

### 3 EVALUATION OF PROJECTS

#### 3.1 EVALUATION CRITERIA

A criteria based evaluation matrix was used to compare and prioritize the corridor improvements developed from the travel demand modeling process. Separate matrices were prepared for intersection improvements and corridor improvements. Criteria were selected based on how well the projects address the City's transportation needs and community values. Both quantitative and qualitative measures were used. The criteria were also assigned an evaluation weighting scale of 1-5 (5 being highest) to reflect their relative importance to improving the City's transportation system. A description of the criteria used for the evaluation and the assigned criteria weighting is provided below:

- **Improve Congestion** - For intersection projects, measures of vehicle delay and intersection volume to capacity (v/c) ratio were used to evaluate the level of congestion relief that the project could provide under existing traffic conditions. The traffic model software program, Synchro™ was used to measure delay and v/c ratio for the various intersection improvements. For corridor projects, v/c ratio was used to measure congestion. The v/c ratio was calculated using the travel demand model volumes and planning level capacity thresholds of collector and arterial roadways. (Criteria weighting: 5)
- **Improve Safety** – Projects were evaluated based on how well they addressed an existing accident problem at an intersection or along a corridor. The City's 2012 Safety Study, which includes composite crash indices for each corridor and intersection, was used as the basis for the evaluation. Projects that addressed locations with a composite crash index above 1.0 (indicative of a high accident location) were assigned the highest rating. (Criteria weighting: 5)
- **Enhance Multimodal Transport** – This criteria was used to evaluate how well a project improved pedestrian, bicycle and/or transit connections. Projects received a high rating if they completed a missing sidewalk or bicycle link, or if they offered a tangible benefit to bus operations and/or future rail connections. Evaluation of this criteria was qualitative based. (Criteria weighting: 2)
- **Improve System And Economic Development** – The intent of this criteria was to determine how well a project improved connections to other roadways or, in the case of an intersection improvement, enabled the future widening of a corridor. Projects were also evaluated based on their potential for facilitating opportunities for new development or redevelopment. Evaluation of this criteria was qualitative based. (Criteria weighting: 3)
- **Ease of Implementation** – The primary considerations for this criteria were ease of construction, environmental issues, major cost elements, and need for right-of-way. Projects that had major obstacles to overcome were assigned a low rating while those that could be implemented with relative ease were assigned a high rating. (Criteria weighting: 3)

#### 3.2 EVALUATION OF CORRIDOR PROJECTS

Figure 3-1 shows the results of the corridor evaluation, along with planning-level cost estimates for each project. In all, 26 roadway segments, within 13 corridors, were identified as important projects to be considered for the City's LACP and MMTP. The corridor segments were determined based on logical funding and construction limits. The rating value for each criteria was multiplied by the criteria weighting

to arrive at a total weighted score for each project. The total weighted score, combined with the project cost estimate, was used to select the highest priority corridor projects. The total cost of the proposed corridor improvements is estimated at \$144.1M (2014 dollars).

The recommended corridor projects are shown on **Figure 3-2**. The projects include a combination of street widening, missing link connections, and miscellaneous improvements to be completed as part of future development projects. **Table 3-1** lists the corridor projects that scored particularly well in the evaluation matrix, and that were determined to offer an immediate benefit to the City’s transportation system.

**Table 3-1: Recommended First Priority Corridor Projects**

Corridor	Limits	Improvement	Cost Estimate
Ken Pratt Boulevard	Nelson Road to Pratt Parkway	Widen from 4 lanes to 6 lanes	\$3.5 Million
Hover Street	SH 119 to Boston Avenue	Widen from 4 lanes to 6 lanes	\$1.4 Million*
Nelson Road	Grandview Meadows Drive to Dry Creek Drive	Widen from 2 lanes to 4 lanes	\$5.9 Million

\* Cost does not include 3<sup>rd</sup> northbound lane to be added by Mall redevelopment

The Ken Pratt Boulevard project from Nelson Road to Pratt Parkway scored as the top priority project. The City should evaluate the benefits of utilizing the new third through lane for Bus Rapid Transit (BRT) instead of, or prior to, making them available to general traffic. The recently completed North Area Mobility Study (NAMS) by the Region Transportation District recommends BRT along the Diagonal Highway (SH 119) between Boulder and Longmont, and this BRT system would benefit from BRT lanes along Ken Pratt Boulevard in Longmont.

### 3.3 EVALUATION OF INTERSECTION PROJECTS

The intersection projects were evaluated in a similar manner as the corridor projects and are shown in **Figure 3-3**. Prior to the evaluation of these projects, a first level screening of all signalized intersections in the City was completed using the City’s Synchro™ model and 2012 intersection crash data. Intersections that were found to have operational and/or safety problems were identified for further review. Improvement options were developed for each intersection, and in several cases, two or three alternatives were evaluated to assess the best option to carry forward. Fourteen intersections were carried forward for detailed evaluation, concept design, and cost estimates. The total cost estimate for all recommended intersection projects is \$42.0M (2014 dollars). **Figure 3-4** illustrates the recommended intersection improvements, their cost, and their expected operational benefit in terms of level-of-service (LOS), delay, and v/c ratio. **Table 3-2** lists the intersection projects that scored particularly well in the evaluation matrix, and that were determined to offer an immediate benefit to the City’s transportation system.

The top rated project, based on the above evaluation criteria, is the improvement of the SH 119 (Diagonal Highway) / Hover Street intersection at a cost of \$6.9M. This project would add additional left-turn lanes to the eastbound, northbound and southbound approaches, as well as a third through lane in the northbound direction. A secondary option using a less traditional design approach was also developed and is included in **Appendix E**. A more detailed evaluation of the traditional and non-traditional design alternatives for SH 119 / Hover Street is recommended for further study.

**Table 3-2: Recommended First Priority Intersection Projects**

<b>Intersection</b>	<b>Improvement</b>	<b>Cost Estimate (2014)</b>
SH 119 (Diagonal Highway) / Hover Street	EB, NB and SB Dual Left Turn Lanes 3 <sup>rd</sup> NB through lane	\$6.9 Million
SH 66 (Ute Highway) / Pace Street	WB and NB Dual Left Turn Lanes	\$3.0 Million
SH 119 (Ken Pratt Boulevard) / Zlaten Drive	WB Dual Left Turn Lane and Right Turn Lane EB and WB 3 <sup>rd</sup> Through Lane	\$2.4 Million
SH 119 / County Line Road	EB and WB 3 <sup>rd</sup> Through Lane	\$3.9 Million
Hover Street / Nelson Road	SB Dual Left Turn Lane NB and SB 3 <sup>rd</sup> Through Lane	\$6.9 Million

Figure 3-1: Corridor Evaluation

		Preliminary Assessment of Corridor Alternatives												
Corridor	Segment		Add Bike Lanes?	Proposed Number of Lanes	Improves Near-Term Congestion	Improves Safety	Enhances Multimodal Transport	Improves System & Economic Development	Ease of Implementation	Total Weighted Score	Cost Estimate <sup>4</sup> - Including ROW (\$ Million)			
											Non-State Highway Inside City Planning Area	State Highway Inside City Planning Area	State Highway Outside City Planning Area	Total
Criteria Weighting (1-5):					5	5	2	3	3					
Pike Rd	Construct from Main to 119th St		Yes	4	●	○	●	●	○	34	\$ 13.1			\$ 13.1
	Widen from Hover to Main		Yes	4	●	●	●	○	●	51	\$ 5.8			\$ 5.8
SH 66 (Ute Hwy)	Widen from Hover to Main St		Yes <sup>1</sup>	4	●	○	●	○	○	54		\$ 7.2		\$ 7.2
	Widen from Main St to County Line		Yes <sup>1</sup>	4	●	○	●	○	○	57	\$ 12.5			\$ 12.5
	Widen from County Line to I-25		Yes <sup>1</sup>	4	●	○	●	○	○	52		\$ 20.7		\$ 20.7
17th Ave	Widen from Alpine to Ute Creek Dr		Yes	4	●	○	●	○	○	39	\$ 4.2			\$ 4.2
9th Ave <sup>3</sup>	Widen from Alpine to Pace		Maintain Existing	4	●	○	●	○	○	44	\$ 1.0			\$ 1.0
WCR 26	Construct Realignment from WCR1 to WCR 24.75		Yes	2	○	○	●	○	○	39	\$ 3.1			\$ 3.1
Boston Ave	Construct from Pratt Pkwy to Price w/ at-grade RR Xing		Yes	2	●	○	●	○	○	49	\$ 2.1			\$ 2.1
Ken Pratt Blvd (SH 119)	Widen from Nelson to Pratt Pkwy		No	6	●	●	●	○	○	76		\$ 3.5		\$ 3.5
	Widen Martin St to 119th St		No	6	●	○	○	○	○	49		\$ 2.8		\$ 2.8
	Widen from 119th St to 3rd Ave		No	6	●	○	○	○	○	44		\$ 1.6		\$ 1.6
	Widen from 3rd Ave to Fairview (City limits)		No	6	●	○	○	○	○	55		-		-
	Widen from Fairview (City limits) to Turner Blvd (West of I-25)		No	6	●	○	○	○	○	42		\$ 10.4		\$ 10.4
Nelson Rd	Widen from Grandview Meadows to Hover Rd		Yes	4	●	○	●	○	○	61	\$ 5.9			\$ 5.9
Clover Basin Dr	Widen from Airport to Dry Creek		Maintain Existing	4	●	○	●	○	○	57	\$ 3.0			\$ 3.0
Hover Rd	Widen from SH 119 to Nelson Rd		No	6	●	○	○	○	○	70	\$ 0.5			\$ 0.5
	Widen from Nelson Rd to Boston Ave		No	6	●	○	○	○	○	62	\$ 0.9			\$ 0.9
Martin St	Construct from Pike to Quail		Yes	2	○	○	○	○	○	32	\$ 2.3			\$ 2.3
119th St / Pace St <sup>2</sup>	Widen from Pike to Ken Pratt (SH 119)		Yes	4	○	○	○	○	○	41	\$ 13.0			\$ 13.0
	Widen from Ken Pratt (SH 119) to Sugar Mill		Yes	4	○	○	○	○	○	32	\$ 4.0			\$ 4.0
	Construct from Sugar Mill to 3rd Ave		Yes	4	○	○	○	○	○	47	\$ 5.3			\$ 5.3
	Widen from 3rd Ave to 9th Ave		Maintain Existing	4	●	○	○	○	○	48	\$ 2.7			\$ 2.7
	Widen from 9th Ave to 17th Ave		Maintain Existing	4	●	○	○	○	○	46	\$ 3.5			\$ 3.5
County Line Rd	Widen from 17th Ave to SH 66		Yes	4	○	○	○	○	○	44	\$ 8.5			\$ 8.5
	Widen from 9th Ave to 17th Ave		Yes	4	○	○	○	○	○	46	\$ 7.2			\$ 7.2
<b>Total</b>										<b>\$ 86.1</b>	<b>\$ 27.6</b>	<b>\$ 31.1</b>	<b>\$ 144.8</b>	

Notes:

1. 8' to 10' shoulder for bicycles. Provide bike lanes through intersections.
2. Maintain and improve bike lanes on Pace Street from 17th Avenue to SH 66. Cost of these improvements is not included in the above table.
3. Maintain and improve bike lanes on 9th Avenue from Hover Road to Airport Road. Cost of these improvements is not included in the above table.
4. Corridor costs are exclusive of proposed intersection improvement costs. See Intersection Cost Estimate Worksheets and Concept Drawings for intersection costs. Also, for SH 119 from 3rd Ave to Fairview, the entire cost of widening SH 119 from 4 to 6 lanes is included in the intersection costs.

Figure 3-2: Proposed Corridor Projects

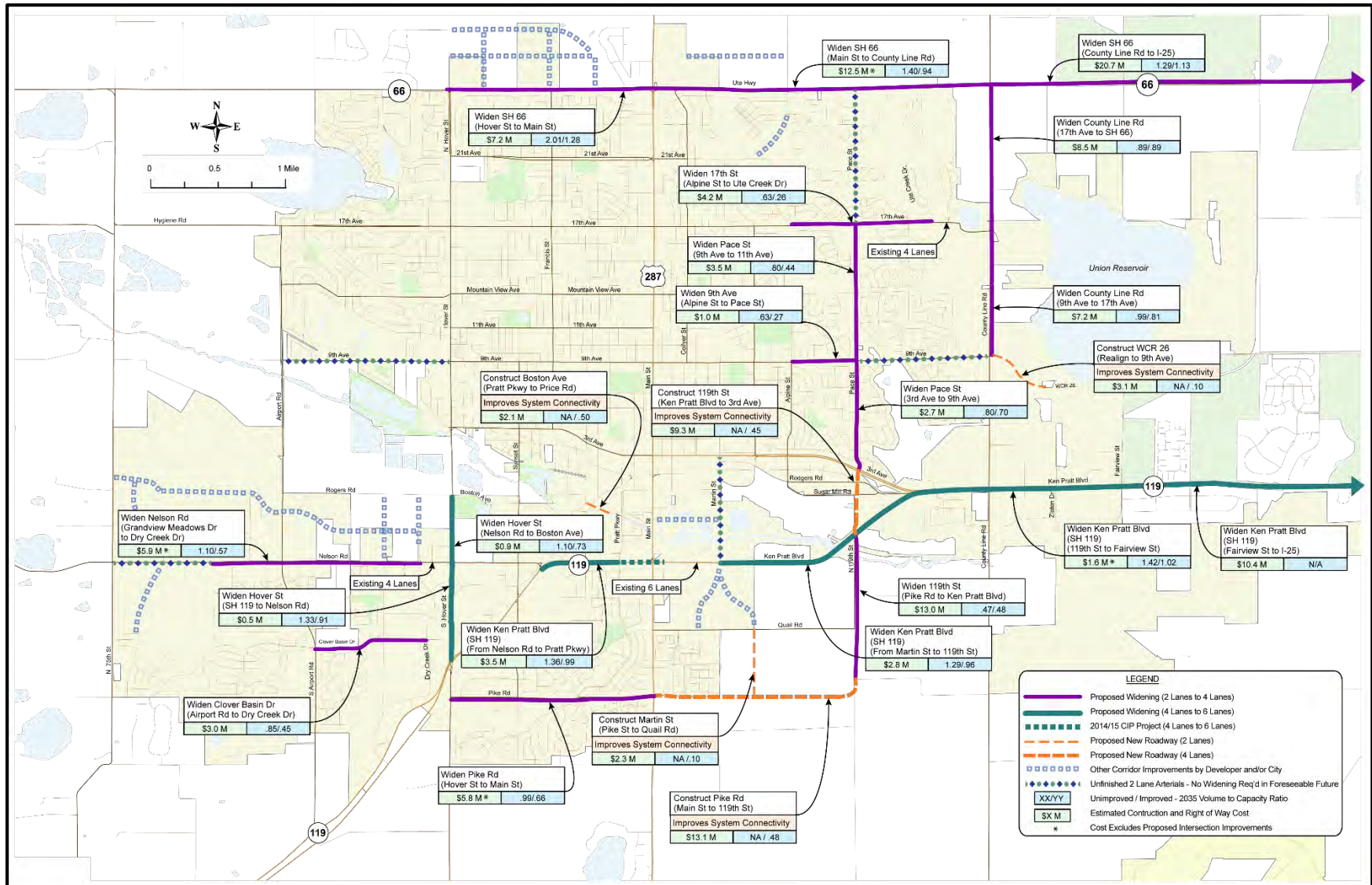


Figure 3-3: Intersection Evaluation

Intersection	Improvement		Preliminary Assessment of Intersection Alternatives						Cost Estimate - Including ROW (\$ Million)		
			Improves Intersection Operations	Potential for Safety Mitigation	Enhances Multimodal Transport	Improves System & Economic Development	Ease of Implementation	Total Weighted Score	Non-State Highway	State Highway	Cost Estimate (Incl. ROW) (\$ Million)
			5	5	2	3	3				
9th Ave & Main St	EB Rt and SB Rt		●	●	●	●	●	59		\$ 0.3	\$ 0.3
SH 66 & US 287	Dual SB Left, 3 SB Thru, SB Rt, convert NB Rt to Thru/Rt		●	●	●	●	○	54		\$ 5.0	\$ 5.0
17th Ave & Main St	Dual NB and SB Lt		○	●	●	●	●	54		\$ 1.3	\$ 1.3
SH 66 & Pace St	Dual WB and NB Lt, NB Free Rt		●	●	●	●	●	64		\$ 3.0	\$ 3.0
9th Ave & Hover Rd	Dual WB Lt		○	●	●	●	●	46	\$ 1.4		\$ 1.4
Nelson Rd & Hover Rd	Dual SB Left, 3 SB Thru, SB Rt, convert NB Rt to Thru/Rt		●	●	●	●	○	61	\$ 6.1		\$ 6.1
Clover Basin Dr & Hover Rd	Dual NB Lt, 3 SB Thru and SB Rt		●	●	●	●	○	54	\$ 3.7		\$ 3.7
SH 119 & Hover Rd	Triple EB Lt, Dual NB Lt, Dual SB Lt, third NB shared Th/Rt)		●	●	●	●	○	73		\$ 6.9	\$ 6.9
Pike Rd & Hover Rd	Dual SB Left and improve NE Corner Radius to accommodate buses		○	○	●	●	●	52	\$ 0.5		\$ 0.5
Ken Pratt Blvd & Sunset St	Widen N/S approaches and reconfigure to 3 lanes - Lt, Th and Th/Rt		○	○	●	●	○	43		\$ 2.5	\$ 2.5
Ken Pratt Blvd & Main St	Dual NB and SB Lt and 3rd NB shared thru/right lane		○	●	●	●	○	58		\$ 4.1	\$ 4.1
Nelson Rd & Airport Rd	Dual EB Left and Add EB Thru Auxiliary Lane		●	○	●	●	●	54	\$ 0.9		\$ 0.9
Ken Pratt Blvd & County Line Rd	Channelized WB Free Rt and 3rd E/W Thru Lane		●	●	○	●	●	62		\$ 3.9	\$ 3.9
SH 119 & Zlaten	Dual WB Left and 3rd E/W Thru Lane		●	○	●	●	●	63		\$ 2.4	\$ 2.4
<b>Total</b>								\$ 12.6	\$ 29.4	\$ 42.0	

Figure 3-4: Proposed Intersection Projects

