



Final Recommendations Report

US 287/120th Avenue Multimodal and Safety Study

Broomfield, CO

COT01 - 24810 | June 16, 2023



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A – Final Public Comments Report

Final Recommendations Report

US 287/120th Avenue Multimodal and Safety Study

Prepared for Colorado Department of Transportation – Region 1 in partnership with City and County of Broomfield

Introduction

The *US 287/120th Avenue Multimodal and Safety Study* was initiated in partnership with the Colorado Department of Transportation (CDOT) and the City and County of Broomfield (City), to better project and prepare for the future demands placed on the US 287 corridor within the study area. The objective for the Study is to build upon previous City, CDOT, and Regional Transportation District (RTD) studies and improvement efforts to develop a comprehensive plan that protects traffic operations, expands multimodal facilities, and increases safety for all users while not precluding economic development throughout the corridor moving into the future. The study area runs along the length of US 287/ 120th Avenue from Lowell Boulevard to Midway Boulevard. In the study area, US 287 travels from Lowell Boulevard to Upham Street in an east-west direction. The corridor then turns to a NW/SE direction from Upham Street to Nickel Street, before finally in a north-south direction from Nickel Street to Midway Boulevard. The study area is depicted in **Figure 1** on page 2.

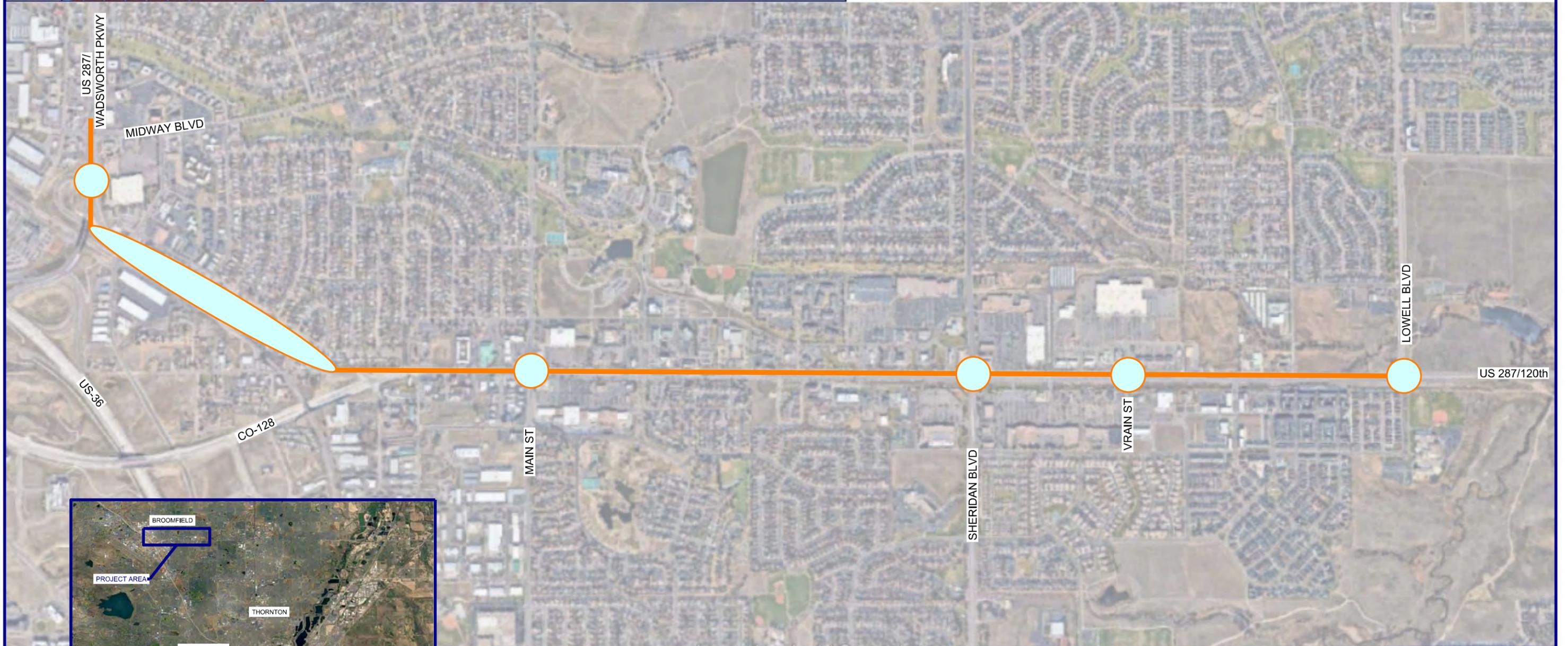
The efforts put forth as part of the *US 287/120th Avenue Multimodal and Safety Study* are compiled within the following three individual reports:

- *Existing Conditions and 2050 Baseline Analysis Report* – A document which establishes the existing operational, environmental, and user safety conditions of the study area, combining field observations with direct public feedback to illustrate the current issues faced when using the corridor which may be exacerbated in future conditions.
- *Evaluation of Alternatives Report* – A document which compiles traffic analysis performed, discusses conclusions drawn, and outlines multiple alternatives which improve and/or protect multimodal operations at several prominent areas and intersections along the study corridor.
- *Final Recommendations Report* – A document which lists the preferred design alternatives as stated by CDOT and stakeholders. For each, a summary of approximate construction cost considerations. When applicable, additional context and alternative design considerations and guidance is provided.

US 287/120th Ave

MULTIMODAL STUDY

Figure 1: STUDY AREA



Legend

-  - Locations with Recommended Alternative Design Projects

Public Inclusion and Feedback

Engaging the public and valuing their concerns and input remained a top priority for the project team throughout the entire timeline of the study. Three primary windows of public outreach underlined the efforts of the study team to collect and incorporate feedback from the local community:

- The initial data gathering phase culminating in the *Existing Conditions and 2050 Baseline Analysis Report*. Project information booths were organized at the 2022 Broomfield Brewhaha and the 2022 Broomfield FISH Family Fun Day Event. In addition, online feedback was compiled via the Broomfield Voice and CDOT project websites, with users entering comments and complaints about specific locations along the study corridor via an interactive map.
- The second public engagement window occurred during the traffic analysis and development phase, concluding with the *Evaluation of Alternatives Report*. Efforts during this period included a project booth at the 2022 Broomfield Days Festival, as well as online video conferences set up for engagement with local business owners. These sessions were recorded for further dissemination.
- The third and final public engagement window took place near the completion of the study timeline, leading up to the completion and submission of the *Final Recommendations Report*. Door-to-door business outreach and attending the 2023 Broomfield Brewhaha event highlighted this phase of public interfacing. Additionally, the study design concepts were uploaded online on the project websites for public feedback. The received comments are attached as an appendix to this report.

Recommended Project List

The rest of this report document will highlight the project alternatives collectively selected as the best option identified during the study for each analyzed location. Each of the following Project Location sections will be broken down into the following subsections:

Primary Recommendation

This section will present the chosen proposed design and highlight major the design aspects.

Recommendation Justification

This section will summarize the considerations and discussion behind the selection of the proposed project; why this design choice was selected as the primary recommendation. It will recap the observed present-day issues, projected 2050 condition problems, and how the chosen alternative attempts to address them.

Recommendation Cost

This section will display the high-level preliminary estimate of main construction bid items and other contingency costs.

Additional Future Considerations

A section applicable for the project locations that demanded the most discussion with solutions being the most varied. This section will cover further options and considerations deliberated during the timeline of the study. It will discuss limitations of the chosen alternative and other potential design paths that may better address long term conditions, multimodal improvements, and projected 2050 traffic volumes.

Project Location 1 – Lowell Boulevard Intersection

Primary Recommendation

Expansion of the southern corner island refuges and raising the pedestrian crosswalks that traverse the southern right turn lanes while maintaining current lane configuration. Signal timing adjustments will also be performed to optimize intersection phasing.

Recommendation Justification

Lowell is a location that functions to an acceptable level in both the current and projected 2050 conditions. Knowing that vehicular traffic is not at risk of failing levels of service based on study projections, the alternatives explored were primarily to assist multimodal safety and connectivity for this intersection and the surrounding area. The Academy of Charter Schools campus, directly to the south of this intersection, will benefit from these improvements. **Figure 2** on page 5 illustrates further details.



Lowell Blvd and US 287/120th Ave

This recommendation should be viewed as a short-term solution, and further improvements should be considered for this intersection once appropriate budget opportunities and funding initiatives become available.

Recommendation Cost

The preliminary estimate for these improvements is approximately \$861,000. This cost includes potential signal pole resets and new intersection detection equipment. **Table 1** on pages 6-7 further details the projected costs.

Considerations For Future Needs

While island expansions and raised crosswalks will suffice for current conditions, The City and County of Broomfield wishes to highlight that should additional public transit operations expand. Bus queue jump lanes should be accounted for and provided space with all designs. Bus stops could be shifted around on the corners of the intersection or placed directly on the islands should proper accommodations and spaces be constructed.

For additional dialogue and analysis for all alternatives examined as a part of the *US 287/120th Avenue Multimodal and Safety Study*, see the *Evaluation of Alternatives Report*.

ALL INFORMATION SHOWN IS
HYPOTHETICAL AND SUBJECT TO CHANGE.

US 287

PEDESTRIAN PUSH BUTTON POST ASSEMBLY (TYP.)

REALIGN CROSSWALK

YIELD SIGN

EXISTING PULL BOXES & UTILITY MARKER

SCHOOL CROSSING SIGN

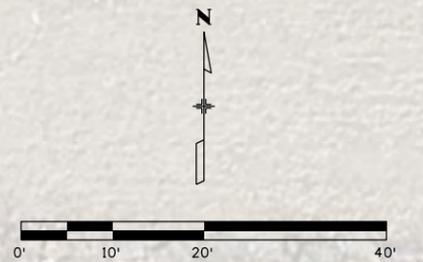
DELINEATOR (TYP.)

RAISED CROSSWALK

EXISTING PULL BOXES

RAISED CROSSWALK

LOWELL
BLVD.



c.burgess 2:17:51 PM X:\E\C\CDOT\166182\5-final-dgn\51-drawings\10-drawings\10-civil\cad\dgn\166182_Lowell Concept.dgn

Print Date: 5/31/2023	
File Name: 166182_Lowell Concept.dgn	
Horiz. Scale: 1:20	Vert. Scale: As Noted
Unit Information	Unit Leader Initials
Short Elliott Hendrickson Inc. Colorado Center Tower One Suite 6000 2000 South Colorado Boulevard Denver, CO 80222-7900 Tele. (720) 540-6800 (800) 490-4966 Fax (720) 540-6801	0000

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
 4670 Holly Street
 Denver, CO 80216-6408
 Phone: 303-398-6783
 FAX: 303-398-6781

Region 1 RS

As Constructed
No Revisions:
Revised:
Void:

FIGURE 2	
US 287 AND LOWELL BLVD. ALT 2	
Designer: C. BURGESS	Structure Numbers
Detailer: K. CRDELL	
Sheet Subset:	Subset Sheets:

Project No./Code
COT01
24810
Sheet Number

Engineers (Semi) Detailed Estimate (FY 22 Cost Index)	Alternative:	Alternative 2 - South Pork Chop Islands
	Prepared By:	ANM
	Date Prepared:	6/15/2023

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	\$12.00	70	\$840.00
2	202-Rem of Median Cover	SY	\$10.00	50	\$500.00
3	202-Rem of Sidewalk	SY	\$38.00	25	\$950.00
4	202- Rem of Curb and Gutter	LF	\$12.00	220	\$2,640.00
5	203-Excavation	CY	\$50.00	40	\$2,000.00
6	203-Embankment Material	CY	\$30.00	15	\$450.00
7	304-Aggregate Base Course	CY	\$70.00	15	\$1,050.00
8	403-Hot Mix Asphalt	TON	\$120.00	20	\$2,400.00
9	608-Concrete Sidewalk	SY	\$100.00	30	\$3,000.00
10	609-Curb and Gutter	LF	\$45.00	220	\$9,900.00
11	610-Median Cover Material	SF	\$16.00	550	\$8,800.00
12	614-Traffic Signal Equipment	LS	\$350,000.00	1	\$350,000.00
13	614-Intersection Detection Equipment	EA	\$15,000.00	4	\$60,000.00
Sub Total					\$442,530.00

**PROJECT CONSTRUCTION BID ITEMS
ROW (Sq. Ft.)**

\$442,530.00

NOTES:

- * Assumed 6" depth over 6" ABC for existing and new asphalt pavement and asphalt patching.
- * Assumed an application rate of 110 lbs/sy/in for asphalt quantities.
- * Assumed 6" depth Concrete Sidewalk over 4" ABC
- * Assumed 6" Concrete Median Cover Material over 7" Embankment Material for median construction.
- * Quantity of excavation assumed to be 24" for R material excavation
- * Assumed concrete section of 9" over 6" ABC
- * 614 Traffic Signal Equipment unit cost includes signal faces, pole and equipment necessary to make signal operational.

Engineers (Semi) Detailed Estimate (FY 22 Cost Index)	Alternative:	Alternative 2 - South Pork Chop Islands
	Prepared By:	ANM
	Date Prepared:	6/15/2023

Item	Unit Cost	Quantity	Extended Cost	<i>Shaded Fields are for INPUT</i>
FROM PAGE 1, BID ITEM TABULATION			\$442,530.00	
			\$442,530.00	
	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N / A	\$442,530.00	(A)
Contingencies	(15 - 30%) of (A)	15.0%	\$66,379.50	(B)
ITS	(6 - 10%) of (A)		\$0.00	(C)
Drainage / Utilities	(3 - 10%) of (A)	8.0%	\$35,402.40	(D)
Signing and Striping	(1 - 5%) of (A)	5.0%	\$22,126.50	(E)
Clearing & Grubbing	(1 - 5%) of (A)	1.0%	\$4,425.30	(F)
Construction Signing & Traffic Control	(5 - 25%) of (A)	5.0%	\$22,126.50	(G)
Mobilization	(4 - 7%) of (A)	5.0%	\$22,126.50	(H)
Total of Construction Bid Items	(A+B+C+D+E+F+G+H)		\$615,116.70	(I)
Force Account - Utilities	(1 - 2%) of I	2.0%	\$12,302.33	(J)
Force Account - Misc.	(5 - 15%) of I	10.0%	\$61,511.67	(K)
Subtotal of Construction Cost	(I+J+K)		\$688,930.70	(L)
Total Construction Engineering	(17%) of L	17.0%	\$117,118.22	(M)
Total Preliminary Engineering	(8%) of L	8.0%	\$55,114.46	(N)
Utilities	Project Dependent	N / A	\$0.00	(O)
Total Project Cost			\$861,000.00	(P)

Project Location 2 – Vrain Street Intersection

Primary Recommendation

Install bike boxes on north and southbound Vrain St., restripe the intersection to narrow travel lanes, and better improve visibility for all travel modes.

Recommendation Justification

During the course of the study, Vrain was identified as one of the most logical locations to bolster bicycle facility infrastructure. Construction of this project would seek to designate Vrain as a major US 287 crossing location for bikes and hopes to improve bike mobility throughout the corridor and surrounding area.

This can be achieved by within the existing roadway footprint by reducing lane widths (to a minimum of 10ft) and designating receiving lanes as shared bike/vehicle. See **Figure 3** on page 9 for more information.

The City and County of Broomfield's upcoming US 287 Sidepath Infill Project will be expanding and improving surrounding multiuse facilities. This crossing point must be enhanced in tandem to support this goal of greater area connectivity.

Recommendation Cost

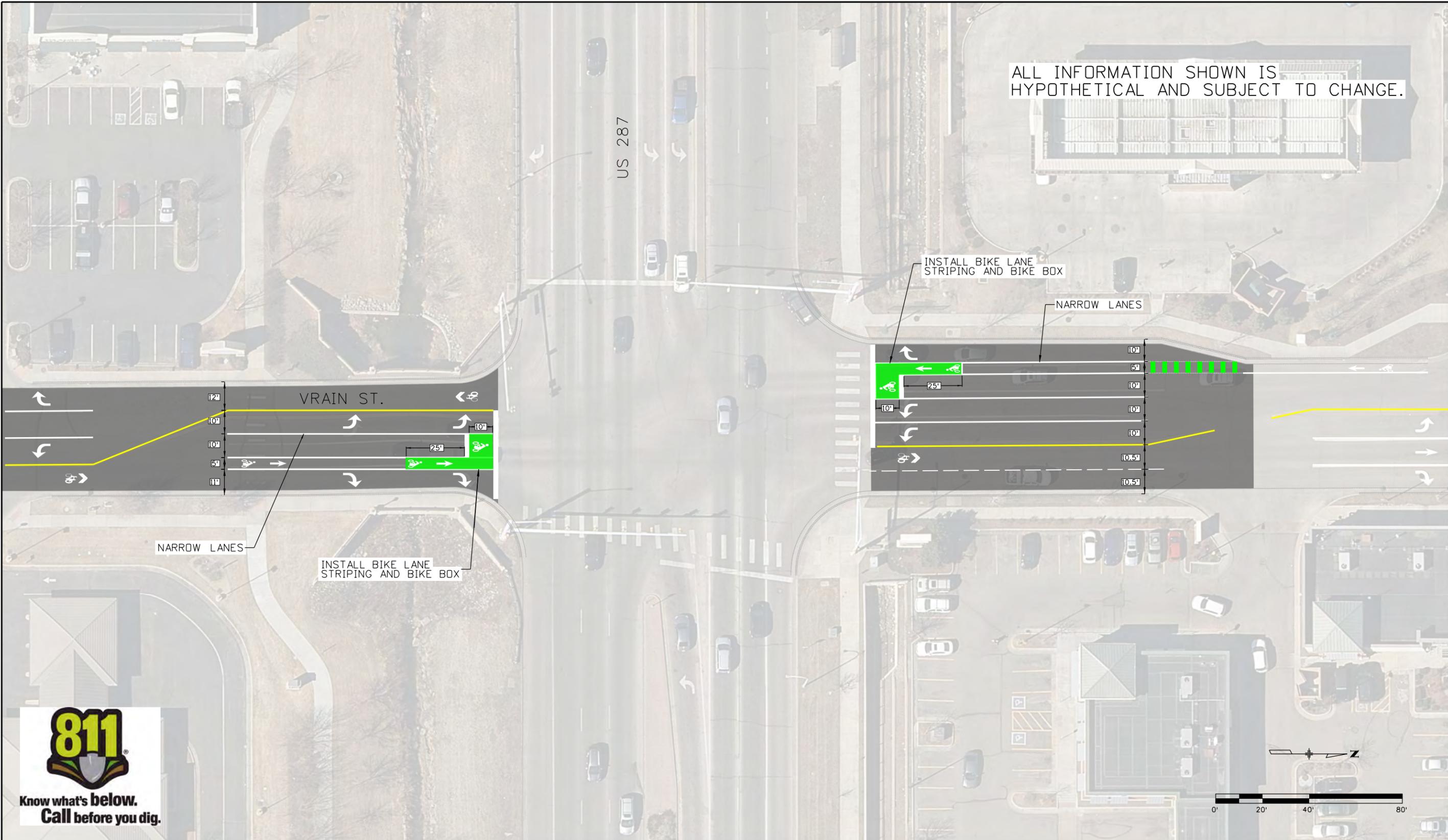
The preliminary estimate for these improvements is approximately \$152,000. This estimate factors in potential drainage and utility work which may be performed while construction occurs at the intersection. **Table 2** on page 10 and 11 further detail the projected costs.

For additional dialogue and analysis for all alternatives examined as a part of the *US 287/120th Avenue Multimodal and Safety Study*, see the *Evaluation of Alternatives Report*.



Vrain St and US 287/120th Ave

ALL INFORMATION SHOWN IS
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FIGURE 3	
US 287 AND VRAIN ST. ALT 2	
Designer: C. BURGESS	Structure Numbers
Detailer: K. CRDELL	
Sheet Subset:	Subset Sheets:

Project No./Code
COT01
24810
Sheet Number

Engineers (Semi) Detailed Estimate (FY 22 Cost Index)	Alternative:	Alternative 2 - Bike Boxes
	Prepared By:	ANM
	Date Prepared:	6/6/2023

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	\$12.00	2,200	\$26,400.00
2	403-Hot Mix Asphalt	TON	\$120.00	200	\$24,000.00
3	614-Intersection Detection Equipment	EA	\$12,000.00	4	\$48,000.00
4	627-Pavement Marking Paint	GAL	\$60.00	20	\$1,200.00
5	627-Thermoplastic Pavement Marking	SF	\$60.00	440	\$26,400.00
6					
7					
8					
9					
10					
11					
12					
13					
Sub Total					\$126,000.00

**PROJECT CONSTRUCTION BID ITEMS
ROW (Sq. Ft.)**

\$126,000.00

NOTES:

- * Assumed 6" depth over 6" ABC for existing and new asphalt pavement and asphalt patching.
- * Assumed an application rate of 110 lbs/sy/in for asphalt quantities.
- * Assumed 6" depth Concrete Sidewalk over 4" ABC
- * Assumed 6" Concrete Median Cover Material over 7" Embankment Material for median construction.
- * Quantity of excavation assumed to be 24" for R material excavation
- * Assumed concrete section of 9" over 6" ABC
- * 614 Traffic Signal Equipment unit cost includes signal faces, pole and equipment necessary to make signal operational.

Engineers (Semi) Detailed Estimate (FY 22 Cost Index)	Alternative:	Alternative 2 - Bike Boxes
	Prepared By:	ANM
	Date Prepared:	6/6/2023

Item	Unit Cost	Quantity	Extended Cost	<i>Shaded Fields are for INPUT</i>
FROM PAGE 1, BID ITEM TABULATION			\$126,000.00	
			\$126,000.00	
	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N / A	\$126,000.00	(A)
Contingencies	(15 - 30%) of (A)	15.0%	\$18,900.00	(B)
ITS	(6 - 10%) of (A)		\$0.00	(C)
Drainage / Utilities	(3 - 10%) of (A)	8.0%	\$10,080.00	(D)
Signing and Striping	(1 - 5%) of (A)	5.0%	\$6,300.00	(E)
Clearing & Grubbing	(1 - 5%) of (A)	1.0%	\$1,260.00	(F)
Construction Signing & Traffic Control	(5 - 25%) of (A)	5.0%	\$6,300.00	(G)
Mobilization	(4 - 7%) of (A)	5.0%	\$6,300.00	(H)
Total of Construction Bid Items	(A+B+C+D+E+F+G+H)		\$175,140.00	(I)
Force Account - Utilities	(1 - 2%) of I	2.0%	\$3,502.80	(J)
Force Account - Misc.	(5 - 15%) of I	10.0%	\$17,514.00	(K)
Subtotal of Construction Cost	(I+J+K)		\$196,156.80	(L)
Total Construction Engineering	(17%) of L	17.0%	\$33,346.66	(M)
Total Preliminary Engineering	(8%) of L	8.0%	\$15,692.54	(N)
Utilities	Project Dependent	N / A	\$0.00	(O)
Total Project Cost			\$245,000.00	(P)

Project Location 3 – Sheridan Boulevard Intersection

Sheridan Blvd is the highest traffic volume connection to US 287 within the study area, making the need to maintain functional level of service vital. This intersection poses extreme mobility and multimodal challenges. It already experiences significant congestion and delays today, which will be further exacerbated moving forward as the area continues to grow and develop. Through analyzing the traffic data two primary problems presented themselves: the need to alleviate current congestion quickly and efficiently, and the need to develop an innovative alternative to better facilitate projected future growth for all transportation modes. This Project Location section will discuss both the short-term and long-term steps that can be taken at this pivotal intersection.

Primary Recommendation(s)

Short-Term Improvement (Standard Configuration):

Convert the other lanes in both east and west directions into through travel lanes along US 287. This option would convert right turn only lanes into choice lanes and also utilize the current paved shoulder to the west of the intersection. There would be no change necessary to Sheridan in the northbound and southbound directions. **Figure 4** on page 14 displays the core information about this recommendation.



Sheridan Blvd and US 287/120th Ave

Long-Term Improvement (Continuous Flow Intersection):

Implement a detached left turn intersection concept. This would guide vehicles traveling on Sheridan wishing to turn left onto US 287 across the through lanes prior to the main intersection via two smaller signals. Doing so allows for more vehicle movements to take place in one green light phase, resulting in less total intersection phases. **Figure 5** on page 17 provides an exhibit for this recommendation.

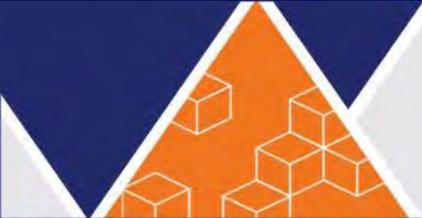
Recommendation(s) Justification

Short-Term Improvement (Standard Configuration):

This option maximizes the capacity of the existing roadway footprint for vehicular traffic efficiently, and for a low construction budget. The benefit to cost ratio for vehicular traffic should prove high pending congestion introduced due to converting the right-in right-out lanes for the adjacent properties.

Long-Term Improvement (Continuous Flow Intersection):

The continuous flow intersection (CFI) concept can be pursued to reduce conflict points for all transit modes and provide a more sustainable intersection that will continue to perform sufficiently while servicing higher traffic volumes for a longer lifespan. This would guide vehicles traveling on Sheridan wishing to turn left onto US 287 across the through lanes prior to the main intersection via two smaller signals. Doing so allows for more vehicle movements to take place in one green light phase, resulting in less total intersection phases. Benefits are not limited to vehicles with this option.



US 287/120th Ave MULTIMODAL STUDY

Center medians will assist vehicles with visual clarity while also providing better refuge for bikes and pedestrian than in current conditions. It enhances bicycle and pedestrian safety by provided island refuges which break the crossings into shorter parts.

Recommendation(s) Cost

Short-Term Improvement (Standard Configuration):

This standard configuration restriping for Sheridan and the surrounding area is estimated to cost \$388,000. This accounts for restriping and asphalt patching that may be needed east and west along US 287 to convert shoulder and turn lane into through travel lane. Further investigation will be needed to confirm that the pavement structure in current shoulder areas is capable of handling full capacity traffic. This estimate (**Table 3** on page 15-16) does not account for the potential need for full depth reconstruction in these areas.

Long-Term Improvement (Continuous Flow Intersection):

The Detached intersection reconfiguration is estimated to cost \$9,090,000 (**Table 4** on page 18-19) for major construction items and contingencies. This includes ITS and extensive signal work needed for the new configuration. The study team did not have the necessary information to evaluate the cost of ROW acquisition and construction easements that will need to be coordinated with the affected property owners.

Considerations For Future Needs

Short-Term Improvement (Standard Configuration):

Adding lanes through restriping and lane width adjustments should be viewed as a short to mid-term solution. Once complete, it will be difficult to expand the roadway for added capacity without significant ROW acquisition and reconstruction of the adjacent City Park Channel floodway structure. Even if these steps to generate space are taken, preliminary analysis shows that only minor improvements can be expected with a standard widening approach. There should be major concern regarding the capacity and level of service of this intersection looking into the future based on 2050 projections should this route be chosen and pursued. Furthermore, this option provides no improvements for other modes of transportation; it focuses on vehicular level of service.

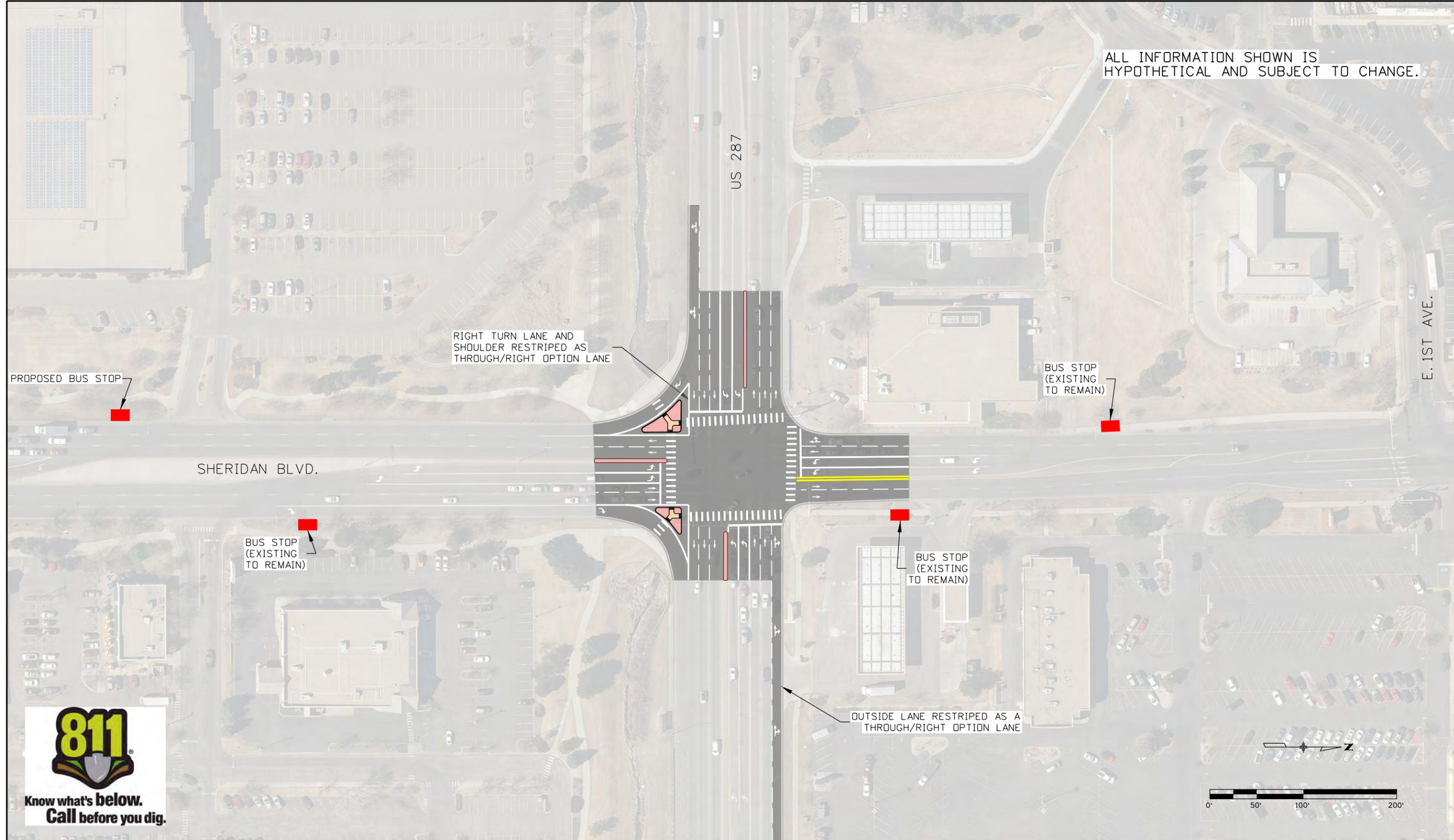
In the westbound direction, the right-in-right-out striping in both east and west directions currently serve as weaving and merging space for vehicles entering and exiting the attached shopping centers areas. Converting this lane into a third travel lane will worsen the weave conditions for vehicles and add to congestion in way that this level of preliminary analysis cannot fully account for.

Long-Term Improvement (Continuous Flow Intersection):

Preliminary analysis shows that this configuration will provide better level of service for a volume of traffic within a similar roadway footprint. It also improves pedestrian crossing safety patterns. Considerations for this option include that where may be greater initial resistance from residents and a longer learning curve for commuters. Transit operations need to be considered as part of this design as well, as the impacts to bus stop locations and mid-block crossing points will need to be further investigated prior to construction.

For additional dialogue and analysis for all alternatives examined as a part of the *US 287/120th Avenue Multimodal and Safety Study*, see the *Evaluation of Alternatives Report*.

ALL INFORMATION SHOWN IS
HYPOTHETICAL AND SUBJECT TO CHANGE.



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Print Date: 6/16/2023	
File Name: 166182_Sheridan Standard Concept.dgn	
Horiz. Scale: 1:100	Vert. Scale: As Noted
Unit Information	Unit Leader Initials
Short Elliott Hendrickson Inc. Colorado Center Tower One Suite 6000 2000 South Colorado Boulevard Denver, CO 80222-7900	Tele: (720) 540-6800 (800) 490-4966 Fax: (720) 540-6801

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation

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Region 1 RS

As Constructed
No Revisions:
Revised:
Void:

FIGURE 4	
US 287 AND SHERIDAN BLVD. ALT 3	
Designer: C. BURGESS	Structure Numbers
Detailer: K. CRDELL	
Sheet Subset:	Subset Sheets:

Project No./Code
COT01
24810
Sheet Number

Engineers (Semi) Detailed Estimate (FY 22 Cost Index)	Alternative:	Alternative 3 - Standard Lane Restriping
	Prepared By:	ANM
	Date Prepared:	6/6/2023

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	\$12.00	6,300	\$75,600.00
2	403-Hot Mix Asphalt	TON	\$120.00	530	\$63,600.00
3	614-Traffic Signal Equipment	LS	\$2,000.00	1	\$2,000.00
4	614-Intersection Detection Equipment	EA	\$12,000.00	4	\$48,000.00
5	627-Pavement Marking Paint	GAL	\$60.00	40	\$2,400.00
Sub Total					\$191,600.00

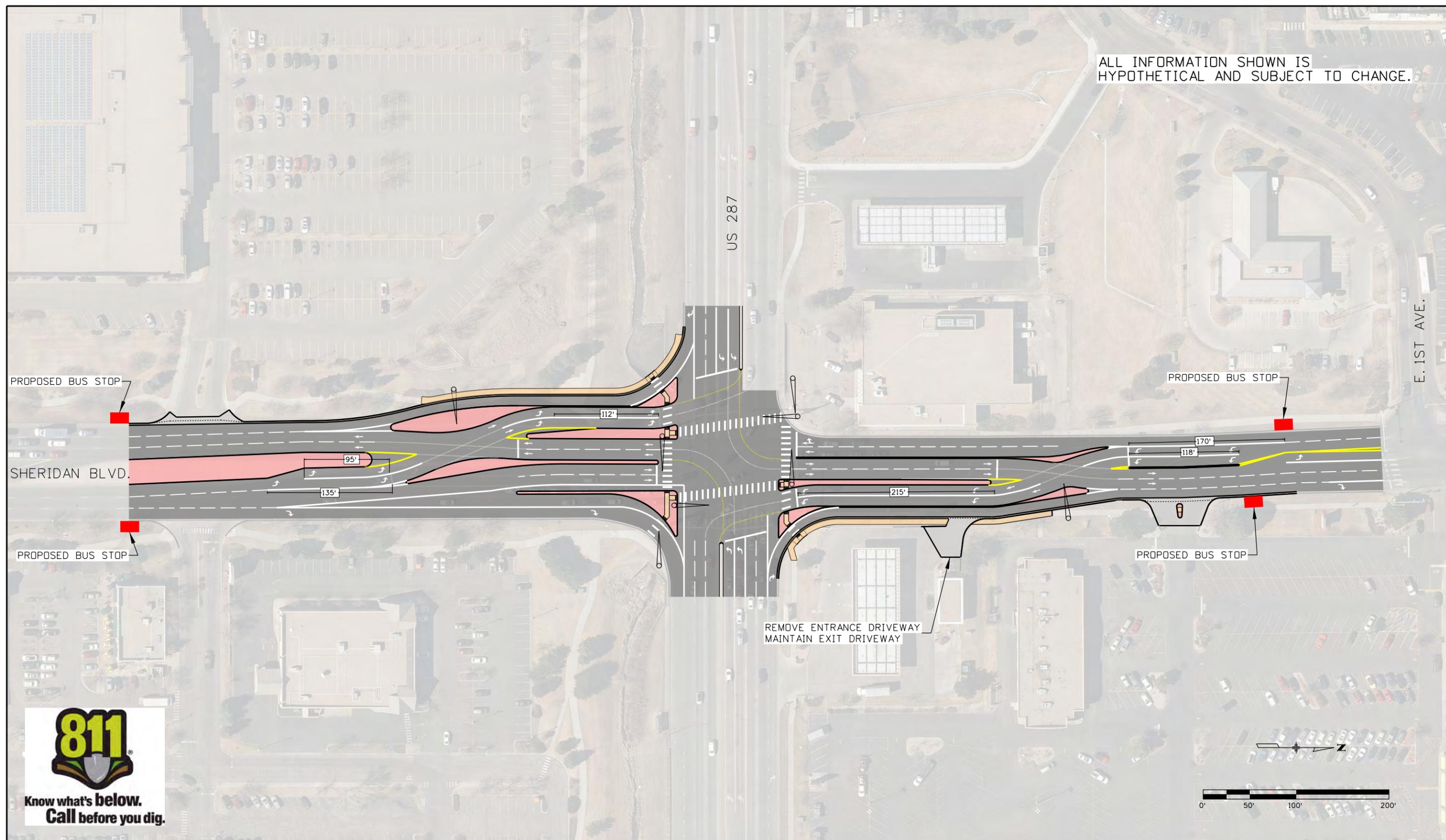
**PROJECT CONSTRUCTION BID ITEMS
ROW (Sq. Ft.)**

\$191,600.00

NOTES:

- * Assumed 6" depth over 6" ABC for existing and new asphalt pavement and asphalt patching.
- * Assumed an application rate of 110 lbs/sy/in for asphalt quantities.
- * Assumed 6" depth Concrete Sidewalk over 4" ABC
- * Assumed 6" Concrete Median Cover Material over 7" Embankment Material for median construction.
- * Quantity of excavation assumed to be 24" for R material excavation
- * Assumed concrete section of 9" over 6" ABC
- * 614 Traffic Signal Equipment unit cost includes signal faces, pole and equipment necessary to make signal operational.

ALL INFORMATION SHOWN IS
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File Name: 166182_Sheridan Concept.dgn
Horiz. Scale: 1:100 Vert. Scale: As Noted
Unit Information Unit Leader Initials
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Sheet Revisions		
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Region 1 RS

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No Revisions:
Revised:
Void:

FIGURE 5	
US 287 AND SHERIDAN BLVD. ALT 2	
Designer: C. BURGESS	Structure Numbers
Detailer: K. CRDELL	
Sheet Subset:	Subset Sheets:

Project No./Code
COT01
24810
Sheet Number

Engineers (Semi) Detailed Estimate (FY 22 Cost Index)	Alternative:	Alternative 2 - Detached Left
	Prepared By:	ANM
	Date Prepared:	6/6/2023

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	\$12.00	1,600	\$19,200.00
2	202-Rem of Conc Pavement	SY	\$16.00	560	\$8,960.00
3	202-Rem of Median Cover	SY	\$10.00	910	\$9,100.00
4	202-Rem of Sidewalk	SY	\$38.00	640	\$24,320.00
5	202- Rem of Curb and Gutter	LF	\$12.00	2,700	\$32,400.00
6	203-Excavation	CY	\$50.00	600	\$30,000.00
7	203-Embankment Material	CY	\$30.00	370	\$11,100.00
8	304-Aggregate Base Course	CY	\$70.00	3,500	\$245,000.00
9	403-Hot Mix Asphalt	TON	\$120.00	3,650	\$438,000.00
10	412-Concrete Pavement	SY	\$60.00	3,700	\$222,000.00
11	608-Concrete Sidewalk	SY	\$100.00	4,000	\$400,000.00
12	609-Curb and Gutter	LF	\$45.00	7,800	\$351,000.00
13	610-Median Cover Material	SF	\$16.00	16,800	\$268,800.00
14	614-Traffic Signal Equipment	LS	\$2,300,000.00	1	\$2,300,000.00
15	614-Intersection Detection Equipment	EA	\$12,000.00	6	\$72,000.00
Sub Total					\$4,431,880.00

**PROJECT CONSTRUCTION BID ITEMS
ROW (Sq. Ft.)**

\$4,431,880.00

NOTES:

- * Assumed 6" depth over 6" ABC for existing and new asphalt pavement and asphalt patching.
- * Assumed an application rate of 110 lbs/sy/in for asphalt quantities.
- * Assumed 6" depth Concrete Sidewalk over 4" ABC
- * Assumed 6" Concrete Median Cover Material over 7" Embankment Material for median construction.
- * Quantity of excavation assumed to be 24" for R material excavation
- * Assumed concrete section of 9" over 6" ABC
- * 614 Traffic Signal Equipment unit cost includes signal faces, pole and equipment necessary to make signal operational.

Engineers (Semi) Detailed Estimate (FY 22 Cost Index)	Alternative:	Alternative 2 - Detached Left
	Prepared By:	ANM
	Date Prepared:	6/6/2023

Item	Unit Cost	Quantity	Extended Cost	Shaded Fields are for INPUT
FROM PAGE 1, BID ITEM TABULATION			\$4,431,880.00	
			\$4,431,880.00	
	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N / A	\$4,431,880.00	(A)
Contingencies	(15 - 30%) of (A)	15.0%	\$664,782.00	(B)
ITS	(6 - 10%) of (A)	7.5%	\$332,391.00	(C)
Drainage / Utilities	(3 - 10%) of (A)	8.0%	\$354,550.40	(D)
Signing and Striping	(1 - 5%) of (A)	5.0%	\$221,594.00	(E)
Clearing & Grubbing	(1 - 5%) of (A)	1.0%	\$44,318.80	(F)
Construction Signing & Traffic Control	(5 - 25%) of (A)	5.0%	\$221,594.00	(G)
Mobilization	(4 - 7%) of (A)	5.0%	\$221,594.00	(H)
Total of Construction Bid Items	(A+B+C+D+E+F+G+H)		\$6,492,704.20	(I)
Force Account - Utilities	(1 - 2%) of I	2.0%	\$129,854.08	(J)
Force Account - Misc.	(5 - 15%) of I	10.0%	\$649,270.42	(K)
Subtotal of Construction Cost	(I+J+K)		\$7,271,828.70	(L)
Total Construction Engineering	(17%) of L	17.0%	\$1,236,210.88	(M)
Total Preliminary Engineering	(8%) of L	8.0%	\$581,746.30	(N)
Utilities	Project Dependent	N / A	\$0.00	(O)
Total Project Cost			\$9,090,000.00	(P)

Project Location 4 – Main Street Intersection

Primary Recommendation

Restriping of the east to north left turn lane from US 287 to Main St, extending it to roughly 500ft.

Recommendation Justification

Main St. will experience dramatic growth and increased congestion with the upcoming Broomfield Town Square development. This development, just north of the study corridor, will lead to significantly greater demand for both directions of travel along Main St north of US 287. This added capacity need overflows to the turning movements onto and off of US 287 at this intersection.

Following traffic analysis, the eastbound US 287 to northbound Main St left turn was found to be the critical movement that will lead to intersection failure in the 2050 condition. This project alternative extends the functional lifespan of the intersection in its current configuration while additional intersections solutions are more extensively designed. This is achieved by extending the east to north left turn bay from 350ft to 500ft for added capacity. The left turn cannot be extended further than this without eliminating the west to south center left turn from US 287 onto Reed St, which may be an option for CDOT and the City and County of Broomfield to consider.



Main St and US 287/120th Ave

Recommendation Cost

The cost for this restriping, patching, installing intersection detection equipment and the associated signal timing adjustments is expected to be around \$94,000. **Table 5** on page 21-22 further breaks down the expected costs.

Considerations For Future Needs

As stated in the project justification, the significant Main St growth projections demand appropriate measures to prevent greater system failure. While the lengthened left turn lane will provide relief for the short-term future, Main Street will need to be widened to properly handle the expected area growth in a more permanent fashion. Alternative 3 in the *Evaluation of Alternatives Report* explores the specifics of this ultimate configuration in more detail.

For additional dialogue and analysis for all alternatives examined as a part of the *US 287/120th Avenue Multimodal and Safety Study*, see the *Evaluation of Alternatives Report*.

Engineers (Semi) Detailed Estimate (FY 21 Cost Index)	Alternative:	Alternative 2 - Extend East Left Turn Lane
	Prepared By:	ANM
	Date Prepared:	6/6/2023

	Item		Unit Cost	Quantity	Cost
1	627-Pavement Marking Paint	GAL	\$60.00	10	\$600.00
2	627-Thermoplastic Pavement Marking	SF	\$60.00	48	\$2,880.00
3	614-Intersection Detection Equipment	EA	\$12,000.00	4	\$48,000.00
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
Sub Total					\$51,480.00

**PROJECT CONSTRUCTION BID ITEMS
ROW (Sq. Ft.)**

\$51,480.00

NOTES:

- * Assumed 6" depth over 6" ABC for existing and new asphalt pavement and asphalt patching.
- * Assumed an application rate of 110 lbs/sy/in for asphalt quantities.
- * Assumed 6" depth Concrete Sidewalk over 4" ABC
- * Assumed 6" Concrete Median Cover Material over 7" Embankment Material for median construction.
- * Quantity of excavation assumed to be 24" for R material excavation
- * Assumed concrete section of 9" over 6" ABC
- * 614 Traffic Signal Equipment unit cost includes signal faces, pole and equipment necessary to make signal operational.

Engineers (Semi) Detailed Estimate (FY 21 Cost Index)	Alternative:	Alternative 2 - Extend East Left Turn Lane
	Prepared By:	ANM
	Date Prepared:	6/6/2023

Item	Unit Cost	Quantity	Extended Cost	<i>Shaded Fields are for INPUT</i>
FROM PAGE 1, BID ITEM TABULATION			\$51,480.00	
			\$51,480.00	
	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N / A	\$51,480.00	(A)
Contingencies	(15 - 30%) of (A)	15.0%	\$7,722.00	(B)
ITS	(6 - 10%) of (A)	0.0%	\$0.00	(C)
Drainage / Utilities	(3 - 10%) of (A)	8.0%	\$4,118.40	(D)
Signing and Striping	(1 - 5%) of (A)	2.0%	\$1,029.60	(E)
Clearing & Grubbing	(1 - 5%) of (A)	1.0%	\$514.80	(F)
Construction Signing & Traffic Control	(5 - 25%) of (A)	5.0%	\$2,574.00	(G)
Mobilization	(4 - 7%) of (A)	5.0%	\$2,574.00	(H)
Total of Construction Bid Items	(A+B+C+D+E+F+G+H)		\$70,012.80	(I)
Force Account - Utilities	(1 - 2%) of I	2.0%	\$1,400.26	(J)
Force Account - Misc.	(5 - 15%) of I	5.0%	\$3,500.64	(K)
Subtotal of Construction Cost	(I+J+K)		\$74,913.70	(L)
Total Construction Engineering	(17%) of L	17.0%	\$12,735.33	(M)
Total Preliminary Engineering	(8%) of L	8.0%	\$5,993.10	(N)
Utilities	Project Dependent	N / A	\$0.00	(O)
Total Project Cost			\$94,000.00	(P)

Project Location 5 – Upham Street to Nickel Street

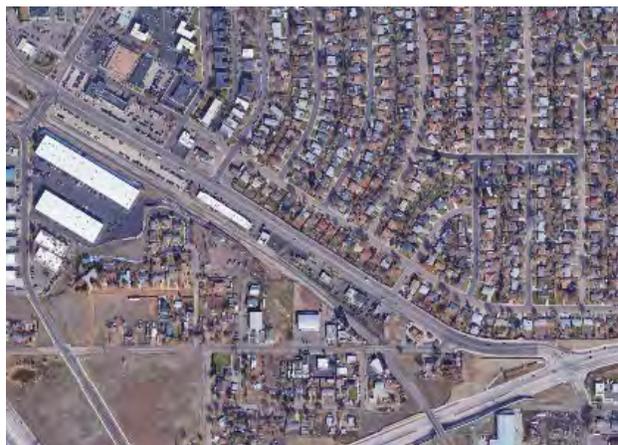
Primary Recommendation

Perform a roadway reconfiguration on US 287 between Upham Street and Nickel Street. This will remove a vehicle travel lane in both directions, dropping from 4 lanes to a 2-lane section. With the additional room created, a designated 6ft bike lane will be constructed in the southbound direction, along with a 10ft multi-use path on the north side which will connect with the Upham intersection.

A raised concrete median is proposed down the center to separate traffic while accommodating center left turn bays. Widths can be adjusted as necessary to achieve preferred roadway elements.

A 6ft sidewalk can be installed on the south side with the capability to maintain existing business access points. Access will need to be evaluated further during project design to better identify opportunities to repurpose and consolidate in coordination with property owners.

Mid-block pedestrian crossing points with flashing beacons can be utilized for safe crossing points. **Figure 6** on the following page highlights major features.



US 287/120th Ave from Upham Rd. to Nickel St.

Recommendation Justification

Following the construction of the CO 128 connector that continues west from the Upham intersection with US 287, this section of US 287 no longer needs to handle the high traffic volumes previously experienced. Traffic volume collection and analysis shows that level of service should not be impacted by removing a travel lane from each direction. Pending confirmation with further traffic analysis during the project design phase, this would free up space for widened sidewalks, improved pedestrian facilities, and a designated bike lane. It improves safety by creating a raised center median, pedestrian crossing points, and providing more room for vehicles to enter and exit business parking areas without entering the travel lanes (previously a major observed safety issue). **Figure 6** on page 24 further details the proposed roadway enhancements.

Enhancements to the Upham St. intersection, such as raised crosswalks and a striped & painted bike lane, can be pursued as part of this design alternative as well (**Figure 7** on page 27). Upham can be connected to the northbound section of US 287 via a north side path. Further evaluation will be required to determine the best way to achieve desired width while navigating between the retaining and sound walls in this area.

Recommendation Cost

The roadway diet, along with additional improvements to the Upham Street intersection, can be achieved for approximately \$6,175,000. **Tables 6 and 7** (pages 25-26 and 28-29) highlight the associated costs with the two conjoined improvement areas. For additional dialogue and analysis for all alternatives examined as a part of the *US 287/120th Avenue Multimodal and Safety Study*, see the *Evaluation of Alternatives Report*.



ALL INFORMATION SHOWN IS HYPOTHETICAL AND SUBJECT TO CHANGE.

DRIVEWAYS LOCATIONS SHOWN MATCH EXISTING CONDITIONS AND ARE SUBJECT TO CHANGE. ACCESS POINTS MAY BE RELOCATED OR CONSOLIDATED PENDING INPUT FROM THE AFFECTED LANDOWNERS AND PUBLIC.



Print Date: 06/14/2023		Sheet Revisions Date: Comments Init.		Colorado Department of Transportation 4670 Holly Street Denver, CO 80216-6408 Phone: 303-398-6783 FAX: 303-398-6781		As Constructed No Revisions:		FIGURE 6 US 287 ROADWAY RECONFIG. EXHIBIT		Project No./Code	
File Name:										COT01	
Horiz. Scale: As Noted Vert. Scale: As Noted				Region 1 RS		Revised:		Designer: C. BURGESS		Structure Numbers	
Unit Information Unit Leader Initials								Void:		Detailer: C. HAYSON	
Short Elliott Hendrickson Inc. Colorado Center Tower One Suite 6000 2000 South Colorado Boulevard Denver, CO 80222-7900 Tele. (720) 540-6800 Fax (720) 540-6801		0000				Sheet Subset:		Subset Sheets:		Sheet Number	

Engineers (Semi) Detailed Estimate (FY 22 Cost Index)	Alternative:	Alternative 1 - Road Reconfig w/ Asphalt
	Prepared By:	ANM
	Date Prepared:	6/6/2023

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	\$12.00	27,200	\$326,400.00
2	202-Rem of Concrete Pavement	SY	\$16.00	40	\$640.00
3	202-Rem of Median Cover	SY	\$10.00	2,300	\$23,000.00
4	202-Rem of Sidewalk	SY	\$38.00	270	\$10,260.00
5	202- Rem of Curb and Gutter	LF	\$12.00	5,900	\$70,800.00
6	203-Excavation	CY	\$50.00	2,500	\$125,000.00
7	203-Embankment Material	CY	\$30.00	420	\$12,600.00
8	304-Aggregate Base Course	CY	\$70.00	3,400	\$238,000.00
9	403-Hot Mix Asphalt	TON	\$120.00	4,000	\$480,000.00
10	412-Concrete Pavement	SY	\$60.00	1,060	\$63,600.00
11	608-Concrete Sidewalk	SY	\$100.00	4,850	\$485,000.00
12	609-Curb and Gutter	LF	\$45.00	6,400	\$288,000.00
13	610-Median Cover Material	SF	\$16.00	19,100	\$305,600.00
14	614-Traffic Signal Equipment	LS	\$650,000.00	1	\$650,000.00
Sub Total					\$3,078,900.00

**PROJECT CONSTRUCTION BID ITEMS
ROW (Sq. Ft.)**

\$3,078,900.00

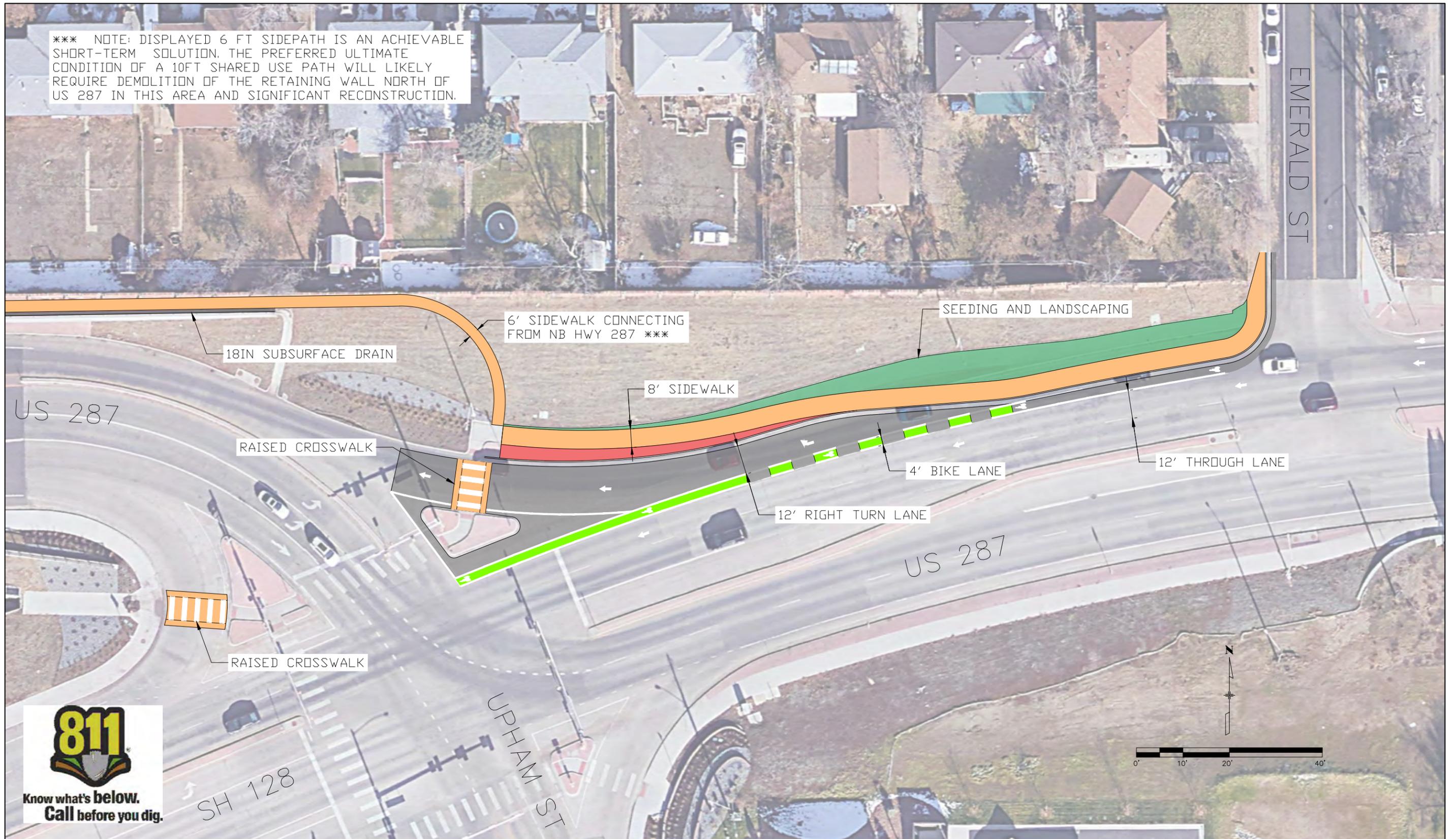
NOTES:

- * Assumed 6" depth over 6" ABC for existing and new asphalt pavement and asphalt patching.
- * Assumed an application rate of 110 lbs/sy/in for asphalt quantities.
- * Assumed 6" depth Concrete Sidewalk over 4" ABC
- * Assumed 6" Concrete Median Cover Material over 7" Embankment Material for median construction.
- * Quantity of excavation assumed to be 24" for R material excavation
- * Assumed concrete section of 9" over 6" ABC
- * 614 Traffic Signal Equipment unit cost includes signal faces, pole and equipment necessary to make signal operational.

Engineers (Semi) Detailed Estimate (FY 21 Cost Index)	Alternative:	Alternative 1 - Road Diet: With Asphalt
	Prepared By:	ANM
	Date Prepared:	6/6/2023

Item	Unit Cost	Quantity	Extended Cost	<i>Shaded Fields are for INPUT</i>
FROM PAGE 1, BID ITEM TABULATION			\$3,078,900.00	
			\$3,078,900.00	
	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N / A	\$3,078,900.00	(A)
Contingencies	(15 - 30%) of (A)	15.0%	\$461,835.00	(B)
ITS	(6 - 10%) of (A)		\$0.00	(C)
Drainage / Utilities	(3 - 10%) of (A)	8.0%	\$246,312.00	(D)
Signing and Striping	(1 - 5%) of (A)	5.0%	\$153,945.00	(E)
Clearing & Grubbing	(1 - 5%) of (A)	1.0%	\$30,789.00	(F)
Construction Signing & Traffic Control	(5 - 25%) of (A)	5.0%	\$153,945.00	(G)
Mobilization	(4 - 7%) of (A)	5.0%	\$153,945.00	(H)
Total of Construction Bid Items	(A+B+C+D+E+F+G+H)		\$4,279,671.00	(I)
Force Account - Utilities	(1 - 2%) of I	2.0%	\$85,593.42	(J)
Force Account - Misc.	(5 - 15%) of I	10.0%	\$427,967.10	(K)
Subtotal of Construction Cost	(I+J+K)		\$4,793,231.52	(L)
Total Construction Engineering	(17%) of L	17.0%	\$814,849.36	(M)
Total Preliminary Engineering	(8%) of L	8.0%	\$383,458.52	(N)
Utilities	Project Dependent	N / A	\$0.00	(O)
Total Project Cost			\$5,992,000.00	(P)

*** NOTE: DISPLAYED 6 FT SIDEWALK IS AN ACHIEVABLE SHORT-TERM SOLUTION. THE PREFERRED ULTIMATE CONDITION OF A 10FT SHARED USE PATH WILL LIKELY REQUIRE DEMOLITION OF THE RETAINING WALL NORTH OF US 287 IN THIS AREA AND SIGNIFICANT RECONSTRUCTION.



Print Date: 04/17/2023		Sheet Revisions			Colorado Department of Transportation		As Constructed		FIGURE 7		Project No./Code	
File Name:		Date:	Comments	Init.	4670 Holly Street Denver, CO 80216-6408 Phone: 303-398-6783 FAX: 303-398-6781		No Revisions:		US 287 AND UPHAM ST INTERSECTION		COT01	
Horiz. Scale: As Noted		Vert. Scale: As Noted			Region 1		Revised:		Designer: C. BURGESS		Structure Numbers	
Unit Information		Unit Leader Initials			RS		Void:		Detailer: C. HAYSON		24810	
Short Elliott Hendrickson Inc. Colorado Center Tower One Suite 6000 2000 South Colorado Boulevard Denver, CO 80222-7900		Tele. (720) 540-6800 (800) 490-4966 Fax (720) 540-6801							Sheet Subset:		Subset Sheets:	
SEH		0000									Sheet Number	

Engineers (Semi) Detailed Estimate (FY 22 Cost Index)	Alternative:	Alternative 2-Upham Improvements
	Prepared By:	ANM
	Date Prepared:	6/6/2023

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	\$12.00	920	\$11,040.00
3	202-Rem of Median Cover	SY	\$10.00	60	\$600.00
4	202-Rem of Sidewalk	SY	\$38.00	290	\$11,020.00
5	202- Rem of Curb and Gutter	LF	\$12.00	220	\$2,640.00
6	203-Excavation	CY	\$50.00	100	\$5,000.00
7	203-Embankment Material	CY	\$30.00	15	\$450.00
8	304-Aggregate Base Course	CY	\$70.00	40	\$2,800.00
9	403-Hot Mix Asphalt	TON	\$120.00	80	\$9,600.00
11	608-Concrete Sidewalk	SY	\$100.00	320	\$32,000.00
12	609-Curb and Gutter	LF	\$45.00	230	\$10,350.00
13	610-Median Cover Material	SF	\$16.00	540	\$8,640.00
14					
Sub Total					\$94,140.00

**PROJECT CONSTRUCTION BID ITEMS
ROW (Sq. Ft.)**

\$94,140.00

NOTES:

- * Assumed 6" depth over 6" ABC for existing and new asphalt pavement and asphalt patching.
- * Assumed an application rate of 110 lbs/sy/in for asphalt quantities.
- * Assumed 6" depth Concrete Sidewalk over 4" ABC
- * Assumed 6" Concrete Median Cover Material over 7" Embankment Material for median construction.
- * Quantity of excavation assumed to be 24" for R material excavation
- * Assumed concrete section of 9" over 6" ABC
- * 614 Traffic Signal Equipment unit cost includes signal faces, pole and equipment necessary to make signal operational.

Engineers (Semi) Detailed Estimate (FY 21 Cost Index)	Alternative:	Alternative 2 - Upham Improvements
	Prepared By:	ANM
	Date Prepared:	6/6/2023

Item	Unit Cost	Quantity	Extended Cost	Shaded Fields are for INPUT
FROM PAGE 1, BID ITEM TABULATION			\$94,140.00	
			\$94,140.00	
	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N / A	\$94,140.00	(A)
Contingencies	(15 - 30%) of (A)	15.0%	\$14,121.00	(B)
ITS	(6 - 10%) of (A)		\$0.00	(C)
Drainage / Utilities	(3 - 10%) of (A)	8.0%	\$7,531.20	(D)
Signing and Striping	(1 - 5%) of (A)	5.0%	\$4,707.00	(E)
Clearing & Grubbing	(1 - 5%) of (A)	1.0%	\$941.40	(F)
Construction Signing & Traffic Control	(5 - 25%) of (A)	5.0%	\$4,707.00	(G)
Mobilization	(4 - 7%) of (A)	5.0%	\$4,707.00	(H)
Total of Construction Bid Items	(A+B+C+D+E+F+G+H)		\$130,854.60	(I)
Force Account - Utilities	(1 - 2%) of I	2.0%	\$2,617.09	(J)
Force Account - Misc.	(5 - 15%) of I	10.0%	\$13,085.46	(K)
Subtotal of Construction Cost	(I+J+K)		\$146,557.15	(L)
Total Construction Engineering	(17%) of L	17.0%	\$24,914.72	(M)
Total Preliminary Engineering	(8%) of L	8.0%	\$11,724.57	(N)
Utilities	Project Dependent	N / A	\$0.00	(O)
Total Project Cost			\$183,000.00	(P)

Project Location 6 – Wadsworth Parkway Slip Ramp

Primary Recommendation

Improve striping and add yield and merge condition signing to provide better visibility for weaving traffic.

Recommendation Justification

This intersection was identified through traffic observation, analysis, and public comments as an area of significant traffic merging and weaving patterns, and high potential for mitigation. Through discussion with CDOT and the City and County of Broomfield, the short-term solution of augmenting existing striping and placing additional warning signs for merging/yielding was determined to be the most effective solution while additional area projects are further developed and implemented in future years. The Study team advocates that the quick and easy to implement short-term solution would most benefit this location while other known upcoming projects are further developed and then implemented.



CO 121 and US 287/120th Ave

Recommendation Cost

New striping and installing new yield condition signs resulted in a construction cost of roughly \$5,000. **Table 8** on page 31-32 highlights the costs associated.

Considerations For Future Needs

This area is subject to major change in future years. The Study team is aware of multiple upcoming projects such as the Midway Blvd. corridor improvement Off-Street Bike Lane/Multi-Use Path, the removal of the Wadsworth connection loops, and the future US 287 connection to Abbot Ave. conceptual schematic as part of larger Wadsworth Parkway renovations. CDOT and The City and County of Broomfield continue to analyze and refine the best path forward to condense roadway access surrounding this intersection and work with affected property owners to improve safety and congestion issues.

The least invasive and expensive option would provide immediate assistance, while not interfering or overlapping with other future construction efforts coming soon in this area. Future possibilities are further explored in the US 287 Vision Zero Study and US 287 Bus Rapid Transit Feasibility Study performed by Boulder County.

For additional dialogue and analysis for all alternatives examined as a part of the *US 287/120th Avenue Multimodal and Safety Study*, see the *Evaluation of Alternatives Report*.

Engineers (Semi) Detailed Estimate (FY 21 Cost Index)	Alternative:	Alternative 1 - Signing & Striping
	Prepared By:	ANM
	Date Prepared:	6/6/2023

	Item		Unit Cost	Quantity	Cost
1	202-Rem Ground Sign	EACH	\$160.00	1	\$160.00
2	614-Sign Panel	SF	\$30.00	32	\$960.00
3	614-Steel Sign Support (2-Inch Round) (Pos	EACH	\$400.00	2	\$800.00
4	627-Thermoplastic Pavement Marking	SF	\$60.00	15	\$900.00
5					
6					
7					
8					
9					
10					
11					
12					
13					
Sub Total					\$2,820.00

**PROJECT CONSTRUCTION BID ITEMS
ROW (Sq. Ft.)**

\$2,820.00

NOTES:

- * Assumed 6" depth over 6" ABC for existing and new asphalt pavement and asphalt patching.
- * Assumed an application rate of 110 lbs/sy/in for asphalt quantities.
- * Assumed 6" depth Concrete Sidewalk over 4" ABC
- * Assumed 6" Concrete Median Cover Material over 7" Embankment Material for median construction.
- * Quantity of excavation assumed to be 24" for R material excavation
- * Assumed concrete section of 9" over 6" ABC
- * 614 Traffic Signal Equipment unit cost includes signal faces, pole and equipment necessary to make signal operational.

Engineers (Semi) Detailed Estimate (FY 22 Cost Index)	Alternative:	Alternative 1 - Signing & Striping
	Prepared By:	ANM
	Date Prepared:	6/6/2023

Item	Unit Cost	Quantity	Extended Cost	<i>Shaded Fields are for INPUT</i>
FROM PAGE 1, BID ITEM TABULATION			\$2,820.00	
			\$2,820.00	
	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	N / A	\$2,820.00	(A)
Contingencies	(15 - 30%) of (A)	15.0%	\$423.00	(B)
ITS	(6 - 10%) of (A)		\$0.00	(C)
Drainage / Utilities	(3 - 10%) of (A)	8.0%	\$225.60	(D)
Signing and Striping	(1 - 5%) of (A)	5.0%	\$141.00	(E)
Clearing & Grubbing	(1 - 5%) of (A)	1.0%	\$28.20	(F)
Construction Signing & Traffic Control	(5 - 25%) of (A)	5.0%	\$141.00	(G)
Mobilization	(4 - 7%) of (A)	5.0%	\$141.00	(H)
Total of Construction Bid Items	(A+B+C+D+E+F+G+H)		\$3,919.80	(I)
Force Account - Utilities	(1 - 2%) of I	2.0%	\$78.40	(J)
Force Account - Misc.	(5 - 15%) of I	10.0%	\$391.98	(K)
Subtotal of Construction Cost	(I+J+K)		\$4,390.18	(L)
Total Construction Engineering	(17%) of L	17.0%	\$746.33	(M)
Total Preliminary Engineering	(8%) of L	8.0%	\$351.21	(N)
Utilities	Project Dependent	N / A	\$0.00	(O)
Total Project Cost			\$5,000.00	(P)



Building a Better World for All of Us®

Building a Better World for All of Us®

Sustainable buildings, sound infrastructure, safe transportation systems, clean water, renewable energy and a balanced environment. Building a Better World for All of Us communicates a companywide commitment to act in the best interests of our clients and the world around us.

We're confident in our ability to balance these requirements.

