

Milton Road Corridor Master Plan

Final Report







Acknowledgments

The Arizona Department of Transportation (ADOT) would like to sincerely thank the City of Flagstaff City Council and the Coconino County Board of Supervisors for their continuous involvement and support of this plan. ADOT would also like to extend a special appreciation to our Project Partners who contributed countless hours to the development of this Corridor Master Plan. ADOT was the lead and sponsor of this plan. Decision-making occurred via a consensus-based process with our Project Management Partners below, while considering input from stakeholders and the public at key milestones.

City of Flagstaff City Council

Present

Mayor Paul Deasy Vice Mayor Miranda Sweet Councilmember Austin Aslan Councilmember Khara House Councilmember Jim McCarthy Councilmember Regina Salas Councilmember Adam Shimoni

Coconino County Board of Supervisors

Past

Past

Mayor Coral Evans

Vice Mayor Jamie Whelan

Councilmember Celia Barotz

Councilmember Jim McCarthy

Councilmember Charlie Odegaard

Councilmember Scott Overton

Councilmember Eva Putzova

Elizabeth Archuleta (Chair) Matt Ryan (Vice-Chair) Art Babbott Lena Fowler Jim Parks

Present

Patrice Horstman (Chair) Jeronimo Vasquez (Vice-Chair) Matt Ryan Judy Begay Lena Fowler

We acknowledge the diligent service and valuable input from Project Management and our Project Partners, and would like to provide special recognition to:

Project Management

Dan Gabiou, ADOT Project Manager Jason James, ADOT Project Manager Nate Reisner, ADOT Northcentral District Steve Orosz, ADOT Northcentral District Kevin Kugler, Michael Baker International Project Manager Brian Snider, Michael Baker International Assistant Project Manager







Project Partners

ADOT

Audra Merrick, David Zimmerman, Doug Carroll, Felicia Beltran, George Williams, Greg Byres, , Jerry McCoy, John Wennes, Josh Fife, Lisa Tapia, Mackenzie Kirby, Saroja Devarakonda, and Sayeed Hani

BNSF Railway (BNSF)

Cheryl Townlian, Kate Kalinosky, Megan McIntyre, Paul Cristina, Ronnie Garcia, and Tiera Adams

City of Flagstaff

Carlton Johnson, Dan Folke, Jeff Bauman, Jenny Niemann, Martin Ince, Nicole Amtonopoulos, Rick Barrett, Sara Dechter, Shane Dille, and Tiffany Antol

Coconino County

Joe Rumann, Nick Hall, and Tim Dalegowski

Federal Highway Administration (FHWA)

Ammon Heier and Ed Stillings

MetroPlan (aka Flagstaff Metropolitan Planning Organization) Dave Wessel and Jeff Meilbeck

Michael Baker International

Alex Thomas, Jessica Belowich, Matt Gomez, and Smitha Kundur

Mountain Line (aka NAIPTA)

Anne Dunno, Bizzy Collins, Heather Dalmolin, and Kate Morley

Northern Arizona University (NAU)

Dan Okoli, Erin Stam, Greg Mace, Richard Bowen, and Stephanie Bauer

United States Forest Service (aka Coconino National Forest)

Brian Poturalski, Debra Mollet, Erin Carey, Jessica Richardson, Josh Peck, Judy Adams, Mike Dechter, Nick Warnke, and Pat McGarvey







Table of Contents

EXECUTIVE SUMMARY	ES-1
 1.0 MILTON ROAD CORRIDOR MASTER PLAN OVERVIEW. 1.1 Milton Road Corridor Overview. 1.2 Milton Road CMP Purpose & Need. 1.3 Milton Road CMP Vision Statement. 1.3 Project Partner Goals & Objectives. 1.4 Planning Process. 1.4 Public Engagement Process Summary. 	1 1 3 3 8 10 11
 2.0 MILTON ROAD CORRIDOR PROFILE. 2.1 Land Use & Growth Impacting Milton Road - Today & Tomorrow. 2.2 Existing Roadway Conditions & Characteristics. 2.2 Existing Traffic Volumes & Level-of-Service (LOS). 2.2 Existing Non-Motorized Mobility. 2.2 Existing Access Management & Current Guidelines. 2.3 Safety Considerations. 2.4 Future Vehicular Traffic Considerations. 2.4 Future Roadway Network. 2.4 Future Roadway Network. 2.4 Future No-Build Vissim Operational Analysis. 	13 13 16 16 22 24 24 27 29 29 29 29 30
 3.0 EVALUATION OF CORRIDOR ALTERNATIVES. 3.1 Corridor Alternative Evaluation & Results. 3.1a Tier 1 Corridor Alternatives Evaluation & Results. 3.1b Tier 2 Corridor Alternatives Evaluation & Results. 3.1c Tier 3 Corridor Alternatives Evaluation & Results. 3.2 Recommended Alternative Selection Process. 3.3 Defining the No Build Hybrid and Rationale for its Selection as the Recommended Alternative. 3.3a Refinement of Short-Term Spot Improvements Applications & Facility Specifications. 	36 38 40 47 65 66 67
 4.0 RECOMMENDED ALTERNATIVE. 4.1 Short-Term Recommended Alternative: No-Build Hybrid	72 74 74
 5.0 IMPLEMENTATION	110 110 111 111 112 115 118





CREATER I FLAGSTAFF



Appendices

- Appendix A Right-of-Way Aerial Exhibit
- Appendix B Project Charter
- Appendix C Public Involvement Plan (PIP)
- Appendix D Public Meeting Summary Reports
- Appendix E Beulah Boulevard Extension & University Avenue Extension Design Plans
- Appendix F Bus Rapid Transit Traffic Analysis & Model Results Memo
- Appendix G Controlling Design Criteria
- Appendix H Tier 3 Evaluation Criteria Task Force Notes & Outcomes
- Appendix I Tier 3 Evaluation Criteria Weighting Public Survey Results
- Appendix J Conflict Resolution Results
- Appendix K Milton Road Access Control Specifications
- Appendix L Detailed Planning-Level Cost Estimate







List of Figures

Figure 1-1: Milton Road Study Corridor	2
Figure 1-2: Long-Term Vision Cross Section of the Recommended Alternative – No Right Turn Lanes	5
Figure 1-3: Long-Term Vision Cross Section of the Recommended Alternative – One Right Turn Lanes	6
Figure 1-4: Long-Term Vision Cross Section of the Recommended Alternative – Two Right Turn Lanes	7
Figure 1-5: Milton Road CMP Goals	9
Figure 1-6: Milton Road CMP Process Flow Chart	10
Figure 2-1: Potential HOH Development Zones	14
Figure 2-2: Future Growth Illustration	15
Figure 2-3: 24-Hour Daily Traffic Volumes	17
Figure 2-4: Existing Number of Average Daily Vehicles & Intersection level-of-Service	19
Figure 2-5: Existing Access Points	26
Figure 2-6: Milton Road All Crashes by Injury Severity Map (January 2012 – December 2016)	28
Figure 2-7: 2040 No-Build AM Peak Hour Traffic Volumes	32
Figure 2-8: 2040 No-Build PM Peak Hour Traffic Volumes	33
Figure 2-9: 2040 No-Build Intersection Control & Lane Geometry	34
Figure 3-1: Three Tier Alternative Evaluation & Screening Process Flow Chart	37
Figure 3-2: Tier 2 Alternatives Recommended for Tier 3 Analysis	46
Figure 3-3: Tier 3 Alternative Evaluation Results	52
Figure 3-4: Existing Milton Road Right-of-Way	69
Figure 3-5: Milton Road Segmentation	70
Figure 4-1: Forest Meadows Street to Route 66 Reference Map	74
Figure 4-2: Short-Term Recommended Alternative: Forest Meadows Street to Route 66	76
Figure 4-3: Short-Term Recommended Cross Section for Milton Road Segments G, J, & N	78
Figure 4-4: Short-Term Recommended Cross Section for Milton Road Segments B, C, D, F, H, K, M, O, & P	81
Figure 4-5 Short-term Recommended Cross Section for Milton Road Segments A, E, and L	83
Figure 4-6: Segment I Reference Map	84
Figure 4-7: Short-Term Recommended Cross Section for Milton Road Segment I	85
Figure 4-8: Forest Route 66 to Beaver Street Reference Map	86
Figure 4-9: Short-Term Recommended Alternative: Route 66 to Beaver Street	88
Figure 4-10: Short-Term Recommended Cross Section for Milton Road Segment Q	90
Figure 4-11: Short-Term Recommended Cross Section for Milton Road Segment S	92
Figure 4-12: Short-Term Recommended Cross Section for Milton Road Segments R, V, & W	94
Figure 4-13: Short-Term Recommended Cross Section for Milton Road Segments T, U, & X	97
Figure 4-14: Long-Term Vision Cross Section of the Recommended Alternative – No Right Turn Lanes	105
Figure 4-15: Long-Term Vision Cross Section of the Recommended Alternative – One Right Turn Lanes	106
Figure 4-16: Long-Term Vision Cross Section of the Recommended Alternative – Two Right Turn Lanes	107
Figure 5-1: Example Roundabout Concept	117







List of Tables

Table 2-1: Existing (2017) Daily Traffic Volumes	17
Table 2-2: Level of Service Criteria for Urban Street Facilities	20
Table 2-3: Existing Pedestrian Crossing Volume	21
Table 2-4: Existing Bicycle Crossing Volume	22
Table 2-5: Minimum Spacing of Drive ways to Intersections per City of Flagstaff	24
Table 2-6: Crash Severity Comparison - All Crashes	27
Table 2-7: Pedestrian & Bicycle Crash Severity Comparison	27
Table 2-8. HCM 6th Edition LOS Thresholds for Interrupted Flow	30
Table 2-9: 2040 AM and PM No Build Milton Road Travel Times	31
Table 2-10: 2040 AM and PM No Build Network Delay	31
Table 2-11: 2040 AM and PM Peak Hour No Build LOS at Signalized and Unsignalized Intersections	35
Table 3-1: Tier 1 Alternative Evaluation & Screening Results	39
Table 3-2: Final Tier 2 Alternative Evaluation Criteria & Weightings	42
Table 3-3: Tier 2 Alternative Rankings Based on Tier 2 Evaluation Criteria Result	43
Table 3-4: Final Tier 3 Evaluation Criteria	49
Table 3-5: Tier 3 Alternative Rankings Based on Tier 3 Evaluation Criteria Results	50
Table 3-6: Milton Road Segmentation, Existing Right-of-Way, & Existing Cross Section Inventory	71
Table 4-1: Short-Term of the Recommended Alternative: Forest Meadow Street to Route 66	75
Table 4-2: Short-Term Recommended Alternative: Route 66 to Beaver Street	87
Table 4-3: Short-Term & Long-Term Spot Improvements	100
Table 4-4: Left-Turn Access Control (assuming a Raised Median)	109
Table 5-1: Total Planning-Level Cost Estimate	110
Table 5-2: Desired Roadway Facility Widths	112



BNSF



EXECUTIVE SUMMARY

Milton Road Corridor Overview

The character and function of Milton Road has changed over the years with the evolution and growth of the City of Flagstaff. Historically, Milton Road primarily served residents and visitors as a connection between Interstate 17 (I-17) to downtown Flagstaff, Interstate 40 (I-40), Historic Route 66, and US Highway 180 (US 180). Although Milton Road continues to serve in that capacity today, the roadway has now grown into an automobile-centric corridor primarily serving commercial services that cater to Flagstaff residents, seasonal visitors, Northern Arizona University (NAU) students, and rural Coconino County residents seeking goods and services. The Milton Road corridor stives to provide travel options for alternative modes of travel for those who walk, bike, or take public transit, but the current infrastructure to support multimodal travel options is insufficient with narrow sidewalks, no bike lanes or bike ways, and a high concentration of driveways which creates conflict between vehicles and bicyclist/pedestrians.

Milton Road is home to a considerable amount of the commercial retail growth and high occupancy student housing in the region. Milton Road is also the primary corridor serving residents and regional visitors as the gateway to the Grand Canyon and recreational sites in the Coconino National Forest.

As Illustrated in **Figure ES-1**, the Milton Road Corridor Master Plan (CMP) study corridor consists of a 1.8-mile segment from West Forest Meadows Street (Mile Post 402.16) to Beaver Street (MP 180.20).

There is an extensive list of issues within the study corridor, including periodic periods of moderate to severe traffic congestion that also fluctuate seasonally, caused by the combination of local traffic, visitors, and a lack of alternative north-south surface street connectivity, particularly occurring during winter snow play weekends



and holidays. The frequency and close proximity of driveways and intersections along Milton Road creates access management conflicts and safety issues. Milton Road's proximity to a significant number of commercial, employer, and housing destinations, as well as adjacency to NAU, brings a more modern articulation of multimodal challenges facing bicyclists, pedestrians, and transit users that were not necessarily prioritized in the early stages of the roadway.







Figure ES-1: Milton Road Study Corridor





UAS

METROPLAN



Milton Road CMP Purpose & Need

The purpose of the Milton Road CMP is to identify a 20-year vision for the Milton Road corridor that addressed the seven Project Partner identified goals (expressed in **Figure 1-5**) by evaluating a mixture of previously recommended and newly introduced System Alternatives. These System Alternatives included a mix of alternatives that utilize and maintain the existing Milton Road right-of-way, alternatives that would require an expanded right-of-way, and alternative routes separate and in addition to Milton Road.

The System Alternatives are also complemented by a series of Spot Improvements – which constitute targeted, near-term, primarily low investment mitigation measures that support mid-term and long-term System Alternatives.

The Milton Road CMP process included public and stakeholder involvement consisting of a thorough, pragmatic and community-vetted set of qualitative and quantitative evaluation criteria over a three-tiered evaluation of the System Alternatives. This process was designed to ultimately reach a Recommended Alternative by achieving an informed consensus of the Project Partners while obtaining desires and feedback from stakeholders and the community. Reference Section 4.0 - Recommended Alternative for detailed information about the Recommended Alternative.









Planning Process

The Milton Road CMP consisted of a thorough and lengthy process with a three-tiered technical analysis that was supported by invaluable contributions from the Project Partners, stakeholders, and members of the public. **Figure ES-2** below depicts the general steps in the Milton Road CMP planning process.

Figure ES-2: Milton Road CMP Process Flow Chart



This process was supported by the dedication of the Project Partners who worked through 25 meetings over the course of the planning process to help guide the consultant, offer important input, desires, feedback on draft documents, development of the alternatives and evaluation criteria, refinement of alternatives, creation of controlling design criteria and spot improvement inventories, and ultimately review and select the Short-term and Long-term Recommended Alternative.





Evaluation of Corridor Alternatives

The Milton Road CMP alternative evaluation and screening process was conducted through a Three Tier approach (**Figure ES-3**). Each of the Three Tier Alternative Evaluation and Screening processes were conducted under the guidance and direction of the Project Partners with updates and meetings at major milestones during the process. The Three-Tiered approach is described below:

- Tier 1 Alternative Evaluation was based on public and stakeholder feedback on the Preliminary System Alternatives developed through the initial phases of the study presented in Working Paper #1 – Existing & Future Conditions for the first screening of alternatives. Reference the project website to view Working Paper #1.
- Tier 2 Alternative Evaluation focused on the development of qualitative and quantitative evaluation criteria that analyzed and measured the performance of the Milton Road Tier 2 Alternatives. The development, methodology, and results of the Tier 2 Alternative Evaluation is presented in *Working Paper #2 Alternatives Analysis*. Reference the project website to view Working Paper #2.
- Tier 3 Alternative Evaluation expanded upon efforts conducted in the Tier 2 Alternative Evaluation phase to further analyze the remaining alternatives through a further refined series of diverse evaluation criteria focusing on quantitative measures to complement traffic modeling outputs that assessed the overall performance of the Tier 3 Alternatives. The development, methodology, and results of the Tier 3 Alternative Evaluation is presented in *Working Paper #2 Alternatives Analysis*. Reference the project website to view Working Paper #2.

In developing transportation projects, there is sometimes a tradeoff between safety, capacity, convenience, and/or comfort of mode based on transportation controls and design that result in impacts to travel times. These tradeoffs must be carefully considered in a future analysis that goes beyond the scope of a planning document.

Some intersection and/or mid-block crossing locations that are identified as future opportunities in the Milton Road Corridor Master Plan may not be implemented as proposed after being analyzed through the planning process and evaluation criteria agreed upon by partners. However, these opportunities could present themselves as we move into the future. Approval to build such crossings requires a technical evaluation process which may not support the implementation of the improvements or may require additional enhancements such as intersection improvements, median refuges, grade separations or location adjustments. If the intersection and segment level of service or other potential negative impacts improve or can be mitigated from the predicted level of service identified in the study at the horizon year, then the additional pedestrian crossings could be considered if warranted in the future. Even though this is a 20-year plan, potential changes from real to projection may be checked on a five-year basis.

UAS(







Figure ES-3: Three Tier Alternative Evaluation & Screening Process Flow Chart



UAS

BNS

METROPLAN



Short-Term Application of the Recommended Alternative: Forest Meadow Street to Route 66

This section describes the short-term application of the Recommended Alternative from Forest Meadows Street to Route 66, as shown in Figure **ES-4**. From Forest Meadows Street to Route 66, as illustrated in **Table ES-1**, there is 100' of available right-of-way beginning from the southern terminus of the study corridor and continues north to Route 66. As part of the segmentation process, there are a total of 16 segments between Forest Meadows Street and Route 66 as determined by the existing cross section condition (Segment A through Segment P). All three of the existing cross section conditions occur between Forest Meadows Street and Route 66:

- 4 Travel Lanes 0 RTL 1 CTL
- 4 Travel Lanes 1 RTL 1 CTL
- 4 Travel 2 RTL 1 CTL

Table ES-1 summarizes the short-term application for the Recommended Alternative by showing the facility types and widths while cross referencing the existing cross section for each segment. Figure **ES-4** depicts the recommendations by cross referencing the proposed cross section with the corresponding segment. Refer to the proceeding subsections for more information.

The Recommended Alternative, and corresponding short-term recommendations, are based on existing ADOT policies. Should ADOT policies change, any impacted recommendation should be re-evaluated as applicable.









Table ES-1: Short-Term Recommended Alternative: Forest Meadow Street to Route 66

.			D 111	Phase 1 Recommendation												
ROW	Segment	Existing Cross Section	ROW Aq.		Southb	ound			Center			North	bound		ROW	
100'	Segment A	4 GP - 2 RTL - 1 CTL	Yes	8' SW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	8' SW	106'	
100'	Segment B	4 GP - 1 RTL - 1 CTL	Yes	10' SW 3' PW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	3' PW	10' SW	105'	
100'	Segment C	4 GP - 1 RTL - 1 CTL	Yes	10' SW	3' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	3' PW 10' SW	105'	
100'	Segment D	4 GP - 1 RTL - 1 CTL	Yes	10' SW	3' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	3' PW 10' SW	105'	
100'	Segment E	4 GP - 2 RTL - 1 CTL	Yes	8' SW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	8' SW	106'	
100'	Segment F	4 GP - 1 RTL - 1 CTL	Yes	10' SW	3' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	3' PW 10' SW	105'	
100'	Segment G	4 GP - 0 RTL - 1 CTL	Yes	10' SW	6' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	6' PW	10' SW	100'	
100'	Segment H	4 GP - 1 RTL - 1 CTL	Yes	10' SW 3' PW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	3' PW	10' SW	105'	
100'	Segment I	4 GP - 2 RTL - 1 CTL	No	5' SW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	5' SW	100'	
100'	Segment J	4 GP - 0 RTL - 1 CTL	Yes	10' SW	3' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	3' PW	10' SW	100'	
100'	Segment K	4 GP - 1 RTL - 1 CTL	Yes	10' SW	3' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	3' PW 10' SW	105'	
100'	Segment L	4 GP - 2 RTL - 1 CTL	Yes	8' SW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	8' SW	106'	
100'	Segment M	4 GP - 1 RTL - 1 CTL	Yes	10' SW 3' PW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	3' PW	10' SW	105'	
100'	Segment N	4 GP - 0 RTL - 1 CTL	Yes	10' SW	6' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	6' PW	10' SW	100'	
100'	Segment O	4 GP - 1 RTL - 1 CTL	Yes	10' SW	3' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	3' PW 10' SW	105'	
100'	Segment P	4 GP - 1 RTL - 1 CTL	Yes	10' SW 3' PW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	3' PW	10' SW	105'	
						Leg	end									

Center Turn / Median	Shoulder (includes 2.5' gutter pan and curb)
Travel Lane	Sidewalk
Right Turn Lane	Parkway





4, 11' GP - 0 RTL - 1, 13' CTL/Median - 2, 3' shlds - 10' Sidewalks - 6' Pkwy 1 Ŧ 74 10' 6' ິລ 3' 11' 11' 3' 10' 11' 3' ເລ 6' 10' C&G 2.5' Shid 🜜 10' 6' 22' 22' 3' 2.5 6' 13' 10' Sidewalk Southbound Median* & Northbound Shld C&G Sidewalk иау Center Left Jarkw Travel Lanes Travel Lanes Parkv Turn Lane 68' Curb to Curb 100' Right-of-Way 4. 11' GP – 1. 11' RTL – 1. 13' CTL/Median –2. 3' shlds-10' Sidewalks – 3' Pkwv 10 ł 44 Ť Т 3' 🖧 3' 11' 3' 🖁 3' 11' 11' 11' 10' 11' 3' 10' 10' Shid 😌 C&G 2.5' arkway 😌 3' 🕄 3' 11' 22' 13' 22' 10' 10' C & G Shld SB Right Southbound Median* & Northbound Sidewalk Sidewal Turn Lane Center Left Travel Lanes Travel Lanes Turn Lane 79' Curb to Curb 105' Right-of-Way

Figure ES-4: Short-Term Recommended Cross Section: Forest Meadow Street to Route 66

4, 11' GP - 2, 11' RTL - 1, 13' CTL/Median - 2, 3' shlds - 8' Sidewalks



METROPLAN



4, 11' GP - 2, 11' RTL - 1, 13' CTL/Median - 2, 3' shoulders - 5' Sidewalks



BNSF

NORTHERN

UNIVERSIT

UAS





Short-Term Application of the Recommended Alternative: Route 66 to Beaver Street

This section describes the short-term application of the Recommended Alternative from Route 66 to Beaver Street, as shown in Figure **ES**- 5. From Route 66 to Beaver Street, as illustrated in **Table ES**- 2Table 4-2, the existing right-of-way footprint fluctuates between 80' and 90' but is predominately 80' for the majority of the roadway segments north of Route 66. As part of the segmentation analysis, there are a total of eight (8) segments between Route 66 and Beaver Street as determined by the existing cross section condition (Segment Q through Segment X). Two of three of the existing cross section conditions occur between Route 66 Beaver Street:

- 4 Travel Lanes 0 RTL 1 CTL
- 4 Travel Lanes 1 RTL 1 CTL

Table ES- 2 provides a summary of the short-term application of the Recommended Alternative north of Route 66 by showing the different facility types and widths while cross referencing the existing cross section for each segment. **Figure ES- 5** depicts the recommendations by referencing the proposed cross section with the corresponding roadway segment. Refer to the proceeding subsections for more information. The following sub-sections provide more detail on the short-term application of the Recommended No-Build Hybrid Alternative from Route 66 to Beaver Street.

The Recommended Alternative, and corresponding short-term recommendations, are based on existing ADOT policies. Should ADOT policies change, any impacted recommendation should be re-evaluated as applicable.







Table ES- 2: Short-Term of the Recommended Alternative: Route 66 to Beaver Street

				Phase 1 Recommendation												
ROW	Segment	Existing Cross Section	Possible ROW Aq.			Southb	ound			Center			Phase 1 ROW			
90'	Segment Q	4 GP - 1 RTL - 1 CTL	Yes		8.5' SW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	8.5 SW		96'
80'	Segment R	4 GP-0 RTL - 1 CTL	Yes*			9' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	9' SW		86'
87.5'	Segment S	4 GP - 1 RTL - 1 CTL	Yes*			10' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	Existing SW	89'
80'	Segment T	4 GP - 0 RTL - 1 CTL	No			6' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	6' SW		80'
80'	Segment U	4 GP - 0 RTL - 1 CTL	No			6' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	6' SW		80'
80'	Segment V	4 GP - 0 RTL - 1 CTL	Yes			9' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	9' SW		86'
80'	Segment W	4 GP - 0 RTL - 1 CTL	Yes			9' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	9' SW		86'
80'	Segment X	4 GP - 0 RTL - 1 CTL	No			6' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	6' SW		80'

<u>Legend</u>	
Center Turn / Median	Shoulder (includes 2.5' gutter pan and curb)
Travel Lane	Sidewalk
Right Turn Lane	Parkway
Right Turn Lane	Parkway





ADOT



68'

Curb to Curb

86'

ht.of.Wa

METROPLAN

Figure ES- 5: Short-Term Recommended Alternative: Route 66 to Beaver Street











Recommended Alternative Long-Term Vision for Milton Road

As the Vision Statement expresses, the long-term application of the Recommended Alternative establishes a long-term community desired vision for Milton Road, consisting of a specific roadway cross section for both ADOT and the City of Flagstaff to collaboratively implement, including enhanced multimodal features. Implementation of this vision is designed to occur incrementally, leveraging future development and redevelopment permitting processes for parcels along the Milton Road corridor to achieve the desired roadway enhancement with little to no impacts to adjacent businesses. As previously described, some of the Spot Improvements are unique to the long-term application of the Recommended Alternative, while others are included in both the short-term and long-term applications.

Figure ES- 6, Figure ES- 7, and **Figure ES-** 8 illustrate the cross section of the Long-term application, which vary between 116' and 144' wide depending on the presence or not of right turn lanes. The Long-term application of the Recommended Alternative includes:

- Maintains the four 11' travel lanes with two northbound and two southbound travels lanes as described in Short-term application;
- A wider center treatment with either a 15' median instead of a 13' median in Short-term recommendation; and also, a wider center left turn and median than Phase at 11' and 4' to maintain the 15' center facility throughout the entire corridor;
- Expanded right turn lanes of 14' to satisfy ADOT design guidelines and to help facilitate right turns for larger vehicles. It is important to note that the right turn lanes are not anticipated to exist throughout the entire corridor as continuous right turn lanes in Long-term; Rather, the right turn lanes are anticipated to exist where they are located today and where they are required as a recommendation from the TIA process in conjunction with new development or redevelopment along the Milton Road corridor. City implementation of connecting roads and requiring improved internal circulation between business can alleviate the need for some future turn lanes;
- Includes the introduction of 6' buffered bike lanes to accommodate improved bike facilities compared to Short-term;
- Ensures a consistent 10' parkway between the sidewalk and the curb. The Long-term Parkway would include vegetation south of Route 66, while north of Route 66, it would consist of hardscape and street furniture amenities, including bike racks, benches, trash receptacles, wayfinding signage, and other types of street furniture/amenities as needed.
- Includes a uniform 10' sidewalk throughout the corridor on both sides of Milton Road to accommodate multimodal users.
- Although outside of the right-of-way, Long-term includes a suggested 10' public utility easement that can also double as a landscaped area between sidewalk and building setbacks. The city of Flagstaff is currently evaluating appropriate building setbacks in response to this Long-term recommendation.

Reference Appendix A for a design schematic showcasing the long-term right-of-way linework along the entire Milton Road CMP study corridor.





8=00







*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.





ADOT





*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.









4, 1	1' GP Lan	es – 1, 1	.5' CTL/	Me	edian –2, 1	l 4' R 1	rls - 2, 6	' Bike La	nes	– 10' Pa	arkways -	- 10' Sid	ewal	ks – 10' Se	tb	ack	14	4' ROW
		A				NOON											ŧÿ	
10		10'	10'	2.5'	14'	∾ * ∾ 6'	<u>11'</u>	11'	4'	11'	11'	11'	6'	14'	2.5'	10'	10'	
nes		10'	10'	2.5	14'	6'	2	2'		15'	2	2'	6'	14'	2.5	10'	10'	,
:Turn La		Sidewalk	Parkway	ငနင	SB Right Turn Lane	SB Bike Lane	South Trave	ibound I Lanes	Me Cei Tu	edian* & nter Left rn Lane	Northl Travel	oound Lanes	NB Bike Lane	NB Right Turn Lane	C&G	Parkway	Sidewalk	
Right	·								Cur	104' rb to Curb								
Two									Rig	144' ht-of-Way								

*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.







1.0 MILTON ROAD CORRIDOR MASTER PLAN OVERVIEW

1.1 Milton Road Corridor Overview

The character and function of Milton Road has changed over the years with the evolution and growth of the City of Flagstaff. Historically, Milton Road primarily served residents and visitors as a connection between Interstate 17 (I-17) to downtown Flagstaff, Interstate 40 (I-40), Historic Route 66, and US Highway 180 (US 180). Although Milton Road continues to serve in that capacity today, the roadway has now grown into an automobile-centric corridor primarily serving commercial services that cater to Flagstaff residents, seasonal visitors, Northern Arizona University (NAU) students, and rural Coconino County residents seeking goods and services. The Milton Road corridor stives to provide travel options for alternative modes of travel for those who walk, bike, or take public transit, but the current infrastructure to support multimodal travel options is insufficient with narrow sidewalks, no bike lanes or bike ways, and a high concentration of driveways which creates conflict between vehicles and bicyclist/pedestrians.

Milton Road is home to a considerable amount of the commercial retail growth and high occupancy student housing in the region. Milton Road is also the primary corridor serving residents and regional visitors as the gateway to the Grand Canyon and recreational sites in the Coconino National Forest.

As Illustrated in **Figure 1-1**, the Milton Road Corridor Master Plan (CMP) study corridor consists of a 1.8-mile segment from West Forest Meadows Street (Mile Post 402.16) to Beaver Street (MP 180.20).

There is an extensive list of issues within the study corridor, including periodic periods of moderate to severe traffic congestion that also fluctuate seasonally, caused by the combination of local traffic, visitors, and a lack of alternative north-south surface street connectivity, particularly occurring during winter snow play weekends and holidays. The frequency



and close proximity of driveways and intersections along Milton Road creates access management conflicts and safety issues. Milton Road's proximity to a significant number of commercial, employer, and housing destinations, as well as adjacency to NAU, brings a more modern articulation of multimodal challenges facing bicyclists, pedestrians, and transit users that were not necessarily prioritized in the early stages of the roadway.







Figure 1-1: Milton Road Study Corridor





BNSF

UAS

METROPLAN

1.2 Milton Road CMP Purpose & Need

The purpose of the Milton Road CMP is to identify a 20-year vision for the Milton Road corridor that addressed the seven Project Partner identified goals (expressed in **Figure 1-5**) by evaluating a mixture of previously recommended and newly introduced System Alternatives. These System Alternatives included a mix of alternatives that utilize and maintain the existing Milton Road right-of-way, alternatives that would require an expanded right-of-way, and alternative routes separate and in addition to Milton Road.

The System Alternatives are also complemented by a series of Spot Improvements – which constitute targeted, near-term, primarily low investment mitigation measures that support mid-term and long-term System Alternatives.

The Milton Road CMP process included public and stakeholder involvement consisting of a thorough, pragmatic and community-vetted set of qualitative and quantitative evaluation criteria over a three-tiered evaluation of the System Alternatives. This process was designed to ultimately reach a Recommended Alternative by achieving an informed consensus of the Project Partners while obtaining desires and feedback from stakeholders and the community. Reference *Section 4.0 - Recommended Alternative* for the information about the Recommended Alternative.

1.3 Milton Road CMP Vision Statement

The Vision for the Milton Road Corridor is to enhance community character while maintaining acceptable operations in a manner that respects all users, modes of travel, and local business. The Vision for Milton Road balances improvement with preservation. The improvements to Milton Road will help create an environment of shared benefits, whereby one user group does not benefit at the expense of another. The Milton Road Corridor Master Plan has determined—through extensive analysis and public input—that ADOT cannot simply build its way out of congestion within this corridor. Therefore, it is recommended here that Milton Road be enhanced within the confines of the existing roadway prism. Specifically, this means that for at least a 20-year period (through 2041), no new through lanes are recommended for Milton Road. All multimodal improvements, as specified below, are designed to avoid or minimize encroachment and impacts to existing businesses or property to the best extent practicable. Specifically, the improvements on Milton Road, as defined by the Milton Road Corridor Master Plan, will encourage walking, cycling, bus ridership, and business, without negatively impeding traffic operations or impacting existing buildings or parking spaces.

The Project Partners and ADOT have determined this Vision should be achieved in two stages:

- Milton Road Short-Term Vision is a modified, or "hybrid" No-Build scenario that implements recommended roadway and multimodal enhancements as identified in Milton Road CMP in the near-term and is achieved primarily within ADOT's existing right-of-way, with minimal impacts to private parking lots and no impacts to existing buildings. Reference Section 4.1 Short-Term Recommended Alternative: No-Build Hybrid for more information on the Short-term implementation.
- Long-term Milton Road Long-Term Vision is a community-desired vision for robust walking and biking bicycle facilities in a well-landscaped corridor. The long-term vision

UAS



BNS



includes wide sidewalks, buffered bike lanes and generous parkways that create a safe, accessible, and business-friendly environment. More information on the long-term vision implementation is provided in the follow sub-section and in *Section 4.2 - Recommended Alternative: Long Term Vision for Milton Road.*

Milton Road Long-Term Vision

The Long-term vision for robust walking and bicycle facilities in a well-landscaped corridor is implemented in Long-term vision. The wide sidewalks, buffered bike lanes and generous parkways illustrated in the specific roadway cross-section create a safe, accessible and business-friendly environment. They allow for beautification that transforms Milton Road into a Great Street. Comfortable transit stops are easily accessed by people on their way to work, shop and tour Flagstaff. Traffic flow is managed by well-appointed medians and strategically located turn lanes. Over time and working with the private sector the City will develop complementary roadways and private parking circulation to aid access and mobility throughout the corridor. Roles are clear for ADOT, the City of Flagstaff, Mountain Line Transit, and the private-sector to collaboratively implement all aspects of this vision. Implementation of this vision is designed to occur incrementally, leveraging future development and redevelopment permitting processes for parcels along the Milton Road corridor to achieve the desired roadway enhancement. Projects of opportunity will be considered in the city site plan review and development permitting processes with necessary right-of-way being acquired at that time. Long-term Corridor Master Plan improvements to achieve the vision will be implemented through redevelopment of adjacent parcels and/or agency projects.

As **Figure 1-2** through **Figure 1-4** illustrate, the long-term vision would result in a uniform and continuous wider sidewalk, landscaped buffers, and buffered bicycle lanes. The cross sections depict how the long-term vision of Milton Road would look under three conditions:

- a) When two right turn Lanes are present;
- b) When one right turn Lane is present; and
- c) When no right turn lanes are present (Long-term vision does <u>not</u> include the addition of new through traffic lanes).

Based on years of analysis, public comment, and consensus of Milton Road Corridor Master Plan Project Partners, let this collective Milton Road CMP Vision serves as a fundamental step in the improvement of Milton Road.





BNS







*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.









4, 1	1' GP Lanes	- 1, 15'	CTL/Me	di	an 1,	14' RTL	– 2, 6' Bi	ke l	Lanes – 1	l <mark>0' Park</mark>	ways – 10)' Side	walks – 1	0' S	Setback		130' ROW
							-						Ŗ			ŧ	
		10'	10'	ÎQ	0 ¥ K 6'	11'	11'	1,	11'	11'	11,	No'ON	1 / '	مت ا	10'	10'	
t Turn Lane		10' Sidewalk	10 10' Parkway	C&G 2.5' 2.	6' SB Bike Lane	2 South Trave	2' nbound I Lanes	_4 	15' Iedian* & enter Left urn Lane	Nort Trav	22' hbound el Lanes	6' NB Bike Lane	14 14' NB Right Turn Lane	C & G 2.5 ¹ 2.	10' Parkway	10' Sidewalk	
Righ									9 Curb t	0' o Curb							
One									13 Right-	60' of-Way							

*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.







Figure 1-4: Long-Term Vision Cross Section of the Recommended Alternative – Two Right Turn Lanes

4, 1	1' GP Lan	es – 1, 1	.5' CTL/	Μe	edian –2, 1	l4' R1	rls - 2, 6	' Bike La	nes	– 10' Pa	arkways ·	– 10' Sid	ewal	<s−10′ se<="" th=""><th>tb</th><th>ack</th><th>14</th><th>4' ROW</th></s−10′>	tb	ack	14	4' ROW
		Ŕ					(ŧÿ	
		10'	10'	5:	14'	6'	+ 11'	11'	4'	<u>רר </u> 11'	11'	11'	No%) 6'	<u>14'</u>	2	10'	10'	NG 28 MINAS BE
t Turn Lanes		10' Sidewalk	10' Parkway	C&G 2.5' 2	14' SB Right Turn Lane	6' SB Bike Lane	2 South Trave	2' Ibound I Lanes	Me Cei Tu	15' edian* & nter Left rn Lane	2 North Travel	2' bound Lanes	6' NB Bike Lane	14' NB Right Turn Lane	C & G 2.5' 2	10' Parkway	10' Sidewalk	
Righ									Cur	104' b to Curb								
Two									Rig	144' ht-of-Way								

*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.







1.3b Project Partner Goals & Objectives

As part of the CMP Process, a team of Project Partners was assembled with representatives from the following agencies:



The Project Partners were established to guide the success of the Milton Road CMP planning process and consultant's efforts by maintaining a positive and supportive working relationship with all partnering agencies, communicating regularly, and staying committed to the project's core values. The Project Partners met early in the planning process to agree upon and create a Charter (Please see Appendix B) to establish a set of fundamental principles and values for the Partners to abide by for the duration of the planning process. The Project Partners also established the following seven goals (**Figure 1-5**) for the Milton Road CMP which are not prioritized in any particular order.





METROPLAN



Figure 1-5: Milton Road CMP Goals



UAS

BNS



METROPLAN



1.4 Planning Process

The Milton Road CMP consisted of a thorough and lengthy process with a three-tiered technical analysis that was supported by invaluable contributions from the Project Partners, stakeholders, and members of the public. **Figure 1-6** below depicts the general steps in the Milton Road CMP planning process.

Figure 1-6: Milton Road CMP Process Flow Chart



This process was supported by the dedication of the Project Partners who worked through 25 meetings over the course of the planning process to help guide the consultant, offer important input, desires, feedback on draft documents, development of the alternatives and evaluation criteria, refinement of alternatives, creation of controlling design criteria and spot improvement inventories, and ultimately review and select the Short-term and Long-term application of the Recommended Alternative.







1.4a Public Engagement Process Summary

As part of the CMP initiation, a Public Involvement Plan (PIP) for the Milton Road CMP was developed in accordance with ADOT's formal PIP and public involvement requirements. The Milton Road CMP PIP demonstrated how ADOT will engage people of all races, cultures and income levels, including minority and low-income populations in the Milton Road CMP planning process. Refer to Appendix C to review the Milton Road CMP Public Involvement Plan.

The two rounds of public outreach conducted for the Milton Road CMP consisted of a combination of an in-person open house meeting, a virtual open house meeting, elected official briefings, and considerable comment card and project survey feedback from residents and business owners. A summary of each open house meeting is provided below. Refer to Appendix D for the first and second Public Meeting Summary Reports for additional information.

Public Open House Meeting #1

The foundation of the Tier 1 Alternative Evaluation process was based on public and stakeholder feedback on the Preliminary System Alternatives presented in *Working Paper #1 – Existing & Future Conditions* (view on project <u>website</u>). The majority of the feedback was received at Public Open House Meeting #1 held at Flagstaff High School on May 10, 2018, in which 86 community members attended.

The primary objective of Public Open House Meeting #1 was to present the Preliminary System Alternatives for the Milton Road CMP study corridor and seek public input to help the Project Partners determine which Preliminary System Alternatives should move forward into the Tier 2 Alternative Evaluation process.

Additional input and guidance on the Tier 1 Alternative evaluation process was received from a series of Project Partner meetings and from City of Flagstaff City Council and Coconino County Board of Supervisors briefings.



Photo of public participation at the Public Open House Meeting #1

Held at Flagstaff High School on May 10, 2018, in which 86 community members attended.







Public Open House Meeting #2

The Public Open House Meeting #2 occurred on November 18, 2021 was held virtually due to the COVID-19 Pandemic. The purpose of Public Open House Meeting #2 was to present the detailed three-Tier Alternative Analyses results and solicit public and stakeholder input on the Tier 3 Alternatives. Public feedback received from the open house meeting was an important contribution to complement the technical findings and assist the Project Partners in the selection of the Recommended Alternative. In fact, the public's opinion was directly integrated into the selection of the Recommended Alternative, as reflected in the series of graphics.

Public Open House Meeting #2 began with a brief presentation to explain the three-tier alternative evaluation process, provide an overview of the Tier 3 Alternative Evaluation analysis, metrics and results, and notify the participants of the online community survey. The online community survey included a series of 24 targeted questions. A total of 104 survey responses were received. In addition to feedback received from the community survey, there was also a Live Question and Answer (Q&A) session to allow meeting participants the opportunity to ask questions about the CMP process as a whole to project representatives in a live format. The Live Q&A session was one hour long with 51 participants and a total of 24 questions recorded and answered. Public input from the survey was the feedback that contributed to the outcome of the final alternatives selected.



Screenshot of the Virtual Public Open House #2 held on November 18, 2021. The virtual room was accessed here: http://miltonroadcorridormasterplan.com/





METROPLAN

ADOT

2.0 MILTON ROAD CORRIDOR PROFILE

Milton Road is a multi-functional corridor serving residents and regional visitors to the Grand Canyon, recreational sites in the Coconino National Forest, and many nearby cultural offerings. There is an extensive list of issues within the study corridor, including moderate to severe traffic congestion that fluctuates seasonally, caused by the combination of local traffic, visitors, and a lack of north-south connectivity in the adjacent street network. The traffic congestion is further exacerbated during winter snow play weekends and holidays as visitors flock to the region.

The frequency and close proximity of driveways and intersections causes access management conflicts. Milton Road has multimodal challenges facing bicyclists, pedestrian, and transit users including safety issues, lack of adequate facilities, lack of safe and convenient crossings, and poor comfort for these modes. The growth of NAU's student body and the number of new student living complexes on and near Milton Road within the last 10 years have caused an increase of pedestrian and bicycle activity along the Milton Road corridor creating a higher demand to provide improved facilities to support multimodal travel options. These improved facilities should include wider and detached sidewalks, dedicated space for bicyclists, and more frequent and safer crossings.

Existing land uses along the Milton Road corridor predominantly consist of retail and service commercial land uses for parcels with frontage on Milton Road. The commercial-oriented land uses along Milton Road serve a combination of local, regional and tourist demands. This section provides a brief overview of the current and project conditions of the Milton Road CMP study corridor. For more detailed information and synopsis, reference *Working Paper #1 – Existing & Future Conditions* on the project website.

2.1 Land Use & Growth Impacting Milton Road - Today & Tomorrow

The NAU campus is situated just east of Milton Road and is a significant economic engine for the City of Flagstaff. Northern Arizona University's Flagstaff campus had over 22,000 students in 2016 which accounts for approximately 30 percent of Flagstaff's population. NAU has been experiencing rapid growth in recent years and is planning for a Flagstaff campus population of 24,000 in 2025.

With the current and future anticipated growth of on campus and off campus housing, strong student interest in pedestrian, bicycle, and bus use over a personal vehicle, and the close proximity to the retail, dining and entertainment opportunities along the Milton Road corridor, an exciting and challenging opportunity for multimodal transportation operations and safety consideration is an important influencing factor for the Milton Road CMP.

In anticipation and response to the ongoing and planned growth in the area, the city of Flagstaff has identified key activity center and high occupancy housing sites located along the Milton Road corridor(see **Figure 2-1** and **Figure 2-2** for locations). Please note that both plans identify the need for high multimodal access in the Milton Road corridor to serve high occupancy housing (HOH) and activity centers.

UAS






Figure 2-1: Potential HOH Development Zones



Source: City of Flagstaff High Occupancy Housing Draft Specific Plan







Figure 2-2: Future Growth Illustration



U**≜**S

BNSF

Source: City of Flagstaff





2.2 Existing Roadway Conditions & Characteristics

Milton Road is classified as a Major Arterial per the City of Flagstaff's functional classification hierarchy and classified as a Principal Arterial per the FHWA functional classification. As defined by FHWA, these roadways serve major centers of metropolitan areas, provide a high degree of mobility and can also provide mobility through rural areas. Unlike their access-controlled counterparts, abutting land uses can be served directly.

The Milton Road CMP study corridor is primarily a five-lane corridor with two general purpose through lanes in each direction, and a center two-way left-turn lane. The majority of the corridor has 100' of existing right-of-way from south of Route 66 to Forest Meadows Street, and the rest of the corridor north of Route 66 to San Francisco Street fluctuates between 90' and 80' – although, predominately 80'. The existing right-of-way footprints are as follows:

- 100' Forest Meadows Street to Route 66;
- 90' Route 66 to Private Drive (Dairy Queen);
- 80' Private Drive (Dairy Queen) to Malpais Lane;
- 87.5' Malpais Lane to Butler/Clay Avenue; and
- 80' Butler/Clay Avenue to San Francisco Street.

Dedicated left-turn and right-turn lanes exist at many intersecting streets. Curb, gutter and sidewalk exist through the entire corridor, while back-of-curb amenities such as landscaped buffers (AKA parkways) and furnishing strips are virtually absent universally across the corridor. There are no bike lanes, however a wider shoulder that can be used by bikes exists on both sides of Milton Road between Old Route 66 and Phoenix Avenue and from approximately 290 feet west of Humphreys Street to Beaver Street.

The posted speed limit is 30 miles per hour throughout the corridor with the exception of the speed limit along the curvature approaching the railroad tracks, where the posted speed limit is 25 mph and a posted speed limit of 35 mph from Forest Meadows Street to Plaza Way. There are eight signalized and seven stop-controlled intersections along the Milton Road CMP study corridor.

2.2a Existing Traffic Volumes & Level-of-Service (LOS)

Twenty-four-hour daily approach and departure traffic volumes in 15-minute intervals were collected at nine locations along the Milton Road study corridor on Tuesday, September 12, 2017. The collected traffic volumes included vehicular, pedestrian and bicycle counts. **Table 2-1** summarizes the existing daily traffic volumes along the study corridor. **Figure 2-4** also illustrates the existing average daily vehicle traffic and the existing intersection level of service (LOS) along the Milton Road corridor.







Table 2-1: Existing (2017) Daily Traffic Volumes

CountLocation	24-Hour Daily Traffic Volume					
	Northbound	Southbound				
Between Forest Meadows St and University Dr	17,825	17,437				
Between Forest University Dr and Chambers Dr	17,820	16,119				
Between Forest University Dr and Plaza Way	14,584	15,891				
Between Riordan Rd and Historic Route 66	17,422	17,199				
Between Historic Route 66 and Malpais Ln	26,671	27,014				
Between Malpais Ln and Butler Ave	25,125	26,367				
Between Butler Ave and Phoenix Ave	20,175	20,614				
Between Phoenix Ave and Humphreys St	15,863	18,323				
Between Humphreys St and Beaver St	12,908	11,954				

Figure 2-3 shows a graphical representation of the 24-hour daily traffic volumes along Milton Road corridor.



Figure 2-3: 24-Hour Daily Traffic Volumes

The ability of a transportation system to transmit the vehicle-based transportation demand is characterized as its Level of Service or LOS. LOS is a rating system from "A", representing the best operation, to "F", representing the worst operation. The appropriate reference for LOS operation is the Highway Capacity Manual, published by the Transportation Research Board. This LOS analysis does not take bike, pedestrian, and transit use into account, and sometimes adding these improvements decreases the vehicle LOS. This manual characterizes the LOS for an urban street facility as described in **Table 2-2**.

In general, LOS A and B represent no congestion, LOS C and D represent moderate congestion, and LOS E and F represent severe congestion. Traffic congestion levels were estimated using the





existing 24-hour daily traffic volumes. Per ADOT guidelines, the lowest acceptable LOS threshold for the study corridor is LOS D.

Highway Capacity Software (HCS) and the previously described traffic counts were used to determine the roadway segment LOS for the Milton Road study corridor. **Figure 2-4** depicts the roadway intersection LOS for the Milton Road study corridor. The signalized and unsignalized study area intersections operate at LOS "D" or better with the existing 2017 traffic volumes, existing lane geometrics and existing signal timing. All the approaches operate at LOS "D" or better with the following exceptions:

- 1. Milton Road and Clay/Butler Avenue LOS E in the eastbound direction during Mid-Day and PM peak hours, LOS E in the westbound direction during the PM peak hour.
- 2. Milton Road and University Drive LOS E in the eastbound direction during Mid-Day and PM peak hours, LOS E in the westbound direction during the PM peak hour.
- 3. Milton Road and Forest Meadows Street LOS E in the westbound direction during Mid-Day and PM peak hours, and
- 4. I-17 Exit Ramp and McConnell Drive LOS F in the northbound direction during the PM peak hour.









UAS

BNSF

Figure 2-4: Existing Number of Average Daily Vehicles & Intersection Level-of-Service



Table 2-2: Level of Service Criteria for Urban Street Facilities

ADOT

Level-of-Service	Characterized by Highway Capacity Manual as:
A	Primarily free-flow speed. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at the boundary intersections is minimal. The travel speed exceeds 85 percent of the base free-flow speed.
B	Reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67 percent and 85 percent of the base free-flow speed.
C	Stable operation. The ability to maneuver and change lanes at mid- segment locations may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50 percent and 67 percent of the base-flow speed.
	Less stable condition in which small increases in flow may cause substantial increases in delay and decrease in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the boundary intersections. The travel speed is between 40 percent and 50 percent of the base free-flow speed.
	Unstable operation and significant delay. Such operation may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30 percent and 40 percent of the base free-flow speed.
	Flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is 30 percent or less of the base free-flow speed. Also, LOSF is assigned to the subject direction of travel if the through movement at one or more boundary intersections has a volume-to-capacity ratio greater than 1.0.



Bicycle & Pedestrian Counts

Table 2-3 and **Table 2-4** summarizes the number of pedestrians and bicyclists respectively at the study area intersections within the Milton Road study corridor during the Mid-Day (11:00 am to 1:00 pm) and PM peak hours (4:00 pm to 6:00 pm).

The highest number of pedestrians crossing Milton Road occurred at Beaver Street, Clay/Butler Avenue and at University Drive. Pedestrian volume is observed to be higher during the PM peak hour at the study intersections with the exception of Route 66, Plaza Way, Chambers Drive and Forest Meadows Street, where the pedestrian volume is higher during the Mid-Day peak hour.

The highest number of bicyclists crossing Milton Road also occurred at Beaver Street, Clay/Butler Avenue and at University Drive. Bicycle volume is observed to be higher during the PM peak hour at the study intersections with the exception of Riordan Road, Plaza Way, Chambers Drive, University Avenue and Forest Meadows Street where the bicyclist volume is higher during the Mid-Day peak hour.

	N	orth Le	eg	Sc	outh L	eg	East Leg			West Leg			
Intersection	Mid- Day	PM	Total	Mid- Day	PM	Total	Mid- Day	PM	Total	Mid- Day	PM	Total	Total
Beaver St	17	35	52	9	3	12	65	101	166	41	63	104	334
Humphreys St	6	20	26	N/A			0 - No Crosswalk			0 - No Crosswalk			26
Phoenix Ave	1	2	3	1	0	1	7	9	16	23	33	56	76
Clay/Butler Ave	93	116	209	0 - N	o Cros	swalk	73	71	144	29	35	64	417
Malpais Ln	0 - N	o Cross	walk	0 - No Crosswalk			N/A			6	14	20	20
Route 66	0 - N	o Cross	walk	33	0	33	N/A			54	51	105	138
Riordon Rd	16	22	38	24	16	40	10	25	35	24	19	43	156
Plaza Way	14	8	22	43	34	77	9	12	21	29	16	45	165
Chambers Dr	0 - N	o Cross	walk	6	0	6	7	8	15		N/A		21
University Ave	1	0	1	0 - N	o Cros	swalk	8	8	16	26	27	53	70
University Dr	80	106	186	0 - N	o Cros	swalk	16	10	26	25	23	48	260
Forest Meadows St	0 - N	o Cross	swalk	8	13	21	10	8	18	12	6	18	57
												Total	1,740

Table 2-3: Existing Pedestrian Crossing Volume

METROPLAN





UAS(



	N	orth L	.eg	So	outh L	eg	E	East Le	g	V	Vest L	eg	
Intersection	Mid- Day PM Total		Mid- Day	PM	Total	Mid- Day	PM	Total	Mid- Day	PM	Total	Total	
Beaver St	4	7	11	5	1	6	6	13	19	34	28	62	98
Humphreys St	2	6	8	N/A			1	1	2	0	1	1	11
Phoenix Ave	1	7	8	1	1	2	7	2	9	14	36	50	69
Clay/Butler Ave	17	29	46	4	7	11	11	36	47	3	6	9	113
Malpais Ln	0 - N	o Cros	swalk	0 - N	o Cros	swalk	0	3	3	4	5	9	12
Route 66	1	0	1	2	0	2	0	3	3	12	3	15	21
Riordon Rd	4	12	16	1	4	5	6	3	9	6	6	12	42
Plaza Way	9	6	15	6	4	10	3	3	6	2	2	4	35
Chambers Dr	0 - N	o Cros	swalk	1	0	1	2	0	2		N/A		3
University Ave	0 - N	o Cros	swalk	1	0	1	4	2	6	6	3	9	16
University Dr	36	32	68	0 - N	o Cros	swalk	2	4	6	9	12	21	95
Forest Meadows St	0	0	0	2	10	12	3	5	8	4	9	13	33
												Total	548

Table 2-4: Existing Bicycle Crossing Volume

2.2b Existing Non-Motorized Mobility

Existing Bike Facilities

Bike lanes do not exist along the Milton Road study corridor between Forest Meadows Street and Old Route 66. Striped shoulders, varying from two- to three-foot wide, exist on both sides of Milton Road between Old Route 66 and Phoenix Avenue. Striped shoulders also exist on both sides of Milton Road from approximately 290 feet west of Humphreys Street to Beaver Street. There are no existing bike lane signs posted or on street markings in association with these facilities as they do not meet the standards for bike lanes.

Existing Pedestrian Facilities

Continuous five- to six-foot wide sidewalks exist on both sides of Milton Road throughout the study corridor. The existing sidewalk widths meet ADA and ADOT requirements, but do not meet the Project Partner preferred standard of 10 feet. Crosswalks along the Milton Road study corridor only exist at the signalized intersections. At the signalized intersection of Milton Road and Humphreys Street, there is no existing crosswalk to cross Milton Road. Several intersections also have at least one prohibited crossing on Milton Road including: Forest Meadows Street, University Drive, Route 66, Butler Avenue, as well as two prohibited crossings at University Avenue and Humphreys Street.







Existing Transit Services

The Northern Arizona Intergovernmental Public Transportation Authority (NAIPTA) is the transit agency in Northern Arizona operating Mountain Line, Mountain Lift and Mountain Link systems in Flagstaff.

Mountain Line and Mountain Lift services are available along the Milton Road study corridor. Bus stops for various routes of Mountain Line are located at the following locations along the Milton Road study corridor:

- North of Forest Meadows Route 14 in the northbound direction and Route 4 in the southbound direction,
- North of University Drive Route 14 in the northbound direction,
- North of University Avenue Route 4 in the southbound direction,
- South of Plaza Way Route 14 in the northbound direction and Route 4 in the southbound direction, and
- South of Butler Avenue Route 8 and Route 14 in the northbound direction.

Mountain Line Route 2, Route 4, Route 5, Route 14 and Route 66 operate along the Milton Road corridor between Phoenix Avenue and Beaver Street originating at the Downtown Convention Center, Mountain Line Transit's primary hub. Route 10 crosses Milton Road on McConnell Drive. However, bus stops for these routes do not exist along the corridor.

The bus stops located north of University Drive, north of University Avenue and south of Butler Avenue have covered structures to accommodate sitting pedestrians and provide shading structures. Route frequencies and average weekday trip ridership numbers are indicated below:

- Route 4: 20-minute frequency with average 550 weekday trips;
- Route 8: 30-minute frequency with average 130 weekday trips;
- Route 10 (crosses Milton Road): 8- to 10-minute frequency with average 4,347 weekday trips; and
- Route 14: 30-minute frequency with average 410 weekday trips.

Milton Road is identified as part of Mountain Line's Permanent Transit Network, which are a set of corridors on which Mountain Line can make the strongest commitment to service. Development of multimodal street improvements and locating transit priority projects on these corridors will do the most to help Mountain Line to deliver efficient and high-ridership service in the future, as identified in the Five-Year Transit Plan.

Mountain Lift is a shared-ride program, which is an origin to destination, demand-responsive paratransit service that mirrors Mountain Line fixed-route service in terms of service times and areas. Mountain Lift service is available to people with disabilities who do not have the functional ability to ride fixed-route buses, either permanently or under certain conditions. Mountain Lift service is available along the Milton Road study corridor.







2.2c Existing Access Management & Current Guidelines

Access management is defined as a process or program implemented to manage access to and from major arterials, intersections and freeway systems so they will operate safely and efficiently. Effective access management programs control the location, spacing, design, and operation of driveways, median openings and intersections to reduce the number of vehicular conflict points. Driveway and access management guidelines for ADOT and City of Flagstaff are summarized below:

ADOT

A summary of the ADOT Traffic Engineering Guidelines and Procedures (TGP) Section 1060 – Median Openings for urban areas is summarized below:

- 1. All median openings shall be designed to include median storage lanes for both directions of travel.
- 2. Spacing between median openings at intersections shall not be less than 330 feet.
- 3. In urban areas, median openings between intersections may be established for public safety and convenience if the opening is not closer than 660 feet to an intersection with an improved public street or another median opening.
- 4. Median openings may be established for business generating relatively high traffic volumes, provided that:
 - a. The minimum left-turn traffic volume is 500 vehicles per day or 100 vehicles during the peak hour in urban areas where the major street speed limit is less than 40 miles per hour.
 - b. The minimum left-turn traffic volume is 350 vehicles per day or 70 vehicles during the peak hour in urban areas where the major street posted speed limit is 40 mph or greater.
 - c. The distance to the nearest adjacent median opening is not less than 330 feet.

City of Flagstaff

A summary of the City of Flagstaff access management guidelines, included in Engineering Design Standards and Specifications for New Infrastructure Section 13-10-006-0001 are as follows:

- 1. Distances between centerlines of adjacent intersections shall be a minimum of 135 feet, regardless of the direction of the intersection streets.
- 2. The minimum spacing of driveways to signalized and unsignalized intersections shall be in accordance with **Table 2-5**.

Table 2-5: Minimum Spacing of Driveways to Intersections per City of Flagstaff

Postod Spood (mph)	Spacing						
Posteu speeu (inpii)	Signalized	Unsignalized					
≤ 30	230	-					
30	-	115					
35	275	135					
40	320	155					
45	365	180					



BNS



Current Access

Each access point along the study corridor was identified through a review of aerial mapping. Each access point was then categorized into one of the following two access types:

- Right-in/Right-out (RIRO) only two traffic movements, right-in and right-out, are permitted into and out of a side street or a driveway. Intersections are typically controlled by a STOP sign on the side street. RIRO access points along the study corridor provide access to private commercial properties.
- Full Access Full access driveways generally allow all traffic movements on all approaches. These intersections are either STOP controlled on both the side streets or traffic signal controlled.

Figure 2-5 illustrates the locations of existing driveways and intersections along the study corridor. Milton Road corridor has excessive number of driveways as well as varying types of driveways along the corridor. This creates multiple potential conflict points for bicyclists, pedestrians, and vehicles, likely increasing the likelihood of collisions and congestion along the corridor. There is a total of 75 driveways along the Milton Road CMP corridor and the number of each type are listed below:

- 65 Full access (without stop sign),
- 1 full access (with stop sign),
- 1 right-in / right-out (with stop sign),
- 3 right-in / right-out (without stop sign),
- 1 Entrance Only,
- 4 Exit Only, and
- 0 Alleys.

Milton Road corridor has a two-way left-turn lane through the corridor. Due to the absence of a raised median along the corridor, access control at existing driveways and intersections is limited.





BN/S



Figure 2-5: Existing Access Points





BNSF



2.3 Safety Considerations

An extensive crash analysis was conducted as part of the Milton Road CMP planning process. Five years of crash data (January 2012 – December 2016) was analyzed to determine trends, patterns, crash types, crash rates and intersection crash breakdown analysis. 338 of 1,489 crashes (23 percent) within the study corridor resulted in an injury crash, which is less than the statewide average injury crash percentage for the year 2012 to 2016 (31 percent). A comparison of total crashes that occurred within the five-year period for the Milton Road study corridor and the Statewide average is shown in **Table 2-6**. For a more in-depth review and analysis of crash data, see the Safety Section of *Working Paper #1 – Existing & Future Conditions* on the project website.

As the implementation of this plan move forward, updated safety analyses will be conducted during each individual design phase.

Crash Severity	Number	Milton Road %	Statewide Average %*			
Fatal	2	0.1%	1%			
Injury	338	23%	31%			
Property Damage Only	1,149	77%	68%			

Table 2-6: Crash Severity Comparison - All Crashes

*Average of all crashes from 2012-2016

A comparison of pedestrian/bicycle crashes that occurred within the five-year period for the Milton Road study corridor and the Statewide average is shown in **Table 2-7**.

Table 2-7: Pedestrian & Bicycle Crash Severity Comparison

Crash Severity	Number	Milton Road %	Statewide Average %*		
Fatal	2	0.03%	6%		
Injury	38	61%	84%		
Property Damage Only	22	35.5%	11%		

*Average of all pedestrian/bicycle crashes from 2012-2016

Figure 2-6 shows the location of crashes along Milton Road on a map and categorizing them by the severity of the injury. The highest concentration of crashes occurs at the inter section of Milton Road and Butler Avenue. It is also important to note that the two fatalities occurred at the intersection of Route 66 and Humphrey's Street, and the intersection of Milton Road and University Avenue.







UAS

Figure 2-6: Milton Road All Crashes by Injury Severity Map (January 2012 – December 2016)





2.4 Future Vehicular Traffic Considerations

The primary purpose of forecasting future traffic volumes is to estimate the additional vehicular travel demand added to existing roadways and to forecast congestion levels due to projected growth in population and employment. The culmination of the following inputs was utilized to develop a sophisticated traffic model which could compare traffic impacts of a 2040 *Base-Build Condition* to all alternatives evaluated. Inputs from ADOT, MetroPlan, the City of Flagstaff, and Mountain Line were utilized to develop the Base-Build Condition for the 2040 design year. To enhance modeling accuracy, any funded roadway construction project within or adjacent to the Milton Road corridor study limits was included in the Base-Build Condition of the traffic model. To be included, the project had to have been identified in an approved Capital Improvement Program (CIP) or Transportation Improvement Program (TIP). This supplemental modeling methodology, analysis and results are also described and elaborated on in *Working Paper #2 – Alternative Analysis*. This model only includes considerations for vehicular traffic (including buses), multimodal transportation was not included.

2.4a Future Roadway Network

The following list of approved CIP or TIP projects were included in the Base-Build Condition of the Milton Road CMP traffic model at the time of the traffic modeling analysis:

- Humphreys Street and Route 66 southbound to westbound add 2nd right turn lane;
- Milton Road and Plaza Way southbound to westbound right turn lane;
- Milton Road and University Avenue convert to right-in/right-out only intersection;
- Milton Road and University Drive connect University Drive west through to University Avenue;
- Beulah Boulevard extension north from Forest Meadows to Yale Drive with new roundabout intersection and University Drive/Avenue realignment (Appendix E); and
- Lone Tree Road overpass volume distribution effects due to the Lone Tree Road overpass.

The Mill Town development is an 18-acre mixed-use development in the southwest quadrant of Milton Road and University Drive that is currently undergoing final design. The development includes commercial space and a rooming and boarding facility. Transportation improvements proposed as part of this development include the Beulah Boulevard extension to University Ave, roundabout at Beulah Boulevard and University Ave, and realignment of University Ave to the signal at Milton Road and University Boulevard, as mentioned above.

2.4b Design Year 2040 Traffic Volumes

For the purposes of this analysis, year 2040 is considered as the design year. Additional volume development efforts were undertaken between Working Paper #1 and #2 to support the microsimulation analysis of the corridor undertaken for Working Paper #2. Peak hour turning movement volumes for the intersections along the Milton Road study corridor were developed in cooperation with the Mountain Line Bus Rapid Transit Study and in coordination with Metro Plan's (formerly FMPO) Travel Demand Model, and then provided to the analysis team as a prepared future year no build Vissim model. Traffic redistribution resulting from the CIP Lone Tree Overpass

UAS

NORTHERN ARIZONA 🕅





and Mill Town transportation improvements was included in the FMPO travel demand model and volume set used in developing future year traffic volumes. The volume development effort was summarized in a memo to Mountain Line (formerly NAIPTA). This memo can be found in Appendix F.

AM and PM peak hour simulation traffic volumes for the year 2040 at the intersections along the Milton Road study corridor are shown in **Figure 2-7** and **Figure 2-8**.

2.4c Future No-Build Vissim Operational Analysis

The operational analysis for the No Build future year was conducted utilizing the projected turning movement volumes with existing and programmed roadway geometry improvements, and existing traffic control. Signal timings for the Milton Road corridor were optimized for the 2040 peak hour traffic volumes using Trafficware Synchro version 10 and evaluated in the microsimulation model. **Figure 2-9** shows the intersection control and lane geometry for the year 2040 along the Milton Road study corridor.

Design Year 2040 LOS

LOS for the study area intersections along the Milton Road study corridor was analyzed for the year 2040 with the peak hour traffic volumes. Future 2040 peak hour traffic volumes, shown in **Figure 2-7** and **Figure 2-8**, and future intersection control and lane geometry, shown in **Figure 2-9**, were utilized to determine the future 2040 peak hour LOS at the study area intersections. **Table 2-11** presents the 2040 peak hour LOS summary for the intersections along the Milton Road study corridor.

Table 2-11 shows approach delay and overall intersection delay as an average of ten simulation runs from the microsimulation model. That delay was then cross-referenced with HCM 6th Ed. LOS thresholds for signalized intersections and two-way stop-control (TWSC) intersections, as shown below in **Table 2-8**. Overall intersection LOS for TWSC intersections is reported as the worst movement, in accordance with current industry practices.

	Signaliz Thres	ed LOS holds	TWSCLOS Thresholds				
LOS	Lower	Upper	Lower	Upper			
А	0	10	0	10			
В	10	20	10	15			
С	20	35	15	25			
D	35	55	25	35			
E	55	80	35	50			
F	80		50				

Table 2-8. HCM 6th Edition LOS Thresholds for Interrupted Flow

Microsimulation Travel Time and Network Delay Results

Model travel times were captured for Milton Road beginning at Forest Meadows Street and ending at Beaver Street and are shown below in **Table 2-9**:. For reference, using the speed limit

UAS(



BN/



over the same distance would result in a travel time of approximately 3.0 minutes, note that this time assumes free-flow operations and no interruptions.

MOE	AM Pea	ak Hour	PM Peak Hour			
IVICE	Northbound	orthbound Southbound		Southbound		
Travel Time	9.9 min	5.2 min	6.6 min	6.6 min		
Avg. Speed	10.4 mph	19.8 mph	15.7 mph	15.7 mph		

Table 2-9: 2040 AM and PM No Build Milton Road Travel Times

Network delay and latent delay capture the delay for all vehicles in the model. This metric is most useful in capturing the overall performance of an alternative as compared to the No Build. Network and latent delay results are presented in **Table 2-10**. Network delay represents the delay of vehicles in the model. Latent delay represents delay for vehicles which are beyond the model boundaries but are trying to enter the model. For example, latent delay can occur on a short link where a signal or flow interruption is causing queue to build up to and past the total link length. The latent delay for the PM peak makes up a greater portion of the total delay than the AM, showing that minor movements and mobility are more restricted by congestion in the PM peak. This is consistent with the PM peak being more congested than the AM.

Table 2-10: 2040 AM and PM No Build Network Delay

	AM Peak Hour		PM Peak Hour				
Network Delay (hrs)	Latent Delay (hrs)	Total Delay (hrs)	Network Delay (hrs)	Latent Delay (hrs)	Total Delay (hrs)		
645	780	1,425	824	1,346	2,170		







UAS

Figure 2-7: 2040 No-Build AM Peak Hour Traffic Volumes











Figure 2-8: 2040 No-Build PM Peak Hour Traffic Volumes



UAS









UAS

Figure 2-9: 2040 No-Build Intersection Control & Lane Geometry





ADOT

Table	2-11 :	2040	AM	and	PM	Peak	Hour	No	Build	LOS	at	Signalized	and	Unsignalized
Inters	ection	S												

		204	10 AM Peak	204	40 PM Peak			204	10 AM Peak	20	40 PM Peak
Intersection	Approach	LOS	Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	Intersection	Approach	LOS	Delay (Sec/Veh)	LOS	Delay (Sec/Veh)
	Northbound	-	-	-	-		Northbound	Α	6.5	Α	1.6
Milton Road and	Southbound	D	46.7	D	53.4	Milton Road and	Southbound	Α	1.6	Α	8.6
Beaver Street	Eastbound	В	14.4	С	20.9	Chambers Drive	Eastbound	-	-	-	-
(signal)	Westbound	В	10.5	В	18.0	(TWSC)	Westbound	D	28.1	В	14.0
	Overall	С	21.0	С	30.6		Overall	D	32.9	С	20.0
	Northbound	-	-	-	-		Northbound	D	46.3	D	48.9
Milton Road and	Southbound	В	16.2	В	12.8	Milton Road and	Southbound	В	14.1	С	25.0
Humphreys Street	Eastbound	В	10.7	В	14.5	University Drive	Eastbound	D	35.0	Е	56.6
(signal)	Westbound	В	10.3	В	15.2	(signal)	Westbound	D	50.4	F	98.2
	Overall	В	11.8	В	14.1		Overall	С	21.4	D	40.5
	Northbound	D	32.5	А	8.2		Northbound	А	9.7	D	42.2
Milton Road and	Southbound	А	1.1	А	7.9	Milton Road and Forest	Southbound	В	12.0	В	13.1
Phoenix Avenue	Eastbound	Α	8.6	А	8.9	Meadows Street	Eastbound	D	46.5	D	49.6
(TWSC)	Westbound	F	350.4	F	67.7	(signal)	Westbound	-	-	-	-
	Overall	F	626.4	F	80.5		Overall	В	19.8	С	31.3
	Northbound	D	37.9	С	24.4						
Milton Road and Clay / Butler Avenue (signal)	Southbound	А	3.2	А	3.6						
	Eastbound	F	205.2	F	89.6						
	Westbound	Е	71.6	Е	70.8						
	Overall	D	41.7	С	32.3						
	Northbound	С	24.3	А	6.4						
Milton Road and	Southbound	А	3.4	А	5.6						
Malpais Lane	Eastbound	F	578.2	F	321.9						
(TWSC)	Westbound	-	-	-	-						
	Overall	F	578.2	F	330.5						
	Northbound	D	45.6	В	15.8						
Milton Road and	Southbound	В	10.0	В	13.9						
Historical Route 66	Eastbound	Е	73.9	D	50.6						
(signal)	Westbound	В	19.0	В	14.9						
	Overall	D	36.1	С	22.2						
	Northbound	С	23.7	А	9.7						
Milton Road and	Southbound	А	2.7	А	7.7						
Riordan Road	Eastbound	D	38.2	С	32.3						
(signal)	Westbound	D	45.6	D	38.2						
	Overall	В	18.0	В	14.8						
	Northbound	С	25.0	С	28.2						
Milton Road and	Southbound	А	4.2	В	16.2						
Plaza Way	Eastbound	F	104.7	Е	70.3						
(signal)	Westbound	Е	56.9	Е	62.6						
	Overall	С	26.4	С	33.4						

*Vissim output. LOS reported is based on the Average Delay

**See Section 2.4a for items included in analysis as part of CIP/TIP







3.0 EVALUATION OF CORRIDOR ALTERNATIVES

The Milton Road CMP alternative evaluation and screening process was conducted through a Three Tier approach (**Figure 3-1**), which is summarized at a high-level in this report, but outlined in greater detail in *Working Paper #2 – Alternatives Analysis* (view on project <u>website</u>). Each of the Three Tier Alternative Evaluation and Screening processes were conducted under the guidance and direction of the Project Partners with updates and meetings at major milestones during the process. The Three-Tiered approach is described below.

- Tier 1 Alternative Evaluation was based on public and stakeholder feedback on the Preliminary System Alternatives developed through the initial phases of the study presented in *Working Paper #1 Existing & Future Conditions* (view on project <u>website</u>) for the first screening of alternatives.
- **Tier 2 Alternative Evaluation** focused on the development of qualitative and quantitative evaluation criteria that analyzed and measured the performance of the Milton Road Tier 2 Alternatives. The development, methodology, and results of the Tier 2 Alternative Evaluation is presented in *Working Paper #2 Alternatives Analysis*. Reference the project website to view Working Paper #2.
- Tier 3 Alternative Evaluation expanded upon efforts conducted in the Tier 2 Alternative Evaluation phase to further analyze the remaining alternatives through a further refined series of diverse evaluation criteria focusing on quantitative measures to complement traffic modeling outputs that assessed the overall performance of the Tier 3 Alternatives. The development, methodology, and results of the Tier 2 Alternative Evaluation is presented in *Working Paper #2 Alternatives Analysis*. Reference the project website to view Working Paper #2.





Figure 3-1: Three Tier Alternative Evaluation & Screening Process Flow Chart



UAS

BNS





3.1 Corridor Alternative Evaluation & Results

This section summarizes the results of the Tier 1, Tier 2, and Tier 3 Alternative Evaluation processes. For more detailed results of the Three-Tiered Alternatives Evaluation and screening process, please refer to Working Paper #2 – Alternatives Analysis (view on project website).

3.1a Tier 1 Corridor Alternatives Evaluation & Results

The foundation of Tier 1 Alternative Evaluation results was based on public and stakeholder feedback on the Preliminary System Alternatives presented in *Working Paper #1 – Existing & Future Conditions* (view on project <u>website</u>). Most the feedback was received at Public Open House Meeting #1, and further enhanced by the Project Partners Other input and feedback on the Tier 1 Alternative evaluation process was received from a series of Project Partner meetings, as well as through City of Flagstaff City Council and Coconino County Board of Supervisors briefings.

Table 3-1 shows and summarizes the results of the sticky-dot voting and prioritization exercise conducted by the members of the public at the Public Open House Meeting #, and ultimately, which of the Tier 1 Preliminary System Alternatives were elected to move forward into Tier 2 Alternative Evaluation by the Project Partners.

It is worth noting here that the Tier 1 System Alternatives included a series of; 1) four alternatives within the existing Milton Road right-of-way, 2) four alternatives that contemplated expanded Milton Road right-of-way scenario and, 3) a series of six total alternate routes to Milton Road (five of which were "backage roads"). All fourteen (14) alternatives were presented to the public and reviewed by the Project Partners as part of the Tier 1 Alternative Evaluation process.

Following Public Open House Meeting #1, the Project Partners deliberated over a series of meetings to discuss and select which of the Tier 1 Milton Road alternatives would proceed into Tier 2 Alternative Evaluation. The Project Partners agreed to move forward with the following Preliminary System Alternatives for Tier 2 consideration:

- No-Build (Maintain as-is);
- Preliminary System Alternative 3 Six Travel Lanes;
- Preliminary System Alternative 4 Four Travel Lanes with Shared Bus/Bike Lanes (SBBL);
- Preliminary System Alternative 5 Six Travel Lanes with Bike Lanes;
- Preliminary System Alternative 6 Six Travel Lanes with SBBLs and a raised center median; and
- Preliminary System Alternative 9 No-Build with the Lone Tree Road Widening Design Concept.

It is worth noting here that the Tier 1 System Alternatives included a series of alternate routes to Milton Road known as "backage roads" that were collectively captured as System Alternative 10 in Tier 1. Through the Project Partner review and deliberation of the public inputs and operational challenges of the backage road concept, Alternative 10 was eliminated from Tier 2 consideration as those improvements are outside ADOT control. Should the City assess that backage roads are beneficial to the corridor it may include them in its plans and programs.

UAS(







Table 3-1: Tier 1 Alternative Evaluation & Screening Results

	Public Open House Meeting #1 Voting Results							
Tier 1 Preliminary System Alternatives	Move Forward for Further Study	Be Eliminated from Further Study	Move Forward for Further Study with Adjustment					
System Alternatives Utilizing Existing Ri	ght-of-Way							
Preliminary System Alternative 1: No-Build (Maintain as Is)		Not Applicable						
Preliminary System Alternative 2: Milton Road Reversible Lane	<u>2</u>	34	4					
Preliminary System Alternative 3: Six, 11-Foot General Purpose Lanes with Center Median/Turn Lane with 6-foot Sidewalks	17	26	2					
Preliminary System Alternative 4: Four, 11-Foot General Purpose Lanes with Center Median/Left Turn Lane, and two 14-foot Shared Bus/Bike Lanes (SBBL) with 7-foot side walks	34	7	8					
System Alternatives that May Require Expand	led Right-of-Way							
Preliminary System Alternative 5: Six, 11-Foot General Purpose Lanes with a Center Median/Center Turn Lane, and 6-Foot Bicycle Lanes with 6-Foot Side walks	25	20	3					
Preliminary System Alternative 6: Six, 11-Foot General Purpose Lanes, Two 13-Foot Shared Bus/Bike Lanes (SBBL), and Center Median/Turn Lane with 7-Foot Sidewalks	4	36	0					
Preliminary System Alternative 7: Eight, 11-Foot General Purpose Lanes	θ	<u>42</u>	2					
Preliminary System Alternative 8: Four, 11-Foot General Purpose Lanes, Two 14-Foot Shared								
Bus/Bike Lanes (SBBL), 14-Foot Landscaped Median, 10-Foot Landscaped Setbacks, and 10-Foot	17	3 4	θ					
Sidewalks								
Alternative Routes to Milton Road								
Preliminary System Alternative 9: Milton Road No-Build and Lone Tree Design Concept Report	43	3	1					
Preliminary System Alternative 10: Backage Road Improvement: Clay Avenue/Malpais	2	17	2					
Lane/McCracken/Blackbird Roost Street								
Preliminary System Alternative 10: Backage Road Improvement: West Route 66/Riordan Ranch Stroot	<u>22</u>	0	<u>9</u>					
Dreliminary System Alternative 10: Backage Road Improvement: Metz Walk Extension to Plaza								
Way	¢	10	3					
Preliminary System Alternative 10: Backage Road Improvement: Plaza Way/Yale	14	6	4					
Street/University Avenue		4	+					
Preliminary System Alternative 10: Backage Road Improvement: Route 66/Yale Street/Beulah Blvd Extension /Et Tutbill	33	7	1					
Biva. Extension/Ft. Futhin								

Notes:

Alternatives displayed with a strikethrough were eliminated from further study and not included in the Tier 2 Alternative Evaluation process.



3.1b Tier 2 Corridor Alternatives Evaluation & Results

This section describes the Tier 2 Alternative Evaluation process and results. At this point in the study process, the former Tier 1 alternatives no longer were classified as "preliminary," and became to be known as "alternatives." Once the initial selection of the Tier 2 Alternatives were refined and established, another series of Project Partner meetings determined through group consensus that the Tier 2 Alternatives needed refinement before the evaluation could start.

Refinement of Tier 2 Alternatives

It was recognized by the Project Partners that the Preliminary System Alternatives from Tier 1 that were selected for Tier 2 analysis generally captured the range and functionality of the preferred and desired facility. However, the Preliminary System Alternatives from Tier 1 were preliminary in nature designed to initially gauge public support or not on broader concepts, primarily developed from previous studies, and did not include detailed specifications such as individual facility widths. The Project Partners desired greater definition on the individual roadway facility components/widths needed to be defined prior to the commencement of the formal Tier 2 evaluation. In addition, the Project Partners felt some other potential alternatives were desired to reflect the possibility of what modernized improvements, particularly for multiple modes of travel, would look like for the "build alternative" types. Four stages of refinement took place prior to evaluation which are described below:

- 1. A set of Controlling Design Criteria was collectively developed by the Project Partners to guide Tier 2 Alternative refinement of the roadway features for the Tier 2 Alternatives. The Controlling Design Criteria were created to identify and compare adopted FHWA and ADOT standards/specification with Project Partner agency standards/specifications for the various roadway features. This process helped acknowledge and document the minimum ADOT/FHWA standards in comparison to Project Partner agency current and preferred standard(s) to consider for inclusion in any refined Tier 2 Alternatives. The Controlling Design Criteria also document any variances or design exceptions that would require FHWA approval. Over the course of several meetings, the Project Partners discussed and confirmed the series of Controlling Design Criteria that guided the refinement of the widths of certain roadway facility types. The Controlling Design Criteria exercise also helped recognize which facility improvements ADOT would/could contribute towards construction funding versus those roadway feature types above and beyond the ADOT standards that other agencies would be required to contribute towards construction cost (should the need arise). The final Controlling Design Criteria can be found in Appendix G.
- 2. The refinement of Alternative 6 To allow for a full range of alternatives for public consideration, Alternative 6 was refined to consist of six Travel Lanes with SBBLs and a raised center median, which included an effort of maintaining a diversity of SBBL alternatives with a higher and lower capacity options in order to allow for a full range of possibilities for traffic operation analysis. The result of this discussion and analysis yielded two hybrid alternatives for Tier 2 Alternative Evaluation: Alternative 6a Six Travel lanes with SBBLs and Alternative 6b Four Travel Lanes with SBBLs.

UAS





ADOT

- 3. Conversion of Alternative 9 No-Build with the Lone Tree Road Widening Design Concept, into the No-Build alternative. This was a direct result of the Lone Tree Overpass project being approved by Flagstaff voters via Proposition 419 coupled with fact that Alternative 9 already closely resembled the No-Build option and was determined redundant and ultimately eliminated from the analysis and the overpass and widening of Lone Tree Road was incorporated as part of the No-Build option.
- 4. Inclusion of Mountain Line's Bus Rapid Transit (BRT) alternatives from their concurrent BRT Feasibility Study to align the goals and implementation of both the Milton Road CMP and the Mountain Line BRT Feasibility Study. A total of three BRT alternatives were discussed among the Project Partners for potential inclusion. However, as a result of Project Partner deliberation on the three newly introduced BRT alternatives, it was determined that one BRT alternative would move forward for Tier 2 consideration: Alternative 13: Two Travel Lanes with Center Running BRT Lanes.

Refer to Section 4.2 of *Working Paper #2 – Alternatives Analysis* on the project <u>website</u> to view more detailed information pertaining to the refinement of the Tier 2 Alternatives.

Tier 2 Alternative Evaluation Criteria

A series of Tier 2 evaluation criteria and weightings were developed to evaluate and measure the performance of the seven Tier 2 Alternatives. The Tier 2 evaluation criteria were crafted to be diverse in nature through the combination of quantitative and qualitative measurements specific to features of each Tier 2 Alternative.

The first step in developing the evaluation criteria was to identify general categories of roadway performance to measure the operational and environmental qualities of the corridor. The Consultant Team worked with the Project Partners and agreed to use the following categories – in no particular order of importance – on to measure and compare the Tier 2 Alternatives:

- Traffic Operations;
- Safety;
- Expand Travel Mode Choices;

• Public Acceptance;

- Construction/Implementation;
- Project Economics; and
- Environmental Impacts.

BNS

Once the categories were selected, the Consultant Team and the Project Partners created a preliminary list of evaluation criteria metrics for each category. The process included researching regulatory mandates across the state and with ADOT; understanding what issues were of highest importance for the ADOT Districts; communicating with ADOT and the Project Partners to understand strategic safety initiatives of the highest value within the various organizations and agencies; investigating measures to evaluate the level of difficulty of implementation through assessment of the costs and right-of-way impacts; and the publics acceptance of each alternative. As a result, 14 different evaluation criteria were developed over the seven categories to use in Tier 2 Alternative Evaluation process. **Table 3-2**provides a summary of the Tier 2 Evaluation Criteria. Refer to Section 4.6 of *Working Paper #2 – Alternatives Analysis* on the project <u>website</u> for more detailed information about the development of the Tier 2 Alternative Evaluation Criteria, and the specific measures and methodologies used to calculate the results of the Tier 2 Alternative Evaluation.

UAS





Table 3-2: Final Tier 2 Alternative Evaluation Criteria & Weightings

Evaluation Criteria Wei								
Category	Criteria / Measure	Threshold / Formula	Modifier					
	Improves Congestion	Formula = (Best Result / Alternative Result) * Weight * 100 Ex - Alt 4: (6.25/11.03) * 5.25% * 100 = 2.97	N/A	5.25%				
	Travel Speed as % of Base Free Flow Speed	Formula = ((Alternative Result * 100) / Best Result) * Weight * 100 / 2	N/A	3.32%				
Reduction in Vehicular Congestion	AM PM	Ex - Alt 4: ((46.1%*100)/62)* 3.32% * 100 /2 = 1.24		(1.66%)				
Reduction in venicular congestion	Improved Intersection LOS AM	Formula = (Best Result / Alternative Result) * Weight * 100 / 2	N/A	6.04% (3.02%)				
	PM Signal/Stop Control Delay AM	Formula = (Best Result / Alternative Result) * Weight * 100 / 2	N/A	(3.02%) 3.29% (1.645%)				
	PM Travel Time:	Ex - Alt 4: (29.5/41.6) * 3.29% * 100 /2 = 1 17 Formula = (Best Result / Alternative		(1.645%) 4.79%				
	AM PM	Result) * Weight * 100 / 2 Ex - Alt 4: (339/560) * 4.79% * 100 /2 = 1.45	N/A	(2.395%) (2.395%)				
Safety	Reduction in Total Crashes	Formula = (Alternative Result / Best Result) * Weight * 100 Ex - Alt 4: (19.4/28.98) * 7.13% * 100 = 4.77	N/A	7.13%				
	Reduced Injury Crashes	Formula = (Alternative Result / Best Result) * Weight * 100 Ex - Alt 5: (21.78/28.78) * 8.18% * 100 = 6.19	N/A	8.18%				
	Reduced Bicycle Crashes	Formula = (Alternative Result / Best Result) * Weight * 100 Ex - Alt 5: (14/14) * 7.10% * 100 = 7.10	N/A	7.10%				
	Dedectrion	Meets or Exceeds both ADOT's minimum standard and the City/FMPO/NAIPTA's (PP) preferred standards	1	7.10%				
Furned Trevel Made Chaires	Pedestrian	Meets or Exceeds ADO1's minimum standard OR the City/FMPO/NAIPTA's (PP) preferred standards, but not both Maintains Existing Condition	0.5	7.1270				
		Meets or Exceeds both ADOT's minimum standard and the City/FMPO/NAIPTA's preferred standards Meete or Exceeds ADOT's minimum standard OB the	1					
	Bicycle	City/FMPO/NAIPTA's preferred standards, but not both	0.5	7.48%				
	Transit	Maintains Existing Condition	0	6.27%				
	AM	Formula = (Best Result / Alternative Posult) * Woight * 100 / 2	N/A	(3.135%)				
	PM	Ex - Alt 4: (250/371) * 6.27% * 100 /2 = 2.11		(3.135%)				
Public Acceptance	Public Support	Public support was moved to Tier Alternative Evaluation & Screenin		8.26%				
Construction/ Implementation	Project Cost ^{#+-}	Formula = (Best Result / (Alternative Result/10M)) * Weight * 100 Ex - Alt 4: (1/(40.542M/10M)) * 4.68% * 100 = 1.15	N/A	4.68%				
	ROW Impact ^{+ -} (Square Feet)	Formula = (Best Result / (Alternative Result/10K)) * Weight * 100 Ex - Alt 4: (1/(26,326/10K)) * 4.98% * 100 = 1.89	N/A	4.96%				
		Ag	gregate Score	83.88%				
				Rank				









Tier 2 Evaluation Criteria Results & Analysis Findings

This section describes a brief summary of the results for the Tier 2 Alternative Evaluation process of the seven Tier 2 Alternatives through the application of the Tier 2 Evaluation Criteria. Refer to Section 4.8 of *Working Paper #2 – Alternative Analysis* for more detailed results and a systematic synopsis for each of the Tier 2 Evaluation Criteria.

The Milton Road CMP Tier 2 Alternatives range in performance rating based on the score of the Tier 2 Alternative Evaluation Criteria. The highest performing alternative received a score of 59.02 points while the lowest performing alternative received a score of 29.20 points – nearly a 30-point difference. **Table 3-3** ranks the alternatives from highest scoring to lowest scoring alternative.

Rank	Tier 2 Alternative	Tier 2 Score
1	Alternative 5 - Six Travel Lanes with Bike Lanes	58.30
2	Alternative 6a - Six Travel Lanes with SBBLs	51.25
3	Alternative 13 – Two Travel Lanes with Center BRT Lanes	43.44
4	Alternative 3 - Six travel lanes	38.85
5	Alternative 6b - Four Travel Lanes with SBBLs	34.87
6	No-Build (leave road as is)	30.27
7	Alternative 4 - Four Travel Lanes with SBBLs	29.20

Table 3-3: Tier 2 Alternative Rankings Based on Tier 2 Evaluation Criteria Result

As demonstrated in **Table 3-3**, Alternative 5 received the highest score of 58.30 points followed by Alternative 6a with 51.25 points, Alternative 12 with 43.44 points, Alternative 3 with 38.85 points, Alternative 6b with 34.87 points, No-Build with 30.27 points, and Alternative 4 with 29.20 points.

The results of the Tier 2 Alternative Evaluation process appear to be aligned with the visual representation of the benefits and trade-offs associated with each of the alternatives. For instance, Alternative 5 intuitively could be expected to be the best performing alternative because the alternative includes a benefit for all modes of transportation by increasing vehicular capacity through the addition of two travel lanes, improving the corridor for bicyclists by introducing a buffered bike lane, and enhancing back-of-curb facilities with a parkway and a widened sidewalk improving the pedestrian environment; all while not having the highest project cost or the largest right-of-way footprint compared to come of the other alternatives.

Conversely, Alternative 4 and Alternative 6b both could be expected to not perform as well as the other alternatives because these two alternatives do not add vehicular capacity and do not sufficiently address other modes of transportation. These two alternatives differ from each other in their back-of-curb facility types, where Alternative 3 may maintain a narrower right-of-way footprint and thus a less expensive cost, but does not have sufficient sidewalks; while on the other hand, Alternative 6b may have much wider sidewalks and a parkway, consequently resulting in a much larger right-of-way impact and a much higher project cost.

Figure 3-2 illustrates a graphical summary of the results for Tier 2 Alternative Evaluation process.

UAS



BNA



Projects Included in Traffic Model Software as Part of Alternative Evaluation

Vissim traffic modeling software was utilized to measure various traffic operations metrics as part of the Tier 2 (and Tier 3) Alternative Evaluation. Since the alternative evaluation year – and ultimate planning horizon of the Milton Road CMP – was the year 2040, a list of programed projects from the Transportation Improvement Program (TIP) and Capital Improvement Program (CIP) and other projects currently under construction were included in the baseline (No-Build) model and carried over into the models developed for each of the Tier 2 (and Tier 3) Alternatives. As previously described in *Section 2.4a - Future Roadway Network*, The list below includes the projects currently under constructed during the duration of the CMP, as well as projects included in the TIP and CIP that were integrated into the Vissim models include:

- Humphrey's Street and Route 66 southbound to westbound add 2nd right turn lane;
- Humphreys Street and Aspen Street northbound to eastbound right turn lane;
- Milton Road and Plaza Way southbound to westbound right turn lane;
- Milton Road and University Avenue convert to right-in/right-out only intersection;
- Milton Road and University Drive connect University Drive west through to University Avenue;
- Milton Road (I-17)/Forest Meadows Street northbound to westbound add 2nd left turn lane; and
- Beulah Boulevard extension north from Forest Meadows to Yale Drive with new intersection and University Drive/Avenue realignment (Appendix E).
- Lone Tree Overpass











Tier 2 Alternatives Recommended for Tier 3 Analysis

The Project Partners were presented with the traffic modeling findings and the detailed Tier 2 Evaluation Criteria results. Over the course of a couple Project Partner meetings, the Project Partners discussed which of the Tier 2 alternatives they preferred to move forward into the final Tier 3 Alternative Evaluation and Screening process.

As **Figure 3-2** illustrates, the Project Partners ultimately eliminated Alternative 3 and Alternative 4. Simply put, Alternative 4 was the lowest performing alternative in total, ranking last in 7th place. With a total sum of approximately one-half of the top ranked alternative, Alternative 4 performed poorly across almost all criteria, but especially poor in the Safety, Expand Travel Mode Choices and Congestion Reduction criteria. From a model results perspective, Alternative 4 did not demonstrate significantly improved travel time or travel speed results, LOS at signalized intersections, and all non-signalized intersections experiencing a LOS of F.

The Project Partners also agreed to eliminate Alternative 3 from further study. Receiving a rank of 4th in the Tier 2 analysis, Alternative 3 was eliminated from further consideration due to its marginal performance in the Tier 2 modeling and moderate to below average scoring in the Tier 2 evaluation criteria, particularly in the Expand Travel Mode Choice criteria. Also, as the Project Partners desired to pair-down Tier 2 alternatives for the Tier 3 analysis, it was generally felt that the roadway features of Alternative 3 (six general purpose travel lanes) were already captured in Alternative 5 (which ranked 1st). Moreover, the bicycle, pedestrian and landscape elements of Alternative 3 were felt to be less desirable/sufficient than Alternative 5, so the Project Partners felt that Alternative 3 became duplicative and substandard to the functionality and character of Alternative 5, so Alternative 3 was eliminated for further consideration. The Project Partners also discussed and agreed that Alternative 6a and 6b would move forward to Tier 3 analysis. The No Build was recommended for Tier 3 in part to be compliant with NEPA requirements to maintain a No Build alternative in the analysis and the No Build Plus was created to recognize that select spot improvements to the existing corridor was desired by the Project Partners.

Accordingly, the Project Partners selected the following Alternatives to move forward for Tier 3 analysis:

- No-Build;
- No-Build Plus;
- Alternative 5;
- Alternative 6a;
- Alternative 6b; and
- Alternative 13.

Please refer to *Section 3.1c - Tier 3 Corridor Alternatives Evaluation & Results* for a description of the No Build Plus alternative.





ADOT

Figure 3-2: Tier 2 Alternatives Recommended for Tier 3 Analysis

Recommended for	No Build / No Build +	No Build Evaluation Criteria Results Rank						
Tier 3 Analysis	- Project Cost: N/A - Required ROW: 0 ft ² - Potential Buildings Impacted: 0	Reduction in Vehicular Congestion (22.69 Possible Points)	Safety (22.41 Possible Points)	Expand Travel Mode Choices (20.87 Possible Points)	Public Acceptance (8.62 Possible Points)	Construction/ Implementation (9.64 Possible Points)	Total Score (83.88 Possible Points)	6 th
		17.12	0.00	3.51	0.00	9.64	30.27	
liminated from	Alternative 3		Altern	ative 3 Evalu	uation Criter	ia Results		Rank
ier 3 Analysis	- Project Cost: \$40,514,000 - Required ROW: 26,326 ft ² - Potential Buildings Impacted: 9	Reduction in Vehicular Congestion (22.69 Possible Points) 18.73	Safety (22.41 Possible Points) 12.92	Expand Travel Mode Claicos (20.87 Possible Points) 4.16	Public Acceptance 18.62 Possible Points)	Construction/ Implementation (9.64 Possible Points) 3.04	Total Score (83.88 Possible Points) 36.65	4 th
Eliminated from	Alternative		Altern	ative 4 Evalu	uation Criter	ria Results		Rank
Tier 3 Analysis	- Project Cost: \$40,542,000 - Required ROW: 26,326 ft ² - Potential Buildings Impacted: 9	Reduction in Vehicular Congestion (22.69 Possible Points) 16.48	Safety (22.41 Possible Points)	Expand Travel Mode Choices (20.87 Possible Points)	Public Acceptance (8.62 Possible Points)	Construction/ Implementation (9.64 Possible Points)	Total Score (83.88 Possible Points)	7 th
		10,40	4.77	4,22		3.04	23.20	
Recommended for	Alternative 5		Altern	ative 5 Evalu	uation Criter	ia Results		Rank
Tier 3 Analysis	- Project Cost: \$60,994,000 - Required ROW: 203,517 ft² - Potential Buildings Impacted: 21	Reduction in Vehicular Congestion (22.69 Possible Points) 21.31	Safety (22.41 Possible Points) 17.42	Expand Travel Mode Choices (20.87 Possible Points) 18.56	Public Acceptance (8.62 Possible Points) 0.00	Construction/ Implementation (9.64 Possible Points) 1.01	Total Score (83.88 Possible Points) 58.30	1 st
Recommended for	Alternative 6a		Altorn	ativo 6a Eval	uption Crito	ria Roculto		Pank
Tier 3 Analysis	- Project Cost: \$73,667,000	Reduction in Vehicular	Safety	Expand Travel Mode	Public	Construction/	Total Score	North Colored
	- Required ROW: 362,398 ft ² - Potential Buildings Impacted: 32	Congestion (22.69 Possible Points)	(22.41 Possible Points)	Choices (20.87 Possible Points)	(8.62 Possible Points)	(9.64 Possible Points)	(83.88 Possible Points)	2 ^{na}
	5,	21.79	15.30	13.39	0.00	0.77	51.25	
Recommended for	Alternative 6b		Altern	ativo 6h Eval	uation Crite	ria Reculto		Pank
Tier 3 Analysis	- Project Cost: \$55,137,000	Reduction in Vehicular	Safety	Expand Travel Mode	Public	Construction/	Total Score	
	- Required ROW: 237,564 ft² - Potential Buildings Impacted: 23	Congestion (22.69 Possible Points)	(22.41 Possible Points)	Choices (20.87 Possible Points)	(8.62 Possible Points)	(9.64 Possible Points)	(83.88 Possible Points)	5 th
		17.00	4.77	12.04	0.00	1.06	34.87	
Recommended for	Alternative 13		Altern	ative 13 Eval	uation Crite	ria Results		Rank
Tier 3 Analysis	- Project Cost: \$57,695,000	Reduction in Vehicular	Safety	Expand Travel Mode	Public	Construction/	Total Score	.
	- Required ROW: 245,096 ft² - Potential Buildings Impacted: 23	Congestion (22.69 Possible Points)	(22.41 Possible Points)	Choices (20.87 Possible Points)	(8.62 Possible Points)	(9.64 Possible Points)	(83.88 Possible Points)	3 rd
		16.31	7.28	18.83	0.00	1.01	43.44	
Updated 10/28/19								



46



t-of-Way





3.1c Tier 3 Corridor Alternatives Evaluation & Results

As discussed in the previous sub-section, based on recommendations from the Project Partners, the following alternatives were included in the Tier 3 Alternative Evaluation and Screening process:

- No-Build;
- No-Build Plus (No-Build Plus Spot Improvements);
- Alternative 5 Six Travel Lanes with Bike Lanes;
- Alternative 6a Six Travel Lanes with SBBLs;
- Alternative 6b Four Travel Lanes with SBBLs; and
- Alternative 13 Two Travel Lanes with Center BRT Lanes.

No-Build Plus Spot Improvements – AKA "No-Build Plus"

As previously introduced, one component that separates the Tier 3 Alternative Evaluation process from the Tier 2 Alternative Evaluation process is the inclusion of spot improvements, and the introduction of the No-Build Plus – which essentially is the prior No-Build option, plus the addition of the spot improvements.

Through a progression of meetings between the Consultant Team and the Project Partners, a series of spot improvements were developed to be integrated into all the Tier 3 Alternatives, except the No-Build alternative. Spot improvements were recognized by the Project Partners as being desired to potentially inventory which type of low investment (compared to the Build Alternatives) enhancements could/should be included as part of the No Build Plus alternative (newly introduced to the Tier 3 process), but also recognize the desire and value of incorporating and measuring the effectiveness (or not) of other desired enhancements such as pedestrian, bicycle, transit, safety and traffic operations along the Milton Road corridor.

The spot improvements are concentrated at intersections since the alternative's cross section address the mid-block applications. Spot improvements were also characterized in one of the following categories:

- Roadway Geometry;
- Roadway Operations;
- Vehicular Safety;
- Access Management;

- Pedestrian;
- Bicycle; and
- Transit.

Once the spot improvement inventory was completed, the Project Partners collaborated and recognized the variation in the spot improvement applications and identified the need to assign specific improvements to certain Tier 3 Alternatives. Spot improvements are assigned to the Tier 3 Alternatives by one of three applications:

• No Build + Alternative Only;

METROPLAN

- Build Alternatives Only; or
- All Alternatives.

Refer Section 5.1a of *Working Paper #2 – Alternatives Analysis* on the project <u>website</u> for the complete inventory of the initial spot improvements.

)U**≜**S(

NORTHERN ARIZONA 🕅

BN/S



Tier 3 Alternative Evaluation Criteria

Similar to the Tier 2 Alternative Evaluation process, a series of Tier 3 Evaluation Criteria and Weightings were developed to evaluate and measure the performance of the six Tier 3 Alternatives. The Tier 3 evaluation criteria were crafted to cover a diversity of community objectives, although the Tier 3 Evaluation Criteria tend to focus more on quantitative measurements and remove any qualitative metrics carried over from Tier 2 Alternative Evaluation process.

The Project Partners held a series of meetings to determine which of the Tier 2 Evaluation Criteria would carry over to the Tier 3 Evaluation Criteria; which Tier 2 Evaluation Criteria should be eliminated from the Tier 3 Evaluation Criteria; which of the Tier 2 Evaluation Criteria need to be revised in order to move into the Tier 3 Evaluation Criteria; and finally, considered potential new evaluation criteria to the Tier 3 Evaluation process.

A few members of the Project Partners elected to participate in a separate small working group to develop the Tier 3 Evaluation Criteria. These meetings of the Consultant Team and the Tier 3 Evaluation Criteria Task Force produced a new set of more refined evaluation criteria. Detailed notes were collected and distributed during the progression of meetings and can be referenced in Appendix H.

As a result of the small work group meetings, 16 different evaluation criteria were developed to apply in Tier 3 Alternative Evaluation process (**Table 3-4**), 10 of which were newly introduced evaluation criteria. The newly introduced alternative evaluation criteria included:

- Network Delay;
- Conflict Points;
- Bicycle Comfort Index;
- Pedestrian Comfort Index;

• Transit Ridership;

- Implementation Opportunities
- Title VI Impacts;
- Neighborhood Impacts;
- Air Quality; and
- Community Character.

Refer to Section 5.3 of *Working Paper #2 – Alternatives Analysis* for more detailed information about the development of the Tier 3 Alternative Evaluation Criteria, and the specific measures and methodologies used to calculate the results of the Tier 2 Alternative Evaluation.

A new approach to developing evaluation criteria weighting was introduced in Tier 3, which were determined through the combined results of a Project Partner and a community-based survey. The Project Partners were provided a survey to populate their desired weight (level of importance/preference) for each of the Tier 3 Evaluation Category and Criteria. This survey used a pair-wise comparison mathematical analysis; allowing each respondent to systematically evaluate each Evaluation Criteria Category against each other two at a time and set their relative impact in achieving the project goals. In addition, the public's perspective integrated into the weighting process from the result of an online survey was created by the Project Partners. The survey generated 813 visits and 562 responses. A full report of the Public Survey can be referenced in Appendix I. Also reference Section 5.4 of *Working Paper #2 – Alternatives Analysis* on the project <u>website</u> for more information on the methodology in developing Tier 3 Evaluation Criteria weighting.

NORTHERN ARIZONA 🕅

EBN/-





Table 3-4: Final Tier 3 Evaluation Criteria

	Final T3 Evaluation Criteria					
Category	Metrics	Scoring Formula				
	Level of Service (Volume / Capacity Ratio)	Result = (Alternative Result/ Best Result) * Weight * 100				
Traffic Operations	Travel Time (AM) - minutes	Result = (Best Result / Alternative Result) * Weight * 100				
	Travel Time (PM) - minutes					
	Network Delay (AM) - hours	Result = (Best Result / Alternative Result) * Weight * 100				
Vehicular Safety	Network Delay (PM) - hours					
,	Reduction in Conflict Points	Result = (Best Result / Alternative Result) * Weight * 100				
	Bicycle Comfort Quality Index	Result = (Alternative Result/ Best Result) * Weight * 100				
Expand Travel Mode Choices	Pedestrian Comfort Index	Result = (Alternative Result/ Best Result) * Weight * 100				
	Transit Travel Time (AM) - minutes	Result = (Best Result / Alternative Result) * Weight * 100				
	Transit Travel Time (PM) - minutes					
	Transit Ridership	Result = (Alternative Result/ Best Result) * Weight * 100				
Public Acceptance	Public Support	# of Public Support Result = (Best Result / Alternative Result) * Weight * 100				
Cost / Implementation	Construction Cost	Result = (Best Result / (Alternative Result/10M)) * Weigh * 100				
	ROW Impact (Square Feet)	Result= (Best Result / (Alternative Result/10K)) * Weight * 100				
	Implementation Opportunities	Result = (Alternative Result/ Best Result) * Weight * 100				
Environmental Impacts	Neighborhood Impacts	Result = (Best Result/Alternative Result) * Weight * 100				
	Title VI Impacts	Result = (Best Result/Alternative Result) * Weight * 100				
Community Character	Air Quality	Result = (Best Result/Alternative Result) * Weight * 100 50% - Meets *City 2030 Regional Plan Policy 50% - Public Survey Output				
Community Character	Great Street	*Formula for City 2030 Policy: % of corridor able to accommodate trees + % of corridor with "wide" sidewalks				







BNSF


Tier 3 Evaluation Criteria Results & Analysis Findings

This section provides a brief summary of the results for the Tier 3 Alternative Evaluation process of the six Tier 3 Alternatives through the application of the Tier 3 Evaluation Criteria. There is a series graphics immediately following this section that include the detailed results of each Tier 3 Evaluation Criteria for each of the Tier 3 Alternatives.

Unlike the Tier 2 Alternative Evaluation process, the Milton Road CMP Tier 3 Alternatives have a very small range in performance rating based on the score of the Tier 3 Alternative Evaluation Criteria. The highest performing alternative - the No Build - received a score of 60.10 points while the lowest performing alternative received a score of 50.75 points – only a difference of 9.35 There is little variation in the final results of each of the Tier 3 Alternatives.

The study team conducted the technical evaluation and totaled the preliminary set of Tier 3 evaluation criteria results for all the criteria except the "Great Streets" and "Public Acceptance" categories. Public survey inputs obtained in the second round of public involvement were utilized to finalize the "Great Streets" and "Public Acceptance" criteria, to then complete the comprehensive Tier 3 evaluation criteria scoring process. The tier 3 Evaluation Criteria scoring results are indicated in **Table 3-5**, ranking the alternatives from highest scoring to lowest scoring alternative.

Rank	Tier 3 Alternative	Score		
1	Alternative 5 - Six Travel Lanes with Bike Lanes	61.2		
2	No-Build (leave road as is)	60.3		
3	Alternative 6a - Six Travel Lanes with SBBLs	58.9		
4	Alternative 6b - Four Travel Lanes with SBBLs 53.9			
5	No-Build Plus (spot improvements only)	56.5		
6	Alternative 13 – Two Travel Lanes with Center BRT Lanes	53.9		

Table 3-5: Tier 3 Alternative Rankings Based on Tier 3 Evaluation Criteria Results

The final results of the Tier 3 Alternative Evaluation process represent the diverse set of evaluation criteria and assigned weightings that allow one alternative to score well under in some areas and another to score well against different criteria. Thus, the resulting scores are very close.

A couple observations on these findings include:

- The introduction of spot improvements has disproportionally increased the gap in the results for the Project Cost and the Right-of-Way Impact Criteria between the No-Build and the other alternatives.
- According to the Vissim model results, the traffic operations are generally performing
 worse in Tier 3 than the traffic operations results in Tier 2. Although difficult to pinpoint,
 the degradation in traffic operations is likely a result of some of the spot improvements
 which were deemed necessary for safety or connectivity. Items such as dual left turn
 lanes, the addition of two new traffic signals, and the inclusion of two HAWK signals have
 a negative consequence on traffic operations but assist other modes. In addition, Transit
 Signal Priority (TSP) was also added at select signalized intersections to address deficient

UAS(





transit operations and further decreased traffic operations. However, multimodal improvements were two of the six project goals and the Project Partners agreed that the vehicle delay was a potential possible tradeoff for the inclusion of multimodal improvements.

- Regarding the effects of the HAWKs Any inclusion of any stop along Milton Road will increase delay. This is not necessarily negative as this provides the ability to cross safely for pedestrians who would not have a way to safely and reasonably cross otherwise. These trade-offs were generally considered by the Project Partners when developing the spot improvement inventory. Although the delay encumbered in minimal, the aggregate of all trade-offs made throughout the corridor contribute to the total vehicular travel time through the corridor.
- The inclusion of dual lefts reduces the amount of green light time for through traffic, particularly noticeable in the southbound operation results. Dual lefts, particularly on the side streets did help left turning traffic. This results in a proportional reduction in time for side street through movements and mainline time as well.
- A Project Partner small working group and the Consultant Team worked to determine and apply increased traffic volumes for the Build Alternatives resulting from road widening. The group elected not to analyze these in the Vissim model and as such, the model results cannot readily attest to the specific effects this would have. Rather, this evaluation was captured in the congestion needs score spreadsheet that was modified according to the Project Team.

The higher ranking No-Build alternative is likely correlated with the fact that the No-Build alternative condition perform moderately well (that is, not disproportionately worse) when compared to the other alternatives across most of the evaluation criteria. The No-Build ranking also reflects the favorable cost-benefit ratio, suggesting that the lower costs of the No-Build alternative generally outweigh the perceived operational benefits (and higher construction costs/right-of-way impacts) of the build Alternatives, with the exception of Alternative 5.

Figure 3-3 illustrates a graphical summary of the results for Tier 3 Alternative Evaluation process.











Figure 3-3: Tier 3 Alternative Evaluation Results

No Build

- Project Cost: N/A
- Required ROW: 0 ft²
- Potential Buildings Impacted: 0

No-Build Plus

- Project Cost: \$9,804,000
- Required ROW: 53,884 ft²
- Potential Buildings Impacted: 0

	I	No-Build Alt	ernative Tie	r 3 Evaluation	Criteria Resuli	ts		Rank
Traffic Operations 13.9 Possible Points)	Vehicular Safety (16.6 Possible Points)	Expand Travel Mode Choices (19.3 Possible Points)	Public Acceptance (12.0 Possible Points)	Construction/ Implementation (10.6 Possible Points)	Environmental Impacts (13.6 Possible Points)	Community Character (14.0 Possible Points)	Total Score (100 Possible Points)	2 nd
11.9	16.6	9.7	0.0	10.6	11.4	0.2	60.3	

No-Build Plus Tier 3 Evaluation Criteria Results									
Traffic Operations 13.9 Possible Points)	Vehicular Safety (16.6 Possible Points)	Expand Travel Mode Choices (19.3 Possible Points)	Public Acceptance (12.0 Possible Points)	Construction/ Implementation (10.6 Possible Points)	Environmental Impacts (13.6 Possible Points)	Community Character (14.0 Possible Points)	Total Score (100 Possible Points)	5 th	
12.3	15.8	11.9	0.0	4.9	11.5	0.2	56.5		





Alternative 5

- Project Cost: \$85,417,000

- Required ROW: 253,662 ft²
- Potential Buildings Impacted: 21

Alternative 5 Tier 3 Evaluation Criteria Results									
Traffic Operations 13.9 Possible Points)	Vehicular Safety (16.6 Possible Points)	Expand Travel Mode Choices (19.3 Possible Points)	Public Acceptance (12.0 Possible Points)	Construction/ Implementation (10.6 Possible Points)	Environmental Impacts (13.6 Possible Points)	Community Character (14.0 Possible Points)	Total Score (100 Possible Points)	1 st	
13.3	12.2	14.9	2.2	0.7	13.5	4.5	61.2		





- Project Cost: \$95,463,000
- Required ROW: 398,689 ft²
- Potential Buildings Impacted: 32

Alternative 6a Tier 3 Evaluation Criteria Results								
Traffic Operations 13.9 Possible Points)	Vehicular Safety (16.6 Possible Points)	Expand Travel Mode Choices (19.3 Possible Points)	Public Acceptance (12.0 Possible Points)	Construction/ Implementation (10.6 Possible Points)	Environmental Impacts (13.6 Possible Points)	Community Character (14.0 Possible Points)	Total Score (100 Possible Points)	3 rd
12.2	12.6	18.6	0.3	0.9	11.0	3.2	58.9	

Alternative 6b Tier 3 Evaluation Criteria Results									
	Traffic Operations 13.9 Possible Points)	Vehicular Safety (16.6 Possible Points)	Expand Travel Mode Choices (19.3 Possible Points)	Public Acceptance (12.0 Possible Points)	Construction/ Implementation (10.6 Possible Points)	Environmental Impacts (13.6 Possible Points)	Community Character (14.0 Possible Points)	Total Score (100 Possible Points)	4 ^{tl}
	12.1	12.1	14.6	0.0	1.0	10.9	3.1	53.9	

Al	te	rnat	tive	6b
1000		110.1110.1110.1110.111		

- Project Cost: \$74,504,000

- Required ROW: 271345 ft² - Potential Buildings Impacted: 23

Alternative 13 Tier 3 Evaluation Criteria Results									
Traffic Operations 13.9 Possible Points)	Vehicular Safety (16.6 Possible Points)	Expand Travel Mode Choices (19.3 Possible Points)	Public Acceptance (12.0 Possible Points)	Construction/ Implementation (10.6 Possible Points)	Environmental Impacts (13.6 Possible Points)	Community Character (14.0 Possible Points)	Total Score (100 Possible Points)	6 th	
12.1	12.1	14.6	0.0	1.0	10.9	3.1	53.9		





Alternative 13

- Project Cost: \$77,334,000
- Required ROW: 286,207 ft²

- Potential Buildings Impacted: 23



BNSF



Plus Spot Improvements





No-Build Tier 3 Evaluation Results

The No-Build option represents the existing roadway conditions of Milton Road, which includes two travel lanes in each direction with a center two-way left turn lane, and (generally) six-foot sidewalks on both sides of the corridor, though the width of the sidewalk is narrower than six feet in some locations. The No-Build condition also includes various right turn lanes across the corridor, either in one direction or both directions. The No-Build option is the only alternative that would not impact private properties. Finally, it is critical to include the No-Build option as the baseline condition to



highlight positive and/or negative change relative to the other alternatives.





Traffic Operations



Expand Travel Modes



Cost / Implementation



Environmental Impacts





Michael Baker

NTERNATIONA



No-Build Plus Tier 3 Evaluation Results

The No-Build Plus option represents the existing roadway conditions of Milton Road, which includes two travel lanes in each direction with a center two-way left turn lane, and (generally) six-foot sidewalks on both sides of the corridor, though the width of the sidewalk is narrower than six-foot in some locations. The No-Build Plus condition also includes various right turn lanes throughout the corridor, either in one direction or both The No-Build Plus maintains the existing condition with the inclusion of a series of spot improvements, as previously described. The spot improvements do not include any new right turn lanes.





Approximate Right-of-Way







Expand Travel Modes







UAS





Alternative 5 Tier 3 Evaluation Results

This Alternative offers both increased capacity and opportunities for expanded mode choices through the introduction of two vehicular lanes and the addition of buffered bike lanes on both sides of the road. Alternative 5 includes six, 11-foot general purpose travel lanes with center median/left turn lane and 6-foot bicycle lanes and 10-foot sidewalks. Alternative 5 also includes enhanced facilities back of curb with a 10-foot sidewalk with a parkway on both sides of the road.





*Median treatment may vary along the study corridor.

** An ADOT design exception and FHWA approval would be required for the application of 11' travel lanes.

METROPLAN

Traffic Operations





UAS







Expand Travel Modes



BNSI

UAS





Alternative 6a Tier 3 Evaluation Criteria Results

This Alternative offers a combination of both increased capacity and opportunities for expanded mode choices by adding both an additional vehicular lane and a shared bus-bike lane (SBBL) in each direction. Alternative 6a includes six, 11-foot general purpose lanes, two 14-foot SBBLs, and center median/turn lane with 10-foot sidewalks. Alternative 6a also includes enhanced facilities back of curb with a 10-foot sidewalk and a parkway on both sides of the road.





*Median treatment may vary along the study corridor. **An ADOT design exception and FHWA approval would be required for the application of 11'travel lanes.

METROPLAN

Traffic Operations



Safety









Expand Travel Modes



BNSI

UAS

Tier 3 Rank

Tier 3 Score

th



Alternative 6b Tier3 Evaluation Criteria Results

This Alternative primarily provides increased opportunities for expanded mode choices by adding a shared bus-bike lane (SBBL) in each direction, while also introducing a larger buffer between the vehicular lanes and the widened sidewalk. Alternative 6b includes four, 11-foot general purpose lanes, two 14-foot SBBLs, 15foot center median/turn lane with 8-foot parkway buffers and 10-foot sidewalks.



*Median treatment may vary along the study corridor.

**An ADOT design exception and FHWA approval would be required for the application of 11' travel lanes.

8=00

METROPLAN

Traffic Operations



Safety



UA







Expand Travel Modes



BNS

UAS





Alternative 13 Tier 3 Evaluation Results

Alternative 13 includes four 11-foot general purpose lanes, two center-running bus-only bus rapid transit lanes, and two six-foot buffered bike lanes. This Alternative would further include 10-foot sidewalks and 10-foot parkways. Alternative 13 would restrict vehicles from making left turns in and out of business access points.





*Median treatment may vary along the study corridor.

**An ADOT design exception and FHWA approval would be required for the application of 11' travel lanes.

METROPLAN

Traffic Operations











Expand Travel Modes





BNS

UAS

3.2 Recommended Alternative Selection Process

After reaching the final results of the Tier 3 Alternative Evaluation, the next step in the Milton Road CMP process was for the Project Partners to evaluate and vet the Tier 3 Alternatives to select a Recommended Alternative. The selection of the Recommended Alternative was a systematic and collaborative process, including the utilization of the survey input from the public and many stakeholders as well as feedback received form the briefing of the Flagstaff City Council.

On Wednesday, November 18, 2020, the second public open house meeting (Public Open House Meeting #2) was held virtually due to the COVID-19 Pandemic. The purpose of Public Open House Meeting #2 was to present the detailed three-Tier Alternative Analyses results and solicit public and stakeholder input on the Tier 3 Alternatives. Public feedback received from the open house meeting was an important contribution to complement the technical findings and assist the Project Partners in the selection of the Recommended Alternative.

Public Open House Meeting #2 began with a brief presentation to explain the three-tier alternative evaluation process, provide an overview of the Tier 3 Alternative Evaluation analysis, metrics and results, and notify the participants of the online community survey. The online community survey included a series of 24 targeted questions. A total of 104 survey responses received collectively yielded a total of 562 individual responses. In addition to feedback received from the community survey, there was also a Live Question and Answer (Q&A) session to allow meeting participants the opportunity to ask questions about the alternatives, alternatives evaluation process, and the CMP process as a whole to project representatives in a live format. The Live Q&A session was one hour long with 51 participants and a total of 24 questions recorded and answered. The results of the online survey were utilized to equitably quantify and distill the public survey results into the T3 evaluation criteria format.

In addition, and prior to the Public Open House Meeting #2, a project briefing was provided to the Flagstaff City Council on the status of the Milton Road CMP focusing on the results of the Tier Two and Tier Three Alternative Analysis, Evaluation Criteria results, and which alternatives where the highest preforming.

A brief synopsis of the public and stakeholder feedback on Tier 3 Alternatives as part of the Recommended Alternative selection process is provided in the following section. However, for more detailed information regarding the process and findings of Public Open House Meeting #2, please refer to Appendix D where one may find the virtual website used to conduct the meeting, the PowerPoint presentation, the results of the Live Q&A, the Tier 2 and Tier 3 Alternative Evaluation display boards, and the detailed results of the online community survey.

Summary of Public/Stakeholder Feedback Received and Considered as Part of the Selection of the Recommended Alternative

The public open house meeting #2 and the community survey enabled the consultant team to incorporate those findings to complete the "Public Acceptance" and "Great Streets" criteria and finalize the entire Tier 3 evaluation criteria analysis.

UAS

NORTHERN ARIZONA 🕅

EBN/-



ADOT

A series of questions in the online community survey asked participants on a numeric scale on how much they would "support" or "oppose" each of the Tier 3 Alternatives, potential spot improvements as well as questions designed to gauge the public's appetite (or not) for acquisition of private property or impacts to private property (parking/buildings) that may be needed to widen the existing roadway. The public feedback received, particularly on the Great Streets criterion gave additional points to the build Alternatives 5, 6A, 6B and 13. It should be noted however that no alternative received clear support or opposition. That is to say, the results were varied and mixed, and in the application of the Tier 3 evaluation criteria, only two alternatives (Alternative 5 and Alternative 6b) yielded slightly positive results from the public acceptance criterion.

The public survey findings also expressed significant opposition to additional right-of-way acquisition and the potential negative impacts to private properties along the Milton Road frontage. While some of the public feedback and survey findings are conflicting, the Project Partners discussed and ultimately achieved consensus that the broader interpretation of the collective survey results suggested that, while the public would like to see a wider "Great Street" with multi-modal characteristics and enhanced streetscape elements, the survey findings were also suggest that the public did not wish to see the widening of Milton Road at the expense of private property acquisition. Moreover, it is important to note here that each of the "build alternatives" yielded negative vehicular travel time impacts in the Tier 3 traffic modeling results as compared to the No-Build alternative, rendering it difficult for ADOT to justify or recommend a costly build alternative that did not provide a benefit to travel time in the Milton Road corridor.

With and through the Project Partner deliberations on the Tier 3 evaluation criteria findings and public feedback received, Project Partner consensus was achieved to select the "No-Build Hybrid" as the Recommended Alternative fort the Milton Road CMP in the short-term.

3.3 Defining the No Build Hybrid and Rationale for its Selection as the Recommended Alternative

The No-Build Hybrid Recommended Alternative can be described as:

- a) a hybrid of the No-Build and No-Build Plus alternatives;
- b) would not add new travel lanes and right turn lanes on Milton Road;
- c) would maintain traffic operations;

- d) would avoid or minimize impacts to private property;
- e) would retain existing roadway lanes and turn lanes (additional right turn lanes may be recommended through future development and formal Traffic Impact Analysis (TIA) processes);
- f) Improves pedestrian mobility with wider sidewalks for much of the corridor and potential for some additional crossings (proposed crossings are for future consideration only, and will be considered for implementation upon meeting ADOT warrant and/or TIA approval);
- g) Accommodates bicycles with a near continuous shoulder, but no standard bike facility; and
- h) Allows for potential transit signal priority to assist transit travel times at several intersections (proposed transit signal priority is for future consideration only and will be

UAS

NORTHERN ARIZONA 🕅

EM.



considered for implementation upon meeting ADOT warrant and/or TIA that concludes no negative impacts to vehicular operations).

As the name implies, this Recommended Alternative is a "hybrid" for two reasons. First, it offers and effective balance between achieving desired Project Partner and public-desired multi-modal and streetscape enhancements to Milton Road, while maintaining minimum ADOT design standards and existing travel operations (and/or not degrading traffic operations), together with an implementation cost that is substantially less than the build alternatives - and more realistic and achievable in the near term. Second, the practical implementation of the No Build Hybrid as the Recommended Alternative will occur in a "hybrid manner", depending on the existing and varied nature of the current Milton Road facilities/features along various segments of the Milton Road corridor. That is to say, the No-Build Hybrid is not a one size fits all solution. As *Section 3.3a* - *Refinement of Short-Term Spot Improvements Applications & Facility* Specifications describes, 24 individual segments of Milton Road were evaluated to ascertain the optimum application of desired facilities/features based on existing roadway features and rights-of-way.

So, while the No Build Hybrid became the Project Partners' Recommended Alternative, much analysis and discussion was still needed to fine tune the Recommended Alternative by evaluating and determining the optimum application of Project Partner-desired facilities/features (and their respective widths) and spot improvements specific to each of the 24 roadway segments along the Milton Road corridor.

3.3a Refinement of Short-Term Spot Improvements Applications & Facility Specifications

In order to develop an accurate depiction of the No-Build Hybrid for Milton Road, a segment analysis was conducted with the Project Partners to balance maintaining minimum feature widths (required for safe operations), including multimodal improvements, improving bike accommodations, and avoiding encroaching upon private buildings and parking.

The following refined roadway feature parameters and goals were followed as part of the segmentation analysis:

- 1. *Maintain ADOT-acceptable roadway feature widths for safe operations, including:
 - a. 13' median/two-way left-turn lane
 - b. 10' left-turn lanes at signalized intersections
 - c. 11' travel lanes
 - d. 11' right-turn lanes
 - e. 5' sidewalk (minimum)
 - f. Add a 3' on-street paved shoulder (to comply with ADOT's 2021 design standard for urban facilities)
- 2. Widen the sidewalk up to 10' (when doing so would not impact buildings or parking spaces)
- 3. Add a parkway/landscaped buffer up to 10' (when doing so would not impact buildings or parking spaces)

*Some recommended features, such as reduced lane widths, do not meet current ADOT design standards and will require a design exception approval by ADOT.

UAS

BNA



The first step was to map the existing right-of-way footprints, which has four different footprints in five different sections across the Milton Road corridor, as depicted in **Figure 3-4**. The existing right-of-way is widest in the southern port of Milton Road and progressively gets more narrower to the north, being 100' at its widest point and 80' and its most narrow point. The existing right-of-way footprints are as follows:

- 100' Forest Meadows Street to Route 66;
- 90' Route 66 to Private Drive (Dairy Queen);
- 80' Private Drive (Dairy Queen) to Malpais Lane;
- 87.5' Malpais Lane to Butler/Clay Avenue; and
- 80' Butler/Clay Avenue to San Francisco Street.

The majority of the corridor has 100' of existing right-of-way from south of Route 66 to Forest Meadows Street, and the rest of the corridor north of Route 66 to San Francisco Street fluctuates between 90' and 80' – although predominately 80' in this section. After the exiting right-of-way footprints were mapped, the various existing roadway facilities were identified as the roadway facility types evolve along the Milton Road study corridor. The corridor consistently has a two-way left turn lane (TWTL)/ center left turn lane (CTL) at signals, and four travel lanes throughout the entire corridor. The roadway feature that changes throughout the corridor is the presence of a right turn lane (RTL), which either doesn't exist, exists in one direction, or exists in both the northbound and southbound directions. As a result, three generalized cross sections were identified throughout the Milton Road.

- Condition 1: 4 Travel Lanes 1 TWLTL/CTL 0 RTL
- Condition 2: 4 Travel lanes 1 TWLTL/CTL 1 RTL
- Condition 3: 4 Travel lanes 1 TWLTL/CTL 2 RTL

Once the three baseline cross section conditions were determined, the corridor was broken into unique segments across Milton Road determined by the change in the existing condition – which mainly consisted of the presence of a right turn lane (or not). As a result, 24 unique segments were established and classified in alphabetical order (Segment A through Segment X) starting at Forest Meadows Street, and moving north to San Francisco Street, as shown in **Figure 3-5**.

Further illustrated in **Table 3-6**, the 100' right-of-way footprint from Forest Meadows Street to Route 66 includes 16 segments: Segment A through Segment X that consist of three cross section conditions. The 90' right-of-way footprint includes one segment: Segment Q with one cross section condition; the 80' right-of-way footprint includes seven segments: Segment R and Segment T thought Segment X with one cross section condition. Finally, the 87.5' right-of-way footprint has one segment: Segment S with one cross section condition.

Another element of **Table 3-6** is the results of an adjacent parcel analysis, which analyzed at a high level. the adjacent parcels within each segment to determine if some limited right-of-way acquisition is feasible without impacting structures or parking. Right-of-way limits were compared to aerial imagery – no survey data was used for this analysis. The majority of the corridor can accommodate some limited right-of-way acquisitions where it is needed in order to provide enhanced back-of-curb facilities. However, it is important to note that most segments do not require right-of-way acquisition, supporting the No-Build Hybrid directive.

UAS

NORTHERN ARIZONA 🕅

EBN/-





Figure 3-4: Existing Milton Road Right-of-Way





BAV-

UAS





ichael B

INTERNATIONA

BAV-





UAS



	S	egment Details	Existing	Existing Cross	Limited Right-of-
			Right-of-Way	Section Condition	Way Acquisition
	Length (ft)	Limits			Accommodated?
Segment A	475'	Forest Meadows St to Saunders Dr	100'	4 GP - 2 RTL - 1 CTL	Yes
Segment B	250'	Saunders Dr to mid-block (250' north)	100'	4 GP - 1 RTL - 1 CTL	Yes
Segment C	858'	Mid-block to University Dr	100'	4 GP - 1 RTL - 1 CTL	Yes
Segment D	365'	University Dr to University Ave	100'	4 GP - 1 RTL - 1 CTL	Yes
Segment E	389'	University Ave to mid-block (389' north)	100'	4 GP - 2 RTL - 1 CTL	Yes
Segment F	574'	Mid-block to mid-block	100'	4 GP - 1 RTL - 1 CTL	Yes
Segment G	353'	Mid-block to mid-block	100'	4 GP - 0 RTL - 1 CTL	Yes
Segment H	195	Mid-block to mid-block	100'	4 GP - 1 RTL - 1 CTL	Yes
SegmentI	394'	Mid-block to Plaza Way	100'	4 GP - 2 RTL - 1 CTL	No
Segment J	224	Plaza Way to mid-block	100'	4 GP - 0 RTL - 1 CTL	Yes
Segment K	202'	Mid-block to Riordan Road	100'	4 GP - 1 RTL - 1 CTL	Yes
Segment L	207	Riordan Road to mid-block	100'	4 GP - 2 RTL - 1 CTL	Yes
Segment M	231'	Mid-block to mid-block	100'	4 GP - 1 RTL - 1 CTL	Yes
Segment N	312'	Mid-block to mid-block	100'	4 GP - 0 RTL - 1 CTL	Yes
Segment O	168'	Mid-block to mid-block	100'	4 GP - 1 RTL - 1 CTL	Yes
Segment P	240'	Mid-block to Route 66	100'	4 GP - 1 RTL - 1 CTL	Yes
Segment Q	315'	Route 66 to mid-block	90'	4 GP - 1 RTL - 1 CTL	Yes
Segment R	168'	Mid-block to mid-block	80'	4 GP- 0 RTL - 1 CTL	Yes (east side only)
Segment S	815'	Mid-block to Butler/Clay Avenue	87.5'	4 GP - 1 RTL - 1 CTL	Yes (east side only)
Segment T	902'	Butler/Clay Avenue to Phoenix Avenue	80'	4 GP - 0 RTL - 1 CTL	No
Segment U	350'	Phoenix Avenue to mid-block	80'	4 GP - 0 RTL - 1 CTL	No
Segment V	405'	Mid-block to mid-block	80'	4 GP - 0 RTL - 1 CTL	Yes
Segment W	340'	Mid-block to Humphrey's Street	80'	4 GP - 0 RTL - 1 CTL	Yes
Segment X	350'	Humphrey's Street to Beaver Street	80'	4 GP - 0 RTL - 1 CTL	No

Table 3-6: Milton Road Segmentation, Existing Right-of-Way, & Existing Cross Section Inventory





4.0 RECOMMENDED ALTERNATIVE

Once the No-build Hybrid was selected as the Recommended Alternative, the Project Partners assembled over the course of multiple meetings to develop and define specific facility enhancements for the corridor that aligned with Milton CMP goals, Project Partner desired facilities, and within the scope of the No-Build Hybrid. As a result, a Short-term, or near-term vison as well as a long term, Long-term ultimate roadway configuration for Milton Road were created.

The Recommended Alternative, and corresponding recommendations, are based on existing ADOT policies. Should ADOT policies change, any impacted recommendation should be re-evaluated as applicable.

In developing transportation projects, there is sometimes a tradeoff between safety, capacity, convenience, and/or comfort of mode based on transportation controls and design that result in impacts to travel times. These tradeoffs must be carefully considered in a future analysis that goes beyond the scope of a planning document. Select at-grade crossing requests did not receive Project Partner concurrence and as a result were evaluated and resolved during an escalation ladder process. The resulting conclusion and supporting language is captured in the below paragraph.

Some intersection and/or mid-block crossing locations that are identified as future opportunities in the Milton Road Corridor Master Plan may not be implemented as proposed after being analyzed through the planning process and evaluation criteria agreed upon by partners. However, these opportunities could present themselves as we move into the future. Approval to build such crossings requires a technical evaluation process which may not support the implementation of the improvements or may require additional enhancements such as intersection improvements, median refuges, grade separations or location adjustments. If the intersection and segment level of service or other potential negative impacts improve or can be mitigated from the predicted level of service identified in the study at the horizon year, then the additional pedestrian crossings could be considered if warranted in the future. Even though this is a 20-year plan, potential changes from real to projection may be checked on a five-year basis.

4.1 Short-Term Recommended Alternative: No-Build Hybrid

As previously described, the short-term application Recommended Alternative is classified as the No-Build Hybrid which constitutes a near-term recommendation that implements multimodal enhancements and fundamental spot improvements that are achieved primarily within ADOT's existing right-of-way; all while achieving ADOT minimum roadway design standards (including the design exceptions) and satisfy Project Partner preferred facilities and widths, where feasible. The limited right-of-way acquisition required to implement the No-Build Hybrid is minimal having little to no impacts to private parking lots and no impacts to existing buildings.





ADOT

As previously described in *Section 3.3a* - *Refinement of Short-Term Spot Improvements Applications & Facility* Specifications, three existing cross section conditions were derived within the Milton Road corridor within the four existing right-of-way footprints. Both the existing rightof-way and the existing cross section condition will be referenced throughout this section as the short-term application of the No-Build Hybrid Recommended Alternative is described. Due to the nature of the No-Build Hybrid, and in concert with the variability in available right-of-way and existing cross section, the proposed condition under short-term changes/adjusts along the corridor. As a result, the short-term application of the Recommended Alternative is presented in two different areas of the Milton Road CMP study corridor: Forest Meadows Street to Route 66; and Route 66 to Beaver Street.

The following subsections go into more detail about the short-term application of the Recommended Alternative in these two sections, segment-by-segment to include cross sections and descriptions of what is proposed under the short-term in comparison to the existing condition. Note that some segments are able to accommodate limited right-of-way acquisition in order to provide enhanced back-of-curb facilities desired by the Project Partners, while also achieving ADOT's key priorities for travel lane and turn lane widths within the pavement section in order to balance maintaining traffic operations, promoting safety applications, and accommodate multimodal improvements.

For supplemental detail of the short-term application of the Recommended Alternative, reference Appendix A for a plan-view schematic drawing illustrating the recommended right-of-way boundary along each roadway segment type for the entire Milton Road CMP study corridor.









NORTHERN ARIZONA 🕅



4.1a Short-Term Application of the Recommended Alternative: Forest Meadow Street to Route 66

This section describes the short-term application of the Recommended Alternative from Forest Meadows Street to Route 66, as shown in **Figure 4-1**. From Forest Meadows Street to Route 66, as illustrated in **Table 4-1**, there is 100' of available right-of-way beginning from the southern terminus of the study corridor and continues north to Route 66. As part of the segmentation process, there are a total of 16 segments between Forest Meadows Street and Route 66 as determined by the existing cross section condition (Segment A through Segment P). All three of the existing cross section conditions occur between Forest Meadows Street and Route 66:

- 4 Travel Lanes 0 RTL 1 CTL
- 4 Travel Lanes 1 RTL 1 CTL
- 4 Travel 2 RTL 1 CTL

Table 4-1 summarizes the Short-term application for the Recommended Recommendation by showing the facility types and widths while cross referencing the existing cross section for each segment. **Figure 4-2** depicts the recommendations by cross referencing the proposed cross section with the corresponding segment. Refer to the proceeding subsections for more information.

The Recommended Alternative, and corresponding Short-term recommendations, are based on existing ADOT policies. Should ADOT policies change, any impacted recommendation should be re-evaluated as applicable.









Table 4-1: Short-Term Recommended Alternative: Forest Meadow Street to Route 66

Forder to a		Forderation of	Dese: bla				P	hase 1 R	lecomme	endation	ı				Dhara 1
ROW	Segment	Cross Section	ROW Aq.		Southb	ound			Center			North	nbound		ROW
100'	Segment A	4 GP - 2 RTL - 1 CTL	Yes	8' SW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	8' SW	106'
100'	Segment B	4 GP - 1 RTL - 1 CTL	Yes	10' SW 3' PW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	3' PW	10' SW	105'
100'	Segment C	4 GP - 1 RTL - 1 CTL	Yes	10' SW	3' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	3' PW 10' SW	105'
100'	Segment D	4 GP - 1 RTL - 1 CTL	Yes	10' SW	3' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	3' PW 10' SW	105'
100'	Segment E	4 GP - 2 RTL - 1 CTL	Yes	8' SW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	8' SW	106'
100'	Segment F	4 GP - 1 RTL - 1 CTL	Yes	10' SW	3' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	3' PW 10' SW	105'
100'	Segment G	4 GP - 0 RTL - 1 CTL	Yes	10' SW	6' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	6' PW	10' SW	100'
100'	Segment H	4 GP - 1 RTL - 1 CTL	Yes	10' SW 3' PW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	3' PW	10' SW	105'
100'	Segment I	4 GP - 2 RTL - 1 CTL	No	5' SW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	5' SW	100'
100'	Segment J	4 GP - 0 RTL - 1 CTL	Yes	10' SW	3' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	3' PW	10' SW	100'
100'	Segment K	4 GP - 1 RTL - 1 CTL	Yes	10' SW	3' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	3' PW 10' SW	105'
100'	Segment L	4 GP - 2 RTL - 1 CTL	Yes	8' SW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	8' SW	106'
100'	Segment M	4 GP - 1 RTL - 1 CTL	Yes	10' SW 3' PW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	3' PW	10' SW	105'
100'	Segment N	4 GP - 0 RTL - 1 CTL	Yes	10' SW	6' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	6' PW	10' SW	100'
100'	Segment O	4 GP - 1 RTL - 1 CTL	Yes	10' SW	3' PW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	3' PW 10' SW	105'
100'	Segment P	4 GP - 1 RTL - 1 CTL	Yes	10' SW 3' PW	5.5' SH	11' RTL	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	3' PW	10' SW	105'
						Leg	end								

Center Turn / Median	Shoulder (includes 2.5' gutter pan and curb)
Travel Lane	Sidewalk
Right Turn Lane	Parkway









METROPLAN

Figure 4-2: Short-Term Recommended Cross Section: Forest Meadows Street to Route 66



4, 11' GP - 2, 11' RTL - 1, 13' CTL/Median - 2, 3' shoulders - 5' Sidewalks



BNSF

NORTHERN

ARIZONA

UAS





Existing Condition 1: No Right Turn Lanes with 100' of Available Right-of-Way

There are three segments – Segment G, Segment J, and Segment N – from Forest Meadows Street to Route 66 where there are no existing right turn lanes within the 100' right-of-way footprint. **Figure 4-3** shows the location of the three segments in relationship to the rest the corridor, and also displays the existing cross section of Segments G, J and N in comparison with the cross section of the short-term application of the Recommended Alternative.

These three segments of Milton Road present the greatest opportunity to incorporate desired facility enhancements because the absence of right turn lanes allows for approximately 23' of available right-of-way that can be allocated towards other roadway facilities. This results in the ability to provide the Project Partners and ADOT desired roadway facilities and facility widths without the need for right-of-way acquisition.

As displayed in the proposed cross section, short-term application of the Recommended Alternative:

- Maintains four travel lanes with two northbound and two southbound travels lanes, although narrowing each travel lane by one foot from 12' to 11' which allocates an additional 4' for other roadway uses;
- Includes an enhanced center treatment of either a 13' median or a 10' center left turn lane with a 3' median which promotes improved access control;
- The addition of two 3' shoulders to achieve ADOT's updated roadway design guidelines intended to improve safety and roadway operations by providing space within the pavement section to accommodate bicycles, snow storage during the winter season, additional space for Mountain Line buses to pull over at bus stops without a pullout, and help facilitate right turns for larger vehicles. In addition, the 3' shoulder also acts as a horizontal buffer between vehicles in the travel lanes and sidewalk users by creating more horizontal space between the two;
- Has a vast improvement of the back-of-curb facilities with the introduction of a 6' parkway (landscaped buffer) and the widening of the sidewalk to 10' from 5' in the existing condition; and

In the scenario a right turn lane is added as a result of development/ redevelopment, and warranted through a formal ADOT TIA/TGP process, the width of the right turn lane would be in addition to the proposed back-of-curb facilities.







EM.



Rt 66 📖

laza Way

Chambers Dr

University Dr

Saunders Dr

100' ROW

Condition 1 - 0 RTL

Condition 3 - 2 RTL

Condition 2 - 1 RTL

G

F

Ε

D

C

B

A

1-17



Figure 4-3: Short-Term Recommended Cross Section for Milton Road Segments G, J, & N

*Median treatment will vary along the corridor. The width of the median will change from 3' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.

**An ADOT design exception and FHWA approval would be required for 11' travel lanes







Existing Condition 2: 1 Right Turn Lane with 100' of Available Right-of-Way

There are nine segments from Forest Meadows Street to Route 66 where there is one right turn lane within the 100' right-of-way footprint: Segment B-D, Segment F, Segment H, Segment K, Segment M, Segment O- P. **Figure 4-4** shows the location of the nine segments in relationship to the rest the corridor and the other segments, and displays the existing cross section of the nine segments in comparison with the cross section of the short-term Recommendation. For illustrative purposes only, the right turn lane is depicted in the southbound direction, however, depending on the segment, the existing right turn lane could be in either the northbound or southbound direction.

These nine segments experience a lesser level of improvement compared to the three existing condition 1 segments under Short-term; Although, these nine segments are still able to provide enhanced back-of-curb facilities while achieving the ADOT's key priorities for travel lane and turn lane widths within the pavement section in order to balance maintaining traffic operations, promoting safety applications, and accommodating multimodal improvements. This is accomplished since under existing condition 2, with one right turn lane and with 100' of available right-of-way, there is approximately 13' feet of available right-of-way that can be utilized for other roadway facilities.

To achieve this Recommended Short-term cross section, an additional 5' of right-of-way will need to be acquired, totaling 105' right-of-way footprint. During the adjacent parcel analysis, it was determined that an additional 5' could be acquired (without impacting any parking or structures) in the most right-of-way constrained area of these nine segments. In an effort to create a typical cross section for existing condition 2 and these nine segments, this proposed cross section is recommended, with the caveat that the parkway (landscape buffer) and/or sidewalk could be wider along certain parcels depending on the adjacent land and the amount of right-of-way that could be acquired without impacting parking or a structure. This level of detail will be addressed during the design process. However, it is important to note that this proposed cross section will not be any reduced or not include any of the roadway facilities displayed.

As displayed in the proposed cross section, short-term application of the Recommended Alternative:

- Maintains four travel lanes with two northbound and two southbound travels lanes, although narrowing each travel lane by one foot from 12' to 11' which allocates an additional 4' for other roadway uses;
- Includes an enhanced center treatment of either a 13' median or a 10' center left turn lane with a 3' median which promotes improved access control;
- The addition of two 3' shoulders to achieve ADOT's updated roadway design guidelines intended to improve safety and roadway operations by providing space within the pavement section to accommodate bicycles, snow storage during the winter season, and help facilitate right turns for larger vehicles. In addition, the 3' shoulder also acts as a horizontal buffer between vehicles in the travel lanes and sidewalk users by creating more horizontal space between the two;

UAS

NORTHERN ARIZONA 🕅





ADOT

- Segment E has a long and continuous right turn lane on the east side that serves two driveways and continues in Segment F to the intersection with Chambers Dr. This lane will be evaluated to opportunities to segment it for each driveway and prevent passing and other driving behavior that presents a risk to pedestrians, cyclists and other vehicles.
- Has improved back-of-curb facilities with the introduction of a 3' parkway and the widening of the sidewalk to 10' from 5' in the existing condition; and
- In the scenario a right turn lane is added as a result of development/ redevelopment, and warranted through a formal ADOT TIA/TGP process, the width of the right turn lane would be in addition to the proposed back-of-curb facilities.









Figure 4-4: Short-Term Recommended Cross Section for Milton Road Segments B, C, D, F, H, K, M, O, & P

*Median treatment will vary along the corridor. The width of the median will change from 3' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.

**An ADOT design exception and FHWA approval would be required for 11' travel lanes







Existing Condition 3:2 Right Turn Lanes with 100' of Available Right-of-way

There are four segments – Segment A, Segment E, Segment I, and Segment L – from Forest Meadows Street to Route 66 where right turn lanes exist in both the northbound and southbound directions. **Figure 4-5** shows the location of the three segments in relationship to the rest the corridor and the other segments, and also displays the existing cross section of Segment A, E, I, and L in comparison with the cross section of the short-term Recommendation. Segment I has a different short-term application under the Recommended Alternative due to potential right-of-way constraints which is addressed in more detail below.

These four segments (including Segment I) do not have the variations as compared to the other 100-foot right-of-way segments because the presence of the two right turn lanes utilize most of the "additional" right-of-way that offered greater flexibility in other segments. However, under the short-term of the Recommended Alternative – by including 6' of right-of-way acquisition - these four segments still achieve ADOT's key priorities within the pavement section in order to balance maintaining traffic operations and promoting safety applications; all while still accommodating multimodal improvements by widening the sidewalk by a total of 3' from 5' in the existing condition to at least 8' in the proposed condition.

The proposed sidewalk is classified as "at least" 8' because during the adjacent parcel analysis, it was determined that approximately 6' of additional right-of-way could be acquired (without impacting any parking or structures) in the most right-of-way constrained areas of these four segments. As a result, the proposed cross section represents the most constrained locations of these segments, meaning that there will most likely be opportunities along these segments to have wider than 8' sidewalks depending on the characteristics of the adjacent properties, which will be addressed in the design process. As displayed in the proposed cross section, the short-term application of the Recommended Alternative:

- Maintains four travel lanes with two northbound and two southbound travels lanes, although narrowing each travel lane by one foot from 12' to 11' which allocates an additional four feet for other roadway uses;
- Includes an enhanced center treatment of either a 13' median or a 10' center left turn lane with a 3' median which promotes improved access control;
- The addition of two 3' shoulders to achieve ADOT's updated roadway design guidelines intended to improve safety and roadway operations by providing space within the pavement section to accommodate bicycles, snow storage during the winter season, ad and help facilitate right turns for larger vehicles. In addition, the 3' shoulder also acts as a horizontal buffer between vehicles in the travel lanes and sidewalk users by creating more horizontal space between the two;
- Has an improved sidewalk with the widening of the sidewalk to at least 8' from 5' in the existing condition; and
- has a long and continuous right turn lane on the east side that serves two driveways and continues in Segment F to the intersection with Chambers Dr. This lane will be evaluated to opportunities to segment it for each driveway and prevent passing and other driving behavior that presents a risk to pedestrians, cyclists and other vehicles. For more detail on Segment I, proceed to the following subsection.

UAS(









Figure 4-5 Short-Term Recommended Cross Section for Milton Road Segments A, E, and L





*Median treatment will vary along the corridor. The width of the median will change from 3' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.

**An ADOT design exception and FHWA approval would be required for 11' travel lanes







Short-term Application of the Recommended Alternative – Segment I

As illustrated in **Figure 4-7**, Segment I is located at the south leg of the intersection of Milton Road and Plaza Way, and has the existing cross section condition 3, including two right turn lanes. Due to the orientation and building placements of the adjacent properties, Segment I has a unique Shortterm application of the Recommended Alternative compared to the other condition 3's Segments A, E and L, as depicted in **Figure 4-7**. The right-of-way constraints associated with the adjacent structures located at the southeastern and southwestem corner of the intersection present added constraints for Segment I. As previously noted, one of the fundamental tenants of Short-term implementation is the minimal impact of right-of-

Figure 4-6: Segment I Reference Map



way acquisition for sidewalk or parkway widening, as long as no existing buildings or parking is minimally impacted. As shown in **Figure 4-6**, the Wells Fargo building at the southeastern corner, and the gas station structure at the southwestern corner, have architectural-forward designs, inhibiting the ability to acquire right-of-way in Segment I to allow sidewalk or parkway widening without impacting the structures. Until one or both of these circled parcels redevelop, the existing condition (5' sidewalk with no parkway) will likely need to be maintained adjacent to the building structures.

As displayed in the proposed cross section, Short-term of the Recommended Alternative:

- Maintains four travel lanes with two northbound and two southbound travels lanes, although narrowing each travel lane by one foot from 12' to 11' which allocates an additional four feet for other roadway uses;
- Includes an enhanced center treatment of either a 13' median or a 10' center left turn lane with a 3' median which promotes improved access control;
- The addition of two 3' shoulders to achieve ADOT's updated roadway design guidelines intended to improve safety and roadway operations by providing space within the pavement section to accommodate bicycles, snow storage during the winter season, and help facilitate right turns for larger vehicles. In addition, the 3' shoulder also acts as a horizontal buffer between vehicles in the travel lanes and sidewalk users by creating more space horizontal space between the two; and
- Maintains the existing 5' sidewalk due to right-of-way constraints, which could be addressed during the City's redevelopment processes.





ADOT



Figure 4-7: Short-Term Recommended Cross Section for Milton Road Segment I





*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.

**An ADOT design exception and FHWA approval would be required for 11' travel lanes






4.1b Short-Term Application of the Recommended Alternative: Route 66 to Beaver Street

This section describes the short-term application of the Recommended Alternative from Route 66 to Beaver Street, as shown in Figure 4-8. From Route 66 to Beaver Street, as illustrated in Table 4-2, the existing right-of-way footprint fluctuates between 80' and 90' but is predominately 80' for the majority of the roadway segments north of Route 66. As part of the segmentation analysis, there are a total of eight (8) segments between Route 66 and Beaver Street as determined by the existing cross section condition (Segment Q through Segment X). Two of three of the existing cross section conditions occur between Route 66 Beaver Street:

- 4 Travel Lanes 0 RTL 1 CTL
- 4 Travel Lanes 1 RTL 1 CTL

Table 4-2 provides a summary of the short-term application of the Recommended Alternative north of Route 66 by showing the different facility types and widths while cross referencing the existing cross section for each segment. **Figure 4-9** depicts the recommendations by referencing the proposed cross section with the corresponding roadway segment. Refer to the proceeding subsections for more information. The following sub-sections provide more detail on the Short-term application of the Recommended No-Build Hybrid alternative from Route 66 to Beaver Street.

The Recommended Alternative, and corresponding short-term recommendations, are based on existing ADOT policies. Should ADOT policies change, any impacted recommendation should be re-evaluated as applicable.









Table 4-2: Short-Term Recommended Alternative: Route 66 to Beaver Street

				Phase 1 Recommendation											
ROW	Segment	Existing Cross Section	Possible ROW Aq.		Southb	ound			Center	Center			nbound		Phase 1 ROW
90'	Segment Q	4 GP - 1 RTL - 1 CTL	Yes	8.5' SW	5.5' SH	11' RTL	. 11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	8.5 SW		96'
80'	Segment R	4 GP- 0 RTL - 1 CTL	Yes*		9' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	9' SW		86'
87.5'	Segment S	4 GP - 1 RTL - 1 CTL	Yes*		10' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	11' RTL	5.5' SH	Existing SW	89'
80'	Segment T	4 GP - 0 RTL - 1 CTL	No		6' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	6' SW		80'
80'	Segment U	4 GP - 0 RTL - 1 CTL	No		6' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	6' SW		80'
80'	Segment V	4 GP - 0 RTL - 1 CTL	Yes		9' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	9' SW		86'
80'	Segment W	4 GP - 0 RTL - 1 CTL	Yes		9' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	9' SW		86'
80'	Segment X	4 GP - 0 RTL - 1 CTL	No		6' SW	5.5' SH	11' GP	11' GP	13' CTL	11' GP	11' GP	5.5' SH	6' SW		80'

Legend	
Center Turn / Median	Shoulder (includes 2.5' gutter pan and curb)
Travel Lane	Sidewalk
Right Turn Lane	Parkway
Right Turn Lane	Parkway





ADOT



METROPLAN

)U**≜**S

UNIVERSI

86'

ht-of-W

Figure 4-9: Short-Term Recommended Cross Section: Route 66 to Beaver Street





INTERNATIONAL



Existing Condition 2:1 Right Turn Lane with 90' of Available Right-of-Way

There is one segment – Segment Q – from Route 66 to Beaver Street where there is one right turn lane and has 90' of existing right-of-way. **Figure 4-10** shows the location of Segment Q in relationship to the remaining portions of this portion of the Milton Road corridor, from Route 66 to Beaver Street; while also displaying the existing cross section of Segments G, J and N in comparison with the cross section of the short-term Recommendation.

This Segment presents an added challenge in developing the short-term application since the property recently acquired by NAU is currently being study for a potential 4th leg intersection and access way onto the university property, thus potentially modifying the intersection of Route 66 and Milton Road into a four-leg intersection from its current condition as a three-leg intersection. Since this 4th leg concept remains preliminary as NAU is working to secure funding for the design and construction of the project, it is difficult to anticipate the future configuration of this intersection and impact to Segment Q as a whole. However, with limited right-of-way acquisition (6'), the proposed condition under the short-term application of the includes a consistent roadway facilities and widths within the pavement section as the other segments along Milton Road, while also offering a widened sidewalk to 8.5' on both sides of Milton Road.

It is recommended that the City of Flagstaff, NAU, ADOT and other necessary Project Partners work to refine the short-term Application of the Recommended Alternative in this Segment as the final design of the intersection is determined. As a result, the sidewalks could potentially be wider than 8.5' on one, or both sides of Milton Road.

As displayed in the proposed cross section, the short-term application of the Recommended Alternative:

- Maintains four travel lanes with two northbound and two southbound travels lanes, although narrowing each travel lane by one foot from 12' to 11' which allocates an additional four feet for other roadway uses;
- Includes an enhanced center treatment of either a 13' median or a 10' center left turn lane with a 3' median which promotes improved access control;
- The addition of two 3' shoulders to achieve ADOT's updated roadway design guidelines which is an application to improve safety and roadway operations by providing space within the pavement section to accommodate bicycles, snow storage during the winter season, and help facilitate right turns for larger vehicles. In addition, the 3' shoulder also acts as a horizontal buffer between vehicles in the travel lanes and sidewalk users by creating more space horizontal space between the two;
- Has an improved sidewalk with the widening of the sidewalk to at least 8.5' from 5' in the existing condition; and
- In the scenario a right turn lane is added as a result of development/ redevelopment, and warranted through a formal ADOT TIA/TGP process, the width of the right turn lane would be in addition to the proposed back-of-curb facilities.

UAS















4, '	11' GP –	1, 1	11	' RTL – 1, 1	13' CTL/M	edia	an – 2, 3	3' sho	oulders –	8.5' Sidew	alks		96	' ROW
				V			4		74	î î	t t			
	8.5'	2.5	3'	11'	11'		11'	3'	10'	11'	11'	3'	2.5	8.5'
ED	8.5' Sidewalk	C&G 2.5'	3' Dius	11' SB Right Turn Lane	Sout Trave	22' :hboi el La	und nes		13' Median* & Center Left Turn Lane	2 North Trave	2' bound I Lanes	3' plus	C & G 2.5'	8.5' Sidewalk
SOG							Cı	79' Irb to Ci	urb					
PRO							Ri	90' ght-of-V	lay					

*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.







Existing Condition 2:1 Right Turn Lane with 87.5' of Available Right-of-Way

There is one segment – Segment S – from Route 66 to Beaver Street where there is one right turn lane and has 87.5' of existing right-of-way. **Figure 4-11** shows the location of Segment S in relationship to the segments between Route 66 to Beaver Street, and displays the existing cross section of Segment S compared to the Recommended No-Build Hybrid short-term application.

Segment S is also unique because the existing sidewalk on the east side of Milton Road is located outside of ADOT's right-of-way on NAU property. Segment S is also one of the only segments on Milton Road that contains shoulders in the existing condition. The fact that the sidewalk on the east side of the roadway is not contained within the existing ADOT right-of-way allows for the potential accommodation of a much wider sidewalk on the west side of Milton Road with only 1.5' of right-of-way acquisition needed. This is also achieved with the narrowing of the travel lanes and the northbound right turn lane.

As part of a separate effort, NAU will work with the other Project Partners to determine improved and final specifications of the east sidewalk. However, the existing sidewalk on the east side is separated from Milton Road and is considered one of the more desirable sidewalk segments along Milton Road.

As displayed in the proposed cross section, the short-term Application of the Recommended Alternative:

- Maintains four travel lanes with two northbound and two southbound travels lanes, although narrowing each travel lane by one foot from 12' to 11' which allocates an additional four feet for other roadway uses;
- Includes an enhanced center treatment of either a 13' median or a 10' center left turn lane with a 3' median which promotes improved access control;
- The addition of two 3' shoulders to achieve ADOT's updated roadway design guidelines intended to improve safety and roadway operations by providing space within the pavement section to accommodate bicycles, snow storage during the winter season, and help facilitate right turns for larger vehicles. In addition, the 3' shoulder also acts as a horizontal buffer between vehicles in the travel lanes and sidewalk users by creating more space horizontal space between the two;
- Has an improved sidewalk with the widening of the west sidewalk to 10' from 5' in the existing condition; and

In the scenario a right turn lane is added as a result of development/ redevelopment, and warranted through a formal ADOTTIA/TGP process, the width of the right turn lane would be in addition to the proposed back-of-curb facilities.







ADOT







4 , '	11' GP – '	1, 1	3' C	CTL/Median	– 2, 3' sho	ulder	rs – 10' Sid	lewalk		89'	ROV	N
	Ż				-							
			N 2									
	10'	2.5	3'	11'	11'	3'	10'	11'	11'	11'	3'	2.5
	10' Sidewalk	š G 2.5'	3' Pl4	2 South	2' bound		13' Median* &	2 North	2' bound	11' NB	3' Pl	\$ G 2.5'
ËD		õ	ŝ	Travel	Lanes		Center Left Turn Lane	Trave	l Lanes	Right Turn Lane	l s	ö
SO							79'			•		
ЧO							Curb to Curb					
Ъ В В							89'					
							Right-of-Way					

*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.





ADOT

Existing Condition 1: No Right Turn Lane with 80' of Available Right-of-Way

There is a total of six segments – Segment R, Segment T, Segment U, Segment V, Segment W, and Segment X – from Route 66 to Beaver Street where there are no right turn lanes with 80' of existing right-of-way. **Figure 4-12** shows the location of these segments in relationship to the segments between Route 66 to Beaver Street, and displays the existing cross section compared to the Recommended No-Build Hybrid alternative short-term application.

Three of the six segments are right-of-way constrained, thereby limiting the ability to potentially acquire additional right-of-way without impacting existing parking or buildings on private property.

Segment R, V, and W present opportunities for potential limited right-of-way acquisition, and during the adjacent parcel analysis, it was determined that only an additional 5' could be acquired (without impacting any parking or structures) in the most right-of-way constrained area of these three segments. As a result, the Short-term application achieves ADOT's key priorities within the pavement section in order to balance maintaining traffic operations and promoting safety applications, while still accommodating multimodal improvements by widening the sidewalk to at least 9' in the proposed condition. The proposed sidewalk is classified as "at least" 9' because during the adjacent parcel analysis, it was determined that only an additional 6' could be acquired (without impacting any parking or structures) in the most right-of-way constrained area of these four segments, and as a result the proposed cross section represents the most constrained point of these segments, meaning that there will most likely be opportunities along these segments to have wider than 9' sidewalks depending on the characteristics of the adjacent properties which will be addressed in the design process.

As displayed in the proposed cross section, the short-term application of the Recommended Alternative:

- Maintains four travel lanes with two northbound and two southbound travels lanes, although narrowing each travel lane by one foot from 12' to 11' which allocates an additional four feet for other roadway uses;
- Includes an enhanced center treatment of either a 13' median or a 10' center left turn lane with a 3' median which promotes improved access control;
- The addition of two 3' shoulders to achieve ADOT's updated roadway design guidelines intended to improve safety and roadway operations by providing space within the pavement section to accommodate bicycles, snow storage during the winter season, and help facilitate right turns for larger vehicles. In addition, the 3' shoulder also acts as a horizontal buffer between vehicles in the travel lanes and sidewalk users by creating more horizontal space between the two;
- Has an improved sidewalk condition from widening the sidewalk t from 5' to 9' in the existing condition; and

NORTHERN ARIZONA 🕅

EBN/-

In the scenario a right turn lane is added as a result of development/ redevelopment, and warranted through a formal ADOT TIA/TGP process, the width of the right turn lane would be in addition to the proposed back-of-curb facilities.

UAS







Figure 4-12: Short-Term Recommended Cross Section for Milton Road Segments R, V, & W

*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.







Short-term Application of the Recommended Alternative – Segments T, U, & X

As illustrated in **Figure 4-13**, Segment T is located between Clay/Butler Avenue and Phoenix Avenue. Segment U is located between Phoenix Avenue and the BNSF overpass; and Segment X is located between Humphrey's Street and the northern terminus of the Milton Road CMP study corridor at Beaver Street. The existing cross section in all three of these segments is 80-feet in width with four general purpose lanes, one TWTL or median under the BNSF overpass, no right turn lanes, and two shoulders.

These three segments have a unique proposed short-term recommended cross section due to the adjacent properties and land uses that present added right-of-way constraints, future development intentions, and unique characteristics such as the BNSF overpass.

Even with the surrounding land uses limiting right-of-way acquisition possibilities, the short-term application of the No-Build Hybrid Recommended Alternative is able to achieve a consistent pavement section with the remainder of the corridor, while accommodating a slight improvement to the sidewalk which is 6' in the proposed condition versus the 5' existing condition. However, certain areas within Segment U and Segment X have other unique elements:

- Segment U Mountain Line informed the Project Partners of their intentions for a future Downtown Connection Center (DCC) to be located at the northeast corner of Phoenix Avenue and Milton Road which includes the entire east side of Segment U. Mountain Line is currently under the preliminary design phase of the DCC and noted that they would like to offer more desirable back-of-curb facilities on the Milton Road frontage of the future DCC property – which would include a parkway and a wider sidewalk. As a result, Mountain Line and the Project Partners will have to determine the back-of-curb treatments after the completion of the Milton Road CMP and ensure that these improvements are conducive with the rest of the proposed Segment U cross section.
- Segment X the Project Partners noted that there are no left turns permitted in Segment X due to the three-leg intersection at Humphrey's Street and that Beaver Street is oneway in the southbound direction. As a result, the Project Partners recommend that this center treatment in Segment X be a consistent 13' raised median to act as a pedestrian refuge. This element will be further explored in the final design. However, informal left turn access to the Flagstaff Chamber of Commerce currently takes place from this striped median. The proposed median, while attractive, will need to be coordinated like any other access management implementation. Driveways on the north side of Route 66 also use this area for left in/out.

As displayed in the proposed cross section, aside from the unique characteristics previously described, the short-term application of the Recommended Alternative:

- Maintains four travel lanes with two northbound and two southbound travels lanes, although narrowing each travel lane by one foot from 12' to 11';
- Includes an enhanced center treatment of either a 13' median or a 10' center left turn lane with a 3' median which promotes improved access control;
- The addition of two 3' shoulders to achieve ADOT's updated roadway design guidelines;

UAS

NORTHERN ARIZONA 🕅

EBN/-





- Widens the existing 5' sidewalk to 6' due to right-of-way constraints; and
- In the scenario a right turn lane is added as a result of development/ redevelopment, and warranted through a formal ADOT TIA/TGP process, the width of the right turn lane would be in addition to the proposed back-of-curb facilities.









Figure 4-13: Short-Term Recommended Cross Section for Milton Road Segments T, U, & X





*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.







4.1c Spot Improvements

Spot Improvements were initially integrated into the CMP process during the Tier 3 Alternative Evaluation process when the No-Build Plus alternative was first introduced.

Through a progression of meetings between the Consultant Team and the Project Partners, a series of spot improvements were integrated into all the Tier 3 Alternatives, except the No-Build alternative. Spot improvements were recognized by the Project Partners as being desired to potentially inventory low investment enhancements (compared to the build alternatives) that could and should be included as part of the No-Build Plus alternative. Their intent is also to recognize the desire and value of incorporating and measuring the effectiveness of other desired enhancements such as pedestrian, bicycle, transit, safety and traffic operations along the Milton Road corridor.

The spot improvements are concentrated at intersections to complement each alternative's cross section, which are mid-block (segment by segment) applications. Spot improvements were also characterized in one of the following categories:

- Roadway Geometry;
- Roadway Operations;
- Vehicular Safety;
- Access Management;

- Pedestrian;
- Bicycle; and
- Transit.

Once the spot improvement inventory was completed, the Project Partners collaborated and recognized the variation in the spot improvement applications and identified the need to assign specific improvements to certain Tier 3 Alternatives. Spot improvements were originally assigned to the Tier 3 Alternatives by one of the three applications:

- No Build + Alternative Only;
- Build Alternatives Only; or
- All Alternatives.

The Project Partners discussed and confirmed the Tier 3 Alternative Spot Improvement Inventory, which can be referenced in section 5.1a Spot Improvements of Working Paper #2 – Alternative Analysis (view on the project website).

Once the No-Build Hybrid was selected as the Recommended Alternative, the Project Partners collaborated once again over a series of meetings to refine the list of Spot Improvements to be specific to both short-term and long-term applications. As a result, most of the Spot Improvements associated with the Build Alternatives were eliminated in favor of the No-Build Hybrid Recommended Alternative while the other Spot Improvements were either assigned to short-term, long-term, or both the short-term and long-term applications of the Recommended Alternative. Ultimately, a total of 96 Spot Improvements across 16 intersection/locations are included in both short-term and long-term application of the Recommended Alternative. **Table 4-3** provides a list of the final inventory of Spot Improvements included with the Recommended Alternative.

UAS(



EBN/-

ADOT

It is recognized that current ADOT policy prevents warranting crosswalks on a predictive volume basis or for the simple existence of special generators such as bus stops. Therefore, the Project Partners recommend that a local agency initiate an effort to seek a formal design variance.

At the November 22, 2021 Milton Road/US 180 CMP TAC Meeting, ADOT and the Project Partner agencies could not come to an agreement on a few issues concerning the potential application of additional at-grade pedestrian crossings on Milton Road and US 180. The three issues that ADOT and the partnering agencies could not come to consensus on are as follows:

- Adding a 4th leg pedestrian crossing on Milton to the Forest Avenue (north leg), Route 66 (north leg) and Clay/Butler (south leg) intersections. The project partners want the 4th leg added. ADOT does not want to add the fourth leg due to the impacts to the operations of the state highway.
- 2. Adding signalized midblock, at grade, crossings on Milton south of Saunders and North of Chambers. The project partners want the signalized at grade mid-block crossings. ADOT does not want to add the at grade mid-block crossings due to the impacts to the operations of the state highway.
- 3. ADOT requires ped crossing and new signals to meet ADOT warrants prior to installing them on Milton and US 180. The project partners would like for monitored test crossings to be allowed, where appropriate. ADOT has warranting criteria for these features and believes the warrants should meet prior installing the features.

Due to the Project Partner impasse on these issues, the escalation process (a formal process collaboratively defined and agreed to by the Project Partners at the beginning of the Milton Road CMP process) was triggered to offer a formal resolution. The resulting language is found in Section 4.0. Please see Appendix J for additional information on the results of the escalation process.



99







Table 4-3: Short-Term & Long-Term Spot Improvements

Intersection/ Location	Recommended No-Build Hybrid Alternative Spot Improvements	1 –Short-Term Spot Improvement 2 –Long-Term Spot Improvement 3 –Short- & Long-Term Spot Improvement						
Forest Meadows Street	 Include an adaptive traffic signal³ Restrict U-Turns^{3%} Improve existing standard crosswalks with high-visibility crosswalks (south and continue to ensure all curb ramps are ADA-compliant³ Pedestrian staging area improvements by expanding the staging area at the nor Introduce bicycle signal detection and actuation³ 	west leg) ³ thwest and southwest corners ³						
Saunders Drive	 Consider a redesign in west leg for a reduced turning radii² Construct a 4-foot finger island/median and or/ensure median is constructed at Include high-visibility crosswalks across the east and future proposed west legs Continue to ensure all curb ramps are ADA-compliant³ 	t the north leg ² ^{3#}						
University Drive	 Construct a 4-foot finger island/median and/or ensure a median is constructed Improve existing standard crosswalks with high-visibility crosswalks (north and Continue to ensure all curb ramps are ADA-compliant³ Restrict U-Turns^{3%} Bicycle signal detection and actuation³ 	at the north leg² east leg)³						
University Avenue	 Right-in, right-out (impacted by the introduction of the University Drive interse Tighten the SB to WB turn radius to improve pedestrian condition (currently be Continue to ensure all curb ramps are ADA-compliant³ 	ction and roundabout with Beulah Blvd) ^{3%} ing implemented/constructed by property owner) ²						
Chambers Drive	 Include northbound and southbound transit stops³ Continue to ensure all curb ramps are ADA-compliant³ Add high-visibility crosswalk on the east leg^{1#} Southbound and westbound left turn restrictions^{3%} Restrict U-Turns^{3%} Ensure median are constructed at the north and south legs of the intersection¹ Construct a traffic signal at the intersection (for future consideration upon mee approval)² 	ting warrant and/or Traffic Impact Analysis (TIA)						







Intersection/ Location	Recommended No-Build Hybrid Alternative Spot Improvements	1 –Short-Term Spot Improvement 2 –Long-Term Spot Improvement 3 –Short- & Long-Term Spot Improvement								
Plaza Way	 Lengthen the storage for northbound left turn lane³ Dedicated right and left turn phase for vehicles^{3%} Improve existing standard crosswalks with high-visibility crosswalks (all legs)³ Restrict U-Turns^{3%} Continue to ensure all curb ramps are ADA-compliant³ Bicycle signal detection and actuation³ Improve the south leg pedestrian crossing by shortening the crossing length thr corner³ 	ough the inclusion of a pork chop at the southeast								
Riordan Street	 Dedicated right and left turn phase for vehicles^{3%} Improve existing standard crosswalks with high-visibility crosswalks (all legs)³ Restrict U-Turns^{3%} Continue to ensure all curb ramps are ADA-compliant³ Bicycle signal detection and actuation³ 									
Route 66	 Bicycle signal detection and actuation³ Dedicated right and left turn phase for vehicles^{3%} Improve existing standard crosswalks with high-visibility crosswalks (west and south legs)³ Restrict U-Turns^{3%} Introduce transit signal prioritization ITS infrastructure³⁺ Continue to ensure all curb ramps are ADA-compliant³ Bicycle signal detection and actuation³ Include northbound and southbound transit stops³ Pedestrian staging area improvements by expanding the staging area at the northwest and southwest corners³ Improve the west leg pedestrian crossing by shortening the crossing length through the inclusion of a pork chop at the southwest 									





Intersection/	n/ 1 –Short-Term Spot Improvem											
Location	Recommended No-Build Hybrid Alternative Spot Improvements	2 –Long-Term Spot Improvement										
LOCATION		3 – Short- & Long-Term Spot Improvement										
	• Restrict left turns in and out, or enforce right in, right out only to eliminate NB N	Ailton Road left turns to WB Malpais Lane (one of top										
	intersections in districts for crashes, left turns) ^{3%}											
	 Introduce west leg high-visibility crosswalks across Malpais Lane^{3#} 											
	• Restrict U-Turns ^{3%}											
	 Continue to ensure all curb ramps are ADA-compliant³ 											
Malpais Lane	 Improve the west leg pedestrian crossing by shortening the crossing length thro corner² 	bugh the inclusion of a pork chop at the southwest										
	 Reconstruct the west leg of the intersection to better perpendicularly align with 	Milton Road ²										
	 Include northbound and southbound transit stops³ 											
	Grade separated pedestrian overpass over the north leg of the intersection align	ned with the north drive of Jack-in-the-Box (Not an										
	ADOT funded project and not part of the CMP Master Plan funding process) ³											
	• Improve existing standard crosswalks with high-visibility crosswalks (west and so	outh legs) ³										
	• Restrict U-Turns ^{3%}											
Butler/Clay	 Introduce transit signal prioritization ITS infrastructure³⁺ 											
Avonuo	 Continue to ensure all curb ramps are ADA-compliant³ 											
Avenue	• Relocate south leg stop bar closer to the existing intersection curb returns ³											
	Pedestrian staging area improvements by expanding the staging area at all corn	ers ³										
	Bicycle signal detection and actuation ³											
	• Introduce high-visibility crosswalk at the east leg across Mikes Pike Street ^{3#}											
Mikes Pike	Reconstruct the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through the southeast corner to allow right turn only lane to continue through turn on the southeast corner to allow right turn on turn	ugh the Butler/Clay Avenue intersection ¹										
Street	 Right in, right out only^{3%} 											
	 Continue to ensure all curb ramps are ADA-compliant³ 											
Tucson	 Introduce high-visibility crosswalks across Tucson Avenue on the west leg^{3#} 											
Avenue	 Continue to ensure all curb ramps are ADA-compliant³ 											
	Construct Traffic Signal (for future consideration upon meeting warrant and/or	Traffic Impact Analysis (TIA) approval) ³										
	 Grade separated crossing (north leg)³ 											
Phoenix	 Continue to ensure all curb ramps are ADA-compliant³ 											
Δνεημε	Introduce transit signal prioritization ITS infrastructure (if signal is implemented) ³⁺										
, trende	Introduce high-visibility crosswalks (across Phoenix Ave only on both the east ar	Introduce high-visibility crosswalks (across Phoenix Ave only on both the east and west legs) ^{3#}										
	Restrict U-Turns (if traffic signal is implemented) ^{3%}											
	 Include northbound and southbound transit stops³ 											





Intersection/ Location	Recommended No-Build Hybrid Alternative Spot Improvements	1 –Short-Term Spot Improvement 2 –Long-Term Spot Improvement 3 –Short- & Long-Term Spot Improvement
Santa Fe Avenue	 Continue to ensure all curb ramps are ADA-compliant³ Introduce high-visibility crosswalks across Santa Fe Avenue^{3#} Implement northbound Milton Road left turn restrictions^{3%} 	
Humphrey's Street	 Continue to ensure all curb ramps are ADA-compliant³ Improve existing standard crosswalks by including high-visibility crosswalks³ Dual Left Turn on Milton Rd to NB Humphrey's St (requires two NB travel lanes Improve the pedestrian crossing environment by implementing leading pedestre Introduce transit signal prioritization ITS infrastructure³⁺ Restrict U-Turns^{3%} 	on Humphrey's Street)² ian intervals³#
Beaver Street	 Continue to ensure all curb ramps are ADA-compliant³ Improve existing standard crosswalks by including high-visibility crosswalks³ Introduce transit signal prioritization ITS infrastructure³⁺ Restrict U-Turns^{3%} 	
Notes: #Proposed cross warrant and/or +Proposed trans TIA that concluc % Proposed sign ADOT warrant c	ings and crossing improvements are for future consideration only, and will be con TIA approval sit signal priority is for future consideration only, and will be considered for impl des no negative impacts to vehicular operations. In phasing adjustments and turn restrictions are for consideration only, and will and/or TIA approval.	nsidered for implementation upon meeting ADOT lementation upon meeting ADOT warrant and/or l be considered for implementation upon meeting







4.2 Recommended Alternative: Long Term Vision for Milton Road

As the Vision Statement expresses, the long-term application of the Recommended Alternative establishes a long-term community desired vision for Milton Road, consisting of a specific roadway cross section for both ADOT and the City of Flagstaff to collaboratively implement, including enhanced multimodal features. Implementation of this vision is designed to occur incrementally, leveraging future development and redevelopment permitting processes for parcels along the Milton Road corridor to achieve the desired roadway enhancement with little to no impacts to adjacent businesses. As previously described, some of the Spot Improvements are unique to the long-term application of the Recommended Alternative, while others are included in both the short-term and the long-term applications.

Figure 4-14, **Figure 4-15**, **Figure 4-16** illustrate the cross section of the long-term application, which vary between 116' and 144' wide depending on the presence or not of right turn lanes. The long-term application of the Recommended Alternative includes:

- Maintains the four 11' travel lanes with two northbound and two southbound travels lanes as described in the short-term application of the Recommended Alternative;
- A wider center treatment with either a 15' median instead of a 13' median in short-term recommendation; and also, a wider center left turn and median than Phase at 11' and 4' to maintain the 15' center facility throughout the entire corridor;
- Expanded right turn lanes of 14' to satisfy ADOT design guidelines and to help facilitate right turns for larger vehicles. It is important to note that the right turn lanes are not anticipated to exist throughout the entire corridor as continuous right turn lanes in the long-term; Rather, the right turn lanes are anticipated to exist where they are located today and where they are required as a recommendation from the TIA process in conjunction with new development or redevelopment along the Milton Road corridor. City implementation of connecting roads and requiring improved internal circulation between business can alleviate the need for some future turn lanes;
- Includes the introduction of 6' buffered bike lanes to accommodate improved bike facilities compared to short-term;
- Ensures a consistent 10' parkway between the sidewalk and the curb. The long-term Parkway would include vegetation south of Route 66, while north of Route 66, it would consist of hardscape and street furniture amenities, including bike racks, benches, trash receptacles, wayfinding signage, and other types of street furniture/amenities as needed.
- Includes a uniform 10' sidewalk throughout the corridor on both sides of Milton Road to accommodate multimodal users.
- Although outside of the right-of-way, long-term includes a suggested 10' public utility easement that can also double as a landscaped area between sidewalk and building setbacks. The city of Flagstaff is currently evaluating appropriate building setbacks in response to this long-term recommendation.

Reference Appendix A for a design schematic showcasing the long-term right-of-way linework along the entire Milton Road CMP study corridor.

UAS





8=00



4, 11' GP Lanes – 1, 15' CTL/Median – 2, 6' Bike Lanes – 10' Parkways – 10' Sidewalks – 10' Setbacks 11												116′	ROW				
					*	e	-					Ŷ			₽ ₽		Ī
				C	200	Ŧ	+ +	-	54	1	1 1	Noto					
S		10'	10'	2.5	6'	11'	11'	4'	11'	11'	11'	6'	2.5'	10'	10'		
ne	·	10'	10'	2.5	6'	2	2'		13'		22'	6'	2.5	10'	10'		
urn La		Sidewalk	Parkway	C & G	SB Bike Lane	South Travel	bound Lanes	M Ce Tu	edian* & enter Left urn Lane	Nor Trav	thbound el Lanes	NB Bike Lane	C&G	Parkway	Sidewalk		
kight T								 Cu	76' Irb to Curb						<u> </u>		
No F								Riç	116' ght-of-Way								

Figure 4-14: Long-Term Vision Cross Section of the Recommended Alternative – No Right Turn Lanes

*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.







4, 1	1' GP Lanes	- 1, 15'	CTL/Me	di	an 1,	14' RTL	– 2, 6' Bi	ke L	anes – 1	LO' Parkw	ays – 10	' Side	walks – 1	0' S	etback		130' ROW
						1					į					ŧ	
	NTER AND	4.01	4.01	Ĩo		+		41		T		Noton	<u>(</u>	Ĩa	4.01	401	
Ð			10'	2.5	<u>b</u> ′	11	<u> 11'</u>	4	<u>11'</u>		<u> 11'</u>	6	<u> </u>	, 2,	<u>10′</u>	10'	-
an		10'	10'	2.5	6'	2	2'		15'	2	2'	6'	14'	2.5	10'	10'	
t Turn L		Sidewalk	Parkway	ငနင	SB Bike Lane	South Trave	ibound I Lanes	M Ce Ti	edian* & enter Left urn Lane	North Travel	bound Lanes	NB Bike Lane	NB Right Turn Lane	C & G	Parkway	Sidewalk	
Right									9 Curb t	0' o Curb							
One									13 Right-	30' of-Way							

Figure 4-15: Long-Term Vision Cross Section of the Recommended Alternative – One Right Turn Lanes

*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.







4, 11' GP Lanes – 1, 15' CTL/Median –2, 14' RTLs - 2, 6' Bike Lanes – 10' Parkways – 10' Sidewalks – 10' Setback												14	4' ROW					
		N					F	′ ■ + +		مله			1030	~			ŧ	
S		10'	10'	2.5'	14'	6'	11'	11'	4'	11'	11'	11'	6'	14'	2.5'	10'	10'	
ne		10'	10'	2.5	14'	6'	2	22'		15'	2	2'	6'	14'	2: 5	10'	10'	
: Turn La		Sidewalk	Parkway	C & G	SB Right Turn Lane	SB Bike Lane	South Trave	nbound I Lanes	Me Ce Tu	edian* & nter Left ırn Lane	North Trave	bound Lanes	NB Bike Lane	NB Right Turn Lane	C & G	Parkway	Sidewalk	
Right									Cu	104' rb to Curb								
Two									Rig	144' Jht-of-Way								

Figure 4-16: Long-Term Vision Cross Section of the Recommended Alternative – Two Right Turn Lanes

*Median treatment will vary along the corridor. The width of the median will change from 2' to 13' depending on the presence of a center turn lane. The position of the median will also shift based on the directionality of the turn lane.





4.3 Access Management in Application of Short-Term & Long-Term Recommended Alternative

As part of the development of the Tier 3 Alternatives, certain representatives from the Project Partner Agencies formed a separate task group to specify the access management application for the Tier 3 Alternatives. This task group worked with ADOT's Transportation Systems Management and Operations (TSMO) group throughout the develop of the access management specifications for their guidance and input. See Appendix K for the final Access Management Specifications Memo and the meeting notes from the task group meetings.

As a result, the following access management specifications have been determined for the shortand long-term application of the Recommended Alternative.

4.3a Raised Median and Center Left Turn Lane Specifications

As part of this process, it was assumed the raised median, access control specifications would be evaluated between Forest Meadows Street and south of Phoenix Ave (with the assumption that there would be a signalized intersection at Phoenix Ave). Further evaluation north of Phoenix Avenue is required. However, for both the short- and long-term Recommended Alternative, the raised median would drop where left turn lane(s) currently exist at signalized intersections, and following the facility widths below:

- Short-term: 13' wide raised median, or 10' center left turn lane with 3' median
- Long-term: 15' wide raised median, or 11' center turn lane with a 4' median

The U-turn movements would follow Tier 3 Spot Improvements, which would generally allow Uturns at signalized intersections and approved left turn movements (raised median breaks) for both the short- and long-term, but would restrict most U-turns unless an exception is identified in the Spot Improvements list.

4.3b Raised Median / Access Control Spacing Guidance

METROPLAN

As part of the public involvement process, 67.8 percent of the public respondents supported the idea of constructing a raised median along Milton Road to improve safety, with 22.6 percent of the public supporting a raised median "in certain areas, but not along the entire corridor" and 25.3 percent supporting a raised median "but only to correct proven safety problems." The Raised Median / Access Control Spacing Guidance below attempts to address the public's comments and should be considered as part of future construction design and redevelopment. Should ADOT policies, City of Flagstaff policies, or conditions change, this guidance should be re-evaluated. It is important to note that "frontage" is defined as the linear distance of the property along ADOT right-of-way.

- Driveway spacing and left-turn-out access median breaks are subject to Level of Service (LOS) and safety analysis at any proposed driveway access point prior to permitting changes to access.
- 2. 300' or less of frontage: one driveway with right-turn-in, right-turn-out access permitted; no median break for left-turn-in, left-turn-out access prohibited.







- 3. 300-500' of frontage: two driveways with right-turn-in, right-turn-out access permitted; no median break for left-turn-in, left-turn-out access prohibited.
- 4. Over 500 feet of frontage: two site driveways and one median break for one left-turn-in movement could be considered.
- 5. A break in the median for left-turn-in access could be considered when cross access agreements are in place, and when consistent with the above guidance. In order for multiple properties to achieve cross access for 500' of frontage, an access agreement should be in place and submitted to ADOT.
- 6. With the exceptions of permitted left-turn-out access, as identified in **Table 4-4**, left-turns onto Milton Road are restricted to signalized intersections if a raised median were constructed on Milton Road.

Recommended Alternative	Location	Permitted Left-Turn Movements						
Short-Term	Saunders Drive	Left-in permitted ¹ ; left-out restricted ²						
	1830 University West Apartment Homes Access Road (north of Pizza Hut)	Left-in permitted; left-out restricted						
	University Avenue (currently west side of Milton	Right in Right out Assuming University Drive is realigned and signalized						
	Target Access (east side of Milton across from current University Ave alignment, north of University Drive)	Left-in restricted; left-out restricted						
	Chambers Drive	Left-in permitted; left-out permitted (Note: Recommended to stay as non- signalized in No Build Hybrid. This is the only non-signalized intersection recommended to permit a left-out movement.)						
	McDonald's Access (west side of Milton)	Left-in restricted; left-out restricted (Reviewed due to connection to Yale St)						
	Malpais Lane	Left-in restricted; left-out restricted						
	Mikes Pike Street	Left-in restricted; left-out restricted						
	Tucson Avenue	Left-in permitted; left-out restricted						
	Phoenix Avenue	If signalized: Not Applicable If not signalized: Left-in permitted; left- out permitted						
	Santa Fe Avenue	Left-in permitted; no left out (existing condition)						
Long-Term	Same as the short-term	All Left-Turn Movement recommendations from Short-term would apply						

Table 4-4: Left-Turn Access Control (assuming a Raised Median)

Notes:

¹Left-in: Traveling on Milton Rd and turning left into an access point

²Left-out: Making a left turn from an access point on to Milton Road

METROPLAN

All of these assumptions are subject to future operational evaluations, and are subject to change based on traffic volumes and operational effects

UAS(





5.0 IMPLEMENTATION

Just as the character and function of Milton Road has evolved from the impacts of steady population, employment and NAU student growth over the last several decades, the successful implementation of strategies and roadway improvements to enhance traffic operations and multimodal experiences along Milton Road will not happen overnight. As the Project Partners discussed and acknowledged, we will not build ourselves out of congestion on Milton Road with a singular design solution, but rather, it will take collective inter-agency efforts, cooperation, funding and/or grants to ultimately achieve the recommended short-term enhancements and long-term vision for Milton Road.

Through the extensive three-tiered qualitative and quantitative analysis, two rounds of public engagement and numerous Project Partner deliberations over the course of the four-year Milton Road CMP planning process, it became evident that a near term, low investment implementation strategy in the short-term, and a long- term vision for Milton Road were necessary to successfully and pragmatically address the varied and complex needs of the Milton Road.

The narrative and illustrations presented in *Section 4.1 - Short-Term Recommended Alternative: No-Build Hybrid,* articulate a clear and concise, segment-by- segment description and illustration of the short-term application of the Recommended Alternative as it applies to each of the 24 Milton Road roadway segments prepared for this CMP analysis. The discussion below presents a synopsis of related tasks and action items and assigns Project Partner roles and responsibilities for the short-term implementation and long-term vision of the Milton Road corridor.

5.1 Cost Estimate

As presented in **Table 5-1**, a planning-level cost estimate was developed for both the short- and long-term applications of the Recommended Alternative. The preliminary construction cost estimate for the study corridor from Forest Meadows Road to Beaver Street was developed under the 2021 Fiscal Year; and the probable cost to implement the short-term application of recommended alternative is approximately \$37,358,000, while the estimated cost to implement the long-term application of the Recommended Alternative is \$95,092,000

A detailed cost estimate by segment can be found in Appendix L. The detailed cost estimates by segment include estimate spreadsheets, spot improvement cost estimates, construction costs, factor percentages, and right-of-way costs. All costs and factors rates were either provided by or reviewed and approved by ADOT. The new right-of-way costs include \$36/square feet for new right-of-way.

Table 5-1: Total Planning-Level Cost Estimate

METROPLAN

Short-Term Cost Estimate	Long-Term Cost Estimate
\$37,358,000	\$95,092,000





5.2 Short-Term Implementation

The short-term recommendations would implement multimodal enhancements as construction funding becomes available from Federal and/or other partner agencies or grants. This would be achieved primarily within ADOT's existing right-of-way, with minimal impacts to private property/parking lots and no impacts to existing buildings.

Because there are several varying roadway design and spot improvement solutions spread across the 24 Milton roadway segments, the construction of improvements for each segment will likely be achieved incrementally over time. The short-term recommended improvements to Milton Road will occur either through requested initiatives from ADOT or the Project Partners should funding become available (with the exception of the upcoming paving overlay project, ADOT does not have funding for any short-term enhancements at this time). But in many cases, the shortterm improvements will be evaluated and implemented in response to city land development and/or re-development permitting processes that may trigger modified access and right-of-way considerations.

5.2a Short-Term Implementation Guiding Principles

METROPLAN

As explained in *Section 4.1 - Short-Term Recommended Alternative: No-Build Hybrid*, the short-term implementation generally adhere to the following guiding principles:

- Many of the proposed facility enhancements will occur within the existing Milton Road right-of-way (with right-of-way widths and facility types varying depending on roadway segment)
- 2) In instances where short-term recommendations for certain roadway segments (1-24) recommend limited right-of-way acquisition, said rights-of-way acquired are intended to be targeted and minimal in their impact to private property. The preference and intent is for limited impact to existing parking and no impact to existing buildings. Refer to *Section 4.1 Short-Term Recommended Alternative: No-Build Hybrid* for information on obtaining short-term right-of-way.
- All roadway and "back of curb" facility enhancements must achieve minimum ADOT design standards or obtain a required design exception. ADOT design exceptions are necessary for reduced lane widths.
- 4) When evaluating the application of enhancements for each of the 24 roadway segments during the short-term implementation, the preference and intent is to satisfy Project Partner preferred facility widths **and** to the greatest extent possible, improve multimodal facilities, where feasible, based on existing right-of-way constraints.
- 5) When redevelopment presents opportunities in Short-term to acquire the right-of-way needed for the long-term vision, ADOT and Project Partners may exact or acquire right of way and build improvements that do not disrupt the continuity of Short-term and may include temporary landscaping and removable features.
- 6) Should ADOT or Project Partner representatives have interest in applying for any grant opportunities to implement short-term, contact ADOT's Grant Coordinator, Kohinoor Kar at <u>kkar@azdot.gov</u> or (602) 712-8239 prior to applying.

UAS(







5.2b Short-Term Implementation Actions

The following sub-sections present a series of tools and interrelated considerations to effectively execute the actionable implementation of the short-term facility enhancements for Milton Road.

Obtain Necessary ADOT Design Variance & Engineering Exception Approvals

As explained above, the Project Partners vetted and determined the recommended short-term roadway facilities, including roadway and back-of-curb feature widths and selection/application of specific spot improvements across the 24 roadway segments and 16 intersections in the Milton Road CMP study corridor. This discussion and vetting by the Project Partners inherently evaluated and balanced the trade-offs and compromises regarding the operational and safety appropriateness of travel lane and turn lane facility widths in order to "create space" to accommodate enhanced bicycle facility, pedestrian sidewalk widths and parkway/landscaping features.

By example (as described in *Section 4.1 - Short-Term Recommended Alternative: No-Build Hybrid*), approximately 80 percent of the Milton Road corridor can achieve 8' to 10' wide sidewalks, a 5' wide shoulder/ bicycle facility and introduction of a landscape buffer (parkway) as part of the short-term implementation.

In order to successfully integrate these Project Partner-desired bicycle and pedestrian facility enhancements, ADOT must formally approve necessary design exceptions for the existing roadway design standards highlighted in **Table 5-2**. The Milton Road CMP recommends ADOT consider and approve the following design exceptions for Milton Road:

Roadway Feature	Current Standard	Recommended Design Exception
General Purpose Lane	12 feet	11 feet
Right Turn lane	12 feet	11 feet
Left Turn Lane	12 feet	10 feet
Center Turn lane (with median)	15 feet	13 feet
Shoulder (striped or unstriped)	3 feet	Maintain at 3 feet, no exception recommended

Table 5-2: Desired Roadway Facility Widths

Incorporate Recommended Lane Widths into Design for Upcoming ADOT Milton road Overlay Project

Assuming ADOT design exception approvals are granted, Implement/construct revised general purpose lane, right turn lane, left turn lane and striped shoulder widths into new pavement design, implement as part of project construction scheduled for the Spring of 2022.







Short-term Right-of-Way Acquisition: Role, Responsibility & Funding Intentions

The following guiding principles provide the role, responsibility, and funding Intentions for the appropriate stakeholders under the short-term implementation of the Recommended Alternative:

(1) If ADOT initiated:

- (a) ADOT leads ROW acquisition/encroachment permit process;
- (b) ADOT responsible for survey/legal description costs;
- (c) ADOT leads property owner negotiations;
- (d) ADOT responsible for land acquisition costs;
- (e) ADOT responsible for O&M (except for back of curb landscaping)
- (f) ADOT/City of Flagstaff shall require minimum design standards as identified and assigned to each of the 24 roadway segments
- (g) While ROW is preferred, easements for select back of curb improvements may be utilized if mutually agreeable by ADOT and the City of Flagstaff

(2) If City initiated:

- (a) City agrees to follow ADOT ROW acquisition/encroachment permit process;
- (b) City leads and funds survey and legal description;
- (c) City takes lead with property owner negotiations/outreach;
- (d) City funds land acquisition costs;
- (e) ADOT responsible for O&M (except for back of curb landscaping)
- (f) While ROW is preferred, easements for select back of curb improvements may be utilized if mutually agreeable by ADOT and the City of Flagstaff

(3) If in response to city development/re-development permitting:

- (a) City lead agency and negotiator with landowner for ROW acquisition/encroachment permit process;
- (b) City consults with ADOT and both agencies mutually determine the location and amount of ROW needed at specific location;
- (c) City leads ROW acquisition/encroachment permit process (city may obtain ROW via dedication or acquisition depending on nature of city permit type, amount of ROW being sought and other required development improvement considerations).
- (d) While ROW is preferred, easements for select back of curb improvements may be utilized if mutually agreeable by ADOT and the City of Flagstaff

Short-term facility improvements that meet or exceeds ADOT standards: Role, Responsibility and Funding Intentions

When a future project need (either ADOT initiated, City initiated or private development initiated) calls for a recommended short-term roadway or spot improvement design solution that meets or exceeds current ADOT standards/specifications (current, meaning at the time of the initiated project need), the following shall apply:

BNA



ADOT Initiated

	ADOT	City	Land Owner
Role	Lead design and construction permitting	Review agency	N/A
Responsibility	Provide notice and solicit city's input on design and construction schedule. Lead property owner notification if property and/or access impacted.	Provide timely comments to ADOT on design drawings and construction schedule.	N/A
Funding	ADOT funding to meet ADOT standards/specifications	If ADOT standards are exceeded, City funding (or alternative funding) needed for facility improvements that exceed ADOT facility width/ standards/ specifications.	N/A

City Initiated

	ADOT	City	Landowner
Role	Review and permitting agency	Lead design and construction permitting	
Responsibility	Provide timely comments to city on design drawings and construction schedule.	Provide notice and solicit ADOT's input on design and construction schedule. Lead property owner notification if property and/or access impacted.	If applicable, adheres to the city's permitting processes.
Funding	City responsible if they initiate	City funding (or alternative funding) for facility improvements above/beyond ADOT standards/specificatio ns	Possible funding contribution from landowner if project relates to ROW enhancements to partially support incoming development/re- development activity.



BNSF



	ADOT	City	Landowner
Role	Review and approval of landowner design and permit requests.	Review and approval of landowner design and permit requests.	Lead in preparation of improvement designs and construction and permitting
Responsibility	Provide timely comments to city and landowner on design drawings and construction schedule. Ensure minimum ADOT standards are met. Permit for improvements to ADOT ROW.	Provide timely comments to ADOT and landowner on design drawings and construction schedule. Identify added improvements city may desire as a result of development activity.	Preparation of design drawings, coordinate with city and ADOT for review. Respond and incorporate ADOT and city review comments.
Funding	No funding obligations.	City may fund desired expanded improvements beyond what is necessary to serve incoming development.	Landowner responsible for funding of improvements associated with development/re- development of property.

Development/Re-developmentPermitting Initiated

Miscellaneous Considerations:

METROPLAN

The following list is an inventory of miscellaneous considerations to take into account during the potential implementation of the short-term application of the Recommended Alternative:

- City of Flagstaff to evaluate existing ordinance development standards to accommodate necessary building setbacks to achieve Long-term vision.
- City of Flagstaff to incorporate access management recommendations into future ordinance text amendments and policy
- TSP implementation Mountain Line provide data; ADOT and city to review
- Mountain Line DCC development currently beginning TIA and COF/ADOT review.
- Grade separated crossing funding and construction ADOT will support per CMP recommendations and design standards; funding provided by other Project Partners

5.3 Long-Term Vision

As described and illustrated in *Section 4.2 - Recommended Alternative: Long Term Vision for Milton Road,* the long-term vision establishes a community desired and ADOT vision, consisting of a specific roadway cross section for both ADOT and the City of Flagstaff to collaboratively



RA/S



implement, including enhanced multimodal features. Implementation of this vision is designed to occur incrementally, leveraging future development and redevelopment permitting processes for parcels along the Milton Road corridor to achieve the desired roadway enhancement with little to no impacts to adjacent buildings. The long-term improvements are intended to be implemented through redevelopment of the corridor by means of the ADOT encroachment permitting process and the City of Flagstaff private development process. ADOT will also work with agencies wishing to program projects to implement the long-term improvements through the encroachment permitting process. The long-term improvements are not intended to be implemented in a manner in which businesses would be condemned. However, there may be instances where incremental or patchwork implementation creates unsafe conditions or a compelling connectivity need (access management, business access, cross-access easements, supporting backage roads, etc) that warrant consideration of eminent domain. Projects of opportunity could be considered in the city site plan review /development permitting processes with ROW dedication or acquisition as defined in the long-term plan or the granting of an easement in order to implement the long-term vision specification. The following guidance shall apply to offer a realistic and collaborative approach to the implementation of long-term improvements for Milton Road:

- a. The ADOT/City of Flagstaff TIA process will be utilized to evaluate proposed private development facility improvements to Milton Road
- b. ADOT's responsibility cost to meet ADOT controlling design criteria standards or approved design exceptions. If ADOT standards for select facilities are exceeded, ADOT will seek funding from other participating partners/agencies.
- c. City of Flagstaff or other partnering agency) responsibility additional costs for facility designs that exceed ADOT controlling design criteria standards
- d. Final design considerations will determine the ultimate geometric alignment. For instance, the Milton Road CMP recommendations herein evaluated the widening from center line of roadway at a planning level of analysis. It is recognized that deviations from centerline may be optimal to widen Milton Road.
- e. The City of Flagstaff will evaluate existing ordinance development standards and/or design guidelines to accommodate the necessary building setbacks to achieve the Milton Road CMP Long-term vision. The City of Flagstaff will evaluate and incorporate the Milton Road CMP access management recommendations into future city ordinance/development code text amendments.
- f. City BNSF underpass study the 144-foot Milton Road CMP long-term cross section for the ADOT Bridge Across Milton Road is recommended but also recognizes that deviations may be needed as the final design is confirmed, but in no case shall be less than the 116foot cross section.
- g. Roundabouts are recognized as an option for future Milton Road intersection design if so desired by the City of Flagstaff. The Milton Road CMP study did not model, evaluate, and/or measure the potential impact of roundabouts on operations/performance. As shown in Figure 5-1, a high-level, conceptual analysis of a potential roundabout ROW footprint at a typical Milton Road intersection is approximately 236'. While the City of Flagstaff is open to potentially considering roundabouts, future studies are needed to

UAS

NORTHERN ARIZONA 🔯

BNS



METROPLAN



determine the operational impacts, design configuration and impacts from their implementation.

Figure 5-1: Example Roundabout Concept



- h. The City of Flagstaff is encouraged to consider the development of connecting roads and regulatory requirements for internal commercial circulation and multi-modal design elements that support access management and business access and reduce the need for right-turn deceleration lanes that create excessively wide segments of pavement.
- i. Parkway enhancements in areas located near city-designated Urban Historic activity centers, the Project Partners desire incorporation of street furnishings and hardscape improvements rather than landscaping.
- j. Milton Road CMP improvements to achieve the vision will be implemented through redevelopment of adjacent parcels and/or agency projects. Long-term Grants are likely not a valid implementation strategy for the long-term vision. The long-term vision is primarily intended to occur as part of the City of Flagstaff's redevelopment process. The City of Flagstaff or other partnering agencies may consider seeking strategic grant opportunities to implement the long-term vision for specific parcels when condemnation would not be applicable





METROPLAN



APPENDICES

- Appendix A Right-of-Way Aerial Exhibit
- Appendix B Project Charter
- Appendix C Public Involvement Plan (PIP)
- Appendix D Public Meeting Summary Reports
- Appendix E Beulah Boulevard Extension & University Avenue Extension Design Plans
- Appendix F Bus Rapid Transit Traffic Analysis & Model Results Memo
- Appendix G Controlling Design Criteria
- Appendix H Tier 3 Evaluation Criteria Task Force Notes & Outcomes
- Appendix I Tier 3 Evaluation Criteria Weighting Public Survey Results
- Appendix J Conflict Resolution Results
- Appendix K Milton Road Access Control Specifications
- Appendix L Detailed Planning-Level Cost Estimate







Appendix A - Right-of-Way Aerial Exhibit

Page intentionally left blank







Appendix B - Project Charter

Page intentionally left blank







Appendix C - Public Involvement Plan (PIP)

Page intentionally left blank






Appendix D - Public Meeting Summary Reports







Appendix E – Beulah Boulevard Extension & University Avenue Extension Design Plans







Appendix F - Bus Rapid Transit Traffic Analysis & Model Results Memo







Appendix G - Controlling Design Criteria







Appendix H - Tier 3 Evaluation Criteria Task Force Notes & Outcomes







Appendix I – Tier 3 Evaluation Criteria Weighting Public Survey Results







Appendix J – Conflict Resolution Results







Appendix K – Milton Road Access Control Specifications







Appendix L – Detailed Planning-Level Cost Estimate



