Final Report for

Final Recommended Alternatives Report

Southwest Longmont Operations Study

Longmont, CO

April 2019

Prepared for:

CITY OF LONGMONT COLORADO

Prepared by:

SEH

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Contents

Contents (continued)

Contents (continued)

List of Tables

List of Figures

Final Recommended Alternatives Report

Southwest Longmont Operations Study

Prepared for City of Longmont

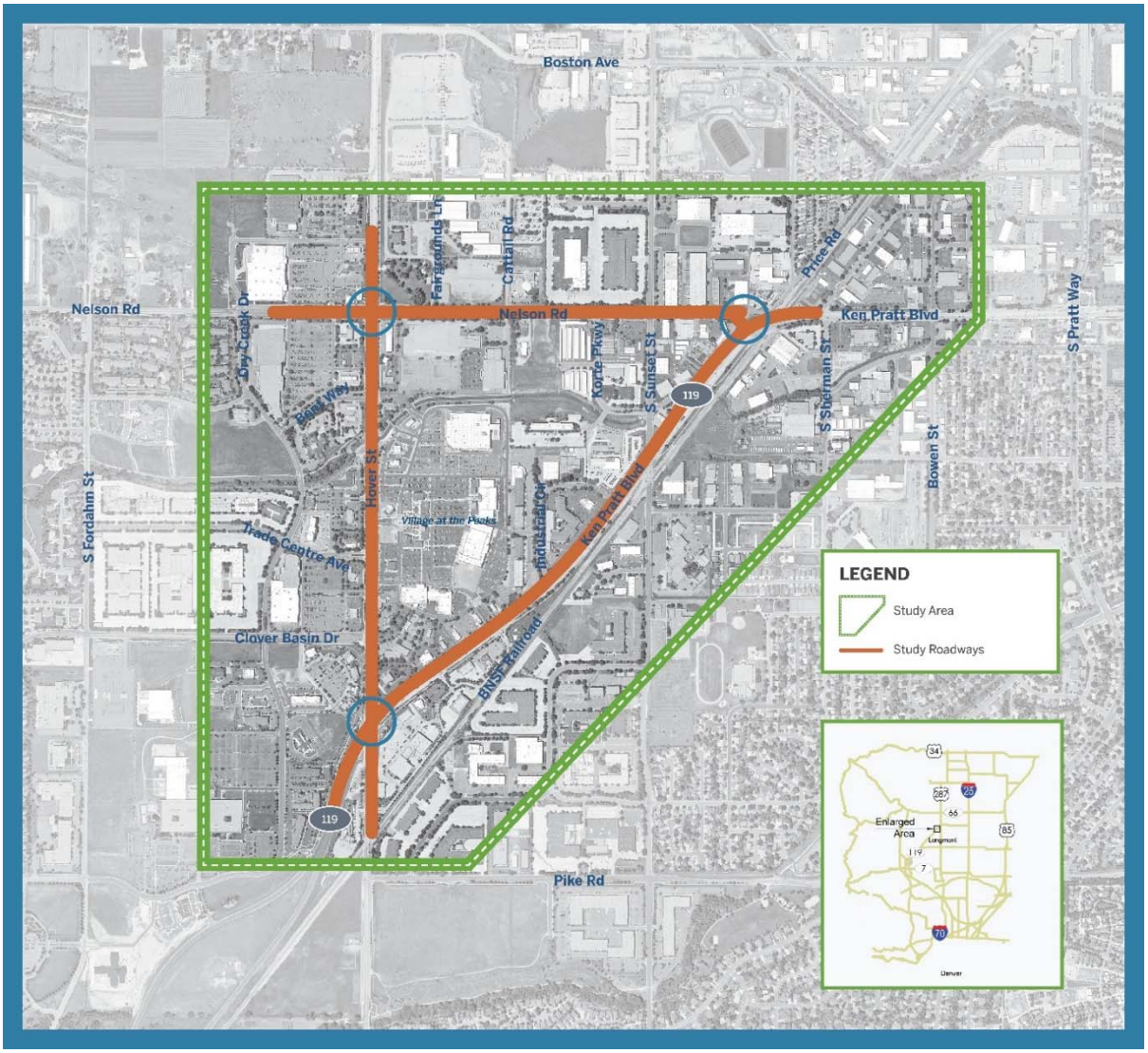
1 Introduction

The *Southwest Longmont Operations Study* was initiated to advance planning to address future demands on Longmont's multimodal transportation system in the southwest part of the City. Specifically, the study examines the arterial roadway network formed by Ken Pratt Boulevard, Hover Street, and Nelson Road, including major intersections along these roadway corridors. The study area is depicted in **Figure 1**. The purpose of the *Final Recommended Alternatives Report* is to identify specific intersection, transportation system, and multimodal improvements, within the study area, into individual projects, vetted through the study process, evaluation, as well as stakeholder and public input. These projects are supported by concept-level designs and budgetary cost estimates to incorporate into the City's implementation plans for future construction.

The *Southwest Longmont Operations Study* was separated into three individual reports.

- *Existing Conditions and 2040 Baseline Analysis Report* - to establish areas of concern based on analysis of existing and future conditions.
- *Evaluation of Alternatives Report* - to create alternatives for locations identified in the *Existing Conditions and 2040 Baseline Analysis Report* and compare them to each other to reach preferred alternatives.
- *Final Recommended Alternatives Report* – List and summarize details of recommended alternatives.

Figure 1 – Study Area



1.1 Study Process

1.1.1 Existing Conditions and 2040 Baseline Analysis Report

This document was created to evaluate and identify issues at the intersections and along the corridors within the study area. It provides guidance for alternatives developed to address the shortfalls of existing locations in the present and 2040. City concerns outlined in *Envision Longmont* were considered for this report and included the following:

- Fulfilling transportation needs with neighborhood character,
- Preserving arterial streets as the backbone of multimodal travel, and
- Integrating safe and accessible bicycle and pedestrian features.

1.1.2 Evaluation of Alternatives Report

The *Evaluation of Alternatives Report* developed and described multiple alternatives for locations identified in the *Existing Conditions and 2040 Baseline Analysis Report* as requiring improvement. Study goals for developing alternatives included:

- Improve mobility and reliability of the system;
- Improve congestion and safety;
- Consider all modes of transportation; and
- Consider comments and suggestions from public involvement process.

1.1.3 Public Involvement

Public involvement includes public meetings with members of the community or interested citizens, but also includes reaching out to stakeholders, in this case including representatives from; City of Longmont, Boulder County, CDOT, and RTD.

A public open house was held on April 5, 2018 to address citizens and garner feedback regarding the alternatives. Public feedback was also received via website survey and comment form. In addition, three Stakeholder Meetings were held to gain consensus of the stakeholders for which alternatives would be supported when going to construction. These were held; March 15, 2018; July 23, 2018; and October 2, 2018.

1.1.4 Transportation Advisory Board / Longmont City Council

The project team presented the recommended alternatives to the Transportation Advisory Board on February 11, 2019 and to the City of Longmont City Council on April 2, 2019. Both entities have concurred with the recommendations set forth in this report.

1.2 Recommended Alternatives

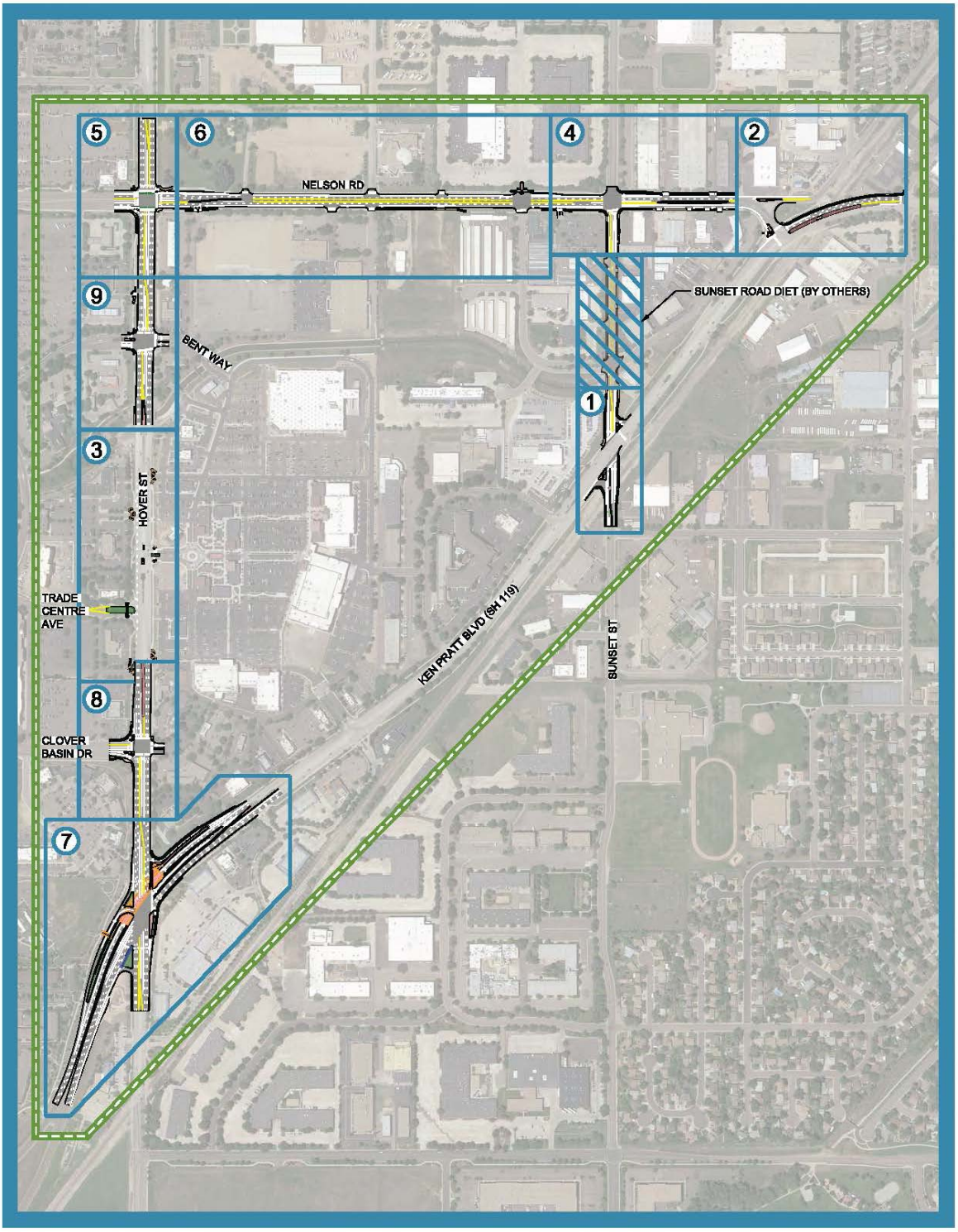
Nine specific projects were developed based on the results of the *Evaluation of Alternatives Report*. The recommended alternative for each location within the study area is listed below in **Table 1**. A summary including a description and cost estimate for each project is detailed in the following sections.

Table 1. – Recommended Alternatives by Location

PROJECT NO.	PROJECT LOCATION	RECOMMENDED ALTERNATIVE
1	Ken Pratt Boulevard & Sunset Street	Conventional Intersection & Road Diet
2	Ken Pratt Boulevard & Nelson Road	Conventional Intersection with Bus Exemption
3	Hover Street Shopping Center Driveways	Improvements to Address Pedestrian Crossing Level of Stress and Safety
4	Nelson Road & Sunset Street	Conventional Intersection
5	Hover Street & Nelson Road	Conventional Intersection with Dual Left Turns and Shared NB/SB Through and Right Turn Lane
6	Nelson Road - Between Hover Street & Ken Pratt Boulevard	Buffered Bike Lanes with Improved Multiuse Path
7	Ken Pratt Boulevard & Hover Street	Westbound Grade Separated
8	Hover Street & Clover Basin Drive	Conventional Intersection with Dual Eastbound Right Turn and Exclusive Southbound Right Turn Lanes
9	Hover Street & Bent Way	Conventional Intersection

A key map of the Recommended Improvements and Proposed Project Limits are illustrated in **Figure 2**.

Figure 2 – Project Prioritization Key Map



2 Project 1- Ken Pratt Boulevard & Sunset Street

2.1 Project 1 Recommended Alternative: Conventional Intersection & Road Diet

Objective: Sunset Street is a Primary Collector. It includes multiple accesses to commercial properties. Public involvement responses included concerns about missing links in bike facility connections in the area. A goal of the proposed improvement is to provide connectivity of bicycle facilities.

The recommended alternative is Alternative 1 from the *Evaluation of Alternatives Report*. The intersection of Ken Pratt Boulevard and Sunset Street is separate but will tie in to the proposed road diet. The intersection incorporates a conventional design. Improvements to the intersection include revising the configuration to have dedicated right and left-turn lanes for both northbound and southbound traffic as well as tie-in to the proposed road diet improvements to Sunset Street.

This intersection with auxiliary lanes includes the following laneage:

- Northbound Approach: One dedicated left-turn lane, one through lane, bike lane, and one dedicated right-turn lane. A raised median separates the northbound/southbound travel lanes and bike lanes are included at the approach in both directions.
- Southbound Approach: One exclusive left-turn lane, one through lane, bike lane, and one exclusive right-turn lane.
- Eastbound Approach: (Maintains existing configuration) one dedicated left-turn lane, two through lanes, and one dedicated right-turn lane.
- Westbound Approach: (Maintains existing configuration) one dedicated left-turn lanes, two through lanes, one of which serves as a shared through / right-turn lane.

Additionally, a road diet on Sunset Street, between Nelson Road and Ken Pratt Boulevard, is currently proposed by the City of Longmont. The road diet includes decreasing the existing roadway cross section from 4 lanes to 3 lanes with one travel lane in each direction and a two way left turn lane median. Additionally, multimodal improvements will include on-street bike lanes in both directions. The recommended alternative is shown in **Figure 3**.

2.2 Project 1 Justification

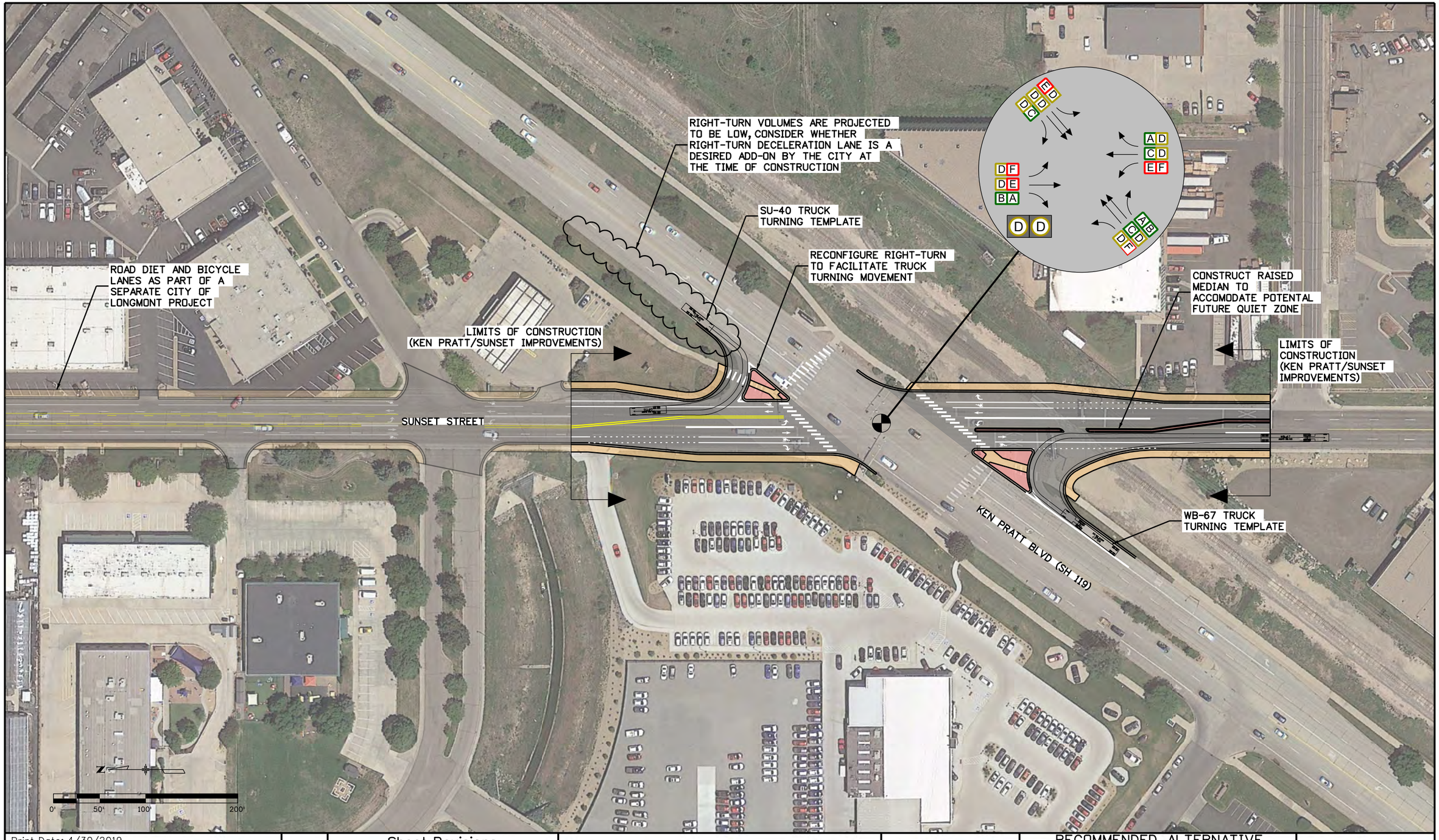
Pedestrian safety and visibility will be improved with the addition of on-street bike lanes and reduction of vehicle travel lanes approaching the intersection. The project is included in the City of Longmont's 2019-2023 Capital Improvement Program as an extension of the proposed Sunset Street road diet from Pike Road to Ken Pratt Boulevard and projected for 2020. The project supports *Envision Longmont* Guiding Principles; #1 by maintaining and enhancing public infrastructure to meet the changing needs of the community and #2 by constructing multi-modal improvements that will provide better mobility and connectivity.

2.3 Project 1 Cost

The budgetary cost estimate to design and construct this alternative is approximately $1.3 Million. This cost estimate does not reflect any right-of way, or coordination with BNSF costs. The semi-detailed cost estimate is shown in **Table 2**.

2.4 Project 1 Priority

The City of Longmont has a road diet proposed for Sunset Street, this project is a natural link in that development that may be built as part of the road diet project as a whole.



Print Date: 4/30/2019	Sheet Revisions		KEN PRATT BOULEVARD / SUNSET STREET
File Name: Figure 10_Ken Pratt_Sunset_Final.dgn	Date:	Comments	Init.
Horiz. Scale: 1:100 Vert. Scale: As Noted			
Unit Information Unit Leader Initials			

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As Constructed	RECOMMENDED ALTERNATIVE CONVENTIONAL INTERSECTION & ROAD DIET		FIGURE 3
No Revisions:	Designer:	Structure Numbers	
Revised:	Detailer:		
Void:	Sheet Subset:	Subset Sheets:	

Project Name: SW Longmont Operations Study

Location of Project: Ken Pratt Blvd/Sunset Street

Table 2

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)	**Alternative:**	**Recommended Alternative: Conventional Intersection**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	$5.00	150	$750.00
2	202-Rem of Conc Pavement	SY	$25.00	550	$13,750.00
3	202-Rem of Median Cover	SY	$10.00	150	$1,500.00
4	202-Rem of Sidewalk	SY	$25.00	700	$17,500.00
5	202- Rem of Curb and Gutter	LF	$10.00	2,100	$21,000.00
6	203-Excavation	CY	$25.00	400	$10,000.00
7	203-Embankment Material	CY	$20.00	150	$3,000.00
8	304-Aggregate Base Course	CY	$25.00	1,000	$25,000.00
9	403-Hot Mix Asphalt	TON	$85.00	200	$17,000.00
10	412-Concrete Pavement	SY	$100.00	1,200	$120,000.00
11	608-Concrete Sidewalk	SY	$60.00	1,100	$66,000.00
12	609-Curb and Gutter	LF	$20.00	2,250	$45,000.00
13	610-Median Cover Material	SF	$5.00	2,110	$10,550.00
14	614-Traffic Signal Equipment	LS	$250,000.00	1	$250,000.00
	Sub Total				**$601,050.00**

PROJECT CONSTRUCTION BID ITEMS **$601,050.00**

ROW (Sq. Ft.)

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 assumbed 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.

Project Name: SW Longmont Operations Study

Location of Project: Ken Pratt Blvd/Sunset Street

Table 2

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)	**Alternative:**	**Recommended Alternative: Conventional Intersection**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

Item	Unit Cost	Quantity	Extended Cost	*Shaded Fields are for INPUT*
FROM PAGE 1, BID ITEM TABULATION			**$601,050.00**	
			$601,050.00	

1000

	% Range	% Used	Cost	
Project Construction Bid Items	75	**N / A**	$601,050.00	**(A)**
Contingencies	(15 - 30%) of (**A**)	25.0%	$150,262.50	**(B)**
ITS	(6 - 10%) of (**A**)		$0.00	**(C)**
Drainage / Utilities	(3 - 10%) of (**A**)	8.0%	$48,084.00	**(D)**
Signing and Striping	(1 - 5%) of (**A**)	5.0%	$30,052.50	**(E)**
Clearing & Grubbing	(1 - 5%) of (**A**)	1.0%	$6,010.50	**(F)**
Construction Signing & Traffic Control	(5 - 25%) of (**A**)	5.0%	$30,052.50	**(G)**
Mobilization	(4 - 7%) of (**A**)	5.0%	$30,052.50	**(H)**
Total of Construction Bid Items	(**A+B+C+D+E+F+G+H**)		$895,564.50	**(I)**
Force Account - Utilities	(1 - 2%) of **I**	2.0%	$17,911.29	**(J)**
Force Account - Misc.	(5 - 15%) of **I**	10.0%	$89,556.45	**(K)**
Subtotal of Construction Cost	(**I+J+K**)		$1,003,032.24	**(L)**
Total Construction Engineering	(17%) of **L**	17.0%	$170,515.48	**(M)**
Total Preliminary Engineering	(8%) of **L**	8.0%	$80,242.58	**(N)**
Utilities	Project Dependent	N / A	$0.00	**(O)**
Right-of-Way (Acre)	Project Dependent	$7000/AC	$1,000.00	**(P)**
		Total Project Cost	$1,255,000.00	**(Q)**

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3 Project 2- Ken Pratt Boulevard & Nelson Road

3.1 Project 2 Recommended Alternative: Conventional Intersection with Bus Exemption

Objective: Ken Pratt Boulevard is classified as a non-rural principal highway (CDOT classification NR-A) within the study area and acts as a major roadway for transit connecting Longmont to Boulder. This project's goals include improving operations and transit mobility, as well as pedestrian and bicyclist safety and mobility.

This alternative is described as Alternative 1a in the *Evaluation of Alternatives Report* for this project. An additional southwest bound through lane on Ken Pratt is extended to the Nelson intersection and terminates at the intersection as an exclusive right-turn lane. This results in also extending storage for the right-turn lane. Another improvement includes eliminating the westbound left-turn movement from Price Road and installing a median for enforcement and guidance. Additionally, the proposed westbound approach includes a proposed queue jump, through lane for buses only. The southeast bound right turn channelizing island is also proposed to be rebuilt to provide the through lane for buses and a slip ramp for bicycles.

This intersection with auxiliary lanes includes the following laneage:

- Northeast Bound Approach (Ken Pratt): (Maintains existing configuration) one exclusive left-turn lane and two through lanes.
- Southwest Bound Approach (Ken Pratt): (Maintains existing configuration) two through lanes and one exclusive right-turn lane.
- Southeast Bound Approach (Nelson Road): (Maintains existing configuration) two exclusive left-turn lanes and one exclusive right-turn lane. (One left-turn lane at Price Road).
- Westbound Approach (Price Road): One through lane.

Figure 4 shows the layout for this alternative.

3.2 Project 2 Justification

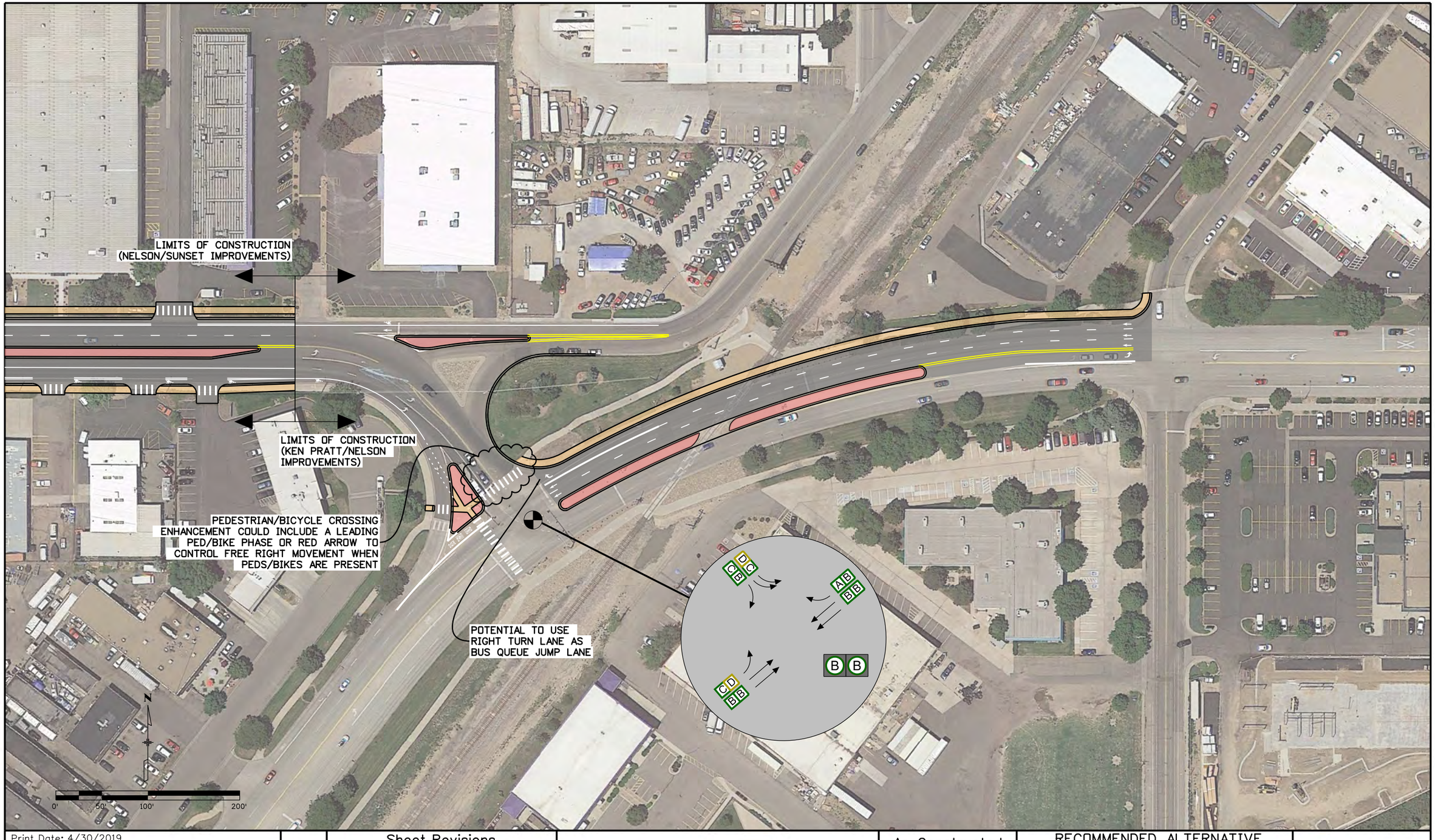
Pedestrian and bicyclist safety will be improved with the addition of on-street bike lanes and improved pedestrian facilities. The project is at the termini of a project included in the City of Longmont's 2019-2023 Capital Improvement Program: Ken Pratt Blvd/SH 119 Improvement – S. Pratt to Nelson (CIP #TRP120). The proposed intersection is designed to fit in with those proposed improvements. The project supports *Envision Longmont* Guiding Principles; #1 by maintaining and enhancing public infrastructure to meet the changing needs of the community, #2 by constructing multimodal improvements that will provide better mobility and connectivity, and #4 by promoting a healthy and active lifestyle by making connections to existing bike paths.

3.3 Project 2 Cost

The budgetary cost estimate to design and construct this alternative is approximately $650,000. This cost estimate does not reflect any right-of way coordination costs. The semi-detailed cost estimate is shown in **Table 3**.

3.4 Project 2 Priority

With the City's proposed (CIP #TRP120) partially funded and already in the works, it is preferred to disturb the area once to include all improvements at the same time.



Print Date: 4/30/2019	Sheet Revisions		
File Name: Figure 9_Ken Pratt_Nelson_Final.dgn	Date:	Comments	Init.
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			

KEN PRATT BOULEVARD / NELSON ROAD

As Constructed

No Revisions:

Revised:

Void:

RECOMMENDED ALTERNATIVE
CONVENTIONAL INTERSECTION
& BUS QUEUE JUMP

Designer:

Detailer:

Sheet Subset:

Structure Numbers

Subset Sheets:

FIGURE 4

Project Name: SW Longmont Operations Study

Location of Project: Ken Pratt Blvd/Nelson Road

Table 3

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)	**Alternative:**	**Recommended Alternative: Conventional Intersection**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	$5.00	100	$500.00
2	202-Rem of Conc Pavement	SY	$25.00	2,750	$68,750.00
3	202-Rem of Median Cover	SY	$10.00	700	$7,000.00
4	202-Rem of Sidewalk	SY	$25.00	650	$16,250.00
5	202- Rem of Curb and Gutter	LF	$10.00	850	$8,500.00
6	203-Excavation	CY	$25.00	400	$10,000.00
7	203-Embankment Material	CY	$20.00	400	$8,000.00
8	304-Aggregate Base Course	CY	$25.00	200	$5,000.00
9	403-Hot Mix Asphalt	TON	$85.00	40	$3,400.00
10	412-Concrete Pavement	SY	$125.00	550	$68,750.00
11	608-Concrete Sidewalk	SY	$60.00	650	$39,000.00
12	609-Curb and Gutter	LF	$20.00	1,700	$34,000.00
13	610-Median Cover Material	SF	$5.00	6,700	$33,500.00
14	614-Traffic Signal Equipment	LS	$250,000.00	0	$0.00
	Sub Total				**$302,650.00**

PROJECT CONSTRUCTION BID ITEMS **$302,650.00**

ROW (Sq. Ft.)

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 assumbed 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.

Project Name: SW Longmont Operations Study

Location of Project: Ken Pratt Blvd/Nelson Road

Table 3

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)		
	Alternative:	**Recommended Alternative: Conventional Intersection**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

Item	Unit Cost	Quantity	Extended Cost	*Shaded Fields are for INPUT*
FROM PAGE 1, BID ITEM TABULATION			**$302,650.00**	
		2,750.00		
		700.00		
		650.00		
			$302,650.00	

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	% Range	% Used	Cost	
Project Construction Bid Items	125	**N / A**	$302,650.00	**(A)**
Contingencies	(15 - 30%) of (**A**)	25.0%	$75,662.50	**(B)**
ITS	(6 - 10%) of (**A**)		$0.00	**(C)**
Drainage / Utilities	(3 - 10%) of (**A**)	8.0%	$24,212.00	**(D)**
Signing and Striping	(1 - 5%) of (**A**)	5.0%	$15,132.50	**(E)**
Clearing & Grubbing	(1 - 5%) of (**A**)	1.0%	$3,026.50	**(F)**
Construction Signing & Traffic Control	(5 - 25%) of (**A**)	5.0%	$15,132.50	**(G)**
Mobilization	(4 - 7%) of (**A**)	5.0%	$15,132.50	**(H)**
Total of Construction Bid Items	(**A+B+C+D+E+F+G+H**)		$450,948.50	**(I)**
Force Account - Utilities	(1 - 2%) of **I**	2.0%	$9,018.97	**(J)**
Force Account - Misc.	(5 - 15%) of **I**	10.0%	$45,094.85	**(K)**
Subtotal of Construction Cost	(**I+J+K**)		$505,062.32	**(L)**
Total Construction Engineering	(17%) of **L**	17.0%	$85,860.59	**(M)**
Total Preliminary Engineering	(8%) of **L**	8.0%	$40,404.99	**(N)**
Utilities	Project Dependent	N / A	$0.00	**(O)**
Right-of-Way (Acre)	Project Dependent	$7000/AC	$1,000.00	**(P)**
		Total Project Cost	$632,000.00	**(Q)**

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4 Project 3- Hover Street Shopping Center Driveways

4.1 Project 3 Recommended Alternative: Various Improvements

Objective: Improvements for pedestrians and bicyclists comfort, and visibility along the Hover Street corridor. **Figure 5** displays the recommended improvements described in more detail below.

4.1.1 Trade Centre Avenue:

At this access point, the crossing location shifts the crossing to the west providing benefits to those turning in and out. For those making the right-in and left-in movements, the shift means people cross after vehicles have slowed down. Additional improvements are listed below.

- Raised Crosswalk: A raised crosswalk at this location and at the right-in location just south of the intersection brings more attention to bicyclists and pedestrians in the crosswalk, and requires drivers to slow down.
- Painted Crosswalks at Driveways: Adding painted crosswalks at driveways also brings more attention to bicyclists and pedestrians crossing alternating green and white stripes to delineate bus and pedestrian crossing at the sidepath locations.

4.1.2 Village at the Peaks Main Driveway:

For this driveway, medians on the east and south legs of the intersection provide a safe refuge for pedestrians and bicyclists unable to cross the entire street during the allotted time. Median noses provide additional protection from turning vehicles as well as slowing vehicles as they make the turning movement.

4.1.3 Right-in Only:

Improvements include clearly marked crosswalks at existing locations and located after cars have made most of their turn to maximize visibility after they have slowed down.

4.1.4 Right-in / Right-out:

Crosswalks will be set back from the curb at existing right-in / right-out driveway accesses to allow vehicles better visibility for people crossing and finding a gap within on-coming traffic to merge on to Hover Street.

4.2 Project 3 Justification

The proposed improvements may be implemented in combination with the City of Longmont's 2019 – 2023 Capital Improvement Program Hover Street Improvements Project (CIP #TRP122). The project improves safety for multimodal transportation along the facility which was a noted concern during public outreach along this corridor. The project supports *Envision Longmont* Guiding Principles; #1 by creating an improved multimodal corridor, #2 by improving the multimodal transportation systems with safer crossings for bicyclists and pedestrians, and #4 by creating a safer corridor for bicyclists and pedestrians to promote healthy and active lifestyles for residents of Longmont.

4.3 Project 3 Cost

The budgetary cost estimate to design and construct this alternative is approximately $300,000. The semi-detailed cost estimate is shown in **Table 4**.

4.4 Project 3 Priority

The Hover Street Improvements Project (CIP #TRP122) is partially funded and already slated for the Capital Improvements Plan, the improvements recommended through this project fit into those goals and allow for simultaneous construction and disturbance.

Print Date: 4/30/2019		Sheet Revisions			HOVER STREET
File Name: Figure 4_Hover_Pedestrian Improvements_Final.dgn		Date:	Comments	Init.	
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					

As Constructed	RECOMMENDED ALTERNATIVE HOVER STREET PEDESTRIAN IMPROVEMENTS		
No Revisions:	Designer:	Structure Numbers	FIGURE 5
Revised:	Detailer:		
Void:	Sheet Subset:	Subset Sheets:	

Project Name: SW Longmont Operations Study

Location of Project: Hover Street

Table 4

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)		
	Alternative:	**Recommended Alternative: Pedestrian Improvements**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	$5.00	3,950	$19,750.00
2	202-Rem of Conc Pavement	SY	$25.00	380	$9,500.00
3	202-Rem of Median Cover	SY	$10.00	2,550	$25,500.00
4	202-Rem of Sidewalk	SY	$25.00	200	$5,000.00
5	202- Rem of Curb and Gutter	LF	$10.00	520	$5,200.00
6	203-Excavation	CY	$25.00	100	$2,500.00
7	203-Embankment Material	CY	$20.00	100	$2,000.00
8	304-Aggregate Base Course	CY	$25.00	200	$5,000.00
9	403-Hot Mix Asphalt	TON	$85.00	10	$850.00
10	412-Concrete Pavement	SY	$125.00	50	$6,250.00
11	608-Concrete Sidewalk	SY	$60.00	375	$22,500.00
12	609-Curb and Gutter	LF	$20.00	600	$12,000.00
13	610-Median Cover Material	SF	$5.00	5,500	$27,500.00
14	614-Traffic Signal Equipment	LS	$250,000.00		$0.00
	Sub Total				**$143,550.00**

PROJECT CONSTRUCTION BID ITEMS **$143,550.00**

ROW (Sq. Ft.)

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 assumbed 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.

Project Name: SW Longmont Operations Study

Location of Project: Hover Street

Table 4

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)		
	Alternative:	**Recommended Alternative: Pedestrian Improvements**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

Item			Unit Cost	Quantity	Extended Cost	*Shaded Fields are for INPUT*
FROM PAGE 1, BID ITEM TABULATION					**$143,550.00**	
					$143,550.00	

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	**N / A**	$143,550.00	**(A)**
Contingencies	(15 - 30%) of (**A**)	25.0%	$35,887.50	**(B)**
ITS	(6 - 10%) of (**A**)		$0.00	**(C)**
Drainage / Utilities	(3 - 10%) of (**A**)	8.0%	$11,484.00	**(D)**
Signing and Striping	(1 - 5%) of (**A**)	5.0%	$7,177.50	**(E)**
Clearing & Grubbing	(1 - 5%) of (**A**)	1.0%	$1,435.50	**(F)**
Construction Signing & Traffic Control	(5 - 25%) of (**A**)	5.0%	$7,177.50	**(G)**
Mobilization	(4 - 7%) of (**A**)	5.0%	$7,177.50	**(H)**
Total of Construction Bid Items	(**A+B+C+D+E+F+G+H**)		$213,889.50	**(I)**
Force Account - Utilities	(1 - 2%) of **I**	2.0%	$4,277.79	**(J)**
Force Account - Misc.	(5 - 15%) of **I**	10.0%	$21,388.95	**(K)**
Subtotal of Construction Cost	(**I+J+K**)		$239,556.24	**(L)**
Total Construction Engineering	(17%) of **L**	17.0%	$40,724.56	**(M)**
Total Preliminary Engineering	(8%) of **L**	8.0%	$19,164.50	**(N)**
Utilities	Project Dependent	N / A	$0.00	**(O)**
Right-of-Way (Acre)	Project Dependent	$7000/AC	$1,000.00	**(P)**
		Total Project Cost	$300,000.00	**(Q)**

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5 Project 4- Nelson Road & Sunset Street

5.1 Project 4 Recommended Alternative: Conventional Intersection

Objective: Sunset Street is a Primary Collector. It includes multiple accesses to commercial properties. Public involvement responses included concerns about missing links in bike facility connections in the area. A goal of the proposed improvement is to provide connectivity of bicycle facilities.

The recommended alternative for this intersection is Alternative 1 in the *Evaluation of Alternatives Report*, which maintains a conventional layout. Improvements include changing the present shared through / right-turn lane to exclusive through and exclusive right-turn lanes at the northbound approach to the intersection. A dedicated right-turn lane in the eastbound direction is also included in the proposed improvements. **Figure 6** shows the layout of the alternative.

This intersection with auxiliary lanes includes the following laneage:

- Northbound Approach: One exclusive left-turn lane, one through lane, bike lane, and one exclusive right-turn lane.
- Southbound Approach: (Maintains existing configuration) one exclusive left-turn lane, one through lane, bike lane, and one exclusive right-turn lane.
- Eastbound Approach: One exclusive left-turn lane, two through lanes, bike lane, and one exclusive right-turn lane.
- Westbound Approach: (Maintains existing configuration) one exclusive left-turn lane, two through lanes, bike lane, and one exclusive right-turn lane.

Additionally, a road diet on Sunset Street, south of Nelson Road, is currently proposed by the City of Longmont. The road diet includes decreasing the existing roadway cross section from 4 lanes to 3 lanes with one travel lane in each direction and a two way left turn lane median. Bicycle improvements will include on-street bike lanes in both directions along Sunset Street while an on-street bike lane is also proposed for eastbound Nelson Road through the intersection and will be incorporated into these improvements.

5.2 Project 4 Justification

The proposed recommendations increase the Level of Service of the intersection from a failing C/E to acceptable C/D for 2040. As part of the overall goal to improve bicycle and pedestrian safety and mobility, this project coincides with The City of Longmont's plans for a road diet on Sunset Street and incorporates it into the design. The project supports *Envision Longmont* Guiding Principles; #1 by maintaining and enhancing public infrastructure to meet the changing needs of the community, #2 by constructing multi-modal improvements that will provide better mobility and connectivity, and #4 by promoting a healthy and active lifestyle by making connections to existing bike paths.

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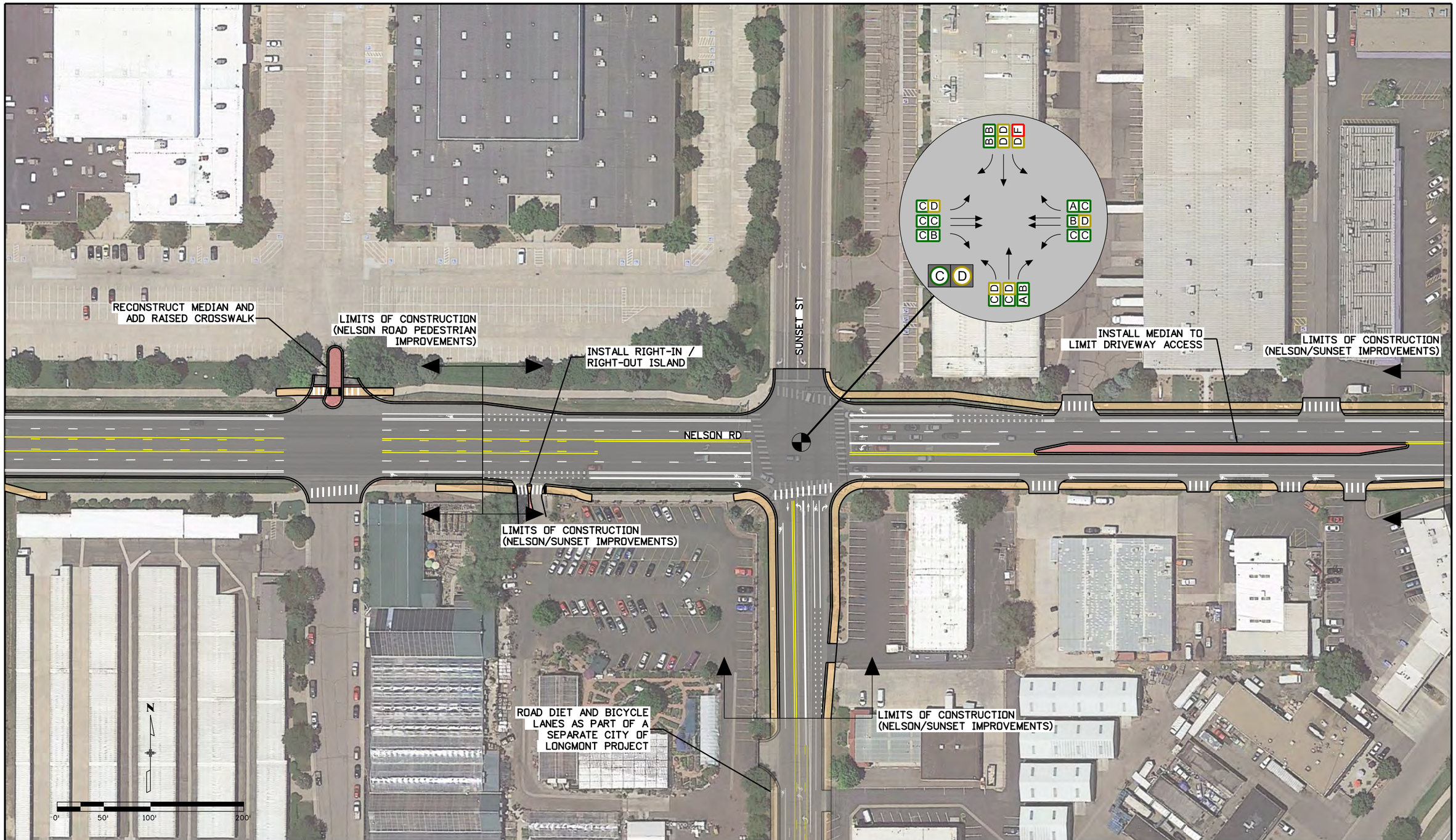
5.3 Project 4 Cost

The budgetary cost estimate to design and construct this alternative is approximately $1.1 Million. This cost estimate does not reflect any right-of way costs or coordination. The semi-detailed cost estimate is shown in **Table 5**.

5.4 Project 4 Priority

As the City extends the Sunset Street road diet and bicycle lanes north from Ken Pratt to Nelson Road, this intersection will be integral to completing the section and guiding bicyclists through.



Print Date: 4/30/2019	Sheet Revisions		
File Name: Figure 8_Nelson Road Bike Lanes2_Final.dgn	Date:	Comments	Init.
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			

NELSON ROAD / SUNSET STREET

As Constructed

No Revisions:

Revised:

Void:

RECOMMENDED ALTERNATIVE CONVENTIONAL INTERSECTION & ROAD DIET

Designer:

Detailer:

Sheet Subset:

Structure Numbers

Subset Sheets:

FIGURE 6

Project Name: SW Longmont Operations Study

Location of Project: Nelson Road/Sunset Street

Table 5

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)		
	Alternative:	**Recommended Alternative: Conventional Intersection**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	$5.00	500	$2,500.00
2	202-Rem of Conc Pavement	SY	$25.00	0	$0.00
3	202-Rem of Median Cover	SY	$10.00	0	$0.00
4	202-Rem of Sidewalk	SY	$25.00	1,150	$28,750.00
5	202- Rem of Curb and Gutter	LF	$10.00	2,420	$24,200.00
6	203-Excavation	CY	$25.00	100	$2,500.00
7	203-Embankment Material	CY	$20.00	100	$2,000.00
8	304-Aggregate Base Course	CY	$25.00	500	$12,500.00
9	403-Hot Mix Asphalt	TON	$85.00	500	$42,500.00
10	412-Concrete Pavement	SY	$125.00	0	$0.00
11	608-Concrete Sidewalk	SY	$60.00	1,275	$76,500.00
12	609-Curb and Gutter	LF	$20.00	2,900	$58,000.00
13	610-Median Cover Material	SF	$5.00	3,420	$17,100.00
14	614-Traffic Signal Equipment	LS	$250,000.00	1	$250,000.00
	Sub Total				**$516,550.00**

PROJECT CONSTRUCTION BID ITEMS **$516,550.00**

ROW (Sq. Ft.)

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 assumbed 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.

Project Name: SW Longmont Operations Study

Location of Project: Nelson Road/Sunset Street

Table 5

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)		
	Alternative:	**Recommended Alternative: Conventional Intersection**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

Item	Unit Cost	Quantity	Extended Cost	*Shaded Fields are for INPUT*
FROM PAGE 1, BID ITEM TABULATION			**$516,550.00**	
			$516,550.00	

	% Range	% Used	Cost	
Project Construction Bid Items	100	**N / A**	$516,550.00	**(A)**
Contingencies	(15 - 30%) of (**A**)	25.0%	$129,137.50	**(B)**
ITS	(6 - 10%) of (**A**)		$0.00	**(C)**
Drainage / Utilities	(3 - 10%) of (**A**)	8.0%	$41,324.00	**(D)**
Signing and Striping	(1 - 5%) of (**A**)	5.0%	$25,827.50	**(E)**
Clearing & Grubbing	(1 - 5%) of (**A**)	1.0%	$5,165.50	**(F)**
Construction Signing & Traffic Control	(5 - 25%) of (**A**)	5.0%	$25,827.50	**(G)**
Mobilization	(4 - 7%) of (**A**)	5.0%	$25,827.50	**(H)**
Total of Construction Bid Items	(**A+B+C+D+E+F+G+H**)		$769,659.50	**(I)**
Force Account - Utilities	(1 - 2%) of **I**	2.0%	$15,393.19	**(J)**
Force Account - Misc.	(5 - 15%) of **I**	10.0%	$76,965.95	**(K)**
Subtotal of Construction Cost	(**I+J+K**)		$862,018.64	**(L)**
Total Construction Engineering	(17%) of **L**	17.0%	$146,543.17	**(M)**
Total Preliminary Engineering	(8%) of **L**	8.0%	$68,961.49	**(N)**
Utilities	Project Dependent	N / A	$0.00	**(O)**
Right-of-Way (Acre)	Project Dependent	$7000/AC	$1,000.00	**(P)**
		Total Project Cost	$1,079,000.00	**(Q)**

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6 Project 5- Hover Street & Nelson Road

6.1 Project 5 Recommended Alternative: Conventional Intersection with Dual Left Turns and Shared NB/SB Through and Right Turn Lane

Objective: Public involvement responses included concerns about missing links in bike facility connections in the area. A goal of the proposed improvement is to provide connectivity and continuity of pedestrian and bicycle facilities.

This project includes improvements for capacity and multi-modal needs. Additional left-turn lanes and an additional through lane are proposed for northbound and southbound approaches. Additional through lanes are accommodated by converting the existing right-turn only lanes to shared through / right-turn lanes in both directions. In addition, continuous bike lanes are proposed along Nelson Road.

This intersection with auxiliary lanes includes the following laneage:

- Northbound Approach: Two exclusive left-turn lanes, two through lanes, and one shared through / right-turn lane.
- Southbound Approach: Two exclusive left-turn lanes, two through lanes, and one shared through / right-turn lane.
- Eastbound Approach: (Maintains existing configuration with the addition of a bike lane) two exclusive left-turn lanes, two through lanes, and one exclusive right-turn lane.
- Westbound Approach: (Maintains existing configuration with the addition of a bike lane) two exclusive left-turn lanes, two through lanes, and one exclusive right-turn lane.

Other multimodal improvements at the intersection include green painted bike lanes for east/west bike traffic as well as curb separated bike lanes on the northwest and southeast corners. High visibility crosswalk markings along with pass-thru islands for bicycles and pedestrians that in addition shorten crossing distances across Hover Street and Nelson Road.

Figure 7 shows the layout for this alternative.

6.2 Project 5 Justification

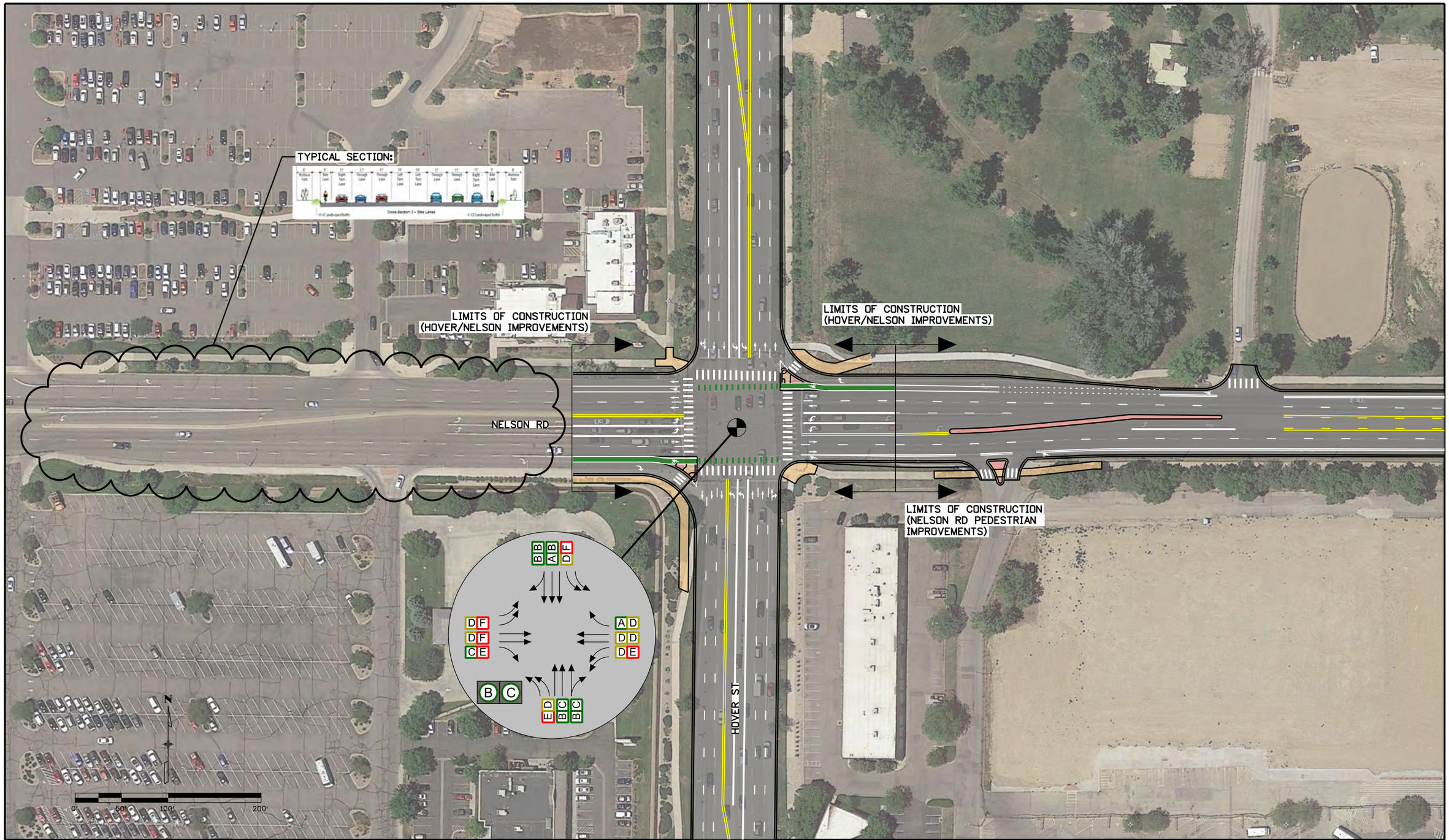
The proposed improvements improve LOS for the intersection from D/F to C/E for 2040. As part of the overall goal to improve bicycle and pedestrian safety and mobility, the connectivity of bike paths along Nelson Road are in lines with City of Longmont visions and mobility goals. The intersection is also included in the City of Longmont's Capital Improvement Program for 2019-2023 (CIP #TRP124). The project supports *Envision Longmont* Guiding Principles; #1 through infrastructure improvements; #2 by improving the transportation systems with better mobility and connectivity for multi-modal transportation; and #4 by promoting a healthy and active lifestyle by making connections to existing bike paths.

6.3 Project 5 Cost

The budgetary cost estimate to design and construct this alternative is approximately $1.3 million. This cost estimate does not reflect any right-of way costs or coordination. The semi-detailed cost estimate is shown in **Table 6**.

6.4 Project 5 Priority

This project in conjunction with the Nelson bike project (Project #6) have the highest priority for the City of Longmont for projects in this report that are not underway. City of Longmont views this project as important to citizens and improving operations at Hover and Nelson as well as completing the bicycle and pedestrian facilities at the intersection and along Nelson Road. This intersection is slated as (CIP #TRP124) in the City's Capital Improvement Program for 2019-2023, while not yet funded it is accounted for.



Print Date: 4/30/2019	Sheet Revisions			HOVER STREET / NELSON ROAD	As Constructed
File Name: Figure 6_Hover_Nelson_Final.dgn	Date:	Comments	Init.		No Revisions:
Horiz. Scale: 1:100 Vert. Scale: As Noted					Revised:
Unit Information Unit Leader Initials					Void:
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					

RECOMMENDED ALTERNATIVE CONVENTIONAL INTERSECTION			FIGURE 7
Designer:	Structure Numbers		
Detailer:			
Sheet Subset:	Subset Sheets:		

Project Name: SW Longmont Operations Study

Location of Project: Hover Street/Nelson Road

Table 6

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)		
	Alternative:	**Recommended Alternative: Conventional w/ 3 Thru Lanes**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	$5.00	8,200	$41,000.00
2	202-Rem of Conc Pavement	SY	$25.00	50	$1,250.00
3	202-Rem of Median Cover	SY	$10.00	80	$800.00
4	202-Rem of Sidewalk	SY	$25.00	450	$11,250.00
5	202- Rem of Curb and Gutter	LF	$10.00	1,400	$14,000.00
6	203-Excavation	CY	$25.00	300	$7,500.00
7	203-Embankment Material	CY	$20.00	250	$5,000.00
8	304-Aggregate Base Course	CY	$25.00	600	$15,000.00
9	403-Hot Mix Asphalt	TON	$85.00	1,000	$85,000.00
10	412-Concrete Pavement	SY	$100.00	1,000	$100,000.00
11	608-Concrete Sidewalk	SY	$60.00	1,000	$60,000.00
12	609-Curb and Gutter	LF	$20.00	1,400	$28,000.00
13	610-Median Cover Material	SF	$5.00	200	$1,000.00
14	614-Traffic Signal Equipment	LS	$250,000.00	1	$250,000.00
	Sub Total				**$619,800.00**

PROJECT CONSTRUCTION BID ITEMS **$619,800.00**

ROW (Sq. Ft.)

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 assumbed 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.

Project Name: SW Longmont Operations Study

Location of Project: Hover Street/Nelson Road

Table 6

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)		
	Alternative:	**Recommended Alternative: Conventional w/ 3 Thru Lanes**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

Item	Unit Cost	Quantity	Extended Cost	*Shaded Fields are for INPUT*
FROM PAGE 1, BID ITEM TABULATION			**$619,800.00**	
			$619,800.00	

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	**N / A**	$619,800.00	**(A)**
Contingencies	(15 - 30%) of (**A**)	25.0%	$154,950.00	**(B)**
ITS	(6 - 10%) of (**A**)		$0.00	**(C)**
Drainage / Utilities	(3 - 10%) of (**A**)	8.0%	$49,584.00	**(D)**
Signing and Striping	(1 - 5%) of (**A**)	5.0%	$30,990.00	**(E)**
Clearing & Grubbing	(1 - 5%) of (**A**)	1.0%	$6,198.00	**(F)**
Construction Signing & Traffic Control	(5 - 25%) of (**A**)	5.0%	$30,990.00	**(G)**
Mobilization	(4 - 7%) of (**A**)	5.0%	$30,990.00	**(H)**
Total of Construction Bid Items	(**A+B+C+D+E+F+G+H**)		$923,502.00	**(I)**
Force Account - Utilities	(1 - 2%) of **I**	2.0%	$18,470.04	**(J)**
Force Account - Misc.	(5 - 15%) of **I**	10.0%	$92,350.20	**(K)**
Subtotal of Construction Cost	(**I+J+K**)		$1,034,322.24	**(L)**
Total Construction Engineering	(17%) of **L**	17.0%	$175,834.78	**(M)**
Total Preliminary Engineering	(8%) of **L**	8.0%	$82,745.78	**(N)**
Utilities	Project Dependent	N / A	$0.00	**(O)**
Right-of-Way (Acre)	Project Dependent	$7000/AC	$1,000.00	**(P)**
		Total Project Cost	$1,294,000.00	**(Q)**

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7 Project 6- Nelson Road – Hover Street to Ken Pratt Boulevard

7.1 Project 6 Recommended Alternative: Buffered Bike Lanes with Improved Multiuse Path

Objective: Nelson Road has inconsistent facilities for pedestrians and bicyclists. Some areas have gaps in the sidepath network, and the on-street bike lane is not continuous through this section of Nelson Road. The goal for this project is multimodal mobility and safety.

This alternative is further illustrated in the *Evaluation of Alternatives Report* as Cross Section 1. Improvements for this section of Nelson Road include buffered bike lanes with a 1.5 foot striped buffer separating the bike lane from vehicular traffic. The space for these lanes would come from lane narrowing. The existing multiuse path will be maintained at eight feet for those still uncomfortable riding on-street.

Figure 8 shows the layout for this alternative.

7.2 Project 6 Justification

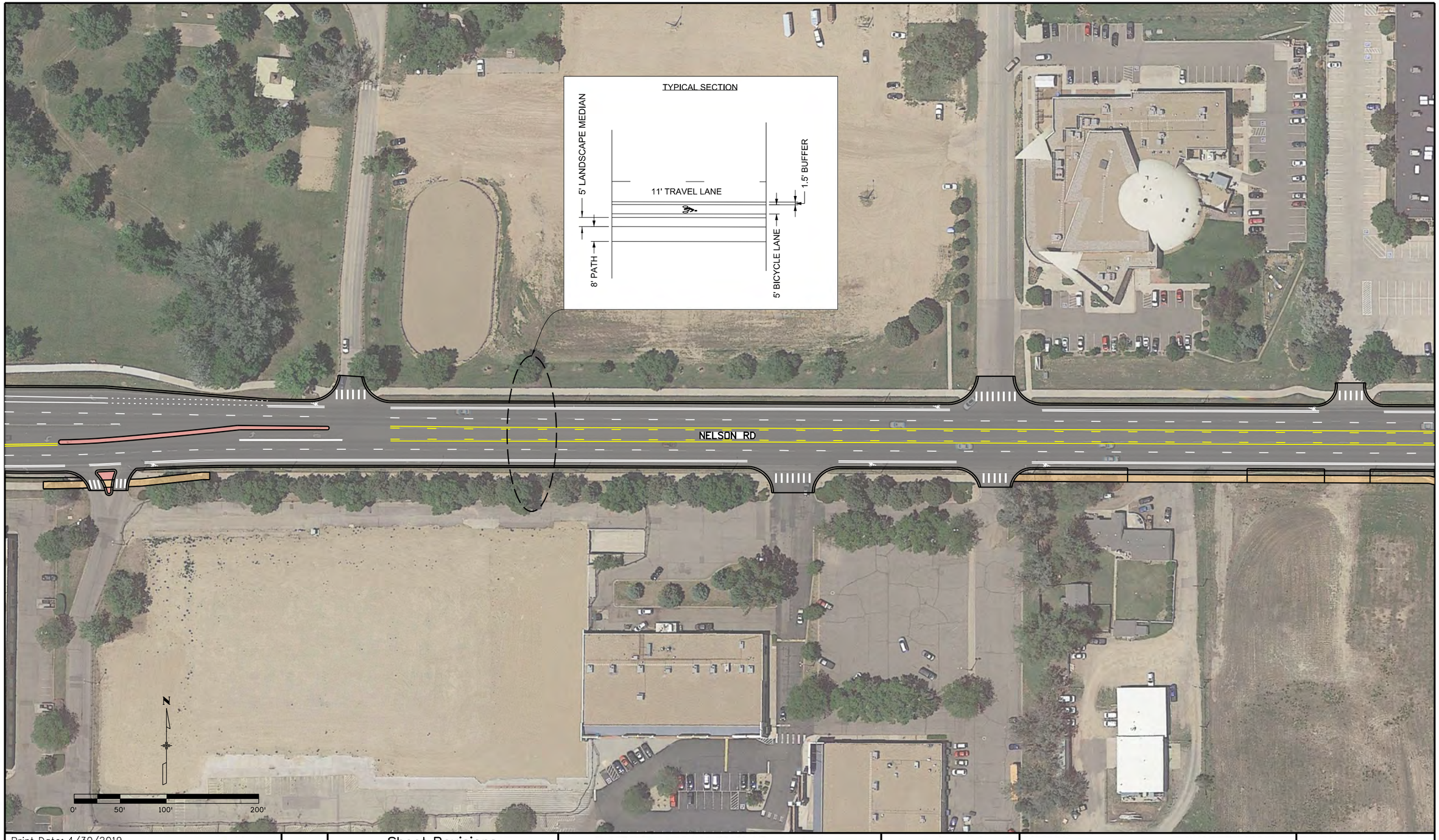
As part of the overall goal to improve bicycle and pedestrian safety and mobility, the connectivity of bike paths along Nelson Road are in lines with City of Longmont visions and mobility goals. Improvements to the corridor west of Hover Street (from Grandview Meadows Drive to Hover Street) (CIP #TRP123) is included in the City of Longmont's Capital Improvement Program for 2019-2023, keeping a consistency through the Nelson Road and Hover Street intersection. The project supports *Envision Longmont* Guiding Principles; #1 through infrastructure improvements; #2 by improving the transportation systems with better mobility and connectivity for multi-modal transportation; and #4 by promoting a healthy and active lifestyle by making connections to existing bike paths.

7.3 Project 6 Cost

The budgetary cost estimate to design and construct this alternative is approximately $550,000. This cost estimate does not reflect any right-of way costs or coordination. The semi-detailed cost estimate is shown in **Table 7**.

7.4 Project 6 Priority

This project in conjunction with the Hover / Nelson intersection project (Project #5) have the highest priority for the City of Longmont that are not already included in projects already underway. City of Longmont views this project as important to citizens by completing the bicycle and pedestrian facilities along Nelson Road and through the intersection while also improving operations at Hover / Nelson. (CIP #TRP123) is not presently funded but on the horizon and included in the Capital Improvement Plan for the City. Project 6 would tie-in to the improvements of Project #5 and carry improvements east to Ken Pratt Boulevard.



Print Date: 4/30/2019		Sheet Revisions			NELSON ROAD	As Constructed
File Name: Figure 7_Nelson Road Bike Lanes_Final.dgn		Date:	Comments	Init.		No Revisions:
Horiz. Scale: 1:100 Vert. Scale: As Noted						Revised:
Unit Information Unit Leader Initials						Void:
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						

RECOMMENDED ALTERNATIVE NELSON ROAD IMPROVEMENTS			FIGURE 8
Designer:	Structure Numbers		
Detailer:			
Sheet Subset:	Subset Sheets:		

Project Name: SW Longmont Operations Study

Location of Project: Nelson Road

Table 7

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)		
	Alternative:	**Recommended Alternative: Nelson Road Improvements**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	$5.00	1,000	$5,000.00
2	202-Rem of Conc Pavement	SY	$25.00	120	$3,000.00
3	202-Rem of Median Cover	SY	$10.00	2,300	$23,000.00
4	202-Rem of Sidewalk	SY	$25.00	280	$7,000.00
5	202- Rem of Curb and Gutter	LF	$10.00	4,200	$42,000.00
6	203-Excavation	CY	$25.00	100	$2,500.00
7	203-Embankment Material	CY	$20.00	100	$2,000.00
8	304-Aggregate Base Course	CY	$25.00	400	$10,000.00
9	403-Hot Mix Asphalt	TON	$85.00	350	$29,750.00
10	412-Concrete Pavement	SY	$125.00	10	$1,250.00
11	608-Concrete Sidewalk	SY	$60.00	680	$40,800.00
12	609-Curb and Gutter	LF	$20.00	4,200	$84,000.00
13	610-Median Cover Material	SF	$5.00	2,150	$10,750.00
14	614-Traffic Signal Equipment	LS	$250,000.00		$0.00
	Sub Total				**$261,050.00**

PROJECT CONSTRUCTION BID ITEMS **$261,050.00**

ROW (Sq. Ft.)

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 assumbed 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.

Project Name: SW Longmont Operations Study

Location of Project: Nelson Road

Table 7

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)	**Alternative:**	**Recommended Alternative: Nelson Road Improvements**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

Item	Unit Cost	Quantity	Extended Cost	*Shaded Fields are for INPUT*
FROM PAGE 1, BID ITEM TABULATION			**$261,050.00**	
			$261,050.00	

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	**N / A**	$261,050.00	**(A)**
Contingencies	(15 - 30%) of (**A**)	25.0%	$65,262.50	**(B)**
ITS	(6 - 10%) of (**A**)		$0.00	**(C)**
Drainage / Utilities	(3 - 10%) of (**A**)	8.0%	$20,884.00	**(D)**
Signing and Striping	(1 - 5%) of (**A**)	5.0%	$13,052.50	**(E)**
Clearing & Grubbing	(1 - 5%) of (**A**)	1.0%	$2,610.50	**(F)**
Construction Signing & Traffic Control	(5 - 25%) of (**A**)	5.0%	$13,052.50	**(G)**
Mobilization	(4 - 7%) of (**A**)	5.0%	$13,052.50	**(H)**
Total of Construction Bid Items	(**A+B+C+D+E+F+G+H**)		$388,964.50	**(I)**
Force Account - Utilities	(1 - 2%) of **I**	2.0%	$7,779.29	**(J)**
Force Account - Misc.	(5 - 15%) of **I**	10.0%	$38,896.45	**(K)**
Subtotal of Construction Cost	(**I+J+K**)		$435,640.24	**(L)**
Total Construction Engineering	(17%) of **L**	17.0%	$74,058.84	**(M)**
Total Preliminary Engineering	(8%) of **L**	8.0%	$34,851.22	**(N)**
Utilities	Project Dependent	N / A	$0.00	**(O)**
Right-of-Way (Acre)	Project Dependent	$7000/AC	$1,000.00	**(P)**
		Total Project Cost	$546,000.00	**(Q)**

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8 Project 7 – Ken Pratt Boulevard & Hover Street

8.1 Project 7 Recommended Alternative: Westbound Grade Separated

Objective: The Ken Pratt (SH 119) corridor serves as a commuter corridor with limited access making the goals for this corridor primarily operations and mobility.

The recommended alternative is Alternative 1a from the *Evaluation of Alternatives Report*. The alternative includes grade separation. The intersection of Ken Pratt Boulevard and Hover Street is a major intersection for the region. The needs of traffic, transit, and pedestrian mobility are all critical to the region. The proposed westbound through movement will be a grade-separated tunnel under Hover Street. A barrier separated pedestrian path through the tunnel will allow bicyclists and pedestrians to cross the north leg of Hover Street safely. The bus stop at the SH 119/Hover underpass will be maintained while also facilitating the propose BRT route with a bus only queue jump lane and transit signal prioritization (TSP).

This intersection including auxiliary lanes has the following configuration:

- Northbound Approach: Two exclusive left-turn lanes, three through lanes, and one exclusive right-turn lane.
- Southbound Approach: Two exclusive left-turn lanes, three through lanes, and one exclusive right-turn lane.
- Eastbound Approach: Three exclusive left-turn lanes, three through lanes, and one exclusive right-turn lane.
- Westbound Approach: Two exclusive left-turn lanes, two through lanes, and one exclusive right-turn lane.

Figure 9 shows the alternative layout.

8.2 Project 7 Justification

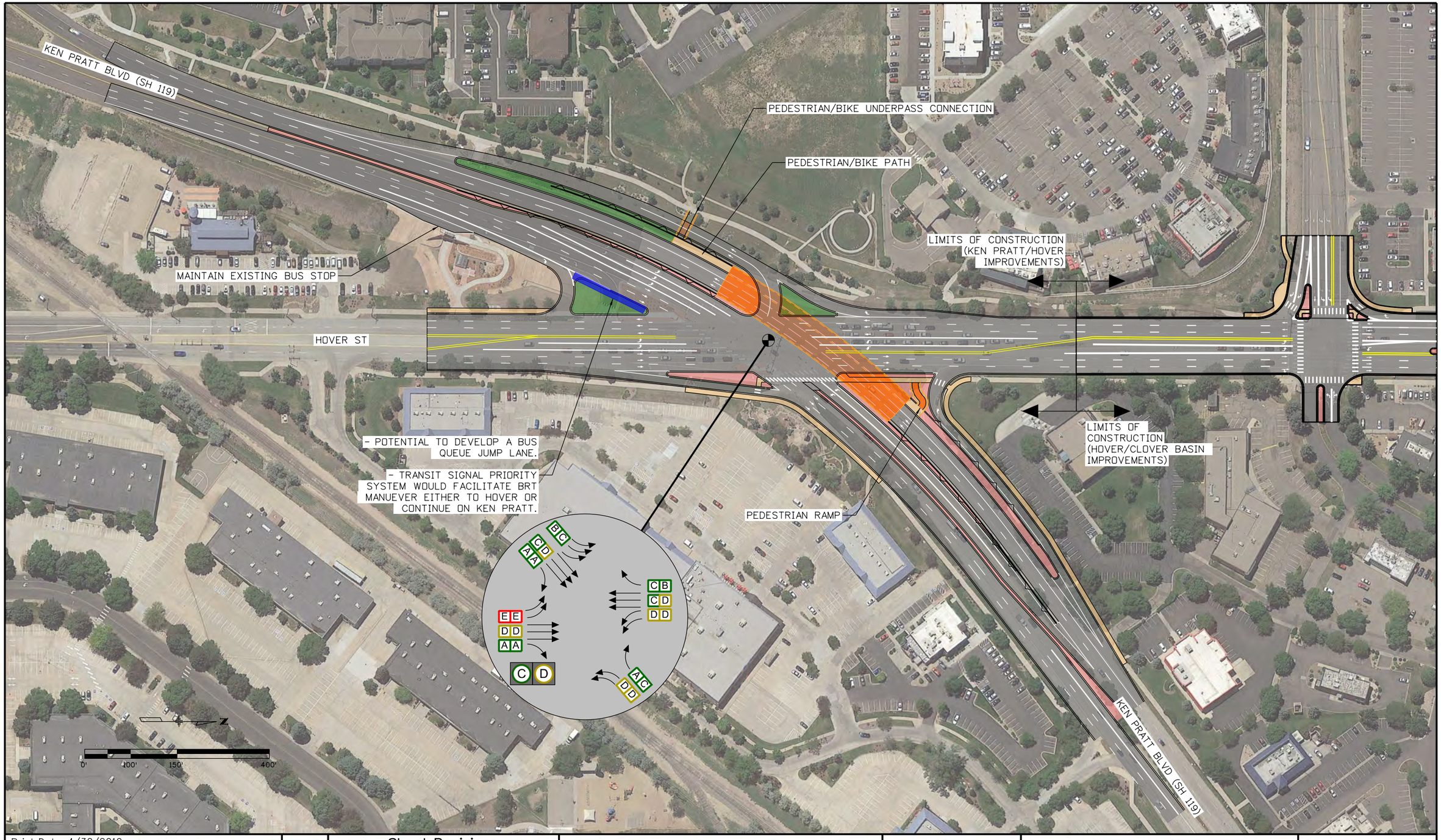
Traffic congestion will be alleviated by implementing a grade-separated westbound through movement. Removing the westbound movement from the traffic signal phase allows a reallocation of signal time to the other priority traffic movements; thereby providing an acceptable LOS for the existing and future conditions. The proposed improvements for this location also support the future SH 119 BRT route along Hover Street and Nelson Road. The intersection is included as a Partially Funded Project in the City of Longmont's 2019-2023 Capital Improvement Program (CIP #TRP121) and supports *Envision Longmont* Guiding Principles; #1 through infrastructure improvements and #2 by improving the transportation systems with better mobility and connectivity.

8.3 Project 7 Cost

The budgetary cost estimate to design and construct this alternative is approximately $17 Million. This cost estimate does not reflect any right-of way costs or coordination. The semi-detailed cost estimate is shown in **Table 8**.

8.4 Project 7 Priority

This is a regionally funded project dependent on funding partnerships between; the City of Longmont, Boulder County, CDOT, RTD, and potentially DRCOG. Therefore, this project has unknown timing and funding; the City of Longmont is committed to working with the regional entities get the funding in place prior to any timeline being set. Due it's regional significance, and not so much, local significance, this project has a lower priority.



Print Date: 4/30/2019	Sheet Revisions			KEN PRATT BOULEVARD / HOVER STREET	As Constructed
File Name: Figure 2_Ken Pratt_Hover_Final.dgn	Date:	Comments	Init.		No Revisions:
Horiz. Scale: 1:150 Vert. Scale: As Noted					Revised:
Unit Information Unit Leader Initials					Void:
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				RECOMMENDED ALTERNATIVE WESTBOUND TUNNEL	FIGURE 9
				Designer: / Detailer: / Sheet Subset: / Structure Numbers / Subset Sheets:	Page 37

Project Name: SW Longmont Operations Study

Location of Project: Ken Pratt Blvd/Hover St

Table 8

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)	**Alternative:**	**Conventional w/ WB Tunnel**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	$5.00	7,500	$37,500.00
2	202-Rem of Conc Pavement	SY	$25.00	21,000	$525,000.00
3	202-Rem of Median Cover	SY	$10.00	1,400	$14,000.00
4	202-Rem of Sidewalk	SY	$25.00	550	$13,750.00
5	202- Rem of Curb and Gutter	LF	$10.00	3,400	$34,000.00
6	203-Excavation	CY	$25.00	950	$23,750.00
7	203-Embankment Material	CY	$20.00	500	$10,000.00
8	304-Aggregate Base Course	CY	$25.00	2,000	$50,000.00
9	403-Hot Mix Asphalt	TON	$85.00		$0.00
10	412-Concrete Pavement	SY	$65.00	33,000	$2,145,000.00
11	608-Concrete Sidewalk	SY	$60.00	850	$51,000.00
12	609-Curb and Gutter	LF	$20.00	4,000	$80,000.00
13	610-Median Cover Material	SF	$5.00	20,000	$100,000.00
14	614-Traffic Signal Equipment	LS	$500,000.00	1	$500,000.00
15	Westbound Tunnel	LS	$2,550,000.00	1	$2,550,000.00
16	Retention Wall	LS	$1,800,000.00	1	$1,800,000.00
	Sub Total				**$7,934,000.00**

PROJECT CONSTRUCTION BID ITEMS **$7,934,000.00**

ROW (Sq. Ft.)

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 assumbed 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.

Project Name: SW Longmont Operations Study

Location of Project: Ken Pratt Blvd/Hover St

Table 8

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)		
	Alternative:	**Conventional w/ WB Tunnel**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

Item	Unit Cost	Quantity	Extended Cost	*Shaded Fields are for INPUT*
FROM PAGE 1, BID ITEM TABULATION			**$7,934,000.00**	
			$7,934,000.00	

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	**N / A**	$7,934,000.00	**(A)**
Contingencies	(15 - 30%) of (**A**)	25.0%	$1,983,500.00	**(B)**
ITS	(6 - 10%) of (**A**)		$0.00	**(C)**
Drainage / Utilities	(3 - 10%) of (**A**)	8.0%	$634,720.00	**(D)**
Signing and Striping	(1 - 5%) of (**A**)	5.0%	$396,700.00	**(E)**
Clearing & Grubbing	(1 - 5%) of (**A**)	1.0%	$79,340.00	**(F)**
Construction Signing & Traffic Control	(5 - 25%) of (**A**)	5.0%	$396,700.00	**(G)**
Mobilization	(4 - 7%) of (**A**)	5.0%	$396,700.00	**(H)**
Total of Construction Bid Items	(**A+B+C+D+E+F+G+H**)		$11,821,660.00	**(I)**
Force Account - Utilities	(1 - 2%) of **I**	2.0%	$236,433.20	**(J)**
Force Account - Misc.	(5 - 15%) of **I**	10.0%	$1,182,166.00	**(K)**
Subtotal of Construction Cost	(**I+J+K**)		$13,240,259.20	**(L)**
Total Construction Engineering	(17%) of **L**	17.0%	$2,250,844.06	**(M)**
Total Preliminary Engineering	(8%) of **L**	8.0%	$1,059,220.74	**(N)**
Utilities	Project Dependent	N / A	$0.00	**(O)**
Right-of-Way (Acre)	Project Dependent	$7000/AC	$1,000.00	**(P)**
		Total Project Cost	$16,551,000.00	**(Q)**

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9 Project 8- Hover Street & Clover Basin Drive

9.1 Project 8 Recommended Alternative: Conventional with Dual Eastbound Right Turn and Exclusive Southbound Right Turn Lanes

Objective: Improvement for safety and operations are the goals for this location.

The recommended alternative at the Hover Street and Clover Basin Drive intersection is Alternative 2 from the *Evaluation of Alternatives Report.* Capacity improvements including; additional exclusive left-turn lanes for northbound traffic are proposed for this project. Other improvements include converting existing southbound shared through / right-turn lane to an exclusive right-turn lane and continuing three through lanes beyond the intersection to the south, with a second eastbound right-turn lane is also proposed. Additionally, channelizing islands are proposed for the eastbound right-turn and southbound right-turn lanes. The islands reduce roadway crossing length for pedestrians. **Figure 10** shows the alternative layout.

9.2 Project 8 Justification

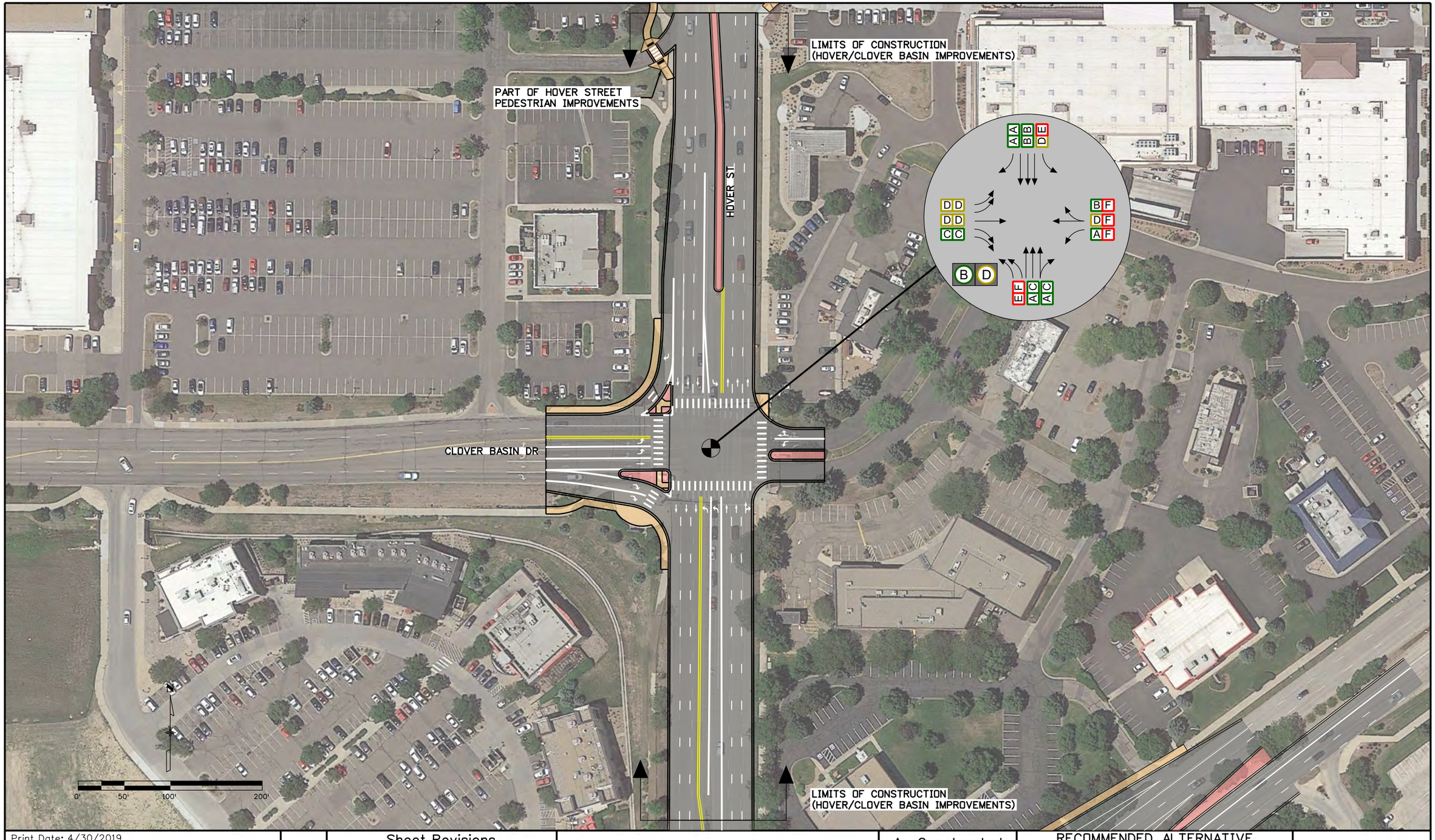
Projected no action 2040 operations are failing LOS E for AM peak hour traffic, and LOS F for PM peak hour traffic. The improvements proposed for this intersection improves LOS for the AM and PM peak hours to acceptable LOS B for the AM and D for the PM. The decreased roadway crossing length in the northbound/southbound direction on the west leg of the intersection will increase safety and the islands will provide a refuge for pedestrians and bicyclists crossing the roadway. The proposed improvements for this project adhere to *Envision Longmont* Guiding Principles; #1 by improving infrastructure; #2 for improvements to roadway and transportation; and #3 addressing safety issues at the intersection.

9.3 Project 8 Cost

The budgetary cost estimate to design and construct this alternative is approximately $1.1 Million. This cost estimate does not reflect any right-of way costs or coordination. The semi-detailed cost estimate is shown in **Table 9**.

9.4 Project 8 Priority

Given the proximity to the intersection of Hover and Ken Pratt, this project is expected to be designed and built at the same time for a seamless design approach, and is contingent on the same funding and timing schedule as that intersection.



Print Date: 4/30/2019
File Name: Figure 3_Hover_Clover Basin_Final.dgn
Horiz. Scale: 1:100 Vert. Scale: As Noted
Unit Information Unit Leader Initials

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Sheet Revisions		
Date:	Comments	Init.

HOVER STREET / CLOVER BASIN DRIVE

As Constructed
No Revisions:
Revised:
Void:

RECOMMENDED ALTERNATIVE
CONVENTIONAL W/ DUAL EBRT
AND EXCLUSIVE SBRT

Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets:

FIGURE 10

Project Name: SW Longmont Operations Study

Location of Project: Hover Street/Clover Basin Dr

Table 9

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)	**Alternative:**	**Recommended Alternative: Conventional w/ x2 EBR + SBR**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	$5.00	200	$1,000.00
2	202-Rem of Conc Pavement	SY	$25.00	0	$0.00
3	202-Rem of Median Cover	SY	$10.00	330	$3,300.00
4	202-Rem of Sidewalk	SY	$25.00	1,000	$25,000.00
5	202- Rem of Curb and Gutter	LF	$10.00	600	$6,000.00
6	203-Excavation	CY	$25.00	650	$16,250.00
7	203-Embankment Material	CY	$20.00	250	$5,000.00
8	304-Aggregate Base Course	CY	$25.00	1,000	$25,000.00
9	403-Hot Mix Asphalt	TON	$85.00	150	$12,750.00
10	412-Concrete Pavement	SY	$100.00	900	$90,000.00
11	608-Concrete Sidewalk	SY	$60.00	1,000	$60,000.00
12	609-Curb and Gutter	LF	$20.00	600	$12,000.00
13	610-Median Cover Material	SF	$5.00	2,950	$14,750.00
14	614-Traffic Signal Equipment	LS	$250,000.00	1	$250,000.00
	Sub Total				**$521,050.00**

PROJECT CONSTRUCTION BID ITEMS **$521,050.00**

ROW (Sq. Ft.)

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 assumbed 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.

Project Name: SW Longmont Operations Study

Location of Project: Hover Street/Clover Basin Dr

Table 9

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)	**Alternative:**	**Recommended Alternative: Conventional w/ x2 EBR + SBR**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

Item	Unit Cost	Quantity	Extended Cost	*Shaded Fields are for INPUT*
FROM PAGE 1, BID ITEM TABULATION			**$521,050.00**	
			$521,050.00	

	% Range	% Used	Cost	
Project Construction Bid Items	75	**N / A**	$521,050.00	**(A)**
Contingencies	(15 - 30%) of (**A**)	25.0%	$130,262.50	**(B)**
ITS	(6 - 10%) of (**A**)		$0.00	**(C)**
Drainage / Utilities	(3 - 10%) of (**A**)	8.0%	$41,684.00	**(D)**
Signing and Striping	(1 - 5%) of (**A**)	5.0%	$26,052.50	**(E)**
Clearing & Grubbing	(1 - 5%) of (**A**)	1.0%	$5,210.50	**(F)**
Construction Signing & Traffic Control	(5 - 25%) of (**A**)	5.0%	$26,052.50	**(G)**
Mobilization	(4 - 7%) of (**A**)	5.0%	$26,052.50	**(H)**
Total of Construction Bid Items	(**A+B+C+D+E+F+G+H**)		$776,364.50	**(I)**
Force Account - Utilities	(1 - 2%) of **I**	2.0%	$15,527.29	**(J)**
Force Account - Misc.	(5 - 15%) of **I**	10.0%	$77,636.45	**(K)**
Subtotal of Construction Cost	(**I+J+K**)		$869,528.24	**(L)**
Total Construction Engineering	(17%) of **L**	17.0%	$147,819.80	**(M)**
Total Preliminary Engineering	(8%) of **L**	8.0%	$69,562.26	**(N)**
Utilities	Project Dependent	N / A	$0.00	**(O)**
Right-of-Way (Acre)	Project Dependent	$7000/AC	$1,000.00	**(P)**
		Total Project Cost	$1,088,000.00	**(Q)**

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10 Project 9- Hover Street & Bent Way

10.1 Project 9 Recommended Alternative: Conventional Intersection

Objective: Improvement for safety and operations are the goals for this location.

This recommended alternative is Alternative 1 for this location in the *Evaluation of Alternatives Report*. Capacity improvements include; additional exclusive left-turn lanes for northbound and southbound traffic. Also included is converting the existing southbound right-turn only lane to a shared through / right-turn lane, and continuing three through lanes beyond the intersection further south.

This intersection with auxiliary lanes includes the following laneage:

- Northbound Approach: Two exclusive left-turn lanes and two through lanes, and one shared through/right turn lane.
- Southbound Approach: Two exclusive left-turn lanes and two through lanes, and one shared through/right turn lane.
- Eastbound Approach: One exclusive left-turn lane, one through lane, and one exclusive right-turn lane.
- Westbound Approach: One exclusive left-turn lane, one through lane, and one exclusive right-turn lane.

Figure 11 displays the proposed layout.

10.2 Project 9 Justification

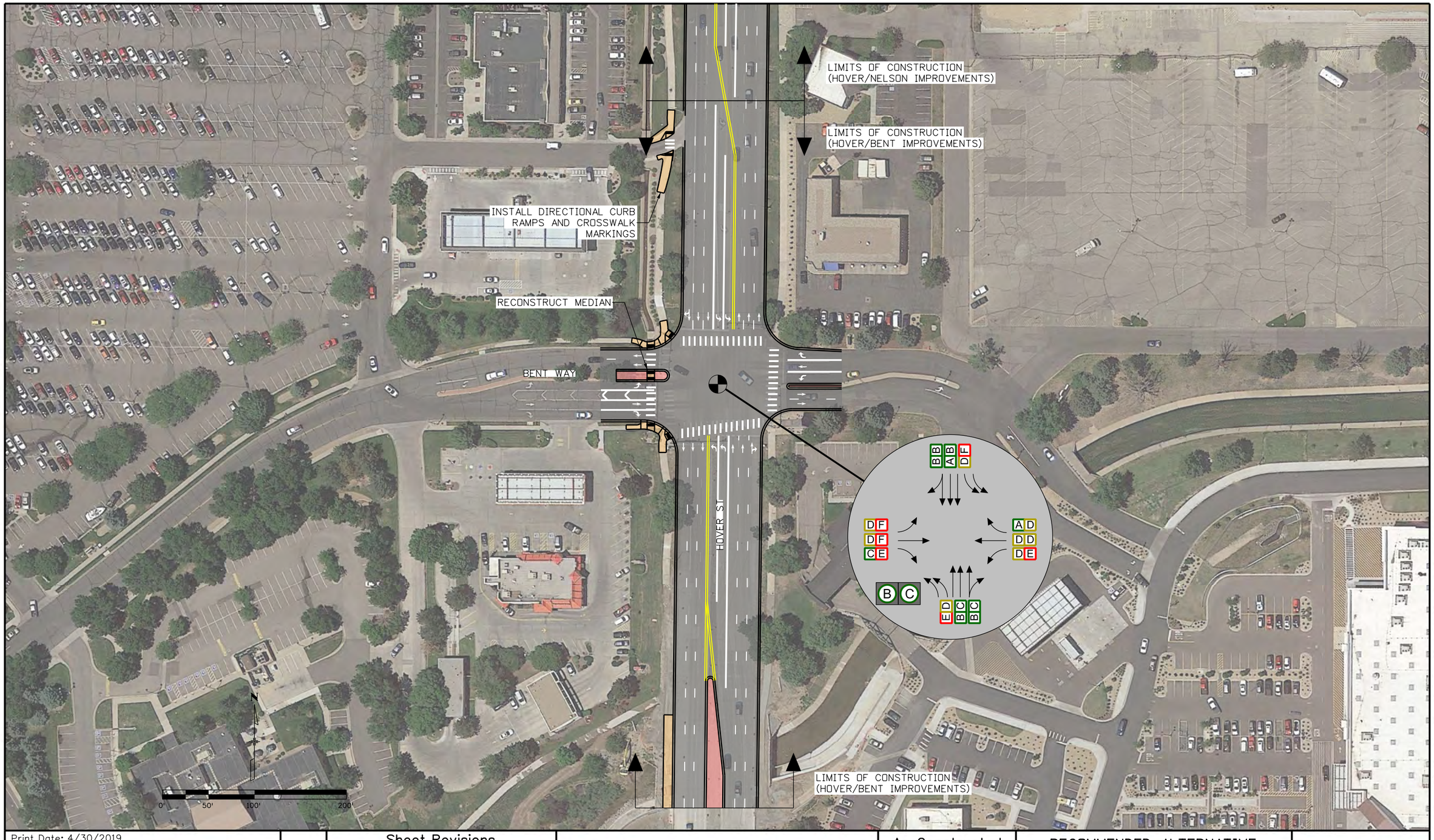
While 2040 operations maintain a LOS B for the AM peak hour, this project improves LOS for the PM from an F for No Action to an acceptable LOS C. The proposed improvements for this project adhere to *Envision Longmont* Guiding Principles; #1 by improving infrastructure; #2 for improvements to roadway and transportation; and #3 addressing safety issues at the intersection with improvements.

10.3 Project 9 Cost

The budgetary cost estimate to design and construct this alternative is approximately $420,000. This cost estimate does not reflect any right-of way costs or coordination. The semi-detailed cost estimate is shown in **Table 10**.

10.4 Project 9 Priority

The impact of these improvements are not immediately critical to the larger population and improvements are minor in comparison, therefore of the total projects it is prioritized last.



Print Date: 4/30/2019	Sheet Revisions		
File Name: Figure 5_Hover_Bent_Final.dgn	Date:	Comments	Init.
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			

HOVER STREET / BENT WAY

As Constructed	
No Revisions:	
Revised:	
Void:	

RECOMMENDED ALTERNATIVE
CONVENTIONAL INTERSECTION

Designer:	Structure Numbers	
Detailer:		
Sheet Subset:	Subset Sheets:	

FIGURE 11

Project Name: SW Longmont Operations Study

Location of Project: Hover Street/Bent Way

Table 10

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)		
	Alternative:	**Recommended Alternative: Conventional Interseciton**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

	Item		Unit Cost	Quantity	Cost
1	202-Rem of Asphalt Mat	SY	$5.00	1,400	$7,000.00
2	202-Rem of Conc Pavement	SY	$25.00	0	$0.00
3	202-Rem of Median Cover	SY	$10.00	500	$5,000.00
4	202-Rem of Sidewalk	SY	$25.00	750	$18,750.00
5	202- Rem of Curb and Gutter	LF	$10.00	400	$4,000.00
6	203-Excavation	CY	$25.00	100	$2,500.00
7	203-Embankment Material	CY	$20.00	100	$2,000.00
8	304-Aggregate Base Course	CY	$25.00	600	$15,000.00
9	403-Hot Mix Asphalt	TON	$85.00	50	$4,250.00
10	412-Concrete Pavement	SY	$125.00	400	$50,000.00
11	608-Concrete Sidewalk	SY	$60.00	300	$18,000.00
12	609-Curb and Gutter	LF	$20.00	400	$8,000.00
13	610-Median Cover Material	SF	$5.00	1,000	$5,000.00
14	614-Traffic Signal Equipment	LS	$50,000.00	1	$50,000.00
	Sub Total				**$189,500.00**

PROJECT CONSTRUCTION BID ITEMS **$189,500.00**

ROW (Sq. Ft.)

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 assumbed 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.

Project Name: SW Longmont Operations Study

Location of Project: Hover Street/Bent Way

Table 10

Engineers (Semi) Detailed Estimate (FY 18 Cost Index)	**Alternative:**	**Recommended Alternative: Conventional Interseciton**
	Prepared By:	**MW**
	Date Prepared:	**4/30/2019**

Item	Unit Cost	Quantity	Extended Cost	*Shaded Fields are for INPUT*
FROM PAGE 1, BID ITEM TABULATION			**$189,500.00**	
			$189,500.00	

	% Range	% Used	Cost	
Project Construction Bid Items	Project Dependent	**N / A**	$189,500.00	**(A)**
Contingencies	(15 - 30%) of (**A**)	25.0%	$47,375.00	**(B)**
ITS	(6 - 10%) of (**A**)		$0.00	**(C)**
Drainage / Utilities	(3 - 10%) of (**A**)	8.0%	$18,950.00	**(D)**
Signing and Striping	(1 - 5%) of (**A**)	5.0%	$12,791.25	**(E)**
Clearing & Grubbing	(1 - 5%) of (**A**)	1.0%	$2,558.25	**(F)**
Construction Signing & Traffic Control	(5 - 25%) of (**A**)	5.0%	$13,558.73	**(G)**
Mobilization	(4 - 7%) of (**A**)	5.0%	$14,236.66	**(H)**
Total of Construction Bid Items	(**A+B+C+D+E+F+G+H**)		$298,969.89	**(I)**
Force Account - Utilities	(1 - 2%) of **I**	2.0%	$5,979.40	**(J)**
Force Account - Misc.	(5 - 15%) of **I**	10.0%	$29,896.99	**(K)**
Subtotal of Construction Cost	(**I+J+K**)		$334,846.28	**(L)**
Total Construction Engineering	(17%) of **L**	17.0%	$56,923.87	**(M)**
Total Preliminary Engineering	(8%) of **L**	8.0%	$26,787.70	**(N)**
Utilities	Project Dependent	N / A	$0.00	**(O)**
Right-of-Way (Acre)	Project Dependent	$7000/AC	$1,000.00	**(P)**
		Total Project Cost	$420,000.00	**(Q)**

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