



# Town of Johnstown

## TOWN COUNCIL WORK SESSION

450 S. Parish, Johnstown, CO  
Monday, December 11, 2023 at 6:00 PM

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*MISSION STATEMENT: Enhancing the quality of life of our residents, businesses, and visitors through community focused leadership.*

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### AGENDA

#### CALL TO ORDER

#### AGENDA ITEMS

- [1.](#) Broadband Planning

#### ADJOURN

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### AMERICANS WITH DISABILITIES ACT NOTICE

In accordance with the Americans with Disabilities Act and other applicable laws, persons who need accommodation in order to attend or participate in this meeting should contact Town Hall at 970-587-4664 no later than 48 hours before the meeting in order to request such assistance.

De conformidad con la Ley de Discapitados Estadounidenses y otras leyes vigentes, los individuos que necesitan adaptaciones funcionales para asistir o participar en esta reunión deberán comunicarse con la Municipalidad marcando el 970 587- 4664 a lo más tardar 48 horas antes de dicha reunión para solicitarla.

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The Community That Cares

[johnstown.colorado.gov](http://johnstown.colorado.gov)

P: 970.587.4664 | 450 S. Parish Ave, Johnstown CO 80534 | F: 970.587.0141



# Town of Johnstown

## TOWN COUNCIL WORKSESSION COMMUNICATION

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**AGENDA DATE:** December 11, 2023

**SUBJECT:** Broadband Planning

**ATTACHMENTS:**

1. Broadband Presentation
2. Broadband Deployment Maps
3. Broadband Cost Estimates

**PRESENTED BY:** Matt LeCerf, Town Manager

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### WORKSESSION ITEM DESCRIPTION:

In May 2021, the Towns of Johnstown, Berthoud, Mead, and Milliken embarked on a joint broadband financial feasibility and needs assessment study. The focus was to evaluate current service providers and the ability to create a municipal broadband system or recruit other providers to enter into our service territories to provide internet and other fiber-based services that adequately met the needs of our respective communities.

In October 2021, the Towns along with our consultants met to present the findings to the elected bodies of the four Towns. The recommendations included exploring and interviewing three (3) entities who could provide the fiber-based services our community deserves.

As part of the presentation, Staff was directed to interview final entities to determine who would be the best partner and in February 2022, the political bodies of the four (4) Towns authorized the development of an MOU with Allo Communications to partner on fiber deployment to the homes for the communities. As part of these negotiations, Allo ultimately committed to serve only a portion of our respective communities and would not commit to a ubiquitous network that would ensure all residents and businesses had access if desired to the fiber service. This model mimicked the franchise agreements we have with other cable providers and we did not want a model that chose winners and losers for who would and would not receive access of high speed fiber to the home. Consequently, the negotiations broke down and we were unable to deliver an agreement to the Council that met the desired objectives.

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In an effort to explore other meaningful alternatives to make high speed internet and fiber services a reality in our community, the Town engaged with Ditesco to provide a high-level design and plan that will provide access to high-speed broadband for all its residents. This planning effort will allow Johnstown to understand costs, delivery alternatives, and potential strategies to best serve the Town.

The presentation this evening will summarize the findings of this broadband planning effort.

*Reviewed and Approved for Presentation,*



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Town Manager

# Town of Johnstown Broadband Planning



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December 2023



## Broadband Planning

# Agenda

- ✓ Broadband FAQs and terminology
- ✓ Summary of provider availability
- ✓ Capital scope and cost
- ✓ Available Models
- ✓ Project Prioritization and Phasing Options
- ✓ Next Steps



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## Terminology

**Latency** – Time taken for source to destination data transfer

**Bandwidth** – Historical term for the number of frequencies used to transmit data. These days, bandwidth is used as a term for “speed” and the rate (or amount) of data transferred over time

**Broadband** – Historical term for a faster data transmission technique. These days broadband is synonymous with “high speed internet”. Defined by the FCC as 25 Mbps download and 3 Mbps upload

**Backhaul** – Principal routes between strategically interconnected access points of the internet, covers long distances such as submarine cables, often made from optical fibers, internet backbone

**Mbps** – Megabit per second (Mb/s), one million bits per second

**Municipal Fiber** – Publicly owned Internet Service Provider classified as a utility, fully accountable to voters, “future proofed” with easily scalable world class bandwidth

## Broadband Technologies

### Satellite

- GSO (Geostationary Orbit) Traditional
- NGSO (Non-Geostationary Orbit) Newer technology (Starlink)

### Fixed Wireless

- Frequencies in electromagnetic spectrum partitioned into *Licensed*, *Unlicensed*, and *Licensed-by-Rule* bands
- “Fixed” wireless as opposed to “mobile” wireless (cellphones)

### Copper Wire

- DSL is the incumbent broadband technology that operates on existing twisted pair copper phone lines

### Coaxial Cable

- Coaxial cables can transmit data much faster than DSL due to the form of the cable but have similar drawbacks

### Fiber to the Premise

- Optical Transmission technology transmit data with low power light pulses
- Fastest and most scalable by many orders of magnitude
- Fiber has connected the world together since 1980s
- *As good as it gets*



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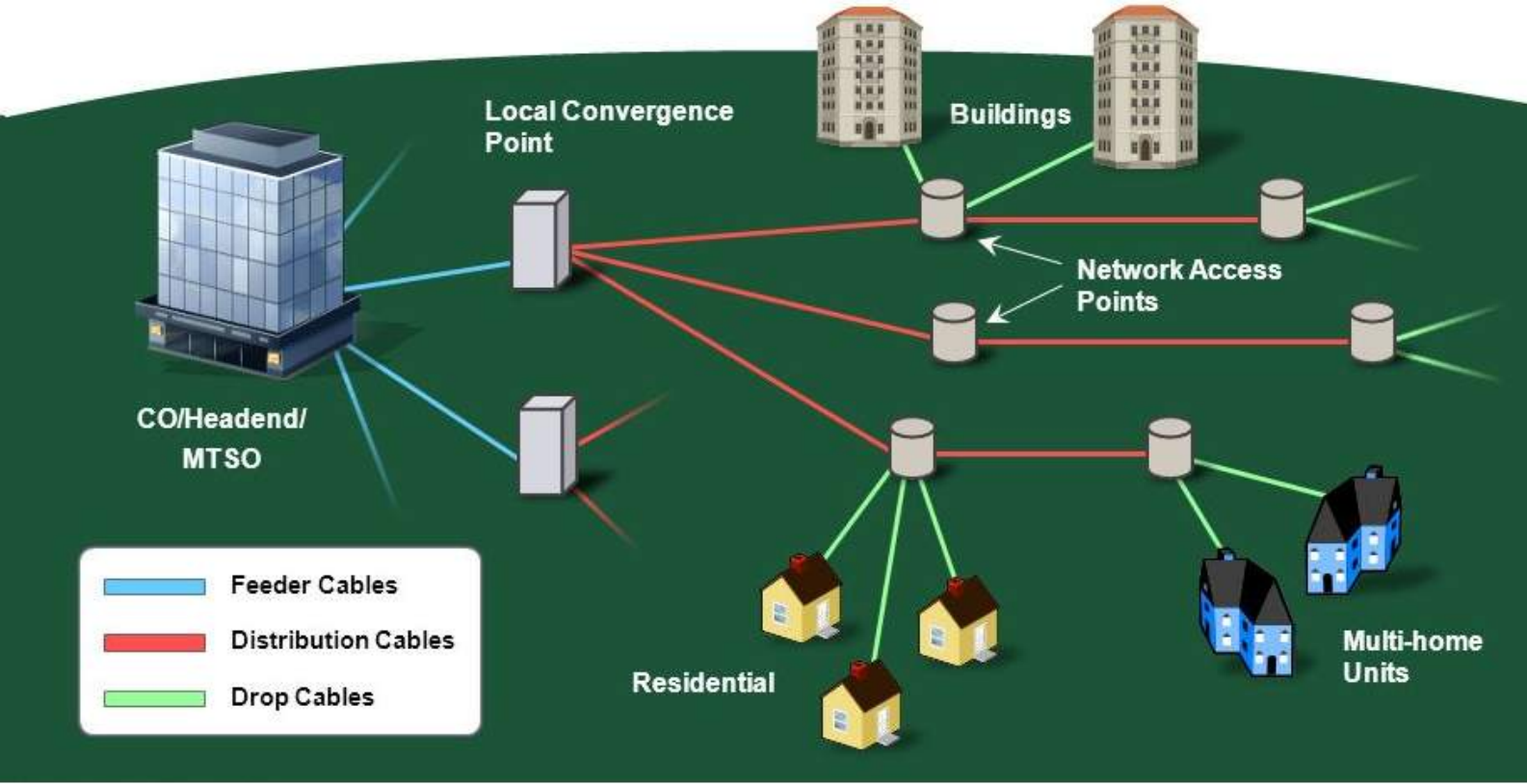
## Availability Summary

Technology Type	Max Download Speeds	Max Upload Speeds	Latency	
Fiber	1,000 – 1,000,000+ Mbps	Symmetrical	10-100ms	Future Proof
Coax	10 - 1,000 Mbps	20-30 Mbps	10-100ms	Approaching limits of technology
Digital Subscriber Line (DSL)	1-100 Mbps	1-5 Mbps	10-100ms	Outdated
Cellular (4G, 5G)	1-55 Mbps	0.5-40 Mbps	10-100ms	Subject to interference, network congestion
Fixed Wireless	10-250 Mbps	10-50 Mbps	10-100ms	Subject to interference/ line of sight
Satellite	10-200 Mbps	5-20 Mbps	50-800ms	High latency, subject to interference, line of sight



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# Fiber Networks



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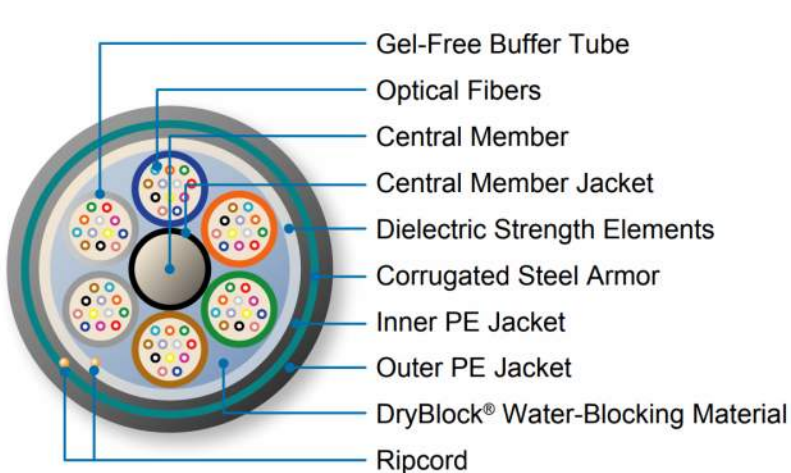
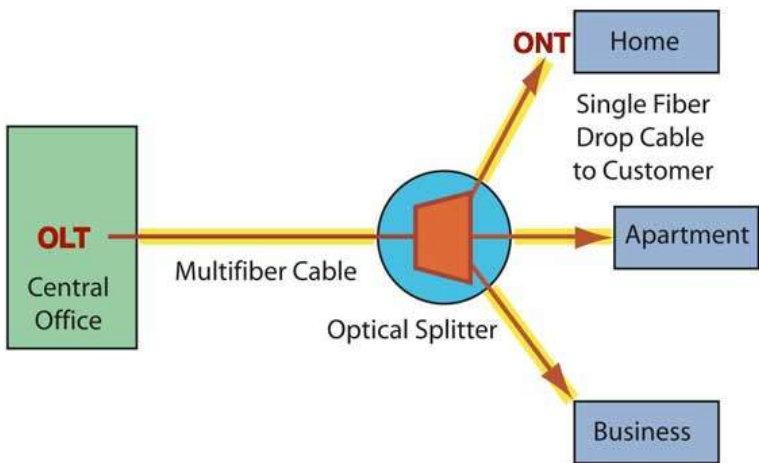
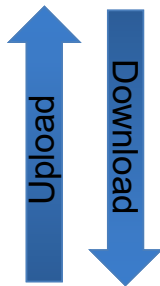


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## Fiber Networks

### Passive Optical Network (PON) Fundamentals

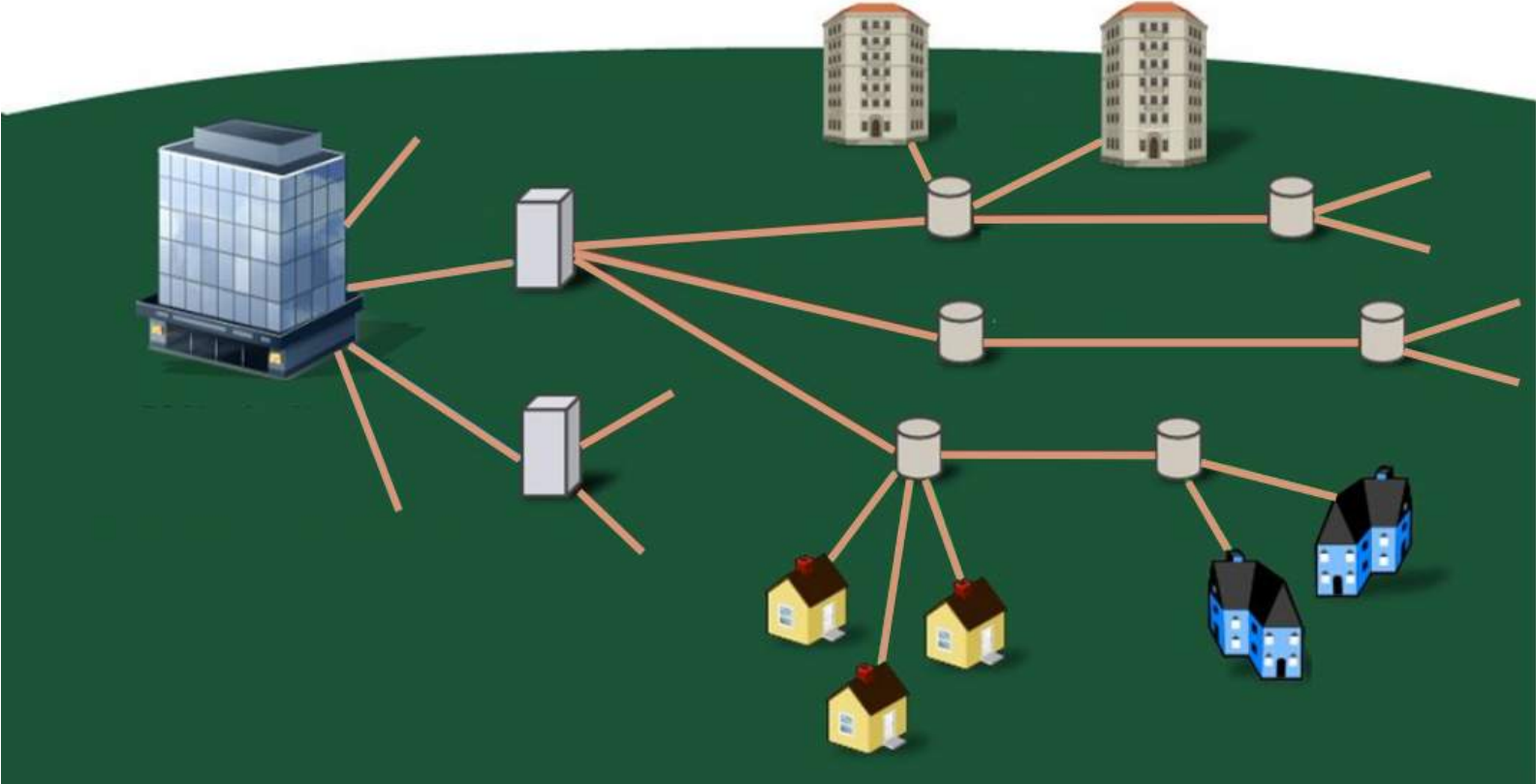
- Internet connected to the Fiber Optic Network at Central Office
- “Feeder” optical fiber(s) runs to a location central to the served premises
- Optical splitter divides/multiplies the signal within each optical fiber 1:32
- Each of the 32 “distribution” fibers connect to a single premise



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# Early Internet: All Copper Infrastructure

# Fiber Networks

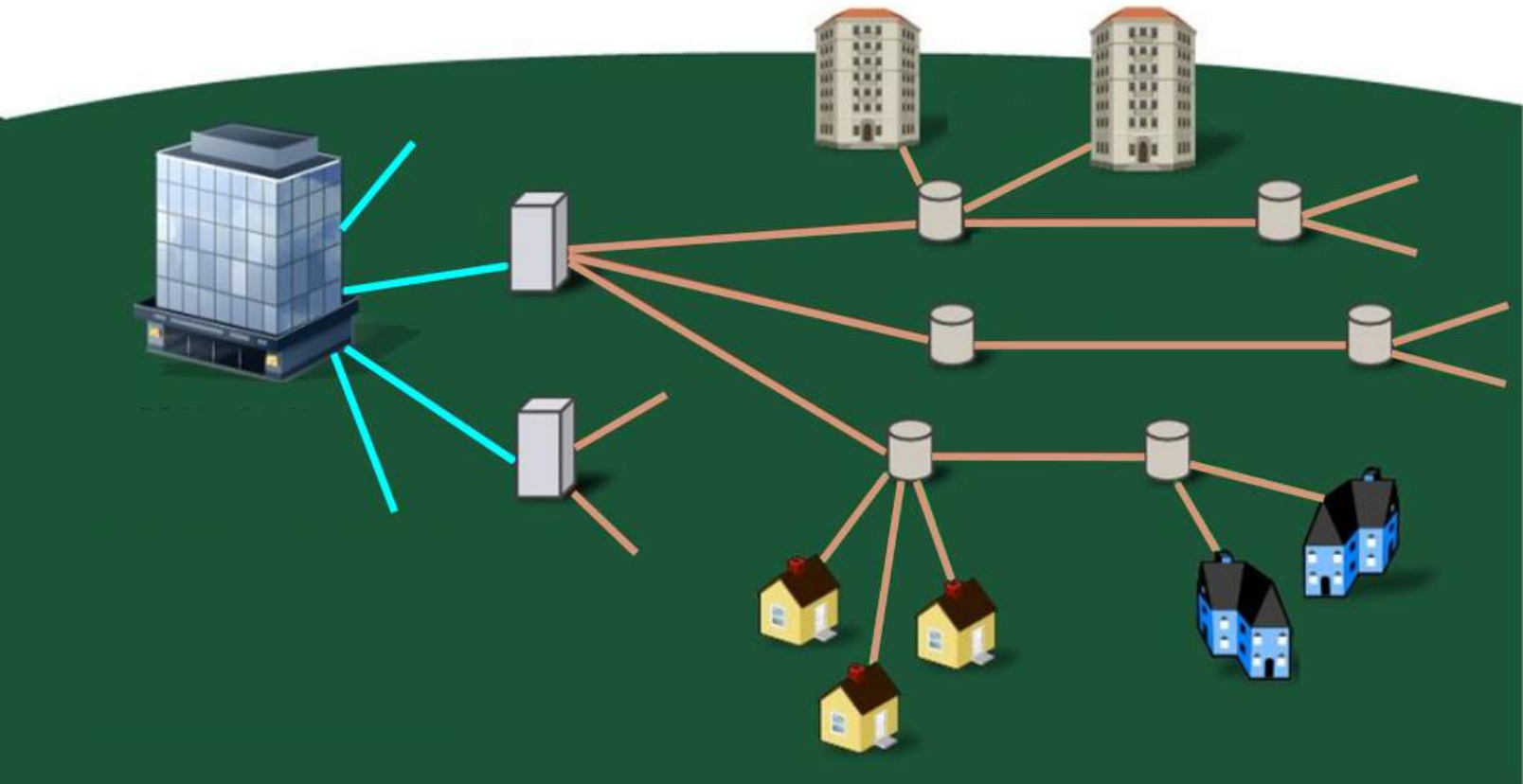


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# ~1980s to ~1990s: Fiber for Backhaul

## Fiber Networks

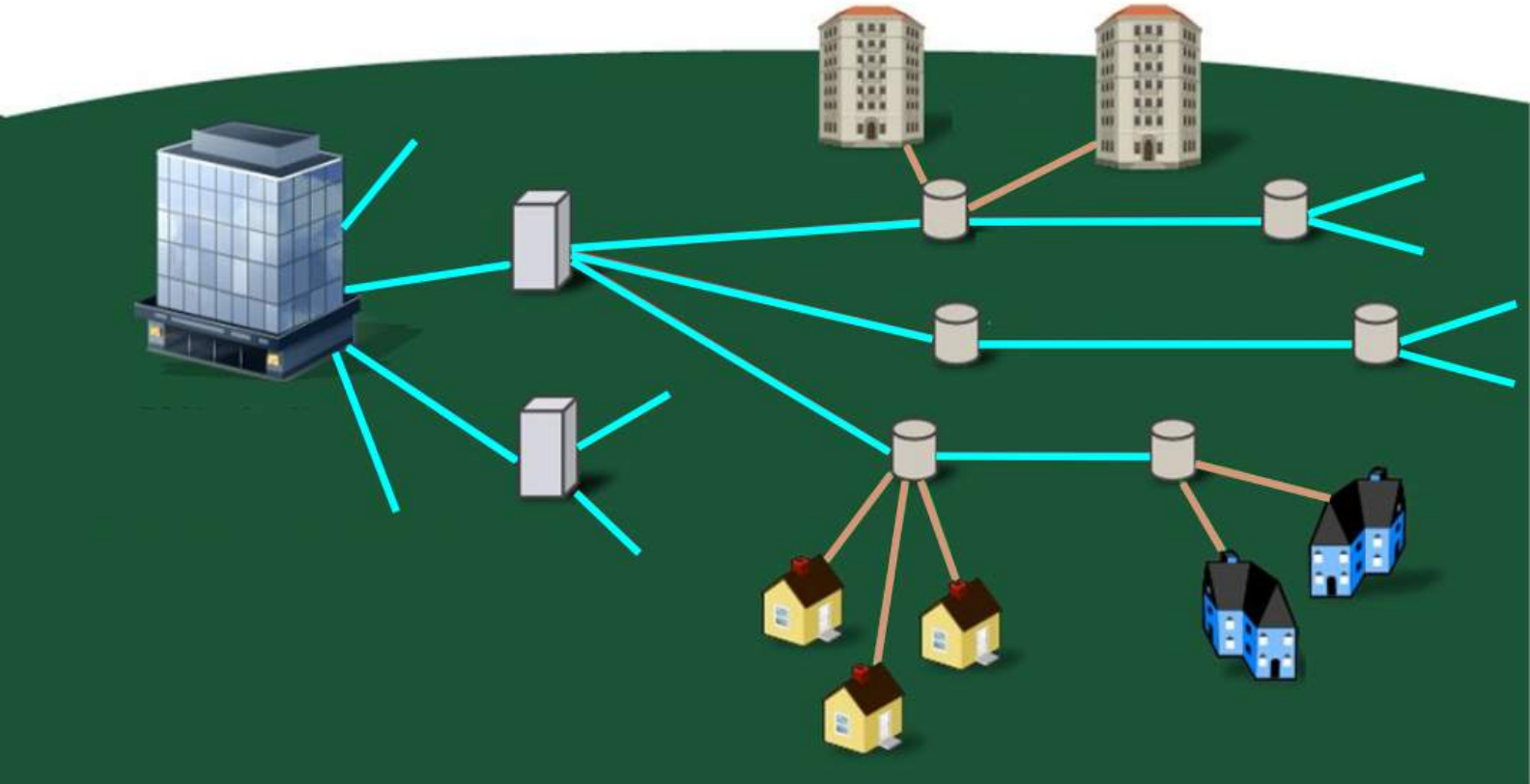


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# ~1990s to ~2000s: Fiber in more local networks

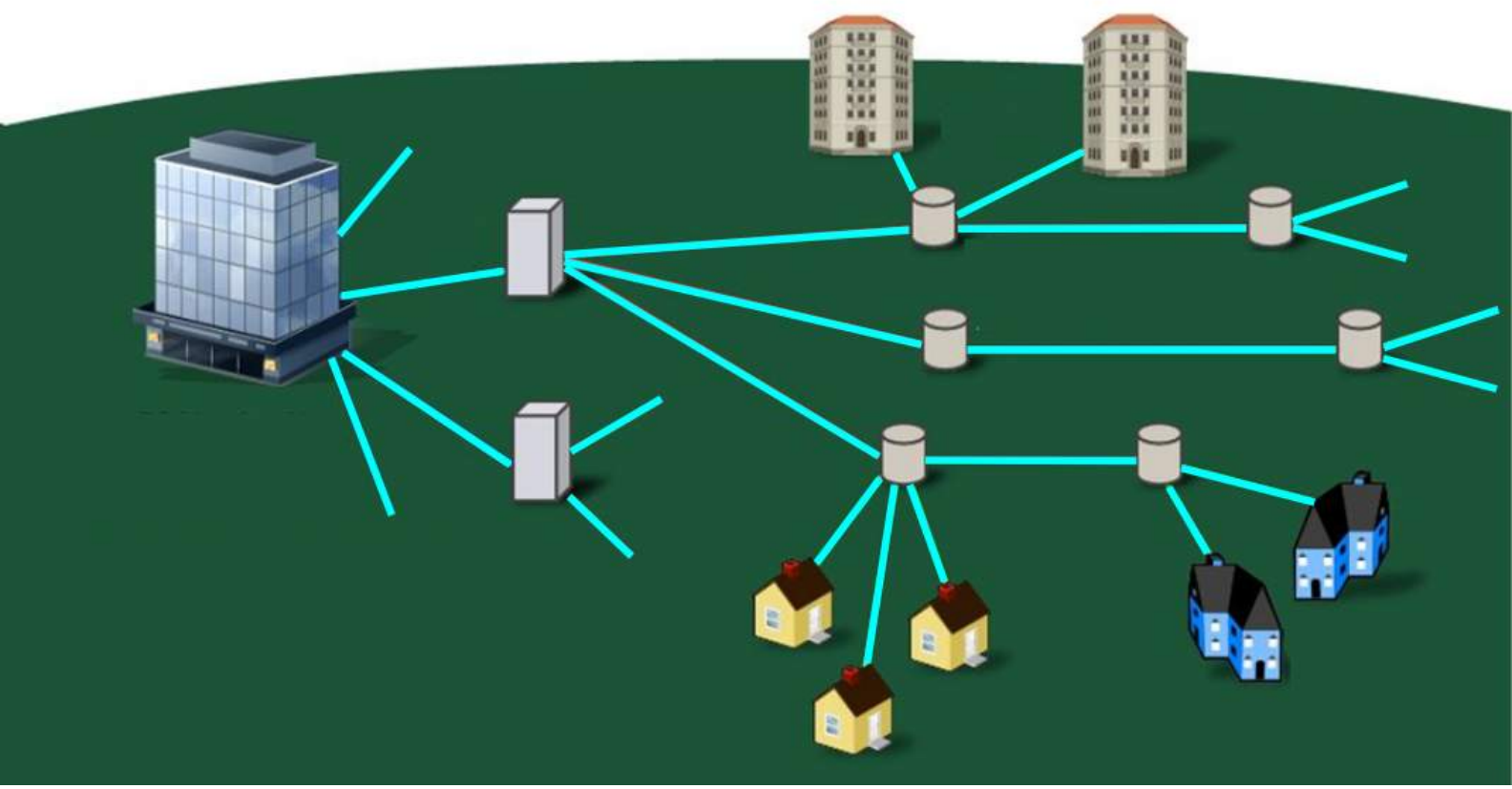
## Fiber Networks



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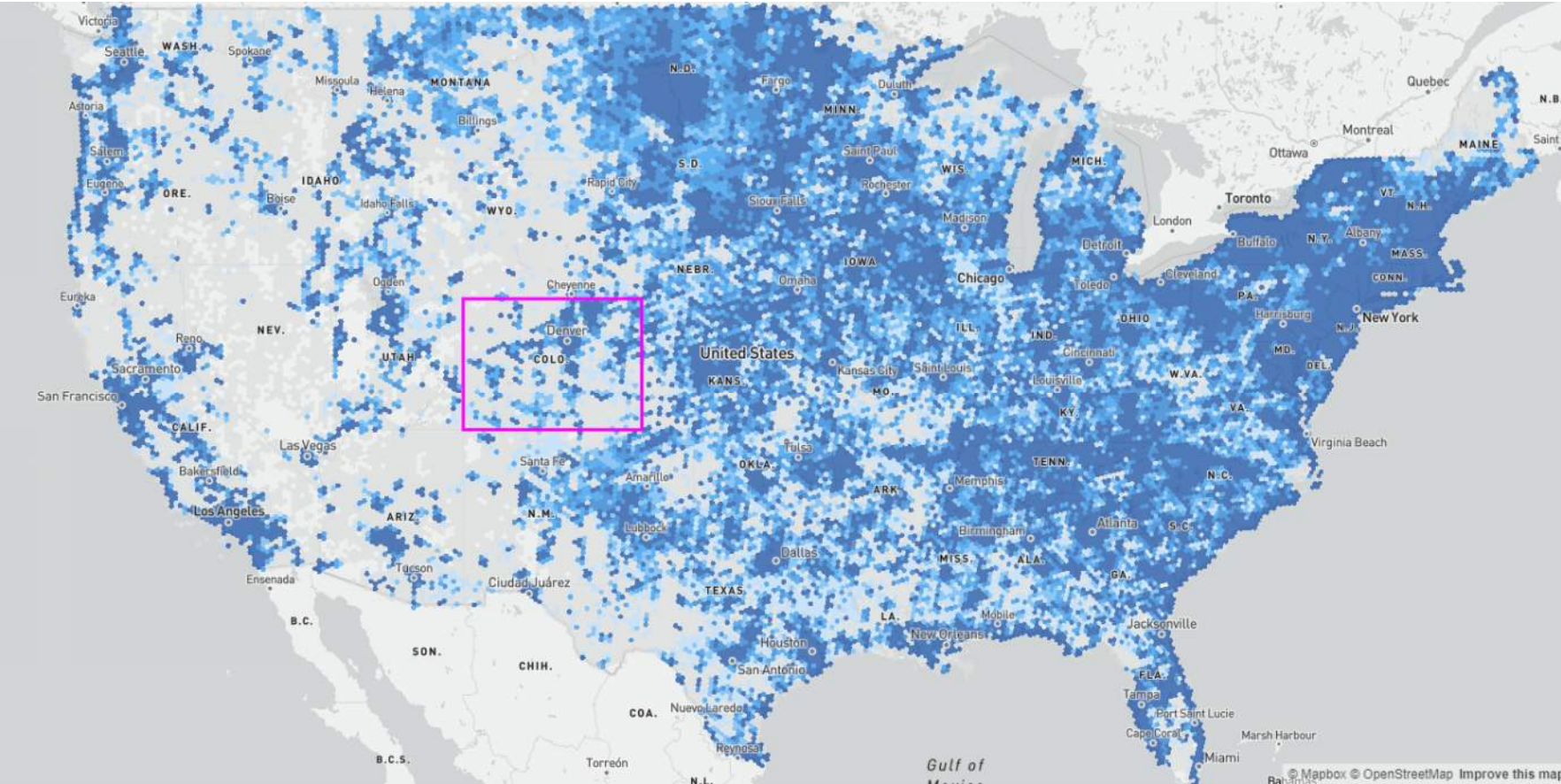
# ~2000s to present: Fiber to the Premise

## Fiber Networks



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# FCC Fabric



## Terminology

**Broadband Serviceable Location (BSL)**: a business or residential location in which mass-market fixed broadband Internet access service is, or can be, installed.

- BSLs are not schools, libraries, community centers, and government buildings, barns, RVs, etc...

**Unserved**: BSLs lack access to Speeds of at least 25 Mbps downstream and 3 Mbps upstream with Latency levels low enough to support real-time applications.

**Underserved**: BSLs lack access to Speeds of at least 100 Mbps downstream and 20 Mbps upstream with low latency

**Served**: BSLs have access to Speeds greater or equal to 100 Mbps downstream and 20 Mbps upstream with low latency



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# FCC Fabric: Availability



Fixed Broadband | Mobile Broadband

Selected Location Location Challenge

**420 CASTLE PINES AVE**  
**JOHNSTOWN, CO 80534**

Status: **Served** | Residential | Unit Count: 1

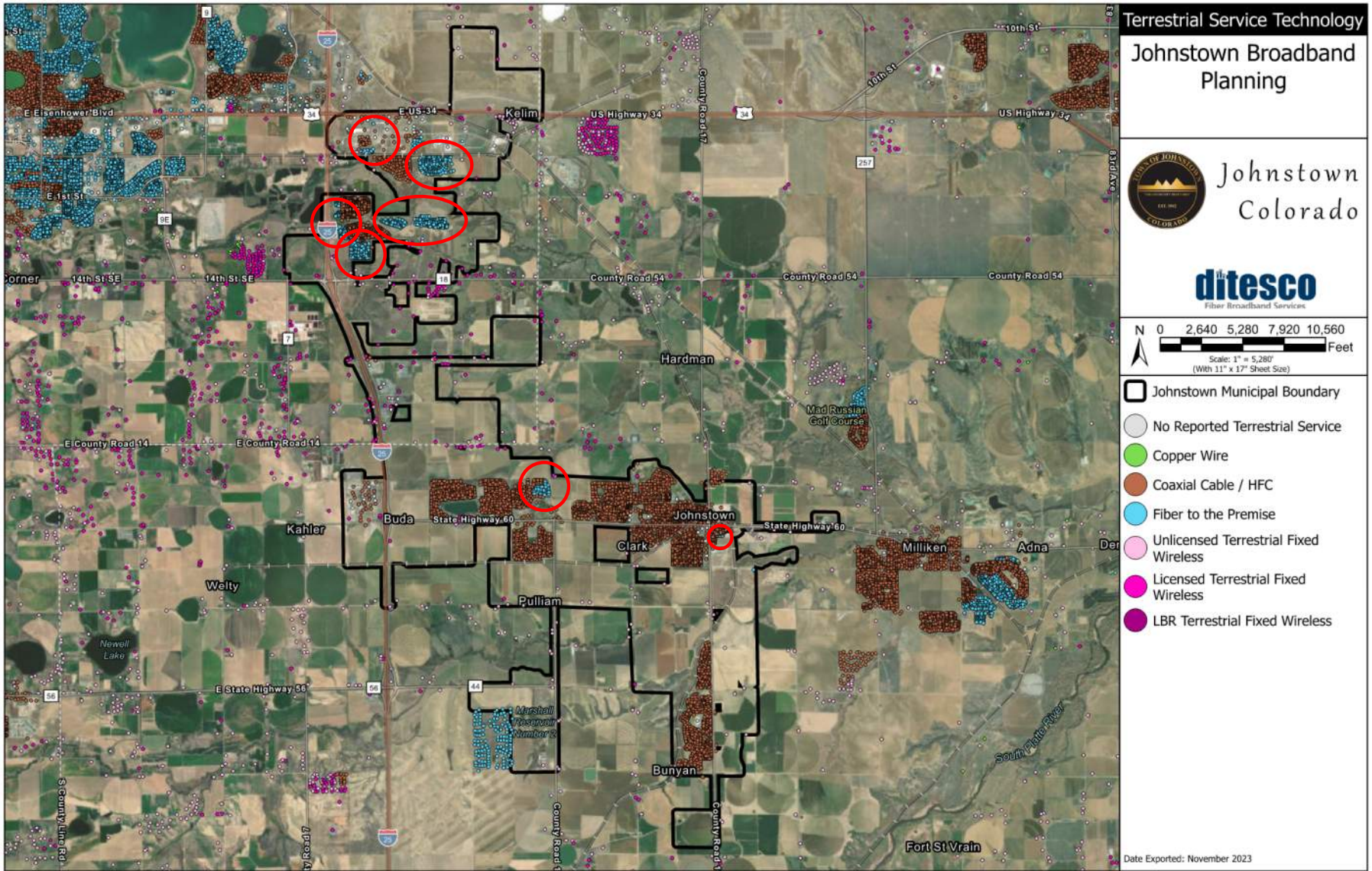
**Broadband** Settings

Type	Residential
Technology	All Wired
Speed	100/20 Mbps or greater
Data As Of	Dec 31, 2022 (Last Updated: 11/7/23)

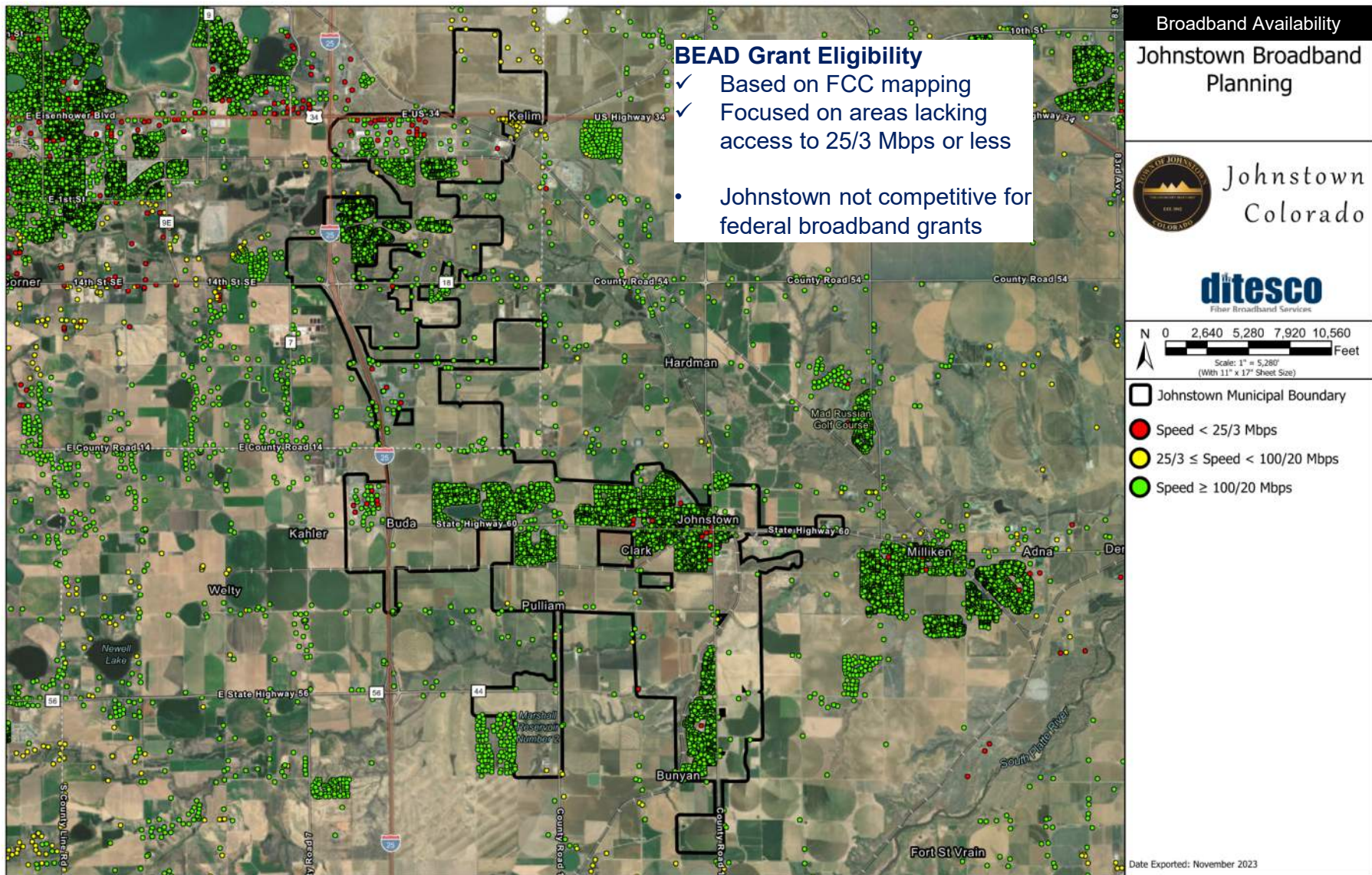
### Grant Eligibility

- ✓ Based on FCC mapping
- ✓ Focused on areas lacking access to 25/3 Mbps or less









## Availability Summary

	Fixed Terrestrial Broadband Provider	Technology Type	Download Max Advertised Speed (Mbps)	Upload Max Advertised Speed (Mbps)	Subscription Cost
Wireline	Century Link	Fiber	940	940	\$75 / month (no install fee)
	TDS	Fiber	1000	1000	\$90 – 120 / month
	TDS	Cable	1000	20	\$90 – 116 / month
	Century Link	DSL	10	1	\$74 / month + \$300 install
Wireless	Century Link	Wireless	0.2 to 140	0.1 to 40	\$70 / month + \$150 install
	Rise Broadband	Wireless	10 to 100	1 to 20	\$75 / month
	Vistabeam Internet	Wireless	100	20	\$88 per Month + \$200 Install
	Ascent Broadband	Wireless	100 to 150	5 to 38	\$90 – \$129+ / month
	T-Mobile	Wireless	0.2 to 25	0.1 to 3	\$55
Satellite	HughesNet	GSO	20 to 50	1 to 3	\$75 / month
	Viasat	GSO	100	Unspecified	\$215 / month
	Starlink	NSGO	56 to 169	9 to 17	\$120 / month + \$650 Install



## Broadband Planning

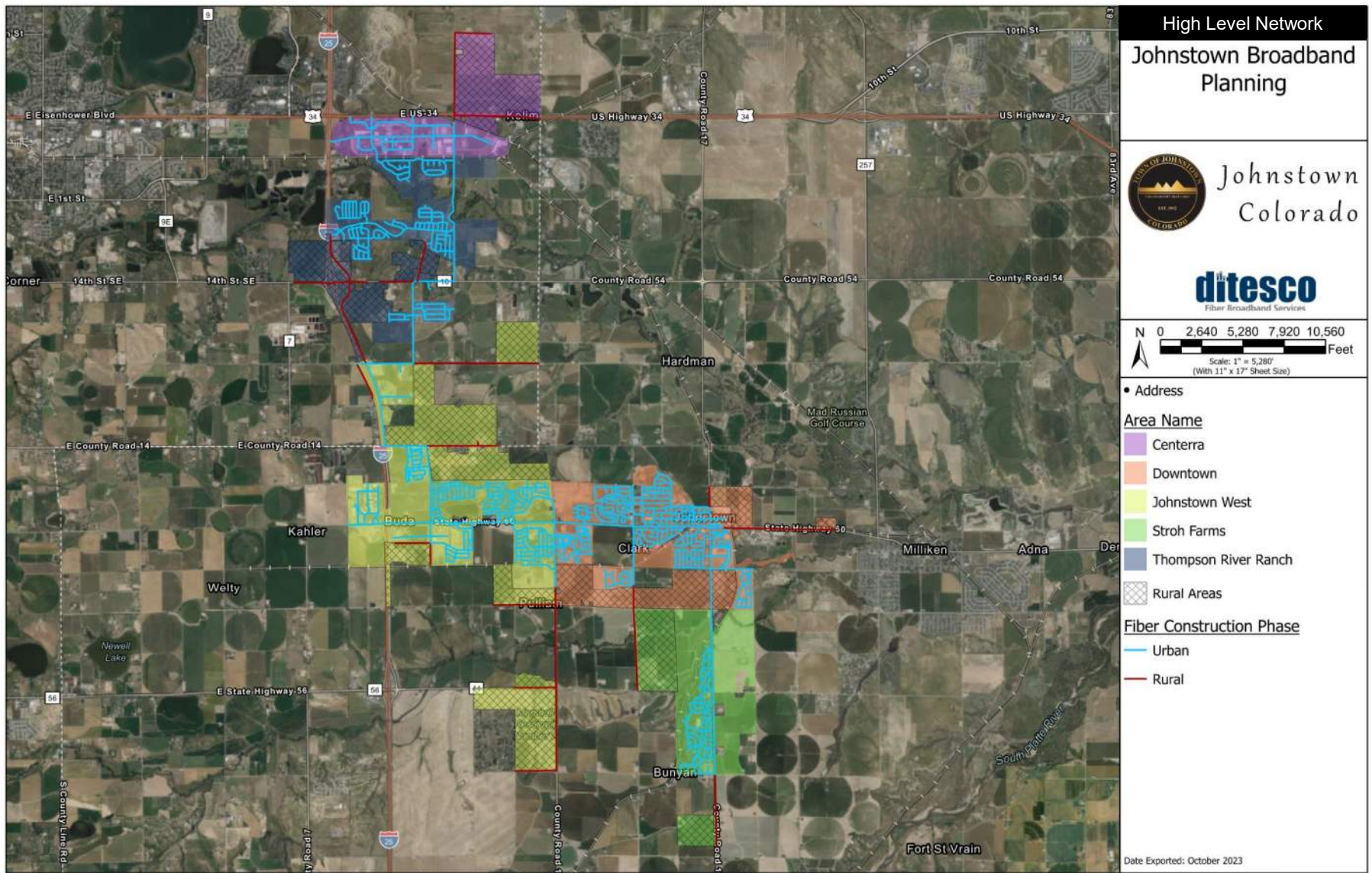
# Public Broadband

## Why have Municipalities/Public agencies pursued broadband?

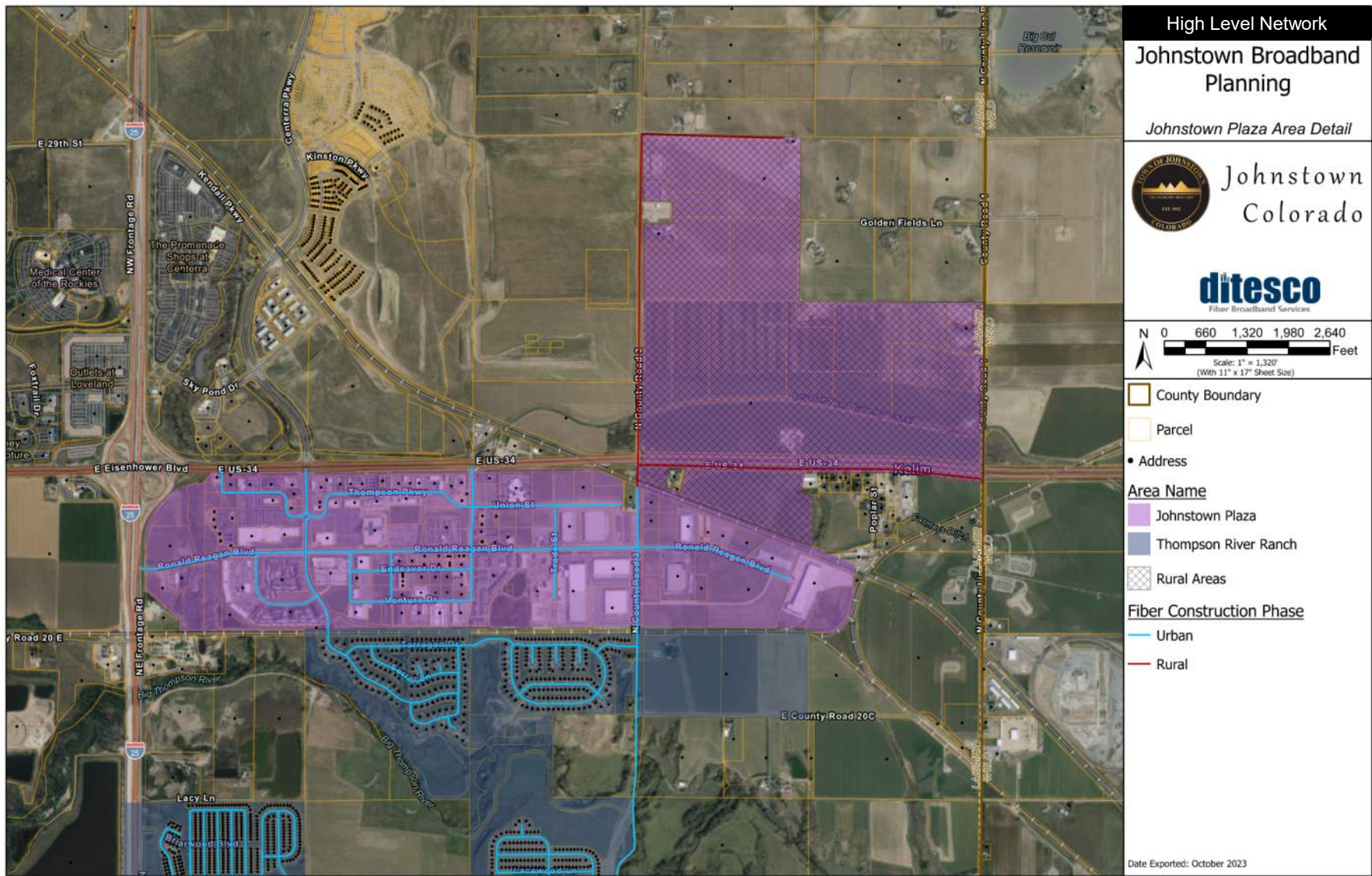
- ✓ Broadband as a Utility
  - Consideration that broadband is no different than power, water, sewer – it is an essential utility
  - Create equity through bridging the “digital divide”
- ✓ Desire to “future proof” community through fiber
- ✓ Economic development/health
- ✓ Create a more reliable, resilient communication infrastructure
- ✓ Set the foundation for “Smart City”
  - Improve transportation, services, communication
  - Data to efficiently operate and manage assets



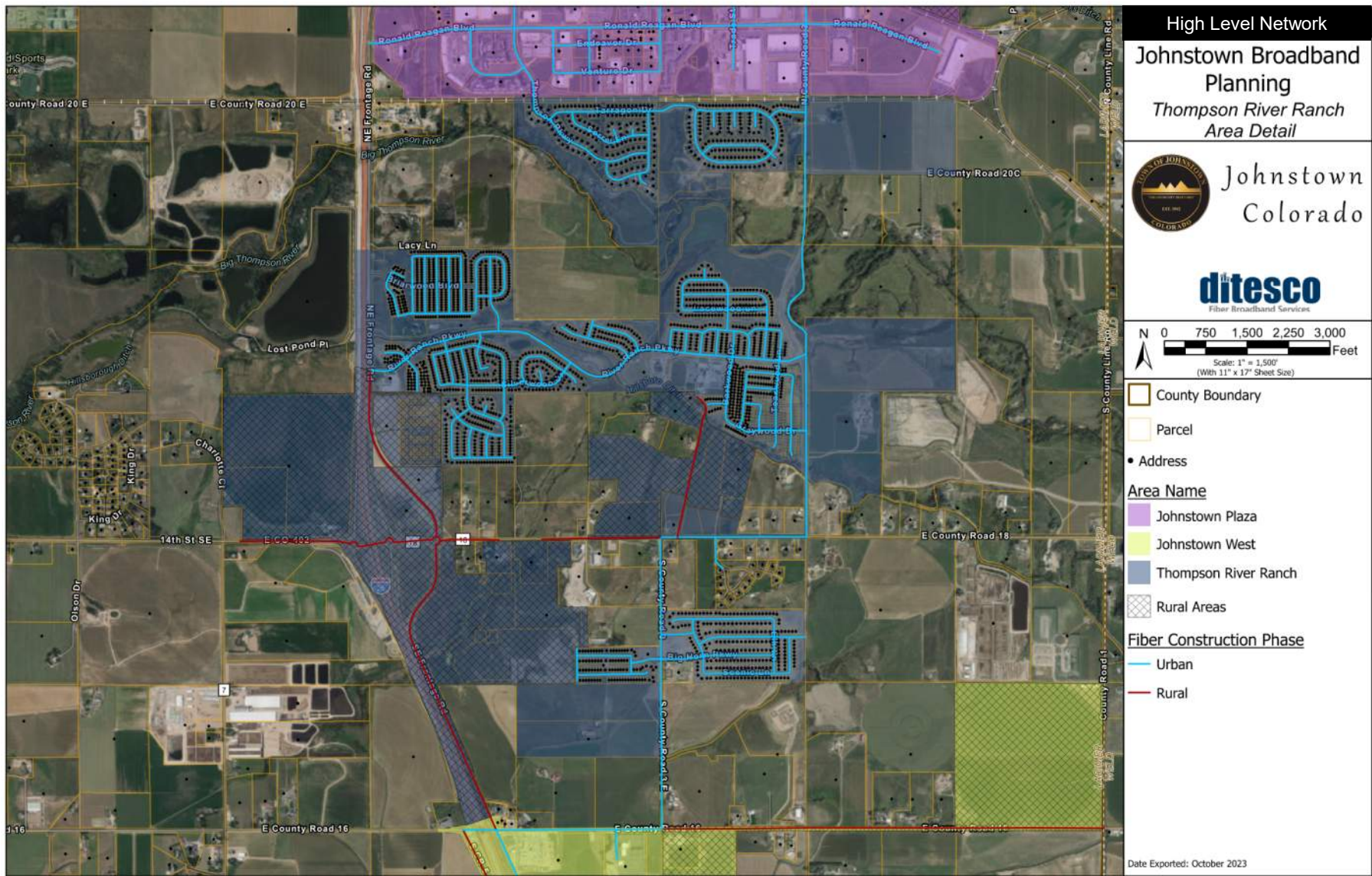
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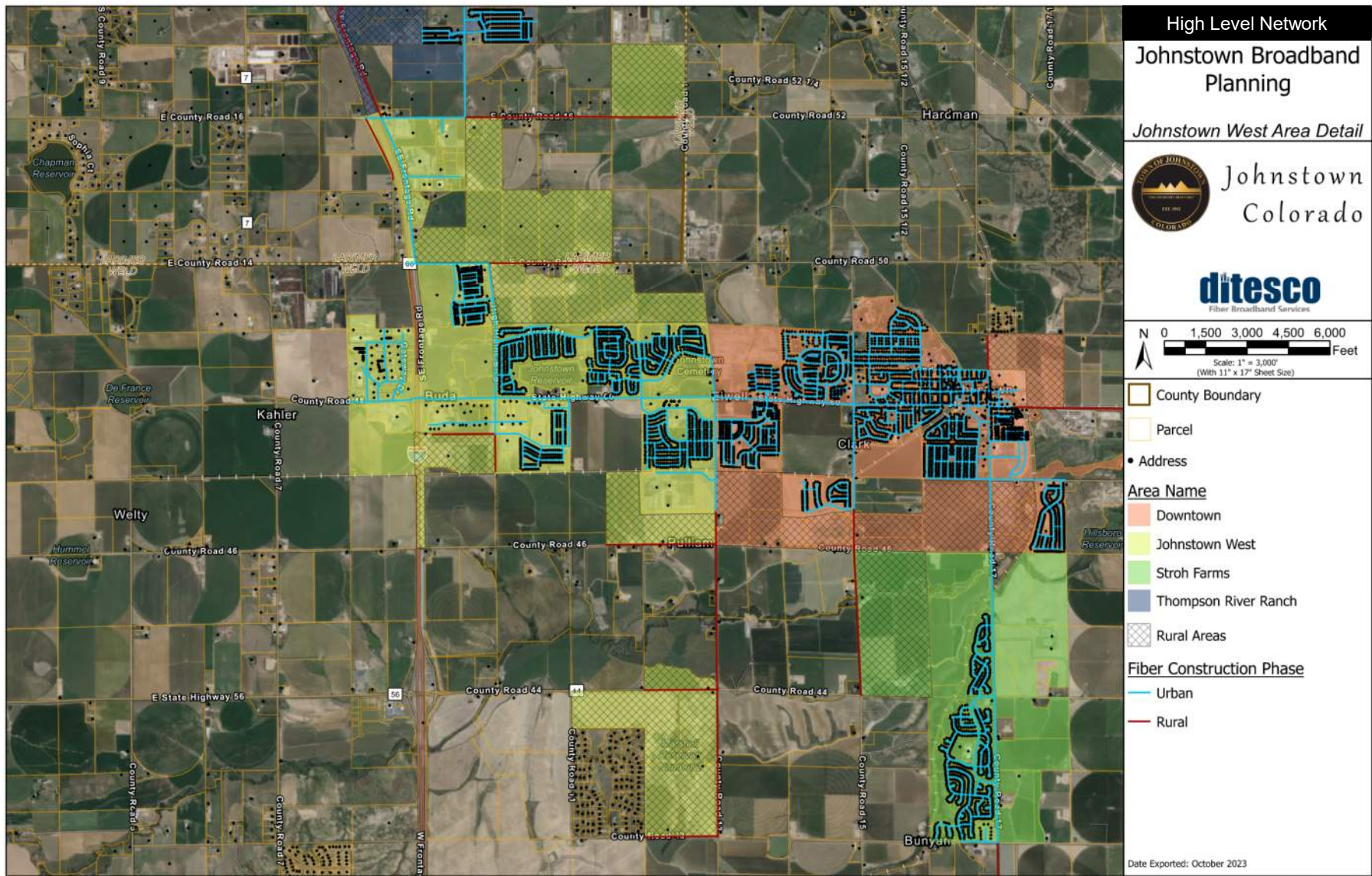




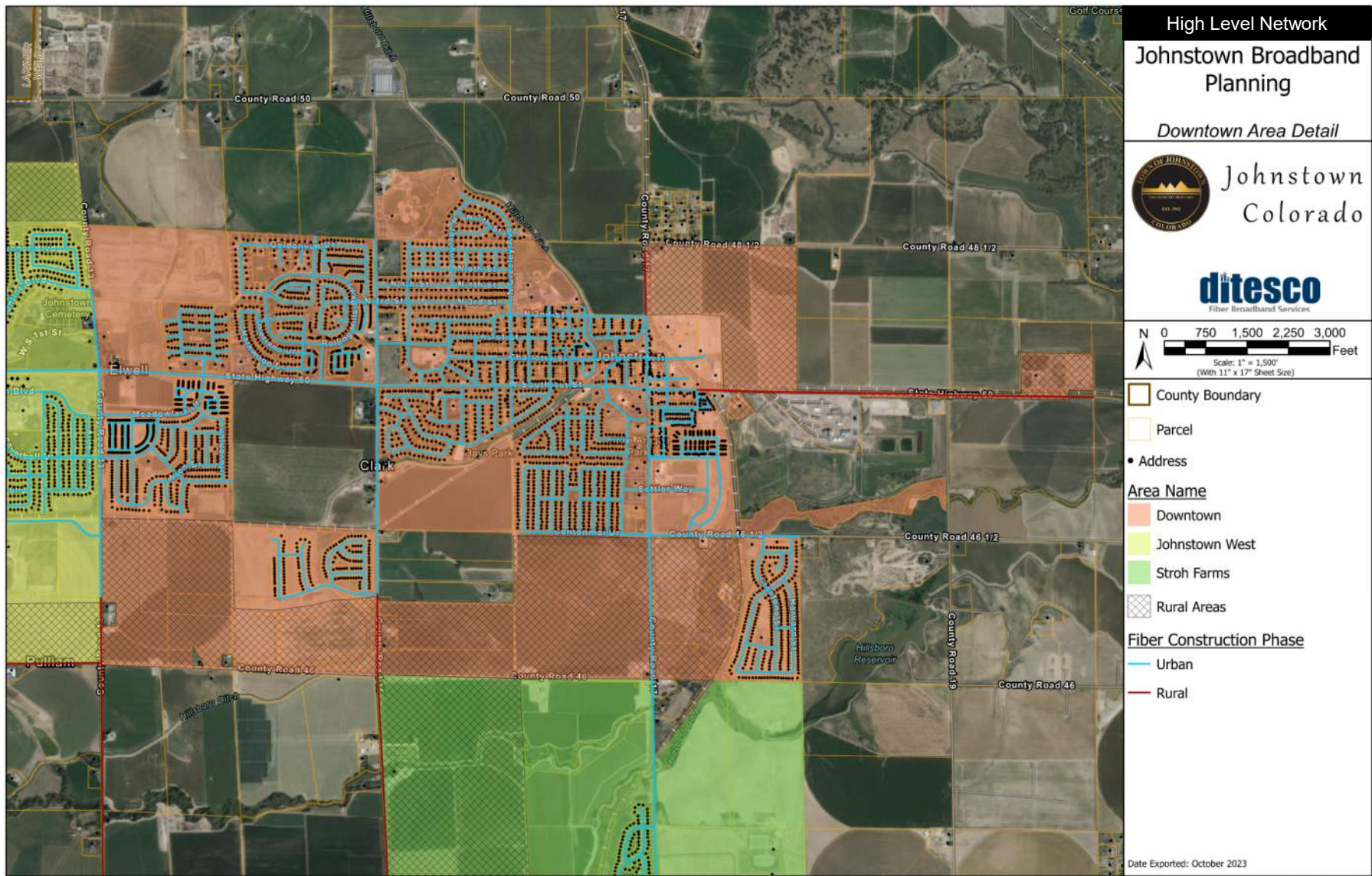










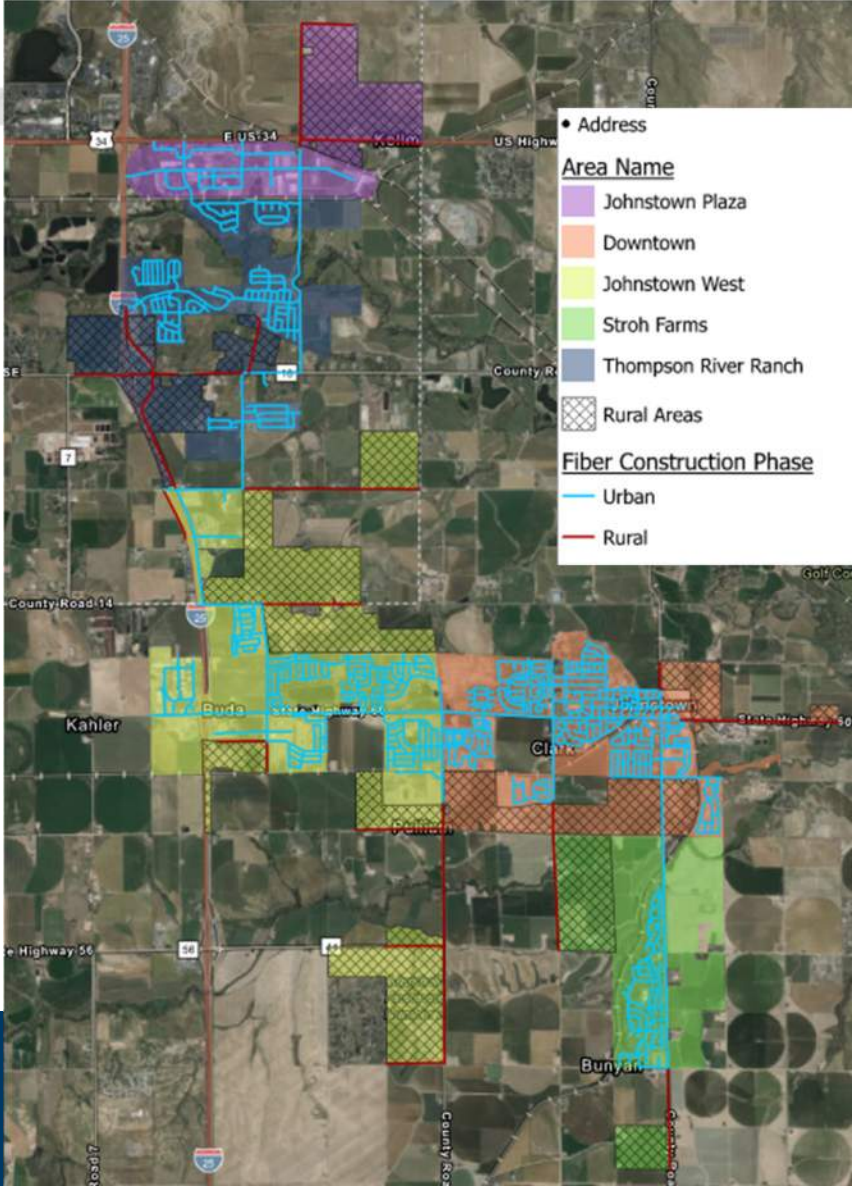






# Capital Project Cost

Total Cost Summary by Area				
ITEM	TOTAL FOOTAGE	NUMBER OF ADDRESSES	COST PER ADDRESS	ESTIMATED COST
Johnstown Plaza	47,042	129	\$20,153	\$2,599,711
Downtown	214,329	3,311	\$3,670	\$12,152,638
Johnstown West	202,376	2,148	\$5,190	\$11,148,924
Stroh Farms	61,799	749	\$4,751	\$3,558,869
Thompson River Ranch	127,490	1,947	\$3,745	\$7,292,471
<b>TOTAL</b>	<b>653,036</b>	<b>8,284</b>		<b>\$36,752,613</b>
Average Cost per Address				\$4,437





## Broadband Opportunities

### Service Models

- ✓ Status Quo
  - Service by private industry
- ✓ Public-Private-Partnership
  - Private ISP, Private Equity, Private Contractor
  - Longer term relationship; lack of control over service
- ✓ Municipality as ISP
  - (i.e. Longmont, Fort Collins, Loveland, Estes Park)
- ✓ Connect to other Municipal Broadband providers
  - Service agreement/IGA
  - Possible revenue sharing/cost offsets
  - Level of control



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## Broadband Planning

# Johnstown Operated Utility

- ✓ Capital Expense: \$36.8 million
- ✓ Utility Start up Costs:
  - Minimum additional 2 years to setup utility prior to construction
  - 10-15 full time staff
  - Vehicles and Equipment
  - Enterprise Software Systems
    - Billing
    - Fiber Management
    - Sales/Marketing
    - Network Operations and Management
  - Professional Services, Marketing, Customer Service
  - Backhaul and IP addresses



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## Broadband Planning

# Johnstown Owned Utility

- ✓ Positive Cash Flow – ~8 years only \$95/month @ 50% take rate
  - ✓ Take rate vs cost can be sensitive and vary by region
  - ✓ Requires ~\$11M general fund transfer
  - ✓ Assumption: \$40M municipal bond, 30 year @ 4.4%
- ✓ Life of Asset – 25 to 50 years
- ✓ Schedule
  - Additional time to construction for utility setup (~2 years)
- ✓ Risk
  - Business model risk fully assumed by Johnstown
  - Staffing availability



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## Broadband Planning

# Municipal Partner - Business Model

- ✓ Capital Expense - \$36.8 million
- ✓ Income Shared to Town – As a % of Gross or Net Income
- ✓ Annualized Return on Investment – 2% to 6%
  - Funded through cash reserves
- ✓ Life of Asset – 25 to 50 years
- ✓ Schedule
  - More flexible phasing to match funding availability
- ✓ Risk
  - Some loss of control to outside entity
  - Operational and overhead costs borne by partner



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## Broadband Planning

# Cash Reserves

- ✓ In the case of Johnstown owned utility
  - Requires larger investment for increased start up and operational costs
  
- ✓ In the case of municipal broadband partner:
  - Flexible annual buildout based on available funding
  - Light up areas as funding is available
  - No additional overhead costs or debt payments
  - Paid back to Town through revenue share on subscriptions



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## Municipal Bond

- ✓ In the case of Town Owned Facility
  - Secured by subscription revenue
  - Recommend approval through ballot measure vote to approve both enterprise utility creation and bond
  
- ✓ In the case of municipal broadband
  - Extends payback period
  - Difficult to secure bond against share of revenue and long payback



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## Broadband Planning

# Certificates of Participation

- ✓ Financing tool (acts similar to a bond)
- ✓ Collateralize Broadband assets to secure debt/issue COPs
- ✓ Secured by subscription revenue
  
- ✓ In the case of municipal broadband:
  - IGA would govern relationship
  - Town would initially own the assets
  - Assets would transfer to ISP over time
  - Debt would be paid by the Town, repayment from ISP subscription revenue



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## Broadband Planning

### Next Steps

- ✓ Questions?
- ✓ Further investigation/analysis



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## Broadband Planning

Thanks!



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## Capital Cost Breakdown

### Johnstown Plaza

ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST
<b>Outside Plant Construction</b>				
General Conditions	LS	8%		\$60,755
Mobilization	LS	10%		\$120,886
Outside Plant Construction - Labor	\$ / ft	33,663	\$22.56	\$759,437
Material Procurement	\$ / ft	33,663	\$8.34	\$280,615
<b>Service Drop Construction</b>				
	\$ / Address	37	\$857.00	\$31,880
<b>Core Networking</b>				
Network Equipment	\$ / ft	33,663	\$1.45	\$48,811
Hut Procurement and Fitout	LS	1	120,000	\$120,000
<b>Subtotal</b>	<b>\$ / ft</b>	<b>33,663</b>	<b>\$42.25</b>	<b>\$1,422,385</b>
Materials Cost Inflation	LS	8.0%		\$22,449
Estimating Contingency	LS	15.0%		\$213,358
Owner Contingency	LS	8.0%		\$113,791
Engineering and Network Design	LS	6.0%		\$85,343
Project Management	LS	4.5%		\$64,007
<b>TOTAL</b>				<b>\$1,921,334</b>
<b>Cost per Address</b>				<b>\$15,495</b>
<b>Cost per linear foot</b>				<b>\$57.08</b>



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# Capital Cost Breakdown

## Downtown Area

ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST
<b>Outside Plant Construction</b>				
General Conditions	LS	8%		\$369,082
Mobilization	LS	10%		\$673,476
Outside Plant Construction - Labor	\$ / ft	204,500	\$22.56	\$4,613,520
Material Procurement	\$ / ft	204,500	\$8.34	\$1,704,713
<b>Service Drop Construction</b>	\$ / Address	992	\$857.00	\$849,973
<b>Core Networking</b>				
Network Equipment	\$ / ft	204,500	\$1.45	\$296,525
Hut Procurement and Fitout	LS	1	120,000	\$120,000
<b>Subtotal</b>	<b>\$ / ft</b>	<b>204500</b>	<b>\$42.19</b>	<b>\$8,627,288</b>
Materials Cost Inflation	LS	8.0%		\$136,377
Estimating Contingency	LS	15.0%		\$1,294,093
Owner Contingency	LS	8.0%		\$690,183
Engineering and Network Design	LS	6.0%		\$517,637
Project Management	LS	4.5%		\$388,228
<b>TOTAL</b>				<b>\$11,653,807</b>
<b>Cost per Address</b>				<b>\$3,525</b>
<b>Cost per linear foot</b>				<b>\$56.99</b>



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## Capital Cost Breakdown

### Johnstown West

ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST
<b>Outside Plant Construction</b>				
General Conditions	LS	8%		\$293,054
Mobilization	LS	10%		\$537,218
Outside Plant Construction - Labor	\$ / ft	162,375	\$22.56	\$3,663,180
Material Procurement	\$ / ft	162,375	\$8.34	\$1,353,559
<b>Service Drop Construction</b>	\$ / Address	642	\$857.00	\$549,937
<b>Core Networking</b>				
Network Equipment	\$ / ft	162,375	\$1.45	\$235,444
Hut Procurement and Fitout	LS	1	120,000	\$120,000
<b>Subtotal</b>	<b>\$ / ft</b>	<b>162,375</b>	<b>\$41.59</b>	<b>\$6,752,392</b>
Materials Cost Inflation	LS	8.0%		\$108,285
Estimating Contingency	LS	15.0%		\$1,012,859
Owner Contingency	LS	8.0%		\$540,191
Engineering and Network Design	LS	6.0%		\$405,144
Project Management	LS	4.5%		\$303,858
<b>TOTAL</b>				<b>\$9,122,728</b>
<b>Cost per Address</b>				<b>\$4,265</b>
<b>Cost per linear foot</b>				<b>\$56.18</b>



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## Capital Cost Breakdown

### Stroh Farms

ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST
<b>Outside Plant Construction</b>				
General Conditions	LS	8%		\$93,655
Mobilization	LS	10%		\$179,850
Outside Plant Construction – Labor	\$ / ft	51,892	\$22.56	\$1,170,684
Material Procurement	\$ / ft	51,892	\$8.34	\$432,572
<b>Service Drop Construction</b>	\$ / Address	224	\$857.00	\$191,540
<b>Core Networking</b>				
Network Equipment	\$ / ft	51,892	\$1.45	\$75,243
Hut Procurement and Fitout	LS	1	120,000	\$120,000
<b>Subtotal</b>	<b>\$ / ft</b>	<b>51,892</b>	<b>\$43.62</b>	<b>\$2,263,543</b>
Materials Cost Inflation	LS	8.0%		\$34,606
Estimating Contingency	LS	15.0%		\$339,531
Owner Contingency	LS	8.0%		\$181,083
Engineering and Network Design	LS	6.0%		\$135,813
Project Management	LS	4.5%		\$101,859
<b>TOTAL</b>				<b>\$3,056,436</b>
<b>Cost per Address</b>				<b>\$4,103</b>
<b>Cost per Linear foot</b>				<b>\$58.90</b>



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## Capital Cost Breakdown

### Thompson River Ranch

ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST
<b>Outside Plant Construction</b>				
General Conditions	LS	8%		\$195,989
Mobilization	LS	10%		\$363,255
Outside Plant Construction - Labor	\$ / ft	108,593	\$22.56	\$2,449,858
Material Procurement	\$ / ft	108,593	\$8.34	\$905,232
<b>Service Drop Construction</b>	\$ / Address	581	\$857.00	\$497,489
<b>Core Networking</b>				
Network Equipment	\$ / ft	108,593	\$1.45	\$157,460
Hut Procurement and Fitout	LS	1	120,000	\$120,000
<b>Subtotal</b>	\$ / ft	108,593	\$43.18	<b>\$4,689,282</b>
Materials Cost Inflation	LS	8.0%		\$72,419
Estimating Contingency	LS	15.0%		\$703,392
Owner Contingency	LS	8.0%		\$375,143
Engineering and Network Design	LS	6.0%		\$281,357
Project Management	LS	4.5%		\$211,018
<b>TOTAL</b>				<b>\$6,332,610</b>
<b>Cost per Address</b>				<b>\$3,273</b>
<b>Cost per Linear foot</b>				<b>\$58.32</b>



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## Capital Cost Breakdown

### Connecting it all: Feeder and Rural Connections

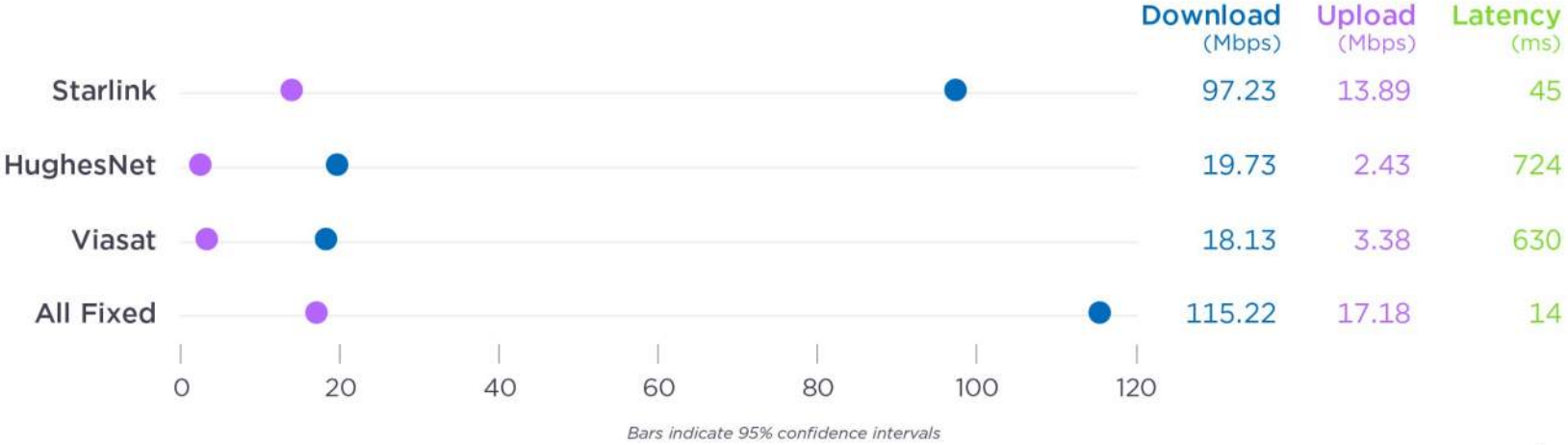
ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST
<b>Outside Plant Construction</b>				
General Conditions	LS	8%		\$166,065
Mobilization	LS	10%		\$297,625
Outside Plant Construction - Labor	\$ / ft	92013	\$22.56	\$2,075,813
Material Procurement	\$ / ft	92013	\$8.34	\$767,021
<b>Service Drop Construction</b>	\$ / Address	11	\$857.00	\$8,999
<b>Core Networking</b>				
Network Equipment	\$ / ft	92013	\$1.45	\$133,419
<b>Subtotal</b>	<b>\$ / ft</b>	<b>92013</b>	<b>\$37.48</b>	<b>\$3,448,942</b>
Materials Cost Inflation	LS	8.0%		\$61,362
Estimating Contingency	LS	15.0%		\$517,341
Owner Contingency	LS	8.0%		\$275,915
Engineering and Network Design	LS	6.0%		\$206,937
Project Management	LS	4.5%		\$155,202
<b>TOTAL</b>				<b>\$4,665,699</b>
<b>Cost per Address</b>				<b>\$133,306</b>
<b>Cost per linear foot</b>				<b>\$50.71</b>



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## Fiber Networks

### Satellite Internet Performance vs. Fixed Broadband in the U.S. Speedtest Intelligence® | Q2 2021



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City of Johnstown  
 High Level Area Cost Study  
 PLAN DATE: 10/26/2023  
 PREPARED BY: PC  
 ESTIMATE TYPE: CLASS 5

## Total Cost Summary

ITEM	TOTAL FOOTAGE	NUMBER OF ADDRESSES	COST PER ADDRESS	ESTIMATED COST	NOTES
Johnstown Plaza	47,042	129	\$20,153	\$2,599,711	
Downtown	214,329	3,311	\$3,670	\$12,152,638	
Johnstown West	202,376	2,148	\$5,190	\$11,148,924	
Stroh Farms	61,799	749	\$4,751	\$3,558,869	
Thompson River Ranch	127,490	1,947	\$3,745	\$7,292,471	
<b>TOTAL</b>	<b>653,036</b>	<b>8,284</b>		<b>\$36,752,613</b>	
<b>Average Cost per Address</b>				<b>\$4,437</b>	

## Urban Areas

ITEM	TOTAL FOOTAGE	NUMBER OF ADDRESSES	COST PER ADDRESS	COST	NOTES
Johnstown Plaza	33663	124	\$15,495	\$1,921,334	
Downtown	204500	3,306	\$3,525	\$11,653,807	
Johnstown West	162375	2,139	\$4,265	\$9,122,728	
Stroh Farms	51892	745	\$4,103	\$3,056,436	
Thompson River Ranch	108593	1,935	\$3,273	\$6,332,610	
<b>TOTAL</b>	<b>561,023</b>	<b>8,249</b>		<b>\$32,086,914</b>	
<b>Average Cost per Address</b>				<b>\$3,890</b>	

## Rural Areas

ITEM	TOTAL FOOTAGE	NUMBER OF ADDRESSES	COST PER ADDRESS	COST	NOTES
Johnstown Plaza	13379	5	\$135,676	\$678,378	
Downtown	9,829	5	\$99,766	\$498,832	
Johnstown West	40,001	9	\$225,133	\$2,026,196	
Stroh Farms	9,907	4	\$125,608	\$502,433	
Thompson River Ranch	18,897	12	\$79,988	\$959,861	
<b>TOTAL</b>	<b>92,013</b>	<b>35</b>		<b>\$4,665,699</b>	
<b>Average Cost per Address</b>				<b>\$133,306</b>	



<b>Johnstown Total</b>	
Total Address Count	8,284
Total Footage (Road Centerline)	653,036
ITEM	EXTENDED COST
<b>TOTAL</b>	<b>\$36,752,613</b>
Cost per Address	\$4,437
Cost per linear foot	\$56.28

<b>Johnstown Total</b>					
Total Address Count			8,284		
Total Footage (Road Centerline)			653,036		
ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST	NOTES
<b>Outside Plant Construction</b>					
General Conditions	LS	8%		\$1,178,599	
Mobilization	LS	10%		\$2,172,311	
Outside Plant Construction - Labor	\$ / ft	653036	\$22.56	\$14,732,492	
Material Procurement	\$ / ft	653036	\$8.34	\$5,443,711	
<b>Service Drop Construction</b>	\$ / Address	2,485	\$857.00	\$2,129,816	30% Take Rate
<b>Core Networking</b>					
Network Equipment	\$ / ft	653036	\$1.45	\$946,902	
Hut Procurement and Fitout	LS	5	120,000	\$600,000	
<b>Subtotal</b>	\$ / ft	653036	<b>\$41.66</b>	<b>\$27,203,832</b>	
<b>Materials Cost Inflation</b>	LS	8.0%		\$435,497	
<b>Estimating Contingency</b>	LS	15.0%		\$4,080,575	
<b>Owner Contingency</b>	LS	8.0%		\$2,176,307	
<b>Engineering and Network Design</b>	LS	6.0%		\$1,632,230	
<b>Project Management</b>	LS	4.5%		\$1,224,172	
<b>TOTAL</b>				<b>\$36,752,613</b>	
Cost per Address				<b>\$4,437</b>	
Cost per linear foot				<b>\$56.28</b>	



<b>Johnstown Total</b>	
Total Address Count	8,284
Total Footage (Road Centerline)	653,036
ITEM	EXTENDED COST
<b>TOTAL</b>	<b>\$36,752,613</b>
Cost per Address	\$4,437
Cost per linear foot	\$56.28

<b>Johnstown - Urban Phase</b>					
Total Address Count		8,249			
Total Footage (Road Centerline)		561,023			
ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST	NOTES
<b>Outside Plant Construction</b>					
General Conditions	LS	8%		\$1,012,534	
Mobilization	LS	10%		\$1,874,685	
Outside Plant Construction - Labor	\$ / ft	561023	\$22.56	\$12,656,679	
Material Procurement	\$ / ft	561023	\$8.34	\$4,676,691	
<b>Service Drop Construction</b>					
	\$ / Address	2,475	\$857.00	\$2,120,818	30% Take Rate
<b>Core Networking</b>					
Network Equipment	\$ / ft	561023	\$1.45	\$813,483	
Hut Procurement and Fitout	LS	5	120,000	\$600,000	
<b>Subtotal</b>	\$ / ft	561023	<b>\$42.34</b>	<b>\$23,754,890</b>	
Materials Cost Inflation	LS	8.0%		\$374,135	
Estimating Contingency	LS	15.0%		\$3,563,234	
Owner Contingency	LS	8.0%		\$1,900,391	
Engineering and Network Design	LS	6.0%		\$1,425,293	
Project Management	LS	4.5%		\$1,068,970	
<b>TOTAL</b>				<b>\$32,086,914</b>	
Cost per Address				<b>\$3,890</b>	
Cost per linear foot				<b>\$57.19</b>	

<b>Johnstown - Rural Phase</b>					
Total Address Count		35			
Total Footage (Road Centerline)		92,013			
ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST	NOTES
<b>Outside Plant Construction</b>					
General Conditions	LS	8%		\$166,065	
Mobilization	LS	10%		\$297,625	
Outside Plant Construction - Labor	\$ / ft	92013	\$22.56	\$2,075,813	
Material Procurement	\$ / ft	92013	\$8.34	\$767,021	
<b>Service Drop Construction</b>					
	\$ / Address	11	\$857.00	\$8,999	30% Take Rate
<b>Core Networking</b>					
Network Equipment	\$ / ft	92013	\$1.45	\$133,419	
<b>Subtotal</b>	\$ / ft	92013	<b>\$37.48</b>	<b>\$3,448,942</b>	
Materials Cost Inflation	LS	8.0%		\$61,362	
Estimating Contingency	LS	15.0%		\$517,341	
Owner Contingency	LS	8.0%		\$275,915	
Engineering and Network Design	LS	6.0%		\$206,937	
Project Management	LS	4.5%		\$155,202	
<b>TOTAL</b>				<b>\$4,665,699</b>	
Cost per Address				<b>\$133,306</b>	
Cost per linear foot				<b>\$50.71</b>	



Johnstown Plaza Area Total	
Total Address Count	129
Total Footage (Road Centerline)	47,042
ITEM	EXTENDED COST
<b>TOTAL</b>	<b>\$2,599,711</b>
Cost per Address	\$20,153
Cost per linear foot	\$55.26

Johnstown Plaza Area - Urban Phase					
Total Address Count		124			
Total Footage (Road Centerline)		33,663			
ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST	NOTES
<b>Outside Plant Construction</b>					
General Conditions	LS	8%		\$60,755	
Mobilization	LS	10%		\$120,886	
Outside Plant Construction - Labor	\$ / ft	33663	\$22.56	\$759,437	
Material Procurement	\$ / ft	33663	\$8.34	\$280,615	
<b>Service Drop Construction</b>					
	\$ / Address	37	\$857.00	\$31,880	30% Take Rate
<b>Core Networking</b>					
Network Equipment	\$ / ft	33663	\$1.45	\$48,811	
Hut Procurement and Fitout	LS	1	120,000	\$120,000	
<b>Subtotal</b>	\$ / ft	33663	<b>\$42.25</b>	<b>\$1,422,385</b>	
Materials Cost Inflation	LS	8.0%		\$22,449	
Estimating Contingency	LS	15.0%		\$213,358	
Owner Contingency	LS	8.0%		\$113,791	
Engineering and Network Design	LS	6.0%		\$85,343	
Project Management	LS	4.5%		\$64,007	
<b>TOTAL</b>				<b>\$1,921,334</b>	
Cost per Address				\$15,495	
Cost per linear foot				\$57.08	

Johnstown Plaza Area - Rural Phase					
Total Address Count		5			
Total Footage (Road Centerline)		13,379			
ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST	NOTES
<b>Outside Plant Construction</b>					
General Conditions	LS	8%		\$24,146	
Mobilization	LS	10%		\$43,276	
Outside Plant Construction - Labor	\$ / ft	13379	\$22.56	\$301,830	
Material Procurement	\$ / ft	13379	\$8.34	\$111,527	
<b>Service Drop Construction</b>					
	\$ / Address	2	\$857.00	\$1,286	30% Take Rate
<b>Core Networking</b>					
Network Equipment	\$ / ft	13379	\$1.45	\$19,400	
<b>Subtotal</b>	\$ / ft	13379	<b>\$37.48</b>	<b>\$501,465</b>	
Materials Cost Inflation	LS	8.0%		\$8,922	
Estimating Contingency	LS	15.0%		\$75,220	
Owner Contingency	LS	8.0%		\$40,117	
Engineering and Network Design	LS	6.0%		\$30,088	
Project Management	LS	4.5%		\$22,566	
<b>TOTAL</b>				<b>\$678,378</b>	
Cost per Address				\$135,676	
Cost per linear foot				\$50.70	





<b>Downtown Area Total</b>	
Total Address Count	3,311
Total Footage (Road Centerline)	214,329
<b>ITEM</b>	<b>EXTENDED COST</b>
<b>TOTAL</b>	<b>\$12,152,638</b>
<b>Cost per Address</b>	<b>\$3,670</b>
<b>Cost per linear foot</b>	<b>\$56.70</b>

<b>Downtown Area - Urban Phase</b>					
Total Address Count	3,306				
Total Footage (Road Centerline)	204,500				
<b>ITEM</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>UNIT COST</b>	<b>EXTENDED COST</b>	<b>NOTES</b>
<b>Outside Plant Construction</b>					
General Conditions	LS	8%		\$369,082	
Mobilization	LS	10%		\$673,476	
Outside Plant Construction - Labor	\$ / ft	204500	\$22.56	\$4,613,520	
Material Procurement	\$ / ft	204500	\$8.34	\$1,704,713	
<b>Service Drop Construction</b>	\$ / Address	992	\$857.00	\$849,973	30% Take Rate
<b>Core Networking</b>					
Network Equipment	\$ / ft	204500	\$1.45	\$296,525	
Hut Procurement and Fitout	LS	1	120,000	\$120,000	
<b>Subtotal</b>	\$ / ft	204500	<b>\$42.19</b>	<b>\$8,627,288</b>	
<b>Materials Cost Inflation</b>	LS	8.0%		\$136,377	
<b>Estimating Contingency</b>	LS	15.0%		\$1,294,093	
<b>Owner Contingency</b>	LS	8.0%		\$690,183	
<b>Engineering and Network Design</b>	LS	6.0%		\$517,637	
<b>Project Management</b>	LS	4.5%		\$388,228	
<b>TOTAL</b>				<b>\$11,653,807</b>	
<b>Cost per Address</b>				<b>\$3,525</b>	
<b>Cost per linear foot</b>				<b>\$56.99</b>	

<b>Downtown Area - Rural Phase</b>					
Total Address Count	5				
Total Footage (Road Centerline)	9,829				
<b>ITEM</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>UNIT COST</b>	<b>EXTENDED COST</b>	<b>NOTES</b>
<b>Outside Plant Construction</b>					
General Conditions	LS	8%		\$17,739	
Mobilization	LS	10%		\$31,793	
Outside Plant Construction - Labor	\$ / ft	9829	\$22.56	\$221,742	
Material Procurement	\$ / ft	9829	\$8.34	\$81,935	
<b>Service Drop Construction</b>	\$ / Address	2	\$857.00	\$1,286	30% Take Rate
<b>Core Networking</b>					
Network Equipment	\$ / ft	9829	\$1.45	\$14,252	
<b>Subtotal</b>	\$ / ft	9829	<b>\$37.52</b>	<b>\$368,747</b>	
<b>Materials Cost Inflation</b>	LS	8.0%		\$6,555	
<b>Estimating Contingency</b>	LS	15.0%		\$55,312	
<b>Owner Contingency</b>	LS	8.0%		\$29,500	
<b>Engineering and Network Design</b>	LS	6.0%		\$22,125	
<b>Project Management</b>	LS	4.5%		\$16,594	
<b>TOTAL</b>				<b>\$498,832</b>	
<b>Cost per Address</b>				<b>\$99,766</b>	
<b>Cost per linear foot</b>				<b>\$50.75</b>	



Johnstown West Area Total	
Total Address Count	2,148
Total Footage (Road Centerline)	202,376
ITEM	EXTENDED COST
<b>TOTAL</b>	<b>\$11,148,924</b>
Cost per Address	\$5,190
Cost per linear foot	\$55.09

Johnstown West Area - Urban Phase						
Total Address Count		2,139				
Total Footage (Road Centerline)		162,375				
ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST	NOTES	
<b>Outside Plant Construction</b>						
General Conditions	LS	8%		\$293,054		
Mobilization	LS	10%		\$537,218		
Outside Plant Construction - Labor	\$ / ft	162375	\$22.56	\$3,663,180		
Material Procurement	\$ / ft	162375	\$8.34	\$1,353,559		
<b>Service Drop Construction</b>	\$ / Address	642	\$857.00	\$549,937	30% Take Rate	
<b>Core Networking</b>						
Network Equipment	\$ / ft	162375	\$1.45	\$235,444		
Hut Procurement and Fitout	LS	1	120,000	\$120,000		
<b>Subtotal</b>	\$ / ft	162375	<b>\$41.59</b>	<b>\$6,752,392</b>		
Materials Cost Inflation	LS	8.0%		\$108,285		
Estimating Contingency	LS	15.0%		\$1,012,859		
Owner Contingency	LS	8.0%		\$540,191		
Engineering and Network Design	LS	6.0%		\$405,144		
Project Management	LS	4.5%		\$303,858		
<b>TOTAL</b>				<b>\$9,122,728</b>		
Cost per Address				\$4,265		
Cost per linear foot				\$56.18		

Johnstown West Area - Rural Phase						
Total Address Count		9				
Total Footage (Road Centerline)		40,001				
ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST	NOTES	
<b>Outside Plant Construction</b>						
General Conditions	LS	8%		\$72,194		
Mobilization	LS	10%		\$129,387		
Outside Plant Construction - Labor	\$ / ft	40001	\$22.56	\$902,423		
Material Procurement	\$ / ft	40001	\$8.34	\$333,449		
<b>Service Drop Construction</b>	\$ / Address	3	\$857.00	\$2,314	30% Take Rate	
<b>Core Networking</b>						
Network Equipment	\$ / ft	40001	\$1.45	\$58,001		
<b>Subtotal</b>	\$ / ft	40001	<b>\$37.44</b>	<b>\$1,497,768</b>		
Materials Cost Inflation	LS	8.0%		\$26,676		
Estimating Contingency	LS	15.0%		\$224,665		
Owner Contingency	LS	8.0%		\$119,821		
Engineering and Network Design	LS	6.0%		\$89,866		
Project Management	LS	4.5%		\$67,400		
<b>TOTAL</b>				<b>\$2,026,196</b>		
Cost per Address				\$225,133		
Cost per linear foot				\$50.65		



Stroh Farms Area Total	
Total Address Count	749
Total Footage (Road Centerline)	61,799
ITEM	EXTENDED COST
<b>TOTAL</b>	<b>\$3,558,869</b>
Cost per Address	\$4,751
Cost per Linear foot	\$57.59

Stroh Farms Area - Urban Phase					
Total Address Count	745				
Total Footage (Road Centerline)	51,892				
ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST	NOTES
<b>Outside Plant Construction</b>					
General Conditions	LS	8%		\$93,655	
Mobilization	LS	10%		\$179,850	
Outside Plant Construction - Labor	\$ / ft	51892	\$22.56	\$1,170,684	
Material Procurement	\$ / ft	51892	\$8.34	\$432,572	
<b>Service Drop Construction</b>	\$ / Address	224	\$857.00	\$191,540	30% Take Rate
<b>Core Networking</b>					
Network Equipment	\$ / ft	51892	\$1.45	\$75,243	
Hut Procurement and Fitout	LS	1	120,000	\$120,000	
<b>Subtotal</b>	\$ / ft	51892	<b>\$43.62</b>	<b>\$2,263,543</b>	
Materials Cost Inflation	LS	8.0%		\$34,606	
Estimating Contingency	LS	15.0%		\$339,531	
Owner Contingency	LS	8.0%		\$181,083	
Engineering and Network Design	LS	6.0%		\$135,813	
Project Management	LS	4.5%		\$101,859	
<b>TOTAL</b>				<b>\$3,056,436</b>	
Cost per Address				<b>\$4,103</b>	
Cost per Linear foot				<b>\$58.90</b>	

Stroh Farms Area - Rural Phase					
Total Address Count	4				
Total Footage (Road Centerline)	9,907				
ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST	NOTES
<b>Outside Plant Construction</b>					
General Conditions	LS	8%		\$17,880	
Mobilization	LS	10%		\$32,045	
Outside Plant Construction - Labor	\$ / ft	9907	\$22.56	\$223,502	
Material Procurement	\$ / ft	9907	\$8.34	\$82,585	
<b>Service Drop Construction</b>	\$ / Address	1	\$857.00	\$1,028	30% Take Rate
<b>Core Networking</b>					
Network Equipment	\$ / ft	9907	\$1.45	\$14,365	
<b>Subtotal</b>	\$ / ft	9907	<b>\$37.49</b>	<b>\$371,406</b>	
Materials Cost Inflation	LS	8.0%		\$6,607	
Estimating Contingency	LS	15.0%		\$55,711	
Owner Contingency	LS	8.0%		\$29,712	
Engineering and Network Design	LS	6.0%		\$22,284	
Project Management	LS	4.5%		\$16,713	
<b>TOTAL</b>				<b>\$502,433</b>	
Cost per Address				<b>\$125,608</b>	
Cost per Linear foot				<b>\$50.71</b>	



<b>Thompson River Ranch Area Total</b>	
Total Address Count	1,947
Total Footage (Road Centerline)	127,490
<b>ITEM</b>	<b>EXTENDED COST</b>
<b>TOTAL</b>	<b>\$7,292,471</b>
Cost per Address	\$3,745
Cost per Linear foot	\$57.20

<b>Thompson River Ranch Area - Urban Phase</b>					
Total Address Count		1,935			
Total Footage (Road Centerline)		108,593			
ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST	NOTES
<b>Outside Plant Construction</b>					
General Conditions	LS	8%		\$195,989	
Mobilization	LS	10%		\$363,255	
Outside Plant Construction - Labor	\$ / ft	108593	\$22.56	\$2,449,858	
Material Procurement	\$ / ft	108593	\$8.34	\$905,232	
<b>Service Drop Construction</b>	\$ / Address	581	\$857.00	\$497,489	30% Take Rate
<b>Core Networking</b>					
Network Equipment	\$ / ft	108593	\$1.45	\$157,460	
Hut Procurement and Fitout	LS	1	120,000	\$120,000	
<b>Subtotal</b>	\$ / ft	108593	<b>\$43.18</b>	<b>\$4,689,282</b>	
Materials Cost Inflation	LS	8.0%		\$72,419	
Estimating Contingency	LS	15.0%		\$703,392	
Owner Contingency	LS	8.0%		\$375,143	
Engineering and Network Design	LS	6.0%		\$281,357	
Project Management	LS	4.5%		\$211,018	
<b>TOTAL</b>				<b>\$6,332,610</b>	
Cost per Address				<b>\$3,273</b>	
Cost per Linear foot				<b>\$58.32</b>	

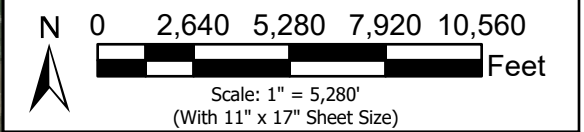
<b>Thompson River Ranch Area - Rural Phase</b>					
Total Address Count		12			
Total Footage (Road Centerline)		18,897			
ITEM	UNIT	QUANTITY	UNIT COST	EXTENDED COST	NOTES
<b>Outside Plant Construction</b>					
General Conditions	LS	8%		\$34,105	
Mobilization	LS	10%		\$61,124	
Outside Plant Construction - Labor	\$ / ft	18897	\$22.56	\$426,316	
Material Procurement	\$ / ft	18897	\$8.34	\$157,525	
<b>Service Drop Construction</b>	\$ / Address	4	\$857.00	\$3,085	30% Take Rate
<b>Core Networking</b>					
Network Equipment	\$ / ft	18897	\$1.45	\$27,401	
<b>Subtotal</b>	\$ / ft	18897	<b>\$37.55</b>	<b>\$709,557</b>	
Materials Cost Inflation	LS	8.0%		\$12,602	
Estimating Contingency	LS	15.0%		\$106,434	
Owner Contingency	LS	8.0%		\$56,765	
Engineering and Network Design	LS	6.0%		\$42,573	
Project Management	LS	4.5%		\$31,930	
<b>TOTAL</b>				<b>\$959,861</b>	
Cost per Address				<b>\$79,988</b>	
Cost per Linear foot				<b>\$50.79</b>	



# Johnstown Broadband Planning



## Johnstown Colorado



### Address

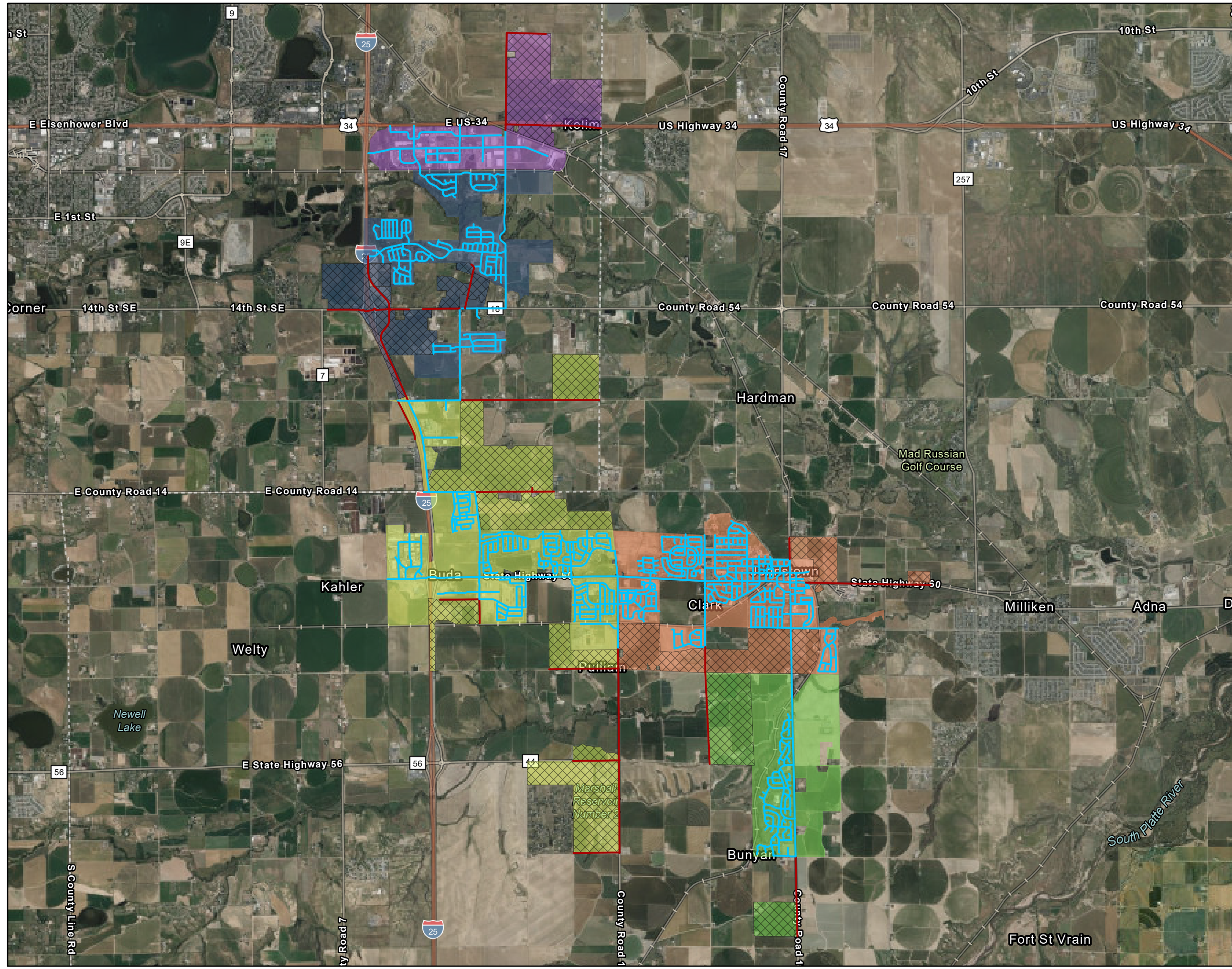
### Area Name

- Johnstown Plaza
- Downtown
- Johnstown West
- Stroh Farms
- Thompson River Ranch

- Rural Areas

### Fiber Construction Phase

- Urban
- Rural



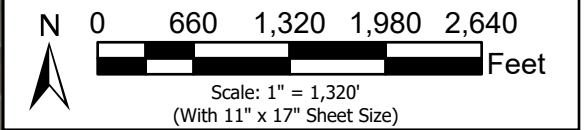


# Johnstown Broadband Planning

## Johnstown Plaza Area Detail



# Johnstown Colorado



County Boundary

Parcel

Address

### Area Name

Johnstown Plaza

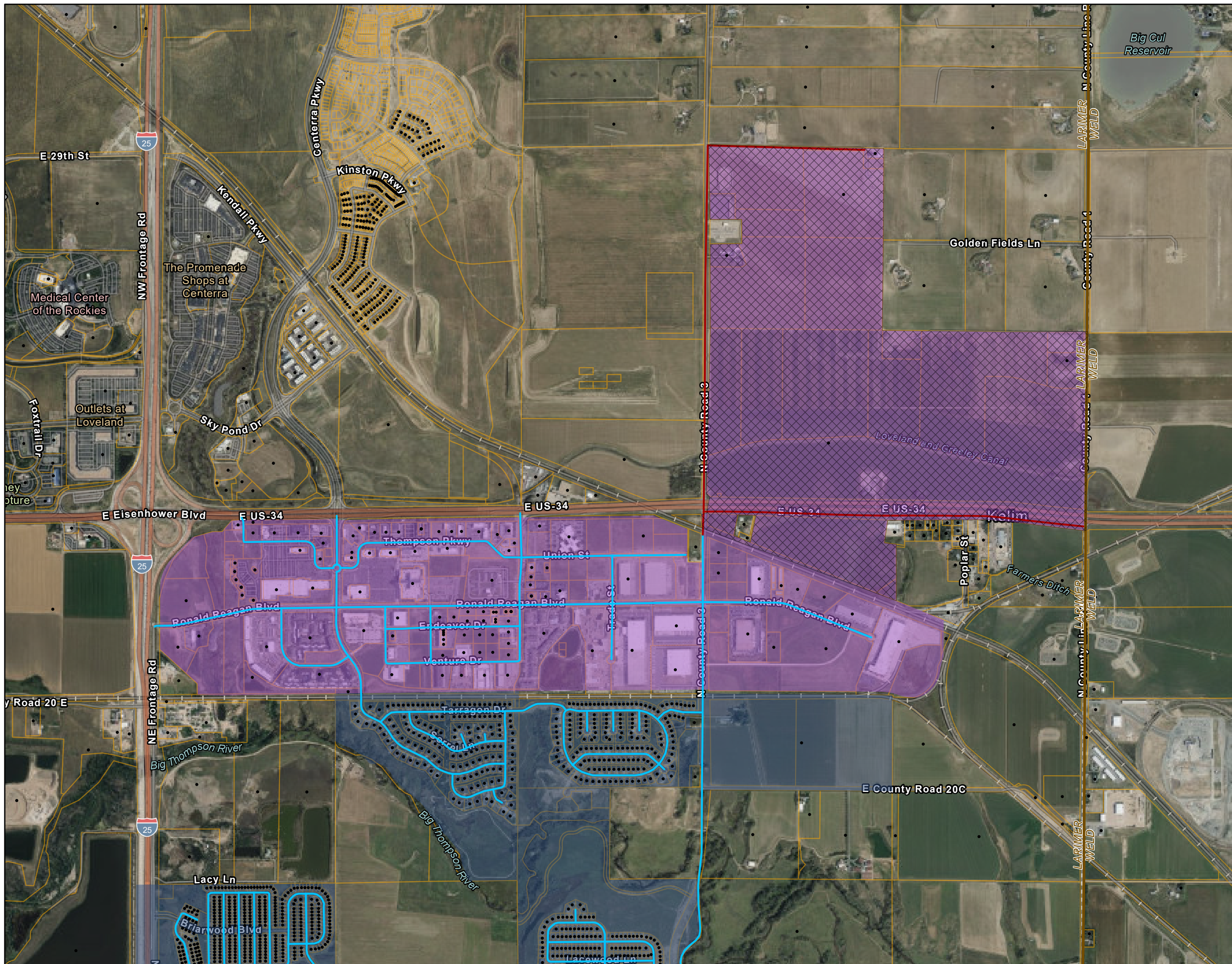
Thompson River Ranch

Rural Areas

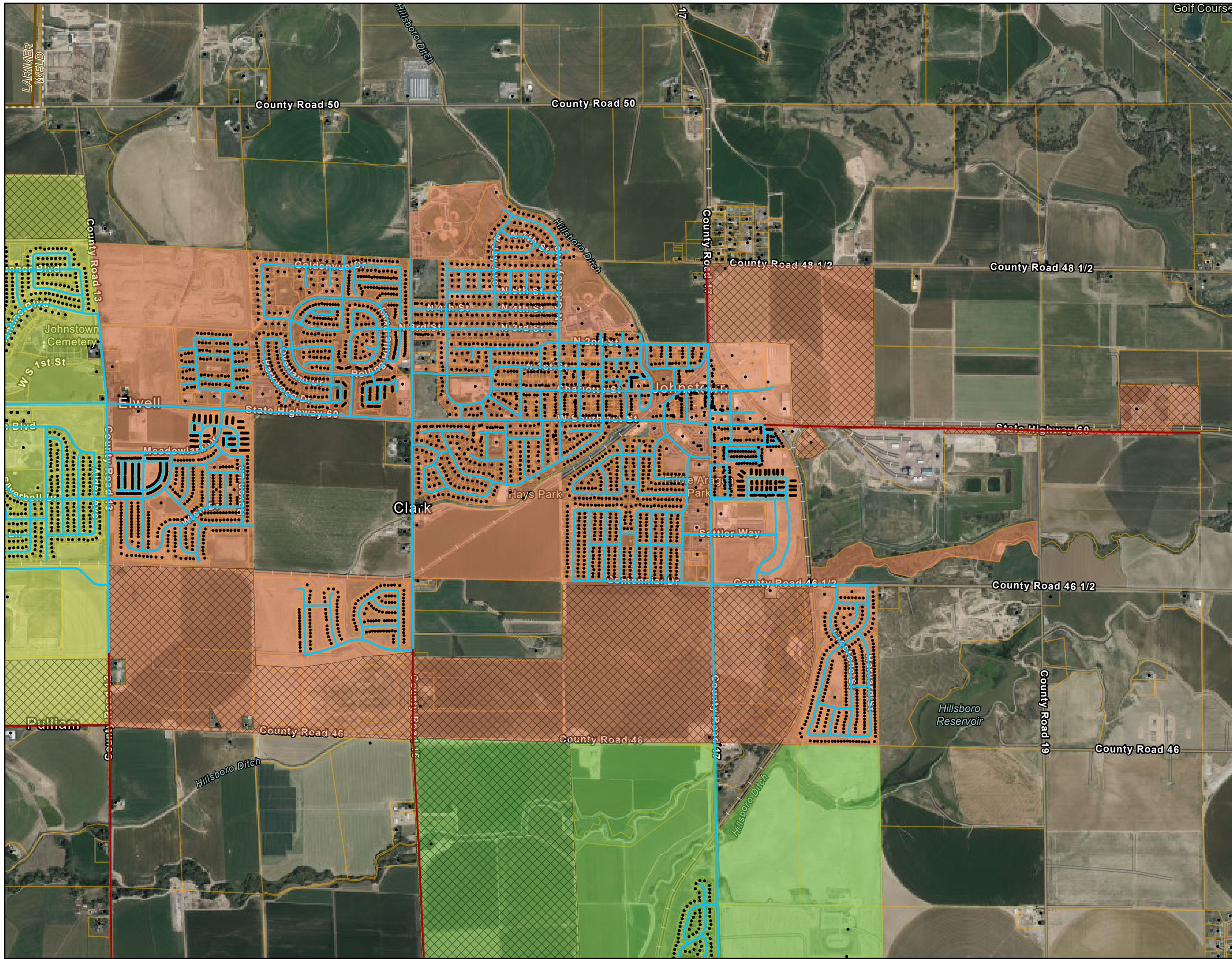
### Fiber Construction Phase

Urban

Rural





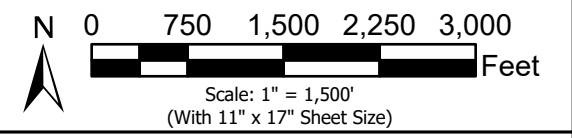


# Johnstown Broadband Planning

## Downtown Area Detail



Johnstown  
Colorado



County Boundary

Parcel

Address

**Area Name**

Downtown

Johnstown West

Stroh Farms

Rural Areas

**Fiber Construction Phase**

Urban

Rural

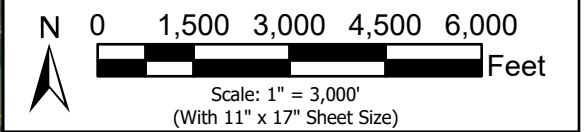









# Johnstown Broadband Planning

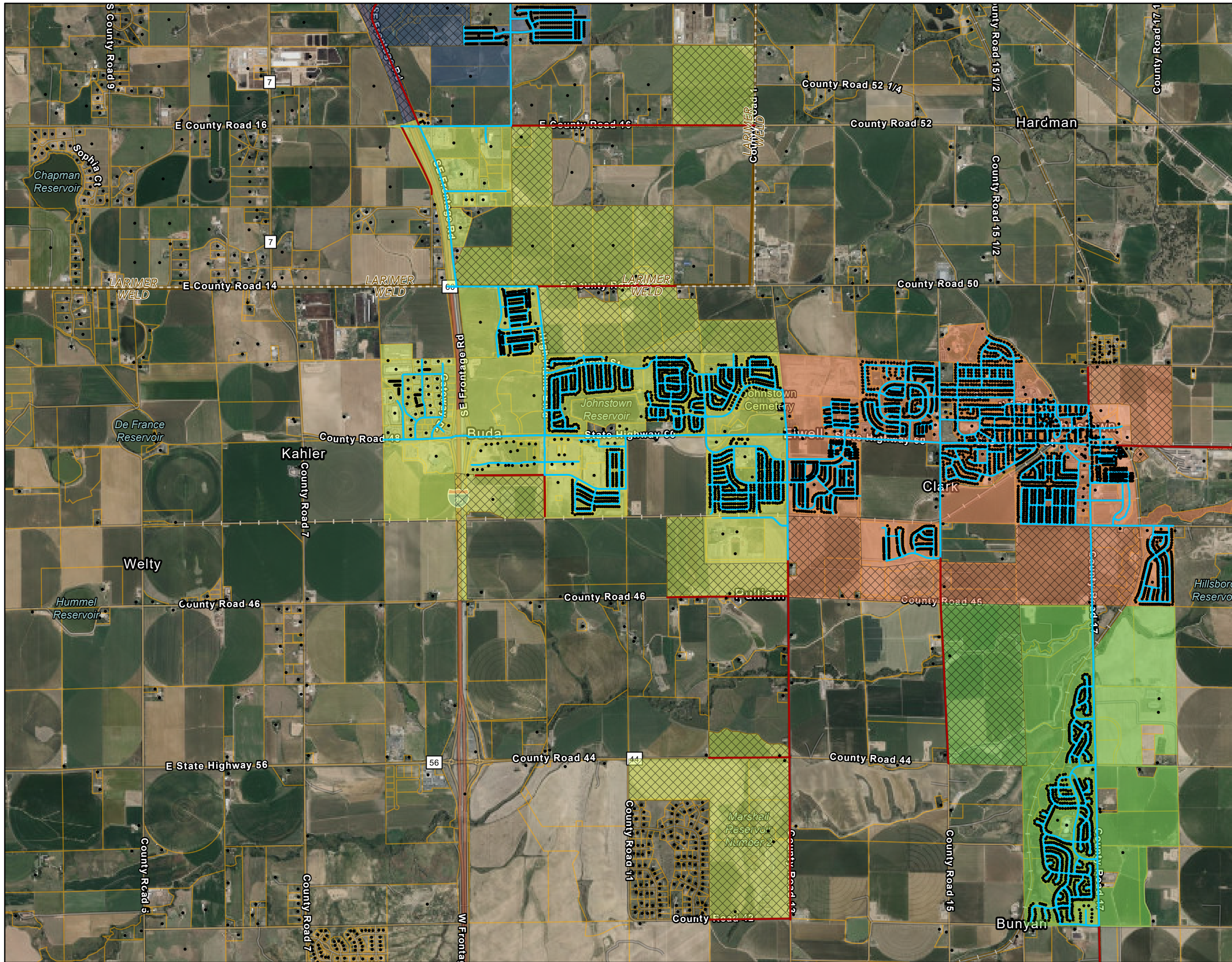
## Johnstown West Area Detail



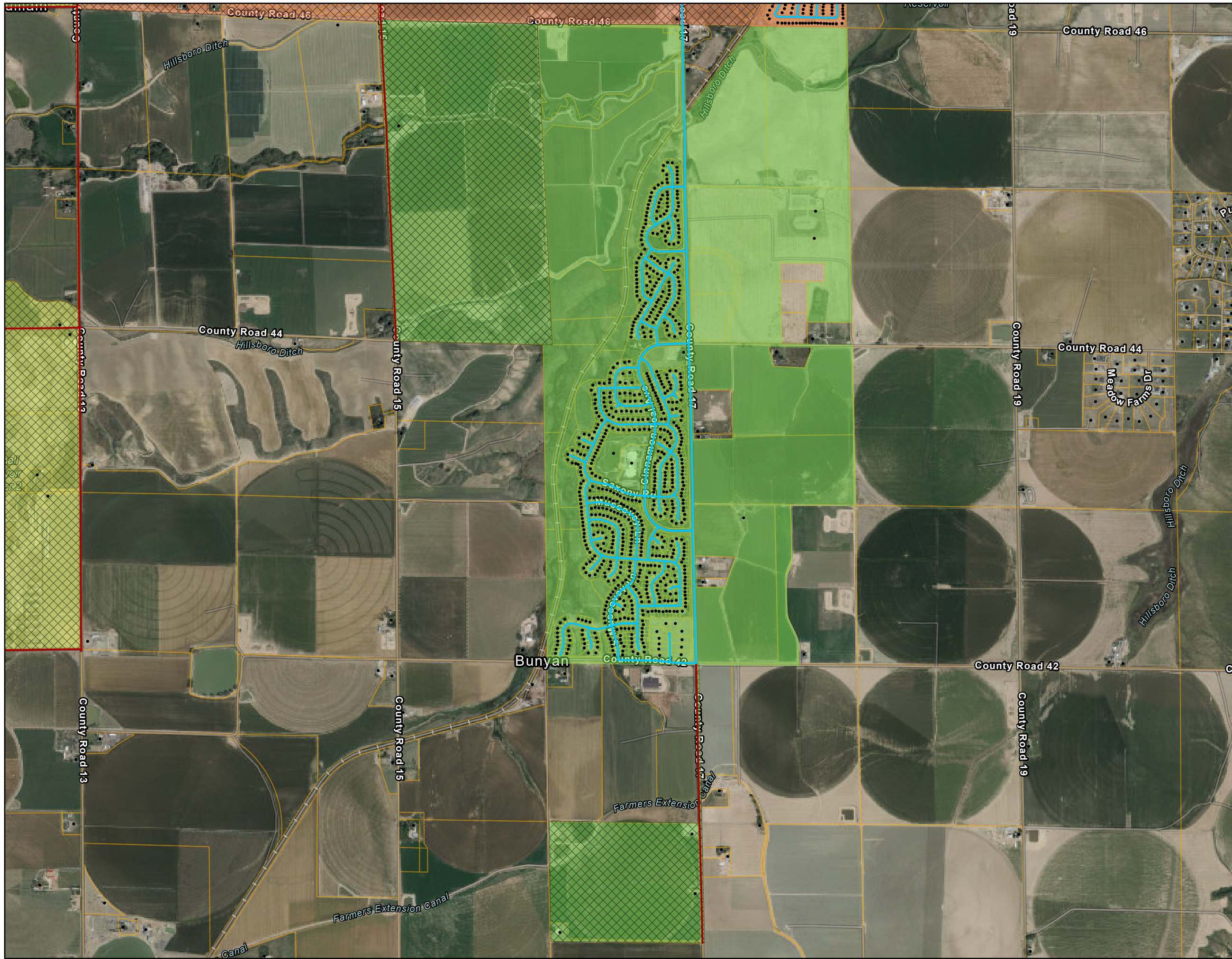
Johnstown  
Colorado



-  County Boundary
-  Parcel
-  Address
- Area Name**
  -  Downtown
  -  Johnstown West
  -  Stroh Farms
  -  Thompson River Ranch
  -  Rural Areas
- Fiber Construction Phase**
  -  Urban
  -  Rural





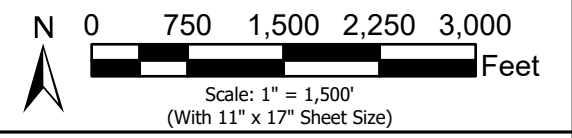











# Johnstown Broadband Planning

## Stroh Farms Area Detail



Johnstown  
Colorado



-  County Boundary
-  Parcel
-  Address
- Area Name**
-  Downtown
-  Johnstown West
-  Stroh Farms
-  Rural Areas
- Fiber Construction Phase**
-  Urban
-  Rural

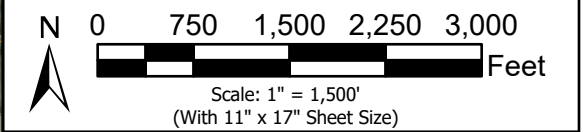


# Johnstown Broadband Planning

## Thompson River Ranch Area Detail



# Johnstown Colorado



County Boundary

Parcel

Address

### Area Name

Johnstown Plaza

Johnstown West

Thompson River Ranch

Rural Areas

### Fiber Construction Phase

Urban

Rural

