/COE Investigation

If a decision is made to delay benefits for a claim, an AOE/COE investigation shall be initiated within three (3) working days of the decision to delay. This may include, but is not limited to, obtaining witness/injured worker statements, initiating the QME/AME process, requesting medical records, etc.

7. Indexing

AIMS shall subscribe to a claims reporting bureau. The examiner shall request a report from the bureau on all new indemnity claims. All claims shall be reported to the Index Bureau at time of initial set-up and re-indexed on an as needed basis thereafter.

8. Reserves

Reserves shall be established based upon the ultimate probable cost of each claim. All reserve categories shall be reviewed on a regular basis but not less than at least every ninety (90) days. Such review shall be indicated in the computer notepad. The examiner shall utilize a reserve worksheet which has been approved by the City and the Local Agency Workers' Compensation Excess Joint Powers Authority pursuant to that JPA's Resolution Establishing a Claims Management Policy. Any changes to reserves shall include an explanation for the change and will be identified for the Client.

The claims assistant shall have the authority to establish reserves up to $5,000. An examiner shall have authority to establish reserves up to $50,000. A senior examiner shall have authority establish reserves up to $75,000. The supervisor shall have authority to establish reserves up to $150,000. A director, vice president, or president of the AIMS shall review and approve all reserves in excess of $150,000.

9. Medical Administration

AIMS shall select a panel of general practitioners, specialists, hospitals, and emergency treatment facilities to which injured employees should be referred, as approved by the Client, and the Claim AIMS shall regularly review and update the panel.

Contact with the treating doctors shall occur every fourteen (14) days on lost time cases and will continue as needed during the continuation of temporary disability to assure that treatment is related to a compensable injury or illness. For long term disability cases, contact shall be maintained consistent with doctor recommendations.

AIMS shall maintain contact with treating physicians to ensure employees receive proper medical treatment and are returned to full or modified employment at the earliest possible date.

AIMS shall maintain direct contact with medical service providers to ensure their reports are received in a timely manner.

AIMS shall arrange medical evaluations when needed, reasonable, and/or requested in compliance with the current Labor Code.

AIMS/ Allied Managed Care (AMC) shall ensure that medical bills are reduced to the Medical Fee Schedule and recommended rates established by the Administrative Director of Workers' Compensation. The Client shall pay for the use and benefits of the services provided. AIMS/AMC agrees to the requirements and fee structure that are in accordance with the procedures set forth in Schedule C.

AIMS shall provide, at the Clients expense, utilization review and/or professional managed care services on an as-needed basis to injured employees and as required by Labor Code, provided the Clients approval is obtained prior to the provision of such service.

10. Medical Payments

Medical bills will be matched to the file, reviewed for correctness, approved for payment, and paid within sixty (60) days of receipt. If all or part of the bill is being disputed, AIMS will notify the medical provider, on the appropriate form letter, within thirty (30) days or as established under Labor Code for Utilization Review.

11. Plan of Action

Each claim file shall contain the examiner's plan of action for the future handling of that claim. Such plan of action will be identified in the computer notepad within five (5) calendar days of initial claim set up. Such plan of action shall be clearly stated including the reasoning for the plan. The plan of action will be reviewed and/or updated at least every thirty (30) calendar day on active claims and at least every six (6) months on claims that have been settled but are open to monitor future medical care. Each plan of action will be clearly identified in the computer notepad.

12. Compensability

The compensability determination (accept claim, deny claim, or delay acceptance pending the results of additional investigation) and the reasons for such determination will be made and documented in the file within three (3) working days of the receipt of the notification of the loss. Delay of benefit letters shall be mailed in compliance with the Division of Industrial Relations' guidelines.

13. Provision of Benefits

AIMS shall provide all compensation and medical benefits in a timely manner and in compliance with the statutory requirements of the California Labor Code and applicable case law. AIMS shall compute and pay temporary disability benefits to injured employees based upon earnings information and authorized disability periods. AIMS shall review, compute, and pay all informal ratings, death benefits, findings and awards, life pensions, or compromise and release settlements. However, all such benefits shall be paid from the established trust fund. AIMS shall comply with the Client's salary continuation plan, which requires AIMS to compute temporary disability benefits and provide verification to the Client twice a month. AIMS shall also advise the Client of potential credits and penalties

For all regular, full-time, non-sworn employees, the Client pays up to one (1) year salary continuation paid directly to the employee. For all regular, full-time employees, including sworn employees, the Client requires AIMS to provide vouchers to the Client confirming employees' time-off work for temporary disability and LC 4850 benefits. For all part-time employees and employees who have exhausted salary continuation, LC 4850 benefits and coordinated paid time-off, temporary disability benefits may be paid directly to the employee through checks issued by AIMS. All disability benefit notices shall be sent to the employee as required by the Labor Code.

14. Return to Work

AIMS shall provide assistance to the Client in establishing a modified work program which is appropriate for injured employees while recovering and prior to their return to regular duties. AIMS shall notify the Client immediately of any change in employee work status.

AIMS shall consult frequently with the Client in those cases where the injury residuals might involve permanent work restrictions and/or retirement potential.

15. Transportation Expense

Transportation reimbursement will be mailed within five (5) days of the receipt of the claim for reimbursement. Advance travel expense payments will be mailed to the injured employee ten (10) days prior to the anticipated date of travel.

16. Litigated Cases/ Cases Involving Outside Investigations

AIMS shall promptly initiate an investigation of issues identified as material to potential litigation. The Client shall be alerted to the need for an outside investigation as soon as possible and AIMS shall appoint an investigator who is acceptable to the Client. The Client shall be kept informed on the scope and results of all investigations.

When defense counsel is not necessary, AIMS shall work closely with the applicant's attorney in informal disposition of litigated cases. All assignments to outside counsel will be done with the Client authorization and consent. In conjunction with the Client, AIMS shall monitor the outside counsel's progress. AIMS shall audit all bills before payment.

Settlement proposals directed to the Client shall be forwarded by AIMS or defense counsel in a concise and clear written form with a reason(s) for such recommendation.

All preparation for a trial shall involve the Client so that all material evidence and witnesses are utilized to obtain a favorable result for the defense.

The supervisor or the examiner will attend Workers' Compensation Appeals Board hearings, meetings with defense counsel, and meetings with members of the Client, staff, departments, and employee groups as necessary and as requested to do so.

17. Allocated Expenses

All allocated expenses (Defense Attorney, Investigative Services, Nurse Case Management etc.) shall only be assigned with prior approval of Client representative.

18. Settlements

AIMS shall obtain the Client's authorization on all settlements using a Settlement Evaluation Worksheet form as provided by the Client. All requests for settlement authority shall include a written claim summary, estimate of permanent disability, and the defense counsel's comments and recommendations, if any.

19. Subrogation

Unless instructed otherwise by the Client, in cases where a third party is responsible for the injury to the employee AIMS will pursue subrogation and notify the Client of the subrogation plan. When subrogation is to be pursued, the third party shall be contacted within ten (10} days with notification of the Client's right to subrogation and the recovery of certain claim expenses. If the third party is a governmental entity, a claim shall be filed with the governing board within six (6) months of the injury or notice of injury.

Appropriate periodic contact shall be made with the responsible party and/or insurer to provide notification of the amount of the estimated recovery to which the City will be entitled.

If the injured worker brings a civil action against the party responsible for the injury, the AIMS shall consult with the Client about the value of the subrogation claim and other considerations. Upon receipt of the Client's authorization, subrogation counsel shall be assigned to file a Lien or a Complaint in Intervention in the civil action.

Whenever practical, AIMS should take advantage of any settlement in a civil action by attempting to settle the workers' compensation claim by means of a third party compromise and release. If such attempt does not succeed, then every effort should be made through the WCAB to offset claim expenses through a credit against the proceeds from the injured worker's civil action.

20. Job Displacement Benefit

AIMS shall advise the injured worker of his/her rights to job displacement benefits.

21. Excess Insurance

Cases that have potential to exceed the Client's self-insured retention shall be reported in accordance with the reporting criteria established by the Local Agency Workers' Compensation Excess Joint Powers Authority (LAWCX) and any other excess insurance policies.

All cases which meet the established reporting criteria are to be reported within ten (10) days of the day on which it is known the criterion is met.

22. Award Payments

Payments made by AIMS for the Client on awards, computations, or compromise and release agreements will be issued within ten (10) days following receipt of the appropriate document.

23. Penalties

The Client will be advised of the assessment of any penalty for delayed payment and the reason thereof and the Claim Administrator plans for payment of such penalty within five (5) days of assessment.

24. Case Closure

AIMS shall establish a goal of 100% closing ratio each month. Within thirty (30) days of being discharged by the treating physician, the employee shall be sent a closing letter.

A follow-up medical appointment with the treating physician shall be set for employees who have not followed-up with recommended medical treatment. The employee shall be notified accordingly to attend this appointment.

AIMS will monitor stipulated cases with future medical provisions. Reserves for future medical will be reviewed semi-annually and adjusted according to use.

25. Future Medical Claims

Claims that remain open to monitor future medical care shall remain open for two (2) years from the last payment of the benefit. Reviews shall be documented in the claim notes to include settlement information, outline future medical care, last date and type of treatment, name of excess carrier, excess carrier reporting level, and excess carrier reporting history. Reserves for future medical treatment will be reviewed every six (6) months and adjusted for use over a three (3) year average and the injured employee's life expectancy based on the current version of the U.S. Life Table. The reason(s} and calculation(s) for the adjustment(s} shall be clearly documented on the computer notepad.

AIMS shall evaluate the claim at least once a year to determine a reasonable amount for settlement of future medical benefits and any remaining benefits due. The reason(s) and calculations(s} for the recommended settlement amount shall be clearly documented in the computer notepad. AIMS shall clearly document the computer notepad with the outcome of the settlement negotiations with the employee or applicant attorney.

26. Loss Runs and Other Reports

A loss run shall be issued by the 15th of the month following the closing date. Any corrections that are requested to be made to the loss run shall be made within thirty (30} days.

AIMS shall provide the following monthly reports to the Client:

A. A report of all open and closed claims run by fiscal year and department, to include the employees name, claim number, date of injury, paid amount with 4850 benefits, paid amount without 4850 benefits, future liability, total incurred with 4850 benefits, total incurred without 4850 benefits, frequency analysis loss cause, frequency analysis day of the week injury, count frequency by body part and any amounts recovered for subrogation or excess insurance;

B. A Management Summary Report;

C. All OSHA 300 log information. If the client communicates to AIMS the modified duty dates for each injured employee AIMS will record the information to populate the report.

D. A check register, in check number order, including any voids, refunds, and recoveries received with a total page showing the payment for the month by fiscal year;

E. A voucher register custom and standard run by fiscal year;

F. A "No Activity" report listing the claims that have had no activity during the previous ninety (90) days. The report components should include no reserve changes, no payments, no recoveries, no refunds, and/or no note pad activity.

AIMS shall provide quarterly reports, in addition to the regular monthly reports, to the Client:

A. A register of temporary disability paid for the quarter;

B. Claims opened and closed in the quarter;

C. Claims on delayed status with current status report;

D. Claims in denied status with current status report;

E. Reserve increases of $10,000 or greater with current status report;

F. Claims reportable to excess carrier with current status report;

G. Claims reported in the quarter by department;

H. Claims cost detail report of all open claims by department;

I. Claims cost detail report of all future medical claims by department.

AIMS shall provide additional annual reports to the Client:

A. Number of claims reported per year;

B. Top 5 body parts injured for the year;

C. Top 5 injury causes for the year;

D. Five most expensive injuries for the year;

E. Claims paid by year for each department for the last five years;

F. Temporary disability paid by year for each department for the last five years;

G. Permanent disability paid by year for each department for the last five years;

H. Medical paid by year for each department for the last five years;

I. Vocational rehabilitation paid by year for each department for the last five years;

J. Legal costs paid by year for the last five years;

K. Investigation costs paid by year for the last five years;

L. Nurse Case Management costs paid by year for the last five years;

M. Utilization Review costs paid by year for the last five years;

N. Bill Review costs paid by year for the last five years;

AIMS will produce additional reports as reasonably needed by the Client.

27. Claims Reporting

AIMS shall maintain all loss information as required by the Workers' Compensation Insurance Rating Bureau.

AIMS shall assist in the preparation of all reports which are now, or will be required by the State of California or other government agencies with respect to self-insurance programs. AIMS will also assist in the preparation of all reports or databases required by the California Institute for Public Risk Analysis (CIPRA) or other statistical database organizations as requested by the Client.

28. Record Retention

All claim files shall be maintained in accordance with statutory time requirements and the Client' s Record Retention Policy.

29. Claim Supervision

AIMS shall provide supervisory staff who will regularly review the work product of the claims examiners The supervisor shall review each claim not less than every ninety (90) days to ensure that each examiner is following the performance standards outlined in this RFP.

30. Availability of Personnel

AIMS shall at all times have one (1) or more of the examiners assigned to the City's account, or in their absence, the supervisor or a manager of Workers' Compensation available by telephone for emergencies through a 24-hour emergency telephone number.

Upon reasonable prior notice, AIMS shall ensure at least one (1) or more of the examiners or supervisors assigned to the Client's account is available to meet in person with Client staff during regular business hours throughout the term of the contract period.

It is highly desirable that AIMS maintain a business office in the Clovis-Fresno metropolitan area to service the Client's account.

31. Examiner Training

AIMS shall ensure each claims examiner handling the Client's claims will receive continuing education training each year. AIMS shall annually certify this in writing on the anniversary date of the agreement between the Client and AIMS.

Examiners assigned to the Client shall have a minimum of three (3) years indemnity claim handling experience and obtain their Self-Insured Certificate from the State of California within one (1) year of being assigned to the Client's account.

32. Member Services

AIMS shall provide special on-site training services annually to personnel from the Client to ensure that the people within the Client who process workers' compensation claims are effectively carrying out the procedures required for a successful program. A copy of AIMS claims manual should be readily available for review by the appropriate Client staff or representative.

AIMS shall require its examiners or other AIMS personnel, as necessary, to attend the Client's regularly scheduled meetings to report on the general state of the program and on any particular cases of interest to the Client. AIMS shall require the supervisor or other AIMS personnel, as necessary, to attend the Client quarterly claims review at City of Clovis offices.

AIMS shall require one (1) of the dedicated unit supervisors/managers to meet with Client's personnel, at the Clients location, as needed to review program procedures regarding workers' compensation reporting requirements and other program matters that require the timely participation of the Client's personnel.

AIMS shall require an examiner to be available and readily respond to a Client's request for assistance with problem cases, including on-site visits to the Client.

AIMS shall provide the Client with information regarding statutes, proposed changes to statutes, and changes to the rules and regulations affecting the Client and its responsibility as a self-insured public employer.

33. Claim Reconciliation

All claim files shall be reconciled to ensure all medical, indemnity, and expense payments have been made correctly. The reconciliation is to verify that payments were made to the correct provider, in the correct amount, and from the correct claim file. The physical file should be verified with the computer information. All open files shall be reconciled.

34. Employee Services

As required, AIMS will develop for review by the Client's materials which provide information and guidance to employees of the Client regarding workers' compensation and the self-insurance program. As required, AIMS will meet with and assist injured employees in resolving problems that arise from injury or illness claims.

35. Compliance with Labor Code

AIMS shall comply with all provisions of the Labor Code and Rules and Regulations in effect at the applicable date of injury.

SCHEDULE C

CLAIM SERVICE FEE AND OTHER FEES

Workers' Compensation Third Party Claims Administration

Contract Year	Start & End Date	Fee
Year One	7/1/2018 – 6/30/2019	$206,458.00*
Year Two	7/1/2019 – 6/30/2020	$211,619.00 *
Year Three	7/1/2020 – 6/30/2021	$216,909.00 *

* Annual cost of living adjustment of 2.5%

Should AIMS receive more claims than anticipated from the current claim administrator at the time of transfer and/or there is a 5% increase/decrease during the initial transfer or during any period of the contract due to significant change in the number of employees, and/or as a result of a catastrophic event, then both AIMS and the Client will negotiate, in good faith, a reasonable fee increase/decrease fee adjustment based on any revised required staffing.

The total annual flat fee proposed above contemplates handling all claims activity in a 12-month period (claims already open at the beginning of the 12-month term and any new claims reported during the 12-month term). The annual fee will be invoiced in 12 equal monthly amounts in arrears. The flat annual fees include all services detailed in the RFP proposal including, but not limited to the following services:

- All Claims Management Functions (currently open & included new claims)
- Data Management
- Claim File Storage
- Claim File Retrieval
- Account Management
- Claims System Reporting
- Public Self-Insurers Annual Report
- Prepare Federal Form 1099 notices
- Custom AIMS "dashboard"
- Website Access (on-line)
- Detailed Stewardship Report/Presentations
- Training Participation
- MMSEA Reporting

In the event the Client elects, upon termination of this Agreement, to require AIMS to conclude the handling of all open claims, AIMS shall invoice the Client at a monthly open rate to be negotiated in good faith between the Parties.

Carve-Out Agreement Pricing-

AIMS will assist the Client if the Client elects to have a Carve-Out Agreement in the negotiation of Carve-Out Agreements with their Unions. AIMS utilizes the services of an outside Applicant Attorney to assist with the discussions and presentation to the Union Members. AIMS will provide sample MOU Agreements, including physician specialty panels, mediation and nurse case management panels. AIMS will assist the Client with the preparation and tracking of all material in connection with the Agreement.

Additionally, AIMS will provide tracking on all aspects of the Agreement for State Reporting purposes and to provide the Client with program effectiveness and any agreed upon cost analysis.

Negotiation/Preparation of Carve-Out Agreement: Annual Tracking/ State Reporting:

- $15,000.00 /one-time set up fee at time of Union negotiations (per Union Agreement)
- $400.00 monthly fee / beginning at program implementation (regardless of # of Unions participating)

Managed Care Services Utilizing Allied Managed Care, Inc. ("AMC")

Medical Bill Review Fees

Fee per bill to reduce to the Official Medical Fee Schedule (OMFS):
$8.50 per bill (flat rate per bill) plus PPO access fee (see below).

The following is included (at no additional charge):

- Full duplicates
- Appeals
- Initial Setup
- Technology Fees for Interface
- Client Training
- Re-evaluation/provider Inquiries
- Expert Testimony in Defense of Reviews
- Electronic Data Interface and On-line Access
- Courier Service

PPO Network

Fees are based on savings below Fee Schedule. Percent of savings is dependent on which PPO network is selected.

PPO Name	Access Fee
Anthem Blue Cross – CA	26%
First Health / Coventry	24%
Procura	22%
PRIME	22%
InterPlan	18%
ClarisPointe	18%
ASI Flex	18%

Negotiation of Non-OMFS and Line-Item Audit bills, including Inpatient/Outpatient Hospital bills (non-PPO charges): 10% of Savings capped at a maximum of $10,000.00.

* Bills that fall into this category require prior approval by the Client before an extended review is conducted.

Electronic billing

Electronic and Standardized Billing Regulations: $1.00 per bill.

Utilization Review Nurse Review Flat Rate:

$85.00 per UR (nurse) Referral. This includes unlimited treatment requests and reviews per referral.

Physician Review Flat Rate:

$225.00 per Peer Review Referral. This includes unlimited treatment requests and reviews per referral.

The following is included in the above fees:

- Initial set-up at the time of award of contract
- Customized Special Account Instructions
- Documentation letters post UR and Peer Review
- Technology Fees for interface
- Production Reports & Metrics
- Consultation with the AMC Medical Director
- Client Training

Telephonic Case Management. including triage services for indemnity claims

$90.00 per hour.

Field Case Management

$107.00 per hour*

*Travel for Field Case Management (On-Site) services will be charged at the Internal Revenue Service approved rate for mileage at the time the mileage is incurred.

Allied Managed Care Provider Network - If the Client elects to have a Provider Network the pricing is listed below:

1st Year Pricing - $15,500 year/ $1,292 per month (regardless of claim volume).

• This includes Certification from State & Enrollment Notices to all Employees. Complete monitoring of the MPN for State Compliance & reporting with toll free access/assistance for the Client and Injured Employees and all services listed under the No Charge Services. 2nd+ Year(s) Pricing - $12,200 year/ $1,017 per month (regardless of claim volume).

First Notice of Loss 24/7 Triage Nurse Call Center

Toll free call center with nurse triage component to minimize reportable injuries. Call center operates 24/7, directing injured employees into appropriate treatment facilities (MPN providers & occupational clinics designated by Client). Nurse intervention at reporting level recognizes "first aid" issues and directs employees to home care instead of seeking treatment. Call center uploads all information into AIMS' Claims Management System eliminating the need for the employer to create a 5020.

Per Reportable Claim:	$150.00
Non-Reportable Claim:	No Charge
Secondary Calls:	$60.00

SCHEDULE D

Insurance Requirements

AIMS shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by AIMS, his/her agents, representatives, employees, or subcontractors.

1. Minimum Scope of Insurance

Coverage shall be at least as broad as:

a. Insurance Services Office Commercial General Liability coverage ("Occurrence" Form CG 0001).

b. Insurance Services Office Form No. CA 0001, covering Automobile Liability, Code 1 (any auto) or Code 8, 9 if no owned autos.

c. Workers' Compensation insurance as required by the Labor Code of the State of California and Employer's Liability insurance.

2. Minimum Limits of Insurance

AIMS shall maintain limits no less than:

a. General Liability: $2,000,000 per occurrence for bodily injury, personal injury, and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately or the general aggregate limit shall be twice the required occurrence limit.

b. Automobile Liability: $1,000,000 per accident for bodily injury and property damage.

c. Workers' Compensation and Employer's Liability: Workers' Compensation limits as required by the Labor Code of the State of California and Employer's Liability limits of $1,000,000 per accident for bodily injury and disease.

d. Errors and Omissions: $5,000,000 per occurrence and shall not be subject to a deductible and/or self-insured retention of greater than $25,000.

e. Employee Dishonesty: $2,000,000 to include comprehensive employee dishonesty, disappearance, theft, and forgery or alteration coverage.

3. Deductibles and Self Insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by the City. At the option of the Client, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions or the AIMS shall provide a financial guarantee satisfactory to the City guaranteeing payment of losses and related investigations, claim administration and defense expenses.

4. Other Insurance Provisions

The general liability and automobile liability policies are to contain, or be endorsed to contain the following provisions:

a. The City, its officers, officials, employees and volunteers are to be covered insureds with respect to liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of the TPA, and with respect to liability arising out of work or operations performed by or on behalf of the Contractor including materials, parts or equipment furnished in connection with such work or operations.

b. For any claims related to the services provided pursuant to an executed agreement the AIMS insurance coverage shall be primary insurance as respects the City, its officers,

officials, employees and volunteers. Any insurance or self-insurance maintained by the City its officers, officials, employees or volunteers shall be excess of the AIMS insurance and shall not contribute to it.

c. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be canceled by either party, except after thirty {30) days prior written notice by certified mail, return receipt requested, has been given to the City.

d. Coverage shall not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insured would be invalid under Subdivision {b) of Section 2782 of the Civil Code.

5. Acceptability of Insurers

Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII.

6. Verification of Coverage

AIMS shall furnish the Client with an original certificate and amendatory endorsements affecting coverage required by this clause. All certificates and endorsements are required to be received and approved by the Client before work commences. The Client reserves the right to require complete, certified copies of all required insurance policies, including endorsements affecting coverage required by these specifications at any time.

All insurance documents are to be sent to: City of Clovis
Attention: Lori Shively
Personnel/Risk Manager Personnel/Risk Management
1033 Fifth Street
Clovis, CA 93612
Loris@cityofclovis.com

SCHEDULE E

SPECIAL PROVISIONS

Additional Terms:

1. Financial Administration: The Client will establish a zero-balance trust account from which AIMS shall make all indemnity medical, and allocated loss expense payments. Payment authorization limits and payment policies will be established by Client and reviewed from time to time with AIMS. AIMS monthly service fee shall not be paid from the trust account.

AIMS shall maintain complete and accurate records with respect to costs, expenses, receipts, and other such information required by the Client that relate to the performance of services under the AGREEMENT. AIMS shall maintain adequate records of services provided in sufficient detail to permit an evaluation of services. All such records shall be maintained in accordance with generally accepted accounting principles and shall be clearly identified and readily accessible.

2. Allocated Expenses: All allocated loss expenses as defined in Schedule C, shall be the responsibility of the Client. It is agreed and understood that, whenever practicable, allocated loss expenses should be billed directly to the Client and the bills will be paid from the trust account.

3. Right to Audit: The Client or its designated representative is authorized to visit AIMS processing and/or storage premises, for purpose of performing a claims audit, and have access to all data, including paper documents, microfilm, microfiche, and magnetically stored data which relate to payments or non- payments made by AIMS. Any assistance or service provided in response to a claims audit described above will be rendered at no additional cost of the Client.

4. Invalid Payments: No charges to the Client for payments made on behalf of persons who were not valid employees of the Client at the date of injury shall be accepted for payment by the Client.

5. Personnel: AIMS agrees to assign only competent personnel according to the reasonable and customary standards of training and experience in the relevant field to perform services pursuant to the AGREEMENT. This includes the assignment of at least one Senior level Claims Examiner. Failure to assign such competent personnel shall constitute grounds for termination of this AGREEMENT pursuant to Section V.B. of this AGREEM ENT. The examiners and claims assistants may be dedicated to the exclusive handling of the Client's claims. AIMS shall be allowed to use a non-dedicated or part-time, experienced examiner when caseloads exceed the number specified in Schedule B. Each examiner shall have passed the State of California, Department of Industrial Relations, Self -Insurance Administrator's Examination; or as a minimum requirement an examiner that has not passed the State examination shall be enrolled in appropriate courses leading to certification within two years.

AIMS shall ensure that other personnel, such as management, clerical, accounting, and data processing, which may be required to satisfactorily provide the services required by this AGREEMENT, shall be provided by AIMS within the agreed fee for services contained in this AGREEMENT. It is understood that the personnel referred to in this paragraph need not be dedicated to the exclusive use of the Client.

6. Claim Reports: AIMS shall, at its expense, provide one week prior to the quarterly claims review meeting a written summary report showing the number of claims reported during the prior quarter, separated by a category (i.e. indemnity or medical only), the number of claims closed during the prior quarter, and any medical cost savings. This report shall show a comparison of the same information for the same quarter for the prior year.

7. Online interface: AIMS shall provide an online interface with its data base, accessible from the Client's computers for the use by the Client. Such data will be put in a format that will permit the Client to make print copies of the data on its printers. If the Client, under AIMS guidance, is not able to maintain an online interface with data maintained by AIMS, AIMS shall be required to provide a copy of all data processed during the past week to the Client's office each Friday in a disk media format which is transferable and useable with the Client's computers.

Two Year Extension of Agreement for Workers' Compensation Claims Administration Services as Amended

This agreement extension recognizes that the original Workers' Compensation Claims Administration Services agreement (Agreement) became effective on July 1, 2018 and remains in effect until June 30, 2021. The Agreement also provides a two-year extension, if mutually agreed and confirmed in writing by both parties. Consistent with this extension provision, the agreement is extended for two years through June 30, 2023.

This agreement extension recognizes that Acclamation Insurance Management Services (AIMS) and the City of Clovis wish to extend the Agreement for the period of July 1, 2021 through June 30, 2023 with a 1% fee increase effective July 1, 2021 and no fee increase for the period of July 1, 2022 through June 30, 2023. The annual fee for year one (1) and two (2) of the extension will be $219,078.00

All other terms and conditions of the Agreement, as amended, remain in full force and effect during the term of this extension.

City of Clovis

_____
Luke Serpa, City Manager
April _____, 2021

AIMS

_____
Dominic Russo, President & CEO
April _____, 2021

Approved as to Form:

_____
City Attorney
April _____, 2021

Attest:

_____
City Clerk
April _____, 2021

ATTACHMENT 2

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: General Services Department

DATE: April 5, 2021

SUBJECT: General Services - Approval – Res. 21-____, Amending the FY2020-21 Transit Budget to add $159,242.48 to purchase Three (3) Braun Vans using State Transit Assistance funds; and Approval - Waive the City's Usual Purchasing Procedures and Authorize the Purchase of Three (3) Braun Vans utilizing the CalACT Competitive Bid Award.

ATTACHMENTS: Res. 21- ____

CONFLICT OF INTEREST
None

RECOMMENDATION
For the City Council to approve a resolution amending the FY2020-21 Transit budget to add $159,242.48 for vehicle purchase expenditures; and for the City Council to waive normal purchasing procedures and authorize the City Manager to approve the purchase of three (3) Braun Vans from Creative Bus Sales utilizing the California Association for Coordinated Transportation (CalACT) competitive bid award.

EXECUTIVE SUMMARY
Staff recommends purchasing three (3) Braun wheelchair accessible vans as replacement vehicles to be used for Round Up paratransit services. This purchase would allow the retirement of three vans that have met the end of their useful life and are requiring significant repairs to remain safely on the road in service. The total cost of the three vans is $153,242.48. There are additional aftermarket costs to put the vans into service including application of the identifying decals and installation of a two-way radio, approximately $2,000 per vehicle. The costs for the vans and other expenses will be paid through State Transit Assistance (STA) funds already received.

BACKGROUND

FY2020-21 Transit Budget Amendment

A budget amendment is required for the FY2020-21 budget to account for expenditure of $159,242.48 in previously received State Transit Assistance as follows:

- Transit Fund 515: Increase expenditure budget for vehicle purchase by $159,242.48 for the three (3) new vans.

Van Purchase

In 2010, The California Association for Coordinated Transportation (CalACT) created a purchasing cooperative administered by Morongo Basin Transit Authority to assist small and medium sized transit agencies with vehicle and bus shelter procurements. Prior to 2010, most California transit agencies, including Clovis Transit, utilized a bus purchasing cooperative administered by Caltrans. However, following the cancellation of the Caltrans program, CalACT created a transit vehicle and bus shelter purchasing cooperative. Creative Bus Sales and A-Z Bus Sales, have various makes and models of vehicles on the purchasing cooperative, but each only sell a particular make and model of bus or van.

The CalACT purchasing cooperative awarded bids are in accordance with the Federal Transit Administration and California Department of Transportation regulations and has been audited by both agencies with no findings. The purchasing cooperative is also compliant with Buy America requirements. By utilizing the purchasing cooperative, Clovis Transit has the ability to buy the specialized vehicles our operation needs at a competitive cost. Like Caltrans did in the past, CalACT charges a 1.5% procurement fee, and estimated delivery is 15 days for the vans.

Vehicle specifications and options were listed in the CalACT RFP and the vendor's proposals. These specifications meet or exceed the transit operation's desired vehicle design and capacity. The three (3) Braun wheelchair accessible vans include the following desirable options:

- Manual swing ramp providing 30" usable width.
- Multiple wheelchair securement locations to better accommodate a wide range of mobility devices.
- ADA-compliant interlock, ramps, and door entrance lighting.
- 2nd row 2-passenger folding bench seat.

FISCAL IMPACT

One van that will be replaced has been in service since 2007 and the remaining two have been on the road since 2011 and are scheduled for replacement in 2021. The three new vans provide an opportunity for cost savings with lower maintenance costs from warranty coverage. Additionally, new vehicles have current technology which results in more efficient fuel use, lower vehicle emissions, a safer ride for passengers, and better ergonomics for transit employees. The vans will be used to transport passengers using Round Up service and will accommodate those using a mobility device to travel.

There is sufficient funding in the deferred State Transit Assistance account for the purchase of these vehicles.

Pricing for the recommended purchase is as follows:

- Proposed three (3) Braun Wheelchair Accessible vans including tax, options, aftermarket equipment, and procurement fee: $159,242.48

Total: $159,242.48

REASON FOR RECOMMENDATION
Replacement of three (3) aging Round Up vans will upgrade the fleet, decrease maintenance costs and reduce expensive repairs on aging equipment. Clovis Transit's use of the CalACT bid is within the City of Clovis Purchasing Policy, Section IV, Article C,1, b, (1).

ACTIONS FOLLOWING APPROVAL
Amend the Transit FY2020-21 budget to reflect the budgetary changes to revenue and expenditure accounts. A purchase order will be prepared for the City Manager's approval and the vehicles will be ordered. The vans are expected 15 days from order. The retired vans will be disposed of in accordance with City policy.

Prepared by: Amy Hance, General Services Manager

Reviewed by: City Manager

RESOLUTION 21-

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CLOVIS APPROVING AMENDMENTS TO THE FY 2020-21 GENERAL SERVICES DEPARTMENT

The City Council of the City of Clovis resolves as follows:

WHEREAS, the City Council adopted the FY2020-21 Budget on June 1, 2020; and,

WHEREAS, the City of Clovis has previously received State Transit Assistance (STA) funds for transit capital purchases; and,

WHEREAS, prior allocations of STA funds were not expended and remain in the Transit Fund awaiting allocation; and,

WHEREAS, the City Council has approved the expenditure of STA funds for the purchase of three (3) new wheelchair accessible vans; and

WHEREAS, the STA funds were not originally included in the FY 2020-21 General Services budget.

NOW, THEREFORE BE IT RESOLVED, that the City Council of The City of Clovis hereby approves the budget amendment shown in the “Summary of Expenditures/Revenues by Department” “Summary of Expenditures/Revenues by Fund”, attached as Exhibit A

* * * * * * *

The foregoing Resolution was introduced and adopted at a regular meeting of the City Council of the City of Clovis held on April 5, 2021, by the following vote, to wit:

AYES:

NOS:

ABSENT:

ABSTAIN:

Dated: April 5, 2021

_____ Mayor

_____ City Clerk

ATTACHMENT 1

SUMMARY OF EXPENDITURES BY DEPARTMENT

DEPARTMENT – GENERAL SERVICES

Transit	$159,242.48
TOTAL DEPARTMENT	$159,242.48

SUMMARY OF EXPENDITURES BY FUND

Transit	$159,242.48
TOTAL FUND	$159,242.48

SUMMARY OF REVENUES BY DEPARTMENT

DEPARTMENT – GENERAL SERVICES

Transit	$159,242.48
TOTAL DEPARTMENT	$159,242.48

SUMMARY OF REVENUE BY FUND

Transit	$159,242.48
TOTAL FUND	$159,242.48

NET GENERAL FUND SUPPORT

TOTAL	$0

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: General Services

DATE: April 5, 2021

SUBJECT: General Services - Approval – Res. 21-___, Approving a Side Letter Agreement with Clovis Employees Association to Adjust the Salary Schedule for Recreation Leader; and Authorizing City Manager to Execute Agreement.

ATTACHMENTS: 1. Resolution

CONFLICT OF INTEREST
None

RECOMMENDATION
For the City Council to approve a resolution, approving a side letter agreement with Clovis Employees Association (CEA) to adjust the salary schedule for the Recreation Leader classification.

EXECUTIVE SUMMARY
Adjusting the salary for the full-time Recreation Leader position will provide a more equitable salary in relation to part-time Recreation Leaders who received minimum wage increases.

BACKGROUND
The salary survey conducted in 2019 found insufficient comparisons to the City of Clovis full-time Recreation Leader position. Without salary comparison data, the salary was not increased beyond the annual across-the-board increases received by all units. However, part-time Recreation Leader employees received salary increases as the minimum wage has increased annually. These increases due to the minimum wage escalation has left the full-time Recreation Leader salary slightly above that of the part-time staff. Considering the full-time Recreation Leader leads the part-time staff, staff is proposing a salary adjustment for the full-time Recreation Leader position which is currently the lowest paid full-time position in the City.

To maintain equity, staff is proposing increasing the Recreation Leader classification as indicated in the chart below:

	Step 1	Step 2	Step 3	Step 4	Step 5
Current Monthly	$2,809	$2,949	$3,096	$3,251	$3,414
Current Hourly	$16.21	$17.01	$17.86	$18.76	$19.70
Proposed Monthly	$3,126	$3,282	$3,446	$3,618	$3,799
Proposed Hourly	$18.03	$18.93	$19.88	$20.87	$21.92

Staff met with representatives of Clovis Employees Association and they concur with the salary adjustment.

FISCAL IMPACT
If approved, the salary adjustment will be effective April 1, 2021. The lone Recreation Leader will remain at his current step 4, and will be eligible to move to Step 5 at his next evaluation date. The impact for the remainder of fiscal year 20-21 is $1,468. The impact for fiscal year 21-22 is expected to be $4,584.

REASON FOR RECOMMENDATION
The equity adjustment is needed to maintain parity between the full-time and part-time Recreation Leader positions. The adjustment will bring the full-time Recreation Leader more in line with the increases the part-time Recreation Leaders received with the minimum wage increases.

ACTIONS FOLLOWING APPROVAL
The side letter agreement will be fully executed and the salary adjustment will be effective April 1, 2021.

Prepared by: Shonna Halterman, General Services Director

Reviewed by: City Manager

RESOLUTION 21-

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CLOVIS APPROVING A SIDE LETTER AGREEMENT TO THE 2019-2022 MEMORANDUM OF UNDERSTANDING WITH CLOVID EMPLOYEES ASSOCIATION (CEA)

The City Council of the City of Clovis resolves as follows:

WHEREAS, the minimum wage has increased incrementally over the past five years with part-time staff receiving the required pay increases; and

WHEREAS, the full-time Recreation Leader position did not receive similar adjustments thereby leaving the position lagging in salary; and

WHEREAS, the Clovis Employees Association (CEA) bargaining unit have met with City management regarding a salary adjustment for the Recreation Leader position; and

WHEREAS, CEA agrees to the increased salary as noted in the Side Letter Agreement herein as Attachment A.

NOW THEREFORE, BE IT RESOLVED by the City Council of the City of Clovis that the Side Letter Agreement with CEA (Attachment A) be added to the current Memorandum of Understanding, and authorize the City Manager to sign the agreement.

* * * * * * * * * * * * * *

The foregoing Resolution was introduced and adopted at a regular meeting of the City Council of the City of Clovis held on April 5, 2021 by the following vote to wit:

AYES:

NOES:

ABSENT:

ABSTAIN:

Dated: April 5, 2021

_____ _____

Mayor City Clerk

ATTACHMENT 1

Side Letter Agreement to the 2019-2022 Memorandum of Understanding Between the City of Clovis and CEA

The City of Clovis and the Clovis Employees Association mutually agree to the following changes in the 2019-2022 Memorandum of Understanding between the City of Clovis and the Clovis Employees Association ("MOU").

1. Effective April 1, 2021, Section 8 (A) of the MOU will be amended to read as follows (changes are noted by italicized type):

A. Wage Scale - The City will implement the following wage increases *to the CEA Salary Matrix, which is incorporated herein by reference,* during the term of this agreement:

1. Fiscal Year 2019-2020:
   - All positions shall receive a 2.0% wage increase. The wage increase shall become effective on the first day of the first payroll period following CEA ratification and City Council approval of this MOU.

2. Fiscal Year 2020-2021:
   - Effective July 1, 2020, all positions shall receive a 2.0% wage increase.

3. Fiscal Year 2021-2022:
   - Effective July 1, 2021, all positions shall receive a 2.0% wage increase.

2. Due to the increase in minimum wage, the Recreation Leader position pay scale requires an equity adjustment to maintain the scale within market range.

3. Effective April 1, 2021, the Recreation Leader pay scale on the CEA Matrix will change to the following:

Step	Step 1	Step 2	Step 3	Step 4	Step 5
Monthly	$3,126	$3,282	$3,446	$3,618	$3,799
Hourly	$18.03	$18.93	$19.88	$20.87	$21.92

4. The 2% increase noted in the MOU which is effective July 1, 2021 will be based on the noted changed rates above.

5. This change in the pay scale shall not affect any employee's current step level or ability to receive merit based increases. Employee(s) in this class will retain their current Step level and eligibility for annual merit based increases, if applicable.

For the CITY:

_____
Luke Serpa, City Manager

Date: _____

For the ASSOCIATION:

_____
Moniqua Randolph, CEA President

Date: _____

ATTEST: _____
John Holt, City Clerk

DATE: _____

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Planning and Development Services Department

DATE: April 5, 2021

SUBJECT: Planning and Development Services - Approval - Bid Award for CIP 21-01, Rubberized Cape Seal 2021, and; Authorize the City Manager to execute the contract on behalf of the City

ATTACHMENTS: 1. Vicinity Map

CONFLICT OF INTEREST
None.

RECOMMENDATION

1. For the City Council to award a contract for CIP 21-01, Rubberized Cape Seal 2021 to VSS International, Inc. in the amount of $951,120.00 and;

2. For the City Council to authorize the City Manager to execute the contract on behalf of the City.

EXECUTIVE SUMMARY
Staff is recommending that City Council authorize the City Manager to award and execute the contract to VSS International, Inc. who was the lowest responsible bidder from a bid opening that took place on March 23, 2021.

The construction involves approximately 85,000 square yards of rubberized cape seal in various local streets as shown on the map in Attachment 1. This project also involves approximately 224,000 square yards of Type II slurry seal at various additional streets.

The work includes removal of all existing traffic striping, markings and markers, furnishing and installation/application of asphalt rubber chip seal, Type II slurry seal, traffic control, street sweeping, cleanup, traffic striping and all other items or details required as described in the Contract Documents.

BACKGROUND
The following is a summary of the bid results of March 23, 2021:

BIDDERS	BASE BIDS
VSS International, Inc.	$951,120.00
American Pavement Systems, Inc.	$1,033,260.00
Pavement Coatings Company	$1,046,840.00
American Asphalt South, Inc.	$1,092,190.00
Intermountain Slurry Seal, Inc.	$1,116,050.00
ENGINEER'S ESTIMATE	**$1,344,500.00**

All bids were examined and the bidder's submittals were found to be in order. VSS International, Inc. is the lowest bidder. Staff has validated the lowest bidder contractor's license status.

FISCAL IMPACT
This project was budgeted in the 2020-2021 Community Investment Program. The project is supported by Measure "C" pass through funds in the City Community Investment Program.

REASON FOR RECOMMENDATION
VSS International, Inc. is the lowest responsible bidder. There are sufficient funds available for the anticipated cost of this project.

ACTIONS FOLLOWING APPROVAL
1. The contract will be prepared and executed, subject to the Contractor providing performance security that is satisfactory to the City.

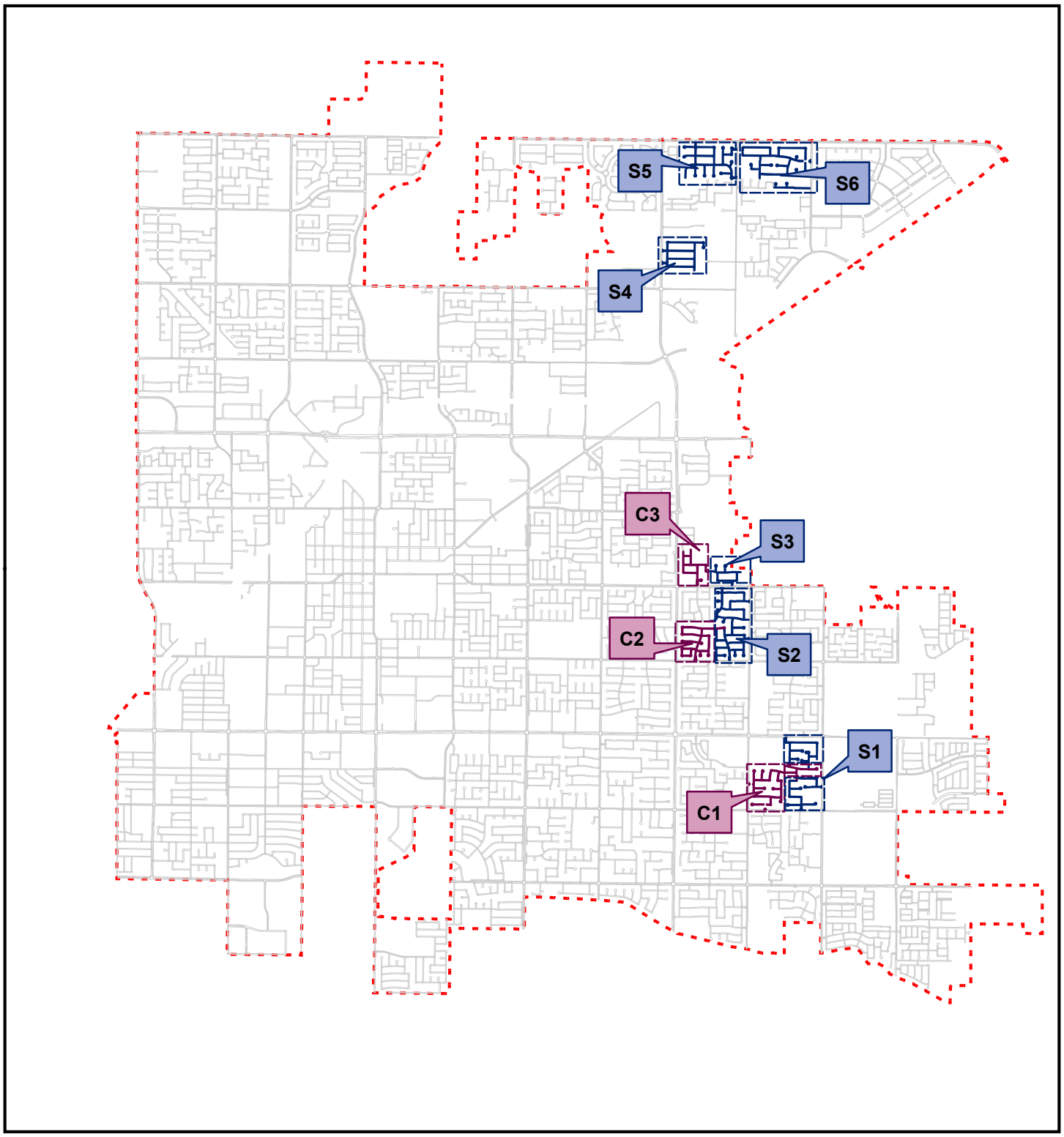
2. Construction will begin approximately two (2) weeks after contract execution and shall be completed in forty (40) working days thereafter.

Prepared by: Thad Avery, Supervising Civil Engineer

Reviewed by: City Manager

VICINITY MAP

CIP 21-01 RUBBERIZED CAPE SEAL 2021



ATTACHMENT 1

CITY OF CLOVIS PROJECT LOCATIONS

CLOVIS CITY LIMITS

1/28/2021

1:5,(

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Planning and Development Services Department

DATE: April 5, 2021

SUBJECT: Planning and Development Services - Approval – Authorizing City Manager to sign Consultant Service Agreement between Toole Design Group, LLC and the City of Clovis for the 2021 Active Transportation Plan Update

ATTACHMENTS:
1. Scope of Work
2. Study Area Map
3. Project Schedule
4. Fee Schedule

CONFLICT OF INTEREST
None.

RECOMMENDATION
For the City Council to authorize the City Manager to enter into an agreement with Toole Design Group, LLC for the 2021 Active Transportation Plan Update.

EXECUTIVE SUMMARY
The City's Active Transportation Plan (ATP) is a comprehensive City-wide document that identifies a vision for walking and bicycling in Clovis through a series of planned bicycle and pedestrian networks. The ATP also provides a prioritized list of projects to develop these networks, and ensures that the City meets state requirements to compete for regional and statewide ATP funds. City Council approved an ATP in October 2016. The 2021 ATP Update will provide a comprehensive analysis of, and update, to the 2016 ATP.

In December 2020, the City solicited competitive proposals from qualified firms to prepare the update to the 2016 ATP. Two proposals from qualified firms were received. The proposals were reviewed and ranked by Planning and Development Services Department staff. Staff is recommending that Council authorize the City Manager to enter into a Consultant Agreement with Toole Design Group, LLC, for $105,281.00, to perform the work identified in the attached Scope of Work (Attachment 1).

BACKGROUND

In October 2016, the City Council approved the City's first ATP. The vision for the City's ATP is to provide a connected and complete network of trails, walkways, and bikeways. These networks focus on providing safe, convenient, and enjoyable connections to key destinations and neighborhoods around the City along major collectors and arterials with minimal gaps and interruptions. The Plan was developed to support and encourage utilitarian and recreational walking and biking by all members of the community.

The update to the 2016 Active Transportation Plan will be presented, upon completion, to the City Council for approval as the 2021 ATP Update. The key tasks to be delivered by the Consultant are as follows:

- Analyze and document baseline conditions for city streets, sidewalks, intersections, walking routes, bicycling routes, and trails.
- Analyze and provide recommendations for Class IV bike lanes.
- Engage stakeholders including school districts, other City Departments, local agencies, neighboring jurisdictions, and public at large, in the public participation process, and incorporate public responses into the Plan.
- Utilize a program or platform similar in use to crowdsourcing to electronically obtain and analyze stakeholder feedback.
- Develop a prioritized list of ATP projects to address need, including any new street areas or components not currently in the 2016 ATP, establish a general cost estimate for each, and identify potential funding sources.
- Prepare base maps for identified projects in GIS, CAD, and/or PDF, and make final mapping products available to City staff.
- Develop appropriate Wayfinding protocols, particularly for the City Trail system.
- Develop and/or update City's design concepts for active transportation route types, including non-intersection crossings.
- Identify grant funding opportunities for ATP projects.
- Provide a list of priority projects expected to receive high scores in state/federal funding programs and having high likelihood of being selected for funding awards.
    - List should include safe routes to school projects or project areas.
- Prepare environmental analysis for the plan in accordance with the California Environmental Quality Act, and assist staff in processing approval of the document.
- Attend agency meetings, typically one Planning Commission meeting and one City Council Meeting, and others as may be requested by City staff.
- Develop the draft and final ATP as a master plan, including an Administrative Draft Plan for staff review, a public review draft and a final draft.
- Address and incorporate comments and feedback from the Administrative Draft Plan to the Final Plan.

The City will work with the consultant to ensure there is robust public engagement through public workshops, stakeholder meetings and inter-department coordination. Public feedback

will also be generated through online forms of communication to account for social distancing requirements.

Following execution of the consultant contract, the Toole Design Group will immediately start the planning and preparation for the ATP update. The project is estimated to take eight months to complete. Staff expects to present the final ATP for Council review and approval at a regularly scheduled public hearing in December 2021.

FISCAL IMPACT
The consultant contract amount of $105,281.00 is funded through Measure C Local Transportation Program funds, for which there is funding capacity in the City's 2020-2021 Community Investment Program Budget.

REASON FOR RECOMMENDATION
Preparation of an updated ATP provides for a timely revision to the City's goals, policies and projects to accommodate our pedestrian and bicycling public, and ensures that the City continues to be eligible to apply for and receive regional and statewide competitive Active Transportation Plan funding and Measure C funding.

ACTIONS FOLLOWING APPROVAL
Staff will execute a consultant services agreement with Toole Design Group to prepare the 2021 Active Transportation Plan Update.

Prepared by: Claudia Cazares, Management Analyst

Reviewed by: City Manager

SCOPE OF WORK
CITY OF CLOVIS ATP UPDATE

INTRODUCTION

This revised scope of work outlines the tasks and deliverables to be undertaken by Toole Design Group and its subconsultant (Crawford and Bowen) (collectively, CONSULTANT) to develop an active transportation plan update for the City of Clovis (COC). The primary tasks comprise:

- Task 1. Project Initiation and Coordination
- Task 2. Public Engagement
- Task 3. Data Collection and Review
- Task 4. Needs and Demands Analysis
- Task 5. Network and Facilities Recommendations
- Task 6. Prioritization and Implementation
- Task 7. Design Guidelines
- Task 8. Plan Documentation and Appendices
- Task 9. Environmental Review
- Task 10. Wayfinding Protocol

Accompanying this scope of work are:

- Attachment 2: Study Area Map
- Attachment 3: Project Schedule
- Attachment 4: Fee Schedule

PROJECT ROLES

Toole Design will provide project management and lead all tasks except the environmental review. Toole Design will oversee the environmental work lead by Crawford and Bowen, below.

Crawford and Bowen will lead the environmental review work.

STUDY AREA

In addition to the area within the city limits, the project area will include following areas that are currently under master planning processes: Heritage Grove, HomePlace and Clovis Northeast Area. See Attachment 2. Study Area Map.

PROJECT ASSUMPTIONS

1. The project duration will be up to 8 months from notice to proceed (Attachment 3) and will generally follow the project schedule developed by the CONSULTANT and approved by City of Clovis.
2. Budget may be transferred between tasks by the CONSULTANT, in consultation and concurrence with COC Project Manager, provided the total contract amount is not exceeded and the transfer is reported in the monthly progress report.
3. COC will be responsible for coordinating the distribution of deliverables among COC staff and any external partners for review and comment, including providing a list of contacts. COC will be responsible for collecting review comments, resolving conflicting comments, and submitting one set of consolidated non-conflicting comments to the CONSULTANT for each submittal.
4. The costs shown in Attachment 4 (Fee Schedule) assumes two (2) rounds of comment/revision for each deliverable (i.e. draft and final). Additional rounds of comments/revisions will be considered extra work and may need to be negotiated prior to the CONSULTANT proceeding with that work.
5. Generally, all major deliverables, including workshop materials and draft plans intended for review by the public will be submitted to COC two weeks in advance. COC will provide comments within one week after submittal. Other materials developed for project meetings such as presentations, hand-outs, etc. may be submitted one week in advance of the scheduled meeting and COC will provide comments at least two (2) days in advance of the meeting. The CONSULTANT will then make revisions without further COC review prior to the meeting.
6. The following will be provided by COC:
    - Aerial photos, GIS or CAD data with ROW, parcel lines, street names, contours, edge of pavement, existing bike and pedestrian facilities, and other relevant information as available for base map creation
    - Traffic data, pedestrian/bicycle volume counts where available, speed data, and traffic volumes
    - Plans, policies, and other documents that are not easily retrievable from online sources.
    - Current demographic information including census related information and school enrollment information.
7. All final deliverables will be provided in PDF, and/or GIS format unless otherwise noted
8. Translation and interpretation services for public outreach will be made available as needed and the budget allocated for these services allow.
9. CONSULTANT will coordinate with other City-contracted consultants in support of VMT/GHG reduction calculations. A maximum of 2 meetings (3-4 hrs. maximum) is assumed.

10. Due to the ongoing effects of the COVID-19 pandemic, outreach efforts will center on virtual platforms; however, CONSULTANT can pivot to in-person events, when appropriate.

TASK 1: PROJECT MANAGEMENT

1.1 Project Initiation

The CONSULTANT will prepare for, participate in, and document a kickoff meeting with the COC project manager and other identified agency officials, to review the scope, schedule, and critical milestones and to clearly identify the project expectations, project vision and goals, challenges, and opportunities. During this meeting, the CONSULTANT will establish protocol for regular status check-ins based on the project manager's preferred method of communication.

1.2 Ongoing Project Administration

Ongoing activities will include coordination of subconsultants, preparation of progress reports, and similar project administration tasks. The CONSULTANT will also develop a Quality Assurance/Quality Control (QA/QC) matrix to track review of all major deliverables.

TASK 1 DELIVERABLES:

- 1.1 Kickoff meeting agenda and meeting notes
- 1.2 Data request memorandum
- 1.3 Final schedule
- 1.4 Bi-weekly check-in meetings, agenda, and action items

TASK 2: COMMUNITY ENGAGEMENT

2.1: Community Engagement Plan

CONSULTANT will develop a tailored Community Engagement Plan that identifies target audiences and specific engagement strategies to garner both valuable input and support for the Plan Update. It will also detail events, noticing strategies, and a schedule for engagement activities.

2.2: Online Public Engagement

Below is a menu of options that can be woven into the Plan Update process. CONSULTANT will work with City staff to determine which engagement tools will be most effective.

PROJECT WEBSITE

CONSULTANT will develop content for a project webpage hosted on the City's website. The webpage will promote engagement activities, project materials, and detail ways to stay involved throughout the course of the project. CONSULTANT will create initial webpage materials in an agreed upon format and provide updates at key project milestones (e.g. existing conditions/baseline, draft recommendations).

INTERACTIVE WEB MAP/SURVEY

The key feature of the project webpage will be an interactive online map with a crowdsourcing platform used to obtain and analyze stake holder feedback. CONSULTANT will develop and include a short survey with the map with demographic questions that can help us assess how wide the spectrum of participants is. The survey will be used to solicit qualitative input and community priorities.

After draft project recommendations are developed, CONSULTANT will load the proposed bikeway network and pedestrian projects into a second online web map for review by the community. This can be used to verify if any critical facilities were missed and to allow people to provide input on priority improvements.

2.3: Outreach Meetings

CONSULTANT will organize and facilitate two outreach meetings, which will be held at key points during the development of the Plan Update. An initial outreach meeting will be held to gather input on the existing bicycle and pedestrian experience in the City of Clovis, and a second meeting will be held to gather input on the proposed networks. The outreach meetings will include a brief presentation by the project team and include interactive activities to seek input and share information about proposed facilities and improvements.

2.4: Commission and City Council Meetings

CONSULTANT will assist the City's Project Manager in providing process updates and seek feedback from the City's Planning Commission and City Council. CONSULTANT will develop materials and participate in up to three Commission and City Council meetings, including one Planning Commission meeting, one City Council meeting, and one additional meeting as needed.

2.5: Stakeholder/Focus Group Meetings

CONSULTANT will conduct up to three virtual stakeholder and focus group meetings to enable a deeper engagement with key community and agency.

Example focus groups to engage may include:

- Schools and Safety: The Clovis Unified School District, the Community Funded Bus Run, Clovis Community College, and the Police Department
- Services and Underrepresented Groups: Community based organizations, such as the Clovis Senior Activity Center, Cultiva La Salud, or the Clovis Community Foundation
- Jobs Access: City of Clovis Chamber of Commerce, BIA, and representatives from major retail centers
- Recreational and Transit Access: City of Clovis Transit, Fresno Area Transportation, Fresno Cycling Club, Fresno County Bicycle Coalition, No Walls Fitness and Walking Club

TASK 2 DELIVERABLES:

- 2.1 Community Engagement Plan (draft and final)
- 2.2 Online engagement, including webpage content and interactive web survey/map, social media blasts
- 2.3 Materials for and facilitation of two (2) outreach meetings
- 2.4 Materials for and attendance at up to three (3) Commission/ Council meetings
- 2.5 Materials for and facilitation of up for three (3) one and half hour stakeholder/focus groups meetings
- (Public Participation Report (draft and final) - to be developed as a part of Task 9)

TASK 3: EXISTING CONDITIONS ASSESSMENT

The purpose of Task 3 will be to 1) Review and analyze the policy and planning framework and 2) Evaluate existing walking and bicycling conditions throughout the city. This will include assessing infrastructure, identifying opportunities and constraints, establishing who is currently bicycling or walking, and identifying where residents or visitors want to ride or walk.

This task will rely upon the data provided by the City as a part of the Task 1 data request and additional research conducted by the consultant team, as allowable by the budget.

3.1: Review Existing Planning Documents

The CONSULTANT will conduct a review of existing plans and policies to establish a baseline understanding, confirm applicability, and recommend additions/modifications. This will include the following documents:

- The City of Clovis 2016 Active Transportation Plan
- The City of Clovis 2014 General Plan
- The Fresno-Clovis Metropolitan Area Class IV Bikeway Feasibility Study
- The Fresno-Clovis Class IV Bikeway Design Guide
- The Fresno Council of Governments Regional ATP
- Heritage Grove Master Plan
- Measure C projects
- California 2021 Active Transportation Program guidelines
- Fresno County Transportation Authority Program requirements

Information will be summarized in a table.

3.2: Documentation of Baseline Conditions

CONSULTANT will document and analyze baseline walking and biking conditions along city streets, sidewalks [city-wide], intersections, walking routes, bicycling routes, and trails. Using available data from the 2016 City of Clovis ATP, the 2020 project list, the City's updated GIS information, the city's yearly trails survey/count data, and the City's revised study area as a

starting point, CONSULTANT will work with City staff to identify active transportation improvements that have been implemented or are funded since the previous plan was adopted.

CONSULTANT will upload the updated data into an internal review web map where City staff can help quickly confirm that all existing facilities are appropriately shown. As a next step, CONSULTANT will visually identify critical gaps, barriers (such as intersections), high-stress roadways, bikeways, or crossings.

CONSULTANT will evaluate larger data sets such as U.S. Census data, the California Household Travel Survey, data from Clovis Transit's Stageline and Round Up lines and from the Fresno County Rural Transit Agency, as available. This data will provide information about bicycle/pedestrian/transit mode share, trip length, trip duration, and possible origins and destinations.

City staff will be asked to provide information on programmatic efforts and funding levels that have supported active transportation in the past five years to provide a funding benchmark. CONSULTANT will review any recommendations from school safety assessments conducted for schools in the Clovis Unified School District, Fresno Unified School District and Sanger Unified School District.

3.3: Collision Analysis

The CONSULTANT will evaluate bicycle- and pedestrian-involved collision data from the most recent five-year period available from the Statewide Integrated Traffic Records System (SWITRS), University of California Berkeley's Traffic Injury Mapping System (TIMS), and COC collision data, to map the injury and fatal crashes. To the extent possible, the SWITRS and City data will be used to identify crash trends by participant, such as racial or age disparities. CONSULTANT map data to identify potential high Injury intersections or corridors.

3.4: Existing Conditions Summary Report

CONSULTANT will document the findings of this task in a succinct, easy-to-understand format, such as a brief slide deck, with a heavy focus on visual and map-based products.

TASK 3 DELIVERABLES:

- 3.1 Existing plans and policies review matrix
- 3.2 Existing and planned GIS layer with web map portal
- 3.3 Collision Analysis Summary and Maps
- 3.4 Existing Conditions Summary Report (draft, final to be incorporated into Plan document)

TASK 4: VISION AND GOALS

4.1: Vision Statement

CONSULTANT will confirm the vision for active transportation in Clovis based on the 2016 plan and input received from the community and City staff during the community engagement

activities. Any recommended modifications to the vision will be shared with city staff for review and approval.

4.2: Goal Framework

CONSULTANT will develop a succinct policy and goal framework that build on the 2016 ATP and vision statement as well as feedback heard during outreach and from City staff. This framework will help form the development of the proposed bicycle and pedestrian network and support programs. The framework may include themes such as connectivity, safety, mode shift, and equity. Ultimately, the goals will be trackable, and it will be easy to identify how the goals relate to the city's other planning documents and efforts.

TASK 4 DELIVERABLES:

- 4.1 Draft and final vision statement (final to be incorporated into Plan document)
- 4.2 Draft and final goal framework (final to be incorporated into Plan document)

TASK 5: NETWORK AND FACILITY RECOMMENDATIONS

5.1: Methodology for Recommendations

CONSULTANT will work with the City to establish a framework for reviewing the City's existing project list and recommending updates to bicycle and pedestrian networks that balance multimodal tradeoffs and limitations, align with established goals, and respond to the usage trends observed in the yearly trails survey/count. This framework could take multiple forms such as: 1) connections to schools and major retail and transit destinations, 2) expansion of a connected trail network, 3) gap closures, 4) addressing important safety issues, such as midblock crossings or crossings at uncontrolled intersections, and 5) for the bicycle network, an All Ages and Abilities On-Street Network.

As a first step, in partnership with the City, CONSULTANT will determine a methodology for identifying project recommendations for the pedestrian and bicycle networks. CONSULTANT will provide the proposed methodology to the City in an outline format for review before it is finalized.

5.2: Updated Bicycle Network

The CONSULTANT will develop draft recommendations to update the bicycle network, including revisiting facility type(s) recommendations from the 2016 plan. CONSULTANT will consider connections to bikeways in the City of Fresno, other neighboring jurisdictions, and County-owned land. Recommendations will consider the identified design user, project vision and goals, and best practices in bicycle planning and design. CONSULTANT will develop recommendations in GIS and will assist the City in the preparation of a public-facing map of existing and proposed facilities. CONSULTANT will provide the final data and pdf maps to the City.

5.3: Pedestrian Project Recommendations

For the pedestrian network, the CONSULTANT will review the locations for proposed sidewalks from the 2016 ATP. Pedestrian conditions are highly localized, and The CONSULTANT will develop criteria tied to facilities design guidance developed in Task 8.1 to screen the pedestrian network and identify gaps. Connections to schools, civic destinations, recreational areas like Old Town Clovis, Clovis Civic Center and Clovis Transit's Stageline and Round Up routes as well as the FCRTA routes will be a primary consideration. CONSULTANT will seek community input on other priority locations for improving bicycling and walking through our outreach during Task 2.

The CONSULTANT will develop recommendations for gaps identified through analysis and public input. Pedestrian facility recommendations, especially those located at crossing locations, will be informed by guidance provided in the FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations and guidance developed in Task 8.1. Roadway characteristics such as speed limit, traffic volumes, and lane configurations are among the criteria to be considered for identifying appropriate mid-block and crossing treatments (high-visibility crosswalk markings, beacon-enhanced crossings, curb extensions, etc.). CONSULTANT will also consider locations where freeway barriers and ramp re-configurations could be improved. Deliverables will be provided in PDF or GIS formats, as applicable.

TASK 5 DELIVERABLES:

- 5.1 Network gaps and facilities recommendations methodology outline (draft and final)
- 5.2 Proposed bicycle project list and network map (draft, final to be incorporated into Plan document)
- 5.3 Proposed pedestrian network recommendations (draft, final to be incorporated into Plan document)

TASK 6: PRIORITIZATION AND IMPLEMENTATION

6.1: Project Prioritization

The first step in this task will be to develop prioritization criteria. The criteria will be based on the vision and goals developed in the previous ATP, as well as any new ones, to ensure that safer, more attractive walking and bicycling environment in City of Clovis can become a reality. Potential criteria include safety, connectivity, trip potential, and equity. CONSULTANT will develop draft criteria for review by City staff and incorporate one round of revisions.

Once prioritization criteria are established, criteria will be weighted based on staff and stakeholder input, and projects will be scored based on their ability to address each criterion. Projects will be grouped by implementation timeline, including short-term projects which may be key candidates for rapid implementation, and mid- and long-term projects which may require additional funding or design. Opportunities to align with other city projects will be flagged.

6.2: Cost Opinions

This task will update and develop planning-level cost estimates for infrastructure projects based on recent City of Clovis bids, neighboring city bids, and Caltrans Contract Cost Database

District 6 bid prices. COC engineering staff will provide cost information and work with the CONSULTANT to reach agreement on cost inputs and format of estimates. Depending on project budget status, COC staff may take the lead on developing costs based on project details provided by the CONSULTANT.

6.3: Implementation Strategy

CONSULTANT will develop an implementation strategy for the proposed projects. This implementation strategy will identify potential phasing, funding and grant opportunities for the ATP projects, and key departments or agencies that will be responsible for advancing the recommendations. With input from the City, performance metrics will be developed as a means of tracking implementation over time. Performance metrics will be closely tied to the goals established in Task 4.

CONSULTANT will develop an implementation matrix that incorporates the results of the prioritization and cost estimation processes, with an eye towards projects that can be implemented quickly and cost-effectively. This matrix will identify a list of projects for the first five years of ATP update implementation as well as potential funding sources. This list will include projects likely to score high in state/federal funding programs, such as ATP grants, and have a high likelihood of being selected for funding awards. This list will include Safe Routes to School projects that connect to schools and projects that connect to key community destinations and project areas. This strategy will set the City on a path toward rapid transformation in key areas.

TASK 6 DELIVERABLES:

- 6.1 Prioritization criteria (draft and final)
- 6.2 Cost Opinions
- 6.3 Implementation matrix including prioritized projects and potential funding sources (draft, final will be incorporated into Plan document)

TASK 7: DESIGN GUIDELINES AND STANDARDS

7.1: Design Guidelines

In this task, CONSULTANT will update and develop design guidance to complement the City's existing standards and guidelines (and any changes to these contemplated by this Update). These include:

- Street crossing spacing and enhancements (intersections and mid-block) – to include best practices guidelines for optimum placement throughout City
- Class IV bikeways

In addition, the CONSULTANT will review the City's existing standards and guidelines pertaining to active transportation and recommend updates based on best practices, if needed. This might include intersection geometry and operations that increase pedestrian and bicyclist comfort, accessibility enhancements, and alternative sidewalks.

TASK 7 DELIVERABLES:

- 7.1 Design guidelines, provided to COC desired format (draft and final)

TASK 8: PLAN DOCUMENTATION AND APPENDICES

8.1: Draft Plan Outline and Sample Layout

The CONSULTANT Team will assemble findings from the technical memoranda and other deliverables developed through previous tasks into a succinct, visually appealing Administrative Draft Active Transportation Plan Update. CONSULTANT will first develop a draft outline for review along with a sample layout.

8.2: Administrative Draft Plan

Following COC approval of the outline, the CONSULTANT will then develop an Administrative Draft for City staff to review. COC will then coordinate the review by appropriate COC departments or other stakeholders. CONSULTANT will incorporate reconciled comments provided from City staff into the document. The Administrative Draft Plan will be a concise, easy to use, and visually appealing as possible. Therefore, the Administrative Active Transportation Plan Update may be organized as follows:

- Table of Contents and Introduction
- Plan Summary, including Public Participation Overview (full report will be made an appendix)
- Vision and Goals
- Existing Conditions Overview (full report will be made into an appendix)
- Proposed Bicycle Network Maps
- Proposed Pedestrian Network Maps
- A brief new section on support programs, including bike parking, encouragement events such as Open Streets or the celebration of Park(ing) Day, and micromobility policies
- Implementation Strategy and Funding Plan
- Appendix A. Full Prioritized Project List
- Appendix B. Existing Conditions Summary Report
- Appendix C. Public Participation Summary Report
- Other appendices as needed

8.3: Public Review and Draft Plan

The Public Review Draft will be available for public review and comment on the City's website with the draft environmental clearance documentation from Task 10 for up to 30 days, or as otherwise specified by City staff. At the end of the public review period, CONSULTANT will present the Draft Plan to the Planning Commission and City Council, for comment, review and approval.

8.4: Final Plan

CONSULTANT will revise the Public Review and Draft to produce a Final City of Clovis Active Transportation Update Plan based on City staff direction regarding community, Committee, and Council comments. CONSULTANT will then provide a consolidated PDF document for City staff to post on the website. At this point, all data, files, and documentation used and created in the development of the ATP update will be provided to the City.

TASK 8 DELIVERABLES:

- 8.1 Draft Plan Outline
- 8.2 Administrative Draft Plan
- 8.3 Public Review Draft Plan
- 8.4 Final City of Clovis Active Transportation Plan Update (and associated native files)

TASK 9: ENVIRONMENTAL REVIEW

9.1: Administrative Draft Initial Study/Negative Declaration (IS/ND)

Using the draft Plan and other sources, CONSULTANT (Crawford & Bowen) will prepare the Administrative Draft IS/ND consistent with the requirements of CEQA, relevant case law, and specifications of the City of Clovis. The IS/ND will include an introductory chapter, the Project description, and the CEQA Appendix G Checklist analysis. The significance of Project-related impacts will be determined for each of the 20 topical areas. For each impact area, CONSULTANT anticipates the analysis will include the following: a brief description of environmental and regulatory setting; description of relevant General Plan/other policy document goals, regulations and policies that pertain to that impact area; evaluation of the environmental impact for that topic; and, a statement regarding the nature of the ATP and the need for case-by-case environmental review of potential future projects.

9.2: Screen-check and Public Review Draft IS/ND

Upon receipt of comments from the City CONSULTANT will make necessary revisions and prepare the Screencheck draft and public review draft IS/ND for submittal to the City. CONSULTANT will prepare the Notice of Intent to Adopt a Negative Declaration (newspaper publication), the State Clearinghouse Notice of Completion Form and the State Clearinghouse Summary Form. CONSULTANT will coordinate with the City on publication, mailing and printing as necessary.

9.3: Final IS/ND

CONSULTANT will provide written responses to comments received on the public review IS/ND as directed by the City. Additional research and analysis will be undertaken by CONSULTANT as necessary to effectively respond to comments. This scope of work assumes that this task will not require more than eight hours of staff time. A cost estimate is provided herein which CONSULTANT believes will be adequate for the task. If the level of response exceeds the expectation described above, CONSULTANT will respond to those comments that are above and beyond the threshold on a T&M basis, or another mutually agreeable formula.

9.4: Final IS/ND Meeting/Hearings

The project may require attendance at a kickoff meeting and public meetings (up to 2) such as adoption hearing(s) and/or public hearing(s). CONSULTANT will be available to attend and can present the IS/ND conclusions at the request of the City. Bi-weekly status meetings via telephone conference calls are anticipated through the duration of the project. This task consists of those management activities to ensure that the project is running smoothly, on time, and within budget. CONSULTANT will ensure information is distributed appropriately, comments regarding project-related issues are communicated effectively and efficiently, and financial performance is tracked regularly. Additional meetings may be attended on a T&M basis.

TASK 9 DELIVERABLES:

- 9.1 Draft CEQA document for staff review
- 9.2 Screencheck and public review draft
- 9.3 Comment Matrix and Response to City staff comments (assumes one set of consolidated comments)
- 9.4 Final CEQA document

TASK 10: WAYFINDING

10.1: Sign Protocol

CONSULTANT will work with COC and its partners, and consider input received from the public and other stakeholders, to establish a wayfinding sign protocol that includes legible sign and pavement marking design standards, an objective process for establishing a logical hierarchical system of destinations, and strategies for reducing sign clutter and improving clarity of signs, which is particularly important at intersections and trail crossing locations. The protocol will also address where it is appropriate to use pavement markings, signs, or a combination of both. The protocol will address the desire to accommodate city and trail branding within signage.

We will work closely to coordinate our efforts and support the ongoing wayfinding plans led by the City of Fresno. The most critical aspects of this work is ensuring that destinations are referenced in a consistent manner between the signage on City of Fresno, County of Fresno, and City of Clovis, and establishing a cooperative approach to sign placement taking into account the needs of the user.

The wayfinding protocol will include:

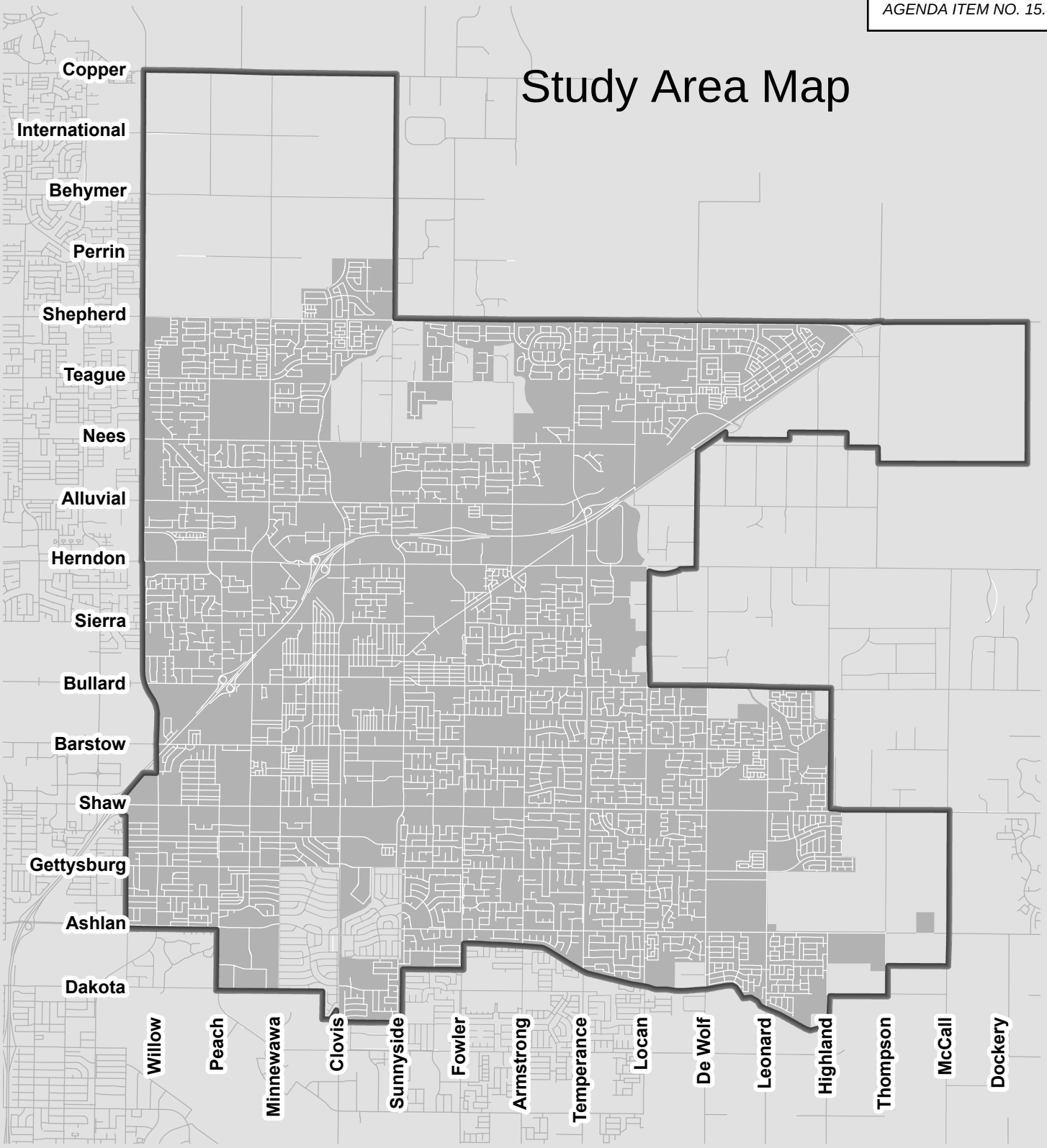
- Sign design standards for MUTCD-compliant bicycle wayfinding signs that incorporate limited city and/or trail branding
- Sign types and assemblies, guidance for wayfinding pavement markings
- Objective hierarchical destination framework
- Sign placement guidelines: which signs are used in what context, sign placement practices
- Guidance for assembling sign panels with destinations, distances, etc

- Up to 3 sign placement scenarios diagrams

Task 10 DELIVERABLES:

- 10.1 Wayfinding sign protocol

Study Area Map



CITY OF CLOVIS
STUDY AREA

Study Area

Clovis City Limits

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12/11/2020 6:23 AM

ATTACHMENT 2

Project Schedule

Clovis ATP Update

3/26/2021

Task	Month from NTP 1	2	3	4	5	6	7	8
Task 1: Project Initiation*								
Task 2: Community Engagement								
Task 3: Existing Conditions Assessment								
Task 4: Vision and Goals								
Task 5: Network and Facility Recommendations								
Task 6: Prioritization and Implementation Strategy								
Task 7: Design Guidelines								
Task 8: Plan Documentation								
Task 9: Environmental Review								

* Project Management and Administration ongoing

ATTACHMENT 3

FEE SCHEDULE

City of Clovis ATP Update

		Toole Design Group							
		Principal-in-Charge	Project Manager	Engineer / Deputy Project Manager	Engagement Lead	Planner / GIS Analyst	Project Manager		
		Michael Hintze	Kristen Lohse	Joel Shaffer	Malia Schilling	Jonathan Yuan	Travis Crawford		
		$ 185.00	$ 145.00	$ 120.00	$ 110.00	$ 110.00	$ 130.00	*Task Hourly Subtotals*	*Task Fee Subtotals*
Project Tasks									
1	**Project Initiation and Coordination**								
1.1	Project Initiation	0	6	0	0	0	0	6	$870
1.2	Ongoing Project Management/QAQC	8	24	0	0	0	8	40	$6,000
	Subtotal Hours	8	30	0	0	0	8	46	
	Subtotal Cost	$1,480.00	$4,350.00	$0.00	$0.00	$0.00	$1,040.00		**$6,870**
2	**Community Engagement**								
2.1	Community Engagement Plan	0	1	0	10	0	0	11	$1,245
2.2	Online Engagement	0	2		16	8	0	26	$2,930
2.3	Outreach Meetings	0	12	4	40	2	0	58	$6,840
2.4	Commission and City Council Meetings	0	10		4	0	0	14	$1,890
2.5	Stakeholder/Focus Group Meetings	0	8	0	16	0	0	24	$2,920
	Subtotal Hours	0	33	4	86	10	0	133	
	Subtotal Cost	$0.00	$4,785.00	$480.00	$9,460.00	$1,100.00	$0.00		**$15,825**
3	**Existing Conditions Assessment**								
3.1	Review Existing Planning Documents	1	1	0	8	0	0	10	$1,210
3.2	Documentation of Baseline Conditions	0	2	1	4	24	0	31	$3,490
3.3	Collision Analysis	1	0	0	0	8	0	9	$1,065
3.4	Existing Conditions Summary Report	1	1		0	12	0	14	$1,650
	Subtotal Hours	3	4	1	12	44	0	64	
	Subtotal Cost	$555.00	$580.00	$120.00	$1,320.00	$4,840.00	$0.00		**$7,415**
4	**Project Vision and Goals**								
4.1	Vision Statement	0	1		4	0	0	5	$585
4.2	Goal Framework	0	1		4	0	0	5	$585
	Subtotal Hours	0	2	0	8	0	0	10	
	Subtotal Cost	$0.00	$290.00	$0.00	$880.00	$0.00	$0.00		**$1,170**
5	**Network and Facilities Recommendations**								
5.1	Methodology for Recommendations	2	1	0	0	4	0	7	$955
5.2	Updated Bicycle Network	1	4	10	0	40	0	55	$6,365
5.3	Pedestrian Project Recommendations	1	4	10	0	30	0	45	$5,265
	Subtotal Hours	4	9	20	0	74	0	107	
	Subtotal Cost	$740.00	$1,305.00	$2,400.00	$0.00	$8,140.00	$0.00		**$12,585**
6	**Prioritization and Implementation**								
6.1	Project Prioritization	2	1	1	0	10	0	14	$1,735
6.2	Cost Opinions	0	2	20	0	2	0	24	$2,910
6.3	Implementation Strategy	2	1	6	0	24	0	33	$3,875
	Subtotal Hours	4	4	27	0	36	0	71	
	Subtotal Cost	$740.00	$580.00	$3,240.00	$0.00	$3,960.00	$0.00		**$8,520**
7	**Design Guidelines**								
7.1	Design Guidelines	1	4	12	20	0	0	37	$4,405
	Subtotal Hours	1	4	12	20	0	0	37	
	Subtotal Cost	$185.00	$580.00	$1,440.00	$2,200.00	$0.00	$0.00		**$4,405**
8	**Plan Documentation and Appendices**								
8.1	Draft Plan Outline and Sample Layout	0	0	0	4	0	0	4	$440
8.2	Administrative Draft Plan	2	4	4	4	24	0	38	$4,510
8.3	Public Review Draft Plan	0	2	4	4	12	0	22	$2,530
8.4	Final Plan	2	4	2	4	10	0	22	$2,730
	Subtotal Hours	4	10	10	16	46	0	82	
	Subtotal Cost	$740.00	$1,450.00	$1,200.00	$1,760.00	$5,060.00	$0.00		**$10,210**
9	**Environmental Review**								
9.1	Administrative Draft Initial Study/Negative Declaration	0	0	0	0		52	52	$6,760
9.2	Screencheck and Public Review IS/ND	0	0	0	0		8	8	$1,040
9.3	Final IS/ND	0	0	0	0		8	8	$1,040
9.4	Final IS/ND Meetings/Hearings	0	0	0	0		6	6	$780
	Subtotal Hours	0	0	0	0	0	74	74	
	Subtotal Cost	$0.00	$0.00	$0.00	$0.00	$0.00	$9,620.00		**$9,620**
10	**Wayfinding Protocol**								
10.1	Wayfinding Protocol	0	24	4	76	12		116	$13,640
	Subtotal Hours	0	24	4	76	12		116	
	Subtotal Cost	$0.00	$3,480.00	$480.00	$8,360.00	$1,320.00	$0.00		**$13,640**
	Total Hours	24	3,576	554	8,502	1,530	82	624	
	Total Dollars	$4,440	$17,400	$9,360	$23,980	$24,420	$10,660		**$90,260**
	Percent of total fee	5%	19%	10%	27%	27%	12%		
	Direct Expenses								
	Supplies								**$ 650**
	Travel & Incidentals								**$ 3,000**
	Translation and Interpretation								**$ 1,800**
	Subtotal Direct Expenses								**$ 5,450**
	Project Cost Proposal								**$95,710**
	CONTINGENCY								$ 9,571
	Total Project Cost Proposal								**$105,281**

ATTACHMENT 4

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Public Utilities Department

DATE: April 5, 2021

SUBJECT: Public Utilities – Approval – Waive formal bidding requirements and authorize the purchase of a Landfill service truck from Pape Kenworth using the Sourcewell Purchasing Contract.

ATTACHMENTS: None

CONFLICT OF INTEREST
None

RECOMMENDATION
For the City Council to waive the City's formal bidding requirements and authorize the purchase of a Landfill service truck from Pape Kenworth using the Sourcewell Purchasing Contract for a total cost of $95,399.17, including tax and freight.

EXECUTIVE SUMMARY
There are funds in this year's Fleet budget to purchase a replacement Landfill service truck, a Kenworth T370 series, for the Solid Waste section of the Public Utilities Department. The equipment is being replaced due to its age and emission requirements. The competitively bid contract price is $95,399.17 and the new equipment will meet the City's emission requirement for On-Road 2020.

The Sourcewell Purchasing contract, formerly the National Joint Powers Alliance (NJPA) contract, is a nationwide public procurement service that makes the governmental procurement process more efficient. All contracts available to participating members have been awarded by virtue of a public competitive procurement process compliant with state statutes.

BACKGROUND
The recommended vehicle is available through the Sourcewell Purchasing Contract, formerly the NJPA contract, which is competitively bid on a nationwide basis.

FISCAL IMPACT
Sufficient funds are included in the 2020-21 Fleet Replacement budget and the user section, Solid Waste, has accumulated the necessary funds to purchase the equipment.

REASON FOR RECOMMENDATION
The existing service truck for the Landfill is 15 years old and is being replaced due to its age and to meet new emission requirements. The new equipment is needed to maintain operations of the City's Solid Waste section.

Staff has evaluated the available equipment and has determined that the replacement service truck meets the needs and required specifications of the Solid Waste section. The proposed method of purchasing the equipment is cost effective and sufficient funds are available.

ACTIONS FOLLOWING APPROVAL
A purchase order will be prepared for the City Manager's approval and sent to the vendor.

Prepared by: Paul Armendariz, Assistant Public Utilities Director

Reviewed by: City Manager

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO:	Mayor and City Council
FROM:	Public Utilities Department
DATE:	April 5, 2021
SUBJECT:	Public Utilities – Approval – Waive formal bidding requirements and authorize the purchase of a replacement Streets paint striper from EZ Liner using the Sourcewell Purchasing Contract.
ATTACHMENTS:	None

CONFLICT OF INTEREST
None

RECOMMENDATION
For the City Council to waive the City's formal bidding requirements and authorize the purchase of a replacement Streets paint striper from EZ Liner using the Sourcewell Purchasing Contract for a total cost of $319,017.54, including tax and freight.

EXECUTIVE SUMMARY
There are funds in this year's Fleet budget to purchase a replacement Streets *paint striper* – an EZ Liner Model TS-AL220 paint striping body mounted on an Isuzu NRR diesel chassis – for the Streets section of the Public Utilities Department. The equipment is being replaced due to its age and emission requirements. The competitively bid contract price is $319,017.54 and the new equipment will meet the City's emission requirement for On-Road 2020.

The Sourcewell Purchasing contract, formerly the National Joint Powers Alliance (NJPA) contract, is a nationwide public procurement service that makes the governmental procurement process more efficient. All contracts available to participating members have been awarded by virtue of a public competitive procurement process compliant with state statutes.

BACKGROUND
The recommended vehicle is available through the Sourcewell Purchasing Contract, formerly the NJPA contract, which is competitively bid on a nationwide basis.

FISCAL IMPACT
Sufficient funds are included in the 2020-21 Fleet Replacement budget and the user section, Streets, has accumulated the necessary funds to purchase the equipment.

REASON FOR RECOMMENDATION
The existing paint striper is approaching 20 years old and is being replaced due to its age and to meet new emission requirements. The new equipment is needed to maintain operations of the City's Streets section.

Staff has evaluated the available equipment and has determined that the replacement Streets paint striper meets the needs and required specifications of the Streets section. The proposed method of purchasing the equipment is cost effective and sufficient funds are available.

ACTIONS FOLLOWING APPROVAL
A purchase order will be prepared for the City Manager's approval and sent to the vendor.

Prepared by: Paul Armendariz, Assistant Public Utilities Director

Reviewed by: City Manager

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Public Utilities Department

DATE: April 5, 2021

SUBJECT: Public Utilities – Approval – Bid Award for CIP 20-04 Pasa Tiempo Park Pour-In-Place Rubber Surfacing; Authorize the City Manager to execute the contract on behalf of the City; and Approval – Res. 21-___, amending the 2020-2021 Parks budget to allocate funds for the project.

ATTACHMENTS: 1. Vicinity Map
2. Resolution and Budget Amendment

CONFLICT OF INTEREST
None

RECOMMENDATION
1. For the City Council to award a contract for CIP 20-04 Pasa Tiempo Park Pour-In-Place Rubber Surfacing to SpectraTurf in the amount of $190,089;

2. For the City Council to authorize the City Manager to execute the contract on behalf of the City; and

3. Approve a resolution amending the 2020-2021 Parks budget to allocate funds for the project.

EXECUTIVE SUMMARY
Staff is recommending that Council authorize the City Manager to execute the contract with SpectraTurf in the amount $190,089.

This is a maintenance project to address safety and ADA issues at Pasa Tiempo Park by replacing the existing surfacing that is in very poor condition with new pour-in-place rubber surfacing. The work consists of site security, removal and disposal of the existing surface, and installation of a new pour-in-place rubber surface.

Staff is requesting that Council approve a resolution to amend the 2020-2021 in the Parks budget to allocate funds for this project.

BACKGROUND
The following is a summary of the bid results of March 9, 2021:

BIDDERS	BASE BIDS
SpectraTurf	$190,089.00
Flexground Surfaces, Inc.	$197,818.25
ENGINEER'S ESTIMATE	$207,700.00

All the bids were examined and found to be in order. Staff has validated the lowest responsive bidder's contractor's license.

FISCAL IMPACT
This project was not budgeted in the 2020-2021 General Fund Parks budget. Staff is requesting approving the budget resolution to allocate funds for the project. This project is funded by Landscape Maintenance District No. 1 (LMD), Zone Southeast (Loma Vista). The Southeast LMD Zone has adequate funds for the playground surface replacement at Pasa Tiempo Park.

REASON FOR RECOMMENDATION
SpectraTurf is the lowest responsive bidder.

ACTIONS FOLLOWING APPROVAL
1. The contract will be prepared and executed, subject to the Contractor providing performance security that is satisfactory to the City.

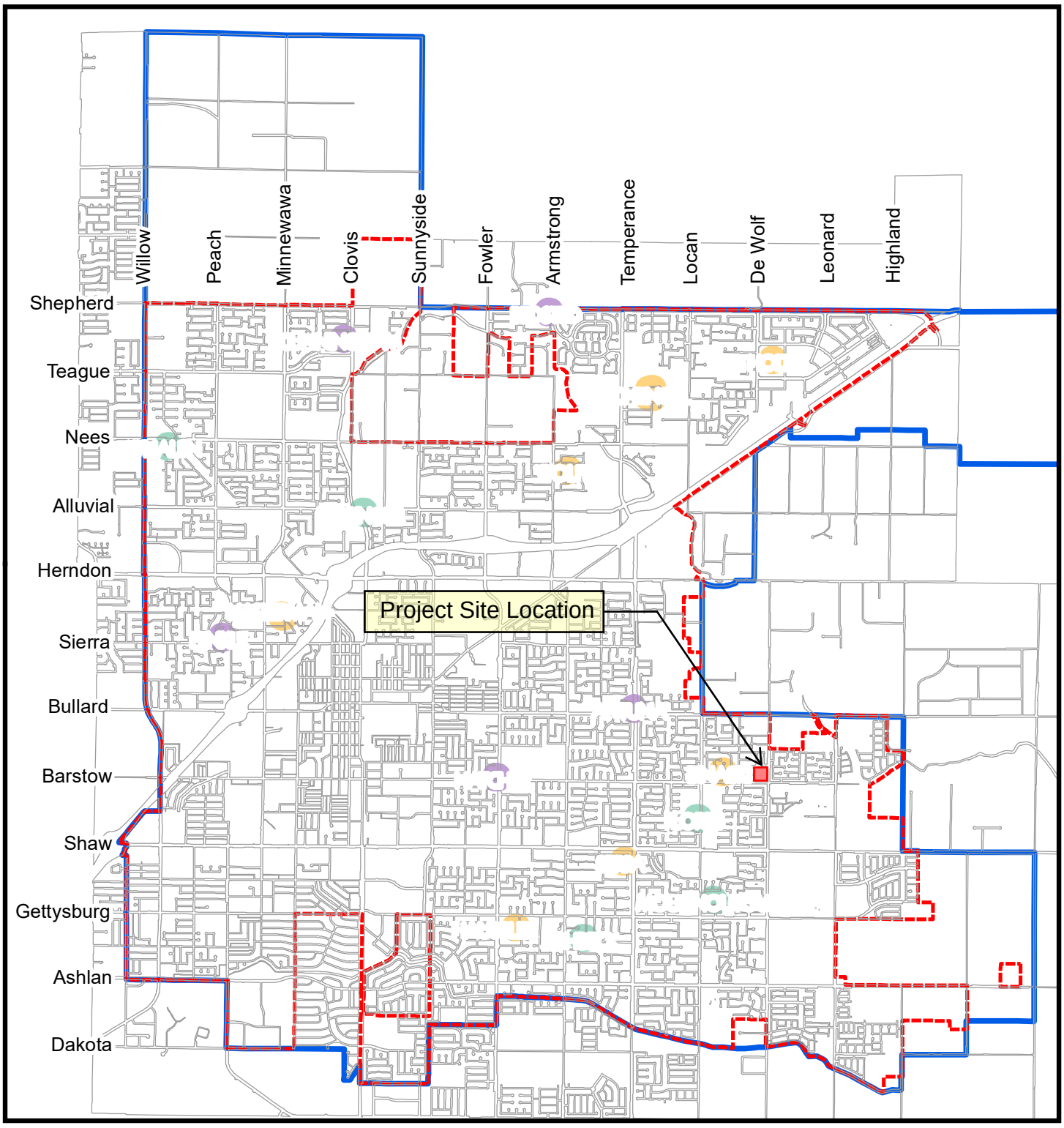
2. Funds will be appropriated in the City of Clovis 2020-2021 Parks budget as specified in the attached budget amendment.

Prepared by: Sarai Yanovsky, Civil Engineer

Reviewed by: City Manager JH

VICINITY MAP

CIP 20-04 Pasa Tiempo Park Pour-In-Place Rubber Surfacing



ATTACHMENT 1

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CITY LIMITS SPHERE OF INFLUENCE

03/23/2021

Prepared By: Sarai Yanovsk

RESOLUTION 21-__

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CLOVIS APPROVING AN AMENDMENT TO THE ANNUAL BUDGET FOR FISCAL YEAR 2020-2021

WHEREAS, the City Council adopted the 2020-2021 Budget on June 1, 2020; and

WHEREAS, the City Council is amending the 2020-2021 Budget to include funding for the CIP 20-04 Pasa Tiempo Park Pour-In-Place Rubber Surfacing Project in the Public Utilities Department; and

WHEREAS, the expenditures for the project were not included in the 2020-2021 Budget.

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of Clovis approves the budget amendment as shown in the "Summary of Expenditures by Department," "Summary of Expenditures by Fund," and "Summary of Budget Transfers by Fund" attached as Exhibit A.

* * * * *

The foregoing resolution was introduced and adopted at a regular meeting of the City Council of the City of Clovis held on April 5, 2021 by the following vote, to wit.

AYES:
NOES:
ABSENT:
ABSTAIN:

DATED:

_____ Mayor

_____ City Clerk

ATTACHMENT 2

EXHIBIT A

SUMMARY OF EXPENDITURES BY DEPARTMENT

Department	
Public Utilities - Parks	$190,000
Total	**$190,000**

SUMMARY OF EXPENDITURES BY FUND

Fund	
General Fund	$190,000
Total	**$190,000**

SUMMARY OF BUDGET TRANSFERS BY FUND

From Fund	
Landscape Maintenance District (LMD)	$190,000
Total	**$190,000**

To Fund	
General Fund	$190,000
Total	**$190,000**

NET GENERAL FUND SUPPORT

Total	**$0**

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Public Utilities Department

DATE: April 5, 2021

SUBJECT: Public Utilities – Approval – Waive formal bidding requirements and authorize the purchase of two commercial front loading refuse trucks and one residential side loading refuse truck from E.M. Tharp Inc., DBA Golden State Peterbilt Western, using the Sourcewell Purchasing Contract.

ATTACHMENTS: None

CONFLICT OF INTEREST
None

RECOMMENDATION
For the City Council to waive formal bidding requirements and authorize the purchase of two commercial front loading refuse trucks and one residential side loading refuse truck from E.M. Tharp Inc., DBA Golden State Peterbilt Western, using the Sourcewell Purchasing Contract for a total cost of $962,853.39, including tax and freight.

EXECUTIVE SUMMARY
There are funds in this year's Fleet budget to purchase two commercial front loading refuse trucks and one residential side loading refuse truck for the Solid Waste section of the Public Utilities Department. The equipment is being replaced due to its age and emission requirements. The competitively bid contract price is $321,390.92 each for the two front loading refuse trucks and $320,071.55 for the one side loading refuse truck, or a total of $962,853.39 for all three trucks, and the new equipment will meet the City's emission requirement for On-Road 2020.

The Sourcewell Purchasing contract, formerly the National Joint Powers Alliance (NJPA) contract, is a nationwide public procurement service that makes the governmental procurement process more efficient. All contracts available to participating members have been awarded by virtue of a public competitive procurement process compliant with state statutes.

BACKGROUND
The recommended vehicles are available through the Sourcewell Purchasing Contract, formerly the NJPA contract, which is competitively bid on a nationwide basis.

FISCAL IMPACT
Sufficient funds are included in the 2020-21 Fleet Replacement budget and the user section, Solid Waste, has accumulated the necessary funds to purchase the equipment.

REASON FOR RECOMMENDATION
The existing refuse trucks are 10 years old and are being replaced due to their age and to meet new emission requirements. The new equipment is needed to maintain operations of the City's Solid Waste section.

ACTIONS FOLLOWING APPROVAL
A separate purchase order for each refuse truck will be prepared for the City Manager's approval and sent to the vendor.

Prepared by: Paul Armendariz, Assistant Public Utilities Director

Reviewed by: City Manager

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Public Utilities Department

DATE: April 5, 2021

SUBJECT: Public Utilities – Approval – Res. 21-___, Declaring the City's Intent to Reimburse Expenditures Related to the Purchase of Police Vehicles from Tax Exempt Lease Purchase Financing; and Authorize the City Manager to Sign the Lease Purchase Agreement and Related Documents

ATTACHMENTS: 1. Resolution No. 21-____

CONFLICT OF INTEREST
None

RECOMMENDATION
Approve a resolution declaring the City's intent to reimburse expenditures related to the purchase of Police vehicles with proceeds from lease purchase financing and authorize the City Manager to sign the lease purchase agreement and the related financing documents.

EXECUTIVE SUMMARY
The Police Department has a need to replace fifteen vehicles. The total cost of the vehicles and required equipment – which includes new computers, outfitting, and decals – will be approximately $750,000.

A lease purchase financing is recommended. The lease purchase structure is also appropriate for this purchase due to the attractive interest rates available for tax-exempt financings. Per IRS regulations, in order to pay the invoices prior to lease funding becoming available, Council will need to approve an "Intent to Reimburse Resolution" to keep the exempt status of the financing.

BACKGROUND
The City will make payment to the vendors from the Fleet Capital budget and will then reimburse those funds when financing proceeds are obtained. In order to ensure the

financing transaction is tax exempt, IRS regulations require that an “Intent to Reimburse Resolution” be approved.

To secure the lease, the City proposes to use the vehicles and related equipment as collateral. The lease purchase proceeds will be used to reimburse the cost for those purchases upon successful funding of the lease.

Upon approval by the City Council, quotes will be requested from several qualified financial institutions. The lowest cost qualifying proposal will be accepted by the City Manager and all related lease documents will be signed by the City Manager.

FISCAL IMPACT
The funding for these purchases was included in the approved 2020-21 Fleet Capital budget. The Police Department will make payments to the Fleet Fund beginning in 2021-22 to offset the lease purchase payments.

REASON FOR RECOMMENDATION
The Police vehicle replacements are necessary due to vehicle age and condition. Lease purchase financing will allow for the vehicle acquisition without a large initial capital investment.

ACTIONS FOLLOWING APPROVAL
The Finance Department will secure quotes for the lease purchase financing.

Prepared by: Paul Armendariz, Assistant Public Utilities Director

Reviewed by: City Manager

RESOLUTION 21-___

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CLOVIS DECLARING THE CITY'S INTENT TO REIMBURSE EXPENDITURES RELATED TO THE PURCHASE OF POLICE VEHICLES WITH PROCEEDS FROM TAX EXEMPT LEASE PURCHASE FINANCING

WHEREAS, the City Council of the City of Clovis intends to obtain lease purchase financing to purchase Police vehicles and related equipment; and

WHEREAS, the City is authorized by the Constitution and the laws of the State of California to incur or issue tax-exempt financing to finance; and

WHEREAS, the City expects to pay for certain costs prior to obtaining the tax exempt indebtedness to be used for the long-term financing; and

WHEREAS, the Clovis City Council wishes to authorize the City Manager to execute all financing related documents.

NOW, THEREFORE, BE IT RESOLVED the City Council of the City of Clovis declares the City's official intent is to use proceeds of tax exempt indebtedness to reimburse the City for certain expenditures associated with the purchase of Police vehicles and related equipment, in such amounts and at such times as may be necessary or convenient, and as allowed by applicable law, not to exceed $750,000 for the vehicles and equipment.

BE IT FURTHER RESOLVED that the City Manager is hereby authorized, empowered, and directed to sign on behalf of the City the Lease/Purchase Agreement and other related lease financing documents (collectively the "Financing Agreements").

* * * * * * *

The foregoing resolution was adopted at a regular meeting of the City Council of the City of Clovis held on April 5, 2021, by the following vote, to wit:

AYES:

NOES:

ABSENT:

ABSTAIN:

Dated:

_____ _____

Mayor City Clerk

ATTACHMENT 1

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Planning & Development Services

DATE: April 5, 2021

SUBJECT: Consider Various Actions associated with an existing consultant agreement between the City of Clovis and Kittelson and Associates, Inc. related to analysis and assessment of Vehicle Miles Traveled (VMT).

a. Consider Approval - Res. 21-___, A request authorizing the City Manager to execute an amendment to an existing consultant agreement between the City of Clovis and Kittelson and Associates, Inc. for additional analysis related to Vehicle Miles Traveled and environmental assessment pursuant to the California Environmental Quality Act.

b. Consider Approval - Res. 21-___, A request to initiate an amendment to the Circulation Element of the 2014 Clovis General Plan to modify, add, and/or edit policies to ensure compliance with VMT guidelines.

Staff: Ricky Caperton, Senior Planner / Sean Smith, Supervising Civil Engineer
Recommendation: Approve

ATTACHMENTS:
1. July 20, 2020 City Council Staff Report
2. Interim Transportation Impact Analysis Guidelines
3. Existing VMT Contract Scope of Work
4. BIA Letter of Support
5. Proposed Scope of Work and Cost Amendment
6. Draft Res. 21-___, Contract Amendment Scope and Cost
7. Draft Res. 21-___, 2014 General Plan Circulation Element Update

CONFLICT OF INTEREST
None.

RECOMMENDATION

Staff recommends that the City Council approve requests authorizing the City Manager to execute an amendment to an existing consultant agreement between the City of Clovis and Kittelson and Associates, Inc. for additional analysis related to Vehicle Miles Traveled (VMT), and to initiate an amendment to the Circulation Element of the 2014 Clovis General Plan.

EXECUTIVE SUMMARY

On July 1, 2020, the metric by which transportation impacts were assessed pursuant to the California Environmental Quality Act (CEQA) guidelines shifted from a level of service (LOS) based analysis, to VMT analysis. In short, the methodology for analyzing transportation impacts under CEQA transitioned from assessing increases in delay and congestion caused by a project to assessing the average distance traveled by vehicles related to the project, known as VMT. A more comprehensive background on VMT and Senate Bill 743 may be found in the July 20, 2020 City Council staff report included as **Attachment 1**.

In advance of the new law taking effect, City Council approved a contract with transportation consultant Kittelson & Associates to assist the City with developing VMT transportation impact analysis guidelines. On July 20, 2020, City Council adopted VMT Interim Guidelines for the City so that development could continue moving forward and appropriately assess traffic impacts using the new VMT metric.

To continue those efforts, staff is recommending that Council consider an amendment to its existing contract with Kittelson to perform additional work beyond the scope and cost contemplated in the original contract. It is important to note that these efforts will not entirely negate the need for preparation of new Environmental Impact Reports (EIRs) at the project-level. However, in many cases it could provide for increased streamlining of traffic analysis at the project level and provide a level of protection for when individual projects would otherwise require an EIR.

BACKGROUND

This section provides additional background on VMT implementation since July 20, 2020, when the City's Interim TIA Guidelines were adopted and an overview of how development activity has progressed since VMT analysis became required. As mentioned above, a comprehensive background on VMT is provided in **Attachment 1** to this staff report. Additionally, the City's adopted *Interim Transportation Impact Analysis Guidelines* are provided as **Attachment 2**, along with the existing scope of work under the City's current contract with Kittelson (**Attachment 3**). The proposed scope of work and budget amendment is included as **Attachment 5**.

Adopted Interim Transportation Impact Analysis Guidelines

On July 20, 2020, the City Council adopted the *Interim Transportation Impact Analysis Guidelines* (TIA) for VMT (see **Attachment 1**). The TIA functions as the City's VMT user guide and outlines the steps to determine if a VMT analysis is required for a project. The TIA identifies screening criteria as well as the City's thresholds for VMT for when projects cannot "screen out."

Although the OPR recommends projects achieve a 15% reduction in VMT from the existing "regional" average, lead agencies have the discretion to adopt different thresholds as long as they are supported by substantial evidence.

The City's adopted thresholds are as follows:

- *Residential:* A 13% reduction below existing average VMT/capita in Fresno County.
- *Office:* A 13% reduction below existing average VMT/employee in Fresno County.
- *Retail:* No net increase in total VMT.
- *Other Land Uses:* Determined on a case-by-case basis, supported by substantial evidence.
- *Mixed Use Projects:* Evaluate each component of a mixed-use and apply the significance threshold for each land use type.

For residential projects, the existing regional average VMT is 16.1 VMT/capita. Therefore, in order for a residential project to be considered to have less-than-significant traffic impacts under CEQA, the project may not exceed 14.1 VMT/capita (13% reduction from the regional average).

For office uses, the existing regional average VMT is 25.6 VMT/employee. Therefore, for an office project to be considered to have a less-than-significant traffic impact under CEQA, the project may not exceed 22.3 VMT/employee.

VMT Mitigation Measures
Under the VMT methodology, mitigation measures to reduce transportation impacts will shift from relieving traffic congestion through capacity inducing solutions (i.e. adding lanes, road widening, and traffic signals) to more Transportation Demand Management (TDM) based. TDM measures focus more on behavioral and infrastructure changes to support and/or encourage shifts in transportation modes away from single-occupancy vehicle use. Because VMT is dependent on location and proximity of residential to employment, goods and services, mitigation measures will be determined on a case-by-case basis.

Development Activity
Since adoption of the City's VMT Guidelines, development activity within the City has slowed, partly due to COVID-19, but also, from growing concerns from the development community regarding how VMT analysis could affect the level of CEQA review. Staff has worked diligently with the local Building Industry Association (BIA), our traffic consultant and other applicants to navigate the complexities of VMT analysis, including determining what and how mitigation measures can be implemented. The BIA has provided a letter of support (**Attachment 4**) which reflects our ongoing efforts to work collaboratively on the best approach.

After several months of exploring ways to achieve a balance between compliance with VMT guidelines and the future of traffic analysis for development projects, staff is recommending that the Circulation Element of the 2014 Clovis General Plan be modified to incorporate VMT-related goals and policies. As part of this effort, a Supplemental Environmental Impact Report (EIR) would be prepared in compliance with the CEQA Guidelines to provide a citywide programmatic analysis of VMT.

The Supplemental EIR will serve as a tool which future development projects may use to tier off of, thus creating a mechanism for a more streamlined approach to traffic analysis. In essence, future projects may utilize and tier off of the results of the citywide traffic impact analysis in the Supplemental EIR for greater efficiency when preparing project-specific traffic analysis as it relates to CEQA.

PROPOSAL AND ANALYSIS

The following discussion provides an overview of how VMT has been implemented since adoption of the City's TIA on July 20, 2020, as well as a summary of the proposed scope of work and cost for the additional work being requested by staff.

VMT Implementation

Since the TIA was adopted by Council, there has yet to be a project that has necessitated a full VMT analysis. However, one project prepared a traffic study that included support for screening out using the "small projects" thresholds resulting in fewer than 500 average daily trips. That said, there are multiple projects being processed or preparing to submit applications that will have full VMT analyses as part of their scope. These projects will be the first in Clovis to utilize VMT as the metric for CEQA review.

Anecdotally, staff has heard from the development community that they are concerned with VMT analysis and the uncertainty it has created with regard to both time and cost. Projects that need to undergo the EIR process to address VMT will add six months to a year of processing time above what would have otherwise occurred if an initial study and mitigated negative declaration were completed. Because mitigation strategies are still being developed within the region and across the State, the cost of mitigating VMT impacts is unpredictable. These impacts, in combination with COVID-19, may be part of the reason staff has not yet processed an entitlement with a complete and full VMT analysis.

For those reasons above, staff currently does not have tangible data as it relates to VMT implementation utilizing the City's adopted VMT TIA Guidelines.

Scope and Budget Amendment

In the months following adoption of the City's VMT TIA Guidelines, staff, consultants, and the development community have worked closely to determine the best path forward in order to keep development moving forward within the confines of VMT compliance.

One solution is to prepare a Supplemental EIR in compliance with CEQA Guidelines to address VMT programmatically at the citywide scale. This would allow future projects to tier off of such analysis and improve the streamlining and efficiency of subsequent traffic studies prepared for individual projects. In preparing a citywide VMT analysis, so long as the later project is consistent with what was analyzed, the likelihood increases that a future traffic study would not necessarily result in the need for another EIR. This citywide approach also provides additional options for future CEQA documents such as addenda, supplemental, and subsequent EIRs, versus having to complete an entirely new EIR.

In order to prepare a Supplemental EIR, there first needs to be a "project" as defined by CEQA. Thus, staff is proposing to amend only the Circulation Element of the 2014 Clovis General Plan, which would qualify as a "project" under CEQA. The purpose of the amendment to the Circulation Element would be to incorporate new or modified goals and policies reflecting VMT. This, in turn, adds another level of protection in compliance with VMT by allowing the future projects to refer back to stated goals and policies of the Circulation Element for the purpose of supporting consistency findings.

For these efforts, Kittelson has included a modified scope and budget (**Attachment 5**). Because the scope is related to existing work being conducted under the current consultant agreement, staff is requesting the amendment to augment the current agreement to include the new scope of work and cost.

The additional work is anticipated to take approximately 6 to 8 months to complete at an additional cost of $90,685. This is in addition to the original contract amount of $164,820 (includes $134,400 base amount plus $30,420 in optional tasks). Therefore, if approved by Council, the total amended contract amount would be $255,505 ($164,820 original contract amount plus $90,685 amendment).

In addition to the added scope and cost of $90,685, there are miscellaneous County Clerk filing fees throughout the EIR process, as well as potentially paying a mandatory Fish and Wildlife fee. These additional fees could cost up to an additional $4,000 and would be in addition to the amended scope and budget.

FISCAL IMPACT

The total contract amendment amount is for $90,685 plus the cost of County Clerk filing, and Fish and Wildlife fees which could total up to an additional $4,000, for a total request of $94,685. This contract amendment will be funded using the City's General Plan Consultant revenues, which has adequate capacity to fund the project.

REASON FOR RECOMMENDATION

Staff has concluded that this approach best allows for development to continue in the most streamlined and efficient manner, while also achieving compliance with the provisions of VMT regulations.

ACTIONS FOLLOWING APPROVAL

At the completion of the update to the Circulation Element update and Supplement EIR, staff will return to City Council for approval of the update and certification of the EIR.

Prepared by: Ricky Caperton, Senior Planner / Sean Smith, Supervising Engineer

Reviewed by: City Manager

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Planning & Development Services

DATE: July 20, 2020

SUBJECT: Consider Approval - Res. 20-___ - Establishing Vehicle Miles Traveled (VMT) thresholds and interim guidelines for assessing traffic impacts in compliance with the provisions of Senate Bill 743 (SB 743).

Staff: Ricky Caperton, AICP, Senior Planner
Recommendation: Approve

ATTACHMENTS:
1. Res. 20-___
2. Interim Transportation Impact Analysis Guidelines
3. SB 743 Background Memo (dated March 18, 2020)
4. Technical Advisory on Evaluating Transportation Impacts in CEQA

CONFLICT OF INTEREST
None.

RECOMMENDATION
For the City Council to approve a resolution (**Attachment 1**) adopting *Interim Transportation Impact Analysis Guidelines* (**Attachment 2**) establishing vehicle miles traveled (VMT) thresholds and interim guidelines for assessing traffic impacts in compliance with provisions of Senate Bill 743 (SB 743).

EXECUTIVE SUMMARY
As of July 1, 2020, the metric by which transportation impacts are assessed pursuant to the California Environmental Quality Act (CEQA) guidelines shifted from a level of service (LOS) based analysis, to VMT analysis. In short, this means that the methodology for analyzing transportation impacts under CEQA transitioned from assessing increase in delay and congestion caused by a project to assessing the average distance traveled related to the project. To prepare for this new law, the City Council approved a request on February 18, 2020 for City staff to enter into a contract with transportation consultant Kittelson & Associates to assist staff with developing VMT transportation impact analysis guidelines. The *Interim Transportation Impact Analysis Guidelines*, provided as **Attachment 2**, are presented for Council consideration.

ATTACHMENT 1

KEY TERMINOLOGY

Because this staff report introduces a new methodology for analyzing traffic impacts for purposes of CEQA, several new or lesser known terms will be introduced. In order to provide some context, several of these newer key terms are defined below.

- **Senate Bill 743 (SB 743):** SB 743 is the law that established (2013) changing the metric of assessing transportation impacts from level of service to vehicle miles traveled.

- **Vehicle Miles Traveled (VMT):** VMT is the term used for referring to the metric by which transportation impacts will be assessed under CEQA. VMT is expressed as an average number of miles a project will produce either per capita (residential) or per employees (non-residential). In general, the higher the VMT, the greater the impact.

- **Transportation Demand Management (TDM):** TDM is the concept of focusing on improvements to the transportation network by encouraging less reliance on single-occupancy automobile use, and focuses more on pedestrian infrastructure and increasing other modes of transportation such as public transit, biking, carpooling, and/or commuting.

- **Threshold of Significance:** Refers to a threshold by which to measure an impact in order to determine the level of impact caused by a project. Most commonly used for CEQA analysis purposes, a threshold of significance is generally the point of which an acceptable level of impact is defined, and if impacts of a project exceed that threshold, then an impact may occur.

- **Mitigation Measure:** Measures to reduce an impact. Mitigation measures can come in the form of in-lieu fees (i.e. developer pays a fee to mitigate the impact) or project improvements (i.e. developer alters the design and installs something to offset the impact). Generally, the mitigation measure should be commensurate with the type and level of significance of said impact caused by a project.

- **VMT Per Capita:** VMT per capita refers to the metric that is used for residential projects for purposes of assessing transportation impacts. VMT per capita is representative of the average number of annual miles of travel divided by the total population of a region.

- **VMT Per Employee:** VMT per employee refers to the metric that is used for non-residential projects for purposes of assessing transportation impacts of a particular non-residential use. VMT per employee is representative of the average number of annual miles of commute travel divided by the employees.

- **Governor's Office of Planning and Research (OPR):** Commonly referred to as OPR, this is the staff serving the Governor and the Cabinet as staff for long-range planning and research. OPR is responsible for the drafting of CEQA Guidelines and formulation of long-range land use goals and policies at the State level.

BACKGROUND

Under the existing CEQA Guidelines, traffic impacts have been analyzed on the basis of the amount of delay or congestion a project would cause at particular intersections, commonly referred to as level of service (LOS). Level of service is generally expressed on a scale ranging from "A" to "F" with LOS "A" resulting in the least amount of vehicle congestion, and degrading to a lower LOS as traffic congestion increases. A project's potential to increase delay was then compared to the City's established threshold for what is considered an "acceptable" delay, which is LOS "D" or better.

Signed into law in 2013, SB 743 established a new methodology to "*more appropriately balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of greenhouse gas emissions*." As a result, the Governor's Office of Planning and Research (OPR) was tasked with developing a criteria for approval by the Natural Resources Agency to update the State CEQA guidelines to incorporate a metric to more effectively measure transportation impacts for the purpose of achieving the goals of SB 743.

On December 28, 2018, the Natural Resources Agency certified and adopted the revised CEQA guidelines which included, among other changes, the updated metric for analyzing transportation impacts under CEQA. This new transportation analysis metric, known as vehicle miles traveled (VMT), goes into effect on July 1, 2020.

Analyzing VMT shifts the methodology in how traffic impacts are assessed under CEQA from a traffic delay and congestion focus (e.g. LOS) to vehicular trip- or travel-based distance (e.g. VMT) focus. Thus, as of July 1, 2020, CEQA analysis will be required to consider VMT as the primary metric for determining the potential for transportation impacts of a project. Therefore, a project may no longer be considered to have a "significant" impact under CEQA with regards to traffic congestion (i.e. increases in level of service caused by a project). Rather, a project's potential to result in transportation impacts will be based on the average number of miles produced by the project, expressed either as VMT per capita for residential projects, or VMT per employee for non-residential projects. This concept is explained in greater detail below.

It is important to note that an analysis of LOS impacts may still be required for purposes of roadway and infrastructure planning, as well as to ensure compliance with existing General Plan policies, and the City's existing Traffic Impact Study Guidelines (2014) for maintaining the safe movement of vehicles throughout the City. Thus, VMT is not in and of itself eliminating or replacing the need to continue analyzing LOS impacts of a project. Rather, VMT will be the metric for determining transportation impacts for CEQA purposes.

In order to better understand the shift from LOS to VMT, it's important to first provide context and a description of the components of VMT. Those components are summarized below; however, for informational purposes and included as **Attachment 3**, an SB 743 background memorandum is provided which includes more detailed information on VMT, as well examples of what some other agencies have adopted for thresholds and methodology.

Level of Service (LOS) Methodology
In the context of CEQA, the existing methodology for analyzing transportation impacts focuses on the quantification of a project's potential to cause increases in delay (i.e. congestion) at intersections, known as level of service (LOS). Under this method, a project's vehicle trips are calculated through a traffic study or trip generation analysis expressed by a measure in the amount of delay those trips would contribute to nearby intersections. If the intersection delays increased beyond a certain level as a result of the project (i.e. threshold of significance), then an impact would occur and mitigation measures were prescribed.

Under LOS, typical mitigation measures might include contribution of fees for future traffic signals, installation of signals or stop signs, and/or the widening of streets or addition of travel and/or turning lanes. These mitigations would generally achieve the goal of reducing a project's contribution to congestion by controlling the timing or capacity of affected intersections through a new or modified traffic signal, or by widening a roadway or adding lanes, thus, reducing the project's impacts on traffic.

Vehicle Miles Traveled (VMT) Methodology
Vehicle miles traveled is a metric in which the average distance (in miles) a use generates is quantified and compared to the regional average VMT. The VMT is considered to be "tour-based," meaning that the average VMT is intended to account for a round-trip (i.e. not a one-way trip). For example, if a household generates an average VMT of 15 miles, that 15 miles theoretically accounts for a trip that may include miles traveled to the workplace, the workplace to the grocery store, then the grocery store back to home. It is important to note that VMT is expressed as an average of the total number of miles divided by the total population in a given region.

As a result of this new metric, a shift in the types of mitigation measures will need to be considered in order to reduce and/or to encourage reduction in VMT. These types of measures are typically referred to as Transportation Demand Management (TDM). TDM measures generally focus more on behavioral shifts in modes of transportation as well as enhancements to infrastructure that promote walkability, biking, transit improvements, and pedestrian infrastructure, and less on capacity inducing measures such as the widening of roadways and addition of travel lanes. In other words, TDM measures generally focus on discouraging the single-occupancy vehicle trips, as well as promoting and encouraging other modes of transportation other than vehicular travel.

Threshold of Significance
In order to adequately assess VMT, the City must have adopted thresholds by which to compare projects for purposes of determining if a project would result in a "significant" impact under CEQA. Although thresholds of significance were not explicitly established by SB 743 or OPR, the *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018) published by OPR, and included as **Attachment 4**, recommends a significance threshold of projects achieving a fifteen percent (15%) reduction in VMT below that of the regional average VMT. Thresholds can either apply to both residential and non-residential uses. This percentage is thought to be reasonably achievable at the project level by the California Air Pollution Control Officer's Association (CAPCOA), as well as for

achieving consistency with statewide GHG emissions reduction goals in *California's 2017 Climate Change Scoping Plan*. Although OPR has recommended a threshold, lead agencies are able to adopt their own thresholds as long as substantial evidence is provided to demonstrate that the reduction targets and goals of SB 743 can be achieved.

Assessing Projects Using VMT

Under the current methodology for assessing transportation impacts under CEQA, a project's LOS was compared to the adopted threshold established by the City for what was considered "acceptable" congestion. This was typically achieved through a trip generation or traffic impact assessment (TIA). The City's existing LOS traffic guidelines currently require a full TIA if a project exceeds certain criteria, one of which being that the project has the potential to exceed 100 peak hour trips.

Under VMT, the general review process would be similar, although the metrics to measure impacts would differ. Using a variety of "screening" criteria, projects would first be reviewed to see if they can be "screened out" from preparing a full VMT analysis. The screening criteria are based on a variety of maps, trip thresholds, size of project, and location. If a project meets these standards, the VMT impact is presumed to be less-than-significant in which case a full traffic analysis may not be required under CEQA. However, if a project cannot be screened out, an analysis may be required to further assess the VMT impacts and determine CEQA mitigation measures (if applicable). If mitigation measures cannot sufficiently reduce the VMT to a less-than-significant level, an Environmental Impact Report (EIR) may be required in which a finding of significant and unavoidable impact may be found.

Although the existing LOS methodology for determining traffic and congestion impacts under CEQA is relatively germane to any land use type or project (i.e. residential, non-residential, capital improvement, redevelopment, etc.) based on a scale of LOS "A" to LOS "F," VMT is more complex in that different land use types may now be analyzed slightly differently. This is based on many factors including project location, existing conditions and land use types surrounding a project site, land use type, and proximity to features such as bus routes, trails, etc.

While OPR provides recommendations for residential, office, and retail land uses, there were no specific recommendations for other land use types, such as industrial, other non-residential land use types, or schools. Thus, lead agencies may develop thresholds for these other land use types or utilize a similar metric as office and/or retail.

The basic factors for VMT assessment are the regional VMT (i.e. baseline), thresholds (i.e. the percentage reduction needed to be considered to have a less than significant impact), and mitigation measures (i.e. measures required to reduce VMT).

Regional Average VMT

As mentioned above, in order to assess the potential traffic impact of a project under VMT, a regional average VMT must be established which serves as the "baseline." Because the threshold of significance is expressed as a percentage reduction from the regional average VMT, it is important to understand what the region is defined as. However, the *Technical*

Advisory on Evaluating Transportation Impacts in CEQA does not explicitly define what a "region" is. That said, lead agencies that have already adopted thresholds have gone with either a countywide and/or citywide average VMT. It is recommended that the entire Fresno County region be considered for the baseline for the City.

The average VMT per capita (i.e. for residential land use types) is 16.1 citywide, and 16.2 countywide, therefore not much of a difference. For non-residential land use (i.e. office only), the VMT per employee is 25.6.

Proposed VMT Thresholds

Although the OPR recommends projects achieve a 15% reduction in VMT from the "regional" average, lead agencies have the discretion to adopt different thresholds as long as they are supported by substantial evidence. If a lead agency chooses a different threshold, substantial evidence is required to demonstrate that the metric can support the three statutory goals; (1) reduction in greenhouse gas emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses. The significance threshold shall also align with state laws with regards to achieving GHG reduction goals.

The proposed VMT thresholds for the City are described below under the "Proposal and Analysis" section of the staff report.

VMT Mitigation Measures

Under the VMT methodology, mitigation measures to reduce transportation impacts will shift from relieving traffic congestion through capacity inducing solutions (i.e. adding lanes, road widening, and traffic signals) to more TDM-based measures aimed more on behavioral and infrastructure changes to support and/or encourage shifts in transportation modes away from single-occupancy vehicle use. Because VMT is dependent on location and proximity of residential to employment, goods and services, mitigation measures will be determined on a case-by-case basis – similarly to how standard practice is for determining mitigations under LOS.

The variety of VMT mitigation measures will likely vary much greater than typical LOS based mitigations for a couple of reasons. First, VMT mitigation measures will have a varying degree in the amount of reduction achieved based on the measure proposed comparatively to the project location and use. For example, adding a pedestrian trail may only reduce VMT by one percent (1%), whereas adding a new transit route may reduce VMT by two percent (2%). The amount of mitigation needed will depend on how great the impact is from a project and how much VMT reduction is needed to attain a less-than-significant CEQA impact. Second, several VMT mitigation measures may be needed to achieve the required level of reduction. In the previous example, a project may need to reduce the VMT by three percent (3%) in which case a pedestrian trail and bus route would need to be added. This concept of mitigation is different than LOS based measures in which a project needs to reduce congestion and the primary way to achieve that is to add or construct a physical street improvement.

Under CEQA, mitigation can, in some cases, take the form of compensation (i.e. mitigation banks, exchanges, and/or fee program). However, for consideration as adequate mitigation under CEQA, the fees need to be adopted as part of a fee program in which CEQA was prepared. This entails a fee nexus study as well to justify the fee, the programs it would fund, and the quantification of reductions. While the concept of a fee-based program for purposes of sufficiently offsetting VMT impacts is being considered and explored by many lead agencies, it has yet to be implemented on a large scale.

PROPOSAL AND ANALYSIS

This section describes the proposed *Interim Transportation Impact Analysis Guidelines* (**Attachment 2**). If approved by Council, the City will begin using the guidelines upon adoption. The interim status of the guidelines is to be able to have the methodology in place and to allow continued processing of entitlements while allowing for additional time to fine-tune the guidelines, including development of a user tool that will allow staff, the public, and the development community to anticipate VMT of projects. While the user tool may not necessarily in and of itself take place of requiring or needing a transportation impact analysis, it will help to determine if one may be required.

As previously mentioned, it is important to note that while VMT will become the primary metric for analyzing transportation impacts under CEQA, LOS analysis may still be required for purposes of designing the overall roadway network and for complying with other City policies. As such, LOS may continue to be utilized for assessing transportation impacts from an infrastructure design and build function, but not for purposes of determining CEQA transportation impacts.

Interim Status, Final VMT Guidelines, and User Tool

In order to achieve compliance with SB 743 and allow projects to continue to be processed, City staff has developed, in consultation with Kittelson & Associates, interim guidelines for assessing how transportation impacts will be analyzed using VMT. The interim status is so that the guidelines can be fine-tuned and for the development of a user tool that the public, developers, and staff can use for determining anticipated VMT of a project. During the interim status, mitigation measures will be explored in more detail to determine which might be the most effective for Clovis. Although “interim,” the proposed guidelines will ensure that the City is legally compliant with SB 743. The user tool would allow for project details to be input into a formula of some type and be able to anticipate VMT. While the tool would provide a high level expected result of VMT of a project, it would not necessarily supplant the need for a formal VMT analysis.

Once the guidelines have been refined and the user tool developed, Council would be required to take action on the final guidelines which is anticipated sometime during the Fall 2020.

Interim Transportation Impact Analysis Guidelines

The *Interim Transportation Impact Analysis Guidelines* (Interim TIA Guidelines) document is intended to provide guidance to City staff, applicants, and consultants on the requirements

to evaluate transportation impacts for projects. This document identifies the framework for when and how to analyze transportation impacts utilizing VMT.

The Interim TIA Guidelines is organized into three (3) main sections, including an Introduction, CEQA-Analysis Requirements, and Local Transportation Analysis. Each of these sections are summarized below.

Section 1: Introduction
This section of the Interim TIA Guidelines provides an overview of the document, as well as summarizes the general requirements of SB 743. It also includes a discussion of what would normally be included in a transportation impact analysis, such as a CEQA analysis and a local transportation analysis. In general, the CEQA analysis portion of traffic reports would assess VMT, and the local transportation impact analysis section would include an analysis of LOS for purposes of continued compliance with General Plan policies related to traffic.

Section 2: CEQA Analysis Requirements
This section of the Interim TIA Guidelines discusses the requirements for conducting analyses for projects pursuant to CEQA. According to CEQA Guidelines Appendix G, which most commonly serves as the "environmental checklist" as the basis for CEQA analysis (i.e. preparation of Initial Studies and/or Environmental Impact Reports), a project would have a significant transportation impact if:

- It conflicts with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities;
- It conflicts with or is inconsistent with CEQA Guidelines Section 15064.3(b) (requirement to use VMT);
- It substantially increases hazards due to a geometric feature or incompatible uses; or
- It results in inadequate emergency access.

The Interim TIA Guidelines are designed to address impacts related to CEQA Guidelines Section 15064.3, Determining the Significance of Transportation Impacts. The general process for analyzing projects under VMT would include the following steps:

Step 1: Project Screening
Using the VMT screening maps, user tool (future tool to be developed), and/or based on the project size and use, determine if the project may be "screened out" and therefore assumed to have a less-than-significant impact. If a project can be screened out, with substantial evidence, then a VMT traffic impact analysis may not be required. If a project cannot be screened out, a VMT traffic impact report may be required to further determine the existing and potential for VMT impacts based on the project size, location, and/or proposed use.

The Interim TIA Guidelines identify five (5) screening criteria, including 1) small projects; 2) affordable housing; 3) local-serving retail; 4) projects near high-quality transit areas; and 5)

projects located in low VMT areas. Each of these screening criterion are briefly summarized below, and described in greater detail in Section 2.1.1, Project Screening, in the *Interim Transportation Impact Analysis Guidelines* included as **Attachment 2** to this staff report.

- *Small Projects:* Projects that generate fewer than 500 vehicle trips per day.

- *Affordable Housing:* Residential projects with 100% deed restricted affordable housing.

- *Local-Serving Retail:* Projects that are locally serving retail with 100,000 square feet of gross floor or less. The determination of local-serving retail considers factors such as location, and goods and services the retail would provide. The City may request a market study as substantial evidence to determine if a project may be screened out under this criteria.

- *High-Quality Transit Area:* Project near high-quality transit areas, as defined by the State, may be screened out. Generally, these are areas served by public transit with at least 15-minute headways during peak hour times of travel. Although most of Clovis would not qualify for this, there is a portion of west Clovis where the Fresno Area Express (FAX) bus system meets this criteria.

- *Low VMT Areas:* Residential and employment projects that area proposed in areas that generate below the City's VMT thresholds may be screened out. The screening maps identify these areas.

Step 2: Significance Impact Thresholds

If a project cannot be "screened out" based on the screening criteria, projects would be required to prepare a VMT traffic analysis. This analysis would determine the level of VMT impact a project may have, and ultimately the level of mitigation measures required to reduce those impacts. The proposed VMT thresholds are summarized below, and described in greater detail in Section 2.1.2, Significant Impact Thresholds, in the *Interim Transportation Impact Analysis Guidelines* included as **Attachment 2** to this staff report.

The proposed VMT impact thresholds for the City are as follows:

- *Residential:* A 13% reduction below existing average VMT/capita in Fresno County.

- *Office:* A 13% reduction below existing average VMT/employee in Fresno County.

- *Retail:* No net increase in total VMT.

- *Other Land Uses:* Determined on a case-by-case basis, supported by substantial evidence.

- *Mixed Use Projects:* Evaluate each component of a mixed-use and apply the significance threshold for each land use type.

For determining the VMT reduction, a projects potential VMT is calculated and compared to the regional average VMT, in this case Fresno County region. For residential projects, the regional average VMT was determined to be 16.1 VMT/capita. Therefore, in order for a residential project to be considered to have less-than-significant traffic impacts under CEQA, the project may not exceed 14.1 VMT/capita – which is a 13% reduction from the regional average.

For office uses, the regional average was determined to be 25.6 VMT/employee. Therefore, for an office project to be considered to have a less-than-significant traffic impact under CEQA, the project may not exceed 22.3 VMT/employee.

Step 3: Mitigation Measures

If after Step 2 a project cannot meet the City VMT threshold, mitigation measures may be required to reduce the traffic impact to a level as close to the threshold as possible. If the threshold cannot be reached, then the project may result in a significant VMT impact. As mentioned earlier in the staff report, mitigation measures under VMT will likely be different than those typically required to mitigation LOS (i.e. congestion based) impacts.

FISCAL IMPACT

None. However, failure to comply with SB 743 regulations would expose the City to potential for litigation and financial loss, as well as cause delays in the processing of entitlement applications.

REASON FOR RECOMMENDATION

Staff has concluded that the guidelines will continue to allow for the processing of entitlements while being in compliance with the provisions of SB 743. The proposed thresholds will allow for the continued implementation of the General Plan, as well as maintaining compliance with VMT analysis for CEQA analysis.

Staff recommends the City Council to approve a resolution adopting *Interim Transportation Impact Analysis Guidelines* for assessing traffic impacts in compliance with provisions of SB 743.

ACTIONS FOLLOWING APPROVAL

No further action is required. However, upon completion of the user tool and final version of the VMT guidelines, staff will present those for action by City Council.

Prepared by: Ricky Caperton, AICP, Senior Planner

Reviewed by: City Manager

BACKGROUND MEMO
SENATE BILL 743

ATTACHMENT 3

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MEMORANDUM

Date:	March 18, 2020	Project #:24913
To:	City of Clovis	
From:	Michael Sahimi and Fernando Sotelo, Kittelson & Associates	
Project:	City of Clovis VMT Implementation	
Subject:	SB 743 Background, Key Elements for Implementation, and Examples	

INTRODUCTION

Senate Bill 743 (SB 743) was signed into law in September 2013. It requires changes to guidelines for the California Environmental Quality Act (CEQA). The purpose of SB 743 is to promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.

Under SB 743, a project's effect on automobile delay shall not constitute a significant environmental impact. Therefore, level of service (LOS) and other similar vehicle delay or capacity metrics may no longer serve as transportation impact metrics for CEQA analysis. The California Office of Planning and Research (OPR) has updated the CEQA Guidelines and provided a final technical advisory in December 2018, which recommends vehicle miles traveled (VMT) as the most appropriate measure of transportation impacts under CEQA. For land use and transportation projects, SB 743-compliant CEQA analysis becomes mandatory on July 1, 2020.

This memorandum documents relevant greenhouse gas (GHG) emission and VMT policies and targets in the region, key elements for the City of Clovis in implementing SB 743, and approaches taken to date by other California agencies in establishing Senate Bill (SB) 743-compliant transportation analysis guidelines and significance criteria. It includes four sections.

SB 743 Background

This section summarizes the SB 743 legislation and state guidance.

Key Elements for Implementation

Jurisdictions adopting SB 743-compliant standards need to implement several elements such as methodologies and impact thresholds. OPR has provided recommendations for most of these elements. This section discusses the key elements and the OPR recommendations.

Existing GHG/VMT Targets and Policies in the Region

Local and regional jurisdictions in the Fresno region have adopted goals, policies, targets, and other recommendations for reducing GHG emissions and VMT in the region. This section summarizes relevant targets and policies that the City of Clovis should be aware of moving forward in its SB 743 implementation.

VMT Implementation by Early Adopters

Several jurisdictions in California have established VMT-based transportation impact guidelines within the past five years. This section details the approaches taken by four cities which have implemented SB 743-related CEQA approaches within the past two years: Elk Grove, Los Angeles, Corona, and San Jose (a full matrix detailing the approach of these and other cities is attached to this memorandum).

SB 743 BACKGROUND

On September 27, 2013, Senate Bill (SB) 743 was signed into law. The Legislature found that with the adoption of the Sustainable Communities and Climate Protection Act of 2008 (SB 375), the State of California had signaled its commitment to encourage land use and transportation planning decisions and investments that reduce vehicle miles traveled (VMT) and thereby contribute to the reduction of greenhouse gas emissions (GHG), as required by the California Global Warming Solutions Act of 2006 (AB 32). Additionally, the Complete Streets Act (AB 1358), requires local governments to plan for a balanced, multimodal transportation network that meets the needs of all users. To further the State's commitment to the goals of SB 375, AB 32 and AB 1358, SB 743 adds Chapter 2.7, Modernization of Transportation Analysis for Transit-Oriented Infill Projects, to Division 13 (Section 21099) of the Public Resources Code.

SB 743 has fundamentally changed transportation impact analysis as part of CEQA compliance. Under current practice, CEQA transportation analyses of individual projects typically determine impacts in the circulation system in terms of roadway delay and/or capacity at specific locations, mostly located in proximity to a project site. SB 743 changes include the elimination of auto delay, level of service (LOS), and other similar measures of vehicular capacity or traffic congestion as a basis for determining significant impacts. Further, it confirms that parking impacts will not be considered significant impacts on the environment for select development projects within infill areas with nearby frequent transit service.

SB 743 includes amendments that revise the definition of "in-fill opportunity zones" to allow cities and counties to opt out of traditional LOS standards established by congestion management programs (CMPs) and requires OPR to update the CEQA Guidelines and establish "criteria for determining the significance of transportation impacts of projects within transit priority areas." As part of the new CEQA Guidelines, the new criteria "shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." OPR has released several iterations of its technical advisory (the final version released in December 2018) with the key guidance being that VMT is the most appropriate metric for evaluating a project's transportation impacts.

The California Natural Resources Agency certified and adopted the CEQA Guidelines including the Guidelines section implementing SB 743. The final text, final statement of reasons, and related materials are posted at http://resources.ca.gov/ceqa. The changes have been approved by the Office of the Administrative Law and are now in effect.

It shall be noted that revisions to CEQA transportation analysis requirements do not preclude the application of local general plan policies, municipal and zoning codes, conditions of approval, or any other planning requirements through a city's planning approval process to ensure adequate operation of the transportation system in terms of transportation congestion measures related to vehicular delay and roadway capacity. Therefore, a city could continue to apply congestion-related transportation impact analysis and mitigation for land development projects through planning approval processes outside CEQA.

KEY ELEMENTS FOR IMPLEMENTATION

In its *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018), OPR provides recommendations for jurisdictions to implement SB 743-compliant transportation analyses. These key elements and OPR recommendations are outlined below. Please note, OPR's recommendations are not binding and lead agencies ultimately have the discretion to set or apply their own significance thresholds, provided they are based on significant evidence. The following discusses key elements related to land use projects and transportation projects.

Land Use Development Projects

There are several key elements for implementing SB 743-compliant standards for land use projects. OPR has provided recommendations pertaining to the appropriate methodology for analyzing impacts related to residential, office, retail, and other land use projects. However, these recommendations still allow for discretion by local agencies in setting thresholds and evaluating non-standard land uses.

VMT Estimating Tool

OPR recommends tour- and trip-based travel models to estimate the VMT generated by land use projects. Other types of tools that can be used include sketch tools and spreadsheet tools.

VMT Metrics

OPR provides specific recommended metrics for residential, office, and retail projects. OPR recommends measuring VMT for residential and office projects on a "per rate" basis. Specifically, OPR recommends VMT per capita for residential projects and VMT per employee for office projects. When estimating VMT using trip-based models, the home-based VMT per capita and home-based work VMT per employee should be used. For activity-based models, the VMT per capita and VMT per employee should be used. OPR recommends estimating total VMT in an area as the metric to assess retail projects.

Impact Thresholds

OPR recommends that VMT-based evaluations should be compared to the citywide or regional average (whichever is applied) minus 15 percent for most land uses. In other words, a project that generates a per capita or per employee VMT that is more than 85 percent of existing VMT could result in a significant impact. OPR recommends comparing to the regional or city average for residential projects, and to the regional average for office projects. If a threshold based on city VMT is used for residential projects, proposed development should not cumulatively exceed the number of units specified in the regional Sustainable Communities Strategy (SCS) for that city, and should be consistent with the SCS. For retail projects, OPR recommends measuring the net decrease or increase in VMT in the study area with and without the project. The recommended impact threshold is any increase in total VMT. These thresholds are in line with statewide greenhouse gas emission reduction targets.

Screening Criteria

OPR recommends several screening thresholds that can be used to quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed VMT study.

- **Map-Based Screening**: As an alternative to calculating VMT individually for each new development project, lead agencies can develop a map-based screening approach which compares the VMT for each travel demand model traffic analysis zone (TAZ) to the appropriate citywide or regional averages. Projects can then be screened out from requiring VMT analysis if they are in a low-VMT area, provided the project incorporates similar features to other projects in the area. It should be noted that this map-based screening is most appropriate only for residential and office land uses.
- **Small Projects**: Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than significant transportation impact.
- **Adjacency to High-Quality Transit**: A residential, retail, and/or office project that is located within a half mile of an existing major transit stop[1] or an existing stop along a high-quality transit corridor[2] could be presumed to have a less-than-significant transportation impact. However, this criteria is applicable absent other indicators that a project would increase VMT, such as a floor area ratio (FAR) of less than 0.75, parking provided in excess of municipal requirements, inconsistency with the SCS, or replacing affordable residential units with a smaller number of moderate- or high-income residential units.

[1] Defined as a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods

[2] Defined as a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

- **Local-Serving Retail**: Since local-serving retail tends to shorten trips and reduce VMT, OPR recommends presuming that local-serving retail (as opposed to regional retail) would not have an impact. Absent local data, OPR defines local-serving retail as 50,000 square feet or less.
- **Affordable Housing**: Given that affordable housing in infill locations generally improve an area's jobs-housing balance and generates less VMT than market-rate housing, OPR recommends assuming a less-than-significant impact for a residential development with 100% affordable housing in infill locations, although jurisdictions could develop their own applicable percentage based on local data and conditions.

Redevelopment Projects

If the project leads to a net overall increase in VMT, then the thresholds developed by the jurisdiction should apply. If a project replaces other uses and results in a net decrease in overall VMT, OPR suggests assuming a less-than-significant impact finding without the need for more detailed VMT analysis using the previously detailed VMT thresholds.

Analyzing Mixed Use Projects

For mixed use projects containing a mix of residential, retail, office, and/or other uses, OPR does not recommend combining the analysis with a single threshold. OPR recommends analyzing the project's dominant use only or analyzing each use separately (taking credit for internal capture) with the applicable significance thresholds.

Analyzing Other Uses

Given that residential, office, and retail projects tend to have the greatest influence of land use projects on VMT in California, OPR has provided recommended metrics and thresholds for these project types. If thresholds for other land use types (such as industrial, medical or institutional) are needed, OPR recommends that lead agencies use location-specific information to develop thresholds.

Mitigation

To mitigate the VMT impacts of land use projects, OPR recommends built environment and Transportation Demand Management (TDM) strategies, a mix of land uses and connective non-auto infrastructure to reduce VMT.

Transportation (Infrastructure) Projects

There are also key elements for implementing SB 743-compliant standards for transportation projects; OPR's recommendations are outlined below.

Types of Projects to Analyze

OPR recommends analyzing transportation projects if they are expected to increase VMT. The OPR technical advisory provides a list of transportation project types that would not likely lead to a substantial or measurable increase in vehicle travel and generally should not require a VMT analysis, such as rehabilitation, safety projects, auxiliary lanes less than one mile in length, turning lanes, conversion to

managed or transit lanes, road diets, removal or relocation or parking spaces, and addition of non-motorized, transit, and active transportation facilities. A full list is provided in the technical advisory. On the other hand, OPR states that projects that would likely lead to an increase in vehicle travel and would require an analysis include the addition of through lanes.

Estimating Tool and Methodology

While travel demand models could capture the effects of additional roadway capacity due to rerouting and mode shift, they generally do not capture the long term effects of new vehicle trips generated as a result of the additional roadway capacity (also known as induced demand). OPR recommends calculating the change in VMT using per-mile demand elasticities to capture the effects of induced demand.

VMT Metric and Threshold

OPR recommends analyzing the effects of transportation projects by measuring the change in total VMT (as opposed to VMT per capita or per employee). However, OPR does not recommend a specific total VMT threshold. Rather, OPR recommends that a lead agency could develop a project-level threshold using the agency's VMT level and budget delineated by the California Air Resources Board (CARB) Scoping Plan and the CARB Mobile Source Strategy.

Mitigation

To mitigate the VMT impacts of transportation projects, OPR recommends mitigation and alternatives such as tolling lanes to encourage carpooling and fund transit, converting existing general purpose lanes to HOV or HOT lanes, implementing or funding off-site TDM strategies, or implementing ITS strategies to improve passenger throughput on existing lanes.

EXISTING GHG/VMT TARGETS AND POLICIES IN THE REGION

As discussed above, lead agencies, have the discretion to set or apply their own thresholds of significance. Section 21099 of the Public Resources Code states that the criteria for determining the significance of transportation impacts must promote: (1) reduction of greenhouse gas emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses. In light of considering VMT thresholds and mitigation measures for projects in the City of Clovis and an alignment with long-range development goals, the following discusses relevant targets and policies by the City of Clovis, the Fresno Council of Governments (Fresno COG), and the County of Fresno are summarized in Table 1.

Table 1: Existing Targets and Policies

Jurisdiction	Document	Relevant Goals, Policies, or Targets
City of Clovis	General Plan (2014)	The Land Use Element calls out Mixed-Use Focus Areas and Specific Plans, which could have additional policies and design/development standards.
		Circulation Element Policy 1.4 (Jobs and housing) is to encourage infill development that would provide jobs and services closer to housing, and vice versa, to reduce citywide vehicle miles travelled and effectively utilize the existing transportation infrastructure.
		Air Quality Element Policy 1.1 (Land use and transportation) is to reduce greenhouse gas and other local pollutant emissions through mixed use and transit-oriented development and well-designed transit, pedestrian, and bicycle systems.
		Air Quality Element Goal 2 is a region with healthy air quality and lower greenhouse gas emissions.
		Air Quality Element Policy 2.1 (regional coordination) is to support regional efforts to reduce air pollution (criteria air pollutants and greenhouse gas emissions) and collaborate with other agencies to improve air quality at the emission source and reduce vehicle miles traveled.
		Air Quality Element Policy 2.2 (Cross-jurisdictional issues) is to collaborate with regional agencies and surrounding jurisdictions to address cross-jurisdictional transportation and air quality issues
		Air Quality Element Policy 2.6 (Innovative mitigation) is to encourage innovative mitigation measures to reduce air quality impacts by coordinating with the SJVAPCD, project applicants, and other interested parties.
	Active Transportation Plan (2016)	AB 32 and SB 375 statewide goals of reducing GHG emissions from 1990 by 28% by 2020 and 50% by 2050 and components of reducing auto trips and VMT are cited as relevant to the Plan.
		Affordable Housing and Sustainable Communities (AHSC) Program funding for projects that demonstrate VMT reduction is cited as a Plan funding source.
Fresno COG	Regional Transportation Plan / Sustainable Communities Strategy 2018-2042 (2017)	Relevant regional goals include the following: • A multimodal regional transportation network compatible with adopted land use plans and consistent with the intent of SB375. • A coordinated policy for public transportation that complements land use and air quality/climate change policies.
		Relevant regional objectives include the following: • Development of a regional transportation network which is environmentally sensitive, fosters sustainable regional growth, and helps reduce greenhouse gas emissions wherever possible.

Jurisdiction	Document	Relevant Goals, Policies, or Targets
		• Participate in and support the coordinated transportation and air quality planning efforts between the eight Valley Metropolitan Planning Organizations, Caltrans, the San Joaquin Valley Air Pollution Control District, the Federal Highway Administration, Federal Transit Administration, the California Air Resources Board, and local agencies charged with land use planning. • Implement all appropriate Transportation System Management, Transportation Demand Management, and Transportation Control Measure strategies as technologically and economically feasible. • Support transportation investments that work toward accomplishing air quality and climate change goals, optimizing the utilization of land and encourage a stable economic base.
		The SCS describes Fresno COG's GHG targets for the Fresno region compared to 2005 levels (5% per capita reduction by 2020 and 10% per capita reduction by 2035).
	2020 Greenhouse Emission Reduction Target for the Fresno County Region (2017)	In its letter to the California Air Resources Board (CARB), Fresno COG recommends a 6% per capita GHG reduction for the Fresno region by 2020 from 2010 levels.
	Long Range Transit Plan (2019)	One of the goals of the LRTP is to collaborate on land use decisions that facilitate increased ridership, improve air quality, and reduce greenhouse gas emissions. Objectives under this goal include supporting compact mixed-used development near transit to increase ridership and reduce VMT and encouraging the location of jobs and amenities near transit to minimize the need for long vehicle trips.
		Recommended land use-related implementation strategies for the LRTP include: • Direct development towards transit corridors. • Promote transit-supportive density. • Develop within urban spheres.
		Recommended marketing and community engagement implementation strategies for the LRTP include: • Institute bulk transit pass programs. • Form pass sale partnerships with businesses in transit corridors.
		The LRTP calls out a VMT fee as a potential revenue and funding opportunity. A VMT fee can generate substantial revenue and implement increased-mobility policy goals.

Jurisdiction	Document	Relevant Goals, Policies, or Targets
County of Fresno	Board Briefing Report on Emissions (2012)	In its Government Operations Greenhouse Gas Emissions Inventory, the County recommends the following: • Regardless of chosen long-term emissions reduction targets, to establish linear interim targets for every two- to three-year period. • Re-inventory emissions on a regular basis (every three to five years). • Long-term goal of reducing emissions by 85% to 90% below 2010 levels by 2050.
		The State's GHG emission reduction targets are: • Reduce emissions to 2000 levels by 2010. • Reduce emissions to 1990 levels by 2020. • Reduce emissions to 80% below 1990 levels by 2050.
		Recommended emissions reduction strategies for the County include: • Explore telecommuting to reduce emissions from employee commute. • Continue to encourage employees to use alternative modes of transportation by offering additional commuter benefits. • Explore various policies to encourage walking and biking in good weather by employees that live within 5 miles, and to encourage carpooling by all employees. • Continue to promote incentives for employees who use transit or carpool. • Emphasize the County's Commute Trip Reduction (CTR) program (e.g. carpooling and biking incentives). • Implement employee commute programs aimed at reducing greenhouse gas emissions.

VMT IMPLEMENTATION BY EARLY ADOPTERS

This section documents approaches taken to date by other California agencies in establishing Senate Bill (SB) 743-compliant transportation analysis guidelines and significance criteria. Several jurisdictions in California have established VMT-based transportation impact guidelines within the past five years. This memorandum details the approaches taken by four cities which have implemented SB 743-related CEQA approaches within the past two years: Elk Grove, Los Angeles, Corona, and San Jose (a full matrix detailing the approaches of these and other cities is attached to this memorandum).

City of Elk Grove

The City of Elk Grove released its updated *Transportation Analysis Guidelines* in December 2019. The guidelines include the following recommendations:

- Assess a project's VMT (compared to existing conditions) and consistency with the General Plan Land Use Plan or the Sacramento Area Council of Governments (SACOG) Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS). This is consistent with OPR recommendations.
- The thresholds of significance for all land use projects consist of VMT per service population (residents + employees) greater than 15 percent below the baseline for the relevant General Plan land use designation, and exceeding the baseline daily VMT for the city or the study area (north, south, east, or west). While the efficiency metric threshold (greater than 15 percent below the average) is consistent with OPR recommendations, the reference to land use designation averages and the threshold of exceeding city or study area baseline VMT differs from OPR recommendations.
- In regard to screening criteria for projects, Elk Grove recommendations are in line with OPR for low VMT screening maps, high-quality transit, and affordable housing. However, Elk Grove also includes the requirement of being located on a high-density housing site as designated in the Housing Element for affordable housing. In addition, Elk Grove differs from OPR in regard to screening for project size. Small projects are defined as 10 residential dwelling units or less or 50,000 square feet of commercial, office, or industrial uses or less.
- For transportation projects, the guidelines utilize OPR's list of projects that should or should not require a detailed VMT analysis. The thresholds of significance for transportation projects are exceeding VMT per service population, inconsistency with the SACOG MTP/SCS, and exceeding the cumulative VMT per service population, using the City's travel demand model. The metrics, threshold, and recommended tool differ from OPR recommendations.
- The Elk Grove guidelines recommend built environment and TDM measures to mitigate VMT impacts.

Elk Grove's guidelines include non-CEQA analysis requirements such as site access and on-site circulation review, off-site traffic operations, and effects on multimodal traffic.

The City of Elk Grove recommends using SACOG's regional travel demand model for land use projects and the city's travel demand model for transportation projects.

City of Los Angeles

The City of Los Angeles released its *Transportation Assessment Guidelines* in July 2019. The guidelines include the following recommendations:

- Assess a project's VMT (compared to existing conditions) and consistency with the Southern California Association of Governments (SCAG) Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). This is consistent with OPR recommendations.
- The threshold of significance for residential projects is household VMT per capita greater than 15 percent below the average for the Area Planning Commission (APC) area[3] in which the project is located. While the threshold (VMT per capita greater than 15 percent below the average) is consistent with OPR recommendations, the comparison geography (APC area) differs from OPR recommendations.
- The threshold of significance for office projects (or other employment projects) is work VMT per employee greater than 15 percent below the average for the APC area. While the threshold (VMT per employee greater than 15 percent below the average) is consistent with OPR recommendations, the comparison geography (APC area) differs from OPR recommendations.
- The threshold of significance for retail projects is a net increase in total VMT. This is consistent with OPR recommendations.
- In regard to screening criteria for projects, Los Angeles differs from OPR in defining a small project, which Los Angeles defines as generating fewer than 250 trips per day. Los Angeles guidelines also recommend screening out public services from VMT analysis, but do not include high-quality transit as a screening criterion.
- Los Angeles's guidelines are consistent with OPR recommendations for analyzing transportation projects (analyzing change in project area VMT using travel demand model and induced demand elasticity formulas).
- The Los Angeles guidelines recommend TDM measures to mitigate VMT impacts.

Los Angeles's guidelines include LOS analysis for non-CEQA purposes. In addition, the guidelines require that projects analyze site driveways and nearby intersections to determine project access and circulation issues.

The City of Los Angeles recommends using either the City's spreadsheet-based tool or full travel demand model to determine the VMT for projects.

[3] An APC area is a sub-city geography within the City of Los Angeles. There are seven (7) APCs in the city.

City of Corona

The City of Corona prepared its *Draft City of Corona CEQA Assessment – VMT Analysis Guidelines* in January 2019. The guidelines include the following recommendations:

- Assess a project's VMT compared to existing conditions. In addition, for cumulative analyses, assess consistency with the General Plan or the increase in the cumulative citywide VMT per service population. The draft Corona guidelines are consistent with OPR recommendations with respect to comparing project VMT to existing VMT, but differ in regard to assessing cumulative VMT impacts.
- The threshold of significance for all land use projects is VMT per service population greater than the existing city average and increasing the cumulative citywide VMT per service population. Corona guidelines differ from OPR recommendations in respect to the appropriate impact threshold (existing VMT vs. 15 percent below existing VMT), VMT metric, and geography for establishing baseline VMT.
- In regard to screening criteria for projects, Corona's draft recommendations are in line with OPR for low VMT screening maps, adjacency to major transit stops, and local-serving retail. Corona's draft guidelines also recommend screening out neighborhood schools from VMT analysis. However, the draft guidelines do not mention OPR's recommended screening criteria for small projects or affordable housing projects.
- Corona's guidelines differ from OPR recommendation for assessing mixed-use projects. OPR recommends analyzing each use separately or analyzing the dominant use. However, Corona's draft guidelines recommend analyzing the project as a whole, in terms of VMT per service population.
- Corona's draft guidelines are generally consistent with OPR recommendations for analyzing transportation projects by recommending the change in total citywide VMT as the preferred metric, measured using the city's travel demand model or lane-mile elasticity formulas to analyze induced vehicle demand.
- The draft Corona guidelines recommend TDM strategies to mitigate VMT impacts.

The City of Corona's draft guidelines do not provide recommendations for analyzing LOS for non-CEQA purposes. However, the draft guidelines defer to the city's General Plan, which includes policies that address LOS and identify LOS standards for city infrastructure.

At this time, the City of Corona does not provide a spreadsheet-based tool for SB 743 analysis; the draft guidelines recommend using the Corona General Plan Model for VMT analyses.

City of San Jose

The City of San Jose released its *Transportation Analysis Handbook* in April 2018. The guidelines include the following recommendations:

- Assess a project's VMT (compared to existing conditions) and consistency with General Plan. The San Jose guidelines are consistent with OPR recommendations with respect to comparing project VMT to existing VMT, but differ in regard to assessing cumulative VMT impacts.
- The threshold of significance for residential projects is VMT per resident greater than 15 percent below the citywide average or the regional average (whichever is lower). This is consistent with OPR recommendations.
- The threshold of significance for general employment projects (such as offices) is VMT per employee greater than 15 percent below the regional average. This is consistent with OPR recommendations.
- The threshold of significance for industrial employment projects is VMT per employee greater than the regional average. While the VMT metric and comparison geography are consistent with OPR recommendations, the VMT impact threshold differs from OPR recommendations.
- The threshold of significance for retail, hotel, and school projects is a net increase in total VMT in the region. San Jose guidelines differ from OPR recommendations by recommending total VMT as the metric for hotel and school projects.
- In regard to screening criteria for projects, San Jose recommendations are in line with OPR for low VMT screening maps, high-quality transit, and affordable housing. However, San Jose differs from OPR for project size. Local serving retail is defined as 100,000 square feet or less. Small projects are defined as 15 units of single-family housing or less, 25 units of multi-family housing or less, 10,000 square feet of office or less, or 30,000 square feet of industrial uses or less. San Jose's guidelines also recommend screening out public services from VMT analysis.
- San Jose's guidelines are consistent with OPR recommendations for analyzing transportation projects, except that they do not recommend a specific tool.
- The San Jose guidelines recommend TDM measures to mitigate VMT impacts.

San Jose retains LOS analysis as part of Local Transportation Analysis (non-CEQA) requirements, specifically for evaluating a project's access and circulation within and near the site.

The City of San Jose recommends utilizing either the city's spreadsheet-based tool or full travel demand model to analyze projects.

Summary

The following are the key findings of this memorandum:

- The guidelines for the four example jurisdictions discussed in this memorandum (Cities of Elk Grove, Los Angeles, Corona, and San Jose) are generally consistent with OPR recommendations. However, there are a few distinct exceptions from the OPR recommendations:
    - Elk Grove and Corona recommend analyzing VMT per service population (residents + employees) for all projects, rather than providing separate metrics for residential, office, and retail projects.

  - The guidelines for Los Angeles, Corona, and Elk Grove each deviate from OPR in regard to the recommended geographies for establishing baseline VMT to compare to projects. For example, Los Angeles requires the use of APC thresholds, while Elk Grove has developed thresholds for individual land use designations.
  - The City of Corona's draft guidelines establish a project VMT impact threshold of greater than the baseline existing VMT, which differs from OPR's recommended threshold for residential and office projects of VMT per capita or per employee greater than 15 percent below existing VMT. San Jose's impact threshold for industrial employment projects also differs from OPR recommendations in this regard.
  - The City of Elk Grove includes an additional land use project threshold of exceeding the baseline daily VMT for the city or the study area (north, south, east, or west)
  - San Jose's guidelines substantially differ from OPR in regard to defining small projects and local-serving retail. Both San Jose and Elk Grove also provide detailed guidance in defining small projects for different land uses.
  - The Cities of Los Angeles, Corona, and San Jose each define additional land uses that are assumed to have less-than-significant VMT impacts and would not require a detailed VMT analysis, such as public services and neighborhood schools.
  - The City of Elk Grove recommends VMT per service populations as the metric for analyzing transportation projects, which differs from OPR's recommendation to use total VMT.
- Of the four example cities discussed in this memo, all distinctly call out requirements for non-CEQA LOS analysis.

A full matrix detailing the approach of these and other cities is attached to this memorandum.

Decision Points			Options/OPR Recommendation	Elk Grove	City of LA	Santa Ana	ITE San Diego	Corona	San Francisco	San Jose	Oakland	Pasadena	San Luis Obispo
Analysis Scenarios			Existing VMT metrics	Existing VMT metrics for land use projects; Existing and Cumulative for transportation projects; Consistency with GP LU Plan or SACOG MTP/SCS	Existing VMT metrics; Consistency with SCAG RTP/SCS	Existing VMT metrics; Consistency with SCAG RTP/SCS; Increase in cumulative total citywide VMT	SANDAG RTIP scenario for future land use and transportation network	Existing VMT metrics; Consistency with General Plan or increase in cumulative citywide VMT metric	Existing and Cumulative VMT metrics	Existing VMT metrics; Consistency with General Plan	Existing VMT metrics	Existing VMT metrics	Existing and Cumulative VMT metrics
Land Use Projects	**VMT Estimating Tool**		Tour- and trip-based models; sketch models; spreadsheet models	SACOG SACSIM model	City of LA VMT Calculator Tool or City's Travel Demand Forecasting model	Orange County Transportation Analysis Model (OCTAM)	SANDAG VMT calculation tool (if <2400 ADT) or SANDAG travel model (if >2400 ADT)	Corona General Plan Model	San Francisco County Transportation Authority's San Francisco Chained Activity Modeling Process (SF-CHAMP) (online)	San Jose VMT Evaluation Tool (sketch tool) or San Jose Travel Demand Model	Travel Demand Model	Pasadena Travel Demand Model	City or SLOCOG travel demand models, or quick-response tools
	VMT Metrics/Categories		**For trip-based models:** **Residential Projects**: Home-based VMT per capita **Office Projects**: Home-based Work VMT per employee **For tour-based models:** **Residential Projects**: VMT per capita **Office Projects**: VMT per employee **For all model types:** **Retail Projects**: Total VMT	VMT per service population and Total daily VMT	**Residential Projects**: Household VMT per capita **Office Projects**: Work VMT per employee **Retail Projects**: Total VMT	VMT per service population (residents + employees)	**Residential Projects**: VMT per capita **Employment Projects**: VMT per employee **Retail Projects**: Total VMT	VMT per service population (residents + employees)	**Residential Projects**: Household VMT per capita **Office Projects**: VMT per employee **Retail Projects**: Work VMT per retail employee	**Residential Projects**: VMT per capita **Office/Industrial Projects**: VMT per employee **Retail/Hotel/School Projects**: Total VMT	**Residential Projects**: Household VMT per capita **Office/Retail Projects**: VMT per employee	VMT per service population and Vehicle Trips (VT) per service population	VMT per trip
	Baseline Geography for VMT comparison		**Residential Projects**: Region or City **Office Projects**: Region	**For VMT per service population**: General Plan land use designation limit (provided in Mobility Element). **For Total Daily VMT:** Total limit Citywide or in Study Area (North, South, East, or West)	**Residential/Office Projects**: Area Planning Commission (APC) area	County	City (or community level) and San Diego region	City	Region (Bay Area)	**Residential Projects**: Region or City **Office/Industrial Projects**: Region **Retail/Hotel/School Projects**: Region	Region	City	Region
	Impact Thresholds of Significance		**Residential/Office**: Greater than 15% below existing **Retail**: Net increase in total VMT	Exceeding baseline daily VMT for City or Study Area and exceeding baseline VMT per service population for General Plan Land Use designation (15% reduction below baseline)	**Residential/Office**: Greater than 15% below existing **Retail**: Net increase in total VMT	Greater than 15% below existing	**Residential/Employment**: Greater than 15% below (compared to RTIP future land use/network outputs and/or SANDAG online tool) **Retail**: Refers to OPR recommendations	Project VMT/SP greater than existing Citywide VMT/SP; Increases cumulatve Citywide VMT/SP	Greater than 15% below existing	**Residential/Office Projects**: Greater than 15% below existing **Industrial**: Greater than existing **Retail/Hotel/School Projects**: Net increase in total VMT	Greater than 15% below existing	Greater than existing	Greater than existing
	Screening Criteria	**Map-based screening (low VMT areas)**	Residential and office projects in area with low VMT, incorporating similar features	Projects within pre-screened areas on VMT screening map		Projects located in low VMT-generating TAZs	Not explicitly discussed	Projects located in low VMT-generating TAZs	Projects located in low VMT-generating TAZs	Projects located in low VMT-generating areas	Projects located in low VMT-generating TAZs		
		Small projects (Minimum Project Size)	Less than 100 trips per day (based on 10KSF office)	Less than 10 residential dwelling units; Commercial, office, or industrial less than 50 KSF; Mixed-use project below the residential and non-residential size thresholds	Less than 250 trips per day	Less than 110 trips per day	**Alternative 1**: Less than 500 daily trips if not in General Plan, or 1000 daily trips if in General Plan **Alternative 2**: Hybrd of OPR approach and local trip rates		100 trips per day or fewer	15 single family units or less; 25 multi family units or less; 10,000 square feet office or less; 30,000 square feet industrial or less	Fewer than 100 daily trips	**Residential**: Less than 50 units **Non-Residential**: Less than 50,000 SF	100 trips per day or fewer
		High-Quality Transit	Within 1/2 mile of existing major transit stop or existing stop along HQTC	Projects within 1/2 mile of an existing major transit stop or an existing stop along a HQTC		Projects located in Transit Priority Areas	Within 1/2 mile of existing major transit stop or existing stop along HQTC (if in place in SANDAG's RTIP scenario)	Projects located in Transit Priority Areas	Within half mile of existing major transit stop	Within 1/2 mile of existing major transit stop or existing stop along HQTC	Within 1/2 mile of existing major transit stop or existing stop along HQTC		Required for projects within transit zones
		Local-Serving Retail	50,000 SF or smaller	Less than 50,000 SF	50,000 SF or smaller	Less than 50,000 SF	Not defined, but refers to OPR	Less than 50,000 SF	Less than or equal to 10,000 SF	100,000 SF or less			
		Affordable Housing	High percentage of affordable housing in infill locations	Project that is high density low-income housing on a high density housing site as designated in Housing Element.		Affordable housing in infill urbanized areas or near major transit stops may be exempt	100% affordable housing in infill locations (to be defined based on local conditions)			100% restricted affordable units			
		Redevelopment Projects	LTS impact if replacement land use leads to net overall decrease in VMT				LTS impact if replacement land use leads to net overall decrease in VMT						
		Other Screening Criteria	--		Net decrease in VMT; Public services	Neighborhood schools		Neighborhood schools		Public services	Public services		

Decision Points		Options/OPR Recommendation	Elk Grove	City of LA	Santa Ana	ITE San Diego	Corona	San Francisco	San Jose	Oakland	Pasadena	San Luis Obispo
	Analyzing Mixed-Use Projects	Analyze each use separately, or analyze dominant use		Analyze all project land uses	VMT per service population (residents + employees)	Analyze each use separately. Also, calculate each uses's trips and internalization reduction based on ITE, MXD, or other method. Apply reductions to trip lengths to obtain VMT per capita or employee.	VMT per service population (residents + employees)	Analyze each use separately	Analyze each use separately			
	Other Land Uses (outside of residential, office, retail)	Lead agencies may use location-specific information to develop thresholds for other land use types	Use VMT limits for relevant Land Use designation and City/study area total VMT	Use criteria for office projects	VMT per service population (residents + employees)	Analyze trip-making characteristics of project and analyze using residential or employment methodology	VMT per service population (residents + employees)			Use residential, office, or retail criteria (as appropriate)		
Transportation Projects	**Types of Projects to Analyze**	Provides list of projects which are expected to either increase or decrease VMT (or have no impact)	Based on OPR list.	Utilizes OPR list	Repair, maintenance or minor alterations are exempt	Utilizes OPR list (e.g, exclude transit, bike, and ped projects). Also, exclude if included in a citywide plan)		List of projects which are expected to either increase or decrease VMT	Utilizes OPR list			
	VMT Metric/Threshold	Change in Total VMT (no significance threshold recommended)	Exceeding VMT per service population; Inconsistent with SACOG MTP/SCS; Exceeding cumulative VMT per service population.	Change in project area VMT	Change in total citywide VMT	Level of VMT expected based on General Plan	Change in total citywide VMT	Exceed region's fair share VMT allocation	Percent Change in Total VMT			
	VMT Estimating Tool/Methodology	Calculate using elasticities or travel demand model with additional analysis for induced demand (provides lane-mile elasticity formula)	City of Elk Grove travel forecasting model	City's Travel Demand Forecasting model and lane-mile elasticity	OCTAM or lane-mile elasticity research	Small project: Sketch planning tool. Large project: SANDAG model. Project that reduces approx. 5 minutes per trip: Analyze induced demand.	City model or lane-mile elasticity	Use a travel model or elasticity model (with agency guidance)				
Mitigation		Built environment and Transportation Demand Management (TDM) strategies	Built environment and Transportation Demand Management (TDM) strategies	TDM Strategies		Built environment/project design and Transportation Demand Management (TDM) strategies	TDM Strategies	TDM Strategies	Transportation Demand Management (TDM) strategies			
Level of Service		No longer constitute significant environmental effect under CEQA	Site access and on-site circulation review; off-site traffic operations; effects on multimodal traffic	Analyze project driveways and nearby intersections for project access and circulation analysis		Local transportation analysis that evaluates project's access and circulation within and near the site (and effect on multimodal traffic) as non-CEQA analysis.	Required for traffic impact studies		Local transportation analysis that evaluates project's access and circulation within and near the site	Intersection LOS required as-needed	Residential street segment analysis; Tiered intersection LOS standards	Intersection and roadway segment LOS
	Update Date		December 2019	July 2019	June 2019	May 2019	March 2019	February 2019	April 2018	April 2017	September 2015	March 2015

TECHNICAL ADVISORY ON EVALUATING TRANSPORTATION IMPACTS IN CEQA

ATTACHMENT 4

TECHNICAL ADVISORY

ON EVALUATING TRANSPORTATION IMPACTS IN CEQA

December 2018

Contents

A. Introduction

This technical advisory is one in a series of advisories provided by the Governor's Office of Planning and Research (OPR) as a service to professional planners, land use officials, and CEQA practitioners. OPR issues technical assistance on issues that broadly affect the practice of land use planning and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). (Gov. Code, § 65040, subds. (g), (l), (m).) The purpose of this document is to provide advice and recommendations, which agencies and other entities may use at their discretion. This document does not alter lead agency discretion in preparing environmental documents subject to CEQA. This document should not be construed as legal advice.

Senate Bill 743 (Steinberg, 2013), which was codified in Public Resources Code section 21099, required changes to the guidelines implementing CEQA (CEQA Guidelines) (Cal. Code Regs., Title 14, Div. 6, Ch. 3, § 15000 et seq.) regarding the analysis of transportation impacts. As one appellate court recently explained: "During the last 10 years, the Legislature has charted a course of long-term sustainability based on denser infill development, reduced reliance on individual vehicles and improved mass transit, all with the goal of reducing greenhouse gas emissions. Section 21099 is part of that strategy . . . ." (*Covina Residents for Responsible Development v. City of Covina* (2018) 21 Cal.App.5th 712, 729.) Pursuant to Section 21099, the criteria for determining the significance of transportation impacts must "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." (*Id.*, subd. (b)(1); see generally, adopted CEQA Guidelines, § 15064.3, subd. (b) [Criteria for Analyzing Transportation Impacts].) To that end, in developing the criteria, OPR has proposed, and the California Natural Resources Agency (Agency) has certified and adopted, changes to the CEQA Guidelines that identify vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project's transportation impacts. With the California Natural Resources Agency's certification and adoption of the changes to the CEQA Guidelines, automobile delay, as measured by "level of service" and other similar metrics, generally no longer constitutes a significant environmental effect under CEQA. (Pub. Resources Code, § 21099, subd. (b)(3).)

This advisory contains technical recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures. Again, OPR provides this Technical Advisory as a resource for the public to use at their discretion. OPR is not enforcing or attempting to enforce any part of the recommendations contained herein. (Gov. Code, § 65035 ["It is not the intent of the Legislature to vest in the Office of Planning and Research any direct operating or regulatory powers over land use, public works, or other state, regional, or local projects or programs."].)

This December 2018 technical advisory is an update to the advisory it published in April 2018. OPR will continue to monitor implementation of these new provisions and may update or supplement this advisory in response to new information and advancements in modeling and methods.

B. Background

VMT and Greenhouse Gas Emissions Reduction. Senate Bill 32 (Pavley, 2016) requires California to reduce greenhouse gas (GHG) emissions 40 percent below 1990 levels by 2030, and Executive Order B-16-12 provides a target of 80 percent below 1990 emissions levels for the transportation sector by 2050. The transportation sector has three major means of reducing GHG emissions: increasing vehicle efficiency, reducing fuel carbon content, and reducing the amount of vehicle travel. The California Air Resources Board (CARB) has provided a path forward for achieving these emissions reductions from the transportation sector in its 2016 Mobile Source Strategy. CARB determined that it will not be possible to achieve the State's 2030 and post-2030 emissions goals without reducing VMT growth. Further, in its 2018 Progress Report on California's Sustainable Communities and Climate Protection Act, CARB found that despite the State meeting its 2020 climate goals, "emissions from statewide passenger vehicle travel per capita [have been] increasing and going in the wrong direction," and "California cannot meet its [long-term] climate goals without curbing growth in single-occupancy vehicle activity."[1] CARB also found that "[w]ith emissions from the transportation sector continuing to rise despite increases in fuel efficiency and decreases in the carbon content of fuel, California will not achieve the necessary greenhouse gas emissions reductions to meet mandates for 2030 and beyond without significant changes to how communities and transportation systems are planned, funded, and built."[2]

Thus, to achieve the State's long-term climate goals, California needs to reduce per capita VMT. This can occur under CEQA through VMT mitigation. Half of California's GHG emissions come from the transportation sector[3], therefore, reducing VMT is an effective climate strategy, which can also result in co-benefits.[4] Furthermore, without early VMT mitigation, the state may follow a path that meets GHG targets in the early years, but finds itself poorly positioned to meet more stringent targets later. For example, in absence of VMT analysis and mitigation in CEQA, lead agencies might rely upon verifiable offsets for GHG mitigation, ignoring the longer-term climate change impacts resulting from land use development and infrastructure investment decisions. As stated in CARB's 2017 Scoping Plan:

> "California's future climate strategy will require increased focus on integrated land use planning to support livable, transit-connected communities, and conservation of agricultural and other lands. Accommodating population and economic growth through travel- and energy-efficient land use provides GHG-efficient growth, reducing GHGs from both transportation and building energy use. GHGs can be further reduced at the project level through implementing energy-efficient construction and travel demand management approaches."[5] (*Id.* at p. 102.)

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[1] California Air Resources Board (Nov. 2018) *2018 Progress Report on California's Sustainable Communities and Climate Protection Act*, pp. 4, 5, available at https://ww2.arb.ca.gov/sites/default/files/2018-11/Final2018Report_SB150_112618_02_Report.pdf.
[2] *Id.*, p. 28.
[3] See https://ca50million.ca.gov/transportation/
[4] Fang et al. (2017) *Cutting Greenhouse Gas Emissions Is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled*.
[5] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 102, available at https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf.

In light of this, the 2017 Scoping Plan describes and quantifies VMT reductions needed to achieve our long-term GHG emissions reduction goals, and specifically points to the need for statewide deployment of the VMT metric in CEQA:

> "Employing VMT as the metric of transportation impact statewide will help to ensure GHG reductions planned under SB 375 will be achieved through on-the-ground development, and will also play an important role in creating the additional GHG reductions needed beyond SB 375 across the State. Implementation of this change will rely, in part, on local land use decisions to reduce GHG emissions associated with the transportation sector, both at the project level, and in long-term plans (including general plans, climate action plans, specific plans, and transportation plans) and supporting sustainable community strategies developed under SB 375."[6]

VMT and Other Impacts to Health and Environment. VMT mitigation also creates substantial benefits (sometimes characterized as "co-benefits" to GHG reduction) in both in the near-term and the long-term. Beyond GHG emissions, increases in VMT also impact human health and the natural environment. Human health is impacted as increases in vehicle travel lead to more vehicle crashes, poorer air quality, increases in chronic diseases associated with reduced physical activity, and worse mental health. Increases in vehicle travel also negatively affect other road users, including pedestrians, cyclists, other motorists, and many transit users. The natural environment is impacted as higher VMT leads to more collisions with wildlife and fragments habitat. Additionally, development that leads to more vehicle travel also tends to consume more energy, water, and open space (including farmland and sensitive habitat). This increase in impermeable surfaces raises the flood risk and pollutant transport into waterways.[7]

VMT and Economic Growth. While it was previously believed that VMT growth was a necessary component of economic growth, data from the past two decades shows that economic growth is possible without a concomitant increase in VMT. (Figure 1.) Recent research shows that requiring development projects to mitigate LOS may actually reduce accessibility to destinations and impede economic growth.[8,9]

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[6] *Id.* at p. 76.

[7] Fang et al. (2017) *Cutting Greenhouse Gas Emissions Is Only the Beginning: A Literature Review of the Co-Benefits of Reducing Vehicle Miles Traveled*, available at https://ncst.ucdavis.edu/wp-content/uploads/2017/03/NCST-VMT-Co-Benefits-White-Paper_Fang_March-2017.pdf.

[8] Haynes et al. (Sept. 2015) *Congested Development: A Study of Traffic Delays, Access, and Economic Activity in Metropolitan Los Angeles*, available at http://www.its.ucla.edu/wp-content/uploads/sites/6/2015/11/Haynes_Congested-Development_1-Oct-2015_final.pdf.

[9] Osman et al. (Mar. 2016) *Not So Fast: A Study of Traffic Delays, Access, and Economic Activity in the San Francisco Bay Area*, available at http://www.its.ucla.edu/wp-content/uploads/sites/6/2016/08/Taylor-Not-so-Fast-04-01-2016_final.pdf.

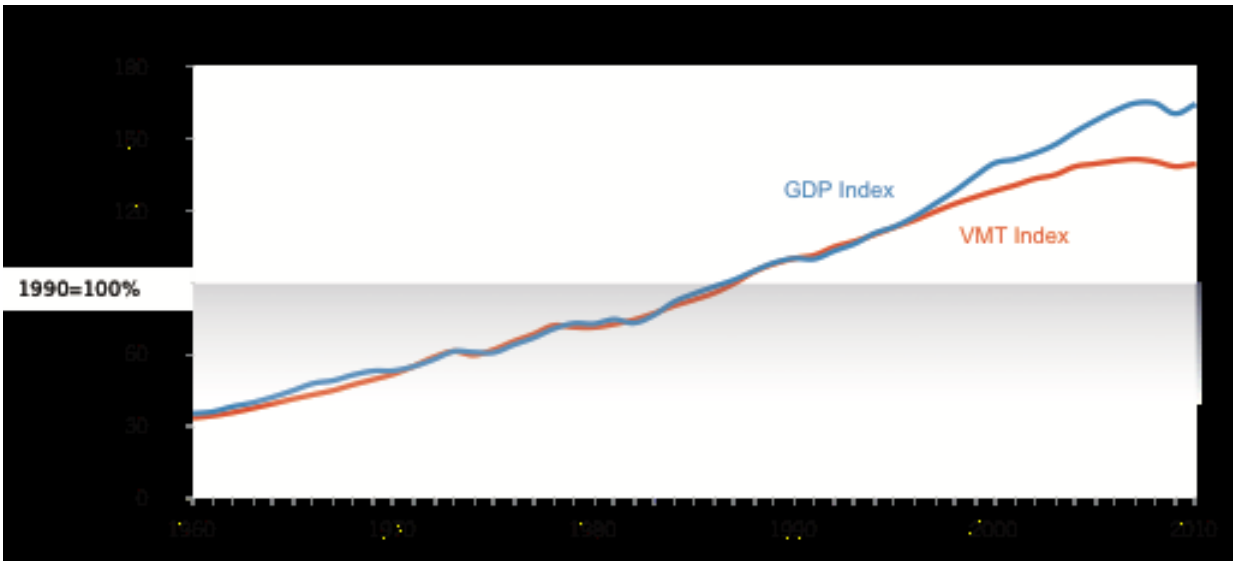

Figure 1. Kooshian and Winkelman (2011) *VMT and Gross Domestic Product (GDP), 1960-2010*.

C. Technical Considerations in Assessing Vehicle Miles Traveled

Many practitioners are familiar with accounting for VMT in connection with long-range planning, or as part of the CEQA analysis of a project's greenhouse gas emissions or energy impacts. This document provides technical information on how to assess VMT as part of a transportation impacts analysis under CEQA. Appendix 1 provides a description of which VMT to count and options on how to count it. Appendix 2 provides information on induced travel resulting from roadway capacity projects, including the mechanisms giving rise to induced travel, the research quantifying it, and information on additional approaches for assessing it.

1. Recommendations Regarding Methodology

Proposed Section 15064.3 explains that a "lead agency may use models to estimate a project's vehicle miles traveled . . . ." CEQA generally defers to lead agencies on the choice of methodology to analyze impacts. (*Santa Monica Baykeeper v. City of Malibu* (2011) 193 Cal.App.4th 1538, 1546; see *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 409 ["the issue is not whether the studies are irrefutable or whether they could have been better" … rather, the "relevant issue is only whether the studies are sufficiently credible to be considered" as part of the lead agency's overall evaluation].) This section provides suggestions to lead agencies regarding methodologies to analyze VMT associated with a project.

Vehicle Types. Proposed Section 15064.3, subdivision (a), states, "For the purposes of this section, 'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to a project." Here, the term "automobile" refers to on-road passenger vehicles, specifically cars and light trucks. Heavy-duty truck VMT could be included for modeling convenience and ease of calculation (for example, where models or data provide combined auto and heavy truck VMT). For an apples-to-apples

comparison, vehicle types considered should be consistent across project assessment, significance thresholds, and mitigation.

Residential and Office Projects. Tour- and trip-based approaches[10] offer the best methods for assessing VMT from residential/office projects and for comparing those assessments to VMT thresholds. These approaches also offer the most straightforward methods for assessing VMT reductions from mitigation measures for residential/office projects. When available, tour-based assessment is ideal because it captures travel behavior more comprehensively. But where tour-based tools or data are not available for all components of an analysis, a trip-based assessment of VMT serves as a reasonable proxy.

Models and methodologies used to calculate thresholds, estimate project VMT, and estimate VMT reduction due to mitigation should be comparable. For example:

- A tour-based assessment of project VMT should be compared to a tour-based threshold, or a trip-based assessment to a trip-based VMT threshold.
- Where a travel demand model is used to determine thresholds, the same model should also be used to provide trip lengths as part of assessing project VMT.
- Where only trip-based estimates of VMT reduction from mitigation are available, a trip-based threshold should be used, and project VMT should be assessed in a trip-based manner.

When a trip-based method is used to analyze a residential project, the focus can be on home-based trips. Similarly, when a trip-based method is used to analyze an office project, the focus can be on home-based work trips.

When tour-based models are used to analyze an office project, either employee work tour VMT or VMT from all employee tours may be attributed to the project. This is because workplace location influences overall travel. For consistency, the significance threshold should be based on the same metric: either employee work tour VMT or VMT from all employee tours.

For office projects that feature a customer component, such as a government office that serves the public, a lead agency can analyze the customer VMT component of the project using the methodology for retail development (see below).

Retail Projects. Generally, lead agencies should analyze the effects of a retail project by assessing the change in total VMT[11] because retail projects typically re-route travel from other retail destinations. A retail project might lead to increases or decreases in VMT, depending on previously existing retail travel patterns.

[10] See Appendix 1, *Considerations About Which VMT to Count,* for a description of these approaches.
[11] See Appendix 1, *Considerations About Which VMT to Count, "*Assessing Change in Total VMT" section, for a description of this approach.

Considerations for All Projects. Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries, for example, by failing to count the portion of a trip that falls outside the jurisdiction or by discounting the VMT from a trip that crosses a jurisdictional boundary. CEQA requires environmental analyses to reflect a "good faith effort at full disclosure." (CEQA Guidelines, § 15151.) Thus, where methodologies exist that can estimate the full extent of vehicle travel from a project, the lead agency should apply them to do so. Where those VMT effects will grow over time, analyses should consider both a project's short-term and long-term effects on VMT.

Combining land uses for VMT analysis is not recommended. Different land uses generate different amounts of VMT, so the outcome of such an analysis could depend more on the mix of uses than on their travel efficiency. As a result, it could be difficult or impossible for a lead agency to connect a significance threshold with an environmental policy objective (such as a target set by law), inhibiting the CEQA imperative of identifying a project's significant impacts and providing mitigation where feasible. Combining land uses for a VMT analysis could streamline certain mixes of uses in a manner disconnected from policy objectives or environmental outcomes. Instead, OPR recommends analyzing each use separately, or simply focusing analysis on the dominant use, and comparing each result to the appropriate threshold. Recommendations for methods of analysis and thresholds are provided below. In the analysis of each use, a mixed-use project should take credit for internal capture.

Any project that includes in its geographic bounds a portion of an existing or planned Transit Priority Area (i.e., the project is within a ½ mile of an existing or planned major transit stop or an existing stop along a high quality transit corridor) may employ VMT as its primary metric of transportation impact for the entire project. (See Pub. Resources Code, § 21099, subds. (a)(7), (b)(1).)

Cumulative Impacts. A project's cumulative impacts are based on an assessment of whether the "incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." (Pub. Resources Code, § 21083, subd. (b)(2); see CEQA Guidelines, § 15064, subd. (h)(1).) When using an absolute VMT metric, i.e., total VMT (as recommended below for retail and transportation projects), analyzing the combined impacts for a cumulative impacts analysis may be appropriate. However, metrics such as VMT per capita or VMT per employee, i.e., metrics framed in terms of efficiency (as recommended below for use on residential and office projects), cannot be summed because they employ a denominator. A project that falls below an efficiency-based threshold that is aligned with long-term environmental goals and relevant plans would have no cumulative impact distinct from the project impact. Accordingly, a finding of a less-than-significant project impact would imply a less than significant cumulative impact, and vice versa. This is similar to the analysis typically conducted for greenhouse gas emissions, air quality impacts, and impacts that utilize plan compliance as a threshold of significance. (See *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) 62 Cal.4th 204, 219, 223; CEQA Guidelines, § 15064, subd. (h)(3).)

D. General Principles to Guide Consideration of VMT

SB 743 directs OPR to establish specific "criteria for determining the significance of transportation impacts of projects[.]" (Pub. Resources Code, § 21099, subd. (b)(1).) In establishing this criterion, OPR was guided by the general principles contained within CEQA, the CEQA Guidelines, and applicable case law.

To assist in the determination of significance, many lead agencies rely on "thresholds of significance." The CEQA Guidelines define a "threshold of significance" to mean "an identifiable **quantitative, qualitative[12] or performance level** of a particular environmental effect, non-compliance with which means the effect will ***normally*** be determined to be significant by the agency and compliance with which means the effect ***normally*** will be determined to be less than significant." (CEQA Guidelines, § 15064.7, subd. (a) (emphasis added).) Lead agencies have discretion to develop and adopt their own, or rely on thresholds recommended by other agencies, "provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence." (*Id*. at subd. (c); *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th 1059, 1068.) Substantial evidence means "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached." (*Id*. at § 15384 (emphasis added); *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1108-1109.)

Additionally, the analysis leading to the determination of significance need not be perfect. The CEQA Guidelines describe the standard for adequacy of environmental analyses:

> An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to **make a decision which intelligently takes account of environmental consequences**. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is **reasonably feasible**. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The **courts have looked not for perfection** but for **adequacy**, **completeness**, and a **good faith effort** at full disclosure.

(CEQA Guidelines, § 15151 (emphasis added).)

These general principles guide OPR's recommendations regarding thresholds of significance for VMT set forth below.

[12] Generally, qualitative analyses should only be conducted when methods do not exist for undertaking a quantitative analysis.

E. Recommendations Regarding Significance Thresholds

As noted above, lead agencies have the discretion to set or apply their own thresholds of significance. (*Center for Biological Diversity v. California Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204, 218-223 [lead agency had discretion to use compliance with AB 32's emissions goals as a significance threshold]; *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th at p. 1068.) However, Section 21099 of the Public Resources Code states that the criteria for determining the significance of transportation impacts must promote: (1) reduction of greenhouse gas emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses. It further directed OPR to prepare and develop criteria for determining significance. (Pub. Resources Code, § 21099, subd. (b)(1).) This section provides OPR's suggested thresholds, as well as considerations for lead agencies that choose to adopt their own

The VMT metric can support the three statutory goals: "the reduction of greenhouse gas emissions, the development of multimodal transportation networks, ***and*** a diversity of land uses." (Pub. Resources Code, § 21099, subd. (b)(1), emphasis added.) However, in order for it to promote and support all three, lead agencies should select a significance threshold that aligns with state law on all three. State law concerning the development of multimodal transportation networks and diversity of land uses requires planning for and prioritizing increases in complete streets and infill development, but does not mandate a particular depth of implementation that could translate into a particular threshold of significance. Meanwhile, the State has clear quantitative targets for GHG emissions reduction set forth in law and based on scientific consensus, and the depth of VMT reduction needed to achieve those targets has been quantified. Tying VMT thresholds to GHG reduction also supports the two other statutory goals. Therefore, to ensure adequate analysis of transportation impacts, OPR recommends using quantitative VMT thresholds linked to GHG reduction targets when methods exist to do so.

Various legislative mandates and state policies establish quantitative greenhouse gas emissions reduction targets. For example:

- Assembly Bill 32 (2006) requires statewide GHG emissions reductions to 1990 levels by 2020 and continued reductions beyond 2020.

- Senate Bill 32 (2016) requires at least a 40 percent reduction in GHG emissions from 1990 levels by 2030.

- Pursuant to Senate Bill 375 (2008), the California Air Resources Board GHG emissions reduction targets for metropolitan planning organizations (MPOs) to achieve based on land use patterns and transportation systems specified in Regional Transportation Plans and Sustainable Community Strategies (RTP/SCS). Current targets for the State's largest MPOs call for a 19 percent reduction in GHG emissions from cars and light trucks from 2005 emissions levels by 2035.

- Executive Order B-30-15 (2015) sets a GHG emissions reduction target of 40 percent below 1990 levels by 2030.

- Executive Order S-3-05 (2005) sets a GHG emissions reduction target of 80 percent below 1990 levels by 2050.

- Executive Order B-16-12 (2012) specifies a GHG emissions reduction target of 80 percent below 1990 levels by 2050 specifically for transportation.

- Executive Order B-55-18 (2018) established an additional statewide goal of achieving carbon neutrality as soon as possible, but no later than 2045, and maintaining net negative emissions thereafter. It states, "The California Air Resources Board shall work with relevant state agencies to develop a framework for implementation and accounting that tracks progress toward this goal."

- Senate Bill 391 requires the California Transportation Plan to support 80 percent reduction in GHGs below 1990 levels by 2050.

- The *California Air Resources Board Mobile Source Strategy* (2016) describes California's strategy for containing air pollutant emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.

- The California Air Resources Board's *2017 Climate Change Scoping Plan Update: The Strategy for Achieving California's 2030 Greenhouse Gas Target* describes California's strategy for containing GHG emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.

Considering these various targets, the California Supreme Court observed:

> Meeting our statewide reduction goals does not preclude all new development. Rather, the Scoping Plan … assumes continued growth and depends on increased efficiency and conservation in land use and transportation from all Californians.

(*Center for Biological Diversity v. California Dept. of Fish & Wildlife*, *supra*, 62 Cal.4th at p. 220.) Indeed, the Court noted that when a lead agency uses consistency with climate goals as a way to determine significance, particularly for long-term projects, the lead agency must consider the project's effect on meeting long-term reduction goals. (*Ibid*.) And more recently, the Supreme Court stated that "CEQA requires public agencies . . . to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes." (*Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 504.)

Meeting the targets described above will require substantial reductions in existing VMT per capita to curb GHG emissions and other pollutants. But targets for overall GHG emissions reduction do not translate directly into VMT thresholds for individual projects for many reasons, including:

- Some, but not all, of the emissions reductions needed to achieve those targets could be accomplished by other measures, including increased vehicle efficiency and decreased fuel carbon content. The CARB's *First Update to the Climate Change Scoping Plan* explains:

"Achieving California's long-term criteria pollutant and GHG emissions goals will require four strategies to be employed: (1) improve vehicle efficiency and develop zero emission technologies, (2) reduce the carbon content of fuels and provide market support to get these lower-carbon fuels into the marketplace, (3) **plan and build communities to reduce vehicular GHG emissions and provide more transportation options, and (4) improve the efficiency and throughput of existing transportation systems.**"[13] CARB's *2018 Progress Report on California's Sustainable Communities and Climate Protection Act* states on page 28 that "California cannot meet its climate goals without curbing growth in single-occupancy vehicle activity." In other words, vehicle efficiency and better fuels are necessary, but insufficient, to address the GHG emissions from the transportation system. Land use patterns and transportation options also will need to change to support reductions in vehicle travel/VMT.

- New land use projects alone will not sufficiently reduce per-capita VMT to achieve those targets, nor are they expected to be the sole source of VMT reduction.

- Interactions between land use projects, and also between land use and transportation projects, existing and future, together affect VMT.

- Because location within the region is the most important determinant of VMT, in some cases, streamlining CEQA review of projects in travel efficient locations may be the most effective means of reducing VMT.

- When assessing climate impacts of some types of land use projects, use of an efficiency metric (e.g., per capita, per employee) may provide a better measure of impact than an absolute numeric threshold. (*Center for Biological Diversity*, *supra*.)

Public Resources Code section 21099 directs OPR to propose criteria for determining the significance of transportation impacts. In this Technical Advisory, OPR provides its recommendations to assist lead agencies in selecting a significance threshold that may be appropriate for their particular projects. While OPR's Technical Advisory is not binding on public agencies, CEQA allows lead agencies to "consider thresholds of significance . . . recommended by other public agencies, provided the decision to adopt those thresholds is supported by substantial evidence." (CEQA Guidelines, § 15064.7, subd. (c).) Based on OPR's extensive review of the applicable research, and in light of an assessment by the California Air Resources Board quantifying the need for VMT reduction in order to meet the State's long-term climate goals, **OPR recommends that a per capita or per employee VMT that is fifteen percent below that of existing development may be a reasonable threshold**.

Fifteen percent reductions in VMT are achievable at the project level in a variety of place types.[14]

Moreover, a fifteen percent reduction is consistent with SB 743's direction to OPR to select a threshold that will help the State achieve its climate goals. As described above, section 21099 states that the

[13] California Air Resources Board (May 2014) *First Update to the Climate Change Scoping Plan*, p. 46 (emphasis added).
[14] CAPCOA (2010) *Quantifying Greenhouse Gas Mitigation Measures*, p. 55, available at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

criteria for determining significance must "promote the reduction in greenhouse gas emissions." In its document *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*[15], CARB assesses VMT reduction per capita consistent with its evidence-based modeling scenario that would achieve State climate goals of 40 percent GHG emissions reduction from 1990 levels by 2030 and 80 percent GHG emissions reduction levels from 1990 by 2050. Applying California Department of Finance population forecasts, CARB finds per-capita light-duty vehicle travel would need to be approximately 16.8 percent lower than existing, and overall per-capita vehicle travel would need to be approximately 14.3 percent lower than existing levels under that scenario. Below these levels, a project could be considered low VMT and would, on that metric, be consistent with 2017 Scoping Plan Update assumptions that achieve climate state climate goals.

CARB finds per capita vehicle travel would need to be kept below what today's policies and plans would achieve.

CARB's assessment is based on data in the 2017 Scoping Plan Update and 2016 Mobile Source Strategy. In those documents, CARB previously examined the relationship between VMT and the state's GHG emissions reduction targets. The Scoping Plan finds:

> "While the State can do more to accelerate and incentivize these local decisions, local actions that reduce VMT are also necessary to meet transportation sector-specific goals and achieve the 2030 target under SB 32. Through developing the Scoping Plan, CARB staff is more convinced than ever that, in addition to achieving GHG reductions from cleaner fuels and vehicles, California must also reduce VMT. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward needed reductions, but alone will not provide the VMT growth reductions needed; there is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals."[16]

Note that, at present, consistency with RTP/SCSs does not necessarily lead to a less-than-significant VMT impact.[17] As the Final 2017 Scoping Plan Update states,

> VMT reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this Plan. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward this goal, but alone will not provide all of the VMT growth reductions that will be needed. There is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals."[18]

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[15] California Air Resources Board (Jan. 2019) *California Air Resources Board 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals*, available at https://ww2.arb.ca.gov/resources/documents/carb-2017-scoping-plan-identified-vmt-reductions-and-relationship-state-climate.

[16] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 101.

[17] California Air Resources Board (Feb. 2018) *Updated Final Staff Report: Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets*, Figure 3, p. 35, available at https://www.arb.ca.gov/cc/sb375/sb375_target_update_final_staff_report_feb2018.pdf.

[18] California Air Resources Board (Nov. 2017) *California's 2017 Climate Change Scoping Plan*, p. 75.

Also, in order to capture the full effects of induced travel resulting from roadway capacity projects, an RTP/SCS would need to include an assessment of land use effects of those projects, and the effects of those land uses on VMT. (See section titled "*Estimating VMT Impacts from Transportation Projects"* below.) RTP/SCSs typically model VMT using a collaboratively-developed land use "vision" for the region's land use, rather than studying the effects on land use of the proposed transportation investments.

In summary, achieving 15 percent lower per capita (residential) or per employee (office) VMT than existing development is both generally achievable and is supported by evidence that connects this level of reduction to the State's emissions goals.

1. Screening Thresholds for Land Use Projects

Many agencies use "screening thresholds" to quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study. (See e.g., CEQA Guidelines, §§ 15063(c)(3)(C), 15128, and Appendix G.) As explained below, this technical advisory suggests that lead agencies may screen out VMT impacts using project size, maps, transit availability, and provision of affordable housing.

Screening Threshold for Small Projects

Many local agencies have developed screening thresholds to indicate when detailed analysis is needed. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day[19] generally may be assumed to cause a less-than-significant transportation impact.

Map-Based Screening for Residential and Office Projects

Residential and office projects that locate in areas with low VMT, and that incorporate similar features (i.e., density, mix of uses, transit accessibility), will tend to exhibit similarly low VMT. Maps created with VMT data, for example from a travel survey or a travel demand model, can illustrate areas that are

[19] CEQA provides a categorical exemption for existing facilities, including additions to existing structures of up to 10,000 square feet, so long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not in an environmentally sensitive area. (CEQA Guidelines, § 15301, subd. (e)(2).) Typical project types for which trip generation increases relatively linearly with building footprint (i.e., general office building, single tenant office building, office park, and business park) generate or attract an additional 110-124 trips per 10,000 square feet. Therefore, absent substantial evidence otherwise, it is reasonable to conclude that the addition of 110 or fewer trips could be considered not to lead to a significant impact.

currently below threshold VMT (see recommendations below). Because new development in such locations would likely result in a similar level of VMT, such maps can be used to screen out residential and office projects from needing to prepare a detailed VMT analysis.

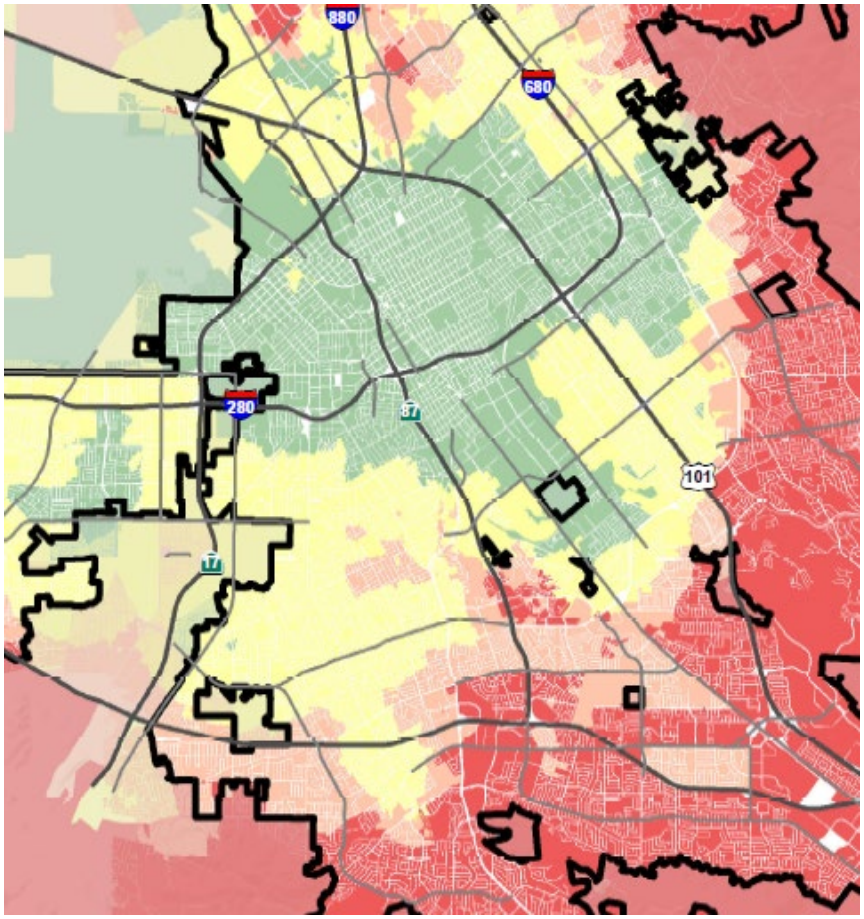


Figure 2. Example map of household VMT that could be used to delineate areas eligible to receive streamlining for VMT analysis. (Source: City of San José, Department of Transportation, draft output of City Transportation Model.)

Presumption of Less Than Significant Impact Near Transit Stations

Proposed CEQA Guideline Section 15064.3, subdivision (b)(1), states that lead agencies generally should presume that certain projects (including residential, retail, and office projects, as well as projects that are a mix of these uses) proposed within ½ mile of an existing major transit stop[20] or an existing stop

[20] Pub. Resources Code, § 21064.3 ("'Major transit stop' means a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.").

along a high quality transit corridor[21] will have a less-than-significant impact on VMT. This presumption would not apply, however, if project-specific or location-specific information indicates that the project will still generate significant levels of VMT. For example, the presumption might not be appropriate if the project:

- Has a Floor Area Ratio (FAR) of less than 0.75
- Includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction (if the jurisdiction requires the project to supply parking)
- Is inconsistent with the applicable Sustainable Communities Strategy (as determined by the lead agency, with input from the Metropolitan Planning Organization)
- Replaces affordable residential units with a smaller number of moderate- or high-income residential units

A project or plan near transit which replaces affordable residential units[22] with a smaller number of moderate- or high-income residential units may increase overall VMT because the increase in VMT of displaced residents could overwhelm the improvements in travel efficiency enjoyed by new residents.[23]

If any of these exceptions to the presumption might apply, the lead agency should conduct a detailed VMT analysis to determine whether the project would exceed VMT thresholds (see below).

Presumption of Less Than Significant Impact for Affordable Residential Development

Adding affordable housing to infill locations generally improves jobs-housing match, in turn shortening commutes and reducing VMT.[24,25] Further, "… low-wage workers in particular would be more likely to choose a residential location close to their workplace, if one is available."[26] In areas where existing jobs-housing match is closer to optimal, low income housing nevertheless generates less VMT than market-

[21] Pub. Resources Code, § 21155 ("For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.").
[22] Including naturally-occurring affordable residential units.
[23] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement,* Chapter 4, pp. 159-160, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.
[24] Karner and Benner (2016) *The convergence of social equity and environmental sustainability: Jobs-housing fit and commute distance* ("[P]olicies that advance a more equitable distribution of jobs and housing by linking the affordability of locally available housing with local wage levels are likely to be associated with reduced commuting distances").
[25] Karner and Benner (2015) *Low-wage jobs-housing fit: identifying locations of affordable housing shortages.*
[26] Karner and Benner (2015) *Low-wage jobs-housing fit: identifying locations of affordable housing shortages.*

rate housing.[27,28] Therefore, a project consisting of a high percentage of affordable housing may be a basis for the lead agency to find a less-than-significant impact on VMT. Evidence supports a presumption of less than significant impact for a 100 percent affordable residential development (or the residential component of a mixed-use development) in infill locations. Lead agencies may develop their own presumption of less than significant impact for residential projects (or residential portions of mixed use projects) containing a particular amount of affordable housing, based on local circumstances and evidence. Furthermore, a project which includes any affordable residential units may factor the effect of the affordability on VMT into the assessment of VMT generated by those units.

2. Recommended Numeric Thresholds for Residential, Office, and Retail Projects

Recommended threshold for residential projects: A proposed project exceeding a level of 15 percent below existing VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita. Proposed development referencing a threshold based on city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the number of units specified in the SCS for that city, and should be consistent with the SCS.

Residential development that would generate vehicle travel that is 15 or more percent below the existing residential VMT per capita, measured against the region or city, may indicate a less-than-significant transportation impact. In MPO areas, development measured against city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the region-based threshold would undermine the VMT containment needed to achieve regional targets under SB 375.

For residential projects in unincorporated county areas, the local agency can compare a residential project's VMT to (1) the region's VMT per capita, or (2) the aggregate population-weighted VMT per capita of all cities in the region. In MPO areas, development in unincorporated areas measured against aggregate city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the regional threshold would undermine achievement of regional targets under SB 375.

[27] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement*, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.
[28] CAPCOA (2010) *Quantifying Greenhouse Gas Mitigation Measures*, pp. 176-178, available at http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

These thresholds can be applied to either household (i.e., tour-based) VMT or home-based (i.e., trip-based) VMT assessments.[29] It is critical, however, that the agency be consistent in its VMT measurement approach throughout the analysis to maintain an "apples-to-apples" comparison. For example, if the agency uses a home-based VMT for the threshold, it should also be use home-based VMT for calculating project VMT and VMT reduction due to mitigation measures.

Recommended threshold for office projects: A proposed project exceeding a level of 15 percent below existing regional VMT per employee may indicate a significant transportation impact.

Office projects that would generate vehicle travel exceeding 15 percent below existing VMT per employee for the region may indicate a significant transportation impact. In cases where the region is substantially larger than the geography over which most workers would be expected to live, it might be appropriate to refer to a smaller geography, such as the county, that includes the area over which nearly all workers would be expected to live.

Office VMT screening maps can be developed using tour-based data, considering either total employee VMT or employee work tour VMT. Similarly, tour-based analysis of office project VMT could consider either total employee VMT or employee work tour VMT. Where tour-based information is unavailable for threshold determination, project assessment, or assessment of mitigation, home-based work trip VMT should be used throughout all steps of the analysis to maintain an "apples-to-apples" comparison.

Recommended threshold for retail projects: A net increase in total VMT may indicate a significant transportation impact.

Because new retail development typically redistributes shopping trips rather than creating new trips,[30] estimating the total change in VMT (i.e., the difference in total VMT in the area affected with and without the project) is the best way to analyze a retail project's transportation impacts.

By adding retail opportunities into the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT. Thus, lead agencies generally may presume such development creates a less-than-significant transportation impact. Regional-serving retail development, on the other hand, which can lead to substitution of longer trips for shorter ones, may tend to have a significant impact. Where such development decreases VMT, lead agencies should consider the impact to be less-than-significant.

Many cities and counties define local-serving and regional-serving retail in their zoning codes. Lead agencies may refer to those local definitions when available, but should also consider any project-

[29] See Appendix 1 for a description of these approaches.
[30] Lovejoy, et al. (2013) *Measuring the impacts of local land-use policies on vehicle miles of travel: The case of the first big-box store in Davis, California, The Journal of Transport and Land Use*.

specific information, such as market studies or economic impacts analyses that might bear on customers' travel behavior. Because lead agencies will best understand their own communities and the likely travel behaviors of future project users, they are likely in the best position to decide when a project will likely be local-serving. Generally, however, retail development including stores larger than 50,000 square feet might be considered regional-serving, and so lead agencies should undertake an analysis to determine whether the project might increase or decrease VMT.

Mixed-Use Projects

Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project's dominant use. In the analysis of each use, a project should take credit for internal capture. Combining different land uses and applying one threshold to those land uses may result in an inaccurate impact assessment.

Other Project Types

Of land use projects, residential, office, and retail projects tend to have the greatest influence on VMT. For that reason, OPR recommends the quantified thresholds described above for purposes of analysis and mitigation. Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types. In developing thresholds for other project types, or thresholds different from those recommended here, lead agencies should consider the purposes described in section 21099 of the Public Resources Code and regulations in the CEQA Guidelines on the development of thresholds of significance (e.g., CEQA Guidelines, § 15064.7).

Strategies and projects that decrease local VMT but increase total VMT should be avoided. Agencies should consider whether their actions encourage development in a less travel-efficient location by limiting development in travel-efficient locations.

Redevelopment Projects

Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would lead to a less-than-significant transportation impact. If the project leads to a net overall increase in VMT, then the thresholds described above should apply.

As described above, a project or plan near transit which replaces affordable[31] residential units with a smaller number of moderate- or high-income residential units may increase overall VMT, because

[31] Including naturally-occurring affordable residential units.

displaced residents' VMT may increase.[32] A lead agency should analyze VMT for such a project even if it otherwise would have been presumed less than significant. The assessment should incorporate an estimate of the aggregate VMT increase experienced by displaced residents. That additional VMT should be included in the numerator of the VMT per capita assessed for the project.

If a residential or office project leads to a net increase in VMT, then the project's VMT per capita (residential) or per employee (office) should be compared to thresholds recommended above. Per capita and per employee VMT are efficiency metrics, and, as such, apply only to the existing project without regard to the VMT generated by the previously existing land use.

If the project leads to a net increase in provision of locally-serving retail, transportation impacts from the retail portion of the development should be presumed to be less than significant. If the project consists of regionally-serving retail, and increases overall VMT compared to with existing uses, then the project would lead to a significant transportation impact.

RTP/SCS Consistency (All Land Use Projects)

Section 15125, subdivision (d), of the CEQA Guidelines provides that lead agencies should analyze impacts resulting from inconsistencies with regional plans, including regional transportation plans. For this reason, if a project is inconsistent with the Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS), the lead agency should evaluate whether that inconsistency indicates a significant impact on transportation. For example, a development may be inconsistent with an RTP/SCS if the development is outside the footprint of development or within an area specified as open space as shown in the SCS.

3. Recommendations Regarding Land Use Plans

As with projects, agencies should analyze VMT outcomes of land use plans across the full area over which the plan may substantively affect travel patterns, including beyond the boundary of the plan or jurisdiction's geography. And as with projects, VMT should be counted in full rather than split between origin and destination. (Emissions inventories have sometimes spit cross-boundary trips in order to sum to a regional total, but CEQA requires accounting for the full impact without truncation or discounting). Analysis of specific plans may employ the same thresholds described above for projects. A general plan, area plan, or community plan may have a significant impact on transportation if proposed new residential, office, or retail land uses would in aggregate exceed the respective thresholds recommended above. Where the lead agency tiers from a general plan EIR pursuant to CEQA Guidelines sections 15152 and 15166, the lead agency generally focuses on the environmental impacts that are specific to the later project and were not analyzed as significant impacts in the prior EIR. (Pub. Resources Code, § 21068.5; Guidelines, § 15152, subd. (a).) Thus, in analyzing the later project, the lead agency

[32] Chapple et al. (2017) *Developing a New Methodology for Analyzing Potential Displacement,* Chapter 4, pp. 159-160, available at https://www.arb.ca.gov/research/apr/past/13-310.pdf.

would focus on the VMT impacts that were not adequately addressed in the prior EIR. In the tiered document, the lead agency should continue to apply the thresholds recommended above.

Thresholds for plans in non-MPO areas may be determined on a case-by-case basis.

4. Other Considerations

Rural Projects Outside of MPOs

In rural areas of non-MPO counties (i.e., areas not near established or incorporated cities or towns), fewer options may be available for reducing VMT, and significance thresholds may be best determined on a case-by-case basis. Note, however, that clustered small towns and small town main streets may have substantial VMT benefits compared to isolated rural development, similar to the transit oriented development described above.

Impacts to Transit

Because criteria for determining the significance of transportation impacts must promote "the development of multimodal transportation networks" pursuant to Public Resources Code section 21099, subd. (b)(1), lead agencies should consider project impacts to transit systems and bicycle and pedestrian networks. For example, a project that blocks access to a transit stop or blocks a transit route itself may interfere with transit functions. Lead agencies should consult with transit agencies as early as possible in the development process, particularly for projects that are located within one half mile of transit stops.

When evaluating impacts to multimodal transportation networks, lead agencies generally should not treat the addition of new transit users as an adverse impact. An infill development may add riders to transit systems and the additional boarding and alighting may slow transit vehicles, but it also adds destinations, improving proximity and accessibility. Such development also improves regional vehicle flow by adding less vehicle travel onto the regional network.

Increased demand throughout a region may, however, cause a cumulative impact by requiring new or additional transit infrastructure. Such impacts may be adequately addressed through a fee program that fairly allocates the cost of improvements not just to projects that happen to locate near transit, but rather across a region to all projects that impose burdens on the entire transportation system, since transit can broadly improve the function of the transportation system.

F. Considering the Effects of Transportation Projects on Vehicle Travel

Many transportation projects change travel patterns. A transportation project which leads to additional vehicle travel on the roadway network, commonly referred to as "induced vehicle travel," would need to quantify the amount of additional vehicle travel in order to assess air quality impacts, greenhouse gas emissions impacts, energy impacts, and noise impacts. Transportation projects also are required to

examine induced growth impacts under CEQA. (See generally, Pub. Resources Code, §§ 21065 [defining "project" under CEQA as an activity as causing either a direct or reasonably foreseeable indirect physical change], 21065.3 [defining "project-specific effect" to mean all direct or indirect environmental effects], 21100, subd. (b) [required contents of an EIR].) For any project that increases vehicle travel, explicit assessment and quantitative reporting of the amount of additional vehicle travel should not be omitted from the document; such information may be useful and necessary for a full understanding of a project's environmental impacts. (See Pub. Resources Code, §§ 21000, 21001, 21001.1, 21002, 21002.1 [discussing the policies of CEQA].) A lead agency that uses the VMT metric to assess the transportation impacts of a transportation project may simply report that change in VMT as the impact. When the lead agency uses another metric to analyze the transportation impacts of a roadway project, changes in amount of vehicle travel added to the roadway network should still be analyzed and reported.[33]

While CEQA does not require perfection, it is important to make a reasonably accurate estimate of transportation projects' effects on vehicle travel in order to make reasonably accurate estimates of GHG emissions, air quality emissions, energy impacts, and noise impacts. (See, e.g., *California Clean Energy Com. v. City of Woodland* (2014) 225 Cal.App.4th 173, 210 [EIR failed to consider project's transportation energy impacts]; *Ukiah Citizens for Safety First v. City of Ukiah* (2016) 248 Cal.App.4th 256, 266.) Appendix 2 describes in detail the causes of induced vehicle travel, the robust empirical evidence of induced vehicle travel, and how models and research can be used in conjunction to quantitatively assess induced vehicle travel with reasonable accuracy.

If a project would likely lead to a measurable and substantial increase in vehicle travel, the lead agency should conduct an analysis assessing the amount of vehicle travel the project will induce. Project types that would likely lead to a measurable and substantial increase in vehicle travel generally include:

- Addition of through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges

Projects that would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis, include:

- Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity
- Roadside safety devices or hardware installation such as median barriers and guardrails

[33] See, e.g., California Department of Transportation (2006) *Guidance for Preparers of Growth-related, Indirect Impact Analyses*, available at http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/GRI_guidance06May_files/gri_guidance.pdf.

- Roadway shoulder enhancements to provide "breakdown space," dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes
- Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, two-way left turn lanes, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Installation of traffic metering systems, detection systems, cameras, changeable message signs and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of new transit service
- Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage
- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor

1. Recommended Significance Threshold for Transportation Projects

As noted in Section 15064.3 of the CEQA Guidelines, lead agencies for roadway capacity projects have discretion, consistent with CEQA and planning requirements, to choose which metric to use to evaluate transportation impacts. This section recommends considerations for evaluating impacts using vehicle miles traveled. Lead agencies have discretion to choose a threshold of significance for transportation projects as they do for other types of projects. As explained above, Public Resources Code section 21099, subdivision (b)(1), provides that criteria for determining the significance of transportation impacts must promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. (*Id.*; see generally, adopted CEQA Guidelines, § 15064.3, subd. (b) [Criteria for Analyzing Transportation Impacts].) With those goals in mind, OPR prepared and the Agency adopted an appropriate transportation metric.

Whether adopting a threshold of significance, or evaluating transportation impacts on a case-by-case basis, a lead agency should ensure that the analysis addresses:

- Direct, indirect and cumulative effects of the transportation project (CEQA Guidelines, § 15064, subds. (d), (h))
- Near-term and long-term effects of the transportation project (CEQA Guidelines, §§ 15063, subd. (a)(1), 15126.2, subd. (a))
- The transportation project's consistency with state greenhouse gas reduction goals (Pub. Resources Code, § 21099)[34]
- The impact of the transportation project on the development of multimodal transportation networks (Pub. Resources Code, § 21099)
- The impact of the transportation project on the development of a diversity of land uses (Pub. Resources Code, § 21099)

The CARB Scoping Plan and the CARB Mobile Source Strategy delineate VMT levels required to achieve legally mandated GHG emissions reduction targets. A lead agency should develop a project-level threshold based on those VMT levels, and may apply the following approach:

1. Propose a fair-share allocation of those budgets to their jurisdiction (e.g., by population);

[34] The California Air Resources Board has ascertained the limits of VMT growth compatible with California containing greenhouse gas emissions to levels research shows would allow for climate stabilization. (See *The 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target* (p. 78, p. 101); *Mobile Source Strategy* (p. 37).) CARB's *Updated Final Staff Report on Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets* illustrates that the current Regional Transportation Plans and Sustainable Communities Strategies will fall short of achieving the necessary on-road transportation-related GHG emissions reductions called for in the 2017 Scoping Plan (Figure 3, p. 35). Accordingly, OPR recommends not basing GHG emissions or transportation impact analysis for a transportation project solely on consistency with an RTP/SCS.

2. Determine the amount of VMT growth likely to result from background population growth, and subtract that from their "budget";
3. Allocate their jurisdiction's share between their various VMT-increasing transportation projects, using whatever criteria the lead agency prefers.

2. Estimating VMT Impacts from Transportation Projects

CEQA requires analysis of a project's potential growth-inducing impacts. (Pub. Resources Code, § 21100, subd. (b)(5); CEQA Guidelines, § 15126.2, subd. (d).) Many agencies are familiar with the analysis of growth inducing impacts associated with water, sewer, and other infrastructure. This technical advisory addresses growth that may be expected from roadway expansion projects.

Because a roadway expansion project can induce substantial VMT, incorporating quantitative estimates of induced VMT is critical to calculating both transportation and other impacts of these projects. Induced travel also has the potential to reduce or eliminate congestion relief benefits. An accurate estimate of induced travel is needed to accurately weigh costs and benefits of a highway capacity expansion project.

The effect of a transportation project on vehicle travel should be estimated using the "change in total VMT" method described in *Appendix 1*. This means that an assessment of total VMT without the project and an assessment with the project should be made; the difference between the two is the amount of VMT attributable to the project. The assessment should cover the full area in which driving patterns are expected to change. As with other types of projects, the VMT estimation should not be truncated at a modeling or jurisdictional boundary for convenience of analysis when travel behavior is substantially affected beyond that boundary.

Transit and Active Transportation Projects

Transit and active transportation projects generally reduce VMT and therefore are presumed to cause a less-than-significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid transit projects, and bicycle and pedestrian infrastructure projects. Streamlining transit and active transportation projects aligns with each of the three statutory goals contained in SB 743 by reducing GHG emissions, increasing multimodal transportation networks, and facilitating mixed use development.

Roadway Projects

Reducing roadway capacity (for example, by removing or repurposing motor vehicle travel lanes) will generally reduce VMT and therefore is presumed to cause a less-than-significant impact on transportation. Generally, no transportation analysis is needed for such projects.

Building new roadways, adding roadway capacity in congested areas, or adding roadway capacity to areas where congestion is expected in the future, typically induces additional vehicle travel. For the types of projects previously indicated as likely to lead to additional vehicle travel, an estimate should be made of the change in vehicle travel resulting from the project.

For projects that increase roadway capacity, lead agencies can evaluate induced travel quantitatively by applying the results of existing studies that examine the magnitude of the increase of VMT resulting from a given increase in lane miles. These studies estimate the percent change in VMT for every percent change in miles to the roadway system (i.e., "elasticity").[35] Given that lead agencies have discretion in choosing their methodology, and the studies on induced travel reveal a range of elasticities, lead agencies may appropriately apply professional judgment in studying the transportation effects of a particular project. The most recent major study, estimates an elasticity of 1.0, meaning that every percent change in lane miles results in a one percent increase in VMT.[36]

To estimate VMT impacts from roadway expansion projects:

1. Determine the total lane-miles over an area that fully captures travel behavior changes resulting from the project (generally the region, but for projects affecting interregional travel look at all affected regions).
2. Determine the percent change in total lane miles that will result from the project.
3. Determine the total existing VMT over that same area.
4. Multiply the percent increase in lane miles by the existing VMT, and then multiply that by the elasticity from the induced travel literature:

[% increase in lane miles] x [existing VMT] x [elasticity] = [VMT resulting from the project]

A National Center for Sustainable Transportation tool can be used to apply this method: https://ncst.ucdavis.edu/research/tools

This method would not be suitable for rural (non-MPO) locations in the state which are neither congested nor projected to become congested. It also may not be suitable for a new road that provides new connectivity across a barrier (e.g., a bridge across a river) if it would be expected to substantially

[35] See U.C. Davis, Institute for Transportation Studies (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*; Boarnet and Handy (Sept. 2014) *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions*, California Air Resources Board Policy Brief, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf.
[36] See Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

shorten existing trips. If it is likely to be substantial, the trips-shortening effect should be examined explicitly.

The effects of roadway capacity on vehicle travel can also be applied at a programmatic level. For example, in a regional planning process the lead agency can use that program-level analysis to streamline later project-level analysis. (See CEQA Guidelines, § 15168.) A program-level analysis of VMT should include effects of the program on land use patterns, and the VMT that results from those land use effects. In order for a program-level document to adequately analyze potential induced demand from a project or program of roadway capacity expansion, lead agencies cannot assume a fixed land use pattern (i.e., a land use pattern that does not vary in response to the provision of roadway capacity). A proper analysis should account for land use investment and development pattern changes that react in a reasonable manner to changes in accessibility created by transportation infrastructure investments (whether at the project or program level).

Mitigation and Alternatives

Induced VMT has the potential to reduce or eliminate congestion relief benefits, increase VMT, and increase other environmental impacts that result from vehicle travel.[37] If those effects are significant, the lead agency will need to consider mitigation or alternatives. In the context of increased travel that is induced by capacity increases, appropriate mitigation and alternatives that a lead agency might consider include the following:

- Tolling new lanes to encourage carpools and fund transit improvements
- Converting existing general purpose lanes to HOV or HOT lanes
- Implementing or funding off-site travel demand management
- Implementing Intelligent Transportation Systems (ITS) strategies to improve passenger throughput on existing lanes

Tolling and other management strategies can have the additional benefit of preventing congestion and maintaining free-flow conditions, conferring substantial benefits to road users as discussed above.

G. Analyzing Other Impacts Related to Transportation

While requiring a change in the methodology of assessing transportation impacts, Public Resources Code section 21099 notes that this change "does not relieve a public agency of the requirement to analyze a project's potentially significant transportation impacts related to air quality, noise, safety, or any other impact associated with transportation." OPR expects that lead agencies will continue to

[37] See National Center for Sustainable Transportation (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, available at http://www.dot.ca.gov/newtech/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf; see Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

address mobile source emissions in the air quality and noise sections of an environmental document and the corresponding studies that support the analysis in those sections. Lead agencies should continue to address environmental impacts of a proposed project pursuant to CEQA's requirements, using a format that is appropriate for their particular project.

Because safety concerns result from many different factors, they are best addressed at a programmatic level (i.e., in a general plan or regional transportation plan) in cooperation with local governments, metropolitan planning organizations, and, where the state highway system is involved, the California Department of Transportation. In most cases, such an analysis would not be appropriate on a project-by-project basis. Increases in traffic volumes at a particular location resulting from a project typically cannot be estimated with sufficient accuracy or precision to provide useful information for an analysis of safety concerns. Moreover, an array of factors affect travel demand (e.g., strength of the local economy, price of gasoline), causing substantial additional uncertainty. Appendix B of OPR's General Plan Guidelines summarizes research which could be used to guide a programmatic analysis under CEQA. Lead agencies should note that automobile congestion or delay does not constitute a significant environmental impact (Pub. Resources Code, §21099(b)(2)), and safety should not be used as a proxy for road capacity.

H. VMT Mitigation and Alternatives

When a lead agency identifies a significant impact, it must identify feasible mitigation measures that could avoid or substantially reduce that impact. (Pub. Resources Code, § 21002.1, subd. (a).) Additionally, CEQA requires that an environmental impact report identify feasible alternatives that could avoid or substantially reduce a project's significant environmental impacts.

Indeed, the California Court of Appeal recently held that a long-term regional transportation plan was deficient for failing to discuss an alternative which could significantly reduce total vehicle miles traveled. In *Cleveland National Forest Foundation v. San Diego Association of Governments, et al.* (2017) 17 Cal.App.5th 413, the court found that omission "inexplicable" given the lead agency's "acknowledgment in its Climate Action Strategy that the state's efforts to reduce greenhouse gas emissions from on-road transportation will not succeed if the amount of driving, or vehicle miles traveled, is not significantly reduced." (*Cleveland National Forest Foundation*, *supra*, 17 Cal.App.5th at p. 436.) Additionally, the court noted that the project alternatives focused primarily on congestion relief even though "the [regional] transportation plan is a long-term and congestion relief is not necessarily an effective long-term strategy." (*Id.* at p. 437.) The court concluded its discussion of the alternatives analysis by stating: "Given the acknowledged long-term drawbacks of congestion relief alternatives, there is not substantial evidence to support the EIR's exclusion of an alternative focused primarily on significantly reducing vehicle trips." (*Ibid*.)

Several examples of potential mitigation measures and alternatives to reduce VMT are described below. However, the selection of particular mitigation measures and alternatives are left to the discretion of

the lead agency, and mitigation measures may vary, depending on the proposed project and significant impacts, if any. Further, OPR expects that agencies will continue to innovate and find new ways to reduce vehicular travel.

Potential measures to reduce vehicle miles traveled include, but are not limited to:

- Improve or increase access to transit.
- Increase access to common goods and services, such as groceries, schools, and daycare.
- Incorporate affordable housing into the project.
- Incorporate neighborhood electric vehicle network.
- Orient the project toward transit, bicycle and pedestrian facilities.
- Improve pedestrian or bicycle networks, or transit service.
- Provide traffic calming.
- Provide bicycle parking.
- Limit or eliminate parking supply.
- Unbundle parking costs.
- Provide parking cash-out programs.
- Implement roadway pricing.
- Implement or provide access to a commute reduction program.
- Provide car-sharing, bike sharing, and ride-sharing programs.
- Provide transit passes.
- Shifting single occupancy vehicle trips to carpooling or vanpooling, for example providing ride-matching services.
- Providing telework options.
- Providing incentives or subsidies that increase the use of modes other than single-occupancy vehicle.
- Providing on-site amenities at places of work, such as priority parking for carpools and vanpools, secure bike parking, and showers and locker rooms.
- Providing employee transportation coordinators at employment sites.
- Providing a guaranteed ride home service to users of non-auto modes.

Notably, because VMT is largely a regional impact, regional VMT-reduction programs may be an appropriate form of mitigation. In lieu fees have been found to be valid mitigation where there is both a commitment to pay fees and evidence that mitigation will actually occur. (*Save Our Peninsula Committee v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 140-141; *Gentry v. City of Murrieta* (1995) 36 Cal.App.4th 1359; *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 727–728.) Fee programs are particularly useful to address cumulative impacts. (CEQA Guidelines, § 15130, subd. (a)(3) [a "project's incremental contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact"].) The mitigation program must undergo CEQA evaluation, either on the program as a whole, or the in-lieu fees or other mitigation must be evaluated

on a project-specific basis. (*California Native Plant Society v. County of El Dorado* (2009) 170 Cal.App.4th 1026.) That CEQA evaluation could be part of a larger program, such as a regional transportation plan, analyzed in a Program EIR. (CEQA Guidelines, § 15168.)

Examples of project alternatives that may reduce vehicle miles traveled include, but are not limited to:

- Locate the project in an area of the region that already exhibits low VMT.
- Locate the project near transit.
- Increase project density.
- Increase the mix of uses within the project or within the project's surroundings.
- Increase connectivity and/or intersection density on the project site.
- Deploy management strategies (e.g., pricing, vehicle occupancy requirements) on roadways or roadway lanes.

Appendix 1. Considerations About Which VMT to Count

Consistent with the obligation to make a good faith effort to disclose the environmental consequences of a project, lead agencies have discretion to choose the most appropriate methodology to evaluate project impacts.[38] A lead agency can evaluate a project's effect on VMT in numerous ways. The purpose of this document is to provide technical considerations in determining which methodology may be most useful for various project types.

Background on Estimating Vehicle Miles Traveled

Before discussing specific methodological recommendations, this section provides a brief overview of modeling and counting VMT, including some key terminology.

Here is an illustrative example of some methods of estimating vehicle miles traveled. Consider the following hypothetical travel day (all by automobile):

1. Residence to Coffee Shop
2. Coffee Shop to Work
3. Work to Sandwich Shop
4. Sandwich Shop to Work
5. Work to Residence
6. Residence to Store
7. Store to Residence

Trip-based assessment of a project's effect on travel behavior counts VMT from individual trips to and from the project. It is the most basic, and traditionally the most common, method of counting VMT. A trip-based VMT assessment of the residence in the above example would consider segments 1, 5, 6 and 7. For residential projects, the sum of home-based trips is called *home-based* VMT.

A *tour-based* assessment counts the entire home-back-to-home tour that includes the project. A tour-based VMT assessment of the residence in the above example would consider segments 1, 2, 3, 4, and 5 in one tour, and 6 and 7 in a second tour. A tour-based assessment of the workplace would include segments 1, 2, 3, 4, and 5. Together, all tours comprise *household* VMT.

[38] The California Supreme Court has explained that when an agency has prepared an environmental impact report:

> [T]he issue is not whether the [lead agency's] studies are irrefutable or whether they could have been better. The relevant issue is only whether the studies are sufficiently credible to be considered as part of the total evidence that supports the [lead agency's] finding[.]

(*Laurel Heights Improvement Assn. v. Regents of the University of California* (1988) 47 Cal.3d 376, 409; see also *Eureka Citizens for Responsible Gov't v. City of Eureka* (2007) 147 Cal.App.4th 357, 372.)

Both trip- and tour-based assessments can be used as measures of transportation efficiency, using denominators such as per capita, per employee, or per person-trip.

Trip- and Tour-based Assessment of VMT

As illustrated above, a tour-based assessment of VMT is a more complete characterization of a project's effect on VMT. In many cases, a project affects travel behavior beyond the first destination. The location and characteristics of the home and workplace will often be the main drivers of VMT. For example, a residential or office development located near high quality transit will likely lead to some commute trips utilizing transit, affecting mode choice on the rest of the tour.

Characteristics of an office project can also affect an employee's VMT beyond the work tour. For example, a workplace located at the urban periphery, far from transit, can require an employee to own a car, which in turn affects the entirety of an employee's travel behavior and VMT. For this reason, when estimating the effect of an office development on VMT, it may be appropriate to consider total employee VMT if data and tools, such as tour-based models, are available. This is consistent with CEQA's requirement to evaluate both direct and *indirect* effects of a project. (See CEQA Guidelines, § 15064, subd. (d)(2).)

Assessing Change in Total VMT

A third method, estimating the *change in total VMT* with and without the project, can evaluate whether a project is likely to divert existing trips, and what the effect of those diversions will be on total VMT. This method answers the question, "What is the net effect of the project on area VMT?" As an illustration, assessing the total change in VMT for a grocery store built in a food desert that diverts trips from more distant stores could reveal a net VMT reduction. The analysis should address the full area over which the project affects travel behavior, even if the effect on travel behavior crosses political boundaries.

Using Models to Estimate VMT

Travel demand models, sketch models, spreadsheet models, research, and data can all be used to calculate and estimate VMT (see Appendix F of the preliminary discussion draft). To the extent possible, lead agencies should choose models that have sensitivity to features of the project that affect VMT. Those tools and resources can also assist in establishing thresholds of significance and estimating VMT reduction attributable to mitigation measures and project alternatives. When using models and tools for those various purposes, agencies should use comparable data and methods, in order to set up an "apples-to-apples" comparison between thresholds, VMT estimates, and VMT mitigation estimates.

Models can work together. For example, agencies can use travel demand models or survey data to estimate existing trip lengths and input those into sketch models such as CalEEMod to achieve more

accurate results. Whenever possible, agencies should input localized trip lengths into a sketch model to tailor the analysis to the project location. However, in doing so, agencies should be careful to avoid double counting if the sketch model includes other inputs or toggles that are proxies for trip length (e.g., distance to city center). Generally, if an agency changes any sketch model defaults, it should record and report those changes for transparency of analysis. Again, trip length data should come from the same source as data used to calculate thresholds to be sure of an "apples-to-apples" comparison.

Additional background information regarding travel demand models is available in the California Transportation Commission's "2010 Regional Transportation Plan Guidelines," beginning at page 35.

Appendix 2. Induced Travel: Mechanisms, Research, and Additional Assessment Approaches

Induced travel occurs where roadway capacity is expanded in an area of present or projected future congestion. The effect typically manifests over several years. Lower travel times make the modified facility more attractive to travelers, resulting in the following trip-making changes:

- **Longer trips.** The ability to travel a long distance in a shorter time increases the attractiveness of destinations that are farther away, increasing trip length and vehicle travel.
- **Changes in mode choice.** When transportation investments are devoted to reducing automobile travel time, travelers tend to shift toward automobile use from other modes, which increases vehicle travel.
- **Route changes.** Faster travel times on a route attract more drivers to that route from other routes, which can increase or decrease vehicle travel depending on whether it shortens or lengthens trips.
- **Newly generated trips.** Increasing travel speeds can induce additional trips, which increases vehicle travel. For example, an individual who previously telecommuted or purchased goods on the internet might choose to accomplish those tasks via automobile trips as a result of increased speeds.
- **Land Use Changes.** Faster travel times along a corridor lead to land development farther along that corridor; that new development generates and attracts longer trips, which increases vehicle travel. Over several years, this induced growth component of induced vehicle travel can be substantial, making it critical to include in analyses.

Each of these effects has implications for the total amount of vehicle travel. These effects operate over different time scales. For example, changes in mode choice might occur immediately, while land use changes typically take a few years or longer. CEQA requires lead agencies to analyze both short-term and long-term effects.

Evidence of Induced Vehicle Travel. A large number of peer reviewed studies[39] have demonstrated a causal link between highway capacity increases and VMT increases. Many provide quantitative estimates of the magnitude of the induced VMT phenomenon. Collectively, they provide high quality evidence of the existence and magnitude of the induced travel effect.

[39] See, e.g., Boarnet and Handy (Sept. 2014) Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions, California Air Resources Board Policy Brief, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf; National Center for Sustainable Transportation (Oct. 2015) *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, available at http://www.dot.ca.gov/research/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf.

Most of these studies express the amount of induced vehicle travel as an "elasticity," which is a multiplier that describes the additional vehicle travel resulting from an additional lane mile of roadway capacity added. For example, an elasticity of 0.6 would signify an 0.6 percent increase in vehicle travel for every 1.0 percent increase in lane miles. Many of these studies distinguish "short run elasticity" (increase in vehicle travel in the first few years) from "long run elasticity" (increase in vehicle travel beyond the first few years). Long run elasticity is larger than short run elasticity, because as time passes, more of the components of induced vehicle travel materialize. Generally, short run elasticity can be thought of as excluding the effects of land use change, while long run elasticity includes them. Most studies find a long run elasticity between 0.6 and just over 1.0,[40] meaning that every increase in lanes miles of one percent leads to an increase in vehicle travel of 0.6 to 1.0 percent. The most recent major study finds the elasticity of vehicle travel by lanes miles added to be 1.03; in other words, each percent increase in lane miles results in a 1.03 percent increase in vehicle travel.[41] (An elasticity greater than 1.0 can occur because new lanes induce vehicle travel that spills beyond the project location.) In CEQA analysis, the long-run elasticity should be used, as it captures the full effect of the project rather than just the early-stage effect.

Quantifying Induced Vehicle Travel Using Models. Lead agencies can generally achieve the most accurate assessment of induced vehicle travel resulting from roadway capacity increasing projects by applying elasticities from the academic literature, because those estimates include vehicle travel resulting from induced land use. If a lead agency chooses to use a travel demand model, additional analysis would be needed to account for induced land use. This section describes some approaches to undertaking that additional analysis.

Proper use of a travel demand model can capture the following components of induced VMT:

- Trip length (generally increases VMT)
- Mode shift (generally shifts from other modes toward automobile use, increasing VMT)
- Route changes (can act to increase or decrease VMT)
- Newly generated trips (generally increases VMT)
    - Note that not all travel demand models have sensitivity to this factor, so an off-model estimate may be necessary if this effect could be substantial.

However, estimating long-run induced VMT also requires an estimate of the project's effects on land use. This component of the analysis is important because it has the potential to be a large component of

[40] See Boarnet and Handy (Sept. 2014) *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions*, California Air Resources Board Policy Brief, p. 2, available at https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf.

[41] Duranton and Turner (2011) *The Fundamental Law of Road Congestion: Evidence from US cities*, available at http://www.nber.org/papers/w15376.

the overall induced travel effect. Options for estimating and incorporating the VMT effects that are caused by the subsequent land use changes include:

1. *Employ an expert panel.* An expert panel could assess changes to land use development that would likely result from the project. This assessment could then be analyzed by the travel demand model to assess effects on vehicle travel. Induced vehicle travel assessed via this approach should be verified using elasticities found in the academic literature.
2. *Adjust model results to align with the empirical research.* If the travel demand model analysis is performed without incorporating projected land use changes resulting from the project, the assessed vehicle travel should be adjusted upward to account for those land use changes. The assessed VMT after adjustment should fall within the range found in the academic literature.
3. *Employ a land use model, running it iteratively with a travel demand model.* A land use model can be used to estimate the land use effects of a roadway capacity increase, and the traffic patterns that result from the land use change can then be fed back into the travel demand model. The land use model and travel demand model can be iterated to produce an accurate result.

A project which provides new connectivity across a barrier, such as a new bridge across a river, may provide a shortened path between existing origins and destinations, thereby shortening existing trips. In rare cases, this trip-shortening effect might be substantial enough to reduce the amount of vehicle travel resulting from the project below the range found in the elasticities in the academic literature, or even lead a net reduction in vehicle travel overall. In such cases, the trip-shortening effect could be examined explicitly.

Whenever employing a travel demand model to assess induced vehicle travel, any limitation or known lack of sensitivity in the analysis that might cause substantial errors in the VMT estimate (for example, model insensitivity to one of the components of induced VMT described above) should be disclosed and characterized, and a description should be provided on how it could influence the analysis results. A discussion of the potential error or bias should be carried into analyses that rely on the VMT analysis, such as greenhouse gas emissions, air quality, energy, and noise.

INTERIM TRANSPORTATION IMPACT ANALYSIS GUIDELINES

City of Clovis, CA

July 14, 2020

ATTACHMENT 2

1. INTRODUCTION

The Interim Transportation Impact Analysis Guidelines document provides guidance to City of Clovis (City) staff, applicants, and consultants on the requirements to evaluate transportation impacts for projects in the city for the purpose of determining impacts under the California Environmental Quality Act (CEQA). The Interim Transportation Impact Analysis Guidelines are intended to:

- promote conformance with applicable City and State regulations;
- provide evaluation consistent with CEQA;
- ensure consistency in preparation of studies by applicants and consultants; and
- provide predictability in content for City staff and the public in reviewing studies.

Although these guidelines are intended to be comprehensive, not all aspects of every transportation analysis can be addressed within this framework. City staff reserve the right to use judgement to request exemptions and/or to modify requirements for specific projects at the time of the review application.

1.1. BACKGROUND

The Interim Transportation Impact Analysis Guidelines specifically address the requirements of California Senate Bill 743 (SB 743) which mandates specific types of CEQA analysis of transportation projects, effective July 1, 2020.

1.1.1. SB 743 Requirements

Prior to implementation of SB 743, CEQA transportation analyses of individual projects typically determined impacts on the circulation system in terms of roadway delay (i.e., congestion) and/or capacity usage at specific locations, such as street intersections or freeway segments. Senate Bill 743, signed into law in September 2013, requires changes to the guidelines for CEQA transportation analysis. The changes include the elimination of auto delay, level of service (LOS), and other similar measures of vehicular capacity or traffic congestion as a basis for determining transportation impacts. The purpose of SB 743 is to promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.

Under SB 743, a project's effect on automobile delay shall not constitute a significant environmental impact under CEQA. Therefore, LOS and other similar vehicle delay or capacity metrics may no longer serve as transportation impact metrics for CEQA analysis. The California Office of Planning and Research (OPR) has updated the CEQA Guidelines and provided a final technical advisory (December 2018), which recommends vehicle miles traveled (VMT) as the most appropriate measure of transportation impacts under CEQA. The California Natural Resources Agency certified and adopted the CEQA Guidelines including the Guidelines section implementing SB 743. The changes have been approved by the Office of the Administrative Law and took effect on July 1, 2020.

LOS analysis is still appropriate and necessary to determine consistency with General Plan policies as they relate to LOS. More specifically, Appendix G of the CEQA Guidelines asks whether a project would "conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities." As the City's currently adopted 2014 General Plan Circulation Element includes a LOS standard, in order to ensure that a project is consistent with the General Plan policy, a LOS analysis may be required at the request of the City Engineer to determine necessary roadway infrastructure improvements and capacity. Any improvements necessary to ensure LOS standards are met may be required as part of the project entitlement.

1.1.2. Local Transportation Analysis

It shall be noted that revisions to CEQA transportation analysis requirements do not preclude the application of local general plan policies, municipal and zoning codes, conditions of approval, or any other planning requirements through a city's planning approval process to ensure adequate operation of the transportation system in terms of transportation congestion measures related to vehicular delay and roadway capacity. As such, the City of Clovis continues to apply congestion-related transportation impact analysis and conditions or requirements for land development projects through planning approval processes outside of the CEQA Guidelines in order to continue implementation of Clovis General Plan policies. These requirements are discussed in Section 3, Local Transportation Analysis.

1.2. TRANSPORTATION IMPACT ANALYSIS REPORTS

This document provides guidance for the two types of analysis that normally comprise a Transportation Impact Analysis (TIA) report:

1. CEQA Analysis
2. Local Transportation Analysis

Not all projects will require all components of a CEQA analysis and a local transportation analysis. For example, a project could meet the screening criteria for being located in a high-quality transit area and be exempt from the preparation of a detailed CEQA VMT analysis. Such a project may only be required to provide a local transportation analysis. Conversely, a project may require a VMT analysis, but not necessarily require a local transportation analysis. Thus, the final scope of the Transportation Impact Analysis would need to be determined by the City.

1.2.1. CEQA Analysis

A CEQA analysis of transportation impacts consists of evaluation measures including conflicts with circulation policies, VMT, hazards, and emergency access. The quantitative methodology, significance thresholds, and mitigation measures for conducting the transportation analysis in

accordance with the requirements of SB 743 are primarily based on VMT metrics. The CEQA analysis is part of the environmental review process and must meet CEQA requirements.

1.2.2. Local Transportation Analysis

The City can require that local non-CEQA analysis address traffic operations, safety issues and needed project design features related to a proposed land use project, as well as analyze site access and internal circulation. The local transportation analysis may be used to assess transportation impacts in relation to the City's policies in the General Plan and other planning documents.

2. CEQA ANALYSIS REQUIREMENTS

This section discusses the requirements for conducting analyses for projects under environmental review, consistent with requirements from SB 743. Under CEQA, a lead agency has the authority to determine its own significance thresholds and methodologies for technical analysis, taking into account its own development patterns, policy goals and context. Lead agencies can make their own specific decisions regarding methodology and thresholds, presuming their choices are supported by substantial evidence.

The CEQA Appendix G Environmental Checklist Form identifies the following four impact types for transportation:

a) Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?
b) Would the project conflict with or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b) (requirement to use VMT)?
c) Would the project substantially increase hazards due to a geometric feature or incompatible uses?
d) Would the project result in inadequate emergency access?

Consistent with State CEQA Guidelines section 15064.3, the City of Clovis has adopted thresholds of significance to determine when a project will have a significant transportation impact based on VMT. The City has developed screening criteria to streamline the analysis for projects that meet certain criteria, referred to as Project Screening, as further described below in Section 2.1.1.

2.1. LAND USE PROJECTS

This section provides information for analyzing individual land use projects, including the process to aid in deciding if a detailed VMT analysis is needed for a land use project. Figure 1 presents a flow chart depicting how a land use project would be analyzed under VMT-based metrics.

2.1.1. Project Screening

A project will require a detailed VMT analysis unless it meets at least one of the City's five screening criteria:

1. Small projects
2. Provision of affordable housing
3. Local-serving retail
4. Project located in a High-Quality Transit Area (HQTA)
5. Project located in low VMT area

Figure 1: Land Use Projects VMT Analysis

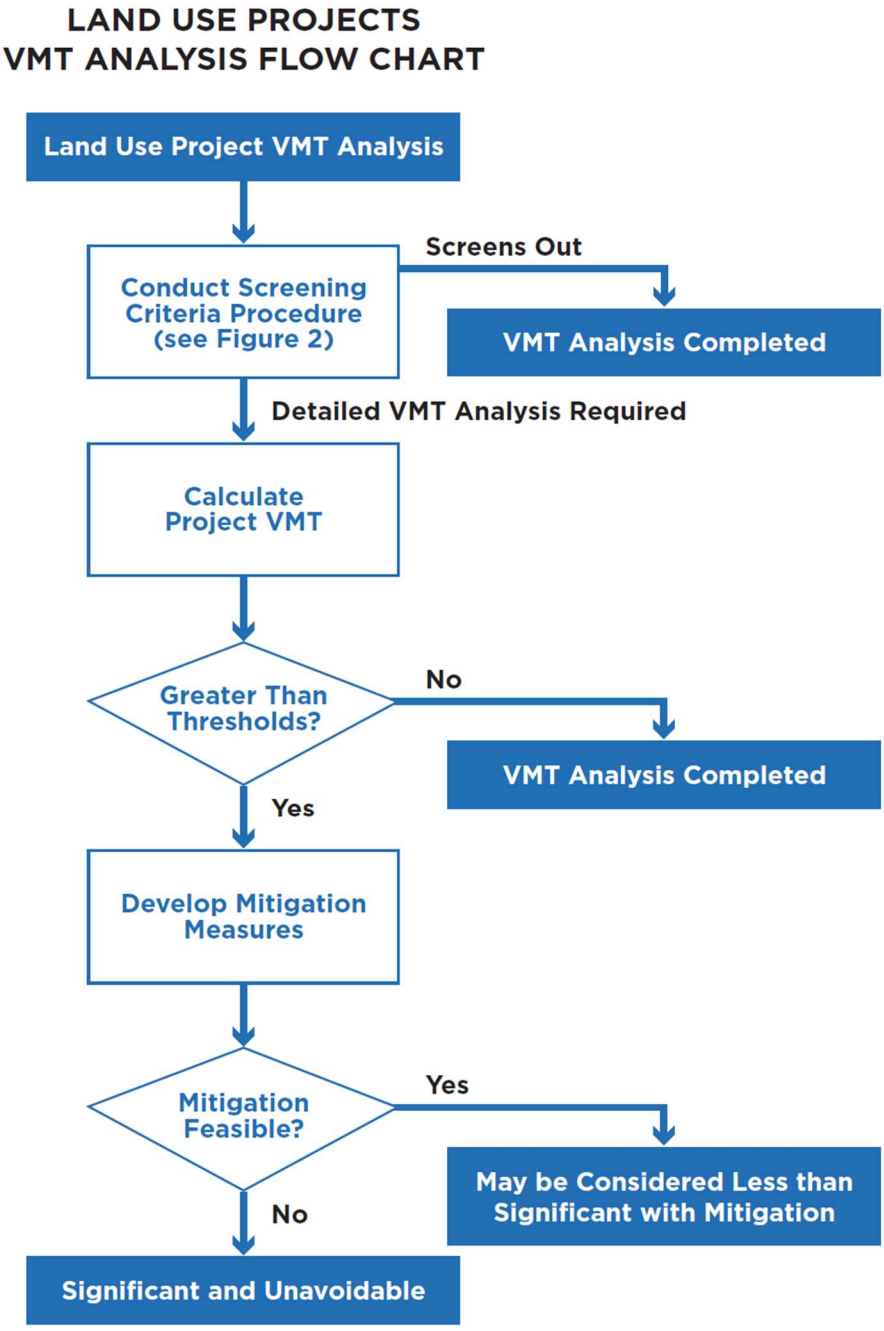
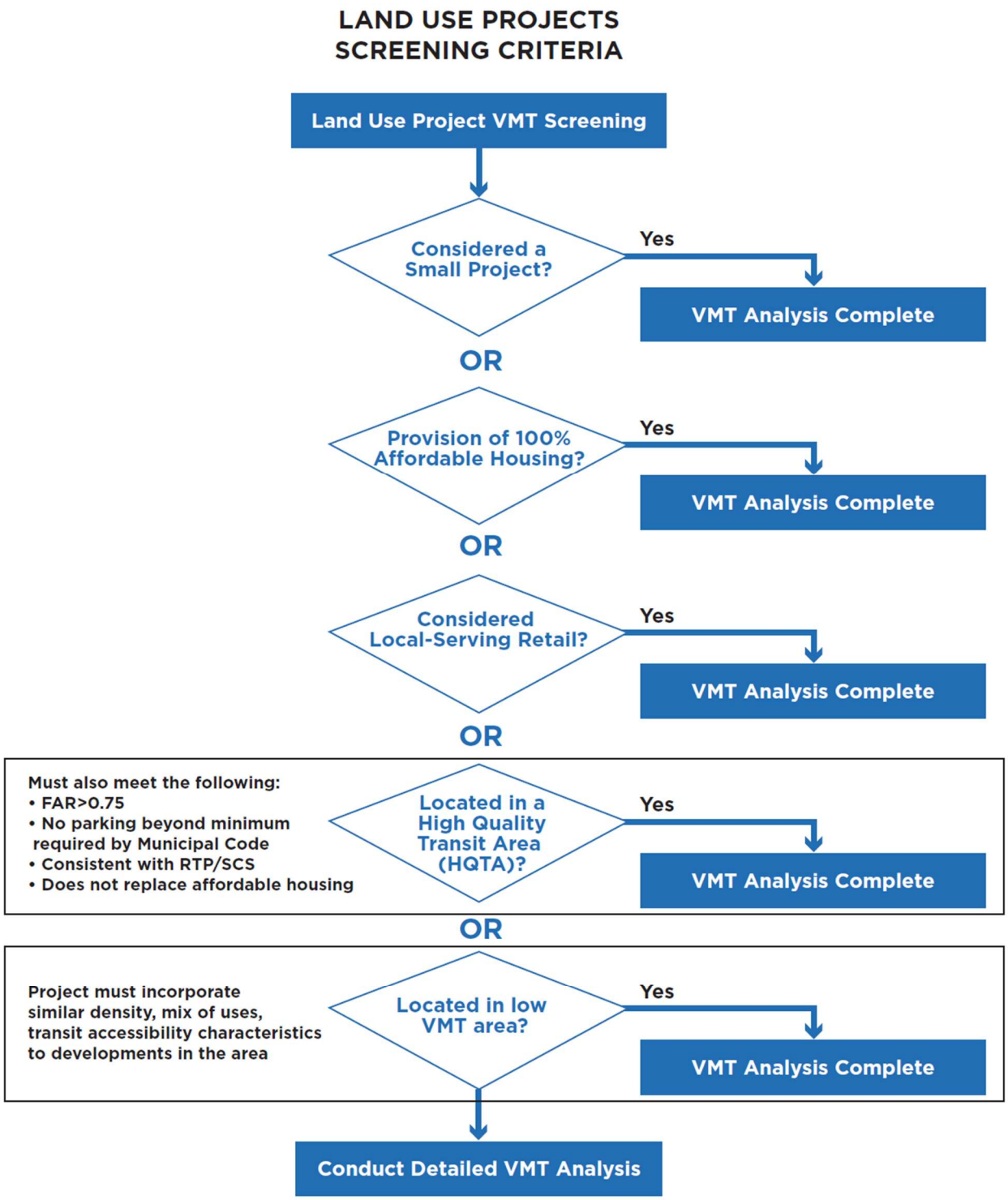


Figure 2 presents a chart depicting how a land use project would be analyzed under the proposed screening criteria. A project that meets at least one of the screening criteria could have a less-than-significant VMT impact due to project or location characteristics.

Figure 2: Land Use Projects Screening Criteria Flow Chart



2.1.1.1. Small Projects

Projects that generate or attract fewer than 500 vehicle trips per day are presumed to cause a less-than-significant VMT impact. Projects that typically generate 500 vehicle daily trips are shown in Table 1.

Table 1: Sample Small Projects (less than 500 daily trips)

Land Use Type	Number of Units/ Square Feet
Single Family Residential	53 Dwelling Units
Townhome/Attached Residential	68 Dwelling Units
Retail	13,250 SF
Light Industrial	100,800 SF

Note: calculated trip rates from the ITE *Trip Generation Manual,* 10th Edition.

2.1.1.2. Affordable Housing

Affordable housing is designated as housing for sale or for rent below market rate. Residential projects in high quality transit areas with a high proportion of affordable housing are presumed to have a less-than-significant transportation impact. Projects can only be screened out if they are located in an area supported by a quality walking and biking network with nearby retail and employment opportunities. If a project contains less than 100 percent affordable housing, the portion that is affordable should be screened out of a detailed VMT analysis.

2.1.1.3. Local-Serving Retail and Public Facilities

Projects that are local-serving retail with 100,000 square feet gross floor area or less are presumed to have a less-than-significant impact. This applies to the entirety of a retail project; for a mixed-use project, this screening criteria should be applied to the retail/commercial component separately to determine if that portion of the project screens out of a detailed VMT analysis.

The determination of local-serving retail is based on location, the characteristics of the project and the vicinity of the site, as well as the envisioned goods and services the retail development would provide. Generally, local-serving retail primarily provides goods and services that most people need on a regular basis and be located close to where people live. Groceries, medicines, fast food and casual restaurants, fitness and beauty services are typical goods and services provided by local-serving retail centers.

The City may require that a project applicant provide a market analysis to demonstrate that the project meets the characteristics of a local-serving retail development based on the goods and services provided relative to the geographic location, the customer base, and other nearby retail uses.

Public services (e.g., police, fire stations, public utilities, neighborhood parks[1]) do not generally generate substantial amounts of trips and VMT. Instead, these land uses are often built to support other nearby land uses (e.g., office and residential). Therefore, these land uses can be presumed to have less-than-significant impacts on VMT. However, this presumption would not apply if the project is sited in a location that requires employees or visitors to travel substantial distances and may require a detailed VMT analysis.

2.1.1.4. High-Quality Transit Area (HQTA)

Projects that are located in a high-quality transit area would not require a detailed VMT analysis. However, this presumption does not apply if the project:

- has a floor area ratio (FAR) of less than 0.75;
- includes substantially more parking for use by residents, customers, or employees of the project than required by the City (per Section 9.32.040 of the Municipal Code) such that it discourages use of alternative modes (transit, biking, walking) by promoting auto ownership and making driving very convenient;
- is inconsistent with the applicable Fresno Council of Governments (Fresno COG) Sustainable Communities Strategy (SCS), as determined by the City; or
- replaces affordable residential units with a smaller number of moderate- or high-income residential units.

A map of the existing High-Quality Transit Areas in the city is provided in Attachment A.

2.1.1.5. Project Located in Low VMT Areas

Residential and employment projects that are proposed in areas that generate VMT below adopted City thresholds are presumed to have a less-than-significant VMT impact and thus can be screened out. The City provides screening maps based on transportation analysis zones (TAZs) and results from the Fresno COG travel model. The following types of projects may be screened out of detailed VMT analysis using these criteria:

- Residential projects proposed in TAZs with total daily resident-based VMT per capita that is 13 percent less than the existing average baseline level for Fresno County
- Office or the employment portions of other non-residential uses with total daily employee-based VMT per employee that is 13 percent less than the existing average baseline level for Fresno County

The TAZs that fall into these categories are shown in green in the maps provided in Attachment B.

[1] For the purpose of conducting VMT analyses, neighborhood parks are defined as typically including playground equipment, playfields, and picnic facilities; ranging in size of up to 30 acres; and serving as social and recreational focal points for neighborhoods.

2.1.1.6. Consistency with RTP/SCS

If a proposed project is inconsistent with the adopted Fresno COG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), the City will evaluate whether that inconsistency may result in a significant impact on transportation. Therefore, projects that are inconsistent with the RTP/SCS would not qualify for screening out of a detailed VMT analysis.

2.1.2. Significant Impact Thresholds

For projects which do not meet any of the screening criteria, the City of Clovis has adopted VMT thresholds for land use development based on a review of long-range plans and policies for the City and for the metropolitan planning organization for the region, Fresno COG.[2] Fresno COG[3] has set a goal to reduce greenhouse gas (GHG) emissions by 13 percent per capita by 2035 as a target for the Fresno region. The intent of SB 743 is to bring CEQA transportation analyses into closer alignment with other statewide policies regarding GHG, complete streets, and smart growth. Therefore, using a threshold of 13 percent below average VMT for residential and office projects is consistent with established regional GHG emission goals.

The OPR technical advisory recommends comparing a project's estimated VMT per capita or VMT per employee to average values on a regional or citywide basis. For retail projects, total VMT within the area affected by the project is measured.

The significance thresholds and specific VMT metrics used to indicate a significant transportation impact are described by land use type in Table 2.

2.1.3. VMT Analysis Methodology

Projects that do not meet the screening criteria must include a detailed evaluation of the VMT generated by the project.

2.1.3.1. Regional Average VMT

Regional average VMT per capita and VMT per employee values are determined using the Fresno COG regional travel model. The travel demand model is a set of mathematical procedures and equations that represent the variety of transportation choices that people make, and how those choices result in trips on the transportation network. The Fresno COG regional travel model is an activity-based model that simulates the County's population, based on detailed Census data, and

[2] SB 375 Greenhouse Emission Reduction Target for the Fresno County Region, Fresno Council of Governments, April 25, 2017.

[3] SB 375 Greenhouse Emission Reduction Target for the Fresno County Region, Fresno Council of Governments, April 25, 2017.

models the daily activity patterns of each simulated individual along with resulting travel demand. The OPR guidelines recommend using a tour-based approach whenever possible.

The daily activity patterns in the travel model are based on a statistical analysis of a household travel survey, where a representative sample of households were asked to track all daily activities and trips by all members of their household. A simulated travel tour might consist of, for example, travel from the home to the gym to work to supermarket to home in a typical weekday. The travel model was calibrated to these surveyed travel patterns, and also validated by its ability to replicate counted traffic volumes, transit ridership, and total Fresno County VMT from the Highway Performance Measurement System (HPMS) which is based on traffic counts.

The VMT per capita includes all trips made by residents, including their trips while away from home, but does not include trips visiting residences (e.g., trips made by delivery vans). The regional average VMT per capita is calculated by summing the vehicle mileage (excluding trips made by transit, bicycle or walking) for all trips made by Fresno County residents, and dividing by the county population.

The VMT per employee includes trips made by employees to and from their workplaces, including trips to and from points other than the employees' homes, but does not include visitors to the employment sites. The regional average VMT per employee is calculated by summing the vehicle mileage (excluding trips made by transit, bicycle or walking) for all trips made by Fresno County employees, and dividing by the total number of employees in the county.

2.1.3.2. VMT per Capita or per Employee

For residential or employment land uses where VMT per capita or VMT per employee are used to determine impacts, the following analysis methods are available:

- The VMT per capita or VMT per employee may be looked up using the latest screening maps (Attachment B) and the TAZ (or TAZs) containing the project site.
- If the value for the TAZ is zero or significantly different compared to the values in surrounding TAZs due to a lack of land use data in the existing condition for the project TAZ, the City may allow the VMT per capita or VMT per employee to be based on an average of surrounding adjacent TAZs.
- If a proposed project affects the balance of residential and non-residential land uses in an area and is a relatively large project, it is recommended that the Fresno COG model be rerun to include the proposed project, and that the VMT per capita and VMT per employee be recalculated.

2.1.3.3. Exclusion of Truck VMT

It shall be noted that SB 743 does not apply to goods movement (i.e., trucks). Section 15064.3 of the CEQA Guidelines states that VMT for transportation impacts refers to "… the amount and distance of automobile travel…". Therefore, the VMT associated with trucks and the movement of

goods is not required to be analyzed and mitigated for the evaluation of transportation impacts under CEQA. Projects that generate a substantial amount of truck traffic also generate automobile trips, and project-related automobile trips would be subject to VMT analysis and mitigation. The VMT for all vehicles, including heavy trucks related to a project, will still be calculated as input for air quality, GHG, noise and energy impact analyses to be evaluated in non-transportation parts of the environmental analysis. The local transportation analysis requires an evaluation of truck traffic in terms of roadway and intersection operations, as discussed in Section 3.

Table 2: Impact Thresholds by Land Use Type

Land Use Type	**Impact Threshold**
Residential	A proposed project exceeding a level of 13 percent below existing average VMT per capita in Fresno County. Regional Average: 16.1 VMT/capita Impact Threshold: 14.1 VMT/capita
Office	A proposed project exceeding a level of 13 percent below existing average VMT per employee in Fresno County. Regional Average: 25.6 VMT/employee Impact Threshold: 22.3 VMT/employee
Retail	A net increase in total VMT. The total VMT for the region without and with the project is calculated. The difference between the two scenarios is the net change in total VMT that is attributable to the project.
Other land uses	The City will make a determination of the applicable thresholds on a case-by-case basis based on the land use type, project description, and setting. Research and development, medical offices, assisted living, and industrial projects may be evaluated similar to office projects using the VMT per employee metric. Projects such as religious institutions, regional parks, hotels, private schools and medical offices may be evaluated using the net VMT criteria similar to retail projects.
Mixed-Use Projects	Evaluate each component of a mixed-use project independently and apply the significance threshold for each land use type. Alternatively, the evaluation would apply only the project's dominant use.

2.1.4. Redevelopment Projects

If a project results in a net decrease in overall VMT, it may be presumed that the project would result in a less-than-significant impact.

If a project replaces existing uses and leads to a net overall increase in VMT compared to the previous uses, then the thresholds for the new land uses should apply. If net VMT increases, then the appropriate VMT metrics and thresholds should be applied. For example, if a residential project replaces an office project resulting in a net increase in VMT, then the project's VMT per capita should be compared with the thresholds for residential projects. If the project is a mixed-use project, then the recommended approach for analyzing mixed-use projects should be applied to analyze each individual use.

2.1.5. Land Use Plans

For land use plans such as specific plans, community plans, and general plan updates, consistent with OPR's recommendations, the City requires comparing the applicable VMT thresholds (such as VMT per capita and/or VMT per employee) described in Section 2.1.3 under existing conditions with the applicable VMT metrics for the expected horizon year for the land use plan. If there is a net increase in the applicable VMT metrics under horizon year conditions, then the project will have a significant impact.

2.1.6. Cumulative Impacts

Per Section 15064 (h) (1) of the CEQA code, "when assessing whether a cumulative effect requires an Environmental Impact Report (EIR), the lead agency shall consider whether the cumulative impact is significant and whether the effects of the project are cumulatively considerable."

Generally, an analysis of cumulative impacts falls under two categories:

1. VMT per capita or per employee
2. Total VMT

These are described below.

2.1.6.1. VMT per Capita or per Employee

For land uses evaluated under an efficiency metric (VMT per capita for residential or VMT per employee for office/employment), if a project falls below the threshold, it would also result in less-than-significant cumulative impacts. In other words, a project that falls below an efficiency-based threshold would have no cumulative impact distinct from the project impact.

2.1.6.2. Total VMT

For land uses evaluated using total VMT (e.g., retail, hotels, etc.), when absolute VMT metrics (such as total VMT recommended for retail and transportation projects) are used, a cumulative VMT

impact analysis may be appropriate. Projects must demonstrate consistency with the City of Clovis General Plan to address cumulative impacts. A determination for consistency with the General Plan or RTP/SCS would be made by the City Engineer and based on factors such as density, design and consistency with the City's General Plan goals and policies. Inconsistencies may be identified if the proposed land use quantities are beyond the designation for the project site in the General Plan or RTP/SCS, in which case the project may result in higher VMT compared to the applicable plan.

If a project is consistent with the General Plan or RTP/SCS, it will be considered as part of the cumulative condition to meet the General Plan's long-range transportation goals, and therefore will result in a less-than-significant cumulative impact. If a project is not consistent with the General Plan, a cumulative impact analysis will be required to determine if the project would result in a net increase in VMT.

2.1.7. Mitigation

If a project would result in significant impacts, CEQA requires feasible mitigation measures to be implemented to reduce or mitigate an impact. Mitigation includes[4]:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation

(c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action

(e) Compensating for the impact by replacing or providing substitute resources or environments, including through permanent protection of such resources in the form of conservation easements

For VMT impacts, a combination of measures from several VMT reduction strategies may be implemented: project characteristics, multimodal improvements, parking, and Transportation Demand Management (TDM). VMT is reduced by implementing strategies that reduce the number of automobile trips generated by the project, shift more trips from automobile to non-automobile modes, and/or reduce the distances that people drive. Generally, these reductions can be achieved by the implementation of TDM strategies.

TDM strategies are designed to change travel behavior in order to reduce the demand for roadway travel and increase the overall efficiency of a local or regional transportation system. This is accomplished by encouraging mode shifts away from the Single Occupant Vehicle (SOV) and auto trips away from peak periods. TDM strategies typically involve some form of incentives for employers and residents in order to reduce driving and encourage transit, walking, biking, and

[4] According to CEQA code Section 15370

carpooling. These incentives can include, but are not limited to, supplying transit passes, rideshare programs, parking cash out, and guaranteed ride home programs. The implementation of TDM measures outcomes include increased transit use and non-motorized travel, reduced VMT, reduced roadway congestion, and reduced parking demand.

Measures to reduce VMT have been documented by several sources. Sources most commonly referenced include the California Air Resources Board (CARB) list of transportation and land use strategies for reducing greenhouse gas emissions;[5] the California Pollution Control Offices Association (CAPCOA) report on quantifying the greenhouse gas mitigation measures;[6] and the San Diego Association of Governments (SANDAG) Mobility Management VMT Reduction Calculator Tool – Design Document. The City recommends the use of these sources to select and apply mitigation measures and appropriate VMT reductions. The project applicant will be required to provide evidence for identifying specific values for mitigations to demonstrate the quantification in reduction of VMT to a level that would be less than significant. The mitigation measures included in the CAPCOA report are included in Attachment D. The mitigation measures included from SANDAG are included in Attachment E.

Projects for which impacts are determined to be significant are required to propose a list of VMT reduction measures and document the associated percentage of VMT reduction supported by substantial evidence. Project VMT is calculated by applying the percentage in reduction. Project VMT is then compared to the threshold of significance to evaluate the project's CEQA transportation impact. The City will review and approve the proposed mitigation and the calculated percentage in VMT reduction.

VMT mitigation fees, mitigation banks, and mitigation exchange programs are potential future methods for handling mitigation. Cities have been exploring the establishment of programs such as mitigation banking and VMT exchanges. VMT exchange banks allow program-level mitigation to take place for projects located in high-VMT areas where mitigation at the project level alone may not be effective. A considerable amount of effort is needed to set up these types of fee programs, which are implemented in advance and independent of the environmental review for a specific land development project. As a first step, the City will need to identify mitigation strategies that are feasible for the City or individual projects to implement. This can include determining the physical feasibility of infrastructure projects or determining the implementation feasibility of programs that would contribute to development of regional pedestrian, bicycle/scooter, and transit projects and possibly TDM actions aimed at changing travel behavior.

[5] https://ww3.arb.ca.gov/cc/sb375/policies/policies.htm

[6] Quantifying Greenhouse Gas Mitigation Measures, California Pollution Control Officers Association 2010.

2.2. TRANSPORTATION PROJECTS

This section provides information for analyzing transportation projects on roads within the City's jurisdiction.

2.2.1. Determining Need for Detailed VMT Analysis

The City of Clovis requires an analysis of transportation projects if they are expected to increase VMT, primarily projects that encourage the use of single-occupancy automobile such as the addition of through travel lanes. However, transportation projects that have already been specifically analyzed in a citywide plan (such as a General Plan update) may be exempt from a detailed VMT analysis. This exemption may be granted if the necessary VMT analysis and potential mitigations have already been calculated and identified at the plan level.

Conversely, projects that would likely not lead to an increase in vehicle travel and which promote use of transit and active transportation, should not require a VMT analysis. Project types that would likely not lead to a substantial or measurable increase in vehicle travel and generally should not require a VMT analysis include:

- road rehabilitation
- safety projects
- auxiliary lanes less than one mile in length
- turning lanes
- conversion to managed or transit lanes
- road diets
- removal or relocation of parking spaces
- addition of non-motorized, transit, and active transportation facilities

A full list is provided in Attachment C.

This approach is consistent with the intent of SB 743 in that it streamlines VMT-reducing projects and thoroughly assesses and mitigates, as appropriate, projects that have the potential to increase VMT.

2.2.2. Thresholds for Transportation Projects

Projects that have already been included and evaluated in the General Plan or the RTP/SCS are presumed to have a less-than-significant impact.

For projects that have not been included in the General Plan or RTP/SCS or are modifications and replacements, any growth in VMT attributable to the transportation project could result in a significant impact. For example, a transportation project that replaces a project included in the General Plan and would generate less VMT compared to the project included in the General Plan would have a less than significant impact. Projects not included in the General Plan or RTP/SCS would have a significant impact if they cause a net increase in VMT.

2.2.3. VMT Analysis Methodology and Tools

For transportation projects (e.g., those that increase vehicular throughput or are not included in a citywide plan) that require a detailed VMT analysis, the City should require analysis using the most current travel demand model (i.e., Fresno COG model) to estimate changes to citywide VMT due to rerouted trips. To capture long-term effects, an induced demand assessment using the following formula should be required:

[% increase in lane miles] x [existing VMT] x [elasticity] = [VMT resulting from the project]

The City requires total VMT in the city as the appropriate VMT metric, with the impact threshold being any increase in total VMT. The analysis shall be performed for the long-range horizon year, normally 20 years out. This approach would discourage induced demand impacts by requiring that a baseline level of VMT in the city not be exceeded.

2.2.4. Mitigation for Transportation Projects

Mitigation measures for transportation projects generally seek to reduce VMT by discouraging single-passenger automobile travel or through funding TDM measures. The following potential mitigation measures for transportation projects are listed as examples for consideration:

- Tolling new lanes to encourage carpooling and fund transit improvements
- Converting existing general-purpose lanes to HOV or HOT lanes
- Implementing or funding off-site travel demand management
- Implementing Intelligent Transportation Systems (ITS) strategies to improve passenger throughput on existing lanes

The City may pursue other mitigation measures supported by substantial evidence.

3. LOCAL TRANSPORTATION ANALYSIS

3.1. PURPOSE

A local transportation analysis (LTA) may be required for land use projects, in addition to the CEQA analysis, to evaluate the effects of a development project on the circulation network, primarily on local access and circulation in the proximity of a project site. The LTA ensures that the project provides safe connections for cyclists, pedestrians, and transit users. This analysis is required to address operational and safety potential issues for all transportation modes, and to identify improvements needed with project implementation and consistent with City policies.

These guidelines are provided to establish general procedures and requirements for the preparation of LTAs associated with development within the city of Clovis. The City recognizes that every development project and analysis context is unique. Therefore, emphasis is placed on the term “guidelines,” and not every aspect of the guideline is necessarily applicable to all projects. These guidelines are intended as a checklist for analysis preparers to ensure common analysis items are not overlooked. They are not intended to be prescriptive to the point of eliminating professional judgment.

3.1.1. Thresholds for LTA Preparation

Unless waived by the City Engineer, an LTA will be required by the City to adequately assess the impacts of development projects on the existing and/or planned street system when the following thresholds are met:

1. When project-generated traffic is expected to be greater than 100 vehicle trips during any peak hour
2. When a project includes a General Plan Amendment (GPA) which changes the use to a designation that has a potential to generate a higher number of vehicle trips than the existing, or originally planned land use designation
3. When the project traffic will substantially affect an intersection or roadway segment already identified as operating at an unacceptable level of service
4. When the project will substantially change the offsite transportation system or connection to it, as determined by the City Engineer

An LTA requires updating when two or more years with no activity have passed since the preparation of the analysis. After two years with no activity, an LTA is considered antiquated and irrelevant. For cases in which a master LTA was prepared for a large development, the specific phases will generally not require supplemental analyses if the master LTA analyzed the large development in phases and the specific phases are consistent with the master LTA.

3.2. STUDY AREA

The intersections and roadway segments to be covered by the LTA will be determined on a case-by-case basis and shall be sufficient in size to include existing and planned streets and intersections that may be impacted by the proposed development. The scope of the LTA, including the study area, proposed trip distribution, and trip generation, shall be reviewed and approved by the Traffic Engineering Manager or designee prior to preparation of the study.

The following guidelines determine the extents of the study area for local transportation analysis:

- Pedestrian, bicycle and transit facilities within a half-mile distance from the project site boundary
- All intersections of major streets that would provide direct access to the project
- All signalized intersections within one-half mile of the project site boundary where the project would add 50 or more peak hour trips, and signalized intersections beyond one-half mile where the project would add 100 or more peak hour trips
- All unsignalized intersections within a half-mile of the project site boundary where the project would add more than 50 peak hour trips

Local transportation analyses shall provide sufficient detail regarding existing pedestrian, bicycle, and transit facilities. This could include identification of deficient facilities, existing and planned bicycle facilities, and existing and planned transit routes and facilities.

3.2.1. Coordination with Caltrans

The LTA and/or City staff shall consult with the State of California Department of Transportation (Caltrans) to determine traffic impacts on Caltrans' State facilities. This consultation should include a request to Caltrans for their concurrence with the scope of analysis for Caltrans' State facilities, or a recommendation from Caltrans for specific modifications to the scope. This analysis must follow the most current Caltrans guidance to analyze transportation impacts from development projects on the State highway system. The consultation should also include a review of recommendations to reduce any impacts to Caltrans' State facilities.

3.2.2. Coordination with Other Agencies

The LTA preparer and/or City staff shall consult with the City of Fresno and/or Fresno County to determine the levels of significance with regard to traffic impacts on Fresno or County roadway facilities. Correspondence with the neighboring agencies shall be provided to the City Engineering Department.

If a consultant is performing work in an adjacent agency and is analyzing circulation and transportation facilities and infrastructure within one mile of the City of Clovis sphere of influence, City of Clovis City Engineer should be contacted for review of the scope of work, as well as receive a completed document for comment.

3.3. LEVELS OF SERVICE

All city intersections and roadway segments shall operate at a LOS D or better under the near-term conditions, unless a finding of overriding consideration was adopted in the General Plan EIR. Under long-term conditions, all city intersections and roadway segments shall operate at a LOS D or better, except for the roadway segments adopted in the General Plan EIR to operate at LOS E or F. Exceptions to this standard may be allowed on a case-by-case basis where lower levels of service would result in other public benefits, such as:

- Preserving agriculture or open space land
- Preserving the rural/historic character of a neighborhood
- Preserving or creating a pedestrian-friendly environment in Old Town or mixed-use village districts
- Avoiding adverse impacts to pedestrians, cyclists, and transit riders
- Where right-of-way constraints would make capacity expansion infeasible

3.3.1. Level of Service Methodologies

The LOS shall be based on average delay for signalized and unsignalized intersections and service volume tables (such as those prepared by the Florida Department of Transportation) for roadway segments. Average delay for study intersections shall be summarized in a table. The traffic analysis methodologies for the facility types indicated below will be accepted without prior consultation:

3.3.1.1. Signalized Intersections

Analysis of signalized intersections shall use the most current edition of the Highway Capacity Manual (HCM) using Synchro, Vistro, Highway Capacity Software (HCS), or other software approved by the City Traffic Engineer.

The procedures in the Highway Capacity Manual do not explicitly address operations of closely spaced signalized intersections. Under such conditions, several unique characteristics must be considered, including spill-back potential from the downstream intersection to the upstream intersection, effects of downstream queues on upstream saturation flow rate, and unusual platoon dispersion or compression between intersections. An example of such closely spaced operations is signalized ramp terminals at urban interchanges. Queue intersections between closely spaced intersections may seriously distort the procedures in the HCM. In this case, simulation of the study area may be necessary, as determined by the City Engineer.

3.3.1.2. Unsignalized Intersections

Analysis of unsignalized intersections shall use the most current edition of the HCM and Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) using Synchro, Vistro, HCS, or other software approved by the City Engineer.

3.3.1.3. Signal Warrants

Analysis of signal warrants shall apply the current MUTCD Signal Warrants.

3.3.1.4. Roundabouts

The SIDRA software does not account for the chaining of two roundabouts and the queues associated between the roundabouts. Simulation with proper assumptions is the only way to ensure this analysis is performed correctly. The consultant shall discuss methodology with City staff prior to performing the work for roundabout analysis. The consultant will need a conceptual design of the roundabout for the analysis. The analysis should reflect United States and Clovis/Fresno driver behavior.

3.3.1.5. LOS Analysis Default Values

While the City of Clovis does not officially advocate the use of any software, Synchro is the software used by City staff. The analysis shall use the latest published version of the HCM. The LOS analysis at study intersections shall be conducted using the following default values as applicable:

- Use of signal timing plans, if available. If not available, then:
    - Minimum split time for protected left-turn phase shall not be less than 12 seconds.
    - Minimum pedestrian times should be satisfied on all phases with pedestrian phase for signals modeled as coordinated signals.
    - For study intersections modeled as actuated uncoordinated signals, the intersections shall be evaluated with at least 10 pedestrian calls per hour in the Existing plus Project and Long-Range conditions, if pedestrian projections are not available.
    - If existing cycle lengths are available, they should be utilized. In instances where existing cycle lengths are not available, LOS calculations should be conducted using the natural cycle lengths. The cycle lengths should remain constant for comparison purposes, unless the project is changing the character of the intersection and it is noted in the report.
    - In instances where signalized intersections are coordinated, coordinated cycle lengths should be determined based on the natural cycle lengths of the coordinated signals and shall be used for evaluation purposes.
    - Minimum All-Red time(s) shall equal 1.0 seconds (2.0 seconds when dual left turn lanes are used).
    - Minimum Yellow time shall equal 3.5 seconds, or greater based on the approach speeds (3.0 seconds for left turn phases).
- Where existing traffic volumes are collected and peak hour factors are available, then LOS calculations for Existing Condition scenarios and the Near-Term scenarios should use available counted peak hour factors, provided that the traffic counts are included in

the Appendix. For all Cumulative scenarios and Existing Conditions where peak hour factors are not available, default factors per the HCM shall be used and shall be consistent throughout the Cumulative scenarios and peak hours.

- Existing storage lengths shall be entered as input data if LOS calculations are conducted using Synchro.
- All assumptions and defaults used shall have proper citation and justification for their use in the LTA.

3.4. TRAFFIC ANALYSIS SCENARIOS

The following scenarios shall be included in the LTA:

A. For projects requiring a General Plan Amendment, intersection LOS analysis and calculation worksheets, as well as figures showing turning volumes and lane configurations, shall be included in the report for the following traffic scenarios:
   a) Existing Conditions – Current year traffic volumes and peak hour LOS analysis
   b) Existing plus Project Conditions – Trip generation and trip distribution added to the previous scenario and LOS analysis
   c) Near-Term Analysis (Existing plus Approved and Pending Projects plus Proposed Project Conditions) – Trip generation and trip distribution added to the previous scenario and LOS analysis
   d) Cumulative Long-Range Conditions – Long-Range conditions (20 years from existing conditions and/or consistent with the latest Fresno COG model)
   e) Cumulative Long-Range Conditions – Project traffic added to the previous scenario
   f) If any phasing is to take place, then such phasing should be studied at its appropriate build out year in addition to the above scenarios.
   g) Trip traces to affected Caltrans freeway interchanges shall be performed for the current General Plan land use and the land use proposed per the GPA.

B. For projects with planned land uses consistent with the General Plan, intersection LOS analysis and calculation worksheets, as well as figures showing turning volumes, shall be included in the report for the following traffic scenarios:
   a) Existing Conditions – Current year traffic volumes and peak hour LOS analysis
   b) Existing plus Project Conditions – Trip generation and trip distribution added to the previous scenario and LOS analysis
   c) Near-Term Analysis (Existing plus Approved and Pending Projects plus Proposed Project Conditions) – Trip generation and trip distribution added to the previous scenario and LOS analysis
   d) If any phasing is to take place, then such phasing should be studied at its appropriate build out year in addition to the above scenarios.
   e) Trip distribution to affected Caltrans freeway interchanges shall be performed for the proposed project.

"No Project" scenarios do not require analyses for improvements. For the proposed project, no physical improvements shall be assumed to be implemented unless there is a Capital Improvement Project already identified and fully funded. If the improvement is identified in an impact fee program and the improvement is fully funded, then that improvement can be assumed under Cumulative Analysis scenarios. However, the “project” may be conditioned with constructing the assumed improvement.

3.4.1. Cumulative Traffic Volumes

Cumulative Long-Range Conditions traffic volumes shall be projected based on the method documented by the Fresno COG model steering committee using procedures such as the increment method. The methodology for developing the forecasts shall be clearly documented in the report. Information from model runs provided by Fresno COG shall be included in the Appendix.

The following scenarios shall be requested from Fresno COG staff to perform this forecasting correctly:

- Current Year Model Run (Existing Conditions Model),
- Cumulative Long-Range No Project Model Run (Cumulative Conditions Model),
- Cumulative Long-Range Project SelectZone FRATAR Model Run, and
- Near-Term Opening Year Model Run, if necessary.

In order to correctly use the model to forecast Cumulative volumes, consultants should contact Fresno COG staff and/or review the Fresno COG webpage.

Consultants should work with Fresno COG staff to prepare a model scope of work request for a basic LTA, and if the analysis is more involved, it may need additional information. The minimum will include reviewing the existing land uses assumed in the model; potentially splitting the TAZs as necessary to more accurately reflect driveways and land uses; and reviewing roadway circulation in the model near the project site. If the consultant is not familiar with the Fresno COG model and the assumptions and information that went into validating the model, the consultant is encouraged to schedule some time with the Fresno COG staff to become an expert on the model as the information provided from the model is the basis for the analysis. The consultant will be accountable for the information provided by Fresno COG.

The consultant should also provide, in the Appendix, the request for modeling services to Fresno COG and the response provided by Fresno COG when the data is returned. An email response from Fresno COG staff is sufficient.

All assumptions shall have proper citation and justification for their use in the LTA.

3.5. TRAFFIC COUNTS

Traffic counts should be collected and included in the Appendix. Available existing counts can be used if they are less than twelve (12) months old and the traffic volumes have not been significantly changed due to more recent development in the vicinity. The City Engineer or the designee shall approve all requests to use other available traffic counts.

Common rules for conducting traffic counts include, but are not limited to, the following:

- Peak hour turning movement volumes shall be conducted on Tuesdays, Wednesdays, or Thursdays during weeks not containing a holiday. Counts shall be conducted in favorable weather conditions.
- Counts shall be collected when schools and colleges are in session, but not during the first two weeks that the schools and colleges are in session. Counts collected when schools and colleges are not in session shall be approved by the City Engineer, including a methodology for adding historical school traffic volumes into the analysis.
- Counts shall be collected during AM (7:00 a.m. to 9:00 a.m.) and PM (4:00 p.m. to 6:00 p.m.) peak periods, unless otherwise specified (such as midday or weekend peak periods).
- Counts should include the peak hour factor calculation.
- A qualified traffic analyst shall observe each study intersection during peak hours of analysis and document their observations such as lane utilization, delay, queue lengths in the field, adjacent intersection queues affecting study intersection capacity, etc.

3.6. TRIP GENERATION

Trip generation should be based on one or more of the following:

- Institute of Transportation Engineers (ITE) Trip Generation Manual (most current edition)
    - Rates should be calculated using the average weight or weighted average formula when applicable.
    - Special consideration should be given for ITE rates based on old data or a small sample and may require additional data collection to determine the appropriate trip generation.
- New rates should be generated using community examples for uses not updated or included in the ITE Trip Generation Manual.
- No pass-by trip reductions are allowed unless justified and approved by the City Engineer.
- All assumptions shall have proper citation and justification for their use in the LTA.

Projected daily trips, AM and PM peak hour trips for the approved, pending and proposed project shall be summarized in a table. Trip generation rates, factors and source, as well as the totals for

the inbound and outbound trips shall also be provided in a table. Trip generation should be summarized in a table form similar to the one below:

Proposed Trip Generation for Weekday

Land Use	Size	Daily		A.M. Peak Hour			P.M. Peak Hour		
		Rate	Trips	Rate In/Out	Trips In/Out	Trips Total	Rate In/Out	Trips In/Out	Trips Total
Retail	4 ksf	120	480	4 60/40	12/8	19	13.25 50/50	26/26	53
Townhomes	32 Apts	7.5	240	10 35/65	8/16	24	0.75 65/35	16/8	24
Senior	100 Units	3.6	360	12 40/60	17/26	43	0.43 60/40	26/170	43
Total Trips			**1080**		**37/49**	**86**		**68/52**	**120**

3.7. TRIP DISTRIBUTION

Trip distribution shall be based on existing travel patterns, locations of complimentary land uses, and/or information derived from the Fresno COG travel model such as a “select zone” analysis.

A figure illustrating the percentage of peak hour traffic going to and from various destinations along the transportation network shall be provided. A figure illustrating peak hour project-only trips at the driveways, study intersections, and roadway segments shall be provided based on the trip distribution. If the trip distribution is different between Existing, Near-Term, and Cumulative conditions, then a figure needs to be provided for each different trip distribution with supporting discussion and justification.

The travel model should be used for a general trip distribution to and from the north, south, east, and west directions; however, the project trips should be manually distributed to the driveways, intersections, and roadway segments. The travel model should not be relied upon to distribute project trips to specific intersection and driveway turn movements.

For General Plan Amendments, the local transportation analysis shall include a trip distribution to affected Caltrans freeway interchanges for both the current General Plan land use and the proposed land use per the GPA. All assumptions shall have proper citation and justification for their use.

3.8. APPROVED AND PENDING PROJECTS

Approved and pending projects located within the vicinity of the project (i.e., developments generating vehicle trips that would impact study intersections and/or roadway segments) or as determined by the City Engineer, that can reasonably be expected to be in place by the project's build out year must be included in the analysis. Related projects shall include all approved, pending,

or constructed projects that are not occupied at the time of the existing traffic counts. A list of approved and pending projects shall be submitted to the Engineering Division for review and approval along with the scope of work. Engineering staff will work with consultants to develop the list if necessary.

A table summarizing the approved and pending projects with their locations, and trip generation shall be provided. If conditional use permit/parcel map/tract numbers are available, then they should be provided in the table. Pending projects are defined as those projects that have been accepted for processing by the City of Clovis Planning and Development Department.

Capital Improvement Projects (CIP) should be identified and documented with funding source and anticipated completion year. City Engineering staff should be contacted for information on CIP projects near a given project.

3.9. SITE ACCESS AND CIRCULATION

Site access and circulation analysis shall be conducted, and recommendations shall be included in the local transportation analysis to address safe and acceptable traffic operations. A figure illustrating the proposed site plan with proposed primary access points should be provided. Discussion on the location and distance of the access points from nearby intersections shall also be provided. The proposed site plan shall illustrate access points and peak hour project-only trips at the access points. For projects that are anticipated to generate truck traffic, truck operations shall also be evaluated to ensure adequacy of site design to satisfy truck loading demand on-site and within the vicinity of the project site, and to ensure that traffic operations on roadways and intersection are satisfactory.

The local transportation analysis should calculate anticipated queues and minimum required throat depth (MRTD) at the project access points and summarize these in a table. The analysis should also evaluate the proposed site plan for sight distance and other unsafe traffic conditions and provide recommendations to mitigate them.

The local transportation analysis shall also conceptually address safe pedestrian paths of travel from:

- residential developments to school sites;
- public streets to commercial and residential areas; and
- nearby bus stops to project sites.

3.10. QUEUING AT STUDY INTERSECTIONS

Queuing analysis for study intersections shall be conducted and documented in the local transportation analysis based on the LOS calculations. Recommendations for queues under existing conditions or projected to exceed the available storage shall be provided. Recommendations such

as, but not limited to, extending existing storage and adding exclusive turn lanes and innovative techniques shall be considered and recommended.

3.11. TRAFFIC OPERATIONS THRESHOLDS

For study signalized intersections, a traffic operations issue is identified if the addition of the traffic generated from the proposed project results in any one of the following:

- Triggers a signalized intersection operating at acceptable LOS to operate at unacceptable levels of service
- Increases the average delay for a study signalized intersection that is already operating at unacceptable LOS

Unsignalized intersections should maintain a Level of Service no worse than LOS D. Unsignalized intersections may include all-way stop, or two-way stop controlled. The delay for unsignalized intersections should be computed as follows:

- All-way stop-controlled – use average delay
- Two-way stop-controlled – use worst approach delay

For unsignalized study intersections, an adverse traffic operations issue is identified if the addition of the traffic generated from the proposed project results in any one of the following:

- Triggers an unsignalized intersection operating at acceptable LOS to operate at unacceptable levels of service (from E or better to F) and meet the signal warrants criteria
- Increases the applicable delay for an unsignalized study intersection that is already operating at unacceptable LOS and meets the signal warrant criteria

Improvements to unsignalized intersections may include a change of traffic control, including yield control, traffic circle/roundabout, or a traffic signal. The CA MUTCD states that if one or more of the criteria for signal warrants is met, an engineering study is required to evaluate other factors to determine if an intersection must be signalized. When analyzed, the peak hour and 8-hour traffic signal warrants should be used to determine if a traffic signal is recommended to improve the adverse effects identified at an unsignalized intersection. Additionally, if a project is near a school or a downtown area with substantial pedestrian activity, then the City may require additional warrants to be evaluated such as pedestrian, accident history, etc. The City reserves the right to determine if a warranted signal will be installed.

3.12. ANALYSIS DISCUSSION

The local transportation analysis should discuss conclusions regarding the transportation issues caused by the proposed project on the roadway system. If the traffic generated by this and other projects requires improvements that are not covered by current impact fees, then the project's fair

share percentage shall be calculated using peak-hour volumes and provided in the local transportation analysis.

For all recommendations to increase the number of travel lanes on a street or at an intersection as an improvement, the report must clearly identify the impacts associated with such a change, such as whether or not additional right of way will be required and whether it is feasible to acquire the right of way based on the level of development of the adjacent land and buildings, if any. All improvements should be reviewed in the field to make sure that they can be accommodated. If they cannot be accommodated or are not feasible, those findings need to be included in the local transportation analysis.

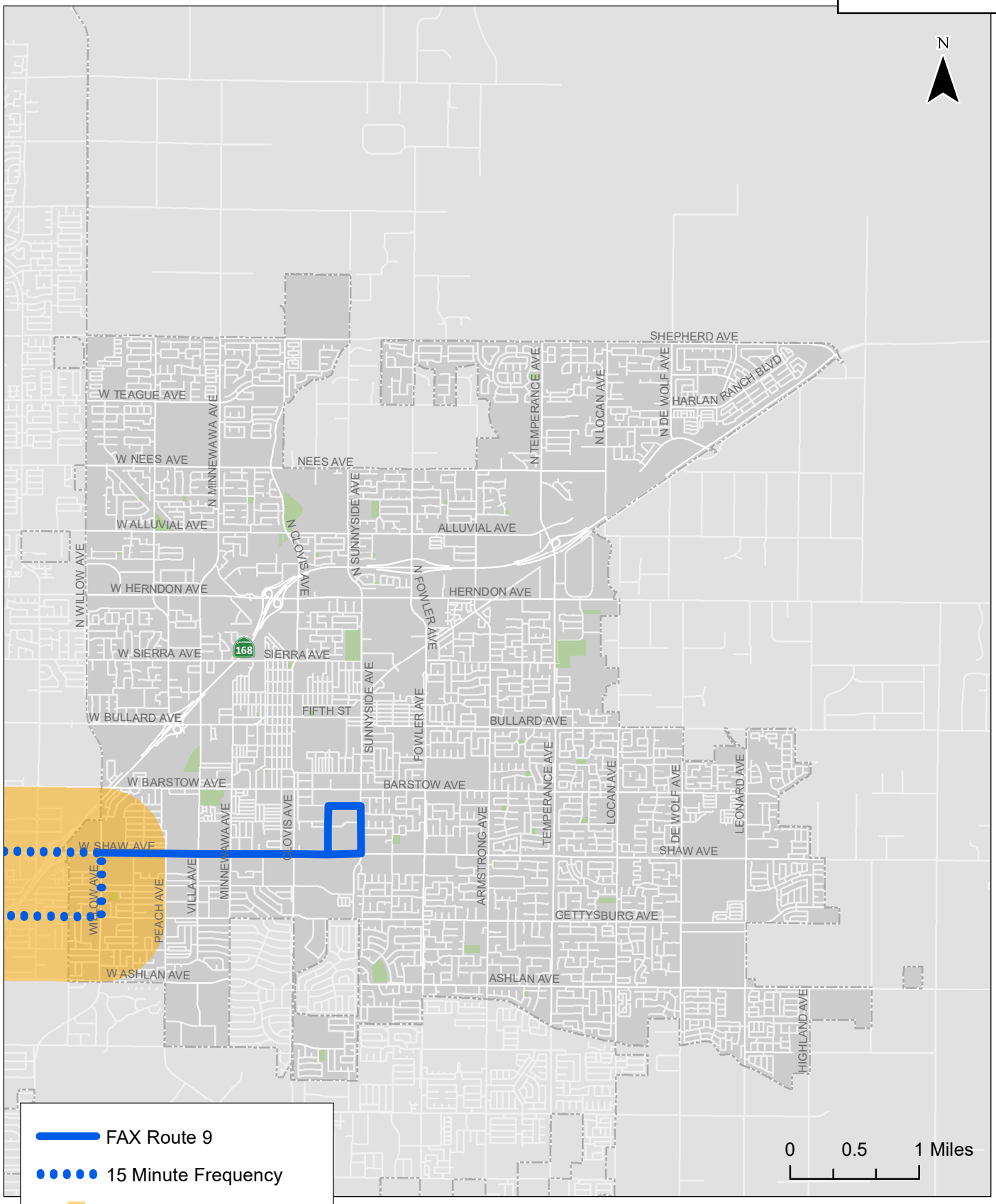
The local transportation analysis should discuss other possible adverse impacts on traffic. Examples of such impacts include:

- the limited visibility of access points on curved roadways
- the need for pavement widening to provide left-turn and right-turn lanes at access points into the proposed project
- the impact of increased traffic volumes on local residential streets
- the need for road realignment to improve sight distance

Projects which propose to amend the City's General Plan Land Use and substantially increase potential traffic generation must provide an analysis of the project at current planned land use versus proposed land use in the build out condition for the project area, including future cumulative conditions. The purpose of such analysis is to provide decision makers with the understanding of the planned circulation network's ability to accommodate additional traffic generation caused by the proposed General Plan Land Use amendments.

The LTA shall be provided as an electronic PDF copy to the City of Clovis City Engineer, according to the report format presented in Attachment F.

Attachment A: High Quality Transit Areas Map



Existing High Quality Transit Areas
City of Clovis VMT Implementation

Figure
A1

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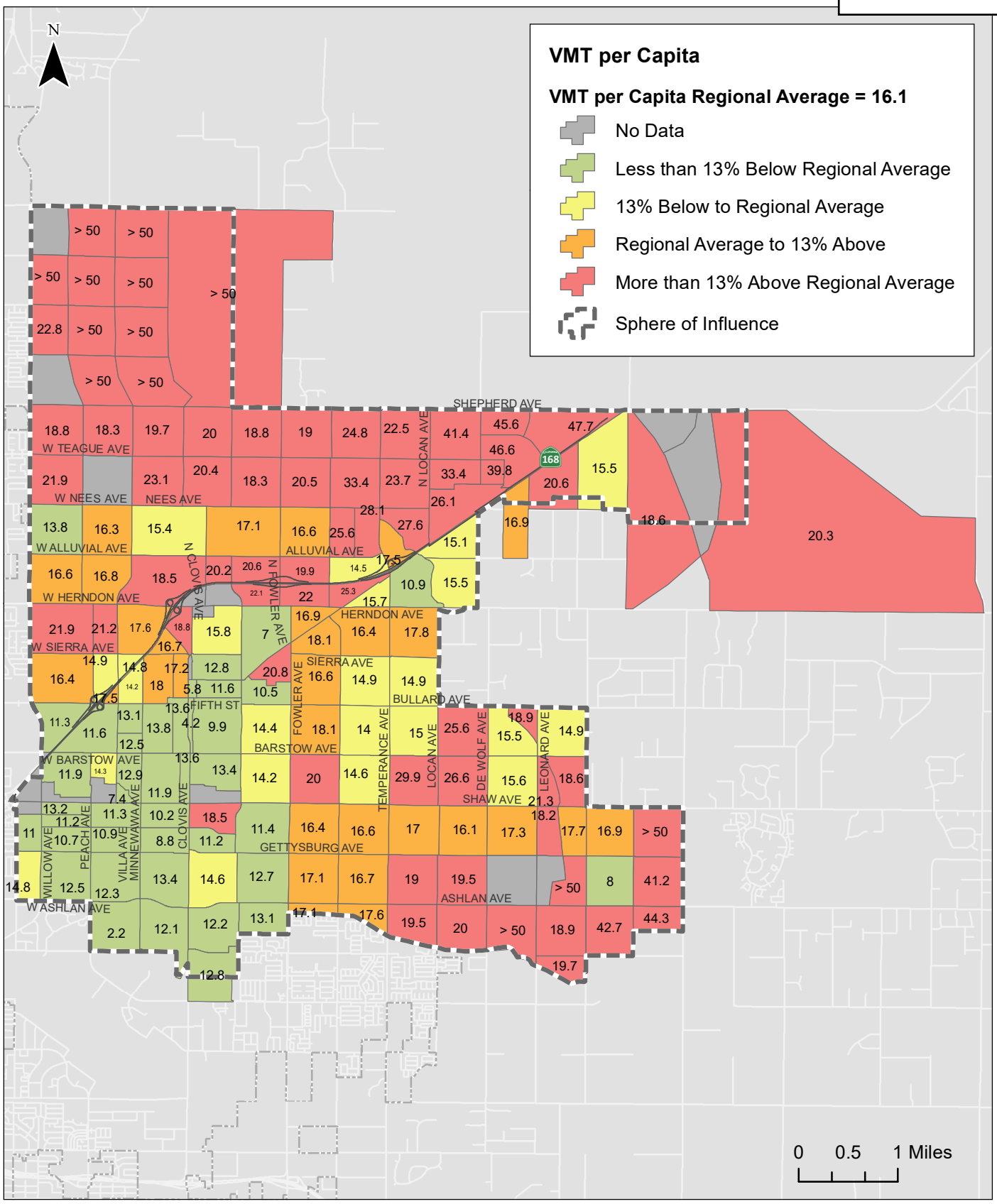
KITTELSON & ASSOCIATES

Coordinate System: NAD 1983 StatePlane California IV FIPS 040
Data Source: City o

Attachment B: VMT Screening Maps



Existing VMT Per Capita (2019)
City of Clovis VMT Implementation

Figure
B1

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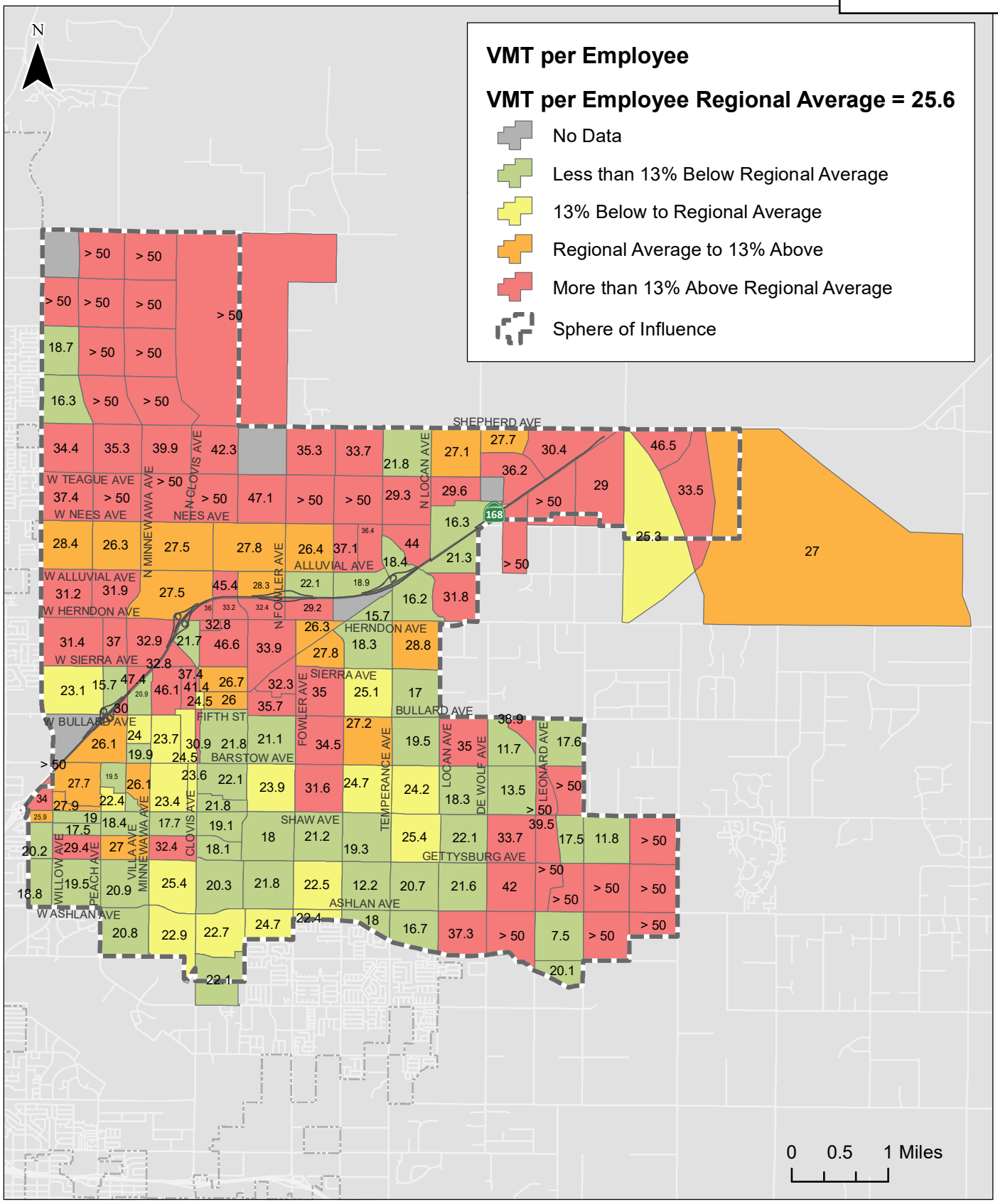
KITTELSON & ASSOCIATES

Coordinate System: NAD 1983 StatePlane California IV FIPS 040
Data Source: City o



Existing VMT Per Employee (2019)
City of Clovis VMT Implementation

Figure
B2

H:\24\24913 - City of Clovis VMT Implementation\gis\Clovis_VMTperemp(2019).mxd - gcarsky - 8:19 AM 7/14/2020

KITTELSON & ASSOCIATES

Coordinate System: NAD 1983 StatePlane California IV FIPS 040
Data Source: City o

Attachment C: VMT-Reducing Transportation Projects

VMT-Reducing Transportation Projects
Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity
Roadside safety devices or hardware installation such as median barriers and guardrails
Roadway shoulder enhancements to provide "breakdown space," dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes
Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety
Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, two-way left turn lanes, or emergency breakdown lanes that are not utilized as through lanes
Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
Conversion of existing general purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
Addition of a new lane that is permanently restricted to use only by transit vehicles
Reduction in number of through lanes
Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles
Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
Installation of traffic metering systems, detection systems, cameras, changeable message signs and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
Timing of signals to optimize vehicle, bicycle, or pedestrian flow
Installation of roundabouts or traffic circles
Installation or reconfiguration of traffic calming devices
Adoption of or increase in tolls
Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
Initiation of new transit service

VMT-Reducing Transportation Projects
Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes
Removal or relocation of off-street or on-street parking spaces
Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
Addition of traffic wayfinding signage
Rehabilitation and maintenance projects that do not add motor vehicle capacity
Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel
Installation of publicly available alternative fuel/charging infrastructure
Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor

Attachment D:CAPCOA Mitigation Measures

Table of Contents

Appendices

This chapter of the Report explains how the quantification of individual strategies is presented in Fact Sheets, how those fact sheets are designed and organized, and how to use them. This chapter also explains how and why mitigation measures have been grouped, and provides detailed discussion of how to apply the quantification methods when more than one strategy is being applied to the same project. A summary of the range of effectiveness for different measures is also provided for general information purposes, in table form, however it is very important that those generalized ranges NOT be used in place of the more specific quantification methods for the measure as detailed in the measure Fact Sheet. Finally, at the end of the Chapter there are step-by-step instructions on using the Fact Sheets, including an example.

Mitigation Strategies and Fact Sheets:

Accurate and reliable quantification depends on properly identifying the important variables that affect the emissions from an activity or source, and from changes to that activity or source. In order to provide a clear summary of those variables and usable instructions on how to find and apply the data needed, we have designed a Fact Sheet format to present each strategy or measure.

Types of Mitigation Strategies: There are three different types of mitigation strategies described in Chapter 7: Quantified measures, Best Management Practices, and General Plan strategies.

Quantified Measures: Quantified measures are fully quantified, project-level mitigation strategies. They are presented in categories where the nature of the underlying emissions sources are the same; the categories are discussed under “Organization of Fact Sheets” below. In addition, the measures may either stand alone, or be considered in connection with one or more other measures (that is, “grouped”). Groups of measures are always within a category; more detailed explanation is provided in “Grouping of Strategies” below. The majority of the strategies in this Report are fully Quantified Measures, and a strategy may be assumed to be of this type unless the Fact Sheet notes otherwise.

Best Management Practices: Several strategies are denoted as Best Management Practice (BMP). These measures are of two types. The first type of BMPs are quantifiable and describe methods that can be used to quantify the GHG mitigation reductions provided the project Applicant can provide substantial evidence supporting the values needed to quantify the reduction. These are listed as BMPs since there is not adequate literature at this time to generalize the mitigation measure reductions. However, the project Applicant may be able to provide the site specific information necessary to quantify a reduction. The second type of BMPs do not have methods for quantifying GHG mitigation reductions. These measures have preliminary evidence suggesting they will reduce GHG emissions if implemented, however, at this time adequate literature and methodologies are not available to quantify these reductions or

they involve life-cycle GHG emission benefits. The measures are encouraged to be implemented nonetheless. Local Agencies may decide to provide incentives to encourage implementation of these measures.

General Plan Strategies: The measures listed under the General Plan category are measures that will have the most benefit when implemented at a General Plan level, but are not quantifiable or applicable at the project specific level. While on a project basis some of these measures may not be quantifiable, at the General Plan level they may be quantified under the assumption that this will be implemented on a widespread basis. Local Agencies may decide to provide incentives or allocate the General Plan level reductions to specific projects by weighting the overall effect by the number of projects the General Plan reduction would apply to.

Introduction to the Fact Sheets: This Report presents the quantification of each mitigation measure in a Fact Sheet format. Each Fact Sheet includes: a detailed summary of each measure's applicability; the calculation inputs for the specific project; the baseline emissions method; the mitigation calculation method and associated assumptions; a discussion of the calculation and an example calculation; and finally a summary of the preferred and alternative literature sources for measure efficacy. The Fact Sheets are found in Chapter 7.

Layout of the Fact Sheets: Each Fact Sheet describes one mitigation measure. The mitigation measure has a unique number and is provided at the bottom of each page in that measure's Fact Sheet. This will assist the end user in determining where a mitigation measure fact sheet begins and ends while still preserving consecutive page numbers in the overall Report.

At the top of each Fact Sheet, the name of the measure category appears on the left, and the subcategory on the right. Cross-references to prior CAPCOA documents appear at the top left, below the category name. Specifically, measures labeled CEQA #: are from the *CAPCOA 2008 CEQA & Climate Change*[1] and measures labeled MP#: are from the *CAPCOA 2009 Model Policies for Greenhouse Gases in General Plans*[2]. This cross-referencing is also included in the list of measures at the beginning of Chapter 7, and is intended to allow the user to move easily between the documents. The measure number is at the bottom of the page, on the right-hand side.

The fact sheets begin with a measure description. This description includes two critical components:

(1) Specific language regarding the measure implementation – which should be consistent with the implementation method suggested by the project Applicant; and

[1] Available online at http://www.capcoa.org/wp-content/uploads/downloads/2010/05/CAPCOA-White-Paper.pdf
[2] Available online at http://www.capcoa.org/wp-content/uploads/downloads/2010/05/CAPCOA-ModelPolicies-6-12-09-915am.pdf

(2) A discussion of key support strategies that are required for the reported range of effectiveness.

Appendices with additional calculations and assumptions for some of the fact sheets are provided at the end of this document. Default assumptions should be carefully reviewed for project applicability. Appendix B details the methodologies that should be used to calculate baseline GHG emissions for a project.

Organization of the Fact Sheets – Categories and Subcategories: The Fact Sheets are organized by general emission category types as follows:

- Energy
- Transportation
- Water
- Landscape Equipment
- Solid Waste
- Vegetation
- Construction
- Miscellaneous Categories
- General Plans

Several of these main categories are split into subcategories, for ease of understanding how to properly address the effects of combining the measures. Strategies are organized into categories and subcategories where they affect similar types of emissions sources. As an example, the category of "Energy" includes measures that reduce emissions associated with energy generation and use. Within that category, there are subcategories of measures that address "Building Energy Use," "Alternative Energy," and "Lighting," each with one or more measures in it. The measures in the subcategory are closely related to each other.

Categories and subcategories for the measures are illustrated in Charts 6-1 and 6-2, below. Chart 6-1 shows all of the measure categories EXCEPT the Transportation category, including their subcategories; note that not all categories have subcategories. Measures in the Transportation category are shown in Chart 6-2. There are a number of subcategories associated with the Transportation category. As shown in Chart 6-2, the primary measures in each subcategory are indicated in bold type, and the measures shown in normal type are either support measures, or they are explicitly "grouped" measures.

It is important to note that subcategories are NOT the same as "grouped" measures / strategies. The grouping of strategies connotes a specific relationship, and is explained in the next section, below.

Chart 6-1: Non-Transportation Strategies Organization

Energy			Water		Area Landscaping	Solid Waste	Vegetation	Construction	Miscellaneous	General Plans
BE	AE	LE	WSW	WUW	A	SW	V	C	Misc	GP
Building Energy	**Alternative Energy**	**Lighting**	**Water Supply**	**Water Use**	**Landscaping Equipment**	**Solid Waste**	**Vegetation**	**Construction**	**Miscellaneous**	**General Plans**
Exceed Title 24	**Onsite Renewable Energy**	**Install High Efficacy Lighting**	**Adopt a Water Conservation Strategy**		**Prohibit gas Powered Landscape Equipment**	Institute or Extend Recycling & Composting Services	**Plant Urban Trees**	**Use Alternative Fuels for Construction Equipment**	**Establish Carbon Sequestration**	Fund Incentives for Energy Efficiency
			OR							
Install Energy Efficient Appliances	**Utilize Combined Heat & Power**	**Limit Outdoor Lighting**	**Use Reclaimed Water**	**Install Low-Flow Fixtures**	Implement Lawnmower Exchange Program Reduction: Grouped	Recycle Demolished Construction Material	**New Vegetated Open Space**	**Use Electric or Hybrid Construction Equipment**	**Establish Off-site Mitigation**	Establish a Local Farmer's Market
Install Programmable Thermostats Reduction: Grouped	**Establish Methane Recovery**	Replace Traffic Lights with LED Reduction: Additional	**Use Graywater**	**Design Water-Efficient Landscapes**	Electric Yard Equipment Compatibility Reduction Grouped			Limit Construction Equipment Idling	**Implement an Innovative Strategy**	Establish Community Gardens
Obtain 3rd Party Commissioning Reduction: Grouped			**Use Locally Sourced Water**	**Use Water-Efficient Irrigation**				Institute a Heavy-Duty Off-Road Vehicle Plan	Use Local and Sustainable Building Materials	Plant Urban Shade Trees
				Reduce Turf				Implement a Construction Vehicle Inventory Tracking System	Require BMP in Agriculture and Animal Operations	Implement Strategies to Reduce Urban Heat-Island Effect
				Plant Native or Drought-Resistant Vegetation					Require Environmentally Responsible Purchasing	

Note: Strategies in bold text are primary strategies with reported VMT reductions; non-bolded strategies are support or grouped strategies.

Chart 6-2: Transportation Strategies Organization

Transportation Measures (Five Subcategories) Global Maximum Reduction (all VMT): urban = 75%; compact infill = 40%; suburban center or suburban with NEV = 20%; suburban = 15%					Global Cap for Road Pricing needs further study	
Transportation Measures (Four Categories) Cross-Category Max Reduction (all VMT): urban = 70%; compact infill = 35%; suburban center or suburban with NEV = 15%; suburban = 10%				Max Reduction = 15% overall; work VMT = 25%; school VMT = 65%;	Max Reduction = 25% (all VMT)	
Land Use / Location Max Reduction: urban = 65%; compact infill = 30%; suburban center = 10%; suburban = 5%	**Neighborhood / Site Enhancement** Max Reduction: without NEV = 5%; with NEV = 15%	**Parking Policy / Pricing** Max Reduction = 20%	**Transit System Improvements** Max Reduction = 10%	**Commute Trip Reduction** (assumes mixed use) Max Reduction = 25% (work VMT)	**Road Pricing Management** Max Reduction = 25%	**Vehicles**
Density (30%)	Pedestrian Network (2%)	Parking Supply Limits (12.5%)	Network Expansion (8.2%)	CTR Program Required = 21% work VMT Voluntary = 6.2% work VMT	Cordon Pricing (22%)	Electrify Loading Docks
Design (21.3%)	Traffic Calming (1%)	Unbundled Parking Costs (13%)	Service Frequency / Speed (2.5%)	Transit Fare Subsidy (20% work VMT)	Traffic Flow Improvements (45% CO_2)	Utilize Alternative Fueled Vehicles
Location Efficiency (65%)	NEV Network (14.4) <NEV Parking>	On-Street Market Pricing (5.5%)	Bus Rapid Transit (3.2%)	Employee Parking Cash-out (7.7% work VMT)	Required Contributions by Project	Utilize Electric or Hybrid Vehicles
Diversity (30%)	Car Share Program (0.7%)	Residential Area Parking Permits	Access Improvements	Workplace Parking Pricing (19.7% work VMT)		
Destination Accessibility (20%)	Bicycle Network <Lanes> <Parking> <Land Dedication for Trails>		Station Bike Parking	Alternative Work Schedules & Telecommute (5.5% work VMT)		
Transit Accessibility (25%)	Urban Non-Motorized Zones		Local Shuttles	CTR Marketing (5.5% work VMT)		
BMR Housing (1.2%)			Park & Ride Lots*	Employer-Sponsored Vanpool/Shuttle (13.4% work VMT)		
Orientation Toward Non-Auto Corridor				Ride Share Program (15% work VMT)		
Proximity to Bike Path				Bike Share Program		
				End of Trip Facilities		
				Preferential Parking Permit		
				School Pool (15.8% school VMT)		
				School Bus (6.3% school VMT)		

Note: Strategies in bold text are primary strategies with reported VMT reductions; non-bolded strategies are support or grouped strategies.

Grouping of Strategies

Strategies noted as “grouped” are separately documented in individual Fact Sheets but must be paired with other strategies within the category. When these “grouped” strategies are implemented together, the combination will result in either an enhancement to the primary strategy by improving its effectiveness or a non-negligible reduction in effectiveness that would not occur without the combination.

Rules for Combining Strategies or Measures

Mitigation measures or strategies are frequently implemented together with other measures. Often, combining measures can lead to better emission reductions than implementing a single measure by itself. Unfortunately, the effects of combining the measures are not always as straightforward as they might at first appear. When more and more measures are implemented to mitigate a particular source of emissions, the benefit of each additional measure diminishes. If it didn’t, some odd results would occur. For example, if there were a series of measures that each, independently, was predicted to reduce emissions from a source by 10%, and if the effect of each measure was independent of the others, then implementing ten measures would reduce all of the emissions; and what would happen with the eleventh measure? Would the combination reduce 110% of the emissions? No. In fact, each successive measure is slightly less effective than predicted when implemented on its own.

On the other hand, some measures enhance the performance of a primary measure when they are combined. This Report includes a set of rules that govern different ways of combining measures. The rules depend on whether the measures are in the *same* category, or different categories. Remember, the categories include: Energy, Transportation, Water, Landscape Equipment, Solid Waste, Vegetation, Construction, Miscellaneous Categories, and General Plans.

Combinations Between Categories: The following procedures must be followed when combining mitigation measures that fall in separate categories. In order to determine the overall reduction in GHG emissions compared to the baseline emissions, the relative magnitude of emissions between the source categories needs to be considered. To do this, the user should determine the percent contribution made by each individual category to the overall baseline GHG emissions. This percent contribution by a category should be multiplied by the reduction percentages from mitigation measures in that category to determine the scaled GHG emission reductions from the measures in that category. This is done for each category to be combined. The scaled GHG emissions for each category can then be added together to give a total GHG reduction for the combined measures in all of the categories.

For example, consider a project whose total GHG emissions come from the following categories: transportation (50%), building energy use (40%), water (6%), and other (4%). This project implements a transportation mitigation measure that results in a 10% reduction in VMT. The project also implements mitigation measures that result in a 30% reduction in water usage. The overall reduction in GHG emissions is as follows:

Reduction from Transportation: 0.50 x 0.10 = 0.5 or 5%
Reduction from Water: 0.06 x 0.30 = 0.018 or 1.8%

Total Reduction: 5% + 1.8% = 6.8%

This example illustrates the importance of the magnitude of a source category and its influence on the overall GHG emission reductions.

The percent contributions from source categories will vary from project to project. In a commercial-only project it may not be unusual for transportation emissions to represent greater than 75% of all GHG emissions whereas for a residential or mixed use project, transportation emissions would be below 50%.

Combinations Within Categories: The following procedures must be followed when combining mitigation measures that fall within the same category.

Non-Transportation Combinations: When combining non-transportation subcategories, the total amount of reductions for that category should not exceed 100% except for categories that would result in additional excess capacity that can be used by others, but which the project wants to take credit for (subject to approval of the reviewing agency). This may include alternative energy generation systems tied into the grid, vegetation measures, and excess graywater or recycled water generated by the project and used by others. These excess emission reductions may be used to offset other categories of emissions, with approval of the agency reviewing the project. In these cases of excess capacity, the quantified amounts of excess emissions must be carefully verified to ensure that any credit allowed for these additional reductions is truly surplus.

Category Maximum- Each category has a maximum allowable reduction for the combination of measures in that category. It is intended to ensure that emissions are not double counted when measures within the category are combined. Effectiveness levels for multiple strategies within a subcategory (as denoted by a column in the appropriate chart, above) may be multiplied to determine a combined effectiveness level up to a maximum level. This should be done first to mitigation measures that are a source reduction followed by those that are a reduction to emission factors. Since the combination of mitigation measures and independence of mitigation measures are both complicated, this Report recommends that mitigation measure reductions within a category be multiplied unless a project applicant can provide substantial evidence indicating that emission reductions are independent of one another. This will take the following form:

GHG emission reduction for category = 1-[(1-A) x (1-B) x (1-C)]

Where:

A, B and C = Individual mitigation measure reduction percentages for the strategies to be combined in a given category.

Global Maximum- A separate maximum, referred to as a global maximum level, is also provided for a combination across subcategories. Effectiveness levels for multiple strategies across categories may also be multiplied to determine a combined effectiveness level up to global maximum level.

For example, consider a project that is combining 3 mitigation strategies from the water category. This project will install low-flow fixtures (measure WUW-1), use water-efficient irrigation (measure WUW-4, and reduce turf (measure WUW-5). Reductions from these measures will be:

- low-flow fixtures 20% or 0.20 (A)
- water efficient irrigation 10% or 0.10 (B)
- turf reductions 20% or 0.20 (C)

To combine measures within a category, the reductions would be
= 1-[(1-A) x (1-B) x (1-C)]
= 1-[(1-.20) x (1-.10) x (1-.20)]
= 1-[(0.8) x (0.9) x (.8)]
= 1-0.576 = 0.424
= 42.4%

Transportation Combinations: The interactions between the various categories of transportation-related mitigation measures is complex and sometimes counter-intuitive. Combining these measures can have a substantive impact on the quantification of the associated emission reductions. In order to safeguard the accuracy and reliability of the methods, while maintaining their ease of use, the following rules have been developed and should be followed when combining transportation-related mitigation measures. The rules are presented by sub-category, and reference Chart 6-2 Transportation Strategies Organization. The maximum reduction values also reflect the highest reduction levels justified by the literature. The chart indicates maximum reductions for individual mitigation measures just below the measure name.

Cross-Category Maximum- A cross-category maximum is provided for any combination of land use, neighborhood enhancements, parking, and transit strategies (columns A-D in Chart 6-1, with the maximum shown in the top row). The total project VMT reduction across these categories should be capped at these levels based on empirical evidence.[3] Caps are provided for the location/development type of the project. VMT reductions may be multiplied across the four categories up to this maximum. These include:

- Urban: 70% VMT
- Compact Infill: 35%
- Suburban Center (or Suburban with NEV): 15%
- Suburban: 10% (note that projects with this level of reduction must include a diverse land use mix, workforce housing, and project-specific transit; limited empirical evidence is available)

(See blue box, pp. 58-59.)

[3] As reported by Holtzclaw, et al for the State of California.

As used in this Report, location settings are defined as follows:

Urban: A project located within the central city and may be characterized by multi-family housing, located near office and retail. Downtown Oakland and the Nob Hill neighborhood in San Francisco are examples of the typical urban area represented in this category. The urban maximum reduction is derived from the average of the percentage difference in per capita VMT versus the California statewide average (assumed analogous to an ITE baseline) for the following locations:

Location	Percent Reduction from Statewide VMT/Capita
Central Berkeley	-48%
San Francisco	-49%
Pacific Heights (SF)	-79%
North Beach (SF)	-82%
Mission District (SF)	-75%
Nob Hill (SF)	-63%
Downtown Oakland	-61%

The average reflects a range of 48% less VMT/capita (Central Berkeley) to 82% less VMT/capita (North Beach, San Francisco) compared to the statewide average. The urban locations listed above have the following characteristics:

- Location relative to the regional core: these locations are within the CBD or less than five miles from the CBD (downtown Oakland and downtown San Francisco).
- Ratio or relationship between jobs and housing: jobs-rich (jobs/housing ratio greater than 1.5)
- Density character
  - typical building heights in stories: six stories or (much) higher
  - typical street pattern: grid
  - typical setbacks: minimal
  - parking supply: constrained on and off street
  - parking prices: high to the highest in the region
- Transit availability: high quality rail service and/or comprehensive bus service at 10 minute headways or less in peak hours

Compact infill: A project located on an existing site within the central city or inner-ring suburb with high-frequency transit service. Examples may be community redevelopment areas, reusing abandoned sites, intensification of land use at established transit stations, or converting underutilized or older industrial buildings. Albany and the Fairfax area of Los Angeles are examples of typical compact infill area as used here. The compact infill maximum reduction is derived from the average of the percentage difference in per capita VMT versus the California statewide average for the following locations:

Location	Percent Reduction from Statewide VMT/Capita
Franklin Park, Hollywood	-22%
Albany	-25%
Fairfax Area, Los Angeles	-29%
Hayward	-42%

The average reflects a range of 22% less VMT/capita (Franklin Park, Hollywood) to 42% less VMT/capita (Hayward) compared to the statewide average. The compact infill locations listed above have the following characteristics:

- Location relative to the regional core: these locations are typically 5 to 15 miles outside a regional CBD
- Ratio or relationship between jobs and housing: balanced (jobs/housing ratio ranging from 0.9 to 1.2)
- Density character
  - typical building heights in stories: two to four stories
  - typical street pattern: grid
  - typical setbacks: 0 to 20 feet
  - parking supply: constrained
  - parking prices: low to moderate
- Transit availability: rail service within two miles, or bus service at 15 minute peak headways or less

As used in this Report, additional location settings are defined as follows:

Suburban Center: A project typically involving a cluster of multi-use development within dispersed, low-density, automobile dependent land use patterns (a suburb). The center may be an historic downtown of a smaller community that has become surrounded by its region's suburban growth pattern in the latter half of the 20th Century. The suburban center serves the population of the suburb with office, retail and housing which is denser than the surrounding suburb. The suburban center maximum reduction is derived from the average of the percentage difference in per capita VMT versus the California statewide average for the following locations:

Location	Percent Reduction from Statewide VMT/Capita
Sebastopol	0%
San Rafael (Downtown)	-10%
San Mateo	-17%

The average reflects a range of 0% less VMT/capita (Sebastopol) to 17% less VMT/capita (San Mateo) compared to the statewide average. The suburban center locations listed above have the following characteristics:

- Location relative to the regional core: these locations are typically 20 miles or more from a regional CBD
- Ratio or relationship between jobs and housing: balanced
- Density character
  - typical building heights in stories: two stories
  - typical street pattern: grid
  - typical setbacks: 0 to 20 feet
  - parking supply: somewhat constrained on street; typically ample off-street
  - parking prices: low (if priced at all)
- Transit availability: bus service at 20-30 minute headways and/or a commuter rail station

While all three locations in this category reflect a suburban "downtown," San Mateo is served by regional rail (Caltrain) and the other locations are served by bus transit only. Sebastopol is located more than 50 miles from downtown San Francisco, the nearest urban center. San Rafael and San Mateo are located 20 miles from downtown San Francisco.

Suburban: A project characterized by dispersed, low-density, single-use, automobile dependent land use patterns, usually outside of the central city (a suburb). Suburbs typically have the following characteristics:

- Location relative to the regional core: these locations are typically 20 miles or more from a regional CBD
- Ratio or relationship between jobs and housing: jobs poor
- Density character
  - typical building heights in stories: one to two stories
  - typical street pattern: curvilinear (cul-de-sac based)
  - typical setbacks: parking is generally placed between the street and office or retail buildings; large-lot residential is common
  - parking supply: ample, largely surface lot-based
  - parking prices: none
- Transit availability: limited bus service, with peak headways 30 minutes or more

The maximum reduction provided for this category assumes that regardless of the measures implemented, the project's distance from transit, density, design, and lack of mixed use destinations will keep the effect of any strategies to a minimum.

Global Maximum- A global maximum is provided for any combination of land use, neighborhood enhancements, parking, transit, and commute trip reduction strategies (the first five columns in the organization chart). This excludes reductions from road-pricing measurements which are discussed separately below. The total project VMT reduction across these categories, which can be combined through multiplication, should be capped

at these levels based on empirical evidence.[4] Maximums are provided for the location/development type of the project. The Global Maximum values can be found in the top row of Chart 6-2.

These include:

- Urban: 75% VMT
- Compact Infill: 40% VMT
- Suburban Center (or Suburban with NEV): 20%
- Suburban: 15% (limited empirical evidence available)

Specific Rules for Subcategories within Transportation- Because of the unique interactions of measures within the Transportation Category, each subcategory has additional rules or criteria for combining measures.

❖ Land Use/Location Strategies – Maximum Reduction Factors: Land use measures apply to a project area with a radius of ½ mile. If the project area under review is greater than this, the study area should be divided into subareas of radii of ½ mile, with subarea boundaries determined by natural "clusters" of integrated land uses within a common walkshed. If the project study area is smaller than ½ mile in radius, other land uses within a ½ mile radius of the key destination point in the study area (i.e. train station or employment center) should be included in design, density, and diversity calculations. Land use measures are capped based on empirical evidence for location setting types as follows:[5]

- Urban: 65% VMT
- Compact Infill: 30% VMT
- Suburban Center: 10% VMT
- Suburban: 5% VMT

❖ Neighborhood/Site Enhancements Strategies – Maximum Reduction Factors: The neighborhood/site enhancements category is capped at 12.7% VMT reduction (with Neighborhood Electric Vehicles (NEVs)) and 5% without NEVs based on empirical evidence (for NEVs) and the multiplied combination of the non-NEV measures.

❖ Parking Strategies – Maximum Reduction Factors: Parking strategies should be implemented in one of two combinations:

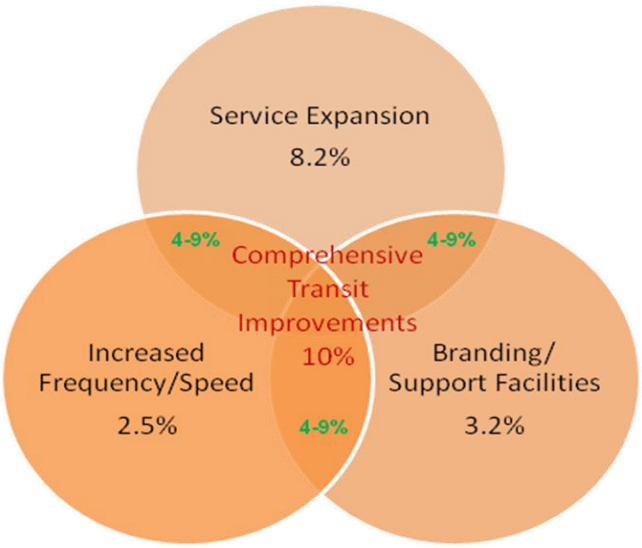
- Limited (reduced) off-street supply ratios plus residential permit parking and priced on-street parking (to limit spillover), or
- Unbundled parking plus residential permit parking and priced on-street parking (to limit spillover).

[4] As reported by Holtzclaw, et al for the State of California. Note that CTR strategies must be converted to overall VMT reductions (from work-trip VMT reductions) before being combined with strategies in other categories.

[5] As reported for California locations in Holtzclaw, et al. "Location Efficiency: Neighborhood and Socioeconomic Characteristics Determine Auto Ownership and Use – Studies in Chicago, Los Angeles, and San Francisco." *Transportation Planning and Technol*ogy, 2002, Vol. 25, pp. 1–27.

Note: The reduction maximum of 20% VMT reflects the combined (multiplied) effect of unbundled parking and priced on-street parking.

- Transit System Strategies – Maximum Reduction Factors: The 10% VMT reduction maximum for transit system improvements reflects the combined (multiplied) effect of network expansion and service frequency/speed enhancements. A comprehensive transit improvement would receive this type of reduction, as shown in the center overlap in the Venn diagram, below.



- Commuter Trip Reductions (CTR) Strategies – Maximum Reduction Factors: The most effective commute trip reduction measures combine incentives, disincentives, and mandatory monitoring, often through a transportation demand management (TDM) ordinance. Incentives encourage a particular action, for example parking cash-out, where the employee receives a monetary incentive for not driving to work, but is not punished for maintaining status quo. Disincentives establish a penalty for a status quo action. An example is workplace parking pricing, where the employee is now monetarily penalized for driving to work. The 25% maximum for work-related VMT applies to comprehensive CTR programs. TDM strategies that include only incentives, only disincentives, and/or no mandatory monitoring, should have a lower total VMT reduction than those with a comprehensive approach. Support strategies to strengthen CTR programs include guaranteed-ride-home, taxi vouchers, and message boards/marketing materials. A 25% reduction in work-related VMT is assumed equivalent to a 15% reduction in overall project VMT for the purpose of the global maximum; this can be adjusted for project-specific land use mixes.

  Two school-related VMT reduction measures are also provided in this category. The maximum reduction for these measures should be 65% of school-related VMT based on the literature.

- Road Pricing/Management Strategies – Maximum Reduction Factors: Cordon pricing is the only strategy in this category with an expected VMT reduction potential. Other forms of road pricing would be applied at a corridor or region-wide level rather than as mitigation applied to an individual development project. No domestic case studies are available for cordon pricing, but international studies suggest a VMT reduction maximum of 25%. A separate, detailed, and project-specific study should be conducted for any project where road pricing is proposed as a VMT reduction measure.

Additional Rules for Transportation Measures- There are also restrictions on the application of measures in rural applications, and application to baseline, as follows:

- Rural Application: Few empirical studies are available to suggest appropriate VMT reduction caps for strategies implemented in rural areas. Strategies likely to have the largest VMT reduction in rural areas include vanpools, telecommute or alternative work schedules, and master planned communities (with design and land use diversity to encourage intra-community travel). NEV networks may also be appropriate for larger scale developments. Because of the limited empirical data in the rural context, project-specific VMT reduction estimates should be calculated.

- Baseline Application: As discussed in previous sections of this report, VMT reductions should be applied to a baseline VMT expected for the project, based on the Institute of Transportation Engineers' 8th Edition *Trip Generation Manual* and associated typical trip distance for each land use type. Where trip generation rates and project VMT provided by the project Applicant are derived from another source, the VMT reductions must be adjusted to reflect any "discounts" already applied.

Range of Effectiveness of Mitigation Measures

The following charts provide the range of effectiveness for the quantified mitigation measures. Each chart shows one category of measures, with subcategories identified. The charts also show the basis for the quantification, and indicate applicable groupings. IMPORTANT: these ranges are approximate and should NOT be used in lieu of the specific quantification method provided in the fact sheet for each measure. Restrictions on combining measures must be observed.

Table 6-1: Energy Category

Energy						
Category	Measure Number	Strategy	BMP	Grouped With #	Range of Effectiveness	
					Percent Reduction in GHG Emissions	Basis
Building Energy Use	BE-1	Buildings exceed Title 24 Building Envelope Energy Efficiency Standards by X% (X is equal to the percentage improvement selected for the project			For a 10% improvement over 2008 Title 24: Non-Residential electricity use: 0.2-5.5%; natural gas use: 0.7-10% Residential electricity use: 0.3-2.6%; natural gas use: 7.5-9.1%	
	BE-2	Install Programmable Thermostat Timers	x		BMP	
	BE-3	Obtain Third-party HVAC Commissioning and Verification of Energy Savings	x	BE-1	BMP	
	BE-4	Install Energy Efficient Appliances			Residential building: 2-4% Grocery Stores: 17-22%	Appliance Electricity Use
	BE-5	Install Energy Efficient Boilers			1.2-18.4%	Fuel Use
Alternative Energy Generation	AE-1	Establish Onsite Renewable Energy Systems-Generic			0-100%	
	AE-2	Establish Onsite Renewable Energy Systems-Solar Power			0-100%	
	AE-3	Establish Onsite Renewable Energy Systems-Wind Power			0-100%	
	AE-4	Utilize a Combined Heat and Power System			0-46%	
	AE-5	Establish Methane Recovery in Landfills			73-77%	
	AE-6	Establish Methane Recovery in Wastewater Treatment Plants			95-97%	
Lighting	LE-1	Install Higher Efficacy Public Street and Area Lighting			16-40%	Outdoor Lighting Electricity Use
	LE-2	Limit Outdoor Lighting Requirements	x		BMP	
	LE-3	Replace Traffic Lights with LED Traffic Lights			90%	Traffic Light Electricity Use

Table 6-2: Transportation Category

Transportation						
Category	Measure Number	Strategy	BMP	Grouped With #	Range of Effectiveness	
					Percent Reduction in GHG Emissions	Basis
Land Use / Location	LUT-1	Increase Density			1.5-30.0%	VMT
	LUT-2	Increase Location Efficiency			10-65%	VMT
	LUT-3	Increase Diversity of Urban and Suburban Developments (Mixed Use)			9-30%	VMT
	LUT-4	Incr. Destination Accessibility			6.7-20%	VMT
	LUT-5	Increase Transit Accessibility			0.5-24.6%	VMT
	LUT-6	Integrate Affordable and Below Market Rate Housing			0.04-1.20%	VMT
	LUT-7	Orient Project Toward Non-Auto Corridor			NA	
	LUT-8	Locate Project near Bike Path/Bike Lane			NA	
	LUT-9	Improve Design of Development			3.0-21.3%	VMT
Neighborhood / Site Design	SDT-1	Provide Pedestrian Network Improvements			0-2%	VMT
	SDT-2	Traffic Calming Measures			0.25-1.00%	VMT
	SDT-3	Implement a Neighborhood Electric Vehicle (NEV) Network			0.5-12.7%	VMT
	SDT-4	Urban Non-Motorized Zones		SDT-1	NA	
	SDT-5	Incorporate Bike Lane Street Design (on-site)		LUT-9	NA	
	SDT-6	Provide Bike Parking in Non-Residential Projects		LUT-9	NA	
	SDT-7	Provide Bike Parking in Multi-Unit Residential Projects		LUT-9	NA	
	SDT-8	Provide EV Parking		SDT-3	NA	
	SDT-9	Dedicate Land for Bike Trails		LUT-9	NA	
Parking Policy / Pricing	PDT-1	Limit Parking Supply			5-12.5%	
	PDT-2	Unbundle Parking Costs from Property Cost			2.6-13%	
	PDT-3	Implement Market Price Public Parking (On-Street)			2.8-5.5%	
	PDT-4	Require Residential Area Parking Permits		PDT-1, 2 & 3	NA	

Transportation - continued

Category	Measure Number	Strategy	BMP	Grouped With #	Range of Effectiveness	
					Percent Reduction in GHG Emissions	Basis
Trip Reduction Programs	TRT-1	Implement Voluntary CTR Programs			1.0-6.2%	Commute VMT
	TRT-2	Implement Mandatory CTR Programs – Required Implementation/Monitoring			4.2-21.0%	Commute VMT
	TRT-3	Provide Ride-Sharing Programs			1-15%	Commute VMT
	TRT-4	Implement Subsidized or Discounted Transit Prog.			0.3-20.0%	Commute VMT
	TRT-5	Provide End of Trip Facilities		TRT-1, 2 & 3	NA	
	TRT-6	Telecommuting and Alternative Work Schedules			0.07-5.50%	Commute VMT
	TRT-7	Implement Commute Trip Reduction Marketing			0.8-4.0%	Commute VMT
	TRT-8	Implement Preferential Parking Permit Program		TRT-1, 2 & 3	NA	
	TRT-9	Implement Car-Sharing Program			0.4-0.7%	VMT
	TRT-10	Implement School Pool Program			7.2-15.8%	School VMT
	TRT-11	Provide Employer-Sponsored Vanpool/Shuttle			0.3-13.4%	Commute VMT
	TRT-12	Implement Bike-Sharing Program		SDT-5, LUT-9	NA	
	TRT-13	Implement School Bus Program			38-63%	School VMT
	TRT-14	Price Workplace Parking			0.1-19.7%	Commute VMT
	TRT-15	Implement Employee Parking “Cash-Out”			0.6-7.7%	Commute VMT

Transportation - continued						
Category	Measure Number	Strategy	BMP	Grouped With #	Range of Effectiveness	
					Percent Reduction in GHG Emissions	Basis
Transit System Improvements	TST-1	Provide a Bus Rapid Transit System			0.02-3.2%	VMT
	TST-2	Implement Transit Access Improvements		TST-3, TST-4	NA	
	TST-3	Expand Transit Network			0.1-8.2%	VMT
	TST-4	Increase Transit Service Frequency/Speed			0.02-2.5%	VMT
	TST-5	Provide Bike Parking Near Transit		TST-3, TST-4	NA	
	TST-6	Provide Local Shuttles		TST-3, TST-4	NA	
Road Pricing / Management	RPT-1	Implement Area or Cordon Pricing			7.9-22.0%	VMT
	RPT-2	Improve Traffic Flow			0-45%	VMT
	RPT-3	Require Project Contributions to Transportation Infrastructure Improvement Projects		RPT-2, TST-1 to 6	NA	
	RPT-4	Install Park-and-Ride Lots		RPT-1, TRT-11, TRT-3, TST-1 to 6	NA	
Vehicles	VT-1	Electrify Loading Docks and/or Require Idling-Reduction Systems			26-71%	Truck Idling Time
	VT-2	Utilize Alternative Fueled Vehicles			Varies	
	VT-3	Utilize Electric or Hybrid Vehicles			0.4-20.3%	Fuel Use

Table 6-3: Water Category

Water						
Category	Measure Number	Strategy	BMP	Grouped With #	Range of Effectiveness	
					Percent Reduction in GHG Emissions	Basis
Water Supply	WSW-1	Use Reclaimed Water			up to 40% for Northern Californiaup to 81% for Southern California	Outdoor Water Use
	WSW-2	Use Gray Water			0-100%	Outdoor Water Use
	WSW-3	Use Locally-Sourced Water Supply			0-60% for Northern and Central California; 11-75% for Southern California	Indoor and Outdoor Water Use
Water Use	WUW-1	Install Low-Flow Water Fixtures.			Residential: 20% Non-Residential: 17-31%	Indoor Water Use
	WUW-2	Adopt a Water Conservation Strategy.			varies	
	WUW-3	Design Water-Efficient Landscapes			0-70%	Outdoor Water Use
	WUW-4	Use Water-Efficient Landscape Irrigation Systems			6.1%	Outdoor Water Use
	WUW-5	Reduce Turf in Landscapes and Lawns			varies	
	WUW-6	Plant Native or Drought-Resistant Trees and Vegetation			BMP	

Table 6-4: Area Landscaping

Area Landscaping						
Category	Measure Number	Strategy	BMP	Grouped With #	Range of Effectiveness	
					Percent Reduction in GHG Emissions	Basis
Area Landscaping	A-1	Prohibit Gas Powered Landscape Equipment.			LADWP: 2.5-46.5% PG&E: 64.1-80.3% SCE: 49.5-72.0% SDGE: 38.5-66.3% SMUD: 56.3-76.0%	Fuel Use
	A-2	Implement Lawnmower Exchange Program			BMP	
	A-3	Electric Yard Equipment Compatibility		A-1 or A-2	BMP	

Table 6-5: Solid Waste Category

Solid Waste						
Category	Measure Number	Strategy	BMP	Grouped With #	Range of Effectiveness	
					Percent Reduction in GHG Emissions	Basis
Solid Waste	SW-1	Institute or Extend Recycling and Composting Services			BMP	
	SW-2	Recycle Demolished Construction Material			BMP	

Table 6-6: Vegetation Category

Vegetation						
Category	Measure Number	Strategy	BMP	Grouped With #	Range of Effectiveness	
					Percent Reduction in GHG Emissions	Basis
Vegetation	V-1	Urban Tree Planting		GP-4	varies	
	V-2	Create new vegetated open space.			varies	

Table 6-7: Construction Category

Construction						
Category	Measure Number	Strategy	BMP	Grouped With #	Range of Effectiveness	
					Percent Reduction in GHG Emissions	Basis
Construction	C-1	Use Alternative Fuels for Construction Equipment			0-22%	Fuel Use
	C-2	Use Electric and Hybrid Construction Equipment			2.5-80%	Fuel Use
	C-3	Limit Construction Equipment Idling beyond Regulation Requirements			varies	
	C-4	Institute a Heavy-Duty Off-Road Vehicle Plan		Any C	BMP	
	C-5	Implement a Vehicle Inventory Tracking System		Any C	BMP	

Table 6-8: Miscellaneous Category

Miscellaneous						
Category	Measure Number	Strategy	BMP	Grouped With #	Range of Effectiveness	
					Percent Reduction in GHG Emissions	Basis
Miscellaneous	Misc-1	Establish a Carbon Sequestration Project			varies	
	Misc-2	Establish Off-Site Mitigation			varies	
	Misc-3	Use Local and Sustainable Building Materials	x		BMP	
	Misc-4	Require Best Management Practices in Agriculture and Animal Operations	x		BMP	
	Misc-5	Require Environmentally Responsible Purchasing	x		BMP	
	Misc-6	Implement an Innovative Strategy for GHG Mitigation	x		BMP	

Table 6-9: General Plans

General Plan Strategies						
Category	Measure Number	Strategy	BMP	Grouped With #	Range of Effectiveness	
					Percent Reduction in GHG Emissions	Basis
General Plans	GP-1	Fund Incentives for Energy Efficiency	x		BMP	
	GP-2	Establish a Local Farmer's Market	x		BMP	
	GP-3	Establish Community Gardens	x		BMP	
	GP-4	Plant Urban Shade Trees	x	V-1	BMP	
	GP-5	Implement Strategies to Reduce Urban Heat-Island Effect	x		BMP	

Applicability of Quantification Fact Sheets Outside of California

In order to apply the quantification methods in this Report to projects located outside of California, the assumptions and methods in the baseline methodology and in the Fact Sheets should be reviewed prior to applying them. First, evaluate the basis for use metrics and emission factors for applicability outside of California. The Report references various sources for use metrics and emission factors; if these are California-specific, the method should be evaluated to determine if these same use metrics and emission factors are applicable to the project area. If they are not applicable, factors appropriate for the project area should be substituted in the baseline and project methods. Key factors to consider are climate zone[6], precipitation, building standards, end-user behavior, and transportation environment (land use and transportation characteristics). Use metrics likely to vary outside of California include:

- Building Energy Use
- Water Use
- Vehicle Trip Lengths and Vehicle Miles Traveled
- Building Standards
- Waste Disposal Rates
- Landscape Equipment Annual Usage

Emission factors relate the use metric to carbon intensity to estimate GHG emissions. Depending on the type of emission factor, these values may or may not change based on location. For instance, the emission factor for combustion of a specific amount of fuel does not typically change; however the engine mix may change by location, and fuel use by those engines may be different. Other emission factors are regionally dependent and alternative sources should be investigated. Emission factors likely to vary outside of California include:

- Electricity associated with water and wastewater supply and treatment
- Carbon intensity of electricity supplied
- Fleet and model year distribution of vehicles which influences emission factors

The user should be able to adjust the methodologies to: (1) calculate the baseline for a given mitigation measure; and then (2) incorporate the appropriate data and assumptions into the calculations for the emission mitigation associated with the measure.

There is at least one mitigation measure that will not be applicable outside of California unless adjustments are made by substituting location-specific factors in the baseline methodology: the improvement beyond Title 24 (BE-1) is not applicable outside of California since buildings outside California would be subject to different building codes. The project Applicant may be able to estimate a baseline energy use for building envelope systems under other building standards and estimate the change in energy use for improvements to building envelope systems using building energy software or literature surveys.

[6] Climate zones are specific geographic areas of similar climatic characteristics, including temperature, weather, and other factors which affect building energy use. The California Energy Commission identified 16 Forecasting Climate Zones (FCZs) within California.

How to Use a Fact Sheet to Quantify a Project

This section provides step-by-step instructions and an example regarding how a fact sheet can be used. After choosing the appropriate fact sheet(s), follow these general steps. Steps may need to be adjusted for different types of fact sheets.

Step 1: Does this fact sheet apply?
Carefully read the measure's description and applicability to ensure that you are using the correct fact sheet.

Step 2: Is the measure "grouped"?
Check Tables 6-1 to 6-9 to see if the measure is "grouped" with other measures. If it is, then all measures in the group must be implemented together.

Step 3: Review defaults
Review the default assumptions in the fact sheet.

Step 4: Data inputs
Determine the type of data and data sources necessary. Refer to Appendix B and other suggested documents.

Step 5: Calculate baseline emissions
Calculate baseline emissions using formulas provided in the fact sheet.

Step 6: Percent reductions
If applicable, calculate the percent reduction for the specific action in the measure.

Step 7: Quantify reductions
Quantify emission reductions for a particular mitigation measure using the provided formula.

Step 8: Grouped measures
If you are using a mitigation measure that is grouped with another measure, refer to Tables 6-1 to 6-9 and complete the calculations for all measures that are grouped together for a particular mitigation strategy.

Step 9: Multiple measures
See Chapter 6 for how to combine reductions from multiple measures.

IMPORTANT: Clearly document information such as data sources, data used, and calculations.

Example:

The following is an example calculation for a building project that will use Fact Sheet 2.1.1 - *Exceed Title 24 Building Envelope Energy Efficiency Standards by X%*. In this example, a large office building is being built, and it will be designed to do 10% more than Title 24 standards for both electricity and natural gas.

- **Step 1 – Does this fact sheet apply?**
  The project and fact sheet have been reviewed, and YES, this fact sheet is appropriate to use to estimate reductions from the project.

- **Step 2 - Is the measure "grouped"?**
  NO, this is a measure that does not have to be done with other measures.

- **Step 3 – Review defaults**
  Default assumptions and emission factors have been reviewed and used, as appropriate.

- **Steps 4 – Data inputs**
  The table below shows the data needed for the example, the sample data input, and the source of the sample data. Make sure the data use the units specified in the equation. *

Data for Fact Sheet 2.1.1 Example

Data Needed	Input	Source of Data
Project type	Commercial land use = Large Office	User Input
Size	100,000 sq. ft	User Input
Climate Zone	1	From Figure BE 1.1
Electricity Intensity$_{baseline}$	8.32 kWh/SF/yr	From Fact Sheet 2.1.1
Utility Provider	PG&E	User Input
Emission Factor$_{Electricity}$	2.08E-4 MT CO_2e/kWh	Fact Sheet 2.1.1
Natural Gas Intensity$_{baseline}$	18.16 kBTU/SF/yr	From Fact Sheet 2.1.1
Emission Factor$_{NaturalGas}$	5.32E-5 MT CO_2e/therm	From Fact Sheet 2.1.1
% Reduction Commitment	10% over 2008 Title 24 Standards	User Input

- **Step 5 – Calculate baseline emissions**
  Once all necessary information has been obtained, use the equation provided to determine the baseline emissions. Round results to the nearest MT.

  ⇨ GHG Emissions Baseline$_{Electicity}$ = Electricity Intensity$_{Baseline}$ x Size x Emission Factor$_{Electricity}$

  = 8.32 kWh/SF/yr x 100,000 SF x (2.08E-4 MT CO_2e/kWh)
  = **173 MT CO_2e/yr [Baseline GHG Emissions for Electricity]**

  ⇨ GHG Emissions Baseline$_{Natural\ Gas}$ = Natural Gas Intensity$_{Baseline}$ x Size x Emission Factor$_{NaturalGas}$

  = 18.16 kBTU/SF/yr x 100,000 SF x (5.32E-5 MT CO_2e/kBTU)
  = **97 MT CO_2e/yr [Baseline GHG Emissions for Natural Gas]**

  ⇨ GHG Emissions$_{Baseline}$ = GHG Emissions Baseline$_{Electricity}$ + GHG Emissions Baseline$_{Natural\ Gas}$

  = 173 MT CO_2e/yr + 97 MT CO_2e/yr
  = 270 MT CO_2e/yr

- **Step 6 – Percent reductions**

Now calculate the percent GHG emission reduction based on the stated improvement goal. In this example the goal is a 10% reduction over Title 24 Energy Efficiency Standards. See Table BE-1.1 for data used for this step.

⇨ $Reduction_{Electricity}$ from 1% over 2008 Title 24 Standards = 0.20%
$Reduction_{NaturalGas}$ from 1% over 2008 Title 24 Standards = 1.00%

From Table BE-1.1

⇨ Multiply the Percent Factor from Table BE-1.1 by the Percent Reduction Commitment (10% for this example)

Reduction in GHG emissions from electricity generation:

= 0.20% x 10
= 2%

Reduction Percentage X 10% goal

Reduction in GHG emissions from natural gas combustion:

= 1% x 10
= 10%

Reduction Percentage X 10% goal

➢ **Step 7 – Quantify reductions**
Using the percent reductions, the emission reductions can be calculated, as shown below.

⇨ Total Building GHG emissions = GHG Emissions $Baseline_{Electricity.}$ x ($Reduction_{Electricity}$)
+ GHG Emissions $Baseline_{NaturalGas}$x ($Reduction_{NaturalGas}$)

= 173 MT CO_2e/yr x ($\frac{100\%-2\%}{100}$) + 97 MT CO_2e/yr x ($\frac{100\%-10\%}{100}$)
= **257 MT CO_2e/yr**

Net reductions are the difference between the baseline emissions and the emissions calculated above for what will occur with this strategy implemented.

⇨ Net reductions = Baseline – Total Building GHG Emissions

= 270 MT CO_2e/yr - 257 MT CO_2e/yr
= **13 MT CO_2e/yr**

This shows that a 10% improvement in energy consumption over 2008 Title 24 Standards from electricity and natural gas will result in a GHG reduction of 13 MT CO_2e/yr.

- **Step 8 – Grouped measures**
  In this example, the measure is not grouped. For grouped measures, refer to Tables 6-1 to 6-9 in Chapter 6 for how to combine reductions.

- **Step 9 – Multiple measures**
  See "Rules for Combining Strategies or Measures" section in Chapter 6 for how to add reductions from multiple measures

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1.0 Introduction

Chapter 7 is made up of a series of Fact Sheets. Each sheet summarizes the quantification methodology for a specific mitigation measure. As described in Chapter 6, the measures are grouped into Categories, and, in some cases, into subcategories. For information about the development of the Fact Sheets, please see Chapter 4. For a discussion of specific quantification issues in select measure categories or subcategories, please refer to Chapter 5. Chapter 6 provides a detailed explanation of the organization and layout of the Fact Sheets, including rules that govern the quantification of measures that have been, or will be, implemented in combination.

In order to facilitate navigation through, and the use of, the Fact Sheets, they have been color coded to reflect the Category the measure is in, and if applicable, the subcategory. The color scheme is shown in Charts 6-1 and 6-2, and also in Table 7-1 (below).

The colored bar at the top of each Fact Sheet corresponds to the Category color as shown in Charts 6-1 and 6-2, and in Table 7-1; the Category name is shown in the colored bar at the left hand margin. The second colored bar, immediately below the first one, shows the name of the subcategory, if any, and corresponds to subcategory color in those charts and tables. The subcategory name appears at the right hand margin.

At the left hand margin, below the Category name, is a cross-reference to the corresponding measure in the previous two CAPCOA reports (*CEQA and GHG*; and *Model Polices for GHG in General Plans*). The term “MP#” refers to a measure in the Model Policies document. The term CEQA# refers to a measure in the CEQA and GHG report.

At the bottom of the page is a colored bar that corresponds to the Category, and, where applicable, there is a colored box at the right hand margin, contiguous with the colored bar. This color of the box corresponds to the subcategory, where applicable. The box contains the measure number.

The layout of information in each Fact Sheet is covered in detail in Chapter 6.

Table 7-1, below, provides an index and cross-reference for the measure Fact Sheets. It is color-coded, as explained above, and may be used as a key to more quickly and easily navigate through the Fact Sheets

Table 7-1: Measure Index & Cross Reference

Section	Category	Page #	Measure #	BMP	MP #	CEQA #
2.0	**Energy**	**85**				
2.1	Building Energy Use	85				
2.1.1	Buildings Exceed Title 24 Building Envelope Energy Efficiency Standards By X%	85	BE-1		EE-2	MM-E6
2.1.2	Install Programmable Thermostat Timers	99	BE-2	x	EE-2	-
2.1.3	Obtain Third-party HVAC Commissioning and Verification of Energy Savings	101	BE-3	x	EE-2	-
2.1.4	Install Energy Efficient Appliances	103	BE-4		EE-2.1.6	MM E-19
2.1.5	Install Energy Efficient Boilers	111	BE-5		-	-
2.2	Lighting	115				
2.2.1	Install Higher Efficacy Public Street and Area Lighting	115	LE-1		EE-2.1.5	-
2.2.2	Limit Outdoor Lighting Requirements	119	LE-2	x	EE-2.3	
2.2.3	Replace Traffic Lights with LED Traffic Lights	122	LE-3		EE-2.1.5	-
2.3	Alternative Energy Generation	125				
2.3.1	Establish Onsite Renewable Energy Systems-Generic	125	AE-1		AE-2.1	MM E-5
2.3.2	Establish Onsite Renewable Energy Systems-Solar Power	128	AE-2		AE-2.1	MM E-5
2.3.3	Establish Onsite Renewable Energy Systems-Wind Power	132	AE-3		AE-2.1	MM E-5
2.3.4	Utilize a Combined Heat and Power System	135	AE-4		AE-2	-
2.3.5	Establish Methane Recovery in Landfills	143	AE-5		WRD-1	-
2.3.6	Establish Methane Recovery in Wastewater Treatment Plants	149	AE-6			
3.0	**Transportation**	**155**				
3.1	Land Use/Location	155				
3.1.1	Increase Density	155	LUT-1		LU-1.5 & LU-2.1.8	MM D-1 & D-4
3.1.2	Increase Location Efficiency	159	LUT-2		LU-3.3	-
3.1.3	Increase Diversity of Urban and Suburban Developments (Mixed Use)	162	LUT-3		LU-2	MM D-9 & D-4
3.1.4	Increase Destination Accessibility	167	LUT-4		LU-2.1.4	MM D-3
3.1.5	Increase Transit Accessibility	171	LUT-5		LU-1,LU-4	MM D-2
3.1.6	Integrate Affordable and Below Market Rate Housing	176	LUT-6		LU-2.1.8	MM D-7
3.1.7	Orient Project Toward Non-Auto Corridor	179	LUT-7		LU-4.2	LUT-3
3.1.8	Locate Project near Bike Path/Bike Lane	181	LUT-8		-	LUT-4
3.1.9	Improve Design of Development	182	LUT-9		-	-
3.2	Neighborhood/Site Enhancements	186				
3.2.1	Provide Pedestrian Network Improvements	186	SDT-1		LU-4	MM-T-6
3.2.2	Provide Traffic Calming Measures	190	SDT-2		LU-1.6	MM-T-8
3.2.3	Implement a Neighborhood Electric Vehicle (NEV) Network	194	SDT-3		TR-6	MM-D-6
3.2.4	Create Urban Non-Motorized Zones	198	SDT-4		LU-3.2.1 & 4.1.4	SDT-1
3.2.5	Incorporate Bike Lane Street Design (on-site)	200	SDT-5		TR-4.1	LUT-9
3.2.6	Provide Bike Parking in Non-Residential Projects	202	SDT-6		TR-4.1	MM T-1
3.2.7	Provide Bike Parking with Multi-Unit Residential Projects	204	SDT-7		TR-4.1.2	MM T-3
3.2.8	Provide Electric Vehicle Parking	205	SDT-8		TR-5.4	MM T-17 & E-11
3.2.9	Dedicate Land for Bike Trails	206	SDT-9		TR-4.1	LUT-9
3.3	Parking Policy/Pricing	207				
3.3.1	Limit Parking Supply	207	PDT-1		LU-1.7 & LU-2.1.1.4	-
3.3.2	Unbundle Parking Costs from Property Cost	210	PDT-2		LU-1.7	-
3.3.3	Implement Market Price Public Parking (On-Street)	213	PDT-3		-	-
3.3.4	Require Residential Area Parking Permits	217	PDT-4		-	PDT-1, PDT-2, PDT-3

Section	Category	Page #	Measure #	BMP	MP #	CEQA #
3.4	Commute Trip Reduction Programs	218				
3.4.1	Implement Commute Trip Reduction Program - Voluntary	218	TRT-1		-	-
3.4.2	Implement Commute Trip Reduction Program – Required Implementation/Monitoring	223	TRT-2		MO-3.1	T-19
3.4.3	Provide Ride-Sharing Programs	227	TRT-3		MO-3.1	-
3.4.4	Implement Subsidized or Discounted Transit Program	230	TRT-4		MO-3.1	-
3.4.5	Provide End of Trip Facilities	234	TRT-5		MO-3.2	TRT-1, TRT-2, TRT-3
3.4.6	Encourage Telecommuting and Alternative Work Schedules	236	TRT-6		TR-3.5	-
3.4.7	Implement Commute Trip Reduction Marketing	240	TRT-7		-	-
3.4.8	Implement Preferential Parking Permit Program	244	TRT-8		TR-3.1	TRT-1, TRT-2, TRT-3
3.4.9	Implement Car-Sharing Program	245	TRT-9		-	-
3.4.10	Implement a School Pool Program	250	TRT-10		-	-
3.4.11	Provide Employer-Sponsored Vanpool/Shuttle	253	TRT-11		MO-3.1	-
3.4.12	Implement Bike-Sharing Programs	256	TRT-12		-	SDT-5, LUT-9
3.4.13	Implement School Bus Program	258	TRT-13		TR-3.4	-
3.4.14	Price Workplace Parking	261	TRT-14		-	-
3.4.15	Implement Employee Parking “Cash-Out”	266	TRT-15		TR-5.3	MM T-9
3.5	Transit System Improvements	270				
3.5.1	Provide a Bus Rapid Transit System	270	TST-1		-	MS-G3
3.5.2	Implement Transit Access Improvements	275	TST-2		LU-3.4.3	TST-3, TST-4
3.5.3	Expand Transit Network	276	TST-3		-	MS-G3
3.5.4	Increase Transit Service Frequency/Speed	280	TST-4		-	MS-G3
3.5.5	Provide Bike Parking Near Transit	285	TST-5		TR-4.1.4	TST-3, TST-4
3.5.6	Provide Local Shuttles	286	TST-6			TST-3, TST-4
3.6	Road Pricing/Management	287				
3.6.1	Implement Area or Cordon Pricing	287	RPT-1		TR-3.6	-
3.6.2	Improve Traffic Flow	291	RPT-2		TR-2.1, TR-2.2	-
3.6.3	Required Project Contributions to Transportation Infrastructure Improvement Projects	297	RPT-3		-	RPT-2, TST-1 to 6
3.6.4	Install Park-and-Ride Lots	298	RPT-4		TR-1	RPT-1, TRT-11, TRT-3, TST-1 to 6
3.7	Vehicles	300				
3.7.1	Electrify Loading Docks and/or Require Idling-Reduction Systems	300	VT-1		TR-6	-
3.7.2	Utilize Alternative Fueled Vehicles	304	VT-2		-	MM T-21
3.7.3	Utilize Electric or Hybrid Vehicles	309	VT-3		-	MM T-20
4.0	**Water**	**332**				
4.1	Water Supply	332				
4.1.1	Use Reclaimed Water	332	WSW-1		COS-1.3	MS-G-8
4.1.2	Use Gray Water	336	WSW-2		COS-2.3	-
4.1.3	Use Locally Sourced Water Supply	341	WSW-3		-	-
4.2	Water Use	347				
4.2.1	Install Low-Flow Water Fixtures	347	WUW-1		EE-2.1.6; COS 2.2	MM-E23
4.2.2	Adopt a Water Conservation Strategy	362	WUW-2		COS-1.	MS-G-8
4.2.3	Design Water-Efficient Landscapes	365	WUW-3		COS-2.1	-
4.2.4	Use Water-Efficient Landscape Irrigation Systems	372	WUW-4		COS-3.1	MS-G-8
4.2.5	Reduce Turf in Landscapes and Lawns	376	WUW-5		-	-
4.2.6	Plant Native or Drought-Resistant Trees and Vegetation	381	WUW-6	x	COS-3.1	MM D-16

Section	Category	Page #	Measure #	BMP	MP #	CEQA #
5.0	**Area Landscaping**	**384**				
5.1	Landscaping Equipment	384				
5.1.1	Prohibit Gas Powered Landscape Equipment.	384	A-1		-	-
5.1.2	Implement Lawnmower Exchange Program	389	A-2	x	EE-4.2	MM D-13
5.1.3	Electric Yard Equipment Compatibility	391	A-3	x	MO-2.4	A-1 or A-2; MM D-14
6.0	**Solid Waste**	**392**				
6.1	Solid Waste	392				
6.1.1	Institute or Extend Recycling and Composting Services	401	SW-1	x	WRD-2	MM D-14
6.1.2	Recycle Demolished Construction Material	402	SW-2	x	WRD-2.3	MM C-4
7.0	**Vegetation**	**402**				
7.1	Vegetation	402				
7.1.1	Urban Tree Planting	402	V-1		COS-3.3, COS 3.2	GP-4, MM T-14
7.1.2	Create New Vegetated Open Space	406	V-2		COS-4.1	-
8.0	**Construction**	**410**				
8.1	Construction	410				
8.1.1	Use Alternative Fuels for Construction Equipment	410	C-1		TR-6, EE-1	MM C-2
8.1.2	Use Electric and Hybrid Construction Equipment	420	C-2		TR-6, EE-1	-
8.1.3	Limit Construction Equipment Idling beyond Regulation Requirements	428	C-3		TR-6.2	-
8.1.4	Institute a Heavy-Duty Off-Road Vehicle Plan	431	C-4	x	TR-6.2, EE-1	Any C
8.1.5	Implement a Construction Vehicle Inventory Tracking System	432	C-5	x	-	-
9.0	**Miscellaneous**	**433**				
9.1	Miscellaneous	433				
9.1.1	Establish a Carbon Sequestration Project	433	Misc-1		LU-5	-
9.1.2	Establish Off-Site Mitigation	435	Misc-2		-	-
9.1.3	Use Local and Sustainable Building Materials	437	Misc-3	x	EE-1	MM C-3, E-17
9.1.4	Require Best Management Practices in Agriculture and Animal Operations	439	Misc-4	x	-	-
9.1.5	Require Environmentally Responsible Purchasing	440	Misc-5	x	MO-6.1	-
9.1.6	Implement an Innovative Strategy for GHG Mitigation	442	Misc-6	x	-	-
10.0	**General Plans**	**444**				
10.1	General Plans	444				
10.1.1	Fund Incentives for Energy Efficiency	444	GP-1	x	-	-
10.1.2	Establish a Local Farmer's Market	446	GP-2	x	LU-2.1.4	MM D-18
10.1.3	Establish Community Gardens	448	GP-3	x	LU-2.1.4	MM D-19
10.1.4	Plant Urban Shade Trees	450	GP-4	x	COS-3.2	V-1, MM T-14
10.1.5	Implement Strategies to Reduce Urban Heat-Island Effect	455	GP-5	x	LU-6.1	MM E-8, E-12

3.0 Transportation

3.1 Land Use/Location

3.1.1 Increase Density

Range of Effectiveness: 0.8 – 30.0% vehicle miles traveled (VMT) reduction and therefore a 0.8 – 30.0% reduction in GHG emissions.

Measure Description:

Designing the Project with increased densities, where allowed by the General Plan and/or Zoning Ordinance reduces GHG emissions associated with traffic in several ways. Density is usually measured in terms of persons, jobs, or dwellings per unit area. Increased densities affect the distance people travel and provide greater options for the mode of travel they choose. This strategy also provides a foundation for implementation of many other strategies which would benefit from increased densities. For example, transit ridership increases with density, which justifies enhanced transit service.

The reductions in GHG emissions are quantified based on reductions to VMT. The relationship between density and VMT is described by its elasticity. According to a recent study published by Brownstone, et al. in 2009, the elasticity between density and VMT is 0.12. Default densities are based on the typical suburban densities in North America which reflects the characteristics of the ITE Trip Generation Manual data used in the baseline estimates.

Measure Applicability:

- Urban and suburban context
    - Negligible impact in a rural context
- Appropriate for residential, retail, office, industrial, and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Number of housing units per acre or jobs per job acre

Mitigation Method:

% VMT Reduction = A * B [not to exceed 30%]

Where:

A = Percentage increase in housing units per acre or jobs per job acre[33] = (number of housing units per acre or jobs per job acre – number of housing units per acre or jobs per job acre for typical ITE development) / (number of housing units per acre or jobs per job acre for typical ITE development) For small and medium sites (less than ½ mile in radius) the calculation of housing and jobs per acre should be performed for the development site as a whole, so that the analysis does not erroneously attribute trip reduction benefits to measures that simply shift jobs and housing within the site with no overall increase in site density. For larger sites, the analysis should address the development as several ½-mile-radius sites, so that shifts from one area to another would increase the density of the receiving area but reduce the density of the donating area, resulting in trip generation rate decreases and increases, respectively, which cancel one another.
B = Elasticity of VMT with respect to density (from literature)

Detail:

- A: [not to exceed 500% increase]
  - If housing: (Number of housing units per acre – 7.6) / 7.6 (See Appendix C for detail)
  - If jobs: (Number of jobs per acre – 20) / 20 (See Appendix C for detail)
- B: 0.07 (Boarnet and Handy 2010)

Assumptions:

Data based upon the following references:

- Boarnet, Marlon and Handy, Susan. 2010. "DRAFT Policy Brief on the Impacts of Residential Density Based on a Review of the Empirical Literature." http://arb.ca.gov/cc/sb375/policies/policies.htm; Table 1.

[33] This value should be checked first to see if it exceeds 500% in which case A = 500%.

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[34]
CO_2e	1.5-30% of running
PM	1.5-30% of running
CO	1.5-30% of running
NOx	1.5-30% of running
SO_2	1.5-30% of running
ROG	0.9-18% of total

Discussion:

The VMT reductions for this strategy are based on changes in density versus the typical suburban residential and employment densities in North America (referred to as "ITE densities"). These densities are used as a baseline to mirror those densities reflected in the ITE Trip Generation Manual, which is the baseline method for determining VMT.

There are two separate maxima noted in the fact sheet: a cap of 500% on the allowable percentage increase of housing units or jobs per acre (variable A) and a cap of 30% on % VMT reduction. The rationale for the 500% cap is that there are diminishing returns to any change in environment. For example, it is reasonably doubtful that increasing residential density by a factor of six instead of five would produce any additional change in travel behavior. The purpose for the 30% cap is to limit the influence of any single environmental factor (such as density). This emphasizes that community designs that implement multiple land use strategies (such as density, design, diversity, etc.) will show more of a reduction than relying on improvements from a single land use factor.

Example:

Sample calculations are provided below for housing:

Low Range % VMT Reduction (8.5 housing units per acre)

= (8.5 – 7.6) / 7.6 *0.07 = 0.8%

High Range % VMT Reduction (60 housing units per acre)

$= \frac{60 - 7.6}{7.6} = 6.9$ or 690% Since greater than 500%, set to 500%

= 500% x 0.07 = 0.35 or 35% Since greater than 30%, set to 30%

[34] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Sample calculations are provided below for jobs:

Low Range % VMT Reduction (25 jobs per acre)
= (25 – 20) / 20 *0.12 = 3%
High Range % VMT Reduction (100 jobs per acre)
$= \frac{100-20}{20} = 4$ or 400%
=400% x 0.12 = 0.48 or 48% Since greater than 30%, set to 30%

Preferred Literature:

- -0.07 = elasticity of VMT with respect to density

Boarnet and Handy's detailed review of existing literature highlighted three individual studies that used the best available methods for analyzing data for individual households. These studies provided the following elasticities: -0.12 - Brownstone (2009), -0.07 – Bento (2005), and -0.08 – Fang (2008). To maintain a conservative estimate of the impacts of this strategy, the lower elasticity of -0.07 is used in the calculations.

Alternative Literature:

- -0.05 to -0.25 = elasticity of VMT with respect to density

The *TRB Special Report 298* literature suggests that doubling neighborhood density across a metropolitan area might lower household VMT by about 5 to 12 percent, and perhaps by as much as 25 percent, if coupled with higher employment concentrations, significant public transit improvements, mixed uses, and other supportive demand management measures.

Alternative Literature References:

TRB, 2009. *Driving and the Built Environment*, Transportation Research Board Special Report 298. http://onlinepubs.trb.org/Onlinepubs/sr/sr298.pdf . Accessed March 2010. (p. 4)

Other Literature Reviewed:

None

3.1.2 Increase Location Efficiency

Range of Effectiveness: 10-65% vehicle miles traveled (VMT) reduction and therefore 10-65% reduction in GHG emissions

Measure Description:

This measure is not intended as a separate strategy but rather a documentation of empirical data to justify the "cap" for all land use/location strategies. The location of the Project relative to the type of urban landscape such as being located in an urban area, infill, or suburban center influences the amount of VMT compared to the statewide average. This is referred to as the location of efficiency since there are synergistic benefits to these urban landscapes.

To receive the maximum reduction for this location efficiency, the project will be located in an urban area/ downtown central business district. Projects located on brownfield sites/infill areas receive a lower, but still significant VMT reduction. Finally, projects in suburban centers also receive a reduction for their efficient location. Reductions are based on the typical VMT of a specific geographic area relative to the average VMT statewide.

Measure Applicability:

- Urban and suburban context
- Negligible impact in a rural context
- Appropriate for residential, retail, office, industrial and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled
$EF_{running}$ = emission factor for running emissions

Inputs:

- No inputs are needed. VMT reduction ranges are based on the geographic location of the project within the region.

Mitigation Method:

% VMT reduction =

- Urban: 65% (representing VMT reductions for the average urban area in California versus the statewide average VMT)
- Compact Infill: 30% (representing VMT reductions for the average compact infill area in California versus the statewide average VMT)
- Suburban Center: 10% (representing VMT reductions for the average suburban center in California versus the statewide average VMT)

Assumptions:

Data based upon the following references:

- Holtzclaw, et al. 2002. "Location Efficiency: Neighborhood and Socioeconomic Characteristics Determine Auto Ownership and Use – Studies in Chicago, Los Angeles, and Chicago." *Transportation Planning and Technology*, Vol. 25, pp. 1–27.

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[35]
CO_2e	10-65% of running
PM	10-65% of running
CO	10-65% of running
NOx	10-65% of running
SO_2	10-65% of running
ROG	6-39% of total

Discussion:

Example:

N/A – no calculations needed

Alternative Literature:

- 13-72% reduction in VMT for infill projects

Preferred Literature:

Holtzclaw, et al., [1] studied relationships between auto ownership and mileage per car and neighborhood urban design and socio-economic characteristics in the Chicago, Los

[35] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Angeles, and San Francisco metro areas. In all three regions, average annual vehicle miles traveled is a function of density, income, household size, and public transit, as well as pedestrian and bicycle orientation (to a lesser extent). The annual VMT for each neighborhood was reviewed to determine empirical VMT reduction "caps" for this report. These location-based caps represent the average and maximum reductions that would likely be expected in urban, infill, suburban center, and suburban locations.

Growing Cooler looked at 10 studies which have considered the effects of regional location on travel and emissions generated by individual developments. The studies differ in methodology and context but they tend to yield the same conclusion: infill locations generate substantially lower VMT per capita than do greenfield locations, ranging from 13 - 72% lower VMT.

Literature References:

[1] Holtzclaw, et al. 2002. "Location Efficiency: Neighborhood and Socioeconomic Characteristics Determine Auto Ownership and Use – Studies in Chicago, Los Angeles, and Chicago." *Transportation Planning and Technology*, Vol. 25, pp. 1–27.

[2] Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change. Urban Land Institute. (p.88, Figure 4-30)

Other Literature Reviewed:

None

3.1.3 Increase Diversity of Urban and Suburban Developments (Mixed Use)

Range of Effectiveness: 9-30% vehicle miles traveled (VMT) reduction and therefore 9-30% reduction in GHG emissions.

Measure Description:

Having different types of land uses near one another can decrease VMT since trips between land use types are shorter and may be accommodated by non-auto modes of transport. For example when residential areas are in the same neighborhood as retail and office buildings, a resident does not need to travel outside of the neighborhood to meet his/her trip needs. A description of diverse uses for urban and suburban areas is provided below.

Urban:

The urban project will be predominantly characterized by properties on which various uses, such as office, commercial, institutional, and residential, are combined in a single building or on a single site in an integrated development project with functional interrelationships and a coherent physical design. The mixed-use development should encourage walking and other non-auto modes of transport from residential to office/commercial/institutional locations (and vice versa). The residential units should be within ¼-mile of parks, schools, or other civic uses. The project should minimize the need for external trips by including services/facilities for day care, banking/ATM, restaurants, vehicle refueling, and shopping.

Suburban:

The suburban project will have at least three of the following on site and/or offsite within ¼-mile: Residential Development, Retail Development, Park, Open Space, or Office. The mixed-use development should encourage walking and other non-auto modes of transport from residential to office/commercial locations (and vice versa). The project should minimize the need for external trips by including services/facilities for day care, banking/ATM, restaurants, vehicle refueling, and shopping.

Measure Applicability:

- Urban and suburban context
- Negligible impact in a rural context (unless the project is a master-planned community)
- Appropriate for mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage of each land use type in the project (to calculate land use index)

Mitigation Method:

% VMT Reduction = Land Use * B [not to exceed 30%]

Where

Land Use = Percentage increase in land use index versus single use development = (land use index – 0.15)/0.15 (see Appendix C for detail)

Land use index = -a / ln(6) (from [2])

$$a = \sum_{i=1}^{6} a_i \times \ln(a_i)$$

a_i = building floor area of land use i / total square feet of area considered

- a_1 = single family residential
- a_2 = multifamily residential
- a_3 = commercial
- a_4 = industrial
- a_5 = institutional
- a_6 = park

if land use is not present and a_i is equal to 0, set a_i equal to 0.01

B = elasticity of VMT with respect to land use index (0.09 from [1])

not to exceed 500% increase

Assumptions:

Data based upon the following references:

[1] Ewing, R., and Cervero, R., "Travel and the Built Environment - A Meta-Analysis." *Journal of the American Planning Association*, <to be published> (2010). Table 4.

[2] Song, Y., and Knaap, G., "Measuring the effects of mixed land uses on housing values." *Regional Science and Urban Economics 34 (2004) 663-680.* (p. 669) http://urban.csuohio.edu/~sugie/papers/RSUE/RSUE2005_Measuring%20the%20effects%20of%20mixed%20land%20use.pdf

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[36]
CO_2e	9-30% of running
PM	9-30% of running
CO	9-30% of running
NOx	9-30% of running
SO_2	9-30% of running
ROG	5.4-18% of total

Discussion:

In the above calculation, a land use index of 0.15 is used as a baseline representing a development with a single land use (see Appendix C for calculations).

There are two separate maxima noted in the fact sheet: a cap of 500% on the allowable percentage increase of land use index (variable A) and a cap of 30% on % VMT reduction. The rationale for the 500% cap is that there are diminishing returns to any change in environment. For example, it is reasonably doubtful that increasing the land use index by a factor of six instead of five would produce any additional change in travel behavior. The purpose for the 30% cap is to limit the influence of any single environmental factor (such as diversity). This emphasizes that community designs that implement multiple land use strategies (such as density, design, diversity, etc.) will show more of a reduction than relying on improvements from a single land use factor.

[36] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Example:

Sample calculations are provided below:

90% single family homes, 10% commercial

- Land use index = -[0.9*ln(0.9)+ 0.1*ln(0.1)+ 4*0.01*ln(0.01)] / ln(6) = 0.3
- Low Range % VMT Reduction = (0.3 – 0.15)/0.15 *0.09 = 9%

1/6 single family, 1/6 multi-family, 1/6 commercial, 1/6 industrial, 1/6 institutional, 1/6 parks

- Land use index = -[6*0.17*ln(0.17)] / ln(6) = 1
- High Range % VMT Reduction (land use index = 1)
- Land use = (1-0.15)/0.15 = 5.6 or 566%. Since this is greater than 500%, set to 500%.
- % VMT Reduction = (5 x 0.09) = 0.45 or 45%. Since this is greater than 30%, set to 30%.

Preferred Literature:

- -0.09 = elasticity of VMT with respect to land use index

The land use (or entropy) index measurement looks at the mix of land uses of a development. An index of 0 indicates a single land use while 1 indicates a full mix of uses. Ewing's [1] synthesis looked at a total of 10 studies, where none controlled for self-selection[37]. The weighted average elasticity of VMT with respect to the land use mix index is -0.09. The methodology for calculating the land use index is described in Song and Knaap [2].

Alternative Literature:

- Vehicle trip reduction = [1 - (ABS(1.5*h-e) / (1.5*h+e)) - 0.25] / 0.25*0.03

Where :
h = study area housing units, and
e = study area employment.

Nelson\Nygaard's report [3] describes a calculation adapted from Criterion and Fehr & Peers [4]. The formula assumes an "ideal" housing balance of 1.5 jobs per household and a baseline diversity of 0.25. The maximum trip reduction with this method is 9%.

[37] Self selection occurs when residents or employers that favor travel by non-auto modes choose locations where this type of travel is possible. They are therefore more inclined to take advantage of the available options than a typical resident or employee might otherwise be.

Alternative Literature References:

[3] Nelson\Nygaard, 2005. Crediting Low-Traffic Developments (p.12). http://www.montgomeryplanning.org/transportation/documents/TripGenerationAnalysisUsingURBEMIS.pdf

[4] Criteron Planner/Engineers and Fehr & Peers Associates (2001). Index 4D Method. *A Quick-Response Method of Estimating Travel Impacts from Land-Use Changes*. Technical Memorandum prepared for US EPA, October 2001.

Other Literature Reviewed:

None

3.1.4 Increase Destination Accessibility

Range of Effectiveness: 6.7 – 20% vehicle miles traveled (VMT) reduction and therefore 6.7-20% reduction in GHG emissions.

Measure Description:

The project will be located in an area with high accessibility to destinations. Destination accessibility is measured in terms of the number of jobs or other attractions reachable within a given travel time, which tends to be highest at central locations and lowest at peripheral ones. The location of the project also increases the potential for pedestrians to walk and bike to these destinations and therefore reduces the VMT.

Measure Applicability:

- Urban and suburban context
- Negligible impact in a rural context
- Appropriate for residential, retail, office, industrial and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Distance to downtown or major job center

Mitigation Method:

% VMT Reduction = Center Distance * B [not to exceed 30%]

Where

Center Distance = Percentage decrease in distance to downtown or major job center versus typical ITE suburban development = (distance to downtown/job center for typical ITE development – distance to downtown/job center for project) / (distance to downtown/job center for typical ITE development)

Center Distance = 12 - Distance to downtown/job center for project) / 12
See Appendix C for detail

B = Elasticity of VMT with respect to distance to downtown or major job center (0.20 from [1])

Assumptions:

Data based upon the following references:

[1] Ewing, R., and Cervero, R., "Travel and the Built Environment - A Meta-Analysis." Journal of the American Planning Association, <to be published> (2010). Table 4.

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[38]
CO_2e	6.7 – 20% of running
PM	6.7 – 20% of running
CO	6.7 – 20% of running
NOx	6.7 – 20% of running
SO_2	6.7 – 20% of running
ROG	4 – 12% of total

Discussion:

The VMT reductions for this strategy are based on changes in distance to key destinations versus the standard suburban distance in North America. This distance is used as a baseline to mirror the distance to destinations reflected in the land uses for the ITE Trip Generation Manual, which is the baseline method for determining VMT.

The purpose for the 30% cap on % VMT reduction is to limit the influence of any single environmental factor (such as destination accessibility). This emphasizes that community designs that implement multiple land use strategies (such as density,

[38] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

design, diversity, destination, etc.) will show more of a reduction than relying on improvements from a single land use factor.

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction (8 miles to downtown/job center) = $\frac{12-8}{12} \times 0.20 = 6.7\%$
- High Range % VMT Reduction (0.1 miles to downtown/job center) = $\frac{12-0.1}{12} \times 0.20 = 20.0\%$

Preferred Literature:

- -0.20 = elasticity of VMT with respect to job accessibility by auto
- -0.20 = elasticity of VMT with respect to distance to downtown

The Ewing and Cervero report [1] finds that VMT is strongly related to measures of accessibility to destinations. The weighted average elasticity of VMT with respect to job accessibility by auto is -0.20 (looking at five total studies). The weighted average elasticity of VMT with respect to distance to downtown is -0.22 (looking at four total studies, of which one controls for self selection[39]).

Alternative Literature:

- 10-30% reduction in vehicle trips

The VTPI literature [2] suggests a 10-30% reduction in vehicle trips for "smart growth" development practices that result in more compact, accessible, multi-modal communities where travel distances are shorter, people have more travel options, and it is possible to walk and bicycle more.

Alternative Literature References:

[2] Litman, T., 2009. "Win-Win Emission Reduction Strategies." Victoria Transport Policy Institute (VTPI). Website: http://www.vtpi.org/wwclimate.pdf. Accessed March 2010. (p. 7, Table 3)

[39] Self selection occurs when residents or employers that favor travel by non-auto modes choose locations where this type of travel is possible. They are therefore more inclined to take advantage of the available options than a typical resident or employee might otherwise be.

Other Literature Reviewed:

None

3.1.5 Increase Transit Accessibility

Range of Effectiveness: 0.5 – 24.6% VMT reduction and therefore 0.5-24.6% reduction in GHG emissions.[40]

Measure Description:

Locating a project with high density near transit will facilitate the use of transit by people traveling to or from the Project site. The use of transit results in a mode shift and therefore reduced VMT. A project with a residential/commercial center designed around a rail or bus station, is called a transit-oriented development (TOD). The project description should include, at a minimum, the following design features:

- A transit station/stop with high-quality, high-frequency bus service located within a 5-10 minute walk (or roughly ¼ mile from stop to edge of development), and/or
    - A rail station located within a 20 minute walk (or roughly ½ mile from station to edge of development)
- Fast, frequent, and reliable transit service connecting to a high percentage of regional destinations
- Neighborhood designed for walking and cycling

In addition to the features listed above, the following strategies may also be implemented to provide an added benefit beyond what is documented in the literature:

- Mixed use development [LUT-3]
- Traffic calmed streets with good connectivity [SDT-2]
- Parking management strategies such as unbundled parking, maximum parking requirements, market pricing implemented to reduce amount of land dedicated to vehicle parking [see PPT-1 through PPT-7]

Measure Applicability:

- Urban and suburban context
- Appropriate in a rural context if development site is adjacent to a commuter rail station with convenient rail service to a major employment center
- Appropriate for residential, retail, office, industrial, and mixed-use projects

Baseline Method:

[40] Transit vehicles may also result in increases in emissions that are associated with electricity production or fuel use. The Project Applicant should consider these potential additional emissions when estimating mitigation for these measures.

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Distance to transit station in project

Mitigation Method:

% VMT = Transit * B [not to exceed 30%]

Where

Transit = Increase in transit mode share = % transit mode share for project - % transit mode share for typical ITE development (1.3% as described in Appendix C)

% transit mode share for project (see Table)

Distance to transit	Transit mode share calculation equation (where x = distance of project to transit)
0 – 0.5 miles	-50*x + 38
0.5 to 3 miles	-4.4*x + 15.2
> 3 miles	no impact
Source: Lund et al, 2004; Fehr & Peers 2010 (see Appendix C for calculation detail)	

B = adjustments from transit ridership increase to VMT (0.67, see Appendix C for detail)

Assumptions:

Data based upon the following references:

[1] Lund, H. and R. Cervero, and R. Willson (2004). *Travel Characteristics of Transit-Oriented Development in California*. (p. 79, Table 5-25)

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[41]
CO_2e	0.5 – 24.6% of running
PM	0.5 – 24.6% of running
CO	0.5 – 24.6% of running
NOx	0.5 – 24.6% of running
SO_2	0.5 – 24.6% of running
ROG	0.3 – 14.8% of total

Discussion:

The purpose for the 30% cap on % VMT reduction is to limit the influence of any single environmental factor (such as transit accessibility). This emphasizes that community designs that implement multiple land use strategies (such as density, design, diversity, transit accessibility, etc.) will show more of a reduction than relying on improvements from a single land use factor.

Example:

Sample calculations are provided below for a rail station:

- Low Range % VMT Reduction (3 miles from station) = [(-4.4*3+15.2) – 1.3%] * 0.67 = 0.5%
- High Range % VMT Reduction (0 miles from station) = [(-50*0+38) – 1.3%] * 0.67 = 24.6%

Preferred Literature:

- 13 to 38% transit mode share (residents in TODs with ½ mile of rail station)
- 5 to 13% transit mode share (residents in TODs from ½ mile to 3 miles of rail station)

The *Travel Characteristics* report [1] surveyed TODs and surrounding areas in San Diego, Los Angeles, San Jose, Sacramento, and Bay Area regions. Survey sites are all located in non-central business district locations, are within walking distance of a transit station with rail service headways of 15 minutes or less, and were intentionally developed as TODs.

[41] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Alternative Literature:

Alternate:

- -0.05 = elasticity of VMT with respect to distance to nearest transit stop

Ewing and Cervero's meta-analysis [2] provides this weighted average elasticity based on six total studies, of which one controls for self-selection. The report does not provide the range of distances where this elasticity is valid.

Alternate:

- 5.9 – 13.3% reduction in VMT

The Bailey, et al. 2008 report [3] predicted a reduction of household daily VMT of 5.8 miles for a location next to a rail station and 2.6 miles for a location next to a bus station. Using the report's estimate of 43.75 daily average miles driven, the estimated reduction in VMT for rail accessibility is 13.3% (5.8/43.75) and for bus accessibility is 5.9% (2.6/43.75).

Alternate:

- 15% reduction in vehicle trips
- 2 to 5 times higher transit mode share

TCRP Report 128 [4] concludes that transit-oriented developments, compared to typical developments represented by the *ITE Trip Generation Manual*, have 47% lower vehicle trip rates and have 2 to 5 times higher transit mode share. *TCRP Report 128* notes that the *ITE Trip Generation Manual* shows 6.67 daily trips per unit while detailed counts of 17 residential TODs resulted in 3.55 trips per unit (a 47% reduction in vehicle trips). This study looks at mid-rise and high-rise apartments at the residential TOD sites. A more conservative comparison would be to look at the *ITE Trip Generation Manual* rates for high-rise apartments, 4.2 trips per unit. This results in a 15% reduction in vehicle trips.

Alternative Literature References:

[2] Ewing, R., and Cervero, R., "Travel and the Built Environment - A Meta-Analysis." *Journal of the American Planning Association*, <to be published> (2010). Table 4.

[3] Bailey, L., Mokhtarian, P.L., & Little, A. (2008). "The Broader Connection between Public Transportation, Energy Conservation and Greenhouse Gas Reduction." ICF International. (Table 4 and 5)

[4] TCRP, 2008. *TCRP Report 128 - Effects of TOD on Housing, Parking, and Travel.* http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_128.pdf (p. 11, 69).

Other Literature Reviewed:

None

3.1.6 Integrate Affordable and Below Market Rate Housing

Range of Effectiveness: 0.04 – 1.20% vehicle miles traveled (VMT) reduction and therefore 0.04-1.20% reduction in GHG emissions.

Measure Description:

Income has a statistically significant effect on the probability that a commuter will take transit or walk to work [4]. BMR housing provides greater opportunity for lower income families to live closer to jobs centers and achieve jobs/housing match near transit. It also addresses to some degree the risk that new transit oriented development would displace lower income families. This strategy potentially encourages building a greater percentage of smaller units that allow a greater number of families to be accommodated on infill and transit-oriented development sites within a given building footprint and height limit. Lower income families tend to have lower levels of auto ownership, allowing buildings to be designed with less parking which, in some cases, represents the difference between a project being economically viable or not.

Residential development projects of five or more dwelling units will provide a deed-restricted low-income housing component on-site.

Measure Applicability:

- Urban and suburban context
- Negligible impact in a rural context unless transit availability and proximity to jobs/services are existing characteristics
- Appropriate for residential and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage of units in project that are deed-restricted BMR housing

Mitigation Method:

% VMT Reduction = 4% * Percentage of units in project that are deed-restricted BMR housing [1]

Assumptions:

Data based upon the following references:

[1] Nelson\Nygaard, 2005. Crediting Low-Traffic Developments (p.15). http://www.montgomeryplanning.org/transportation/documents/TripGenerationAnalysisUsingURBEMIS.pdf

Criteron Planner/Engineers and Fehr & Peers Associates (2001). Index 4D Method. *A Quick-Response Method of Estimating Travel Impacts from Land-Use Changes*. Technical Memorandum prepared for US EPA, October 2001.

Holtzclaw, John; Clear, Robert; Dittmar, Hank; Goldstein, David; and Haas, Peter (2002), "Location Efficiency: Neighborhood and Socio-Economic Characteristics Determine Auto Ownership and Use – Studies in Chicago, Los Angeles and San Francisco", *Transportation Planning and Technology*, 25 (1): 1-27.

All trips affected are assumed average trip lengths to convert from percentage vehicle trip reduction to VMT reduction (%VT = %VMT)

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[42]
CO_2e	0.04 – 1.20% of running
PM	0.04 – 1.20% of running
CO	0.04 – 1.20% of running
NOx	0.04 – 1.20% of running
SO_2	0.04 – 1.20% of running
ROG	0.024 – 0.72% of total

Discussion:

At a low range, 1% BMR housing is assumed. At a medium range, 15% is assumed (based on the requirements of the San Francisco BMR Program[5]). At a high range, the San Francisco program is doubled to reach 30% BMR. Higher percentages of BMR are possible, though not discussed in the literature or calculated.

[42] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction = 4% * 1% = 0.04%
- High Range % VMT Reduction = 4% * 30% = 1.20%

Preferred Literature:

Nelson\Nygaard [1] provides a 4% reduction in vehicle trips for each deed-restricted BMR unit. This is calculated from Holtzclaw [3], with the following assumptions: 12,000 average annual VMT per vehicle, $33,000 median per capita income (2002 figures per CA State Department of Finance), and average income in BMR units 25% below median. With a coefficient of -0.0565 (estimate for VMT/vehicle as a function of $/capita) from [3], the VMT reduction is 0.0565*33,000*0.25/12,000 = 4%.

Alternative Literature:

- 50% greater transit school trips than higher income households

Fehr & Peers [6] developed Direct Ridership Models to predict the Bay Area Rapid Transit (BART) ridership activity. One of the objectives of this assessment was to understand the land use and system access factors that influence commute period versus off-peak travel on BART. The analysis focused on the Metropolitan Transportation Commission 2000 Bay Area Travel Survey [7], using the data on household travel behavior to extrapolate relationships between household characteristics and BART mode choice. The study found that regardless of distance from BART, lower income households generate at least 50% higher BART use for school trips than higher income households. More research would be needed to provide more applicable information regarding other types of transit throughout the state.

Other Literature Reviewed:

[4] Bento, Antonio M., Maureen L. Cropper, Ahmed Mushfiq Mobarak, and Katja Vinha. 2005. "The Effects of Urban Spatial Structure on Travel Demand in the United States." *The Review of Economics and Statistics* 87,3: 466-478. (cited in Measure Description section)

[5] San Francisco BMR Program: http://www.ci.sf.ca.us/site/moh_page.asp?id=48083 (p.1) (cited in Discussion section).

[6] Fehr & Peers. *Access BART*. 2006.

[7] BATS. 2000. 2000 Bay Area Travel Survey.

3.1.7 Orient Project Toward Non-Auto Corridor

Range of Effectiveness: Grouped strategy. [See LUT-3]

Measure Description:

A project that is designed around an existing or planned transit, bicycle, or pedestrian corridor encourages alternative mode use. For this measure, the project is oriented towards a planned or existing transit, bicycle, or pedestrian corridor. Setback distance is minimized.

The benefits of Orientation toward Non-Auto Corridor have not been sufficiently quantified in the existing literature. This measure is most effective when applied in combination of multiple design elements that encourage this use. There is not sufficient evidence that this measure results in non-negligible trip reduction unless combined with measures described elsewhere in this report, including neighborhood design, density and diversity of development, transit accessibility and pedestrian and bicycle network improvements. Therefore, the trip reduction percentages presented below should be used only as reasonableness checks. They may be used to assess whether, when applied to projects oriented toward non-auto corridors, analysis of all of those other development design factors presented in this report produce trip reductions at least as great as the percentages listed below.

Measure Applicability:

- Urban or suburban context; may be applicable in a master-planned rural community
- Appropriate for residential, retail, office, industrial, and mixed-use projects

Alternative Literature:

Alternate:

- 0.25 – 0.5% reduction in vehicle miles traveled (VMT)

The Sacramento Metropolitan Air Quality Management District (SMAQMD) Recommended Guidance for Land Use Emission Reductions attributes 0.5% reduction for a project oriented towards an *existing* corridor. A 0.25% reduction is attributed for a project oriented towards a *planned* corridor. The planned transit, bicycle, or pedestrian corridor must be in a General Plan, Community Plan, or similar plan.

Alternate:

- 0.5% reduction in VMT per 1% improvement in transit frequency
- 0.5% reduction in VMT per 10% increase in transit ridership

The *Center for Clean Air Policy (CCAP) Guidebook* [2] attributes a 0.5 % reduction per 1% improvement in transit frequency. Based on a case study presented in the CCAP report, a 10% increase in transit ridership would result in a 0.5% reduction. (This information is based on a TIAX review for SMAQMD).

The sources cited above reflect existing guidance rather than empirical studies.

Alternative Literature References:

[1] Sacramento Metropolitan Air Quality Management District (SMAQMD). "Recommended Guidance for Land Use Emission Reductions." http://www.airquality.org/ceqa/GuidanceLUEmissionReductions.pdf

[2] Center for Clean Air Policy (CCAP). *Transportation Emission Guidebook*. http://www.ccap.org/safe/guidebook/guide_complete.html
TIAX Results of 2005 Literature Search Conducted by TIAX on behalf of SMAQMD

Other Literature Reviewed:

None

3.1.8 Locate Project near Bike Path/Bike Lane

Range of Effectiveness: Grouped strategy. [See LUT-4]

Measure Description:

A Project that is designed around an existing or planned bicycle facility encourages alternative mode use. The project will be located within 1/2 mile of an existing Class I path or Class II bike lane. The project design should include a comparable network that connects the project uses to the existing offsite facilities.

This measure is most effective when applied in combination of multiple design elements that encourage this use. Refer to Increase Destination Accessibility (LUT-4) strategy. The benefits of Proximity to Bike Path/Bike Lane are small as a standalone strategy. The strategy should be grouped with the Increase Destination Accessibility strategy to increase the opportunities for multi-modal travel.

Measure Applicability:

- Urban or suburban context; may be applicable in a rural master planned community
- Appropriate for residential, retail, office, industrial, and mixed-use projects

Alternative Literature:

Alternate:

- 0.625% reduction in vehicle miles traveled (VMT)

As a rule of thumb, the *Center for Clean Air Policy (CCAP) Guidebook* [1] attributes a 1% to 5% reduction associated with comprehensive bicycle programs. Based on the CCAP guidebook, the TIAX report allots 2.5% reduction for all bicycle-related measures and a 1/4 of that for this measure alone. (This information is based on a TIAX review for SMAQMD).

Alternative Literature References:

[1] Center for Clean Air Policy (CCAP). *Transportation Emission Guidebook*. http://www.ccap.org/safe/guidebook/guide_complete.html; TIAX Results of 2005 Literature Search Conducted by TIAX on behalf of SMAQMD.

Other Literature Reviewed:

None

3.1.9 Improve Design of Development

Range of Effectiveness: 3.0 – 21.3% vehicle miles traveled (VMT) reduction and therefore 3.0-21.3% reduction in GHG emissions.

Measure Description:

The project will include improved design elements to enhance walkability and connectivity. Improved street network characteristics within a neighborhood include street accessibility, usually measured in terms of average block size, proportion of four-way intersections, or number of intersections per square mile. Design is also measured in terms of sidewalk coverage, building setbacks, street widths, pedestrian crossings, presence of street trees, and a host of other physical variables that differentiate pedestrian-oriented environments from auto-oriented environments.

Measure Applicability:

- Urban and suburban context
- Negligible impact in a rural context
- Appropriate for residential, retail, office, industrial and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Number of intersections per square mile

Mitigation Method:

$$\% \text{ VMT Reduction} = \text{Intersections} * B$$

Where

Intersections = Percentage increase in intersections versus a typical ITE suburban development

$$= \frac{\text{Intersections per square mile of project} - \text{Intersections per square mile of typical ITE suburban development}}{\text{Intersections per square mile of typical ITE suburban development}}$$

$$= \frac{\text{Intersections per square mile of project} - 36}{36}$$

See Appendix C for detail [not to exceed 500% increase]

B = Elasticity of VMT with respect to percentage of intersections (0.12 from [1])

Assumptions:

Data based upon the following references:

[1] Ewing, R., and Cervero, R., "Travel and the Built Environment - A Meta-Analysis." *Journal of the American Planning Association*, <to be published> (2010). Table 4.

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[43]
CO_2e	3.0 – 21.3% of running
PM	3.0 – 21.3% of running
CO	3.0 – 21.3% of running
NOx	3.0 – 21.3% of running
SO_2	3.0 – 21.3% of running
ROG	1.8 – 12.8% of total

Discussion:

The VMT reductions for this strategy are based on changes in intersection density versus the standard suburban intersection density in North America. This standard density is used as a baseline to mirror the density reflected in the *ITE Trip Generation Manual*, which is the baseline method for determining VMT.

The calculations in the Example section look at a low and high range of intersection densities. The low range is simply a slightly higher density than the typical ITE

[43] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

development. The high range uses an average intersection density of mixed use/transit-oriented development sites (TOD Site surveys in the Bay Area for *Candlestick-Hunters Point Phase II TIA,* Fehr & Peers, 2009).

There are two separate maxima noted in the fact sheet: a cap of 500% on the allowable percentage increase of intersections per square mile (variable A) and a cap of 30% on % VMT reduction. The rationale for the 500% cap is that there are diminishing returns to any change in environment. For example, it is reasonably doubtful that increasing intersection density by a factor of six instead of five would produce any additional change in travel behavior. The purpose for the 30% cap is to limit the influence of any single environmental factor (such as design). This emphasizes that community designs that implement multiple land use strategies (such as density, design, diversity, etc.) will show more of a reduction than relying on improvements from a single land use factor.

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction (45 intersections per square mile) = (45 – 36) / 36 * 0.12 = 3.0%
- High Range % VMT Reduction (100 intersections per square mile) = (100 – 36) / 36 * 0.12 = 21.3%

Preferred Literature:

- -0.12 = elasticity of VMT with respect to design (intersection/street density)
- -0.12 = elasticity of VMT with respect to design (% of 4-way intersections)

Ewing and Cervero's [1] synthesis showed a strong relationship of VMT to design elements, second only to destination accessibility. The weighted average elasticity of VMT to intersection/street density was -0.12 (looking at six studies). The weighted average elasticity of VMT to percentage of 4-way intersections was -0.12 (looking at four studies, of which one controlled for self-selection[44]).

Alternative Literature:

Alternate:

- 2-19% reduction in VMT

[44] Self selection occurs when residents or employers that favor travel by non-auto modes choose locations where this type of travel is possible. They are therefore more inclined to take advantage of the available options than a typical resident or employee might otherwise be.

Growing Cooler [2] looked at various reports which studied the effect of site design on VMT, showing a range of 2-19% reduction in VMT. In each case, alternative development plans for the same site were compared to a baseline or trend plan. Results suggest that VMT and CO_2 per capita decline as site density increases as well as the mix of jobs, housing, and retail uses become more balanced. *Growing Cooler* notes that the limited number of studies, differences in assumptions and methodologies, and variability of results make it difficult to generalize.

Alternate:

- 3 – 17% shift in mode share from auto to non-auto

The Marshall and Garrick paper [3] analyzes the differences in mode shares for grid and non-grid ("tree") neighborhoods. For a city with a tributary tree street network, a neighborhood with a tree network had auto mode share of 92% while a neighborhood with a grid network had auto mode share of 89% (3% difference). For a city with a tributary radial street network, a tree neighborhood had auto mode share of 97% while a grid neighborhood had auto mode share of 84% (13% difference). For a city with a grid network, a tree neighborhood had auto mode share of 95% while a grid neighborhood had auto mode share of 78% (17% difference). The research is based on 24 California cities with populations between 30,000 and 100,000.

Alternative Literature References:

[2] Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change. Urban Land Institute.

[3] Marshall and Garrick, 2009. "The Effect of Street Network Design on Walking and Biking." Submitted to the 89th Annual Meeting of Transportation Research Board, January 2010. (Table 3)

Other Literature Reviewed:

None

3.2 Neighborhood/Site Enhancements

3.2.1 Provide Pedestrian Network Improvements

Range of Effectiveness: 0 - 2% vehicle miles traveled (VMT) reduction and therefore 0 - 2% reduction in GHG emissions.

Measure Description:

Providing a pedestrian access network to link areas of the Project site encourages people to walk instead of drive. This mode shift results in people driving less and thus a reduction in VMT. The project will provide a pedestrian access network that internally links all uses and connects to all existing or planned external streets and pedestrian facilities contiguous with the project site. The project will minimize barriers to pedestrian access and interconnectivity. Physical barriers such as walls, landscaping, and slopes that impede pedestrian circulation will be eliminated.

Measure Applicability:

- Urban, suburban, and rural context
- Appropriate for residential, retail, office, industrial and mixed-use projects
- Reduction benefit only occurs if the project has both pedestrian network improvements on site and connections to the larger off-site network.

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The project applicant must provide information regarding pedestrian access and connectivity within the project and to/from off-site destinations.

Mitigation Method:

Estimated VMT Reduction	Extent of Pedestrian Accommodations	Context
2%	Within Project Site and Connecting Off-Site	Urban/Suburban
1%	Within Project Site	Urban/Suburban
< 1%	Within Project Site and Connecting Off-Site	Rural

Assumptions:

Data based upon the following references:

- Center for Clean Air Policy (CCAP) Transportation Emission Guidebook. http://www.ccap.org/safe/guidebook/guide_complete.html (accessed March 2010)
- 1000 Friends of Oregon (1997) "Making the Connections: A Summary of the LUTRAQ Project" (p. 16): http://www.onethousandfriendsoforegon.org/resources/lut_vol7.html

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[45]
CO_2e	0 - 2% of running
PM	0 - 2% of running
CO	0 - 2% of running
NOx	0 - 2% of running
SO_2	0 - 2% of running
ROG	0 – 1.2% of total

Discussion:

As detailed in the preferred literature section below, the lower range of 1 – 2% VMT reduction was pulled from the literature to provide a conservative estimate of reduction potential. The literature does not speak directly to a rural context, but an assumption was made that the benefits will likely be lower than a suburban/urban context.

Example:

N/A – calculations are not needed.

Preferred Literature:

[45] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

- 1 - 2% reduction in VMT

The Center for Clean Air Policy (CCAP) attributes a 1% reduction in VMT from pedestrian-oriented design assuming this creates a 5% decrease in automobile mode share (e.g. auto split shifts from 95% to 90%). This mode split is based on the Portland Regional Land Use Transportation and Air Quality (LUTRAQ) project. The LUTRAQ analysis also provides the high end of 10% reduction in VMT. This 10% assumes the following features:

– Compact, mixed-use communities
– Interconnected street network
– Narrower roadways and shorter block lengths
– Sidewalks
– Accessibility to transit and transit shelters
– Traffic calming measures and street trees
– Parks and public spaces

Other strategies (development density, diversity, design, transit accessibility, traffic calming) are intended to account for the effects of many of the measures in the above list. Therefore, the assumed effectiveness of the Pedestrian Network measure should utilize the lower end of the 1 - 10% reduction range. If the pedestrian improvements are being combined with a significant number of the companion strategies, trip reductions for those strategies should be applied as well, based on the values given specifically for those strategies in other sections of this report. Based upon these findings, and drawing upon recommendations presented in the alternate literature below, the recommended VMT reduction attributable to pedestrian network improvements, above and beyond the benefits of other measures in the above bullet list, should be 1% for comprehensive pedestrian accommodations within the development plan or project itself, or 2% for comprehensive internal accommodations and external accommodations connecting to off-site destinations.

Alternative Literature:

Alternate:

- Walking is three times more common with enhanced pedestrian infrastructure
- 58% increase in non-auto mode share for work trips

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MP# **LU-4**

SDT-1

Neighborhood / Site Enhancement

The Nelson\Nygaard [1] report for the City of Santa Monica Land Use and Circulation Element EIR summarized studies looking at pedestrian environments. These studies have found a direct connection between non-auto forms of travel and a high quality pedestrian environment. Walking is three times more common with communities that have pedestrian friendly streets compared to less pedestrian friendly communities. Non-auto mode share for work trips is 49% in a pedestrian friendly community, compared to 31% in an auto-oriented community. Non-auto mode share for non-work trips is 15%, compared to 4% in an auto-oriented community. However, these effects also depend upon other aspects of the pedestrian friendliness being present, which are accounted for separately in this report through land use strategy mitigation measures such as density and urban design.

Alternate:

- 0.5% - 2.0% reduction in VMT

The Sacramento Metropolitan Air Quality Management District (SMAQMD) Recommended Guidance for Land Use Emission Reductions [2] attributes 1% reduction for a project connecting to *existing* external streets and pedestrian facilities. A 0.5% reduction is attributed to connecting to *planned* external streets and pedestrian facilities (which must be included in a pedestrian master plan or equivalent). Minimizing pedestrian barriers attribute an additional 1% reduction in VMT. These recommendations are generally in line with the recommended discounts derived from the preferred literature above.

Preferred and Alternative Literature Notes:

[1] Nelson\Nygaard, 2010. City of Santa Monica Land Use and Circulation Element EIR Report, Appendix – Santa Monica Luce Trip Reduction Impacts Analysis (p.401). http://www.shapethefuture2025.net/

Nelson\Nygaard looked at the following studies: Anne Vernez Moudon, Paul Hess, Mary Catherine Snyder and Kiril Stanilov (2003), Effects of Site Design on Pedestrian Travel in Mixed Use, Medium-Density Environments, http://www.wsdot.wa.gov/research/reports/fullreports/432.1.pdf; Robert Cervero and Carolyn Radisch (1995), Travel Choices in Pedestrian Versus Automobile Oriented Neighborhoods, http://www.uctc.net/papers/281.pdf;

[2] Sacramento Metropolitan Air Quality Management District (SMAQMD) Recommended Guidance for Land Use Emission Reductions. (p. 11) http://www.airquality.org/ceqa/GuidanceLUEmissionReductions.pdf

Other Literature Reviewed:

None

3.2.2 Provide Traffic Calming Measures

Range of Effectiveness: 0.25 – 1.00% vehicle miles traveled (VMT) reduction and therefore 0.25 – 1.00% reduction in GHG emissions.

Measure Description:

Providing traffic calming measures encourages people to walk or bike instead of using a vehicle. This mode shift will result in a decrease in VMT. Project design will include pedestrian/bicycle safety and traffic calming measures in excess of jurisdiction requirements. Roadways will be designed to reduce motor vehicle speeds and encourage pedestrian and bicycle trips with traffic calming features. Traffic calming features may include: marked crosswalks, count-down signal timers, curb extensions, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, chicanes/chokers, and others.

Measure Applicability:

- Urban, suburban, and rural context
- Appropriate for residential, retail, office, industrial and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage of streets within project with traffic calming improvements
- Percentage of intersections within project with traffic calming improvements

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MP# **LU-1.6**

SDT-2

Neighborhood / Site Enhancement

Mitigation Method:

		% of streets with improvements			
		25%	*50%*	*75%*	*100%*
		% VMT Reduction			
% of intersections with improvements	*25%*	**0.25%**	**0.25%**	**0.5%**	**0.5%**
	50%	**0.25%**	**0.5%**	**0.5%**	**0.75%**
	75%	**0.5%**	**0.5%**	**0.75%**	**0.75%**
	100%	**0.5%**	**0.75%**	**0.75%**	**1%**

Assumptions:

Data based upon the following references:

[1] Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.*(p. B-25) http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendices_Complete_102209.pdf

[2] Sacramento Metropolitan Air Quality Management District (SMAQMD) *Recommended Guidance for Land Use Emission Reductions.* (p.13) http://www.airquality.org/ceqa/GuidanceLUEmissionReductions.pdf

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[46]
CO_2e	0.25 – 1.00% of running
PM	0.25 – 1.00% of running
CO	0.25 – 1.00% of running
NOx	0.25 – 1.00% of running
SO_2	0.25 – 1.00% of running
ROG	0.15 – 0.6% of total

Discussion:

The table above allows the Project Applicant to choose a range of street and intersection improvements to determine an appropriate VMT reduction estimate. The Applicant will look at the rows on the left and choose the percent of intersections within

[46] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

the project which will have traffic calming improvements. Then, the Applicant will look at the columns along the top and choose the percent of streets within the project which will have traffic calming improvements. The intersection cell of the row and column selected in the matrix is the VMT reduction estimate.

Though the literature provides some difference between a suburban and urban context, the difference is small and thus a conservative estimate was used to be applied to all contexts. Rural context is not specifically discussed in the literature but is assumed to have similar impacts.

For a low range, a project is assumed to have 25% of its streets with traffic calming improvements and 25% of its intersections with traffic calming improvements. For a high range, 100% of streets and intersections are assumed to have traffic calming improvements

Example:

N/A - No calculations needed.

Preferred Literature:

- -0.03 = elasticity of VMT with respect to a pedestrian environment factor (PEF)
- 1.5% - 2.0% reduction in suburban VMT
- 0.5% - 0.6% reduction in urban VMT

Moving Cooler [1] looked at Ewing's synthesis elasticity from the Smart Growth INDEX model (-0.03) to estimate VMT reduction for a suburban and urban location. The estimated reduction in VMT came from looking at the difference between the VMT results for Moving Cooler's strategy of pedestrian accessibility only compared to an aggressive strategy of pedestrian accessibility and traffic calming.

The Sacramento Metropolitan Air Quality Management District (SMAQMD) *Recommended Guidance for Land Use Emission Reductions* [2] attributes 0.25 – 1% of VMT reductions to traffic calming measures. The table above illustrates the range of VMT reductions based on the percent of streets and intersections with traffic calming measures implemented. This range of reductions is recommended because it is generally consistent with the effectiveness ranges presented in the other preferred literature for situations in which the effects of traffic calming are distinguished from the other measures often found to co-exist with calming, and because it provides graduated effectiveness estimates depending on the degree to which calming is implemented.

Alternative Literature:

None

Transportation

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MP# **LU-1.6**

SDT-2

Neighborhood / Site Enhancement

Alternative Literature References:

None

Other Literature Reviewed:

None

3.2.3 Implement a Neighborhood Electric Vehicle (NEV) Network

Range of Effectiveness: 0.5-12.7% vehicle miles traveled (VMT) reduction since Neighborhood Electric Vehicles (NEVs) would result in a mode shift and therefore reduce the traditional vehicle VMT and GHG emissions[47]. Range depends on the available NEV network and support facilities, NEV ownership levels, and the degree of shift from traditional

Measure Description:

The project will create local "light" vehicle networks, such as NEV networks. NEVs are classified in the California Vehicle Code as a “low speed vehicle”. They are electric powered and must conform to applicable federal automobile safety standards. NEVs offer an alternative to traditional vehicle trips and can legally be used on roadways with speed limits of 35 MPH or less (unless specifically restricted). They are ideal for short trips up to 30 miles in length. To create an NEV network, the project will implement the necessary infrastructure, including NEV parking, charging facilities, striping, signage, and educational tools. NEV routes will be implemented throughout the project and will double as bicycle routes.

Measure Applicability:

- Urban, suburban, and rural context
- Small citywide or large multi-use developments
- Appropriate for mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

[47] Transit vehicles may also result in increases in emissions that are associated with electricity production or fuel use. The Project Applicant should consider these potential additional emissions when estimating mitigation for these measures.

Inputs:

The following information needs to be provided by the Project Applicant:

- low vs. high penetration

Mitigation Method:

$$\% \text{ VMT reduction} = \text{Pop} * \text{Number} * \text{NEV}$$

Where

Penetration	=	Number of NEVs per household (0.04 to 1.0 from [1])
NEV	=	VMT reduction rate per household (12.7% from [2])

Assumptions:

Data based upon the following reference:

[1] City of Lincoln, MHM Engineers & Surveyors, *Neighborhood Electric Vehicle Transportation Program Final Report*, Issued 04/05/05
[2] City of Lincoln, *A Report to the California Legislature as required by Assembly Bill 2353, Neighborhood Electric Vehicle Transportation Plan Evaluation,* January 1, 2008.

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[48]
CO_2e	0.5 – 12.7% of running
PM	0.5 – 12.7% of running
CO	0.5 – 12.7%of running
NOx	0.5 – 12.7% of running
SO_2	0.5 – 12.7% of running
ROG	0.3 – 7.6% of total

Discussion:

The estimated number of NEVs per household may vary based on what the project estimates as a penetration rate for implementing an NEV network. Adjust according to project characteristics. The estimated reduction in VMT is for non-NEV miles traveled. The calculations below assume that NEV miles traveled replace regular vehicle travel.

[48] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

This may not be the case and the project should consider applying an appropriate discount rate on what percentage of VMT is actually replaced by NEV travel..

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction (low penetration) = 0.04 * 12.7% = 0.5%
- High Range % VMT Reduction (high penetration) = 1.0 * 12.7% = 12.7%

Preferred Literature:

- 12.7% reduction in VMT per household
- Penetration rates: 0.04 to 1 NEV / household

The NEV Transportation Program plans to implement the following strategies: charging facilities, striping, signage, parking, education on NEV safety, and NEV/bicycle lines throughout the community. . One estimate of current NEV ownership reported roughly 600 NEVs in the city of Lincoln in 2008[49]. With current estimated households of ~13,500[50], a low estimate of NEV penetration would be 0.04 NEV per household. A high NEV penetration can be estimated at 1 NEV per household. The 2007 survey of NEV users in Lincoln revealed an average use of about 3,500 miles per year [2]. With an estimated annual 27,500 VMT/household[51], this results in a 12.7% reduction in VMT per household.

Alternative Literature:

- 0.5% VMT reduction for neighborhoods with internal NEV connections
- 1% VMT reduction for internal and external connections to surrounding neighborhoods
- 1.5% VMT reduction for internal NEV connections and connections to other existing NEV networks serving all other types of uses.

The Sacramento Metropolitan Air Quality Management District (SMAQMD) Recommended Guidance for Land Use Emission Reductions notes that current studies show NEVs do not replace gas-fueled vehicles as the primary vehicle. For the purpose

[49] Lincoln, California: A NEV-Friendly Community, Bennett Engineering, the City of Lincoln, and LincolnNEV, August 28, 2008 - http://electrickmotorsports.com/news.php
[50] SACOG Housing Estimates Statistics (http://www.sacog.org/about/advocacy/pdf/fact-sheets/HousingStats.pdf). Linearly interpolated 2008 household numbers between 2005 and 2035 projections.
[51] SACOG SACSim forecasts for VMT per household at 75.4 daily VMT per household * 365 days = 27521 annual VMT per household

of providing incentives for developers to promote NEV use, a project will receive the above listed VMT reductions for implementation.

Alternative Literature Reference:

[1] Sacramento Metropolitan Air Quality Management District (SMAQMD) Recommended Guidance for Land Use Emission Reductions. (p. 21) http://www.airquality.org/ceqa/GuidanceLUEmissionReductions.pdf

Other Literature Reviewed:

None

3.2.4 Create Urban Non-Motorized Zones

Range of Effectiveness: Grouped strategy. [See SDT-1]

Measure Description:

The project, if located in a central business district (CBD) or major activity center, will convert a percentage of its roadway miles to transit malls, linear parks, or other non-motorized zones. These features encourage non-motorized travel and thus a reduction in VMT.

This measure is most effective when applied with multiple design elements that encourage this use. Refer to Pedestrian Network Improvements (SDT-1) strategy for ranges of effectiveness in this category. The benefits of Urban Non-Motorized Zones alone have not been shown to be significant.

Measure Applicability:

- Urban context
- Appropriate for residential, retail, office, industrial, and mixed-use projects

Alternative Literature:

Alternate:

- 0.01 – 0.2% annual Vehicle Miles Traveled (VMT) reduction

Moving Cooler [1] assumes 2 – 6% of U.S. CBDs/activity centers will convert to non-motorized zones for the purpose of calculating the potential impact. At full implementation, this would result in a range of CBD/activity center annual VMT reduction of 0.07-0.2% and metro VMT reduction of 0.01-0.03%.

Alternate:

Pucher, Dill, and Handy (2010) [2] note several international case studies of urban non-motorized zones. In Bologna, Italy, vehicle traffic declined by 50%, and 8% of those arriving in the CBD came by bicycle after the conversion. In Lubeck, Germany, of those who used to drive, 12% switched to transit, walking, or bicycling with the conversion. In Aachen, Germany, car travel declined from 44% to 36%, but bicycling stayed constant at 3%

Notes:

No literature was identified that quantifies the benefits of this strategy at a smaller scale.

Alternative Literature References:

[1] Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf

[2] Pucher J., Dill, J., and Handy, S. *Infrastructure, Programs and Policies to Increase Bicycling: An International Review.* February 2010. *Preventive Medicine 50 (2010) S106–S125.* http://policy.rutgers.edu/faculty/pucher/Pucher_Dill_Handy10.pdf

Other Literature Reviewed:

None

3.2.5 Incorporate Bike Lane Street Design (on-site)

Range of Effectiveness: Grouped strategy. [See LUT-9]

Measure Description:

The project will incorporate bicycle lanes, routes, and shared-use paths into street systems, new subdivisions, and large developments. These on-street bike accommodations will be created to provide a continuous network of routes, facilitated with markings and signage. These improvements can help reduce peak-hour vehicle trips by making commuting by bike easier and more convenient for more people. In addition, improved bicycle facilities can increase access to and from transit hubs, thereby expanding the "catchment area" of the transit stop or station and increasing ridership. Bicycle access can also reduce parking pressure on heavily-used and/or heavily-subsidized feeder bus lines and auto-oriented park-and-ride facilities.

Refer to Improve Design of Development (LUT-9) strategy for overall effectiveness levels. The benefits of Bike Lane Street Design are small and should be grouped with the Improve Design of Development strategy to strengthen street network characteristics and enhance multi-modal environments.

Measure Applicability:

- Urban and suburban context
- Appropriate for residential, retail, office, industrial, and mixed-use projects

Alternative Literature:

Alternate:

- 1% increase in share of workers commuting by bicycle (for each additional mile of bike lanes per square mile)

Dill and Carr (2003) [1] showed that each additional mile of Type 2 bike lanes per square mile is associated with a 1% increase in the share of workers commuting by bicycle. Note that increasing by 1 mile is significant compared to the current average of 0.34 miles per square mile. Also, an increase in 1% in share of bicycle commuters would double the number of bicycle commuters in many areas with low existing bicycle mode share.

Alternate:

- 0.05 – 0.14% annual greenhouse gas (GHG) reduction
- 258 – 830% increase in bicycle community

Moving Cooler [2], based off of a national baseline, estimates 0.05% annual reduction in GHG emissions and 258% increase in bicycle commuting assuming 2 miles of bicycle

lanes per square mile in areas with density > 2,000 persons per square mile. For 4 miles of bicycle lanes, estimates 0.09% GHG reductions and 449% increase in bicycle commuting. For 8 miles of bicycle lanes, estimates 0.14% GHG reductions and 830% increase in bicycle commuting. Companion strategies assumed include bicycle parking at commercial destinations, busses fitted with bicycle carriers, bike accessible rapid transit lines, education, bicycle stations, end-trip facilities, and signage.

Alternate:

- 0.075% increase in bicycle commuting with each mile of bikeway per 100,000 residents

A before-and-after study by Nelson and Allen (1997) [3] of bicycle facility implementation found that each mile of bikeway per 100,000 residents increases bicycle commuting 0.075%, all else being equal.

Alternative Literature References:

[1] Dill, Jennifer and Theresa Carr (2003). "Bicycle Commuting and Facilities in Major U.S. Cities: If You Build Tem, Commuters Will Use Them – Another Look." *TRB 2003 Annual Meeting CD-ROM*.

[2] Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf

[3] Nelson, Arthur and David Allen (1997). "If You Build Them, Commuters Will Use Them; Cross-Sectional Analysis of Commuters and Bicycle Facilities." *Transportation Research Record 1578.*

Other Literature Reviewed:

None

3.2.6 Provide Bike Parking in Non-Residential Projects

Range of Effectiveness: Grouped strategy. [See LUT-9]

Measure Description:

A non-residential project will provide short-term and long-term bicycle parking facilities to meet peak season maximum demand. Refer to Improve Design of Development (LUT-9) strategy for overall effectiveness ranges. Bike Parking in Non-Residential Projects has minimal impacts as a standalone strategy and should be grouped with the Improve Design of Development strategy to encourage bicycling by providing strengthened street network characteristics and bicycle facilities.

Measure Applicability:

- Urban, suburban, and rural contexts
- Appropriate for retail, office, industrial, and mixed-use projects

Alternative Literature:

Alternate:

- 0.625% reduction in Vehicle Miles Traveled (VMT)

As a rule of thumb, the Center for Clean Air Policy (CCAP) guidebook [1] attributes a 1% to 5% reduction in VMT to the use of bicycles, which reflects the assumption that their use is typically for shorter trips. Based on the *CCAP Guidebook*, the TIAX report allots 2.5% reduction for all bicycle-related measures and a quarter of that for this bicycle parking alone. (This information is based on a TIAX review for Sacramento Metropolitan Air Quality Management District (SMAQMD).)

Alternate:

- 0.05 – 0.14% annual greenhouse gas (GHG) reduction
- 258 – 830% increase in bicycle community

Moving Cooler [2], based off of a national baseline, estimates 0.05% annual reduction in GHG emissions and 258% increase in bicycle commuting assuming 2 miles of bicycle lanes per square mile in areas with density > 2,000 persons per square mile. For 4 miles of bicycle lanes, *Moving Cooler* estimates 0.09% GHG reductions and 449% increase in bicycle commuting. For 8 miles of bicycle lanes, *Moving Cooler* estimates 0.14% GHG reductions and 830% increase in bicycle commuting. Companion strategies assumed include bicycle parking at commercial destinations, busses fitted with bicycle carriers, bike accessible rapid transit lines, education, bicycle stations, end-trip facilities, and signage.

Alternative Literature References:

[1]*Center For Clean Air Policy (CCAP) Transportation Emission Guidebook*. http://www.ccap.org/safe/guidebook/guide_complete.html; Based on results of 2005 literature search conducted by TIAX on behalf of SMAQMD.

[2] Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf

Other Literature Reviewed:

None

3.2.7 Provide Bike Parking with Multi-Unit Residential Projects

Range of Effectiveness: Grouped strategy. [See LUT-9]

Measure Description:

Long-term bicycle parking will be provided at apartment complexes or condominiums without garages. Refer to Improve Design of Development (LUT-9) strategy for effectiveness ranges in this category. The benefits of Bike Parking with Multi-Unit Residential Projects have no quantified impacts and should be grouped with the Improve Design of Development strategy to encourage bicycling by providing strengthened street network characteristics and bicycle facilities.

Measure Applicability:

- Urban, suburban, or rural contexts
- Appropriate for residential projects

Alternative Literature:

No literature was identified that specifically looks at the quantitative impact of including bicycle parking at multi-unit residential sites.

Alternative Literature References:

None

Other Literature Reviewed:

None

3.2.8 Provide Electric Vehicle Parking

Range of Effectiveness: Grouped strategy. [See SDT-3]

Measure Description:

This project will implement accessible electric vehicle parking. The project will provide conductive/inductive electric vehicle charging stations and signage prohibiting parking for non-electric vehicles. Refer to Neighborhood Electric Vehicle Network (SDT-3) strategy for effectiveness ranges in this category. The benefits of Electric Vehicle Parking may be quantified when grouped with the use of electric vehicles and or Neighborhood Electric Vehicle Network.

Measure Applicability:

- Urban or suburban contexts
- Appropriate for residential, retail, office, mixed use, and industrial projects

Alternative Literature:

No literature was identified that specifically looks at the quantitative impact of implementing electric vehicle parking.

Alternative Literature References:

None

Other Literature Reviewed:

None

3.2.9 Dedicate Land for Bike Trails

Range of Effectiveness: Grouped strategy. [See LUT-9]

Measure Description:

Larger projects may be required to provide for, contribute to, or dedicate land for the provision of off-site bicycle trails linking the project to designated bicycle commuting routes in accordance with an adopted citywide or countywide bikeway plan.

Refer to Improve Design of Development (LUT-9**)** strategy for ranges of effectiveness in this category. The benefits of Land Dedication for Bike Trails have not been quantified and should be grouped with the Improve Design of Development strategy to strengthen street network characteristics and improve connectivity to off-site bicycle networks.

Measure Applicability:

- Urban, suburban, or rural contexts
- Appropriate for large residential, retail, office, mixed use, and industrial projects

Alternative Literature:

No literature was identified that specifically looks at the quantitative impact of implementing land dedication for bike trails.

Alternative Literature References:

None

Other Literature Reviewed:

None

3.3 Parking Policy/Pricing

3.3.1 Limit Parking Supply

Range of Effectiveness: 5 – 12.5% vehicle miles travelled (VMT) reduction and therefore 5 – 12.5% reduction in GHG emissions.

Measure Description:

The project will change parking requirements and types of supply within the project site to encourage "smart growth" development and alternative transportation choices by project residents and employees. This will be accomplished in a multi-faceted strategy:

- Elimination (or reduction) of minimum parking requirements[52]
- Creation of maximum parking requirements
- Provision of shared parking

Measure Applicability:

- Urban and suburban context
- Negligible in a rural context
- Appropriate for residential, retail, office, industrial and mixed-use projects
- Reduction can be counted only if spillover parking is controlled (via residential permits and on-street market rate parking) [See PPT-5 and PPT-7]

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled
$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- ITE parking generation rate for project site
- Actual parking provision rate for project site

[52] This may require changes to local ordinances and regulations.

Mitigation Method:

$$\% \text{ VMT Reduction} = \frac{\text{Actual parking provision} - \text{ITE parking generation rate}}{\text{ITE parking generation rate}} \times 0.5$$

Assumptions:

Data based upon the following references:

[1] Nelson\Nygaard, 2005. Crediting Low-Traffic Developments (p. 16) http://www.montgomeryplanning.org/transportation/documents/TripGenerationAnalysisUsingURBEMIS.pdf

All trips affected are assumed average trip lengths to convert from percentage vehicle trip reduction to VMT reduction (% vehicle trips = %VMT).

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[53]
CO_2e	5 – 12.5% of running
PM	5 – 12.5% of running
CO	5 – 12.5% of running
NOx	5 – 12.5% of running
SO_2	5 – 12.5% of running
ROG	3 – 7.5% of total

Discussion:

The literature suggests that a 50% reduction in conventional parking provision rates (per ITE rates) should serve as a typical ceiling for the reduction calculation. The upper range of VMT reduction will vary based on the size of the development (total number of spaces provided). ITE rates are used as baseline conditions to measure the effectiveness of this strategy.

Though not specifically documented in the literature, the degree of effectiveness of this measure will vary based on the level of urbanization of the project and surrounding areas, level of existing transit service, level of existing pedestrian and bicycle networks and other factors which would complement the shift away from single-occupant vehicle travel.

[53] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis.

Example:

If the ITE parking generation rate for the project is 100 spaces, for a low range a 5% reduction in spaces is assumed. For a high range a 25% reduction in spaces is assumed.

- Low range % VMT Reduction = [(100 - 95)/100] * 0.5 = 2.5%
- High range % VMT Reduction = [(100 - 75)/100] * 0.5 = 12.5%

Preferred Literature:

To develop this model, Nelson\Nygaard [1] used the Institute of Transportation Engineers' *Parking Generation* handbook as the baseline figure for parking supply. This is assumed to be unconstrained demand. Trip reduction should only be credited if measures are implemented to control for spillover parking in and around the project, such as residential parking permits, metered parking, or time-limited parking.

Alternative Literature:

- 100% increase in transit ridership
- 100% increase in transit mode share

According to *TCRP Report 95, Chapter 18* [2], the central business district of Portland, Oregon implemented a maximum parking ratio of 1 space per 1,000 square feet of new buildings and implemented surface lot restrictions which limited conditions where buildings could be razed for parking. A "before and after" study was not conducted specifically for the maximum parking requirements and data comes from various surveys and published reports. Based on rough estimates the approximate parking ratio of 3.4 per 1,000 square feet in 1973 (for entire downtown) had been reduce to 1.5 by 1990. Transit mode share increased from 20% to 40%. The increases in transit ridership and mode share are not solely from maximum parking requirements. Other companion strategies, such as market parking pricing and high fuel costs, were in place.

Alternative Literature Sources:

[1] TCRP Report 95, Chapter 18: Parking Management and Supply: Traveler Response to *Transportation System Changes*. (p. 18-6) http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_95c18.pdf

Other Literature Reviewed:

None

3.3.2 Unbundle Parking Costs from Property Cost

Range of Effectiveness: 2.6 – 13% vehicles miles traveled (VMT) reduction and therefore 2.6 – 13% reduction in GHG emissions.

Measure Description:

This project will unbundle parking costs from property costs. Unbundling separates parking from property costs, requiring those who wish to purchase parking spaces to do so at an additional cost from the property cost. This removes the burden from those who do not wish to utilize a parking space. Parking will be priced separately from home rents/purchase prices or office leases. An assumption is made that the parking costs are passed through to the vehicle owners/drivers utilizing the parking spaces.

Measure Applicability:

- Urban and suburban context
- Negligible impact in a rural context
- Appropriate for residential, retail, office, industrial and mixed-use projects
- Complementary strategy includes Workplace Parking Pricing. Though not required, implementing workplace parking pricing ensures the market signal from unbundling parking is transferred to the employee.

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Monthly parking cost for project site

Mitigation Method:

% Reduction in VMT = Change in vehicle cost * elasticity * A

Where:

- -0.4 = elasticity of vehicle ownership with respect to total vehicle costs (lower end per VTPI)
- Change in vehicle cost = monthly parking cost * (12 / $4,000), with $4,000 representing the annual vehicle cost per VTPI [1]
- A: 85% = adjustment from vehicle ownership to VMT (see Appendix C for detail)

Assumptions:

Data based upon the following references:

[1] Victoria Transport Policy Institute, *Parking Requirement Impacts on Housing Affordability;* http://www.vtpi.org/park-hou.pdf; January 2009; accessed March 2010. (Annual/monthly parking fees estimated by VTPI in 2009) (p. 8, Table 3)

- For the elasticity of vehicle ownership, VTPI cites Phil Goodwin, Joyce Dargay and Mark Hanly (2003), *Elasticities Of Road Traffic And Fuel Consumption With Respect To Price And Income: A Review*, ESRC Transport Studies Unit, University College London (www.transport.ucl.ac.uk), commissioned by the UK Department of the Environment, Transport and the Regions (now UK Department for Transport); J.O. Jansson (1989), "Car Demand Modeling and Forecasting," *Journal of Transport Economics and Policy*, May 1989, pp. 125-129; Stephen Glaister and Dan Graham (2000), *The Effect of Fuel Prices on Motorists*, AA Motoring Policy Unit (www.theaa.com) and the UK Petroleum Industry Association (http://195.167.162.28/policyviews/pdf/effect_fuel_prices.pdf); and Thomas F. Golob (1989), "The Casual Influences of Income and Car Ownership on Trip Generation by Mode", *Journal of Transportation Economics and Policy*, May 1989, pp. 141-162

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[54]
CO_2e	2.6 – 13% of running
PM	2.6 – 13% of running
CO	2.6 – 13% of running

[54] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

NOx	2.6 – 13% of running
SO_2	2.6 – 13% of running
ROG	1.6 – 7.8% of total

Discussion:

As discussed in the preferred literature section, monthly parking costs typically range from $25 to $125. The lower end of the elasticity range provided by VTPI is used here to be conservative.

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction = $25* 12 / $4000 * 0.4 * 85% = 2.6%
- High Range % VMT Reduction = $125* 12 / $4000 * 0.4 * 85%= 12.8%

Preferred Literature:

- -0.4 to -1.0 = elasticity of vehicle ownership with respect to total vehicle costs

The above elasticity comes from a synthesis of literature. As noted in the VTPI report [1], a 10% increase in total vehicle costs (operating costs, maintenance, fuel, parking, etc.) reduces vehicle ownership between 4% and 10%. The report, estimating $4,000 in annual costs per vehicle, calculated vehicle ownership reductions from residential parking pricing.

Vehicle Ownership Reductions from Residential Parking Pricing

Annual (Monthly) Parking Fee	-0.4 Elasticity	-0.7 Elasticity	-1.0 Elasticity
$300 ($25)	4%	6%	8%
$600 ($50)	8%	11%	15%
$900 ($75)	11%	17%	23%
$1,200 ($100)	15%	23%	30%
$1,500 ($125)	19%	28%	38%

Alternative Literature:

None

Alternative Literature Notes:

None

Other Literature Reviewed:

None

3.3.3 Implement Market Price Public Parking (On-Street)

Range of Effectiveness: 2.8 – 5.5% vehicle miles traveled (VMT) reduction and therefore 2.8 – 5.5% reduction in GHG emissions.

Measure Description:

This project and city in which it is located will implement a pricing strategy for parking by pricing all central business district/employment center/retail center on-street parking. It will be priced to encourage "park once" behavior. The benefit of this measure above that of paid parking at the project only is that it deters parking spillover from project-supplied parking to other public parking nearby, which undermine the vehicle miles traveled (VMT) benefits of project pricing. It may also generate sufficient area-wide mode shifts to justify increased transit service to the area.

Measure Applicability:

- Urban and suburban context
- Negligible impact in a rural context
- Appropriate for retail, office, and mixed-use projects
- Applicable in a specific or general plan context only
- Reduction can be counted only if spillover parking is controlled (via residential permits)
- Study conducted in a downtown area, and thus should be applied carefully if project is not in a central business/activity center

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Location of project site: low density suburb, suburban center, or urban location

- Percent increase in on-street parking prices (minimum 25% needed)

Mitigation Method:

% VMT Reduction = Park$ * B

Where:

Park$ = Percent increase in on-street parking prices (minimum of 25% increase [1])

B = Elasticity of VMT with respect to parking price (0.11, from [2])

Assumptions:

Data based upon the following references:

[1] Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. (p. B-10)

Moving Cooler's parking pricing analysis cited Victoria Transport Policy Institute, *How Prices and Other Factors Affect Travel Behavior* (http://www.vtpi.org/tdm/tdm11.htm#_Toc161022578). The VTPI paper summarized the elasticities found in the Hensher and King paper. David A. Hensher and Jenny King (2001), "Parking Demand and Responsiveness to Supply, Price and Location in Sydney Central Business District," *Transportation Research A*, Vol. 35, No. 3 (www.elsevier.com/locate/tra), March 2001, pp. 177-196.

[2] J. Peter Clinch and J. Andrew Kelly (2003), *Temporal Variance Of Revealed Preference On-Street Parking Price Elasticity*, Department of Environmental Studies, University College Dublin (www.environmentaleconomics.net). (p. 2) http://www.ucd.ie/gpep/research/workingpapers/2004/04-02.pdf As referenced in VTPI: http://www.vtpi.org/tdm/tdm11.htm#_Toc161022578

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[55]
CO_2e	2.8 – 5.5% of running

[55] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

PM	2.8 – 5.5% of running
CO	2.8 – 5.5% of running
NOx	2.8 – 5.5% of running
SO_2	2.8 – 5.5% of running
ROG	1.7 – 3.3% of total

Discussion:

The range of parking price increases should be a minimum of 25% and a maximum of 50%. The minimum is based on Moving Cooler [1] discussions which state that a less than 25% increase would not be a sufficient amount to reduce VMT. The case study [2] looked at a 50% price increase, and thus no conclusions can be made on the elasticities above a 50% increase. This strategy may certainly be implemented at a higher price increase, but VMT reductions should be capped at results from a 50% increase to be conservative.

Example:

Assuming a baseline on-street parking price of $1, sample calculations are provided below:

- Low Range % VMT Reduction (25% increase) = ($1.25 - $1)/$1 * 0.11 = 2.8%
- High Range % VMT Reduction (50% increase) = ($1.50 - $1)/$1 * 0.11 = 5.5%

Preferred Literature:

- -0.11 parking demand elasticity with respect to parking prices

The Clinch & Kelly study [2] of parking meters looked at the impacts of a 50% price increase in the cost of on-street parking. The case study location was a central on-street parking area with a 3-hour time limit and a mix of business and non-business uses. The study concluded the parking increases resulted in an estimated average price elasticity of demand of -0.11, while factoring in parking duration results in an elasticity of -0.2 (cost increases also affect the amount of time cars are parked). Though this study is international (Dublin, Ireland), it represents a solid study of parking meter price increases and provides a conservative estimate of elasticity compared to the alternate literature.

Alternative Literature:

Alternate:

- -0.19 shopper parking elasticity with respect to parking price
- -0.48 commuter parking elasticity with respect to parking price

PDT-3 Parking Policy / Pricing

The *TCRP 95 Chapter 13* [3] report looked at a case study of the city of San Francisco implementing a parking tax on all public and private off-street parking (in 1970). Based on the number of cars parked, the report estimated parking price elasticities of -0.19 to -0.48, an average over a three year period.

Alternate:

- -0.15 VMT elasticity with respect to parking prices (for low density regions)
- -0.47 VMT elasticity with respect to parking prices (for high density regions)

The Moving Cooler analysis assumes a 25 percent increase in on-street parking fees is a starting point sufficient to reduce VMT. Using the elasticities stated above, Moving Cooler estimates an annual percent VMT reduction from 0.42% - 1.14% for a range of regions from a large low density region to a small high density region. The calculations assume that pricing occurs at the urban central business district/employment cent/retail center, one-fourth of all person trips are commute based trips, and approximately 15% of commute trips are to the CBD or regional activity centers.

Alternative Literature References:

[3] TCRP Report 95. *Chapter 13: Parking Pricing and Fees - Traveler Response to Transportation System Changes.* http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_95c13.pdf. (p.13-42)

Other Literature Reviewed:

None

3.3.4 Require Residential Area Parking Permits

Range of Effectiveness: Grouped strategy. (See PPT-1, PPT-2, and PPT-3)

Measure Description:

This project will require the purchase of residential parking permits (RPPs) for long-term use of on-street parking in residential areas. Permits reduce the impact of spillover parking in residential areas adjacent to commercial areas, transit stations, or other locations where parking may be limited and/or priced. Refer to Parking Supply Limitations (PPT-1), Unbundle Parking Costs from Property Cost (PPT-2), or Market Rate Parking Pricing (PPT-3) strategies for the ranges of effectiveness in these categories. The benefits of Residential Area Parking Permits strategy should be combined with any or all of the above mentioned strategies, as providing RPPs are a key complementary strategy to other parking strategies.

Measure Applicability:

- Urban context
- Appropriate for residential, retail, office, mixed use, and industrial projects

Alternative Literature:

- -0.45 = elasticity of vehicle miles traveled (VMT) with respect to price
- 0.08% greenhouse gas (GHG) reduction
- 0.09-0.36% VMT reduction

Moving Cooler [1] suggested residential parking permits of $100-$200 annually. This mitigation would impact home-based trips, which are reported to represent approximately 60% of all urban trips. The range of VMT reductions can be attributed to the type of urban area. VMT reductions for $100 annual permits are 0.09% for large, high-density; 0.12% for large, low-density; 0.12% for medium, high-density; 0.18% for medium, low-density; 0.18% for small, high-density; and 0.12% for small, low-density. VMT reductions for $200 annual permits are 0.18% for large, high-density; 0.24% for large, low-density; 0.24% for medium, high-density; 0.36% for medium, low-density; 0.36% for small, high-density; and 0.24% for small, low-density.

Alternative Literature References:

[1] Cambridge Systematics. Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions. Technical Appendices. Prepared for the Urban Land Institute. http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf

3.4 Commute Trip Reduction Programs

3.4.1 Implement Commute Trip Reduction Program - Voluntary

Commute Trip Reduction Program – Voluntary, is a multi-strategy program that encompasses a combination of individual measures described in sections 3.4.3 through 3.4.9. It is presented as a means of preventing double-counting of reductions for individual measures that are included in this strategy. It does so by setting a maximum level of reductions that should be permitted for a combined set of strategies within a voluntary program.

Range of Effectiveness: 1.0 – 6.2% commute vehicle miles traveled (VMT) Reduction and therefore 1.0 – 6.2% reduction in commute trip GHG emissions.

Measure Description:

The project will implement a voluntary Commute Trip Reduction (CTR) program with employers to discourage single-occupancy vehicle trips and encourage alternative modes of transportation such as carpooling, taking transit, walking, and biking. The main difference between a voluntary and a required program is:

- Monitoring and reporting is not required
- No established performance standards (i.e. no trip reduction requirements)

The CTR program will provide employees with assistance in using alternative modes of travel, and provide both “carrots” and “sticks” to encourage employees. The CTR program should include all of the following to apply the effectiveness reported by the literature:

- Carpooling encouragement
- Ride-matching assistance
- Preferential carpool parking
- Flexible work schedules for carpools
- Half time transportation coordinator
- Vanpool assistance
- Bicycle end-trip facilities (parking, showers and lockers)

Other strategies may also be included as part of a voluntary CTR program, though they are not included in the reductions estimation and thus are not incorporated in the estimated VMT reductions. These include: new employee orientation of trip reduction and alternative mode options, event promotions and publications, flexible work schedule for all employees, transit subsidies, parking cash-out or priced parking, shuttles, emergency ride home, and improved on-site amenities.

Transportation

TRT-1 Commute Trip Reduction

Measure Applicability:

- Urban and suburban context
- Negligible in a rural context, unless large employers exist, and suite of strategies implemented are relevant in rural settings
- Appropriate for retail, office, industrial and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage of employees eligible
- Location of project site: low density suburb, suburban center, or urban location

Mitigation Method:

$$\% \text{ VMT Reduction} = A * B$$

Where

A = % reduction in commute VMT (from [1])
B = % employees eligible

Detail:

- A: 5.2% (low density suburb), 5.4% (suburban center), 6.2% (urban) annual reduction in commute VMT (from [1])

Assumptions:

Data based upon the following references:

- Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. (Table 5.13) http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[56]
CO_2e	1.0 – 6.2% of running
PM	1.0 – 6.2% of running
CO	1.0 – 6.2% of running
NOx	1.0 – 6.2% of running
SO_2	1.0 – 6.2% of running
ROG	0.6 –3.7% of total

Discussion:

This set of strategies typically serves as a complement to the more effective workplace CTR strategies such as pricing and parking cash out.

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction (low density suburb and 20% eligible) = 5.2% * 0.2 = 1.0%
- High Range % VMT Reduction (urban and 100% eligible) = 6.2% * 1 = 6.2%

Preferred Literature:

- 5.2 - 6.2% commute VMT reduction

Moving Cooler assumes the employer support program will include: carpooling, ride-matching, preferential carpool parking, flexible work schedules for carpools, a half-time transportation coordinator, vanpool assistance, bicycle parking, showers, and locker facilities. The report assigns 5.2% reduction to large metropolitan areas, 5.4% to medium metropolitan areas, and 6.2% to small metropolitan areas.

[56] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Alternative Literature:

Alternate:

- 15-19% reduction in commute vehicle trips

TCRP 95 Draft Chapter 19 [2] looked at a sample of 82 Transportation Demand Management (TDM) programs. Low support TDM programs had a 15% reduction, medium support programs 15.9%, and high support 19%. Low support programs had little employer effort. These programs may include rideshare matching, distribution of transit flyers, but have little employer involvement. With medium support programs, employers were involved with providing information regarding commute options and programs, a transportation coordinator (even if part-time), and assistance for ridesharing and transit pass purchases. With high support programs, the employer was providing most of the possible strategies. The sample of programs should not be construed as a random sample and probably represent above average results.

Alternate:

- 4.16 – 4.76% reduction in commute VMT

The Herzog study [3] compared a group of employees, who were eligible for comprehensive commuter benefits (with financial incentives, services such as guaranteed ride home and carpool matching, and informational campaigns) and general marketing information, to a reference group of employees not eligible for commuter benefits. The study showed a 4.79% reduction in VMT, assuming 75% of the carpoolers were traveling to the same worksite. There was a 4.16% reduction in VMT, assuming only 50% of carpoolers were traveling to the same worksite.

Alternate:

- 8.5% reduction in vehicle commute trips

Employer survey results [4] showed that employees at the surveyed companies made 8.5% fewer vehicle trips to work than had been found in the baseline surveys conducted by large employers under the area's trip reduction regulation (i.e. comparing voluntary program with a mandatory regulation). This implied that the 8.5% reduction is a conservative estimate as it is compared to another trip reduction strategy, rather than comparing to a baseline with no reduction strategies implemented. Another survey also showed that 68% of commuters drove alone to work when their employer did not encourage trip reduction. It revealed that with employer encouragement, the drive-alone rate fell 5 percentage points to 63%.

This strategy assumes a companion strategy of employer encouragement. The literature did not specify what commute options each employer provided as part of the program. Options provided may have ranged from simply providing public transit

information to implementing a full TDM program with parking cash out, flex hours, emergency ride home, etc. This San Francisco Bay Area survey worked to determine the extent and impact of the emissions saved through voluntary trip reduction efforts (www.cleanairpartnership.com). It identified 454 employment sites with voluntary trip reduction programs and conducted a selected random survey of the more than 400,000 employees at those sites. The study concluded that employer encouragement makes a significant difference in employees' commute choices.

Alternative Literature References:

[2] Pratt, Dick. Personal Communication Regarding the Draft of TCRP 95 Traveler Response to Transportation System Changes – Chapter 19 Employer and Institutional TDM Strategies.

[3] Herzog, Erik, Stacey Bricka, Lucie Audette, and Jeffra Rockwell. 2006. "Do Employee Commuter Benefits Reduce Vehicle Emissions and Fuel Consumption? Results of Fall 2004 Survey of Best Workplaces for Commuters." *Transportation Research Record 1956*, 34-41. (Table 8)

[4] Transportation Demand Management Institute of the Association for Commuter Transportation. *TDM Case Studies and Commuter Testimonials*. Prepared for the US EPA. 1997. (p. 25-28) http://www.epa.gov/OMS/stateresources/rellinks/docs/tdmcases.pdf

Other Literature Reviewed:

None

3.4.2 Implement Commute Trip Reduction Program – Required Implementation/Monitoring

Commute Trip Reduction Program – Required, is a multi-strategy program that encompasses a combination of individual measures described in sections 3.4.3 through 3.4.9. It is presented as a means of preventing double-counting of reductions for individual measures that are included in this strategy. It does so by setting a maximum level of reduction that should be permitted for a combined set of strategies within a program that is contractually required of the development sponsors and managers and accompanied by a regular performance monitoring and reporting program.

Range of Effectiveness: 4.2 – 21.0% commute vehicle miles traveled (VMT) reduction and therefore 4.2 – 21.0% reduction in commute trip GHG emissions.

Measure Description:

The jurisdiction will implement a Commute Trip Reduction (CTR) ordinance. The intent of the ordinance will be to reduce drive-alone travel mode share and encourage alternative modes of travel. The critical components of this strategy are:

- Established performance standards (e.g. trip reduction requirements)
- Required implementation
- Regular monitoring and reporting

Regular monitoring and reporting will be required to assess the project's status in meeting the ordinance goals. The project should use existing ordinances, such as those in the cities of Tucson, Arizona and South San Francisco, California, as examples of successful CTR ordinance implementations. The City of Tucson requires employers with 100+ employees to participate in the program. An Alternative Mode Usage (AMU) goal and VMT reduction goal is established and each year the goal is increased. Employers persuade employees to commute via an alternative mode of transportation at least one day a week (including carpooling, vanpooling, transit, walking, bicycling, telecommuting, compressed work week, or alternatively fueled vehicle). The Transportation Demand Management (TDM) Ordinance in South San Francisco requires all non-residential developments that produce 100 average daily vehicle trips or more to meet a 35% non-drive-alone peak hour requirement with fees assessed for non-compliance. Employers have established significant CTR programs as a result.

Measure Applicability:

- Urban and suburban context
- Negligible in a rural context, unless large employers exist, and suite of strategies implemented are relevant in rural settings
- Jurisdiction level only
- Strategies in this case study calculations included:

- Parking cash out
- Employer sponsored shuttles to transit station
- Employer sponsored bus servicing the Bay Area
- Transit subsidies

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage of employees eligible

Mitigation Method:

$$\% \text{ VMT Reduction} = A * B$$

Where

A = % shift in vehicle mode share of commute trips (from [1])
B = % employees eligible
C = Adjustment from vehicle mode share to commute VMT

Detail:

- A: 21% reduction in vehicle mode share (from [1])
- C: 1.0 (see Appendix C for detail)

Assumptions:

Data based upon the following references:

[1] Nelson/Nygaard (2008). *South San Francisco Mode Share and Parking Report for Genentech, Inc*.(p. 8)

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[57]
CO_2e	4.2 – 21.0% of running
PM	4.2 – 21.0% of running
CO	4.2 – 21.0% of running
NOx	4.2 – 21.0% of running
SO_2	4.2 – 21.0% of running
ROG	2.5 – 12.6% of total

Discussion:

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction (20% eligibility) = 21% * 20% = 4.2%
- High Range % VMT Reduction (100% eligibility) = 21% * 100% = 21%

Preferred Literature:

- 21% reduction in vehicle mode share

Genentech, in South San Francisco [1], achieved a 34% non-single-occupancy vehicle (non-SOV) mode share (66% SOV) in 2008. Since 2006 when SOV mode share was 74% (26% non-SOV), there has been a reduction of over 10% in drive alone share. Carpool share was 12% in 2008, compared to 11.57% in 2006. Genentech has a significant TDM program including parking cash out ($4/day), express GenenBus service around the Bay Area, free shuttles to Bay Area Rapid Transit (BART) and Caltrain, and transit subsidies. The Genentech campus surveyed for this study is a large, single-tenant campus. Taking an average transit mode share in a suburban development of 1.3% (NHTS,

[57] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

http://www.dot.ca.gov/hq/tsip/tab/documents/travelsurveys/Final2001_Stw Travel Survey WkdayRpt.pdf (SCAG, SANDAG, Fresno County)), this is an estimated decrease from 98.7% to 78% vehicle mode share (66% SOV + 12% carpool), a 21% reduction in vehicle mode share.

Alternative Literature:

Alternate:

- 10.7% average annual increase in use of non-SOV commute modes

For the City of Tucson [2], use of alternative commute modes increased 64.3% between 1989 and 1995. Employers integrated several key activities into their TDM plans: disseminating information, developing company policies to support TDM, investing in facility enhancements, conducting promotional campaigns, and offering subsidies or incentives to encourage AMU.

Alternative Literature References:

[2] Transportation Demand Management Institute of the Association for Commuter Transportation. *TDM Case Studies and Commuter Testimonials*. Prepared for the US EPA. 1997. (p. 17-19) http://www.epa.gov/OMS/stateresources/rellinks/docs/tdmcases.pdf

Other Literature Reviewed:

None

3.4.3 Provide Ride-Sharing Programs

Range of Effectiveness: 1 – 15% commute vehicle miles traveled (VMT) reduction and therefore 1 - 15% reduction in commute trip GHG emissions.

Measure Description:

Increasing the vehicle occupancy by ride sharing will result in fewer cars driving the same trip, and thus a decrease in VMT. The project will include a ride-sharing program as well as a permanent transportation management association membership and funding requirement. Funding may be provided by Community Facilities, District, or County Service Area, or other non-revocable funding mechanism. The project will promote ride-sharing programs through a multi-faceted approach such as:

- Designating a certain percentage of parking spaces for ride sharing vehicles
- Designating adequate passenger loading and unloading and waiting areas for ride-sharing vehicles
- Providing a web site or message board for coordinating rides

Measure Applicability:

- Urban and suburban context
- Negligible impact in many rural contexts, but can be effective when a large employer in a rural area draws from a workforce in an urban or suburban area, such as when a major employer moves from an urban location to a rural location.
- Appropriate for residential, retail, office, industrial, and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage of employees eligible

- Location of project site: low density suburb, suburban center, or urban location

Mitigation Method:

% VMT Reduction = Commute * Employee

Where

Commute = % reduction in commute VMT (from [1])
Employee = % employees eligible

Detail:

- Commute: 5% (low density suburb), 10% (suburban center), 15% (urban) annual reduction in commute VMT (from [1])

Assumptions:

Data based upon the following references:

[1] VTPI. *TDM Encyclopedia*. http://www.vtpi.org/tdm/tdm34.htm; Accessed 3/5/2010.

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[58]
CO_2e	1 – 15% of running
PM	1 – 15% of running
CO	1 – 15% of running
NOx	1 – 15% of running
SO_2	1 – 15% of running
ROG	0.6 – 9% of total

Discussion:

This strategy is often part of Commute Trip Reduction (CTR) Program, another strategy documented separately (see TRT-1 and TRT-2). The Project Applicant should take care not to double count the impacts.

Example:

Sample calculations are provided below:

[58] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

- Low Range % VMT Reduction (low density suburb and 20% eligible) = 5% * 20% = 1%
- High Range % VMT Reduction (urban and 100% eligible) = 15% * 1 = 15%

Preferred Literature:

- 5 – 15% reduction of commute VMT

The *Transportation Demand Management (TDM) Encyclopedia* notes that because rideshare passengers tend to have relatively long commutes, mileage reductions can be relatively large with rideshare. If ridesharing reduces 5% of commute trips it may reduce 10% of vehicle miles because the trips that are reduced are twice as long as average. Rideshare programs can reduce up to 8.3% of commute VMT, up to 3.6% of total regional VMT, and up to 1.8% of regional vehicle trips (Apogee, 1994; TDM Resource Center, 1996). Another study notes that ridesharing programs typically attract 5-15% of commute trips if they offer only information and encouragement, and 10-30% if they also offer financial incentives such as parking cash out or vanpool subsidies (York and Fabricatore, 2001).

Alternative Literature:

- Up to 1% reduction in VMT (if combined with two other strategies)

Per the Nelson\Nygaard report [2], ride-sharing would fall under the category of a minor TDM program strategy. The report allows a 1% reduction in VMT for projects with at least three minor strategies.

Alternative Literature References:

[2] Nelson\Nygaard, 2005. *Crediting Low-Traffic Developments* (p.12). http://www.montgomeryplanning.org/transportation/documents/TripGenerationAnalysisUsingURBEMIS.pdf

Criteron Planner/Engineers and Fehr & Peers Associates (2001). Index 4D Method. *A Quick-Response Method of Estimating Travel Impacts from Land-Use Changes*. Technical Memorandum prepared for US EPA, October 2001.

Other Literature Reviewed:

None

3.4.4 Implement Subsidized or Discounted Transit Program

Range of Effectiveness: 0.3 – 20.0% commute vehicle miles traveled (VMT) reduction and therefore a 0.3 – 20.0% reduction in commute trip GHG emissions.

Measure Description:

This project will provide subsidized/discounted daily or monthly public transit passes. The project may also provide free transfers between all shuttles and transit to participants. These passes can be partially or wholly subsidized by the employer, school, or development. Many entities use revenue from parking to offset the cost of such a project.

Measure Applicability:

- Urban and suburban context
- Negligible in a rural context
- Appropriate for residential, retail, office, industrial, and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage of project employees eligible
- Transit subsidy amount
- Location of project site: low density suburb, suburban center, or urban location

Mitigation Method:

$$\% \text{ VMT Reduction} = A * B * C$$

Where

A = % reduction in commute vehicle trips (VT) (from [1])

B = % employees eligible

C = Adjustment from commute VT to commute VMT

Detail:

- A:

	Daily Transit Subsidy			
	$0.75	$1.49	$2.98	$5.96
Worksite Setting	**% Reduction in Commute VT**			
Low density suburb	**1.5%**	**3.3%**	**7.9%**	**20.0%***
Suburban center	**3.4%**	**7.3%**	**16.4%**	**20.0%***
Urban location	**6.2%**	**12.9%**	**20.0%***	**20.0%***
* Discounts greater than 20% will be capped, as they exceed levels recommended by TCRP 95 Draft Chapter 19 and other literature.				

- C: 1.0 (see Appendix C for detail)

Assumptions:

Data based upon the following references:

[1] Nelson\Nygaard, 2010. *City of Santa Monica Land Use and Circulation Element EIR Report, Appendix – Santa Monica Luce Trip Reduction Impacts Analysis* (p.401).

[2] Nelson\Nygaard used the following literature sources: VTPI, Todd Litman, *Transportation Elasticities, http://www.vtpi.org/elasticities.pdf.* Comsis Corporation (1993), *Implementing Effective Travel Demand Management Measures: Inventory of Measures and Synthesis of Experience*, USDOT and Institute of Transportation Engineers (www.ite.org); www.bts.gov/ntl/DOCS/474.html.

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[59]
CO_2e	0.3 - 20% of running
PM	0.3 - 20% of running
CO	0.3 - 20% of running
NOx	0.3 - 20% of running
SO_2	0.3 - 20% of running
ROG	0. 18 - 12% of total

[59] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Discussion:

This strategy is often part of a Commute Trip Reduction (CTR), another strategy documented separately (see TRT-1 and TRT-2). The Project Applicant should take care not to double count the impacts.

The literature evaluates this strategy in relation to the employer, but keep in mind that this strategy can also be implemented by a school or the development as a whole.

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction ($0.75, low density suburb, 20% eligible) = 1.5% * 20% = 0.3%
- High Range % VMT Reduction ($5.96, urban, 100% eligible) = 20% * 100% = 20%

Preferred Literature:

Commute Vehicle Trip Reduction	**Daily Transit Subsidy**			
Worksite Setting	**$0.75**	**$1.49**	**$2.98**	**$5.96**
Low density suburb, rideshare oriented	0.1%	0.2%	0.6%	1.9%
Low density suburb, mode neutral	1.5%	3.3%	7.9%	21.7%*
Low density suburb, transit oriented	2.0%	4.2%	9.9%	23.2%*
Activity center, rideshare oriented	1.1%	2.4%	5.8%	16.5%
Activity center, mode neutral	3.4%	7.3%	16.4%	38.7%*
Activity center, transit oriented	5.2%	10.9%	23.5%*	49.7%*
Regional CBD/Corridor, rideshare oriented	2.2%	4.7%	10.9%	28.3%*
Regional CBD/Corridor, mode neutral	6.2%	12.9%	26.9%*	54.3%*
Regional CBD/Corridor, transit oriented	9.1%	18.1%	35.5%*	64.0%*

* Discounts greater than 20% will be capped, as they exceed levels recommended by *TCRP 95 Draft Chapter 19* and other literature.

Nelson\Nygaard (2010) updated a commute trip reduction table from VTPI Transportation Elasticities to account for inflation since the data was compiled. Data regarding commute vehicle trip reductions was originally from a study conducted by Comsis Corporation and the Institute of Transportation Engineers (ITE).

Alternative Literature:

Alternate:

- 2.4-30.4% commute vehicle trip reduction (VTR)

TCRP 95 Draft Chapter 19 [2] indicates transit subsidies in areas with good transit and restricted parking have a commute VTR of 30.4%; good transit but free parking, a commute VTR of 7.6%; free parking and limited transit 2.4%. Programs with transit subsidies have an average commute VTR of 20.6% compared with an average commute VTR of 13.1% for sites with non-transit fare subsidies.

Alternate:

- 0.03-0.12% annual greenhouse gas (GHG) reduction

Moving Cooler [3] assumed price elasticities of -0.15, -0.2, and -0.3 for lower fares 25%, 33%, and 50%, respectively. *Moving Cooler* assumes average vehicle occupancy of 1.43 and a VMT/trip of 5.12.

Alternative Literature References:

[2] Pratt, Dick. Personal Communication Regarding the Draft of TCRP 95 Traveler Response to Transportation System Changes – Chapter 19 Employer and Institutional TDM Strategies.

[3] Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. (Table D.3) http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf

Other Literature Reviewed:

None

3.4.5 Provide End of Trip Facilities

Range of Effectiveness: Grouped strategy (see TRT-1 through TRT-3)

Measure Description:

Non-residential projects will provide "end-of-trip" facilities for bicycle riders including showers, secure bicycle lockers, and changing spaces. End-of-trip facilities encourage the use of bicycling as a viable form of travel to destinations, especially to work. End-of-trip facilities provide the added convenience and security needed to encourage bicycle commuting.

End-of-trip facilities have minimal impacts when implemented alone. This strategy's effectiveness in reducing vehicle miles traveled (VMT) depends heavily on the suite of other transit, pedestrian/bicycle, and demand management measures offered. End-of-trip facilities should be grouped with Commute Trip Reduction (CTR) Programs (TRT-1 through TRT-2).

Measure Applicability:

- Urban, suburban, and rural context
- Appropriate for residential, retail, office, industrial, and mixed-use projects

Alternative Literature:

Alternate:

- 22% increase in bicycle mode share

The bicycle study documents a multivariate analysis of UK National Travel Survey (Wardman et al. 2007) which found significant impacts on bicycling to work. Compared to base bicycle mode share of 5.8% for work trips, outdoor parking would raise the share to 6.3%, indoor secure parking to 6.6%, and indoor parking plus showers to 7.1%. This results in an estimate 22% increase in bicycle mode share ((7.1%-5.8%)/5.8% = 22%). This suggests that such end of trip facilities have an important impact on the decision to bicycle to work. However, these effects represent reductions in VMT no greater than 0.02% (see Appendix C for calculation detail).

Alternate:

- 2 - 5% reduction in commute vehicle trips

The *Transportation Demand Management (TDM) Encyclopedia*, citing Ewing (1993), documents Sacramento's TDM ordinance. The City allows developers to claim trip reduction credits for worksite showers and lockers of 5% in central business districts, 2% within 660 feet of a transit station, and 2% elsewhere.

Alternate:

- 0.625% reduction in VMT

The *Center for Clean Air Policy (CCAP) Guidebook* attributes a 1% to 5% reduction associated with the use of bicycles, which reflects the assumption that their use is typically for shorter trips. Based on the *CCAP Guidebook*, a 2.5% reduction is allocated for all bicycle-related measures and a 1/4 of that for this measure alone. (This information is based on a TIAX review for SMAQMD).

Alternative Literature References:

[1] Pucher J., Dill, J., and Handy, S. *Infrastructure, Programs and Policies to Increase Bicycling: An International Review.* February 2010. (Table 2, pg. S111) http://policy.rutgers.edu/faculty/pucher/Pucher_Dill_Handy10.pdf

[2] Victoria Transportation Policy Institute (VTPI). *TDM Encyclopedia,* http://www.vtpi.org/tdm/tdm9.htm; accessed 3/4/2010; last update 1/25/2010). VTPI citing: Reid Ewing (1993), "TDM, Growth Management, and the Other Four Out of Five Trips," *Transportation Quarterly*, Vol. 47, No. 3, Summer 1993, pp. 343-366.

[3] Center for Clean Air Policy (CCAP), *CCAP Transportation Emission Guidebook*. http://www.ccap.org/safe/guidebook/guide_complete.html; TIAX Results of 2005 Literature Search Conducted by TIAX on behalf of SMAQMD

Other Literature Reviewed:

None

3.4.6 Encourage Telecommuting and Alternative Work Schedules

Range of Effectiveness: 0.07 – 5.50% commute vehicle miles traveled (VMT) reduction and therefore 0.07 – 5.50% reduction in commute trip GHG emissions.

Measure Description:

Encouraging telecommuting and alternative work schedules reduces the number of commute trips and therefore VMT traveled by employees. Alternative work schedules could take the form of staggered starting times, flexible schedules, or compressed work weeks.

Measure Applicability:

- Urban, suburban, and rural context
- Appropriate for retail, office, industrial, and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage of employees participating (1 – 25%)
- Strategy implemented: 9-day/80-hour work week, 4-day/40-hour work week, or 1.5 days of telecommuting

Mitigation Method:

% Commute VMT Reduction = Commute

Where

Commute = % reduction in commute VMT (See table below)

	Employee Participation				
	1%	**3%**	**5%**	**10%**	**25%**
	% Reduction in Commute VMT				
9-day/80-hour work week	0.07%	0.21%	0.35%	0.70%	1.75%
4-day/40-hour work week	0.15%	0.45%	0.75%	1.50%	3.75%
telecommuting 1.5 days	0.22%	0.66%	1.10%	2.20%	5.5%
Source: Moving Cooler Technical Appendices, Fehr & Peers Notes: The percentages from Moving Cooler incorporate a discount of 25% for rebound effects. The percentages beyond 1% employee participation are linearly extrapolated.					

Assumptions:

Data based upon the following references:

[1] Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. (p. B-54)
http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[60]
CO_2e	0.07 – 5.50% of running
PM	0.07 – 5.50% of running
CO	0.07 – 5.50% of running
NOx	0.07 – 5.50% of running
SO_2	0.07 – 5.50% of running
ROG	0.04 – 3.3% of total

Discussion:

This strategy is often part of a Commute Trip Reduction Program, another strategy documented separately (see TRT-1 and TRT-2). The Project Applicant should take care not to double count the impacts.

The employee participation rate should be capped at a maximum of 25%. *Moving Cooler* [1] notes that roughly 50% of a typical workforce could participate in alternative

[60] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

work schedules (based on job requirements) and roughly 50% of those would choose to participate.

The 25% discount for rebound effects is maintained to provide a conservative estimate and support the literature results. The project may consider removing this discount from their calculations if deemed appropriate.

Example:

N/A – no calculations are needed.

Preferred Literature:

- 0.07% - 0.22% reduction in commuting VMT

Moving Cooler [1] estimates that if 1% of employees were to participate in a 9 day/80 hour compressed work week, commuting VMT would be reduced by 0.07%. If 1% of employees were to participate in a 4 day/40 hour compressed work week, commuting VMT would reduce by 0.15%; and 1% of employees participating in telecommuting 1.5 days per week would reduce commuting VMT by 0.22%. These percentages incorporate a discounting of 25% to account for rebound effects (i.e., travel for other purposes during the day while not at the work site). The percentages beyond 1% employee participation are linearly extrapolated (see table above).

Alternative Literature:

Alternate:

- 9-10% reduction in VMT for participating employees

As documented in *TCRP 95 Draft Chapter 19* [2], a Denver federal employer's implementation of compressed work week resulted in a 14-15% reduction in VMT for participating employees. This is equivalent to the 0.15% reduction for each 1% participation cited in the preferred literature above. In the Denver example, there was a 65% participation rate out of a total of 9,000 employees. *TCRP 95* states that the compressed work week experiment has no adverse effect on ride-sharing or transit use. Flexible hours have been shown to work best in the presence of medium or low transit availability.

Alternate:

- 0.5 vehicle trips reduced per employee per week
- 13 – 20 VMT reduced per employee per week

As documented in *TCRP 95 Draft Chapter 19* [2], a study of compressed work week for 2,600 Southern California employees resulted in an average reduction of 0.5 trips per week (per participating employee). Participating employees also reduced their VMT by 13-20 miles per week. This translates to a reduction of between 5% and 10% in commute VMT, and so is lower than the 15% reduction cited for Denver government employees.

Alternative Literature References:

[2] Pratt, Dick. Personal Communication Regarding the Draft of TCRP 95 Traveler Response to Transportation System Changes – Chapter 19 Employer and Institutional TDM Strategies.

Other Literature Reviewed:

None

3.4.7 Implement Commute Trip Reduction Marketing

Range of Effectiveness: 0.8 – 4.0% commute vehicle miles traveled (VMT) reduction and therefore 0.8 – 4.0% reduction in commute trip GHG emissions.

Measure Description:

The project will implement marketing strategies to reduce commute trips. Information sharing and marketing are important components to successful commute trip reduction strategies. Implementing commute trip reduction strategies without a complementary marketing strategy will result in lower VMT reductions. Marketing strategies may include:

- New employee orientation of trip reduction and alternative mode options
- Event promotions
- Publications

CTR marketing is often part of a CTR program, voluntary or mandatory. CTR marketing is discussed separately here to emphasis the importance of not only providing employees with the options and monetary incentives to use alternative forms of transportation, but to clearly and deliberately promote and educate employees of the various options. This will greatly improve the impact of the implemented trip reduction strategies.

Measure Applicability:

- Urban and suburban context
- Negligible in a rural context
- Appropriate for residential, retail, office, industrial and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled
$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage of project employees eligible (i.e. percentage of employers choosing to participate)

Mitigation Method:

% Commute VMT Reduction = A * B * C

Where

A = % reduction in commute vehicle trips (from [1])

B = % employees eligible

C = Adjustment from commute VT to commute VMT

Detail:

- A: 4% (per [1])
- C: 1.0 (see Appendix C for detail)

Assumptions:

Data based upon the following references:

[1] Pratt, Dick. Personal communication regarding the *Draft of TCRP 95 Traveler Response to Transportation System Changes – Chapter 19 Employer and Institutional TDM Strategies.* Transit Cooperative Research Program.

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[61]
CO_2e	0.8 – 4.0% of running
PM	0.8 – 4.0% of running
CO	0.8 – 4.0% of running
NOx	0.8 – 4.0% of running
SO_2	0.8 – 4.0% of running
ROG	0.5 – 2.4% of total

[61] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Discussion:

The effectiveness of commute trip reduction marketing in reducing VMT depends on which commute reduction strategies are being promoted. The effectiveness levels provided below should only be applied if other programs are offered concurrently, and represent the total effectiveness of the full suite of measures.

This strategy is often part of a CTR Program, another strategy documented separately (see strategy T# E1). Take care not to double count the impacts.

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction (20% eligible) = 4% * 20% = 0.8%
- High Range % VMT Reduction (100% eligible) = 4% * 100% = 4.0%

Preferred Literature:

- 4-5% commute vehicle trips reduced with full-scale employer support

TCRP 95 Draft Chapter 19 notes the average empirically-based estimate of reductions in vehicle trips for full-scale, site-specific employer support programs alone is 4-5%. This effectiveness assumes there are alternative commute modes available which have on-going employer support. For a program to receive credit for such outreach and marketing efforts, it should contain guarantees that the program will be maintained permanently, with promotional events delivered regularly and with routine performance monitoring.

Alternative Literature:

- 5-15% reduction in commute vehicle trips
- 3% increase in effectiveness of marketed transportation demand management (TDM) strategies

VTPI [2] notes that providing information on alternative travel modes by employers was one of the most important factors contributing to mode shifting. One study (Shadoff,1993) estimates that marketing increases the effectiveness of other TDM strategies by up to 3%. Given adequate resources, marketing programs may reduce vehicle trips by 5-15%. The 5 – 15% range comes from a variety of case studies across the world. U.S. specific case studies include: 9% reduction in vehicle trips with TravelSmart in Portland (12% reduction in VMT), 4-8% reduction in vehicle trips from four cities with individualized marketing pilot projects from the Federal Transit Administration (FTA). Averaged across the four pilot projects, there was a 6.75% reduction in VMT.

Alternative Literature References:

[2] VTPI, TDM Encyclopedia – TDM Marketing; http://www.vtpi.org/tdm/tdm23.htm; accessed 3/5/2010. Table 7 (citing FTA, 2006)

Other Literature Reviewed:

None

3.4.8 Implement Preferential Parking Permit Program

Range of Effectiveness: Grouped strategy (see TRT-1 through TRT-3)

Measure Description:

The project will provide preferential parking in convenient locations (such as near public transportation or building front doors) in terms of free or reduced parking fees, priority parking, or reserved parking for commuters who carpool, vanpool, ride-share or use alternatively fueled vehicles. The project will provide wide parking spaces to accommodate vanpool vehicles.

The impact of preferential parking permit programs has not been quantified by the literature and is likely to have negligible impacts when implemented alone. This strategy should be grouped with Commute Trip Reduction (CTR) Programs (TRT-1 and TRT-2) as a complementary strategy for encouraging non-single occupant vehicle travel.

Measure Applicability:

- Urban, suburban context
- Appropriate for residential, retail, office, mixed use, and industrial projects

Alternative Literature:

No quantitative results are available. The case study in the literature implemented a preferential parking permit program as a companion strategy to a comprehensive TDM program. Employees who carpooled at least three times a week qualified to use the spaces.

Alternative Literature References:

[1] Transportation Demand Management Institute of the Association for Commuter Transportation. *TDM Case Studies and Commuter Testimonials*. Prepared for the US EPA. 1997. http://www.epa.gov/OMS/stateresources/rellinks/docs/tdmcases.pdf

Other Literature Reviewed:

None

3.4.9 Implement Car-Sharing Program

Range of Effectiveness: 0.4 – 0.7% vehicle miles traveled (VMT) reduction and therefore 0.4 – 0.7% reduction in GHG emissions.

Measure Description:

This project will implement a car-sharing project to allow people to have on-demand access to a shared fleet of vehicles on an as-needed basis. User costs are typically determined through mileage or hourly rates, with deposits and/or annual membership fees. The car-sharing program could be created through a local partnership or through one of many existing car-share companies. Car-sharing programs may be grouped into three general categories: residential- or citywide-based, employer-based, and transit station-based. Transit station-based programs focus on providing the "last-mile" solution and link transit with commuters' final destinations. Residential-based programs work to substitute entire household based trips. Employer-based programs provide a means for business/day trips for alternative mode commuters and provide a guaranteed ride home option.

Measure Applicability:

- Urban and suburban context
- Negligible in a rural context
- Appropriate for residential, retail, office, industrial, and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Urban or suburban context

TRT-9 Commute Trip Reduction

Mitigation Method:

% VMT Reduction = A * B / C

Where

A = % reduction in car-share member annual VMT (from the literature)

B = number of car share members per shared car (from the literature)

C = deployment level based on urban or suburban context

Detail:

- A: 37% *(per [1])*
- B: 20 *(per [2])*
- C:

Project setting	1 shared car per X population
Urban	1,000
Suburban	2,000
Source: *Moving Cooler*	

Assumptions:

Data based upon the following references:

[1] Millard-Ball, Adam. "Car-Sharing: Where and How it Succeeds," (2005) Transit Cooperative Research Program (108). P. 4-22

[2] Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. (p. B-52, Table D.3) http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendices_Complete_102209.pdf

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[62]
CO_2e	0.4 – 0.7% of running
PM	0.4 – 0.7% of running
CO	0.4 – 0.7% of running
NOx	0.4 – 0.7% of running
SO_2	0.4 – 0.7% of running
ROG	0.24 – 0.42% of total

[62] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Discussion:

Variable C in the mitigation method section represents suggested levels of deployment based on the literature. Levels of deployment may vary based on the characteristics of the project site and the needs of the project residents and employees. This variable should be adjusted accordingly.

The methodology for calculation of VMT reduction utilizes *Moving Cooler's* rule of thumb[63] for the estimated number of car share members per vehicle. An estimate of 50% reduction in car-share member annual VMT (from *Moving Cooler*) was high compared to other literature sources, and *TCRP 108's* 37% reduction was used in the calculations instead.

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction (suburban) = 37% * 20 / 2000 = 0.4%
- High Range % VMT Reduction (urban) = 37% * 20 / 1000 = 0.7%

Preferred Literature:

- 37% reduction in car-share member VMT

The *TCRP 108* [1] report conducted a survey of car-share members in the United States and Canada in 2004. The results of the survey showed that respondents, on average, drove only 63% of the average mileage they previously drove when not car-share members.

Alternative Literature:

Alternate – Residential or Citywide Based:

- 0.05-0.27% reduction in GHG
- 0.33% reduction in VMT in urban areas

Moving Cooler [2] assumed an aggressive deployment of one car per 2,000 inhabitants of medium-density census tracks and of one car per 1,000 inhabitants of high-density census tracks. This strategy assumes providing a subsidy to a public, private, or nonprofit car-sharing organization and providing free or subsidized lease for usage of public street parking. *Moving Cooler* assumed 20 members per shared car and 50% reduction in VMT per equivalent car. The percent reduction calculated assumes a percentage of urban areas are low, medium, and high density, thus resulting in a lower

[63] See discussion in Alternative Literature section for "rule of thumb" detail.

than expected reduction in VMT assuming an aggressive deployment in medium and high density areas.

Alternate – Transit Station and Employer Based:

- 23-44% reduction in drive-alone mode share
- Average daily VMT reduction of 18 – 23 miles

TCRP 95 Draft Chapter 19 [3] looked at two demonstrations, CarLink I and CarLink II, in the San Francisco Bay Area. CarLink I ran from January to November 1999. It involved 54 individuals and 12 rental cars stationed at the Dublin-Pleasanton BART station. CarLink II ran from July 2001 to June 2002 and involved 107 individuals and 19 rental cars. CarLink II was based in Palo Alto in conjunction with Caltrain commuter rail service and several employers in the Stanford Research Park. Both CarLink demonstrations were primarily targeted for commuters. CarLink I had a 23% increase in rail mode share, a reduction in drive-alone mode share of 44%, and a decrease in Average Daily VMT of 18 miles. CarLink II had a VMT for round-trip commuters decrease of 23 miles per day and a mode share for drive alone decrease of 22.9%.

Alternate:

- 50% reduction in driving for car-share members

A UC Berkeley study of San Francisco's City CarShare [4] found that members drive nearly 50% less after joining. The study also found that when people joined the car-sharing organization, nearly 30% reduced their household vehicle ownership and two-thirds avoided purchasing another car. The UC Berkeley study found that almost 75% of vehicle trips made by car-sharing members were for social trips such as running errands and visiting friends. Only 25% of trips were for commuting to work or for recreation. Most trips were also made outside of peak periods. Therefore, car-sharing may generate limited impact on peak period traffic.

Alternative Literature References:

[3] Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. (p. B-52, Table D.3) http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendices_Complete_102209.pdf

[4] Pratt, Dick. *Personal Communication Regarding the Draft of TCRP 95 Traveler Response to Transportation System Changes – Chapter 19 Employer and Institutional TDM Strategies.* Transit Cooperative Research Program.

Cervero, Robert and Yu-Hsin Tsai. *San Francisco City CarShare: Travel-Demand Trends and Second-Year Impacts,* 2005. (Figure 7, p. 35, Table 7, Table 12) http://escholarship.org/uc/item/4f39b7b4

Other Literature Reviewed:

None

3.4.10 Implement a School Pool Program

Range of Effectiveness: 7.2 – 15.8% school vehicle miles traveled (VMT) Reduction and therefore 7.2 – 15.8% reduction in school trip GHG emissions.

Measure Description:

This project will create a ridesharing program for school children. Most school districts provide bussing services to public schools only. SchoolPool helps match parents to transport students to private schools, or to schools where students cannot walk or bike but do not meet the requirements for bussing.

Measure Applicability:

- Urban, suburban, and rural context
- Appropriate for residential and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Degree of implementation of SchoolPool Program(moderate to aggressive)

Mitigation Method:

$$\% \text{ VMT Reduction} = \text{Families} * B$$

Where

Families = % families that participate (from [1] and [2])

B = adjustments to convert from participation to daily VMT to annual school VMT

Detail:

- Families: 16% (moderate implementation), 35% (aggressive implementation), (from [1] and [2])
- B: 45% (see Appendix C for detail)

Assumptions:

Data based upon the following references:

[1] Transportation Demand Management Institute of the Association for Commuter Transportation. *TDM Case Studies and Commuter Testimonials*. Prepared for the US EPA. 1997. (p. 10, 36-38) http://www.epa.gov/OMS/stateresources/rellinks/docs/tdmcases.pdf

[2] Denver Regional Council of Governments (DRCOG). *Survey of Schoolpool Participants, April 2008.* http://www.drcog.org/index.cfm?page=SchoolPool. Obtained from Schoolpool Coordinator, Mia Bemelen.

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[64]
CO_2e	7.2 – 15.8% of running
PM	7.2 – 15.8% of running
CO	7.2 – 15.8% of running
NOx	7.2 – 15.8% of running
SO_2	7.2 – 15.8% of running
ROG	4.3 – 9.5% of total

Discussion:

This strategy reflects the findings from only one case study.

Example:

Sample calculations are provided below:

- Low Range % School VMT Reduction (moderate implementation) = 16% * 45% = 7.2%
- High Range % School VMT Reduction (aggressive implementation) = 35% * 45% = 15.8%

[64] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Preferred Literature:

- 7,711 – 18,659 daily VMT reduction

As presented in the TDM Case Studies [1] compilation, the SchoolPool program in Denver saved 18,659 VMT per day in 1995, compared with 7,711 daily in 1994 – a 142% increase. The Denver Regional Council of Governments (DRCOG) [2] enrolled approximately 7,000 families and 32 private schools in the program. The DRCOG staff surveyed a school or interested families to collect home location and schedules of the students. The survey also identified prospective drivers. DRCOG then used carpool-matching software and GIS to match families. These match lists were sent to the parents for them to form their own school pools. 16% of families in the database formed carpools. The average carpool carried 3.1 students.

The SchoolPool program is still in effect and surveys are conducted every few years to monitor the effectiveness of the program. The latest survey report received was in 2008. The report showed that the participant database had increased to over 10,000 families, an 18% increase from 2005. 29% of participants used the list to form a school carpool. This percentage was lower than 35% in 2005 but higher than prior to 2005, at 24%. The average number of families in each carpool ranged from 2.1 prior to 2005 to 2.8 in 2008. The average number of carpool days per week was roughly 4.7. The number of school weeks per year was 39. Per discussions with the Schoolpool Coordinator, a main factor of success was establishing a large database. This was achieved by having parents opt-out of the database versus opting-in.

Alternative Literature:

None

Alternative Literature References:

None

Other Literature Reviewed:

None

3.4.11 Provide Employer-Sponsored Vanpool/Shuttle

Range of Effectiveness: 0.3 – 13.4% commute vehicle miles traveled (VMT) reduction and therefore 0.3 – 13.4% reduction in commute trip GHG emissions.

Measure Description:

This project will implement an employer-sponsored vanpool or shuttle. A vanpool will usually service employees' commute to work while a shuttle will service nearby transit stations and surrounding commercial centers. Employer-sponsored vanpool programs entail an employer purchasing or leasing vans for employee use, and often subsidizing the cost of at least program administration, if not more. The driver usually receives personal use of the van, often for a mileage fee. Scheduling is within the employer's purview, and rider charges are normally set on the basis of vehicle and operating cost.

Measure Applicability:

- Urban, suburban, and rural context
- Appropriate for office, industrial, and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled
$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage of employees eligible

Mitigation Method:

$$\% \text{ VMT Reduction} = A * B * C$$

Where
A = % shift in vanpool mode share of commute trips (from [1])
B = % employees eligible
C = adjustments from vanpool mode share to commute VMT

Detail:

- A: 2-20% annual reduction in vehicle mode share (*from [1]*)
  - Low range: low degree of implementation, smaller employers
  - High range: high degree of implementation, larger employers
- C: 0.67 (See Appendix C for detail)

Assumptions:

Data based upon the following references:

[1] TCRP Report 95. *Chapter 5: Vanpools and Buspools - Traveler Response to Transportation System Changes.* http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_95c5.pdf. (p.5-8)

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[65]
CO_2e	0.3 – 13.4% of running
PM	0.3 – 13.4% of running
CO	0.3 – 13.4% of running
NOx	0.3 – 13.4% of running
SO_2	0.3 – 13.4% of running
ROG	0.18 – 8.0% of total

Discussion:

Vanpools are generally more successful with the largest of employers, as large employee counts create the best opportunities for employees to find a suitable number of travel companions to form a vanpool. In the San Francisco Bay Area several large companies (such as Google, Apple, and Genentech) provide regional bus transportation for their employees. No specific studies of these large buspools were identified in the literature. However, the GenenBus serves as a key element of the overall commute trip reduction (CTR) program for Genentech, as discussed in the CTR Program – Required strategy.

This strategy is often part of a CTR Program, another strategy documented separately (see strategy T# E1). Take care not to double count the impacts.

Example:

Sample calculations are provided below:

[65] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

- Low Range % VMT Reduction (low implementation/small employer, 20% eligible) = 2% * 20% * 0.67 = 0.3%
- High Range % VMT Reduction (high implementation/large employer, 100% eligible) = 20% * 100% * 0.67 = 13.4%

Preferred Literature:

- 2-20% vanpool mode share

TCRP Report 95 [1] notes that vanpools can capture 2 to 20% mode share. This range can be attributed to differences in programs, access to high-occupancy vehicle (HOV) lanes, and geographic range. The *TCRP Report* highlights a case study of the 3M Corporation, which with the implementation of a vanpooling program saw drive alone mode share decrease by 10 percentage points and vanpooling mode share increase to 7.8 percent. The *TCRP Report* notes most vanpools programs do best where one-way trip lengths exceed 20 miles, where work schedules are fixed and regular, where employer size is sufficient to allow matching of 5 to 12 people from the same residential area, where public transit is inadequate, and were some congestion or parking problems exist.

Alternative Literature:

In *TDM Case Studies* [2], a case study of Kaiser Permanente Hospital has shown their employer-sponsored shuttle service eliminated 380,100 miles per month, or nearly 4 million miles of travel per year, and four tons of smog precursors annually.

Alternative Literature References:

[2] Transportation Demand Management Institute of the Association for Commuter Transportation. *TDM Case Studies and Commuter Testimonials*. Prepared for the US EPA. 1997. http://www.epa.gov/OMS/stateresources/rellinks/docs/tdmcases.pdf

Other Literature Reviewed:

None

3.4.12 Implement Bike-Sharing Programs

Range of Effectiveness: Grouped strategy (see SDT-5 and LUT-9)

Measure Description:

This project will establish a bike sharing program. Stations should be at regular intervals throughout the project site. The number of bike-share kiosks throughout the project area should vary depending on the density of the project and surrounding area. Paris' bike-share program places a station every few blocks throughout the city (approximately 28 bike stations/square mile). Bike-station density should increase around commercial and transit hubs.

Bike sharing programs have minimal impacts when implemented alone. This strategy's effectiveness is heavily dependent on the location and context. Bike-sharing programs have worked well in densely populated areas (examples in Barcelona, London, Lyon, and Paris) with existing infrastructure for bicycling. Bike sharing programs should be combined with **Bike Lane Street Design (SDT-5)** and **Improve Design of Development (LUT-9)**.

Taking evidence from the literature, a 135-300% increase in bicycling (of which roughly 7% are shifting from vehicle travel) results in a negligible impact (around 0.03% vehicle miles traveled (VMT) reduction (see Appendix C for calculations)).

Measure Applicability:

- Urban and suburban-center context only
- Negligible in a rural context
- Appropriate for residential, retail, office, industrial, and mixed-use projects

Alternative Literature:

Alternate:

The International Review [1] found bike mode share increases:

- from 0.75% in 2005 to 1.76% in 2007 in Barcelona (Romero, 2008) (135% increase)
- From 1% in 2001 to 2.5% in 2007 in Paris (Nadal, 2007; City of Paris, 2007) (150% increase)
- From 0.5% in 1995 to 2% in 2006 in Lyon (Bonnette, 2007; Velo'V, 2009) (300% increase)

London [2] is the only study that reports the breakdown of the prior mode In London: 6% of users reported shifting from driving, 34% from transit, 23% said they would not have

travelled (Noland and Ishaque, 2006). Additionally, 68% of the bike trips were for leisure or recreation. Companion strategies included concurrent improvements in bicycle facilities.

The London program was implemented west of Central London in a densely populated area, mainly residential, with several employment centers. A relatively well developed bike network existed, including over 1,000 bike racks. The program implemented 25 locker stations with 70 bikes total.

Alternate:

- 1/3 vehicle trip reduced per day per bicycle (1,000 vehicle trips reduced per day in Lyon)

The Bike Share Opportunities [3] report looks at two case studies of bike-sharing implementation in France. In Lyon, the 3,000 bike-share system shifts 1,000 car trips to bicycle each day. Surveys indicate that 7% of the bike share trips would have otherwise been made by car. Lyon saw a 44% increase in bicycle riding within the first year of their program while Paris saw a 70% increase in bicycle riding and a 5% reduction in car use and congestion within the first year and a half of their program. The Bike Share Opportunities report found that population density is an important part of a successful program. Paris' bike share subscription rates range between 6% and 9% of the total population. This equates to an average of 75,000 rentals per day. The effectiveness of bike share programs at sub-city scales are not addressed in the literature.

Alternative Literature References:

[1] Pucher J., Dill, J., and Handy, S. Infrastructure, Programs and Policies to Increase Bicycling: An International Review. February 2010. (Table 4)

[2] Noland, R.B., Ishaque, M.M., 2006. "Smart Bicycles in an urban area: Evaluation of a pilot scheme in London." *Journal of Public Transportation*. 9(5), 71-95. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.117.8173&rep=rep1&type=pdf#page=76

[3] NYC Department of City Planning, *Bike-Share Opportunities in New York City,* 2009. (p. 11, 14, 24, 68) http://www.nyc.gov/html/dcp/html/transportation/td_bike_share.shtml

Other Literature Reviewed:

None

3.4.13 Implement School Bus Program

Measure Effectiveness Range: 38 – 63% School VMT Reduction and therefore 38 – 63% reduction in school trip GHG emissions[66]

Measure Description:

The project will work with the school district to restore or expand school bus services in the project area and local community.

Measure Applicability:

- Urban, suburban, and rural context
- Appropriate for residential and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage of families expected to use/using school bus program

Mitigation Method:

$$\% \text{ VMT Reduction} = A * B$$

Where

A = % families expected to use/using school bus program

B = adjustments to convert from participation to school day VMT to annual school VMT

[66] Transit vehicles may also result in increases in emissions that are associated with electricity production or fuel use. The Project Applicant should consider these potential additional emissions when estimating mitigation for these measures.

Detail:

- A: a typical range of 50 – 84% (see discussion section)
- B: 75% (see Appendix C for detail)

Assumptions:

Data based upon the following references:

[1] JD Franz Research, Inc.; *Lamorinda School Bus Program, 2003 Parent Survey, Final Report;* January 2004; obtained from Juliet Hansen, Program Manager. (p. 5)

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[67]
CO_2e	38 – 63% of running
PM	38 – 63% of running
CO	38 – 63% of running
NOx	38 – 63% of running
SO_2	38 – 63% of running
ROG	23 – 38% of total

Discussion:

The literature presents a high range of effectiveness showing 84% participation by families. 50% is an estimated low range assuming the project has a minimum utilization goal. Note that the literature presents results from a single case study.

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction (50% participation) = 50% * 75% = 38%
- High Range % VMT Reduction (85% participation) = 84% * 75% = 63%

Preferred Literature:

- 84% penetration rate
- 2,451 – 2,677 daily vehicle trips reduced
- 441,180 – 481,860 annual vehicle trips reduced

[67] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Transportation

MP# **TR-3.4** **TRT-13** **Commute Trip Reduction**

The Lamorinda School Bus Program was implemented to reduce traffic congestion in the communities of Lafayette, Orinda, and Moraga, California. In 2003, a parent survey was conducted to determine the extent to which the program diverted or eliminated vehicle trips. This survey covered a representative sample of all parents (not just those signed up for the school bus program). The range of morning trips prevented is 1,266 to 1,382; the range of afternoon trips prevented is 1,185 to 1,295. Annualized, the estimated total trip prevention is between 441,180 to 481,860. 83% of parents surveyed reported that their child usually rides the bus to school in the morning. 84% usually rode the bus back home in the afternoons. The data came from surveys and the results are unique to the location and extent of the program. The report did not indicate the number of school buses in operation during the time of the survey.

Alternative Literature:

None

Alternative Literature References:

None

Other Literature Reviewed:

None

3.4.14 Price Workplace Parking

Range of Effectiveness: 0.1 – 19.7% commute vehicle miles traveled (VMT) reduction and therefore 0.1 -19.7% reduction in commute trip GHG emissions.

Measure Description:

The project will implement workplace parking pricing at its employment centers. This may include: explicitly charging for parking for its employees, implementing above market rate pricing, validating parking only for invited guests, not providing employee parking and transportation allowances, and educating employees about available alternatives.

Though similar to the Employee Parking "Cash-Out" strategy, this strategy focuses on implementing market rate and above market rate pricing to provide a price signal for employees to consider alternative modes for their work commute.

Measure Applicability:

- Urban and suburban context
- Negligible impact in a rural context
- Appropriate for retail, office, industrial, and mixed-use projects
- Reductions applied only if complementary strategies are in place:
    - Residential parking permits and market rate public on-street parking - to prevent spill-over parking
    - Unbundled parking - is not required but provides a market signal to employers to transfer over the, now explicit, cost of parking to the employees. In addition, unbundling parking provides a price with which employers can utilize as a means of establishing workplace parking prices.

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Location of project site: low density suburb, suburban center, or urban location
- Daily parking charge ($1 - $6)
- Percentage of employees subject to priced parking

Mitigation Method:

$$\% \text{ VMT Reduction} = A * B$$

Where

A = Percentage reduction in commute VMT (from [1] and [2])

B = Percent of employees subject to priced parking

Detail:

- A:

Project Location	Daily Parking Charge			
	$1	$2	$3	$6
Low density suburb	0.5%	1.2%	1.9%	2.8%
Suburban center	1.8%	3.7%	5.4%	6.8%
Urban Location	6.9%	12.5%	16.8%	19.7%

Moving Cooler, VTPI, Fehr & Peers.
Note: 2009 dollars.

Assumptions:

Data based upon the following references:

[1] Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. (Table 5.13, Table D.3) http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendices_Complete_102209.pdf

[2] VTPI, Todd Litman, *Transportation Elasticities,*(Table 15) *http://www.vtpi.org/elasticities.pdf.*

Comsis Corporation (1993), *Implementing Effective Travel Demand Management Measures: Inventory of Measures and Synthesis of Experience*, USDOT and Institute of Transportation Engineers (www.ite.org); www.bts.gov/ntl/DOCS/474.html.

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[68]
CO_2e	0.1 – 19.7% of running
PM	0.1 – 19.7% of running
CO	0.1 – 19.7% of running
NOx	0.1 – 19.7% of running
SO_2	0.1 – 19.7% of running
ROG	0.06 – 11.8% of total

Discussion:

Priced parking can result in parking spillover concerns. The highest VMT reductions should be given only with complementary strategies such as parking time limits or neighborhood parking permits are in place in surrounding areas.

Example:

Sample calculations are provided below:

- Low Range % Commute VMT Reduction (low density suburb, $1/day, 20% priced) = 0.5% * 20% = 0.1%
- High Range % Commute VMT Reduction (urban, $6/day, 100% priced) = 19.7% * 100% = 19.7%

Preferred Literature:

The table above (variable A) was calculated using the percent commute VMT reduction from *Moving Cooler* (0.5% - 6.9% reduction for $1/day parking charge). The percentage reductions for $2 - $6 / day parking charges were extrapolated by multiplying the *Moving Cooler* percentages with the ratios from the VTPI table below (percentage increases). For example, to obtain a percent VMT reduction for a $6/day parking charge for a low density suburb, 0.5% * ((36.1%-6.5%) /6.5%) = 2.3%. The methodology was utilized to capture the non-linear effect of parking charges on trip reduction (VTPI) while maintaining a conservative estimate of percent reductions (*Moving Cooler*).

Preferred:

- 0.5-6.9% reduction in commuting VMT
- 0.44-2.07% reduction in greenhouse gas (GHG) emissions

[68] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Moving Cooler Technical Appendices indicate that increasing employee parking costs $1 per day ($0.50 per vehicle for carpool and free for vanpools) can reduce GHG between 0.44% and 2.07% and reduce commuting VMT between 0.5% and 6.9%. The reduction in GHG varies based on how extensive the implementation of the program is. The reduction in commuting VMT differs for type of urban area as shown in the table below. Please note that these numbers are independent of results for employee parking cash-out strategy (discussed in its own fact sheet).

		Percent Change in Commuting VMT					
Strategy	Description	Large Metropolitan (higher transit use)	Large Metropolitan (lower transit use)	Medium Metro (higher)	Medium Metro (lower)	Small Metro (higher)	Small Metro (lower)
Parking Charges	Parking charge of $1/day	6.9%	0.9%	1.8%	0.5%	1.3%	0.5%
Source: *Moving Cooler*							

Preferred:

Commute Vehicle trip reduction	**Daily Parking Charges**			
Worksite Setting	**$0.75**	**$1.49**	**$2.98**	**$5.96**
Suburb	6.5%	15.1%	25.3%*	36.1%*
Suburban Center	12.3%	25.1%*	37.0%*	46.8%*
Central Business District	17.5%	31.8%*	42.6%*	50.0%*
Source: VTPI [2]				

* Discounts greater than 20% should be capped, as they exceed levels recommended by *TCRP 95* and other literature.

The reduction in commute trips varies by parking fee and worksite setting [2]. For daily parking fees between $1.49 and $5.96, worksites set in low-density suburbs could decrease vehicle trips by 6.5-36.1%, worksites set in activity centers could decrease vehicle trips by 12.3-46.8%, and worksites set in regional central business districts could decrease vehicles by 17.5-50%. (Note that adjusted parking fees (from 1993 dollars to 2009 dollars) were used. Adjustments were taken from the *Santa Monica General Plan EIR Report, Appendix*, Nelson\Nygaard).

Alternative Literature:

Alternate:

- 1 percentage point reduction in auto mode share
- 12.3% reduction in commute vehicle trips

TCRP 95 Draft Chapter 19 [4] found that an increase of $8 per month in employee parking charges was necessary to decrease employee SOV mode split rates by one

percentage point. *TCRP 95* compared 82 sites with TDM programs and found that programs with parking fees have an average commute vehicle trip reduction of 24.6%, compared with 12.3% for sites with free parking.

Alternate:

- 1% reduction in VMT ($1 per day charge)
- 2.6% reduction in VMT ($3 per day charge)

The Deakin, et al. report [5] for the California Air Resources Board (CARB) analyzed transportation pricing measures for the Los Angeles, Bay Area, San Diego, and Sacramento metropolitan areas.

Alternative Literature References:

[4] Pratt, Dick. Personal Communication Regarding the Draft of TCRP 95 Traveler Response to Transportation System Changes – Chapter 19 Employer and Institutional TDM Strategies. (Table 19-9)

[5] Deakin, E., Harvey, G., Pozdena, R., and Yarema, G., 1996. *Transportation Pricing Strategies for California: An Assessment of Congestion, Emissions, Energy and Equity Impacts.* Final Report. Prepared for California Air Resources Board (CARB), Sacramento, CA (Table 7.2)

Other Literature Reviewed:

None

3.4.15 Implement Employee Parking "Cash-Out"

Range of Effectiveness: 0.6 – 7.7% commute vehicle miles traveled (VMT) reduction and therefore 0.6 – 7.7% reduction in commute trip GHG emissions

Measure Description:

The project will require employers to offer employee parking "cash-out." The term "cash-out" is used to describe the employer providing employees with a choice of forgoing their current subsidized/free parking for a cash payment equivalent to the cost of the parking space to the employer.

Measure Applicability:

- Urban and suburban context
- Not applicable in a rural context
- Appropriate for retail, office, industrial, and mixed-use projects
- Reductions applied only if complementary strategies are in place:
    - Residential parking permits and market rate public on-street parking -to prevent spill-over parking
    - Unbundled parking - is not required but provides a market signal to employers to forgo paying for parking spaces and "cash-out" the employee instead. In addition, unbundling parking provides a price with which employers can utilize as a means of establishing "cash-out" prices.

Baseline Method:

See introduction section.

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage of employees eligible
- Location of project site: low density suburb, suburban center, or urban location

Mitigation Method:

$$\% \text{ VMT Reduction} = A * B$$

Where

A = % reduction in commute VMT (from the literature)
B = % of employees eligible

Detail:

- A: Change in Commute VMT: 3.0% (low density suburb), 4.5% (suburban center), 7.7% (urban) change in commute VMT (source: Moving Cooler)

Assumptions:

Data based upon the following references:

- Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. (Table 5.13, Table D.3) http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[69]
CO_2e	0.6 – 7.7% of running
PM	0.6 – 7.7% of running
CO	0.6 – 7.7% of running
NOx	0.6 – 7.7% of running
SO_2	0.6 – 7.7% of running
ROG	0.36 – 4.62% of running

Discussion:

Please note that these estimates are independent of results for workplace parking pricing strategy (see strategy number T# E5 for more information).

If work site parking is not unbundled, employers cannot utilize this unbundled price as a means of establishing "cash-out" prices. The table below shows typical costs for parking facilities in large urban and suburban areas in the US. This can be utilized as a reference point for establishing reasonable "cash-out" prices. Note that the table does not include external costs to parking such as added congestion, lost opportunity cost of land devoted to parking, and greenhouse gas (GHG) emissions.

	Structured (urban)	Surface (suburban)
Land (Annualized)	$1,089	$215
Construction (Annualized)	$2,171	$326

[69] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

O & M Costs	$575	$345
Annual Total	$3,835	$885
Monthly Costs	$320	$74
Source: VTPI, *Transportation Costs and Benefit Analysis II – Parking Costs*, April 2010 (p.5.4-10)		

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction (low density suburb and 20% eligible) = 3% * 0.2 = 0.6%
- High Range % VMT Reduction (urban and 100% eligible) = 7.7% * 1 = 7.7%

Preferred Literature:

- 0.44% - 2.07% reduction in GHG emissions
- 3.0% - 7.7% reduction in commute VMT

Moving Cooler Technical Appendices indicate that reimbursing "cash-out" participants $1/day can reduce GHG between 0.44% and 2.07% and reduce commuting VMT between 3.0% and 7.7%. The reduction in GHG varies based on how extensive the implementation of the program is. The reduction in commuting VMT differs for type of urban area is shown in the table below.

		Percent Change in Commuting VMT					
Strategy	Description	Large Metropolitan (higher transit use)	Large Metropolitan (lower transit use)	Medium Metro (higher)	Medium Metro (lower)	Small Metro (higher)	Small Metro (lower)
Parking Cash-Out	Subsidy of $1/day	7.7%	3.7%	4.5%	3.0%	4.0%	3.0%

Alternative Literature:

Alternate:

- 2-6% reduction in vehicle trips

VTPI used synthesis data to determine parking cash out could reduce commute vehicle trips by 10-30%. VTPI estimates that the portion of vehicle travel affected by parking cash-out would be about 20% and therefore there would be only about a 2-6% total reduction in vehicle trips attributed to parking cash-out.

Alternate:

- 12% reduction in VMT per year per employee
- 64% increase in carpooling
- 50% increase in transit mode share
- 39% increase in pedestrian/bike share

Shoup looked at eight California firms that complied with California's 1992 parking cash-out law, applicable to employers of 50 or more persons in regions that do not meet the state's clean air standards. To comply, a firm must offer commuters the option to choose a cash payment equal to any parking subsidy offered. Six of companies went beyond compliance and subsidized one or more alternatives to parking (more than the parking subsidy price). The eight companies ranged in size between 120 and 300 employees, and were located in downtown Los Angeles, Century City, Santa Monica, and West Hollywood. Shoup states that an average of 12% fewer VMT per year per employee is equivalent to removing one of every eight cars driven to work off the road.

Alternative Literature Notes:

Litman, T., 2009. "Win-Win Emission Reduction Strategies." Victoria Transport Policy Institute. Website: http://www.vtpi.org/wwclimate.pdf. Accessed March 2010. (p. 5)

Donald Shoup, "Evaluating the Effects of Cashing Out Employer-Paid Parking: Eight Case Studies." *Transport Policy*, Vol. 4, No. 4, October 1997, pp. 201-216. (Table 1, p. 204)

Other Literature Reviewed:

None

3.5 Transit System Improvements

3.5.1 Provide a Bus Rapid Transit System

Range of Effectiveness: 0.02 – 3.2% vehicle miles traveled (VMT) reduction and therefore 0.02 – 3% reduction in GHG emissions.

Measure Description:

The project will provide a Bus Rapid Transit (BRT) system with design features for high quality and cost-effective transit service. These include:

- Grade-separated right-of-way, including bus only lanes (for buses, emergency vehicles, and sometimes taxis), and other Transit Priority measures. Some systems use guideways which automatically steer the bus on portions of the route.
- Frequent, high-capacity service
- High-quality vehicles that are easy to board, quiet, clean, and comfortable to ride.
- Pre-paid fare collection to minimize boarding delays.
- Integrated fare systems, allowing free or discounted transfers between routes and modes.
- Convenient user information and marketing programs.
- High quality bus stations with Transit Oriented Development in nearby areas.
- Modal integration, with BRT service coordinated with walking and cycling facilities, taxi services, intercity bus, rail transit, and other transportation services.

BRT systems vary significantly in the level of travel efficiency offered above and beyond "identity" features and BRT branding. The following effectiveness ranges represent general guidelines. Each proposed BRT should be evaluated specifically based on its characteristics in terms of time savings, cost, efficiency, and way-finding advantages. These types of features encourage people to use public transit and therefore reduce VMT.

Measure Applicability:

- Urban and suburban context
- Negligible in a rural context. Other measures are more appropriate to rural areas, such as express bus service to urban activity centers with park-and-ride lots at system-efficient rural access points.
- Appropriate for specific or general plans

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Existing transit mode share
- Percentage of lines serving Project converting to BRT

The following are optional inputs. Average (default) values are included in the calculations but can be updated to project specificity if desired. Please see Appendix C for calculation detail:

- Average vehicle occupancy

Mitigation Method:

$$\% \text{ VMT Reduction} = \text{Riders} * \text{Mode} * \text{Lines} * D$$

Where

Riders = % increase in transit ridership on BRT line (28% from [1])

Mode = Existing transit mode share (see table below)

Lines = Percentage of lines serving project converting to BRT

D = Adjustments from transit ridership increase to VMT (0.67, see Appendix C)

Project setting	Transit mode share
Suburban	1.3%
Urban	4%
Urban Center	17%
Source: NHTS, 2001 http://www.dot.ca.gov/hq/tsip/tab/documents/travelsurveys/Final2001_StwTravelSurveyWkdayRpt.pdf (Urban – MTC, SACOG. Suburban – SCAG, SANDAG, Fresno County.) Urban Center from San Francisco County Transportation Authority Countywide Transportation Plan, 2000.	

- D: 0.67 (see Appendix C for detail)

Assumptions:

Data based upon the following references:

[1] FTA, August 2005. "Las Vegas Metropolitan Area Express BRT Demonstration Project", NTD, http://www.ntdprogram.gov/ntdprogram/cs?action=showRegionAgencies&region=9

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[70]
CO_2e	0.02 – 3.2% of running
PM	0.02 – 3.2% of running
CO	0.02 – 3.2% of running
NOx	0.02 – 3.2% of running
SO_2	0.02 – 3.2% of running
ROG	0.012 – 1.9% of total

Discussion:

Increases in transit ridership due to shifts from other lines do not need to be addressed since it is already incorporated in the literature.

In general, transit operational strategies alone are not enough for a large modal shift [2], as evidenced by the low range in VMT reductions. Through case study analysis, the TCRP report [2] observed that strategies that focused solely on improving level of service or quality of transit were unsuccessful at achieving a significant shift. Strategies that reduce the attractiveness of vehicle travel should be implemented in combination to attract a larger shift in transit ridership. The three following factors directly impact the attractiveness of vehicle travel: urban expressway capacity, urban core density, and downtown parking availability.

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction (suburban,10% of lines) = 28% * 1.3% * 10% * 0.67 = 0.02%

[70] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

- High Range % VMT Reduction (urban, 100% of lines) = 28% * 17% * 100% * 0.67 = 3.2%

Preferred Literature:

- 28% increase in transit ridership in the existing corridor

The FTA study [1] looks at the implementation of the Las Vegas BRT system. The BRT supplemented an existing route along a 7.5 mile corridor. The existing route was scaled back. Total ridership on the corridor (both routes combined) increased 61,704 monthly riders, 28% increase on the existing corridor and 1.4% increase in system ridership. The route represented an increase in 2.1% of system service miles provided.

Alternative Literature:

Alternate:

- 27-84% increase in total transit ridership

Various bus rapid transit systems obtained the following total transit ridership growth: Vancouver 96B (30%), Las Vegas Max (35-40%), Boston Silver Line (84%), Los Angeles (27-42%), and Oakland (66%). VTPI [3] obtained the BRT data from BC Transit's unpublished research. The effectiveness of a BRT strategy depends largely on the land uses the BRT serves and their design and density.

Alternate:

- 50% increase in weekly transit ridership
- 60 – 80% shorter travel time compared to vehicle trip

The Martin Luther King, Jr. East Busway in Pennsylvania opened in 1983 as a separate roadway exclusively for public buses. The busway was 6.8 miles long with six stations. Ridership has grown from 20,000 to 30,000 weekday riders over 10 years. The busway saves commuters significant time compared with driving: 12 minutes versus 30-45 minutes in the AM or an hour in the PM [4].

Alternative Literature References:

[2] Transit Cooperative Research Program. TCRP 27 – Building Transit Ridership: An Exploration of Transit's Market Share and the Public Policies That Influence It (p.47-48). 1997. [cited in discussion section above]

[3] TDM Encyclopedia; Victoria Transport Policy Institute (2010). Bus Rapid Transit; (http://www.vtpi.org/tdm/tdm120.htm); updated 1/25/2010; accessed 3/3/2010.

[4] Transportation Demand Management Institute of the Association for Commuter Transportation. *TDM Case Studies and Commuter Testimonials*. Prepared for the US EPA. 1997. (p.55-56)
http://www.epa.gov/OMS/stateresources/rellinks/docs/tdmcases.pdf

3.5.2 Implement Transit Access Improvements

Range of Effectiveness: Grouped strategy. [See TST-3 and TST-4]

Measure Description:

This project will improve access to transit facilities through sidewalk/ crosswalk safety enhancements and bus shelter improvements. The benefits of Transit Access Improvements alone have not been quantified and should be grouped with Transit Network Expansion (TST-3) and Transit Service Frequency and Speed (TST-4).

Measure Applicability:

- Urban, suburban context
- Appropriate for residential, retail, office, mixed use, and industrial projects

Alternative Literature:

No literature was identified that specifically looks at the quantitative impact of improving transit facilities as a standalone strategy.

Alternative Literature References:

None

Other Literature Reviewed:

None

3.5.3 Expand Transit Network

Range of Effectiveness: 0.1 – 8.2% vehicle miles travelled (VMT) reduction and therefore 0.1 – 8.2% reduction in GHG emissions[71]

Measure Description:

The project will expand the local transit network by adding or modifying existing transit service to enhance the service near the project site. This will encourage the use of transit and therefore reduce VMT.

Measure Applicability:

- Urban and suburban context
- May be applicable in a rural context but no literature documentation available (effectiveness will be case specific and should be based on specific assessment of levels of services and origins/destinations served)
- Appropriate for specific or general plans

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage increase transit network coverage
- Existing transit mode share
- Project location: urban center, urban, or suburban

[71] Transit vehicles may also result in increases in emissions that are associated with electricity production or fuel use. The Project Applicant should consider these potential additional emissions when estimating mitigation for these measures.

The following are optional inputs. Average (default) values are included in the calculations but can be updated to project specificity if desired. Please see Appendix C for calculation detail:

- Average vehicle occupancy

Mitigation Method:

% VMT Reduction = Coverage * B * Mode * D

Where

Coverage = % increase in transit network coverage

B = elasticity of transit ridership with respect to service coverage (see Table below)

Mode = existing transit mode share

D = adjustments from transit ridership increase to VMT (0.67, from Appendix C)

B:

Project setting	Elasticity
Suburban	1.01
Urban	0.72
Urban Center	0.65
Source: TCRP 95, Chapter 10	

Mode: Provide existing transit mode share for project or utilize the following averages

Project setting	Transit mode share
Suburban	1.3%
Urban	4%
Urban Center	17%
Source: NHTS, 2001http://www.dot.ca.gov/hq/tsip/tab/ documents/travelsurveys/Final2001_StwTravelSurveyWkdayRpt.pdf (Urban – MTC, SACOG. Suburban – SCAG, SANDAG, Fresno County.) Urban Center from San Francisco County Transportation Authority Countywide Transportation Plan, 2000.	

Assumptions:

Data based upon the following references:

[1] Transit Cooperative Research Program. TCRP Report 95 Traveler Response to System Changes – Chapter 10: Bus Routing and Coverage. 2004. (p. 10-8 to 10-10)

Emission Reduction Ranges and Variables:

Pollut0ant	Category Emissions Reductions[72]
CO_2e	0.1 – 8.2% of running
PM	0.1 – 8.2% of running
CO	0.1 – 8.2% of running
NOx	0.1 – 8.2% of running
SO_2	0.1 – 8.2% of running
ROG	0.06 – 4.9% of total

Discussion:

In general, transit operational strategies alone are not enough for a large modal shift [2], as evidenced by the low range in VMT reductions. Through case study analysis, the TCRP report [2] observed that strategies that focused solely on improving level of service or quality of transit were unsuccessful at achieving a significant shift. Strategies that reduce the attractiveness of vehicle travel should be implemented in combination to attract a larger shift in transit ridership. The three following factors directly impact the attractiveness of vehicle travel: urban expressway capacity, urban core density, and downtown parking availability.

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction (10% expansion, suburban) = 10% * 1.01 * 1.3% * .67 = 0.1%
- High Range % VMT Reduction (100% expansion, urban) = 100% * 0.72 * 17% * .67 = 8.2%

The low and high ranges are estimates and may vary based on the characteristics of the project.

[72] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Preferred Literature:

- 0.65 = elasticity of transit ridership with respect to service coverage/expansion (in radial routes to central business districts)
- 0.72 = elasticity of transit ridership with respect to service coverage/expansion (in central city routes)
- 1.01 = elasticity of transit ridership with respect to service coverage/expansion (in suburban routes)

TCRP 95 Chapter 10 [1] documents the results of system-wide service expansions in San Diego. The least sensitivity to service expansion came from central business districts while the largest impacts came from suburban routes. Suburban locations, with traditionally low transit service, tend to have greater ridership increases compared to urban locations which already have established transit systems. In general, there is greater opportunity in suburban locations.

Alternative Literature:

- -0.06 = elasticity of VMT with respect to transit revenue miles

Growing Cooler [3] modeled the impact of various urban variables (including transit revenue miles and transit passenger miles) on VMT, using data from 84 urban areas around the U.S.

Alternative Literature References:

[2] Transit Cooperative Research Program. TCRP 27 – Building Transit Ridership: An Exploration of Transit's Market Share and the Public Policies That Influence It (p.47-48). 1997. [cited in discussion section above]

[3] Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change. Urban Land Institute.

3.5.4 Increase Transit Service Frequency/Speed

Range of Effectiveness: 0.02 – 2.5% vehicle miles traveled (VMT) reduction and therefore 0.02 – 2.5% reduction in GHG emissions[73]

Measure Description:

This project will reduce transit-passenger travel time through more reduced headways and increased speed and reliability. This makes transit service more attractive and may result in a mode shift from auto to transit which reduces VMT.

Measure Applicability:

- Urban and suburban context
- May be applicable in a rural context but no literature documentation available (effectiveness will be case specific and should be based on specific assessment of levels of services and origins/destinations served)
- Appropriate for specific or general plans

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage reduction in headways (increase in frequency)
- Level of implementation
- Project setting: urban center, urban, suburban
- Existing transit mode share

[73] Transit vehicles may also result in increases in emissions that are associated with electricity production or fuel use. The Project Applicant should consider these potential additional emissions when estimating mitigation for these measures.

The following are optional inputs. Average (default) values are included in the calculations but can be updated to project-specific values if desired. Please see Appendix C for calculation detail:

- Average vehicle occupancy

Mitigation Method:

% VMT Reduction = Headway * B * C * Mode * E

Where

Headway = % reduction in headways

B = elasticity of transit ridership with respect to increased frequency of service (from [1])

C = adjustment for level of implementation

Mode = existing transit mode share

E = adjustments from transit ridership increase to VMT

Detail:

- Headway: reasonable ranges from 15 – 80%
- B:

Setting	Elasticity
Urban	0.32
Suburban	0.36
Source: TCRP Report 95 Chapter 9	

- C:

Level of implementation = number of lines improved / total number of lines serving project	Adjustment
<50%	50%
>=50%	85%
Fehr & Peers, 2010.	

- Mode: Provide existing transit mode share for project or utilize the following averages

Project setting	Transit mode share
Suburban	1.3%
Urban	4%
Urban Center	17%
Source: NHTS, 2001http://www.dot.ca.gov/hq/tsip/tab/ documents/travelsurveys/Final2001_StwTravelSurveyWkdayRpt.pdf (Urban – MTC, SACOG. Suburban – SCAG, SANDAG, Fresno County.)	

Urban Center from San Francisco County Transportation Authority Countywide Transportation Plan, 2000.

- E: 0.67 (see Appendix C for detail)

Assumptions:

Data based upon the following references:

[1] Transit Cooperative Research Program. TCRP Report 95 Traveler Response to System Changes – Chapter 9: Transit Scheduling and Frequency (p. 9-14)

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[74]
CO_2e	0.02 – 2.5% % of running
PM	0.02 – 2.5% % of running
CO	0.02 – 2.5% % of running
NOx	0.02 – 2.5% % of running
SO_2	0.02 – 2.5% % of running
ROG	0.01 – 1.5% % of total

Discussion:

Reasonable ranges for reductions were calculated assuming existing 30-minute headways reduced to 25 minutes and 5 minutes to establish the estimated low and high reductions, respectively.

The level of implementation adjustment is used to take into account increases in transit ridership due to shifts from other lines. If increases in frequency are only applied to a percentage of the lines serving the project, then we conservatively estimate that 50% of the transit ridership increase is a shift from the existing lines. If frequency increases are applied to a majority of the lines serving the project, we conservatively assume at least some of the transit ridership (15%) comes from existing riders.

In general, transit operational strategies alone are not enough for a large modal shift [2], as evidenced by the low range in VMT reductions. Through case study analysis, the TCRP report [2] observed that strategies that focused solely on improving level of service or quality of transit were unsuccessful at achieving a significant shift. Strategies that reduce the attractiveness of vehicle travel should be implemented in combination to attract a larger shift in transit ridership. The three following factors directly impact the

[74] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

attractiveness of vehicle travel: urban expressway capacity, urban core density, and downtown parking availability.

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction (15% reduction in headways, suburban, <50% implementation) = 15% * 0.36 * 50% * 1.3% *0.67 = 0.02%
- High Range % VMT Reduction (80% reduction in headways, urban, >50% implementation) = 80% * 0.32 * 85% * 17% * 0.67 = 2.5%

Preferred Literature:

- 0.32 = elasticity of transit ridership with respect to transit service (urban)
- 0.36 – 0.38 = elasticity of transit ridership with respect to transit service (suburban)

TCRP 95 Chapter 9 [1] documents the results of frequency changes in Dallas. Increases in frequency are more sensitive in a suburban environment. Suburban locations, with traditionally low transit service, tend to have greater ridership increases compared to urban locations which already have established transit systems. In general, there is greater opportunity in suburban locations

Alternative Literature:

- 0.5 = elasticity of transit ridership with respect to increased frequency of service
- 1.5 to 2.3% increase in annual transit trips due to increased frequency of service
- 0.4-0.5 = elasticity of ridership with respect to increased operational speed
- 4% - 15% increase in annual transit trips due to increased operational speed
- 0.03-0.09% annual GHG reduction (for bus service expansion, increased frequency, and increased operational speed)

For increased frequency of service strategy, *Moving Cooler* [3] looked at three levels of service increases, 3%, 3.5% and 4.67% increases in service, resulting in a 1.5 – 2.3% increase in annual transit trips. For increased speed and reliability, Moving Cooler looked at three levels of speed/reliability increases. Improving travel speed by 10% assumed implementing signal prioritization, limited stop service, etc. over 5 years. Improving travel speed by 15% assumed all above strategies plus signal synchronization and intersection reconfiguration over 5 years. Improving travel speed by 30% assumed all above strategies and an improved reliability by 40%, integrated fare system, and implementation of BRT where appropriate. *Moving Cooler* calculates estimated 0.04-0.14% annual GHG reductions in combination with bus service expansion strategy.

Alternative Literature References:

[2] Transit Cooperative Research Program. TCRP 27 – Building Transit Ridership: An Exploration of Transit's Market Share and the Public Policies That Influence It (p.47-48). 1997. [cited in discussion section]

[3] Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. (p B-32, B-33, Table D.3) http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendices_Complete_102209.pdf

3.5.5 Provide Bike Parking Near Transit

Range of Effectiveness: Grouped strategy. [See TST-3 and TST-4]

Measure Description:

Provide short-term and long-term bicycle parking near rail stations, transit stops, and freeway access points. The benefits of Station Bike Parking have no quantified impacts as a standalone strategy and should be grouped with Transit Network Expansion (TST-3) and Increase Transit Service Frequency and Speed (TST-4) to encourage multi-modal use in the area and provide ease of access to nearby transit for bicyclists.

Measure Applicability:

- Urban, suburban context
- Appropriate for residential, retail, office, mixed use, and industrial projects

Alternative Literature:

No literature was identified that specifically looks at the quantitative impact of including transit station bike parking.

Alternative Literature References:

None

Other Literature Reviewed:

None

3.5.6 Provide Local Shuttles

Range of Effectiveness: Grouped strategy. [See TST-4 and TST-5]

Measure Description:

The project will provide local shuttle service through coordination with the local transit operator or private contractor. The local shuttles will provide service to transit hubs, commercial centers, and residential areas. The benefits of Local Shuttles alone have not been quantified and should be grouped with Transit Network Expansion (TST-4) and Transit Service Frequency and Speed (TST-5) to solve the "first mile/last mile" problem. In addition, many of the CommuteTrip Reduction Programs (Section 2.4, TRP 1-13) also included local shuttles.

Measure Applicability:

- Urban, suburban context
- Appropriate for large residential, retail, office, mixed use, and industrial projects

Alternative Literature:

No literature was identified to support the effectiveness of this strategy alone.

Alternative Literature References:

None

Other Literature Reviewed:

None

3.6 Road Pricing/Management

3.6.1 Implement Area or Cordon Pricing

Range of Effectiveness: 7.9 – 22.0% vehicle miles traveled (VMT) reduction and therefore 7.9 – 22.0% reduction in GHG emissions.

Measure Description:

This project will implement a cordon pricing scheme. The pricing scheme will set a cordon (boundary) around a specified area to charge a toll to enter the area by vehicle. The cordon location is usually the boundary of a central business district (CBD) or urban center, but could also apply to substantial development projects with limited points of access, such as the proposed Treasure Island development in San Francisco. The cordon toll may be static/constant, applied only during peak periods, or be variable, with higher prices during congested peak periods. The toll price can be based on a fixed schedule or be dynamic, responding to real-time congestion levels. It is critical to have an existing, high quality transit infrastructure for the implementation of this strategy to reach a significant level of effectiveness. The pricing signals will only cause mode shifts if alternative modes of travel are available and reliable.

Measure Applicability:

- Central business district or urban center only

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Percentage increase in pricing for passenger vehicles to cross cordon
- Peak period variable price or static all-day pricing (London scheme)

The following are optional inputs. Average (default) values are included in the calculations but can be updated to project-specific values if desired. Please see Appendix C for calculation detail:

- % (due to pricing) route shift, time-of-day shift, HOV shift, trip reduction, shift to transit/walk/bike

Mitigation Method:

$$\% \text{ VMT Reduction} = \text{Cordon\$} * B * C$$

Where

Cordon$ = % increase in pricing for passenger vehicles to cross cordon

B = Elasticity of VMT with respect to price (from [1])

C = Adjustment for % of VMT impacted by congestion pricing and mode shifts

Detail:

- Cordon$: reasonable range of 100 – 500% (See Appendix C for detail))
- B: 0.45 [1]
- C:

Cordon pricing scheme	Adjustment
Peak-period variable pricing	8.8%
Static all-day pricing	21%
Source: See Appendix C for detail	

Assumptions:

Data based upon the following references:

[1] Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. (p. B-13, B-14) http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf

- Referencing: VTPI, *Transportation Elasticities: How Prices and Other Factors Affect Travel Behavior.* July 2008. www.vtpi.org

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[75]
CO_2e	7.9 - 22.0% of running
PM	7.9 - 22.0% of running
CO	7.9 - 22.0% of running
NOx	7.9 - 22.0% of running
SO_2	7.9 - 22.0% of running
ROG	4.7 – 13.2% of total

Discussion:

The amount of pricing will vary on a case-by-case basis. The 100 – 500% increase is an estimated range of increases and should be adjusted to reflect the specificities of the pricing scheme implemented. Take care in calculating the percentage increase in price if baseline is $0.00. An upper limit of 500% may be a good check point. If baseline is zero, the Project Applicant may want to conduct calculations with a low baseline such as $1.00.

These calculations assume that the project is within the area cordon, essentially assuming that 100% of project trips will be affected. See Appendix C to make appropriate adjustments.

Example:

Sample calculations are provided below:

- Low Range % VMT Reduction (100% increase in price, peak period pricing) = 100% * 0.45 * 8.8% = 4.0%
- High Range % VMT Reduction (500% increase in price, all-day pricing) = 500% * 0.45 * 21% = 47.3% = 22% (established maximum based on literature)

Preferred Literature:

- -0.45 VMT elasticity with regard to pricing
- 0.04-0.08% greenhouse gas (GHG) reduction

Moving Cooler [1] assumes an average of 3% of regional VMT would cross the CBD cordon. A VMT reduction of 20% was estimated to require an average of 65 cents/mile applied to all congested VMT in the CBD, major employment, and retail centers. The

[75] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

range in GHG reductions is attributed to the range of implementation and start date. *Moving Cooler* reports an elasticity range from -0.15 to -0.47 from VTPI. *Moving Cooler* utilizes a stronger elasticity (0.45) to represent greater impact cordon pricing will have on users compared to other pricing strategies.

Alternative Literature:

- 6.5-14.0% reduction in carbon emissions
- 16-22% reduction in vehicles
- 6-9% increase in transit use

The Center for Clean Air Policy (CCAP) [2] cites two case studies in Europe, one in London and one in Stockholm, which show vehicle reductions of 16% and 22%, respectively. London's fee reduced CO_2 by 6.5%. Stockholm's program reduced injuries by 10%, increased transit use by 6-9%, and reduced carbon emissions by 14% in the central city within months of implementation.

Alternative Literature References:

[2] Center for Clean Air Policy (CCAP), *Short-term Efficiency Measures.* (p. 1) http://www.ccap.org/docs/resources/715/Short-Term%20Travel%20Efficiency%20Measures%20cut%20GHGs%209%2009%20final.pdf

CCAP cites Transport for London. *Central London Congestion Charging: Impacts Monitoring*, *Sixth Annual Report*. July 2008 http://www.tfl.gov.uk/assets/downloads/sixth-annual-impacts-monitoring-report-2008-07.pdf (p. 6) and Leslie Abboud and Jenny Clevstrom, "Stockholm's Syndrome," August 29, 2006, *Wall Street Journal.* http://transportation.northwestern.edu/mahmassani/Media/WSJ_8.06.pdf (p. 2)

Other Literature Reviewed:

None

3.6.2 Improve Traffic Flow

Range of Effectiveness: 0 - 45% reduction in GHG emissions

Measure Description:

The project will implement improvements to smooth traffic flow, reduce idling, eliminate bottlenecks, and management speed. Strategies may include signalization improvements to reduce delay, incident management to increase response time to breakdowns and collisions, Intelligent Transportation Systems (ITS) to provide real-time information regarding road conditions and directions, and speed management to reduce high free-flow speeds.

This measure does not take credit for any reduction in GHG emissions associated with changes to non-project traffic VMT. If Project Applicant wants to take credit for this benefit, the non-project traffic VMT would also need to be covered in the baseline conditions.

Measure Applicability:

- Urban, suburban, and rural context

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Average base-year travel speed (miles per hour (mph)) on implemented roads (congested[76] condition)

[76] A roadway is considered "congested" if operating at Level of Service (LOS) E or F

- Future travel speed (mph) on implemented roads for both a) congested and b) free-flow[77] condition
- Total vehicle miles traveled (VMT) on implemented roadways
- Total project-generated VMT

Mitigation Method:

$$\%\ CO_2\ \text{Emissions Reduction} = 1 - \frac{\text{Project GHG Emission}_{\text{post strategy}}}{\text{Project GHG emission}_{\text{baseline}}}$$

Where

$\text{Project GHG emission}_{\text{post strategy}}$ = $EF_{running}$ after strategy implementation * project VMT

$\text{Project GHG emission}_{baseline}$ = $EF_{running}$ before strategy implementation * project VMT

$EF_{running}$ = emission factor for running emissions [from table presented under "Detail" below]

Detail:

mph	Grams of CO_2 / mile	
	congested	Free-flow
5	1,110	823
10	715	512
15	524	368
20	424	297
25	371	262
30	343	247
35	330	244
40	324	249
45	323	259
50	325	273
55	328	289
60	332	306
65	339	325
70	353	347
75	377	375
80	420	416
85	497	478
Source: Barth, 2008, Fehr & Peers [1]		

[77] A roadway is considered "free flow" if operating at LOS D or better

By only including the project VMT portion, the reduction is typically on scale with the percentage of cost for traffic improvements and full reduction calculated for project VMT should be used. However, if the project cost is a greater share than their contribution to the VMT on the road, than the project and non-project VMT should be calculated and the percent reduction should be multiplied by the percent cost allocation. The GHG emission reductions associated with non-project VMT (if applicable) would be calculated as follows:

Metric Tonnes GHG reduced due to improving non-Project traffic flow = % Cost Allocation * Non-Project VMT * ($EF_{congested}$ –$EF_{freeflow}$) / (1,000,000 gram/MT)

Where:

Non-Project VMT that the Project's cost share impacts = portion of non-project VMT

$EF_{congested}$ = emissions for congested road in g/VMT

$EF_{freeflow}$ = emissions for freeflow road in g/VMT

Assumptions:

Data based upon the following references:

[1] Barth and Boriboonsomsin, "Real World CO_2 Impacts of Traffic Congestion", *Transportation Research Record, Journal of the Transportation Research Board,* No. 2058, Transportation Research Board, National Academy of Science, 2008.

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[78]
CO_2e	0 - 45% of running
PM	0 - 45% of running
CO	0 - 45% of running

[78] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

NOx	0 - 45% of running
SO_2	0 - 45% of running
ROG	0 - 27% of total

Discussion:

Care must be taken when estimating effectiveness since significantly improving traffic flow essentially lowers the cost and delay involved in travel, which under certain circumstances may induce additional VMT. [See Appendix C for a discussion on induced travel.]

The range of effectiveness presented above is a very rough estimate as emissions reductions will be highly dependent on the level of implementation and degree of congestion on the existing roadways. In addition, the low range of effectiveness was stated at 0% to highlight the potential of induced travel negating benefits achieved from this strategy.

Example:

Sample calculations are provided below:

- Signal timing coordination implementation:
  - Existing congested speeds of 25 mph
  - Conditions post-implementation: would improve to 25 mph free flow speed
  - Proposed project daily traffic generation is 200,000 VMT
  - Project CO_2 $Emissions_{baseline}$ = (371 g CO_2/mile) * (200,000 VMT daily) * (1 MT / 1 x 10^6 g) = 74 MT of CO_2 daily
  - Project CO_2 $Emissions_{post\ strategy}$ = (262 g CO_2/mile) * (200,000 VMT daily) * (1 MT / 1 x 10^6 g) = 52.4 MT of CO_2 daily
  - Percent CO_2emissions reduction = 1- (52.4 MT/ 74 MT) = 29%
- Speed management technique:
  - Existing free-flow speeds of 75 mph
  - Conditions post-implementation: reduce to 55 mph free flow speed
  - Proposed project daily traffic generation is 200,000 VMT
  - Project CO_2 $Emissions_{baseline}$ = (375 g CO_2/mile) * (200,000 VMT daily) * (1 MT / 1 x 10^6 g) = 75 MT of CO_2 daily
  - Project CO_2 $Emissions_{post\ strategy}$ = (289 g CO_2/mile) * (200,000 VMT daily) * (1 MT / 1 x 10^6 g) = 58 MT of CO_2 daily
  - Percent CO_2emissions reduction= 1 – (58 tons/ 75 tons) = 23%

Preferred Literature:

- 7 – 12% reduction in CO_2 emissions

This study [1] examined traffic conditions in Southern California using energy and emissions modeling and calculated the impacts of 1) congestion mitigation strategies to smooth traffic flow, 2) speed management techniques to reduce high free-flow speeds, and 3) suppression techniques to eliminate acceleration/deceleration associated with stop-and-go traffic. Using typical conditions on Southern California freeways, the strategies could reduce emissions by 7 to 12 percent.

The table (in the mitigation method section) was calculated using the CO_2 emissions equation from the report:

$$\ln (y) = b_0 + b_1 * x + b_2 * x^2 + b_3 * x^3 + b_4 * x^4$$

where

y = CO_2 emission in grams / mile

x = average trip speed in miles per hour (mph)

The coefficients for b_i were based off of Table 1 of the report, which then provides an equation for both congested conditions (real-world) and free-flow (steady-state) conditions.

Alternative Literature:

- 4 - 13% reduction in fuel consumption

The FHWA study [2] looks at various case studies of traffic flow improvements. In Los Angeles, a new traffic control signal system was estimated to reduce signal delays by 44%, vehicle stops by 41%, and fuel consumption by 13%. In Virginia, a study of retiming signal systems estimated reductions of stops by 25%, travel time by 10%, and fuel consumption by 4%. In California, optimization of 3,172 traffic signals through 1988 (through California's Fuel Efficient Traffic Signal Management program) documented an average reduction in vehicle stops of 16% and in fuel use of 8.6%. The 4-13% reduction in fuel consumption applies only to that vehicular travel directly benefited by the traffic flow improvements, specifically the VMT within the corridor in which the ITS is implemented and only during the times of day that would otherwise be congested without ITS. For example, signal coordination along an arterial normally congested in peak commute hours would produce a 4-13% reduction in fuel consumption only for the VMT occurring along that arterial during weekday commute hours.

Alternate:

- Up to 0.02% *increase* in greenhouse gas (GHG) emissions

Moving Cooler [3] estimates that bottleneck relief will result in an increase in GHG emissions during the 40-year period, 2010 to 2050. In the short term, however,

improved roadway conditions may improve congestion and delay, and thus reduce fuel consumption. VMT and GHG emissions are projected to increase after 2030 as induced demand begins to consume the roadway capacity. The study estimates a maximum increase of 0.02% in GHG emissions.

Alternative Literature References:

[2] FHWA, *Strategies to Reduce Greenhouse Gas Emissions from Transportation Sources*. http://www.fhwa.dot.gov/environment/glob_c5.pdf.

[3] Cambridge Systematics. *Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions.* Technical Appendices. Prepared for the Urban Land Institute. http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendix%20B_Effectiveness_102209.pdf

Other Literature Reviewed:

None

3.6.3 Required Project Contributions to Transportation Infrastructure Improvement Projects

Range of Effectiveness: Grouped strategy. [See RPT-2 and TST-1 through 7]

Measure Description:

The project should contribute to traffic-flow improvements or other multi-modal infrastructure projects that reduce emissions and are not considered as substantially growth inducing. The local transportation agency should be consulted for specific needs.

Larger projects may be required to contribute a proportionate share to the development and/or continuation of a regional transit system. Contributions may consist of dedicated right-of-way, capital improvements, easements, etc. The local transportation agency should be consulted for specific needs.

Refer to Traffic Flow Improvements (RPT-2) or the Transit System Improvements (TST-1 through 7) strategies for a range of effectiveness in these categories. The benefits of Required Contributions may only be quantified when grouped with related improvements.

Measure Applicability:

- Urban, suburban, and rural context
- Appropriate for residential, retail, office, mixed use, and industrial projects

Alternative Literature:

Although no literature discusses project contributions as a standalone measure, this strategy is a supporting strategy for most operations and infrastructure projects listed in this report.

Other Literature Reviewed:

None

3.6.4 Install Park-and-Ride Lots

Range of Effectiveness: Grouped strategy. [See RPT-1, TRT-11, TRT-3, and TST-1 through 6]

Measure Description:

This project will install park-and-ride lots near transit stops and High Occupancy Vehicle (HOV) lanes. Park-and-ride lots also facilitate car- and vanpooling. Refer to Implement Area or Cordon Pricing (RPT-1), Employer-Sponsored Vanpool/Shuttle (TRT-11), Ride Share Program (TRT-3), or the Transit System Improvement strategies (TST-1 through 6) for ranges of effectiveness within these categories. The benefits of Park-and-Ride Lots are minimal as a stand-alone strategy and should be grouped with any or all of the above listed strategies to encourage carpooling, vanpooling, ride-sharing, and transit usage.

Measure Applicability:

- Suburban and rural context
- Appropriate for residential, retail, office, mixed use, and industrial projects

Alternative Literature:

Alternate:

- 0.1 – 0.5% vehicle miles traveled (VMT) reduction

A 2005 FHWA [1] study found that regional VMT in metropolitan areas may be reduced between 0.1 to 0.5% (citing Apogee Research, Inc., 1994). The reduction potential of this strategy may be limited because it reduces the trip length but not vehicle trips.

Alternate:

- 0.50% VMT reduction per day

Washington State Department of Transportation (WSDOT) [2] notes the above number applies to countywide interstates and arterials.

Alternative Literature References:

[1] FHWA. Transportation and Global Climate Change: A Review and Analysis of the Literature – Chapter 5: Strategies to Reduce Greenhouse Gas Emissions from Transportation Sources. http://www.fhwa.dot.gov/environment/glob_c5.pdf

[2] Washington State Department of Transportation. *Cost Effectiveness of Park-and-Ride Lots in the Puget Sound Area.* http://www.wsdot.wa.gov/research/reports/fullreports/094.1.pdf

Other Literature Reviewed:

None

3.7 Vehicles

3.7.1 Electrify Loading Docks and/or Require Idling-Reduction Systems

Range of Effectiveness: 26-71% reduction in TRU idling GHG emissions

Measure Description:

Heavy-duty trucks transporting produce or other refrigerated goods will idle at truck loading docks and during layovers or rest periods so that the truck engine can continue to power the cab cooling elements. Idling requires fuel use and results in GHG emissions.

The Project Applicant should implement an enforcement and education program that will ensure compliance with this measure. This includes posting signs regarding idling restrictions as well as recording engine meter times upon entering and exiting the facility.

Measure Applicability:

- Truck refrigeration units (TRU)

Inputs:

The following information needs to be provided by the Project Applicant:

- Electricity provider for the Project
- Horsepower of TRU
- Hours of operation

Baseline Method:

$$\text{GHG emission} = \frac{CO_2\ \text{Exhaust}}{\text{Activity} \times \text{AvgHP} \times \text{LF}} \times \text{Hp} \times \text{Hr} \times \text{C} \times \text{LF}$$

Where:

GHG emission = MT CO_2e
CO_2 Exhaust = Statewide daily CO_2 emission from TRU for the relevant horsepower tier (tons/day). Obtained from OFFROAD2007.
Activity = Statewide daily average TRU operating hours for the relevant horsepower tier (hours/day). Obtained from OFFROAD2007.
AvgHP = Average TRU horsepower for the relevant horsepower tier (HP). Obtained from OFFROAD2007.
Hp = Horsepower of TRU.
Hr = Hours of operation.
C = Unit conversion factor

LF = Load factor of TRU for the relevant horsepower tier (dimensionless). Obtained from OFFROAD 2007.

Note that this method assumes the load factor of the TRU is same as the default in OFFROAD2007.

Mitigation Method:

Electrify loading docks

TRUs will be plugged into electric loading dock instead of left idling. The indirect GHG emission from electricity generation is:

$$\text{GHG emission} = \text{Utility} \times \text{Hp} \times \text{LF} \times \text{Hr} \times \text{C}$$

Where:

GHG emissions = MT CO_2e

Utility = Carbon intensity of Local Utility (CO_2e/kWh)

Hp = Horsepower of TRU.

LF = Load factor of TRU for the relevant horsepower tier (dimensionless). Obtained from OFFROAD2007.

Hr = Hours of operation.

C = Unit conversion factor

$$\text{GHG Reduction \%}^{79} = 1 - \frac{\text{Utility} \times \text{C}}{\text{EF} \times 10^{-6}}$$

Idling Reduction

Emissions from reduced TRU idling periods are calculated using the same methodology for the baseline scenario, but with the shorter hours of operation.

$$\text{GHG Reduction \%} = 1 - \frac{\text{time}_{\text{mitigated}}}{\text{time}_{\text{baseline}}}$$

Electrify loading docks

Power Utility	TRU Horsepower (HP)	Idling Emission Reductions[80]
LADW&P	< 15	26.3%
	< 25	26.3%
	< 50	35.8%

[79] This assumes energy from engine losses are the same.

[80] This reduction percentage applies to all GHG and criteria pollutant idling emissions.

PG&E	< 15	72.9%
	< 25	72.9%
	< 50	76.3%
SCE	< 15	61.8%
	< 25	61.8%
	< 50	66.7%
SDGE	< 15	53.5%
	< 25	53.5%
	< 50	59.5%
SMUD	< 15	67.0%
	< 25	67.0%
	< 50	71.2%

Idling Reduction

Emission reduction from shorter idling period is same as the percentage reduction in idling time.

Discussion:

The output from OFFROAD2007 shows the same emissions within each horsepower tier regardless of the year modeled. Therefore, the emission reduction is dependent on the location of the Project and horsepower of the TRU only.

Assumptions:

Data based upon the following references:

- California Air Resources Board. Off-road Emissions Inventory. OFFROAD2007. Available online at: http://www.arb.ca.gov/msei/offroad/offroad.htm
- California Climate Action Registry Reporting Online Tool. 2006 PUP Reports. Available online at: https://www.climateregistry.org/CARROT/public/reports.aspx

Preferred Literature:

The electrification of truck loading docks can allow properly equipped trucks to take advantage of external power and completely eliminate the need for idling. Trucks would need to be equipped with internal wiring, inverter, system, and a heating, ventilation, and air conditioning (HVAC) system. Under this mitigation measure, the direct emissions from fuel combustion are completely displaced by indirect emissions from the CO_2 generated during electricity production. The amount of electricity required depends on the type of truck and refrigeration elements; this data could be determined from manufacturer specifications. The total kilowatt-hours required should be multiplied by the carbon-intensity factor of the local utility provider in order to calculate the amount of indirect CO_2 emissions. To take credit for this mitigation measure, the Project Applicant

would need to provide detailed evidence supporting a calculation of the emissions reductions.

Alternative Literature:

None

Other Literature Reviewed:

1. USEPA. 2002. Green Transport Partnership, A Glance at Clean Freight Strategies: Idle Reduction. Available online at: http://nepis.epa.gov/Adobe/PDF/P1000S9K.PDF
2. ATRI. 2009. Research Results: Demonstration of Integrated Mobile Idle Reduction Solutions. Available online at: http://www.atri-online.org/research/results/ATRI1pagesummaryMIRTDemo.pdf

None

3.7.2 Utilize Alternative Fueled Vehicles

Range of Effectiveness: Reduction in GHG emissions varies depending on vehicle type, year, and associated fuel economy.

Measure Description:

When construction equipment is powered by alternative fuels such as biodiesel (B20), liquefied natural gas (LNG), or compressed natural gas (CNG) rather than conventional petroleum diesel or gasoline, GHG emissions from fuel combustion may be reduced.

Measure Applicability:

- Vehicles

Inputs:

The following information needs to be provided by the Project Applicant:

- Vehicle category
- Traveling speed (mph)
- Number of trips and trip length, or Vehicle Miles Traveled (VMT)
- Fuel economy (mpg) or Fuel consumption

Baseline Method:

$$\text{Baseline } CO_2 \text{ Emission} = EF \times \frac{1}{FE} \times VMT \times C$$

Where:

Baseline CO_2 Emission = MT of CO_2
EF = CO_2 emission factor, from CCAR General Reporting Protocol (g/gallon)
VMT = Vehicle miles traveled (VMT) = T x L
FE = Fuel economy (mpg)
C = Unit conversion factor

$$\text{Baseline } N_2O/CH_4 \text{ Emission} = EF \times VMT \times C$$

Where:

Baseline N_2O/CH_4 Emission = MT of N_2O or CH_4
EF = N_2O or CH_4 emission factor, from CCAR General Reporting Protocol (g/mile)
VMT = Vehicle miles traveled (VMT) = T x L
T = Number of one-way trips
L = One-way trip length
FC = Fuel consumption (gallon) = VMT/FE

FE = Fuel economy (mpg)
C = Unit conversion factor

The total baseline GHG emission is the sum of the emissions of CO_2, N_2O and CH_4, adjusted by their global warming potentials (GWP):

Baseline GHG Emission
= Baseline CO_2 Emission + Baseline N_2O Emission × 310 +Baseline CH_4 Emission × 21

Where:

Baseline GHG Emission = MT of CO_2e
310 = GWP of N_2O
21 = GWP of CH_4

Mitigation Method:

Mitigated emissions from using alternative fuel is calculated using the same methodology before, but using emission factors for the alternative fuel, and fuel consumption calculated as follows:

$$GHG emissions = \frac{1}{FE} \times ER \times VMT \times EF_{CO2} + VMT \times EF_{N20} + VMT \times EF_{CH4}$$

Where:

ER = Energy ratio from US Department of Energy (see table below)
EF = Emission Factor for pollutant
VMT = Vehicle miles traveled (VMT)
FE = Fuel economy (mpg)

Fuel	Energy Ratio: Amount of fuel needed to provide same energy as			
	1 gallon of Gasoline		1 gallon of Diesel	
Gasoline	1	gal	1.13	gal
#2 Diesel	0.88	gal	1	gal
B20	0.92	gal	1.01	gal
CNG	126.67	ft^3	143.14	ft^3
LNG	1.56	gal	1.77	gal
LPC	1.37	gal	1.55	gal

Emission reductions can be calculated as:

$$\text{Reduction} = 1 - \frac{\text{Mitigated Emission}}{\text{Running Emission}}$$

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions
CO_2e	Range Not Quantified[81]
PM	Range Not Quantified
CO	Range Not Quantified
NOx	Range Not Quantified
SO_2	Range Not Quantified
ROG	Range Not Quantified

Discussion:

Using the methodology described above, only the running emission is considered. A hypothetical scenario for a gasoline fueled light duty automobile in 2015 is illustrated below. The CO_2 emission factor from motor gasoline in CCAR 2009 is 8.81 kg/gallon. Assuming the automobile makes two trips of 60 mile each per day, and using the current passenger car fuel economy of 27.5 mpg under the CAFE standards, then the annual baseline CO_2 emission from the automobile is:

$$8.81 \times \frac{2 \times 60 \times 365}{27.5} \times 10^{-3} = 14.0 \text{ MT/year}$$

Where 10^{-3} is the conversion factor from kilograms to MT.

Using the most recent N_2O emission factor of 0.0079 g/mile in CCAR 2009 for gasoline passenger cars, the annual baseline N_2O emission from the automobile is:

$$0.0079 \times 2 \times 365 \times 60 \times 10^{-6} = 0.000346 \text{ MT/year}$$

[81] The emissions reductions varies and depends on vehicle type, year, and the associated fuel economy. The methodology above describes how to calculate the expected GHG emissions reduction assuming the required input parameters are known.

Similarly, using the same formula with the most recent CH_4 emission factor of 0.0147 g/mile in CCAR 2009 for gasoline passenger cars, the annual baseline CH_4 emission from the automobile is calculated to be 0.000644 MT/year.

Thus, the total baseline GHG emission for the automobile is:

$$14.0 + 0.000346 \times 310 + 0.000644 \times 21 = 14.1 \text{ MT/year}$$

If compressed natural gas (CNG) is used as alternative fuel, the CNG consumption for the same VMT is:

$$\frac{2 \times 60 \times 365}{27.5} \times 126.67 = 201{,}751 \text{ ft}^3$$

Using the same formula as for the baseline scenario but with emission factors of CNG and the CNG consumption, the mitigated GHG emission can be calculated as shown in the table below

Pollutant	Emission (MT/yr)
CO_2	11.0
N_2O	0.0022
CH_4	0.0323
CO_2e	12.4

Therefore, the emission reduction is:

$$1 - \frac{12.4}{14.0} = 11.4\%$$

Notice that in the baseline scenario, N_2O and CH_4 only make up <1% of the total GHG emissions, but actually increase for the mitigated scenario and contribute to >10% of total GHG emissions.

Assumptions:

Data based upon the following references:

- California Climate Action Registry (CCAR). 2009. General Reporting Protocol. Version 3.1. Available online at: http://www.climateregistry.org/tools/protocols/general-reporting-protocol.html

- US Department of Energy. 2010. Alternative and Advanced Fuels – Fuel Properties. Available online at: http://www.afdc.energy.gov/afdc/fuels/properties.html

Preferred Literature:

The amount of emissions avoided from using alternative fuel vehicles can be calculated using emission factors from the California Climate Action Registry (CCAR) General Reporting Protocol [1]. Multiplying this factor by the fuel consumption or vehicle miles traveled (VMT) gives the direct emissions of CO_2 and N_2O /CH_4, respectively. Fuel consumption and VMT can be calculated interchangeably with the fuel economy (mpg). The total GHG emission is the sum of the emissions from the three chemicals multiplied by their respective global warming potential (GWP).

Assuming the same VMT, the amount of alternative fuel required to run the same vehicle fleet can be calculated by multiplying gasoline/diesel fuel consumption by the equivalent-energy ratio obtained from the US Department of Energy [2]. Using the alternative fuel consumption and the emission factors for the alternative fuel from CCAR, the mitigated GHG emissions can be calculated. The GHG emissions reduction associated with this mitigation measure is therefore the difference in emissions from these two scenarios.

Alternative Literature:

None

Notes:

[1] California Climate Action Registry (CCAR). 2009. General Reporting Protocol. Version 3.1. Available online at: http://www.climateregistry.org/tools/protocols/general-reporting-protocol.html
[2] US Department of Energy. 2010. Alternative and Advanced Fuels – Fuel Properties. Available online at: http://www.afdc.energy.gov/afdc/fuels/properties.html

Other Literature Reviewed:

None

3.7.3 Utilize Electric or Hybrid Vehicles

Range of Effectiveness: 0.4 - 20.3% reduction in GHG emissions

Measure Description:

When vehicles are powered by grid electricity rather than fossil fuel, direct GHG emissions from fuel combustion are replaced with indirect GHG emissions associated with the electricity used to power the vehicles. When vehicles are powered by hybrid-electric drives, GHG emissions from fuel combustion are reduced.

Measure Applicability:

- Vehicles

Inputs:

The following information needs to be provided by the Project Applicant:

- Vehicle category
- Traveling speed (mph)
- Number of trips and trip length, or Vehicle Miles Traveled (VMT)
- Fuel economy (mpg)

Baseline Method:

$$\text{Baseline Emission} = EF \times (1 - R) \times VMT \times C$$

Where:

Baseline Emission = MT of Pollutant
EF = Running emission factor for pollutant at traveling speed, from EMFAC.
VMT = Vehicle miles traveled (VMT)
R = Additional reduction in EF due to regulation (see Table 1)
C = Unit conversion factor

Mitigation Method:

Fully Electric Vehicle

Vehicle will run solely on electricity. The indirect GHG emission from electricity generation is:

$$\text{Mitigated Emission} = \text{Utility} \times \frac{1}{FE} \times VMT \times ER \times C$$

Where:

Mitigated Emission = MT of CO_2e
Utility = Carbon intensity of Local Utility (CO_2e/kWh)
VMT = Vehicle miles traveled (VMT)
ER = Energy Ratio = 33.4 kWh/gallon-gasoline or 37.7 kWh/gallon-diesel
FE = Fuel Economy (mpg)
C = Unit conversion factor

Power Utility	Carbon-Intensity (lbs CO_2e/MWh)
LADW&P	1,238
PG&E	456
SCE	641
SDGE	781
SMUD	555

Criteria pollutant emissions will be 100% reduced for equipment running solely on electricity.

Hybrid-Electric Vehicle

The Project Applicant has to determine the fuel consumption reduced from using the hybrid-electric vehicle. The emission reductions for all pollutants are the same as the fuel reduction.

Emission reductions can be calculated as:

$$\text{GHG Reduction\%} = 1 - \frac{\text{Mitigated Emission}}{\text{RunningEmission}}$$

Emission Reduction Ranges and Variables:

See Table VT-3.1 below.

Discussion:

Using the methodology described above, only the running emission is considered. A hypothetical scenario for a gasoline fueled light duty automobile with catalytic converter in 2015 is illustrated below. The running CO_2 emission factor at 30 mph from an EMFAC run of the Sacramento county with temperature of 60F and relative humidity of 45% is 336.1 g/mile. From Table VT-3.1, there will be an additional reduction of 9.1% for the emission factor in 2015 due to Pavley standard. Assuming the automobile makes two trips of 60 mile each per day, then annual baseline emission from the automobile is:

$$336.1\times(100\%-9.1\%)\times 2\times 365\times 60\times 10^{-6}=13.4 \text{ MT/year}$$

Where 10^{-6} is the conversion factor from grams to MT. Assuming the current passenger car fuel economy of 27.5 mpg under the CAFE standards, and using the carbon-intensity factor for PG&E, the electric provider for the Sacramento region, the mitigated emission from replacing the automobile described above with electric vehicle would be:

$$\left(456\times\frac{2\times 365\times 60}{27.5}\times 33.4\times\frac{1}{2{,}204\times 10^{3}}\right)=11.0 \text{ MT/year}$$

Therefore, the emission reduction is:

$$1-\frac{11.0}{13.4}=17.9\%$$

Assumptions:

Data based upon the following references:

- California Air Resources Board. EMFAC2007. Available online at: http://www.arb.ca.gov/msei/onroad/latest_version.htm
- California Climate Action Registry (CCAR). 2009. General Reporting Protocol. Version 3.1. Available online at: http://www.climateregistry.org/tools/protocols/general-reporting-protocol.html
- California Climate Action Registry Reporting Online Tool. 2006 PUP Reports. Available online at: https://www.climateregistry.org/CARROT/public/reports.aspx
- US Department of Energy. 2010. Alternative and Advanced Fuels – Fuel Properties. Available online at: http://www.afdc.energy.gov/afdc/fuels/properties.html

Preferred Literature:

The amount of emissions avoided from using electric and hybrid vehicles can be calculated using CARB's EMFAC model, which provides state-wide and regional running emission factors for a variety of on-road vehicles in units of grams per mile [1]. Multiplying this factor by the vehicle miles traveled (VMT) gives the direct emissions. For criteria pollutant, emissions can be assumed to be 100% reduced from running on electricity. For GHG, assuming the same VMT, the electricity required to run the same vehicle fleet can be calculated by dividing by the fuel economy (mph) and multiplying the gasoline-electric energy ratio obtained from the US Department of Energy [2]. Multiplying this value by the carbon-intensity factor of the local utility gives the amount of indirect GHG emissions associated with electric vehicles. The GHG emissions

reduction associated with this mitigation measure is therefore the difference in emissions from these two scenarios.

Alternative Literature:

None

Notes:

[1] California Air Resources Board. EMFAC2007. Available online at: http://www.arb.ca.gov/msei/onroad/latest_version.htm
[2] US Department of Energy. 2010. Alternative and Advanced Fuels – Fuel Properties. Available online at: http://www.afdc.energy.gov/afdc/fuels/properties.html

Other Literature Reviewed:

None

Table VT-3.1
Reduction in EMFAC Running Emission Factor from New Regulations

Year	Vehicle Class	Reduction	Pollutant	Regulation
2010	LDA/LDT/MDV	0.4%	CO_2	Pavley Standard
2011	LDA/LDT/MDV	1.6%	CO_2	Pavley Standard
2012	LDA/LDT/MDV	3.5%	CO_2	Pavley Standard
2013	LDA/LDT/MDV	5.3%	CO_2	Pavley Standard
2014	LDA/LDT/MDV	7.1%	CO_2	Pavley Standard
2015	LDA/LDT/MDV	9.1%	CO_2	Pavley Standard
2016	LDA/LDT/MDV	11.0%	CO_2	Pavley Standard
2017	LDA/LDT/MDV	13.1%	CO_2	Pavley Standard
2018	LDA/LDT/MDV	15.5%	CO_2	Pavley Standard
2019	LDA/LDT/MDV	17.9%	CO_2	Pavley Standard
2020	LDA/LDT/MDV	20.3%	CO_2	Pavley Standard
2011	Other Buses	21.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	School Bus	19.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	MHDDT Agriculture	17.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	MHDDT CA International Registration Plan	4.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	MHDDT Instate	6.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	MHDDT Out-of-state	4.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	HHDDT Agriculture	23.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	HHDDT CA International Registration Plan	1.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	HHDDT Non-neighboring Out-of-state	0.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	HHDDT Neighboring Out-of-state	2.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	HHDDT Singleunit	10.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	HHDDT Tractor	9.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	Other Buses	25.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	Power Take Off	28.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	School Bus	45.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	MHDDT Agriculture	20.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	MHDDT CA International Registration Plan	12.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	MHDDT Instate	11.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles

Year	Vehicle Class	Reduction	Pollutant	Regulation
				Regulation
2012	MHDDT Out-of-state	12.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT Agriculture	29.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT CA International Registration Plan	8.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT Non-neighboring Out-of-state	15.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT Neighboring Out-of-state	15.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT Drayage at Other Facilities	9.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT Drayage in Bay Area	9.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT Drayage near South Coast	7.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT Singleunit	14.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT Tractor	13.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	Other Buses	45.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	Power Take Off	57.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	School Bus	68.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	MHDDT Agriculture	31.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	MHDDT CA International Registration Plan	55.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	MHDDT Instate	64.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	MHDDT Out-of-state	55.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	HHDDT Agriculture	48.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	HHDDT CA International Registration Plan	60.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	HHDDT Non-neighboring Out-of-state	50.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	HHDDT Neighboring Out-of-state	63.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	HHDDT Drayage at Other Facilities	67.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	HHDDT Drayage in Bay Area	65.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	HHDDT Drayage near South Coast	51.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation

Year	Vehicle Class	Reduction	Pollutant	Regulation
2013	HHDDT Singleunit	66.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	HHDDT Tractor	69.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	Other Buses	53.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	Power Take Off	63.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	School Bus	71.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	MHDDT Agriculture	33.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	MHDDT CA International Registration Plan	65.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	MHDDT Instate	77.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	MHDDT Out-of-state	65.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	MHDDT Utility	0.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT Agriculture	52.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT CA International Registration Plan	63.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT Non-neighboring Out-of-state	46.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT Neighboring Out-of-state	64.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT Singleunit	79.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT Tractor	79.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT Utility	4.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	Other Buses	49.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	Power Take Off	61.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	School Bus	71.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	MHDDT Agriculture	34.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	MHDDT CA International Registration Plan	60.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	MHDDT Instate	74.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	MHDDT Out-of-state	60.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	MHDDT Utility	0.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation

Transportation

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Year	Vehicle Class	Reduction	Pollutant	Regulation
2015	HHDDT Agriculture	53.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	HHDDT CA International Registration Plan	55.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	HHDDT Non-neighboring Out-of-state	37.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	HHDDT Neighboring Out-of-state	55.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	HHDDT Singleunit	77.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	HHDDT Tractor	76.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	HHDDT Utility	4.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	Other Buses	43.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	Power Take Off	75.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	School Bus	70.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	MHDDT Agriculture	32.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	MHDDT CA International Registration Plan	56.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	MHDDT Instate	73.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	MHDDT Out-of-state	56.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	MHDDT Utility	0.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT Agriculture	51.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT CA International Registration Plan	45.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT Non-neighboring Out-of-state	27.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT Neighboring Out-of-state	46.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT Singleunit	75.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT Tractor	73.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT Utility	4.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	Other Buses	36.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	Power Take Off	71.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	School Bus	67.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation

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Year	Vehicle Class	Reduction	Pollutant	Regulation
2017	MHDDT Agriculture	55.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	MHDDT CA International Registration Plan	52.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	MHDDT Instate	70.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	MHDDT Out-of-state	52.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	MHDDT Utility	0.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT Agriculture	58.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT CA International Registration Plan	37.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT Non-neighboring Out-of-state	18.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT Neighboring Out-of-state	37.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT Singleunit	73.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT Tractor	70.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT Utility	3.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	Other Buses	31.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	Power Take Off	67.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	School Bus	74.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	MHDDT Agriculture	53.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	MHDDT CA International Registration Plan	47.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	MHDDT Instate	68.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	MHDDT Out-of-state	47.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	MHDDT Utility	0.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	HHDDT Agriculture	55.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	HHDDT CA International Registration Plan	30.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	HHDDT Non-neighboring Out-of-state	11.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	HHDDT Neighboring Out-of-state	30.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	HHDDT Singleunit	72.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation

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Year	Vehicle Class	Reduction	Pollutant	Regulation
2018	HHDDT Tractor	67.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	HHDDT Utility	3.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	Other Buses	27.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	Power Take Off	76.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	School Bus	73.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	MHDDT Agriculture	53.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	MHDDT CA International Registration Plan	42.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	MHDDT Instate	65.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	MHDDT Out-of-state	42.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	MHDDT Utility	0.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT Agriculture	54.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT CA International Registration Plan	24.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT Non-neighboring Out-of-state	5.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT Neighboring Out-of-state	24.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT Singleunit	69.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT Tractor	64.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT Utility	3.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	Other Buses	23.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	Power Take Off	74.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	School Bus	71.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	MHDDT Agriculture	52.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	MHDDT CA International Registration Plan	37.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	MHDDT Instate	60.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	MHDDT Out-of-state	37.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	MHDDT Utility	0.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation

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Year	Vehicle Class	Reduction	Pollutant	Regulation
2020	HHDDT Agriculture	52.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	HHDDT CA International Registration Plan	19.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	HHDDT Non-neighboring Out-of-state	3.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	HHDDT Neighboring Out-of-state	20.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	HHDDT Singleunit	66.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	HHDDT Tractor	61.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	HHDDT Utility	2.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	Other Buses	21.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	Power Take Off	79.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	School Bus	68.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	MHDDT Agriculture	51.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	MHDDT CA International Registration Plan	33.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	MHDDT Instate	57.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	MHDDT Out-of-state	33.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	MHDDT Utility	5.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Agriculture	50.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT CA International Registration Plan	16.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Non-neighboring Out-of-state	3.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Neighboring Out-of-state	16.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Drayage at Other Facilities	10.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Drayage in Bay Area	9.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Drayage near South Coast	9.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Singleunit	64.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Tractor	59.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Utility	5.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation

Year	Vehicle Class	Reduction	Pollutant	Regulation
2022	Other Buses	20.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	Power Take Off	79.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	School Bus	66.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	MHDDT Agriculture	50.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	MHDDT CA International Registration Plan	28.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	MHDDT Instate	53.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	MHDDT Out-of-state	28.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	MHDDT Utility	6.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Agriculture	49.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT CA International Registration Plan	13.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Non-neighboring Out-of-state	1.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Neighboring Out-of-state	14.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Drayage at Other Facilities	10.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Drayage in Bay Area	8.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Drayage near South Coast	8.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Singleunit	61.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Tractor	55.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Utility	5.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	Other Buses	18.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	Power Take Off	74.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	School Bus	64.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	MHDDT Agriculture	79.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	MHDDT CA International Registration Plan	23.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	MHDDT Instate	48.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	MHDDT Out-of-state	23.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation

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Year	Vehicle Class	Reduction	Pollutant	Regulation
2023	MHDDT Utility	7.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Agriculture	68.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT CA International Registration Plan	11.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Non-neighboring Out-of-state	1.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Neighboring Out-of-state	11.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Drayage at Other Facilities	9.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Drayage in Bay Area	8.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Drayage near South Coast	8.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Singleunit	56.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Tractor	51.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Utility	4.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	Other Buses	15.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	Power Take Off	68.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	School Bus	61.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	MHDDT Agriculture	77.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	MHDDT CA International Registration Plan	20.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	MHDDT Instate	43.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	MHDDT Out-of-state	20.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	MHDDT Utility	5.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Agriculture	65.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT CA International Registration Plan	9.1%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Non-neighboring Out-of-state	0.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Neighboring Out-of-state	9.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Drayage at Other Facilities	9.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Drayage in Bay Area	7.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation

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Year	Vehicle Class	Reduction	Pollutant	Regulation
2024	HHDDT Drayage near South Coast	7.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Singleunit	50.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Tractor	46.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Utility	3.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	Other Buses	13.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	Power Take Off	62.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	School Bus	58.2%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	MHDDT Agriculture	75.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	MHDDT CA International Registration Plan	15.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	MHDDT Instate	37.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	MHDDT Out-of-state	15.3%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	MHDDT Utility	3.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Agriculture	62.7%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT CA International Registration Plan	6.8%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Non-neighboring Out-of-state	0.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Neighboring Out-of-state	7.0%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Drayage at Other Facilities	8.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Drayage in Bay Area	7.5%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Drayage near South Coast	7.6%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Singleunit	44.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Tractor	42.9%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Utility	2.4%	PM2.5	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	MHDDT CA International Registration Plan	1.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	MHDDT Instate	2.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	MHDDT Out-of-state	1.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation

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Year	Vehicle Class	Reduction	Pollutant	Regulation
2011	HHDDT CA International Registration Plan	0.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	HHDDT Non-neighboring Out-of-state	0.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	HHDDT Neighboring Out-of-state	1.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	HHDDT Singleunit	4.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2011	HHDDT Tractor	3.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	Power Take Off	13.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	School Bus	2.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	MHDDT CA International Registration Plan	1.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	MHDDT Instate	2.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	MHDDT Out-of-state	1.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT CA International Registration Plan	0.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT Non-neighboring Out-of-state	0.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT Neighboring Out-of-state	0.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT Singleunit	3.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2012	HHDDT Tractor	3.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	Other Buses	18.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	Power Take Off	34.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	School Bus	4.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	MHDDT Agriculture	5.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	MHDDT CA International Registration Plan	12.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	MHDDT Instate	25.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	MHDDT Out-of-state	12.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	HHDDT Agriculture	10.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	HHDDT CA International Registration Plan	8.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	HHDDT Non-neighboring Out-of-state	1.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation

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Year	Vehicle Class	Reduction	Pollutant	Regulation
2013	HHDDT Neighboring Out-of-state	8.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	HHDDT Singleunit	33.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2013	HHDDT Tractor	28.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	Other Buses	40.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	Power Take Off	37.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	School Bus	6.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	MHDDT Agriculture	9.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	MHDDT CA International Registration Plan	22.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	MHDDT Instate	34.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	MHDDT Out-of-state	22.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	MHDDT Utility	0.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT Agriculture	17.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT CA International Registration Plan	13.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT Non-neighboring Out-of-state	4.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT Neighboring Out-of-state	14.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT Singleunit	45.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT Tractor	36.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2014	HHDDT Utility	1.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	Other Buses	52.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	Power Take Off	33.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	School Bus	6.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	MHDDT Agriculture	18.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	MHDDT CA International Registration Plan	20.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	MHDDT Instate	31.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	MHDDT Out-of-state	20.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation

Year	Vehicle Class	Reduction	Pollutant	Regulation
2015	MHDDT Utility	0.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	HHDDT Agriculture	27.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	HHDDT CA International Registration Plan	11.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	HHDDT Non-neighboring Out-of-state	2.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	HHDDT Neighboring Out-of-state	12.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	HHDDT Singleunit	42.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	HHDDT Tractor	34.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2015	HHDDT Utility	1.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	Other Buses	54.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	Power Take Off	43.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	School Bus	4.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	MHDDT Agriculture	19.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	MHDDT CA International Registration Plan	22.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	MHDDT Instate	32.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	MHDDT Out-of-state	22.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	MHDDT Utility	0.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT Agriculture	29.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT CA International Registration Plan	11.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT Non-neighboring Out-of-state	3.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT Neighboring Out-of-state	13.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT Singleunit	43.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT Tractor	35.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2016	HHDDT Utility	1.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	Other Buses	59.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	Power Take Off	38.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation

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Year	Vehicle Class	Reduction	Pollutant	Regulation
2017	MHDDT Agriculture	43.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	MHDDT CA International Registration Plan	27.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	MHDDT Instate	35.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	MHDDT Out-of-state	27.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	MHDDT Utility	1.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT Agriculture	45.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT CA International Registration Plan	14.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT Non-neighboring Out-of-state	7.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT Neighboring Out-of-state	17.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT Singleunit	46.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT Tractor	38.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2017	HHDDT Utility	1.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	Other Buses	56.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	Power Take Off	32.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	School Bus	7.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	MHDDT Agriculture	41.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	MHDDT CA International Registration Plan	26.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	MHDDT Instate	41.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	MHDDT Out-of-state	26.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	MHDDT Utility	1.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	HHDDT Agriculture	42.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	HHDDT CA International Registration Plan	15.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	HHDDT Non-neighboring Out-of-state	4.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	HHDDT Neighboring Out-of-state	16.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	HHDDT Singleunit	51.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation

Transportation

CEQA# MM T-20 **VT-3** **Vehicles**

Year	Vehicle Class	Reduction	Pollutant	Regulation
2018	HHDDT Tractor	43.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2018	HHDDT Utility	1.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	Other Buses	52.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	Power Take Off	38.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	School Bus	6.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	MHDDT Agriculture	40.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	MHDDT CA International Registration Plan	22.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	MHDDT Instate	38.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	MHDDT Out-of-state	22.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	MHDDT Utility	1.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT Agriculture	40.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT CA International Registration Plan	12.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT Non-neighboring Out-of-state	2.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT Neighboring Out-of-state	13.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT Singleunit	48.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT Tractor	41.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2019	HHDDT Utility	1.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	Other Buses	49.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	Power Take Off	41.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	School Bus	5.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	MHDDT Agriculture	38.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	MHDDT CA International Registration Plan	19.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	MHDDT Instate	34.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	MHDDT Out-of-state	19.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	MHDDT Utility	1.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation

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CEQA# MM T-20 **VT-3** **Vehicles**

Year	Vehicle Class	Reduction	Pollutant	Regulation
2020	HHDDT Agriculture	38.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	HHDDT CA International Registration Plan	9.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	HHDDT Non-neighboring Out-of-state	1.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	HHDDT Neighboring Out-of-state	10.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	HHDDT Singleunit	45.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	HHDDT Tractor	39.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2020	HHDDT Utility	1.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	Other Buses	48.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	Power Take Off	51.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	School Bus	4.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	MHDDT Agriculture	38.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	MHDDT CA International Registration Plan	21.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	MHDDT Instate	41.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	MHDDT Out-of-state	21.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	MHDDT Utility	33.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Agriculture	37.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT CA International Registration Plan	9.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Non-neighboring Out-of-state	1.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Neighboring Out-of-state	9.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Drayage at Other Facilities	40.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Drayage in Bay Area	41.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Drayage near South Coast	39.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Singleunit	54.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Tractor	45.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2021	HHDDT Utility	21.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation

Transportation

CEQA# MM T-20 **VT-3** **Vehicles**

Year	Vehicle Class	Reduction	Pollutant	Regulation
2022	Other Buses	48.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	Power Take Off	60.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	School Bus	3.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	MHDDT Agriculture	40.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	MHDDT CA International Registration Plan	20.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	MHDDT Instate	41.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	MHDDT Out-of-state	20.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	MHDDT Utility	28.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Agriculture	40.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT CA International Registration Plan	8.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Non-neighboring Out-of-state	1.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Neighboring Out-of-state	9.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Drayage at Other Facilities	39.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Drayage in Bay Area	40.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Drayage near South Coast	39.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Singleunit	54.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Tractor	45.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2022	HHDDT Utility	18.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	Other Buses	47.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	Power Take Off	54.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	School Bus	2.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	MHDDT Agriculture	65.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	MHDDT CA International Registration Plan	18.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	MHDDT Instate	39.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	MHDDT Out-of-state	18.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation

Transportation

CEQA# MM T-20 **VT-3** Vehicles

Year	Vehicle Class	Reduction	Pollutant	Regulation
2023	MHDDT Utility	25.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Agriculture	59.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT CA International Registration Plan	7.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Non-neighboring Out-of-state	1.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Neighboring Out-of-state	8.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Drayage at Other Facilities	38.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Drayage in Bay Area	39.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Drayage near South Coast	38.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Singleunit	52.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Tractor	44.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2023	HHDDT Utility	16.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	Other Buses	43.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	Power Take Off	47.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	School Bus	1.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	MHDDT Agriculture	63.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	MHDDT CA International Registration Plan	15.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	MHDDT Instate	33.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	MHDDT Out-of-state	15.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	MHDDT Utility	19.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Agriculture	56.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT CA International Registration Plan	6.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Non-neighboring Out-of-state	0.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Neighboring Out-of-state	6.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Drayage at Other Facilities	38.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Drayage in Bay Area	39.4%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation

Transportation

CEQA# MM T-20 **VT-3** **Vehicles**

Year	Vehicle Class	Reduction	Pollutant	Regulation
2024	HHDDT Drayage near South Coast	37.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Singleunit	47.2%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Tractor	39.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2024	HHDDT Utility	13.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	Other Buses	39.0%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	Power Take Off	39.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	School Bus	1.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	MHDDT Agriculture	61.1%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	MHDDT CA International Registration Plan	11.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	MHDDT Instate	28.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	MHDDT Out-of-state	11.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	MHDDT Utility	13.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Agriculture	53.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT CA International Registration Plan	4.6%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Non-neighboring Out-of-state	0.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Neighboring Out-of-state	4.8%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Drayage at Other Facilities	37.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Drayage in Bay Area	38.9%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Drayage near South Coast	37.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Singleunit	41.5%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Tractor	35.7%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation
2025	HHDDT Utility	10.3%	NOx	On-Road Heavy-Duty Diesel Vehicles Regulation

Appendix A

List of Acronyms and Glossary of Terms

List of Acronyms

ACM	alternative calculation method
AF	acre feet
B20	biodiesel (20%)
BOD	biochemical oxygen demand
BMP	best management practice
C	carbon
CAFE	corporate average fuel economy
CAPCOA	California Air Pollution Control Officers Association
CAR	Climate Action Registry
CARB	California Air Resources Board
CCAR	California Climate Action Registry
CDWR	California Department of Water Resources
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CEUS	California Commercial End-Use Survey
CGBSC	California Green Building Standards Code
CH_4	methane
CHP	combined heat and power
CIWMB	California Integrated Waste Management Board
CNG	compressed natural gas
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
DE	destruction efficiency
DEIR	Draft Environmental Impact Report
DU	dwelling unit
EF	emission factor
EIA	United States Energy Information Administration
EIR	Environmental Impact Report
EMFAC	on-road vehicle emission factors model
ET_0	reference evapotranspiration
ETWU	estimated total water use
FCZ	forecasting climate zone
GHG	greenhouse gas
GP	General Plan
GRP	General Reporting Protocol
GWP	global warming potential
HA	hydrozone area
HHV	higher heating value
hp	horsepower
HVAC	heating, ventilating, and air conditioning
IE	irrigation efficiency
IPCC	Intergovernmental Panel on Climate Change
ITE	Institute of Transportation Engineers
ITS	intelligent transportation systems
kBTU	thousand British thermal units
kW	kilowatt
kWh	kilowatt-hour
kWh/yr	kilowatt-hours/year
lbs	pounds

LA	landscape area
LADWP	Los Angeles Department of Water and Power
LCA	life cycle assessment
LDA	light-duty auto
LDT	light-duty truck
LED	light-emitting diode
LFM	landfill methane
LNG	liquefied natural gas
LPG	liquefied petroleum gas
MAWA	maximum applied water allowance
MMBTU	million British thermal units
MSW	mixed solid waste
MTCE	metric tonnes carbon equivalent
N_2O	nitrous oxide
NOx	nitrogen oxides
NRDC	Natural Resources Defense Council
NREL	National Renewable Energy Laboratory
OLED	organic light-emitting diode
OFFROAD	off-road vehicle emission factors model
PF	plant factor
PG&E	Pacific Gas and Electric
PM	particulate matter
PUP	Power/Utility Protocol
RASS	Residential Appliance Saturation Survey
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SDGE	San Diego Gas and Electric
SLA	special landscape area
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMUD	Sacramento Municipal Utility District
scf	standard cubic feet
SHP	separate heat and power
SO_2	sulfur dioxide
sqft	square feet
TDM	transportation demand management
TDV	time dependent valuation
TOD	transit-oriented development
tonnes	metric tonnes; 1,000 kilograms
TRU	truck refrigeration unit
URBEMIS	Urban Emissions Model
US	United States
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
VCAPCD	Ventura County Air Pollution Control District
VTPI	Victoria Transport Policy Institute
VMT	vehicle miles traveled
VTR	vehicle trip reduction
WARM	Waste Reduction Model
WMO	World Meteorological Organization
yr	year

Glossary of Terms

Alternative Calculation Method
Software used to demonstrate compliance with the California Building Energy Efficiency Standards (Title 24). The software must comply with the requirements listed in the Alternative Calculation Method Approval Manual.

Additionality[a]
The reduction in emissions by sources or enhancement of removals by sinks that is additional to any that would occur in the absence of the project. The project should not subsidize or take credit for emissions reductions which would have occurred regardless of the project.

Albedo[a]
The fraction of solar radiation reflected by a surface or object, often expressed as a ratio or fraction. Snow covered surfaces have a high albedo; the albedo of soils ranges from high to low; vegetation covered surfaces and oceans have a low albedo. The Earth's albedo varies mainly through varying cloudiness, snow, ice, leaf area, and land cover changes. Paved surfaces with high albedos reflect solar radiation and can help reduce the urban heat island effect.

Below Market Rate Housing
Housing rented at rates lower than the market rate. Below market rate housing is designed to assist lower-income families. When below market rate housing is provided near job centers or transit, it provides lower income families with desirable job/housing match or greater opportunities for commuting to work through public transit.

Biochemical Oxygen Demand
Represents the amount of oxygen that would be required to completely consume the organic matter contained in wastewater through aerobic decomposition processes. Under the same conditions, wastewater with higher biochemical oxygen demand (BOD) concentrations will generally yield more methane than wastewater with lower BOD concentrations. BOD_5 is a measure of BOD after five days of decomposition.

Biogenic Emissions[b]
Carbon dioxide emissions produced from combusting a variety of biofuels, such as biodiesel, ethanol, wood, wood waste and landfill gas.

Carbon Dioxide Equivalent
A measure for comparing carbon dioxide with other greenhouse gases. Tonnes carbon dioxide equivalent is calculated by multiplying the tonnes of a greenhouse gas by its associated global warming potential.

California Environmental Quality Act
A statute passed in 1970 that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.

Carbon Neutral Power
A power generation system which has net zero carbon emissions. Examples of existing carbon neutral power systems are photovoltaics, wind turbines, and hydropower systems.

Carbon Sink
Any process or mechanism that removes carbon dioxide from the atmosphere. A forest is an example of a carbon sink, because it sequesters carbon dioxide from the atmosphere.

"Carrot"
The purpose of a carrot is to provide an incentive which encourages a particular action. Parking cash-out would be considered a "carrot" since the employee receives a monetary incentive for not driving to work, but is not punished for maintaining status quo.

Combined Heat and Power
Also known as cogeneration. Combined heat and power is the generation of both heat and electricity from the same process, such as combustion of fuel, with the purpose of utilizing or selling both simultaneously. In combined heat and power systems, the thermal energy byproducts of a process are captured and used, where they would be wasted in a separate heat and power system. Examples of combined heat and power systems include gas turbines, reciprocating engines, and fuel cells.

Compact Infill
A Project which is located within or contiguous with the central city. Examples may include redevelopment areas, abandoned sites, or underutilized older buildings/sites.

Climate Zone
Geographic area of similar climatic characteristics, including temperature, weather, and other factors which affect building energy use. The California Energy Commission identified 16 Forecasting Climate Zones (FCZs) for use in the CEUS and RASS analyses. The designation of these FCZs was based in part on the utility service area.

Cordon Pricing
Tolls charged for entering a particular area (a "cordon"), such as a downtown.

Density
The amount of persons, jobs, or dwellings per unit of land area. This is an important metric for determining traffic-related parameters.

Destination Accessibility
A measure of the number of jobs or other attractions reachable within a given travel time. Destination accessibility tends to be highest at central locations and lowest at peripheral ones.

Efficacy
The capacity to produce a desired effect.

ENERGY STAR
A joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy which sets national standards for energy efficient consumer products. ENERGY STAR certified products are guaranteed to meet the efficiency standards specified by the program.

Elasticity
The percentage change of one variable in response to a percentage change in another variable. Elasticity = percent change in variable A / percent change in variable B (where the

change in B leads to the change in A). For example, if the elasticity of VMT with respect to density is -0.12, this means a 100% increase in density leads to a 12% decrease in VMT.

Evapotranspiration[c]
The loss of water from the soil both by evaporation and by transpiration from the plants growing in the soil.

General Plan
A set of long-term goals and policies that guide local land use decisions. The 2003 *General Plan Guidelines* developed by the California Office of Planning and Research provides advice on how to write a general plan that expresses a community's long-term vision, fulfills statutory requirements, and contributes to creating a great community.

Global Warming Potential[b]
The ratio of radiative forcing that would result from the emission of one kilogram of a greenhouse gas to that from the emission of one kilogram of carbon dioxide over a fixed period of time.

Graywater
Non-drinkable water that can be collected and reused onsite for irrigation, flushing toilets, and other purposes. This water has not been processed through a waste water treatment plant.

Greenhouse Gas
For the purposes of this report, greenhouse gases are the six gases identified in the Kyoto Protocol: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Headway
The amount of time (in minutes) that elapses between two public transit vehicles servicing a given route and given line. Headways for buses and rail are generally shorter during peak periods and longer during off-peak periods. Headway is the inverse of frequency (headway = 1/frequency), where frequency is the number of arrivals over a given time period (i.e. buses per hour).

Intelligent Transportation System
A broad range of communications-based information and electronics technologies integrated into transportation system infrastructure and vehicles to relieve congestion and improve travel safety.

Job Center
An area with a high degree and density of employment.

Kilowatt Hour
A unit of energy. In the U.S., the kilowatt hour is the unit of measure used by utilities to bill consumers for energy use.

Land Use Index
Measures the degree of land use mix of a development. An index of 0 indicates a single land use while 1 indicates a full mix of uses.

Lumen
A unit of luminous flux. A measure of the brilliance of a source of visible light, or the power of light perceived by the human eye.

Master Planned Community
Large communities developed specifically incorporating housing, office parks, recreational area, and commercial centers within the community. Master planned communities tend to encompass a large land area with the intent of being self-sustaining. Many master planned communities may have lakes, golf courses, and large parks.

Mixed Use
A development that incorporates more than one type of land use. For example, a small mixed use development may have buildings with ground-floor retail and housing on the floors above. A larger mixed use development will locate a variety of land uses within a short proximity of each other. This may include integrating office space, shopping, parks, and schools with residential development. The mixed-use development should encourage walking and other non-auto modes of transport from residential to office/commercial/institutional locations (and vice versa).

Ordinance
A local law usually found in municipal code.

Parking Spillover
A term used to describe the effects of implementing a parking management strategy in a sub-area that has unintended consequences of impacting the surrounding areas. For example, assume parking meters are installed on all streets in a commercial/retail block with no other parking strategies implemented. Customers will no longer park in the metered spots and will instead "spillover" to the surrounding residential neighborhoods where parking is still unrestricted.

Photovoltaic[c]
A system that converts sunlight directly into electricity using cells made of silicon or other conductive materials (solar cells). When sunlight hits the cells, a chemical reaction occurs, resulting in the release of electricity.

Recycled Water
Non-drinkable water that can be reused for irrigation, flushing toilets, and other purposes. It has been processed through a wastewater treatment plant and often needs to be redistributed.

Ride Sharing
Any form of carpooling or vanpooling where additional passengers are carried on the trip. Ride-sharing can be casual and formed independently or be part of an employer program where assistance is provided to employees to match up commuters who live in close proximity of one another.

Renewable Energy[a]
Energy sources that are, within a short time frame relative to the Earth's natural cycles, sustainable, and include non-carbon technologies such as solar energy, hydropower, and wind, as well as carbon-neutral technologies such as biomass.

Self Selection
When an individual selects himself into a group.

Separate Heat and Power
The typical system for acquiring heat and power. Thermal energy and electricity are generated and used separately. For example, heat is generated from a boiler while electricity is acquired from the local utility. Separate heat and power systems are used as the baseline of comparison for combined heat and power systems.

Sequestration[a]
The process of increasing the carbon content of a carbon reservoir other than the atmosphere. Biological approaches to sequestration include direct removal of carbon dioxide from the atmosphere through afforestation, reforestation, and practices that enhance soil carbon in agriculture. Physical approaches include separation and disposal of carbon dioxide from flue gases or from processing fossil fuels to produce hydrogen- and carbon dioxide-rich fractions and longterm storage in underground in depleted oil and gas reservoirs, coal seams, and saline aquifers.

"Stick"
The purpose of a stick is to establish a penalty for a status quo action. Workplace parking pricing would be considered a "stick" since the employee is now monetarily penalized for driving to work.

Suburban
An area characterized by dispersed, low-density, single-use, automobile dependent land use patterns, usually outside of the central city (a suburb).

Suburban Center
The suburban center serves the population of the suburb with office, retail and housing which is denser than the surrounding suburb.

Title 24
Title 24 Part 6 is also known as the California Building Energy Efficiency Standard, which regulates building energy efficiency standards. Regulated energy uses include space heating and cooling, ventilation, domestic hot water heating, and some hard-wired lighting. Title 24 determines compliance by comparing the modeled energy use of a 'proposed home' to that of a minimally Title 24 compliant 'standard home' of equal dimensions. Title 24 focuses on building energy efficiency per square foot; it places no limits upon the size of the house or the actual energy used per dwelling unit. The current Title 24 standards were published in 2008.

Transit-Oriented Development
A development located near and specifically designed around a rail or bus station. Proximity alone does not characterize a development as transit-oriented. The development and surrounding neighborhood should be designed for walking and bicycling and parking management strategies should be implemented. The development should be located within a short walking distance to a high-quality, high frequency, and reliable bus or rail service.

Transportation Demand Management
Any transportation strategy which has an intent to increase the transportation system efficiency and reduce demand on the system by discouraging single-occupancy vehicle travel and encouraging more efficient travel patterns, alternative modes of transportation such as walking, bicycling, public transit, and ridesharing. TDM measures should also shift travel patterns from peak to off-peak hours and shift travel from further to closer destinations.

Transit Ridership
The number of passengers who ride in a public transportation system, such as buses and subways.

Tree and Grid Network
Describes the layout of streets within and surrounding a project. Streets that are characterized as a tree network actually look like a tree and its branches. Streets are not laid out in any uniform pattern, intersection density is low, and the streets are less connected. In a grid network, streets are laid out in a perpendicular and parallel grid pattern. Streets tend to intersect more frequently, intersection density is higher, and the streets are more connected.

Urban
An area which is located within the central city with higher density of land uses than you would find in the suburbs. It may be characterized by multi-family housing and located near office and retail.

Urban Heat Island Effect
The phenomenon in which a metropolitan area is warmer than its surrounding rural areas due to increased land surface which retains heat, such as concrete, asphalt, metal, and other materials found in buildings and pavements.

Vehicle Miles Traveled
The number of miles driven by vehicles. This is an important traffic parameter and the basis for most traffic-related greenhouse gas emissions calculations.

Vehicle Occupancy
The number of persons in a vehicle during a trip, including the driver and passengers.

Notes:

[a] Definition adapted from: IPCC. 2001. Third Assessment Report: Climate Change 2001 (TAR). Annex B: Glossary of Terms. Available online at: http://www.ipcc.ch/pdf/glossary/tar-ipcc-terms-en.pdf

[b] Definition adapted from: CCAR. 2009. General Reporting Protocol, Version 3.1. Available online at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

[c] Definition adapted from: USEPA. 2010. Greening EPA Glossary. Available online at: http://www.epa.gov/oaintrnt/glossary.htm

Appendix B

Greenhouse Gas Mitigation Measures Task 0: Standard Approach to Calculate Unmitigated Emissions

Greenhouse Gas Mitigation Measures Task 0: Standard Approach to Calculate Unmitigated Emissions

Prepared for:
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Date:
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Contents

1 Introduction

ENVIRON International Corporation (ENVIRON) and Fehr & Peers worked with the California Air Pollution Control Officers Association (CAPCOA) to quantify reductions associated with greenhouse gas (GHG) mitigation measures that can be applied to California Environmental Quality Act (CEQA) Environmental Impact Report (EIR) analyses. The first part of this overall task defines a standard approach to calculate the baseline emissions before mitigation. This report contains the recommendations for methodologies and approaches to assess the baseline GHG emissions.

This report and its methodologies form the basis for the subsequent tasks associated with quantification of GHG mitigation measures. To the extent possible, default values are included with this report and in the mitigation measure Fact Sheets.

This report presents methods to be used to calculate short-term and one-time emissions sources as well as emissions that will occur annually after construction (operational emissions). The one-time emission sources include changes in carbon sequestration due to vegetation changes and emissions associated with construction. The annual operational emissions include the emissions associated with building energy use including natural gas and electricity, emissions associated with mobile sources, emissions associated with water use and wastewater treatment, emissions associated with area sources such as natural gas fired hearths , landscape maintenance equipment, swimming pools, and golf courses.

2 GHG Equivalent Emissions

The term “GHGs” includes gases that contribute to the greenhouse effect, such as carbon dioxide (CO_2,) methane (CH_4), and nitrous oxide (N_2O), as well as gases that are only man-made and that are emitted through the use of modern industrial products, such as hydrofluorocarbons (HFCs), chlorinated fluorocarbons (CFCs), and sulfurhexafluoride (SF_6). These last three families of gases, while not naturally present in the atmosphere, have properties that also cause them to trap infrared radiation when they are present in the atmosphere, thus making them GHGs. These six gases comprise the major GHGs that are recognized by the Kyoto Accords (water is not included).[1] There are other GHGs that are not recognized by the Kyoto Accords, due either to the smaller role that they play in climate change or the uncertainties surrounding their effects. Atmospheric water vapor is not recognized by the Kyoto Accords because there is not an obvious correlation between water concentrations and specific human activities. Water appears to act in a positive feedback manner; higher temperatures lead to higher water vapor concentrations in the atmosphere, which in turn can cause more global warming.[2] California has recently recognized nitrogen trifluoride as another regulated greenhouse gas.

[1] This Kyoto Protocol sets legally binding targets and timetables for cutting the greenhouse gas emissions of industrialized countries. The US has not approved the Kyoto treaty.

[2] From the IPCC Third Assessment Report: http://www.grida.no/climate/ipcc_tar/wg1/143.htm and http://www.grida.no/climate/ipcc_tar/wg1/268.htm

Residents and the employees and patrons of commercial and municipal buildings and services use electricity, heating, water, and are transported by motor vehicles. These activities directly or indirectly emit GHGs. The most significant GHG emissions resulting from such residential and commercial developments are emissions of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). GHG emissions are typically measured in terms of MT of CO_2 equivalents (CO_2e), calculated as the product of the mass emitted of a given GHG and its specific global warming potential (GWP).

The effect that each of these gases can have on global warming is a combination of the mass of their emissions and their global warming potential (GWP). GWP indicates, on a MT for MT basis, how much a gas is predicted to contribute to global warming relative to how much warming would be predicted to be caused by the same mass of CO_2. CH_4 and N_2O are substantially more potent GHGs than CO_2, with GWPs of 21 and 310, respectively according to the IPCC's Second Assessment Report (SAR).[3] In emissions inventories, GHG emissions are typically reported in terms of pounds (lbs) or MT[4] of CO_2 equivalents (CO_2e). CO_2e are calculated as the product of the mass emitted of a given GHG and its specific GWP. While CH_4 and N_2O have much higher GWPs than CO_2, CO_2 is emitted in such vastly higher quantities that it accounts for the majority of GHG emissions in CO_2e, both from developments and human activity in general. Since most regulatory agencies and protocols use the SAR GWP values as a basis, this assessment will also use SAR GWP values even though more recent values exist. However, SAR did not consider nitrogen trifluoride, however there are no sources of nitrogen trifluoride that would typically need to be quantified.

3 Units of measurement: MT of CO_2 and CO_2e

In many sections of this report, including the final summary sections, emissions are presented in units of CO_2e either because the GWPs of CH_4 and N_2O were accounted for explicitly, or the CH_4 and N_2O are assumed to contribute a negligible amount of GWP when compared to the CO_2 emissions from that particular emissions category.

Emissions and reductions are calculated in terms of metric tons. As such, "MT" will be used to refer to metric tons (1,000 kilograms). "Tons" will be used to refer to short tons (2,000 pounds [lbs]).

4 Indirect GHG Emissions from Electricity Use

As noted above, indirect GHG emissions are created as a result of electricity use. When electricity is used in a building, the electricity generation typically takes place offsite at the power plant; electricity use in a building generally causes emissions in an indirect manner. The project should use information specific for each local utility provider for different parts of

[3] GWP values from IPCC's Second Assessment Report (SAR, 1996) are still used by international convention and are used in this protocol, even though more recent (and slightly different) GWP values were developed in the IPCC's Fourth Assessment Report (FAR, 2007)

[4] In this report, "MT" will be used to refer to metric MT (1,000 kilograms). "Tons" will be used to refer to short tons (2,000 pounds).

California. Accordingly, indirect GHG emissions from electricity usage are calculated using the utility specific carbon-intensity factor based Power/Utility Protocol (PUP) report from California Climate Action Registry (CCAR)[5] for the 2006 baseline year. ENVIRON does not recommend using the 2004 PUP reports since this year was one of the first year's utilities reported emissions, as such, the data is likely less accurate than subsequent years since utilities had a chance to refine data collection methods for the later years. Furthermore, a large coal burning power plant in Mojave was going offline in 2005 which was factored into the Scoping Plan analysis. Therefore, ENVIRON suggests using the 2006 PUP reports since it likely represents a more accurate dataset year. This emission factor takes into account the baseline year's mix of energy sources used to generate electricity for a specific utility and the relative carbon intensities of these sources. The emission factor will be determined as a CO_2e incorporating the CO_2, CH_4, and N_2O emissions.

Power Utility	Carbon-Intensity (lbs CO_2e/MWh)
LADW&P	1,238
PG&E	456
SCE	641
SDGE	781
SMUD	555

5 Short-Term Emissions

Short-term or one-time emissions from the development of a Project are associated with vegetation removal and re-vegetation on the Project site and construction-related activities.

5.1 Construction Activities

Construction activities occur during the early stage of a project. Construction activities include any demolition, site grading, building construction, and paving. These construction activities have several main sources of GHG emissions. Off-road construction equipment such as dozers, pavers, and backhoes are used on-site during construction. These pieces of equipment typically are diesel fueled although other fuels are occasionally used. Besides the off-road construction, there are on-road vehicles. These vehicles are used for worker commuting, delivering of material to the site, and hauling material away from the site. The methodology to calculate these sources of emissions is described in the next sections.

5.1.1 Estimating GHG Emissions from Off-Road Construction Equipment

This section describes how emissions from off-road equipment used during demolition, site grading, building construction and paving are calculated. This section can be used for any fuel

[5] California Climate Action Registry (CCAR) Database. PUP Report.

burning equipment such as diesel, gasoline, or compressed natural gas (CNG). For electric equipment please see the method in the next section.

First, the number and type of equipment that will be used in the construction, as well as the duration of the entire construction project, is needed. Absent other data, ENVIRON recommends that each piece of equipment will operate for 8 hours a day, five days a week throughout the construction duration. An equipment hour is defined as one hour of a piece of equipment being used. Specifications for each type of construction equipment (horsepower, load factor, and GHG emission factor) are provided by OFFROAD2007[6]. CO_2 and CH_4 emissions for each type of construction equipment are calculated as follows:

$$\textit{Equipment Emissions [grams]} = \textit{Total equipment hours} \times \textit{emission factor [grams per brake horsepower-hour]} \times \textit{equipment horsepower} \times \textit{load factor}^{7}$$

The grams of CO_2 and CH_4 are multiplied by their respective GWP and then the two emissions are summed to derive the final CO_2e emissions from the piece of off-road equipment. Since OFFROAD2007 does not provide an emission factor for N_2O which is a minor subset of nitrogen oxides (NO_x) emissions and the contribution to the overall GHG emissions is likely small, it is therefore not included in calculations that used OFFROAD2007. These were accounted for with alternative fuels since they have a larger proportion of N_2O and CH_4.

5.1.2 Estimating GHG emissions from Electric Off-Road Construction Equipment

In order to estimate the indirect GHG emissions associated with electricity consumption of electrical powered equipment, the following inputs are required. First, the total operating hours of the electrical piece of equipment is needed. Secondly, the amount of kilowatts the equipment uses per time is needed. These two pieces are used along with the carbon intensity factor for the local utility provider as follows:

$$\textit{Equipment Emissions} = \textit{Total equipment hours} \times \textit{average power draw (kW/hr)} \times \textit{Utility EF (g } CO_2e \textit{ per kWhr)}$$

5.1.3 GHG Emissions from On-Road Vehicles Associated with Construction

Emissions from on-road vehicles associated with construction include workers commuting to the site, vendors delivering materials, and hauling away of materials. GHGs are emitted from these vehicles in two ways: running emissions, produced by driving the vehicle, and startup emissions, produced by turning the vehicle on. Idling emissions will not be considered since

[6] OFFROAD2007 is a model developed by the Air Resources Board which contains emission factors for off-road equipment. It is available at : http://www.arb.ca.gov/msei/offroad/offroad.htm

[7] Load factor is the percentage of the maximum horsepower rating at which the equipment normally operates.

regulations exist which limit idling[8] and they would represent a small contribution to the GHG emissions. The majority of these on-road vehicle emissions are running emissions.

Running emissions are calculated using the same method for all trip types. The total Vehicle Miles Traveled (VMT) for the trip type category is estimated, and then multiplied by the representative GHG emission factors for the vehicles expected to be driven. The total VMT for a given trip type is calculated as follows:

$$VMT = \text{Number of round trips} \times \text{average round trip length (miles)}$$

The number of trips should be based on project specific information. Default values associated with each land use type can be obtained construction cost estimators or default values in emission estimator programs. Average round trip length should be based on project specific information or county specific default values. After total VMT is calculated, GHG emissions for on-road vehicles associated with construction can be calculated from the following equation:

$$CO_2 \text{ emissions} = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled
$EF_{running}$ = running emission factor for vehicle fleet for trip type

The CO_2 calculation involves the following assumptions:

a. Vehicle Fleet Defaults:

    a. Workers commute half with light duty trucks (LDTs) and half commute in light duty autos (LDAs). Half of the LDTs are type 1 and the other half type 2.

    b. Vendors are all heavy-heavy duty vehicles.

    c. Hauling is all heavy-heavy duty vehicles.

b. The emission factor depends upon the speed of the vehicle. A default value of 35 miles per hour will be used.

c. EMFAC emission factors from the construction year will be used for $EF_{running}$.

[8] The Air Resources Board adopted in 2004 and modified in 2005 an Air Toxic Control Measure that limits idling in diesel vehicles to 5-minutes. http://www.arb.ca.gov/msprog/truck-idling/truck-idling.htm

The emissions associated with CH_4 and N_2O are calculated in a similar manner or assumed to represent 5% of the total CO_2e emissions. They are then converted to CO_2e by multiplying by their respective global warming potential.

Startup emissions are CO_2 emitted from starting a vehicle. For the various trips during all phases, the startup emissions are calculated using the following assumptions:

a. The same vehicle fleet assumptions as used in running emissions.

b. Two engine startups per day with a 12 hour wait before each startup.[9]

The USEPA recommends assuming that CH_4, N_2O, and HFCs account for 5% of GHG emissions from on-road vehicles, taking into account their GWPs.[10] To incorporate these additional GHGs into the calculations, the total GHG footprint is calculated by dividing the CO_2 emissions by 0.95.

5.2 Vegetation Change

ENVIRON suggests following the IPCC protocol for vegetation since it has default values that work well with the information typically available for development projects. This method is similar to the CCAR Forest Protocol[11] and the Center for Urban Forest Research Tree Carbon Calculator[12], but it has more general default values available that will generally applicable to all areas of California without requiring detailed site-specific information[13].

5.2.1 Quantifying the One-Time Release by Changes in Carbon Sequestration Capacity

The one-time release of GHGs due to permanent changes in carbon sequestration capacity is calculated using the following four steps:[14]

1. *Identify and quantify the change in area of various land types due to the development (i.e. alluvial scrub, non-native grassland, agricultural, etc.).* These area changes include not only the area of land that will be converted to buildings, but also areas disrupted by the construction of utility corridors, water tank sites, and associated borrow and grading areas.

[9] The emission factor grows with the length of time the engine is off before each ignition.

[10] USEPA. 2005. *Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle.* Office of Transportation and Air Quality. February.

[11] CCAR. 2007. Forest Sector Protocol Version 2.1. September. Available at: http://www.climateregistry.org/resources/docs/protocols/industry/forest/forest_sector_protocol_version_2.1_sept2007.pdf

[12] Available at: http://www.fs.fed.us/ccrc/topics/urban-forests/ctcc/

[13] The CCAR Forest Protocol and Urban Forest Research Tree Carbon Calculator are not used since their main focus is annual emissions for carbon offset considerations. As such they are designed to work with very specific details of the vegetation that is not available at a CEQA level of analysis.

[14] This section follows the IPCC guidelines, but has been adapted for ease of use for these types of Projects.

Areas temporarily disturbed that will eventually recover to become vegetated will not be counted as vegetation removed as there is no net change in vegetation or land use.[15]

2. *Estimate the biomass associated with each land type.* For the purposes of this report, ENVIRON suggests using the available general vegetation types found in the IPCC publication Guidelines for National Greenhouse Gas Inventories (IPCC Guidelines).[16]

   California vegetation is heavily dominated by scrub and chaparral vegetation which may not be accurately characterized by default forest land properties. Consequently, ecological zones and biomass based subdivisions identified in the IPCC Guidelines were used to sub-categorize the vegetation as scrub dominated. These subcategories should be used to determine the CO_2 emissions resulting from land use impacts.

3. *Calculate CO_2 emissions from the net change of vegetation.* When vegetation is removed, it may undergo biodegradation,[17] or it may be combusted. Either pathway results in the carbon (C) present in the plants being combined with oxygen (O_2) to form CO_2. To estimate the mass of carbon present in the biomass, biomass weight is multiplied by the mass carbon fraction, 0.5. [18] The mass of carbon is multiplied by 3.67[19] to calculate the final mass of CO_2, assuming all of this carbon is converted into CO_2.

4. Calculate the overall change in sequestered CO_2. – For all types of land that change from one type of land to another,[20] initial and final values of sequestered CO_2 are calculated using the equation below.

   Overall Change in Sequestered CO_2 [MT CO_2]

$$= \sum_i \left(SeqCO_2\right)_i \times \left(area\right)_i - \sum_j \left(SeqCO_2\right)_j \times \left(area\right)_j$$

   Where:

$SeqCO_2$	=	mass of sequestered CO_2 per unit area [MT CO_2/acre]
area	=	area of land for specific land use type [acre]
i	=	index for final land use type
j	=	index for initial land use type

[15] This assumption facilitates the calculation as a yearly growth rate and CO_2 removal rate does not have to be calculated. As long as the disturbed land will indeed return to its original state, this assumption is valid for time periods over 20 years.

[16] Available online at http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.htm

[17] Cleared vegetation may also be deposited in a landfill or compost area, where some anaerobic degradation which will generate CH_4 may take place. However, for the purposes of this section, we are assuming that only aerobic biodegradation will take place which will result in CO_2 emissions only.

[18] The fraction of the biomass weight that is carbon. Here, a carbon fraction of 0.5 is used for all vegetation types from CCAR Forest Sector Protocol.

[19] The ratio of the molecular mass of CO_2 to the molecular mass of carbon is 44/12 or 3.67.

[20] For example from forestland to grassland, or from cropland to permanently developed.

5.2.2 Calculating CO_2 Sequestration by Trees

Planting individual trees will sequester CO_2. Changing vegetation as described above results in a one-time carbon-stock change. Planting trees is also considered to result in a one-time carbon-stock change. Default annual CO_2 sequestration rates on a per tree basis, based on values provided by the IPCC are used[21]. An average of 0.035 MT CO_2 per year per tree can be used for trees planted, if the tree type is not known.

Urban trees are only net carbon sinks when they are actively growing. The IPCC assumes an active growing period of 20 years. Thereafter, the accumulation of carbon in biomass slows with age, and will be completely offset by losses from clipping, pruning, and occasional death. Actual active growing periods are subject to, among other things, species, climate regime, and planting density. In this report, the IPCC default value of 20 years is recommended. For large tree sequestration projects, the Project may consider using the Forest or Urban tree planting protocols developed by Climate Action Registry (CAR). These protocols have slightly different assumptions regarding steady state, tree growth, and replacement of trees..

5.3 Built Environment

The amount of energy used, and the associated GHG emissions emitted per square foot of available space vary with the type of building. For example, food stores are far more energy intensive than warehouses, which have little climate-conditioned space. Therefore, this analysis is specific to the type of building.

GHGs are emitted as a result of activities in buildings for which electricity and natural gas are used as energy sources. Combustion of any type of fuel emits CO_2 and other GHGs directly into the atmosphere; when this occurs within a building (such as by natural gas consumption) this is a direct emission source[22] associated with that building. GHGs are also emitted during the generation of electricity from fossil fuels. When electricity is used in a building, the electricity generation typically takes place offsite at the power plant; electricity use in a building generally causes emissions in an indirect manner.

Energy use in buildings is divided into energy consumed by the built environment and energy consumed by uses that are independent of the construction of the building such as plug-in appliances. In California, Title 24 part 6 governs energy consumed by the built environment, mechanical systems, and some fixed lighting. This includes the space heating, space cooling, water heating, and ventilation systems. Non-building energy use, or "plug-in" energy use can be further subdivided by specific end-use (refrigeration, cooking, office equipment, etc.). The following two steps are performed to quantify the energy use due to buildings:

[21] The Center for Urban Forest Research Tree Carbon Calculator is not suggested since it requires knowledge on specific tree species to estimate carbon sequestered. This information is typically not available during the preparation of CEQA documents.

[22] California Climate Action Registry (CCAR) General Reporting Protocol (GRP), Version 3.1 (January). Available at: http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf, Chapter 8

1. Calculate energy use from systems covered by Title 24[23] (HVAC system, water heating system, and the lighting system).
2. Calculate energy use from office equipment, plug-in lighting, and other sources not covered by Title 24.

The resulting energy use quantities are then converted to GHG emissions by multiplying by the appropriate emission factors obtained by incorporating information on local electricity providers for electricity, and by natural gas emission factors for natural gas combustion.

ENVIRON recommends using default values for Title 24 and non-Title 24 energy use for various building types. These will take into account the building size and climate zone. There are several sources of information that can be used to obtain building energy intensity. Each is described briefly below.

The *California Commercial Energy Use Survey* (CEUS) data is provided by the California Energy Commission (CEC). It is based on a survey conducted in 2002 for existing commercial buildings in various climate zones. Electricity and natural gas use per square foot for each end use in each building type and climate zone is extracted from the CEUS data. Since the data is provided by end use, it is straightforward to calculate the Title 24 and non-Title 24 regulated energy intensity for each building type.

Commercial Buildings Energy Consumption Survey (CBECS) is a survey of non-residential buildings that was conducted in 2003 by the Energy Information Administration (EIA). Electricity and natural gas use per square foot can be extracted from this data. The energy use estimates are assumed to represent 2001 Title 24 compliant buildings. Using CBECS, the percent of electricity and natural gas used for each end use can be calculated. It is then straightforward to calculate the Title 24 and non-Title 24 electricity and natural gas intensity for each building type. Similar surveys exist for manufacturing and residential energy use.

The *Residential Appliance Saturation Survey* (RASS) refers to the California Energy Commission Consultant Report entitled “California Statewide Residential Appliance Saturday Study”. Data from RASS is used to calculate the total electricity and natural gas use for residential buildings on a per dwelling unit. The RASS study estimates the unit energy consumption (UEC) values for individual households surveyed and also provides the saturation number for each type of end use. The saturation number indicates the proportion of households that have a demand for each type of end-use category. As the data is provided by end use, it is straightforward to calculate the Title 24 and non-Title 24 electricity and natural gas intensity for each building type.

Alternative Calculation Method (ACM) software is available that makes estimates of the energy consumption by a model Title 24 compliant building. These programs provide

[23] Title 24, Part 6, of the California Code of Regulations: California's Energy Efficiency Standards for Residential and Nonresidential Buildings. http://www.energy.ca.gov/title24/

annual energy use for the heating, ventilation, and air conditioning (HVAC) system in each building; therefore, estimates from ACM software represent Title 24-regulated energy use. These do not calculate the non-Title 24 energy use for the buildings.

The Department of Energy produced the *Building America Research Benchmark Definition* (BARBD) technical manual, which presents empirical equations for electricity and natural gas usage. As the data is provided by end use, it is straightforward to calculate the Title 24 and non-Title 24 electricity and natural gas intensity for each building type.

Literature surveys may also be used for building and land use types not well represented by the above sources.

ENVIRON suggests using the CEUS and RASS datasets for these calculations since the data is available for several land use categories in different climate zones in California.

The Title 24 standards have been updated twice (in 2005 and 2008) since some of these data were compiled. CEC has published reports estimating the percentage deductions in energy use resulting from these new standards. Based on CEC's discussion on average savings for Title 24 improvements, these CEC savings percentages by end use can be used to account for reductions in electricity use due to updates to Title 24. Since energy use for each different system type (ie, heating, cooling, water heating, and ventilation) as well as appliances is defined, this method will easily allow for application of mitigation measures aimed at reducing the energy use of these devices in a prescriptive manner.

Based on the electricity intensity, CO_2e intensity values (CO_2e emissions per square foot or dwelling unit, as applicable, per year) for each building type can be calculated. Electricity intensity data is multiplied by an electricity emission factor to generate CO_2e intensity values. The total CO_2e emissions from each building type are calculated by multiplying the CO_2e intensity values by the appropriate metric (building square footage for non-residential buildings or number of dwelling units for residential buildings). Summing the CO_2e emissions from all building types gives the total CO_2e emissions from electricity use in Title 24 and non-Title 24 sources in buildings.

Based on the natural gas intensity, CO_2e intensity values (CO_2e emissions per square foot or dwelling unit, as applicable, per year) for each building type can be calculated. Natural gas intensity data is multiplied by a natural gas emission factor to generate CO_2e intensity values. The total CO_2e emissions from each building type are calculated by multiplying the CO_2 intensity values by the appropriate metric (building square footage for non-residential buildings or number of dwelling units for residential buildings). Summing the CO_2e emissions from all building types gives the total CO_2e emissions from natural gas use in Title 24 and non-Title 24 sources in buildings.

5.3.1 Natural Gas Boilers

GHG emissions from the combustion of natural gas are calculated as the product of natural gas consumption, natural gas heat content, and carbon-intensity factor. The Project Applicant has

to determine the natural gas consumption, while the heat content and carbon-intensity factor can obtained from the CCAR General Reporting Protocol.

5.4 Area Sources

Area sources are local combustion of fuel. The area sources covered in this section include natural gas fireplaces/stoves and landscape maintenance equipment. Natural gas usage from the primary building heating is not included in this category since it is already included with building energy use. Each of these area sources is discussed further.

5.4.1 Natural Gas Fireplaces/Stoves

GHG emissions associated with natural gas fired fireplaces are calculated using emission factors from CCAR. The average BTU per hour for fireplaces in homes needs to be specified. Default values for annual fireplace usage varies for each County. Natural gas is assumed to have 1,020 BTU per standard cubic foot[24].

5.4.2 Landscape Maintenance

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, roto tillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers, as well as air compressors, generators, and pumps.

Similar to construction off-road equipment, emission factors are based on the OFFROAD2007 model. These are combined with the hours of operation for each equipment piece as well as the horsepower and load factors. The GHG emissions will be calculated based on the emission factors for the equipment and fuel reported from OFFROAD2007 and the appropriate GWP. Default usages (hours of operation) should be determined for the landscape equipment based on the Project needs.

5.5 Water

Delivering and treating water for use at the project site requires energy. This embodied energy associated with the distribution of water to the end user is associated with the electricity to pump and treat the water. GHG emissions due to water use are related to the energy used to convey, treat and distribute water. Thus, these emissions are indirect emissions from the production of electricity to power these systems.

The amount of electricity required to treat and supply water depends on the volume of water involved. Three processes are necessary to supply water to users: (1) supply and conveyance of the water from the source; (2) treatment of the water to potable standards; and (3) distribution of the water to individual users.

[24] USEPA. 1998. AP-42 Emission Factors. Chapter 1.4 Natural Gas Combustion.

Therefore, to quantify the GHG emissions associated with the distribution of water to an end user, the carbon intensity of electricity is used along with the amount of electricity used in pumping and treating the water. Since consumption of water varies greatly for each land use type, default values need to be determined with several listed in the mitigation measure fact sheets. Since buildings may have different percentages of water associated with indoor and outdoor water usage, the water usage is quantified separately. In addition since mitigation measures associated with water use may be directed separately toward indoor and outdoor water usage, this will be beneficial for this task.

5.5.1 Indoor

Indirect emissions resulting from electricity use are determined by multiplying electricity use by the CO_2e emission factor provided by the local electricity supplier. Energy use per unit of water for different aspects of water treatment (e.g. source water pumping and conveyance, water treatment, distribution to users) is determined using the stated volumes of water and energy intensities values (i.e., energy use per unit volume of water) provided by reports from the California Energy Commission (CEC) on energy use for California's water systems.[25] The CEC report estimates the electricity required to extract and convey one million gallons of water. Using this energy intensity factor, the expected indoor water demand, and the utility-specific carbon-intensity factor, GHG emissions from indoor water supply and conveyance may be calculated.

The amount of electricity required to treat and distribute one million gallon of potable water is estimated in the CEC report. Based on the estimated indoor water demand, these energy intensity factors, and the utility-specific carbon intensity factor, GHG emissions from indoor water treatment and distribution may be calculated.

The sum of emissions due to supplying, conveying, treating, and distributing indoor water gives the total emissions due to indoor water use.

5.5.2 Outdoor

Indirect emissions resulting from electricity use are determined by multiplying electricity use by the CO_2 emission factor provided by the local electricity supplier. Energy use per unit of water for different aspects of water treatment (e.g. source water pumping and conveyance, water treatment, distribution to users) is determined using the stated volumes of water and energy intensities values (i.e., energy use per unit volume of water) provided by reports from the California Energy Commission (CEC) on energy use for California's water systems.[26] The

[25] CEC 2005. California's Water-Energy Relationship. Final Staff Report. CEC-700-2005-011-SF,
CEC 2006. Refining Estimates of Water-Related Energy Use in California. PIER Final Project Report. Prepared by Navigant Consulting, Inc. CEC-500-2006-118. December.

[26] CEC 2005. California's Water-Energy Relationship. Final Staff Report. CEC-700-2005-011-SF,
CEC 2006. Refining Estimates of Water-Related Energy Use in California. PIER Final Project Report. Prepared by Navigant Consulting, Inc. CEC-500-2006-118. December.

energy needed to supply and convey the water will be used to pump this water from the sources and distribute it throughout the development. The CEC report estimates the electricity required to extract and convey one million gallons of water. Using this energy intensity factor, the expected outdoor water demand, and the utility-specific carbon-intensity factor, GHG emissions from outdoor water supply and conveyance may be calculated.

The amount of electricity required to treat and distribute one million gallon of potable water (see recycled water for non-potable water) is estimated in the CEC report. Based on the estimated outdoor water demand, these energy intensity factors, and the utility-specific carbon intensity factor, GHG emissions from outdoor water treatment and distribution may be calculated.

The sum of emissions due to supplying, conveying, treating, and distributing outdoor water gives the total emissions due to outdoor water use.

5.5.2.1 Landscape Watering – Turf Grass

The amount of outdoor water used in the landscape watering of turf grass is calculated based on the California Department of Water Resources (CDWR) 2009 Model Water Efficient Landscape Ordinance[27] and the CDWR 2000 report "A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California: The Landscape Coefficient Method and WUCOLS III."[28] Using this methodology, the amount of water required to support the baseline turf water demand ($Water_{baseline}$) is calculated as follows:

$$ETC = Kc \times ET_0$$

Where:

ETC	=	Crop Evapotranspiration, the total amount of water the baseline turf loses during a specific time period due to evapotranspiration[29] (inches water/day)
KC	=	Crop Coefficient, factor determined from field research, which compares the amount of water lost by the crop (e.g. turf) to the amount of water lost by a reference crop (unitless). Species-specific; provided in CDWR 2000
ET_0	=	Reference Evapotransporation, the amount of water lost by a reference crop (inches water/day) Region-specific; provided in Appendix A of CDWR 2009

[27] California Department of Water Resources. 2009. Model Water Efficient Landscape Ordinance. Available online at: http://www.water.ca.gov/wateruseefficiency/docs/MWELO09-10-09.pdf

[28] California Department of Water Resources. 2000. A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California: The Landscape Coefficient Method and WUCOLS III. Available online at: http://www.water.ca.gov/pubs/conservation/a_guide_to_estimating_irrigation_water_needs_of_landscape_plantings_in_california__wucols/wucols00.pdf

[29] Evapotranspiration is water lost to the atmosphere due to evaporation from soil and transpiration from plant leaves. For a more detailed definition, see this California Irrigation Management Information System (CIMIS) website: http://wwwcimis.water.ca.gov/cimis/infoEtoOverview.jsp;jsessionid=91682943559928B8A9A243D2A2665E19

Then:

$$Water_{baseline} = ETC \times Area_{baseline} \times 0.62 \times 365$$

Where:

$Water_{baseline}$	=	Volume of water required to support the baseline turf (gallons/year)
$Area_{baseline}$	=	Area of existing or standard turf (square feet)
0.62	=	conversion factor (gallons/squarefoot.inches water)
365	=	conversion factor (days/year)

Based on the estimated outdoor water demand for watering turf grass, the outdoor water energy intensity factors described above, and the utility-specific carbon intensity factor, GHG emissions from watering turf grass in lawns may be calculated.

5.5.2.2 Landscape Watering – General

The amount of outdoor water used in the landscape watering of landscapes and lawns is calculated based on the California Department of Water Resources (CDWR) 2009 Model Water Efficient Landscape Ordinance.[30] Using this methodology, the amount of water required to support the baseline lawn water demand ($Water_{baseline}$) is defined as the Maximum Applied Water Allowance (MAWA) and is calculated as follows:

$$Water_{baseline} = MAWA = ET_0 \times 0.62 \times [(0.7 \times LA) + (0.3 \times SLA)]$$

Where:

$Water_{baseline}$	=	Volume of water required to support the baseline lawn (gallons/year)
MAWA	=	Maximum Applied Water Allowance (gallons/year)
ET_0	=	Annual Reference Evapotranspiration[31] from Appendix A of CDWR 2009 (inches per year)
0.7	=	ET Adjustment Factor (ETAF)
LA	=	Landscape Area[32] includes Special Landscape Area[33] (square feet)

[30] California Department of Water Resources. 2009. Model Water Efficient Landscape Ordinance. Available online at: http://www.water.ca.gov/wateruseefficiency/docs/MWELO09-10-09.pdf

[31] Evapotranspiration is water lost to the atmosphere due to evaporation from soil and transpiration from plant leaves. For a more detailed definition, see this California Irrigation Management Information System (CIMIS) website: http://wwwcimis.water.ca.gov/cimis/infoEtoOverview.jsp;jsessionid=91682943559928B8A9A243D2A2665E19

[32] § 491 Definitions in CDWR 2009: "Landscape Area (LA) means all the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance calculation. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designed fro non-development (e.g., open spaces and existing native vegetation)."

[33] § 491 Definitions in CDWR 2009: "Special Landscape Area (SLA) means an area of the landscape dedicated

0.62	=	Conversion factor (to gallons per square foot)
SLA	=	Portion of the landscape area identified as Special Landscape Area (square feet)
0.3	=	the additional ETAF for Special Landscape Area

Based on the estimated outdoor water demand for watering lawns, the outdoor water energy intensity factors described above, and the utility-specific carbon intensity factor, GHG emissions from watering lawns may be calculated.

5.5.3 Recycled Water

After use, wastewater is treated and reused as reclaimed water. Any reclaimed water produced is generally redistributed to users via pumping. An estimate of the non-potable water demand to be met through the distribution of recycled water is needed. Estimates of the amount of energy needed to redistribute and, if necessary, treat reclaimed water is 400 kW-hr per acre foot.[34] Based on the estimated demand for reclaimed water, the estimated electricity demand and the utility-specific carbon-intensity factor, non-potable reclaimed water redistribution emissions are calculated.

5.5.4 Process

Industrial land uses can use a large amount of water for their processes. The water used for this will not be quantified since there is not sufficient water use data for this type of land use for the development of a default value. Water use is highly dependent on the specific industry..

5.6 Wastewater

Emissions associated with wastewater treatment include indirect emissions necessary to power the treatment process and direct emissions from degradation of organic material in the wastewater.

5.6.1 Direct Emissions

Direct emissions from wastewater treatment include emissions of CH_4 and biogenic CO_2. The method described by the Local Government Operations Protocol developed by the California Air Resources Board is suggested with default values assigned since detailed plant specific data will typically not be available.[35] The assumed daily 5-day carbonaceous biological oxygen

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solely to edible plants, areas irrigated with recycled water, water features using recycled water and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface."

[34] CEC 2005. California's Water-Energy Relationship. Final Staff Report. CEC-700-2005-011-SF.

[35] California Air Resources Board. 2008. *Local Government Operations Protocol - for the quantification and reporting of greenhouse gas emissions inventories*. Version 1.0. September 2008. Developed in partnership by California Air Resources Board, California Climate Action Registry, ICLEI - Local Governments for Sustainability, The Climate Registry

demand (BOD_5) of 200 mg/L-wastewater is multiplied by the protocol defaults for maximum CH_4-producing capacity (0.6 kg-CH_4/kg-BOD_5) and other default values to obtain the direct CH_4 emission. The amount of digester gas produced per volume of wastewater, and amount of N_2O per volume of wastewater needs to be determined. These values are then multiplied by the Global Warming Potential factor[36] of 21 for CH_4 or 310 for the GWP of N_2O that would be generated otherwise to obtain the annual CO_2 equivalent emissions.

5.6.2 Indirect Emissions

Indirect GHG emissions result from the electricity necessary to power the wastewater treatment process. The electricity required to operate a wastewater treatment plant is estimated to be 1,911 kW-hr per million gallons.[37] Based on the expected amount of wastewater requiring treatment, which will be assumed to be equal to the indoor potable water demand absent other data, the energy intensity factor and the utility-specific carbon-intensity factor, indirect emissions due to wastewater treatment are calculated.

5.7 Public Lighting

Lighting sources contribute to GHG emissions indirectly, via the production of the electricity that powers these lights. Lighting sources considered in this source category include streetlights, traffic lights, and parking lot lights. The annual electricity use may be estimated using the number of heads, the power requirements of each head, and the assumption that they operate for 12 hours a day on average for 365 days per year or 24 hours for traffic lights. The emission factor for public lighting is the utility-specific carbon-intensity factor. Multiplying the electricity usage by the emission factor gives an estimate of annual CO_2e emissions from public lighting.

5.8 Municipal Vehicles

GHG emissions from municipal vehicles are due to direct emissions from the burning of fossil fuels. Municipal vehicles considered in this source category include vehicles such as police cars, fire trucks, and garbage trucks. Data from reports by Medford, MA; Duluth, MN; Northampton, MA; and Santa Rosa, California[38] show that the CO_2 emissions from municipal

[36] Intergovernmental Panel on Climate Change. IPCC Second Assessment - Climate Change 1995.

[37] CEC 2006. Refining Estimates of Water-Related Energy Use in California. PIER Final Project Report. Prepared by Navigant Consulting, Inc. CEC-500-2006-118. December.

[38] City of Medford. 2001. Climate Action Plan. October. http://www.massclimateaction.org/pdf/MedfordPlan2001.pdf

City of Northampton. 2006. Greenhouse Gas Emissions Inventory. Cities for Climate Protection Campaign. June. http://www.northamptonma.gov/uploads/listWidget/3208/NorthamptonInventoryClimateProtection.pdf

City of Santa Rosa. Cities for Climate Protection: Santa Rosa. http://ci.santa-rosa.ca.us/City_Hall/City_Manager/CCPFinalReport.pdf

Skoog., C. 2001. Greenhouse Gas Inventory and Forecast Report. City of Duluth Facilities Management and The International Council for Local Environmental Initiatives. October.http://www.ci.duluth.mn.us/city/information/ccp/GHGEmissions.pdf

vehicles would be approximately[39] 0.05 MT per capita per year. Using these studies and the expected population, emissions from municipal vehicles may be calculated.

5.9 On-Road Mobile Sources

This section estimates GHG emissions from on-road mobile sources. The on-road mobile source emissions considered a project will be from the typical daily operation of motor vehicles by project residents and non-residents. The GHG emissions based upon all vehicle miles traveled associated with residential and non-residential trips regardless of internal or external destinations or purpose of trip are estimated. Traffic patterns, trip rates, and trip lengths are based upon the methods discussed below.

The CCAR GRP[40] recommends estimating GHG emissions from mobile sources at an individual vehicle level, assuming knowledge of the fuel consumption rate for each vehicle as well as the miles traveled per car. Since these parameters are not known for a future development, the CCAR guidance can not be used as recommended.

Estimating Trip Rates

The majority of transportation impact analysis conducted for CEQA documents in California apply trip generation rates provided by the Institute of Transportation Engineers (ITE) in their regularly updated report *Trip Generation*. The report is based on traffic counts data collected over four decades at built developments throughout the United States. This data is typically based on single-use developments, in suburban locations with ample free parking and with minimal transit service and demand management strategies in place. As a result, the ITE trip generation rates represent upper bound trip generation rates for an individual land use type. This represents a good basis against which to measure the trip-reducing effects of any one or more of the mitigation strategies that will be quantified in subsequent tasks. Therefore, we recommend ITE trip rates as the baseline condition against which the effectiveness of CAPCOA's mitigation measures is applied.

There are some CEQA traffic studies that use data other than ITE trip generation rates. Below we briefly discuss the possible use of these alternative datasets. These traffic studies typically use trip generation data from one of the following sources:

SANDAG Traffic Generators. In the San Diego region, most studies use data from the SANDAG *Traffic Generators* report. This report is similar to the ITE *Trip Generation* in that it uses primarily suburban, single use developments, except that this dataset is based on traffic counts conducted in the San Diego region rather than throughout the United States. In studies where the SANDAG data is used, CAPCOA reviewers should apply the trip reduction estimates presented in subsequent tasks directly to the SANDAG trip generation rates.

[39] In an effort to be conservative, the largest per capita number from these four reports was used.

[40] California Climate Action Registry (CCAR). 2009. *General Reporting Protocol*. Version 3.1. January.

Travel Forecast Models. For some large development projects or general plans, the local or regional travel model is used to estimate the number of trips generated as well as trip lengths and vehicle speeds at which the individual trips occur. These models account for whether the trip segment occurs on a freeway or local streets as well as the degree of congestion. The values for trip generation rates and trip lengths using ITE and average trip lengths can be to assess the model estimates of vehicle trip generation and VMT. These comparisons should recognize that the travel models explicitly account for various factors that reduce trip-making and VMT, including the demographic characteristics of the site occupants, location and accessibility of the development site relative to other destinations in the region, the mix of land uses within the site and its surrounding area, and possibly the availability of effective transit service. When performing a comparison using the ITE trip rates and average trip lengths, the reviewer should take into consideration that these factors have already been accounted for in the modeling. Therefore, we recommend applying ITE trip rates and lengths along with the adjustments recommended elsewhere in this document (accounting for site location, design and demographics) as a means of reality-checking transportation model results.

Traffic counts at comparable developments. Some traffic assessments elect to conduct traffic counts at existing developments that are similar to the proposed development. When reviewing impact assessments produced using such information, the reviewer should take into account the extent to which the surveyed development(s) already contain trip generation and trip length reducing measures. Care needs to be used to avoid double-counting reductions.

Estimating VMT from Mobile Sources

Data on average trip lengths are used to translate trip generation rates into vehicle miles of travel (VMT). These trip lengths should be obtained from published sources of average trip lengths for different types of trip types (i.e., commute trips, shopping trips, and others) for each region within the state. Vehicle miles traveled (VMT) are calculated by multiplying ITE trip rates by the typical trip lengths.

Some mechanisms that reduce trip generation rates and trip lengths below these standard ITE-trip rates and current average trip lengths might be considered to be intrinsic parts of the development proposal rather than mitigation measures, such as project location (e.g., infill or transit oriented development [TOD]), density, mix of uses, and urban design. These are not considered part of the baseline condition, but are recognized and quantified as project design features (PDFs). This approach has the following advantages: 1) it creates a consistent basis of analysis for all development projects regardless of location and self-mitigating features already included in the project proposal, and 2) it highlights all elements of a project that reduce trip generation rates and vehicle miles traveled.

Other Factors Influencing Mobile Source GHG Emissions

Beyond trip generation, trip length and VMT, other factors that affect GHG emissions include traffic flow, vehicle fuel consumption rates, and fuel type.

Traffic speed and efficiency profiles are largely influenced by: a) the project location and degree of prevailing congestion in its vicinity, b) the degree to which the project implements traffic level-

of-service mitigation measures often triggered by CEQA review, and c) actions taken by local, regional governments and Caltrans to reduce corridor or area-wide congestion.

The simplified mitigation assessment methods developed for this study use several categories of emissions factors per VMT that account for a) the generalized project location (core infill, inner ring suburbs, outer suburbs, rural), and b) and region-specific fleet and emissions rate if available.

While it is beyond the scope of this document to provide CAPCOA the ability to perform traffic speed and efficiency analysis, the study report advises CAPCOA on the type of analysis to expect to see in CEQA documents on development projects. CEQA impact and mitigation assessment methods should continue to perform air quality analysis using tools such as EMFAC that reference prevailing traffic speed profiles, especially for infill development and congested corridors, while applying appropriate credit for congestion reducing measures included in the project mitigation requirements, funded capital improvements plans, and fiscally constrained Regional Transportation Plans (RTPs.)

5.9.1 Estimating GHG Emissions from Mobile Sources

The CO_2 emissions from mobile sources were calculated with the trip rates, trip lengths and emission factors for running and starting emissions from EMFAC2007 as follows:

$$CO_2\ emissions = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled
$EF_{running}$ = emission factor for running emissions

The CO_2e calculation involves the following assumptions:

- The emission factor depends upon the speed of the vehicle.
- EMFAC emission factors from the baseline year will be used for $EF_{running}$ based on County specific fleet mix for different trip types and adjusted to account for applicable regulations that are not currently incorporated yet into EMFAC.

Startup emissions are CO_2 emitted from starting a vehicle. Startup emissions are calculated using the following assumptions:

- The number of starts is equal to the number of trips made annually.
- The breakdown in vehicles is EMFAC fleet mix for County specific fleet mix.
- The emission factor for startup is calculated based on a weighted average of time between starts for each trip type (commute trips versus all other types).

Fleet distribution types will be based on EMFAC2007 or the most recent EMFAC version available. For mobile sources, the USEPA recommends assuming that CH_4, N_2O, and HFCs

account for 5% of GHG emissions from on-road vehicles, taking into account their GWPs.[41] To incorporate these additional GHGs into the calculations, the total GHG footprint is calculated by dividing the CO_2 emissions by 0.95.

Emission factors for alternative fuel can be obtained from the CCAR General Reporting Protocol. For comparison with alternative fuel, N_2O and CH_4 emissions should be calculated separately as their emissions from alternative fuel are generally higher than from gasoline or diesel.

Low-emission-vehicle programs, such as neighborhood electric vehicles (NEV) or car sharing programs, will only be considered in accounting for GHG reductions if included in project-specific design or mitigation measures.

5.10 GHG Emissions from Specialized Land Uses

Below are methods to quantify GHG emissions from some additional land use categories that may be commonly found in development projects. These include golf courses and swimming pools. The methods proposed to determine GHG emissions associated with these sources is discussed in the following sections. The GHG emissions will typically fall into other categories such as landscape maintenance, water usage, and buildings, but since the data sources are different, they are explicitly described.

5.10.1 Golf Courses

Emission flux resulting from the construction of the golf course is not discussed, nor is the sequestration of CO_2 into the turf, trees, or lakes of the golf course. Operational CO_2 emissions were calculated for three areas: irrigation, maintenance (mowing), and on-site buildings' energy use. All three components are discussed in this section.

5.10.2 Calculating CO_2 Emissions from Irrigation of the Golf Course

The release of GHGs due to irrigation practices was calculated in two steps:

1. Identify the quantity of water needed.

2. Calculate the emissions associated with pumping the water.

1. *Identify the quantity of water needed.* Standard water use for an 18-hole golf course ranges from 250 to 450 acre-ft yearly. A survey of golf course superintendents conducted in the summer of 2003 by the Northern and Southern California Golf Associations revealed an annual average California usage of 345 acre-ft.[42] Numerous factors will affect the actual water usage

[41] USEPA. 2005. *Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle.* Office of Transportation and Air Quality. February.

[42] Northern California Golf Association. Improving California Golf Course Water Efficiency, pg 14. http://www.owue.water.ca.gov/docs/2004Apps/2004-079.pdf

of a specific golf course, and it is likely to vary by year. ENVIRON recommends using the average usage of 345 acre-ft per year annually.

2. Calculate the associated emissions. Using the information identified above, ENVIRON calculates total emissions from irrigation of an 18-hole golf course as follows:

Estimate total dynamic head: This is the combination of lift (300 feet) and desired pressure. Standard athletic field sprinklers require a base pressure of approximately 65 psi.[43]

60 psi x 2.31 ft/psi [44]	=	*139 ft*
+ lift	=	*300 ft*
Total dynamic head	=	*439 ft*

Identify fuel unit and multiply by head: Possible pumping fuels include electricity, natural gas, diesel, and propane. In these calculations, ENVIRON assumes that all pumps will use electricity. Based on the literature, ENVIRON recommends using a pumping energy use of 1.551 kW-hr/acre-ft/ft.[45]

$$1.551 \text{ kW-hr/acre-ft/ft} \times 439 \text{ ft} = 681 \text{ kW-hr/acre-foot}$$

Multiply energy demand by emission factor and convert to MT: The energy demand per acre-ft calculated above is multiplied by the emission factor for the electricity generation source and converted to MT.

$$\frac{681 \text{kW-hr/acre-ft} \times 0.666 \text{ lbs } CO_2\text{/kW-hr}}{2204.62 \text{ lbs/ton}} = 0.21 \text{ MT } CO_2\text{/acre-ft}$$

The anticipated annual water demand will be multiplied by these values and then combined this with the calculated emission factor yields total annual emissions from irrigation of the golf course. Other outdoor land uses that require irrigation can follow a similar procedure.

5.10.3 Calculating CO_2 Emissions from Maintenance of the Golf Course

Maintenance emissions include the emissions resulting from the mowing of turf grass. The release of GHGs due to mowing was calculated in three steps:

1. Identify the area of turf and frequency of mowing.
2. Identify the efficiency of a typical mower.

[43] Full Coverage Irrigation. Partial List of Customers Using FCI Nozzles. http://www.fcinozzles.com/clients.asp.

[44] Conversion factor: 1 psi = 2.31 feet of head. Kele & Associates Technical Reference: Liquid Level Measurement. http://www.kele.com/tech/monitor/Pressure/LiqLevMs.pdf

[45] Kansas State University Irrigation Management Series. Comparing Irrigation Energy Costs. Table 4. http://www.oznet.ksu.edu/library/ageng2/mf2360.pdf

3. Calculate the emissions associated with mowing.

1. *Identify the area of turf and frequency of mowing*: An Arizona State economic analysis of golf courses reports that on average 2/3 of the land within a golf course is maintained.[46] ENVIRON suggests assuming that the course will be mowed twice weekly, although high maintenance areas such as greens will be mowed more frequently.[47] ENVIRON recommends a growing season of 52 weeks/year.[48]

2. *Identify the efficiency of a typical mower*. Typical mower calculations are based on the specifications for a lightweight fairway mower (model 3235C) reported by John Deere's Golf & Turf division.[49] A typical mower will use one tank (18 gallons) of diesel per day (assumed to be 8 hours). Given the size specifications of the mower and assuming an average speed of 5.5 mph, such a mower can cover 44 acres on 18 gallons of diesel.

3. *Calculate the emissions associated with mowing*. Using the information collected above and a CO_2 emission factor for diesel combustion[50], ENVIRON calculates the emission factor for mowing the golf course:

$$\frac{2\ mowings}{week} \times \frac{52\ weeks}{year} \times \frac{18\ gallons\ diesel}{44\ acre\text{-}mowing} \times \frac{22.4\ lbs\ CO_2/\ gallon\ diesel}{2204\ lbs/ton} = \frac{0.43\ MT\ CO_2}{acre\text{-}year}$$

5.10.4 Calculating CO_2 Emissions from Building Energy Use at the Golf Course

Any of the non-residential building energy use data sources described in the Buildings section may be used to estimate energy intensity at the golf course.

5.11 Pools

Recreation centers may include various pools, spas, and restroom buildings; ENVIRON assumes that pools are the main consumers of energy in recreation centers. This section describes the methods used to estimate the GHGs associated with pools in recreation centers.

The energy used to heat and maintain a swimming pool depends on several factors, including (but not limited to): whether the pool is indoors or outdoors, size of the pool (surface area and depth), water temperature, and energy efficiency of pool pump and water heater, and whether

[46] Total acreage divided by total acreage maintained. Arizona State University, Dr. Troy Schmitz. Economic Impacts and Environmental Aspects of the Arizona Golf Course Industry. http://agb.poly.asu.edu/workingpapers/0501.pdf.

[47] Based on Best Practices video. http://buckeyeturf.osu.edu/podcast/?p=51

[48] Based on 95% of Southern California Survey respondents report an irrigation season greater than 9-10 months. http://www.owue.water.ca.gov/docs/2004Apps/2004-079.pdf

[49] John Deere Product Specifications. 3235C Lightweight Fairway Mower. http://www.deere.com/en_US/ProductCatalog/GT/series/gt_lwfm_c_series.html

[50] EIA. Fuel and Energy Source Codes and Emission Coefficients. http://www.eia.doe.gov/oiaf/1605/factors.html

solar heating is used. By making assumptions for these parameters and using known or predicted values for energy use, ENVIRON estimates the electricity and natural gas use of an outdoor pool.

5.11.1 Recreation Center Characterization

In the calculations described below, ENVIRON assumes that the proposed pools will be outdoor pools with dimensions 50 meters by 22.9 meters (a typical, competition-size pool). ENVIRON bases electricity calculations on a pool that ran its standard water filter for 24 hours per day, 365 days per year. As there is little data publicly available on the energy use of commercial swimming pools, ENVIRON extrapolates energy consumption from information obtained from two sources: 1) Data on electricity used by pool pumps from Pacific Gas and Electric (PG&E),[51] and 2) Data on the annual cost to heat a commercial pool located in Carlsbad, CA.[52]

5.11.2 Electricity Use of Pools

A PG&E study on energy efficiency of a pool pump at the Lyons Pool in Oakland, CA, found an annual electricity use of 110,400 kilowatt hours per year (kWh per yr).[53] The study pool is smaller than the assumed size of the proposed pool (actual size of the Lyons Pool is 35 yards by 16 yards). Accordingly, ENVIRON scales the electricity use to reflect the larger size of the proposed pool.

5.11.3 Natural Gas Use of Pools

The estimated annual cost of heating a standard competition-size pool is $184,400 (or 72% of the total cost of pool operations).[54] ENVIRON used the average PG&E commercial rate for natural gas of $0.95 per therm to convert this cost into annual natural gas use (hundred cubic feet per year [ccf/year]).[55] The commercial rate averages the variable cost due to energy usage and time of year. This corresponds to approximately 184,400 ccf per year.[56]

This value is comparable to that obtained from the pool industry.[57] The estimated cost of heating a residential pool using a natural gas heater is about one dollar per square foot of water

[51] PG&E. 2006. Energy Efficient Commercial Pool Program, Preliminary Facility Report. Lyons Pool, "City of Oakland/Oakland Unified School District." October.

[52] Mendioroz, R. 2006. Fueling Change: A Number of Design Schemes and Alternative-Energy Strategies Can Help Operators Beat the Price of Natural Gas. Athletic Business. March.

[53] PG&E. 2006. Energy Efficient Commercial Pool Program, Preliminary Facility Report. Lyons Pool, "City of Oakland/Oakland Unified School District." October.

[54] Mendioroz, R. 2006. Fueling Change: A Number of Design Schemes and Alternative-Energy Strategies Can Help Operators Beat the Price of Natural Gas. Athletic Business. March.

[55] Pacific Gas and Electric (PG&E). 2007. Gas Rate Finder. Vol 36-G, No. 9. September. http://www.pge.com/tariffs/GRF0907.pdf

[56] At the commercial rate given 1 ccf costs $1.

[57] SolarCraft Services Inc. 2007. Phone conversation with Chris Bumas on September 18, 2007. Novato, CA http://www.solarcraft.com/

surface area per month ($/sqft-month) in residential therms.[58] Applying this value to a competition-size pool yields an annual natural gas use of 147,600 ccf/year.

5.11.4 Conversion of Electricity and Natural Gas Use to Greenhouse Gas Emissions

ENVIRON used utility-specific electricity and natural gas emission factors to calculate the total CO_2 emissions for each pool. A summary of the calculations is shown below:

$$Emissions\ from Electricity\left(\frac{Tonnes CO_2\ /\ yr}{1{,}000 sqft}\right) =$$
$$\frac{Energy\ Use\ (ccf\ /\ yr) \times Emission\ Factor\ (lbs\ CO_2e\ /\ ccf) \times Conversion\ Factor\ (tonne\ /\ 2205\ lbs)}{Surface\ Area\ of\ Pool\ (1{,}000\ sqft)}$$

$$Emissions\ from Natural\ Gas\left(\frac{Tonnes CO_2\ /\ yr}{1{,}000 sqft}\right) =$$
$$\frac{Energy\ Use\ (ccf\ /\ yr) \times Emission\ Factor\ (lbs\ CO_2e\ /\ ccf) \times Conversion\ Factor\ (tonne\ /\ 2205\ lbs)}{Surface\ Area\ of\ Pool\ (1{,}000\ sqft)}$$

[58] The residential price for one therm of natural gas.

Appendix C

Transportation Appendices

Appendix C.1

Transportation Calculations

Appendix C.1 – Transportation Calculations

Table C-1 provides further detail into the calculations of percent reduction in vehicle miles traveled (VMT) for each of the fact sheets (that have references to the appendix). Many of the strategies in the table below do not provide the full equations for percent reduction in vehicle miles traveled. Only the equations or variables which require further detail are outlined here. The table also provides detail on any assumptions which are made to perform the calculations and the basis of such assumptions. An additional section below Table C-1 provides a detailed discussion of the calculations made for the transit accessibility strategy.

Table C-1
Transportation Calculations

Strategy	T#	Equation	Variable	Value	Source/Notes
Increase Density (Land Use/Location)	A2	A = Percentage increase in housing units per acre = (number of housing units per acre – number of housing units per acre for typical ITE development) / (number of housing units per acre for typical ITE development)	number of housing units per acre for typical ITE development	7.6 = blended average density of residential development in the US in 2003	A.C. Nelson. "Leadership in a New Era." *Journal of the American Planning Association,* Vol. 72, Issue 4, 2006, pp. 393-407 – as cited in *Growing Cooler*
		A = Percentage increase in jobs per job acre = (number of jobs per job acre – number of jobs per job acre for typical ITE development) / (number of jobs per job acre for typical ITE development)	number of jobs per job acre for typical ITE development	20 = average jobs per job acre	Year 2005 Land Use, Sacramento County Travel Demand Model, 2008
Improve Design of Development (Land Use/Location)	A3	A = Percentage increase in intersections versus a typical ITE suburban development = (intersections per square mile of project – intersections per square mile of typical ITE suburban development) / (intersections per square mile of typical ITE suburban development)	intersections per square mile of typical ITE suburban development	36 = ITE site average intersection density	Based on Fehr & Peers methodology for analysis in the report: *Proposed Trip Generation, Distribution, and Transit Mode Split Forecasts for the Bayview Waterfront Project Transportation Study*, Fehr & Peers, 2009

Table C-1 Transportation Calculations					
Strategy	**T#**	**Equation**	**Variable**	**Value**	**Source/Notes**
Increase Diversity (Mixed Use) (Land Use/Location)	A5	A = Percentage increase in land use index versus single use development = (project land use index – single land use index) / single land use index	single land use index	0.15 = - [1*(ln 1) + 0.01*(ln 0.01)+…+0.01*(ln 0.01)]/ ln(6)	--
Increase Destination Accessibility (Land Use/Location)	A6	A = Percentage decrease in distance to downtown or major job center = (distance to downtown/job center for typical ITE development – distance to downtown/job center for project) / (distance to downtown/job center for typical ITE development)	distance to downtown/job center for typical ITE development	12 miles (average work trip length from NHTS)	2000-2001 California Statewide Travel Survey, 2001 NHTS Summary of Travel Trends, p.15 (Table 5)
Increase Transit Accessibility (Land Use/Location)	A7	A = Increase in transit mode share = % transit mode share for project - % transit mode share for typical ITE development	% transit mode share for typical ITE development	1.3%	NHTS, 2001 http://www.dot.ca.gov/hq/tsip/tab/documents/travelsurveys/Final2001_StwTravelSurveyWkdayRpt.pdf, p.150 (Suburban – SCAG, SANDAG, Fresno County.)
		B = Adjustment from transit mode share to VMT = 1 / average vehicle occupancy * conversion from VT to VMT = 0.67	Divide by average vehicle occupancy to translate to VT	1 / average vehicle occupancy = 1 / 1.5 = 0.67	NHTS, http://www.dot.ca.gov/hq/tsip/tab/documents/travelsurveys/2000_Household_Survey.pdf, p.iii
			conversion from VT to VMT	1	Assume all trip lengths are equal (vehicle trips to VMT) [1]

[1] To convert to vehicle miles traveled, we assume that all vehicle trips will average out to typical trip length ("assume all trip lengths are equal"). Thus, we can assume that a percentage reduction in vehicle trips will equal the same percentage reduction in vehicle miles traveled.

Table C-1 Transportation Calculations					
Strategy	**T#**	**Equation**	**Variable**	**Value**	**Source/Notes**
Unbundle Parking Cost from Property Cost (Parking Pricing/Policy)	C3	A = Adjustment from Vehicle Ownership to VMT = average trips per 2 vehicles * 1 vehicle per average trips =(9.8 trips/ 2 vehicles) * (1 vehicle / 5.7 trips) = 0.85	Average trips per X vehicles	Households with 2 vehicles take 9.8 trips while households with 1 vehicle take 5.7 trips per day	i.e. A reduction of 1 vehicle leads to an 0.85 reduction in vehicle trips http://www.dot.ca.gov/hq /tsip/tab/documents/travel surveys/2000_Household _Survey.pdf, table 8.7
Expand Transit Network (Transit System Improvements)	D2	D = Adjustment for Transit Ridership Increase to VMT	--	0.67	see Increase Transit Accessibility
Enhance Transit Service Frequency/Speed (Transit System Improvements)	D3	E = Adjustment for Transit Ridership Increase to VMT	--	0.67	see Increase Transit Accessibility
Implement Bus Rapid Transit (Transit System Improvements)	D4	D = Adjustment for Transit Ridership Increase to VMT	--	0.67	see Increase Transit Accessibility
Implement Required Trip Reduction Programs (Trip Reduction Programs)	E2	C = Adjustment from vehicle mode share to commute VMT	--	1	Assume all trip lengths are equal (vehicle mode share to vehicle trips to VMT) [i]
Provide a Transit Fare Subsidy (Trip Reduction Programs)	E3	C = Adjustment from commute VT to commute VMT	--	1	Assume all trip lengths are equal (vehicle trips to VMT) [i]
Implement Commute Trip Reduction Marketing (Trip Reduction Programs)	E7	C = Adjustment from commute VT to commute VMT	--	1	Assume all trip lengths are equal (vehicle trips to VMT) [i]

Table C-1 Transportation Calculations					
Strategy	**T#**	**Equation**	**Variable**	**Value**	**Source/Notes**
Provide Employer-Sponsored Vanpool/Shuttle (Trip Reduction Programs)	E8	C = Adjustment from vanpool mode share to commute VMT	--	0.67	see Increase Transit Accessibility
Implement Bike-Sharing Programs (Trip Reduction Programs)	E10	% VMT Reduction = A * B * C = 2% * 7% * 20% = 0.03%	--	--	--
		A = 2% = Net new bicycle mode share = (existing mode share * % increase in bicycle mode share) – existing mode share	Existing mode share	Estimate at 1%	Pucher et al., 2010
			% increase in bicycle mode share	135 – 300%	Pucher et al., 2010, Table 4 (see fact sheet for calculations)
		B = % of new bicycle trips shifting from vehicles (from literature)	--	6-7%	Pucher et al., 2010 and Bike-Share in NYC, 2009, Table 4, p.45
		C = adjustments to convert from vehicle mode share to VMT * adjustment for shorter than average trip lengths = 1*20%	adjustments to convert from vehicle mode share to VMT	1	Assume all trip lengths are equal (vehicle mode share to vehicle trips to VMT) [i]
			adjustment for shorter than average trip lengths	1.94/9.9 = 20%	Adjustment to reflect ratio of bike trip length to average trip length (this strategy will only replace the shorter vehicle trips that can be reasonably replaced by a bicycle). [1.94 miles (average bike trip length from Moving Cooler Appendices B-28 referencing NHTS) / 9.9 miles (average household trip length from NHTS Transferability, 2001 NHTS, http://nhts-gis.ornl.gov/transferability/Default.aspx)]

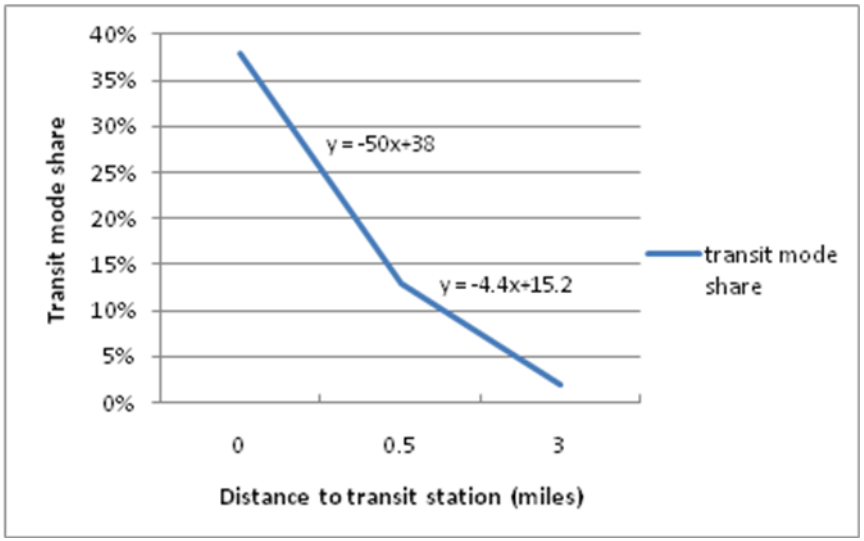
Table C-1 Transportation Calculations					
Strategy	**T#**	**Equation**	**Variable**	**Value**	**Source/Notes**
Provide End of Trip Facilities (Trip Reduction Programs)	E11	*utilizing the same equation in bike sharing program section, set A = 1.3% = (7.1% - 5.8%) % VMT Reduction = A * B * C = 1.3% * 7% * 20% = 0.02%	--	--	--
Establish Schoolpool (Trip Reduction Programs)	E13	B = Adjustments to convert from participation to daily VMT to annual school VMT = [(avg # of families per carpool - 1) / avg # of families per carpool] *% of school days	avg # of families per carpool	2.5	TDM Case Studies, DRCOG, p.13
			% of school days	75% = 39 school weeks/ 52 weeks	TDM Case Studies, DRCOG, p.13
Provide School Buses (Trip Reduction Programs)	E14	B = Adjustments to convert from participation to daily VMT to annual school VMT = % of school days	% of school days	75% = 39 school weeks/ 52 weeks	TDM Case Studies, DRCOG, p.13
Cordon Pricing (Road Pricing Management)	F2	A = % increase in pricing for passenger vehicles to cross cordon	--	100 – 500%	*Moving Cooler* uses peak hour price per mile instead of crossing price. The percentage change can still be calculated to provide a general estimate for a high range % change. Assuming a baseline of $0.10, calculated percentage increase to $0.49 - $0.65 (*Moving Cooler*) and adjusted with rounding
		C = % of VMT Impacted by Cordon Pricing and Mode Shift Adjustments = %VMT impacted by congestion pricing * Mode shift adjustment = 8.8% (peak period) and 21% (all day)	--	--	--

Table C-1 Transportation Calculations					
Strategy	**T#**	**Equation**	**Variable**	**Value**	**Source/Notes**
		Peak period = 25% * 35% = 8%	%VMT impacted by congestion pricing	25%	20% of trips are work trips (NHTS Transferability, 2001 NHTS, http://nhts-gis.ornl.gov/transferability/Default.aspx) and round up assuming other trips travel during peak periods
			Mode shift adjustment	35% = 20% + 30%/2	Of the estimated trips affected to the increase in price, assume 50% is either a time of day shift/route shift/no change, 30% convert to HOV trips (with average 2 ppl per HOV), and 20% are trip reductions/shift to transit, walk or bike
		Static all day price (London) = 60% * 35% = 21%	% VMT impacted by congestion pricing	60%	Conservatively assume 60% of trips fall in the peak periods and mid-day
			Mode shift adjustment	35%= 20% + 30%/2	Of the estimated reduced trips due to the increase in price, assume 50% is either a time of day shift/route shift/no change, 30% convert to HOV trips (with average 2 people per HOV), and 20% are trip reductions/shift to transit, walk or bike

Increase Transit Accessibility (Land Use/Location)

Distance to transit	Transit mode share calculation equation (where x = distance of project to transit)
0 – 0.5 miles	-50*x + 38

0.5 to 3 miles	-4.4*x + 15.2
> 3 miles	no impact
Source: Lund et al, 2004; Fehr & Peers 2010	



Data was taken from Table 5-25 of Lund et al, 2004. The table provided transit commute mode shares for those living with ½ mile of a rail station for 5 sites surveyed within California. Removing the extreme low and high percentages, this provided a range of transit commute mode share of 13% to 38%. A simple linear extrapolation was conducted to provide a relationship for distance to transit (between 0 and ½ mile) to transit mode share, via the equation: transit mode share = -50 * distance to transit + 38. The table also provided transit mode shares for those living from ½ to 3 miles from a station, a range from 2% to 13%. Using the same methodology, a relationship for distance to transit (between ½ mile and 3 miles) to transit mode share is provided via the equation: transit mode share = -4.4x + 15.2.

Appendix C.2

Trip Adjustment Factors

Appendix C.2 – Trip Adjustment Factors

The trip adjustment factors are not explicitly used for calculations of reduction in vehicle miles traveled (VMT) but serve as an added resource point for users of this document. For example, we report all commute trip reduction (CTR) program strategies as a percentage reduction in commute VMT. If the user would like to translate this to project level VMT (assuming the project is NOT an office park), and the user does not have statistics about the project area readily available, then the trip adjustment factors table can be utilized.

Example: Assume the user is providing a 15% reduction in commute VMT for a implementation of a ride share program. To calculate an estimated reduction in project level VMT, the user can multiple 15% by 20% (NHTS average % of work trips) and again multiply by 12.0 / 9.9 (average work trip length/average trip length) to adjust for both the portion of trips which are work related and that work trips tend to be longer than average trips.

TABLE C-2. TRIP ADJUSTMENT FACTORS

	NHTS[1]	Sacramento Region[2]	San Diego Region [3]	Rural (Kings County, CA) [4]
Average Work Trip Length (vehicle)	12.0	10.4	8.4	-
Average Trip Length (vehicle)	9.9	6.8	6.9	8.7
Average % of Work Trips	20%	20%	-	12%
Average % of School Trips	9.8%	-	-	-
Average Length of School Trips (Vehicle)	6.0	-	4.2	-
Average Vehicle Occupancy (All Trips)	1.5	1.4	1.5	-

Source:
1. 2000-2001 California Statewide Travel Survey, 2001 NHTS Summary of Travel Trends
2. SACMET model, Fehr & Peers, 2010.
3. SANDAG Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002)
4. NHTS Transferability, 2001 NHTS, http://nhts-gis.ornl.gov/transferability/Default.aspx

Appendix C.3
Induced Travel Memo

FEHR & PEERS
TRANSPORTATION CONSULTANTS

MEMORANDUM

Date: February 3, 2010

To: CAPCOA Team

From: Tien-Tien Chan, Jerry Walters, and Meghan Mitman

Subject: ***Induced Travel Material***

SF10-0475

Induced travel is a term used to describe how travel demand responds to roadway capacity expansion and roadway improvements. Consistent with the theory of supply and demand, the general topic of research concerning induced travel is that reducing the cost of travel (i.e., reduced travel time due to a new road improvement) will increase the amount of travel. In other words, road improvements alone can prompt traffic increases. To what degree and under what circumstances these increases occur is a matter of debate and the key subject of most induced travel research. We have attached the following documents which represent research on induced travel effects:

- *Comparative Evaluations on the Elasticity of Travel Demand* – study conducted for the Utah DOT which included national literature review of induced travel studies
- *Are Induced-Travel Studies Inducing Bad Investments?* – article by Cervero in Access Magazine: Transportation Research at the University of California
- *Road Expansion, Urban Growth, Growth, and Induced Travel: A Path Analysis* – APA Journal paper by Cervero, also discusses the impacts of induced growth and induced investments

The reader should be aware that conditions may vary considerably and the extent of induced travel depends on a variety of factors, including: the degree of prior congestion in the corridor, its duration over hours of the day, its extent over lane miles of the corridor, the degree to which un-served traffic diverts to local streets and the degree of congestion on those routes, the availability of alternate modes within the corridor, whether corridor is radial and oriented toward downtown with high parking cost and limited availability or circumferential, planned level of growth in the corridor, whether the corridor is interstate or interregional, whether it is a truck route, and other factors.

GHG reduction strategies such as transportation system management (e.g. signal coordination, adaptive signal control) may also have the potential for inducing travel. For such strategies, if the estimated improvement exceeds 10% benefit in travel time reduction, we recommend conducting project specific analysis on induced travel prior to establishing GHG reduction benefits.

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Appendix D

Building Mitigation Measure Quantification Methods

This Appendix summarizes the steps and assumptions used in two of the mitigation strategies – exceed Title 24 energy efficiency standards (BE-1) and installing energy efficient appliances (BE-4).

Background

GHGs are emitted as a result of activities in residential and commercial buildings when electricity and natural gas are used as energy sources. New California buildings must be designed to meet the building energy efficiency standards of Title 24, also known as the California Building Standards Code. Title 24 Part 6 regulates energy uses including space heating and cooling, hot water heating, ventilation, and hard-wired lighting. By committing to a percent improvement over Title 24, a development reduces its energy use and resulting GHG emissions.

The Title 24 standards have been updated twice (in 2005 and 2008)[1] since some of these data used to estimate energy use were compiled. California Energy Commission (CEC) has published reports estimating the percentage deductions in energy use resulting from these new standards. Based on CEC's discussion on average savings for Title 24 improvements, these CEC savings percentages by end use can be used to account for reductions in electricity and natural gas use due to the two most recent updates to Title 24. Since energy use for each different system type (ie, heating, cooling, water heating, and ventilation) as well as appliances is defined in this survey, the use of survey data with updates for Title 24 will easily allow for application of mitigation measures aimed at reducing the energy use of these devices in a prescriptive manner.

Another mitigation measure to reduce a building's energy consumption as well as the associated GHG emissions from natural gas combustion and electricity production is to use energy-efficient appliances. For residential dwellings, typical builder-supplied appliances include refrigerators and dishwashers. Clothes washers and ceiling fans would be applicable if the builder supplied them. For commercial land uses, only energy-efficient refrigerators have been evaluated for grocery stores.

1 California Energy Commission. 2003. Impact Analysis: 2005 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Available at: http://www.energy.ca.gov/title24/2005standards/archive/rulemaking/documents/2003-07-11_400-03-014.PDF
California Energy Commission. 2006. California Commercial End-Use Survey. Prepared by Itron Inc. Available at: http://www.energy.ca.gov/ceus/

Methodology

Datasets

The Residential Appliance Saturation Survey (RASS)[2] and California Commercial Energy Use Survey (CEUS)[3] datasets were used to estimate the energy intensities of residential and non-residential buildings, respectively, since the data is available for several land use categories in different climate zones in California. The RASS dataset further differentiates the energy use intensities between single-family, multi-family and townhome residences.

The Energy Star and Other Climate Protection Partnerships 2008 Annual Report[4] and subsequent Annual Reports were reviewed for typical reductions for energy-efficient appliances. ENERGY STAR residential refrigerators, clothes washers, dishwashers, and ceiling fans use 15%, 25%, 40%, and 50% less electricity than standard appliances, respectively. ENERGY STAR commercial refrigerators use 35% less electricity than standard appliances.

Calculations

Exceeding Title 24 Energy Efficiency Standards (BE-1)

RASS and CEUS datasets were used to obtain the energy intensities of different end use categories for different building types in different climate zones. Energy intensities from CEUS are given per square foot per year and used as presented. RASS presents Unit Energy Consumption (UEC) per dwelling unit per year and saturation values; the energy intensities used in this analysis are products of the UEC and saturation values.

Data for some climate zones is not presented in the CEUS and RASS studies. However, data from adjacent climate zones is assumed to be representative and substituted as follows:

For non-residential building types:
Climate Zone 11 used Climate Zone 9 data.
Climate Zone 12 used Climate Zone 9 data.
Climate Zone 14 used Climate Zone 1 data.
Climate Zone 15 used Climate Zone 10 data.

For residential building types:
Climate Zone 6 used Climate Zone 2 data.
Climate Zone 14 used Climate Zone 1 data.
Climate Zone 15 used Climate Zone 10 data.

RASS and CEUS data are based on 2002 consumption data. Because older buildings tend to be less energy efficient, and the majority of the buildings in the survey were likely constructed

2 California Statewide Residential Appliance Saturation Study Reporting Center. Available at: http://websafe.kemainc.com/RASSWEB/DesktopDefault.aspx
3 California Energy Commission. 2006. California Commercial End-Use Survey. Prepared by Itron Inc. Available at: http://www.energy.ca.gov/ceus/
4 United States Environmental Protection Agency 2009. ENERGY STAR and Other Climate Protection Partnerships: 2008 Annual Report. Available at: http://www.epa.gov/cpd/pdf/2008AnnualReportFinal.pdf

before 2001, the RASS and CEUS data likely overestimate energy use for a 2001 Title 24-compliant building.

To account for updates since the 2001 Title 24 standards, percentage reductions for each end use category taken directly from the CEC's "Impact Analysis for 2005 Energy Efficiency Standards" and "Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings" reports were applied to the CEUS and RASS datasets for improvements from 2001 to 2005, and 2005 to 2008, respectively (see Tables D-1 and D-2). For the CEUS data, exterior lighting was assumed to be covered by Title 24 lighting and therefore has the full percentage reductions taken. Interior lighting was assumed to be 50% Title 24 and 50% non-Title 24 uses. Therefore only half of the reduction for lighting was applied. The resulting 2008 numbers were then used as baseline energy intensities for this mitigation strategy. The total baseline energy intensities are calculated as follows:

$$\text{Baseline} = \sum\left[T24_{2001} \times \left(1 - R_{2001\text{-}2005}\right) \times \left(1 - R_{2005\text{-}2008}\right)\right] + \sum NT24$$

Where:

Baseline = Total baseline energy intensities of building category
$T24_{2001}$ = Energy intensities of Title 24 regulated end use from RASS or CEUS
$R_{2001\text{-}2005}$ = Reduction from 2001 to 2005
$R_{2005\text{-}2008}$ = Reduction from 2005 to 2008
NT24 = Non-Title 24 regulated end use energy intensities

Table D-1
Reduction in Title 24 Regulated End Use for Non-Residential Buildings

Energy Source	End Use	Reduction from 2001 to 2005	Reduction from 2005 to 2008
Electricity	Heating	4.9%	37.2%
	Ventilation	5.0%	1.5%
	Refrigeration	0.0%	0.0%
	Process	0.0%	0.0%
	Office Equipment	0.0%	0.0%
	Motors	0.0%	0.0%
	Miscellaneous	0.0%	0.0%
	Interior Lighting	4.9%	5.9%
	Water Heating	0.0%	0.0%
	Cooking	0.0%	0.0%
	Air Compressors	0.0%	0.0%
	Cooling	6.7%	8.3%
	Exterior Lighting	9.8%	11.7%
Natural Gas	Cooking	0.0%	0.0%
	Cooling	10.4%	9.3%
	Heating	3.1%	15.9%
	Water Heating	0.0%	0.0%
	Process	0.0%	0.0%
	Miscellaneous	0.0%	0.0%

Table D-2
Reduction in Title 24 Regulated End Use for Residential Buildings

Energy Source	End Use (As presented in RASS Dataset)	Reduction from 2001 to 2005			Reduction from 2005 to 2008		
		Multi-family	Single family	Town home	Multi-family	Single family	Town home
Electricity	Conv. Electric heat	24.3%	19.8%	24.3%	19.7%	22.7%	19.7%
	HP Eheat	24.3%	19.8%	24.3%	19.7%	22.7%	19.7%
	Aux Eheat	24.3%	19.8%	24.3%	19.7%	22.7%	19.7%
	Furnace Fan	24.3%	19.8%	24.3%	19.7%	22.7%	19.7%
	Central A/C	24.3%	19.8%	24.3%	19.7%	22.7%	19.7%
	Room A/C	24.3%	19.8%	24.3%	19.7%	22.7%	19.7%
	Evap Cooling	24.3%	19.8%	24.3%	19.7%	22.7%	19.7%
	Water Heat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Solar Water Heater	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Dryer	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Clothes Washer	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Dish Washer	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	First Refrigerator	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Second Refrigerator	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Freezer	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Pool Pump	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Spa	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Outdoor Lighting	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Range/Oven	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	TV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Spa Electric Heat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Microwave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Home Office	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	PC	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Water Bed	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Well Pump	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Miscellaneous	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Natural Gas	Primary Heat	15.7%	6.7%	15.7%	7.0%	10.0%	7.0%
	Auxiliary Heat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Conv. Gas Water Heat	15.7%	6.7%	15.7%	7.0%	10.0%	7.0%
	Solar Water Heat w/Gas Backup	15.7%	6.7%	15.7%	7.0%	10.0%	7.0%
	Dryer	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Range/Oven	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Pool Heat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Spa Heat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Miscellaneous	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

The same approach was used to quantify GHGs emission reduction from exceeding Title 24 energy efficiency standards by 1%. The 1% reduction was applied to only energy use intensities for Title 24 regulated end use categories. For the CEUS data, the reduction was not applied to any portion of interior lighting. The reduced energy use intensities were added to the unadjusted energy use intensities for non-Title 24 regulated end use categories to obtain the total energy use intensities for exceeding Title 24 energy efficiency standards by 1% for each building category. These were then compared to the baseline line energy intensities for the overall percentage reduction as follows:

$$\text{Percentage Reduction} = 1 - \frac{\sum\left[T24_{2001} \times (1 - R_{2001\text{-}2005}) \times (1 - R_{2005\text{-}2008}) \times 99\%\right] + \sum NT24}{\text{Baseline}}$$

Where:

Baseline	=	Total baseline energy intensities of building category
$T24_{2001}$	=	Energy intensities of Title 24 regulated end use from RASS or CEUS
$R_{2001\text{-}2005}$	=	Reduction from 2001 to 2005
$R_{2005\text{-}2008}$	=	Reduction from 2005 to 2008
NT24	=	Non-Title 24 regulated end use energy intensities

Installing Energy Efficient Appliances

The same baseline line energy use intensities from the Exceeding Title 24 Energy Efficiency Standards mitigation were used for this mitigation strategy. For all appliances except ceiling fan, the reductions as presented in the ENERGY STAR 2008 annual report were applied to the energy use intensities of the corresponding energy end use categories. All other end use categories were kept unadjusted. The percentage reductions were calculated as follows:

$$\text{Percentage Reduction} = 1 - \frac{\text{Appliance Intensity} \times (1 - \text{ESR}) + \sum \text{Other End Use}}{\text{Baseline}}$$

Where:

Baseline	=	Total baseline energy intensities of building category
Appliance Intensity	=	2008 baseline energy intensity of appliance in consideration
ESR	=	Reduction from ENERGY STAR appliance
Other End Use	=	2008 baseline energy intensity of all other end uses

RASS does not specify a ceiling fan end-use; rather, electricity use from ceiling fans is accounted for in the “Miscellaneous” category which includes interior lighting, attic fans, and other miscellaneous plug-in loads. Since the electricity usage of ceiling fans alone is not

specified, a value from the National Renewable Energy Laboratory (NREL) Building American Research Benchmark Definition (BARBD)[5] was used. BARBD reported that the average energy use per ceiling fan is 84.1 kWh per year. In this mitigation measure, it was assumed that each multi-family, single-family, and townhome residence has one ceiling fan. Therefore, the 50% reduction from ENERGY STAR for ceiling fan was applied to 84.1 kWh of the electricity attributed to the Miscellaneous RASS category. In other words, 42.05 kWh was subtracted from the electricity end use intensities of the "Miscellaneous RASS" category in evaluating the GHGs emission reduction from installing energy efficient ceiling fans.

The total energy use intensities with reduction from each appliance in consideration were then compared to the baseline line energy intensities for the overall percentage reduction as follows:

$$\text{Percentage Reduction} = 1 - \frac{(\text{Misc} - 42.05) + \sum \text{Other End Use}}{\text{Baseline}}$$

Where:

Baseline = Total baseline energy intensities of building category
Misc = 2008 energy intensity in Miscellaneous category for electricity
Other End Use = 2008 baseline energy intensity of all other end uses

5 NREL. 2010. Building America Research Benchmark Definition. Available online at: http://www.nrel.gov/docs/fy10osti/47246.pdf

Attachment E: SANDAG Mitigation Measures

Mobility Management VMT Reduction Calculator Tool – Design Document

June 2019

Table of Contents

Introduction

This report documents the design of the Mobility Management VMT Reduction Calculator Tool. The Microsoft Excel–based Tool produces estimates of the percent reduction in vehicle miles traveled (VMT) resulting from the application of mobility management strategies. The Tool is intended to act as a resource for evaluating and quantifying the impacts of mobility management strategies as part of the development review and transportation analysis process. The Tool supports the goals of Senate Bill 743 (Steinberg, 2013) (SB 743) by providing jurisdictions and developers with a resource to quantify VMT reductions resulting from implementation of a variety of mitigation strategies at various scales.

This report describes the user inputs, constants assumptions, formulas, and outputs for each strategy included in the Tool. Most of this information is available in the Tool itself, although this document provides some additional explanation of data sources and calculation methods.

The report is organized similarly to the Tool itself. The first four sections describe the Main page, FAQs page, Project-Level Results page, and Community-Level Results page. The remaining sections describe the 22 strategies included in the Tool, grouped into the following five categories:

- **Employer Commute Programs**
- **Land Use Strategies**
- **Parking Management**
- **Neighborhood Enhancements**
- **Transit Strategies**

Main Page

MOBILITY MANAGEMENT VMT REDUCTION CALCULATOR TOOL SANDAG

Users of the Tool should begin on the Main page. The Main page is organized around the following five boxes:

Overview

Describes the Tool and its purpose.

Instructions

Describes how to use the Tool in a series of six steps.

Legend

Describes the formatting for cells used in the VMT-reduction calculations for each strategy.

Project Information

The user can enter the following optional information:

- Project Name (optional):
- Project Address (optional):
- Project Type (optional):

The user should enter the following information:

- Scale of Analysis:
  - Project/site *or*
  - City/community
- Analysis Location:
  - Using a drop-down menu, the user should select the city in which the analysis is located
- Community Plan Area (CPA), if applicable:
  - If the user selects San Diego or Unincorporated San Diego County, using the drop-down menu the user should select the CPA in which the analysis is located

Mobility Management Strategies

The user will see a list of the 22 strategies included in the Tool, shown below. Each strategy name is a hyperlinked, and clicking on a name will take the user to that strategy. The color scheme in these tables is intended to match that used in the Guidebook. These tables also contain links to the Project-Level Results and Community-Level Results pages.

Project/Site-Level Strategies

Project-Level Results

Employer Commute Programs Strategies implemented by employers that encourage workers to commute by modes other than auto	
1A	Voluntary Employer Commute Program
1B	Mandatory Employer Commute Program
1C	Employer Carpool Program
1D	Employer Transit Pass Subsidy
1E	Employer Vanpool Program
1F	Employer Telework Program

Land Use Strategies Strategies that modify the location or characteristics of development projects to encourage non-auto travel modes	
2A	Transit Oriented Development
2B	Mixed Use Development

Parking Management Strategies that discourage auto travel by modifying the price or supply of vehicle parking	
3A	Parking Pricing
3B	Parking Cash Out

Community/City-Level Strategies

Community-Level Results

Neighborhood Enhancements Strategies that improve or encourage neighborhood-level bicycle, pedestrian, and other multimodal travel options	
4A	Street Connectivity Improvement
4B	Pedestrian Facility Improvement
4C	Bikeway Network Expansion
4D	Bike Facility Improvement
4E	Bikeshare
4F	Carshare
4G	Community-Based Travel Planning

Transit Strategies Strategies that improve transit service and cause a mode shift from auto to transit	
5A	Transit Service Expansion
5B	Transit Frequency Improvements
5C	Transit-Supportive Treatments
5D	Transit Fare Reduction
5E	Microtransit NEV Shuttle

FAQs Page

This page contains frequently asked questions and associated answers.

1. What does this tool do?

The SANDAG VMT Reduction Calculator Tool can be used to estimate the percent reduction in VMT from various mobility management strategies. The tool operates at two geographic scales: project/site-level and community/city-level. The tool user must provide simple input information about a strategy in order to produce a VMT-reduction estimate. The tool is intended to act as a resource for evaluating and quantifying the impacts of mobility management strategies as part of the development review and transportation analysis process. The tool supports the goals of SB 743 by providing jurisdictions and developers with a resource to quantify VMT reductions resulting from implementation of a variety of mitigation strategies.

2. How do I enter strategy information?

Tool users enter information about a strategy of interest in the orange-colored cells found on each strategy page. Users cannot enter information in any other cells.

3. How do I see if the strategy has a VMT impact?

Each strategy page has a row labeled "Change in VMT." A negative value in this row indicates a reduction in VMT; a positive value indicates an increase in VMT (denoted with a red outline of the cell).

4. What VMT reduction strategies are included in the tool?

The 22 strategies are listed on the Main page of this tool. Users can also review the Mobility Management Strategy Guidebook that serves as a companion resource to this tool for more information.

5. How do I select VMT reduction strategies?

From the Main page or the Results page, the user can click on a strategy hyperlink of interest. On the Strategy page, entering input values in all of the orange-colored cells will activate that strategy. If the user does not want the VMT-reduction results of a given strategy to be included in the summary results, either delete the Strategy page inputs in the orange-colored cells or click "Exclude from results" on the Strategy page.

6. Where can I learn more about how the reductions are calculated?

Each strategy page lists the references that were used to develop the VMT reduction estimates. Users can also review the Mobility Management Strategy Guidebook that serves as a companion resource to this tool for more information.

7. How is the total percent change in VMT adjusted when I select multiple strategies?

If only one strategy is selected, the user will see on the Results page (a) the percent change in VMT associated with that strategy and (b) the percent change in VMT (total) from all strategies. In this case, the values are the same. If more than one strategy is selected, the tool uses "multiplicative dampening" to adjust the sum of VMT reduction. Multiplicative dampening accounts for the diminished percent change in VMT that a strategy will have if other strategies are also selected. The total is calculated with the following formula:

Total = {[100% – (Strategy A % change in VMT)] × [100% – (Strategy B % change in VMT)] × … × [100% – (Strategy Z % change in VMT)]} – 100%

8. How are the mode share, trip length, and VMT per capita data derived?

The mode share, trip length, and VMT per capita data found in this tool reflect travel by residents of the San Diego region only. The data are parsed by jurisdiction and, for the City of San Diego and the Unincorporated County of San Diego, by CPA. The data reflect the home origin of residents during an average 24-hour weekday. The analysis includes all trip purposes (all activities assigned to the home location). The data do not reflect travel for which the home origin is located outside of the San Diego region or by visitors to the San Diego region. It does not include travel made by heavy-duty trucks or travel for commercial purposes.

9. Can I calculate the total percent change in VMT from multiple strategies if the scales of analysis from my chosen strategies are not the same?

The tool safeguards against accidentally calculating the total percent change in VMT from strategies of different scales of analysis by graying out cells through conditional formatting and creating separate Print pages for the project/site-level results and the community/city-level results. While it may be possible that a user's project involves strategies that affect VMT at both scales, it is likely that combining the percentage VMT reduction from strategies of different scales would not be valid. If a user's project involves strategies that affect VMT at both scales, the user should use the tool as follows:

a. Input project information on Main page
b. Calculate VMT reductions from all applicable project/site-level strategies
c. Print the project/site-level VMT results
d. Open a clean version of the tool with no user inputs entered
e. Repeat steps a through c for the community/city-level strategies

10. Why are there two totals displayed on the Results pages?

As discussed above in Question 7, the total percent change in VMT can be calculated when multiple strategies are selected. However, if the selected strategies reduce VMT from different types of trips (i.e., employee commute trips and all project-generated trips), it may not be valid to combine the total percent change in VMT. For example, parking pricing at a commercial facility affects VMT from all project-generated trips, while an employee vanpool program only affects VMT from the facility's employee commute trips. Of the ten project-level strategies, seven reduce VMT from employee commute trips and three reduce VMT from all project-generated trips (including non-commute trips). The seven are summed to an Employee Commute Trips Total using multiplicative dampening (see Question 7), and the three are separately summed to a Project-Generated Trips Total in the same way. This similarly occurs on the Community-Level Results page, where, of the 12 strategies, 11 reduce VMT from all city/CPA trips and one (4D Bike Facility Improvement) reduces VMT from trips on the roadway affected by a bikeway addition.

11. Can the tool be used to analyze strategies in rural areas?

There is little empirical research to support the estimation of VMT reduction in rural areas. Strategies that are likely to be most effective in rural areas include employer vanpool and telecommute programs. Many of the

strategies included in this tool will have little to no effectiveness in rural areas. Because of the lack of relevant research, analysis of strategies applied in a rural context should be done on a case-by-case basis and should generally not rely on the relationships contained in this tool.

12. How is the maximum VMT reduction calculated for each strategy?

On each strategy page below the "Type of VMT affected," the "Max VMT reduction" is listed. Sometimes a strategy's maximum VMT reduction is dependent only on user inputs, other times it is capped at a certain percentage, and other times it is based on regional parameters (e.g., mode share) specific to each city/CPA. Furthermore, the max VMT reduction can also be changed by optional user inputs that override default data. The max VMT reduction listed on each strategy page is meant to provide the user with a general estimate of the reduction potential for each strategy. The values listed were derived from the tool using the City of San Diego Downtown/City Centre CPA as the analysis location with all default data. The user may achieve a max VMT reduction that is different than the Max VMT reduction listed based on the differences in regional parameters of the selected city/CPA and any additional user overrides.

13. How is each place type defined?

Low-density suburb: Dispersed, low-density, single-use, automobile-dependent land use patterns, usually outside of the central city. Other characteristics may include: 20+ miles from regional central business district; more housing than jobs; buildings are one to two stories; curvilinear (cul-de-sac) street patterns; parking between street and office or retail and large-lot residential parking is common; ample parking and largely surface lot–based; no parking prices; limited bus service with peak headways 30+ minutes.

Suburban center: Cluster of multi-use development within dispersed, low-density, automobile-dependent land use patterns. Serves the population of a suburb with office, retail, and housing that is denser than the surrounding suburb. Other characteristics may include: 20+ miles from regional central business district; balanced jobs/housing ratio; buildings are two stories; grid street pattern; 0–20-foot setbacks; somewhat constrained parking supply on street and ample off-street; low to no parking prices; bus service at 20–30-minute headways; and/or a commuter rail station.

Urban: Located within a central city with multi-family housing and nearby office and retail. Other characteristics may include: within or less than five miles from the central business district; jobs/housing ratio > 1.5; buildings are at least six stories; grid street pattern; minimal setbacks; constrained parking supply; high parking prices; and high-quality rail service and/or comprehensive bus service.

14. There is text in a locked cell that is cut off, and I cannot click into the cell to read the remainder of the text. How can I read the cell text?

The margins of all cells have been adjusted so that at Excel's 100% zoom level, all the text can be seen. Adjust your zoom level to 100% if you see that a cell's text is cut off. This also applies to any text in comment bubbles.

15. What does "percent of employees eligible" mean, as used in strategies 1A through 1D?

This refers to the percentage of employees that would be able to participate in the strategy's program if they desired to. This will usually be 100%. Employees who might not be able to participate could include those who work nighttime hours when transit and rideshare services are not available or employees who are required to drive to work as part of their job duties. This input does not refer to the percentage of employees who actually participate in the program.

Project-Level Results Page

This page lists all the project-level strategies and displays the percentage reduction in VMT calculated for each strategy that the user analyzes. In the default state of the Tool, all strategies are "inactive," so no VMT reduction results are initially shown on this page. As the user "activates" an individual strategy by providing inputs, the tool calculates the percentage reduction in VMT for the strategy, displaying the results on the individual strategy page and this results summary page.

The bottom of this page displays the total percentage reduction in VMT for multiple project-level strategies selected. The total VMT reduction formula applies multiplicative dampening so as not to double-count VMT impacts. For example, if one strategy reduces VMT by 10%, then only 90% of VMT remains to be affected by subsequent strategies. If a second strategy is applied that also reduces VMT by 10%, the combined resulting VMT would be 81% (10% reduction of 90% of VMT). Thus, the VMT reduction impact of both strategies is 19% rather than 20% if the impacts were purely additive. The following is the formula used to calculate the total VMT reduction if multiple strategies are selected:

> Total = {[100% – (Strategy A % change in VMT)] × [100% – (Strategy B % change in VMT)] × … × [100% – (Strategy Z % change in VMT)]} – 100%

The page shows two rows for total VMT reduction – one for strategies that affect employee commute trips and one for project strategies that affect all project-generated trips. This is because it may not be valid to combine VMT reductions for the two types. For example, parking pricing at a commercial facility affects VMT from all project-generated trips, while an employee vanpool program only affects VMT from the facility's employee commute trips. Of the ten project-level strategies, seven reduce VMT from employee commute trips, and three reduce VMT from all project-generated trips (including non-commute trips). The seven are summed to an Employee Commute Trips Total using multiplicative dampening, and the three are separately summed to a Project-Generated Trips Total in the same way.

Community-Level Results Page

This page lists all the community-level strategies and displays the percentage reduction in VMT calculated for each strategy that the user analyzes. The functionality of this page is similar to the Project-Level Results Page.

Like the Project-Level Results page, this page shows two total rows. Of the 12 strategies, 11 reduce VMT from all city/CPA trips and one (4D Bike Facility Improvement) reduces VMT from trips on the roadway affected by a bikeway addition. These should not be combined.

Employer Commute Program Strategies

Strategies implemented by employers that encourage workers to commute by modes other than autos.

1A. Voluntary Employer Commute Program

Description: Employer offers a voluntary employer commute trip-reduction program. The program may include a carpool or vanpool program, subsidized or discounted transit passes, bike amenities, commute trip-reduction marketing, and preferential parking permit program. This strategy encompasses strategies 1C (Employer Carpool Program), 1D (Employer Transit Pass Subsidy), and 1E (Employer Vanpool Program) and cannot be analyzed in combination with these strategies. Unlike strategy 1B (Mandatory Employer Commute Program), this strategy does not require monitoring, reporting, or performance standards. If this strategy is selected, strategy 1B cannot be analyzed as part of the total VMT reduction.

Formula: % change in VMT = % of employees eligible × % change in commute VMT

User Inputs:

- Is the program contractually required of the developer or property owner and accompanied by a regular performance monitoring and reporting program? [Yes/No]
  - If Yes, must use Strategy 1B
  - If No, use Strategy 1A
- Place type of project/site
  - Low-density suburb
  - Suburban center
  - Urban
- Percent of employees eligible
  - Refers to percentage of employees that would be able to participate in the strategy's program if they desired to. This will usually be 100%. Employees who might not be able to participate could include those who work nighttime hours when transit and rideshare services are not available or employees who are required to drive to work as part of their job duties. This input does not refer to the percentage of employees who actually participate in the program.

Constants and Assumptions:

- Percent change in commute VMT:
  - Low-density suburb: –6.2%
  - Suburban center: –5.4%
  - Urban: –5.2%
- Strategy cannot be used in combination with 1B.
- Strategy encompasses strategies 1C, 1D, and 1E and cannot be analyzed in combination with these strategies.

SANDAG Data:

None.

Sources:

- California Air Pollution Control Officers Association. 2010. "Quantifying Greenhouse Gas Mitigation Measures." capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf
- Cambridge Systematics. 2009. "Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions." Technical Appendices. Prepared for the Urban Land Institute. reconnectingamerica.org/assets/Uploads/2009movingcoolerexecsumandappend.pdf
- Boarnet, Marlon G., Hsin-Ping Hsu, and Susan Handy. 2014. "Impacts of Employer-Based Trip Reduction Programs and Vanpools on Passenger Vehicle Use and Greenhouse Gas Emissions: Policy Brief." arb.ca.gov/cc/sb375/policies/ebtr/ebtr_brief.pdf

1B. Mandatory Employer Commute Program

Description: Employer offers a mandatory employer commute trip-reduction program. The program may include a carpool or vanpool program, subsidized or discounted transit passes, bike amenities, encouragement for telecommuting and alternative work schedules, commute trip-reduction marketing, and preferential parking permit program. This strategy encompasses strategies 1C, 1D, and 1E and cannot be analyzed in combination with these strategies. Unlike strategy 1A (Voluntary Employer Commute Program), this strategy would be contractually required of the developer or property owner and is accompanied by a regular performance-monitoring and reporting program. If this strategy is selected, strategy 1A cannot be analyzed as part of the total VMT reduction.

Formula: % change in VMT = % of employees eligible × % change in commute VMT

User Inputs:

- Is the program contractually required of the developer or property owner and accompanied by a regular performance-monitoring and reporting program? [Yes/No]
  - If Yes, use Strategy 1B
  - If No, must use Strategy 1A
- Percent of employees eligible
  - Refers to percentage of employees that would be able to participate in the strategy's program if they desired to. This will usually be 100%. Employees who might not be able to participate could include those who work nighttime hours when transit and rideshare services are not available or employees who are required to drive to work as part of their job duties. This input does not refer to the percentage of employees who actually participate in the program.

Constants and Assumptions:

- Percent change in commute VMT is –26%
- Strategy cannot be used in combination with 1A.
- Strategy encompasses strategies 1C, 1D, and 1E and cannot be analyzed in combination with these strategies.

SANDAG Data:

None.

Sources:

- California Air Pollution Control Officers Association. 2010. "Quantifying Greenhouse Gas Mitigation Measures." capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf
- City of South San Francisco. 2015. "2015 Genentech Annual Report." ci-ssf-ca.granicus.com/MetaViewer.php?view_id=2&clip_id=859&meta_id=62028
- Cambridge Systematics. 2009. "Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions." Technical Appendices. Prepared for the Urban Land Institute. reconnectingamerica.org/assets/Uploads/2009movingcoolerexecsumandappend.pdf

1C. Employer Carpool Program

Description: Employers can encourage carpooling by providing ridematching assistance to employees, providing priority parking for carshare vehicles, and providing incentives for carpooling.

Formula: % change in VMT = % of employees eligible × % change in commute VMT

User Inputs:

- Place type of project/site
  - Low-density suburb
  - Suburban center
  - Urban
- Percent of employees eligible
  - Refers to percentage of employees that would be able to participate in the strategy's program if they desired to. This will usually be 100%. Employees who might not be able to participate could include those who work nighttime hours when transit and rideshare services are not available or employees who are required to drive to work as part of their job duties. This input does not refer to the percentage of employees who actually participate in the program.

Constants and Assumptions:

- Percent change in commute VMT:
  - Low-density suburb: –3%
  - Suburban center: –5%
  - Urban: –8%
- Strategy encompassed by strategies 1A and 1B and cannot be analyzed in combination with these strategies.

SANDAG Data:

None.

Sources:

- Ewing, R. 1993. "TDM, Growth Management and the Other Four out of Five Trips." Transportation Quarterly, Vol. 48, No. 3.

- Victoria Transport Policy Institute. "Ridesharing: Carpooling and Vanpooling." TDM Encyclopedia. vtpi.org/tdm/tdm34.htm
- California Air Pollution Control Officers Association. 2010. "Quantifying Greenhouse Gas Mitigation Measures." capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf
- New York State Department of Transportation. 2019. Data from 511NYRideshare program participants.

1D. Employer Transit Pass Subsidy

Description: Employers can encourage employees to take transit by providing subsidized or discounted daily or monthly public transit passes to employees.

Formula: % change in VMT = % of employees eligible × % change in commute VMT

Where % change in commute VMT differs by place type (low-density suburb, suburban center, or urban) and level of daily transit subsidy ($1 to $4)

User Inputs:

- Place type of project/site
  - Urban
  - Suburban center
  - Low-density suburb
- Transit subsidy per day
  - $1
  - $2
  - $3
  - $4
- Percent of employees eligible
  - Refers to percentage of employees that would be able to participate in the strategy's program if they desired to. This will usually be 100%. Employees who might not be able to participate could include those who work nighttime hours when transit and rideshare services are not available or employees who are required to drive to work as part of their job duties. This input does not refer to the percentage of employees who actually participate in the program.

Constants and Assumptions:

- Percent change in commute VMT

Place Type	Subsidy Level per Day			
	$1.00	$2.00	$3.00	$4.00
Low-Density Suburb	–0.1%	–0.2%	–0.4%	–0.6%
Suburban Center	–1.1%	–2.4%	–4.1%	–5.8%
Urban	–2.2%	–4.7%	–7.8%	–10.9%

  - Estimated based on Nelson Nygaard (2010) and TCRP (2010). Subsidy levels in Nelson Nygaard were updated to reflect inflation. Also considers maximum VMT reductions suggested in Boarnet et al. (2014).

- Strategy encompassed by strategies 1A and 1B and cannot be analyzed in combination with these strategies.

SANDAG Data:

None.

Sources:

- Nelson Nygaard. 2010. "Santa Monica LUCE Trip Reduction Impacts Analysis." City of Santa Monica Land Use and Circulation Element, Final EIR. smgov.net/Departments/PCD/Plans/2010-Land-Use-and-Circulation-Element/
- Transportation Research Board. 2010. "TCRP Report 95 Chapter 19: Employer and Institutional TDM Strategies." trb.org/Publications/TCRPReport95.aspx
- Boarnet, Marlon G., Hsin-Ping Hsu, and Susan Handy. 2014. "Impacts of Employer-Based Trip Reduction Programs and Vanpools on Passenger Vehicle Use and Greenhouse Gas Emissions: Policy Brief." arb.ca.gov/cc/sb375/policies/ebtr/ebtr_brief.pdf

1E. Employer Vanpool Program

Description: Vanpooling is a flexible form of public transportation that provides groups of 5–15 people with a cost-effective and convenient rideshare option for commuting. An employer can encourage ridesharing by subsidizing vanpooling for employees who have a similar origin and destination and by providing priority parking for employees who vanpool.

The SANDAG Vanpool Program provides a subsidy of up to $400 per month to offset the vehicle lease cost.

Formula: $\%\ \text{change in VMT} = (M_A \times L_A + M_V \times L_V/O_V) / (M_A \times L_A + M_V \times L_V) - 1$

Where:

M_A = auto (non-vanpool) mode share

M_V = vanpool/long trip mode share

L_A = length of average auto commute trip

L_V = length of vanpool/long commute trip

O_V = average vanpool occupancy

User Inputs:

- Does the employer sponsor a vanpool program? [Yes/No]
  - If No, strategy does not apply to project and no change in VMT.
- Percentage of employees who participate in vanpool (optional override of regional default)
- One-way length of average auto commute (optional override of regional default)
- One-way length of long (vanpool) commute (optional override of regional default)

Constants and Assumptions:

- If the user override of vanpool participation rate exceeds maximum of 15%, the default value will be used. This maximum is based on TCRP Report 95, Chapter 5 and ICF's experience implementing the 511NYRideshare program, the nation's largest regional TDM program.
- Strategy encompassed by strategies 1A and 1B and cannot be analyzed in combination with these strategies.

SANDAG Data:

- Percentage of employees who participate in vanpool is 2.7%.
- Average one-way commute trip length is 12.71 miles.
- Average one-way vanpool trip length is 42 miles.
- Average vanpool occupancy (including driver) is 6.25 persons.

Sources:

- SANDAG. 2018. Commute Behavior Survey.
- SANDAG. Activity Based Model. 2016. (v14.0.1, scenario ID 232)
- SANDAG. 2018. SANDAG Vanpool Program
- Transportation Research Board. 2005. "TCRP Report 95 Chapter 5 Buspools and Vanpools." trb.org/Publications/TCRPReport95.aspx
- New York State Department of Transportation. 2019. Data from 511NYRideshare program participants.

1F. Employer Telecommute Program

Description: A telework program enables employees to work from home or a remote location one or more days per week. Depending on the nature of the work, schedules can range from full-time, specific days of the week, or as-needed. The VMT impacts of telework are similar to a flexible work schedule program, which enables employees to work long hours in exchange for one day off every week or two.

Formula: % change in VMT = % of employees who participate × % change in commute VMT for 1% of employees telecommuting X days/week

Where X = 1, 2, or 3

User Inputs:

- Percentage of employees who participate
- Days per week the average employee telecommutes

Constants and Assumptions:

- Percent change in commute VMT for 1% of employees telecommuting at X days/week:
  - 1: –0.15%
  - 2: –0.29%
  - 3: –0.44%

SANDAG Data:

None.

Sources:

- Cambridge Systematics. 2009. "Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions." Technical Appendices. Prepared for the Urban Land Institute. reconnectingamerica.org/assets/Uploads/2009movingcoolerexecsumandappend.pdf
- California Air Pollution Control Officers Association. 2010. "Quantifying Greenhouse Gas Mitigation Measures." capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

Land Use Strategies

Strategies that modify the location or characteristics of development projects to encourage non-auto travel modes.

2A. Transit-Oriented Development

Description: Transit-Oriented Development (TOD) refers to projects built in compact, walkable areas that have easy access to public transit, ideally in a location with a mix of uses, including housing, retail, offices, and community facilities. TODs generally are described as places within a ten-minute walk of a high-frequency rail transit station (e.g., SPRINTER, COASTER, Trolley). They should, at a minimum, incorporate adequate bike and pedestrian access to transit, thereby encouraging transit use and reducing vehicle travel.

Formula: % change in VMT = difference in transit mode share with strategy × mode shift factor

User Inputs:

- Is the project within 0.5 mile of a rail transit station (e.g., SPRINTER, COASTER, Trolley)? [Yes/No]
  - If No, strategy cannot be used
- Existing transit mode share (optional override of city/CPA default)

Constants and Assumptions:

- Ratio of transit mode share for TOD area compared to transit mode share for surrounding city/CPA is 4.9.
- Maximum transit mode share is 27%, per Lund (2004).
- Mode shift factor is 0.70. Calculated as (1/average vehicle occupancy) or (1/1.42). Mode shift factor is an adjustment to reflect the reduction in vehicle trips associated with a reduction in person trips, since some vehicles carry more than one person.

SANDAG Data:

- Default transit mode share (all trips), by City/CPA

Sources:

- Tal, G., et al. 2013. "Technical Background Document on the Impacts of Transit Access (Distance to Transit) Based on a Review of the Empirical Literature." arb.ca.gov/cc/sb375/policies/transitservice/transit_brief.pdf
- SANDAG. Activity Based Model. 2016. (v14.0.1, scenario ID 232)
- Lund, H., et al. 2004. "Travel Characteristics of Transit-Oriented Development in California." bart.gov/sites/default/files/docs/Travel_of_TOD.pdf

2B. Mixed Use Development

Description: Mixed use projects incorporate a range of complementary land uses that provide a more balanced development approach relative to the surrounding neighborhood and encourage transportation alternatives. This could include co-location residential development, office space, retail shops, and others. Land use mix is measured using an entropy index. An index of 0 indicates a single land use while an index of 1 indicates equal distribution of all land uses. For ease of use, the strategy is calculated using only two land use types - residential (number of residents) and commercial (number of jobs).

Formula: % change in VMT = % change in land use index × elasticity

Where:

land use index = –A / (ln[2])

A = (b1/a) × ln(b1/a) + (b2/a) × ln(b2/a)

a = residents + jobs

b1 = residents

b2 = jobs

User Inputs:

- Existing land use index (optional override of city/CPA default)
- Residents added with project
- Jobs added with project

Constants and Assumptions:

- Elasticity of VMT with respect to land use index is –0.09, per Ewing and Cervero (2010).
- Percent change in land use index with strategy is capped at 500%, per CAPCOA (2010).
- Percent change in VMT is capped at –30%, per CAPCOA (2010).

SANDAG Data:

- Default land use index, by city/CPA, is calculated based on SANDAG-provided data on population and jobs.

Sources:

- SANDAG Land Use Inventory (SPACECORE). 2016.
- Ewing, R., and Cervero, R. 2010. "Travel and the Built Environment – A Meta-Analysis." Journal of the American Planning Association.

Parking Management Strategies

Strategies that discourage auto travel by modifying the price or supply of vehicle parking.

3A. Parking Pricing

Description: Priced parking can be implemented on- or off-street and helps to effectively manage the parking supply. Priced parking works best in areas where on-street parking is managed (e.g., priced parking, residential permit programs, time limits, etc.) to reduce unintended consequences of parking in adjacent neighborhoods.

Formula: % change in VMT = % change in parking price × elasticity

User Inputs:

- Parking price unit. User selects one of these options:
  - $/hour
  - $/day
  - $/month
  - $/year
- Existing parking price
- Parking price with project

Constants and Assumptions:

- Elasticity of vehicle trips with respect to parking price is –0.15.
- Change in vehicle trips assumed to equal change in VMT.
- A minimum 25% parking price change is needed to affect VMT.
- Change in parking price is capped at a minimum of –50% and a maximum of 50%.

SANDAG Data:

None.

Sources:

- Transportation Research Board. 2009. TCRP Report 95, Chapter 13, Parking Pricing and Fees. p13-4. trb.org/Publications/TCRPReport95.aspx
- Cambridge Systematics. 2009. "Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions." Technical Appendices. Prepared for the Urban Land Institute. reconnectingamerica.org/resource-center/browse-research/2009/moving-cooler-an-analysis-of-transportation-strategies-for-reducing-greenhouse-gas-emissions/

3B. Parking Cash Out

Description: Employers can offer employees who are provided free parking the option to take the cash value of the space in lieu of the space itself. California state law (Assembly Bill 2109 [Katz, 1992]) requires that

certain employers who provide subsidized parking for their employees offer a cash allowance in lieu of a parking space. This strategy is only applicable where employers pay for or rent parking for their employees.

Parking cash-out is most successful when paired with incentives or programs that encourage the use of transportation alternatives.

Formula: % change in VMT = % of employees who participate × % change in commute VMT among participants

User Inputs:

- Percentage of employees who participate

Constants and Assumptions:

- 12% reduction in commute VMT among participants.

SANDAG Data:

None.

Sources:

- California Air Resources Board. 2009. "California's Parking Cash-Out Program: An Informational Guide for Employers." arb.ca.gov/planning/tsaq/cashout/cashout_guide_0809.pdf
- Shoup, Donald C. 2005. "Parking Cash Out." Planners Advisory Service, American Planning Association. shoup.bol.ucla.edu/ParkingCashOut.pdf

Neighborhood Enhancement Strategies

Strategies that improve or encourage neighborhood-level bicycle, pedestrian, and other multimodal travel options.

4A. Street Connectivity Improvement

Description: A connected and complete street network improves accessibility, safety, and livability of the community. Traditional grid street patterns with short blocks offer a high degree of connectivity compared to street networks with curvilinear designs and cul-de-sacs. This strategy uses intersection density as a proxy for street connectivity improvements, which helps facilitate a greater number of short trips. Example projects that increase intersection density would be building a new street network in a subdivision or retrofitting an existing street network to improve connectivity (e.g., cul-de-sacs converted to grid streets).

Formula: % change in VMT = % change in intersection density × elasticity

User Inputs:

- Existing intersection density (intersections per square mile) (optional override of city/CPA default)
- Intersection density with strategy (intersections per square mile)

Constants and Assumptions:

- Elasticity of VMT with respect to intersection density is –0.12.
- Change in intersection density capped at a minimum of –50% and a maximum of 50%.

SANDAG Data:

- Default intersection density, by city/CPA, is provided by SanGIS (2016).

Sources:

- San Diego Geographic Information Source (SanGIS). 2016. "Roads_All." San Diego Geographic Information Source – JPA. sangis.org/download/index.html. Downloaded: May 1, 2019.
- Ewing, R., and Cervero, R. 2010. "Travel and the Built Environment – A Meta-Analysis." Journal of the American Planning Association.
- Handy, Susan, et al, 2014. "Impacts of Network Connectivity on Passenger Vehicle Use and Greenhouse Gas Emissions: Policy Brief." arb.ca.gov/cc/sb375/policies/connectivity/network_connectivity_brief.pdf

4B. Pedestrian Facility Improvement

Description: Enhancing pedestrian facilities (e.g., streetscape and pedestrian crossing improvements) within the jurisdiction or community helps encourage walking and reduce the reliance on the single-occupancy vehicle. This strategy applies to sidewalk enhancements that improve the existing streetscape and is not inclusive of greenfield developments with new roadways.

Formula: % change in VMT = % change in ratio of sidewalk length to street length × elasticity

User Inputs:

- Existing sidewalk length in city/CPA (miles)

- Existing street length in city/CPA (miles)
- Sidewalk length in city/CPA with project (miles)

Constants and Assumptions:

- Street length is assumed to remain constant, since the strategy involves adding sidewalks to the existing street network, not modifying street networks. Assuming a constant street length simplifies the user inputs and prevents users from erroneously entering unreasonable values.
- Elasticity of VMT with respect to sidewalk coverage ratio is –0.05.
- VMT change is capped at 1.4%, which is based on the following assumptions:
  - 10% of auto trips are short trips that could shift to walking (average 0.83 mile in length, per SANDAG)
  - 90% of auto trips are longer trips that cannot shift to walking (average 6.5 miles in length, per SANDAG)
  - So maximum VMT change = (10% × 0.83) / (90% × 6.5) = 1.4%

SANDAG Data:

- Regional average one-way walk trip length is 0.83 miles.
- Regional average one-way auto trip length is 6.5 miles.

Sources:

- Frank, L., Greenwald, M., Kavage, S. and Devlin, A. 2011. "An Assessment of Urban Form and Pedestrian and Transit Improvements as an Integrated GHG Reduction Strategy." WSDOT Research Report WA-RD 765.1, Washington State Department of Transportation. wsdot.wa.gov/research/reports/fullreports/765.1.pdf
- Handy, Susan, et al, 2014. "Impacts of Pedestrian Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions: Policy Brief." arb.ca.gov/cc/sb375/policies/ped/walking_brief.pdf

4C. Bikeway Network Expansion

Description: A bikeway network includes an interconnected system of bike lanes, bike paths, and cycle tracks (Class I, Class II, and Class IV facilities). Bike facilities may share the roadway with vehicles or provide a dedicated pathway that separates bikes from cars or pedestrians. Increasing the network of bike facilities helps encourage biking as a safe and convenient alternative to driving. If this strategy is selected, strategy 4D (Bike Facility Improvement) cannot be analyzed as part of the total VMT reduction.

Formula: % change in VMT = (–1) × % change in bikeway miles × elasticity × existing bike mode share × bike trip length / (existing auto mode share × auto trip length)

Derivation of Formula:

% change in VMT	= [change in auto VMT] / [current auto VMT]
	= (–1) × [change in bicycle miles traveled] / [current auto VMT]
	= (–1) × [total trips in city/CPA × bike mode share × bike trip length × % change in bikeway density × elasticity] / [total trips in city/CPA × auto mode share × auto trip length]

User Inputs:

- Would the project expand a network of bikeways or add a single bikeway? [Network of bikeways/ Single bikeway]
  - If Network of bikeways, use Strategy 4C
  - If Single bikeway, must use Strategy 4D
- Existing bicycle mode share (optional override of city/CPA default)
- Existing auto mode share (optional override of city/CPA default)
- Are any of the current or proposed bikeways in the city/CPA classified as Class III? [Yes/No]
  - If Yes, Class III bike lane miles should be left out of the bikeway mile user inputs.
- Existing bikeway miles in city/CPA
- Additional bikeway miles in city/CPA with project
- One-way bicycle trip length (optional override of regional default)
- One-way auto trip length (optional override of regional default)

Constants and Assumptions:

- Elasticity of bike trips with respect to bikeway miles per 10,000 population is 0.25.
- Maximum VMT change capped at 5.0%, which is based on the following assumptions:
  - 10% of auto trips are short trips that could shift to bicycling (average 2.9 mile in length, per SANDAG)
  - 90% of auto trips are longer trips that cannot shift to walking (average 6.5 miles in length, per SANDAG)
  - So maximum VMT change = (10% × 2.9) / (90% × 6.5) = 5.0%

SANDAG Data:

- Default auto mode share, by city/CPA
- Default bicycle mode share, by city/CPA
- Regional average one-way bicycle trip length is 2.9 miles.
- Regional average one-way auto trip length is 6.5 miles.

Sources:

- SANDAG. 2016. Activity Based Model. (v14.0.1, scenario ID 232)
- Pucher, J. and R. Buehler, 2011. "Analysis of Bicycling Trends and Policies in Large North American Cities: Lessons for New York." Report for U. S. Department of Transportation, Research and Innovative Technology Administration, Washington, D.C. and UTRC II New York.

4D. Bike Facility Improvement

Description: If a comprehensive bikeway network expansion (strategy 4C) is not feasible, the addition of a single bike lane (Class II), bike path (Class I), or protected bikeway (Class IV) to an existing bikeway network helps improve biking conditions within an area. Class I facilities are bike paths that are physically separated from motor vehicle traffic. Class II facilities are striped bicycle lanes that provide exclusive use to bicycles on a roadway. Class IV facilities are protected on-street bikeways, also called cycle tracks. Consider local or state

bike width standards when implementing facility improvements. If this strategy is selected, strategy 4C (Bikeway Network Expansion) cannot be analyzed as part of the total VMT reduction.

Formula: % change in VMT = –1 × (auto trips reduced by strategy) × (bike trip length) / (existing auto trips on roadway) × (auto trip length)

Where auto trips reduced by strategy = AADT × (A + C)

AADT = Existing average annual daily traffic volume on roadway affected by strategy

A = AADT adjustment factor

C = Credit for Activity Centers near project

User Inputs:

- Would the project expand a network of bikeways or add a single bikeway? [Network of bikeways/ Single bikeway]
  - If Network of bikeways, must use Strategy 4C
  - If Single bikeway, use Strategy 4D
- One-way bicycle trip length (optional override of regional default)
- One-way auto trip length (optional override of regional default)
- Existing Annual Average Daily Traffic (AADT) on roadway parallel to bicycle project
- Length of bike project (only Class I, II, or IV) in one direction (miles)
  - ≤ 1
  - > 1 and ≤ 2
  - > 2
- Activity Centers near project
  - 3 within 0.5 mile
  - 4–6 within 0.5 mile
  - 7 or more within 0.5 mile
  - 3 within 0.25 mile
  - 4–6 within 0.25 mile
  - 8 or more within 0.25 mile

Constants and Assumptions:

- Adjustment factor (A) of AADT for auto trips replaced by bike trips due to strategy

Average Daily Traffic	Bike Project Length (miles)	Adjustment Factor
0 – 12,000	≤ 1	0.0019
	> 1 and ≤ 2	0.0029
	> 2	0.0038
12,001 – 24,000	≤ 1	0.0014
	> 1 and ≤ 2	0.002
	> 2	0.0027
24,001 – 30,000	≤ 1	0.001
	> 1 and ≤ 2	0.0014
	> 2	0.0019

  - Estimated based on California Air Resources Board (CARB) (2005). Based on assumption that at all municipalities would be either cities with a population greater than or equal to 250,000 or a non-university town with a population less than 250,000.
- Credit for activity centers based on number and distance
  - If 3 within 0.5 mile, 0.0005 credits
  - If 4–6 within 0.5 mile, 0.001 credits
  - If 7 or more within 0.5 mile, 0.0015 credits
  - If 3 within 0.25 mile, 0.001 credits
  - If 4–6 within 0.25 mile, 0.002 credits
  - If 8 or more within 0.25 mile, 0.003 credits
- Existing Annual Average Daily Traffic on roadway parallel to bicycle project (two-way traffic volume in trips/day on road parallel to proposed bike lane) cannot exceed 30,000, per CARB (2005).

SANDAG Data:

- Regional average one-way bicycle trip length is 2.9 miles.
- Regional average one-way auto trip length is 6.5 miles.

Sources:

- SANDAG. 2016. Activity Based Model. (v14.0.1, scenario ID 232)
- California Air Resources Board. 2005. "Methods to Find the Cost-Effectiveness of Funding Air Quality Projects." arb.ca.gov/planning/tsaq/eval/mv_fees_cost-effectiveness_methods_may05.doc

4E. Bikeshare

Description: Bikeshare programs help to reduce traffic congestion and demand for parking by providing users with on-demand access to bikes for short-term rental. Bikeshare systems that feature electrified vehicles (scooters, e-bikes) help increase the range of the bike trip, making these services convenient and attractive to users. Providing discounted bikeshare memberships or dedicated bikeshare parking can encourage users and improve the user experience.

Formula: % change in VMT = –1 × [change in % of population with access × daily bike share trips per person × auto substitution rate × bike share trip length] / [average daily auto trips per person × auto trip length]

Derivation of Formula:

% change in VMT	= [change in VMT] / [total VMT]
	= –1 × [total population × change in % with access to bikeshare × daily bikeshare trips per person × auto substitution rate × bikeshare trip length] / [total population × daily auto trips per person × auto trip length]
	= –1 × [change in % with access to bikeshare × daily bikeshare trips per person × auto substitution rate × bikeshare trip length] / [daily auto trips per person × auto trip length]

User Inputs:

- Major Statistical Area (MSA) of program expansion
  - Central
  - North City
  - South Suburban
  - East Suburban
  - North County West
  - North County East
  - East County
- Percentage of population in target community that will have access to the expanded bikeshare system
- One-way auto trip length (optional override of regional default)

Constants and Assumptions:

- Bikeshare daily one-way trips per 1,000 residents based on MSA
  - If Central, 23
  - If North City, 23
  - If South Suburban, 6
  - If East Suburban, 6
  - If North County West, 6
  - If North County East, 6
  - If East County, 6

- Percentage of e-bike share trips replacing auto trips is 37%.

SANDAG Data:

- Regional average one-way auto trip length is 6.5 miles.
- Average daily one-way auto trips per adult, city/CPA.
- Average one-way e-bike trip length is 1.7 miles.

Sources:

- WSP. 2019. "Draft TDM Off-Model Methodology—March 2019 Revision." Memo to SANDAG.
- MacArthur, J., M. Harpool, D. Scheppke. 2018. "North American survey of electric bike owners." National Institute for Transportation and Communities: Washington D.C.
- SANDAG. 2016. Activity Based Model. (v14.0.1, scenario ID 232)
- SANDAG. 2018. Anonymized and aggregated data from bikeshare operators in San Diego.

4F. Carshare

Description: Carsharing offers people with convenient access to a vehicle for personal or commuting purposes. Carsharing helps to encourage transportation alternatives by reducing vehicle ownership. Roundtrip carshare providers require members to return the vehicle to a designated location. One-way carshare (i.e., free-floating) providers allow members to pick up the vehicle in one place and end their trip in another. Discounted carshare memberships and priority parking for carsharing vehicles help encourage use of carsharing services.

Formula: % change in VMT = –1 × (increase in % of adults with access to carshare × % of adults with access who become members × VMT reduction per member) / (trips per day × average auto trip length)

Derivation of Formula:

% change in VMT = [change in VMT] / [total VMT]

= –1 × [total population × change in % of population with access to carshare × % of adults with access who become members × VMT reduction per member] / [total population × trips per day × average auto trip length]

= –1 × [change in % with access to carshare × % of adults with access who become members × VMT reduction per member] / [trips per day × average auto trip length]

User Inputs:

- Percentage of cars providing round-trip carshare (vs. one-way carshare)
  - Represents the number of round-trip carshare cars divided by total carshare cars, where total cars includes both roundtrip and one-way providers. If all round-trip, enter 100.
- Percentage of adults in city/CPA with existing carshare access
  - Carshare access defined as at least one carshare pod within 0.5 mile of residence
- Percentage of adults in city/CPA with carshare access with strategy
- One-way auto trip length (optional override of regional default)

Constants and Assumptions:

- Percentage of adults with carshare access who become members is 2%, per WSP (2019).
- VMT reduction per day per carshare member is 7 for roundtrip carshare (Cervero 2007) and 1.1 for one-way carshare (Martin 2016). Formula calculates a weighted average based on user input for percent round-trip.

SANDAG Data:

- Average daily one-way auto trips per adult, by city/CPA.
- Regional average one-way auto trip length is 6.5 miles.

Sources:

- WSP. 2019. "Draft TDM Off-Model Methodology—March 2019 Revision." Memo to SANDAG.
- Cervero, Robert, Golub, Aaron, Nee, Brendan. 2007. "City CarShare: Longer-Term Travel Demand and Car Ownership Impacts." Transportation Research Record: Journal of the Transportation Research Board, 1992, pp 70–80.
- Martin, E., and Shaheen, S. 2016. "The Impacts of Car2go on Vehicle Ownership, Modal Shift, Vehicle Miles Traveled, and Greenhouse Gas Emissions: An Analysis of Five North American Cities." innovativemobility.org/wp-content/uploads/2016/07/Impactsofcar2go_FiveCities_2016.pdf
- SANDAG. 2016. Activity Based Model. (v14.0.1, scenario ID 232)

4G. Community-Based Travel Planning

Description: Community-based travel planning is a residential-based approach to outreach that provides households with customized information, incentives, and support to encourage the use of transportation alternatives. The approach involves a team of trained Travel Advisors engaging residents at home or in their communities to offer information, incentives, and advice about how members of households can travel in alternative ways that meet their needs. Teams of trained Travel Advisors visit all households within a targeted geographic area, have tailored conversations about residents' travel needs, and educate residents about the various transportation options available to them. Due to the personalized outreach method, communities are typically targeted in phases.

Formula: % change in VMT = –1 × % of households in community that are targeted × % of targeted households that participate × % reduction in single-occupancy vehicle trips among participating households

User Inputs:

- Households in city/CPA that are targeted

Constants and Assumptions:

- Percentage of targeted households that participate is 17%.
- Percentage of single-occupancy vehicle trip reduction among participating households is 12%.

SANDAG Data:

- Households, by CPA/city

Sources:

- SANDAG. 2016. Land Use Inventory (SPACECORE).
- Results from program evaluations including King County Metro Transit. 2014, 2015, 2017; North Coast Corridor Program. 2014; Portland Bureau of Transportation. 2010; Community Transit. n.d. Curb @ Home.
- WSP. 2019. "Draft TDM Off-Model Methodology—March 2019 Revision." Memo to SANDAG.

Transit Strategies

Strategies that improve transit service and cause a mode shift from auto to transit.

5A. Transit Service Expansion

Description: Expanding the transit network increases the transit system's ability to accommodate existing and future travel demand, particularly for peak-period commute trips. This strategy provides an effective alternative to congested freeways and roadways for travelers and can reduce vehicle miles traveled by increasing transit ridership. Transit network service improvements should be coordinated closely with the operating transit agency.

Formula: % change in VMT = –1 × (existing transit mode share × % change in network coverage × elasticity × mode shift factor) / (existing auto mode share)

Derivation of Formula:

% change in VMT	= [change in auto VMT] / [current auto VMT]
	= –[change in transit passenger miles × mode shift factor] / [current auto VMT]
	= –[total trips × transit mode share × trip length × % change in network coverage × elasticity of transit ridership with respect to network coverage × mode shift factor] / [total trips × auto mode share × trip length]
	= –[transit mode share × % change in network coverage × elasticity × mode shift factor] / [auto mode share]

User Inputs:

- Existing bus transit route length in city/CPA (miles)
- Bus transit route length in city/CPA with expansion (miles)
- Existing transit mode share (optional override of city/CPA default)
- Existing auto mode share (optional override of city/CPA default)

Constants and Assumptions:

- Elasticity of transit ridership with respect to service coverage is 0.72.
- Percent change in bus network coverage is capped at 100%.
- If the user override of existing transit mode share exceeds maximum of 25%, the default value will be used.
- If the user override of existing auto mode share falls below minimum of 50%, the default value will be used.

SANDAG Data:

- Default auto mode share, by city/CPA (all trips)
- Default transit mode share, by city/CPA (all trips)
- Mode shift factor is 0.70. Calculated as (1/average vehicle occupancy) or (1/1.42). Mode shift factor is an adjustment to reflect the reduction in vehicle trips associated with a reduction in person trips, since some vehicles carry more than one person.

Sources:

- SANDAG. 2016. Activity Based Model. (v14.0.1, scenario ID 232)
- Transportation Research Board. 2004. "TCRP Report 95 Chapter 10 Bus Routing and Coverage." trb.org/Publications/TCRPReport95.aspx

5B. Transit Frequency Improvements

Description: Transit frequency improvements can be implemented systemwide or on individual routes. Frequency improvements increase transit ridership by reducing travel times, which improves the user experience and increases the attractiveness of transit service. Transit network service improvements should be coordinated closely with the operating transit agency.

Formula: % change in VMT = –1 × (existing transit mode share × % change in transit frequency × elasticity × mode shift factor × implementation adjustment) / (existing auto mode share)

Derivation of Formula:

% change in VMT	= ([change in auto VMT] / [current auto VMT]) × implementation adjustment
	= (–1 × [change in transit passenger miles × mode shift factor] / [current auto VMT]) × implementation adjustment
	= (–1 × [total trips × transit mode share × trip length × % change in transit frequency × elasticity of transit ridership with respect to frequency × mode shift factor] / [total trips × auto mode share × trip length]) × implementation adjustment
	= (–1 × [transit mode share × % change in transit frequency × elasticity × mode shift factor] / [auto mode share]) × implementation adjustment

User Inputs:

- Existing peak period headway (minutes)
- Peak period headway with strategy (minutes)
- Existing total transit routes serving city/CPA
- Transit routes serving city/CPA that are improved
- Existing transit mode share (optional override of city/CPA default)
- Existing auto mode share (optional override of city/CPA default)

Constants and Assumptions:

- Elasticity of transit ridership with respect to frequency of service is 0.33.
- The percent change in transit frequency (arrivals per hour) is capped at a 300% increase or a 75% decrease.
- If the user override of existing transit mode share exceeds maximum of 25%, the default value will be used.
- If the user override of existing auto mode share falls below minimum of 50%, the default value will be used.

SANDAG Data:

- Default transit mode share, by city/CPA
- Default auto mode share, by city/CPA
- Mode shift factor is 0.70. Calculated as (1/average vehicle occupancy) or (1/1.42). Mode shift factor is an adjustment to reflect the reduction in vehicle trips associated with a reduction in person trips, since some vehicles carry more than one person.

Sources:

- SANDAG. 2016. Activity Based Model. (v14.0.1, scenario ID 232)
- Transportation Research Board. 2004. "TCRP Report 95 Chapter 9, Transit Scheduling and Frequency." trb.org/Publications/TCRPReport95.aspx

5C. Transit-Supportive Treatments

Description: Apply roadway infrastructure and/or traffic signal modifications to improve transit travel times and reliability, leading to mode shift to transit. Treatments can include transit signal priority, bus-only signal phases, queue jumps, curb extensions to speed passenger loading, and dedicated bus lanes. Transit-supportive treatments should be coordinated closely with the operating transit agency.

Formula: % change in VMT = –1 × (existing transit mode share × % change in transit travel time × elasticity × mode shift factor) / existing auto mode share

Derivation of Formula:

% change in VMT	= [change in auto VMT] / [current auto VMT]
	= –1 × [change in transit passenger miles × mode shift factor] / [current auto VMT]
	= –1 × [total trips × transit mode share × trip length × % change in transit travel time × elasticity of transit ridership with respect to travel time × mode shift factor] / [total trips × auto mode share × trip length]
	= –1 × [transit mode share × % change in transit travel time × elasticity × mode shift factor] / [auto mode share]

User Inputs:

- Percentage of community transit routes that receive treatments with project
- Percent change in transit travel time due to treatments (optional override of default)
- Existing transit mode share (optional override of city/CPA default)
- Existing auto mode share (optional override of city/CPA default)

Constants and Assumptions:

- Default percent change in transit travel time due to treatments is –12%.
- Elasticity of transit ridership with respect to transit travel time is –0.4.
- If the user override of default percent change in transit travel time due to treatments value falls below minimum of –20% or exceeds maximum of 0%, the default value will be used.

- If the user override of existing transit mode share exceeds maximum of 25%, the default value will be used.
- If the user override of existing auto mode share falls below minimum of 50%, the default value will be used.

SANDAG Data:

- Mode shift factor is 0.70. Calculated as (1/average vehicle occupancy) or (1/1.42). Mode shift factor is an adjustment to reflect the reduction in vehicle trips associated with a reduction in person trips, since some vehicles carry more than one person.
- Default auto mode share, by city/CPA
- Default transit mode share, by city/CPA

Sources:

- Transportation Research Board. 2016. "TCRP Report 183: A Guidebook on Transit-Supportive Roadway Strategies." trb.org/Main/Blurbs/173932.aspx
- SANDAG. 2016. Activity Based Model. (v14.0.1, scenario ID 232)
- Transportation Research Board. 2007. "TCRP Report 118: Bus Rapid Transit Practitioners Guide." trb.org/Publications/Blurbs/158960.aspx

5D. Transit Fare Reduction

Description: Transit pricing strategies are designed to reduce the costs associated with using transit, thereby creating incentives for people to shift from other traveling modes. Fare reductions can be implemented systemwide or in specific fare-free or reduced fare zones. This strategy varies from Employer Transit Pass Subsidy (Strategy 1D), which can be offered through employer-based benefits programs in which the employer fully or partially pays the employee's cost of transit.

Formula: % change in VMT = –1 × (existing transit mode share × % change in transit fare × elasticity × mode shift factor) / (existing auto mode share)

Derivation of Formula:

% change in VMT	= [change in auto VMT] / [current auto VMT]
	= –1 × [change in transit passenger miles × mode shift factor] / [current auto VMT]
	= –1 × [total trips × transit mode share × trip length × % change in transit fare × elasticity of transit ridership with respect to fare × mode shift factor] / [total trips × auto mode share × trip length]
	= –1 × [transit mode share × % change in transit fare × elasticity × mode shift factor] / [auto mode share]

User Inputs:

- Transit fare unit
  - $/trip
  - $/hour
  - $/day

  - $/month
  - $/year
- Existing regular transit fare
- Regular transit fare with project
- Existing transit mode share (optional override of city/CPA default)
- Existing auto mode share (optional override of city/CPA default)

Constants and Assumptions:

- Elasticity of transit ridership with respect to transit fare is –0.3.

SANDAG Data:

- Default auto mode share, by city/CPA
- Default transit mode share, by city/CPA
- Mode shift factor is 0.70. Calculated as (1/average vehicle occupancy) or (1/1.42). Mode shift factor is an adjustment to reflect the reduction in vehicle trips associated with a reduction in person trips, since some vehicles carry more than one person.
- Percent change in transit fare is capped at 50%.
- If the user override of existing transit mode share exceeds maximum of 25%, the default value will be used.
- If the user override of existing auto mode share falls below minimum of 50%, the default value will be used.

Sources:

- SANDAG. 2016. Activity Based Model. (v14.0.1, scenario ID 232)
- California Air Resources Board. 2013. "Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emission." arb.ca.gov/cc/sb375/policies/transitservice/transit_bkgd.pdf

5E. Microtransit NEV Shuttle

Description: Microtransit services utilize real-time ride-hailing, mobile tracking, and app-based payment to provide demand-based service to users. Microtransit services are flexible and can be designed to fulfill the mobility needs of a community. Neighborhood electric vehicles (NEVs) are a type of microtransit service that operate within a defined service area and fulfill trips that are short-distance in nature, typically less than two miles long. NEVs help to facilitate connections to and from transit stations and provide users with an alternative to driving for short trips.

Formula: % change in VMT = –1 × (% of city/CPA covered by new microtransit service × microtransit share of person trips × auto substitution rate × average microtransit trip length) / (auto mode share × average auto trip length)

Derivation of Formula:

% change in VMT	= [change in VMT] / [total VMT]
	= –1 × [total daily person trips × microtransit share of person trips × change in % with access to microtransit × auto substitution rate × average microtransit trip length] / [total daily person trips × auto mode share × auto trip length]
	= –1 × [microtransit share of person trips × change in % with access to microtransit × auto substitution rate × average microtransit trip length] / [auto mode share × auto trip length]

User Inputs:

- Percentage of city/CPA covered by new microtransit service
- One-way microtransit trip length (optional override of regional default)
- One-way auto trip length (optional override of regional default)
- Existing auto mode share (optional override of city/CPA default)

Constants and Assumptions:

- Microtransit share of all person trips is 0.41%.
- Auto trip substitution rate is 0.33.
- Average length of one-way microtransit trip is one mile.
- If the user override of existing auto mode share value falls below minimum of 50%, the default value will be used.

SANDAG Data:

- Default existing auto mode share, by city/CPA
- Regional average one-way auto trip length is 6.5 miles.

Sources:

- WSP. 2019. "Draft TDM Off-Model Methodology—March 2019 Revision." Memo to SANDAG.
- SANDAG. Activity Based Model. 2016. (v14.0.1, scenario ID 232)

Attachment F: Local Transportation Analysis Report Format

LOCAL TRANSPORTATION ANALYSIS REPORT FORMAT

COVER PAGE

1. Project address
2. Project name (if applicable)
3. Prepared for
4. Date (month/day/year)
5. Consultant contact information including a contact name
6. Consultant job number (if applicable)
7. Entitlement Number (i.e. Tract or CUP Number)
8. City Planner Name (if known)
9. Stamp and/or signature of qualified engineer or authorized owner/principal of firm stating the study was prepared and reviewed under their supervision and direction.

TABLE OF CONTENTS LIST OF FIGURES LIST OF TABLES

EXECUTIVE SUMMARY

Provide summary of the LTA, project location and size, intersections analyzed, study scenarios, impacts, mitigation and recommendations in a figure and table. Methodology used to analyze the impacts does not need to be included in the executive summary. Document results of LOS analysis, intersections and roadway segments Provide summary of site access and circulation. Results of LOS analysis should be summarized in a table form as follows for both existing and cumulative scenarios:

Summary of Intersection Level of Service

	Existing		***Existing plus Proposed Project***		***Existing plus Approved and Pending plus Proposed Project***	
Intersection	***Delay***	***LOS***	***Delay***	***LOS***	***Delay***	***LOS***

INTRODUCTION

Provide description of the project, location, size and proposed primary access. A vicinity map showing the site location and the study area relative to other transportation systems along with study intersections and roadway segments should be provided. Document study intersections, roadway segments and study scenarios providing brief explanation on each study scenarios. Describe the methodology used to analyze the impacts of the study and the thresholds for determining an impact.

EXISTING CONDITIONS

Provide a description of existing streets and roadways within the project site (if any) and in the surrounding area. Include information on the roadway classifications (per the

Clovis General Plan Circulation Element), the number of lanes, posted speed limits, divided/undivided and bike lanes.

Existing daily directional and peak-hour through and turning traffic volumes on the roadways surrounding and/or logically associated with the project site, including major highways and freeways. Local streets affected by the project should also be shown. Each report shall include appendices providing count data used in the preparation of the report. The source and date of the traffic volume information shall be indicated. A figure illustrating the peak hour traffic volumes, lane configurations, and traffic control at the study intersections and roadway segments should be provided.

All assumed roadways and intersections or any other transportation circulation improvements must be identified and discussed. The discussion should include the scope and the status of the assumed improvements including the construction schedule and financing plan.

In addition, any transit facilities within 1,300 feet of the project or study intersections/roadways segments, including the service provider(s), routes, frequency and location/amenities of existing bus stops should be provided.

Existing and planned bicycle and pedestrian facilities adjacent to the project site, utilized by the project, connected to by the project, or impacted by the project should be identified and described in detail.

Results of LOS analysis should be summarized in table (in a format illustrated above) and discussed. If any of the study intersections or roadway segments are operating at unacceptable levels, mitigation measures should be identified.

EXISTING PLUS PROPOSED PROJECT CONDITIONS

This scenario is required by CEQA to show the impacts of the proposed project on the existing conditions. It should include a project description, trip generation and distribution, level of service analysis, and appropriate tables, figures, and recommendations/mitigation as described below.

Project Description

A description of the project, including factors which quantify traffic generators, e.g., dwelling units, square feet of office space, persons to be employed, restaurant seats, acres of raw land, etc. Provide site plan including access, project-only trips at the access points, circulation, parking, and loading as applicable.

Trip Generation and Trip Distribution

Provide trip generation and trip distribution. Provide any relevant information, discussion if applicable.

Level of Service Analysis

Provide a figure illustrating peak hour traffic volumes at the study intersections and roadway segments for Existing plus Proposed Project Conditions. Results of LOS analysis should be summarized in table and discussed. If any of the study intersections or roadway segments are projected to operate at unacceptable levels, mitigation measures should be identified.

Site Access and Circulation

Provide site access and circulation analysis and discussion as per the "SITE ACCESS AND CIRCULATION" Section of this document. Provide a figure showing on site and circulation recommendations.

NEAR-TERM ANALYSIS (EXISTING PLUS APPROVED AND PENDING PROJECT PLUS PROPOSED PROJECT CONDITIONS)

Approved and pending projects located within the vicinity of project, (projects that would impact study intersections and/or roadway segments or as determined by Traffic Engineering Manager), that can reasonably be expected to be in place by the project's construction year along with the trip generation should be summarized in a table. A figure illustrating the Existing plus Approved and Pending Projects Plus Proposed Project peak hour traffic volumes should be provided.

Results of LOS analysis should be summarized in table and discussed. If any of the study intersections or roadway segments are projected to operate at unacceptable levels, mitigation measures should be identified.

CUMULATIVE 20-YEAR AND CUMULATIVE 20-YEAR PLUS PROJECT CONDITIONS

Provide similar information for both scenarios as above referenced scenarios. Please discuss in detail how the traffic volume forecasts were developed using the Fresno COG model. This information should be easy to follow and reproducible by a peer consultant.

QUEUING

Discuss and provide recommendations to mitigate unacceptable queues at study intersections under appropriate scenarios as applicable.

SIGNAL WARRANTS

Provide signal warrants analysis and discuss results of the analysis under appropriate scenarios as applicable.

CONCLUSION

MITIGATIONS & RECOMMENDATIONS

Provide objective recommendations in a table or figure and discuss the timing and funding of recommendations.

APPENDIX

Traffic Counts
Fresno COG Model Runs and Turning Movement Forecast outputs
Signal Warrants
References and Bibliography Level Service Calculation Sheets

CITY OF CLOVIS
CONSULTANT SERVICE AGREEMENT

This Consultant Services Agreement ("Agreement") is entered into between the City of Clovis, a California general law city ("City") and the individual or entity identified below ("Consultant") with respect to the following recitals, which are a substantive part of this Agreement. This Agreement shall be effective on the date signed by City, which shall occur after execution by Consultant ("Effective Date").

RECITALS

A. City desires to obtain services for the preparation of a study/report and associated services ("Services") described in **Exhibit A**, and as further set forth in the proposal from Consultant attached as **Exhibit B** ("Proposal") and incorporated herein by reference. If there is a conflict between the terms of the Proposal and this Agreement, this Agreement shall control.

B. Consultant is engaged in the business of furnishing the Services and hereby warrants and represents that it is qualified, licensed, and professionally capable of performing the Services.

C. City desires to retain Consultant, and Consultant desires to provide the City with the Services, on the terms and conditions as set forth in this Agreement.

NOW, THEREFORE, in consideration of the promises and mutual agreements herein, City and Consultant agree as follows:

AGREEMENT

1. Scope of Services. Consultant shall perform the Services described in the Recitals.

2. Commencement of Services; Term of Agreement. Consultant shall commence the Services upon City's issuance of a written "Notice to Proceed" and shall continue with the Services until Consultant, as determined by City, has satisfactorily performed and completed the Services, or until such time as the Agreement is terminated by either party pursuant to Section 16 herein, whichever is earlier.

3. Payment for Services. City shall pay Consultant a sum not to exceed the total set forth in **Exhibit A** for the Services performed pursuant to this Agreement. Consultant shall submit monthly invoices to City containing detailed billing information regarding the Services provided and Unless otherwise specified in **Exhibit A**, City shall tender payment to Consultant within thirty (30) days after receipt of invoice.

4. Independent Contractor Status. Consultant and its subcontractors shall perform the Services as independent contractors and not as officers, employees, agents or volunteers of City. Nothing contained in this Agreement shall be deemed to create any contractual relationship between City and Consultant's employees or subcontractors, nor shall anything contained in this Agreement be deemed to give any third party, including but not limited to Consultant's employees or subcontractors, any claim or right of action against City.

5. Standard of Care. Consultant expressly represents it is qualified in the field for which Services are being provided under this Agreement and that to the extent Consultant utilizes subcontractors, such subcontractors are, and will be, qualified in their fields. Consultant also expressly represents that both Consultant and its subcontractors, if any, are now, and will be throughout their performance of the Services under this Agreement, properly licensed or otherwise qualified and authorized to perform the Services required and contemplated by this Agreement. Consultant and its subcontractors, if any, shall utilize the

standard of care and skill customarily exercised by members of their profession, shall use reasonable diligence and best judgment while performing the Services, and shall comply with all applicable laws and regulations.

6. Identity of Subcontractors and Sub-Consultants. Consultant shall, before commencing any work under this Agreement, provide to City in writing: (a) the identity of all subcontractors and sub-consultants (collectively referred to as "subcontractors"), if any, Consultant intends to utilize in Consultant's performance of this Agreement; and (b) a detailed description of the full scope of work to be provided by such subcontractors. Consultant shall only employ subcontractors pre-approved by City and in no event shall Consultant replace an approved subcontractor without the advance written permission of City, with the understanding that City's permission will not be unreasonably withheld. Notwithstanding any other provisions in this Agreement, Consultant shall be liable to City for the performance of Consultant's subcontractors.

7. Subcontractor Provisions. Consultant shall include in its written agreements with its subcontractors, if any, provisions which: (a) impose upon the subcontractors the obligation to provide to City the same insurance and indemnity obligations that Consultant owes to City; (b) make clear that City intends to rely upon the reports, opinions, conclusions and other work product prepared and performed by subcontractors for Consultant; and (c) entitle City to impose upon subcontractors the assignment rights found elsewhere in this Agreement.

8. Power to Act on Behalf of City. Consultant shall not have any right, power, or authority to create any obligation, express or implied, or make representations on behalf of City except as may be expressly authorized in advance in writing from time to time by City and then only to the extent of such authorization.

9. Record Keeping; Reports. Consultant shall keep complete records showing the type of Services performed. Consultant shall be responsible and shall require its subcontractors to keep similar records. City shall be given reasonable access to the records of Consultant and its subcontractors for inspection and audit purposes. Consultant shall provide City with a working draft of all reports and five (5) copies of all final reports prepared by Consultant under this Agreement.

10. Ownership and Inspection of Documents. All data, tests, reports, documents, conclusions, opinions, recommendations and other work product generated by or produced for Consultant or its subcontractors in connection with the Services, regardless of the medium, including physical drawings and materials recorded on computer discs ("Work Product"), shall be and remain the property of City. City shall have the right to use, copy, modify, and reuse the Work Product as it sees fit. Upon City's request. Consultant shall make available for inspection and copying all such Work Product and all Work product shall be turned over to City promptly at City's request or upon termination of this Agreement, whichever occurs first. Consultant shall not release any Work Product to third parties without prior written approval of the City Manager. This obligation shall survive termination of this Agreement and shall survive for four (4) years from the date of expiration or termination of this Agreement.

11. Confidentiality. All data, reports, conclusions, opinions, recommendations and other work product prepared and performed by and on behalf of Consultant in connection with the Services performed pursuant to this Agreement shall be kept confidential and shall be disclosed only to City, unless otherwise provided by law or expressly authorized by City. Consultant shall not disclose or permit the disclosure of any confidential information acquired during performance of the Services, except to its agents, employees and subcontractors who need such confidential information in order to properly perform their duties relative to this Agreement. Consultant shall also require its subcontractors to be bound to these confidentiality provisions.

12. City Name and Logo. Consultant shall not use City's name or insignia, photographs relating to the

City projects for which Consultant's services are rendered, or any publicity pertaining to the Consultant's services under this Agreement in any magazine, trade paper, newspaper, television or radio production or other similar medium without the prior written consent of City.

13. Conflicts of Interest. Consultant warrants that neither Consultant nor any of its employees have an interest, present or contemplated, in the Services. Consultant further warrants that neither Consultant nor any of its employees have real property, business interests or income that will be affected by the Services. Consultant covenants that no person having any such interest, whether an employee or subcontractor shall perform the Services under this Agreement. During the performance of the Services, Consultant shall not employ or retain the services of any person who is employed by the City or a member of any City Board or Commission.

14. Non-liability of Officers and Employees. No officer or employee of City shall be personally liable to Consultant, or any successors in interest, in the event of a default or breach by City for any amount which may become due Consultant or its successor, or for any breach of any obligation under the terms of this Agreement.

15. City Right to Employ Other Consultants. This Agreement is non-exclusive with Consultant. City reserves the right to employ other consultants in connection with the Services.

16. Termination of Agreement. This Agreement shall terminate upon completion of the Services, or earlier pursuant to the following.

a. Termination by City: Without Cause. This Agreement may be terminated by City at its discretion upon seven (7) days prior written notice to Consultant.

b. Termination by City or Consultant: For Cause. Either party may terminate this Agreement upon fourteen (14) days prior written notice to the other party of a material breach, and a failure to cure within that time period.

c. Compensation to Consultant Upon Termination. In the event termination is not due to fault attributable to Consultant, and provided all other conditions for payment have been met, Consultant shall be paid compensation for services satisfactorily performed prior to notice of termination. As to any phase partially performed but for which the applicable portion of Consultant's compensation has not become due, Consultant shall be paid the reasonable value of its services provided. However, in no event shall such payment when added to any other payment due under the applicable part of the work exceed the total compensation of such part as specified in Section 3 herein. In the event of termination due to Consultant's failure to perform in accordance with the terms of this Agreement through no fault of City, City may withhold an amount that would otherwise be payable as an offset to City's damages caused by such failure.

d. Effect of Termination. Upon receipt of a termination notice (or completion of this Agreement), Consultant shall: (i) promptly discontinue all Services affected (unless the notice directs otherwise); and (ii) deliver or otherwise make available to the City, without additional compensation, all data, documents, procedures, reports, estimates, summaries, and such other information and materials as may have been accumulated by the Consultant in performing this Agreement, whether completed or in process. Following the termination of this Agreement for any reason whatsoever, City shall have the right to utilize such information and other documents, or any other works of authorship fixed in any tangible medium of expression, including but not limited to physical drawings, data magnetically or otherwise recorded on computer disks, or other writings prepared or caused to be prepared under this Agreement by Consultant. Consultant may not refuse to provide such writings or materials for any reason whatsoever.

17. Insurance. Consultant shall satisfy the insurance requirements set forth in **Exhibit C**.

18. Indemnity and Defense. Consultant hereby agrees to indemnify, defend and hold the City, its officials, officers, employees, agents, and volunteers harmless from and against all claims, demands, causes of action, actions, damages, losses, expenses, and other liabilities, (including without limitation reasonable attorney fees and costs of litigation) of every nature; ~~a~~rising out of or in connection with the alleged or actual tortious acts, or; to the extent caused by the errors, omissions or negligence of Consultant or its subcontractors relating to the performance of Services described herein, unless the injuries or damages are the result of City's ~~sole~~ negligence or willful misconduct. Nothwithstanding the foregoing and relative to professional liability claims, Consultant has no obligation to defend or pay City's defense costs incurred prior to a final determination of liability to pay any amount that exceeds the proportionate share of Consultant's finally determined percentage of liability as determined by a court of competent jurisdiction.

Consultant and City agree that said indemnity and defense obligations shall survive the expiration or termination of this Agreement for any items specified herein that arose or occurred during the term of this Agreement.

19. Taxes. Consultant agrees to pay all taxes, licenses, and fees levied or assessed by any governmental agency on Consultant incident to the performance of Services under this Agreement, and unemployment compensation insurance, social security, or any other taxes upon the wages of Consultant, its employees, agents, and representatives. Consultant agrees to obtain and renew an annual business license from City and pay the applicable annual business license fee to City during the term of this Agreement.

20. Assignment. Neither this Agreement nor any duties or obligations hereunder shall be assignable by Consultant without the prior written consent of City. In the event of an assignment to which City has consented, the assignee shall agree in writing to personally assume and perform the covenants, obligations, and agreements herein contained. In addition, Consultant shall not assign the payment of any monies due Consultant from City under the terms of this Agreement to any other individual, corporation or entity. City retains the right to pay any and all monies due Consultant directly to Consultant.

21. Form and Service of Notices. Any and all notices or other communications required or permitted by this Agreement or by law to be delivered to, served upon, or given to either party to this Agreement by the other party shall be in writing and shall be deemed properly delivered, served or given by one of the following methods:

a. Personally delivered to the party to whom it is directed. Service shall be deemed the date of delivery.

b. Delivered by e-mail to a known address of the party to whom it is directed provided the e-mail is accompanied by a written acknowledgment of receipt by the other party. Service shall be deemed the date of written acknowledgement.

c. Delivery by a reliable overnight delivery service, ex., Federal Express, receipted, addressed to the addressees set forth below the signatories to this Agreement. Service shall be deemed the date of delivery.

d. Delivery by deposit in the United States mail, first class, postage prepaid. Service shall be deemed delivered seventy-two (72) hours after deposit.

22. Entire Agreement. This Agreement, including the attachments, represents the entire Agreement between City and Consultant and supersedes all prior negotiations, representations or agreements, either

written or oral with respect to the subject matter herein. This Agreement may be amended only by written instrument signed by both City and Consultant.

23. Successors and Assigns. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective successors and assigns.

24. Authority. The signatories to this Agreement warrant and represent that they have the legal right, power, and authority to execute this Agreement and bind their respective entities.

25. Severability. In the event any term or provision of this Agreement is declared to be invalid or illegal for any reason, this Agreement will remain in full force and effect and will be interpreted as though such invalid or illegal provision were not a part of this Agreement. The remaining provisions will be construed to preserve the intent and purpose of this Agreement and the parties will negotiate in good faith to modify any invalidated provisions to preserve each party's anticipated benefits.

26. Applicable Law and Interpretation and Venue. This Agreement shall be interpreted in accordance with the laws of the State of California. The language of all parts of this Agreement shall, in all cases, be construed as a whole, according to its fair meaning, and not strictly for or against either party. This Agreement is entered into by City and Consultant in the County of Fresno, California. Consultant shall perform the Services required under this Agreement in the County of Fresno, California. Thus, in the event of litigation, venue shall only lie with the appropriate state or federal court in Fresno County.

27. Amendments and Waiver. This Agreement shall not be modified or amended in any way , and no provision shall be waived, except in writing signed by the parties hereto. No waiver of any provision of this Agreement shall be deemed, or shall constitute, a waiver of any other provision, whether or not similar, nor shall any such waiver constitute a continuing or subsequent waiver of the same provision. Failure of either party to enforce any provision of this Agreement shall not constitute a waiver of the right to compel enforcement of the remaining provisions of this Agreement.

28. Third Party Beneficiaries. Nothing in this Agreement shall be construed to confer any rights upon any party not a signatory to this Agreement.

29. Execution in Counterparts. This Agreement may be executed in counterparts such that the signatures may appear on separate signature pages. A copy or an original, with all signatures appended together, shall be deemed a fully executed Agreement.

30. Alternative Dispute Resolution. If a dispute arises out of or relating to this Agreement, or the alleged breach thereof, and if said dispute cannot be settled through negotiation, the parties agree first to try in good faith to settle the dispute by non-binding mediation before resorting to litigation or some other dispute resolution procedure, unless the parties mutually agree otherwise. The mediator shall be mutually selected by the parties, but in case of disagreement, the mediator shall be selected by lot from among two nominations provided by each party. All costs and fees required by the mediator shall be split equally by the parties, otherwise each party shall bear its own costs of mediation. If mediation fails to resolve the dispute within thirty (30) days, either party may pursue litigation to resolve the dispute.

Demand for mediation shall be in writing and delivered to the other party to this Agreement. A demand for mediation shall be made within reasonable time after the claim, dispute or other matter in question has arisen. In no event shall the demand for mediation be made after the date when institution of legal or equitable proceedings based on such a claim, dispute or other matter in question would be barred by California statues of limitations.

31. Non-Discrimination. Consultant shall not discriminate on the basis of any protected class under federal or State law in the provision of the Services or with respect to any Consultant employees or applicants for employment. Consultant shall ensure that any subcontractors are bound to this provision. A protected class, includes, but is not necessarily limited to race, color, national origin, ancestry, religion, age, sex, sexual orientation, marital status, and disability.

Now, therefore, the City and Consultant have executed this Agreement on the date(s) set forth below.

CONSULTANT
Name: Tim Erney / Kittelson + Associates, Inc.

By: _____

Date: 3-19-2020

CITY OF CLOVIS

By: _____

Date: 3/31/2020

Party Identification and Contact Information:

Consultant: Kittelson & Associates, Inc.
Name: Tim Erney, AICP/PTP/CTP
Address: 750 The City Drive, Suite 400
Orange, CA 92868
Telephone: 714-468-1181
Email: terney@kittelson.com

City:
Name:

Address:
Telephone:
Email:

ATTEST

_____
John Holt, City Clerk

APPROVED AS TO FORM

_____
David J. Wolfe, City Attorney

EXHIBIT A
DESCRIPTION OF SERVICES

Description of the services and work product desired.

The work to be completed is as stated in EXHIBIT B of this contract, and includes the following tasks to be completed by the Consultant:

Task 1: Project Initiation
Task 2: Interim VMT Analysis Guide
- Task 2.1: Establish Metrics and Thresholds
- Task 2.2: Develop Screening Criteria
- Task 2.3: Develop VMT Mitigation Measures

Task 3: Case Studies and Discussion of Future Programmatic Approaches
Task 4: Updated VMT Analysis Guide
Task 5: Project Management, Meetings, and Hearings

OPTIONAL TASKS

Optional Task 1: VMT User Tool
Optional Task 2: Staff and Developer Training

Total compensation to be paid to Consultant. Terms of payment.

Compensation shall not exceed one hundred sixty four thousand, eight hundred twenty dollars and no cents ($164,820). This cost includes $134,400 for completion of tasks one (1) through five (5) outlined in the Consultant's proposal included as EXHIBIT B, and $30,420 for completion of Optional Task one (1) and Optional Task two (2), as outlined in EXHIBIT B. The City reserves the right to not to elect the optional tasks.

	Task	Ki Hours
1	Project Initiation	62
2	Interim VMT Analysis Guide	230
3	Case Studies and Discussion of Future Programmatic Approache	130
4	Updated VMT Analysis Guide	100
5	Project Management, Meetings and Hearings	126

EXHIBIT B
CONSULTANT PROPOSAL

See attached.

EXHIBIT C
INSURANCE REQUIREMENTS

Prior to commencement of the Services, Consultant shall take out and maintain, at its own expense, and shall cause any subcontractor with whom Consultant contracts for the performance of Services pursuant to this Agreement to take out and maintain, the following insurance until completion of the Services or termination of this Agreement, whichever is earlier, except as otherwise required by subsection (d) below. All insurance shall be placed with insurance companies that are licensed and admitted to conduct business in the State of California and are rated at a minimum with an "A:VII" by A.M. Best Company, unless otherwise acceptable to the City.

a. Minimum Limits of Insurance. Consultant shall maintain limits no less than:

(i) Professional Liability Insurance (Errors and Omissions) in an amount not less than $2,000,000.00 per occurrence or claim, $2,000,000 aggregate. Said insurance shall be maintained at all times during Consultant's performance of Services under this Agreement, and for a period of five years following completion of Consultant's Services under this Agreement or termination of this Agreement.

(ii) General Liability Insurance (including operations, products and completed operations coverages) in an amount not less than $1,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location (ISO CG 25 03 or 25 04) or the general aggregate limit shall be twice the required occurrence limit.

(iii) Worker's Compensation Insurance as required by the State of California.

(iv) Business Automobile Liability Insurance in an amount not less than $1,000,000 per accident for bodily injury and property damage.

(v) Umbrella or Excess Liability. In the event Consultant purchases an Umbrella or Excess insurance policy(ies) to meet the "Minimum Limits of Insurance," this insurance policy(ies) shall "follow form" and afford no less coverage than the primary insurance policy(ies). In addition, such Umbrella or Excess insurance policy(ies) shall also apply on a primary and non-contributory basis for the benefit of the City, its officers, officials, employees, agents and volunteers.

If Consultant maintains higher limits than the minimums shown above, the City shall be entitled to coverage at the higher limits maintained.

b. Other Insurance Provisions. The general liability policy is to contain, or be endorsed to contain, the following provisions:

(i) The City, its officers, officials, employees, agents, and volunteers are to be covered as insured's with respect to liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of the Consultant; and with respect to liability arising out of work or operations performed by or on behalf of the Consultant including materials, parts or equipment furnished in connection with such work or operations. General liability coverage can be provided in the form of an endorsement to the Consultant's insurance (at least as broad as ISO Form 20 10 11 85 or both CG 20 10, CG 20 26, CG 20 33 or CG 20 38; and CG 20 37 forms if later revisions used).

(ii) For any claims related to the Services performed pursuant to this Agreement, the Consultant's insurance coverage shall be primary insurance as respects the City, its officers, officials, employees, agents, and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees, agents or volunteers shall be excess of the Consultant's insurance and shall not contribute with it.

(iii) Each insurance policy required by this section shall be endorsed to state that the City shall receive written notice at least thirty (30) days prior to the cancellation, non-renewal, or material modification of the coverages required herein.

(iv) Coverage shall not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insured would be invalid under Subdivision (b) of Section 2782 of the Civil Code.

(v) Consultant grants to the City a waiver of any right to subrogation which any insurer of said Consultant may acquire against the City by virtue of the payment of any loss under such insurance. Consultant agrees to obtain any endorsement that may be necessary to affect this waiver of subrogation, but this provision applies regardless of whether or not the City has received a waiver of subrogation endorsement from the insurer.

(vi) Any deductibles or self-insured retentions must be declared to and approved by the City of Clovis Risk Services. The City may require the Consultant to purchase coverage with a lower deductible or retention or provide proof of ability to pay losses and related investigations, claim administration, and defense expenses within the retention.

c. Evidence of Coverage. Consultant shall deliver to City written evidence of the above insurance coverages, including the required endorsements prior to commencing Services under this Agreement; and the production of such written evidence shall be an express condition precedent, notwithstanding anything to the contrary in this Agreement, to Consultant's right to be paid any compensation under this Agreement. City's failure, at any time, to object to Consultant's failure to provide the specified insurance or written evidence thereof (either as to the type or amount of such insurance), shall not be deemed a waiver of City's right to insist upon such insurance later.

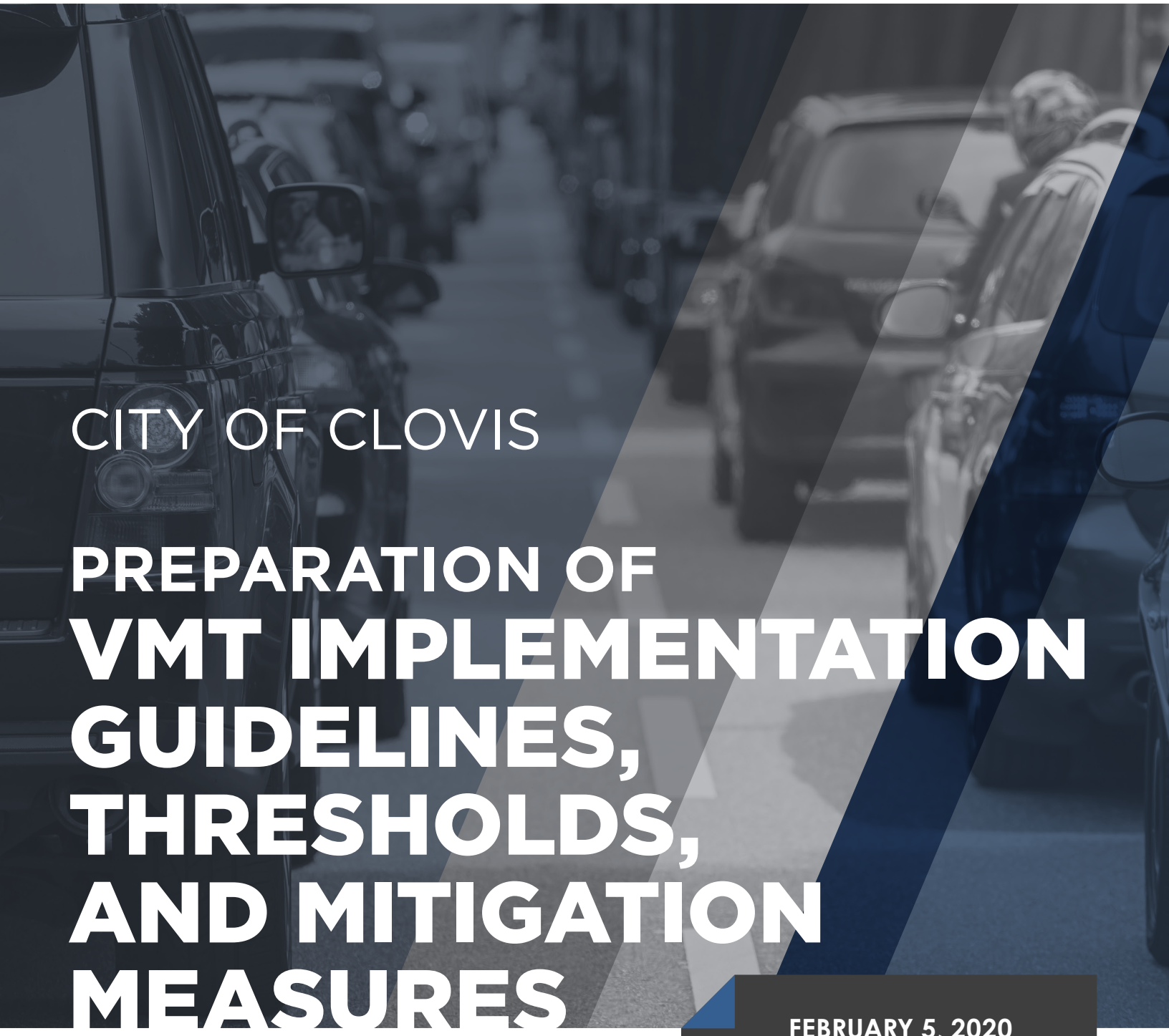
d. Maintenance of Insurance. If Consultant fails to furnish and maintain the insurance required by this section, City may (but is not required to) purchase such insurance on behalf of Consultant, and the Consultant shall pay the cost thereof to City upon demand, and City shall furnish Consultant with any information needed to obtain such insurance. Moreover, at its discretion, City may pay for such insurance with funds otherwise due Consultant under this Agreement.

Consultant shall maintain all of the foregoing insurance coverages during the term of this Agreement, except as to (a) the products and completed operations coverage under the General Liability Insurance which shall also be maintained for a period of ten (10) years following completion of the Services by Consultant or termination of this Agreement, whichever is earlier; and (b) Professional Liability Insurance, which shall be maintained for a period of five (5) years following completion of the Services by Consultant or termination of this Agreement, whichever is earlier.

e. Subcontractors. If the Consultant should subcontract all or any portion of the work to be performed in this Agreement, the Consultant shall cover the subcontractor, and/or require each subcontractor to adhere to all the requirements contained herein. Similarly, any cancellation, lapse, reduction or change of subcontractor's insurance shall have the same impact as described above.

f. Special Risks or Circumstances. The City reserves the right to modify these requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other special circumstances.

g. Indemnity and Defense. Except as otherwise expressly provided, the insurance requirements in this section shall not in any way limit, in either scope or amount, the indemnity and defense obligations separately owed by Consultant to City under this Agreement.



CITY OF CLOVIS

PREPARATION OF VMT IMPLEMENTATION GUIDELINES, THRESHOLDS, AND MITIGATION MEASURES

PROPOSAL

FEBRUARY 5, 2020

KITTELSON & ASSOCIATES

CITY OF CLOVIS

PREPARATION OF VMT IMPLEMENTATION GUIDELINES, THRESHOLDS, AND MITIGATION MEASURES

PROPOSAL | February 5, 2020

Submitted by:
Kittelson & Associates, Inc.
750 The City Drive, Suite 410
Orange, CA 92868
(714) 468-1997

CONTENTS

KITTELSON & ASSOCIATES
750 THE CITY DRIVE, SUITE 410
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P 714.468.1997

February 5, 2020 Project #: 24913

Ricky Caperton, AICP
City of Clovis, Planning & Development
1033 Fifth Street
Clovis, CA 93612

RE: **City of Clovis – RFP for the Preparation of Vehicle Miles Traveled (VMT) Implementation Guidelines, Thresholds, and Mitigation Measures**

Dear Mr. Caperton:

To achieve the state's goals of significant greenhouse gas emission reductions in the coming decades, Senate Bill 743 (SB 743) prohibits traditional vehicle capacity metrics such as level of Service (LOS) for analyzing transportation impacts under the California Environmental Quality Act (CEQA). The California Office of Planning and Research (OPR) provided guidance for local jurisdictions (Technical Advisory on Evaluating Transportation Impacts in CEQA) in December 2018 that included vehicle-miles traveled (VMT) as the preferred metric for assessing transportation impacts under CEQA. Compliance for cities and counties in the state will become mandatory by July 1, 2020.

Kittelson & Associates, Inc. (Kittelson) is pleased to present this response to the request for proposals (RFP) to the City of Clovis to support you with Professional Services for State Bill 743 (SB 743) Implementation Guidelines, Thresholds and Mitigation Measures. We have assembled a comprehensive team of professionals highly experienced in this topic area. Our proposal describes our firm, our staff, and selected relevant qualifications that demonstrate our ability to support the City of Clovis.

Kittelson has supported many communities in developing their transportation analysis guidance and appropriate tools in response to recent changes such as the SB 743 legislation. We are supporting a number of agencies with this transition and feel we can provide similar value to the City of Clovis. Our team combines the strong, objective technical analysis needed to assist the City of Clovis in assisting the City with implementation of guidelines, thresholds and mitigation measures to comply with SB743.

As a team:

- We have been working closely with state agencies on the development of the alternative performance metrics and their implementation and have participated and contributed to multiple working groups and conferences across the state with respect to SB 743 methodology development and implementation.
- We have been advising cities and other jurisdictions to plan for the policy and procedural changes of SB 743 and other CEQA reform measures.

- We have in-house experts on CEQA traffic analysis, transportation demand management programs, and travel demand modeling to conduct VMT calculations.
- Our staff participated in the preparation of the 2014 City of Clovis General Plan Update and Environmental Impact Report (EIR) and worked on many other projects in the region.
- Our travel modelers have experience updating and using the Fresno Council of Governments (COG) Regional Travel Demand Forecasting Model; we have applied the model for many regional and local studies including VMT analysis.
- Our team will be supported by **De Novo Planning Group**, who has practical experience in processing projects for environmental review under CEQA and will act as an advisor to discuss potential implications from implementation of SB743 in Clovis from a CEQA standpoint.

Fernando Sotelo, TE/PTP will serve as Kittelson's project manager, **Michael Aronson**, PE, will serve as Principal in Charge; and **Tim Erney**, AICP, PTP, CTP, will serve as Quality Assurance/Quality Control manager. I will work closely with our staff in our Orange and Oakland offices and will be supported by resources in transportation modeling, transportation demand management and tool development.

We believe our understanding of the technical work to be done as part of the changes for SB 743 compliance will allow us to efficiently and effectively support the City of Clovis in developing its vision for future CEQA and SB 743 compliance.

I will serve as primary point of contact for this contract. Michael Aronson and Tim Erney are authorized to negotiate a contract for the proposed services with the City of Clovis on behalf of the Kittelson team. If you have any questions or need additional information, please contact me directly at (714) 468-1186 or fsotelo@kittelson.com.

Sincerely,
KITTELSON & ASSOCIATES, INC.

Fernando Sotelo, TE
Associate Engineer

Tim Erney, AICP/PTP/CTP
Senior Principal

1. FIRM DESCRIPTION

Kittelson & Associates, Inc. (Kittelson) has provided comprehensive transportation engineering, planning, and research services to government and private organizations since 1985. Our staff is united by collective expertise, local and national experts who offer decades of progressive research, technological innovation, and a diverse portfolio of industry-leading work. We recognize that healthy, sustainable societies depend on efficient, active, and safe multi-modal transportation that is cost-effective to manage, operate, enhance, and use.

With a staff of over 240 people working in 25 offices nationwide (including four offices in California), we are able to address our clients' needs with local experience and national expertise.

Kittelson has conducted transportation impact studies and site access/circulation assessments for jurisdictions throughout California, and thus is extremely familiar with the state-of-the-practice with respect to the development and application of impact study guidelines and establishment of thresholds. Kittelson staff are working closely with Caltrans and multiple jurisdictions to address the requirements of SB 743 and utilize VMT for the assessment of CEQA-related impacts. In addition, our staff have supported transportation planning in the San Joaquin Valley for over 20 years, including several stages of development of the Fresno COG travel model.

De Novo Planning Group (De Novo) is a land use and environmental planning firm specializing in community planning, environmental studies, design, and development services. For the past 10 years, De Novo Planning Group has successfully completed over 300 projects consisting of comprehensive general plans, specific plans, housing elements, environmental impact reports, negative declarations, initial studies, NEPA analyses, climate action plans, biological assessments, wetland delineations, and development projects throughout California, including multiple projects in Fresno County and the Central Valley.

2. KEY STAFF

FERNANDO SOTELO, TE, AICP
Project Manager

Fernando Sotelo, TE, AICP – Project Manager

Fernando Sotelo is a registered traffic engineer in California and a certified transportation planner. He has extensive experience in CEQA and the technical aspects of transportation planning, including travel demand forecasting, traffic impact analyses, and the preparation of transportation sections for EIRs for major projects such as general plan updates and specific plans. Fern
on the City of Clovis General Plan Update in 2014, coordinating with the transportation consultant for the preparation of the technical study and preparing the transportation analysis for the EIR. As project manager, Fernando will manage the consultant team, provide direction on technical work and deliverables, conduct quality control checks for analysis and deliverables, and lead communications with the City of Clovis's project manager.

- City of Clovis General Plan Update
- County of San Bernardino General Plan Update & EIR (including SB-743 metrics)
- City of Palo Alto General Plan Update & EIR (including VMT scenario evaluations and TDM metrics)

MIKE ARONSON, PE
Principal-in-Charge

Mike Aronson has over 30 years of experience in all aspects of transportation planning and traffic operations analysis. He has managed transportation studies for general plans, major corridor studies, rail transit extensions, Caltrans highway project development, and many types of development and master plans. In addition, Mike has led the development or updates of numerous travel demand models (including Fresno County, Kings County and several other counties in the San Joaquin Valley) and their use in estimating the effects of transportation demand management (TDM) measures. As Principal in Charge, Mike will provide oversight for the project team and ensure that deliverables meet the city's needs and the project remains on schedule.

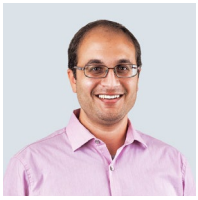
- Alameda County Transportation Commission Modeling On-Call and SB 743 Support
- Caltrans Transportation Analysis Framework
- Fresno COG Model Updates and On-Call Services

TIM ERNEY, AICP, PTP, CTP
Quality Control/Quality Assurance Manager

Tim Erney is a certified transportation planner with 22 years of extensive experience with planning and engineering projects throughout California. His primary focus has been on managing analyses and documentation for environmental review projects, access and circulation studies, sustainable transportation practices, TDM measures, parking evaluations, pedestrian and bicycle reviews, and data collection programs. In addition, he has done detailed technical analyses of local and regional roadway facilities, including traffic forecasting, modal split analyses, traffic diversion, and operational analyses. He has experience working with cities and other jurisdictions throughout California to implement

transportation analyses consistent with SB 743, including as part of citywide general plan updates and environmental impact reports. As Quality Control/ Quality Assurance Manager, Tim will support the project team in providing quality control/quality assurance overview of all work products.

- Orange County Transportation Authority (OCTA) SB 743 Support
- City of San Marcos General Plan Update & EIR (including SB 743 approach, traffic study guidelines, and TDM reduction tool)
- Fresno West Area Specific Plan EIR



MICHAEL SAHIMI, AICP
Transportation Planner

Michael Sahimi is a transportation planner experienced in traffic operations, environmental analysis, travel demand modeling and forecasting, circulation studies, and parking studies. He is also involved in active transportation, safety analysis, and transit planning. Michael's recent work in Orange and Los Angeles Counties includes providing guidance for local and regional jurisdictions in developing their approach to SB 743 compliance. Michael recently worked with travel demand modelers to prepare SB 743 recommendations for OCTA as the agency looks to provide guidance for local agencies in the county. He is currently providing assistance to the City of La Verne as the City is updating its General Plan, providing the City with sample VMT metrics, significance thresholds, and VMT screening maps to guide its SB 743 approach. He is also assisting the City of San Marcos in developing a comprehensive SB 743 approach as it undertakes its General Plan Update; Michael is involved in assisting the City with finalizing its SB 743 approach (including methodology and metrics), developing SB 743-compliant transportation impact analysis guidelines, and developing a TDM reduction calculator tool that is sensitive to conditions unique to the city.

- OCTA SB 743 Support
- City of La Verne General Plan Update & EIR (including SB 743 guidance)
- City of San Marcos General Plan Update & EIR (including SB 743 approach, traffic study guidelines, and TDM reduction tool)

MIAO GAO
Travel Demand Modeler

Miao Gao has applied her formal education in transportation planning and her strong analytical skills to the completion of projects across the US for numerous transportation agencies. Miao has eight years of experience including in travel demand modeling, long-range transportation planning, general plan updates, traffi simulation, operational analysis, and data analytics. She has utilized her experience with the OCTAM, SCAG and SANDAG travel demand models, as well as sketch VMT estimation and reduction tools, to develop VMT metric, significance thresholds and other guidance for multiple jurisdictions. Miao is also working with the City of San Marcos develop an approach to estimate VMT from a regional travel demand model, and how to utilize this information to support future development projects.

- Orange County Transportation Authority (OCTA) SB 743 Support
- City of San Marcos General Plan Update & EIR (including SB 743 approach, traffic study guidelines, and TDM reduction tool)
- City of La Verne General Plan Update & EIR

AARON ELIAS, PE
Transportation Engineer

Aaron Elias is a senior engineer with expertise in traffic operations, multimodal level of service, and environmental analysis. Aaron is currently serving as the project manager for the Dublin SB 743 VMT Implementation and Model Update and leading the transportation analysis efforts for the Fresno West Area Specific Plan. In addition, Aaron has experience in assessing transportation conditions to support technical studies and implementation of traffic study guidelines. Aaron is an expert on the application of the urban street facilities chapter of the Highway Capacity Manual (HCM), and has served on the Highway Capacity Subcommittee that oversees the pedestrian and bicycle chapters of the HCM.

- City of Dublin SB 743 VMT Implementation and Model Update
- Fresno West Area Specific Plan EIR
- Fresno Blackstone-Shaw Activity Center Study

BEN RITCHIE (DE NOVO)

Ben Ritchie is a founding principal at De Novo Planning Group with over 17 years of experience. Ben's expertise includes managing long range planning documents, completing complex and controversial CEQA documents, and facilitating community outreach and public communications efforts for the firm. Ben has extensive knowledge of CEQA and has assisted jurisdictions in drafting and updating their local CEQA implementation guidelines. He served as the Environmental Coordinator for the City of Rancho Cordova, where he oversaw the environmental planning division and the preparation of all CEQA documents prepared by staff and outside consultants. His experience includes a variety of land use, transportation, and sustainability projects throughout California.

- City of Lake Forest General Plan Update & EIR
- City of San Jacinto General Plan Update, Zoning Code Update, Climate Action Plan, and EIR
- Fresno West Area Specific Plan EIR

STEVE MCMURTRY (DE NOVO)

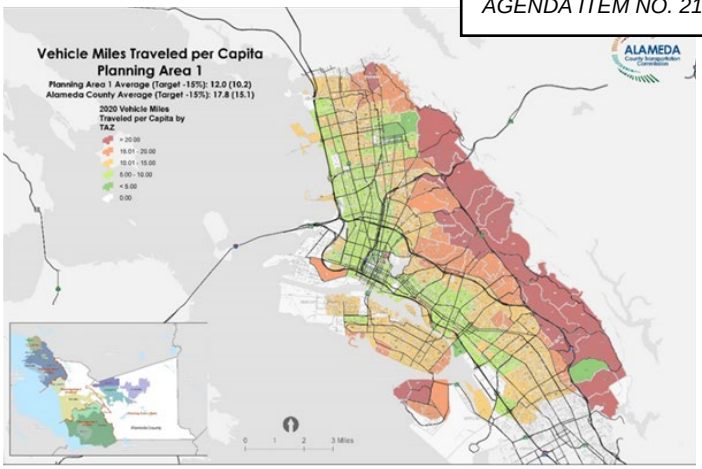
Steve McMurtry is a Principal with De Novo Planning Group and is responsible for project management, preparation of environmental documents, land use plans, air quality modeling, biological assessments, LESA modeling, regulatory permitting, litigation support, and expert witness testimony Steve's experience includes service in engineering and planning firms, as well as in the building industry. He has served as the project manager for thirteen RTP EIRs in California and is known as an expert in transportation environmental planning. He has successfully led multidisciplinary teams to complete hundreds of environmental, land use planning, and development projects in 32 California counties. Steve has extensive experience preparing environmental documents and obtaining regulatory permits for state and federally funded projects, including projects within the State Highway System. Because of his expertise, he has been called on for litigation support and expert witness testimony relative to environmental and CEQA issues .

- Ventana Specific Plan EIR, City of Merced
- Merced County 2014 RTP EIR, Merced County Association of Governments
- Family Entertainment Zone Master Plan EIR, City of Manteca

3. RELEVANT EXPERIENCE

Over the last 20 years, Kittelson has been conducting transportation/traffic impact studies throughout California, which have traditionally focused on intersection and roadway operations and the effect of a project on traffic flow conditions. With the passage of SB 743, however, most jurisdictions are unsure how to implement the new VMT requirements, in terms of methodology, significance criteria and data sources. Based on the firm's experiences, Kittelson has been retained to provide consulting services to cities and agencies to help understand SB 743 and to develop an implementation approach. Relevant projects related to implementation and application of SB 743 are provided below.

- Caltrans Transportation Analysis Framework & SB 743 Implementation
- Alameda CTC SB 743 VMT Mapping
- City of San Marcos General Plan Update & EIR
- City of San Mateo VMT Guidelines
- OCTA SB 743 Support
- City of Glendale General Plan & VMT SB 743 Update
- City of La Verne General Plan Update & EIR



- City of Colma General Plan & VMT Guidelines
- San Francisco - Various VMT Applications
- Oakland - Various VMT Applications

The following section provides detailed information on three relevant projects.

CALTRANS TRANSPORTATION ANALYSIS FRAMEWORK

BUDGET $218,223
CONTACT Robert Ferwerda, Caltrans, Robert.Ferwerda@dot.ca.gov, (916) 654-5672

Kittelson is preparing a transportation analysis framework for Caltrans that will provide district engineers and planners with the technical supporting information they need to determine how best to forecast the VMT, transit, and non-motorized impacts of projects on the State Highway System in compliance with SB 743. This work involves working closely with Caltrans management groups in the development of the framework document, the creation of case study projects demonstrating the application of the framework in real world conditions, and the development and delivery of training materials, workshops, and courses to Caltrans district personnel who will be implementing the framework.

ALAMEDA CTC MONITORING, ON-CALL, AND SB 743 SUPPORT

BUDGET $278,000
CONTACT Saravana Suthanthira, Alameda County Transportation Commission, (510) 208-7426

Kittelson has been the Alameda CTC on-call travel modeling consultant for over 10 years. In addition to providing modeling updates and assistance, Kittelson has supported Alameda CTC in assessing VMT across Alameda County, which is in turn used to support local jurisdictions' SB 743 efforts. Kittelson has prepared VMT maps of Alameda CTC's planning areas, showing levels of VMT per capita or per employee by TAZ using the countywide travel demand model. Kittelson is currently creating an associated online address and parcel lookup tool.

CITY OF SAN MARCOS GENERAL PLAN UPDATE & EIR

BUDGET $220,000
CONTACT Karen Brindley, Planning Manager, Planning Division, City of San Marcos, KBrindley@san-marcos.net, (760) 744-1050

Kittelson is developing the updated mobility element for this General Plan Update. For this effort, Kittelson will be providing additional transportation planning services, namely preparing new SB 743-consistent Transportation Impact Study Guidelines for the City and tools for SB 743-related analyses. Kittelson is assisting City staff in the preparation of updated TIS Guidelines, with methodologies and thresholds for the evaluation of VMT. In addition, City-specific significance thresholds, analysis methodologies and processes/procedures will be developed for the evaluation of new development and transportation projects. Kittelson is also designing and implementing an off-model VMT spreadsheet tool that can combine travel demand model-derived data with adjustments based on input factors that influence VMT.

4. PROJECT APPROACH

The following describes our approach to the project, which has been derived from the scope of work provided in the RFP.

TASK 1: PROJECT INITIATION

This task corresponds to Task A of the RFP. As a first step, Kittelson will meet with City staff in order to assess the City's preferences for certain decision points and to determine the priorities the City has for this project. As part of this kickoff meeting, Kittelson will work with City staff to confirm roles for City and consultant staff during the project, the scope of work and expectations, project goals, deliverables for each task, and details of the project schedule. Based on this meeting, a project work plan will be developed by Kittelson and distributed to City staff and the team.

Kittelson will coordinate with Fresno COG on behalf of the City to obtain preliminary analyses, results and recommendations derived from their ongoing SB743 Local Assistance Program and Regional Guidelines Development effort. Kittelson will provide an overview of the results and findings and potential implications for the City of Clovis. As part of the project initiation discussion, Kittelson will provide examples of SB 743 implementation conducted to date by other jurisdictions including Fresno COG, City of Fresno and others across the state such as WRCOG. The feedback received from the City during this session will help determine the next steps and the nature of the recommendations throughout this process.

Task 1 Deliverables:

- Memorandum on SB 743 implementation to date including Fresno COG's preliminary
- Project work plan

TASK 2: INTERIM VMT ANALYSIS GUIDE

This task includes elements of tasks B and C of the RPF. In this task, Kittelson will work with the City to prepare an interim analysis guide for staff and the public describing requirements for the preparation of transportation impact studies in the City of Clovis. Given the accelerated schedule to finalize this guidance prior to July 1, 2020, an interim guide will be prepared, which will be refined and finalized after completion of all tasks. The analysis guide will include recommendations for VMT analysis tools, include land use and transportation project VMT metrics and thresholds, provide VMT screening criteria that are sensitive to the City's context that can be used to screen out low VMT-producing projects, and mitigation measures to reduce VMT. The following summarizes the steps for the preparation of the interim analysis guide and to set methodologies and thresholds.

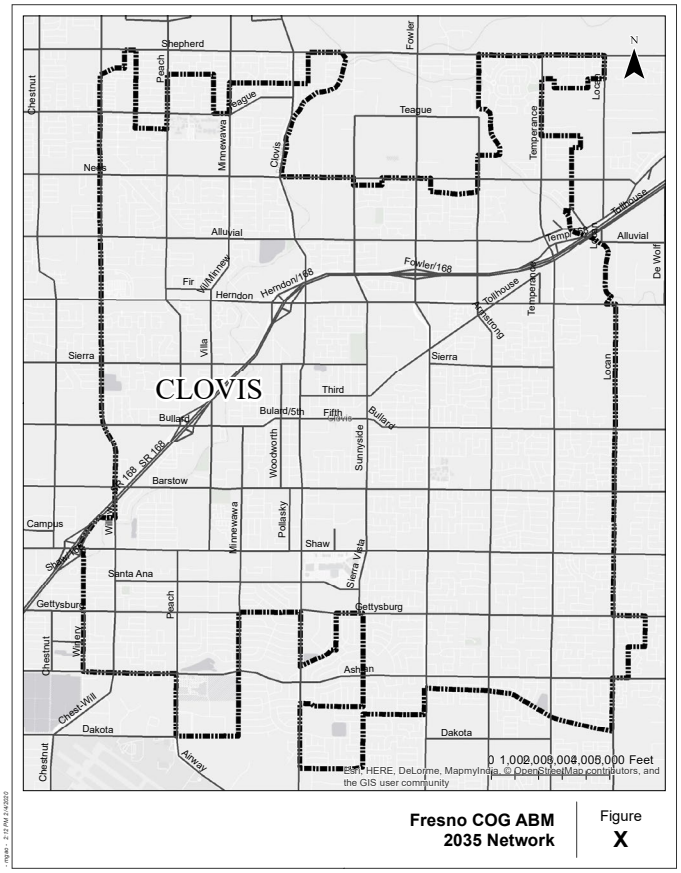
TASK 2.1: ESTABLISH METRICS AND THRESHOLDS

OPR provides jurisdictions with recommended VMT metrics and thresholds, as well as the baseline geographies to use for VMT comparisons. However, jurisdictions ultimately can decide their approach in order to reflect local conditions, provided it is based on substantial evidence. As such, Kittelson will utilize the Fresno COG model to provide the following information for land use projects:

- VMT averages at the city and county levels for comparison purposes
- VMT data for distinct areas of the City based on land use and transportation network patterns

Kittelson will document and recommend VMT metrics and geographies that the City can utilize in assessing land use projects. For example, based on the diversity of the City and the uniqueness of areas and planned projects to the northeast such as Heritage Grove, northwest such as Harlan Ranch and the southeast such as Loma Vista, Kittelson may recommend establishing a series of districts as the baseline comparison geography for projects as opposed to the entire city or county (similar to the approach taken by the City of Los Angeles).

In terms of the significance threshold, OPR recommends a 15% reduction from the baseline for residential and office projects, which may be difficult to achieve in some portions of the City. As such, Kittelson will provide recommended impact thresholds for different land uses and regions. To reflect the City's diverse sub-areas and to base VMT reduction thresholds on substantial local evidence, Kittelson will review VMT for distinct subareas in the City to determine realistic VMT reduction thresholds.



Fresno COG ABM 2035 Network | Figure **X**

KITTELSON & ASSOCIATES

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TASK 2.2: DEVELOP SCREENING CRITERIA

In its Technical Advisory, OPR provides suggestions that jurisdictions can utilize to screen out or exempt projects from undergoing CEQA VMT analysis. The proposed approach to each element is outlined below.

- **Map-based screening**: OPR recommends screening out projects in low-VMT TAZs. Based on the sub-area geographies selected in Task B1, we will utilize the travel demand model to produce maps of TAZs that exhibit low per capita and/or low per employee VMT.
- **Small projects**: OPR recommends exempting projects that generate fewer than 100 trips per day, which can be adjusted based on local conditions. We will utilize the model to test various trip thresholds to determine their effects on area VMT.
- **High-quality transit**: OPR recommends exempting projects within ½ mile of an existing major transit stop or existing stop along a high-quality transit corridor (with certain exceptions). We will produce maps of these areas in the city.
- **Local-serving retail**: OPR recommends exempting retail projects smaller than 50,000 square feet, since they are likely to be local-serving and reduce trip distances. Kittelson will confirm these thresholds for retail and other land uses (entertainment, recreation, etc...). During Task 3, we will utilize the travel model to test various project sizes to determine their effects on an area's VMT.

TASK 2.3: DEVELOP VMT MITIGATION MEASURES

Following the establishment of VMT methodologies and thresholds for land use and transportation projects in the City, Kittelson will work with the City to ensure that it has the appropriate tools to reduce the VMT impacts of projects. Primarily, this will be in the form of transportation demand mabnagement (TDM) measures. Utilizing resources such as the CAPCOA "Quantifying Greenhous Gas Mitigation Measures," Kittelson will review available TDM measures for addressing VMT-related impacts and will recommend measures that are applicable for the various areas in the City. The effectiveness of mitigation measures will be reviewed in the context of different areas in the City.

Task 2 Deliverables:

- Mapping of VMT per capita and per employee
- Memorandum and maps for recommended screening criteria,
- Metrics, geographies, and thresholds
- Draft and final Interim City of Clovis VMT Analysis Guide

TASK 3: CASE STUDIES AND DISCUSSION OF FUTURE PROGRAMMATIC APPROACHES

This task incorporates portions of Tasks C and D included in the RFP, and would be completed after the essential tasks described in Task 2 are completed for the July 2020 deadline.

Kittelson will coordinate with the City to identify up to ten (10) case studies of recent and future projects in different areas of the City indicative of localized land use patterns to inform the potential for screening, to assess the thresholds level, effectiveness of potential mitigation measures and the implications for developers and processing projects under CEQA.

De Novo will assist the project team as a CEQA advisor to provide advice on the implications of adopting new metrics and thresholds to process CEQA documents, opportunities to screen out and streamline project applications, and when to conduct updates to the VMT tool and these guidelines. De Novo will also assist with practical expertise in how the application of VMT metrics, thresholds and mitigation measures would affect the processing of land use projects under CEQA and in respect to legal defensibility.

As part of this task Kittelson will recommend future programmatic approaches to update the VMT-based metrics in future planning efforts such as General Plan Updates and also for opportunities to tier off transportation analysis from large scale EIRs for subsequent projects.

Kittelson and De Novo will also review the City's

current transportation fee program in order to determine if it should be updated from a trip-based fee to a VMT-based fee. Factors impacting this consideration will include, but not be limited to: whether the City plans to maintain a LOS methodology for non-CEQA purposes; the transportation improvements and mitigation measures linked to the fee; and the level and type of new development anticipated in the City. Kittelson will prepare a memo detailing these considerations and any recommended changes to the existing fee program. This scope would not establish the fees and calculations to determine them.

Task 3 Deliverables:

- Memorandum documenting the results of the case studies efforts
- Memorandum summarizing future programmatic approaches including transportation impact fee program

TASK 4: UPDATED VMT ANALYSIS GUIDE

Kittelson will refine the methodologies and thresholds and utilize the findings of the case studies to revise and finalize the transportation impact analysis (TIA) guidelines in coordination with the city. Kittelson will work with the City to determine whether the current LOS requirements are appropriate or if they should be revised to focus the traffic operations analysis at project driveways and the immediate vicinity of the project. As part of these changes, Kittelson recommends updates to the guidelines to incorporate requirements for non-automobile evaluations, including impacts to bicyclists, pedestrians and transit, and accommodation of passenger pick-ups/drop-offs and delivery vehicles. The final VMT analysis guide will be conducted after completion of Tasks 2 and 3.

Task 4 Deliverables:

- Draft and final updated City of Clovis VMT Analysis Guide

TASK 5: PROJECT MANAGEMENT, MEETINGS, AND HEARINGS

This task corresponds to Task E in the RFP.

To ensure that the project proceeds and deadlines are met, Kittelson will schedule and facilitate biweekly conference calls with relevant City staff. This scope also includes thress (3) in-person meetings, and two (2) public hearings.

OPTIONAL TASKS

OPTIONAL TASK O1: VMT USER TOOL

Kittelson will develop a user-friendly online tool to estimate VMT and mitigation effectiveness for projects in the city. This tool would display TAZ-level VMT information from the travel dem can be looked up based on the project's address or parcel number.

Kittelson will research adjustment factors based on state sources such as the CAPCOA "Quantifying Greenhous Gas Mitigation Measures" and factors used by other jurisdictions before incorporating adjustments into the online tool. Kittelson will also research thresholds used by other jurisdictions in determining the need for a full travel demand model run versus utilizing online VMT tools.

The VMT User Tool will combine the model-derived data with adjustments based on input factors that influence VMT such as location of the project, proposed development land uses, and project design and the effect of mitigation measures.

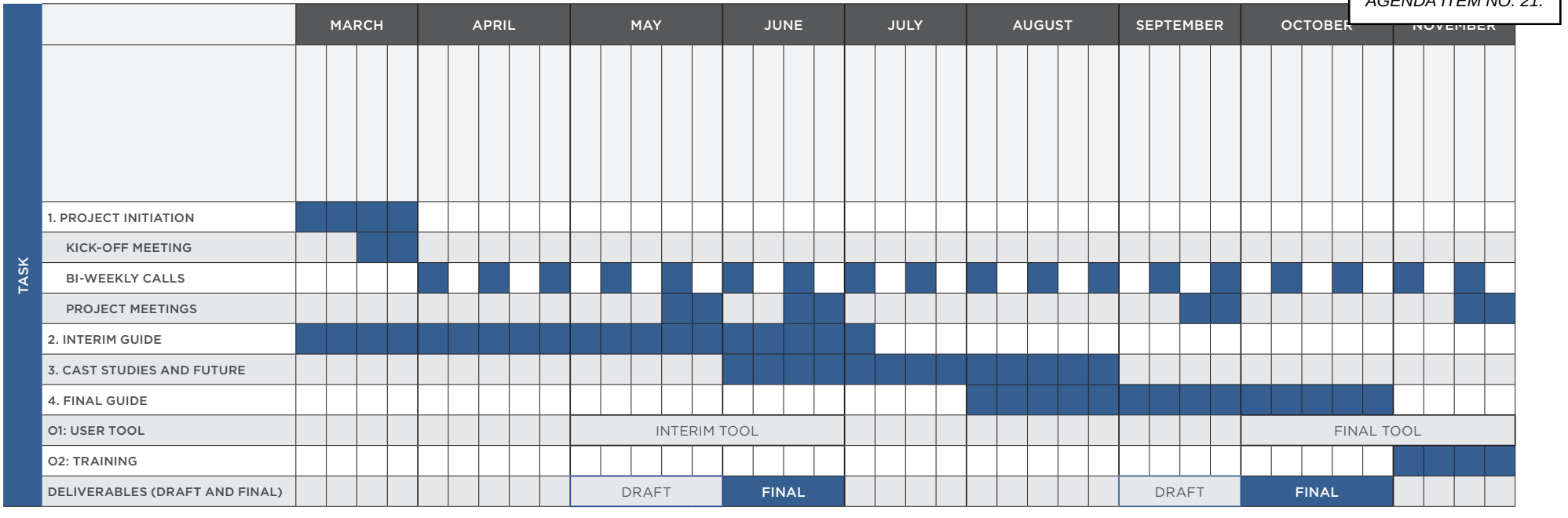
Deliverables

- Online tool incorporating mapping and adjustments

OPTIONAL TASK O2: STAFF AND DEVELOPER TRAINING

Under this task Kittelson will present the draft VMT tools and Guidelines in a workshop format with an electronic presentation, and possibly boards and handouts to train City staff and interest groups for conducting transportation studies using the VMT-based guidelines and VMT user tool. The City would facilitate the training by providing a venue and by conducting outreach efforts in preparation for the training session. For this scope it is anticipated that the training will be conducted over the course of one day for up to two sessions.

5. PROJECT SCHEDULE



Cost Summary

Project Name: Clovis SB743
Kittelson Project Manager: Fernando Sotelo
Kittelson Project Number: 24913
Date: 43866

		The Kittelson Team					
		Kittelson		De Novo		Totals	
	Task	Hours	Amount	Hours	Amount	Hours	Amount
1	Project Initiation	62	$11,420	0	$0	62	$11,420
2	Interim VMT Analysis Guide	230	$39,060	0	$0	230	$39,060
3	Case Studies and Discussion of Future Programmatic Approaches	130	$20,460	8	$1,400	138	$21,860
4	Updated VMT Analysis Guide	100	$17,320	12	$2,100	112	$19,420
5	Project Management, Meetings and Hearings	126	$30,640	8	$2,000	134	$32,640
	Contingency		$10,000		$0		$10,000
	TOTAL	648	$128,900	28	$5,500	676	$134,400

7. CONFLICTS OF INTEREST

Kittelson & Associates has been under contract to Costco to prepare traffic studies and traffic design plans for the Costco site in Clovis. To the best of Kittelson's knowledge, Kittelson has no financial, business, or other relationship with the City of Clovis or any other private parties doing business in the city that would constitute a conflict of interest with regard to this contract. Should the City have any questions or concerns, please contact Fernando Sotelo, Kittelson Associate Engineer, at fsotelo@kittelson.com or (714) 468-1186.

EXCEPTIONS

Kittelson has reviewed the City of Clovis's sample Consultant Services Agreement and Insurance Requirements and requests the City's consideration of the following proposed modifications if awarded this contract:

As a design professional, Consultant's professional liability coverage prohibits additional insureds under any circumstance. Accordingly, this coverage also bars any third-party, upfront defense. The policy will, however, reimburse indemnitees for those reasonable legal costs and expenses incurred as a result of the Consultant's liability as determined by a court of competent jurisdiction. As written the language in Section 18 of the City's sample agreement subjects the Consultant to uninsurable claims and defense costs. To ensure this language is consistent with the parameters of the Consultant's insurance professional and general liability insurance and that the City has benefit of said coverage, would the City be amenable to modifying this language as follows upon any contact award:

> 18. Indemnity and Defense. Consultant hereby agrees to indemnify, defend and hold the City, its officials, officers, employees, agents, and volunteers harmless from and against all claims, demands, causes of action, actions, damages, losses, expenses, and other liabilities, (including without limitation reasonable attorney fees and costs of litigation) of every nature: Arising out of or in connection with the alleged or actual tortious acts~~,~~ or; to the extent caused by the errors, omissions or negligence of Consultant or its subcontractors relating to the performance of Services described herein, unless the injuries or damages are the result of City's ~~sole~~ negligence or willful misconduct. Notwithstanding the foregoing and relative to professional liability claims, Consultant has no obligation to defend or pay City's defense costs incurred prior to a final determination of liability or to pay any amount that exceeds the proportionate share of Consultant's finally determined p[illegible] liability as determined by a court of competent jurisdiction.

Consultant and City agree that said indemnity and defense obligations shall survive the expiration or termination of this Agreement for any items specified herein that arose or occurred during the term of this Agreement.

Building Industry Association
of Fresno/Madera Counties, Inc.

March 26, 2021

Clovis City Council
1033 Fifth Street
Clovis, CA 93611

RE: Analysis of Vehicle Miles Traveled

Dear Councilmembers:

On July 1, 2020 tentative maps for new single-family subdivisions approved after that date became subject to the provisions of SB743 that requires a reduction from a baseline threshold for vehicle miles travelled (VMT). The City has analyzed data to arrive at a VMT baseline threshold for various parts of the City.

The City and the BIA have been cooperating to develop mitigation measures for implementation to reduce VMT to the baseline threshold. Based on discussion to date, most areas of the City where single-family subdivisions will be constructed are above the baseline threshold and will likely not achieve sufficient reduction with current measures.

The inability of home builders to mitigate the VMT for their projects will require each development to prepare an EIR to identify the projects impacts. This requirement is an expensive and time-consuming endeavor that will only add to the cost of housing, which will erode the affordability of homes in Clovis.

To address this issue, the BIA proposed, and the City Staff concurred, that the City begin the process to prepare a citywide analysis and environmental assessment to support changes to the Circulation Element of the City's General Plan. The BIA supports such actions that would achieve the completion of further analysis on the impacts of VMT and appropriate amendments to the Circulation Element. This process will identify lands within the City's General Plan that will be unable to achieve the baseline threshold for VMT and propose mitigation measures. The goal would be to create new implementable measures and a new development impact fee to support those measures.

If you have any question, please call me at (559) 226-5900.

Sincerely,

Michael Prandini
President & CEO

ATTACHMENT 4

KITTELSON & ASSOCIATES
750 THE CITY DRIVE, SUITE 410
ORANGE, CA 92868
P 714.468.1997

March 1, 2021 Project #: 249130

Mr. Ricky Caperton, AICP
Senior Planner
City of Clovis Planning Division
1033 Fifth Street
Clovis, CA 93612

RE: Supplemental EIR Scope

Dear Ricky,

Kittelson & Associates, Inc. (Kittelson) and De Novo Planning Group (De Novo) are providing a scope, schedule and budget for an amendment to the current Consultant Services Agreement for Vehicle Miles Traveled (VMT) Implementation Guidelines, Thresholds, and Mitigation Measures dated March 31, 2020. The amendment will provide the City of Clovis with a Supplemental Environmental Impact Report (SEIR) addressing proposed new General Plan transportation policies regarding VMT.

The attached sections provide the project background, scope of work, schedule and budget for the Supplemental EIR. Please call or e-mail if you have any questions. We look forward to continuing to help the City of Clovis resolve issues with the State of California requirements.

Sincerely,
KITTELSON & ASSOCIATES, INC.

Fernando Sotelo, P.E.
Project Manager

Michael N. Aronson, P.E.
Principal Engineer

ATTACHMENT 5

BACKGROUND

According to CEQA Guidelines section 15168, subdivision (c)(5), "[a] program EIR will be most helpful in dealing with later activities if it provides a description of planned activities that would implement the program and deals with the effects of the program as specifically and comprehensively as possible." Later environmental documents (EIRs, mitigated negative declarations, or negative declarations) can incorporate by reference materials from the program EIR regarding regional influences, secondary impacts, cumulative impacts, broad alternatives, and other factors (CEQA Guidelines Section 15168[d][2]). These later documents need only focus on new impacts that have not been considered before (CEQA Guidelines Section 15168[d][3]).

Section 15168(c), entitled "Use with Later Activities," provides, in pertinent part, as follows:

> Later activities in the program must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared:
>
> 1. If a later activity would have effects that were not examined in the program EIR, a new Initial Study would need to be prepared leading to either an EIR or a Negative Declaration. That later analysis may tier from the program EIR as provided in Section 15152.
> 2. If the agency finds that pursuant to Section 15162, no subsequent EIR would be required, the agency can approve the activities as being within the scope of the project covered by the program EIR, and no new environmental document would be required. Whether a later activity is within the scope of a program EIR is a factual question that the lead agency determines based on substantial evidence in the record. Factors that an agency may consider in making that determination include, but are not limited to, consistency of the later activity with the type of allowable land use, overall planned density and building intensity, geographic area analyzed for environmental impacts, and covered infrastructure, as described in the program EIR.
> 3. An agency shall incorporate feasible mitigation measures and alternatives developed in the program EIR into later activities in the program.
> 4. Where the later activities involve site specific operations, the agency should use a written checklist or similar device to document the evaluation of the site and the activity to determine whether the environmental effects of the operation were within the scope of the program EIR.

Generally, when a property owner submits applications for site-specific approvals (i.e., tentative maps, conditional use permits, or other discretionary entitlements), the City staff will review the applications for consistency with the General Plan. This consistency review ultimately determines whether the application for site specific approval is consistent with the General Plan, Conditions of Approval, and Mitigation Measures, and whether it is consistent with what was anticipated and analyzed in the program EIR. Often a City will conclude that most, or all, components of the site-specific application can be developed with no new analysis of environmental effects, or a focused analysis limited to the

environmental effects that could not be reasonably foreseen at the time the General Plan EIR was prepared.

These site-specific approvals may be narrowed pursuant to the rules for tiering set forth in CEQA Guidelines Section 15152. "'[T]iering is a process by which agencies can adopt programs, plans, policies, or ordinances with EIRs focusing on 'the big picture,' and can then use streamlined CEQA review for individual projects that are consistent with such…[first tier decisions] and are…consistent with local agencies' governing general plans and zoning.'" (Koster v. County of San Joaquin (1996) 47 Cal.App.4th 29, 36.) Section 15152 provides that, where a first-tier EIR has "adequately addressed" the subject of cumulative impacts, such impacts need not be revisited in second- and third-tier documents. Furthermore, second- and third-tier documents may limit the examination of impacts to those that "were not examined as significant effects" in the prior EIR or "[a]re susceptible to substantial reduction or avoidance by the choice of specific revisions in the project, by the imposition of conditions, or other means." In general, significant environmental effects have been "adequately addressed" if the lead agency determines that:

a) they have been mitigated or avoided as a result of the prior environmental impact report and findings adopted in connection with that prior environmental impact report; or
b) they have been examined at a sufficient level of detail in the prior environmental impact report to enable those effects to be mitigated or avoided by site specific revisions, the imposition of conditions, or by other means in connection with the approval of the later project.

Where a site-specific approval within the City warrants additional environmental review, there are several paths forward. This includes an EIR Addendum, a Mitigated Negative Declaration, or some form of Environmental Impact Report. The EIR Addendum and Mitigated Negative Declaration are two forms of CEQA review that are commonly prepared for small projects such as those identified in the CBIA concern. An EIR (including a Supplemental EIR), is a larger document, that includes a more extensive timeline and cost to prepare.

Based on the requirements of SB 743, the City of Clovis has developed new TIA Guidelines that adopt a VMT method of analysis on a go-forward basis. The City anticipates amending the General Plan to address this new method and establish the TIA Guidelines as a policy of the City. The General Plan Amendment is largely an administrative function to ensure that the General Plan is consistent with new legislative requirements, but it also functions to ensure that small projects that are otherwise consistent with the General Plan are able to utilize the rules for tiering set forth in CEQA Guidelines Section 15152 when they become subject to the City's new VMT methodology for traffic analysis.

The CEQA Guidelines provides that a Supplemental EIR must be prepared for a project if there is a new significant environmental effect or new information of substantial importance that was not known or could not have been known at the time the previous EIR was certified [CEQA Guidelines Sec 15162(c)]. Furthermore, the CEQA Guidelines provide that a Supplemental EIR may be prepared if the project has only minor revisions [CEQA Guidelines Sec 15162(c)].

The addition of the new policy in the General Plan requires a General Plan Amendment, albeit minor and serving mainly to respond to new state legislation. The addition/modification of policies in the GP since the last GP EIR was certified is considered "new information of substantial importance that was not known or could not have been known at the time the previous EIR was certified" under [CEQA Guidelines Sec 15162(c)], thus requiring a Supplemental EIR.

SCOPE OF WORK

The Kittelson/De Novo team will prepare a Supplemental EIR for the proposed project. While the Supplemental EIR will focus solely on the topic of Transportation, it will provide the information necessary to make the certified GP EIR adequate for the use under the tiering rules as revised with the supplemental information [CEQA Guidelines Sec. 15163(b)].

Task 1: Project Kickoff and Prepare NOP

The consultant team will have a kickoff conference call with the City staff to coordinate the information needs, schedule, etc. Information needed from City staff to begin Task 2 includes the land use assumptions to ensure that the Fresno COG Model and General Plan (GP) Land Use Map are consistent. This information will be used to prepare the Transportation section of the EIR.

De Novo will prepare an Initial Study and Notice of Preparation (NOP) for the EIR that will identify the potential environmental effects of the proposed project. Our scope of work anticipates that the project will not result in new significant impacts in any environmental topic areas with the exception of traffic/transportation and that the NOP will identify that these issues will not be addressed in the EIR at a detailed level.

De Novo will prepare the NOP for public circulation. At the direction of the City staff, we will provide the State Clearinghouse with a Notice of Completion, and NOP to begin the 30-day State review period. It is noted that the State Clearinghouse has adopted an electronic submittal process, and City staff will need to authorize De Novo staff to make submittals of these documents. Additionally, we will provide the City staff with a copy of the NOP for City staff to file with the County Clerk and a newspaper of regional circulation in Fresno County. The remaining copies will be provided to City staff.

Task 1 Deliverables:

- Up to twenty (20) copies and one (1) electronic version (MS Word and PDF) of the NOP

Task 2: Prepare an Administrative Draft Supplemental EIR

The consultant team will prepare the Supplemental EIR for the GP Amendment in an administrative draft form for the City staff to review. The Supplemental EIR will be intended to provide the information and environmental analysis necessary to assist public agency decision-makers in considering approval of the GP Amendment.

The EIR will focus on the potentially significant environmental effects that may result from changes or modifications to the GP Amendment, as well as the new information that was not available at the time that the previous environmental document was prepared. We anticipate the changes being minor, and focusing on the VMT Guidelines, and VMT methodology needed for projects under the General Plan following the SB 743 guidance. We will focus the supplemental analysis to this single topic. A discussion

of the other environmental topics will be limited to a brief explanation of why those effects are adequately addressed in the previously certified GP EIR. Each section will include GIS graphics and figures as necessary to create an easy to comprehend document that is user-friendly.

The EIR will consist of the following sections:

Executive Summary

This section will provide a concise description of the GP Amendment, the potential areas of controversy, issues to be resolved, project alternatives, and a summary of impacts and mitigation measures. The intent of this section is to provide City staff and the public with a simple and easy to understand overview of the project and related issues, which will be analyzed and discussed much more thoroughly in the contents of the EIR.

Introduction

The Introduction will serve as an overview of the EIR, describing its purpose and relevant environmental review procedures, the document organization, and the methodology used.

Project Description

The Project Description section will consist of a detailed description of the GP Amendment, including the proposed action, the project goals and objectives, and the relationship of the GP Amendment to other regional plans and projects. This section will also present the City's, and other agency involvement in the project, and the use of the EIR by other agencies, including permits and approvals. This section will be consistent with the requirements of State CEQA Guidelines Section 15124 and will provide a clear picture of "subsequent projects" under the GP Amendment, including short-term and long-term projects.

Environmental Setting, Impacts, and Mitigation Measures

The Environmental Setting, Impacts, and Mitigation Measures section will present a detailed discussion of each individual environmental topic. Each discussion will include the following:

- An environmental setting and environmental baseline conditions (including figures and GIS graphics);
- The applicable local, state, and federal regulatory setting;
- The threshold of significance used for each impact determination;
- The methodology used for conducting the environmental analysis and making significance determinations;
- An analysis of direct and indirect significant impacts associated with the project;
- An analysis of direct and indirect significant impacts associated with implementation of the project alternatives;
- An analysis of the cumulative impacts associated with the project and the project alternatives;
- Identification of mitigation measures to reduce impacts; and
- A determination of the significance of each impact after mitigation.

Transportation and Circulation

The primary environmental impact analysis will focus on transportation and circulation. The following subtasks will provide the transportation analysis.

Subtask 2.1: Land Use Forecast

Kittelson will coordinate with city staff to confirm the future land uses to be evaluated consistent with the current General Plan land use map. Key decisions will include:

- Determine if the analysis should include full potential buildout of the General Plan, or a constrained horizon year growth forecast for a specific year such as 2035 or 2042.
- Confirm quantification assumptions for areas designated for Specific Plans and/or mixed-use development.

Kittelson will obtain the current files for the Fresno Council of Governments (COG) travel model. Kittelson will review the land uses assumed in the current Fresno COG travel model forecasts as used for the approved 2018 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). These land uses will be compared to the Clovis General Plan land uses and modified as needed.

Subtask 2.1 Deliverables:

- Draft tables and maps showing General Plan land use forecast assumptions
- Memorandum documenting final adjusted land use forecasts

Subtask 2.2: Travel Forecasts

Kittelson will coordinate with COG staff to update the land use inputs for the travel model. Kittelson will run the model to prepare forecasts representing the Clovis General Plan. The VMT values will be compiled in terms of total VMT, VMT per capita and VMT per employee for each transportation analysis zone (TAZ).

Subtask 2.2 Deliverables:

- Listing of forecast VMT statistics by TAZ

Subtask 2.3: VMT Evaluation

The travel forecasts will be used to evaluate VMT in each area of Clovis. The VMT will be compared to regional averages for both base year (2019) conditions and future conditions. Kittelson will prepare maps of base year and future year VMT per capita and per employee.

Subtask 2.3 Deliverables:

- Maps of base year and future year VMT per capita and per employee by TAZ

Subtask 2.4: Transportation Documentation

Kittelson will provide an evaluation of transportation impacts and mitigation measures relative to the city's selected VMT policies. The evaluation will include all items in the California Environmental Quality Act (CEQA) checklist for transportation impacts. The documentation will be provided in a format consistent with the overall EIR format as inputs to the Administrative Draft EIR.

Subtask 2.4 Deliverables:

- Transportation section of Administrative Draft EIR

Cumulative Impact Summary

The consultant team will analyze the environmental impacts of the GP Amendment when viewed in combination with other known, approved, or reasonably foreseeable projects in the region. The cumulative analysis will address each topic covered in the environmental analysis and will identify appropriate mitigation measures for any significant impacts identified. This cumulative analysis will be based on a list of known projects in the region as well as forecasts from the County, the incorporated Cities, and the State.

Report Preparers and References

This section will provide a list of all persons, agencies, and references used to prepare the EIR.

Task 2 Deliverables:

- One (1) electronic version (MS Word and PDF) of the Administrative Draft EIR.

Task 3: Revise/Prepare Public Draft EIR

Comments received from City staff regarding the Administrative Draft EIR will be incorporated into the Draft EIR for public circulation. The consultant team will prepare a Draft EIR for public circulation and will prepare a Notice of Availability (NOA). At the direction of the City staff, De Novo will provide the State Clearinghouse with a Notice of Completion, and Notice of Availability to begin the 45-day State review period. It is noted that the State Clearinghouse has adopted an electronic submittal process, and City staff will need to authorize De Novo staff to make submittals of these documents. Additionally, we will provide the City staff with a copy of the NOA for City staff to file with the County Clerk and a newspaper of regional circulation in Fresno County. The remaining copies will be provided to City staff.

Task 3 Deliverables:

- Up to twenty (20) copies and one (1) electronic version (MS Word and PDF) of the Public Draft EIR and NOA

Task 4: Prepare Administrative Draft Final EIR

Upon completion of the public review period, the consultant team will prepare a written response to the public comments, and where necessary the appropriate revisions will be made to the EIR text. Any additional text will be marked in underline format and any deleted text will be marked in ~~strikeout~~ format. All responses will be prepared pursuant to Section 15088 of the State CEQA Guidelines and provided to City staff for review.

We anticipate 15 or fewer comment letters, one to three pages in length. Excessively long comment letters, or those that are complicated and require a significant effort and/or additional analysis to respond to are considered outside the scope of work and cost estimate.

Task 4 Deliverables:

- One (1) electronic version (MS Word and PDF) of the Administrative Draft Final EIR

Task 5: Revise/Prepare Final EIR

Comments received from City staff regarding the Administrative Draft Final EIR will be incorporated into the Final EIR for public circulation. The consultant team will prepare a Final EIR and will provide it to City staff for printing and distribution. Representatives of the consultant team will attend a City Council hearing for consideration of project approval.

Upon completion of the Final EIR, our team will prepare a Mitigation Monitoring and Reporting Program (MMRP) pursuant to Section 21081.6 of the Public Resources Code. The MMRP will consolidate information contained in the environmental analysis, including the specific mitigation measure, the party responsible for implementation, the party responsible for monitoring, the time frame for implementation, and a section for confirmation of implementation.

Task 5 Deliverables:

- Twenty (20) copies and one (1) electronic version (MS Word and PDF) of the Final EIR and MMRP

Task 6: Findings of Fact/ Overriding Considerations

De Novo will prepare the required CEQA Findings of Fact and Statement of Overriding Considerations pursuant to requirements of Sections 15091 and 15093 of the State CEQA Guidelines. These findings shall be prepared using a format consistent with City of Clovis formatting, and will be a simple update to the CEQA Findings of Fact and Statement of Overriding Considerations that were adopted as part of the General Plan Update EIR. The intent is to replace the section that addressed traffic impacts utilizing the LOS method, with the new VMT method. It is anticipated that the conclusion of Significant and Unavoidable would remain the same in the Findings of Fact, and that this would require a Statement of Overriding Considerations. We will provide the Findings document to City staff for an administrative

review. Comments received from staff regarding the Administrative Findings will be incorporated into a final version of the Findings for use by the City at the public hearings.

Task 6 Deliverables:

- Administrative Draft and Final Findings of Fact and Statement of Overriding Considerations

Task 7: Attendance at Planning Commission/City Council Meetings

Representatives of the consultant team will attend up to two (2) public hearings, which includes a Planning Commission and City Council hearing. The consultant team will be responsible for preparing any exhibits that may be necessary for display at these meetings, presentations, and responses to public comment. We anticipate that the consultant team members will not travel for each meeting, but instead that the attendance will be through a video call.

Task 7 Deliverables:

- Consultant participation in two (2) public hearings

Task 8: Notice of Determination

Upon certification of the EIR, De Novo will prepare a Notice of Determination for filing with the State Clearinghouse. The City will be responsible for paying the CDFW filing fees, which are approximately $3,445.25. The City will also be responsible for paying the Clerk fee, which is typically $50.

Task 8 Deliverables:

- One (1) electronic copy of the NOD.

Task 9: Project Management

This task involves coordination with the consultant team and City staff, as well as the administrative duties associated with project management, accounting, and invoicing. In order to ensure that the project stays on track and within budget, we will hold bi-weekly conference calls with City staff. Representatives of the consultant team will also attend two public meetings, the scoping meeting and City Council hearing to consider adoption of the project.

SCHEDULE

The project schedule is shown in the following table.

Project Task	*Time Period (days)*	*Start*	*Finish*
Task 1: Project Initiation and NOP			
Kickoff Call	1	1-Mar-21	2-Mar-21
Draft Project Description	5	2-Mar-21	7-Mar-21
Staff Administrative Review	*5*	*7-Mar-21*	*12-Mar-21*
Prepare Revised Project Description	2	12-Mar-21	14-Mar-21
Prepare Initial Study/NOP	7	7-Mar-21	14-Mar-21
Staff Administrative Review	*7*	*14-Mar-21*	*21-Mar-21*
Complete Public NOP	2	21-Mar-21	23-Mar-21
Staff Screencheck Review	*1*	*23-Mar-21*	*24-Mar-21*
Statutory 30-day Public Review Period	30	24-Mar-21	23-Apr-21
Public Scoping Meeting	1	TBD	TBD
Task 2: Prepare Admin Draft EIR			
VMT Analysis (need to start at kickoff)	105	1-Mar-21	14-Jun-21
Administrative Draft EIR	115	1-Mar-21	24-Jun-21
Staff Administrative Review of Draft EIR	*7*	*24-Jun-21*	*1-Jul-21*
Task 3: Revise/Prepare Public Draft EIR			
Screen-check Draft EIR/VMT analysis revisions	14	1-Jul-21	15-Jul-21
Staff Screencheck Review of Draft EIR	*1*	*15-Jul-21*	*16-Jul-21*
Complete Public Draft EIR	5	16-Jul-21	21-Jul-21
Statutory 45-day Public Review Period	***45***	***21-Jul-21***	***4-Sep-21***
Task 4: Prepare Admin Final EIR			
Complete Administrative Final EIR	7	4-Sep-21	11-Sep-21
Staff Administrative Review	*7*	*11-Sep-21*	*18-Sep-21*
Task 5: Revise/Prepare Final EIR			
Screen-check Final EIR and MMRP	7	18-Sep-21	25-Sep-21
Staff Screencheck Reviewof Final EIR	*1*	*25-Sep-21*	*26-Sep-21*
Complete Final EIR and MMRP	2	25-Sep-21	27-Sep-21
Send Final EIR to all Commentors	2	27-Sep-21	29-Sep-21
Task 6: Findings of Fact/Overriding Considerations			
Admin Findings / Overriding Considerations	7	29-Sep-21	6-Oct-21
Staff Review Findings / Overriding Considerations	*7*	*6-Oct-21*	*13-Oct-21*
Complete Findings / Overriding Considerations	7	13-Oct-21	20-Oct-21
Task 7: Public Hearings for Draft EIR			
Public Hearing	1	TBD	TBD
Task 8: Notice of Determination			
Complete Administrative NOD	1	TBD	TBD
Staff Administrative Review	*1*	*TBD*	*TBD*
File NOD with SCH/County Clerk	1	TBD	TBD

BUDGET

The project budget is listed in the following table.

Project Task	*Kittelson*	*De Novo*	*Total*
Task 1: Project Initiation and NOP	$1,700	$5,550	$7,250
Task 2: Prepare Admin Draft EIR		6,435	
2.1: Land Use Forecast	*17,280*		
2.2: Travel Forecasts	*11,560*		
2.3: VMT Analysis	*7,140*		
2.4: Transportation Section	*11,060*		
Task 2 Subtotal	*$47,040*	*$6,435*	*$53,475*
Task 3: Revise/Prepare Public Draft EIR	4,460	3,350	7,810
Task 4: Prepare Admin Final EIR	1,010	5,585	6,595
Task 5: Revise/Prepare Final EIR	850	1,320	2,170
Task 6: Findings of Fact/Overriding Considerations		2,530	2,530
Task 7: Public Hearings for Draft EIR	2,050	1,200	3,250
Task 8: Notice of Determination		650	650
Task 9: Project Management	4,030	2,925	6,955
TOTAL	**$61,140**	**$29,545**	**$90,685**

RESOLUTION 21-___

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CLOVIS AUTHORIZING THE CITY MANAGER TO EXECUTE AN AMENDMENT TO AN EXISTING CONSULTANT AGREEMENT WITH KITTLESON AND ASSOCIATES, INC. FOR SERVICES RELATED TO VEHICLE MILES TRAVELED ANALYIS AND ENVIRONMENTAL REVIEW PURSUANT TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

WHEREAS, the City hired a consultant to prepare local Vehicle Miles Traveled ("VMT") implementing procedures ("Guidelines"); and

WHEREAS, the City has an existing consultant agreement with Kittelson and Associates, Inc. for services related to VMT, executed on March 31, 2020 (**Attachment 3**); and

WHEREAS, the City desires to expand upon the original scope of the agreement, which will result in additional costs, thus necessitating a contract amendment to complete the VMT analysis; and

WHEREAS, the City's consultant provided a scope and budget amendment (**Attachment 5**) reflecting additional services requested by the City; and

WHEREAS, the Guidelines provide for the orderly and consistent implementation of the General Plan in accordance with CEQA and SB 743.

NOW, THEREFORE, BE IT RESOLVED, that the City of Clovis Council authorizes the City Manager to sign the amendment to the existing consultant agreement between the City of Clovis and Kittelson and Associates, Inc., reflecting the scope and budget amendment attached hereto as **Attachment 5** addressing additional services needed to complete an analysis of VMT.

The foregoing resolution was introduced and adopted at a regular meeting of the City Council of the City of Clovis held on April 5, 2021, by the following vote, to wit:

AYES:
NOES:
ABSENT:
ABSTAIN:

DATED: April 5, 2021

_____ _____
Mayor City Clerk

ATTACHMENT 6

RESOLUTION 21-____

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CLOVIS AUTHORIZING INITIATION OF AN AMENDMENT TO THE CIRCULATION ELEMENT OF THE 2014 CLOVIS GENERAL PLAN BY CITY STAFF

WHEREAS, the City of Clovis Planning and Development Services requests the City of Clovis City Council to direct staff to initiate an amendment to the Circulation Element of the 2014 Clovis General Plan; and

WHEREAS, upon authorization from the City Council, City staff will initiate an amendment to the Circulation Element of the 2014 Clovis General Plan as it relates to Vehicle Miles Traveled, and present any staff recommendations for policy updates, additions, deletions, and/or other modifications to the Circulation Element for City Council consideration at a later date; and

WHEREAS, the City Council finds merit in considering an amendment to the Circulation Element of the 2014 Clovis General Plan; and

NOW, THEREFORE, BE IT RESOLVED, that the City of Clovis Council authorizes staff to initiate an amendment to the Circulation Element of the 2014 Clovis General Plan for recommended policy updates related to Vehicle Miles Traveled.

* * * * *

The foregoing resolution was introduced and adopted at a regular meeting of the City Council of the City of Clovis held on April 5, 2021, by the following vote, to wit.

AYES:
NOES:
ABSENT:
ABSTAIN:

DATED: April 5, 2021

_____ Mayor

_____ City Clerk

ATTACHMENT 7

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: General Services

DATE: April 5, 2021

SUBJECT: Consider Approval – Res. 21-___, Approving the Contract for Harold Eidal as a Contract Extra Help Business Workflow Analyst in Accordance with Government Code Section 21224.

Staff: Lori Shively, Personnel/Risk Manager
Recommendation: Approve

ATTACHMENTS: 1. Resolution

CONFLICT OF INTEREST
None.

RECOMMENDATION
Staff recommends that the City Council approve the contract of Harold Eidal, a CalPERS retired annuitant, in accordance with Government Code Section 21224 as a Contract Extra Help Business Workflow Analyst to perform duties related to EnerGov Regulatory Application System and the City GIS system.

EXECUTIVE SUMMARY
Staff requests authority to hire a retired annuitant, Harold Eidal, per Government Code Section 21224. The retired CalPERS annuitant will be hired for a limited duration, not to exceed one year, to fulfill the need for an experienced EnerGov Regulatory Application System and City GIS system user.

BACKGROUND
On February 10, 2021, the City's GIS Analyst resigned and the current Business Workflow Specialist, who currently performs the GIS process, is leaving on April 15, 2021. Harold Eidal previously worked for the City of Clovis for 13 years and implemented the City's EnerGov Business Workflow System in 2010. Mr. Eidal is also familiar with the City GIS system and how to integrate into EnerGov, along with being intimately familiar with the process and fees and constructed workflows for Building, Engineering and Fire.

Mr. Eidal will be hired for a limited duration while the City conducts a recruitment for the full-time Business Workflow Analyst. This will allow the department to decrease the current backlog. Mr. Eidal has the necessary skills since he is familiar with the City GIS system and how each of the systems integrate.

FISCAL IMPACT

Due to the vacancy of the GIS Analyst and Business Workflow Specialist, and the timeline to recruit for a Business Workflow Specialist and a Business Workflow Analyst, there is sufficient funding in the FY 2021-2022 Salary section budget.

REASON FOR RECOMMENDATION

By adopting this resolution, the City Council will provide for the compliance with established guidelines during the building and land management process as outlined by California State Law or local policy in an immediate and urgent way. Mr. Eidal, being familiar with EnerGov Regulatory Application System and the City GIS system, will be able to provide services that no other current City staff has the time and skills for, as well as the ability to train the incumbents.

Government Code Section 21224 allows local agencies to reinstate CalPERS retirees to a vacant position or as extra help where the work performed is of limited duration and the retiree is to perform tasks such as the elimination of backlogs, limited term special project work, or to do work in excess of what regular permanent staff can do. Until a new full-time Business Workflow Analyst with the proper qualifications can be recruited and complete the hiring process, Harold Eidal will fill the vacant position as an extra help employee for a limited duration of not more than one additional year. He will not exceed the 960-hour threshold for retired annuitants established by CalPERS.

ACTIONS FOLLOWING APPROVAL

Staff will execute the employment contract with the retired annuitant, Harold Eidal, which will be effective starting April 12, 2021 through April 11, 2022. The extension will terminate no later than April 11, 2022.

Prepared by: Lori Shively, Personnel/Risk Manager

Reviewed by: City Manager 

RESOLUTION 21-___

RESOLUTION OF THE CITY OF CLOVIS APPROVING A CONTRACT FOR A RETIRED ANNUITANT Government Code Section 21224

WHEREAS, the City Council for the City of Clovis hereby authorizes the contract employment from the time period of April 12, 2021 through April 11, 2022 for Harold Eidal as an extra help retired annuitant to perform the duties related to EnerGov Regulatory Application System and the City GIS system, for the City of Clovis under Government Code section 21224; and

WHEREAS, the Planning and Development Services Department is responsible for ensuring compliance with established guidelines during the building and land management process as outlined by California State Law or local policy. Harold Eidal previously worked for the City of Clovis as a contract Administrative Analyst in the Planning and Development Services Department for 13 years and implemented the City's EnerGov Business Workflow System in 2010; is familiar with the City GIS system and how to integrate into EnerGov; intimately familiar with process and fees, and constructed workflows for Building, Engineering, and Fire; and

WHEREAS, the current Business Workflow Specialist, who currently performs the GIS process, is leaving on April 15, 2021 and the Planning and Development Services Department needs someone to fill the position immediately; and

WHEREAS, the City will continue conducting a recruitment for a Business Workflow Analyst and Business Workflow Specialist. The contract will allow time to complete the recruitment and train the incumbents. The required EnerGov Regulatory Application System and GIS duties need to be performed and the Planning and Development Services Department does not have anyone who can complete this required work; and

WHEREAS, the employment agreement is effective April 12, 2021 through April 11, 2022 in order to give Harold Eidal time to train the incumbents. The employment agreement effective April 12, 2021 between Harold Eidal and the City of Clovis has been reviewed by this body and is attached as Attachment A of Attachment 1 to this resolution; and

WHEREAS, no matters, issues, terms or conditions related to this employment and appointment have been or will be placed on the consent calendar; and

WHEREAS, the employment shall be limited to 960 hours per fiscal year and limited to one year in duration or until the recruitment and training of a new Business Workflow Analyst and Business Workflow Specialist are completed, whichever comes first; and

WHEREAS, the compensation paid to retirees cannot be less than the minimum nor exceed the maximum monthly base salary paid to other employees performing comparable duties, divided by 173.333 to equal the hourly rate; and

WHEREAS, there is a sudden vacancy, a current recruitment is underway, and an appointment is necessary to ensure compliance with established guidelines during the building and land management process. The maximum base salary for a position with this expertise is $8,568 per month and the hourly equivalent is $49.43. The minimum base salary is $7,049 per month and the hourly equivalent is $40.67; and

WHEREAS, Harold Eidal has not and will not receive any other benefit, incentive, or compensation in lieu of benefit or other form of compensation in addition to this hourly pay rate.

NOW, THEREFORE, BE IT RESOLVED, that the City Council for the City of Clovis hereby certifies the nature of the appointment of Harold Eidal as described herein and detailed in the attached employment agreement document. This appointment is necessary to ensure compliance with established guidelines during the building and land management process for the Planning and Development Services Department until the recruitment and training process for a Business Workflow Analyst, which there is no other current City staff with the time and skills for the position(s), is complete.

* * * * *

The foregoing resolution was introduced and adopted at a regular meeting of the City Council of the City of Clovis held on April 5, 2021 by the following vote, to wit:

AYES:
NOES:
ABSENT:
ABSTAIN:

DATED:

_____ _____

Mayor City Clerk

ATTACHMENT 1

AT WILL EMPLOYMENT AGREEMENT
Between the City of Clovis and Harold Eidal
April 12, 2021

The City of Clovis hereinafter referred to as CITY, and **Harold Eidal**, hereinafter referred to as EMPLOYEE, in consideration of the promises made herein, agree as follows:

TERM

The CITY shall employ EMPLOYEE to work in the position of Business Workflow Analyst with the City of Clovis on an at-will contract basis from April 12, 2021 through April 11, 2022. This contract may be terminated at any time without prior notice by either party, however the City requests EMPLOYEE to provide a two-week notice prior to his termination of the contract.

EMPLOYMENT STATUS AND REPORTING RELATIONSHIP

During the term of the agreement, the EMPLOYEE is classified as an at-will employee who may be terminated or resign for any reason. During the term of this agreement, EMPLOYEE will report to the Planning and Development Administrative Manager. The EMPLOYEE is not represented by a bargaining unit and this contract does not provide any rights other than those specifically provided in this agreement.

DUTIES

Provides technical assistance and serves as the department business workflow analyst for the regulatory application and workflow systems for permits, plan review, licensing, and code compliance; performs analysis of processes to evaluate and recommend methods to continuously improve procedures, services, and systems; performs workflow analysis and implements improvements to procedures, services, and systems; defines SQL requirements; develops and maintains reports designed to aid in management of procedures, services, and systems including Crystal Reports; provides systems assistance to staff in problem resolution; test and implement new versions and current systems; gather information for procedural and user documentation, manuals, forms and supporting materials; provides training and system documentation to new and current staff; additional duties related to GIS consultation, training/onboarding/and supervision of new staff; and performs related duties as required.

COMPENSATION AND BENEFITS

In exchange for the performance of the above services, CITY agrees to compensate EMPLOYEE during the period of the contract as follows:

Salary: The EMPLOYEE will earn an hourly salary of $49.43. It is anticipated that EMPLOYEE will work up to 20 hours per week.

Retirement: CITY and EMPLOYEE will not pay into the CalPERS program. As a CalPERS retired annuitant, EMPLOYEE will not work more than 960 hours in the fiscal year.

Workers Compensation: The CITY provides workers' compensation benefits as required by law. The CITY and the EMPLOYEE contribute the required percentage for Medicare. The EMPLOYEE pays into State Disability Insurance.

HOLIDAYS

The EMPLOYEE will not be compensated for any holidays observed by the CITY.

VACATION/SICK LEAVE

The EMPLOYEE will not be provided with any paid vacation or sick leave.

GENERAL PROVISIONS

This agreement shall become effective upon execution by all parties and supersedes any and all previous employment agreements between the EMPLOYEE and the CITY. The text herein shall constitute the entire agreement between the parties. It shall be binding upon and inure to the benefit of the heirs at law and executors of the EMPLOYEE.

Venue for any litigation resulting from litigation to enforce any provision of or resulting from this agreement or the at will employment relationship herein established, is specifically agreed and declared by both parties to be in the Superior Court of Fresno County, California, or the United States District Court, Eastern District located in Fresno, California.

This Agreement represents the total and complete understanding of the parties regarding the subjects set forth herein. Any other oral understandings or other prior understandings shall have no force or effect. This Agreement shall supersede any and all prior agreements between the parties regarding the subject of this Agreement.

This Agreement cannot be changed or supplemented orally and may be modified or superseded only by a written instrument executed by both parties.

In the event any term or provision of this Agreement is declared to be invalid or illegal for any reason, this Agreement will remain in full force and effect and will be interpreted as though such invalid or illegal provision was not a part of this Agreement. The remaining provisions will be construed to preserve the intent and purpose of this Agreement and the parties agree to negotiate in good faith to modify any invalidated provisions to preserve each party's anticipated benefits.

CITY	**EMPLOYEE**
_____	_____
Luke Serpa, City Manager	Harold Eidal, Business Workflow Analyst
_____	_____
Date	Date

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Administration

DATE: April 5, 2021

SUBJECT: Consider Approval – Reappointment of Planning Commissioner

Staff: Luke Serpa, City Manager
Recommendation: Approve

ATTACHMENTS: None

CONFLICT OF INTEREST
None.

RECOMMENDATION
It is recommended that the Mayor, subject to approval by the City Council, consider the reappointment of Brandon Bedsted to the Planning Commission. The reappointment is for a four-year term of office which would expire in May of 2025.

EXECUTIVE SUMMARY
Planning Commissioner Brandon Bedsted, whose term of office expires in May of 2021, has requested to be reappointed. The Mayor is recommending that the Planning Commissioner be reappointed.

BACKGROUND
Planning Commissioner Brandon Bedsted has requested to be reappointed. Upon review and recommendation from staff, the Mayor is recommending that he be reappointed for another four-year term.

FISCAL IMPACT
None.

REASON FOR RECOMMENDATION
Pursuant to Clovis Municipal Code Chapter 9.1, the Mayor, with the approval of the City Council, shall make appointment to the Planning Commission.

ACTIONS FOLLOWING APPROVAL
Staff will inform the appointed Planning Commissioner of the action taken by the City Council.

Prepared by: Jacquie Pronovost, Executive Assistant

Reviewed by: City Manager

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Administration

DATE: April 5, 2021

SUBJECT: Consider Approval – Various City Council Committee Appointments.

Staff: Luke Serpa, City Manager
Recommendation: Approve

ATTACHMENTS: 1. City Council Committee Appointments List

CONFLICT OF INTEREST
None.

RECOMMENDATION
That the Mayor consider appointments to the City Council committee assignments to distribute and fill vacancies.

EXECUTIVE SUMMARY
Because of the reorganization of the City Council, committee appointments are needed by the current Mayor in the restructuring of the committees.

BACKGROUND
There are a number of Council committee appointments that are periodically made by the Mayor and reviewed from time to time. There are several vacancies created by the reorganization of the City Council. Please see **Attachment 1** which is a list of the committee appointments highlighted in yellow that need to be reappointed. The purpose and description of these committees are also provided.

REASON FOR RECOMMENDATION
Various appointments to committees need to be reviewed from time to time and when vacancies occur. Appointments should be made in a timely fashion to allow for continuity of representation on all committees.

ACTIONS FOLLOWING APPROVAL
Staff will notify the appropriate agencies of such appointments and take whatever further actions are needed, as directed by the Mayor and City Council.

Prepared by: Jacquie Pronovost, Executive Assistant

Reviewed by: City Manager

CITY COUNCIL COMMITTEE APPOINTMENTS

All appointments listed below, except those showing expiration dates, remain current until replaced by another appointment.

California Identification System ("CAL-ID"). The California Dept. of Justice created this committee regarding the fingerprinting process. The Fresno County Committee meets every 3 months on Fridays at 10:00 a.m. at the Clovis Police Department's Public Safety Community Room. ONLY THE CAL-ID Board can make the Board appointment to this committee – Not the City Council. Contact person is Valerie Mull of the Sheriff's Dept., 600-8130.

Member: Lynne Ashbeck (May 2017 – Current)
Alternate: Vong Mouanoutoua (May 2017 – Current)

City Selection Committee. Makes various appointments to Countywide Boards such as LAFCO, Fresno Visitor and Convention Bureau, etc. Representative is Mayor or appointed by Mayor for a two-year term. Meets on an as-needed basis. Contact is Bernice Seidel, Clerk, Board of Supervisors, 600-3529 #4. Email: bseidel@co.fresno.ca.us.

Member: Drew Bessinger (May 2019 – May 2021)
Alternate: Jose Flores (May 2019 – May 2021)

Consolidated Mosquito Abatement District. Appointed as City representative to the Mosquito Abatement District. Recommended by Mayor with vote of City Council. Must live in the City of Clovis and in the Consolidated Mosquito Abatement District area. New members appointed to a first term of two years; consecutive re-appointments may be for two or four years. Meets the 3rd Monday of the month at 1:00 p.m. at the Consolidated Mosquito Abatement District Office, 13151 E. Industrial Dr., Parlier, CA. Contact person is Steve Mulligan, 896-1085.

City Representative: Karl Peterson (Dec. 31, 2018 - Dec. 31, 2022)

Council of Fresno County Governments (COG). A voluntary association comprised of local governments. Metropolitan planning agency for coordinating regional transportation planning and release of federal and state funds. The major role is to foster intergovernmental communication and coordination with an emphasis on transportation. Representative is Mayor or appointed by Mayor. Meets the last Thursday of each month at 5:30 p.m. at 2035 Tulare Street, Ste. 201, Fresno. There are no meetings in August or December unless needed. Contact person is Jeaneen Cervantes, 233-4148 #222.

Member: Drew Bessinger (May 2019 – May 2021)
Alternate: Jose Flores (May 2019 – May 2021)

ATTACHMENT 1

Economic Development Corporation Serving Fresno County. Member of Board of Directors for private, non-profit marketing organization designated to attract businesses and industry to Fresno County and its cities, comprised of local representatives from both the private and public sector. City of Clovis is the founding member and has one seat on the Board. Appointed by City Council for an open-ended term. Appointment must be non-elected official. Meets on the last Wednesday of every other month at 7:30 a.m. Contact person is Lee Ann Eager, 476-2513.

Member: Andrew Haussler (October 2016 – Current)

Fresno/Clovis Convention & Visitors Bureau Board of Directors. Promotion of tourism and convention business in the Fresno County region. Appointed by the City Selection Committee**.** They normally meet at noon on a Thursday at various locations during January, March, May, September, and November. The contact person is Layla Forstedt, CEO, 981-5550.

Member: Shawn Miller – (May 2009 - Current)

Fresno/Clovis Media Authority. The Board meets quarterly at the 5:30 p.m. at the Community Media Access Collaborative (CMAC) at 1555 Van Ness Ave., Fresno, CA 93721. The Mayor appoints two Clovis representatives. Contact person is Chad McCollum, 324-2436.

Member: Shannon Babb (2017 – Current)
Member: Micheline Golden (2019 – Current)

Fresno County Regional Transportation Mitigation Fee Agency. This committee meets on an as-needed basis after COG meetings to discuss Policy. Representative is Mayor or appointed by Mayor. Meeting at 2035 Tulare Street, Ste. 201, Fresno. Contact person is Jeaneen Cervantes, 233-4148 #222. Email: JCervantes@fresnocog.org.

Members: Drew Bessinger (May 2019 – May 2021)
Jose Flores (May 2019 – May 2021)

Fresno County Transportation Authority (FCTA) Board. This board oversees the spending of Measure C Sales Tax County-wide on transportation issues funded by the plan. Appointed by Mayor for a two-year term. Meets on a Wednesday of every other month at 9:00 a.m. at their offices. There are no alternates – Only the City's Member representative can attend the FCTA meetings. Contact person is Denise DeBenedetto, 600-3282.

Member: Lynne Ashbeck (May 2019 – May 2021)

Fresno County Transportation Authority (FCTA) Executive Committee. This committee oversees an expenditure plan to renew Measure C to be included in the 2022 election ballot. This committee is comprised of community leaders from government and private industry. Meets on a monthly basis until the election in the Spring of 2022. Appointed by the Mayor. Contact person is Denise DeBenedetto, 600-3282.

Member: Vong Mouanoutoua (May 2020 – May 2022)

Fresno Metropolitan Flood Control District Board of Directors (FMFCD). City representative to Governing Board of FMFCD. Appointed by City Council for a four-year term. Meets the 2nd and 4th Wednesday of each month at 6 p.m. at the FMFCD Board Room. Contact person is Esther Schwandt, Clerk of the Board, 456-3292.

City Representative: Roy Spina, Jr. (August 2018 – August 2022)

Joint Subcommittee on School Issues. Ad hoc committee meets with representatives of Clovis Unified School District and Board of Trustees on matters related to school district and City facilities and operations of mutual concern. The City's representatives are comprised of the City Manager and PDS Director, and the current Mayor and a Councilmember appointed by the Mayor for a 2-year term which meets quarterly from 12:00-1:00 p.m. Contact person is Jacquie Pronovost, 324-2063.

Members: Drew Bessinger (May 2019 – May 2021)
Vong Mouanoutoua (May 2019 – May 2021)

North Kings Groundwater Sustainability Agency (NKGSA) Board of Directors. A Joint Powers Authority serving as the area's Groundwater Sustainability Agency to fulfill the requirements of the Sustainable Ground Water Management Act. Meets the fourth Thursday of each month at 6:00 p.m. at the Fresno Irrigation District located at 2907 S. Maple Avenue in Fresno. Contact person is Lynn Rowe at FID: 233-7161 Ext. 7106.

Members: Jose Flores (May 2019 – May 2021)
Alternate: Lynne Ashbeck (May 2019 –May 2021)

Personnel Commission. Appointed by Mayor with majority vote of City Council for a four-year term. Meets on an as-needed basis. Contact person is General Services Director Shonna Halterman, 324-2767.

Scott Fetterhoff (May 2018 – May 2022)
Diane Staebler (May 2020 – May 2024)
Kari Mercer (May 2018 - May 2022)
Jerry Brady (May 2019 – May 2023)
Jerry Schuber (May 2018 - May 2022)
Jose "JoJo" Reyes (May 2020 – May 2024)
Darren Rose (May 2018 – May 2022)

Planning Commission. Appointed by Mayor with majority vote of City Council for a four-year term. Normally meets on the 4th Thursday of each month at 6:00 p.m. in the Council Chamber. Contact person is Planning and Development Services Director Renee Mathis, 324-2351.

Paul Hinkle (May 2020 – May 2024)
Alma Antuna (May 2018 – May 2022)
Michael Cunningham (May 2019 – May 2023)
Amy Hatcher (May 2018 – May 2022)
Brandon Bedsted (May 2021 – May 2025)

San Joaquin Valley Air Pollution Control District Governing Board. A vacancy on this Governing Board must be filled by a Councilmember from a "Large" city within the Fresno County, per Health & Safety Code Section 40600.5. Effective January 1, 2018, the City of Clovis was appointed the "Large" city for representation. Drew Bessinger served a 3-year term expiring in January 2021, and in February 2021, Drew was re-appointed by the Special City Selection Committee to serve one more 3-year term which expires in January 2024. Contact person is Michelle Franco at 230-6038 (*michelle.franco@valleyair.org*).

Board Member: Drew Bessinger (January 2021 – January 2024)

San Joaquin Valley Special City Selection Committee. Advisory committee which makes appointments of city representatives to the Air District's Governing Board. Appointed by the Special City Selection Committee. This committee meets on an as-needed basis at the Fresno Regional Office, 1990 E. Gettysburg, Fresno. Drew Bessinger was appointed Chair of this committee in 2021 and remains indefinitely with no term limits. Contact person is Michelle Franco at 230-6038 (*michelle.franco@valleyair.org*).

Chair Member: Drew Bessinger (May 2019 – Current)
Alternate: Jose Flores (May 2019 – Current)

Upper Kings Basin Integrated Regional Water Management aka Kings Basin Water Authority. The Board meets quarterly at 9:30 a.m. at the Fresno County Farm Bureau, 1274 W. Hedges in Fresno. The Mayor is the Representative, and the Public Utilities Director and/or the Assistant Public Utilities Director is the Alternate. Contact Person is Soua Lee: 237-5567 #115, email: SLee@krcd.org.

Representative: Drew Bessinger (May 2019 – May 2021)
Alternate: Public Utilities Director Scott Redelfs (attends all meetings) or Assistant Public Utilities Director Paul Armendariz attends in his place.

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Administration

DATE: April 5, 2021

SUBJECT: Consider Approval – Change of Council Meeting Schedule.

Staff: Luke Serpa, City Manager
Recommendation: Approve

ATTACHMENTS: None

CONFLICT OF INTEREST
None.

RECOMMENDATION
For the City Council to approve the cancellation of the regular City Council meeting scheduled for Monday, April 12, 2021.

EXECUTIVE SUMMARY
There is a need to change the schedule of meetings for the City Council in April. Staff is recommending that City Council cancel the meeting of April 12, 2021.

BACKGROUND
Staff is able to consolidate the agenda items to the first and third meetings in April. Staff is recommending that City Council consider canceling the meeting of April 12, 2021. Given adequate notice, staff will be able to amend the timing of actions coming forward so that operations will not be affected by the cancellation.

FISCAL IMPACT
None.

REASON FOR RECOMMENDATION
Pursuant to the Clovis Municipal Code, the City Council meets in regular session on the first, second, and third Monday of each month, except when those Mondays occur on a recognized City holiday. The City Council needs to confirm any change to the schedule of meetings in order to properly notice the public of the City Council's schedule of meetings.

ACTIONS FOLLOWING APPROVAL
A revised schedule of meetings will be published in conformance with law.

Prepared by: Jacquie Pronovost, Executive Assistant

Reviewed by: City Manager

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Administration

DATE: April 5, 2021

SUBJECT: Consider – Authorizing a Letter of Opposition to Proposed Legislation - SB 556 (Dodd) Regarding Attachments to Street Light Poles, Traffic Signal Poles, Utility Poles, and Support Structures.

Staff: Luke Serpa, City Manager
Recommendation: Consider

ATTACHMENTS: None

City Manager Luke Serpa will give a verbal presentation on this item.

Please direct questions to the City Manager's office at 559-324-2060.

CITY of CLOVIS

REPORT TO THE CITY COUNCIL

TO: Mayor and City Council

FROM: Administration

DATE: April 5, 2021

SUBJECT: Update on the American Rescue Plan Act of 2021.

Staff: Andrew Haussler, Community and Economic Development Director
Recommendation: Receive Update

ATTACHMENTS: None

Community and Economic Development Director Andrew Haussler will give a verbal presentation on this item.

Please direct questions to the City Manager's office at 559-324-2060.