



CITY OF MARSHALL
Public Improvement & Transportation
Committee
A g e n d a
Tuesday, March 25, 2025 at 2:00 PM
City Hall, 344 West Main Street

APPROVAL OF AGENDA

APPROVAL OF MINUTES

1. (PI/T) Consider Approval of the Minutes of the January 23, 2025 Meeting

NEW BUSINESS

2. Project ST-001-2025: Chip Sealing on Various City Streets
3. Municipal State Aid Street (MSAS) Review - Consider Revocation of and Establishment of State Aid Streets
4. Project SWM-003: Legion Field Stormwater Improvements Project-Phase III
5. Project PK-011 / (SAP 139-090-006): C Street/Southview Drive Trail Project
6. Project ST-034: Intersection Control Evaluation (ICE) for Intersection of Susan Drive and US 59 Frontage Road

OTHER BUSINESS ITEMS

ADJOURN

Disclaimer: These agendas have been prepared to provide information regarding an upcoming meeting of the Common Council of the City of Marshall. This document does not claim to be complete and is subject to change.

- UNAPPROVED -

**MINUTES
PUBLIC IMPROVEMENT/TRANSPORTATION COMMITTEE MEETING
JANUARY 23, 2025
3:00 PM**

MEMBERS PRESENT: Craig Schafer, James Lozinski, John Alcorn

MEMBERS ABSENT: None

STAFF PRESENT: Jason Anderson, Director of Public Works/City Engineer;
Eric Hanson, Assistant City Engineer;
Sharon Hanson, City Administrator;
E.J. Moberg, Director of Administrative Services

OTHERS PRESENT: Kerry Netzke-RCRCA; Ron Halgerson-114 Park Ave; Dan Giles-112 Park Ave

Call to Order

Schafer called the meeting to order at 3:00 pm.

1. Approval of Minutes

MOTION MADE BY LOZINSKI to approve the minutes of the October 7, 2024 meeting as presented, SECOND BY ALCORN. ALL VOTED IN FAVOR. THE MOTION PASSED 3:0.

Elect Chairperson – MOTION BY LOZINSKI, SECOND BY ALCORN to appoint Craig Schafer as Chair. ALL VOTED IN FAVOR. MOTION PASSED 2:0, SCHAFFER ABSTAINED.

2. Request for City Funding on Streambank Restoration Project

Background: On December 17, 2024, Kerry Netzke and Ron Halgerson presented to the Lyon County Commissioners to request funding for a “pilot project” for a riverbank stabilization project at 112 Park Avenue in Marshall. Kerry and Ron were presenting as representatives of the Redwood Riverbank Workgroup. The property at 112 Park Avenue is a single-family residential property that is located along the Redwood River and is experiencing erosion and loss of property due to the failure of an existing, in-place slope protection management practice. Essentially, there is an old retaining wall that has failed, and a project must be completed to keep the river from advancing further into the property.

A memo from the Commissioner’s was provided to the Committee and also a request from the Redwood Riverbank Workgroup is for funding the \$40,800 project from Lyon County would utilize buffer enforcement dollars that Lyon County receives annually from the State of Minnesota. At the meeting, the Lyon County Commission motioned to fund 40% of the project cost, up to \$16,320, contingent upon the City of Marshall also funding 40% of the project costs. The proposed cost split is \$16,320 from both the City and Lyon County, and an \$8,160 cost share from the property owner at 112 Park Avenue.

Should the City elect to participate in funding this riverbank stabilization project, funding would likely come from the Surface Water Management Utility (SWMU). Each property within the city limits of Marshall contributes funding to the SWMU in an amount that is proportional to the runoff quantity and water quality impact of each property. Because commercial and industrial land uses are typically more intensely developed, those types of properties contribute more runoff and therefore they contribute more funding into the SWMU.

The SWMU is established under the authority of Minnesota Statute 444.075. The Statute allows for the expenditure of funds as needed to build, obtain, repair, reconstruct, improve, or enlarge all facilities. In addition to being a public waterway, the Redwood River may be considered part of the city’s drainage facilities because it plays a key role in surface water drainage for the City of Marshall. Additionally, one of the missions of the SWMU is to protect

environmental diversity, and preventing sediments from being washed into the river would help to protect the Redwood River and its environmental diversity.

If the Council moves to fund river slope repair projects, city staff believe it would be prudent to create a program that is approved by the City Council. The program could have a specific annual budget that is allocated annually, and project submittals could be reviewed for consideration of funding. It is worth noting that all projects are required to receive a MnDNR permit for working along a public water. If this is the desire, city staff could bring forward a proposed program for future consideration.

Anderson presented the item. Discussions have been held with Ron and Kerry. Currently the City does not have a program. It has been suggested that the Surface Water Management Utility (SWM) is a potential funding source. In review the State Statute and City authority of this fund, it would not be illegal to participate with these funds per Statute 444.075 with confirmation from City Attorney. Anderson reviewed current uses of SWM funding. Justification for this use of this fund would be an acknowledgment that city uses river for city drainage, it is a part of the drainage system and as such, the public purpose for spending the money would be to maintain and operate the Redwood River as a drainageway. Currently have not spent funds for riverbank stabilization on private properties but only public properties/infrastructure. Potential review and consideration to create a program to legally fund these projects whereby creating a framework, annual City contribution amounts, scoring and rating. While this is being presented as a "pilot project", the City has received numerous requests for these projects as there are many properties along the river within the city.

Halgerson presented general information map "Redwood River Assessment/Inventory" map. Staff of DNR and Lyon County SWRCD floated the 3.5 mile stretch between the Fairgrounds and the City Street Department where the group identified areas of concern in the river. Ron stated wherever there is a change in flow it is evident of greater potential of erosion. The intent is to establish a "pilot project" whereby providing educational awareness and profile this as a starting point. Whole composition of how we deal with water management has changed immensely as water makes its way to Redwood River with 350 sq miles of upstream watershed and six streams that feed the Redwood River along with predominantly tiling.

Kerry Netzke-RCRA presented powerpoint including history of Redwood River, establishment of Redwood River work group, project onset and shared assistance, impacts of Diversion Channel, able to determine as it is known what the high levels and low levels are going to be and can decide projects accordingly. Redwood River Workgroup established in Fall 2023. Workgroup discussions have evolved around the increased deterioration of the riverbank through the city, there's a lot of 1930 eras WPA projects through the town, riprap deterioration over 100 years, loss of fish passage, enforcing the ordinances on grass clippings, possible grant funding, DNR existing funds, 1W1P comprehensive watershed management plan. Netzke outlined the locations on the river of concern from the June 2024 observations from group kayak tour of the river and presented multiple of photographs of the highlight areas. Kerry summarized previous discussions with USACOE and that discussions remain ongoing. DNR has prepared some conceptual drawings.

Schafer inquired on the permitting process with DNR, group plan permissible projects and waive request. Kerry provided summary of meeting with Lyon County Commissioners on December 17, 2024. Kerry indicated 1W1P funding will not be available until 2026 through State-funded Watershed Based Implementation Funding. Kerry uncertain of funding Redwood River watershed would be receiving, but the Cottonwood watershed will be receiving \$1.9M/2 years. Buffer enforcement and compliance and ditch assessments was discussed. Skunk Hollow Road history discussed. Lozinski inquired on determination of a pilot project. Lozinski inquired to Moberg regarding County funding Moberg indicated County gets \$130,000 annually. Lozinski restated this project was not budgeted in 2025, and Moberg provided information on stormwater bonding. Anderson commented on similar potential programs not yet implemented by the City, including rain barrel programs/rebates, rain garden program and matching grants. This stabilization project is not keeping water out of the system, but it is maintaining the conveyance, and would need to determine budget allocation and its effect on surface water rates. Halgerson stated that if we accept that Redwood River is part of drainage system, then we should be investing in such a project. Schafer summarized potential presentation to the City Council. Sharon Hanson inquired to Kerry about potential eligibility of LCCMR (Legislative-Citizen Commission on Minnesota Resources) funding. Kerry indicated on the comprehensive watershed management

plan being developed through 1W1P is based on prioritizing where impairments are coming from, targeting action areas and measurable goals. Kerry gave summary between Area II and RCRC. Anderson proposed a program that annually budgeted an amount that is built into the SWM budget with a set of rules, criteria and policy, which is made public with projects come forward as presented, reviewed by a board/committee and funded as monies are available and when monies are depleted, come back in following year whereby there is not a selection process. In closing, Halgerson said a goal is to alter the mindset of the Redwood River, and a hidden benefit is working in front of your residence is because the flow is working as it should be. Kerry closed with that is educational providing information on the condition of the Redwood River and it should not be treated like a storm sewer but rather as the water resource which it is. Also that there are funding focusing on the water resource and not on the storm water utility.

MOTION MADE BY LOZINSKI, SECOND BY ALCORN for City staff to look into creating a program for dealing with projects on stabilizing the streambank on the Redwood River within the City of Marshall. ALL VOTED IN FAVOR. THE MOTION PASSED 3:0.

Other Business

Project ST-002-2025: Bituminous Overlay Project – Anderson provided a map and listing of streets proposed for the project. MOTION BY LOZINSKI, SECOND BY ALCORN to recommend authorization to advertise for ST-002-2025: Bituminous Overlay Project to the City Council. ALL VOTED IN FAVOR. MOTION PASSED 3:0.

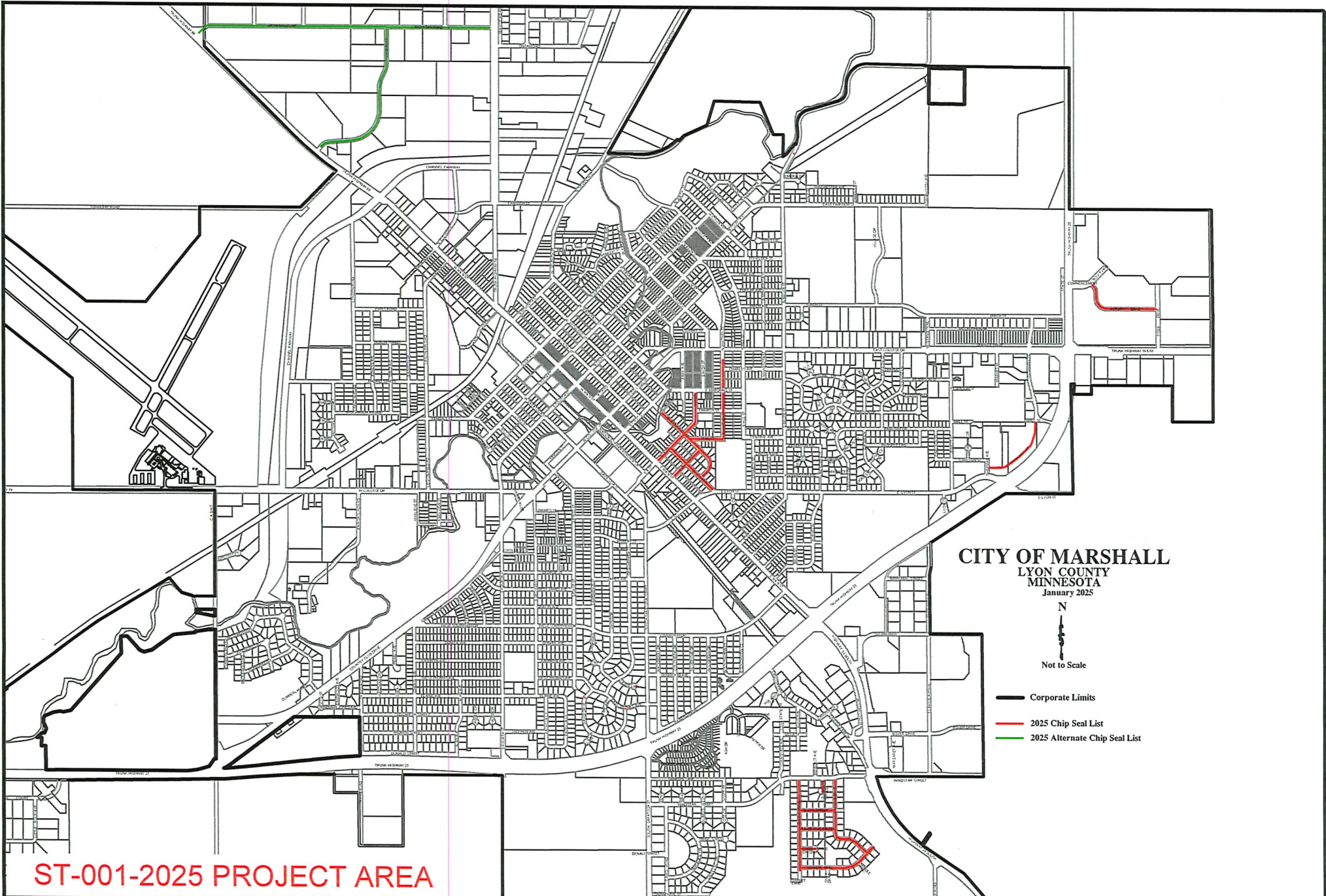
Adjourn

Being no further business, MOTION BY LOZINSKI, SECOND BY ALCORN to adjourn. ALL VOTED IN FAVOR. MOTION PASSED 3:0. Meeting adjourned at 4:39 pm.

Respectfully submitted,
Lona Rae Konold, Administrative Assistant

CITY OF MARSHALL
AGENDA ITEM REPORT
PI/T – 03/25/2025

Presenter:	Jason Anderson																																																								
Meeting Date:	Tuesday, March 25, 2025																																																								
Category:	NEW BUSINESS																																																								
Type:	INFO/ACTION																																																								
Subject:	Project ST-001-2025: Chip Sealing on Various City Streets																																																								
Background Information:	<div><p>The estimated total project cost is approximately \$161,644 including all streets shown below (excluding “Alternate Streets”). The 2025 Street Department budget includes a \$165,000 line item for this project.</p><table><tr><th colspan="4">BASE BID STREETS</th></tr><tr><th>Street</th><th>From-To</th><th>Street</th><th>From-To</th></tr><tr><td>South Whitney Street</td><td>East College Drive to Jean Street</td><td>A Street</td><td>Main Street - Marshall Street</td></tr><tr><td>Ellis Avenue</td><td>Windstar Street to south end of Stonebridge</td><td>East Redwood Street</td><td>A Street - River</td></tr><tr><td>Quartzite Circle</td><td>Windstar Street to south end of Stonebridge</td><td>East Redwood Street</td><td>A Street - Lyon Street</td></tr><tr><td>Slate Street</td><td>Ellis Avenue to Diamond Drive</td><td>Jean Street</td><td>East Redwood Street - Whitney Street</td></tr><tr><td>Diamond Drive</td><td>Windstar Street to Granite Street</td><td>B Street</td><td>East Main Street - East Redwood Street</td></tr><tr><td>Travertine Street</td><td>Ellis Avenue to Diamond Drive</td><td>East Lyon Street</td><td>A Street - Lyon/C Street</td></tr><tr><td>Granite Street</td><td>Ellis Avenue to Diamond Drive</td><td>O'Connell Street</td><td>Sherman Avenue - Mall Street Entrance</td></tr><tr><td>Cobblestone Circle</td><td>Ellis Avenue</td><td>Victory Drive</td><td>Tiger Drive - Commencement Blvd.</td></tr></table><table><tr><th colspan="4">ALTERNATE STREETS</th></tr><tr><th>Street</th><th>From-To</th><th>Street</th><th>From-To</th></tr><tr><td>Lake Road</td><td>Michigan Road - T.H. 68</td><td>Michigan Road</td><td>MERIT Center Gravel Road - Atlantic Avenue</td></tr><tr><td>Michigan Road</td><td>North T.H. 59 - Merrit Training Road</td><td></td><td></td></tr></table></div>	BASE BID STREETS				Street	From-To	Street	From-To	South Whitney Street	East College Drive to Jean Street	A Street	Main Street - Marshall Street	Ellis Avenue	Windstar Street to south end of Stonebridge	East Redwood Street	A Street - River	Quartzite Circle	Windstar Street to south end of Stonebridge	East Redwood Street	A Street - Lyon Street	Slate Street	Ellis Avenue to Diamond Drive	Jean Street	East Redwood Street - Whitney Street	Diamond Drive	Windstar Street to Granite Street	B Street	East Main Street - East Redwood Street	Travertine Street	Ellis Avenue to Diamond Drive	East Lyon Street	A Street - Lyon/C Street	Granite Street	Ellis Avenue to Diamond Drive	O'Connell Street	Sherman Avenue - Mall Street Entrance	Cobblestone Circle	Ellis Avenue	Victory Drive	Tiger Drive - Commencement Blvd.	ALTERNATE STREETS				Street	From-To	Street	From-To	Lake Road	Michigan Road - T.H. 68	Michigan Road	MERIT Center Gravel Road - Atlantic Avenue	Michigan Road	North T.H. 59 - Merrit Training Road		
BASE BID STREETS																																																									
Street	From-To	Street	From-To																																																						
South Whitney Street	East College Drive to Jean Street	A Street	Main Street - Marshall Street																																																						
Ellis Avenue	Windstar Street to south end of Stonebridge	East Redwood Street	A Street - River																																																						
Quartzite Circle	Windstar Street to south end of Stonebridge	East Redwood Street	A Street - Lyon Street																																																						
Slate Street	Ellis Avenue to Diamond Drive	Jean Street	East Redwood Street - Whitney Street																																																						
Diamond Drive	Windstar Street to Granite Street	B Street	East Main Street - East Redwood Street																																																						
Travertine Street	Ellis Avenue to Diamond Drive	East Lyon Street	A Street - Lyon/C Street																																																						
Granite Street	Ellis Avenue to Diamond Drive	O'Connell Street	Sherman Avenue - Mall Street Entrance																																																						
Cobblestone Circle	Ellis Avenue	Victory Drive	Tiger Drive - Commencement Blvd.																																																						
ALTERNATE STREETS																																																									
Street	From-To	Street	From-To																																																						
Lake Road	Michigan Road - T.H. 68	Michigan Road	MERIT Center Gravel Road - Atlantic Avenue																																																						
Michigan Road	North T.H. 59 - Merrit Training Road																																																								
Fiscal Impact:	Included in project descriptions above.																																																								
Alternative/ Variations:	No alternative actions recommended.																																																								
Recommendations:	that the Committee recommend to City Council to authorize advertisement for bids for Project ST-001-2025: Chip Sealing on Various City Streets.																																																								



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE	REVISIONS	INIT.

DESIGNED BY: J.A.R.
 DRAWN BY: J.A.R.
 APPROVED BY: J.R.A.
 SCALE: NA



CITY ENGINEERS OFFICE
 344 WEST MAIN STREET
 MARSHALL, MINNESOTA
 56258

CHIP SEAL 2025
 COVER SHEET

STATE AID PROJECT NO.: NA	CITY PROJECT NUMBER: ST-001-2025
DATE: 02/1/2025	SH Page 6

STATEMENT OF ESTIMATED QUANTITIES

Line#	Notes	Item No.	Item	Unit	Total
1		2356.606	BITUMINOUS MATERIAL FOR SEAL COAT	GAL	21,084
2		2356.609	SEAL COAT AGGREGATE (FA-2)	TON	703

BASIS FOR PLANNED QUANTITIES

Type CRS-2P Emulsified Asphalt 0.30 Gal./Sq.Yd.

FA-2 Aggregate 20 lbs. per Sq.Yd.

Base Bid Streets		SQ. YD.	Gallons of Oil Per Sq. Yd.	Total Gallons Per Road	Granite Lbs. Per Sq. Yd.	Total Lbs. of Granite	Total Tons of Granite
Street	From-To						
South Whitney Street	East College Drive to Jean Street	6,889	0.30	2,066.7	20	137,780	68.89
Ellis Avenue	Windstar Street to South end of Stonebridge	6,866	0.30	2,059.8	20	137,320	68.66
Quartzite Circle	Windstar Street to South end of Stonebridge	1,522	0.30	456.6	20	30,440	15.22
Slate Street	Ellis Avenue to Diamond Drive	2,512	0.30	753.6	20	50,240	25.12
Diamond Drive	Windstar Street to Granite Street	7,157	0.30	2,147.1	20	143,140	71.57
Travertine Street	Ellis Avenue to Diamond Drive	2,569	0.30	770.7	20	51,380	25.69
Granite Street	Ellis Avenue to Diamond Drive	5,497	0.30	1,649.1	20	109,940	54.97
Cobblestone Circle	Ellis Avenue	1,618	0.30	485.4	20	32,360	16.18
A Street	Main Street - Marshall Street	7,308	0.30	2,192.4	20	146,160	73.08
East Redwood Street	A Street - River	1,897	0.30	569.1	20	37,940	18.97
East Redwood Street	A Street - Lyon Street	4,222	0.30	1,266.6	20	84,440	42.22
Jean Street	East Redwood Street - Whitney Street	2,507	0.30	752.1	20	50,140	25.07
B Street	East Main Street - East Redwood Street	2,890	0.30	867.0	20	57,800	28.90
East Lyon Street	A Street - Lyon/C Street	4,707	0.30	1,412.1	20	94,140	47.07
O'Connell Street	Sherman Avenue - Mall Street Entrance	5,973	0.30	1,791.9	20	119,460	59.73
Victory Drive	Tiger Drive - Commencement Blvd.	6,146	0.30	1,843.8	20	122,920	61.46
2025 Sealcoat Totals*		70,280		21,084		1,405,600	703

* The City of Marshall reserves the right to remove streets to meet the project budget, with no change to unit prices.

Award of all or part of the project will be based upon the total bid price and the funds available for the project.

Alternate Street Quantities are not included in the Base Bid Quantities.

Alternate Streets dependent on budget and actual bids

Alternate Streets		SQ. YD.	Gallons of Oil Per Sq. Yd.	Total Gallons Per Road	Granite Lbs. Per Sq. Yd.	Total Lbs. of Granite	Total Tons of Granite
Street	From-To						
Lake Road	Michigan Road - T.H. 68	13,700	0.30	4,110.0	20	274,000	137.00
Michigan Road	North T.H. 59 - Merrit Training Road	11,689	0.30	3,506.7	20	233,780	116.89
Michigan Road	Merit Center Gravel Road - Atlantic Avenue	12,376	0.30	3,712.8	20	247,520	123.76
Alternate Project Subtotal		37,765		11,330		755,300	378

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE	REVISIONS	INIT.

DESIGNED BY: J.A.R.
DRAWN BY: J.A.R.
APPROVED BY: J.R.A.
SCALE: NA



CITY ENGINEERS OFFICE
344 WEST MAIN STREET
MARSHALL, MINNESOTA
56258

CHIP SEAL 2025

QUANTITY SHEET

STATE AID PROJECT NO.: CITY PROJECT NUMBER:

NA ST-001-2025

DATE:
02/15/2025

Page 7

Item 2. DATE: ENGINEER REG NO 53322

2025 BITUMINOUS CHIP SEALING ESTIMATE

			0.30		20.00			\$65.00		
Base Bid Streets		SQ. YD.	Gallons of Oil Per Sq. Yd.	Total Gallons Per Road	Granite Lbs. Per Sq. Yd.	Total Lbs. of Granite	Total Tons of Granite	Granite Cost Per Ton	Granite Cost	Total Street Cost
Street	From-To									
South Whitney Street	East College Drive to Jean Street	6,889	0.30	2,066.7	20	137,780	68.89	\$65.00	\$4,477.85	\$15,844.70
Ellis Avenue	Windstar Street to South end of Stonebridge	6,866	0.30	2,059.8	20	137,320	68.66	\$65.00	\$4,462.90	\$15,791.80
Quartzite Circle	Windstar Street to South end of Stonebridge	1,522	0.30	456.6	20	30,440	15.22	\$65.00	\$989.30	\$3,500.60
Slate Street	Ellis Avenue to Diamond Drive	2,512	0.30	753.6	20	50,240	25.12	\$65.00	\$1,632.80	\$5,777.60
Diamond Drive	Windstar Street to Granite Street	7,157	0.30	2,147.1	20	143,140	71.57	\$65.00	\$4,652.05	\$16,461.10
Travertine Street	Ellis Avenue to Diamond Drive	2,569	0.30	770.7	20	51,380	25.69	\$65.00	\$1,669.85	\$5,908.70
Granite Street	Ellis Avenue to Diamond Drive	5,497	0.30	1,649.1	20	109,940	54.97	\$65.00	\$3,573.05	\$12,643.10
Cobblestone Circle	Ellis Avenue	1,618	0.30	485.4	20	32,360	16.18	\$65.00	\$1,051.70	\$3,721.40
A Street	Main Street - Marshall Street	7,308	0.30	2,192.4	20	146,160	73.08	\$65.00	\$4,750.20	\$16,808.40
East Redwood Street	A Street - River	1,897	0.30	569.1	20	37,940	18.97	\$65.00	\$1,233.05	\$4,363.10
East Redwood Street	A Street - Lyon Street	4,222	0.30	1,266.6	20	84,440	42.22	\$65.00	\$2,744.30	\$9,710.60
Jean Street	East Redwood Street - Whitney Street	2,507	0.30	752.1	20	50,140	25.07	\$65.00	\$1,629.55	\$5,766.10
B Street	East Main Street - East Redwood Street	2,890	0.30	867.0	20	57,800	28.90	\$65.00	\$1,878.50	\$6,647.00
East Lyon Street	A Street - Lyon/C Street	4,707	0.30	1,412.1	20	94,140	47.07	\$65.00	\$3,059.55	\$10,826.10
O'Connell Street	Sherman Avenue - Mall Street Entrance	5,973	0.30	1,791.9	20	119,460	59.73	\$65.00	\$3,882.45	\$13,737.90
Victory Drive	Tiger Drive - Commencement Blvd.	6,146	0.30	1,843.8	20	122,920	61.46	\$65.00	\$3,994.90	\$14,135.80
2025 Sealcoat Totals*		70,280		21,084		1,405,600	703		\$45,682.00	\$161,644.00

* The City of Marshall reserves the right to remove streets to meet the project budget, with no change to unit prices.
Award of all or part of the project will be based upon the total bid price and the funds available for the project.
Alternate Street Quantities are not included in the Base Bid Quantities.

Alternate Streets dependent on budget and actual bids

			0.30		20.00			\$65.00		
Alternate Streets		SQ. YD.	Gallons of Oil Per Sq. Yd.	Total Gallons Per Road	Granite Lbs. Per Sq. Yd.	Total Lbs. of Granite	Total Tons of Granite	Granite Cost Per Ton	Granite Cost	Total Street Cost
Street	From-To									
Lake Road	Michigan Road - T.H. 68	13,700	0.30	4,110.0	20	274,000	137.00	\$65.00	\$8,905.00	\$31,510.00
Michigan Road	North T.H. 59 - Merrit Training Road	11,689	0.30	3,506.7	20	233,780	116.89	\$65.00	\$7,597.85	\$26,884.70
Michigan Road	Merit Center Gravel Road - Atlantic Avenue	12,376	0.30	3,712.8	20	247,520	123.76	\$65.00	\$8,044.40	\$28,464.80
Alternate Project Subtotal		37,765		11,330		755,300	378		\$24,547.25	\$86,859.50
2025 Sealcoat Totals		108,045		32,414		2,160,900	1,080			\$248,503.50

Award of all or part of the project will be based upon the total bid price and the funds available for the project.

**CITY OF MARSHALL
AGENDA ITEM REPORT
PI/T – 03/25/2025**

Presenter:	Jason Anderson
Meeting Date:	Tuesday, March 25, 2025
Category:	NEW BUSINESS
Type:	ACTION
Subject:	Municipal State Aid Street (MSAS) Review - Consider Revocation of and Establishment of State Aid Streets
Background Information:	<p>The attached resolutions will revise the streets that are designated for Municipal State Aid. MSAS streets are eligible for State financing for construction and major maintenance items.</p> <p>If a designated street is removed from the list within 20 years of it being constructed with Municipal State Aid money, a prorated portion must be removed from the aid on a future project.</p> <p>A street may be selected as a MSAS route if it is projected to carry heavier traffic or is identified as a collector or arterial on the city's functional classification plan, if it connects points of major traffic interest, and if it provides an integrated and coordinated highway and street system. The street must terminate on another Municipal State Aid Street, County State Aid Highway, County road, or a State highway.</p> <p>The recommended revisions will accomplish this goal, while allowing the City to use Municipal State Aid money for these routes.</p> <p>In 2025, our total MSAS allocation is \$1,055,860. Of this allocation, \$422,992 is attributed to our population and \$632,868 is attributed to our system "needs". With 20.06 miles currently dedicated as MSAS, we receive \$52,635 per mile in funding.</p> <p>Out of our \$1,055,860, we allocate \$29,160 to general maintenance. These general maintenance dollars are revenue to the Street Department budget. An additional \$47,600 is applied to bond interest for the 2021 MSAS overlay project, leaving \$979,100 for our 2025 construction account.</p> <p>A summary of the proposed revisions is attached for your review. A map designating Municipal State Aid streets is also provided.</p>
Fiscal Impact:	No cost to make these changes. Changes will slightly increase our annual MSAS allocation.
Alternative/ Variations:	
Recommendations:	PI/T recommend Council approval of the attached resolutions.

RESOLUTION 25-_____

RESOLUTION REVOKING MUNICIPAL STATE AID STREETS

WHEREAS, it appears to the City Council of the City of Marshall, Minnesota, that the streets hereinafter described should be revoked as a Municipal State Aid Street under the provisions of Minnesota Law,

NOW THEREFORE, BE IT RESOLVED, by the City Council of the City of Marshall, Minnesota that the roads described as follows, to-wit:

**MSAS 139-134-010 Non-Existing Route
from Madrid Street to West Channel Road**

**MSAS 139-134-010 Non-Existing Route outside City Limits
from West Channel Road to TH 68**

be, and hereby are revoked as a Municipal State Aid Street of said City, subject to the approval of the Commissioner of Transportation of the State of Minnesota.

BE IT FURTHER RESOLVED, that the City Clerk is hereby authorized and directed to forward two certified copies of this resolution to the Commissioner of Transportation for his consideration.

Passed and adopted by the Council this _____ day of _____, 2025.

Mayor of the City of Marshall, MN

ATTEST:

City Clerk/Financial Director

This Instrument Drafted by: Jason R. Anderson, P.E., Director of Public Works/City Engineer

CERTIFICATION

I hereby certify that the above is a true and correct copy of a Resolution duly passed, adopted and approved by the City Council of said City on _____, 20____.

(SEAL)

City Clerk

RESOLUTION 25-_____

RESOLUTION ESTABLISHING MUNICIPAL STATE AID STREETS

WHEREAS, it appears to the City Council of the City of Marshall, Minnesota, that the street hereinafter described should be designated a Municipal State Aid Street under the provisions of Minnesota Law.

NOW THEREFORE, BE IT RESOLVED, by the City Council of the City of Marshall, Minnesota that the roads described as follows, to-wit:

Proposed MSAS 139-141-010 from US 59 to Clarice Avenue

Proposed MSAS 139-140-010 from TH 19/68 to TH 23

be, and hereby are established, located, and designated a Municipal State Aid Street of said City, subject to the approval of the Commissioner of Transportation of the State of Minnesota.

BE IT FURTHER RESOLVED, that the City Clerk is hereby authorized and directed to forward two certified copies of this resolution to the Commissioner of Transportation for his consideration, and that upon his approval of the designation of said road or portion thereof, that same be constructed, improved and maintained as a Municipal State Aid Street of the City of Marshall, Minnesota.

Passed and adopted by the Council this _____ day of _____, 2025.

Mayor of the City of Marshall, MN

ATTEST:

City Clerk/Financial Director

This Instrument Drafted by: Jason R. Anderson, P.E., Director of Public Works/City Engineer

CERTIFICATION

I hereby certify that the above is a true and correct copy of a Resolution duly passed, adopted and approved by the City Council of said City on _____, 20____.

(SEAL)

City Clerk

TO: Jason Anderson
Marshall City Engineer

FROM: William Lanoux
Manager, Municipal State Aid Needs Unit

DATE: March 14, 2025

SUBJECT: Municipal State Revocation & Designations (no payback on revocation)

The following Municipal State Aid Street revocation will be approved when the *City Council resolution* has been received.

MSAS 134: *Airport Industrial Road* – from Madrid Road to Trunk Hwy 68 (0.85 non-existing miles)

Note: at the time of this revocation, 0.23 miles of this route was coded as “outside city limits”

The following Municipal State Aid Street designations will be approved when the *City Council resolution* has been received.

MSAS 140: *Tiger Drive*– from Trunk Hwy 19/68 to Trunk Hwy 23 (0.74 miles)

MSAS 141: *Boyer Drive*– from Trunk Hwy 59 to Clarice Avenue (0.23 miles)

A Commissioner's Order will follow.

Needs Update Comments:

Routes can receive Needs and be used in the calculation of your 2026 allotment. Include these revisions with your 2025 spring Needs update (*this year*).

Certification of Mileage Update Comments:

You can include these revisions on the *2025 Annual Certification of Mileage* that is due in January 2026.

Note: when you certify the revocation of MSAS 134, please remove 0.62 miles from line 6, and remove 0.23 miles from line 16.

	Available Mileage	0.13	2024 Certified Mileage
+	Revoked Mileage	0.85	
-	<u>Designated Mileage</u>	<u>0.97</u>	
	Remaining Available Mileage	0.01	

If you have any questions, contact your DSAE or Bill Lanoux at (651) 366-3817 for instructions.

An equal opportunity employer

State Aid Route Revisions

		Miles	ADT	Miles Available
	State Aid Balance	0.13		0.13
Remove Routes				
	Non-Existing Route (Madrid Street to West Channel Road)			
	MSAS 139-134-010	0.62	0	0.75
	Non-Existing Route outside City limits (West Channel Road to TH 68)			
	MSAS 139-134-010	0.23	0	0.98
		0.850		
Add Routes				
	Boyer Drive (US 59 to Clarice)			
	Proposed MSAS 139-141-010	-0.23	2779	-0.23
	Tiger Drive (TH 19/68 to TH 23)			
	Proposed MSAS 139-140-010	-0.74	1632	-0.97
		-0.97		
	Remaining Miles Balance			0.01

CITY OF MARSHALL
AGENDA ITEM REPORT
PI/T – 03/25/2025

Presenter:	Jason Anderson
Meeting Date:	Tuesday, March 25, 2025
Category:	NEW BUSINESS
Type:	ACTION
Subject:	Project SWM-003: Legion Field Stormwater Improvements Project-Phase III
Background Information:	<p>In 2024, the MPCA solicited project proposals to distribute \$35M to communities for projects to prepare local stormwater infrastructure for the impacts of climate change. The intent of the funding is specifically identified to address water quantity and prevent localized flooding.</p> <p>At that time, City staff had identified the Legion Field Stormwater Improvements—Phase III project as an ideal candidate project for this funding. Phase III is the final project that was identified in the 2019 Legion Field Stormwater Study. Phase III will help remedy stormwater flooding in the areas of Kendall Street, Peltier Street, Glenn Street, and Simmons Street, as well as property east and north of the Nexus Apartments on Legion Field Road. The project includes a clearing and grading of approximately 1,100 FT of BNSF railroad ditch that conveys city stormwater from Legion Field Road to the north and east, a new stormwater pipe crossing of the BNSF railroad near Turkey Valey Farms, and new large diameter stormwater pipe to convey this water to a new stormwater pond to be constructed on city-owned land north of the Nexus Apartments.</p> <p>The Phase III project is currently identified for 2025 in our CIP. The project has been deferred for numerous years due to lack of funding.</p> <p>Per the MPCA, extreme storms have pushed aging and undersized stormwater systems in communities across the state to the breaking point. Over the last 20 years, Minnesota has experienced 10 “mega-rain” events, when at least six inches of rain falls over an area of at least 1,000 square miles.</p> <p>At their meeting on 04/09/2024, the City Council authorized City staff to submit for said MPCA Stormwater Resiliency Grant funding for the above-referenced project. At their meeting on 11/12/2024, the City Council authorized execution of a contract with Bolton & Menk, Inc. of Mankato, Minnesota, for an hourly, not to exceed, contract in the amount of \$76,500.00 for design of this project.</p> <p>The City was awarded an MPCA Grant in the amount of \$867,894.00 for the above-referenced project. At the 12/10/2024 meeting, the City Council accepted the MPCA Grant Agreement, which provides for State compensation and reimbursements to the City of Marshall in the amount of \$867,894.00. Engineering costs are not grant eligible, and all construction costs beyond the grant amount will be paid through the Surface Water Management Utility.</p> <p>Project plans are 95% complete and ready for review. Project cost estimate is \$1,432,408, including 5% contingency and 16% engineering costs.</p>

Fiscal Impact:	This project is included in the 2025 CIP with an estimated cost of \$1,400,000.
Alternative/ Variations:	No alternative actions recommended.
Recommendations:	To approve plans and specifications and authorize city staff to advertise the project for bids.

CITY OF MARSHALL, MINNESOTA

CONSTRUCTION PLANS FOR

LEGION ROAD FLOOD MITIGATION - PHASE 3

POND GRADING, DITCH GRADING, STORM SEWER

MARCH, 2024

RESOURCE LIST

CITY OF MARSHALL
CITY HALL
344 W MAIN ST
MARSHALL, MN 56258
507-537-6760

CITY ADMINISTRATOR:
SHARON HANSON

DIRECTOR OF PUBLIC WORKS/CITY ENGINEER
JASON ANDERSON
507-537-6051

WASTEWATER SUPERINTENDENT
SCOTT TRUEDSON

WATER OPERATIONS MANAGER
JEFF LARSON

ELECTRICAL OPERATIONS MANAGER
TONY MEAD

PUBLIC WAYS SUPERINTENDENT:
DEAN COUDRON

SPECIFICATION REFERENCE

THE 2020 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" AND THE "SUPPLEMENTAL SPECIFICATIONS" DATED SEPTEMBER 2022 SHALL GOVERN.

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST EDITION OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, INCLUDING THE LATEST FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS.

THE CITY OF MARSHALL STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

NOTE: EXISTING UTILITY INFORMATION SHOWN ON THIS PLAN HAS BEEN PROVIDED BY THE UTILITY OWNER. THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY GOPHER STATE ONE CALL, 1-800-252-1166 OR 651-454-0002.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D UNLESS OTHERWISE NOTED. THIS UTILITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."



MAP LEGEND

PROJECT LIMITS

SHEET NUMBER	SHEET TITLE
1	TITLE SHEET
2 - 3	LEGEND & GENERAL NOTES
4	LOCATION SHEET
5	EXISTING CONDITIONS & REMOVALS
6 - 8	DETAILS
9 - 12	STORM WATER POLLUTION PREVENTION PLAN
13	POND GRADING PLAN
14 - 16	STORM SEWER PLAN & PROFILE
17 - 20	DITCH PLAN & PROFILE
21 - 23	CROSS SECTION

THIS PLAN SET CONTAINS 23 SHEETS.

PARTIAL MAP OF THE
CITY OF MARSHALL
LYON COUNTY, MN



0 300 600
SCALE FEET

REVIEWED & APPROVED _____ DATE: _____
CITY ENGINEER

BM=1164.07
GSID #86047
AT THE JUNCTION OF TH 59 &
TH 68 IN MARSHALL

PROJECT DATUM: LYON COUNTY COORDINATES
HORIZONTAL: NAD83
VERTICAL: NAVD88

RECORD DRAWING INFORMATION
OBSERVER:
CONTRACTOR:
DATE:

CITY OF MARSHALL, MINNESOTA
LEGION ROAD FLOOD MITIGATION - PHASE 3

TITLE SHEET

SHEET

1

Page 17

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

95% PLAN SET

SHANE T. TRAULICH, P.E.

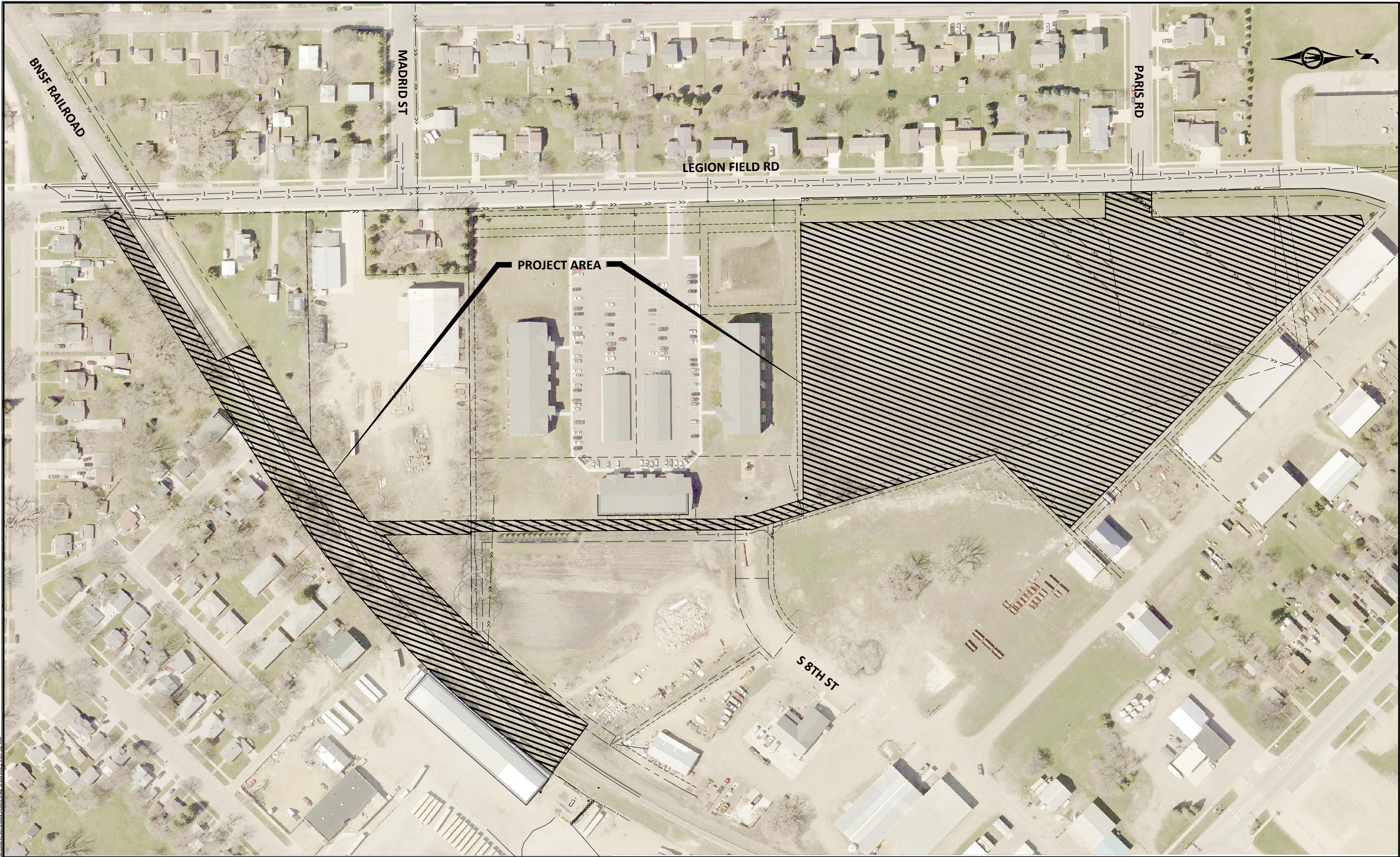
LIC. NO. 57836 DATE 03/20/2025



1243 CEDAR STREET NE
SLEEPY EYE, MINNESOTA 56085
Phone: (507) 794-5541
Email: SleepyEye@bolton-menk.com
www.bolton-menk.com



DESIGNED	NO.	ISSUED FOR	DATE
DTB, STT			
DRAWN			
DTB, STT			
CHECKED			
STT			
CLIENT PROJ. NO.			
24X.136629.000			



366290001 CAD (S) 24X.136629.000.dwg 2/20/2025 9:07:32 AM

Item 4.



I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

95% PLAN SET
SHANE T. TRAULICH, P.E.
LIC. NO. 57836 DATE 03/20/2025



1243 CEDAR STREET NE
SLEEPY EYE, MINNESOTA 56085
Phone: (507) 794-5541
Email: SleepyEye@bolton-menk.com
www.bolton-menk.com

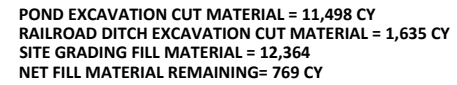


DESIGNED	DTB, STT	NO.	ISSUED FOR	DATE
DRAWN	DTB, STT			
CHECKED	STT			
CLIENT PROJ. NO.	24X.136629.000			

CITY OF MARSHALL, MINNESOTA
LEGION ROAD FLOOD MITIGATION - PHASE 3

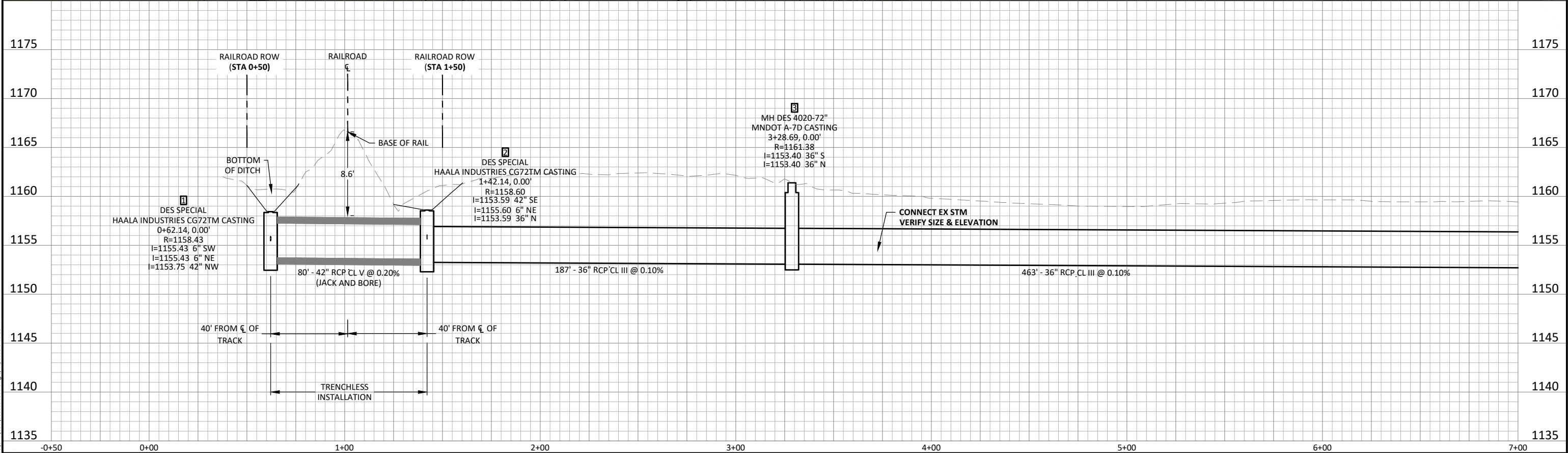
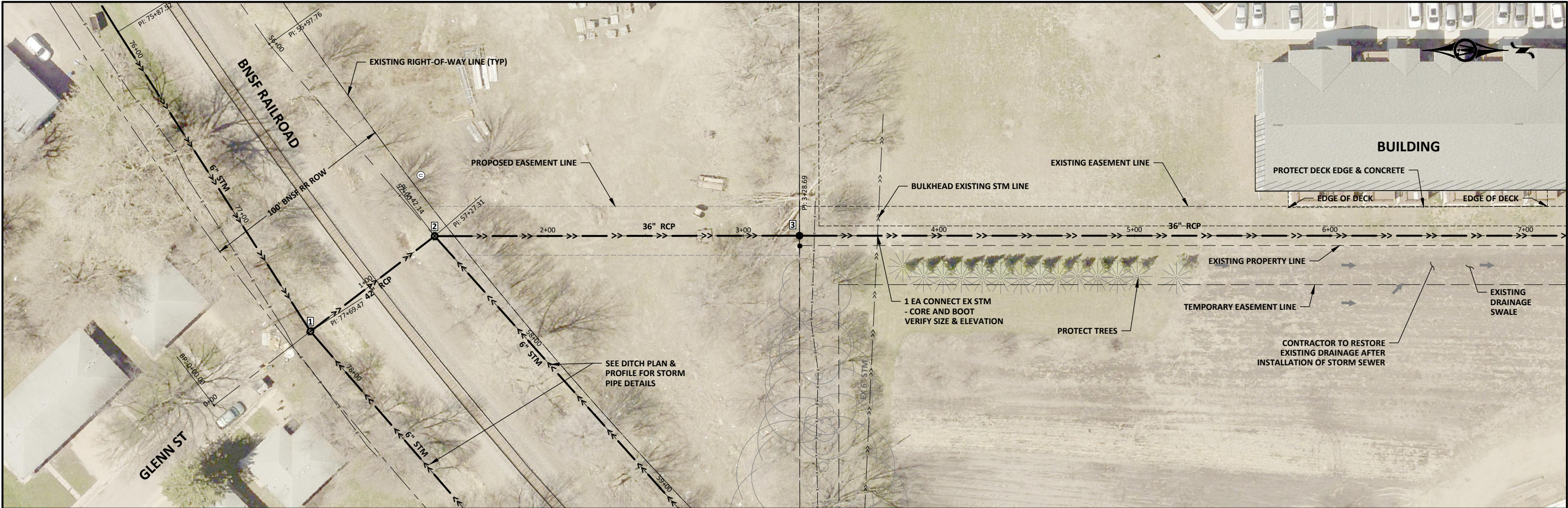
LOCATION SHEET

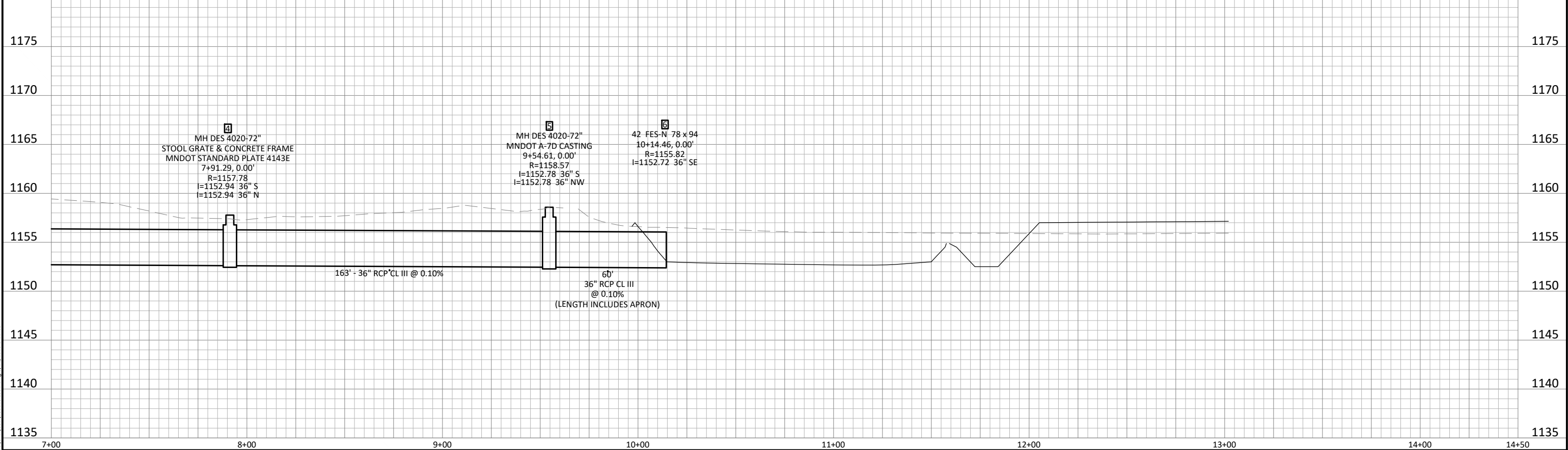
SHEET
4
Page 18



SHEET
12

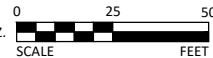
Page 19





36629C501.dwg 3/20/2025 9:12:05 AM

Item 4.



I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
95% PLAN SET
SHANE T. TRAULICH, P.E.
LIC. NO. 57836 DATE 03/20/2025

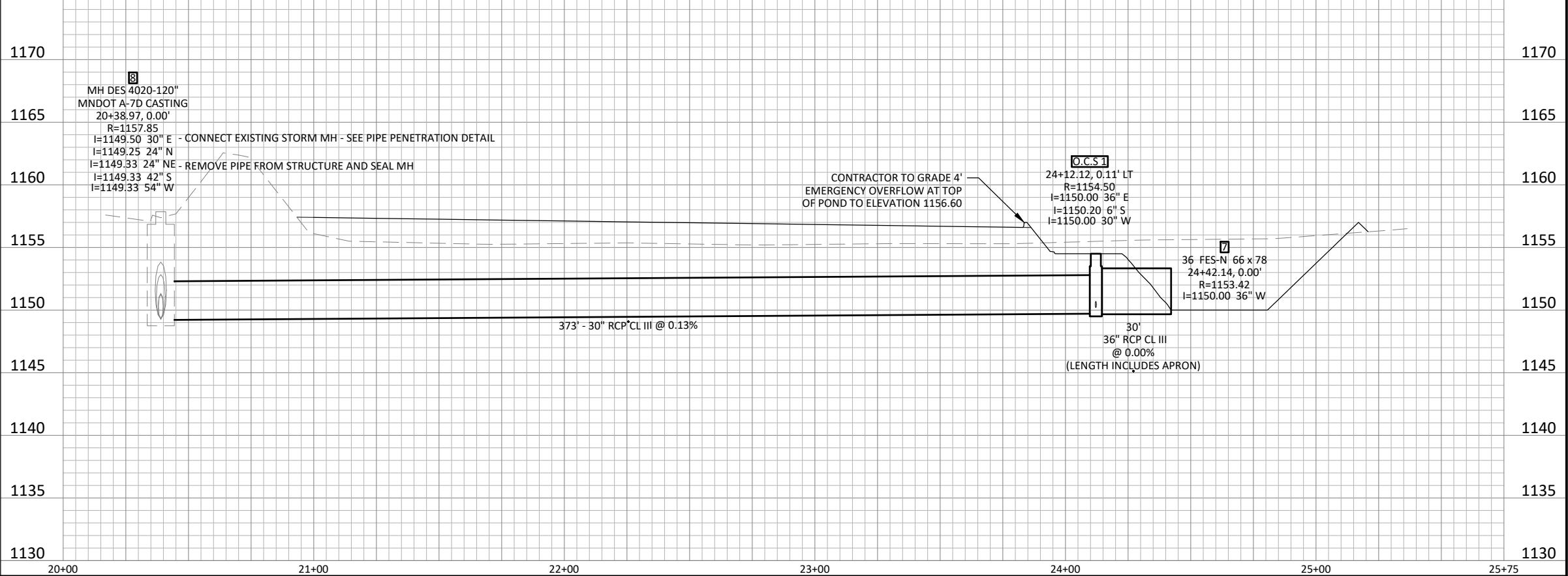
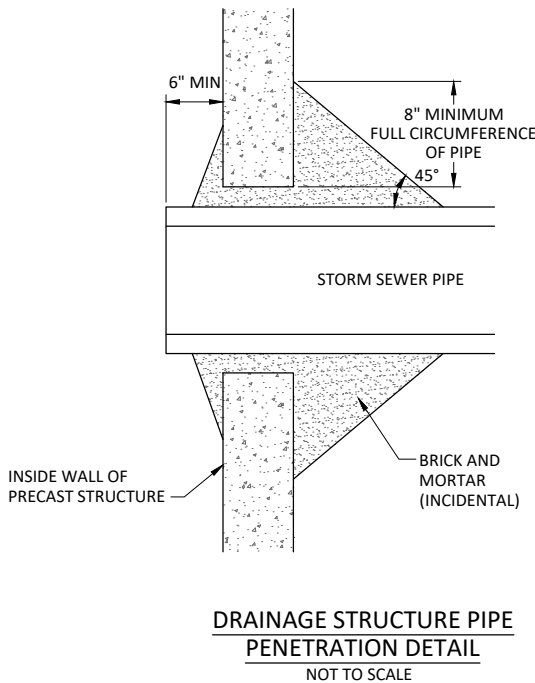
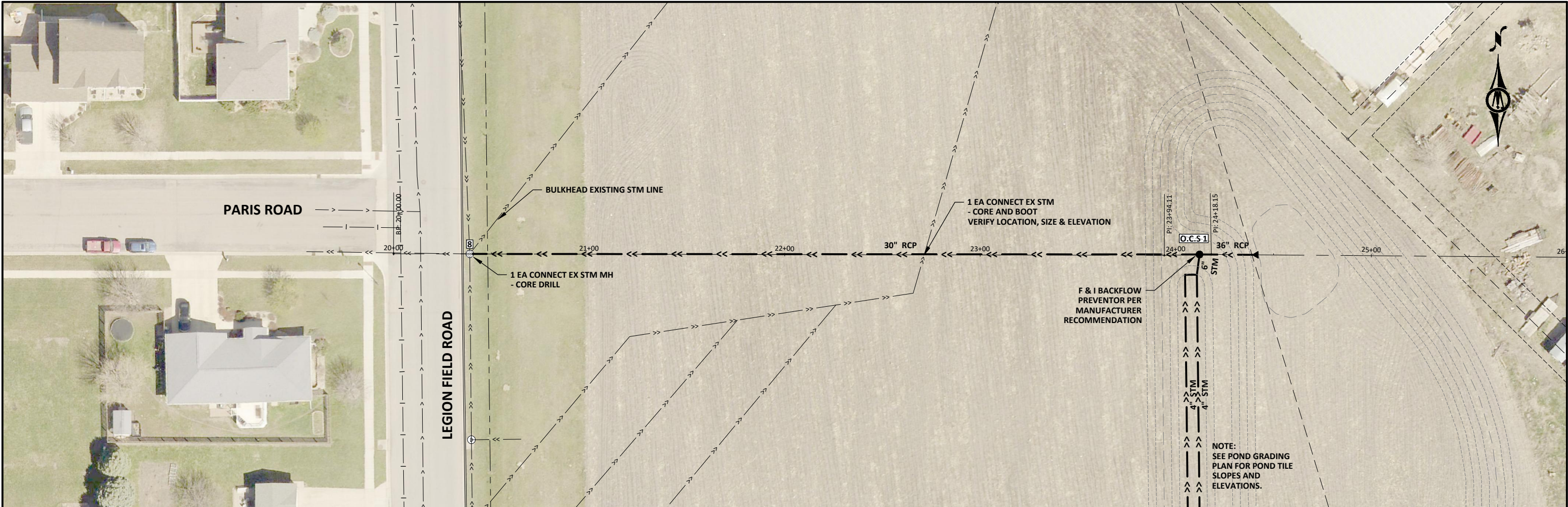


1243 CEDAR STREET NE
SLEEPY EYE, MINNESOTA 56085
Phone: (507) 794-5541
Email: SleepyEye@bolton-menk.com
www.bolton-menk.com



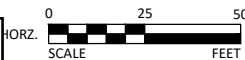
DESIGNED	DTB, STT	NO.	ISSUED FOR	DATE
DRAWN	DTB, STT			
CHECKED	STT			
CLIENT PROJ. NO.	24X.136629.000			

CITY OF MARSHALL, MINNESOTA
LEGION ROAD FLOOD MITIGATION - PHASE 3
STORM SEWER PLAN & PROFILE
136629C501 - C5.02



36629C501 CADD (3D) 136629C501.dwg 3/20/2025 9:13:05 AM

Item 4.



I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
95% PLAN SET
SHANE T. TRAULICH, P.E.
LIC. NO. 57836 DATE 03/20/2025



1243 CEDAR STREET NE
SLEEPY EYE, MINNESOTA 56085
Phone: (507) 794-5541
Email: SleepyEye@bolton-menk.com
www.bolton-menk.com



DESIGNED	DTB, STT	NO.	ISSUED FOR	DATE
DRAWN	DTB, STT			
CHECKED	STT			
CLIENT PROJ. NO.	24X.136629.000			

CITY OF MARSHALL, MINNESOTA
LEGION ROAD FLOOD MITIGATION - PHASE 3
STORM SEWER PLAN & PROFILE
136629C501 - C5.03

**CITY OF MARSHALL
AGENDA ITEM REPORT
PI/T – 03/25/2025**

Presenter:	Jason Anderson
Meeting Date:	Tuesday, March 25, 2025
Category:	NEW BUSINESS
Type:	ACTION
Subject:	Project PK-011 / (SAP 139-090-006): C Street/Southview Drive Trail Project
Background Information:	<p>City staff secured a Transportation Alternatives (TA) (Federal) grant in 2020 in the amount of \$399,528 for the construction of this shared use path. In addition, City Engineering staff submitted for and received \$211,997 in 2025 Active Transportation grant funds.</p> <p>This project is currently at 95% design and has been submitted for project permitting. All easements are secured and numerous meetings have occurred between city staff and adjacent property owners. City staff anticipate bidding this project in summer 2025. Included with the packet are some plan sheets for PI/T Committee review and concurrence.</p>
Fiscal Impact:	The City has \$399,528 in TA grant, and \$211,997 in AT grant funding for this project. The current cost estimate is \$599,438 in construction costs, and \$95,910 in engineering costs (not grant eligible). Additionally, city staff has requested to advance up to \$150,000 in Municipal State Aid funds to help cover engineering fees and project costs in excess of grant awards.
Alternative/Variations:	No alternative actions recommended.
Recommendations:	To recommend City staff to advertise the project for bids once plans and specifications are ready.

Minnesota Department of Transportation
City of Marshall, Minnesota
Project Number PK-011
SP 139-090-006

Construction Plans for Grading, Concrete Trail, and ADA Improvements

MINN PROJ NO. TA 4225(271)

INDEX

SHEET NO. DESCRIPTION

1	Title Sheet
2	Estimated Quantity Sheet
3	Notes & Typical Sections Sheet
4-5	SWPPP Sheets
6-11	Pedestrian Curb Ramp Details
12-15	Driveway and Sidewalk Details
16-19	Existing Conditions and Removals
20-26	Plan and Profile Sheets
27	ADA Plan Sheet
28-32	Cross Section Sheets

THIS PLAN SET CONTAINS 32 SHEETS.

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSE PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

APPROVED: DESIGN ENGINEER, MARSHALL MINNESOTA DATE REG NO 53322

DESIGN ENGINEER, PRINTED NAME DATE

APPROVED: CITY ENGINEER, MARSHALL MINNESOTA DATE REG NO 53322

DISTRICT STATE AID ENGINEER: REVIEWED FOR COMPLIANCE WITH STATE AND/OR FEDERAL AID RULES/POLICY DATE

STATE AID ENGINEER: APPROVED FOR STATE AND/OR FEDERAL AID FUNDING DATE

LEGEND

ALIGNMENT STATIONS	
EXISTING GAS LINE	
EXISTING COMMUNICATION LINE	
EXISTING FIBER LINE	FIB FIB
EXISTING UNDERGROUND POWER	
EXISTING STREET LIGHT	
EXISTING CATCH BASIN	
EXISTING STORM MANHOLE	
EXISTING SANITARY MANHOLE	
EXISTING HYDRANT	
EXISTING WATER VALVE	
NEW CATCH BASIN	
NEW HYDRANT	
NEW WATER VALVE	
NEW SANITARY MANHOLE	
NEW STORM MANHOLE	
BENCHMARK TOP NUT HYDRANT	

SPECIFICATION REFERENCE

THE 2020 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST EDITION OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, INCLUDING THE LATEST FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS.

THE CITY OF MARSHALL STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

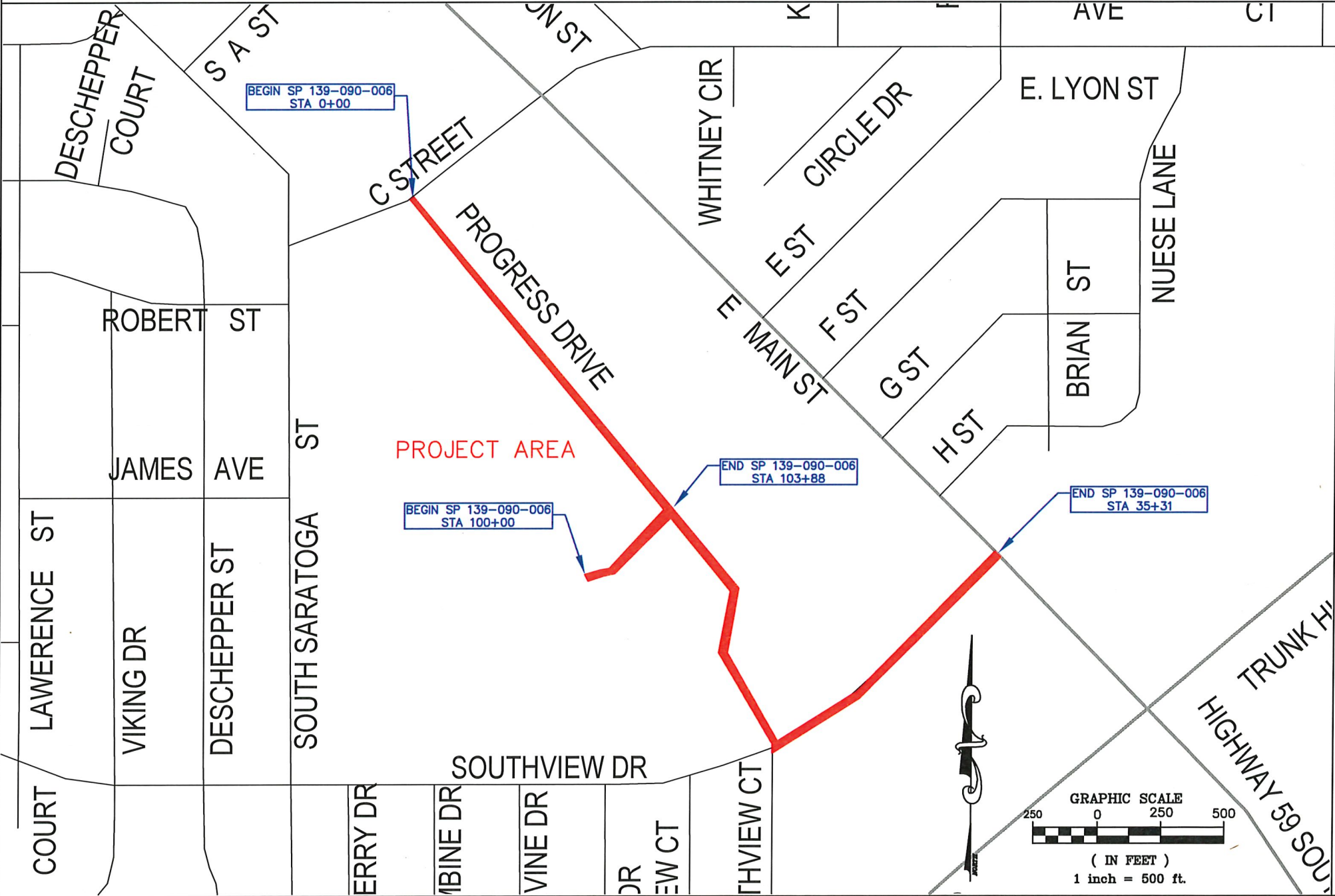
PROJECT LENGTH

PRIMARY TRAIL	3531	FEET	0.669	MILES
SCHOOL TRAIL LEG	389	FEET	0.074	MILES
GROSS LENGTH TRAIL	3920	FEET	0.742	MILES
EXCEPTIONS	0	FEET	0.000	MILES
NET LENGTH	3920	FEET	0.742	MILES

DESIGN DATA
DESIGN SPEED 20 MPH
STOPPING SIGHT DISTANCE BASED ON
4.5' HEIGHT OF EYE
0.0' HEIGHT OF OBJECT


SCALES

PLAN	1"=40'
PROFILE	1"=5'
INDEX MAP	1"=500'
GENERAL LAYOUT	1"=40'



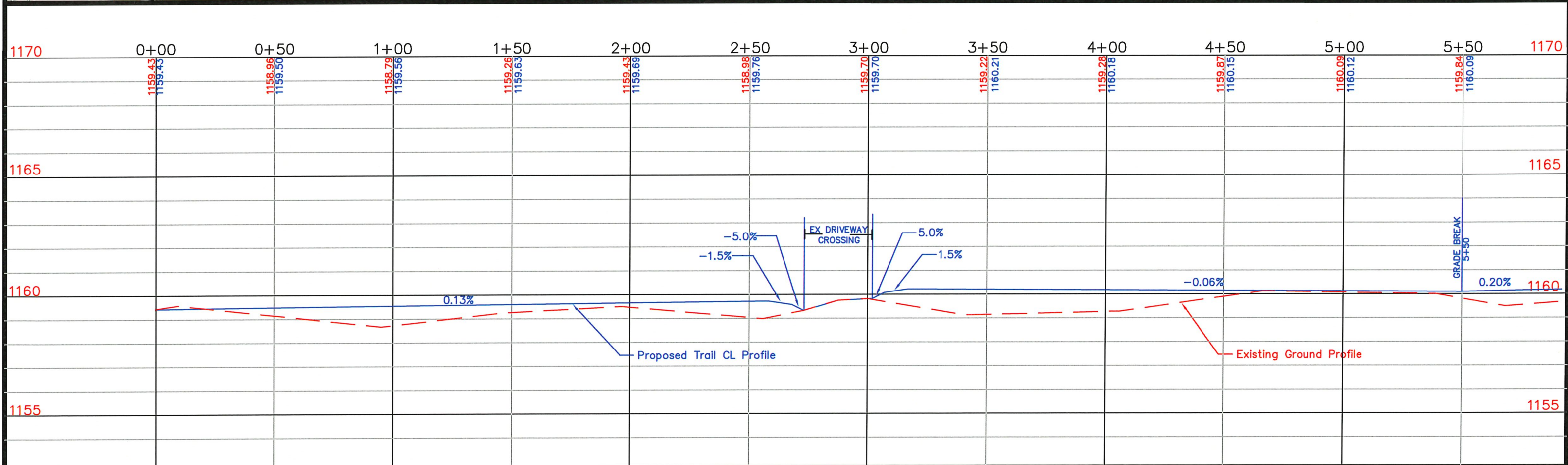
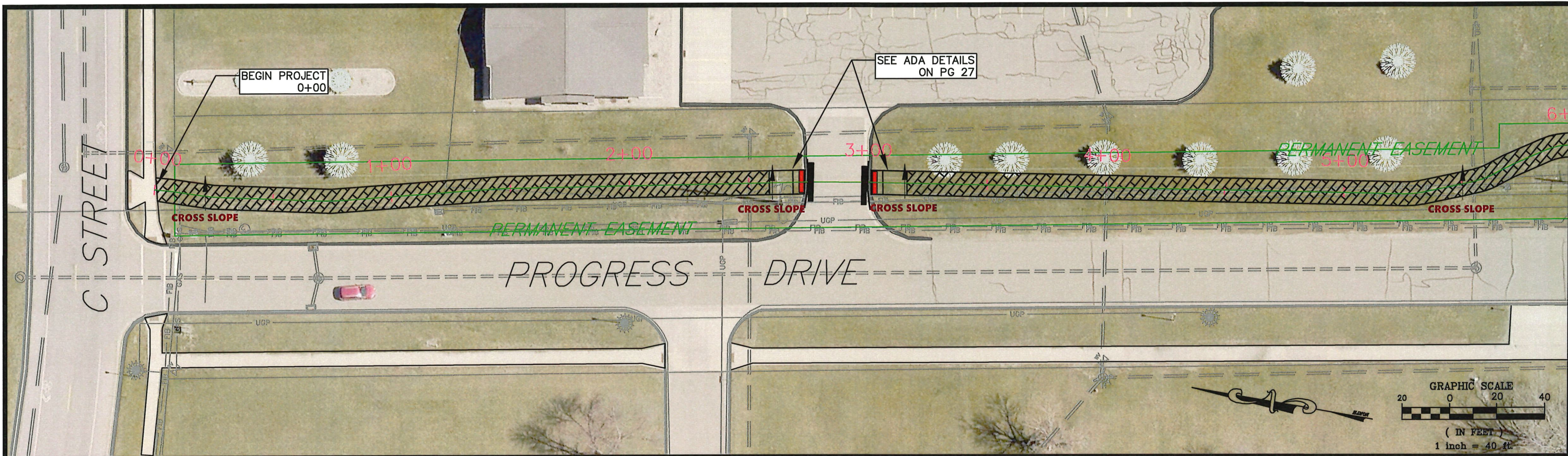
DESIGNED BY: JRL
DRAWN BY: JRL
Item 5.
SCALE: N/A

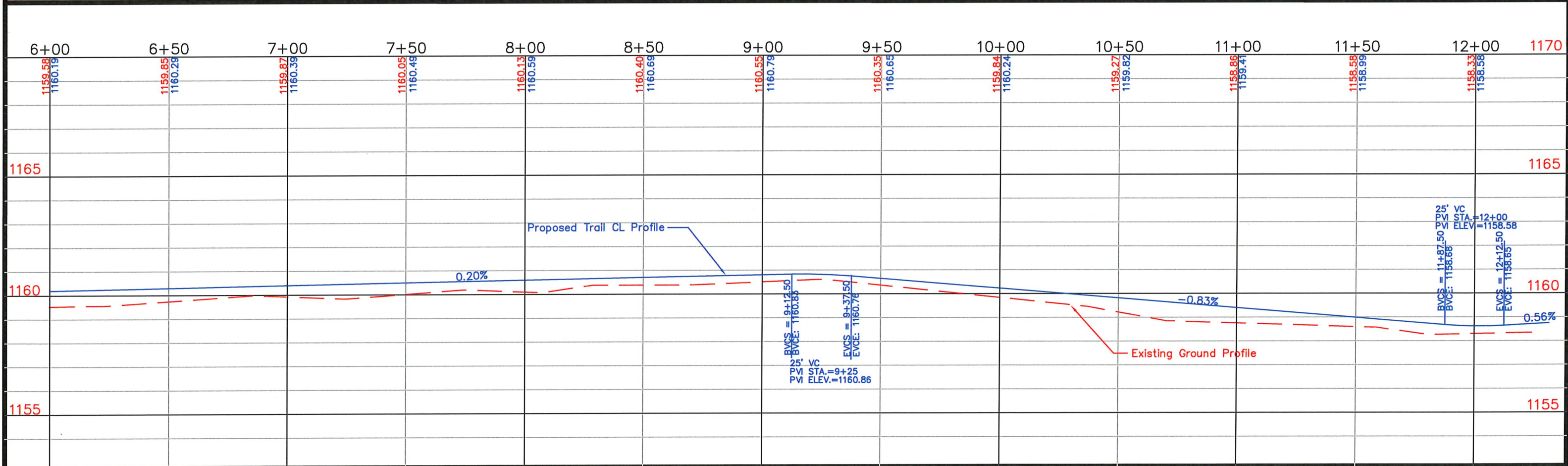
DATE	REVISIONS	INIT.

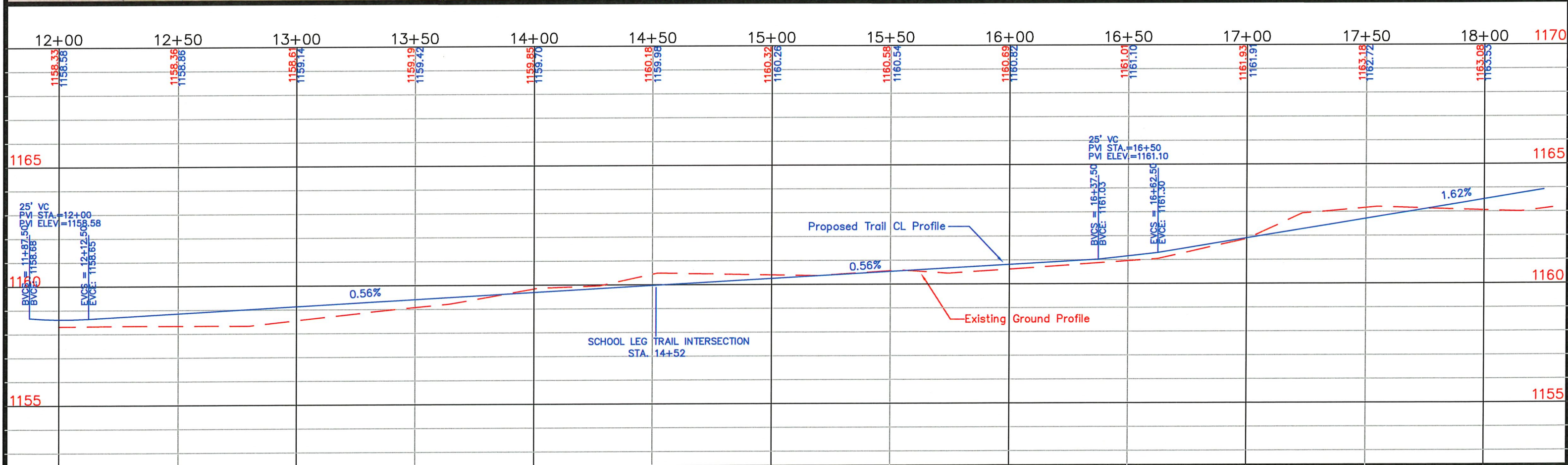
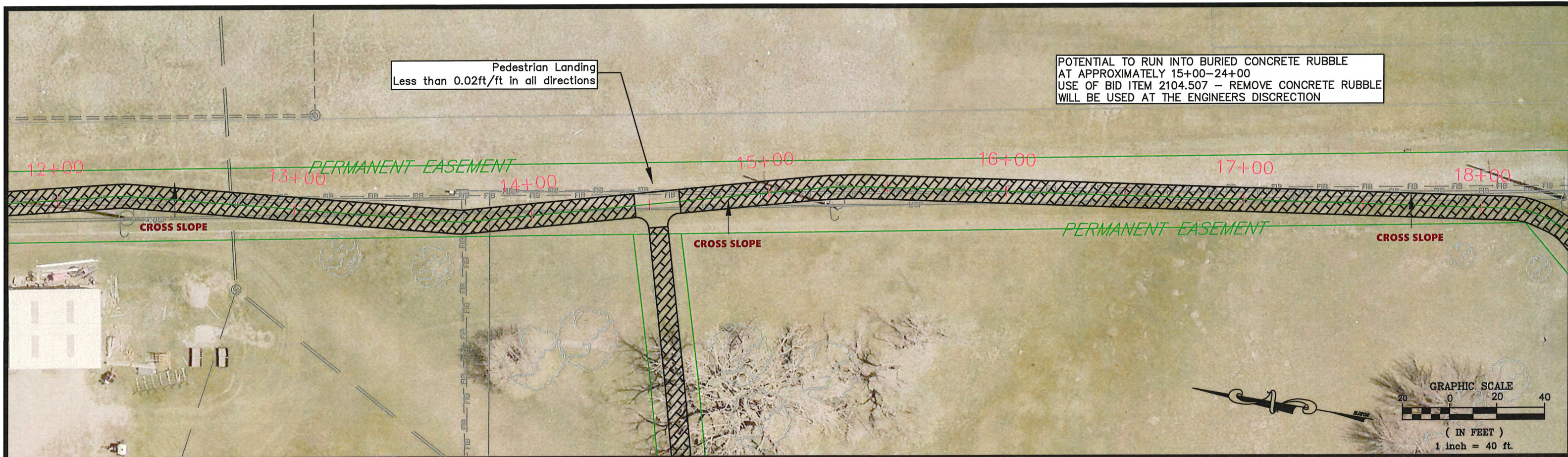

MARSHALL
ENGINEERING DEPARTMENT
344 WEST MAIN STREET
MARSHALL, MINNESOTA
56258

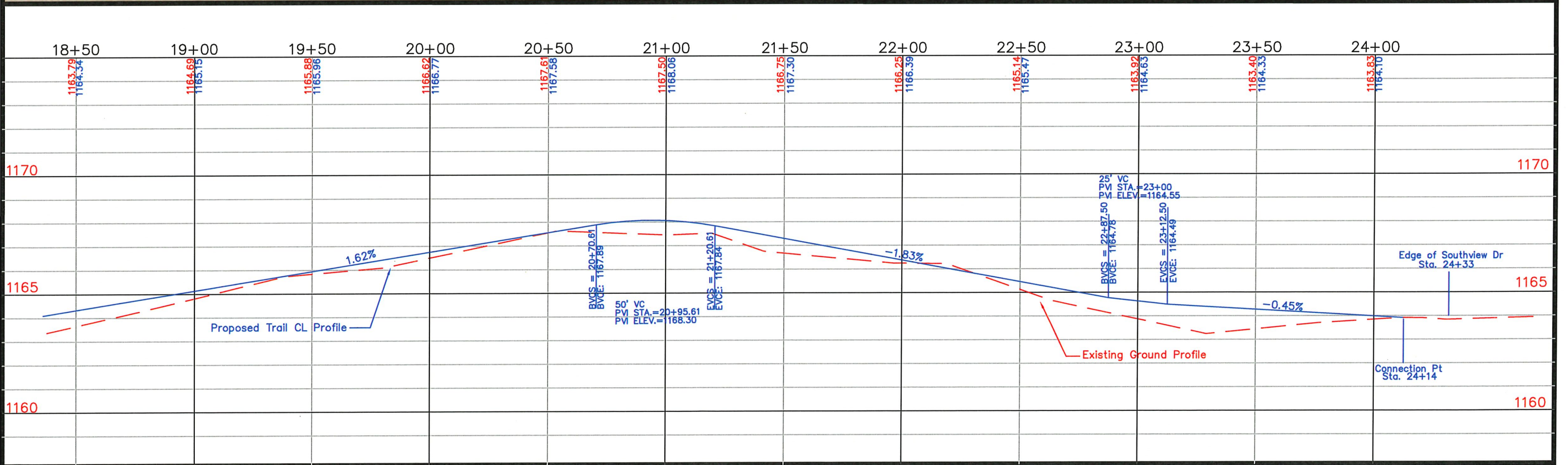
C STREET & SOUTHVIEW TRAIL
TITLE SHEET

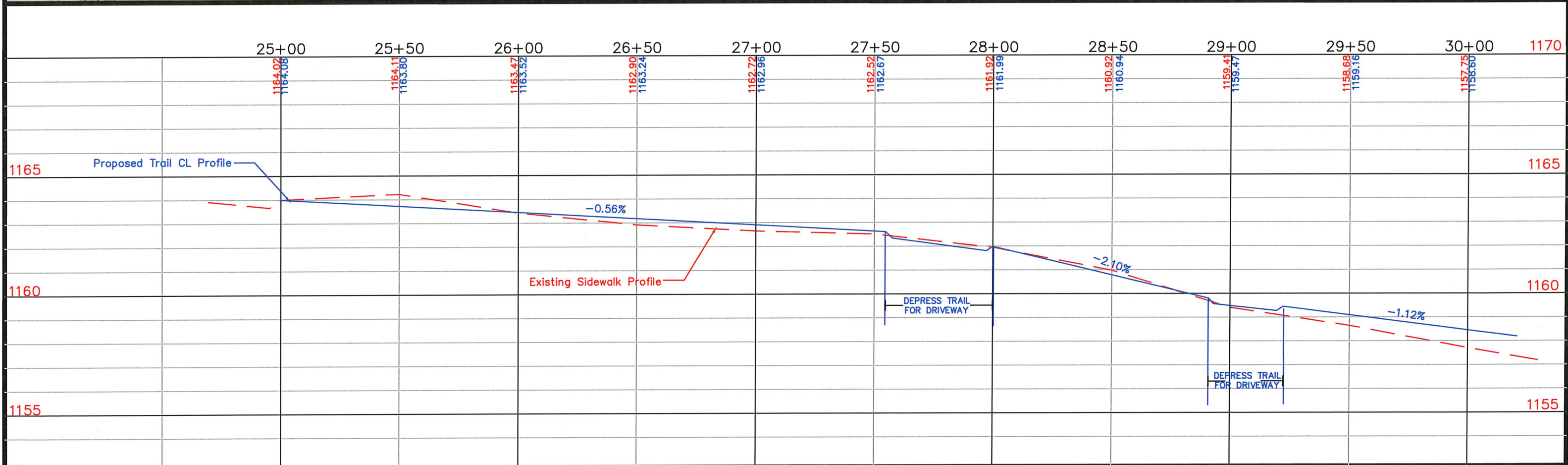
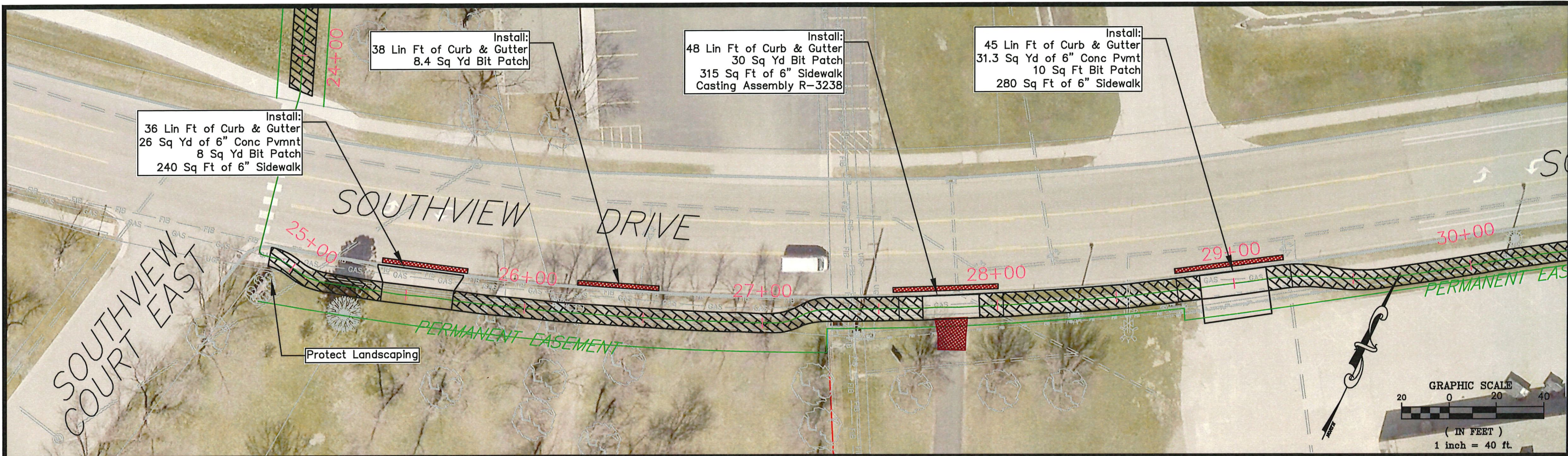
CITY PROJECT NO. PK-011
DATE 03/01/2025
STATE PROJECT NO. SP 139-090-006
SHEET NO. 1 Page 24

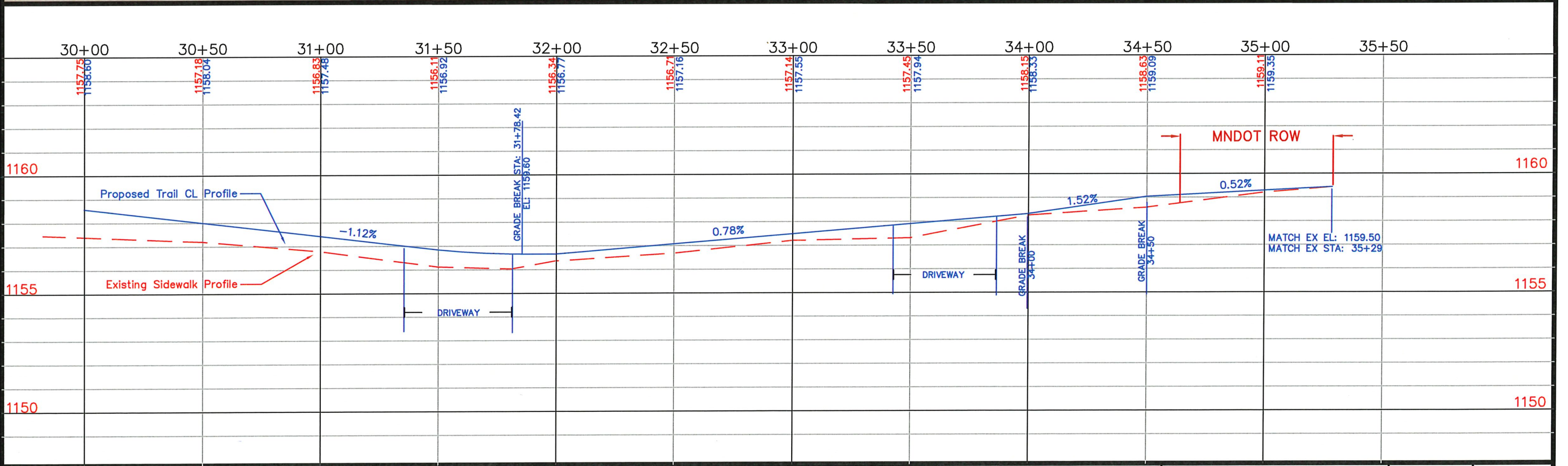
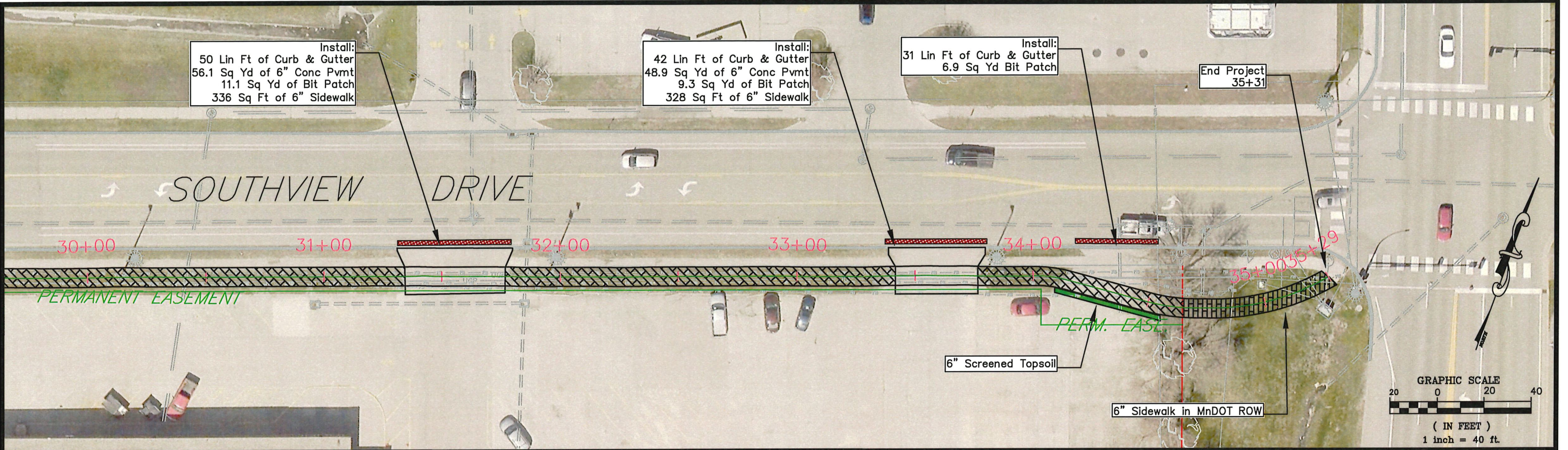


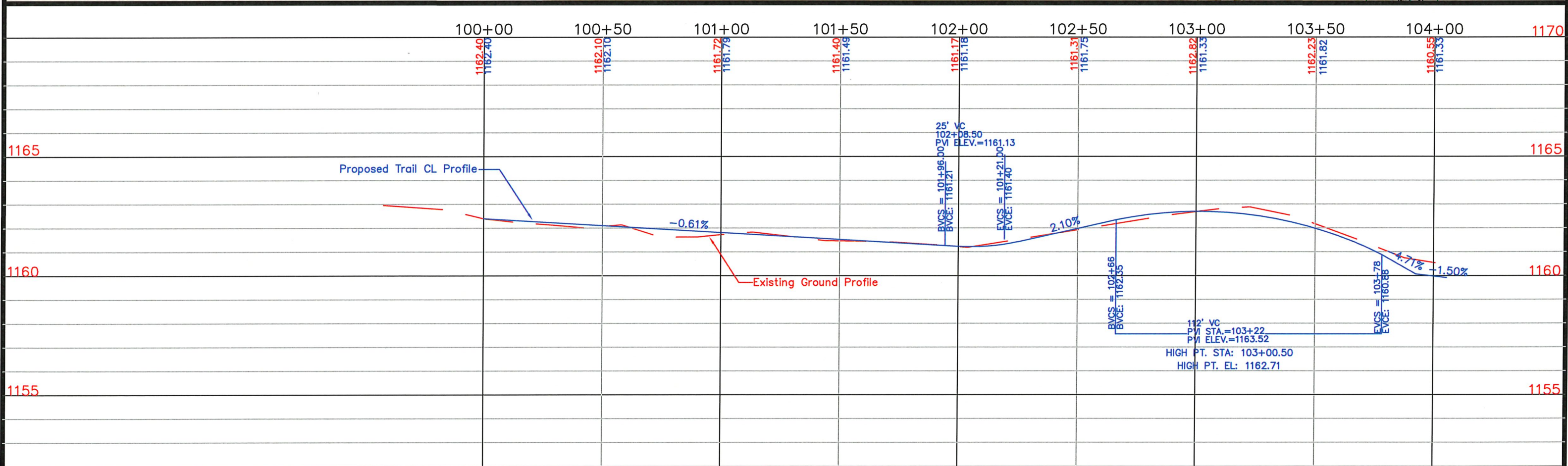
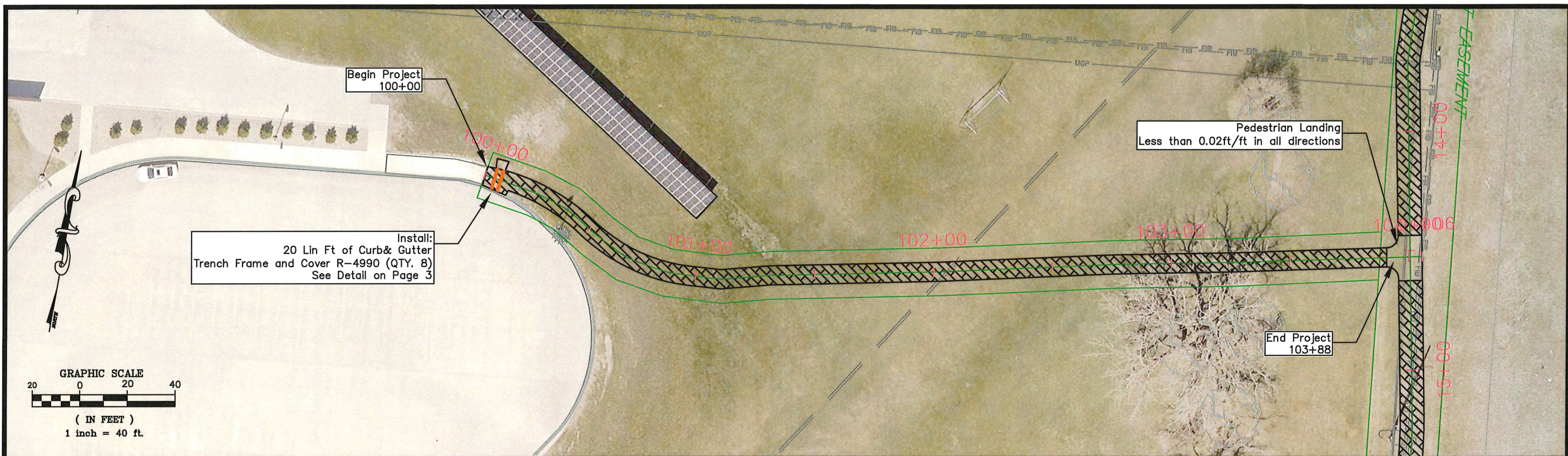












CITY OF MARSHALL
AGENDA ITEM REPORT
PI/T – 03/25/2025

Presenter:	Jason Anderson
Meeting Date:	Tuesday, March 25, 2025
Category:	NEW BUSINESS
Type:	INFO/ACTION
Subject:	Project ST-034: Intersection Control Evaluation (ICE) for Intersection of Susan Drive and US 59 Frontage Road
Background Information:	<p>The intersection of Susan Drive just east of US 59/Main Street is an important and busy intersection in our community. The intersection is quite wide and there are numerous travel lanes designated on each leg of the intersection. The intersection is further troubled by the “free” movements into the intersection coming off Main Street.</p> <p>At the 09/26/2023 meeting, the City Council authorized City staff to work with Bolton & Menk to complete an Intersection Control Evaluation (ICE) and to offer the City design options for geometric improvement at this intersection to help ensure good traffic flow, while also considering safety for all users of the intersection. As part of the study, Bolton & Menk conducted a traffic analysis that included the usage of video cameras and traffic movement counts in this area.</p> <p>Though the ICE Report was not yet finalized at the time, this item was presented to the PI/T Committee at their 11/28/2023 meeting. At the 11/28/2023 meeting that evening, the City Council adopted Resolution 23-074, which is the “Resolution of Support for LRIP Application”, authorizing City staff to submit an LRIP grant application for an intersection improvement project. Because staff was unable to come to agreement with the property owners of the adjacent 1200 Susan Drive property, staff did not submit for an LRIP grant in 2023-2024.</p> <p>The ICE Report is now completed and staff would like concurrence regarding options for this intersection. With guidance from the PI/T Committee and ultimately the City Council, city staff will re-engage with our pursuit of grant funds to help cover costs of a future project in this location.</p>
Fiscal Impact:	Cost estimates will be prepared in the future once preferred intersection layouts are selected. Project costs will be State Aid eligible due to Susan Drive being a Municipal State Aid Street System (MSAS) route.
Alternative/Variations:	No alternative actions recommended.
Recommendations:	To recommend approval of the ICE report and to provide input on exhibits included in the report.



Real People. Real Solutions.

Intersection Control Evaluation (ICE) Report

Susan Drive and Margaret Avenue

Marshall, Lyon County, MN

February 18, 2025

Submitted by:

Bolton & Menk, Inc.
2040 Highway 12 East
Willmar, MN 56201
P: 320.231.3956
F: 320.231.9710

Certification

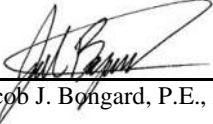
Intersection Control Evaluation Report

Susan Drive and Margaret Avenue

in

City of Marshall
Lyon County, Minnesota

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.



Jacob J. Bongard, P.E., PTOE

52210
Reg. No.

2/18/2025
Date

Approved:

Marshall City Engineer

Date

Introduction

An analysis of the intersection control alternatives at Susan Drive and Margaret Avenue was completed to evaluate and identify necessary improvements to vehicle and pedestrian infrastructure at the intersections due to safety concerns and the close proximity of the two intersections. The intersection is located in Marshall, Lyon County, Minnesota. See **Figure 1** for a project location map.

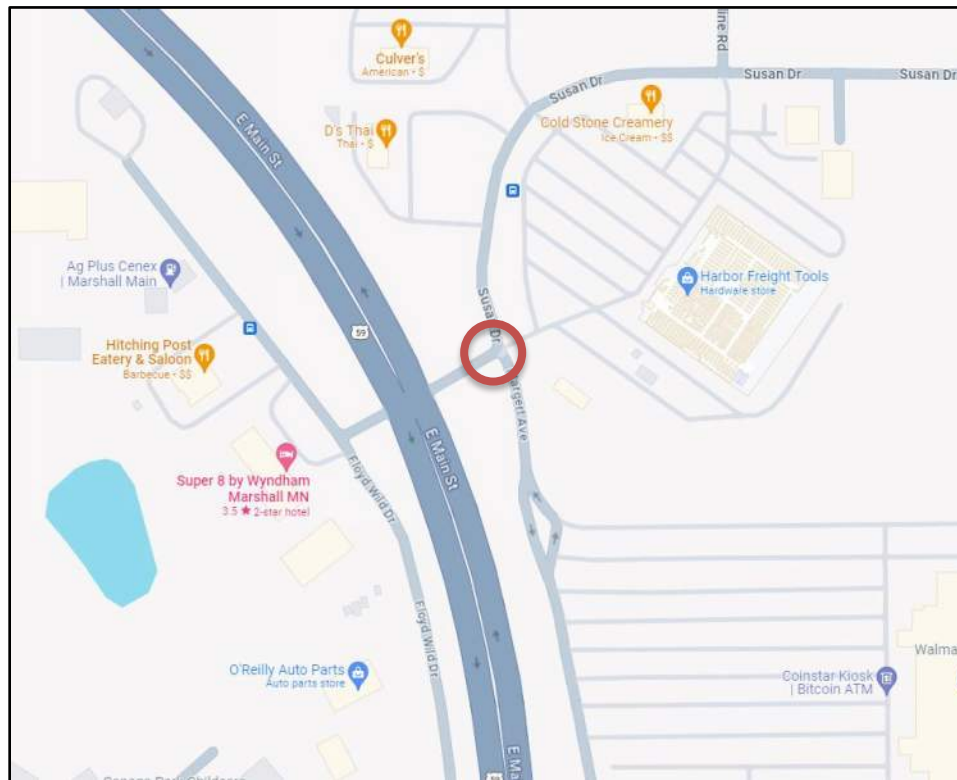


Figure 1. Project Location Map (Map Courtesy of Google)

Existing Conditions

The study area is in the City of Marshall, Lyon County, Minnesota. Susan Drive is a 2-lane undivided roadway that is 38ft from curb to curb. It is classified as a local street and has no posted speed limit but is designed for 30mph. Margaret Avenue is a 2-lane undivided roadway that is 38ft from curb to curb. It is classified as a local street and has no posted speed limit.

The intersection of Susan Drive and Margaret Avenue is a four-legged intersection that is three-way stop controlled with the eastbound approach being a free movement. The segment of Susan Drive between US 59 and Margaret Avenue has 105ft of stacking distance between the adjacent intersections. The north leg is the continuation of Susan Drive. The east leg is the entrance to the commercial parking lot for Harbor Freight Tools. The south leg is Margaret Avenue which leads to the Wal-Mart parking lot. Pedestrian facilities exist on the north leg only.

The study intersection is closely spaced to the US 59 (E Main St) and Susan Drive intersection. US 59 is a 4-lane, divided roadway with curb and gutter classified as a principal arterial that runs north-south through Marshall. The speed limit is 40 mph at the Susan Drive intersection. The intersection of US 59 and Susan Dr is signalized with US 59 considered the major roadway. The west leg of the intersection has 50ft of stacking distance and then opens into a frontage road system that services a variety of businesses including a gas station, hotel, restaurant, and other commercial businesses. Pedestrian

accommodations are provided for the the north and east legs of the intersection. See **Figure 2** for the existing intersection layout and lane configuration.

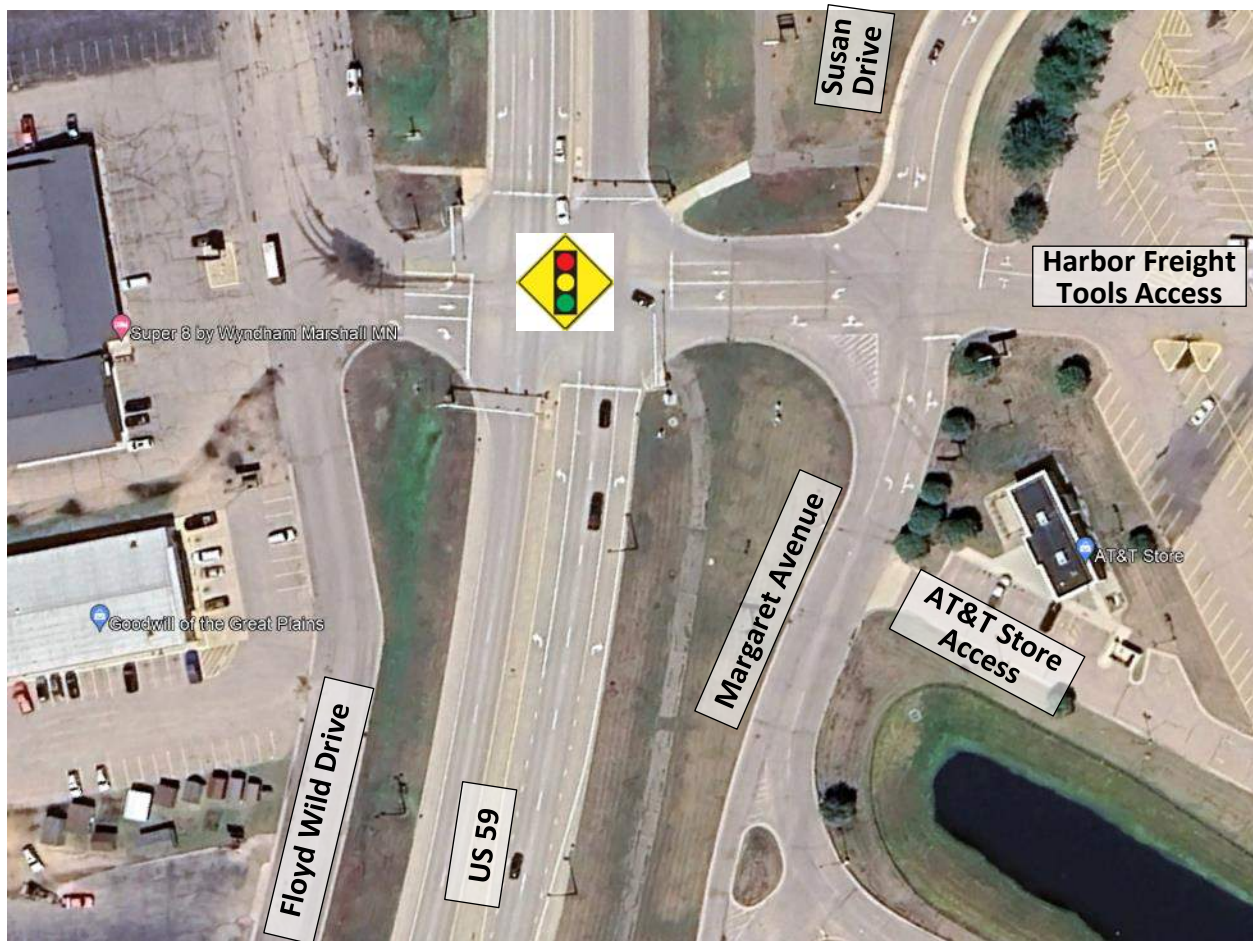


Figure 2: Existing Intersection Layout

Data Collection

Traffic counts were collected in October of 2023 at the intersections of US 59/Susan Drive and Susan Drive/Margaret Avenue. A 13-hour turning movement count was collected on Thursday, October 12th between the hours of 6 am and 7 pm. The details of the count can be found in **Appendix A**. AM and PM peak hours were identified as:

Susan Drive and Margaret Avenue

- 11:00 AM to 12:00 PM for the AM Peak Hour
- 12:45 PM to 1:45 PM for the PM Peak Hour

US 59 and Susan Drive

- 11:00 AM to 12:00 PM for the AM Peak Hour
- 3:45 PM to 4:45 PM for the PM Peak Hour

Though the PM peak hours for the two intersections differ, peak volumes were analyzed together to be conservative and capture the greatest volume threshold.

Safety Analysis

A crash review was completed for the intersection using 2018-2022 crash data obtained from the Minnesota Crash Mapping Analysis Tool (MnCMAT2).

Crash data from 2018-2022 was analyzed to determine the observed crash rate, statewide average crash rate, critical crash rate and critical index. The same parameters for injury crashes were also calculated. The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference (i.e. observed crash rate ÷ critical crash rate); a critical index greater than 1.0 indicates that the observed crash rate is greater than the critical rate and that the intersection crash history is above the expected, normal range. **Tables 1 and 2** summarize the safety analysis results for the intersection.

Table 1. Intersection Crash Data (2018-2022)

Intersection	Traffic Control	Total Crashes (5 Years)	Total Crash Rate				Fatal & Serious Injury Crash Rate			
			Observed	Statewide Average	Critical Rate	Crash Index	Observed	Statewide Average	Critical Rate	Crash Index
US 59 & Susan Dr	Signal	9	0.777	0.508	1.090	0.710	0.00	0.69	8.13	0.00
Susan Dr & Margaret Ave	TWSC	5	0.989	0.128	0.640	1.550	0.00	0.311	13.38	0.00

For the US 59 and Susan Drive intersection, the observed total crash rate for this period is 0.78 per MEV; this is 29% below the critical rate. Based on similar statewide intersections, an additional 4 crashes over the five years would indicate this intersection operates outside the normal range.

For the Susan Drive and Margaret Avenue intersection, the observed total crash rate for this period is 0.99 per MEV; this is 1.6 times the critical rate. If crashes were reduced by 2 over five years, this intersection would perform within normal range.

Table 2. Crash Severity & Type Summary (2018-2022)

Intersection	Crash Severity					Crash Type					
	Fatal	A Injury	B Injury	C Injury	PDO	Angle	Rear End	Left Turn	Sideswipe Opposing	Run off Road	Total
US 59 & Susan Dr	0	0	2	2	5	3	1	3	1	0	9
Susan Dr & Margaret Ave	0	0	0	0	5	2	1	1	0	1	5

An analysis of crash types and severities may help in identifying common safety issues. For the Susan Drive and Margaret Avenue intersection, the analysis of the crash types reveals that two of the five observed crashes during the five-year period were reported as right-angle collisions. An intersection safety screening worksheet and crash summaries for this intersection are shown in **Appendix B**.

Warrant Analysis

All-way stop control and traffic control signal warrant analysis was completed for the intersection of Susan Drive and Margaret Avenue using the 2023 traffic volumes.

Traffic Control Signal Warrant Analysis

Traffic signal warrants have been developed as national guidelines to promote continuity of traffic control devices to ensure that traffic signals are installed at intersections that would benefit from their use.

The MnMUTCD (Chapter 4C) states that the investigation of the need for a traffic control signal shall include an analysis of the applicable factors contained in the following traffic signal warrants:

- Warrant 1: Eight-Hour Vehicular Volume
- Warrant 2: Four-Hour Vehicular Volume

- Warrant 3: Peak Hour
- Warrant 4: Pedestrian Volume
- Warrant 5: School Crossing
- Warrant 6: Coordinated Signal System
- Warrant 7: Crash Experience
- Warrant 8: Roadway Network
- Warrant 9: Intersection Near a Grade Crossing

A traffic control signal should not be installed unless one or more of the warrants can be met, however the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic signal. Furthermore, a traffic control signal should not be installed unless an engineering study indicates that the traffic control signal will improve the overall safety and operation of the intersection. Finally, the signal should not disrupt the progressive flow of traffic. The following assumptions were made when analyzing Warrant 1:

- North and south legs considered the major approaches due to higher volume.
- Right turn lane volumes for the east and west legs were omitted
- Right turn lanes were omitted in the approach lane counts

The warrant analysis shows that no warrants are met for the Susan Dr and Margaret Ave intersection with existing traffic volumes. A traffic signal is not warranted at the intersection. The results of the signal warrant analysis are documented in **Appendix C**.

All-Way Stop Control Warrant Analysis

All-way stop control can be useful as a safety measure at intersections if safety concerns exist because of high traffic volumes in multiple directions or if there is insufficient sight distance available to see conflicting traffic on an approach to an intersection. The decision to install an all-way stop control should be based on an engineering study.

The MnMUTCD identifies the following criteria that should be considered in the engineering study for an all-way stop control installation:

- Condition A: Where traffic control signals are justified, an all-way stop can be installed as an interim measure.
- Condition B: Five or more crashes are reported in a 12-month period.
- Condition C: The volume of either vehicles or a combination of vehicles, pedestrians and bicycles entering the intersection from all approaches for any eight hours of an average day meets the minimum volume requirements set forth in section 2B.7 of the 2018 MnMUTCD.

All-way stop control is met for 2 of the required 8 hours with the 2023 traffic volumes for the existing conditions. All-way stop control is not warranted at the intersection. The results of the all-way stop warrant analysis are documented in **Appendix C**.

Operations Analysis

The operational analysis results are described as a Level of Service (LOS) ranging from A to F as shown in **Table 3**. These letters serve to describe a range of operating conditions for different types of facilities. Levels of service are calculated based on the Highway Capacity Manual 6th edition, which base the level of service on control delay. Control delay is the delay experienced by vehicles slowing down as they are approaching the intersection, the wait time at the intersection, and the time for the vehicle to speed up through the intersection and enter the traffic stream. The average intersection control delay is a volume weighted average of delay experienced by all motorists entering the intersection on all intersection approaches for signalized and roundabout intersections. Level of Service D is commonly taken as an acceptable design year LOS.

Table 3: Level of Service Criteria

	Signalized Intersection	Unsignalized Intersection
LOS	Control Delay per Vehicle (sec.)	Control Delay per Vehicle (sec.)
A	≤ 10	≤ 10
B	>10 and ≤ 20	>10 and ≤ 15
C	>20 and ≤ 35	>15 and ≤ 25
D	>35 and ≤ 55	>25 and ≤ 35
E	>55 and ≤ 80	>35 and ≤ 50
F	>80	>50

Traffic operations and queuing details for 2023 traffic volumes can be found in the **Appendix D**.

Existing Conditions

Both intersections operate with acceptable delays on all approaches in 2023. **Table 3** shows that all approaches of the Susan Drive and Margaret Avenue intersection operate with LOS A except northbound which has LOS B.

Table 4. Existing Conditions Traffic Operations Analysis

Existing Condition					
Intersection	Approach Leg	AM Peak LOS	PM Peak LOS	AM Peak Intersection LOS	PM Peak Intersection LOS
US Highway 59 & Susan Dr	NB	B	B	B	B
	SB	C	C		
	EB	C	C		
	WB	A	A		
Susan Dr & Margaret Ave	NB	B	B	A	A
	SB	A	A		
	EB	A	A		
	WB	A	A		

Alternatives Analysis

A range of potential alternatives were explored for the US 59 at Susan Drive and Susan Drive at Margaret Avenue intersections to improve safety and support efficient movement of traffic through the area. This exercise included a comprehensive review of the following characteristics to identify a well-rounded improvement supportive of the many competing needs and interests at the intersection:

- *Business Access* – Sufficient access must be maintained to area businesses including Harbor Freight Tools, AT&T, D’S Thai Restaurant, and Walmart (via Margaret Avenue to the south).
- *Pedestrian/Bicyclist Accommodations* – Reducing overall exposure and simplifying decision-making for pedestrians and bicyclists in the area is a priority. Lane reductions, defined marked pedestrian crossings, and improved sidewalk/trail connectivity were considered.
- *Traffic Control* – The traffic signal at US 59 and Susan Drive will be maintained. Review of the existing three-way stop at Susan Drive and Margaret Avenue is needed to identify if other alternatives provide improved traffic flow and safety.
- *Intersection Geometry* – The current spacing between US 59 and Margaret Avenue allows for limited stacking distance and requires complex decision-making for drivers navigating the area. Re-alignment of Susan Drive or Margaret Avenue, lane reductions, access modifications, and other elements were reviewed to simplify movements at the intersection.

Several alternatives were developed, each with varying levels of accommodation for the competing needs at the intersection. The following two alternatives were viewed as best accommodating the needs of the area:

- Alternative #1: Susan Drive T-Intersection - The Susan Drive T-Intersection Alternative involves relocating the harbor freight entrance and realigning Susan Drive, aiming to improve traffic flow. See **Figure 3** for details.
- Alternative #2: Margaret Avenue Closure – The Margaret Avenue Closure Alternative recommends closing the access to Walmart on Margaret Avenue. See **Figure 4** for details.

Both alternatives will be analyzed for their feasibility and impact on the transportation system.

Alternative #1: Susan Drive T-Intersection

The T-Intersection Alternative assumes relocating the harbor freight entrance and realigning Susan Drive so that the existing southbound right and eastbound left become the through movements. Margaret Avenue then Ts into Susan Dr and is stop controlled. The lane configuration on the WB approach of US 59 is modified to combine the left and thru movements. This change allows room for a southbound left turn lane at the new Susan Drive and Margaret Avenue intersection. The pedestrian crossing of Susan Drive is shifted north to the new Harbor Freight entrance. This concept is shown in **Figure 3** and a standalone figure is included in **Appendix E**.



Figure 3. T-Intersection Alternative

Operations Analysis

The Build Conditions analysis for the T-intersection alternative shows that the revised configuration is expected to operate with acceptable delays on all approaches with existing traffic volumes. **Table 5** shows that all approaches operate with LOS A except northbound which operates at a LOS B during the AM and PM peak hours. The findings also show that modifications proposed at the Susan Drive and Margaret Avenue intersection do not negatively impact the function of the signalized US Highway 59 and Susan Drive intersection.

Table 5. Build Conditions Traffic Operations Analysis

Build Condition					
Condition	Approach Leg	AM Peak LOS	PM Peak LOS	AM Peak Intersection LOS	PM Peak Intersection LOS
US Highway 59 & Susan Dr	NB	B	B	B	B
	SB	C	C		
	EB	C	C		
	WB	B	A		
Susan Dr & Margaret Ave	NB	B	B	A	A
	SB	A	A		
	EB	A	A		

Queues for the westbound approach of Susan Drive at US Highway 59 were analyzed to identify if issues arise between the closely spaced intersections. As noted, the westbound approach is reduced from three lanes of approach (left, thru, and right) to two lanes of approach (left-thru and right). Storage length In the Existing Conditions there is separate left, through and right turn lanes. Storage length for the thru-left lane is extended from 105 feet to 115 with the build condition. **Table 6** shows expected queuing between the intersections. The maximum queue for both alternatives is 50ft. This is approximately 2 car lengths and does not extend beyond the available storage in either condition.

Table 6. Build Conditions Traffic Queuing Analysis

US Highway 59 & Susan Dr					
Condition	Peak Hour	Approach Leg	Movement	Queue (ft)	
				Average	Maximum
Existing	AM	WB	L	25	25
			T	25	25
			R	0	50
	PM		L	25	50
			T	25	25
			R	0	50
Build	AM		LT	25	50
			R	0	50
	PM		LT	25	50
			R	0	50

Alternative #2: Margaret Avenue Closure

The Margaret Avenue Closure Alternative assumes severing the Margaret Avenue connection between Susan Drive and Walmart south of the AT&T access off Margaret Avenue. The lane configuration on the WB approach of US Highway 59 is changed to combine the left and thru movements. For the Susan Drive and Margaret Avenue intersection, the eastbound, northbound, and westbound approaches are combined into a single lane. An exclusive right turn lane is maintained for the southbound approach to the intersection. The existing pedestrian crossing of the north leg is maintained. This concept is shown in **Figure 4** and a standalone figure is included in **Appendix E**.

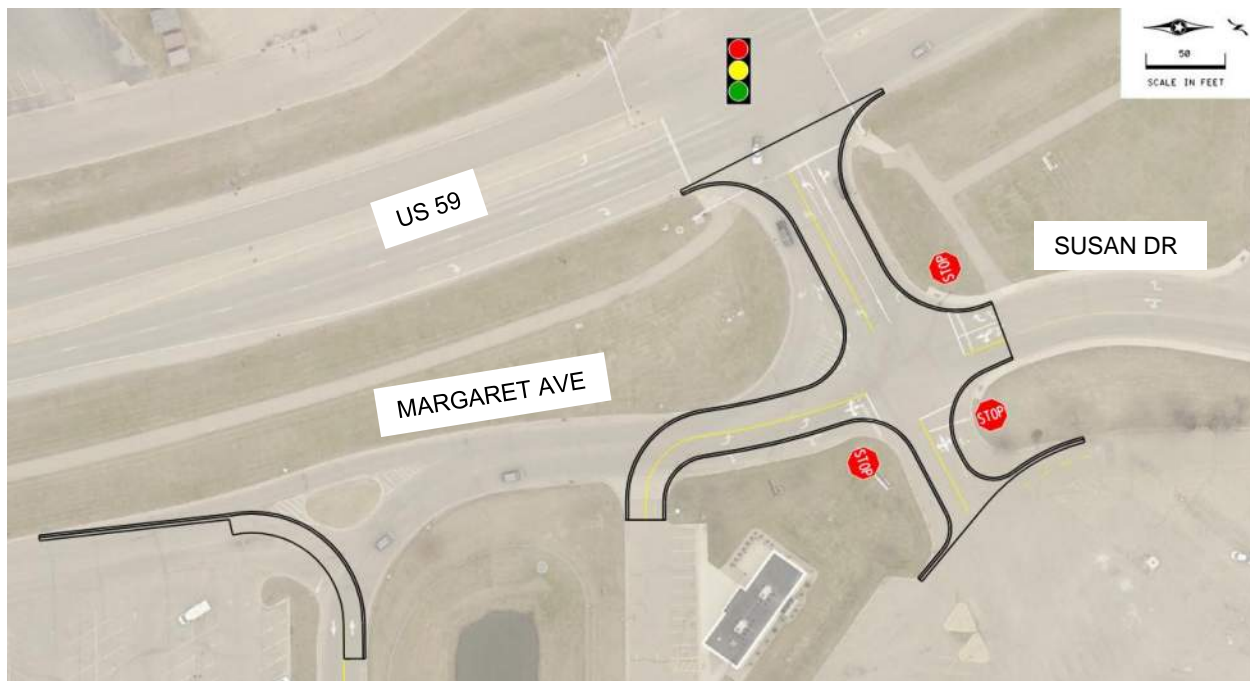


Figure 4. Margaret Avenue Closure Alternative

Operations Analysis

The Build Conditions analysis for the Margaret Avenue Closure Alternative shows acceptable operations for all approaches. Traffic levels are expected to be reduced for the west and south legs of the Susan Drive and Margaret Avenue intersection with all Walmart traffic now redirected to Boyer Drive to the south.

Additional Alternatives Reviewed

In addition to Alternatives 1 and 2 outlined above, the following alternatives were explored and documented as potential intersection treatments for the Susan Drive and Margaret Avenue but are not recommended to be carried forward.

Alternative #3: Tightened Intersection Alternative

The Tightened Intersection Alternative minimizes pavement needs for the intersection. The lane configuration on the WB approach of US Highway 59 is modified to combine the left and thru approach lanes. For the Susan Drive and Margaret Avenue intersection, the lanes are combined to one left/thru/right for the eastbound and westbound approaches. The existing pedestrian crossing of the north leg is maintained. This concept is shown in **Figure 5** and a standalone figure is included in **Appendix E**.

This alternative was dismissed as it is not expected to provide the safety and operational benefits of Alternatives 1 and 2 outlined previously.

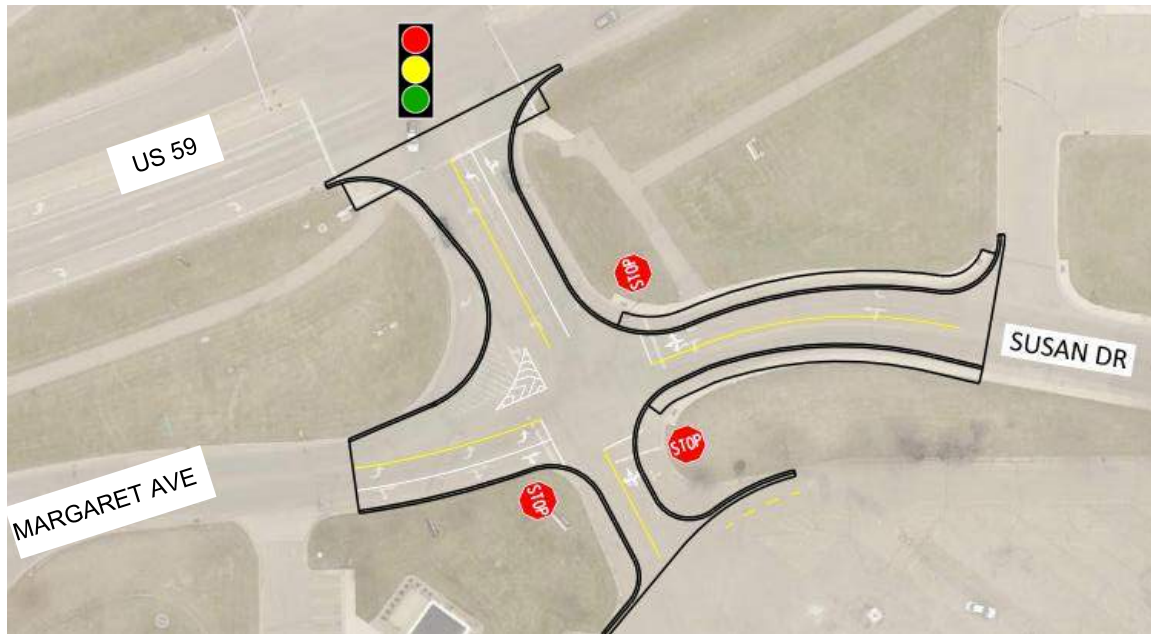


Figure 5. Tightened Intersection Alternative

Alternative #4: Eastbound Free Right Alternative

The Eastbound Free Right Alternative assumes relocating the Harbor Freight Tools entrance and realigns Susan Drive to allow the existing southbound right and eastbound left to function as the through movements. Margaret Avenue then Ts into Susan Dr and is stop controlled. The lane configuration on the westbound approach of US Highway 59 is changed to combine the left and thru movements. This change allows room for a southbound left turn lane at the new Susan Drive and Margaret Ave. The pedestrian crossing of Susan Drive is shifted north to driveway entrance. This concept is shown in **Figure 6** and a standalone figure is included in **Appendix E**.

This alternative was dismissed as it is not expected to provide the safety and operational benefits of Alternatives 1 and 2 outlined previously.



Figure 6. Eastbound Free Right Alternative

Recommendations

The operations and warrant analysis for the Susan Drive and Margaret Avenue intersection indicate that a variety of intersection alternatives could effectively serve the level of traffic traveling through the intersection with existing conditions. Alternative #1 and Alternative #2 are the preferred improvements due to their ability to best manage the competing interests of the intersection. It will be the decision of City officials as to whether access closures are permissible or if those presented in varying alternatives represent fatal flaws in carrying forward a preferred vision. All alternatives outlined in this document are expected to simplify decision-making at the intersection while maintaining sufficient operations.

Appendix A

Turning Movement Counts

US 59 & Susan Dr, Marshall MN

0 0

Thursday, October 12, 2023

Time	Southbound						Westbound						Northbound						Eastbound						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	3	13	7	0	23	0	0	0	6	0	6	0	0	19	1	0	20	0	10	0	1	0	11	60
6:15 AM	0	5	17	11	0	33	0	1	0	5	0	6	0	2	26	0	0	28	0	8	0	3	0	11	78
6:30 AM	0	5	23	6	0	34	0	0	0	5	0	5	0	4	34	1	0	39	0	12	1	1	0	14	92
6:45 AM	0	16	24	6	0	46	0	0	2	6	0	8	0	1	39	3	0	43	0	5	0	1	0	6	103
Hourly Total	0	29	77	30	0	136	0	1	2	22	0	25	0	7	118	5	0	130	0	35	1	6	0	42	333
7:00 AM	0	9	27	10	0	46	0	1	0	13	1	14	0	1	31	0	0	32	0	1	1	0	0	2	94
7:15 AM	0	6	32	12	1	50	0	0	0	11	0	11	0	4	68	1	0	73	0	11	1	3	0	15	149
7:30 AM	0	10	32	11	0	53	0	1	1	13	0	15	0	5	86	2	0	93	0	9	2	1	0	12	173
7:45 AM	0	23	43	21	0	87	0	0	2	11	0	13	0	5	78	3	0	86	0	16	2	4	0	22	208
Hourly Total	0	48	134	54	1	236	0	2	3	48	1	53	0	15	263	6	0	284	0	37	6	8	0	51	624

US 59 & Susan Dr, Marshall MN
0 0

Thursday, October 12, 2023

Time	Southbound 0						Westbound 0						Northbound 0						Eastbound 0						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	
8:00 AM	0	19	51	16	0	86	0	3	3	17	1	23	0	2	47	1	0	50	0	12	0	3	0	15	174
8:15 AM	0	24	46	12	0	82	0	2	0	15	0	17	0	2	47	3	0	52	0	16	2	1	0	19	170
8:30 AM	0	23	36	14	0	73	0	2	2	27	0	31	0	3	32	3	0	38	0	7	0	2	0	9	151
8:45 AM	1	24	35	13	0	73	0	2	2	17	0	21	0	2	43	3	0	48	0	13	2	6	0	21	163
Hourly Total	1	90	168	55	0	314	0	9	7	76	1	92	0	9	169	10	0	188	0	48	4	12	0	64	658
9:00 AM	0	23	50	18	0	91	0	2	4	22	0	28	0	2	47	5	0	54	0	9	0	4	0	13	186
9:15 AM	1	22	45	17	0	85	0	1	1	25	0	27	0	4	44	6	0	54	0	16	1	4	0	21	187
9:30 AM	0	33	40	13	0	86	0	2	3	24	0	29	0	4	39	3	0	46	0	16	3	3	0	22	183
9:45 AM	0	36	43	23	0	102	0	3	2	30	0	35	0	4	71	5	0	80	0	15	1	4	0	20	237
Hourly Total	1	114	178	71	0	364	0	8	10	101	0	119	0	14	201	19	0	234	0	56	5	15	0	76	793
10:00 AM	0	23	50	13	0	86	0	2	0	28	0	30	0	1	55	3	0	59	0	20	3	2	0	25	200
10:15 AM	0	46	37	19	0	102	0	2	1	36	0	39	0	3	54	4	0	61	0	12	6	1	0	19	221
10:30 AM	0	45	32	20	3	97	0	1	2	33	0	36	0	2	60	6	0	68	0	13	1	2	0	16	217
10:45 AM	0	48	43	16	0	107	0	2	1	34	0	37	0	1	44	5	0	50	0	17	7	3	0	27	221
Hourly Total	0	162	162	68	3	392	0	7	4	131	0	142	0	7	213	18	0	238	0	62	17	8	0	87	859
11:00 AM	0	36	49	18	0	103	0	3	4	28	0	35	0	4	48	4	0	56	0	21	2	3	0	26	220
11:15 AM	0	40	51	19	0	110	0	4	5	40	0	49	0	2	46	6	0	54	0	19	6	4	0	29	242
11:30 AM	0	42	49	15	0	106	0	7	4	40	0	51	0	2	49	4	0	55	0	11	5	3	0	19	231
11:45 AM	0	41	70	14	0	125	0	4	2	42	0	48	0	3	54	6	0	63	0	16	4	4	0	24	260
Hourly Total	0	159	219	66	0	444	0	18	15	150	0	183	0	11	197	20	0	228	0	67	17	14	0	98	953
12:00 PM	0	55	72	16	0	143	0	4	2	44	0	50	0	2	67	9	0	78	0	23	4	2	0	29	300
12:15 PM	0	42	59	23	0	124	0	5	4	48	0	57	0	1	69	3	0	73	0	16	3	4	0	23	277
12:30 PM	1	53	51	23	0	128	0	5	2	43	0	50	0	0	59	4	0	63	0	15	3	3	0	21	262
12:45 PM	0	52	51	29	0	132	0	7	3	50	0	60	0	2	62	5	0	69	0	16	2	4	0	22	283
Hourly Total	1	202	233	91	0	527	0	21	11	185	0	217	0	5	257	21	0	283	0	70	12	13	0	95	1122
1:00 PM	0	48	61	17	0	126	0	12	2	72	0	86	0	5	50	11	0	66	0	14	3	6	0	23	301
1:15 PM	0	51	54	20	0	125	0	4	5	45	0	54	0	1	50	7	0	58	0	21	3	1	0	25	262
1:30 PM	0	45	41	21	0	107	0	3	3	52	0	58	0	2	49	5	0	56	0	22	3	2	0	27	248
1:45 PM	0	38	52	26	0	116	0	8	7	39	0	54	0	3	41	3	0	47	0	28	5	4	0	37	254
Hourly Total	0	182	208	84	0	474	0	27	17	208	0	252	0	11	190	26	0	227	0	85	14	13	0	112	1065
2:00 PM	0	43	37	16	0	96	0	5	3	63	0	71	0	5	43	6	0	54	0	21	3	4	0	28	249
2:15 PM	0	38	66	16	0	120	0	3	5	47	0	55	0	3	47	1	0	51	0	22	4	3	0	29	255
2:30 PM	0	45	49	18	0	112	0	3	5	45	0	53	0	2	84	6	0	92	0	17	2	4	0	23	280
2:45 PM	0	39	53	17	0	109	0	4	4	48	0	56	0	0	66	2	0	68	0	9	2	3	0	14	247
Hourly Total	0	165	205	67	0	437	0	15	17	203	0	235	0	10	240	15	0	265	0	69	11	14	0	94	1031
3:00 PM	0	27	55	10	0	92	0	3	0	47	0	50	0	1	50	2	0	53	0	19	3	0	0	22	217
3:15 PM	0	44	62	32	0	138	0	4	5	41	0	50	0	2	50	0	0	52	0	18	5	2	0	25	265
3:30 PM	0	48	54	23	0	125	0	4	2	42	0	48	0	2	59	1	0	62	0	23	5	3	0	31	266
3:45 PM	0	61	75	22	0	158	0	4	2	59	0	65	0	3	88	3	0	94	0	17	3	3	0	23	340
Hourly Total	0	180	246	87	0	513	0	15	9	189	0	213	0	8	247	6	0	261	0	77	16	8	0	101	1088

US 59 & Susan Dr, Marshall MN
0 0

Thursday, October 12, 2023

Time	Southbound 0						Westbound 0						Northbound 0						Eastbound 0						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	
4:00 PM	0	54	67	24	0	145	0	8	3	47	2	58	0	2	78	8	0	88	0	17	4	5	0	26	317
4:15 PM	0	45	58	23	0	126	0	5	2	52	0	59	0	5	55	3	0	63	0	14	5	4	0	23	271
4:30 PM	0	40	88	18	0	146	0	4	2	43	0	49	0	3	66	3	0	72	0	16	6	1	0	23	290
4:45 PM	0	47	84	6	0	137	0	6	3	71	0	80	0	1	70	5	0	76	0	17	7	2	0	26	319
Hourly Total	0	186	297	71	0	554	0	23	10	213	2	246	0	11	269	19	0	299	0	64	22	12	0	98	1197
5:00 PM	0	45	89	5	0	139	0	6	6	54	0	66	0	4	68	4	0	76	0	25	4	5	0	34	315
5:15 PM	0	45	60	5	0	110	0	7	4	41	0	52	0	4	68	3	0	75	0	19	2	3	0	24	261
5:30 PM	0	40	60	4	0	104	0	5	2	46	0	53	0	3	45	4	0	52	0	14	1	3	0	18	227
5:45 PM	0	40	60	0	0	100	0	2	4	45	0	51	0	2	58	6	0	66	0	8	4	7	0	19	236
Hourly Total	0	170	269	14	0	453	0	20	16	186	0	222	0	13	239	17	0	269	0	66	11	18	0	95	1039
6:00 PM	0	37	44	4	0	85	0	10	2	57	0	69	0	2	58	4	0	64	0	14	2	2	0	18	236
6:15 PM	0	30	42	1	0	73	0	3	4	44	0	51	0	3	41	2	0	46	0	12	3	2	0	17	187
6:30 PM	0	48	34	0	0	82	0	5	1	45	0	51	0	1	40	5	0	46	0	13	4	2	0	19	198
6:45 PM	0	40	26	0	0	66	0	5	0	39	0	44	0	3	28	0	0	31	0	10	0	1	0	11	152
Hourly Total	0	155	146	5	0	306	0	23	7	185	0	215	0	9	167	11	0	187	0	49	9	7	0	65	773
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DAILY TOTAL	3	1842	2542	763	4	5150	0	189	128	1897	4	2214	0	130	2770	193	0	3093	0	785	145	148	0	1078	11535
Cars	3	1818	2310	687	4	4818	0	184	125	1847	4	2156	0	118	2538	186	0	2842	0	704	144	132	0	980	10796
Heavy Vehicles	0	24	232	76	0	332	0	5	3	50	0	58	0	12	232	7	0	251	0	81	1	16	0	98	739
Heavy Vehicle %	0.00%	1.30%	9.13%	9.96%	0.00%	6.45%	0.00%	2.65%	2.34%	2.64%	0.00%	2.62%	0.00%	9.23%	8.38%	3.63%	0.00%	8.12%	0.00%	10.32%	0.69%	10.81%	0.00%	9.09%	6.41%

US 59 & Susan Dr, Marshall MN
0 0
Thursday, October 12, 2023

AM Peak Hour																									
Time	Southbound						Westbound						Northbound						Eastbound						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	
11:00 AM	0	36	49	18	0	103	0	3	4	28	0	35	0	4	48	4	0	56	0	21	2	3	0	26	220
11:15 AM	0	40	51	19	0	110	0	4	5	40	0	49	0	2	46	6	0	54	0	19	6	4	0	29	242
11:30 AM	0	42	49	15	0	106	0	7	4	40	0	51	0	2	49	4	0	55	0	11	5	3	0	19	231
11:45 AM	0	41	70	14	0	125	0	4	2	42	0	48	0	3	54	6	0	63	0	16	4	4	0	24	260
Peak Hour Total PHF	0	159	219	66	0	444	0	18	15	150	0	183	0	11	197	20	0	228	0	67	17	14	0	98	953
	0.000	0.946	0.782	0.868	0.000	0.888	0.000	0.643	0.750	0.893	0.000	0.897	0.000	0.688	0.912	0.833	0.000	0.905	0.000	0.798	0.708	0.875	0.000	0.845	0.916

PM Peak Hour																									
Time	Southbound						Westbound						Northbound						Eastbound						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	
3:45 PM	0	61	75	22	0	158	0	4	2	59	0	65	0	3	88	3	0	94	0	17	3	3	0	23	340
4:00 PM	0	54	67	24	0	145	0	8	3	47	2	58	0	2	78	8	0	88	0	17	4	5	0	26	317
4:15 PM	0	45	58	23	0	126	0	5	2	52	0	59	0	5	55	3	0	63	0	14	5	4	0	23	271
4:30 PM	0	40	88	18	0	146	0	4	2	43	0	49	0	3	66	3	0	72	0	16	6	1	0	23	290
Peak Hour Total PHF	0	200	288	87	0	575	0	21	9	201	2	231	0	13	287	17	0	317	0	64	18	13	0	95	1218
	0.000	0.820	0.818	0.906	0.000	0.910	0.000	0.656	0.750	0.852	0.250	0.888	0.000	0.650	0.815	0.531	0.000	0.843	0.000	0.941	0.750	0.650	0.000	0.913	0.896

Total Vehicles On Leg			10605		
Vehicles Entering Intersection 5150			Vehicles Exiting Intersection 5455		
Southbound					
Cars	687	2310	1818	3	4
Heavy	76	232	24	0	0
Total	763	2542	1842	3	4



Total Vehicles on Leg 2099	Vehicles Entering Intersection 1078	Eastbound	Cars	Heavy	Total
	Vehicles Exiting Intersection 1021		0	0	0
			0	0	0
			704	81	785
			144	1	145
			132	16	148



Daily Volumes

Cars	Heavy	Total	Westbound	Vehicles Entering Intersection 2214	Total Vehicles on Leg 4394
1847	50	1897			
125	3	128			
184	5	189			
0	0	0			
4	0	4			



Cars	0	0	118	2538	186
Heavy	0	0	12	232	7
Total	0	0	130	2770	193
Northbound					
Vehicles Entering Intersection			3093		
			Vehicles Exiting Intersection		
			2879		
Total Vehicles On Leg			5972		

Susan Dr & Margert Ave, Marshall MN

0 0

Thursday, October 12, 2023

Time	Southbound						Westbound						Northbound						Eastbound						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	2	2	0	4	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0	4	0	4	12
6:15 AM	0	0	0	2	0	2	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	5	0	5	15
6:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	4	0	1	0	5	0	2	0	5	0	7	13
6:45 AM	0	0	2	3	0	5	0	1	0	0	0	1	0	5	0	0	0	5	0	5	2	12	0	19	30
Hourly Total	0	0	4	7	0	11	0	1	1	0	0	2	0	17	4	1	0	22	0	7	2	26	0	35	70
7:00 AM	0	0	1	3	0	4	0	0	1	0	0	1	0	10	1	0	0	11	0	2	0	8	0	10	26
7:15 AM	0	0	1	3	1	4	0	0	0	0	0	0	0	9	1	0	0	10	0	2	1	5	0	8	22
7:30 AM	0	0	3	6	0	9	0	1	0	0	0	1	0	8	0	0	0	8	0	5	0	9	0	14	32
7:45 AM	0	0	1	7	0	8	0	0	0	0	0	0	0	6	1	0	0	7	0	14	2	12	0	28	43
Hourly Total	0	0	6	19	1	25	0	1	1	0	0	2	0	33	3	0	0	36	0	23	3	34	0	60	123

Susan Dr & Margert Ave, Marshall MN
0 0

Thursday, October 12, 2023

Time	Southbound 0						Westbound 0						Northbound 0						Eastbound 0						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswal k Crossings	Vehicle Approac h Total	
8:00 AM	0	0	2	8	0	10	0	1	1	1	0	3	0	14	2	0	0	16	0	5	1	14	0	20	49
8:15 AM	0	0	1	6	0	7	0	0	0	1	0	1	0	11	3	0	0	14	0	7	3	18	0	28	50
8:30 AM	0	0	1	13	0	14	0	1	4	0	0	5	0	15	1	1	0	17	0	9	1	16	0	26	62
8:45 AM	0	0	1	9	0	10	0	0	0	0	0	0	0	11	3	1	0	15	0	5	3	21	0	29	54
Hourly Total	0	0	5	36	0	41	0	2	5	2	0	9	0	51	9	2	0	62	0	26	8	69	0	103	215
9:00 AM	0	1	2	7	0	10	0	0	4	0	0	4	0	18	1	0	0	19	0	12	1	14	0	27	60
9:15 AM	0	0	3	7	0	10	0	0	1	1	0	2	0	18	2	1	0	21	0	6	4	19	1	29	62
9:30 AM	0	0	2	14	0	16	0	3	2	0	0	5	0	13	5	0	0	18	0	10	3	26	0	39	78
9:45 AM	0	1	4	6	0	11	0	1	0	0	0	1	0	28	3	1	0	32	0	9	2	31	0	42	86
Hourly Total	0	2	11	34	0	47	0	4	7	1	0	12	0	77	11	2	0	90	0	37	10	90	1	137	286
10:00 AM	0	0	5	7	0	12	0	1	1	0	0	2	0	24	1	1	0	26	0	6	1	23	0	30	70
10:15 AM	0	0	2	11	0	13	0	0	1	0	0	1	0	26	2	0	0	28	0	17	5	34	0	56	98
10:30 AM	0	0	6	9	0	15	0	1	0	1	0	2	0	27	7	1	0	35	0	16	3	33	0	52	104
10:45 AM	0	0	4	13	0	17	0	1	4	0	0	5	0	22	4	1	0	27	0	20	3	37	0	60	109
Hourly Total	0	0	17	40	0	57	0	3	6	1	0	10	0	99	14	3	0	116	0	59	12	127	0	198	381
11:00 AM	0	0	8	11	0	19	0	0	0	0	0	0	0	23	9	0	0	32	0	12	5	24	0	41	92
11:15 AM	0	1	6	20	0	27	0	1	0	0	2	1	0	25	5	1	0	31	0	26	3	23	0	52	111
11:30 AM	0	0	5	24	0	29	0	1	1	1	0	3	0	26	4	3	0	33	0	23	2	29	0	54	119
11:45 AM	0	0	5	19	0	24	0	0	1	0	0	1	0	30	9	3	0	42	0	14	5	32	0	51	118
Hourly Total	0	1	24	74	0	99	0	2	2	1	2	5	0	104	27	7	0	138	0	75	15	108	0	198	440
12:00 PM	0	0	5	22	0	27	0	0	5	1	0	6	0	21	11	0	0	32	0	29	6	35	0	70	135
12:15 PM	0	0	9	24	0	33	0	0	3	0	0	3	0	30	12	1	0	43	0	22	0	25	0	47	126
12:30 PM	0	1	8	22	0	31	0	1	1	0	0	2	0	27	5	0	0	32	0	26	2	32	0	60	125
12:45 PM	0	1	7	32	0	40	0	0	1	0	0	1	0	30	13	1	0	44	0	22	5	31	0	58	143
Hourly Total	0	2	29	100	0	131	0	1	10	1	0	12	0	108	41	2	0	151	0	99	13	123	0	235	529
1:00 PM	0	0	7	36	1	43	0	0	5	0	1	5	0	41	13	4	0	58	0	25	1	34	0	60	166
1:15 PM	0	0	1	17	0	18	0	1	7	0	0	8	0	31	6	0	0	37	0	23	4	31	0	58	121
1:30 PM	0	0	7	26	0	33	0	3	1	0	0	4	0	32	11	1	0	44	0	12	5	37	0	54	135
1:45 PM	0	0	5	23	0	28	0	1	0	1	0	2	0	31	13	3	0	47	0	16	1	28	0	45	122
Hourly Total	0	0	20	102	1	122	0	5	13	1	1	19	0	135	43	8	0	186	0	76	11	130	0	217	544
2:00 PM	0	0	4	27	0	31	0	1	7	0	0	8	0	37	8	0	0	45	0	25	3	25	1	53	137
2:15 PM	0	0	9	27	0	36	0	0	2	0	0	2	0	25	5	0	0	30	0	7	5	31	0	43	111
2:30 PM	0	0	9	23	0	32	0	3	2	0	0	5	0	27	10	2	0	39	0	19	2	30	0	51	127
2:45 PM	0	0	4	15	0	19	0	0	4	0	0	4	0	37	11	1	0	49	0	17	4	26	0	47	119
Hourly Total	0	0	26	92	0	118	0	4	15	0	0	19	0	126	34	3	0	163	0	68	14	112	1	194	494
3:00 PM	0	0	6	11	0	17	0	2	4	0	0	6	0	36	3	1	0	40	0	8	3	19	0	30	93
3:15 PM	0	0	4	16	0	20	0	2	3	0	0	5	0	31	7	0	0	38	0	10	7	32	0	49	112
3:30 PM	0	0	5	18	0	23	0	2	0	0	0	2	0	30	7	1	0	38	0	25	1	26	0	52	115
3:45 PM	0	0	7	18	0	25	0	1	2	0	0	3	0	45	7	2	0	54	0	24	3	39	0	66	148
Hourly Total	0	0	22	63	0	85	0	7	9	0	0	16	0	142	24	4	0	170	0	67	14	116	0	197	468

Susan Dr & Margert Ave, Marshall MN

0 0

Thursday, October 12, 2023

Time	Southbound						Westbound						Northbound						Eastbound						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	
4:00 PM	0	0	6	19	0	25	0	1	2	0	0	3	0	37	8	1	0	46	0	22	0	45	0	67	141
4:15 PM	0	0	8	23	0	31	0	2	1	0	0	3	0	36	10	0	0	46	0	16	1	36	0	53	133
4:30 PM	0	0	6	24	0	30	0	2	1	0	0	3	0	23	8	1	0	32	0	18	3	29	0	50	115
4:45 PM	0	0	9	32	0	41	0	2	4	0	0	6	0	43	9	4	0	56	0	18	4	37	0	59	162
Hourly Total	0	0	29	98	0	127	0	7	8	0	0	15	0	139	35	6	0	180	0	74	8	147	0	229	551
5:00 PM	0	0	10	24	0	34	0	3	6	0	1	9	0	38	9	1	0	48	0	19	3	30	0	52	143
5:15 PM	0	0	4	17	0	21	0	1	2	0	0	3	0	33	10	2	0	45	0	17	2	33	0	52	121
5:30 PM	0	0	11	12	0	23	0	1	5	0	1	6	0	36	6	0	0	42	0	16	3	28	0	47	118
5:45 PM	0	1	3	14	0	18	0	0	0	0	0	0	0	37	9	0	0	46	0	15	6	28	0	49	113
Hourly Total	0	1	28	67	0	96	0	5	13	0	2	18	0	144	34	3	0	181	0	67	14	119	0	200	495
6:00 PM	0	0	6	25	0	31	0	0	6	0	0	6	0	39	2	0	0	41	0	18	3	21	0	42	120
6:15 PM	0	0	3	20	0	23	0	0	2	0	0	2	0	31	6	2	0	39	0	11	0	22	0	33	97
6:30 PM	0	0	3	18	0	21	0	0	9	1	0	10	0	30	4	1	0	35	0	13	2	41	0	56	122
6:45 PM	0	0	5	14	0	19	0	1	3	0	0	4	0	25	6	0	0	31	0	10	3	28	0	41	95
Hourly Total	0	0	17	77	0	94	0	1	20	1	0	22	0	125	18	3	0	146	0	52	8	112	0	172	434
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DAILY TOTAL	0	6	238	809	2	1053	0	43	110	8	5	161	0	1300	297	44	0	1641	0	730	132	1313	2	2175	5030
Cars	0	6	236	791	2	1033	0	33	109	8	5	150	0	1259	296	44	0	1599	0	716	129	1295	1	2140	4922
Heavy Vehicles	0	0	2	18	0	20	0	10	1	0	0	11	0	41	1	0	0	42	0	14	3	18	1	35	108
Heavy Vehicle %	0.00%	0.00%	0.84%	2.22%	0.00%	1.90%	0.00%	23.26%	0.91%	0.00%	0.00%	6.83%	0.00%	3.15%	0.34%	0.00%	0.00%	2.56%	0.00%	1.92%	2.27%	1.37%	50.00%	1.61%	2.15%

Susan Dr & Margert Ave, Marshall MN
0 0
Thursday, October 12, 2023

AM Peak Hour																									
Time	Southbound						Westbound						Northbound						Eastbound						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	
11:00 AM	0	0	8	11	0	19	0	0	0	0	0	0	0	23	9	0	0	32	0	12	5	24	0	41	92
11:15 AM	0	1	6	20	0	27	0	1	0	0	2	1	0	25	5	1	0	31	0	26	3	23	0	52	111
11:30 AM	0	0	5	24	0	29	0	1	1	1	0	3	0	26	4	3	0	33	0	23	2	29	0	54	119
11:45 AM	0	0	5	19	0	24	0	0	1	0	0	1	0	30	9	3	0	42	0	14	5	32	0	51	118
Peak Hour Total PHF	0	1	24	74	0	99	0	2	2	1	2	5	0	104	27	7	0	138	0	75	15	108	0	198	440
	0.000	0.250	0.750	0.771	0.000	0.853	0.000	0.500	0.500	0.250	0.250	0.417	0.000	0.867	0.750	0.583	0.000	0.821	0.000	0.721	0.750	0.844	0.000	0.917	0.924

PM Peak Hour																									
Time	Southbound						Westbound						Northbound						Eastbound						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	
12:45 PM	0	1	7	32	0	40	0	0	1	0	0	1	0	30	13	1	0	44	0	22	5	31	0	58	143
1:00 PM	0	0	7	36	1	43	0	0	5	0	1	5	0	41	13	4	0	58	0	25	1	34	0	60	166
1:15 PM	0	0	1	17	0	18	0	1	7	0	0	8	0	31	6	0	0	37	0	23	4	31	0	58	121
1:30 PM	0	0	7	26	0	33	0	3	1	0	0	4	0	32	11	1	0	44	0	12	5	37	0	54	135
Peak Hour Total PHF	0	1	22	111	1	134	0	4	14	0	1	18	0	134	43	6	0	183	0	82	15	133	0	230	565
	0.000	0.250	0.786	0.771	0.250	0.779	0.000	0.333	0.500	0.000	0.250	0.563	0.000	0.817	0.827	0.375	0.000	0.789	0.000	0.820	0.750	0.899	0.000	0.958	0.851

Total Vehicles On Leg			2088		
Vehicles Entering Intersection 1053			Vehicles Exiting Intersection 1035		
Southbound					
Cars	791	236	6	0	2
Heavy	18	2	0	0	0
Total	809	238	6	0	2








Total Vehicles on Leg 4394	Vehicles Entering Intersection 2175	Eastbound	Cars	Heavy	Total
	Vehicles Exiting Intersection 2219		1	1	2
			0	0	0
			716	14	730
			129	3	132
			1295	18	1313



Daily Volumes

Cars	Heavy	Total	Westbound	Vehicles Entering Intersection 161	Total Vehicles on Leg 343
8	0	8			
109	1	110			
33	10	43			
0	0	0			
5	0	5			
				Vehicles Exiting Intersection 182	



					
Cars	0	0	1259	296	44
Heavy	0	0	41	1	0
Total	0	0	1300	297	44
Northbound					
Vehicles Entering Intersection			1641		
Vehicles Exiting Intersection			1594		
Total Vehicles On Leg			3235		

Appendix B

Crash Analysis

Intersection Safety Screening

Intersection: US 59 and Susan Dr, Marshall, MN

Statewide Averages based on 2016-2020 crashes

Crashes by Crash Severity	
Fatal (K)	0
Serious Injury (A)	0
Minor Injury (B)	2
Possible Injury (C)	2
Property Damage (PDO)	5
Total Crashes	9

Intersection Characteristics	
Entering Volume	6,342
Environment	Urban
Lighting	Lit
Traffic Control	Signal

Annual crash cost = \$153,000

Statewide comparison = Signal, Low Volume (<=20K)

Total Crash Rate	
Observed	0.777
Statewide Average	0.508
Critical Rate	1.090
Critical Index	0.71

Fatal & Serious Injury Crash Rate	
Observed	0.000
Statewide Average	0.690
Critical Rate	8.130
Critical Index	0.00

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference (i.e. observed crash rate ÷ critical crash rate).

The observed total crash rate for this period is 0.78 per MEV; this is 29% below the critical rate. Based on similar statewide intersections, an additional 4 crashes over the five years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

Intersection Safety Screening

Intersection: Susan Dr and Margaret Ave, Marshall, MN

Statewide Averages based on 2016-2020 crashes

Crashes by Crash Severity		Intersection Characteristics	
Fatal (K)	0	Entering Volume	2,767
Serious Injury (A)	0	Environment	Urban
Minor Injury (B)	0	Lighting	Lit
Possible Injury (C)	0	Traffic Control	Thru-Stop
Property Damage (PDO)	5		
Total Crashes	5		

Annual crash cost = \$13,000

Statewide comparison = Urban, Thru/STOP

Total Crash Rate		Fatal & Serious Injury Crash Rate	
Observed	0.989	Observed	0.000
Statewide Average	0.128	Statewide Average	0.311
Critical Rate	0.640	Critical Rate	13.380
Critical Index	1.55	Critical Index	0.00

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference (i.e. observed crash rate ÷ critical crash rate).

The observed total crash rate for this period is 0.99 per MEV; this is 1.6 times the critical rate. If crashes were reduced by 2 over five years, this intersection would perform within normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

Appendix C

Warrant Analysis

SIGNAL WARRANTS ANALYSIS

2023 Volumes

Minor Rights Excluded

LOCATION:
 COUNTY: LYON
 REF. POINT:
 DATE: 1/17/2024
 OPERATOR: KMH

Speed	Approach Description	Lanes
30	Major App1: NB Margaret Ave	2
30	Major App3: SB Susan Dr	2
30	Minor App2: EB Susan Dr	1
30	Minor App4: WB Harbor Freight Entrance	2

0.70 FACTOR USED?

No

POPULATION < 10,000?

No

EXISTING SIGNAL ?

No

THRESHOLDS 1A/1B:

600/900

150/75

200/100

HOUR	MAJOR APP. 1	MAJOR APP. 3	TOTAL 1+3	MAJOR 1A/1B	MINOR APP. 2	MINOR 2 1A/1B	MINOR APP. 4	MINOR 4 1A/1B	MET SAME 1A/1B
0:00 - 1:00	0	0	0	/	0	/	0	/	/
1:00 - 2:00	0	0	0	/	0	/	0	/	/
2:00 - 3:00	0	0	0	/	0	/	0	/	/
3:00 - 4:00	0	0	0	/	0	/	0	/	/
4:00 - 5:00	0	0	0	/	0	/	0	/	/
5:00 - 6:00	0	0	0	/	0	/	0	/	/
6:00 - 7:00	22	11	33	/	9	/	2	/	/
7:00 - 8:00	36	25	61	/	26	/	2	/	/
8:00 - 9:00	62	41	103	/	34	/	7	/	/
9:00 - 10:00	90	47	137	/	47	/	11	/	/
10:00 - 11:00	116	57	173	/	71	/	9	/	/
11:00 - 12:00	138	99	237	/	90	/X	4	/	/
12:00 - 13:00	151	131	282	/	112	/X	11	/	/
13:00 - 14:00	186	122	308	/	87	/X	18	/	/
14:00 - 15:00	163	118	281	/	82	/X	19	/	/
15:00 - 16:00	170	85	255	/	81	/X	16	/	/
16:00 - 17:00	180	127	307	/	82	/X	15	/	/
17:00 - 18:00	181	96	277	/	81	/X	18	/	/
18:00 - 19:00	146	94	240	/	60	/	21	/	/
19:00 - 20:00	0	0	0	/	0	/	0	/	/
20:00 - 21:00	0	0	0	/	0	/	0	/	/
21:00 - 22:00	0	0	0	/	0	/	0	/	/
22:00 - 23:00	0	0	0	/	0	/	0	/	/
23:00 - 24:00	0	0	0	/	0	/	0	/	/

	Met (Hr)	Required (Hr)	
Warrant 1A	0	8	Not satisfied
Warrant 1B	0	8	Not satisfied
Warrant 2	0	4	Not satisfied
Warrant 3	0	1	Not satisfied
Warrant 7	0	8	Not satisfied

LOCATION:
COUNTY: LYON

REF. POINT:
DATE: 1/17/2024

OPERATOR: KMH

Speed	Approach Description	Lanes
30	Major App1: NB Margaret Ave	2
30	Major App3: SB Susan Dr	2
30	Minor App2: EB Susan Dr	1
30	Minor App4: WB Harbor Freight Entrance	2

0.70 FACTOR USED? No
POPULATION < 10,000? No
EXISTING SIGNAL ? No

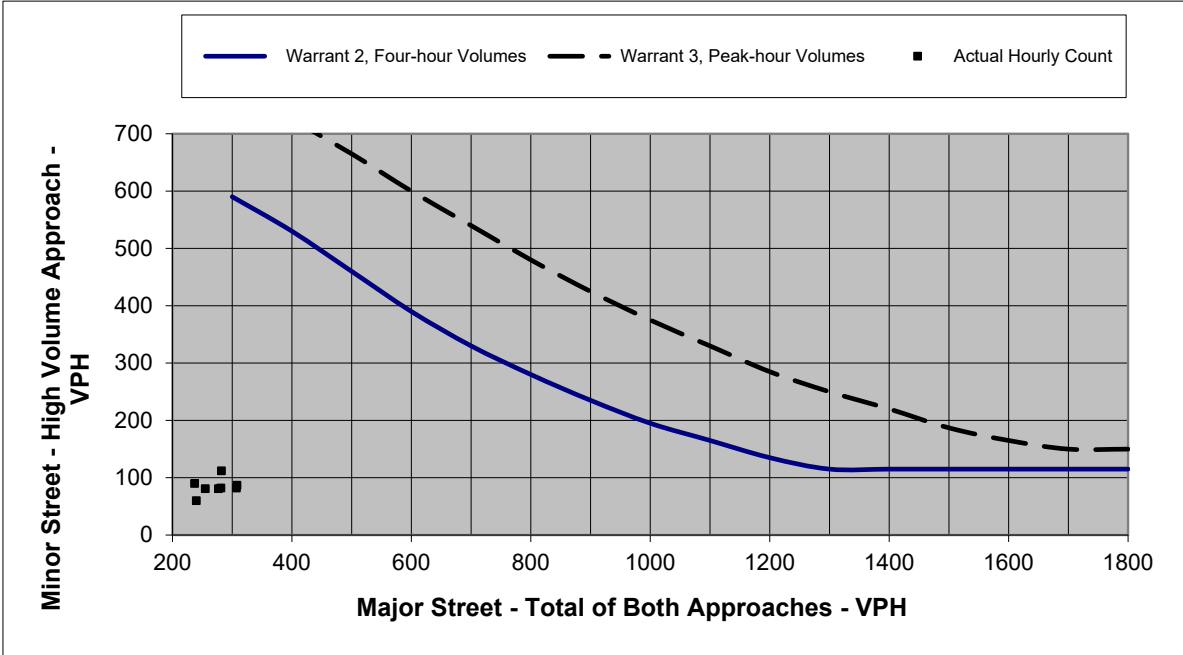


Figure 1. Four Hour and Peak Hour Warrant Analysis
Note: For data points outside the graph range, check the minor street volume against the lower thresholds

Warrant Criteria			Actual Hourly Count	
Major	Warrant 2, F	Warrant 3, Pe	Major	Actual Hourly Count
200			0	0
300	590		0	0
400	530	725	0	0
500	460	665	0	0
600	390	600	0	0
700	330	540	0	0
800	280	480	33	9
900	235	425	61	26
1000	195	375	103	34
1100	165	330	137	47
1200	135	285	173	71
1300	115	250	237	90
1400	115	220	282	112
1500	115	187	308	87
1600	115	165	281	82
1700	115	150	255	81
1800	115	150	307	82
			277	81
			240	60
			0	0
			0	0
			0	0
			0	0
			0	0

ALL WAY STOP WARRANT

2023 Volumes

LOCATION:

COUNTY: LYON

REF. POINT:

DATE: 1/17/2024

OPERATOR: KMH

0.70 FACTOR USED?

No

Speed	Approach Description	Lanes
30	Major App1: NB Margaret Ave	2
30	Major App3: SB Susan Dr	1
30	Minor App2: EB Susan Dr	1
30	Minor App4: WB Harbor Freight Entrance	2

300

200

HOUR	MAJOR APP. 1	MAJOR APP. 3	MINOR APP. 2	MINOR APP. 4	MAJOR TOTAL Σ (APP. 1 & APP. 3)	MINOR TOTAL APP. 2 + APP. 4	WARRANT MET
0:00 - 1:00	0	0	0	0	0	0	/
1:00 - 2:00	0	0	0	0	0	0	/
2:00 - 3:00	0	0	0	0	0	0	/
3:00 - 4:00	0	0	0	0	0	0	/
4:00 - 5:00	0	0	0	0	0	0	/
5:00 - 6:00	0	0	0	0	0	0	/
6:00 - 7:00	22	11	35	2	33	37	/
7:00 - 8:00	36	25	60	2	61	62	/
8:00 - 9:00	62	41	103	9	103	112	/
9:00 - 10:00	90	47	137	12	137	149	/
10:00 - 11:00	116	57	198	10	173	208	/X
11:00 - 12:00	138	99	198	5	237	203	/X
12:00 - 13:00	151	131	235	12	282	247	/X
13:00 - 14:00	186	122	217	19	308	236	X/X
14:00 - 15:00	163	118	194	19	281	213	/X
15:00 - 16:00	170	85	197	16	255	213	/X
16:00 - 17:00	180	127	229	15	307	244	X/X
17:00 - 18:00	181	96	200	18	277	218	/X
18:00 - 19:00	146	94	172	22	240	194	/
19:00 - 20:00	0	0	0	0	0	0	/
20:00 - 21:00	0	0	0	0	0	0	/
21:00 - 22:00	0	0	0	0	0	0	/
22:00 - 23:00	0	0	0	0	0	0	/
23:00 - 24:00	0	0	0	0	0	0	/

Met (Hr) Required (Hr)

Allway Stop Warrant:

2

8

Not satisfied

























REMARKS:

Appendix D

Traffic Operations Analysis

HCM 6th Signalized Intersection Summary 3: US Highway 59 & Susan Drive

11/24/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	18	13	21	9	201	13	287	17	200	288	87
Future Volume (veh/h)	64	18	13	21	9	201	13	287	17	200	288	87
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	24	20	32	12	236	20	354	32	244	351	96
Peak Hour Factor	0.94	0.75	0.65	0.66	0.75	0.85	0.65	0.81	0.53	0.82	0.82	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	408	564	478	471	564	478	713	1541	687	502	937	418
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.26	0.43	0.43	0.09	0.26	0.26
Sat Flow, veh/h	1132	1870	1585	1362	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	68	24	20	32	12	236	20	354	32	244	351	96
Grp Sat Flow(s),veh/h/ln	1132	1870	1585	1362	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.5	0.9	0.9	1.7	0.5	12.2	0.5	6.3	1.2	9.4	8.1	4.8
Cycle Q Clear(g_c), s	4.9	0.9	0.9	2.6	0.5	12.2	0.5	6.3	1.2	9.4	8.1	4.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	408	564	478	471	564	478	713	1541	687	502	937	418
V/C Ratio(X)	0.17	0.04	0.04	0.07	0.02	0.49	0.03	0.23	0.05	0.49	0.37	0.23
Avail Cap(c_a), veh/h	408	564	478	471	564	478	713	1541	687	502	937	418
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.3	24.7	24.7	25.6	24.6	28.7	10.9	17.8	16.4	24.0	30.1	28.9
Incr Delay (d2), s/veh	0.9	0.1	0.2	0.3	0.1	3.6	0.1	0.3	0.1	3.3	1.1	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.4	0.4	0.6	0.2	5.1	0.2	2.5	0.4	4.6	3.5	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.2	24.9	24.9	25.9	24.6	32.3	11.0	18.2	16.5	27.3	31.3	30.2
LnGrp LOS	C	C	C	C	C	C	B	B	B	C	C	C
Approach Vol, veh/h	112			280			406			691		
Approach Delay, s/veh	26.3			31.2			17.7			29.7		
Approach LOS	C			C			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	49.0		36.1	32.0	32.0		36.1				
Change Period (Y+Rc), s	* 5.6	* 5.6		5.9	* 5.7	* 5.6		* 5.9				
Max Green Setting (Gmax), s	* 9.4	* 43		30.1	* 26	* 26		* 30				
Max Q Clear Time (g_c+I1), s	11.4	8.3		6.9	2.5	10.1		14.2				
Green Ext Time (p_c), s	0.0	2.4		0.4	0.0	2.2		0.8				

Intersection Summary

HCM 6th Ctrl Delay	26.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC PM Peak Existing Condition
5: Margaret Ave & Susan Drive

11/24/2023

Intersection										
Int Delay, s/veh	7.9									
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations		↰	↱		↰↱		↰	↱	↰	↱
Traffic Vol, veh/h	82	15	133	4	14	0	22	111	134	43
Future Vol, veh/h	82	15	133	4	14	0	22	111	134	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	None	-	-
Storage Length	-	-	60	-	-	-	150	-	150	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	82	75	90	33	50	25	79	77	82	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	100	20	148	12	28	0	28	144	163	52
Major/Minor	Major1			Major2			Minor2		Minor1	
Conflicting Flow All	28	0	0	20	0	0	306	14	272	20
Stage 1	-	-	-	-	-	-	52	-	220	-
Stage 2	-	-	-	-	-	-	254	-	52	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.93	7.33	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	-	6.13	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	-	6.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	3.319	3.519	3.319
Pot Cap-1 Maneuver	1585	-	-	1595	-	-	635	1063	670	1057
Stage 1	-	-	-	-	-	-	955	-	782	-
Stage 2	-	-	-	-	-	-	750	-	955	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1585	-	-	1595	-	-	549	1063	525	1057
Mov Cap-2 Maneuver	-	-	-	-	-	-	549	-	525	-
Stage 1	-	-	-	-	-	-	887	-	726	-
Stage 2	-	-	-	-	-	-	633	-	792	-
Approach	EB			WB			SB		NW	
HCM Control Delay, s	2.8			2.2			9.4		13.8	
HCM LOS							A		B	
Minor Lane/Major Mvmt	NWLn1NWLn2		EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	525	653	1585	-	-	1595	-	-	580	1063
HCM Lane V/C Ratio	0.311	0.104	0.063	-	-	0.008	-	-	0.055	0.136
HCM Control Delay (s)	14.9	11.1	7.4	0	-	7.3	0	-	11.6	8.9
HCM Lane LOS	B	B	A	A	-	A	A	-	B	A
HCM 95th %tile Q(veh)	1.3	0.3	0.2	-	-	0	-	-	0.2	0.5

HCM 6th TWSC AM Peak Existing Condition
5: Margaret Ave & Susan Drive

11/24/2023
























Intersection										
Int Delay, s/veh	6.9									
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations		↰	↱		↰	↱	↰	↱	↰	↱
Traffic Vol, veh/h	75	15	108	2	2	1	24	74	104	27
Future Vol, veh/h	75	15	108	2	2	1	24	74	104	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	None	-	-
Storage Length	-	-	60	-	-	-	150	-	150	-
Veh in Median Storage, #	-	0	-	-	0	-	0	-	0	-
Grade, %	-	0	-	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	82	16	117	2	2	1	26	80	113	29
Major/Minor	Major1			Major2			Minor2		Minor1	
Conflicting Flow All	3	0	0	16	0	0	206	2	198	16
Stage 1	-	-	-	-	-	-	7	-	180	-
Stage 2	-	-	-	-	-	-	199	-	18	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.93	7.33	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	-	6.13	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	-	6.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	3.319	3.519	3.319
Pot Cap-1 Maneuver	1618	-	-	1601	-	-	743	1081	752	1063
Stage 1	-	-	-	-	-	-	1014	-	821	-
Stage 2	-	-	-	-	-	-	802	-	999	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1618	-	-	1601	-	-	682	1081	646	1063
Mov Cap-2 Maneuver	-	-	-	-	-	-	682	-	646	-
Stage 1	-	-	-	-	-	-	957	-	775	-
Stage 2	-	-	-	-	-	-	721	-	897	-
Approach	EB			WB			SB		NW	
HCM Control Delay, s	2.8			2.9			9.1		11.4	
HCM LOS							A		B	
Minor Lane/Major Mvmt	NWLn1NWLn2		EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	646	722	1618	-	-	1601	-	-	668	1081
HCM Lane V/C Ratio	0.175	0.051	0.05	-	-	0.001	-	-	0.041	0.074
HCM Control Delay (s)	11.8	10.3	7.3	0	-	7.3	0	-	10.6	8.6
HCM Lane LOS	B	B	A	A	-	A	A	-	B	A
HCM 95th %tile Q(veh)	0.6	0.2	0.2	-	-	0	-	-	0.1	0.2

HCM 6th Signalized Intersection Summary

3: US Highway 59 & Susan Drive

AM Peak Build Condition

01/12/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	17	14	18	15	150	11	197	20	159	219	66
Future Volume (veh/h)	67	17	14	18	15	150	11	197	20	159	219	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	24	16	28	20	169	16	216	24	167	281	76
Peak Hour Factor	0.80	0.71	0.88	0.64	0.75	0.89	0.69	0.91	0.83	0.95	0.78	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	199	245	207	162	101	207	762	2283	1018	876	2417	1078
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.02	0.64	0.64	0.05	0.68	0.68
Sat Flow, veh/h	1194	1870	1585	800	775	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	84	24	16	48	0	169	16	216	24	167	281	76
Grp Sat Flow(s),veh/h/ln	1194	1870	1585	1576	0	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	6.8	1.1	0.9	1.1	0.0	10.4	0.3	2.3	0.5	3.1	2.7	1.6
Cycle Q Clear(g_c), s	9.2	1.1	0.9	2.5	0.0	10.4	0.3	2.3	0.5	3.1	2.7	1.6
Prop In Lane	1.00		1.00	0.58		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	199	245	207	263	0	207	762	2283	1018	876	2417	1078
V/C Ratio(X)	0.42	0.10	0.08	0.18	0.00	0.81	0.02	0.09	0.02	0.19	0.12	0.07
Avail Cap(c_a), veh/h	403	565	479	525	0	477	897	2283	1018	1246	2417	1078
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	38.3	38.2	38.8	0.0	42.3	5.8	6.8	6.5	5.1	5.6	5.4
Incr Delay (d2), s/veh	1.4	0.2	0.2	0.3	0.0	7.6	0.0	0.1	0.0	0.1	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.5	0.4	1.1	0.0	4.5	0.1	0.8	0.2	0.9	0.9	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.4	38.4	38.3	39.1	0.0	49.8	5.8	6.9	6.5	5.2	5.7	5.5
LnGrp LOS	D	D	D	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h	124			217			256			524		
Approach Delay, s/veh	42.5			47.5			6.8			5.5		
Approach LOS	D			D			A			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.4	73.6		19.0	11.2	69.8		19.0				
Change Period (Y+Rc), s	* 5.6	* 5.6		5.9	* 5.7	* 5.6		* 5.9				
Max Green Setting (Gmax), s	* 9.4	* 43		30.1	* 26	* 26		* 30				
Max Q Clear Time (g_c+I1), s	2.3	4.7		12.4	5.1	4.3		11.2				
Green Ext Time (p_c), s	0.0	2.0		0.7	0.4	1.3		0.4				

Intersection Summary

HCM 6th Ctrl Delay 18.0

HCM 6th LOS B

Notes






* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
5: Susan Drive & Margaret Ave

01/12/2024

Intersection

Int Delay, s/veh 3.9

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Vol, veh/h	90	108	24	100	104	34
Future Vol, veh/h	90	108	24	100	104	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	117	26	109	113	37

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	215
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1355
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1355
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	NB	SB	NW
HCM Control Delay, s	0	1.5	11.5
HCM LOS			B

Minor Lane/Major Mvmt	NBT	NBRNWLn1	SBL	SBT
Capacity (veh/h)	-	-	706	1355
HCM Lane V/C Ratio	-	-	0.212	0.019
HCM Control Delay (s)	-	-	11.5	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.8	0.1

AM Peak Baseline
























Synchro 11 Report
Page 2

HCM 6th Signalized Intersection Summary

3: US Highway 59 & Susan Drive

PM Peak Build Condition

01/12/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	18	13	21	9	201	13	287	17	200	288	87
Future Volume (veh/h)	64	18	13	21	9	201	13	287	17	200	288	87
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	24	20	32	12	236	20	354	32	244	351	96
Peak Hour Factor	0.94	0.75	0.65	0.66	0.75	0.85	0.65	0.81	0.53	0.82	0.82	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	238	324	274	236	79	274	654	2051	915	740	2255	1006
Arrive On Green	0.17	0.17	0.17	0.17	0.17	0.17	0.02	0.58	0.58	0.08	0.63	0.63
Sat Flow, veh/h	1132	1870	1585	1004	457	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	68	24	20	44	0	236	20	354	32	244	351	96
Grp Sat Flow(s),veh/h/ln	1132	1870	1585	1461	0	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.5	1.1	1.1	1.6	0.0	14.5	0.5	4.7	0.9	5.2	4.0	2.4
Cycle Q Clear(g_c), s	8.1	1.1	1.1	2.7	0.0	14.5	0.5	4.7	0.9	5.2	4.0	2.4
Prop In Lane	1.00		1.00	0.73		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	238	324	274	315	0	274	654	2051	915	740	2255	1006
V/C Ratio(X)	0.29	0.07	0.07	0.14	0.00	0.86	0.03	0.17	0.03	0.33	0.16	0.10
Avail Cap(c_a), veh/h	384	565	479	503	0	477	784	2051	915	1069	2255	1006
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.8	34.6	34.6	35.3	0.0	40.2	8.2	9.9	9.1	6.4	7.4	7.1
Incr Delay (d2), s/veh	0.7	0.1	0.1	0.2	0.0	7.8	0.0	0.2	0.1	0.3	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.5	0.4	0.9	0.0	6.2	0.2	1.7	0.3	1.7	1.4	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.4	34.7	34.7	35.5	0.0	47.9	8.2	10.1	9.2	6.7	7.6	7.3
LnGrp LOS	D	C	C	D	A	D	A	B	A	A	A	A
Approach Vol, veh/h	112				280				406			
Approach Delay, s/veh	37.6				46.0				9.9			
Approach LOS	D				D				A			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	69.1		23.2	13.5	63.3		23.2				
Change Period (Y+Rc), s	* 5.6	* 5.6		5.9	* 5.7	* 5.6		* 5.9				
Max Green Setting (Gmax), s	* 9.4	* 43		30.1	* 26	* 26		* 30				
Max Q Clear Time (g_c+I1), s	2.5	6.0		16.5	7.2	6.7		10.1				
Green Ext Time (p_c), s	0.0	2.6		0.8	0.6	2.1		0.4				

Intersection Summary

HCM 6th Ctrl Delay 17.5

HCM 6th LOS B

Notes





* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
5: Susan Drive & Margaret Ave

01/12/2024

Intersection

Int Delay, s/veh 4.8

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Vol, veh/h	97	133	22	125	134	49
Future Vol, veh/h	97	133	22	125	134	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	90	79	77	82	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	118	148	28	162	163	59

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	266
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1298
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1298
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	NB	SB	NW
HCM Control Delay, s	0	1.1	13.6
HCM LOS			B













Minor Lane/Major Mvmt	NBT	NBRNWLn1	SBL	SBT
Capacity (veh/h)	-	-	638	1298
HCM Lane V/C Ratio	-	-	0.349	0.021
HCM Control Delay (s)	-	-	13.6	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	1.6	0.1

PM Peak 3:42 pm 11/22/2023

Synchro 11 Report
Page 2













Queues AM Peak Existing Condition
3: US Highway 59

11/24/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	24	16	28	20	169	16	216	24	167	281	76
v/c Ratio	0.20	0.04	0.03	0.07	0.04	0.28	0.02	0.14	0.03	0.36	0.30	0.14
Control Delay	27.7	25.2	0.1	25.6	25.0	5.5	8.9	17.4	0.1	14.9	30.5	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	25.2	0.1	25.6	25.0	5.5	8.9	17.4	0.1	14.9	30.5	0.6
Queue Length 50th (ft)	40	11	0	13	9	0	4	42	0	46	75	0
Queue Length 95th (ft)	69	23	0	23	22	45	10	66	0	78	95	0
Internal Link Dist (ft)	78			125			1128			972		
Turn Bay Length (ft)	150		150	150		150	150		150	150		150
Base Capacity (vph)	417	560	582	417	562	596	739	1535	739	469	934	531
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.04	0.03	0.07	0.04	0.28	0.02	0.14	0.03	0.36	0.30	0.14
Intersection Summary												












Queues PM Peak Existing Condition
3: US Highway 59

11/24/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	68	24	20	32	12	236	20	354	32	244	351	96
v/c Ratio	0.16	0.04	0.03	0.08	0.02	0.37	0.03	0.23	0.04	0.57	0.38	0.18
Control Delay	27.0	25.2	0.1	25.7	24.8	5.3	8.9	18.3	0.1	19.6	31.5	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	25.2	0.1	25.7	24.8	5.3	8.9	18.3	0.1	19.6	31.5	1.7
Queue Length 50th (ft)	32	11	0	15	5	0	5	72	0	70	96	0
Queue Length 95th (ft)	66	25	0	27	16	44	11	92	0	99	124	9
Internal Link Dist (ft)	78			125			1128			972		
Turn Bay Length (ft)	150		150	150		150	150		150	150		150
Base Capacity (vph)	420	560	582	417	562	642	702	1535	739	431	934	531
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.04	0.03	0.08	0.02	0.37	0.03	0.23	0.04	0.57	0.38	0.18
Intersection Summary												












Queues AM Peak Build Condition
3: Susan Drive & US Highway 59

11/24/2023

											
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	24	16	48	169	16	216	24	167	281	76
v/c Ratio	0.21	0.04	0.03	0.10	0.28	0.02	0.14	0.03	0.36	0.30	0.14
Control Delay	27.8	25.2	0.1	25.9	5.5	8.9	17.4	0.1	14.9	30.5	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	25.2	0.1	25.9	5.5	8.9	17.4	0.1	14.9	30.5	0.6
Queue Length 50th (ft)	40	11	0	22	0	4	42	0	46	75	0
Queue Length 95th (ft)	69	23	0	41	45	10	66	0	78	95	0
Internal Link Dist (ft)		78		138			1128			972	
Turn Bay Length (ft)	150		150		150	150		150	150		150
Base Capacity (vph)	406	560	582	485	596	739	1535	739	469	934	531
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.04	0.03	0.10	0.28	0.02	0.14	0.03	0.36	0.30	0.14
Intersection Summary											

Queues PM Peak Build Condition
3: Susan Drive & US Highway 59

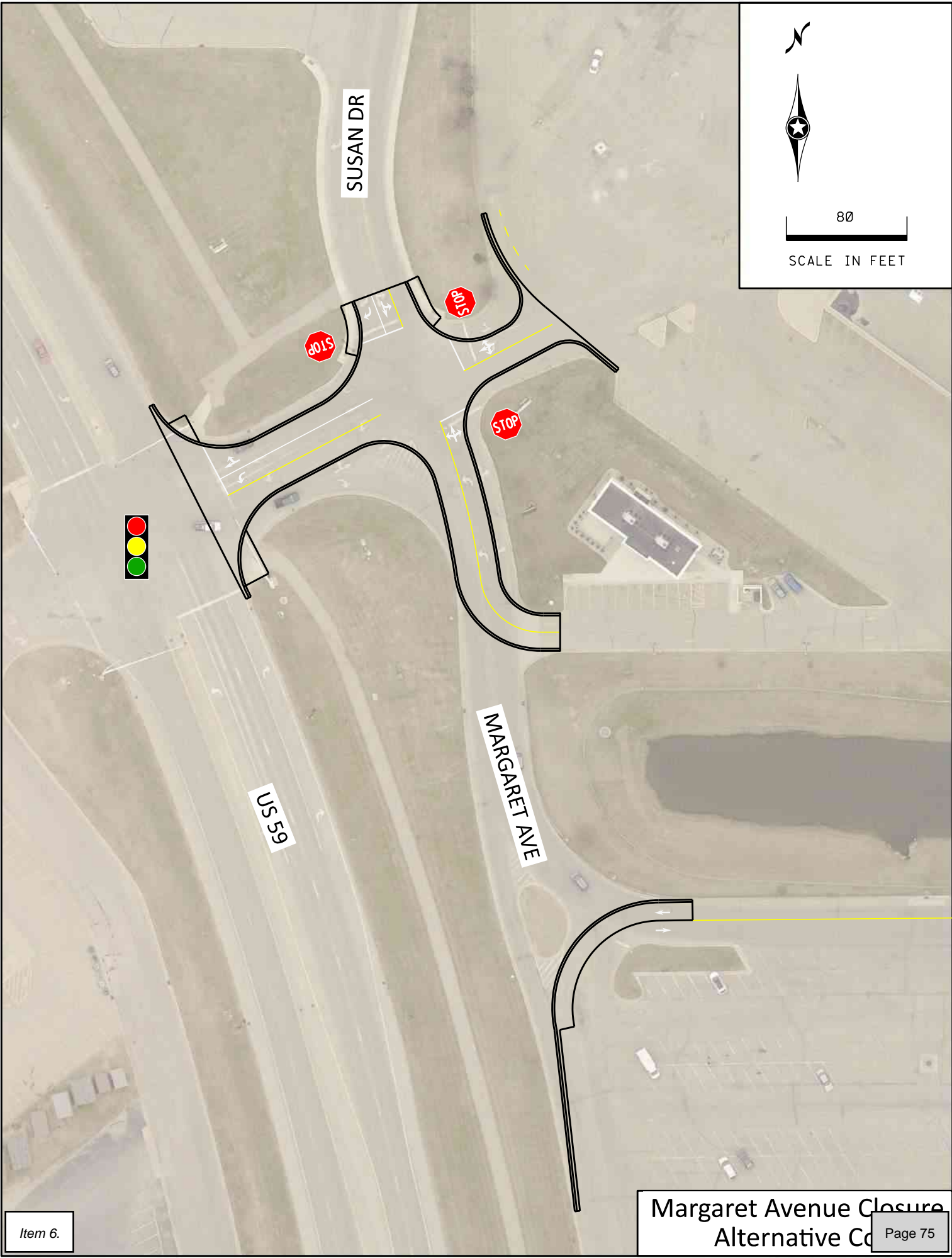
11/24/2023

											
Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	68	24	20	44	236	20	354	32	244	351	96
v/c Ratio	0.17	0.04	0.03	0.09	0.37	0.03	0.23	0.04	0.57	0.38	0.18
Control Delay	27.2	25.2	0.1	25.9	5.3	8.9	18.3	0.1	19.6	31.5	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	25.2	0.1	25.9	5.3	8.9	18.3	0.1	19.6	31.5	1.7
Queue Length 50th (ft)	32	11	0	20	0	5	72	0	70	96	0
Queue Length 95th (ft)	66	25	0	38	44	11	92	0	99	124	9
Internal Link Dist (ft)		78		138			1128			972	
Turn Bay Length (ft)	150		150		150	150		150	150		150
Base Capacity (vph)	408	560	582	466	642	702	1535	739	431	934	531
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.04	0.03	0.09	0.37	0.03	0.23	0.04	0.57	0.38	0.18
Intersection Summary											

Appendix E

Intersection Alternatives





SUSAN DR

STOP

STOP

STOP

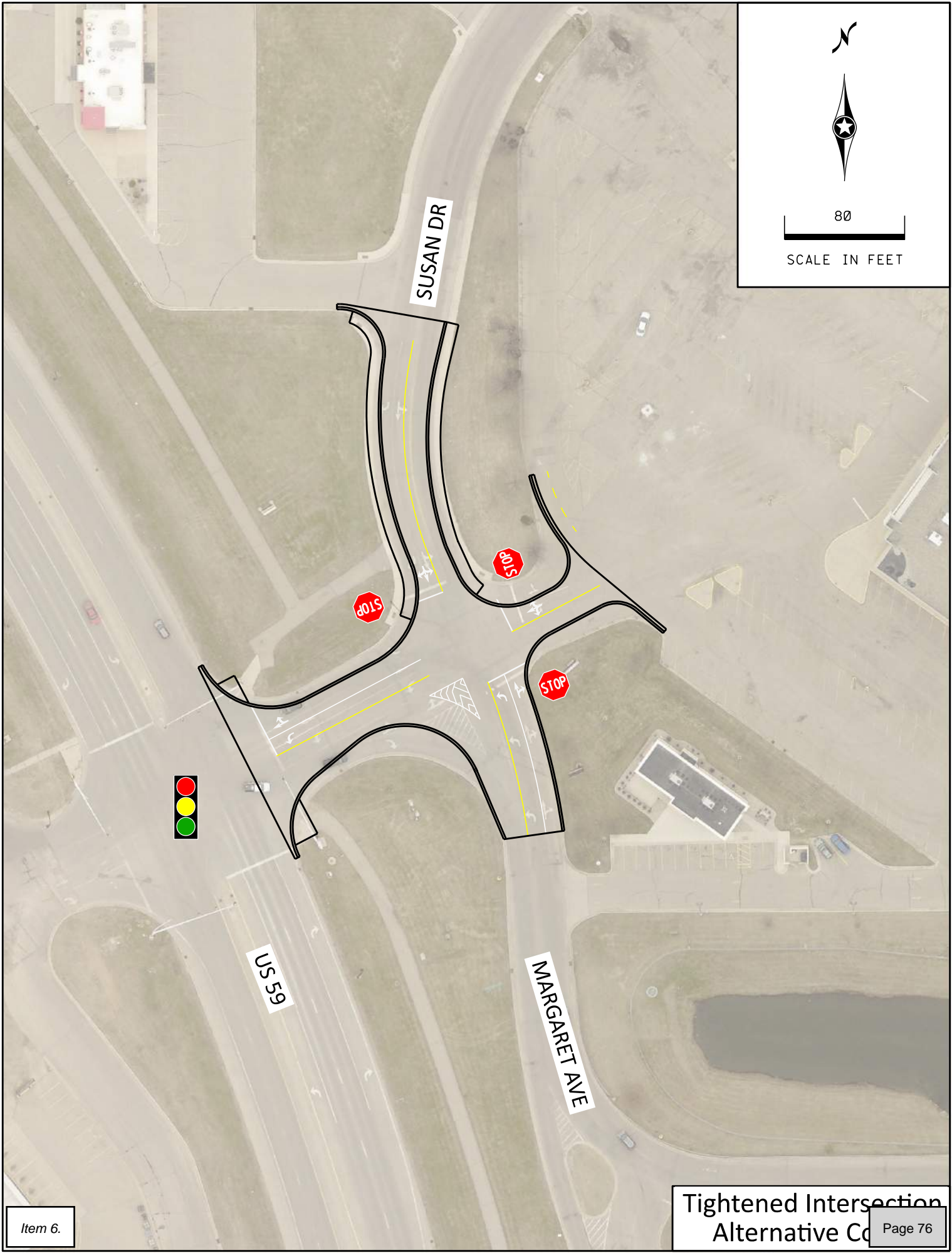
US 59

MARGARET AVE



80
SCALE IN FEET





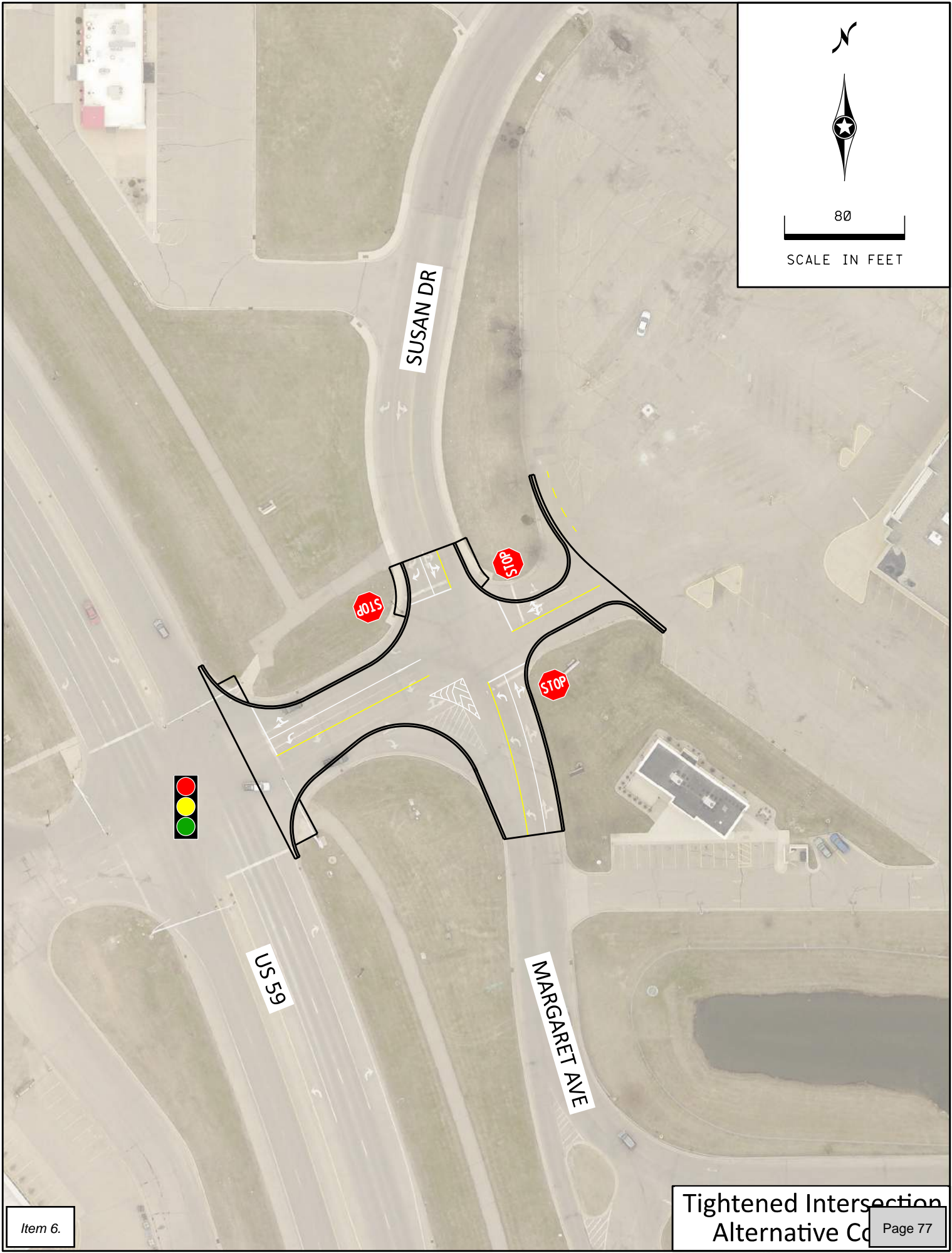
SUSAN DR

US 539

MARGARET AVE

80

SCALE IN FEET



SUSAN DR

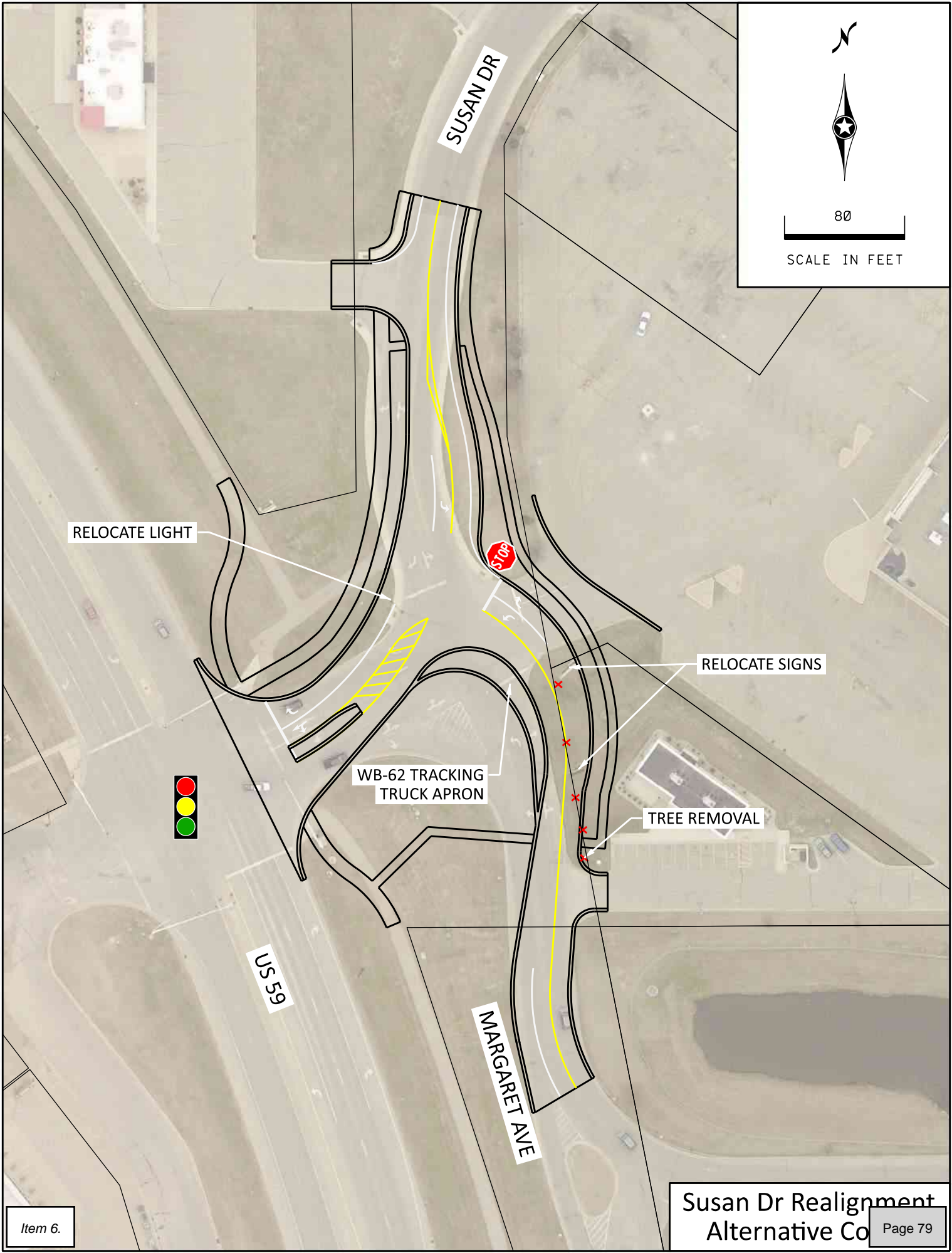
US 59

MARGARET AVE

80

SCALE IN FEET





SUSAN DR

80

SCALE IN FEET

RELOCATE LIGHT



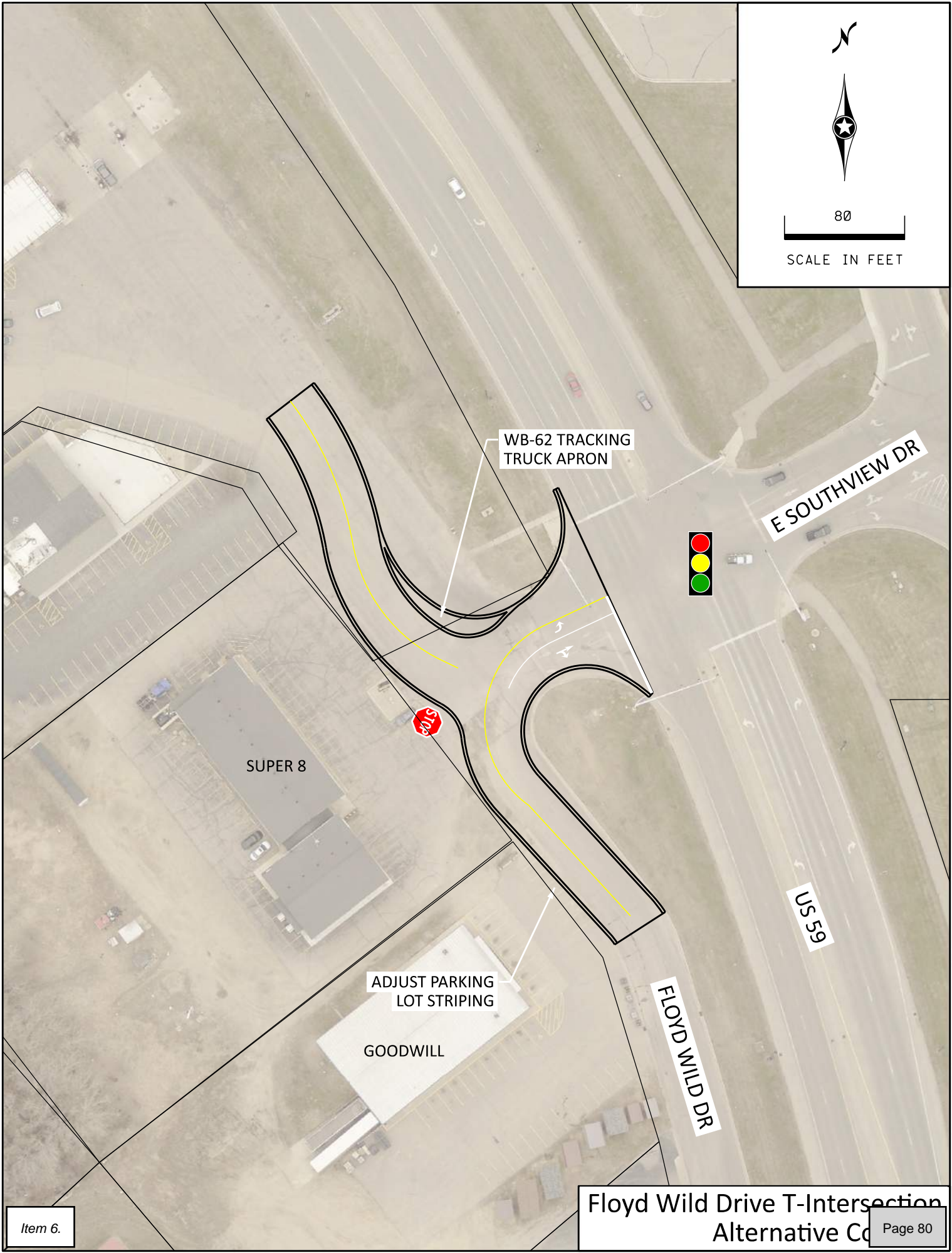
WB-62 TRACKING
TRUCK APRON

RELOCATE SIGNS

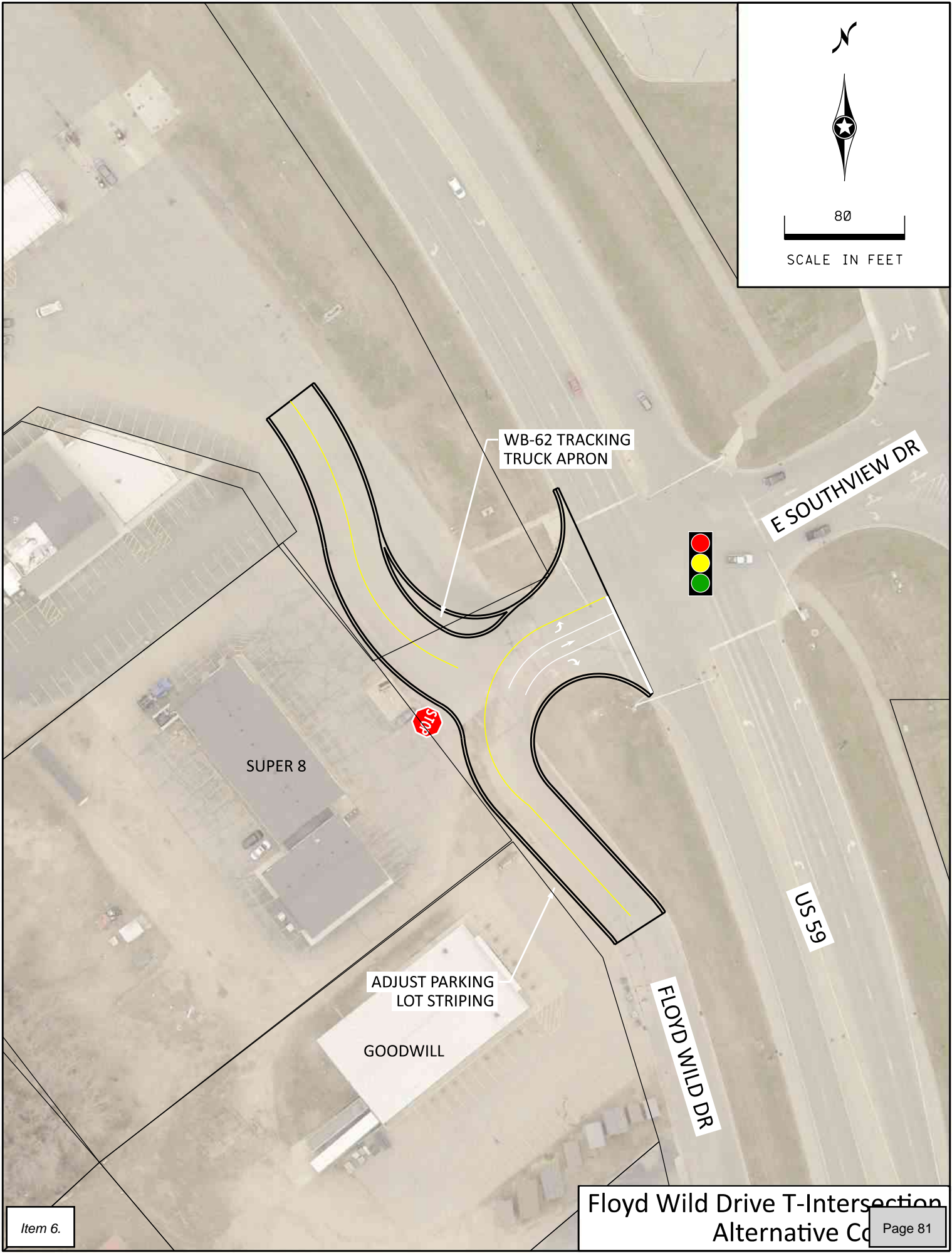
TREE REMOVAL

US 59

MARGARET AVE



Item 6.



N



80

SCALE IN FEET

WB-62 TRACKING
TRUCK APRON

E SOUTHVIEW DR



SUPER 8

ADJUST PARKING
LOT STRIPING

GOODWILL

US 59

FLOYD WILD DR

Floyd Wild Drive T-Intersection
Alternative C