Eagle River Traffic Mitigation Phase I

OLD GLENN HIGHWAY/ EAGLE RIVER ROAD INTERSECTION

Design Study Report

SEPTEMBER 2017

MOA PROJECT NO. 11-16
FINAL DESIGN STUDY REPORT
EAGLE RIVER TRAFFIC MITIGATION – PHASE I
OLD GLENN HIGHWAY/EAGLE RIVER ROAD INTERSECTION
EAGLE RIVER, ALASKA
MOA PROJECT NO. 11-16

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# TABLE OF CONTENTS

1.0 INTRODUCTION ...............................................................................................................1
   1.1 History and Background .............................................................................................1
   1.2 Objectives ...................................................................................................................2
   1.3 Guiding Documents .................................................................................................4

2.0 EXISTING CONDITIONS ..................................................................................................5
   2.1 Area Context (Zoning, Land Use, and Ownership) ...................................................5
   2.2 Roadway Facilities ....................................................................................................6
   2.3 Pedestrian and Bicycle Facilities ..............................................................................7
      2.3.1 Old Glenn Highway .........................................................................................7
      2.3.2 Eagle River Road ............................................................................................7
   2.4 Transit .......................................................................................................................8
   2.5 Landscaping .............................................................................................................8
   2.6 Lighting .....................................................................................................................9
   2.7 Utilities .....................................................................................................................9
   2.8 Geotechnical Summary ............................................................................................10
      2.8.1 Fill Material ..................................................................................................10
      2.8.2 Native Silty Sands and Gravels/Sandy Silt .......................................................10
      2.8.3 Alluvial/Glacial Deposits .............................................................................10
      2.8.4 Groundwater ..................................................................................................11
   2.9 Storm Drain Facilities ..............................................................................................11
   2.10 Environmental ......................................................................................................11

3.0 DESIGN CRITERIA .........................................................................................................12
   3.1 Design Standards ......................................................................................................12

4.0 DESIGN ALTERNATIVES ..............................................................................................13
   4.1 Alternative 1 – No Build .........................................................................................13
   4.2 Alternative 2 – Extension DSR Recommendations .................................................15
   4.3 Alternative 3 – Revised Concepts ..........................................................................17

5.0 DRAINAGE .....................................................................................................................20
   5.1 Drainage Patterns ....................................................................................................20
   5.2 Design Conditions ...................................................................................................20
   5.3 Water Quality .........................................................................................................21
      5.3.1 MS4 Permit ....................................................................................................21

6.0 TRAFFIC ANALYSIS ....................................................................................................22
   6.1 Existing Conditions .................................................................................................22
   6.2 Future Conditions ....................................................................................................23
   6.3 Analysis Conclusions .............................................................................................24

7.0 DESIGN RECOMMENDATIONS ...................................................................................26
   7.1 Roadway Typical Section .......................................................................................26
   7.2 Horizontal and Vertical Alignment .........................................................................27
   7.3 Pedestrian and Bicycle Facilities ..........................................................................27
   7.4 Geotechnical Recommendations ...........................................................................28
   7.5 Roadway Illumination .........................................................................................28
7.6 Drainage Recommendations ........................................................................................................30
  7.6.1 Stormwater Quantity ...........................................................................................................30
  7.6.2 Stormwater Quality .............................................................................................................31
  7.6.3 Future Considerations .........................................................................................................31
7.7 Landscape Recommendations ..................................................................................................31
8.0 OTHER CONSIDERATIONS .......................................................................................................32
  8.1 Access Control and Driveways .................................................................................................32
  8.2 Utility Conflicts .......................................................................................................................33
  8.3 Maintenance Considerations ....................................................................................................33
    8.3.1 Pavement and Snow Storage ............................................................................................33
    8.3.2 Storm Drain Facilities ........................................................................................................34
    8.3.3 Street Lighting ....................................................................................................................34
    8.3.4 Landscaping .......................................................................................................................34
9.0 EROSION AND SEDIMENT CONTROL ..................................................................................35
10.0 ENVIRONMENTAL COMMITMENTS AND CONSIDERATIONS ......................................35
  10.1 Environmental Commitments ...............................................................................................35
  10.2 Additional Environmental Considerations ...............................................................................36
11.0 RIGHT-OF-WAY REQUIREMENTS ......................................................................................36
12.0 COST ESTIMATE, FUNDING, AND SCHEDULE ..................................................................39
13.0 STAKEHOLDER/PUBLIC INVOLVEMENT .........................................................................39
  13.1 Moving Forward ......................................................................................................................40
14.0 CONCLUSIONS .....................................................................................................................41
15.0 REFERENCES ........................................................................................................................43
TABLE OF CONTENTS

FIGURES

Figure 1: Project Area Map ................................................................. 3
Figure 2: Zoning (left) and Land Use (right) Maps .............................. 6
Figure 3: Alternative 1 – No Build ...................................................... 14
Figure 4: Alternative 2 – Extension DSR Recommendations ................. 16
Figure 5: Alternative 3 – Revised Concepts ......................................... 19
Figure 6: Typical Sections at Intersection ........................................ 27
Figure 7: Preliminary ROW Impacts ................................................... 38

TABLES

Table 1: Existing Roadway Summary ............................................... 7
Table 2: Delay and LOS at the Old Glenn Highway/Eagle River Road Intersection ............................ 23
Table 3: Traffic Analysis Conclusions, 3-Leg Intersection Summary .......... 25
Table 4: Traffic Analysis Conclusions, 4-Leg Intersection Summary .......... 25
Table 5: Roadway Lighting Criteria .................................................. 29
Table 6: Intersection Lighting Criteria ............................................. 29
Table 7: Preliminary ROW Impacts ................................................... 37
Table 8: Intersection Improvements Cost Estimate .............................. 39
Table 9: Project Schedule ................................................................. 39

APPENDICES

Appendix A ......................................................................................... Design Criteria
Appendix B ....................................................................................... Concept Design
Appendix C ..................................................................................... Existing Utilities
Appendix D ..................................................................................... Draft Drainage Analysis
Appendix E ................................................................................... Traffic Analysis Report
Appendix F ................................................................................... Public Involvement
**LIST OF ACRONYMS**

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<th>Acronym</th>
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<td>UDC</td>
<td>Urban Design Council</td>
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<td>United States Fish and Wildlife Service</td>
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<td>westbound</td>
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1.0 INTRODUCTION

1.1 History and Background

This project was developed as a result of the 2015 Eagle River Traffic Mitigation (ERTM) Phase I project that proposes to extend Business Boulevard south to Eagle River Road. The Draft Design Study Report (DSR) prepared for the ERTM Phase I project (DOWL, 2015), referred to in this report as the Extension DSR, analyzed several alignment alternatives that would extend Business Boulevard to Eagle River Road via a fourth leg at the Old Glenn Highway/Eagle River Road intersection. Results of a traffic analysis performed for the Extension DSR determined that a fourth leg would cause the intersection to operate at level-of-service (LOS) F during the design year (2035) if no additional improvements are made. As a result, the Extension DSR proposed improvements that increase intersection operations to LOS C. Proposed improvements included additional through and turning lanes and incorporation of the direct-access hook ramp identified in the Eagle River Core Business District (CBD) and Residential Core Circulation Study (CBD Study) (Kittelson, 2011).

Other alternatives that were considered and dismissed throughout the project’s preliminary engineering phases include:

- VFW Road “Hook-Ramp” – This scenario would connect VFW Road to the Glenn Highway creating an exit-ramp/hook ramp connecting to Eagle River Road. Challenges to this scenario that led to its dismissal are:
  - A VFW hook-ramp creates a secondary road connection (not desirable); typically a primary road connection is preferred.
  - Internal access to surrounding properties becomes difficult.
  - Concerns with proper separation from the newly constructed Eagle River Bridge and undesirable distances between ramps.
  - Grade differences between the newly constructed Glenn Highway widening and the VFW Road vary 5’ to 25’ making a workable tie-in location unlikely.

- Roundabouts along Old Glenn Highway – Roundabouts were analyzed along the Old Glenn Highway at the exit ramp terminal and Eagle River Road as separate alternatives
during the reconnaissance stage of the project. Both scenarios were dismissed because they do not allow the extension of Business Boulevard to align opposite of the Eagle River Road/Old Glenn Highway intersection.

The Old Glenn Highway/Eagle River Road Intersection project takes many of the recommendations from the Extension DSR and refines them to better fit the immediate needs of the community as a 3-leg intersection. Adjustments attempt to minimize impacts to private property and reduce construction costs while maintaining the capability to accommodate a 4th leg so Business Boulevard can be extended in the future.

1.2 Objectives

The Municipality of Anchorage (MOA) Project Management and Engineering Department (PM&E) is proposing to upgrade the intersection of Old Glenn Highway and Eagle River Road in Eagle River, Alaska. The project area is shown in Figure 1.

The objectives of this project are to improve operations at the Old Glenn Highway/Eagle River Road intersection by reducing weaving through the implementation of a channelized right turn lane (or hook ramp) and prepare the intersection for a future extension to Business Boulevard by adding the capacity necessary for a fourth leg to the intersection.

The Old Glenn Highway/Eagle River Road intersection is located in close proximity to the Eagle River exit along Glenn Highway. Weaving movements that cause driver confusion occur as vehicles exit the Glenn Highway interchange and quickly change lanes for through or turning movements at the intersection. Additional weaving at the intersection is a result of vehicles coming over the overpass from Artillery Road, weaving across two lanes to the off-ramp lane to Eagle River Road. An increase in housing and commercial development has increased commuter traffic in the community contributing to congestion and delays at the intersection during morning and evening peak hours.
Figure 1: Project Area Map
A direct-access hook ramp from the northbound (NB) Glenn Highway exit to southbound (SB) Eagle River Road was identified as a high priority in the CBD Study. The CBD Study was prepared to evaluate potential improvements that will increase connectivity and promote vehicular and pedestrian access into and within the Eagle River CBD. Integrating the hook ramp into the intersection improvements project will reduce weaving and improve traffic operations at the intersection and promote community growth by adhering to existing planning and guiding documents.

An extension of Business Boulevard to Eagle River Road at the Old Glenn Highway/Eagle River Road intersection was also identified as a high priority project in the CBD Study. The extension would significantly impact operations at the intersection so designing the intersection to accommodate a future 4-leg intersection will minimize future rework.

1.3 Guiding Documents

MOA has a number of plans and regulations that guide development, including road development, within the Eagle River community. This project is being developed in conformance with the following plans and documents:

- Chugiak Eagle River Comprehensive Plan Update (2006);
- Eagle River Central Business District Revitalization Plan (2003);
- Chugiak-Eagle River Long Range Transportation Plan (LRTP) (2007);
- Eagle River CBD and Residential Core Circulation Study (2011);
- Eagle River Traffic Mitigation Phase I Reconnaissance Report (2013);
- DOT&PF’s Central Region Annual Traffic Volume Report 2011-2013: and

These documents are available either online or by request from MOA. Refer to the Extension Draft DSR for more information on how these documents were developed and how they relate to the ERTM Phase I project.
2.0 EXISTING CONDITIONS

2.1 Area Context (Zoning, Land Use, and Ownership)

Land in the project area is zoned according to the following land uses:

- **General Business (B-3) District** – Intended for general commercial use, although community and residential uses are also permitted.

- **Public Lands and Institutions (PLI) District** – Intended for major public and institutional uses.

- **Single-Family Residential (R-1) District** – Intended for low density residential development.

- **Multiple-Family Residential (R-2M) District** – Intended to allow for medium-density residential development.

Figure 2 shows maps of the zoning and land uses for properties in the project area. Properties zoned as B-3 District north of Old Glenn Highway include a restaurant, funeral home, automotive repair shop, personal services, and an animal care facility. The area also contains one single-family residence, two churches, and two banks. The PLI District property east of the Old Glenn Highway/Eagle River Road intersection is the Eagle River Elementary School, owned by Eklutna, Inc. A smaller, isolated PLI property east of Eagle River Road contains a former fire station. The PLI property just south of Monte Road resides as Chief Alex Park and is located within DOT&PF ROW. The park is maintained by the Chugiak Eagle River Chamber of Commerce. The B-3 District south of Old Glenn Highway, the Eagle Financial Center includes the University of Alaska – Anchorage (UAA) campus, a financial institution, and professional and medical offices.
2.2 Roadway Facilities

The Old Glenn Highway/Eagle River Road intersection improvements project is a State-grant funded project within the MOA that is owned by and located within the Alaska Department of Transportation and Public Facilities (DOT&PF) right-of-way (ROW). As a result, proposed roadway improvements within the project area must comply with both MOA and DOT&PF design standards. Design standards for both agencies are listed in Section 3.1.

Old Glenn Highway and Eagle River Road are classified as Class III Arterials according to MOA’s 2014 OS&HP and classified as urban Minor Arterial roadways according to DOT&PF’s Central Region Annual Traffic Volume Report 2011-2013. Arterials typically offer higher mobility and a lower degree of access. Old Glenn Highway and Eagle River Road, as minor arterials, do manage access for safety and conflict but maintain access to the business district, specifically along Old Glenn Highway. Table 1 summarizes the characteristics of the two major roadways within the project.
Table 1: Existing Roadway Summary

<table>
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<th>Curbed</th>
<th>Posted Speed (mph)</th>
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<td>Old Glenn Highway</td>
<td>Minor Arterial</td>
<td>57’</td>
<td>5</td>
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<td>Eagle River Road</td>
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<td>No (shoulders)</td>
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</tbody>
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mph = miles per hour

2.3 Pedestrian and Bicycle Facilities

2.3.1 Old Glenn Highway

Pedestrian and bicycle facilities along Old Glenn Highway include 8-foot wide attached multi-use pathways on both sides of the road that extend north from Eagle River Road to North Eagle River Access Road. These pathways were repaved in 2002. The pathway on the north side of Old Glenn Highway continues southwest to the overpass at Glenn Highway’s Eagle River exit, where it narrows to a 5-foot wide concrete sidewalk and continues across the bridge. Pedestrian crossings include curb ramps and detectable warning tiles and are located at Cross Drive (east-west), Eagle River Road (east-west), and the east side of the Old Glenn Highway/Eagle River Road intersection (north-south). The pedestrian and bicycle routing along Old Glenn Highway and Eagle River Road are both signed to direct users to and from the freeway pathway connection.

2.3.2 Eagle River Road

Pedestrian and bicycle facilities along Eagle River Road include a paved 8-foot wide separated multi-use pathway along the east side of the road that extends from Old Glenn Highway south past Eagle River Loop Road. The pathway is broken up by cottonwood tree roots and is in poor condition from approximately VFW Road to the project limit south of Fire House Lane.

Eagle River Road serves as a connection point along the Glenn Highway pathway, an 8-foot wide paved multi-use pathway that follows Glenn Highway from Anchorage to Birchwood. The pathway bypasses the Eagle River exit by veering east, away from Glenn Highway, and following the west side of VFW Road for approximately 0.2 miles. In 2016 as part of an improvement project along Glenn Highway, a new segment of multi-use pathway was constructed on the west side of Eagle River Road from VFW Road to the Old Glenn Highway.
intersection. Pathway users must make two crossings (east and north) at the Old Glenn Highway/Eagle River Road intersection and follow the pathway along the west side of Old Glenn Highway to Brooks Loop. At Brooks Loop the pathway turns west and connects back to Glenn Highway. This connection route can be confusing to pathway users and it adds undesirable pedestrian-vehicle conflict points.

2.4 Transit

People Mover Transit Route 102 serves Eagle River through a roundtrip route from Anchorage to Peters Creek. Two transit stops exist within the project corridor and are both located northeast of the Old Glenn/Eagle River Road intersection to service northbound and southbound passengers.

2.5 Landscaping

Landscaping along the southbound lanes of Old Glenn Highway includes decorative fencing, planters, and a two foot decorative concrete stamped buffer that extends from the existing southbound bus stop to Brooks Loop, all within the DOT&PF ROW. The landscaping is performing as intended and requires little maintenance. South of the bus stop the ROW narrows and landscaping is sparse with the occasional tree and grassed sections.

Eagle River Road has native vegetation outside the ROW on the east and west sides of the road. Both sides of the roadway have drainage ditches or slopes vegetated primarily with grasses and herbaceous plants. Larger plant species, with the exception of a few cottonwood trees, have been cleared to approximately 20 feet from the edge of pavement to accommodate snow removal, drainage, improve sight distance, and discourage moose browsing.

The Eagle Financial Center, located on the southwest corner of the Old Glenn Highway/Eagle River Road intersection, contains a large well-maintained landscaped area that extends along the north perimeter of the parking lot and the west side of the building. The landscaped area contains spruce, birch, currant, lilac, and mountain ash. A 1-foot wide landscape curb defines the planting beds from the parking lot and bank drive-through lane. Irrigation is provided via quick-couplers along the landscape curb.
Along the southern edge of the Eagle River Business District, the Chugiak Eagle River Chamber of Commerce maintains Chief Alex Park located within DOT&PF ROW, just south of Monte Road. It houses a picnic area, landscaped garden, the Town Clock, a Commemorative Brick Pavilion, and a “Welcome to Eagle River” sign. The Park has been a Chugiak Eagle River Chamber of Commerce project since 1983. It was initially developed through grants from the State of Alaska, and is now entirely supported by contributions from businesses, residents, and nonprofit organizations.

2.6 Lighting

Lighting along Old Glenn Highway is continuous throughout the project limits. Lighting is provided by 400 watt high pressure sodium (HPS) fixtures at 40-foot mounting heights and Medium-Cutoff-Type-3 (MC3) lighting distribution. The electroliers are installed in a staggered configuration behind the multi-use pathway on either side of the highway. The main circuit is located on the east side of the road with spurs across the road to feed electroliers on the west side. Power is provided by a load center located near the southeast corner of the Old Glenn Highway/Eagle River Road intersection. DOT&PF is pursuing retrofit LED lighting as part of a separate federally funded project that may occur in 2018.

Lighting along Eagle River Road extends from Old Glenn Highway south to Fire House Lane, approximately through the end of the SB merge area. Lighting is provided by 400 watt HPS fixtures at 40-foot mounting heights and MC3 lighting distribution. The electroliers are located along the east side of Eagle River Road within the existing drainage ditch between the road and the multi-use pathway. Power is supplied by the same load center that powers the lights along Old Glenn Highway at the southeast corner of the Old Glenn Highway/Eagle River Road intersection.

2.7 Utilities

Piped utilities along the project corridor include water, sewer, storm sewer, and natural gas. Water and sewer mains are owned by Anchorage Water and Wastewater Utility (AWWU), storm sewer pipes are owned by MOA and DOT&PF, and natural gas facilities are owned by ENSTAR Natural Gas (ENSTAR). Other utilities in the project area include fiber optic, telephone, and
electric. Communication lines are owned by General Communications, Inc. (GCI) and Matanuska Telephone Association (MTA). Electricity lines are owned by Matanuska Electric Association (MEA). Refer to Appendix C for details and figures of existing utilities in the project corridor.

2.8 Geotechnical Summary

A study of archived geotechnical data from MOA, DOT&PF, and DOWL in-house resources was conducted to determine a baseline geotechnical summary within the project area in advance of project-specific drilling. In general, the subsurface conditions in the project area consist of a surficial layer of fill or silty sands/sandy silts overlying alluvial and glacial deposits. The following is a summary of the anticipated geologic conditions.

2.8.1 Fill Material

The paved road sections along Eagle River Road and Old Glenn Highway appear to vary from 2 to 6 feet and consist of 2 to 3.5 inches of asphalt pavement. The pavement overlay is dense to very dense fill material classified as well- to poorly-graded sands and gravels and well- to poorly-graded sands and gravels with silt. These soils are non- to low-frost susceptible.

2.8.2 Native Silty Sands and Gravels/Sandy Silt

Beneath the existing road section fill material and in areas adjacent to the existing road embankments, such as the Eagle Financial Center south of Old Glenn Highway, native silty sands and gravels and sandy silts have been observed to depths of approximately 3 to 15 feet. These granular soils are generally dense to very dense and the fine-grained soils are stiff to hard. Cobbles and boulders up to 3 feet in diameter have been encountered in the deposit.

2.8.3 Alluvial/Glacial Deposits

Below the fill material and silty sands and gravels are alluvial and glacial deposits. These deposits classify as well- to poorly-graded sands and gravels with varying silt content and silts with sand and gravel. Cobbles and boulders more than 4 feet in diameter have been observed in test pits throughout the project area. These soils are generally non- to moderately-frost susceptible and contain non-plastic fines.
2.8.4 Groundwater

The depth to groundwater appears to be greater than 15 feet throughout the project area. The permeability of the soils encountered is limited due to the high density and the fines content of the siltier soils. Because of this, groundwater levels encountered during drilling may not represent static water levels. A more accurate evaluation of groundwater conditions can be determined through the installation of piezometers and subsequent groundwater measurements.

2.9 Storm Drain Facilities

Runoff within the project area is handled by both ditches and piped storm drain systems. Refer to the Draft Drainage Analysis in Appendix D for more details. The following is a summary of existing storm drain facilities:

- Runoff from the east portion of the Old Glenn Highway/Eagle River Road intersection is collected by curb inlets and a piped storm drain system that flows north along Old Glenn Highway, west along Ursa Minor Circle, and discharges into Eagle River Loop Creek via a ditch along NB Glenn Highway.

- Runoff from the west side of the Old Glenn Highway/Eagle River Road intersection is collected by curb inlets and a piped storm drain system that discharges to a ditch along the east side of the NB exit ramp of Glenn Highway. This ditch provides some detention. It flows south for approximately 3,000 feet and discharges towards Eagle River.

- Runoff from Eagle River Road within the project area generally flows north and is collected in deep, well-vegetated ditches with several low-points that provide detention and infiltration. Near the NB Glenn Highway exit ramp, similar landscaped low-points are connected by depressed and perched culverts that help to impound, retain, and infiltrate runoff.

2.10 Environmental

The following is a summary of existing environmental conditions within the project area:

- No wetlands or streams have been identified in the project area according to the U.S. Fish & Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps and MOA
wetland maps. Roadside drainage swales may require additional investigation to determine their jurisdiction under the Clean Water Act (Section 404);

- The project area is mapped as Zone X on the Federal Emergency Management Agency (FEMA) flood rate maps, indicating it lies outside the expected 500-year floodplain;
- No threatened or endangered species or critical habitat are known to exist in the project vicinity, according to the USFWS Information for Planning & Conservation online database;
- No active contaminated sites are within the project area, according to the Alaska Department of Environmental Conservation (DEC) Contaminated Sites inventory. Two sites are listed as “Cleanup Complete” and two sites, one at Frontier Texaco (now a Shell gas station) and one at the former trailer court located on Grand Canyon Loop, are listed as “Cleanup Complete – Institutional Controls.” Institutional controls typically indicate that soil or groundwater monitoring for contaminants is ongoing.
- No record of cultural, prehistoric, or historic sites are known to be located along or within the project area, other than Glenn Highway, according to the State Historic Preservation Office (SHPO) Alaska Historic Resources Survey.

3.0 DESIGN CRITERIA

3.1 Design Standards

Design standards and guidelines that apply to this project are contained in the following publications:

See Appendix A for the Design Criteria Table. No design waivers are anticipated at this time.

4.0 DESIGN ALTERNATIVES

The following sections are summaries of the design alternatives considered for this project. Further details can be found in the Traffic Analysis Report in Appendix E.

Level of Service (LOS) is a parameter used to describe the quality of traffic operations related to acceptable delays and speeds and is graded from A to F. LOS A represents free-flow conditions and LOS F represents heavily congested conditions. For this project, the minimum acceptable LOS is LOS C for existing years and LOS D for future years.

4.1 Alternative 1 – No Build

Alternative 1 (Figure 3) is the no-build alternative and proposes no additional improvements be made to the Old Glenn Highway/Eagle River Road intersection and surrounding facilities. A no-build alternative would not address weaving concerns and would not improve intersection performance. It was determined in the Extension DSR that the intersection would operate below LOS D during the design year (2035) if no upgrades are implemented. This does not meet the minimum acceptable LOS and could not accommodate a future Business Boulevard extension. This alternative does not address the objectives of the project.
Figure 3: Alternative 1 – No Build
4.2 Alternative 2 – Extension DSR Recommendations

Alternative 2 (Figure 4) is a re-analysis of the improvements proposed in the Extension DSR to evaluate how well they would accommodate revised 2035 volume forecasts. Proposed improvements for a 3-leg intersection configuration include the following:

- **Old Glenn Highway/Eagle River Road Intersection**: Add a second NB left-turn lane, a second westbound (WB) left-turn lane, and a second WB through lane to address overcapacity and vehicle delay. Terminate the WB through lane on Old Glenn Highway prior to the overpass at the Eagle River exit. Include 12-feet of gore striping between the NB left-turn lanes and the NB right-turn lane on Eagle River Road. The gore striping allows for a through lane when the fourth leg is added in the future.

- **Old Glenn Highway/Cross Drive Intersection**: This improvement recommends closing the Cross Drive access to Old Glenn Highway when the Business Boulevard Extension is constructed. The closure of Cross Drive fits with the long-term vision of constructing the Business Boulevard extension. The public has expressed concern with this closure in the near term and alternatively the project is further analyzing the Cross Drive and Brooks Loop access in a Brooks Loop/Cross Drive Supplemental Traffic Analysis Memorandum (DOWL, April 2017).

- **Old Glenn Highway/Brooks Loop Intersection**: This improvement recommends closing the Brook’s Loop access to Old Glenn Highway at Monte Road when the Business Boulevard Extension is constructed. The closure of Brook’s Loop fits with the long-term vision of constructing the Business Boulevard extension. Access may be converted to RIRO pending the outcome of the Brooks Loop/Cross Drive Supplemental Traffic Analysis Memorandum (DOWL, April 2017).

- **Old Glenn Highway/NB Glenn Highway Exit Ramp**: Construct a hook ramp off of the NB Glenn Highway exit ramp to provide uninterrupted traffic flow for vehicles travelling to SB Eagle River Road. Add a third SB through lane on Eagle River Road that terminates near the VFW Road intersection to receive traffic from the hook ramp.

- **Eagle River Road**: Construct a raised median along Eagle River Road from VFW Road to Old Glenn Highway to increase access control (eliminates left turns) and safety.

- **Future Modifications for 4th Leg**: Restripe the NB Eagle River Road lanes to include two left-turn lanes, one through lane, and one right-turn lane. This will eliminate the gore striping proposed initially for the 3-leg intersection in the first bullet above.
Figure 4: Alternative 2 – Extension DSR Recommendations
Alternative 2 addresses the objectives of this project by improving the operation of the 3-leg intersection configuration and preparing the intersection to accommodate a potential 4th leg in the future. However, this alternative has potentially negative impacts such as encroaching onto private property at the Alliance Christian Fellowship, S K Enterprises, Wells Fargo Bank, Eagle Financial Center, Eagle River Elementary, and First National Bank; reducing access to businesses; it doesn’t solve pedestrian crossing of the hook ramp free-right turn; has a more constrained plowing space than other alternatives; and higher construction costs.

4.3 Alternative 3 – Revised Concepts

Alternative 3 (Figure 5) was developed to refine the improvements proposed in the Extension DSR to the minimum needed for acceptable operation at the Old Glenn Highway/Eagle River Road intersection and to reduce impacts to surrounding properties, driveways, and intersections. Proposed improvements for a 3-leg intersection configuration include the following:

- **Old Glenn Highway/Eagle River Road Intersection**: Add a second NB left-turn lane and a second WB through lane to address overcapacity and vehicle delay.

- **Old Glenn Highway/Cross Drive Intersection**: Convert Cross Drive’s access to Old Glenn Highway from full access to RIRO. The public has expressed concern with access in the near term and alternatively the project is further analyzing the Cross Drive and Brooks Loop access in a Brooks Loop/Cross Drive Supplemental Traffic Analysis Memorandum (DOWL April 2017).

- **Old Glenn Highway/Brooks Loop Intersection**: Maintain Brook Loop’s access to Old Glenn Highway at Monte Road. Access may be converted to RIRO pending the outcome of the Brooks Loop/Cross Drive Supplemental Traffic Analysis Memorandum (DOWL April 2017).

- **Old Glenn Highway/Eagle River Overpass**: Convert the existing WB left-turn lane into a raised median, convert the existing WB through lane to a WB left-turn lane, and add a new WB through lane to the outside of existing.

- **Old Glenn Highway/NB Glenn Highway Exit Ramp**: Construct a hook ramp off of the NB Glenn Highway exit ramp to provide uninterrupted traffic flow for vehicles travelling
to SB Eagle River Road. The existing outside SB through lane on Eagle River Road will receive traffic from the hook ramp and terminate near the VFW Road intersection. The pedestrian crossing for this hook ramp will need further analyzing during the design phase, per ATM Section 4A-100, to determine if traffic mitigation is needed.

- **Eagle River Road**: Install a two-way left-turn lane (TWLTL) along Eagle River Road from VFW Road to the Old Glenn Highway intersection to provide access into and out of the Eagle Financial Center parking area.

- **Future Modifications for 4th Leg**: Pave the vegetated area between the outside lane on NB Eagle River Road and the multi-use pathway as an additional lane. Restripe for two left-turn lanes, one through lane, and one right-turn lane.

Similar to Alternative 2, Alternative 3 addresses the objective of this project by improving the operation of the 3-leg intersection and preparing the intersection to accommodate a potential fourth leg. This alternative reduces impacts to adjacent private property by reducing the number of added turning and through lanes, allowing RIRO access at Cross Drive, maintaining full turning access to/from Old Glenn Highway at Brooks Loop/Monte Road, and allowing left turns into and out of the parking area of the Eagle Financial Center. Fewer additional lanes and reduced ROW impacts also reduces project costs.
Figure 5: Alternative 3 – Revised Concepts
5.0  DRAINAGE

Site drainage conditions and details can be found in the Draft Drainage Analysis provided in Appendix D. The following sections contain a summary of the drainage conditions and water quality considerations.

5.1  Drainage Patterns

Existing drainage structures are summarized in Section 2.9. In general, a north-south divide exists at the Old Glenn Highway/Eagle River Road intersection that results in flow to the northeast and southwest directions. Two piped storm drain systems convey runoff from the project area, one in each of the drainage directions. Multiple low points, particularly along Eagle River Road and at the NB exit ramp on Glenn Highway, also help to collect, retain, and infiltrate roadway runoff.

Two existing problem areas have been identified by DOT&PF maintenance personnel. Two culverts, one under the paved multi-use pathway on the east side of Eagle River Road and one under Eagle River Road south of the intersection, ice up during winter months and require thawing. In addition, runoff from Chief Alex Park (northeast of the intersection) drains north across the sidewalk and onto Old Glenn Highway, causing roadway icing.

5.2  Design Conditions

This project is subject to both DOT&PF and MOA drainage design criteria. The applicable design references are included in Section 3.1. The 10-year design storm is required for sizing conveyance structures and the 1-, 10-, and 100-year storms are used for peak runoff drainage controls.

The following proposed intersection improvements will impact drainage patterns within the project area:

- A stretch of non-curbed roadway along Eagle River Road will be converted into a curbed roadway;
- The Old Glenn Highway/Eagle River Road intersection will be widened to include more auxiliary lanes; and
• The NB Glenn Highway exit ramp will be widened to incorporate the direct-access hook ramp, reducing the size of the ditch on the east side of the ramp.

5.3 Water Quality

Currently, runoff from Eagle River Road is treated through retention areas and vegetated swales. Runoff conveyed by the piped storm drain systems is not currently treated prior to discharge. Runoff can continue to be treated using vegetated swales after intersection improvements are complete. Existing ditches can be altered in accordance with the MOA DCM Section 2.17 to provide water-quality treatment for the increased post-construction peak flows. For the piped storm systems, oil and grit separators (OGS) are feasible and practical water quality treatment options that can be added to the system.

5.3.1 MS4 Permit

This project is within the area of coverage of a Municipal Separate Storm Sewer System (MS4) permit for stormwater discharge. The National Pollutant Discharge Elimination System (NPDES) Program originated under Section 402 of the Clean Water Act (CWA, 33 USC §1251) and requires that pollutant discharges to surface water be authorized by permit. DEC issued this authorization, the Alaska Pollutant Discharge Elimination System (APDES) Permit No. AKS 052558, jointly to MOA and DOT&PF effective from August 1, 2015 to July 31, 2020. DOT&PF applies MOA drainage criteria for compliance on projects within MOA’s permit area. Details of MOA criterion that meet requirements of the MS4 permit can be found in Section 1.3 of the Drainage Analysis, located in Appendix D.

At a minimum, this project will follow the Authorization to Discharge under NPDES and use control measures to comply with Best Management Practices (BMPs) and the Storm Water Management Program (SWMP). Considerations include the following:

• The project will follow the criteria set forth in DOT&PF’s HDM and MOA’s DDG.

• The contractor will develop a Storm Water Pollution Protection Plan (SWPPP) prior to construction that follows the guidelines of the Erosion and Sediment Control Plan (ESCP) provided to the contractor. The SWPPP will comply with the APDES permitting program and the Alaska Construction General Permit (ACGP).
• The contractor will describe how to minimize and manage to reduce pollution to stormwater in the contractor’s SWPPP.

• The contractor will comply with all permit conditions with respect to installation and maintenance of control measures, inspections, monitoring (if necessary), corrective actions, reporting, and recordkeeping.

• The contractor will address all discharge in the SWPPP. The contractor will prepare a Hazardous Material Control Plan (HMCP).

• The maintenance of the pipes, sewers, and other conveyances will remain the responsibility of MOA or DOT&PF.

6.0 TRAFFIC ANALYSIS

A Traffic Analysis Report, provided in Appendix E, was prepared to study the capacity and operations of the Old Glenn Highway/Eagle River Road intersection and surrounding intersections. The study evaluated existing and future operations of the Old Glenn Highway/Eagle River Road intersection under 3-leg and 4-leg configurations. The 3-leg configuration represents the most likely near- and mid-term build scenario of the intersection and needs to accommodate future traffic volumes. The 4-leg configuration was included to determine how the intersection will operate if the Business Boulevard extension is added in the future.

Intersection capacities and operations are reported as LOS based on the HCM 2010 methodology. For this project, LOS C is identified as the minimum acceptable intersection performance for the existing year and LOS D for the design year. These values are based on design references used by MOA and DOT&PF.

6.1 Existing Conditions

Traffic counts at study intersections were collected in March of 2016. The Old Glenn Highway/Eagle River Road intersection has tolerable delays (less than 25 seconds) and operates at LOS C in the morning and evening peak hours under existing conditions. The northbound approach of the Eagle River exit at Cross Drive operates at LOS F and D in the morning and
evening peak hours, respectively. Monte Road’s WB approach at Old Glenn Highway also operates at LOS F. The remaining approaches in the study area operate at LOS C or better.

6.2 Future Conditions

A design year of 2035 was used for the traffic analysis. The following growth rates were used to determine the future traffic volumes:

- 1.4 percent for Artillery Road;
- 1.0 percent for Old Glenn Highway; and
- 2.0 percent for Eagle River Road.

The roadway growth rates above were determined from the 2013 AADT from DOT&PF’s Annual Traffic Volume Report and the 2035 AADT from the Anchorage Metropolitan Area Transportation Solutions (AMATS) model. The future traffic volumes were modeled according to the three alternatives discussed in Section 4.0. Each alternative was evaluated under a 3-leg and 4-leg configuration. Results of the design year traffic analysis for the Old Glenn Highway/Eagle River Road intersection are shown in Table 2.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Delay</td>
<td>LOS</td>
</tr>
<tr>
<td>Existing 2016</td>
<td>23.4</td>
<td>C</td>
</tr>
<tr>
<td><strong>Alternative 1 – No-Build (2035)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No-Build 2035 Three-Leg</td>
<td>44.4</td>
<td>D</td>
</tr>
<tr>
<td>No-Build 2035 Four-Leg</td>
<td>65.8</td>
<td>E</td>
</tr>
<tr>
<td><strong>Alternative 2 – Extension DSR Recommendations (2035)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extension DSR 2035 Three-Leg</td>
<td>20.0</td>
<td>C</td>
</tr>
<tr>
<td>Extension DSR 2035 Four-Leg</td>
<td>44.7</td>
<td>D</td>
</tr>
<tr>
<td><strong>Alternative 3 – Revised Concepts (2035)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revised 2035 Three-Leg</td>
<td>13.2</td>
<td>B</td>
</tr>
<tr>
<td>Revised 2035 Four-Leg</td>
<td>38.0</td>
<td>D</td>
</tr>
</tbody>
</table>

Note: Highlighted cells do not meet minimum acceptable LOS D by the design year.
While the focus of Table 2 is on the OGH/ERR intersection, many intersections will benefit from the improvements, particularly once the improvements are combined with the Business Boulevard Extension. The intersection improvements will reduce the traffic load at either end of the Business Boulevard Extension, which will serve the area and also reduce delays on Monte Road and Brooks Loop.

The future performances of other study intersections are included in the Traffic Analysis Report (Appendix E). Some ancillary intersections, such as Cross Drive and Monte Road, fall below LOS D in the design year in all three alternatives due to traffic volume growth. However, Cross Drive LOS of E or below is addressed with a proposed connection between Centerfield Drive and Brooks Loop. The Brooks Loop and Monte Road approaches would have noticeably reduced delay if the eastbound approach is restricted to right-turn only. This analysis is documented in the Brooks Loop/Cross Drive Supplemental Traffic Analysis Memorandum (DOWL April 2017).

6.3 Analysis Conclusions

The results of the traffic analysis demonstrate that the existing Old Glenn Highway/Eagle River Road intersection meets the target LOS D as a 3-leg intersection in the design year without additional improvements, but drops to LOS E with the addition of a fourth leg. This indicates that the existing intersection can support future traffic volumes but cannot accommodate an extension of Business Boulevard.

Alternative 3 was selected as the preferred alternative because it:

- Reduces delay during the AM Peak Hour and during the PM Peak Hour Three-Leg configuration;
- Improves intersection performance to the target LOS D or above as a 3-leg and 4-leg intersection in the design year;
- Minimizes impacts to surrounding private property and reduces ROW acquisition needs compared to Alternative 2;
- Minimizes project cost compared to Alternative 2 because it reduces additional turning lanes from four lanes to two lanes without a significant drop in operational performance and uses TWLTLs in place of medians along Eagle River Road; and
- Reduces weaving movements by adding a hook ramp and streamlining the intersection for traffic approaching from the Eagle River exit ramp and overpass.

Table 3 summarizes the recommended improvements of Alternative 3 for a 3-leg intersection and Table 4 summarizes additional improvements recommended when Business Boulevard is extended as a fourth leg.

### Table 3: Traffic Analysis Conclusions, 3-Leg Intersection Summary

<table>
<thead>
<tr>
<th>Location</th>
<th>Proposed Improvement</th>
</tr>
</thead>
</table>
| Old Glenn Highway/Eagle River Road | • Add a second NB left-turn lane;  
• Add a second WB through lane;  
• Add a landscape buffer on the east side of the NB approach.  
• Install a TWLTL from Fire House Lane to approximately the middle driveway at the Eagle Financial Center building. At the approach to the Old Glenn Highway intersection, the TWLTL transitions to a raised median to separate oncoming traffic.  
• Provide pedestrian crossing mitigation as needed per ATM Section 4A-100. |
| Glenn Highway Eagle River exit at Glenn Highway/Cross Drive | • Convert Cross Drive to RIRO, right-in only, or closed access;  
• Add a new WB through lane to the outside of the existing lanes. |
| Old Glenn Highway/Brooks Loop   | • Maintain Brooks Loop’s access to Old Glenn Highway at Monte Road.  
• As part of the Brooks Loop/Cross Drive Supplemental Traffic Analysis Memorandum (DOWL April 2017), the project analyzed restricting the Brooks Loop intersection to right turns only. |
| Glenn Highway NB Exit Ramp      | • Construct a hook ramp;  
• The existing SB through lane on Eagle River Road will receive traffic from the hook ramp and terminate near the VFW Road intersection. |

NB=northbound; WB=westbound; RIRO=right-in right-out; ROW=right of way; SB=southbound; UAA=University of Alaska – Anchorage

### Table 4: Traffic Analysis Conclusions, 4-Leg Intersection Summary

<table>
<thead>
<tr>
<th>Location</th>
<th>Proposed Improvement</th>
</tr>
</thead>
</table>
| Eagle River Road        | • Convert the NB right-turn lane into a NB through lane;  
• Pave the landscape buffer outside the NB lanes and restripe to include 2 left-turn lanes, 1 through lane, and 1 right-turn lane. |
| Business Boulevard      | • Add one SB left-turn lane, one SB through lane, and one SB right-turn lane;  
• Add one NB receiving lane. |

NB=northbound; SB=southbound
Refer to Appendix B for the Concept Design, which illustrate the improvements recommended for the 3-leg intersection and associated improvements within the project area.

7.0 DESIGN RECOMMENDATIONS

The proposed intersection improvements at Old Glenn Highway and Eagle River Road are in early design stages. Recommendations are based on preliminary information and may change as the design progresses. The following sections summarize major components of the proposed design. Design references can be found in Section 4.0 and the Design Criteria Table is located in Appendix A.

7.1 Roadway Typical Section

Because this project is an intersection improvement project, it will not impact the overall typical section of Old Glenn Highway or Eagle River Road. The current typical sections of the two roads consist of the following:

- Old Glenn Highway is a 5-lane facility, two lanes in each direction, with a TWLTL. It has curb and gutter with attached pathways along both sides of the road.
- Eagle River Road is a 2-lane facility, one lane in each direction, with shoulders. It is has a multi-use pathway on the east side of the road along the entire project length and on the west side of the road from VFW Road to Old Glenn Highway.

Figure 6 is an illustration of the proposed intersection approaches at Old Glenn Highway and Eagle River Road under the 3-leg intersection configuration. It demonstrates how the intersection will differ from the base typical section of each road. When a fourth leg is added to the intersection, the 12-foot shoulder on the east side of Eagle River Road will be paved as an additional right-turn lane.
7.2 Horizontal and Vertical Alignment

The horizontal and vertical alignments of the proposed intersection improvements will closely follow existing. No significant changes to the existing alignments are anticipated.

Currently, the Monte Road and Brooks Loop intersections with the Old Glenn Highway are offset from each other. Brooks Loop may be realigned with Monte Road as part of this project if funding is available to do so. The realignment will require water utility relocations that exist in the north west quadrant of Brooks Loop.

7.3 Pedestrian and Bicycle Facilities

All existing pedestrian and bicycle facilities that are disturbed in the project area will be replaced in kind. The multi-use pathway that is disturbed along the east side of ERR will be replaced with a 12-foot wide asphalt pathway separated by a 12-foot landscaped shoulder. The shoulder will be paved as an additional turn lane when a fourth leg is added to the intersection, but it will not impact the location of the pathway. This project does not address the bike lane/ramp transition.
that’s needed to meet the MOA Bike Plan. However, DOT&PF’s ERR project proposes transitioning from the ERR bike lanes via bike ramps up to the existing eastside pathway just north of the VFW intersection. Disturbed pathways along Old Glenn Highway will be replaced in kind. All reconstructed facilities will match existing facilities at tie-in points.

A pedestrian crossing sign currently exists on the south side of the Artillery Road overpass over the Glenn Highway. This sign can be misinterpreted as a pedestrian route, when only a 2-foot wide shoulder exists on the south side of the overpass. An arrow to clarify that pedestrians should cross to the north side of the bridge minimizes confusion.

The pathway along the west side of Eagle River Road that was constructed in 2016 improves pathway connectivity in the project area and better delineates the Glenn Highway pathway connection through Eagle River. This segment of pathway will be protected in place where possible and repaired as necessary. The proposed island separating the hook ramp from the eastbound through/right lane provides a pedestrian refuge prior to crossing the hook ramp. This crossing will be reviewed for traffic mitigation measures per the ATM Section 4A-100. Additional directional signing can be added to further improve connectivity.

7.4 Geotechnical Recommendations

The geotechnical investigation for proposed improvements are dependent on the extent of improvements that can occur based on available funding. Proposed project improvements should be decided by late Spring 2017 with the geotechnical investigation anticipated to occur in the Summer of 2017. The results will provide project-specific information needed to develop geotechnical recommendations and provided as a separate document.

7.5 Roadway Illumination

Continuous lighting will be maintained along both Old Glenn Highway and Eagle River Road. The lighting limits along Eagle River Road will be adjusted to ensure the extents of the SB merge lane are accommodated. Because the roads are within DOT&PF ROW, lighting must comply with DOT&PF criteria according to the design guidance provided in the December 2016 Highway Lighting Memorandum, the HPCM, and AASHTO. Table 5 provides the luminance criteria for minor arterials according to the AASHTO Roadway Lighting Design Guide.
Table 5: Roadway Lighting Criteria

<table>
<thead>
<tr>
<th>Roadway Name</th>
<th>Roadway Classification</th>
<th>General Land Use</th>
<th>(L_{\text{avg}}) (cd/m²)</th>
<th>Uniformity (avg) (L_{\text{avg}}/L_{\text{min}})</th>
<th>Uniformity (max) (L_{\text{max}}/L_{\text{min}})</th>
<th>Uniformity (max) (L_{\text{max}}/L_{\text{avg}})</th>
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</thead>
<tbody>
<tr>
<td>Old Glenn Highway</td>
<td>Minor Arterial</td>
<td>Commercial</td>
<td>1.2</td>
<td>3:1</td>
<td>5:1</td>
<td>0.3:1</td>
</tr>
<tr>
<td>Eagle River Road</td>
<td>Minor Arterial</td>
<td>Intermediate</td>
<td>0.9</td>
<td>3:1</td>
<td>5:1</td>
<td>0.3:1</td>
</tr>
</tbody>
</table>

\(\text{cd/m}^2=\text{candles per square meter}\)

Lighting for the various intersections within the project area will be upgraded. According to AASHTO, intersections should be illuminated to the sum of the intersecting roadway illuminance values. Table 6 provides the lighting criteria for intersections within the project limits.

Table 6: Intersection Lighting Criteria

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Roadway Classification (General Land Use)</th>
<th>Average Illuminance (min) (fc)</th>
<th>Uniformity Ratio (max) (avg/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Glenn Highway</td>
<td>Minor Arterial (Commercial)</td>
<td>2.4</td>
<td>4:1</td>
</tr>
<tr>
<td>Eagle River Road</td>
<td>Minor Arterial (Intermediate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old Glenn Highway</td>
<td>Minor Arterial (Commercial)</td>
<td>2.1</td>
<td>4:1</td>
</tr>
<tr>
<td>Cross Drive</td>
<td>Local (Intermediate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old Glenn Highway</td>
<td>Minor Arterial (Commercial)</td>
<td>2.1</td>
<td>4:1</td>
</tr>
<tr>
<td>Monte Road</td>
<td>Local (Intermediate)</td>
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<td></td>
</tr>
<tr>
<td>Old Glenn Highway</td>
<td>Minor Arterial (Commercial)</td>
<td>2.1</td>
<td>4:1</td>
</tr>
<tr>
<td>Centerfield Drive</td>
<td>Local (Intermediate)</td>
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</tr>
<tr>
<td>Eagle River Road</td>
<td>Minor Arterial (Intermediate)</td>
<td>1.7</td>
<td>4:1</td>
</tr>
<tr>
<td>VFW Road</td>
<td>Local (Intermediate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eagle River Road</td>
<td>Minor Arterial (Intermediate)</td>
<td>1.4</td>
<td>4:1</td>
</tr>
<tr>
<td>Fire House Lane</td>
<td>Local (Intermediate)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(\text{fc=foot-candle}\)
As discussed in Section 2.5, existing lighting is provided by HPS fixtures. Replacing HPS with LED fixtures is recommended to reduce power consumption and reduce re-lamping maintenance intervals. DOT&PF is looking to convert the illumination along the Old Glenn Highway to LEDs in the near future depending on available federal funding.

7.6 Drainage Recommendations

Drainage recommendations have not been finalized for this project due to uncertainties in the early design phases. Three alternatives for stormwater discharge are discussed in the Draft Drainage Analysis located in Appendix D. Recommendations will be finalized in the Final Drainage Analysis, which will be submitted as a separate document with the 65% Design. The following is a summary of general recommendations and considerations pertaining to drainage improvements in the project area.

7.6.1 Stormwater Quantity

The existing piped storm drain system along Old Glenn Highway can accommodate increased runoff volumes that result from the proposed improvements on Old Glenn Highway. Along Eagle River Road, a new piped stormwater system with curb inlets is recommended to accommodate larger runoff volumes from the added lanes and the proposed curbing on the east side of the road. Field inlets should be provided for the transition from ditch flow to the curbed section. Three alternatives for drainage on the east side of Eagle River Road were analyzed in the Draft Drainage Analysis and include the following:

- Discharge to the existing storm drain system along Old Glenn Highway;
- Discharge to the ditch east of the NB Glenn Highway exit ramp; or
- Discharge to a new detention area on the west side of Eagle River Road before discharging to the ditch east of the NB Glenn Highway exit ramp.

MOA design criteria requires that post-development runoff volumes do not exceed pre-development volumes by more than five percent. The Draft Drainage Analysis identifies that two of the three MOA drainage control requirements will not be met by this project without the construction of additional detention structures. New structures may result in additional ROW
acquisitions. If ROW impacts are determined to be too great, design waivers or exemptions could be pursued by the project team.

7.6.2 Stormwater Quality

Water treatment for the increased stormwater runoff could be provided through the use of vegetated swales (particularly at the exit ramp ditch) and/or by one or more OGS. Further analysis will determine whether the swales that remain after construction are adequate to meet MOA stormwater quality requirements. OGS can be installed in areas with ROW restrictions. Similar to the discussion in Section 7.6.1, additional swales can be constructed to assist with water treatment, but ROW acquisitions may be necessary.

7.6.3 Future Considerations

Drainage recommendations for this project assume a 3-leg intersection configuration at Old Glenn Highway/Eagle River Road. When the fourth leg of the intersection is constructed, the 12-foot shoulder between the NB right-turn lane on Eagle River Road and the multi-use pathway will be paved as an additional lane (see Figure 6, Section 7.1). This will move the curb and gutter east to the edge of the multi-use pathway. When this occurs, storm drain pipe will need to be extended to curb inlets at the new curb line.

As an alternative to extending storm drain pipe in the future a flush detectable edge treatment consisting of rumble strips and delineators, could be evaluated as part of this project along the east side of Eagle River Road’s NB right-turn lane. This would allow runoff to flow onto the grassy shoulder where it could be collected by field inlets. The field inlets could be located closer to the final anticipated location of the curb inlets needed for the 4-leg intersection configuration, reducing future rework.

7.7 Landscape Recommendations

The Old Glenn Highway/Eagle River Road intersection is the main entrance to Eagle River and will be enhanced with landscape plantings and architectural elements including lighting and decorative fences. Due to limited ROW, planting of trees and shrubs will be limited. The proposed medians will be paved with patterned, integrally-colored concrete or patterned asphalt. Ornamental screened fence panels, patterned or themed similar to fences already in place in
Eagle River, are proposed behind new sidewalks and pathways. Grass will be the main
groundcover. Where space allows within the ROW, indigenous, drought-resistance trees and
shrubs will be used to screen and enhance the roadway.

Landscaping along Eagle River Road will consist of soil stabilization in areas disturbed by
construction activity using hydro-seeding with a “no-mow” revegetation mix. Seed mixes will
meet requirements of either the Municipality of Anchorage Standard Specifications (MASS)
Article 4.2 or DOT&PF Standard Specifications Section 618.

8.0 OTHER CONSIDERATIONS

8.1 Access Control and Driveways

Old Glenn Highway and Eagle River Road are classified as Class III Arterials according to
MOA’s 2014 OS&HP and classified as urban Minor Arterial roadways according to DOT&PF’s
Central Region Annual Traffic Volume Report 2011-2013. Arterials typically offer higher
mobility and a lower degree of access. Old Glenn Highway and Eagle River Road, as minor
arterials, do manage access for safety and conflict but maintain access to the business district,
specifically along Old Glenn Highway.

A preliminary access evaluation was completed within the project area to identify driveways in
close proximity to signals, within intersection functional areas, and where crash history and
operational conflicts are evident. Where feasible, driveways are maintained or shifted slightly to
provide comparable access. Preliminary access restrictions recommended include:

- Closure of one curb-cut driveway access located on the northwest side of the Old Glenn
  Highway/Eagle River Road intersection. This property has an alternate access off of
  Cross Drive;
- Closure of the northern driveway of the Eagle Financial Center; and
- Restriction of Cross Drive to RIRO access onto Old Glenn Highway. The public has
  expressed concern with access in the near term and alternatively the project is further
  analyzing the Cross Drive and Brooks Loop access in a Brooks Loop/Cross Drive
  Supplemental Traffic Analysis Memorandum (DOWL April 2017).
Access control recommendations are subject to change as the design progresses.

8.2 Utility Conflicts

Utility owners within the project area include MOA, DOT&PF, AWWU, MTA, GCI, MEA, and ENSTAR. Coordination with utility owners will be a significant component of this project due to the intersection’s proximity to various distribution and supply utilities, as discussed in Appendix C. The utility conflict review will begin once the improvements recommended for design are determined. Utility conflicts and agreements with impacted utility companies will be established during design.

The utility review will analyze utilities within the proposed roadway improvements of the preferred alternative to determine the need for relocation and/or adjustment to final grade. Major utility crossing locations, such as Old Glenn Highway at Brooks Loop/Monte Road and Eagle River Road at Fire House Lane, will be of particular focus. All utilities own facilities at or near these intersections. Where possible, utilities will be protected in place to minimize project costs. If relocations or adjustments are necessary, they should be completed with long term service in mind.

Proposed upgrades to storm drain facilities along Old Glenn Highway and Eagle River Road are discussed in Section 7.6 and the Draft Drainage Analysis in Appendix D.

8.3 Maintenance Considerations

This project will largely follow the existing alignment of Old Glenn Highway and Eagle River Road, but proposes several improvements that will impact maintenance efforts.

8.3.1 Pavement and Snow Storage

Snow removal and storage efforts will increase as a result of this project due to the addition of auxiliary lanes at the Old Glenn Highway/Eagle River Road intersection and the hook ramp off of the NB Glenn Highway exit ramp. Snow removal will remain the responsibility of DOT&PF. Snow storage along Eagle River Road is recommended in the vegetated ditches between the roadway and the multi-use pathway. Snow from Old Glenn Highway will be removed and transported to an approved disposal site.
8.3.2 Storm Drain Facilities

A properly designed and constructed piped storm drain system along the east side of Eagle River Road will reduce maintenance efforts by improving the two problem areas near the southeast portion of the Old Glenn Highway/Eagle River Road intersection (see Section 5.1). The two existing culverts on Eagle River Road that require thawing during winter months could be replaced with curb inlets and field inlets that connect to the existing and/or proposed storm drain system. The runoff from Chief Alex Park could similarly be handled by one or more field inlets on the south side of the sidewalk along Old Glenn Highway and connected to the existing storm drain system.

Future maintenance for the proposed vegetated (seeded) swales along Eagle River Road will remain similar to existing efforts, requiring little maintenance other than mowing. If OGS devices are installed for water quality treatment, they will need to be inspected as required by the MS4 permit and cleaned when full. Detention basins will require a means of access and routine maintenance to assure that outlet structures function properly, vegetation is maintained to allow for adequate storage volume, and accumulated sediment is removed on a periodic basis.

8.3.3 Street Lighting

Existing HPS fixtures will be replaced with LED fixtures. LED lights have a longer service life, which will reduce maintenance efforts. In the future, efforts may be further reduced through the use of adaptive lighting. Maintenance will continue to be the responsibility of DOT&PF.

8.3.4 Landscaping

All landscaping features implemented as part of this project will be selected with consideration toward minimizing future maintenance. A low maintenance revegetation mix similar to existing will be used to reestablish disturbed areas along Eagle River Road. Where space allows, indigenous, plantings that are adapted to the Eagle River area, or drought-resistant trees and shrubs will be selected to minimize maintenance requirements. Existing trees and shrubs will remain undisturbed where feasible. Other landscaping features will be decorative architectural pieces that will require little to no ongoing maintenance.
9.0 EROSION AND SEDIMENT CONTROL

The construction contractor selected for this project will be required to prepare a SWPPP prior to the start of construction that follows the guidelines of the MOA’s Storm Water Treatment Plan Review Guidance Manual (SWTPRGM). It shall remain on-site at all times during construction. The contractor will be required to preserve existing vegetation where practicable and stabilize all disturbed areas using BMPs to minimize erosion and sedimentation during and after construction. BMPs will include seeding, temporary seeding, mulching, rolled erosion control products, geotextiles, sedimentation basins, filter fabrics (silt fences), protection and preservation of established vegetation, and/or other approved methods. These stabilization techniques will remain in place until soil is permanently stabilized. The Contractor will be required to initiate stabilization measures as soon as practicable.

10.0 ENVIRONMENTAL COMMITMENTS AND CONSIDERATIONS

This project primarily involves reconfiguration of existing road surfaces and previously disturbed areas. It does not impact wetlands, waterways, or 100-year floodplains. It also does not involve federal lands, identified critical habitat, or threatened or endangered species. Existing conditions and observations are provided in Section 2.9.

10.1 Environmental Commitments

Environmental documentation under the National Environmental Policy Act (NEPA) is not required because this is a State-funded project. A State of Alaska environmental checklist will be completed. The following permits and authorizations will also be required:

- **DEC APDES Construction General Permit.** This requires a SWPPP and Notice-of-Intent (NOI) to be submitted to DEC. Ground-disturbing activities may not begin until DEC has listed the project NOI as “active”.

- **SWPPP.** As discussed in Section 9.0, a SWPPP must be prepared by the contractor and submitted to the MOA either before or concurrent with the NOI and must be accompanied by any MOA-required fees.

- **DEC Stormwater Letter of Non-Objection.** New and altered stormwater systems must meet DEC’s Letter of Non-Objection requirements.
10.2 Additional Environmental Considerations

This project is state funded and consultation is not required. However, consultation with the federally recognized Native Village of Eklutna will be done to verify that no unrecorded cultural or prehistoric resources are present in the project vicinity.

Vegetative clearing should not occur during the USFWS-proposed Migratory Bird Nesting window of May 1 through June 15.

Given the presence of DEC-recognized contaminated sites located up-gradient and within 200 feet of the proposed project, the potential to encounter contaminated soils or groundwater may exist during construction. Should this occur, DEC will be contacted to determine the appropriate corrective action.

11.0 RIGHT-OF-WAY REQUIREMENTS

A critical component of this project is the timely and successful acquisition of all necessary ROW, easements, and permits. These acquisitions or temporary construction permits (TCP) are driven by the extents of the proposed design, which include efforts to minimize the impacts on affected parcels and property owners. Preliminary acquisitions identified for this project include one Public Use Easement (PUE) totaling 765 square feet (sf). Table 7 provides details of the parcels affected and Figure 7 illustrates the locations of preliminary acquisition and anticipated TCPs. The size, location, and quantity of the proposed ROW acquisition and TCPs are subject to change as the design progresses.
Table 7: Preliminary ROW Impacts

<table>
<thead>
<tr>
<th>Parcel Number</th>
<th>MOA Tax ID#</th>
<th>Legal Description</th>
<th>Site Address</th>
<th>Owner Name</th>
<th>Current Use</th>
<th>PUE/TCP Area (sf)</th>
<th>Easement Purpose</th>
<th>Existing Improvements within Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUE 1</td>
<td>050-175-06</td>
<td>TR A</td>
<td>10928 Eagle River Road</td>
<td>Eagle Financial Center, LLC</td>
<td>Bank/UAA Campus</td>
<td>765</td>
<td>Roadway, C&amp;G, Retaining Wall</td>
<td>Grass Landscaping</td>
</tr>
<tr>
<td>TCP 1</td>
<td>050-172-03</td>
<td>BLK 4, LT 1</td>
<td>11000 Old Glenn Highway</td>
<td>S K Enterprises, LLC</td>
<td>Retail Multi-Occupancy</td>
<td>100</td>
<td>Roadway C&amp;G</td>
<td>Asphalt Driveway</td>
</tr>
<tr>
<td>TCP 2</td>
<td>050-172-02</td>
<td>T12N R2W Sec 11, SW4NE4SE4N</td>
<td>16610 Brooks Loop</td>
<td>Alliance Christian Fellowship of the Christian &amp; Missionary Alliance of Eagle River</td>
<td>Church Office</td>
<td>615</td>
<td>Asphalt Pathway</td>
<td>Asphalt Driveway</td>
</tr>
<tr>
<td>TCP 3</td>
<td>050-171-06</td>
<td>BLK 1, LT 1</td>
<td>10900 Old Eagle River Road</td>
<td>Eklutna, Inc.</td>
<td>Eagle River Elementary School</td>
<td>780</td>
<td>Asphalt Pathway</td>
<td>Vegetated Brush</td>
</tr>
</tbody>
</table>

Total PUE Area = 765 sf

sf=square feet; BLK=Block; LT=Lot; TR=Tract; C&G=curb and gutter
Figure 7: Preliminary ROW Impacts
12.0 COST ESTIMATE, FUNDING, AND SCHEDULE

The ERTM Phase I project is funded by State grants totaling $8.5 million. In 2013, Business Boulevard Extension project presented alternatives that ranged in cost from $23 million to $28 million. The improvements project at the Old Glenn Highway/Eagle River Road Intersection project was developed to prepare for the Extension project with the limited funds available.

A preliminary cost estimate, summarized in Table 8, has been prepared for the recommended intersection improvements. Contingencies have been added to the construction cost to account for reasonable margins of accuracy during the early stages of design.

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design and ROW Costs To-Date (as part of Extension Project)</td>
<td>$2,300,000</td>
</tr>
<tr>
<td>Construction (w/ 20% contingency)</td>
<td>$6,360,000</td>
</tr>
<tr>
<td>Construction Engineering &amp; Administration (15%)</td>
<td>$954,000</td>
</tr>
<tr>
<td>Design</td>
<td>$150,000</td>
</tr>
<tr>
<td>ROW Acquisition</td>
<td>$40,000</td>
</tr>
<tr>
<td>Utility Relocation</td>
<td>$650,000</td>
</tr>
<tr>
<td><strong>TOTAL Intersection Improvements Cost</strong></td>
<td><strong>$10,454,000</strong></td>
</tr>
</tbody>
</table>

Intersection improvements at the Old Glenn Highway/Eagle River Road intersection will progress prior to the completion of the Extension DSR and subsequent design. The anticipated schedule is shown in Table 9.

<table>
<thead>
<tr>
<th>Task</th>
<th>Approximate Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROW Acquisition/Permitting</td>
<td>Fall 2017</td>
</tr>
<tr>
<td>Design</td>
<td>Spring 2017 to Spring 2018</td>
</tr>
<tr>
<td>Bidding &amp; Construction</td>
<td>Summer 2018</td>
</tr>
</tbody>
</table>

13.0 STAKEHOLDER/PUBLIC INVOLVEMENT

Stakeholder involvement in the ERTM Phase I project was initiated by MOA in July of 2013 and is conducted using the context sensitive solutions (CSS) process provided in MOA’s *Strategy for*
Developing Context Sensitive Transportation Projects. The purpose of public involvement is to provide information, solicit comments, and make the design team accessible to stakeholders.

A variety of public involvement planning, workshops, and meetings have taken place since 2013 with a focus on the Business Boulevard extension. Refer to the Extension DSR for full meeting notes and outreach materials used to-date. Material is also available from MOA upon request. Public comments from these meetings helped identify the need to address capacity and congestion issues at the Old Glenn Highway/Eagle River Road intersection prior to moving forward with the Business Boulevard extension. They also influenced recommendations to address access concerns for businesses at Cross Drive, Brooks Loop, and the Eagle Financial Center.

13.1 Moving Forward

Public involvement for the intersection improvements at Old Glenn Highway/Eagle River Road will continue through the design phases. The process will continue to follow MOA’s CSS process and appearances will be scheduled at the Urban Design Commission (UDC). Completed and anticipated design phase public involvement includes the following activities:

- Completed:
  - 2016 and 2017 Anchorage Transportation Fairs
  - Presentation to the Chugiak-Eagle River Advisory Board
  - Public comment on the Draft DSR;
  - Cross Drive/Brooks Loop Stakeholder Meeting
  - Posted the Draft DSR to the project website;
  - Presentation to the Chugiak/Birchwood/Eagle River Rural Road Service Area (CEBRRRSA);
  - Planning and Zoning (P&Z) Commission; and
  - Draft DSR open house.

- Anticipated
  - Posting the Final DSR to the project website; and
  - 65% Design open house.
The dates, materials presented, and notes of the Old Glenn Highway and Eagle River Road Intersection Improvements project public meetings are provided in Appendix F.

14.0 CONCLUSIONS

The recommended alternative for improvements at the Old Glenn Highway/Eagle River Road intersection is Alternative 3, Revised Concepts. According to the Traffic Analysis Report (Appendix E), the proposed intersection improvements in this alternative provide LOS C or better for a 3-leg intersection and LOS D or better for a 4-leg intersection during the design year of 2035. This meets the objective of the project to improve the operation of the 3-leg intersection for future traffic volumes in a way that is able to accommodate the Business Boulevard extension.

Alternative 3 is recommended over Alternative 2, Extension DSR Recommendations, because it has fewer impacts to surrounding private property and requires less ROW acquisition. It also minimizes weaving movements and has a lower construction cost. Alternative 1, No-Build, does not meet the objectives of the project because it does not simplify weaving patterns at the intersection and results in traffic operations that fall below LOS D as a 4-leg intersection during the design year.

Additional benefits of Alternative 3 include:

- Improved pedestrian crossing safety and connectivity between existing and new pedestrian and bicycle facilities and clarification of the Glenn Highway pathway through Eagle River;
- Improved drainage along Eagle River Road and Old Glenn Highway, particularly in identified problem areas; and
- Fewer additional lanes (than Alternative 2), which is more aesthetic and results in less impervious surface area.

Appendix B contains the Concept Design that illustrates the improvements recommended within the project area for the 3-leg intersection configuration.
The following tasks will be required before the design progresses further:

- Perform drilling within the project area for final geotechnical recommendations. This information will contribute to a recommended pavement design.

- Define to what extent, the proposed improvements in Alternative 3, Revised Concepts can be constructed within the remaining funding available. This will influence recommendations and extents of landscaping, street lighting, and storm drain facilities. It will also help determine a more accurate estimate of ROW impacts and construction costs.
15.0 REFERENCES

