APPENDIX H

Level 2 Screening Results White Paper

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Juneau – Egan Drive and Yandukin Drive Intersection Improvements

IRIS Program No. SFHWY00079
Federal Project No. 0003208

Level 2 Screening Results White Paper

March 2021

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by DOT&PF pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated November 3, 2017, and executed by FHWA and DOT&PF.

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Abbreviations

ADA	Americans with Disabilities Act
ADF&G	Alaska Department of Fish and Game
CBJ	City and Borough of Juneau
CMF	Crash Modification Factor
DOT&PF	Alaska Department of Transportation and Public Facilities
ELE	Compatible Design Elements
E-Y	Egan Drive at Yandukin Drive-Glacier Lemon Road Intersection
FAA	Federal Aviation Administration
GIS	Geographic Information System
HSIP	Highway Safety Improvement Program
HSM	*Highway Safety Manual*
INT	Intersection
ITS	Intelligent Transportation System
KE	Kinney Engineering, LLC
mph	miles per hour
M&O	DOT&PF Maintenance and Operations
NEPA	National Environmental Policy Act
OVP	Overpass/Interchange
PEL	Planning and Environmental Linkage
RIRO	right-in, right-out
ROW	right-of-way
RWIS	Road Weather Information System
TDM	Traffic Demand Management
USFS	United States Forest Service

Executive Summary

Based on the Level 1 screening results (documented in the *Level 1 Screening Results White Paper*), five build alternatives and three compatible elements were advanced to Level 2 screening for the Egan Drive at Yandukin Drive/Glacier Lemon Road (E-Y) intersection Planning and Environmental Linkage (PEL) Study. Compatible elements are additional intersection treatments that do not stand alone (do not meet purpose and need on their own) but can be combined with the alternatives to better meet the project's purpose and needs. The five build alternatives (with their new names in bold) are:

- **Mobility** – Prior name: INT-1, ELE-4, ELE-7 HSIP interim action with median crossovers and a grade-separated pedestrian crossing
- **Partial Access Signal** – Prior name: INT-2, ELE-4 Partial access signalized intersection with median crossovers
- **Full Access Signal** – Prior name: INT-3, ELE-4 Full access signalized intersection with median crossovers
- **Two Signalized T-Intersections** – Prior name: INT-6 Two signalized T-intersections
- **Diamond Interchange** – Prior name: OVP-2, ELE-5 Diamond interchange with Glacier Lemon Spur Extension to Glacier Nugget

As noted above, these five build alternatives include three compatible elements (median crossovers, a grade-separated pedestrian crossing, and the extension of the Glacier Lemon Spur to the Glacier Nugget intersection with Egan Drive). The analysis allowed the project team to choose to swap the median crossover element for the spur extension element for any alternative, and to add the grade-separated pedestrian crossing to any alternative where it was appropriate.

Table 1 compares the overall results for these alternatives under each Level 2 screening measure. The following general observations about some compatible elements can be made:

- The project team consulted with the Alaska Department of Transportation and Public Facilities Maintenance and Operations (M&O) to determine how long it would take to set up traffic control for the median crossovers. Based on information provided by M&O, the median crossovers take longer to set up than the average time it currently takes for a crash to be cleared at the intersection. Thus, the median crossovers do not meet project purpose and need for providing an additional route when there is a crash, since traffic would be stopped waiting for the median crossovers to be installed as long as it would be stopped waiting for a crash to be cleared.
- The grade-separated pedestrian crossing provides the most benefit for pedestrians and bicycles. It eliminates vehicle conflicts with pedestrians/bicycles crossing Egan Drive and provides the shortest time to cross Egan Drive (no delay crossing the road). Thus, the grade-separated crossing was included in the alternatives for this analysis when applicable. This allowed for a full analysis of the maximum benefits available to non-motorized users for each alternative. However, the feasibility and desirability of a grade-separated crossing at this location is not established. More investigation during later stages of project development will be needed to confirm whether the grade-separated or

an at-grade pedestrian crossing are feasible and recommended at the intersection. Therefore, the recommended alternative includes either a grade-separated or at-grade pedestrian crossing at the intersection.
- Providing a signalized pedestrian crossing at the Yandukin/Glacier Lemon intersection provides a benefit for both non-motorized safety and connectivity. Thus, alternatives with this element could be considered in the development of a recommended alternative.
- The Glacier Lemon Spur Extension is the only compatible element that responds to the portion of the purpose and need that addresses the system connectivity of an alternate route. It is consistent with previous planning done in the study area and is supported by many members of the general public.

Note that the scores for all alternatives with median crossovers are grayed out in Table 1 because the project team discovered during this analysis that median crossovers did not meet the purpose and need for an alternate driving route during a crash. These alternatives were removed from consideration when determining the recommended alternative.

Weighting was applied to each criteria and the combined categories to represent the relative importance of criteria in consultation with the stakeholder advisory groups. The project team conducted a survey of Community Focus Group and Agency Focus Group members that asked them to rank the screening criteria and categories in order of importance. The results of this survey were used to assign the "overall percentage weights" to each criterion shown in Table 1 of this Level 2 Screening Results White Paper. Also, the project team chose to multiply by two the scores for the crash frequency and crash severity metrics; this was done to recognize that safety improvements were identified as the primary need for the project and, therefore, the safety-related metrics are emphasized compared to other metrics in the results.

During the Level 2 screening, the project team determined that acquiring airport property or the private properties near Honsinger Pond (on the airport side of Egan Drive) would have economic, schedule, and feasibility impacts that were not apparent at the time the Level 1 screening was performed. Additionally, the Level 2 concept designs identified that the extent of right-of-way (ROW) need was greater than had been anticipated during the Level 1 analysis for several alternatives. Further, acquiring land from the airport is likely complicated and time consuming and may not be possible, as it requires Federal Aviation Administration (FAA) approval. Based on the extensive, unacceptable ROW impacts to the Honsinger Pond private properties, the Two Signalized T-Intersections alternative was removed from consideration.

The Partial Access Signal, Full Access Signal, and Diamond Interchange alternatives, each with the Glacier Lemon Spur Extension, meet the baseline purpose and need. However, the Partial Access Signal alternative with the Glacier Lemon Spur Extension has several advantages compared to the Full Access Signal and Diamond Interchange alternatives:

- The Partial Access Signal alternative requires less ROW (7.11 acres) than the Full Access Signal (11.47 acres) and Diamond Interchange alternatives (14.1 acres)
- The Partial Access Signal alternative does not impact the properties at the airport or near Honsinger Pond. This means it is much less complicated, avoids potential fatal flaws

associated with receiving FAA approval to release the property, and is more consistent with economic development goals than the Full Access Signal and Diamond Interchange alternatives.

- The Partial Access Signal alternative has less wetland, storm water, and air quality impacts than the Full Access Signal and Diamond Interchange alternatives.
- The Partial Access Signal alternative costs (including design, ROW acquisition, and construction) are substantially less than the Full Access Signal and Diamond Interchange alternatives.
- The overall project complexity of the Partial Access Signal alternative is less, meaning that there would be less disturbance to the traveling public during construction for a shorter period than the Full Access Signal or Diamond Interchange alternative.

Based on the Level 2 Screening metrics, the Partial Access Signal alternative with the Glacier Lemon Spur Extension and a protected pedestrian crossing (either a grade-separated pedestrian crossing or a crossing protected by a signal) is the recommended alternative.

Table 1: Executive Summary Comparison of Level 2 Alternative Combinations

		Alternative & Compatible Element										
		No Build	Mobility & Median Crossovers	Mobility & Glacier Lemon Spur Extension	Partial Access Signal & Median Crossovers	Partial Access Signal & Glacier Lemon Spur Extension	Full Access Signal & Median Crossovers	Full Access Signal & Glacier Lemon Spur Extension	Two Signalized T-Intersections	Two Signalized T-Intersections & Glacier Lemon Spur Extension	Diamond Interchange & Median Crossovers	Diamond Interchange & Glacier Lemon Spur Extension
	Include Pedestrian Bridge?	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A
	Move Transit Stops?	N/A	N/A	No	N/A	No	N/A	No	N/A	No	N/A	No
Combined Purpose and Need and Categories												
Purpose and Need Overall Score:	100.00%	3.2	3.7	4.3	5.4	6.0	6.0	6.0	5.9	5.5	5.6	6.2
Transit Overall Score:	26.00%	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.7	0.5
Land Use Overall Score:	27.33%	0.5	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7
Environmental Overall Score:	25.33%	0.8	0.7	0.4	0.7	0.4	0.6	0.3	0.6	0.3	0.5	0.3
Cost:	21.33%	1.1	1.1	0.9	1.1	0.6	0.9	0.6	0.6	0.4	0.2	0.2
Combined Purpose and Need and Categories Score:		**6.1**	**6.7**	**6.7**	**8.4**	**8.0**	**8.5**	**7.9**	**8.1**	**7.2**	**7.7**	**7.9**
Purpose and Need Metrics												
Metric	**Overall Percentage Weight**	Purpose and Need Raw Rankings										
Crash Frequency	30.7% (x2)	6	6	6	8	8	10	8	10	8	10	10
Crash Severity	26.7% (x2)	2	2	2	6	6	6	6	4	4	6	6
Bicycles and Pedestrians	15.1%	1	5	5	5	5	5	5	5	5	4	4
Travel Time Reliability	19.1%	3	1	4	1	4	1	4	3	4	1	4
Pedestrian and Bicycle Access Time	8.4%	1	5	5	5	5	5	5	5	5	2	2
Purpose and Need Overall Score:		**3.2**	**3.7**	**4.3**	**5.4**	**6.0**	**6.0**	**6.0**	**5.9**	**5.5**	**5.6**	**6.2**
Transit Metrics												
Metric	**Overall Percentage Weight**	Transit Raw Rankings										
Transit Route Time	50.0%	2	2	1	2	1	1	1	1	1	3	2
Bus Stop Impacts	50.0%	2	2	2	2	2	2	2	2	2	2	2
Transit Overall Score:		**2.0**	**2.0**	**1.5**	**2.0**	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**	**2.5**	**2.0**
Land Use Metrics												
Metric	**Overall Percentage Weight**	Land Use Raw Rankings										
Plan Impacts	28.6%	1	3	3	3	3	2	2	3	3	3	3
Access Travel Time	45.2%	2	2	2	2	1	2	2	1	1	3	3
Business Visibility	26.2%	3	3	3	3	3	3	3	3	3	2	2
Land Use Overall Score:		**2.0**	**2.5**	**2.5**	**2.5**	**2.1**	**2.3**	**2.3**	**2.1**	**2.1**	**2.7**	**2.7**
Environmental Metrics												
Metric	**Overall Percentage Weight**	Environmental Raw Rankings										
ROW Impacts	17.0%	3	3	2	3	2	3	2	2	1	2	1
Wetland Impacts	18.7%	3	3	2	3	2	2	1	2	1	2	1
Stormwater Impacts	14.3%	3	3	2	3	2	2	1	2	1	1	1
Fish Habitats and Streams Impacts	21.4%	3	3	1	3	1	3	1	3	1	3	1
Historic and 4(f) Properties Impacts	15.0%	3	3	1	3	1	2	1	2	1	2	1
Air Quality Impacts	13.6%	3	2	2	2	2	1	1	2	1	1	1
Environmental Overall Score:		**3.0**	**2.9**	**1.6**	**2.9**	**1.6**	**2.2**	**1.2**	**2.2**	**1.0**	**1.9**	**1.0**
Cost Score:		**5**	**5**	**4**	**5**	**3**	**4**	**3**	**3**	**2**	**1**	**1**

1 Introduction

Five build alternatives and three compatible elements were analyzed using the identified Level 2 screening criteria for the Egan Drive at Yandukin Drive/Glacier Lemon Road (E-Y) intersection Planning and Environmental Linkage (PEL) Study.

The initial steps in the alternatives development and evaluation process that have been used for the PEL Study are documented in the *Level 1 Screening Results White Paper*. Subsequent steps include:

- Development of Level 2 screening criteria. This information was presented to the Community Focus Group (August 21, 2020) and the Agency Working Group (August 20, 2020) as well as to the general public (October 14 through November 12, 2020). A description of these criteria is included in this white paper. Appendix B includes Community Focus Group and Agency Working Group Inputs.
- Level 2 Screening of the five build alternatives and three compatible elements that were brought forward for additional screening (presented in this white paper).

HSIP Interim Action

During the development of this PEL study, a parallel effort has been undertaken to identify improvements focused on safety that could be made more quickly while a long-term alternative that meets all of the identified purpose and need elements (Appendix A – Purpose and Need) is being developed. The proposed safety improvement project has competed with other safety improvements throughout the state and has received Highway Safety Improvement Program (HSIP) funding, which will aim for construction in 2022. As such, the HSIP project is considered the No Build condition in this Level 2 screening analysis.

This white paper documents the Level 2 screening criteria used (shown in Table 2 and Table 3), the five build alternatives and three compatible elements that were evaluated under this Level 2 analysis, and the screening results for the alternatives and compatible elements under the Level 2 screening criteria. Appendix C includes Options for Alternatives Considered and Not Pursued Further.

The information in this white paper is intended to be used in a subsequent National Environmental Policy Act (NEPA) process. It provides critical planning analyses, consistent with 23 U.S. Code 168 (preliminary screening of alternatives and elimination of alternatives) and 23 Code of Federal Regulations 450.

Table 2: Level 2 Baseline Purpose and Need Screening Criteria

Baseline Purpose and Need Metrics			
Purpose	**Need**	**Metric**	**Explanation of Metrics**
Primary	Safety	Crash frequency	Comparison of the forecasted number of crashes for each alternative as compared to the other alternatives at both the E-Y and Glacier Nugget intersections
		Crash severity	Comparison of the forecasted crash severity for each alternative as compared to the other alternatives at both the E-Y and Glacier Nugget intersections
		Bicycles and pedestrians	Comparison of the number and types of conflict points between pedestrians and vehicles for each alternative compared to other alternatives at both the E-Y and Glacier Nugget intersections
Secondary	Alternate Driving Routes	Crash delay	Comparison of the average delay experienced by vehicles affected when a crash closes lanes on Egan Drive under each alternative
	Non-motorized accessibility	Accessibility comfort	Comparison of the pedestrian travel time for each alternative as compared to the other alternatives; the travel time was measured for traveling between two known pedestrian generators and crossing Egan Drive at a controlled or separated crossing

Table 3. Level 2 Other Considerations Screening Criteria

Other Considerations		
Consideration	**Metric**	**Explanation of Metrics**
Transit	Transit Route Time	Measure of whether the bus travel time within the study area is increased, equal to, or less than the bus travel time for the No Build alternative
	Bus Stop Impacts	Qualitative indication of whether the bus stop location under each alternative is the same/improved or worse than the No Build alternative
Land Use	Plan Impacts	Qualitative measure of how well the alternative is consistent with five community plans
	Access Travel Time	Measure of the time it takes to travel between zones across and along Egan Drive under each alternative
	Business visibility	Qualitative measure of whether elements of each alternative would limit the visibility of storefronts or their signs from Egan Drive; this includes potential future commercial development
Environmental	Right-of-way Impacts	Measure of acreage needed to be acquired to construct each alternative
	Wetland Impacts	Measure of the acreage of wetlands impacted by the construction of each alternative
	Stormwater Impacts	Measure of the acreage of additional impervious surfaces added by the construction of each alternative
	Fish Habitats and Streams	Measure of linear feet of impacted fish-bearing streams
	Historic and 4(f) Properties	Qualitative measure of the likelihood that each alternative would impact a protected property
	Air Quality	Measure of increase in acreage of pavement subject to winter sanding for each alternative
Cost	Cost Range	Estimated cost of each alternative

2 Development of Level 2 Screening Criteria

The primary purpose of the Level 2 screening was to compare how well each alternative meets the project purpose and need, enabling a comparison between alternatives, and to also quantify the effects of the alternatives on other considerations that were identified as important by the project team, the agency and community focus groups, and the public. The Level 2 screening criteria are documented in Table 2 and Table 3.

2.1 Assumptions for Level 2 Alternatives

Each Level 2 alternative that was advanced from Level 1 screening meets project purpose and need elements.

Each alternative provides pedestrian and bicycle facilities that comply with the Americans with Disabilities Act (ADA). Proposed signals are warranted.

Rough Order of Magnitude (-40%/+50%) design concepts for each alternative were prepared that emphasize minimizing costs and environmental impacts while maximizing operational and safety benefits. A greater degree of accuracy would require more detailed design efforts and was not included in this effort. These "planning-level" design concepts are represented in the following figures, analyses, and cost estimates. Each alternative was conceptually designed using horizontal design criteria. Vertical design was estimated only. It was assumed business access under each alternative would be similar to existing and that no additional modes of transit, such as a light rail, would be added. It was also assumed that bus stops would be relocated or rebuilt if existing bus stops are impacted by an alternative.

Level 2 travel demand volumes differ from volumes utilized in Kinney Engineering, LLC's (KE's) 2018 *Juneau – Egan Dr. & Yandukin Intersection Improvement Traffic Analysis and Alternative Concepts Report* and the *Level 1 Screening Results White Paper*. When turning movement counts are taken in the field at intersections in a project area, the volume balance between intersections needs to be adjusted to account for traffic fluctuations between count days and for origins/destinations on the links between intersections. Typically, to provide conservative existing turning movement volumes, KE increases movement volumes as needed to provide balanced traffic flow between intersections. However, for this Level 2 analysis, a less conservative approach was taken: volume counts taken at the E-Y intersection were held constant while volumes at surrounding intersections were decreased to achieve balance. Turning movement volumes used in the Level 2 analysis are shown in Appendix D.

Freight traffic volumes and bus trips were assumed to remain similar to existing freight percentages.

The Alaska Department of Transportation and Public Facilities (DOT&PF) Southcoast Region appears to use signal timings in line with the 5th Edition of the Institute of Transportation Engineers *Traffic Engineering Handbook*. To maintain regional consistency, KE calculated red and yellow clearance intervals and pedestrian clearance times for proposed and updated signals using this guidance. Additionally, for the Full Access Signalized Intersection and the Two Signalized T-Intersections alternatives, it was assumed that a pedestrian (walking at 3.5 feet per second) would cross Egan Drive in two stages, finding refuge in the median. The Partial Access Signal alternative operated acceptably assuming a single stage pedestrian crossing.

Assumptions were made about the implementation of the median crossovers. After speaking with the DOT&PF Maintenance and Operations (M&O), it was assumed that it would take approximately 40 minutes after the crash to complete the median crossover set up. It was assumed that M&O personnel would be at another work site when the crash occurs. M&O would need to close the existing work site and travel to the workshop to gear up to set up the traffic control before heading towards the crash scene and beginning to set up the median crossovers. Once a crash occurs, it was assumed that northbound vehicles would detour to Yandukin Drive, Old Dairy Road, then Glacier Nugget Highway to get back on Egan Drive. Vehicles making this movement would need to yield to southbound Egan Drive vehicles, which are unaffected by the crash. When the median crossovers are set up, only Egan Drive through movements would be allowed. Westbound vehicles from Glacier Lemon Road desiring to enter Egan Drive would need to travel to the Sunny Point Interchange. Similarly, southbound left turns from Egan Drive to Glacier Lemon Road would need to use the Sunny Point Interchange.

3 Level 2 Alternatives

This section presents the alternative combinations advanced from the Level 1 screening and analyzed under the Level 2 screening.

The alternatives were screened and ranked against each other using the Level 2 criteria. Two variants of each alternative were included in the Level 2 screening. One variant added the Median Crossover treatment (except for the Two Signalized T-Intersections alternative, which would allow additional routes when there is a crash without the median crossover treatment), and the other variant included a two-way frontage road to the Glacier Nugget intersection (Glacier Lemon Spur Extension). By analyzing the two variants, the analysis verified that each main alternative was paired with a viable method for reducing delay when a crash occurs by providing an alternate route.

Three additional compatible elements were assumed to be included in all the build alternatives when applicable:

- Traffic Demand Management (TDM),
- Intelligent Transportation Systems (ITS), and
- Flashing Intersection Ahead or Signal Ahead Signs.

More detail regarding TDM and ITS programs are discussed in Appendix E.

3.1 No Build

The No Build alternative assumes implementation of the recommended interim action measures proposed in the HSIP nomination for the E-Y intersection, which include:

- Reducing the speed limit on Egan Drive from 55 miles per hour (mph) to 45 mph November through January near the E-Y and Glacier Nugget intersections
- Installing left-turn median striping with recessed pavement markers
- Installing an offset, northbound, right-turn lane with recessed pavement markers

Figure 1 depicts the No Build condition.

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Figure 1: No Build Concept Design

3.2 Build Alternatives

3.2.1 Mobility

The Mobility alternative improves on the No Build improvements (which are expected to improve safety over the existing condition) by addressing the mobility needs in the study area. This alternative focuses on the movement of vehicles when a crash occurs, blocking Egan Drive, as well as pedestrian and bicycle safety and mobility. The median crossover element was added to evaluate one method of allowing Egan Drive traffic to keep moving when a crash occurs. The grade-separated pedestrian crossing element would allow pedestrians and bicycles to cross Egan Drive closer to the E-Y intersection.

Figure 2 presents the design concept for the Mobility alternative. A description of the median crossover treatment can be found in Section 4.1.4.2.

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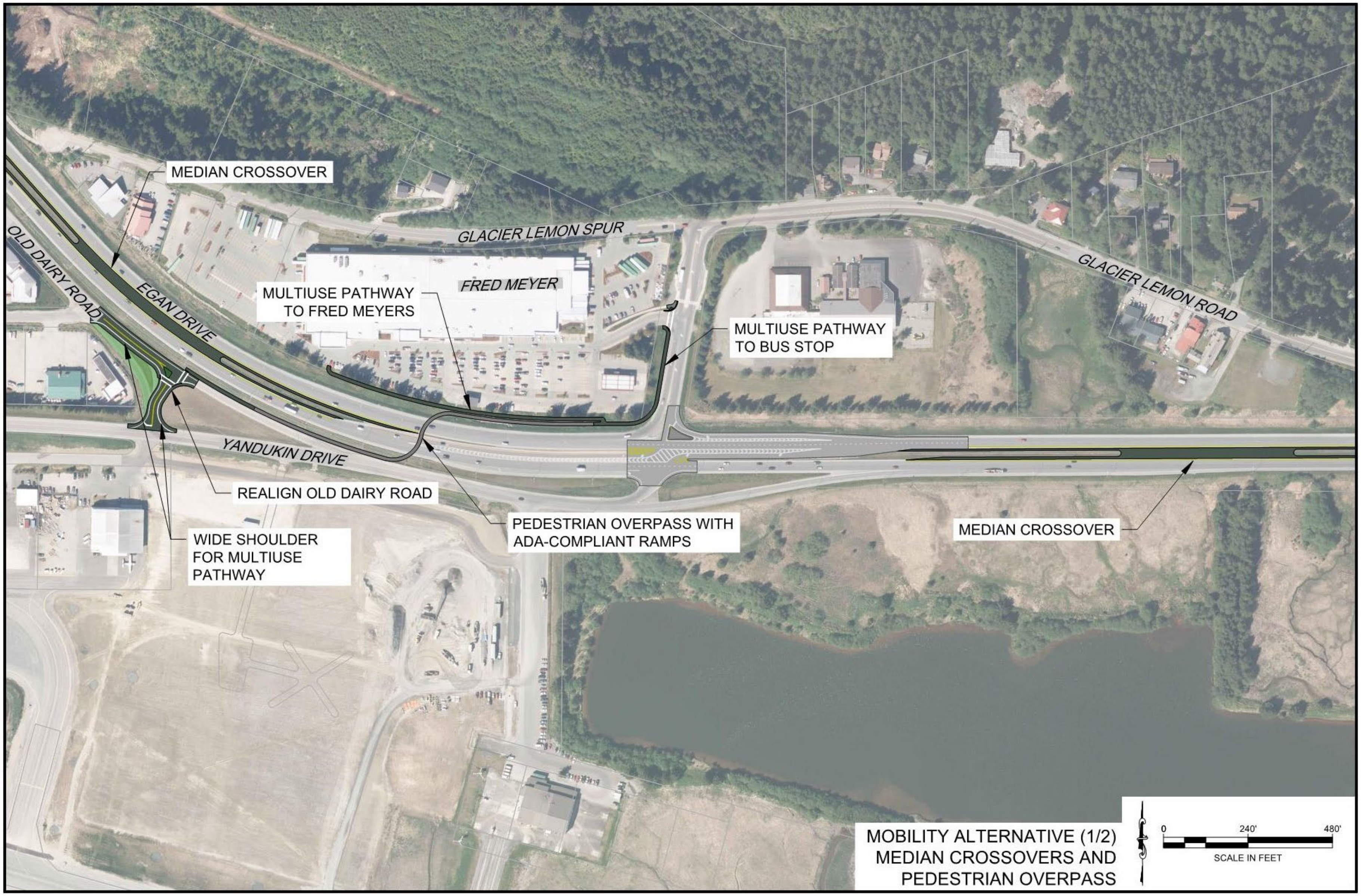

Figure 2: Mobility Concept Design

3.2.2 Partial Access Signal

The Partial Access Signal alternative would signalize the E-Y intersection but would only allow currently permitted vehicle movements (no left turns or through movements from the side streets would be allowed). A signalized crossing would be provided for pedestrians and bicyclists to cross Egan Drive at the E-Y intersection, similar to the signalized crossing at the Glacier Nugget intersection. Adding median crossovers met the need for an alternate driving route during a crash. The median crossover element was added to evaluate one method of allowing Egan Drive traffic to keep moving when a crash occurs.

Figure 3 presents the conceptual design of the Partial Access Signal.

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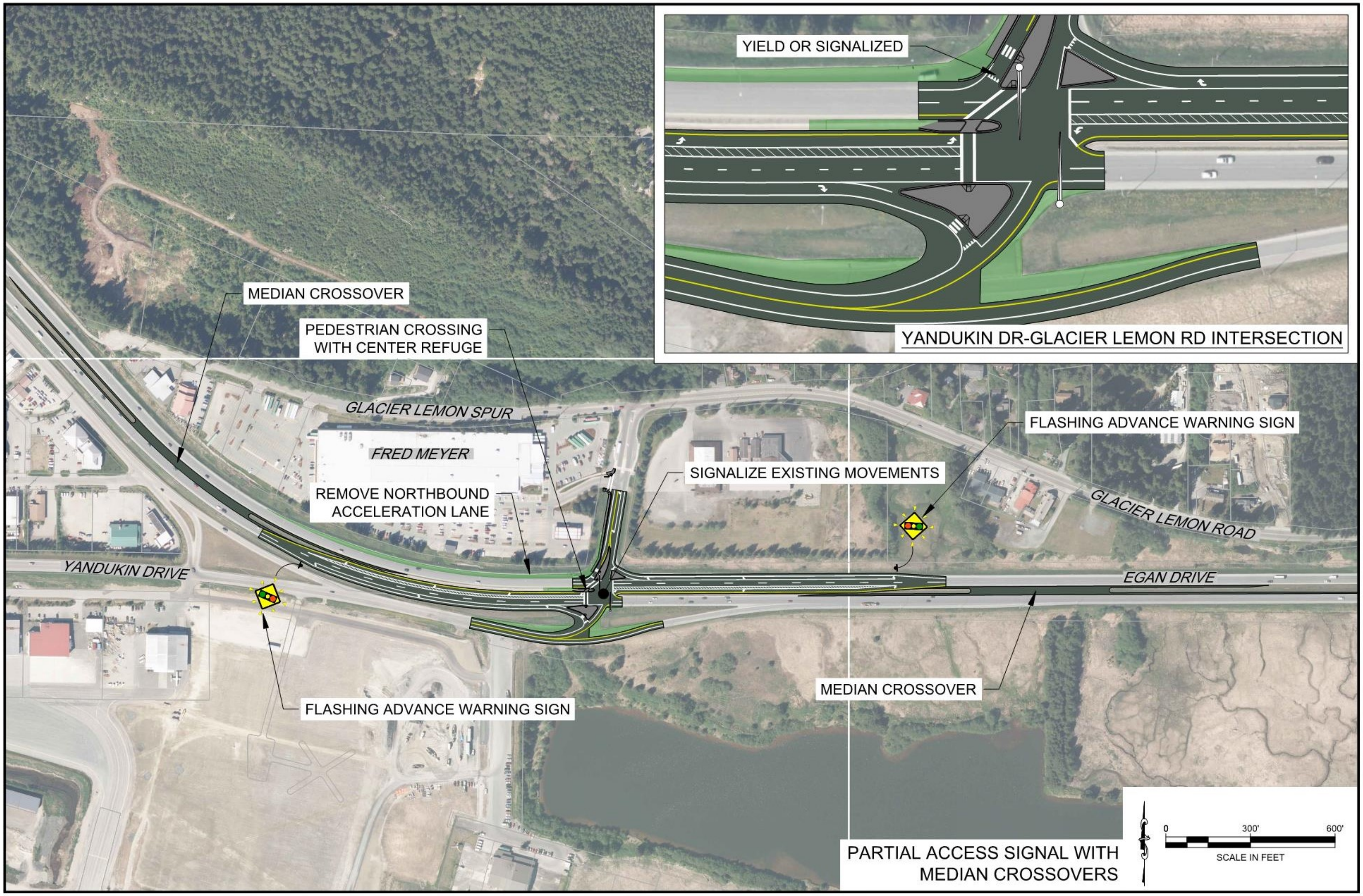

Figure 3: Partial Access Signal Concept Design

3.2.3 Full Access Signal

The Full Access Signal alternative would signalize the E-Y intersection and reconstruct the approaches to allow all vehicle movements at the intersection. A signalized crossing of Egan Drive would be provided for pedestrians and bicyclists at the E-Y intersection, similar to the signalized crossing at the Glacier Nugget intersection. The median crossover element was added to evaluate one method of allowing Egan Drive traffic to keep moving when a crash occurs.

Figure 4 presents the conceptual design of the Full Access Signal with median crossovers.

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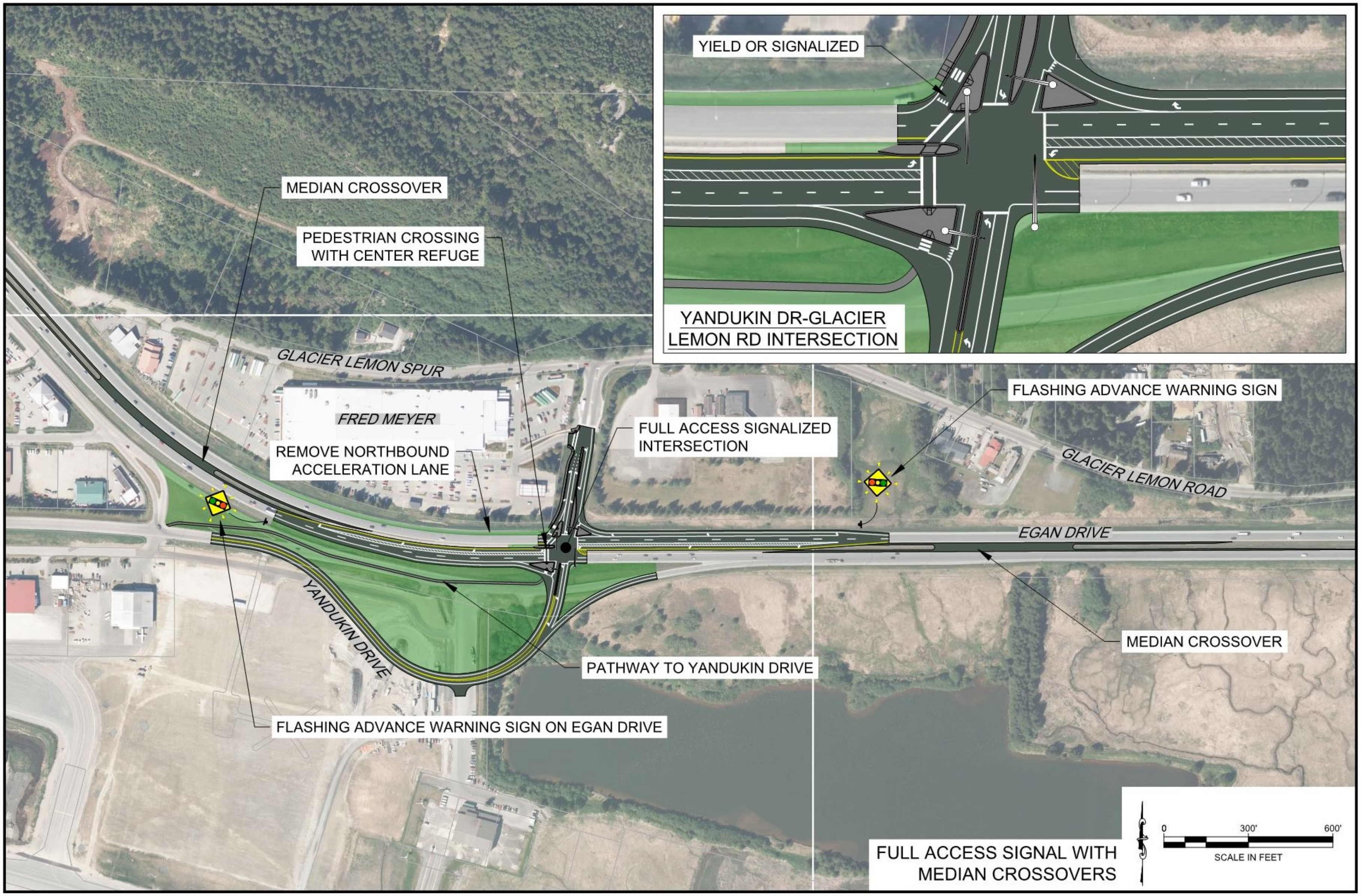

Figure 4: Full Access Signal Concept Design

3.2.4 Two Signalized T-Intersections

The Two Signalized T-Intersections alternative would separate the E-Y intersection into two signalized T-intersections, with the Yandukin Drive intersection moved southeast of the Juneau Christian Center. Separating the E-Y intersection into two intersections would provide detour routes when there is a crash. This alternative meets all baseline purpose and need elements without the addition of other compatible elements since the Two Signalized T-Intersections alternative inherently provides an alternate route in the event of a crash without needing to manually set up temporary traffic control devices. A signalized crossing of Egan Drive would be provided for pedestrians and bicyclists at the Glacier Lemon intersection, similar to the signalized crossing at the Glacier Nugget intersection.

Figure 5 presents the conceptual design of the Two Signalized T-Intersections.

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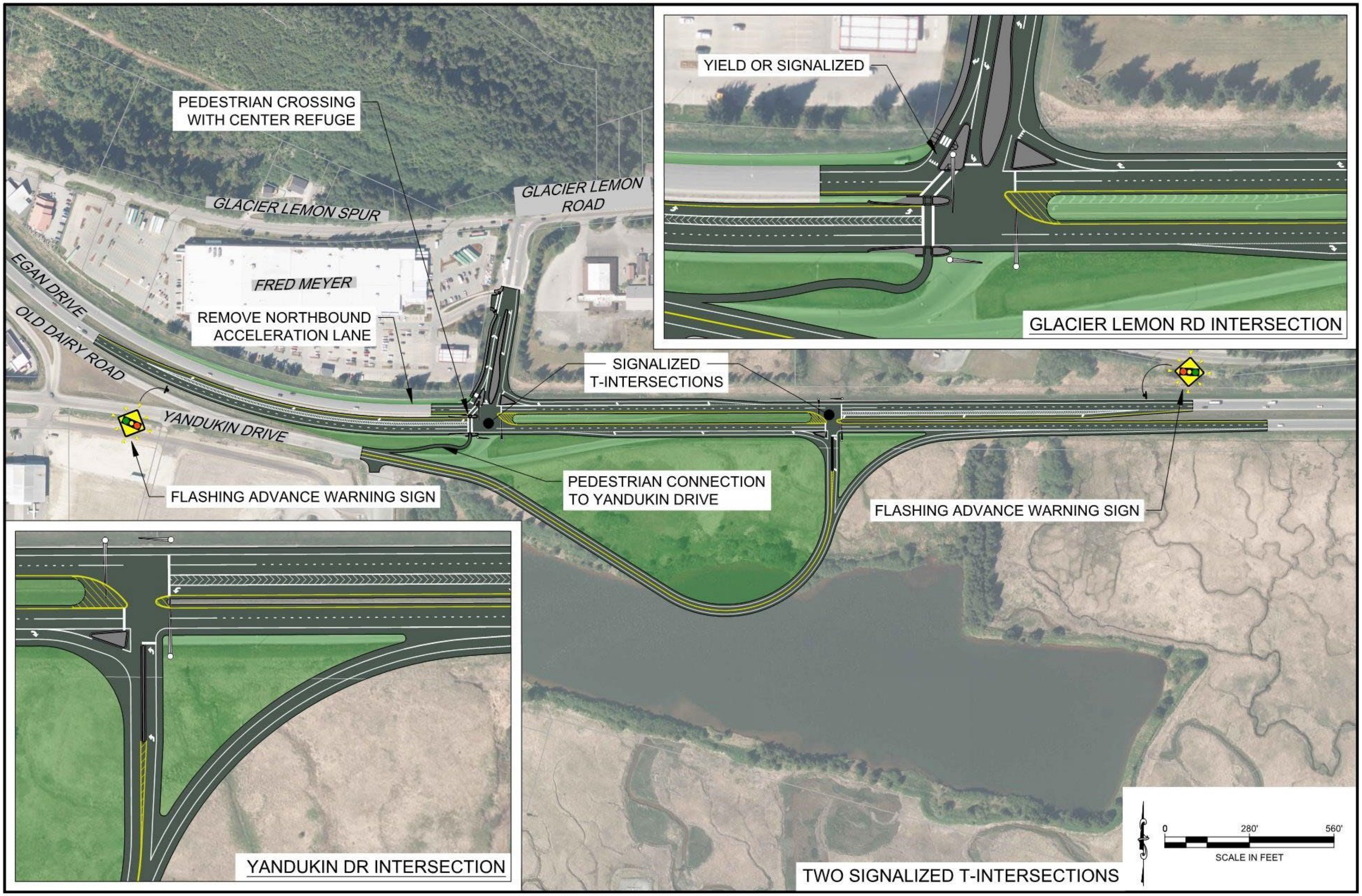

Figure 5: Two Signalized T-Intersections Concept Design

3.2.5 Diamond Interchange

Th Diamond Interchange alternative would convert the E-Y intersection into a diamond interchange. Egan Drive would be elevated over the Yandukin Drive intersection, separating high-speed Egan Drive traffic from other movements and allowing it to flow without interruption. Traffic would use ramps to enter and exit Egan Drive; ramp and side street traffic would be controlled by single lane roundabouts at the ramp intersections. A pedestrian crossing would be provided under Egan Drive. The Glacier Lemon Spur Extension was added to evaluate one method of allowing Egan Drive traffic to keep moving when a crash occurs.

Figure 6 presents the conceptual design of the Diamond Interchange with the Glacier Lemon Spur Extension.

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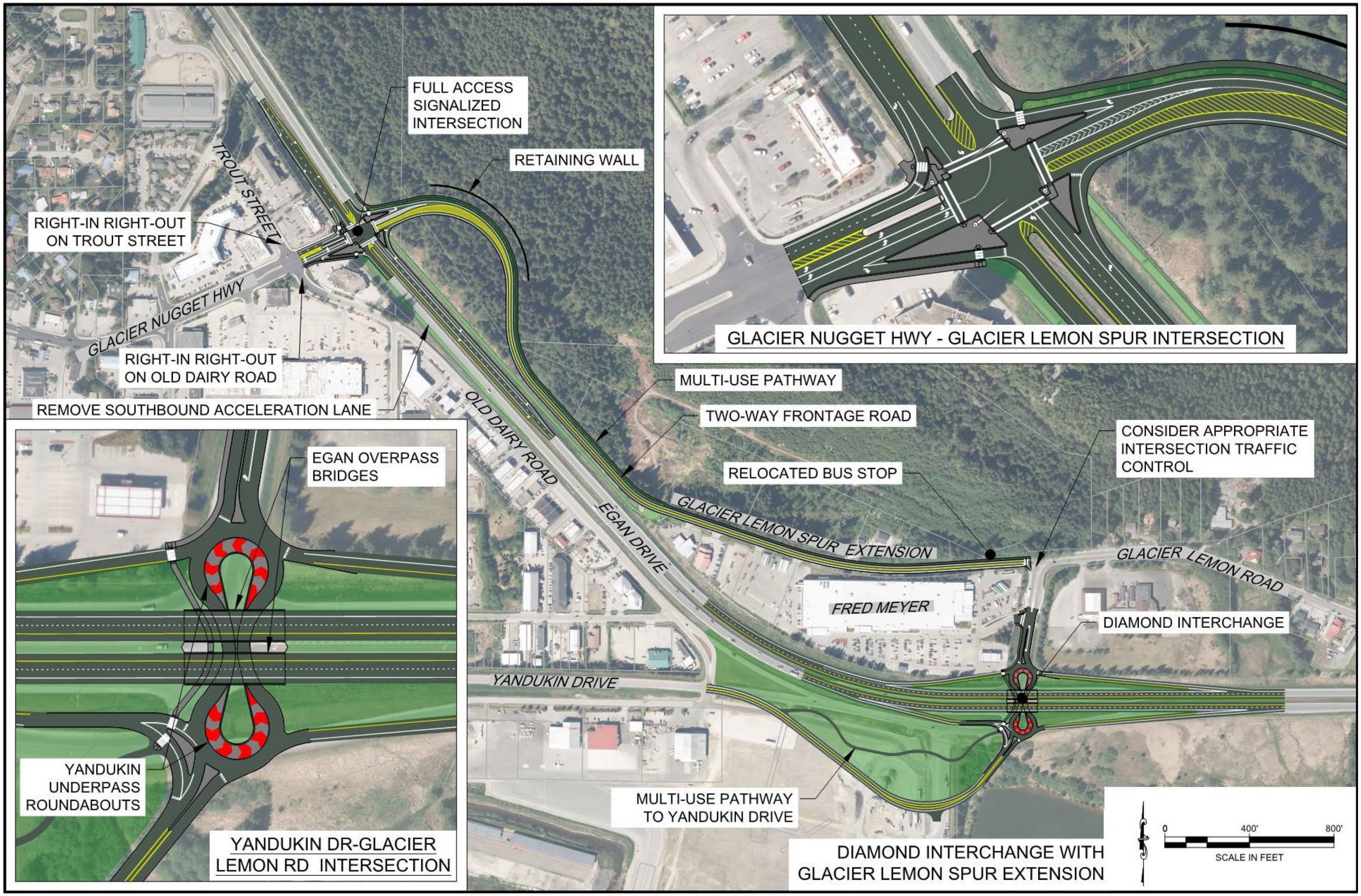

Figure 6: Diamond Interchange Concept Design

4 Methodology and Detailed Results

This section describes the general methodology used for each screening criterion and the specific results for each alternative. For each criterion, a target level was established, and each alternative was ranked from 1 to 5 based on how well they met the target, with 1 indicating alternatives that did very poorly as compared to the target value and 5 indicating alternatives that met or exceeded the target value. The scores for the crash frequency and crash severity criteria were multiplied by two, resulting in a score range of 1 to 10. The scores are presented in Table 1 in a summary of all alternatives and in chapter 5 for each alternative individually.

4.1 Purpose and Need Elements

The purpose and need statement (see Appendix A Purpose and Need) indicates the primary need for this project is safety, which is measured as crash frequency, crash severity, and non-motorized crash frequency. Two secondary needs were identified: travel time reliability, which refers to the ability to detour around a crash when it occurs, and non-motorized accessibility, which is focused on the ability of pedestrians and bicyclists to cross Egan Drive at the E-Y intersection. The following sections describe the methods used to evaluate the criteria for all purpose and need elements.

4.1.1 Safety: Crash Frequency

Crash frequency was forecasted for the 20-year design life of the project using Method 4 in the *Highway Safety Manual* (HSM), Section 7.4.1, Estimating Change in Crashes for a Proposed Project. The method predicts future crashes based on the observed crash frequency at the existing intersections and forecasted volumes to predict the No Build crash frequency.

The baseline crash frequency is the total number of forecasted crashes at the combined E-Y and Glacier Nugget intersections over a 20-year period. Because the HSIP nomination for the E-Y intersection has been funded, the No Build alternative assumes the HSIP project would be built, and the 20-year No Build crash frequency was reduced by the expected crash reduction due to the HSIP treatment, as presented in the HSIP nomination documentation.

The expected crash frequency for the build alternatives were developed by multiplying the baseline crash frequency by the expected Crash Modification Factor (CMF) associated with each alternative. CMFs are an estimate of the percent change in the number of crashes at a location if a specific treatment is implemented. Predicted crash frequencies for the alternatives were determined by applying the CMFs associated with each alternative to the No Build baseline crash frequency. The CMF for forecasting crashes at the Glacier Nugget intersection for the alternatives with the Glacier Lemon Spur Extension was developed using the ratio of Safety Performance Functions found in the HSM, which predict the number of crashes based on intersection characteristics, including the number of approach legs.

Table 4 presents the total number of forecasted crashes at the E-Y and Glacier Nugget intersections over the 20-year period.

Table 4: 20-Year Total Forecasted Crashes at E-Y and Glacier Nugget Intersections

Alternative	20-Year Forecasted Crash Frequency[1] (total at E-Y and Glacier Nugget intersections)
No Build	295
Mobility with Median Crossovers	295
Mobility with Glacier Lemon Spur Extension	299
Partial Access Signal with Median Crossovers	277
Partial Access Signal with Glacier Lemon Spur Extension	282
Full Access Signal with Median Crossovers	265
Full Access Signal with Glacier Lemon Spur Extension	281
Two Signalized T-Intersections	268
Two Signalized T-Intersections with Glacier Lemon Spur Extension	283
Diamond Interchange with Median Crossovers	245
Diamond Interchange with Glacier Lemon Spur Extension	263

[1] Crash frequency assumes predicted crash reduction from construction of HSIP nominated project.

The alternatives with the Glacier Lemon Spur Extension are predicted to have more total crashes compared to the alternatives without the extension because it adds another leg to the intersection, increasing the number of movements that vehicles can conflict with.

Without the spur extension, forecasted Glacier Nugget volumes were expected to be the same as the No Build alternative for the Mobility and Partial Access Signal alternatives, resulting in no crash reduction at Glacier Nugget. The remaining alternatives have full access at the E-Y intersection, which redistributed some volumes to E-Y, resulting in the Glacier Nugget intersection having less volume than the No Build alternative and reducing the Glacier Nugget crash frequency.

The Mobility alternative with the Glacier Lemon Spur Extension has the highest predicted number of crashes of all the alternatives since no change in crashes were predicted at the E-Y intersection, and the Glacier Lemon Spur Extension is forecast to increase crashes at the Glacier Nugget intersection.

The project team chose to multiply by two the scores for the crash frequency and crash severity metrics; this was done to recognize that safety improvements were identified as the primary need for the project and, therefore, the safety-related metrics are emphasized compared to other metrics in the results.

4.1.2 Safety: Crash Severity

The methodology used to forecast crashes was also used to forecast the severity of crashes over the 20-year period. Similar to crash frequency, the HSIP nomination was assumed to be built and the No Build crash severity was reduced by the predicted crash severity reduction from the HSIP project prior to applying alternative CMFs. High severity was considered to be a major injury (i.e., sustaining injuries usually resulting in hospital transport) or fatality.

Table 5 presents the total number of forecasted high-severity crashes at the E-Y and Glacier Nugget intersections over a 20-year period under each alternative.

Table 5: 20-Year Total Forecasted High Severity Crashes at E-Y and Glacier Nugget Intersections

Alternative	20-Year Forecasted High Severity Crashes[1] (total at E-Y and Glacier Nugget intersections)
No Build	8
Mobility with Median Crossovers	8
Mobility with Glacier Lemon Spur Extension	7
Partial Access Signal with Median Crossovers	5
Partial Access Signal with Glacier Lemon Spur Extension	4
Full Access Signal with Median Crossovers	5
Full Access Signal with Glacier Lemon Spur Extension	5
Two Signalized T-Intersections	5
Two Signalized T-Intersections with Glacier Lemon Spur Extension	5
Diamond Interchange with Median Crossovers	4
Diamond Interchange with Glacier Lemon Spur Extension	4

[1] Severe crash frequency assumes predicted crash reduction from construction of HSIP nominated project.

High severity crashes are predicted to be similar between build alternatives with and without the Glacier Lemon Spur Extension. The difference in crashes with and without the Glacier Lemon Spur Extension for the Mobility and Partial Access Signal alternatives is due to the volumes redistributing from the E-Y intersection to use the extension road. In contrast, the remaining build alternatives provide two locations to cross Egan Drive, resulting in fewer vehicles shifting to the Glacier Lemon Spur Extension.

The Diamond Interchange alternatives are predicted to have the lowest number of high severity crashes among the alternatives. The Diamond Interchange separates high-speed Egan Drive vehicles from the lower-speed vehicles on Yandukin Drive and Glacier Lemon Road, and there are fewer vehicles at the ramp intersections.

The project team chose to multiply by two the scores for the crash frequency and crash severity metrics; this was done to recognize that safety improvements were identified as the primary need for the project and, therefore, the safety-related metrics are emphasized compared to other metrics in the results.

4.1.3 Safety: Bicycle and Pedestrian Crash Frequency

Bicycle and pedestrian safety were analyzed qualitatively based on characteristics that are known to affect the number and severity of bicycle and pedestrian crashes, such as conflicting traffic volumes and movements, vehicle speed, and traffic control type. These characteristics were analyzed for each alternative using a qualitative point system, as shown in Table 6, with higher points given to factors that are considered more likely to result in a non-motorized crash or in higher non-motorized crash severity. Alternatives with fewer non-motorized, crash-likelihood points received higher ranking scores.

Table 6: Qualitative Point System for Bicycle and Pedestrians Crash Safety

Qualitative Factors	Qualitative Points	Reason of Point Weighting
Volume of unsignalized traffic	1.0 per 1,000 vehicles	Pedestrians cross unsignalized traffic; higher likelihood of a crash compared to signalized traffic
Volume of signalized traffic	0.5 per 1,000 vehicles	Pedestrians are provided their own time to cross traffic; lower likelihood of crash compared to unsignalized traffic
Conflicting permissive left turns from side streets	1.0 per left turn movement	Permissive left movements present; higher likelihood of crash compared to if left turns had a protected phase or no permissive left turns were present
Number of lanes crossing uncontrolled lanes (≥45 mph)	1.0 per lane	Pedestrians crossing lanes on high-speed road with uncontrolled vehicles; higher likelihood of a high-severity crash compared to controlled vehicles on low-speed roads
Number of lanes crossing controlled lanes (≥45 mph)	0.5 per lane	Pedestrians cross on high-speed road; however, vehicles are controlled (yield, stop, or signal controls); lower likelihood of a crash compared to uncontrolled vehicles, but a higher likelihood compared to controlled vehicles on low-speed roads
Number of lanes crossing uncontrolled lanes (<45 mph)	0.5 per lane	Lanes are uncontrolled; however, speeds are low; lower likelihood of a high-severity crash compared to uncontrolled vehicles on high-speed roads, but a higher likelihood compared to controlled vehicles on low-speed roads
Number of lanes crossing controlled lanes (<45 mph)	0.25 per lane	Pedestrians cross low-speed roads and vehicles are controlled (yield, stop, or signal controls); lower likelihood of a high-severity crash compared to uncontrolled vehicles on high-speed roads

Pedestrians are currently prohibited from crossing at the E-Y intersection. The official route to cross Egan Drive within the study area is for pedestrians to travel to and cross at the Glacier Nugget intersection. However, pedestrians have been observed to cross at Yandukin Drive, which is less safe compared to the signalized crossing at Glacier Nugget. For the purpose of analyzing bicycle and pedestrian safety, the least safe crossing was analyzed for the No Build alternative.

The Glacier Lemon Spur Extension changes the pedestrian crossings at the Glacier Nugget intersection, removing free right-turn movements where pedestrians are crossing; therefore, the change in point value for crossing the Glacier Nugget intersection was added to the alternatives that included the Glacier Lemon Spur Extension.

Table 7 presents the total number of non-motorized, crash-likelihood points for pedestrians and bicycles crossing Egan Drive for each alternative.

Table 7: Total Number of Non-Motorized, Crash-Likelihood Points

Alternative	Total Non-Motorized, Crash-Likelihood Points
No Build	12.62
Mobility with Median Crossovers	0.00
Mobility with Glacier Lemon Spur Extension	0.52
Partial Access Signal with Median Crossovers	6.07
Partial Access Signal with Glacier Lemon Spur Extension	6.31
Full Access Signal with Median Crossovers	6.91
Full Access Signal with Glacier Lemon Spur Extension	7.58
Two Signalized T-Intersections	5.65
Two Signalized T-Intersections with Glacier Lemon Spur Extension	6.32
Diamond Interchange with Median Crossovers	2.61
Diamond Interchange with Glacier Lemon Spur Extension	3.00

The No Build alternative received the highest number of non-motorized, crash-likelihood points because under the No Build alternative (even with the HSIP-nominated project), pedestrians and bicycles cross seven unsignalized lanes with high speeds and high-traffic volumes at the E-Y intersection. The Mobility alternatives received the lowest score since pedestrians would be grade separated from Egan Drive traffic, eliminating conflicts between vehicles and pedestrian/bicycles. An increase in non-motorized crash likelihood was assumed for the Glacier Lemon Spur Extension since the introduction of through volumes on the side street increases the overall number of lanes crossed. Note that the concept design for changes at the Glacier Nugget intersection due to the Glacier Lemon Spur Extension included several features aimed at improving pedestrian and bicycle safety as much as possible, including removing free right turns.

The grade-separated pedestrian bridge, included in the Mobility alternative, outperforms the other alternatives on this metric since it eliminates the conflicts between pedestrian/bicycles and vehicles. Based on this result (and similar improvements for accessibility), the pedestrian bridge is recommended to be added to all the build alternatives except for the Diamond Interchange to help alternatives better meet the project purpose and needs. The Diamond Interchange alternatives inherently include a separated pedestrian crossing in their design.

4.1.4 Alternate Driving Routes: Travel Time Reliability

To measure how the different alternatives would affect the ability to keep traffic moving when a crash occurs, one specific crash situation that is known to impact traffic at the E-Y intersection was analyzed. As shown in Figure 7, the example crash closes all northbound traffic lanes just past the Yandukin Drive intersection, blocking all traffic from heading north from the E-Y intersection towards Mendenhall Valley. The only current detour outlet is a northbound left turn onto Yandukin Drive toward the airport. It is assumed that the crash occurs during the PM peak hour. This detailed analysis of this one crash situation is expected to be representative of the impacts of the alternatives under other similar crash situations.

Figure 7: Crash Location for No Build

Table 8 shows the overall combined delay for vehicles that are affected when a crash of this type occurs, measured in vehicle-hours. Vehicle-hours is the sum of the delay experienced by all vehicles from when the crash occurs until the crash is cleared and all queues have dissipated. Results are shown for all alternatives.

Table 8: Vehicle Delay when a Crash Occurs (PM Peak, Northbound Lanes Closed)

Alternative	Delay When a Crash Occurs in the PM Peak (vehicle-hours)
No Build	505
Mobility with Median Crossovers	300
Mobility with Glacier Lemon Spur Extension	349
Partial Access Signal with Median Crossovers	300
Partial Access Signal with Glacier Lemon Spur Extension	349
Full Access Signal with Median Crossovers	296
Full Access Signal with Glacier Lemon Spur Extension	423
Two Signalized T-Intersections	534
Two Signalized T-Intersections with Glacier Lemon Spur Extension	402
Diamond Interchange with Median Crossovers	263
Diamond Interchange with Glacier Lemon Spur Extension	409

4.1.4.1 No Build: Delay During a Crash

Figure 8 summarizes the incident events that were assumed for the analysis for the No Build alternative, based on input from highway users and DOT&PF M&O. The analysis assumes that the northbound lanes are fully closed for a half-hour after a crash occurs while victims are treated, one northbound lane is then opened, clean up continues after the first lane is opened, and the northbound lanes are fully opened after 45 minutes.

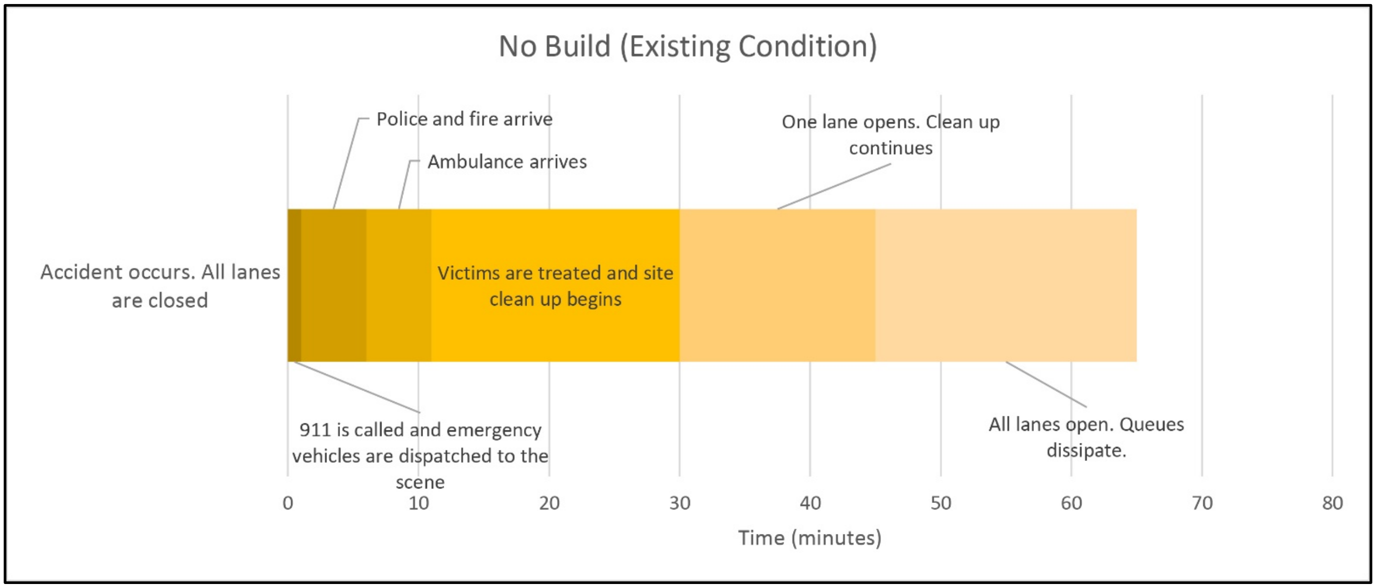

Figure 8: Assumptions Regarding Emergency Response and Clean Up After a Crash for No Build

Figure 9 shows the assumptions of how traffic would detour when the crash occurs under the No Build alternative. Northbound traffic stops on Egan Drive and waits for the crash to clear. Some northbound vehicles can turn left and use Old Dairy Road to bypass the crash; however, these vehicles must wait for gaps in the southbound traffic, which is unaffected.

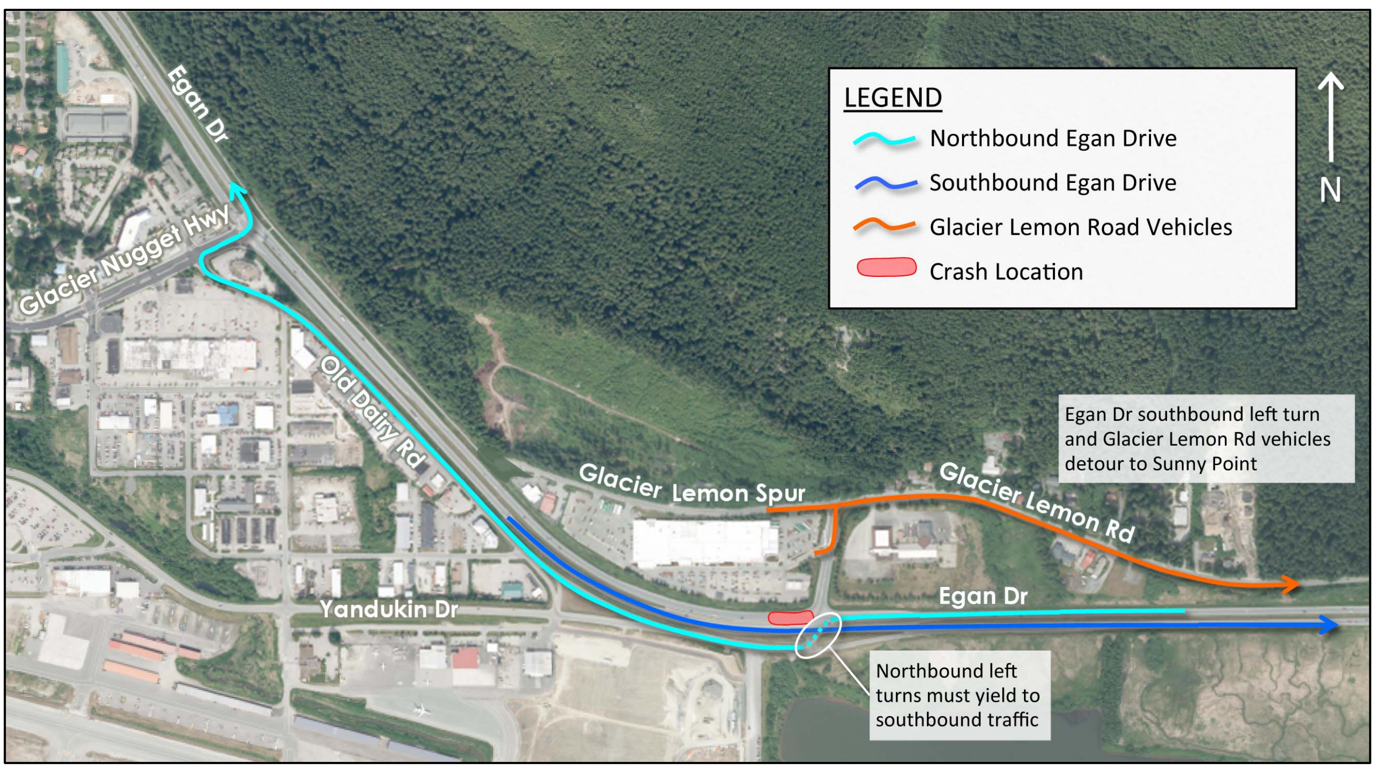

Figure 9: Detour Route under No Build Alternative

The delay to vehicles that stay on Egan Drive is measured using demand-capacity curves, such as the one in Figure 10 showing the Egan Drive delay for the No Build alternative. The vehicle-hours of delay is the area between the demand curve (blue line) and the capacity curve (orange line). The vehicle-hours of delay to vehicles that detour from Egan Drive to take another route is measured as the difference between the travel time under normal conditions (with no crash) and the travel time with the incident, multiplied by the number of vehicles taking the alternate route.

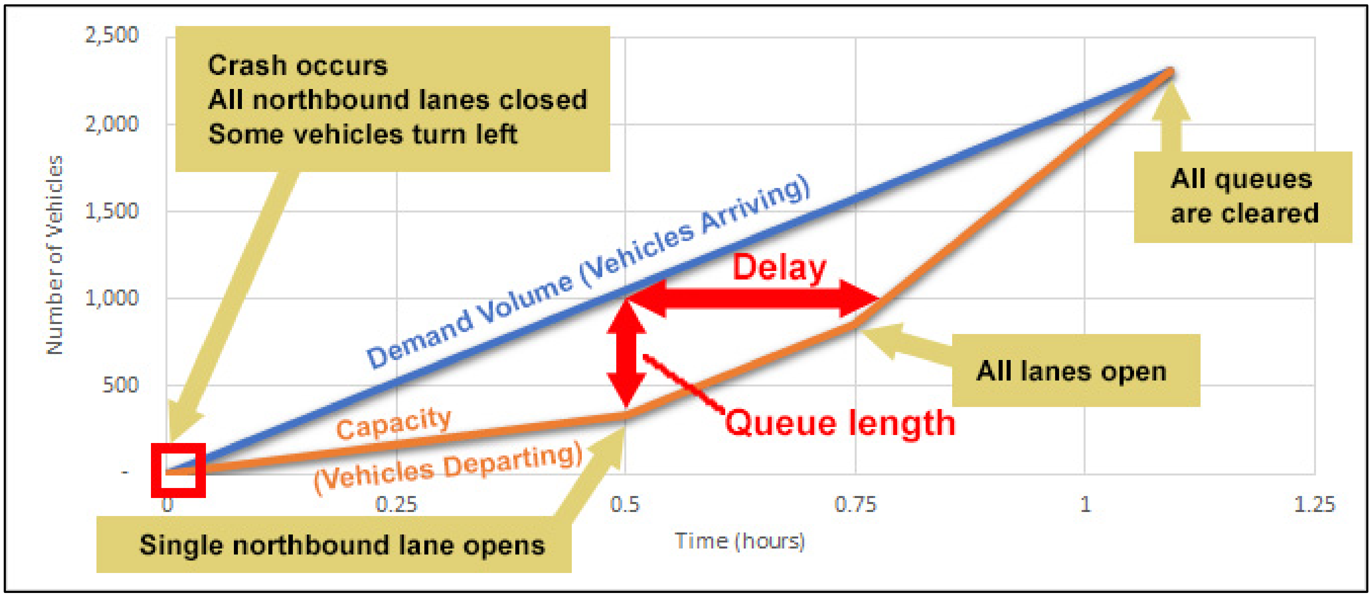

Figure 10: Demand-Capacity Curve for No Build Alternative in 2040, Northbound PM Peak

4.1.4.2 Median Crossovers: Delay During a Crash

Under the alternatives with median crossovers, traffic initially detours similar to the No Build alternative until DOT&PF M&O staff can arrive on scene and set up the traffic control for the crossover. Figure 11 shows the detour routes once traffic control is set up. Notice that traffic would not be able to turn left at the Yandukin/Glacier Lemon Spur intersection once traffic control is established.

Figure 12 summarizes the incident events that were assumed for the analysis for the median crossovers, based on input from highway users and DOT&PF M&O. The analysis assumes that the northbound lanes are fully closed when a crash occurs. Both emergency vehicles and M&O are dispatched as quickly as possible. M&O staff were presumed to be out at a work site performing maintenance at the time of the crash. As such, it would take approximately 40 minutes for M&O staff to secure their work site, gather traffic control equipment, then set up the crossover. Thus, the median crossover is set up shortly before the northbound lanes are fully opened 45 minutes after the crash occurs.

Based on the understanding that it will take nearly as long to set up the traffic control for the median crossover treatment as it would take to clear the roadway after a crash, the median crossover treatment is not recommended as it does not provide a significant benefit when there is a crash.

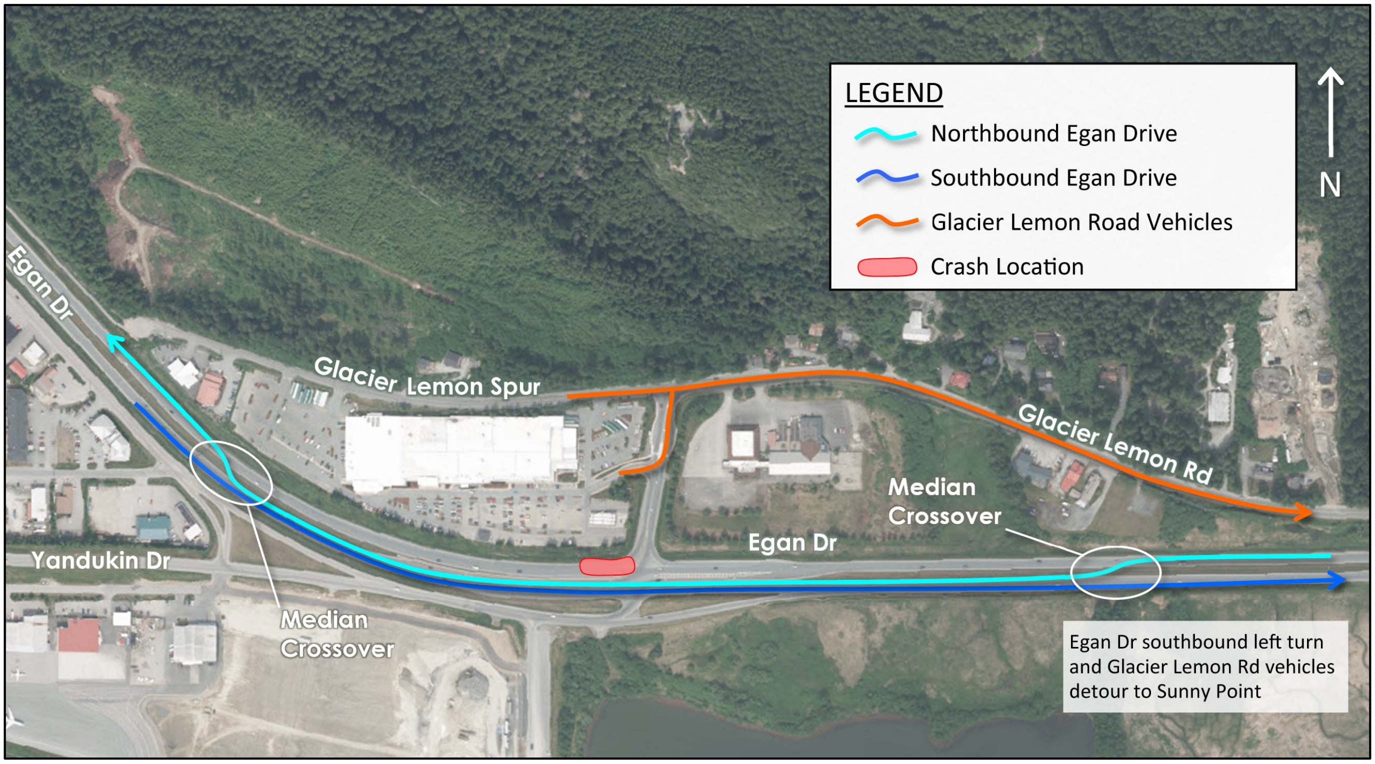

Figure 11: Detour Route under Median Crossover Element After Median Crossover Traffic Control is Set Up

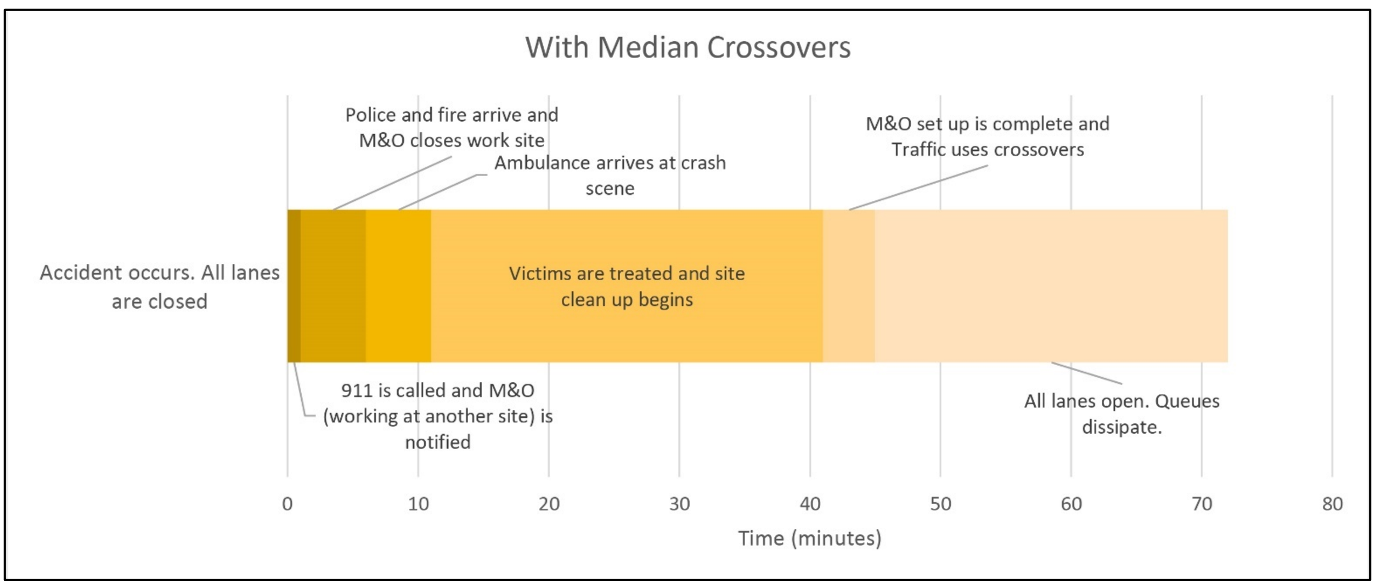

Figure 12: Assumptions Regarding Emergency and M&O Response and Clean Up After a Crash for Median Crossovers

4.1.4.3 Extension of Glacier Lemon Spur: Delay During a Crash

Under the alternatives with the extension of the Glacier Lemon Spur to the Glacier Nugget intersection, traffic has additional choices for how to detour around the crash. Figure 13 shows the detour routes under this scenario.

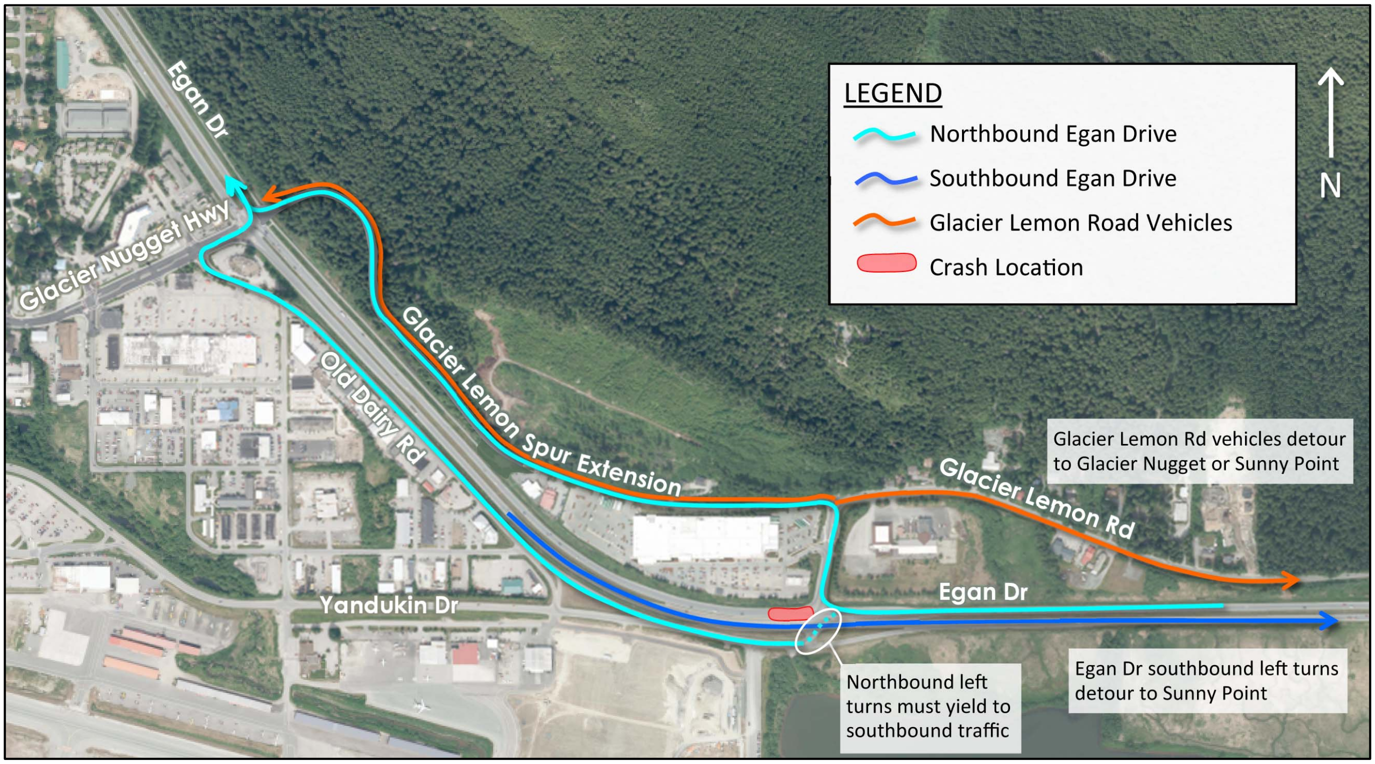

Figure 13: Detour Route under Extension of Glacier Lemon Spur

Figure 14 summarizes the incident events that were assumed for the analysis for the Glacier Lemon Spur Extension, based on input from highway users and DOT&PF M&O. The analysis assumes that the northbound lanes are fully closed for a half-hour after a crash occurs, one northbound lane is opened after victims are treated and clean up has begun, and the northbound lanes are fully opened after 45 minutes.

The extension of Glacier Lemon Spur to the Glacier Nugget intersection is shown to be a benefit in providing a way to reduce the impact of a crash on delay to Egan Drive traffic.

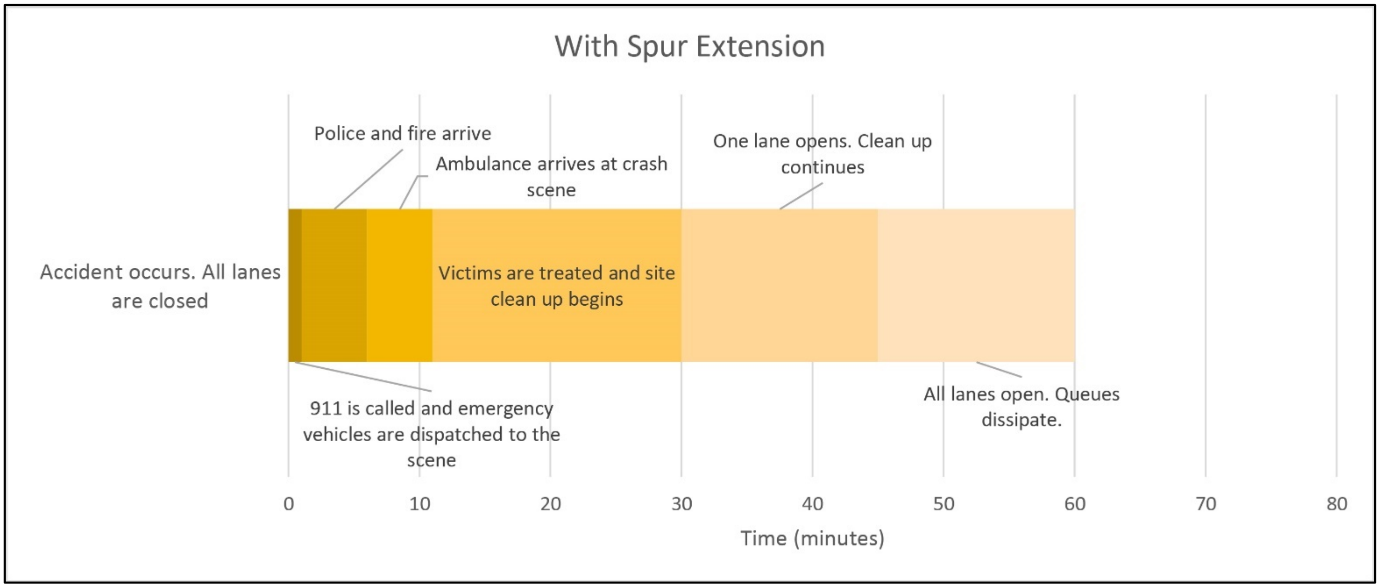

Figure 14: Assumptions Regarding Emergency Response and Clean Up After a Crash for Extension of Glacier Lemon Spur

4.1.5 Non-motorized Accessibility

Non-motorized accessibility was scored by calculating the time it would take a pedestrian to travel from one side of Egan Drive to the other. Businesses generating pedestrian and bicycle activities include the Nugget Mall, bus stops, Fred Meyer, and the strip of businesses along Old Dairy Road. The proposed relocation of the Glory Hall emergency housing shelter is expected to generate more pedestrian traffic for the area.

Almost 60 pedestrians were observed crossing Egan Drive during a 6-hour count at the Glacier Nugget intersection in 2017, with more estimated to have crossed during the hours when traffic was not counted. The Glory Hall emergency housing shelter, proposed to be relocated near Teal Street and Alpine Avenue, could potentially increase the number of pedestrians crossing Egan Drive; the shelter is expected to have 40 emergency shelter beds and the day room has a capacity of 120 people.

Travel time was calculated between two southern central zones on either side of Egan Drive: the proposed Glory Hall emergency housing shelter on the Yandukin Drive side and Fred Meyer. The total travel time includes the time it takes for a pedestrian to walk the distance between the shelter and Fred Meyer, and the average pedestrian delay to cross Egan Drive in both directions (to and from Fred Meyer).

Figure 15 presents the travel paths measured for the alternatives. The travel route for the No Build alternative assumes pedestrians travel to the Glacier Nugget signal to cross Egan Drive because it is currently the official Egan Drive crossing for the study area and no pedestrian crossing facilities are available at the E-Y intersection. Pedestrians under the build alternatives are routed to cross at the E-Y intersection if a crossing is provided as part of the alternative. Note that only the delay for crossing Egan Drive was used in the calculations; no other intersection-related delay was included.

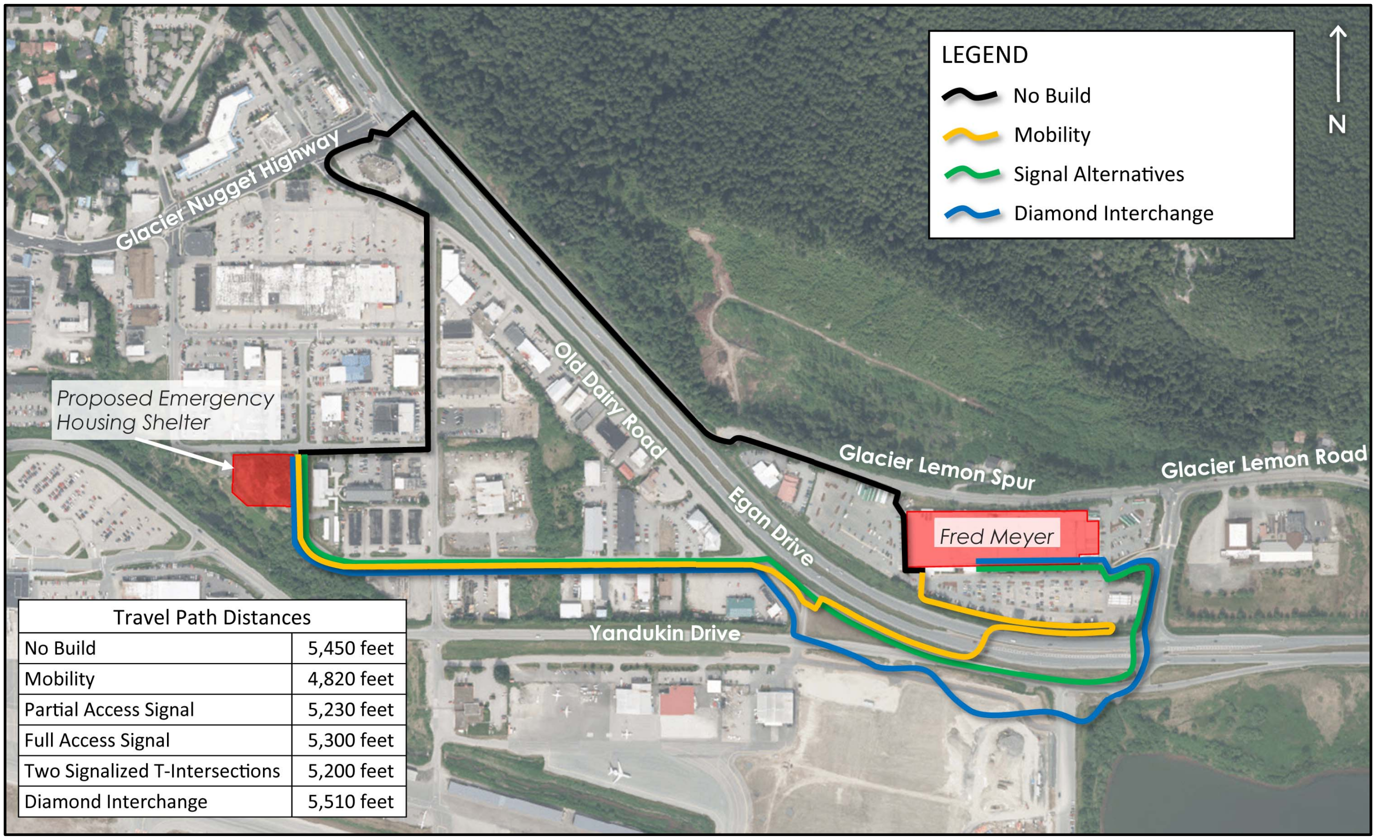

Figure 15: Pedestrian and Bicycle Travel Paths

Table 9 presents the average pedestrian travel time to walk between the proposed relocated Glory Hall emergency housing shelter and Fred Meyer. A walking speed of 3.5 feet per second was assumed in the calculations.

Table 9: Average Pedestrian Travel Time between the Emergency Housing Shelter and Fred Meyer

Alternative	Average Travel Time between Glory Hall and Fred Meyer (minute/pedestrian)
No Build	27.2
Mobility with Median Crossovers	23.0
Mobility with Glacier Lemon Spur Extension	23.0
Partial Access Signal with Median Crossovers	26.5
Partial Access Signal with Glacier Lemon Spur Extension	25.9
Full Access Signal with Median Crossovers	26.6
Full Access Signal with Glacier Lemon Spur Extension	26.3
Two Signalized T-Intersections	26.3
Two Signalized T-Intersections with Glacier Lemon Spur Extension	25.9
Diamond Interchange with Median Crossovers	26.4
Diamond Interchange with Glacier Lemon Spur Extension	26.3

The Mobility alternatives have the shortest travel time compared to the other alternatives since pedestrians do not experience any delay crossing Egan Drive (pedestrians are grade separated from Egan Drive traffic) and has the shortest walking distance. Pedestrians crossing the Diamond Interchange experience short delays less than 10 seconds per pedestrian at the ramp intersections; the walking distance between Glory Hall and Fred Meyer was assumed to be the same as for the signalized crossings. Differences between the non-motorized travel time for alternatives with and without the Glacier Lemon Spur Extension are mostly due to changes in traffic volumes at the E-Y intersection, resulting in changes in non-motorized crossing delay of less than 1 minute.

A grade-separated pedestrian bridge is recommended for all build alternatives, except for the Diamond Interchange alternatives, because the travel time is at least 3 minutes less than the other alternatives, including No Build. The pedestrian bridge is not recommended for the Diamond Interchange because the interchange inherently includes a grade-separated pedestrian crossing in the design.

4.2 Other Considerations

In developing the purpose and need for this project, some other considerations were identified by the public and project stakeholders as being important considerations in developing an alternative for this project, such as impacts to other transportation needs. These considerations include transit, travel times, land use, and environmental considerations, as well as project costs. The following sections describe the methods used to evaluate the criteria for the other considerations.

4.2.1 Transit: Transit Route Time

Transit route travel times were scored by calculating travel times for the various possible bus route paths within the project area for each alternative and using the shorter of the routes. The scoring identified whether transit route travel time for each alternative was greater than, equal to, or less than existing. Travel times were calculated using intersection movement delay values from Synchro analysis and estimated travel time along segments based on segment length and speed limit.

The bus routes analyzed are shown in Figure 16 and Figure 17.

Figure 16: Bus Routing for all Alternatives without the Glacier Lemon Spur Extension

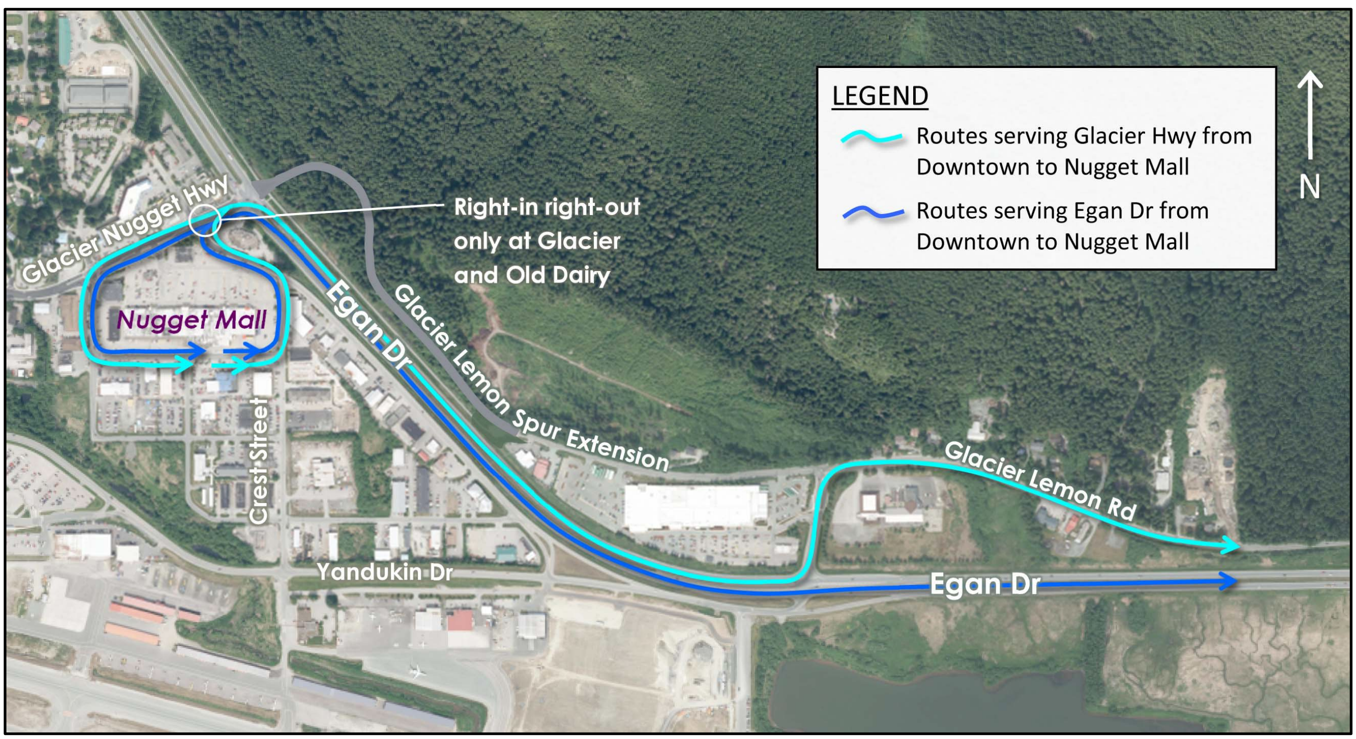

Figure 17: Bus Routing for all Alternatives with the Glacier Lemon Spur Extension

Table 10 presents the average transit delay through the study area.

Table 10: Total Transit Route Travel Time Delay

Alternative	Delay (minutes)	Comparison to Existing
No Build	6.9	Existing
Mobility with Median Crossovers	6.9	Equal to
Mobility with Glacier Lemon Spur Extension	8.1	Greater than
Partial Access Signal with Median Crossovers	6.9	Equal to
Partial Access Signal with Glacier Lemon Spur Extension	8.6	Greater than
Full Access Signal with Median Crossovers	7.8	Greater than
Full Access Signal with Glacier Lemon Spur Extension	7.6	Greater than
Two Signalized T-Intersections	8.5	Greater than
Two Signalized T-Intersections with Glacier Lemon Spur Extension	9.1	Greater than
Diamond Interchange with Median Crossovers	6.3	Less than
Diamond Interchange with Glacier Lemon Spur Extension	7.0	Greater than

Generally, adding the Glacier Lemon Spur Extension to an alternative increases the average transit route time compared to the same alternative without the extension. The increase is due to the change in traffic control for the eastbound right turns from Glacier Nugget Highway to southbound Egan Drive free right turn from free to yield-control (introduces delay for movement).

The travel time for the Full Access Signal with the Glacier Lemon Spur Extension is shorter than the alternative without the extension. The signal timing coordination among the nearby signals resulted in longer delays at the Glacier Nugget intersection without the extension road than with the extension road.

4.2.2 Transit: Bus Stop Impacts

Bus stop impacts were scored qualitatively based on whether bus accessibility improved, stayed the same, or decreased with an alternative. This measure included an analysis of the walking distance between the bus stops and destinations such as Fred Meyer and Juneau Christian Center, and the volume of traffic crossed during the AM and PM peak hours to access the existing and proposed bus stop locations.

The build alternatives with the Glacier Lemon Spur Extension were analyzed with a relocated bus stop (relocated to the extension road), to consider the effect of changing the routing to use the new roadway. Analysis of the bus stop at the relocated location showed a decrease in bus accessibility compared to No Build because it increased the walking distance for transit users between the bus stop and Juneau Christian Center, and the travel path crossed a higher volume of traffic to travel to both the Juneau Christian Center and Fred Meyer. Based on this analysis, the alternatives were ranked using the results for the bus stops remaining at the existing locations for all alternatives.

Table 11 presents the qualitative value for bus stop accessibility for the alternatives. Transit riders are anticipated to have the same bus stop accessibility as the No Build alternative, with the bus stops remaining at the current locations. Thus, the bus stop impacts metric does not result in any differences among alternatives.

Table 11: Bus Stop Accessibility Change Compared to No Build

Alternative	Bus Stop Accessibility
No Build	Same as No Build
Mobility with Median Crossovers	Same as No Build
Mobility with Glacier Lemon Spur Extension	Same as No Build
Partial Access Signal with Median Crossovers	Same as No Build
Partial Access Signal with Glacier Lemon Spur Extension	Same as No Build
Full Access Signal with Median Crossovers	Same as No Build
Full Access Signal with Glacier Lemon Spur Extension	Same as No Build
Two Signalized T-Intersections	Same as No Build
Two Signalized T-Intersections with Glacier Lemon Spur Extension	Same as No Build
Diamond Interchange with Median Crossovers	Same as No Build
Diamond Interchange with Glacier Lemon Spur Extension	Same as No Build

Capital Transit should continue to be engaged as a stakeholder as the project moves through NEPA and into design.

4.2.3 Land Use: Plan Impacts

Plan impacts were scored qualitatively based on whether the alternative was consistent with the following plans: *Juneau Safe Routes to School Plan* (2012), *Airport Sustainability Master Plan – Juneau International Airport* (2019), *Juneau Non-Motorized Transportation Plan* (2009), *City and Borough of Juneau Transit Development Plan* (2014), and *City and Borough of Juneau Area Wide Transportation Plan* (2001). An alternative was considered consistent with a plan if it accomplished a stated goal or project described in a plan, or if it did not state a goal or project in the study area. Table 12 and Appendix G summarize consistency with local transportation and land use plans.

Table 12: Plan Impacts

Alternative	Safe Routes to School Plan	Airport Sustainability Master Plan	Non-Motorized Transportation Plan	Transit Development Plan	Area-Wide Transportation Plan
No Build	x				
Mobility with Median Crossovers	x	x		x	
Mobility with Glacier Lemon Spur Extension	x	x		x	
Partial Access Signal with Median Crossovers	x	x		x	
Partial Access Signal with Glacier Lemon Spur Extension	x	x		x	
Full Access Signal with Median Crossovers	x			x	

Alternative	Safe Routes to School Plan	Airport Sustainability Master Plan	Non-Motorized Transportation Plan	Transit Development Plan	Area-Wide Transportation Plan
Full Access Signal with Glacier Lemon Spur Extension	x			x	
Two Signalized T-Intersections	x	x		x	
Two Signalized T-Intersections with Glacier Lemon Spur Extension	x	x		x	
Diamond Interchange with Median Crossovers	x			x	x
Diamond Interchange with Glacier Lemon Spur Extension	x			x	x

x = consistency with plan

4.2.4 Land Use: Access Travel Time

4.2.4.1 Travel Time Delay

Travel time delay was scored by calculating travel times along specific routes to and from nine origin and destination zones within the project area, summing the total calculated travel time for each route, then comparing the sums for each alternative. Analyzed origin and destination zones are depicted in Figure 18. Travel times were calculated using intersection movement delay values from Synchro analysis and estimated travel time along segments based on segment length and speed limit.

Alternatives with the Glacier Lemon Spur Extension and/or full access (all movements allowed) at the E-Y intersection allowed some travel routes to be rerouted compared to the No Build and partial access alternatives. In these instances, the travel times for the possible travel routes were compared and the shortest travel time was used in the analysis. Figure 19 through Figure 22 depict how specific analyzed routes varied between alternatives. Note that the Glacier Lemon Spur Extension is lower speed than Egan Drive. The intersection of Glacier Nugget Highway with Old Dairy Road was assumed to operate as left in, right in, right out (RIRO) only under all alternatives, as future traffic volumes make it very difficult for traffic to turn left from the side streets, and the intersection is currently signed as left in, RIRO from 4:00 to 6:00 PM daily.

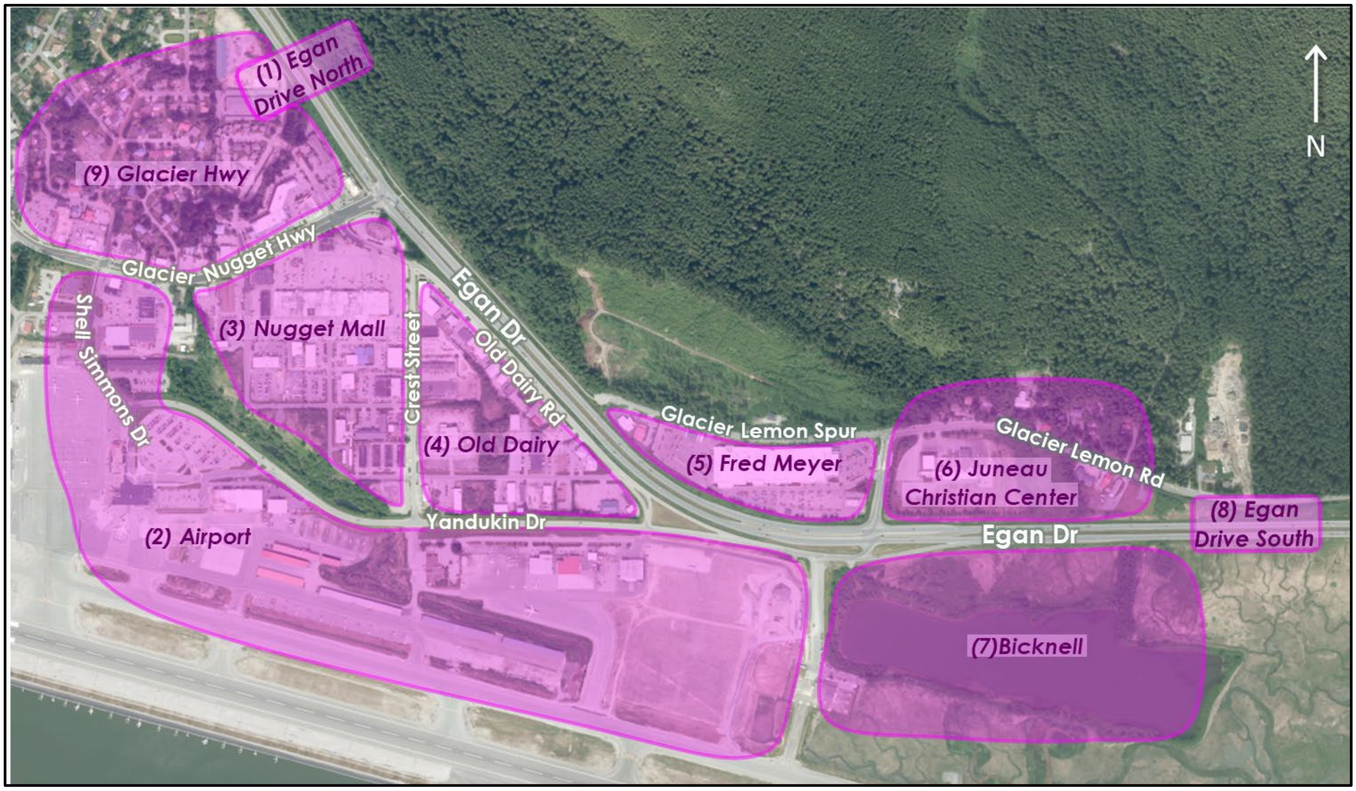

Figure 18: Origins and Destinations

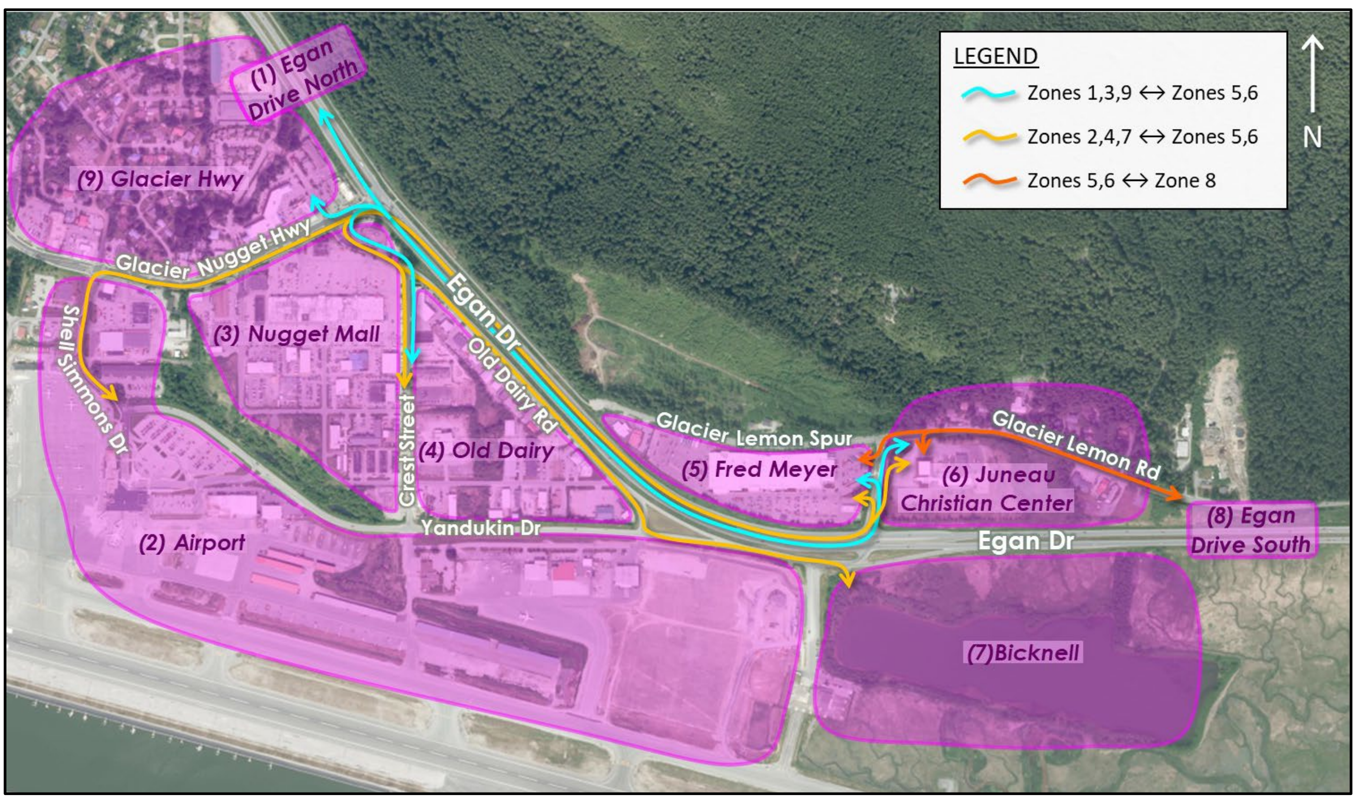

Figure 19: Routing for No Build, Mobility, and Partial Access Signal Alternatives

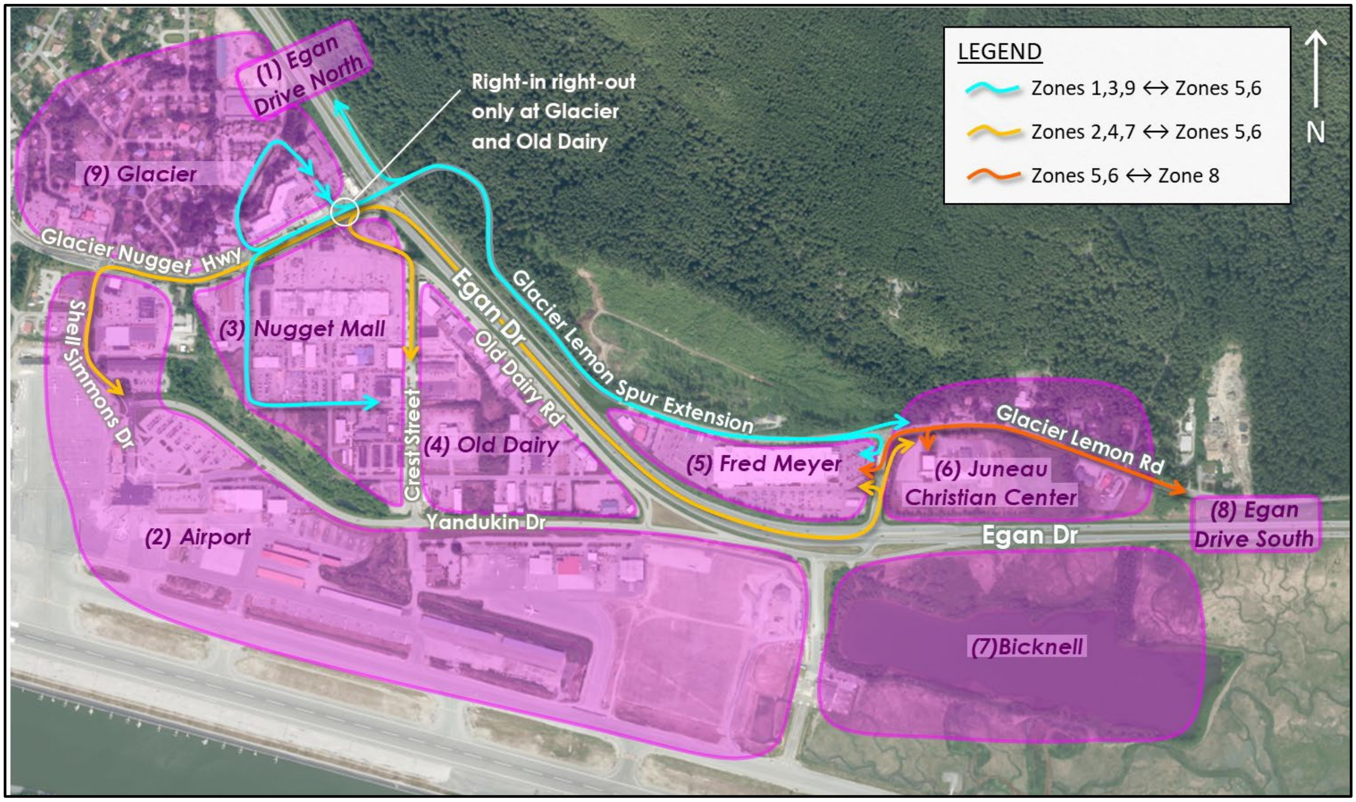

Figure 20: Routing for No Build, Mobility, and Partial Access Signal Alternatives with Glacier Lemon Spur Extension

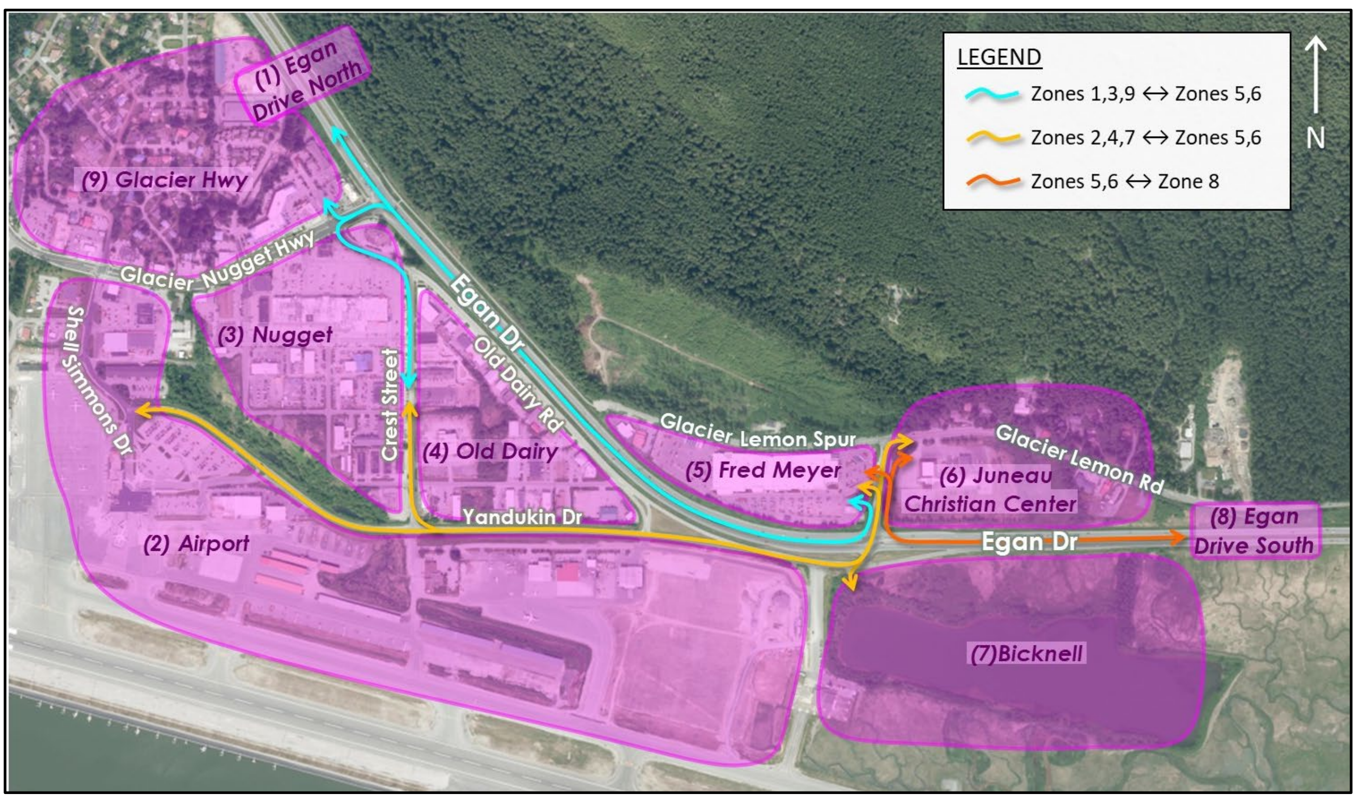

Figure 21: Routing for Full Access Signal and Diamond Interchange Alternatives

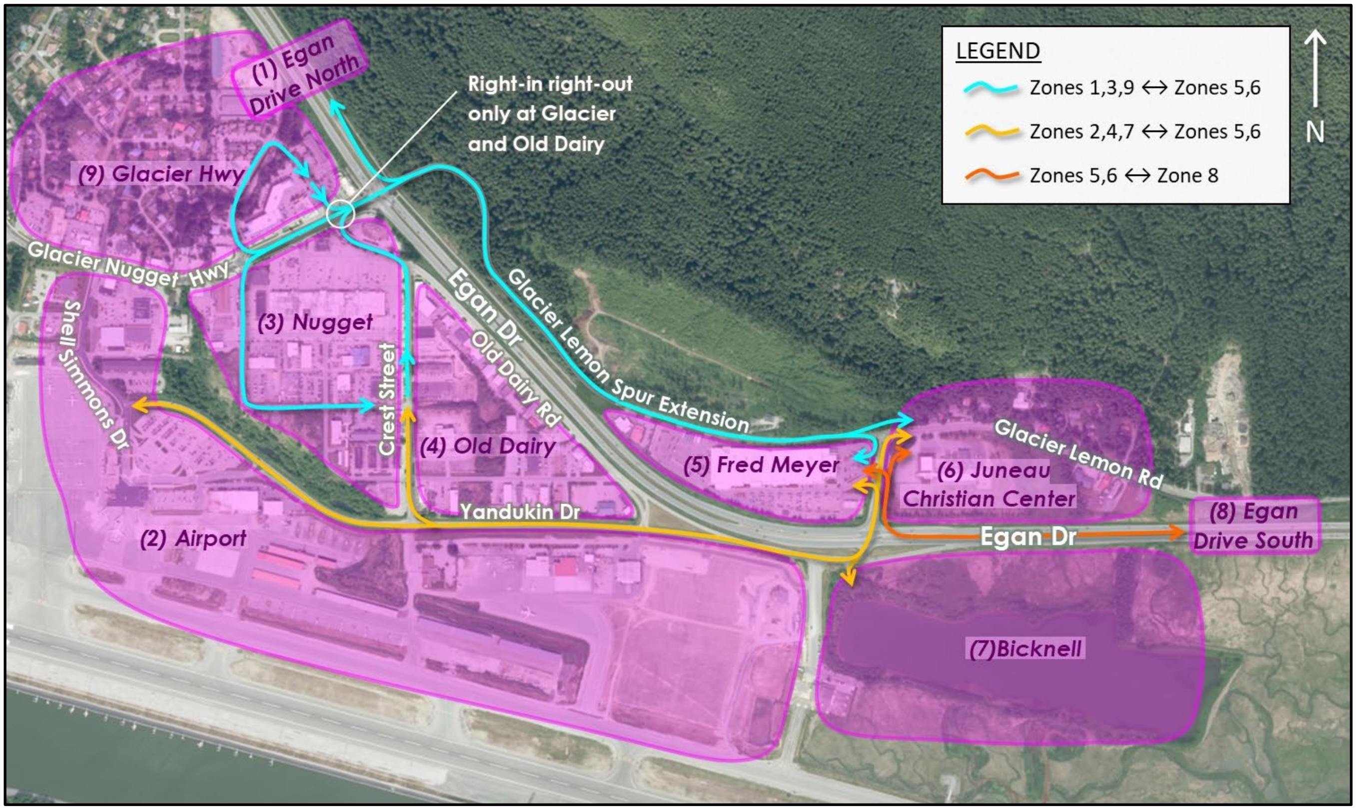

Figure 22: Routing for Full Access Signal and Diamond Interchange Alternatives with Glacier Lemon Spur Extension

Table 13 presents analysis results. The delay presented represents the sum of travel time delay between zones and is an average of calculated AM and PM peak delay.

Table 13: Total Travel Time Delay

Alternative	Delay (minutes)
No Build	184
Mobility with Median Crossovers	184
Mobility with Glacier Lemon Spur Extension	183
Partial Access Signal with Median Crossovers	182
Partial Access Signal with Glacier Lemon Spur Extension	193
Full Access Signal with Median Crossovers	181
Full Access Signal with Glacier Lemon Spur Extension	174
Two Signalized T-Intersections	205
Two Signalized T-Intersections with Glacier Lemon Spur Extension	198
Diamond Interchange with Median Crossovers	149
Diamond Interchange with Glacier Lemon Spur Extension	153

There are multiple reasons for the difference in travel time between alternatives with and without the Glacier Lemon Spur Extension, including volume changes, traffic control changes to channelized right turns, the additional leg at the Glacier Nugget intersection, and signal coordination among the Egan Drive signals. The changes and optimized signal coordination were different for each alternative, resulting in some alternative travel times increasing with the Glacier Lemon Spur Extension, while other travel times decreased.

The Diamond Interchange alternative has the shortest overall travel time delay among the alternatives. It takes less time to cross Egan Drive with the Diamond Interchange than with the partial access alternatives because there is less out-of-direction travel and fewer vehicles traveling through the Glacier Nugget intersection (some vehicles are redistributed to use the E-Y intersection). The Diamond Interchange alternative does not stop Egan Drive through vehicles, resulting in less delay compared to the other full access alternatives, which signalize and introduce delay to Egan Drive traffic at the E-Y intersection. There is longer travel time for the Diamond Interchange with the Glacier Lemon Spur Extension than without the extension because of the additional leg at the Glacier Nugget intersection; the additional phases needed for the intersection shortened the green time for vehicles on Egan Drive.

The Full Access Signal with the Glacier Lemon Spur Extension also has shorter overall travel time delay compared to other alternatives. Similar to the Diamond Interchange alternative, there are fewer vehicles traveling through the Glacier Nugget intersection and less out of direction travel, which results in shorter travel times compared to partial access alternatives. The Full Access Signal without the spur extension has longer travel times because the signal coordination for the Egan Drive signals is less optimal and results in increased delays for Egan Drive vehicles turning left to the side streets.

Travel Time by Time of Day

The traffic volumes used for analyzing each alternative represent the highest daily volumes that are typically experienced by drivers. This is typically the volumes used for design of new or improved infrastructure because it strikes a balance: designing for the few hours of the year with the highest volumes would result in daily traffic rarely fully utilizing the provided infrastructure (over design), while designing for average hourly volumes would result in building a new facility that is uncomfortably congested for many hours of the day.

Because the analysis uses volumes that represent the highest volumes experienced daily, users at other times of day will experience less delay (shorter travel times) than those presented in this report. Figure 23 shows traffic volume changes on Egan Drive over a typical day (Thursday, September 14, 2017). Note that the highest volume periods with the most delay last only about a half-hour in the morning and an hour in the evening.

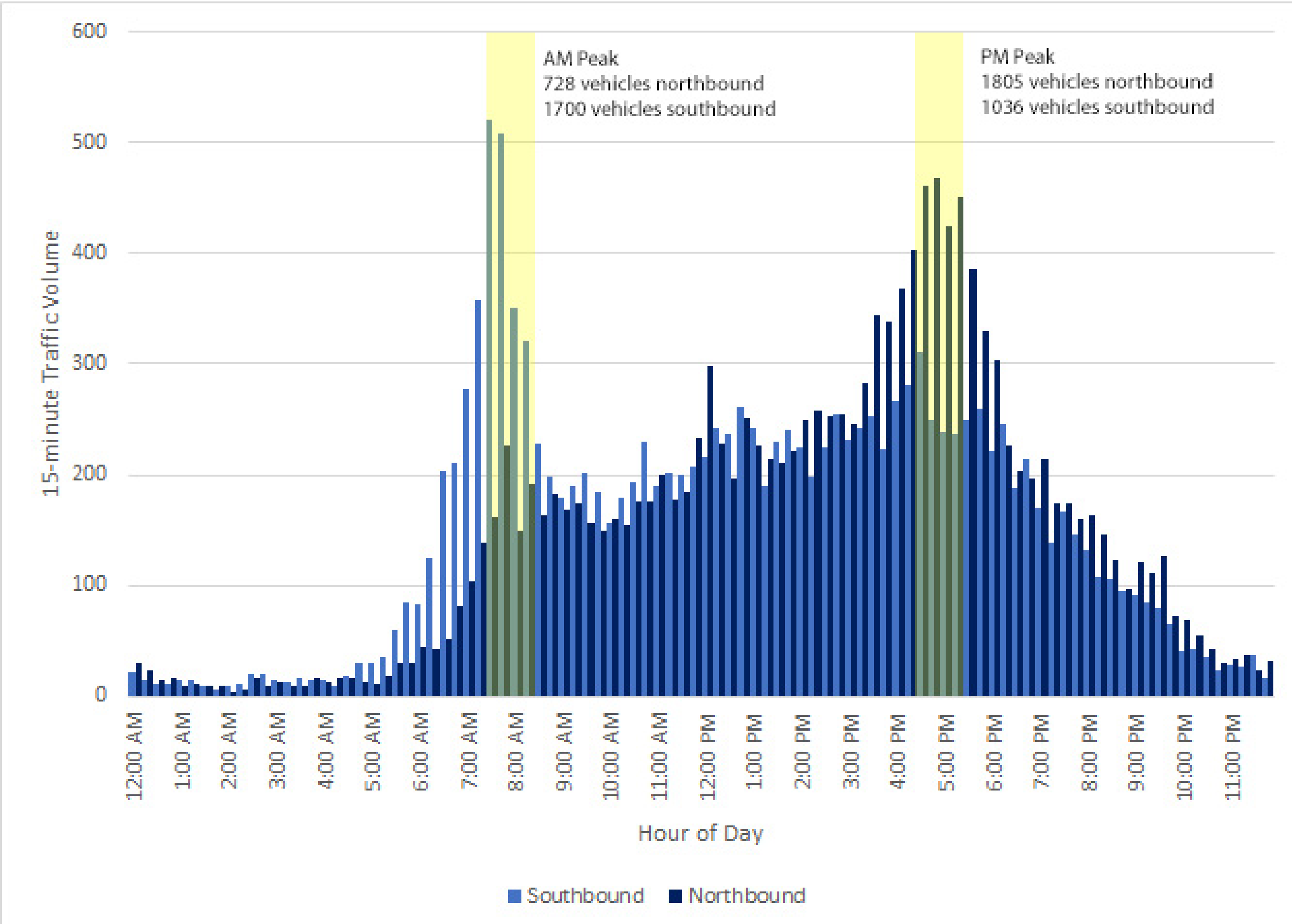

Figure 23: Egan Drive 15-Minute Volumes (North of Yandukin; Thursday, September 14, 2017)

4.2.5 Land Use: Business Visibility and Economic Development

Business visibility was scored based on whether businesses would retain their current storefront and sign visibility with the build alternatives. This analysis also included potential future commercial development areas (e.g., near Honsinger Pond). Five business areas were used to evaluate the alternatives: Fred Meyer area, Juneau Christian Center area, private property near Honsinger Pond, Nugget Mall, and the strip of businesses along Old Dairy Road.

Table 14 presents the number of businesses with decreased visibility because of an alternative.

The Diamond Interchange is the only alternative that elevates Egan Drive. The guardrail or concrete barriers on the bridge structure would obstruct portions of Fred Meyer, Juneau Christian Center, and the private properties near Honsinger Pond. The elevated roadway would obstruct the line of sight for side street vehicles on one side of Egan Drive, keeping them from viewing businesses on the other side of the road.

Table 14: Number of Businesses with Decreased Visibility

Alternative	Number of Businesses with Decreased Visibility
No Build	0
Mobility with Median Crossovers	0
Mobility with Glacier Lemon Spur Extension	0
Partial Access Signal with Median Crossovers	0
Partial Access Signal with Glacier Lemon Spur Extension	0
Full Access Signal with Median Crossovers	0
Full Access Signal with Glacier Lemon Spur Extension	0
Two Signalized T-Intersections	0
Two Signalized T-Intersections with Glacier Lemon Spur Extension	0
Diamond Interchange with Median Crossovers	3
Diamond Interchange with Glacier Lemon Spur Extension	3

4.2.6 Environmental: Right-Of-Way Impacts

ROW impacts were calculated using a Geographic Information System (GIS) analysis of each design overlaid on the City and Borough of Juneau (CBJ) parcel map. No surveys were completed. Areas in acres were calculated for design features that extended outside of the current State of Alaska ROW. Cut and fill limits were used as the boundary for the designs. Uneconomic remnants and land that would be difficult to access were included in the ROW impact totals for each alternative. Table 15 summarizes the ROW impacts.

Table 15: ROW Impacts

Alternative	ROW to be Acquired (acres)
No Build	0.00
Mobility with Median Crossovers	0.34
Mobility with Glacier Lemon Spur Extension	7.11
Partial Access Signal with Median Crossovers	0.34
Partial Access Signal with Glacier Lemon Spur Extension	7.11
Full Access Signal with Median Crossovers	4.70
Full Access Signal with Glacier Lemon Spur Extension	11.47
Two Signalized T-Intersections	11.44
Two Signalized T-Intersections with Glacier Lemon Spur Extension	18.21
Diamond Interchange with Median Crossovers	7.30
Diamond Interchange with Glacier Lemon Spur Extension	14.07

Each alternative requires ROW acquisitions. The Glacier Lemon Spur Extension would require the acquisition of 6.77 acres of private and United States Forest Service (USFS) land.

A substantial concern was raised by representatives of the Juneau Airport about alternatives that needed land from the airport. The Northeast Development in the *Airport Sustainability Master Plan* identifies land needed from the Full Access Signal and Diamond Interchange alternatives as being slated for hangars/facilities on the large aircraft parking apron. The FAA Headquarters office oversees any property release from an airport. The process required is complex and time consuming and may end without the release being approved. This is a substantial potential fatal flaw associated with these alternatives.

A substantial concern was raised by the private property owner south of the intersection. They have development plans for their recently acquired property, and they intend to begin construction. They would not support an alternative that would impact their property development: the Partial Access Signal would be preferable; the Full Access and Diamond Interchange would render their property useless for their intended use. This is a substantial potential fatal flaw associated with these alternatives.

Alternatives that include the Glacier Lemon Spur Extension would provide additional road access that would potentially benefit the private property owners along the road alignment. Additional access to the public lands along the road alignment could also be provided.

4.2.7 Environmental: Wetlands Impacts

Wetlands impacts were calculated using a GIS analysis of each design overlaid on the National Wetlands Inventory Map provided by the U.S. Fish and Wildlife Service. No wetlands surveys were completed. Areas in acres were calculated for design impacts (see Table 16). Wetlands were assumed to exist within current State of Alaska ROW in median areas and ditches.

Table 16: Wetlands Impacts

Alternative	Wetlands Impacted (Acres)
No Build	0.0
Mobility with Median Crossovers	0.1
Mobility with Glacier Lemon Spur Extension	3.4
Partial Access Signal with Median Crossovers	0.1
Partial Access Signal with Glacier Lemon Spur Extension	3.4
Full Access Signal with Median Crossovers	2.8
Full Access Signal with Glacier Lemon Spur Extension	6.1
Two Signalized T-Intersections	4.0
Two Signalized T-Intersections with Glacier Lemon Spur Extension	7.3
Diamond Interchange with Median Crossovers	4.6
Diamond Interchange with Glacier Lemon Spur Extension	7.9

No build alternative entirely avoids wetlands impacts. The median crossovers are assumed to require the filling of 0.1 acre of wetlands. The Glacier Lemon Spur Extension is assumed to require the fill of 3.4 acres of wetlands.

4.2.8 Environmental: Stormwater Impacts

Stormwater impacts were calculated using a GIS analysis of each design compared to existing pavement area. The difference between the two layers was calculated and is presented here as additional impervious surface area. Impervious areas include new asphalt for driving lanes and shoulders, and new concrete for sidewalks and curb features. No surveys were completed. Areas in acres were calculated for design impacts (see Table 17).

Table 17: Stormwater Impacts

Alternative	Additional Impervious Surface (Acres)
No Build	0.00
Mobility with Median Crossovers	1.99
Mobility with Glacier Lemon Spur Extension	4.57
Partial Access Signal with Median Crossovers	2.13
Partial Access Signal with Glacier Lemon Spur Extension	4.71
Full Access Signal with Median Crossovers	3.25
Full Access Signal with Glacier Lemon Spur Extension	5.83
Two Signalized T-Intersections	3.39
Two Signalized T-Intersections with Glacier Lemon Spur Extension	7.31
Diamond Interchange with Median Crossovers	5.20
Diamond Interchange with Glacier Lemon Spur Extension	7.78

4.2.9 Environmental: Fish Habitats and Streams

Fish habitat and stream impacts were calculated by using the GIS analysis of each design compared to existing pavement area. The difference between the two layers was calculated and then overlaid on the Alaska Department of Fish and Game (ADF&G) fish survey data. ADF&G staff surveyed the project area on November 5 and 14, 2019, and September 1, 2020. Resident and anadromous fish streams were included in the impact calculations. It is assumed that unnamed fish steams in the project area are currently culverted under the entire width of Egan Dive. It is also assumed that these culverts would be extended to accommodate the alternative design and that these extensions would be accomplished without replacing the entire existing culvert under Egan Drive. Impacts, summarized in Table 18, are presented in linear feet.

Table 18: Fish Habitats and Streams Impacts

Alternative	Impacts to fish streams (linear feet)
No Build	0
Mobility with Median Crossovers	107
Mobility with Glacier Lemon Spur Extension	1906
Partial Access Signal with Median Crossovers	133
Partial Access Signal with Glacier Lemon Spur Extension	1931
Full Access Signal with Median Crossovers	90
Full Access Signal with Glacier Lemon Spur Extension	1189
Two Signalized T-Intersections	328
Two Signalized T-Intersections with Glacier Lemon Spur Extension	2217
Diamond Interchange with Median Crossovers	231
Diamond Interchange with Glacier Lemon Spur Extension	2030

Each build alternative would impact both fish bearing streams. Generally, alternatives that include the Glacier Lemon Spur Extension would impact more linear feet of fish-bearing streams than those alternatives that include the median crossover components.

4.2.10 Environmental: Historic Properties Impacts

Historic and Section 4(f) property impacts were scored qualitatively based on how likely an alternative was to potentially impact a property protected under Section 106 of the National Historic Preservation Act or Section 4(f) of the U.S. Department of Transportation Act of 1966. The impact categories were presented as follows:

- **Not Likely:** No ROW acquisition and no major change in configuration
- **Possible:** ROW acquisition and/or change in configuration that may have indirect or direct effects to a potential historic site
- **Probable:** ROW acquisition and/or change in configuration that may have indirect or direct effects to a potential historic site and acquisition of USFS land that may be protected under Section 4(f)

Table 19 summarizes impacts to historic and Section 4(f) properties.

Table 19: Historic and Section 4(f) Property Impacts

Alternative	Impact Likelihood
No Build	Not Likely
Mobility with Median Crossovers	Not Likely
Mobility with Glacier Lemon Spur Extension	Probable
Partial Access Signal with Median Crossovers	Not Likely
Partial Access Signal with Glacier Lemon Spur Extension	Probable
Full Access Signal with Median Crossovers	Possible
Full Access Signal with Glacier Lemon Spur Extension	Probable
Two Signalized T-Intersections	Possible
Two Signalized T-Intersections with Glacier Lemon Spur Extension	Probable
Diamond Interchange with Median Crossovers	Possible
Diamond Interchange with Glacier Lemon Spur Extension	Probable

The Mobility and Partial Access Signal with median crossovers alternatives are not likely to affect protected properties as they do not require additional ROW and do not significantly change the roadway configuration. All alternatives that include the Glacier Lemon Spur Extension will probably affect protected resources as there is potential ROW acquisition from USFS land that may be protected under Section 4(f). Note that these impacts were made known to the project team during the Level 2 screening analysis. All ROW acquisition has the potential for previously unidentified historic resources to be present; therefore, each alternative with a ROW acquisition is ranked as at least “Possible”. Additionally, the Two Signalized T-Intersections and Diamond Interchange alternatives have the possibility for indirect effects on a potential historic property as they move features closer and/or higher in elevation to the property, potentially creating indirect visual and/or noise impacts.

4.2.11 Environmental: Air Quality Impacts

Air quality impacts were calculated using a GIS analysis of each design that calculated the driving lanes area, presented here as additional surface area subject to winter sanding. This metric is used to approximate the potential air quality impacts because resuspended road dust is an important contributor to ambient particulate matter. In areas with significant snow events, the use of wintertime roadway abrasives for traction control can result in increased particulate matter emissions. It is assumed that the median crossovers would be subject to winter sanding. No surveys were completed. Areas in acres were calculated for design impacts and are shown in Table 20.

Table 20: Air Quality Impacts

Alternative	Additional Area Subject to Winter Sanding (Acres)
No Build	0.00
Mobility with Median Crossovers	1.40
Mobility with Glacier Lemon Spur Extension	1.48
Partial Access Signal with Median Crossovers	1.79
Partial Access Signal with Glacier Lemon Spur Extension	1.87
Full Access Signal with Median Crossovers	2.29
Full Access Signal with Glacier Lemon Spur Extension	2.36
Two Signalized T-Intersections	1.64
Two Signalized T-Intersections with Glacier Lemon Spur Extension	3.05
Diamond Interchange with Median Crossovers	2.87
Diamond Interchange with Glacier Lemon Spur Extension	2.94

4.2.12 Cost Estimates

To score this metric, an engineer's estimate was prepared for each alternative based on the conceptual level designs. Table 21 presents the cost estimates for each alternative, which are expected to have a rough order of magnitude accuracy range between -30% to +40%. The estimate includes the cost of design, ROW, utilities, and construction. The engineer's estimate for each alternative can be found in Appendix F.

The alternatives with the Glacier Lemon Spur Extension cost more than those with median crossovers since more ROW is needed for the road extension. ROW impacts to private properties near Honsinger Pond resulted in greater costs for the Full Access Signal, Two Signalized T-intersections, and Diamond Interchange alternatives. The Diamond Interchange alternative has the largest costs due to the elevated bridge structure.

Table 21: Cost Estimate Comparison

Alternative	Total Project Cost (in thousand dollars)
No Build	$0
Mobility with Median Crossovers	$5,641
Mobility with Glacier Lemon Spur Extension	$26,635
Partial Access Signal with Median Crossovers	$12,673
Partial Access Signal with Glacier Lemon Spur Extension	$33,435
Full Access Signal with Median Crossovers	$20,573
Full Access Signal with Glacier Lemon Spur Extension	$41,099
Two Signalized T-Intersections	$36,145
Two Signalized T-Intersections with Glacier Lemon Spur Extension	$57,669
Diamond Interchange with Median Crossovers	$66,356
Diamond Interchange with Glacier Lemon Spur Extension	$86,477

5 Overall Screening Results

This section presents the Level 2 screening results. These results have been used to determine the recommended alternative(s).

5.1 Compatible Elements

The compatible elements were not analyzed independently from the alternatives. The main alternatives were instead analyzed with combinations for each compatible element option, namely a pedestrian overpass, median crossovers, and the Glacier Lemon Spur Extension. This analysis yielded the following results:

- **Pedestrian Overpass.** Pedestrian and bicycle facilities are currently not provided at the E-Y intersection. Businesses and services within the study area generate pedestrian traffic. Furthermore, the proposed relocated Glory Hall emergency housing shelter is anticipated to increase the amount of pedestrian traffic in the area.
  - A pedestrian overpass would completely separate non-motorized users from Egan Drive traffic, resulting in a higher safety rating than alternatives that provide a signalized crossing of Egan Drive.
  - Similarly, pedestrians would not experience delay in using an overpass to cross Egan Drive as they would if using a signalized crossing of Egan Drive. As such, the pedestrian overpass has the higher accessibility rating than alternatives that provide a signalized crossing of Egan Drive.
  - The pedestrian overpass is recommended to be included in a recommended alternative. Considerations should be given to ensuring that using the pedestrian overpass is easy and convenient, to encourage use of the crossing, and to use geometry and fencing to discourage an at-grade crossing of Egan Drive.
  - Concerns have been expressed that the public may not use a pedestrian overpass because of perceived out of direction travel, safety concerns, and extra effort to climb the ramp. Additional stakeholder and public engagement on this topic is warranted.
  - A signalized pedestrian crossing at the Yandukin/Glacier Lemon intersection provides a benefit in terms of both non-motorized safety and connectivity. Thus, alternatives with this element could be considered in the development of a recommended alternative.
- **Median Crossovers.** The median crossovers were examined as a lower-cost method of providing a way for vehicles to travel around a crash when it occurs; however, this treatment requires an agency to set up temporary traffic control when a crash occurs. DOT&PF M&O indicated it would take approximately 40 minutes to set up traffic control once they are informed of a crash due to the need to secure their work site and gather traffic control equipment before setting up the traffic control. Because the median crossover traffic control takes so long to set up, it provides no benefit over the existing condition. Median crossovers are not recommended to be included in a recommended alternative.
- **Glacier Lemon Spur Extension to Glacier Nugget.** This extension would provide a permanent alternate route to Egan Drive that would also provide a way to travel around a crash on Egan

Drive. The extension provides more access for crossing Egan Drive, which will move some traffic from the E-Y intersection to the Glacier Nugget intersection.

- Crash frequency may increase somewhat at the Glacier Nugget intersection due to the increase in traffic using that intersection.
- The extension was found to decrease travel time when there is a crash on Egan Drive by providing more options for traveling around the crash that are immediately available (do not require deployment of traffic control).
- The extension provides an additional route for traveling from one side of Egan Drive to the other, which reduces travel time for accessing properties on either side of Egan Drive in this area.
- The extension has been proposed in CBJ community plans: the *Lemon Creek Area Plan* (2018), *Comprehensive Plan of the City and Borough of Juneau* (2013), and *City and Borough of Juneau Area Wide Transportation Plan* (2001).
- The extension provides an opportunity for future land uses to develop along the road.
- The extension provides for system network redundancy and connectivity.
- The extension is recommended to be included in a recommended alternative.

5.2 No Build

The No Build alternative was screened to compare results with build alternatives. Table 22 presents the screening results for the No Build alternative.

The HSIP project, which will be constructed in the next few years, is expected to decrease vehicle crash frequency and severity at the E-Y intersection compared to the existing condition. Thus, the No Build alternative assumes that the HSIP project is built and there has already been a decrease in crashes at the E-Y intersection.

There are no alternate routes provided under the No Build alternative during a crash event. Therefore, the No Build alternative does not meet the purpose and need for the project.

Businesses within the study area generate pedestrian traffic. The proposed relocated Glory Hall emergency housing shelter is anticipated to increase the amount of pedestrian traffic in the area, with desired destinations on the other side of Egan Drive. Pedestrian and bicycle facilities are currently not provided at the E-Y intersection (crossing is prohibited at the intersection, resulting in the No Build alternative scoring a 1 for the bicycle and pedestrian crash and non-motorized accessibility metrics).

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Table 22: No Build Screening Results

Purpose	Need	Metric	Score	Brief Explanation of Score
Primary	Safety	Crash Frequency	6	No change in crash frequency
		Crash Severity	2	No change in crash severity
		Bicycles and Pedestrians	1	Pedestrians and bicycles are prohibited from crossing at Yandukin Drive; pedestrian crossing facilities are not provided
Secondary	Alternate Driving Routes	Travel Time Reliability	3	Travel time when a crash closes the northbound Egan Drive lanes is increased approximately 12 minutes per vehicle under the existing condition; this is less than the maximum desirable of 15 minutes
	Non-motorized Accessibility	Pedestrian and Bicycle Access Time	1	Pedestrians and bicycles must travel to the Glacier Nugget intersection to cross Egan Drive
Other Considerations	Transit	Transit Route Time	2	Transit uses existing routes to serve Egan Drive and Glacier Highway from Downtown to Nugget Mall
		Bus Stop Impacts	2	The accessibility of the bus stops on Glacier Lemon Road would not change
	Land Use	Plan Impacts	1	Consistent with *Juneau Safe Routes to School Plan*
		Access Travel Time	2	Vehicles must travel to Glacier Nugget intersection to cross Egan Drive; without the Glacier Lemon Spur Extension, vehicles must use Egan Drive to travel between Glacier Nugget and Fred Meyer
		Business Visibility	3	Visibility to businesses along Egan Drive stay the same
	Environmental	ROW Impacts	3	No impacts
		Wetland Impacts	3	No impacts
		Stormwater Impacts	3	No impacts
		Fish Habitats and Streams Impacts	3	No impacts
		Historic & 4(f) Properties Impacts	3	No impacts
		Air Quality Impacts	3	No impacts
	Cost	Cost Range	5	No cost

5.3 Build Alternatives

5.3.1 Mobility

Table 23 presents the screening results for the Mobility alternative with median crossovers, and Table 24 presents the screening results with the Glacier Lemon Spur Extension.

The Mobility alternative is anticipated to have the same number of crashes as the No Build alternative. The Mobility alternative, which includes the pedestrian overpass and Glacier Lemon Spur Extension or median crossovers, meets the primary need for safety, as well as secondary needs for non-motorized accessibility, alternate route in the event of crashes, and maintaining traffic flow. The grade-separated pedestrian crossing removes conflicts between vehicles and pedestrians/bicycles by separating pedestrians and bicycles from Egan Drive through traffic. The grade-separated crossing provides a crossing near the E-Y intersection and has the shortest crossing time compared to the at-grade crossings under the No Build and other build alternatives because no delay is experienced crossing Egan Drive.

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Table 23: Mobility with Median Crossovers Screening Results

Purpose	Need	Metric	Score	Brief Explanation of Score
Primary	Safety	Crash Frequency	6	No change in crash frequency
		Crash Severity	2	No change in crash severity
		Bicycles and Pedestrians	5	Pedestrians and bicycles are grade separated from traffic, eliminating conflicts between vehicles and pedestrians/bicycles
Secondary	Alternate Driving Routes	Travel Time Reliability	1	Time for personnel to arrive and set up median crossovers is longer than the average time it takes for a crash to be cleared at the intersection
	Non-motorized Accessibility	Pedestrian and Bicycle Access Time	5	Pedestrians and bicycles do not experience any delay crossing Egan Drive because they are grade separated from Egan Drive traffic
Other Considerations	Transit	Transit Route Time	2	Transit uses existing routes to serve Egan Drive and Glacier Highway from Downtown to Nugget Mall
		Bus Stop Impacts	2	The bus stops on Glacier Lemon Road would be accessed similar to the No Build alternative
	Land Use	Plan Impacts	3	Consistent with *Safe Routes to School Plan*, *Airport Sustainability Master Plan*, and *Transit Development Plan*
		Access Travel Time	2	Vehicles must travel to Glacier Nugget intersection to cross Egan Drive; without Glacier Lemon Spur Extension, vehicles must use Egan Drive to travel between Glacier Nugget and Fred Meyer
		Business Visibility	3	Visibility to businesses along Egan Drive stay the same
	Environmental	ROW Impacts	3	ROW needed for pedestrian crossing and Old Dairy Road-Yandukin reconfiguration
		Wetland Impacts	3	Database indicates wetlands in median and ditches on Egan Drive
		Stormwater Impacts	3	Addition of crossovers and turn lanes
		Fish Habitats and Streams Impacts	3	No impacts
		Historic & 4(f) Properties Impacts	3	No resources likely affected
		Air Quality Impacts	2	Added pavement that will undergo winter sanding
	Cost	Cost Range	5	$4 to $8 million (cost includes grade-separated pedestrian crossing and median crossovers)

Table 24: Mobility with Glacier Lemon Spur Extension Screening Results

Purpose	Need	Metric	Score	Brief Explanation of Score
Primary	Safety	Crash Frequency	6	Crashes are expected to decrease at E-Y intersection because there would be less traffic traveling through the intersection; some E-Y traffic would move to Glacier Nugget due to Glacier Lemon Spur Extension; crashes at Glacier Nugget would increase because of the additional leg (more traffic and potential conflicts)
		Crash Severity	2	Fewer high-severity crashes than the No Build alternative but more than other alternatives
		Bicycles and Pedestrians	5	Pedestrians and bicycles are grade separated from traffic, eliminating conflicts between vehicles and pedestrians/bicycles
Secondary	Alternate Driving Routes	Travel Time Reliability	4	Glacier Lemon Spur Extension can accommodate some detour vehicles, at a lower speed compared to Egan Drive
	Non-motorized Accessibility	Pedestrian and Bicycle Access Time	5	Pedestrians and bicycles do not experience any delay crossing Egan Drive because they are grade separated from Egan Drive traffic
Other Considerations	Transit	Transit Route Time	1	Transit uses existing route to serve Egan Drive, but route time increases due to change in traffic control for right turns along the route (free to yield)
		Bus Stop Impacts	2	The bus stops on Glacier Lemon Road would be accessed similar to the No Build alternative
	Land Use	Plan Impacts	3	Consistent with *Safe Routes to School Plan*, *Airport Sustainability Master Plan*, and *Transit Development Plan*
		Access Travel Time	2	Vehicles must travel to Glacier Nugget intersection to cross Egan Drive; lower speed Glacier Lemon Spur Extension provides new route between Glacier Nugget and Fred Meyer; RIRO at Glacier-Old Diary
		Business Visibility	3	Visibility to businesses along Egan Drive stay the same
	Environmental	ROW Impacts	2	Private and USFS partial parcel acquisitions needed for Glacier Lemon Spur Extension
		Wetland Impacts	2	Wetlands identified for Glacier Lemon Spur Extension
		Stormwater Impacts	2	Addition of Glacier Lemon Spur Extension
		Fish Habitats and Streams Impacts	1	No impacts
		Historic & 4(f) Properties Impacts	1	Potential for previously unidentified resources associated with ROW acquisition; ROW acquisition from USFS land may be protected under Section 4(f)
		Air Quality Impacts	2	Added pavement that will undergo winter sanding
	Cost	Cost Range	4	$19 to $37 million (cost includes grade-separated pedestrian crossing and the Glacier Lemon Spur Extension)

5.3.2 Partial Access Signal

Table 25 presents the screening results for the Partial Access Signal alternative with median crossovers and a pedestrian overpass, and Table 26 presents the results with the Glacier Lemon Spur Extension and a pedestrian overpass. The Partial Access Signal alternative, which includes the pedestrian overpass and Glacier Lemon Spur Extension or median crossovers, meets the primary need for safety as well as secondary needs for non-motorized accessibility, alternate route in the event of crashes, and maintaining traffic flow.

Installing a signal to control left turns from Egan Drive to the side streets at the E-Y intersection would reduce both the number and severity of crashes compared to the No Build alternative. While a signal introduces delay to the through traffic on Egan Drive, it does not significantly change the time to travel between destinations in the project area.

The results shown in Table 25 include a pedestrian overpass. It would be possible to install the overpass only and continue to prohibit pedestrians from crossing Egan Drive at Yandukin/Glacier Lemon, or a signalized pedestrian crossing could be built at the intersection in addition to the overpass.

The Partial Access Signal alternative has few ROW and wetlands impacts.

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Table 25: Partial Access Signal with Median Crossovers Screening Results

Purpose	Need	Metric	Score	Brief Explanation of Score
Primary	Safety	Crash Frequency	8	Installing a signal is expected to decrease angle crashes but increase rear-end crashes
		Crash Severity	6	Forecasted high-severity crashes are predicted to be less than the No Build alternative
		Bicycles and Pedestrians	5	Grade-separated pedestrian crossing eliminates conflicts between vehicles and pedestrians/bicycles; signalized crossing at E-Y
Secondary	Alternate Driving Routes	Travel Time Reliability	1	Time for personnel to arrive and set up median crossovers is longer than the average time it takes for a crash to be cleared at the intersection; assumes the signal goes into flash mode (acts the same as Mobility alternative)
	Non-motorized Accessibility	Pedestrian and Bicycle Access Time	5	Pedestrians and bicycles do not experience any delay crossing Egan Drive at the grade-separated pedestrian crossing
Other Considerations	Transit	Transit Route Time	2	Transit uses existing routes to serve Egan Drive and Glacier Highway from Downtown to Nugget Mall
		Bus Stop Impacts	2	The bus stops on Glacier Lemon Road would be accessed similar to the No Build alternative
	Land Use	Plan Impacts	3	Consistent with *Safe Routes to School Plan*, *Airport Sustainability Master Plan*, and *Transit Development Plan*
		Access Travel Time	2	Vehicles must travel to Glacier Nugget intersection to cross Egan Drive; without Glacier Lemon Spur Extension, vehicles must use Egan Drive to travel between Glacier Nugget and Fred Meyer
		Business Visibility	3	Visibility to businesses along Egan Drive stays the same
	Environmental	ROW Impacts	3	No ROW acquisition
		Wetland Impacts	3	Database indicates wetlands in median and ditches on Egan Drive
		Stormwater Impacts	3	Addition of pavement in design
		Fish Habitats and Streams Impacts	3	No impacts
		Historic & 4(f) Properties Impacts	3	No resources likely affected
		Air Quality Impacts	2	Added pavement that will undergo winter sanding
	Cost	Cost Range	5	$9 to $18 million (cost includes median crossovers, signals, and grade-separated pedestrian crossing)

Table 26: Partial Access Signal with Glacier Lemon Spur Extension Screening Results

Purpose	Need	Metric	Score	Brief Explanation of Score
Primary	Safety	Crash Frequency	8	Installing a signal is expected to decrease angle crashes but increase rear-end crashes; Glacier Lemon Spur Extension is expected to increase crashes at the Glacier Nugget signal
		Crash Severity	6	Forecasted high-severity crashes are predicted to be less than the No Build alternative
		Bicycles and Pedestrians	5	Grade-separated pedestrian crossing eliminates conflicts between vehicles and pedestrians/bicycles; signalized crossing at E-Y
Secondary	Alternate Driving Routes	Travel Time Reliability	4	Glacier Lemon Spur Extension has limited excess capacity and requires vehicles to travel out-of-direction to avoid the crash location
	Non-motorized Accessibility	Pedestrian and Bicycle Access Time	5	Pedestrians and bicycles do not experience any delay crossing Egan Drive at the grade-separated pedestrian crossing
Other Considerations	Transit	Transit Route Time	1	Transit uses existing route to serve Egan Drive, but route time increases due to change in traffic control for right turns along the route (free to yield)
		Bus Stop Impacts	2	The bus stops on Glacier Lemon Road would be accessed similar to the No Build alternative
	Land Use	Plan Impacts	3	Consistent with *Safe Routes to School Plan*, *Airport Sustainability Master Plan*, and *Transit Development Plan*
		Access Travel Time	1	Vehicles must travel to Glacier Nugget intersection to cross Egan Drive; lower speed Glacier Lemon Spur Extension provides new route between Glacier Nugget and Fred Meyer; RIRO at Glacier-Old Dairy
		Business Visibility	3	Visibility to businesses along Egan Drive stays the same
	Environmental	ROW Impacts	2	Private and USFS partial parcel acquisitions needed for Glacier Lemon Spur Extension
		Wetland Impacts	1	Wetlands identified for Glacier Lemon Spur Extension
		Stormwater Impacts	2	Addition of Glacier Lemon Spur Extension
		Fish Habitats and Streams Impacts	1	No impacts
		Historic & 4(f) Properties Impacts	1	Potential for previously unidentified resources associated with ROW acquisition; ROW acquisition from USFS land may be protected under Section 4(f)
		Air Quality Impacts	2	Added pavement that will undergo winter sanding
	Cost	Cost Range	3	$23 to $47 million (cost includes signals, grade-separated pedestrian crossing, and Glacier Lemon Spur Extension)

5.3.3 Full Access Signal

Table 27 presents the screening results for the Full Access Signal alternative with median crossovers and pedestrian overpass, and Table 28 presents the results with the Glacier Lemon Spur Extension and pedestrian overpass. The Full Access Signal alternative, which includes the pedestrian overpass and Glacier Lemon Spur Extension or median crossovers, meets the primary need for safety as well as secondary needs for non-motorized accessibility, alternate route in the event of crashes, and maintaining traffic flow.

Installing a signal would reduce crash frequency and severity at the E-Y intersection compared to the No Build alternative. While a signal introduces delay to the through traffic on Egan Drive, this alternative would allow vehicles to cross Egan Drive at the Yandukin/Glacier Lemon intersection. Nevertheless, the time to travel between destinations in the project area does significantly change when compared to the No Build alternative.

The results shown Table 27 include a pedestrian overpass. It would be possible to install the overpass only and continue to prohibit pedestrians from crossing Egan Drive at Yandukin/Glacier Lemon, or a signalized pedestrian crossing could be built at the intersection in addition to the overpass.

The Full Access Signal alternative would require more ROW and have more wetland impacts than the No Build, Mobility, and Partial Access Signal alternatives. The Full Access Signal alternative also provides improved business access and vehicle accessibility compared to the No Build alternative, benefitting vehicles desiring to cross Egan Drive.

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Table 27: Full Access Signal with Median Crossovers Screening Results

Purpose	Need	Metric	Score	Brief Explanation of Score
Primary	Safety	Crash Frequency	10	Installing a signal is expected to decrease angle crashes but increase rear end crashes
		Crash Severity	6	Forecasted high-severity crashes are predicted to be less than the No Build alternative
		Bicycles and Pedestrians	5	Grade-separated pedestrian crossing eliminates conflicts between vehicles and pedestrians/bicycles; signalized crossing at E-Y
Secondary	Alternate Driving Routes	Travel Time Reliability	1	Time for personnel to arrive and set up median crossovers is longer than the average time it takes for a crash to be cleared at the intersection; assumes the signal operates in flash mode and allows only northbound and southbound traffic while lanes are closed
	Non-motorized Accessibility	Pedestrian and Bicycle Access Time	5	Pedestrians and bicycles do not experience any delay crossing Egan Drive at the grade-separated pedestrian crossing
Other Considerations	Transit	Transit Route Time	1	Transit uses existing routes to serve Egan Drive and Glacier Highway from Downtown to Nugget Mall
		Bus Stop Impacts	2	The bus stops on Glacier Lemon Road would be accessed similar to the No Build alternative
	Land Use	Plan Impacts	2	Consistent with *Safe Routes to School Plan* and *Transit Development Plan*
		Access Travel Time	2	Vehicles can cross Egan Drive at both Glacier Nugget and E-Y intersections; without Glacier Lemon Spur Extension, vehicles must use Egan Drive to travel between Glacier Nugget and Fred Meyer
		Business Visibility	3	Visibility to businesses along Egan Drive stays the same
	Environmental	ROW Impacts	3	Airport and private property partial acquisition needed
		Wetland Impacts	2	Wetlands in median, ditches, and private property
		Stormwater Impacts	2	Added pavement in design
		Fish Habitats and Streams Impacts	3	No impacts
		Historic & 4(f) Properties Impacts	2	Potential for previously unidentified resources associated with ROW acquisition
		Air Quality Impacts	1	Added pavement that will undergo winter sanding
	Cost	Cost Range	4	$14 to $29 million (cost includes median crossovers, realignment of Yandukin Drive, signals, and grade-separated pedestrian crossing)

Table 28: Full Access Signal with Glacier Lemon Spur Extension Screening Results

Purpose	Need	Metric	Score	Brief Explanation of Score
Primary	Safety	Crash Frequency	8	Installing a signal is expected to decrease angle crashes but increase rear end crashes; Glacier Lemon Spur Extension is expected to increase crashes at the Glacier Nugget signal
		Crash Severity	6	Forecasted high-severity crashes are predicted to be less than the No Build alternative
		Bicycles and Pedestrians	5	Grade-separated pedestrian crossing eliminates conflicts between vehicles and pedestrians/bicycles; signalized crossing at E-Y
Secondary	Alternate Driving Routes	Travel Time Reliability	4	Glacier Lemon Spur Extension has limited excess capacity and requires vehicles to travel out-of-direction to avoid the crash location
	Non-motorized Accessibility	Pedestrian and Bicycle Access Time	5	Pedestrians and bicycles do not experience any delay crossing Egan Drive at the grade-separated pedestrian crossing
Other Considerations	Transit	Transit Route Time	1	Transit uses existing route to serve Egan Drive, but route time increases due to change in traffic control for right turns along the route (free to yield)
		Bus Stop Impacts	2	The bus stops on Glacier Lemon Road would be accessed similar to the No Build alternative
	Land Use	Plan Impacts	2	Consistent with *Safe Routes to School Plan* and *Transit Development Plan*
		Access Travel Time	2	Vehicles can cross Egan Drive at both Glacier Nugget and E-Y intersections; lower speed Glacier Lemon Spur Extension provides new route between Glacier Nugget and Fred Meyer
		Business Visibility	3	Visibility to businesses along Egan Drive stays the same
	Environmental	ROW Impacts	2	Airport and private property partial acquisition needed south of Egan; USFS property and private land acquisition needed for Glacier Lemon Spur Extension
		Wetland Impacts	1	Wetlands in Egan Drive median, ditches, private property, and Glacier Lemon Spur Extension parcels
		Stormwater Impacts	1	Added pavement in design
		Fish Habitats and Streams Impacts	1	No impacts
		Historic & 4(f) Properties Impacts	1	Potential for previously unidentified resources associated with ROW acquisition; ROW acquisition from USFS land may be protected under Section 4(f)
		Air Quality Impacts	1	Added pavement that will undergo winter sanding
	Cost	Cost Range	3	$29 to $58 million (cost includes realignment of Yandukin Drive, signals, grade-separated pedestrian crossing, and Glacier Lemon Spur Extension)

5.3.4 Two Signalized T-Intersections

Table 29 presents the screening results for the Two Signalized T-Intersections alternative with the pedestrian overpass, and Table 30 presents the results with the Glacier Lemon Spur Extension and the pedestrian overpass. The Two Signalized T-Intersections alternative, which includes the pedestrian overpass and may include the Glacier Lemon Spur Extension, meets the primary need for safety as well as secondary needs for non-motorized accessibility, alternate route in the event of crashes, and maintaining traffic flow.

Installing a signal to control left turns from Egan Drive to the side streets at the two E-Y intersections would reduce crash frequency and severity compared to the No Build alternative. While the Two Signalized T-Intersections alternative allows vehicles to cross Egan Drive using the Yandukin and Glacier Lemon intersections, crossing Egan Drive requires traveling through two signalized intersections; thus, overall travel time in the area is not improved.

This alternative provides more flexibility in routing traffic around a crash on Egan Drive; however, it was not found to work significantly better than the No Build alternative.

This alternative would have the greatest ROW impacts compared to the other alternatives due to extending the Yandukin Drive approach. The project team determined that the ROW impacts were unacceptable and dismissed this alternative from further consideration.

The results shown in Table 29 include a pedestrian overpass. It would be possible to install the overpass only and continue to prohibit pedestrians from crossing Egan Drive at Glacier Lemon Road, or a signalized pedestrian crossing could be built at the intersection, in addition to the overpass.

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Table 29: Two Signalized T-Intersections Screening Results

Purpose	Need	Metric	Score	Brief Explanation of Score
Primary	Safety	Crash Frequency	10	Installing a signal is expected to decrease angle crashes but increase rear end crashes; separating E-Y to two T-intersections results in more conflicts between vehicles compared to other signalized alternatives
		Crash Severity	4	Forecasted high-severity crashes are predicted to be less than the No Build alternative
		Bicycles and Pedestrians	5	Grade-separated pedestrian crossing eliminates conflicts between vehicles and pedestrians/bicycles; signalized crossing at E-Y
Secondary	Alternate Driving Routes	Travel Time Reliability	3	The detour route has limited excess capacity and requires vehicles to travel out-of-direction to avoid the crash location
	Non-motorized Accessibility	Pedestrian and Bicycle Access Time	5	Pedestrians and bicycles do not experience any delay crossing Egan Drive at the grade-separated pedestrian crossing
Other Considerations	Transit	Transit Route Time	1	Transit uses existing routes to serve Egan Drive and Glacier Highway from Downtown to Nugget Mall
		Bus Stop Impacts	2	The bus stops on Glacier Lemon Road would be accessed similar to the No Build alternative
	Land Use	Plan Impacts	3	Consistent with *Safe Routes to School Plan*, *Airport Sustainability Master Plan*, and *Transit Development Plan*
		Access Travel Time	1	Vehicles can cross Egan Drive at both Glacier Nugget and E-Y intersections, but must travel through two signals at E-Y
		Business Visibility	3	Visibility to businesses along Egan Drive stays the same
	Environmental	ROW Impacts	2	Private property (Honsinger Pond) partial acquisition
		Wetland Impacts	2	Honsinger Pond and adjacent wetlands
		Stormwater Impacts	2	Additional pavement in design
		Fish Habitats and Streams Impacts	3	Unnamed fish bearing stream at eastern edge of Egan merge ramp; culvert extension likely required
		Historic & 4(f) Properties Impacts	2	Potential for previously unidentified resources associated with ROW acquisition; ROW acquisition from USFS land may be protected under Section 4(f)
		Air Quality Impacts	2	Added pavement that will undergo winter sanding
	Cost	Cost Range	3	$25 to $51 million (cost includes realignment/extension of Yandukin Drive to intersection near Juneau Christian Center, signals, and grade-separated pedestrian crossing)

Table 30: Two Signalized T-Intersections with Glacier Lemon Spur Extension Screening Results

Purpose	Need	Metric	Score	Brief Explanation of Score
Primary	Safety	Crash Frequency	8	Installing a signal is expected to decrease angle crashes but increase rear end crashes; separating E-Y to two T-intersections results in more conflicts between vehicles; Lemon Spur Extension is expected to increase crashes at the Glacier Nugget signal
		Crash Severity	4	Forecasted high-severity crashes are predicted to be less than the No Build alternative
		Bicycles and Pedestrians	5	Grade-separated pedestrian crossing eliminates conflicts between vehicles and pedestrians/bicycles; signalized crossing at E-Y
Secondary	Alternate Driving Routes	Travel Time Reliability	4	Glacier Lemon Spur Extension has limited excess capacity and requires vehicles to travel out-of-direction to avoid the crash location
	Non-motorized Accessibility	Pedestrian and Bicycle Access Time	5	Pedestrians and bicycles do not experience any delay crossing Egan Drive at the grade-separated pedestrian crossing
Other Considerations	Transit	Transit Route Time	1	Transit uses existing route to serve Egan Drive, but route time increases due to change in traffic control for right turns along the route (from free to yield)
		Bus Stop Impacts	2	The bus stops on Glacier Lemon Road would be accessed similar to the No Build alternative
	Land Use	Plan Impacts	3	Consistent with *Safe Routes to School Plan*, *Airport Sustainability Master Plan*, and *Transit Development Plan*
		Access Travel Time	1	Vehicles can cross Egan Drive at both Glacier Nugget and E-Y intersections but must travel through two signals at E-Y; lower speed Glacier Lemon Spur Extension provides new route between Glacier Nugget and Fred Meyer
		Business Visibility	3	Visibility to businesses along Egan Drive stays the same
	Environmental	ROW Impacts	1	Private and USFS partial parcel acquisitions needed for Glacier Lemon Spur Extension
		Wetland Impacts	1	Honsinger Pond and adjacent wetlands, Glacier Lemon Spur Extension parcels wetlands
		Stormwater Impacts	1	Additional pavement in design
		Fish Habitats and Streams Impacts	1	Unnamed fish bearing stream at eastern edge of Egan merge ramp; culvert extension likely required
		Historic & 4(f) Properties Impacts	1	Potential for previously unidentified resources associated with ROW acquisition; indirect effects to historic properties possible; ROW acquisition from USFS land may be protected under Section 4(f)
		Air Quality Impacts	1	Added pavement that will undergo winter sanding
	Cost	Cost Range	2	$40 to $81 million (cost includes realignment/extension of Yandukin Drive to intersection near Juneau Christian Center, signals, grade-separated pedestrian crossing, and Glacier Lemon Spur Extension)

5.3.5 Diamond Interchange

Table 31 presents the screening results for the Diamond Interchange alternative with median crossovers, and Table 32 presents the results with the Glacier Lemon Spur Extension. The Diamond Interchange alternative, which includes the pedestrian overpass and Glacier Lemon Spur Extension or median crossovers, meets the primary need for safety as well as secondary needs for non-motorized accessibility, alternate route in the event of crashes, and maintaining traffic flow.

The Diamond Interchange alternative is predicted to have the fewest total crashes among the alternatives. The grade separation of key movements at the E-Y intersection would reduce conflicts between the high-speed Egan Drive traffic and low-speed side street traffic.

The interchange has greater ROW and wetlands impacts compared to the No Build alternative due to the bridge structure. Only the Two Signalized T-Intersection alternative has more ROW impacts than the Diamond Interchange alternative.

The interchange improves vehicle accessibility compared to the No Build alternative, benefitting vehicles desiring to cross Egan Drive. In addition, Egan Drive through traffic does not stop at the E-Y intersection. As a result, the overall time for travel in the study area is reduced compared to all other alternatives.

This alternative has the highest cost range of all alternatives due to the need to construct the bridge structure and acquire ROW from several properties.

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Table 31: Diamond Interchange with Median Crossovers Screening Results

Purpose	Need	Metric	Score	Brief Explanation of Score
Primary	Safety	Crash Frequency	10	Installing an interchange is forecasted to have the fewest number of total crashes among the alternatives
		Crash Severity	6	The alternative is expected to have the fewest number of high-severity crashes compared to the other alternatives
		Bicycles and Pedestrians	4	Pedestrians and bicycles cross one lane of traffic at a time and encounter fewer traffic volumes compared to signalized crossing alternatives; vehicles are yield-controlled and travel at lower speeds
Secondary	Alternate Driving Routes	Travel Time Reliability	1	The Diamond Interchange allows more movements to continue to flow normally; however, the time for personnel to arrive and set up median crossovers is longer than the average time it takes for a crash to be cleared at the intersection
	Non-motorized Accessibility	Pedestrian and Bicycle Access Time	2	Pedestrians and bicycles experience less than 10 seconds delay crossing the Egan Drive on- and off-ramps at E-Y
Other Considerations	Transit	Transit Route Time	3	Transit uses existing routes to serve Egan Drive and Glacier Highway from Downtown to Nugget Mall
		Bus Stop Impacts	2	The bus stops on Glacier Lemon Road would be accessed similar to the No Build alternative
	Land Use	Plan Impacts	3	Consistent with *Safe Routes to School Plan*, *Transit Development Plan*, and *Area-Wide Transportation Plan*
		Access Travel Time	3	Vehicles can cross Egan Drive at Glacier Nugget and cross under Egan and Yandukin Drives (unsignalized)
		Business Visibility	2	Guardrail or concrete barriers on the bridge structure obstructs portions of the Fred Meyer, Juneau Christian Center, and private properties; the elevated roadway obstructs side street vehicles from viewing businesses on the other side of Egan Drive
	Environmental	ROW Impacts	2	Airport and private property partial acquisition needed; Fred Meyer parking lot and Juneau Christian Center land needed
		Wetland Impacts	2	Honsinger Pond and adjacent wetlands; Egan Drive ditches and median wetlands
		Stormwater Impacts	1	Additional pavement in design
		Fish Habitats and Streams Impacts	3	No impacts
		Historic & 4(f) Properties Impacts	2	Potential for previously unidentified resources associated with ROW acquisition; indirect effects to historic properties possible
		Air Quality Impacts	1	Added pavement that will undergo winter sanding
	Cost	Cost Range	1	$46 to $93 million (cost includes median crossovers, bridge, ramps, and single-lane roundabouts)

Table 32: Diamond Interchange with Glacier Lemon Spur Extension Screening Results

Purpose	Need	Metric	Score	Brief Explanation of Score
Primary	Safety	Crash Frequency	10	Installing an interchange is forecasted to have the fewest number of crashes at E-Y among the alternatives; however, Glacier Lemon Spur Extension is expected to increase crashes at the Glacier Nugget signal
		Crash Severity	6	The alternative is expected to have the fewest number of high-severity crashes compared to other alternatives
		Bicycles and Pedestrians	4	Pedestrians and bicycles cross one lane of traffic at a time and encounter fewer traffic volumes compared to signalized crossing alternatives; vehicles are yield-controlled and travel at lower speeds
Secondary	Alternate Driving Routes	Travel Time Reliability	4	Glacier Lemon Spur Extension has limited excess capacity and requires vehicles to travel out-of-direction to avoid the crash location
	Non-motorized Accessibility	Pedestrian and Bicycle Access Time	2	Pedestrians and bicycles experience less than 10 seconds of delay crossing the Egan Drive on- and off-ramps at E-Y
Other Considerations	Transit	Transit Route Time	2	Transit uses existing route to serve Egan Drive, but route time increases due to the RIRO at Glacier-Old Dairy and change in traffic control for right turns along the route (free to yield)
		Bus Stop Impacts	2	The bus stops on Glacier Lemon Road would be accessed similar to the No Build alternative
	Land Use	Plan Impacts	3	Consistent with *Safe Routes to School Plan*, *Transit Development Plan*, and *Area-Wide Transportation Plan*
		Access Travel Time	3	Vehicles can cross Egan Drive at Glacier Nugget and cross under Egan and Yandukin Drives (unsignalized); lower speed Glacier Lemon Spur Extension provides new route between Glacier Nugget and Fred Meyer
		Business Visibility	2	Guardrail or concrete barriers on the bridge structure obstructs portions of Fred Meyer, Juneau Christian Center, and private properties; the elevated roadway obstructs side street vehicles from viewing businesses on the other side of Egan Drive
	Environmental	ROW Impacts	1	Private and USFS partial parcel acquisitions needed for Glacier Lemon Spur Extension
		Wetland Impacts	1	Honsinger Pond and adjacent wetlands; Egan Drive ditches; Glacier Lemon Spur Extension parcels wetlands
		Stormwater Impacts	1	Additional pavement in design
		Fish Habitats and Streams Impacts	1	No impacts
		Historic & 4(f) Properties Impacts	1	Potential for previously unidentified resources associated with ROW acquisition; indirect effects to historic properties possible; ROW acquisition from USFS land may be protected under Section 4(f)
		Air Quality Impacts	1	Added pavement that will undergo winter sanding
	Cost	Cost Range	1	$61 to $121 million (cost includes bridge structure, ramps, single-lane roundabouts, and Glacier Lemon Spur Extension)

6 Conclusion

6.1 Recommended Alternatives

Based on Level 2 screening, the Partial Access Signal with the Glacier Lemon Spur Extension and a protected pedestrian crossing (either a grade-separated pedestrian crossing or a crossing protected by a signal) is the recommended alternative.

The Partial Access Signal alternative scored the highest among the alternatives that met the project purpose and need, with acceptable impacts to ROW, wetlands, and vegetation. While the Full Access Signal and Diamond Interchange alternatives also met purpose and need with acceptable impacts, the Partial Access Signal had several advantages compared to the other two top-scoring alternatives, as discussed below.

The Partial Access Signal alternative has less wetland impacts than the Diamond Interchange alternative and less ROW, stormwater, and air quality impacts than the Full Access Signal and Diamond Interchange alternatives. The Partial Access Signal alternative is less complex, which means there would be less impacts to the traveling public during construction, and construction would be for a shorter period. The overall costs of the Partial Access Signal alternative are less than the other two top-scoring alternatives. The overall costs for the benefit provided by the Partial Access Signal alternative are more consistent with optimizing the system performance within statewide planning budgets.

The project team determined that impacts to the airport property and private properties near Honsinger Pond were critical factors in identifying the recommended alternative because acquiring the ROW needed for the Full Access Signal and the Diamond Interchange alternatives could significantly impact the new development planned for that area, which would likely have socioeconomic impacts that were not considered in the Level 2 criteria. Furthermore, acquiring land from the airport is potentially complicated and time consuming (see discussion of FAA approval in Section 4.2.6 Environmental: Right-Of-Way Impacts). The Partial Access Signal alternative does not impact these properties, while the Full Access Signal and Diamond Interchange alternatives do impact these properties.

6.2 Alternatives Not Recommended

All build alternatives that included the median crossovers were dismissed because the median crossovers did not meet the project purpose and need for an alternate driving route during a crash. Analysis of the travel time reliability metric indicated that the time to implement the crossovers (i.e., for DOT&PF M&O personnel to arrive and set it up) would take longer than the average time it currently takes for a crash to clear at the intersection.

The Mobility alternative with the Glacier Lemon Spur Extension was dismissed because it does not score as high as the other alternatives, mostly because it does not reduce vehicle crash frequency and severity at the intersection as compared to the No Build alternative.

The Two Signalized T-Intersection alternative, both with and without the Glacier Lemon Road Extension, was dismissed because it would have unacceptable impacts to the private properties near Honsinger Pond, making any new development in that area nearly impossible. Extending Yandukin Drive would require acquisition of multiple properties, resulting in the alternative impacting planned property developments.

Both the Full Access Signal and Diamond Interchange alternatives meet each project need when they include the Glacier Lemon Road Extension. They both provide benefits to the public in terms of increased safety (reduce vehicle crash frequency and severity) and pedestrian accessibility. They appear to be less advantageous as compared to the Partial Access Signal alternative in terms of ROW impacts and cost; however, there may be other considerations that were not evaluated in this study.

Appendix A Purpose and Need

Purpose

The purpose of the Egan and Yandukin Intersection Planning and Environmental Linkages (PEL) Study is to identify ways to improve transportation safety for all users. The secondary purposes are to identify ways to improve mobility and route diversity in the transportation grid, improve access and mobility for pedestrian and bicyclists, and maintain traffic capacity and flow through the Egan Drive and Yandukin Drive intersection and the surrounding area.

Need

Transportation improvements will address the following needs:

- **Safety –** The traveling public has expressed concerns regarding intersection safety. Crash frequency at this intersection is similar to the statewide average for similar intersections. Data show that out of a total of 86 crashes between 2005 and 2017, 7 involved major injuries. While there have been no fatalities at the intersection, nearly 48 percent of all crashes involved some sort of injury.
- **Alternate Route in the Event of Crashes –** Motorists traveling between the Mendenhall Valley and downtown are limited to using a single roadway, Egan Drive, for travel. Juneau businesses rely on the intersection as a vital component of the connection between downtown, Juneau International Airport, Mendenhall Valley and points farther out the road. When an accident occurs on Egan Drive, the lack of an alternate route directly affects travel time reliability, particularly during peak travel times. The lack of an alternate route results in area-wide congestion and traffic delays when collisions occur, and increases overall perception of the crash rate and severity at the intersection.
- **Non-Motorized Access –** The nearest controlled crossing of Egan Drive for pedestrians and bicyclists is 3/4 mile north from the Egan Drive and Yandukin Drive intersection. Bicyclists and pedestrians unwilling to follow the lengthy, circuitous path often cross Egan Drive at Yandukin Drive, which is illegal and unsafe.

Additional Goals

- Provide improvements that are consistent with approved land use plans and ordinances
- Consider designs that maintain or improve access to and visibility of businesses
- Support opportunities for economic development and planned future land uses
- Seek to minimize increases in vehicle delay, especially during the peak morning and evening commuting time periods, to maintain the high mobility function of the corridor

Appendix B Community Focus Group and Agency Working Group Inputs

Community Focus Group and Agency Working Group Input on Level 2 Screening Measures

The following comments on the Level 2 Screening Criteria were received during the presentation and comment period for Agency Workshop #3 on August 20, 2020. Modification to the Level 2 Screening Criteria made by the project team in response to the comments are noted with an asterisks (*), where appropriate:

Comment 1:

Alex Pierce: How does the peak hour delay piece rank compared to other criteria and metrics?

Jeanne Bowie: Level 1 Screening did not rank one criteria above the other. Each criteria could either plus one (green), minus one (red), or stay the same (no fill color). Peak hour delay is only 1/14th of the score.

Comment 2:

Randy Vigil: If this was to be used, it would involve U.S. Army Corps of Engineers permitting [referring to Diamond Interchange Alternative]. What is the weighting of each valued criteria? What are the other important criteria as compared to others? Would some have more weight than others?

Michael Horntvedt: Baseline metrics in first evaluations will receive a higher weight than the others as they are the primary goals. The weighting of each criteria might come up in the second level of screening. Baseline purpose and need will have a higher weighting over others.

*In response to Comment 2, the project team conducted a survey of Community Focus Group and Agency Focus Group members that asked them to rank the screening criteria in order of importance. The results of this survey were used to assign the "overall percentage weights" to each criterion shown in Table 1 of the Level 2 Screening Results White Paper. The results of the survey are included in this Appendix.

Alex Pierce: As this project moves forward, I'd like to understand more how the other considerations are being weighed as they are all different and might not be a one to one consideration. CBJ [City and Borough of Juneau] would weigh level of service higher than economic impact.

Michael Horntvedt: These criteria are looking at travel time, not level of service as a metric so that we are understanding how these integrated alternatives will affect people's travel times on all modes. We are still open to conversation.

* See response to Comment 2.

The following comments on the Level 2 Screening Criteria were received during the presentation and comment period for Community Focus Group Workshop #3 on August 21, 2020. Modification to the Level 2 Screening Criteria made by the project team in response to the comments are noted with an asterisks (*), where appropriate:

Comment 1:

Senator Kiehl: I appreciate the work on crash severity and focus on providing an alternative route when there is a crash.

Comment 2:

Irene Gallion: Under primary concerns on Level 1 Screening criteria: what kind of data do we have available in regard to pedestrians and vehicles?

Michael Horntvedt: We will use data available throughout the state. Right now, we're looking at crash modification factors to better understand how each alternative will rate for safety. Quantitative evaluations will be in Level 2 Screening.

Comment 3:

Rob Welton: How will the team quantify bike and pedestrian conflicts based on the national experiences with similar treatment?

Michael Horntvedt: This will be more on the numbers side in Level 2 Screening. The number of points and level of detail will be provided in Level 2 Screening.

Comment 4:

Rob Welton: Crash modification factors are data that the state maintains, but doesn't usually track bike/pedestrian and is usually vehicle related. What tools are out there for bike/pedestrian type things?

Jeanne Bowie: Anytime anyone in the nation does a study that looks at before and after situation for safety improvements is included in a CMF [Crash Modification Factor] warehouse. Pedestrian and Bike are included in some of those.

Comment 5:

Sen. Kiehl: What's the wetland permit criterion about if not cost?

Michael Horntvedt: The permitting is about process and risk. There is a higher level of impacts to the system.

Taylor Horne: Green for wetlands is no impact, white is mid-level permit, red is high impact. Since none ranked white, Level 1 shows whether there is impact or not. Level 2 will look at quantifying the impact.

Comment 6:

Sen. Kiehl: Can you help us understand the "business visibility" criterion? Some things that close the median at E-Y [Egan Drive at Yandukin Drive-Glacier Lemon Road Intersection] score badly on that, others don't. Some interchanges score badly on it, others don't.

Michael Horntvedt: Business visibility is set to be "can people see the businesses they want to go to?" Overpasses would block their views.

Jeanne Bowie: Closure 3 includes an interchange at the intersection. If there is an interchange, it impacts the view; if an alternative didn't include an interchange, it did not impact view.

*In response to Comment 6, the project team modified the Level 2 Screening Criteria for Business Visibility to include both existing and future businesses in the project area.

Comment 7:

Rep. Story: Equity considerations, that are so important to consider, is a metric that we do not have. If you are dependent on transit for work, getting basic supplies, some are more favorable to those citizens, with their time and ease for elders, families traveling with small children.

Comment 8:

Unknown: Transit route time is a metric that you could say is part of the equity measurement.

* In response to Comments 7 and 8, the project team used the Pedestrian and Bicycle Facility Connectivity, Transit Route Time, and Bust Stop Impacts Level 2 Screening Criteria to approximate equity considerations.

Comment 9:

Sen. Kiehl: Level 1's unweighted scoring was disappointing. (e.g., options that needed some ROW [right-of-way] and options that needed *vast* amounts of ROW both got the same -1. Visibility was weighted the same as life and death issues.) So, some of the better alternatives are now off the table. In Level 2, how do you plan to weigh alternatives within a category, and how do you plan to weigh categories against each other?

Taylor Horne: We are still in the process of this as we are talking to you today. Level 1 was weighing the safety measures higher than others but we're able to tweak designs and add elements to turn other categories green, so it did come down to other considerations. Safety is still the number 1 priority and would carry a higher weighting but we're still in the process of working out what are the important ones and how do they weigh among the others.

Sen. Kiehl: Not sure if I agree with what was done with Level 1. Moving to Level 2, it's important to look at the achievability of some safety goals and to weight them accordingly. Rep. Story included that impact on transit isn't important to equity issues, but is important to economic issues; for example, this would be above business visibility. I don't think direction travel is a business killer. It's important not to duplicate a cost consideration, but if one is a little bit negative on one option and way negative on another option, that should be ranked.

Taylor Horne: To speak to the last point, we do propose to suss out those alternatives to compare to one another to see where the range is for each of these metrics to create buckets to see if there are groupings that are higher or lower, and we will compare them to one another.

* In response to Comment 9, the project team conducted a survey of Community Focus Group and Agency Focus Group members that asked them to rank the screening criteria in order of importance. The results of this survey were used to assign the "overall percentage weights" to each criterion shown in

Table 1 of the Level 2 Screening Results White Paper. The results of the survey are included in this Appendix.

Comment 10:

Irene Gallion: Can other metrics like Cost include some rough-order-of-magnitude costs for maintenance? (Maybe over life of project? Not sure if that is meaningful). It seems DOT&PF is inclined away from signals, so it would be good to know the cost impacts of signals. Also, for alternatives that add lane miles, the increased maintenance costs for that. I think M&O [Alaska Department of Transportation and Public Facilities Maintenance and Operations] can give you a per-lane-mile average cost. I like the plan for bike and pedestrian analysis.

Taylor: We are going to have a much more detailed rough order of magnitude with a rough estimate of cost to have an actual number at the end of this that can also be included as a deciding factor to the outcome. We can show how each metric ranks and the cost, including M&O and ongoing costs.

Comment 11:

Rep. Story: And part of any ranking can add an equity metric that also can be a weight in deciding factors.

Taylor Horne: Do you have thoughts on which go into that? Like how hard it is to walk in between destinations?

Rep. Story: Yes, I will be thinking about other equity measures. Part of this can be making sure that we hear from citizens riding the bus, be accessible at Capital Transit bus stops with the plans.

* See response to Comment 8.

Q1 What is your first and last name?

Answered: 13 Skipped: 0

1. Mike Gende
2. Denise Guizio
3. Harold Klum
4. Andi Story
5. Patty Wahto
6. Kate Kanouse
7. Robert Welton
8. James King
9. Charlie Williams
10. Nicholas Zito
11. Rich Etheridge
12. Sarah Meitl
13. Lee Cole

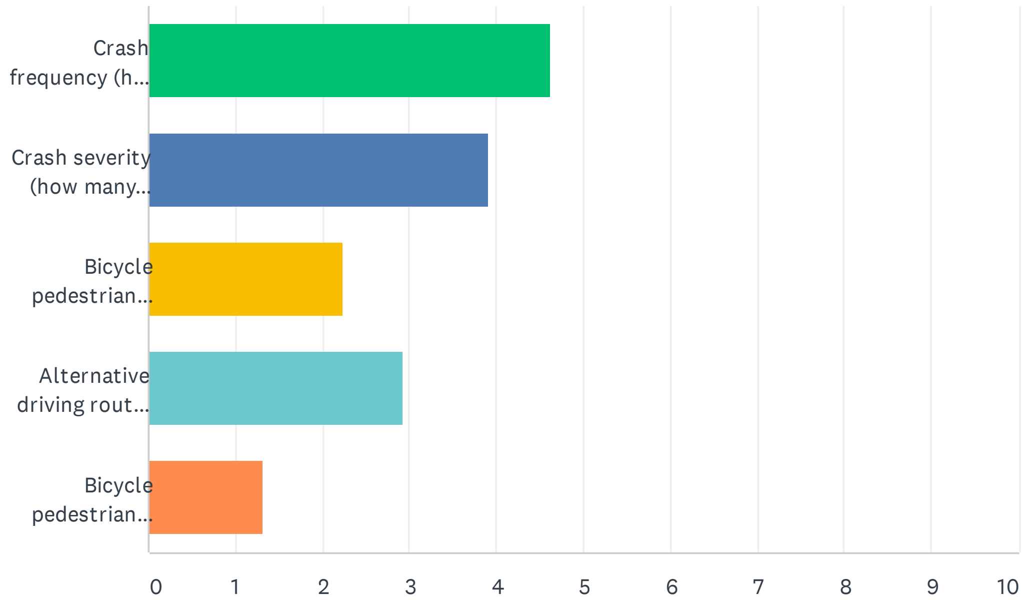
Q2 What organization do you represent?

Answered: 13 Skipped: 0

1. Fred Meyer
2. Capital Transit
3. Capital Transit
4. State of Alaska Representative, District 34
5. CBJ - Juneau International Airport
6. ADF&G Habitat
7. Juneau Freewheelers Bicycle Club
8. USDA Forest Service
9. Greater Juneau Chamber of Commerce
10. Alaska State Troopers
11. Capital City Fire Rescue
12. Alaska SHPO
13. AK Dept. of Natural Resources/DMLW/SERO

Q3 Primary & Secondary NeedsThese are the Needs that were identified for the project. Rank the needs in order of importance with 1 being the most important and 5 being least important.

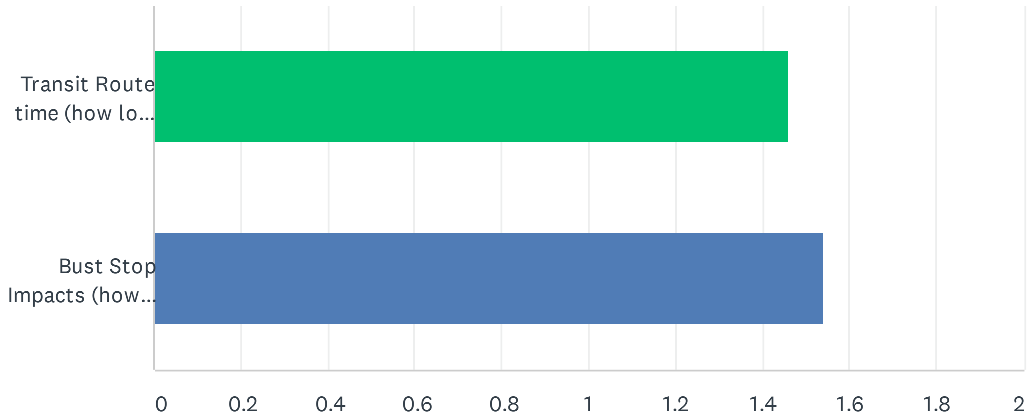
Answered: 13 Skipped: 0



	1	2	3	4	5	TOTAL	SCORE
Crash frequency (how many crashes occur)	61.54% 8	38.46% 5	0.00% 0	0.00% 0	0.00% 0	13	4.62
Crash severity (how many crashes result in hospitalization)	30.77% 4	46.15% 6	7.69% 1	15.38% 2	0.00% 0	13	3.92
Bicycle pedestrian safety (how many crashes occur involving a person walking or biking)	0.00% 0	0.00% 0	46.15% 6	30.77% 4	23.08% 3	13	2.23
Alternative driving routes (how well the alternative allows traffic to keep moving when Egan Drive is blocked by a crash)	7.69% 1	15.38% 2	46.15% 6	23.08% 3	7.69% 1	13	2.92
Bicycle pedestrian accessibility (how easy it is for someone walking or biking to cross Egan Drive)	0.00% 0	0.00% 0	0.00% 0	30.77% 4	69.23% 9	13	1.31

Q4 Other Consideration: TransitThese are the other considerations related to transit that were identified for the project. Rank in order of importance with 1 being the most important and 2 being least important.

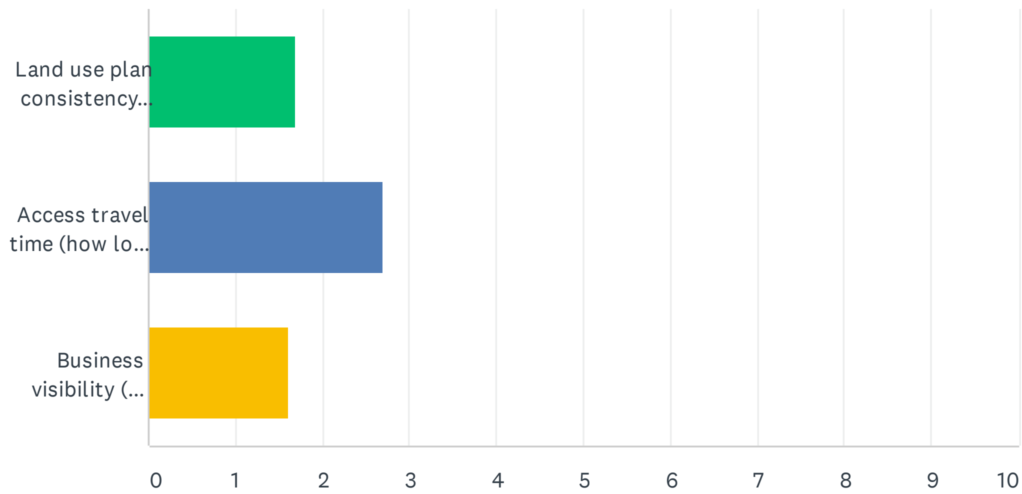
Answered: 13 Skipped: 0



	1	2	TOTAL	SCORE
Transit Route time (how long it takes a bus to complete its route through the area)	46.15% 6	53.85% 7	13	1.46
Bust Stop Impacts (how easy it is for riders to access the bus stop)	53.85% 7	46.15% 6	13	1.54

Q5 Other Consideration: Economic VitalityThese are the other considerations related to economic vitality that were identified for the project. Rank in order of importance with 1 being the most important and 3 being least important.

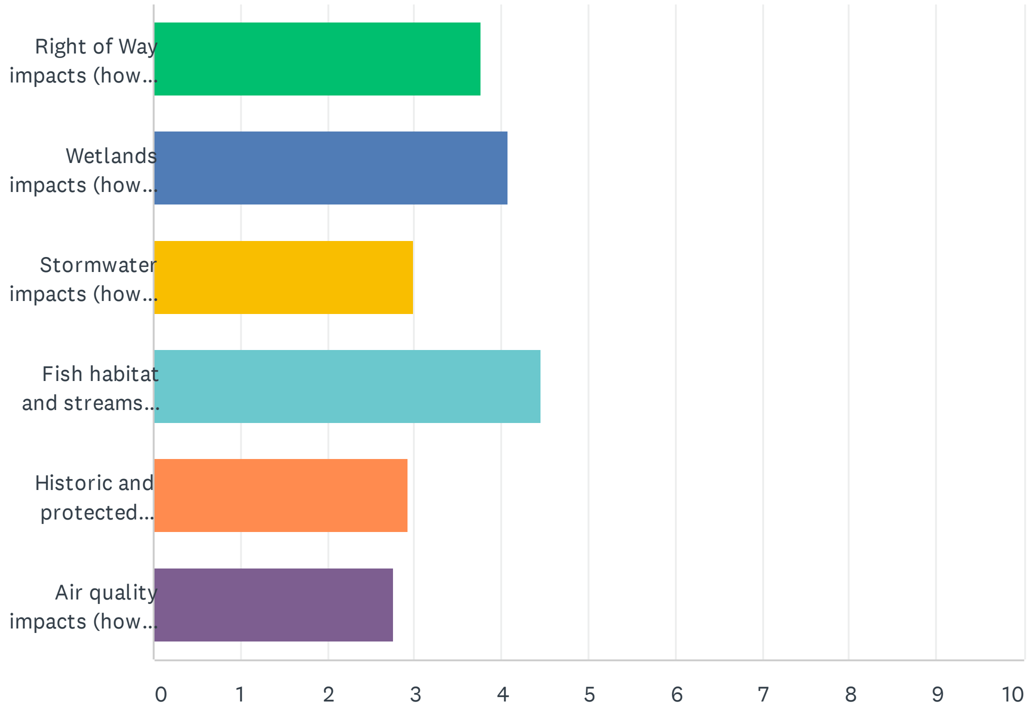
Answered: 13 Skipped: 0



	1	2	3	TOTAL	SCORE
Land use plan consistency (how well proposed improvements support local planning documents)	15.38% 2	38.46% 5	46.15% 6	13	1.69
Access travel time (how long it takes to drive between residences or businesses in the area)	76.92% 10	15.38% 2	7.69% 1	13	2.69
Business visibility (how proposed improvements change the visibility of business signs and storefronts)	7.69% 1	46.15% 6	46.15% 6	13	1.62

Q6 Other Consideration: Environmental VitalityThese are the other considerations related to the environment that were identified for the project. Rank in order of importance with 1 being the most important and 6 being least important.

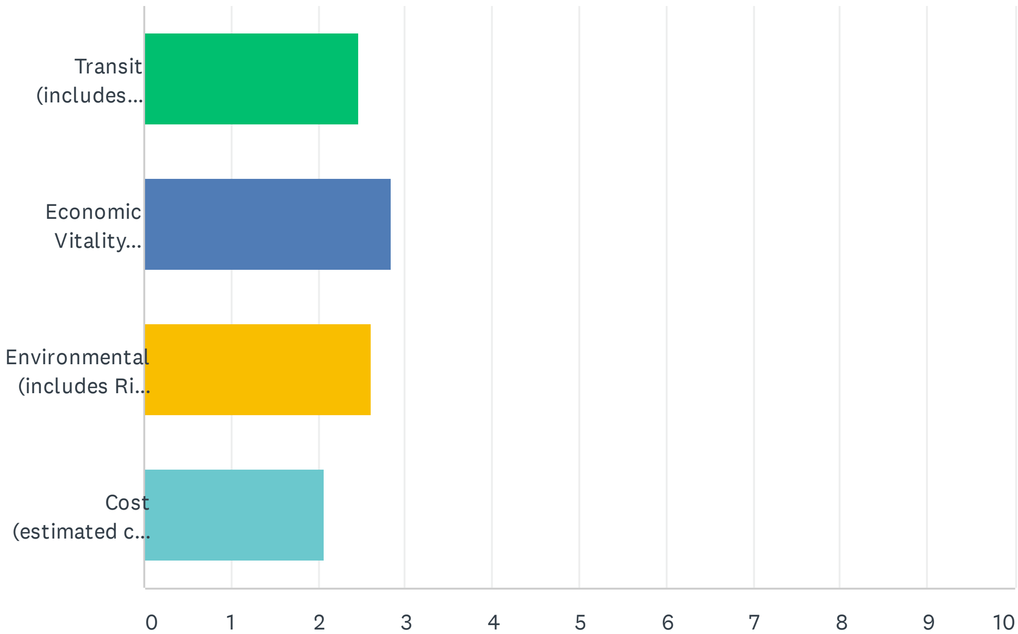
Answered: 13 Skipped: 0



	1	2	3	4	5	6	TOTAL	SCORE
Right of Way impacts (how much land is required to be purchased)	23.08% 3	23.08% 3	7.69% 1	15.38% 2	15.38% 2	15.38% 2	13	3.77
Wetlands impacts (how much protected wetlands are impacted)	7.69% 1	30.77% 4	38.46% 5	15.38% 2	0.00% 0	7.69% 1	13	4.08
Stormwater impacts (how much stormwater impacts are expected)	0.00% 0	7.69% 1	30.77% 4	23.08% 3	30.77% 4	7.69% 1	13	3.00
Fish habitat and streams impacts (how many fish bearing streams and habitat are impacted)	46.15% 6	7.69% 1	15.38% 2	7.69% 1	23.08% 3	0.00% 0	13	4.46
Historic and protected properties impacts (how many protected properties may experience potentially adverse effects)	23.08% 3	0.00% 0	7.69% 1	15.38% 2	23.08% 3	30.77% 4	13	2.92
Air quality impacts (how much increased air pollution is expected from more idling cars and/or more road sanding in winter)	0.00% 0	30.77% 4	0.00% 0	23.08% 3	7.69% 1	38.46% 5	13	2.77

Q7 Other Considerations Categories:Rank the different categories under Other Considerations against each other. Rank each category in order of importance with 1 being the most important and 4 being least important.

Answered: 13 Skipped: 0



	1	2	3	4	TOTAL	SCORE
Transit (includes Transit Route time and Bus Stop impacts)	23.08% 3	23.08% 3	30.77% 4	23.08% 3	13	2.46
Economic Vitality (includes Land Use Plan consistency, Access Travel Time, and Business visibility)	23.08% 3	38.46% 5	38.46% 5	0.00% 0	13	2.85
Environmental (includes Right of Way, Wetlands, Stormwater, Fish Habitat, Historic Properties, and Air Quality)	30.77% 4	30.77% 4	7.69% 1	30.77% 4	13	2.62
Cost (estimated cost of proposed intersection improvement)	23.08% 3	7.69% 1	23.08% 3	46.15% 6	13	2.08

Q8 Do you have any comments or questions?

Answered: 5 Skipped: 8

1. Thank you, this is past the deadline, but could still access the survey so I took it!
2. Thanks for inviting us to the process.
3. It makes sense to do a permanent solution. Let's go through this and do it right rather than a series of band aid solutions that are less costly and will require DOT to be back on this project in two years to work out other solutions.

Appendix C Options for Alternatives Considered and Not Pursued Further

Two control type options were considered for the Two Signalized T-Intersections alternative: traditional signal control at the intersections and continuous green T-intersection control. A continuous green T-intersection control operates similar to a traditional T-intersection signal with two main differences. First, Egan Drive through movements at the top of the T-intersection would receive a continuous green light and would not need to stop at the intersection. Second, Yandukin Drive left turns would turn into an acceleration lane and merge onto Egan Drive from the left side.

The continuous green T-intersection control option was dismissed because it performed similar to the traditional signal control but would require more right-of-way (ROW) than the traditional signal. A preliminary analysis indicates that close coordination between the two T-intersections under the traditional signal control would work as well as a continuous green T-intersection control and would allow most through traffic on Egan Drive to pass through both signals while only stopping at one of them (at the most).

Under the continuous green T-intersection control, through movements along the top of the T-intersection do not stop. Left turns from the side street would enter the lane adjacent to the through traffic to speed up before merging with through traffic. For the left turns to maneuver safely, the design would need to include a buffer between the left-turn lane and through lane, which would widen the road and require more ROW.

Under the continuous green T-intersection control, there would need to be enough distance between the intersections to allow a side street vehicle turning left at one intersection to turn right at the next intersection. This distance was calculated to be approximately 2,600 feet, which would require the purchase of additional ROW to move Yandukin Drive further east.

Appendix D Turning Movement Volumes

The Alaska Department of Transportation and Public Facilities Southcoast Region forecasts a 0.25 percent growth rate per year for the region. The growth factor was used to forecast future baseline turning movement volumes. The Level 2 Screening analysis developed four traffic demand cases for the 2040 design year. The turning movement volumes were redistributed per alternative to reflect the differences in alternative design and access.

1. Partial access at Yandukin Drive
   - No Build
   - Mobility with Median Crossovers
   - Partial Access Signal with Median Crossovers
2. Partial access at Yandukin Drive with the Glacier Lemon Spur Extension to Glacier Nugget
   - Mobility with Glacier Lemon Spur Extension
   - Partial Access Signal with Glacier Lemon Spur Extension
3. Full access at Yandukin Drive
   - Full Access Signal with Median Crossovers
   - Two Signalized T-Intersections with Median Crossovers
   - Diamond Interchange with Median Crossovers
4. Full access at Yandukin Drive with the Glacier Lemon Spur Extension to Glacier Nugget
   - Full Access Signal with Glacier Lemon Spur Extension
   - Two Signalized T-Intersections with Glacier Lemon Spur Extension
   - Diamond Interchange with Glacier Lemon Spur Extension

The following figures (D-1 through D-16) present the forecasted 2040 design turning movement volumes for the No Build and build alternatives with the median crossovers and Glacier Lemon Spur Extension.

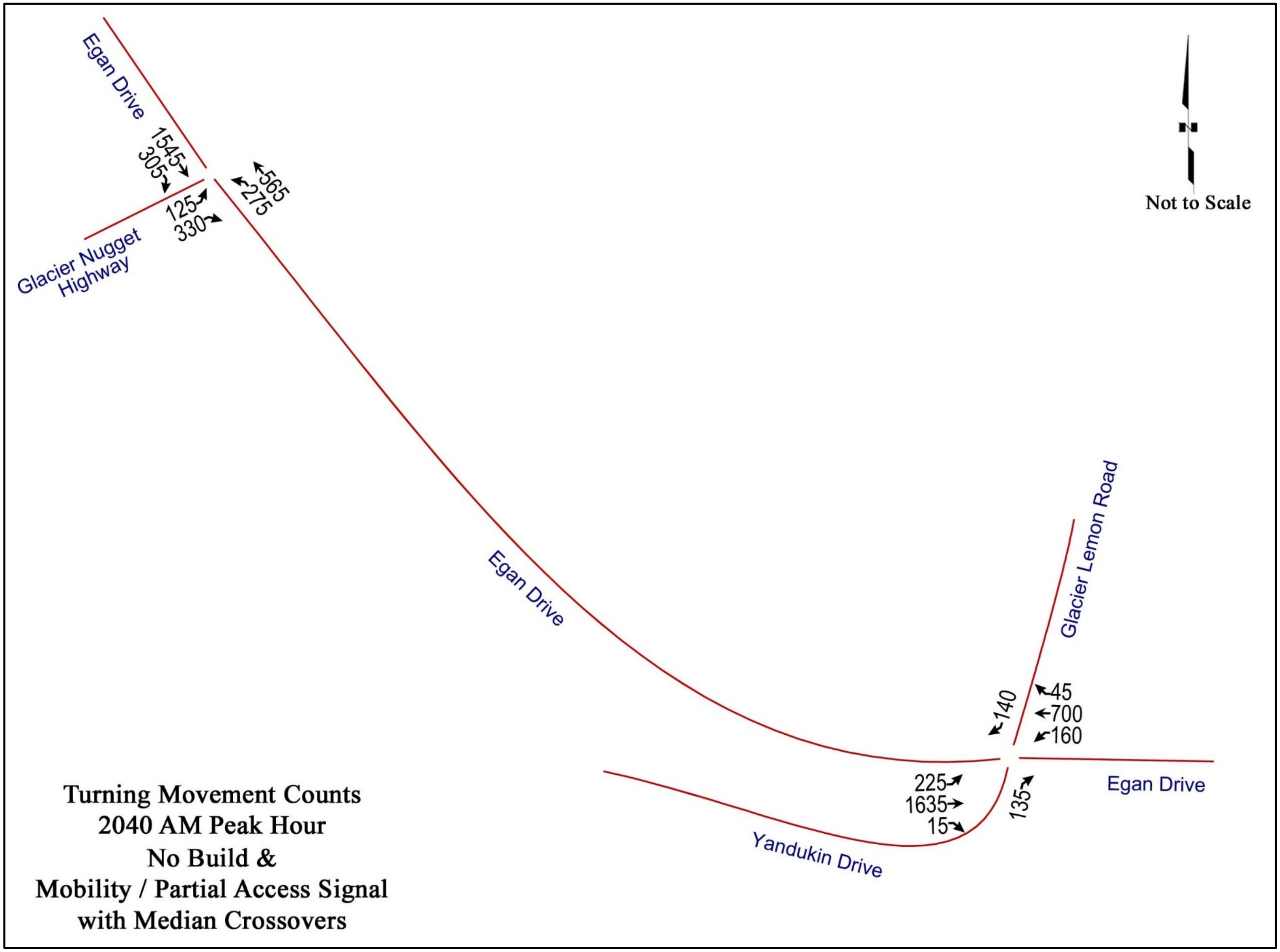


Figure D-1: Turning Movement Volumes – No Build, Mobility, and Partial Access Signal with Median Crossovers, 2040 AM Peak

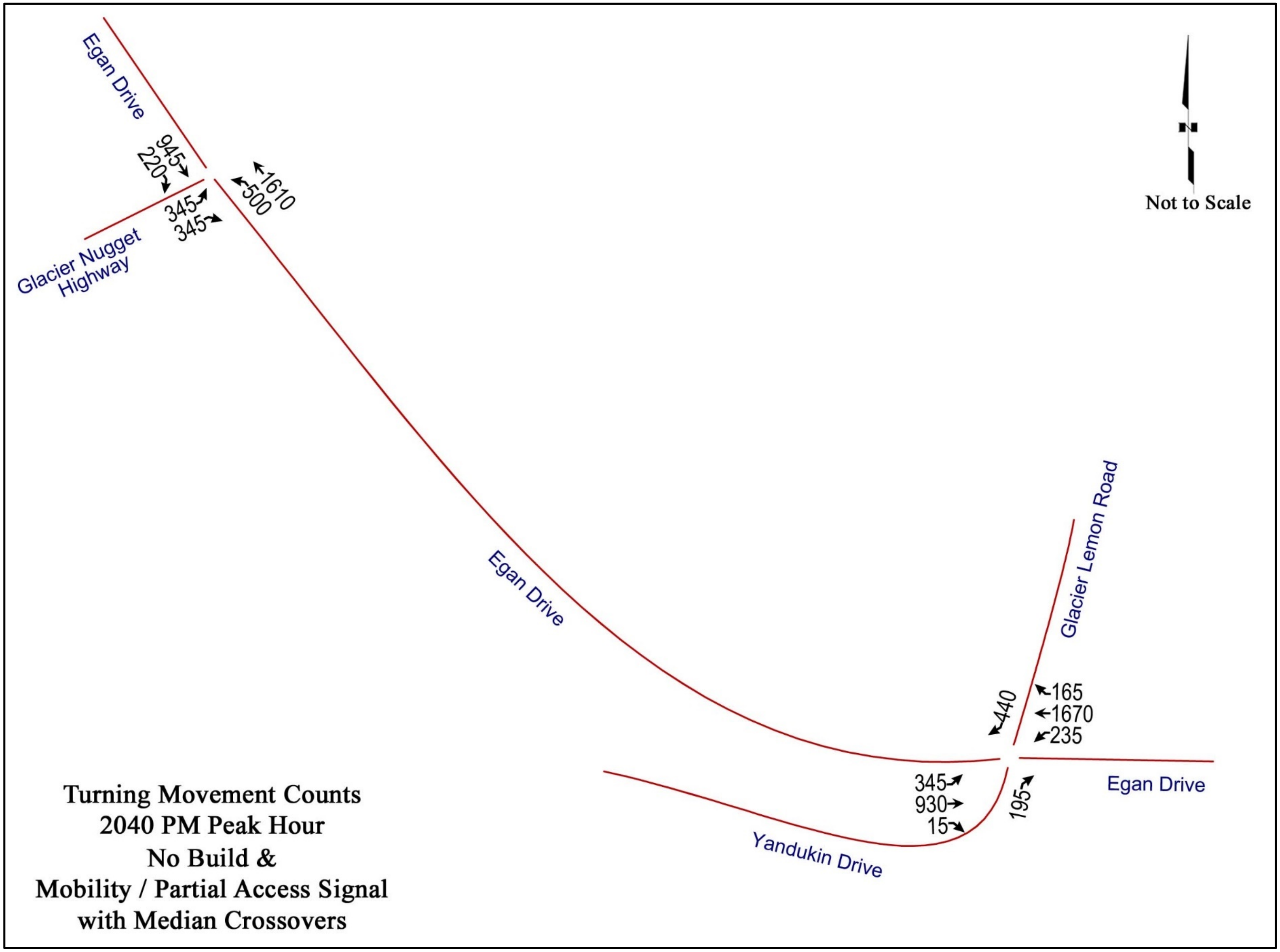


Figure D-2: Turning Movement Volumes – No Build, Mobility, and Partial Access Signal with Median Crossovers, 2040 PM Peak

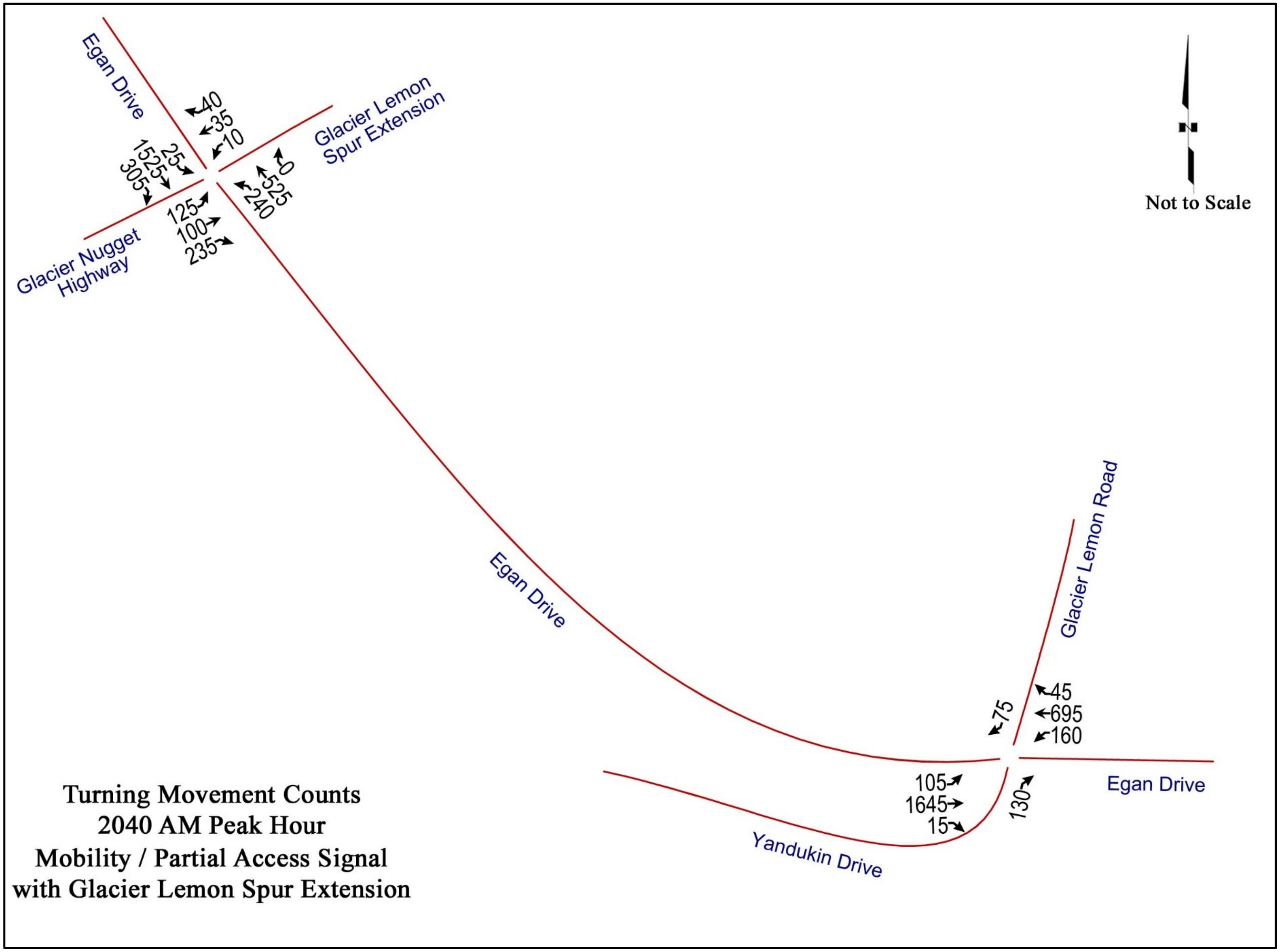


Figure D-3: Turning Movement Volumes – Mobility and Partial Access Signal with Glacier Lemon Spur Extension, 2040 AM Peak

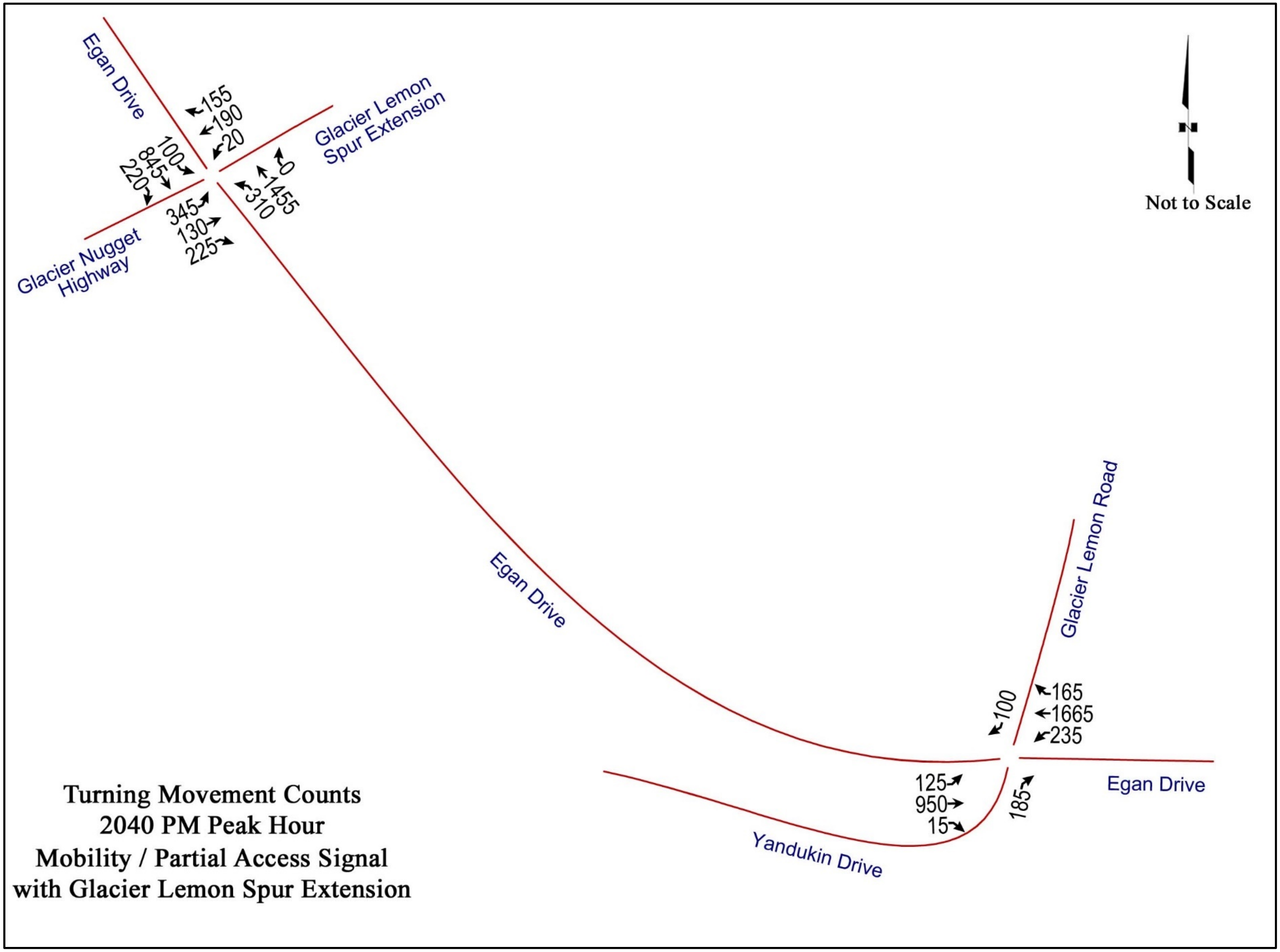


Figure D-4: Turning Movement Volumes – Mobility and Partial Access Signal with Glacier Lemon Spur Extension, 2040 PM Peak

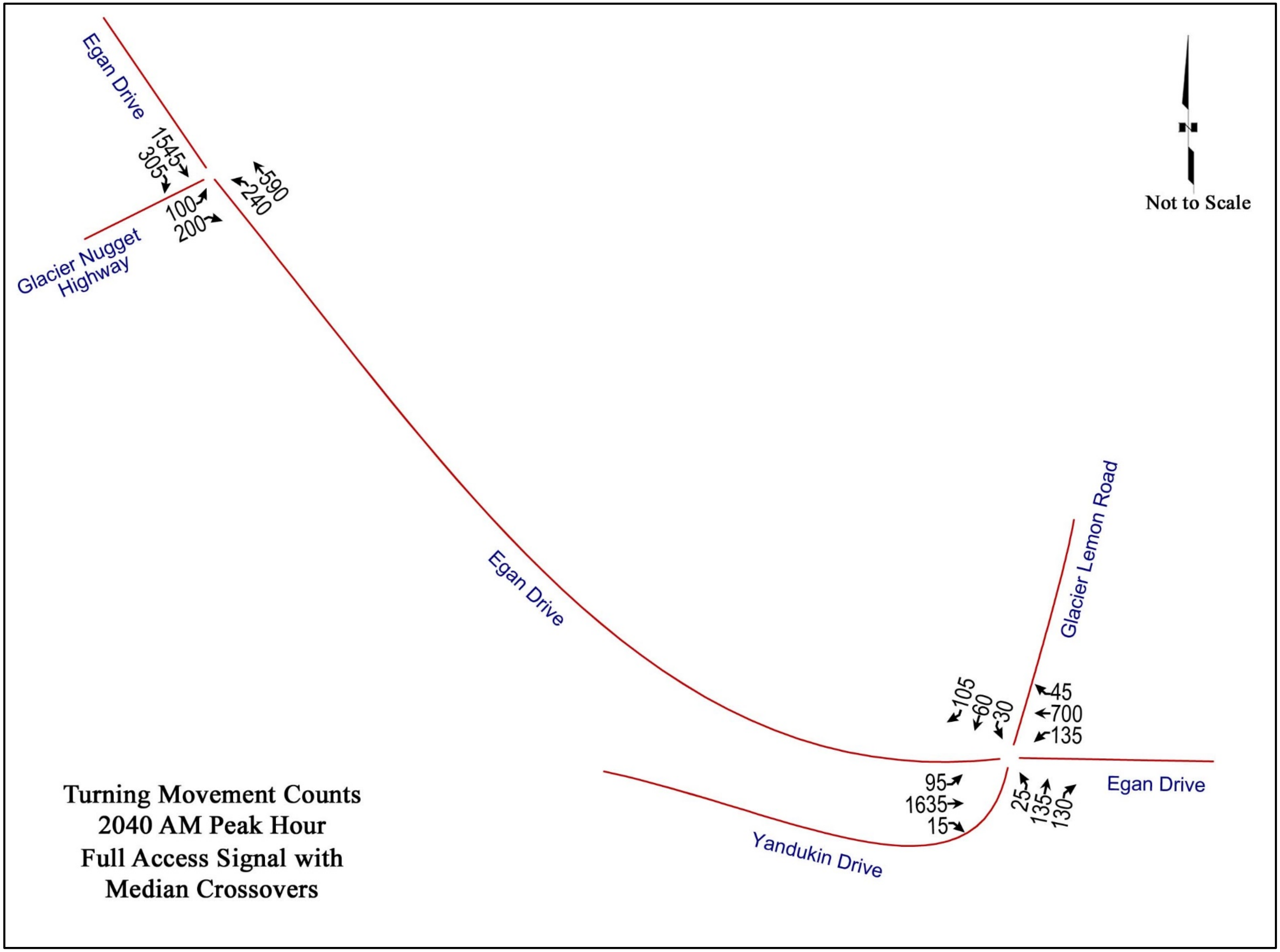


Figure D-5: Turning Movement Volumes – Full Access Signal with Median Crossovers, 2040 AM Peak

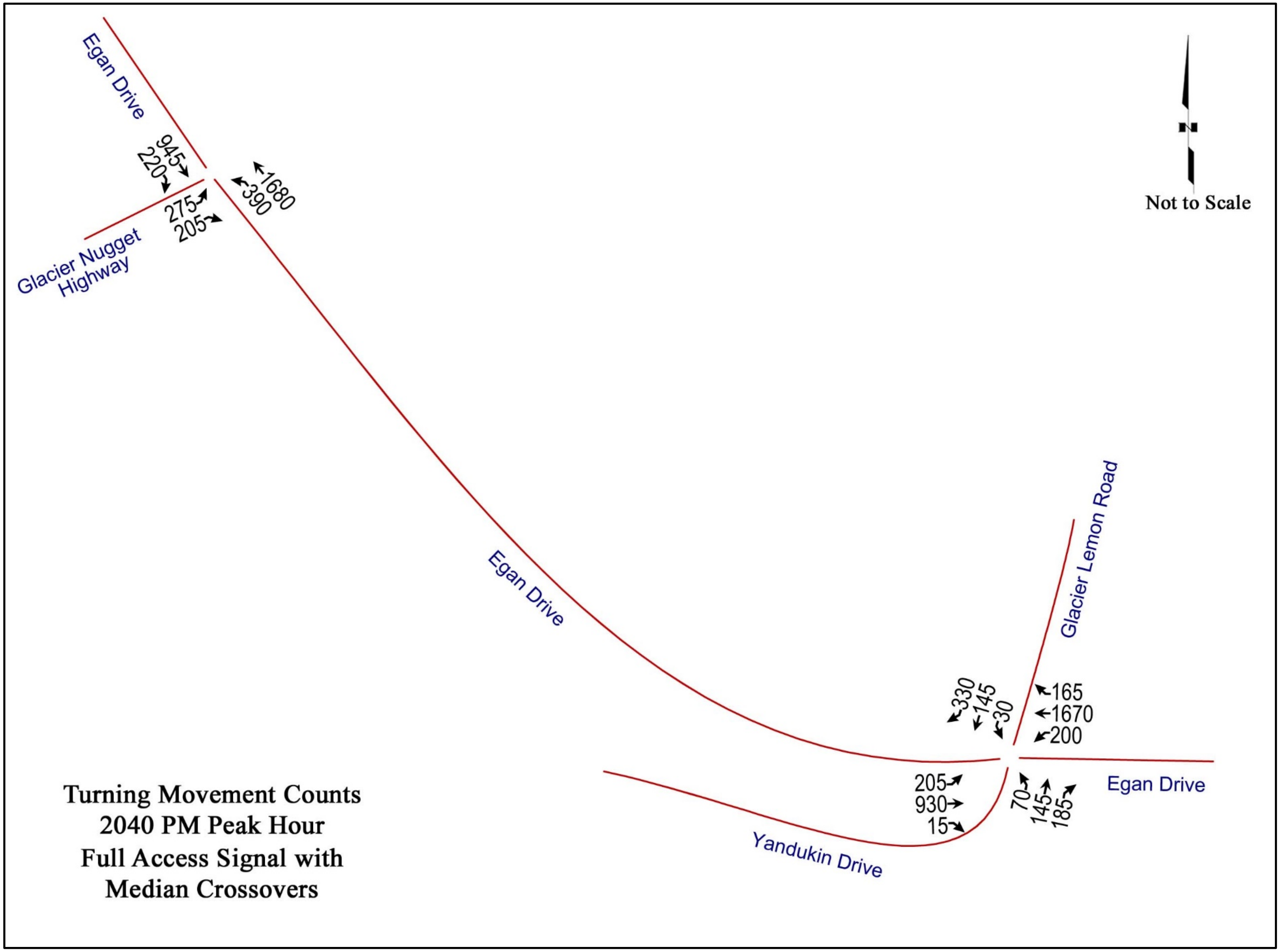


Figure D-6: Turning Movement Volumes – Full Access Signal with Median Crossovers, 2040 PM Peak

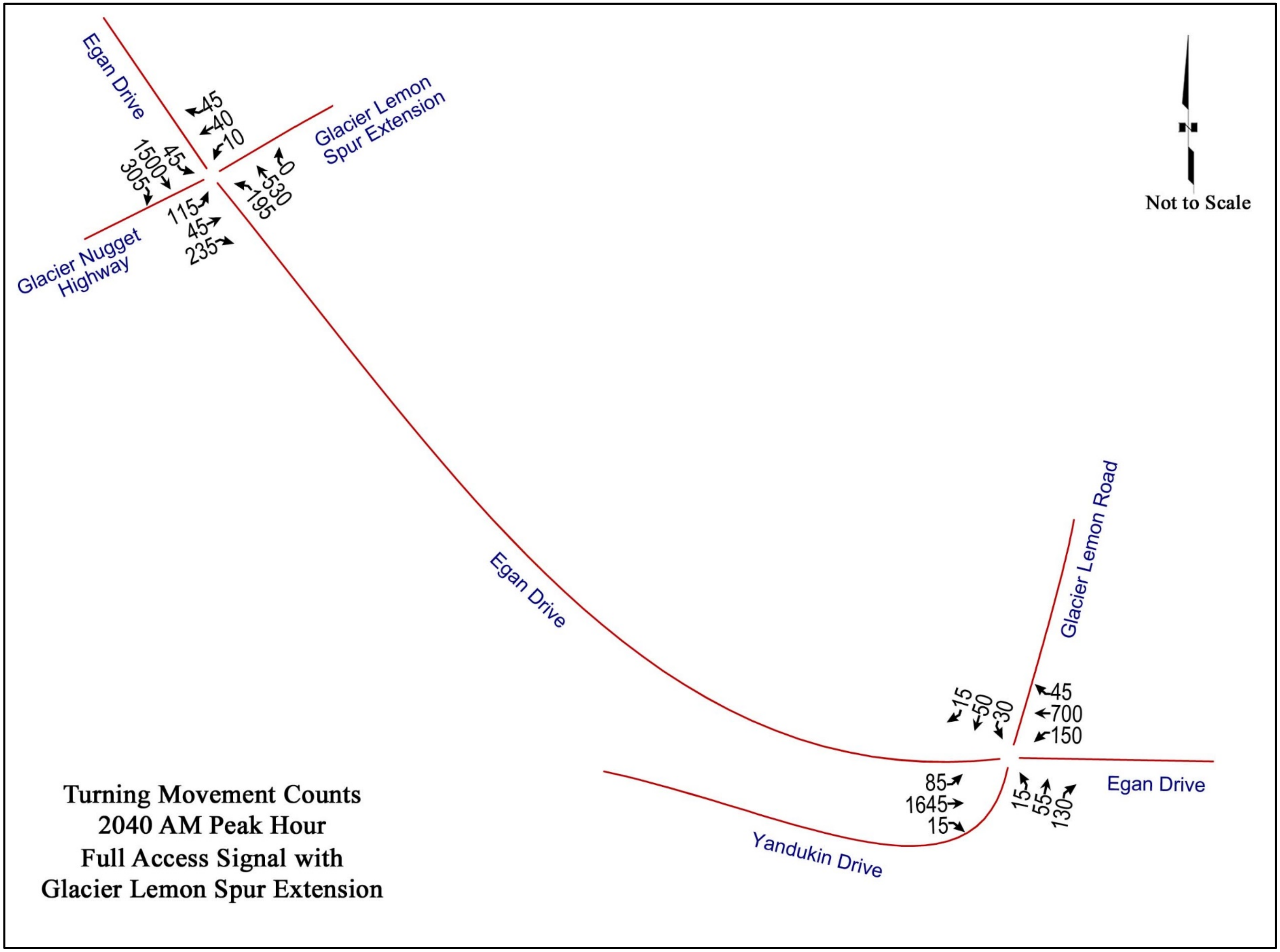


Figure D-7: Turning Movement Volumes – Full Access Signal with Glacier Lemon Spur Extension, 2040 AM Peak

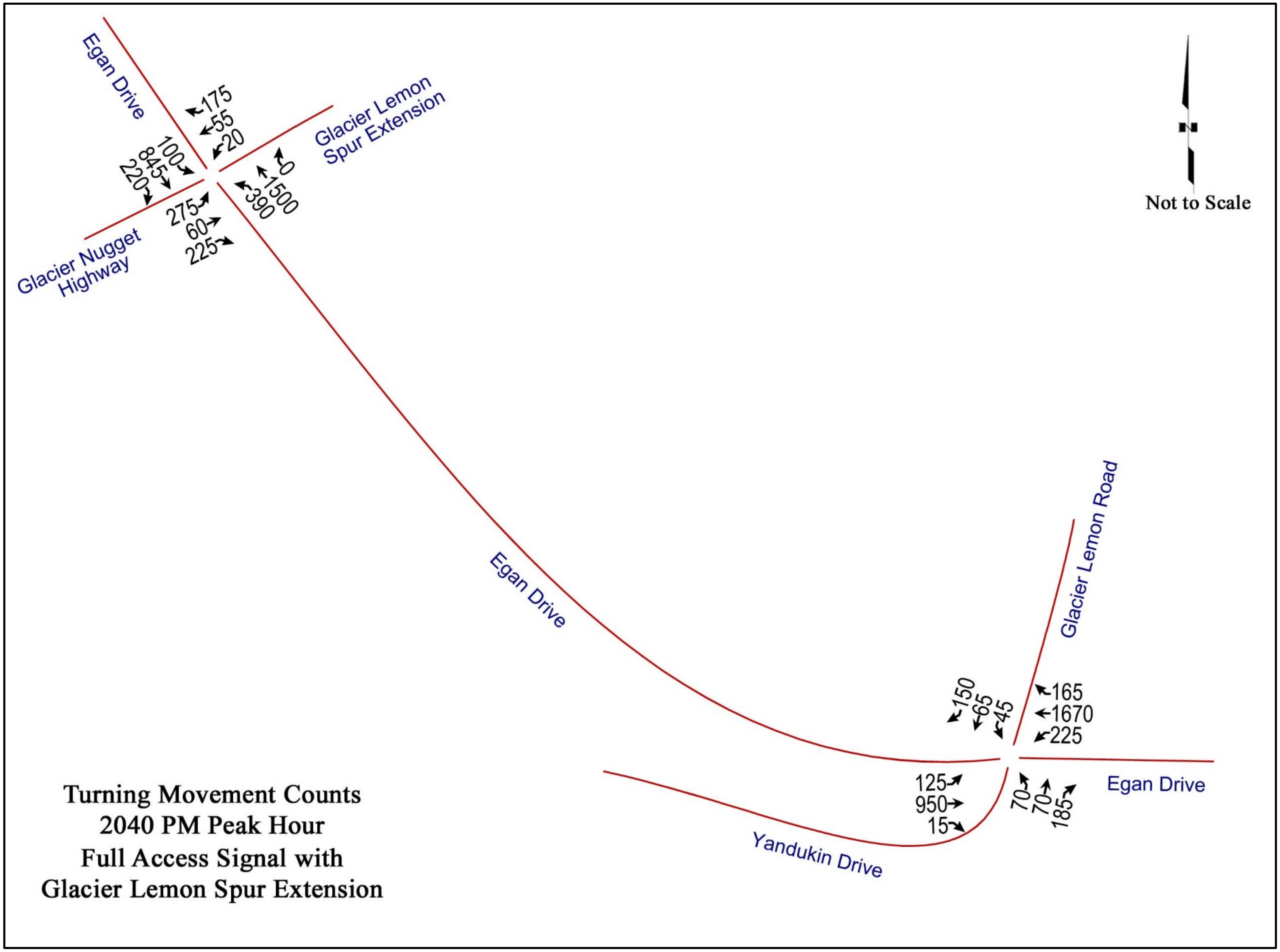


Figure D-8: Turning Movement Volumes – Full Access Signal with Glacier Lemon Spur Extension, 2040 PM Peak

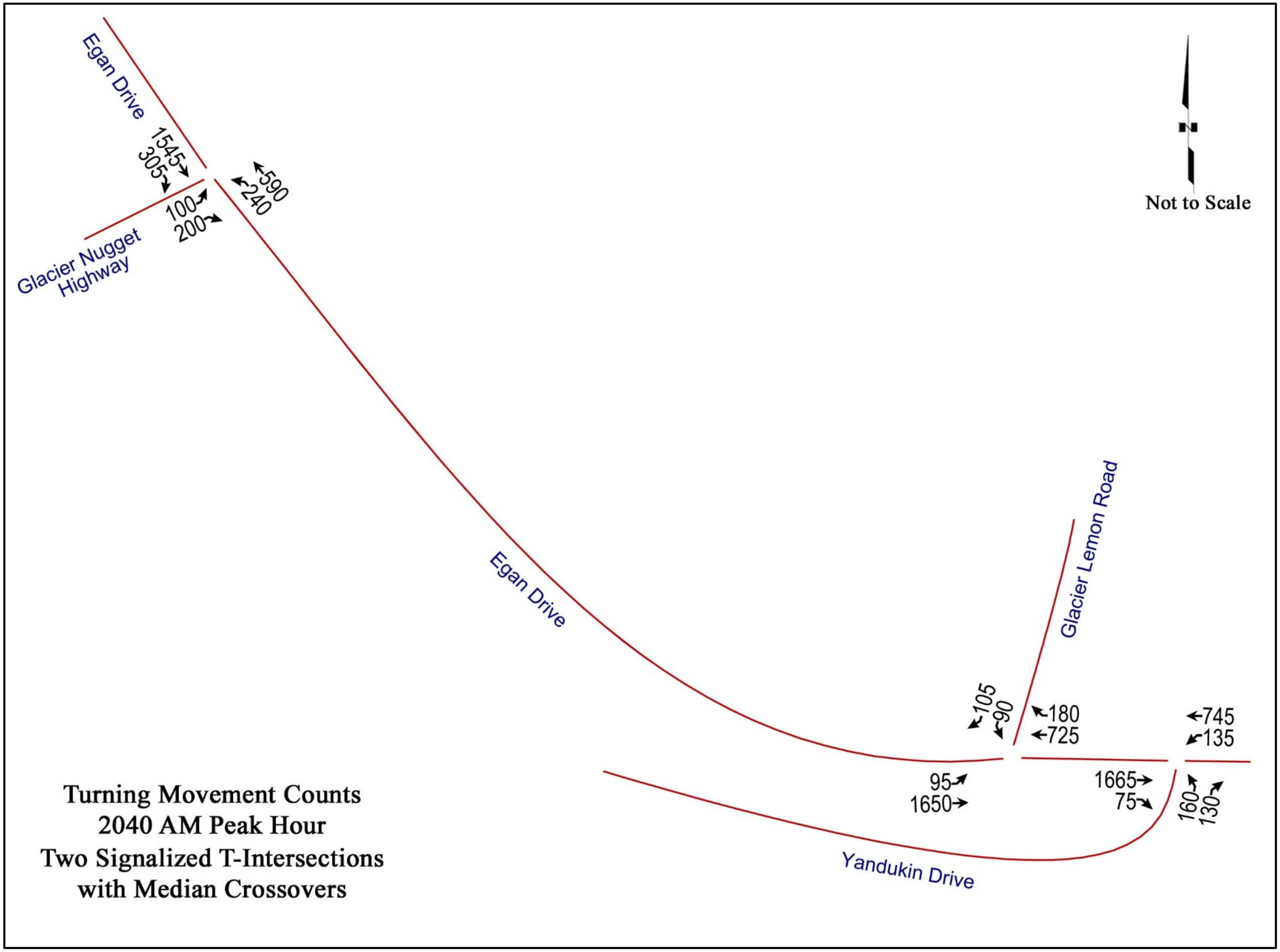


Figure D-9: Turning Movement Volumes – Two Signalized T-Intersections with Median Crossovers, 2040 AM Peak

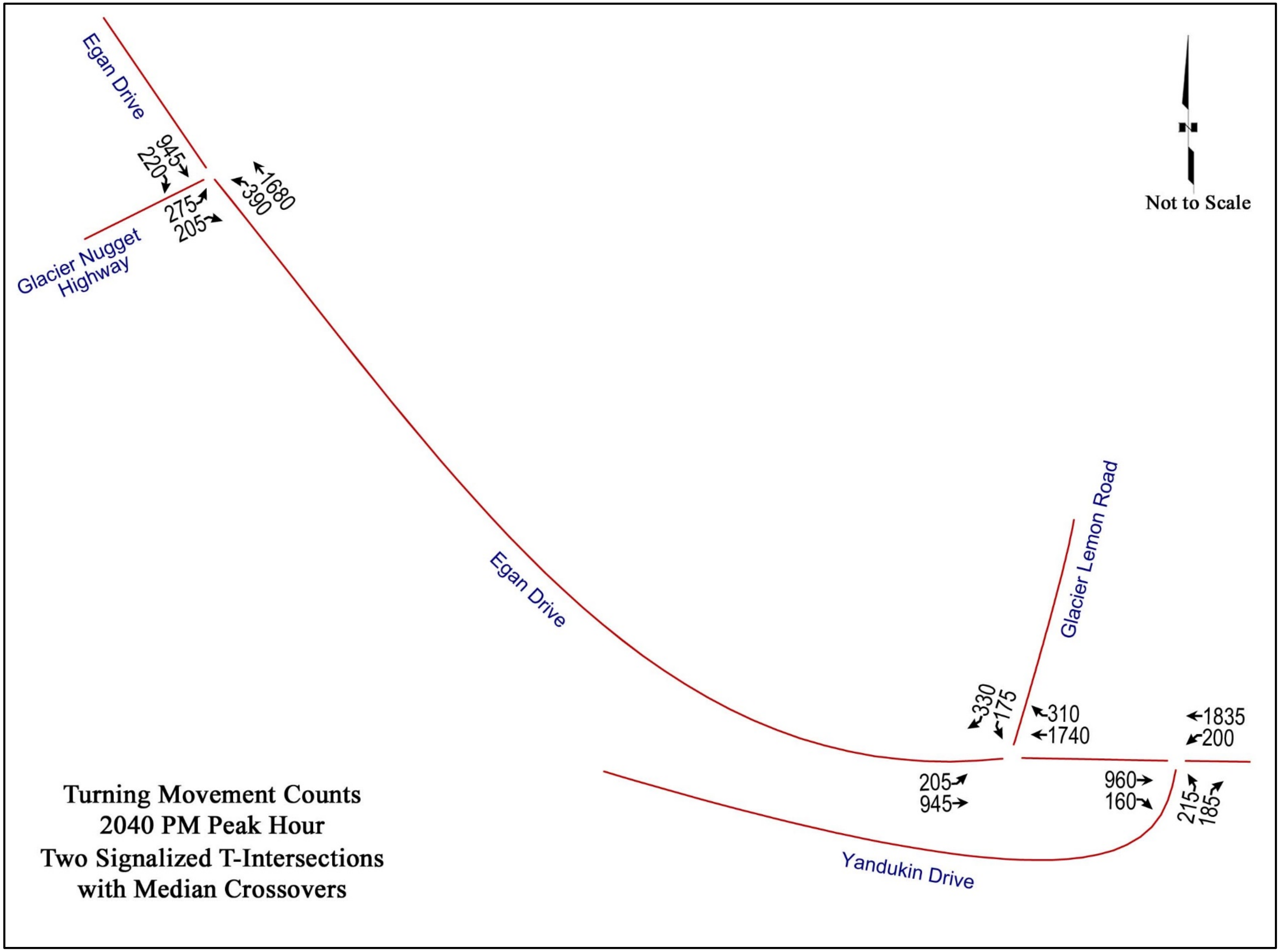


Figure D-10: Turning Movement Volumes – Two Signalized T-Intersections with Median Crossovers, 2040 PM Peak

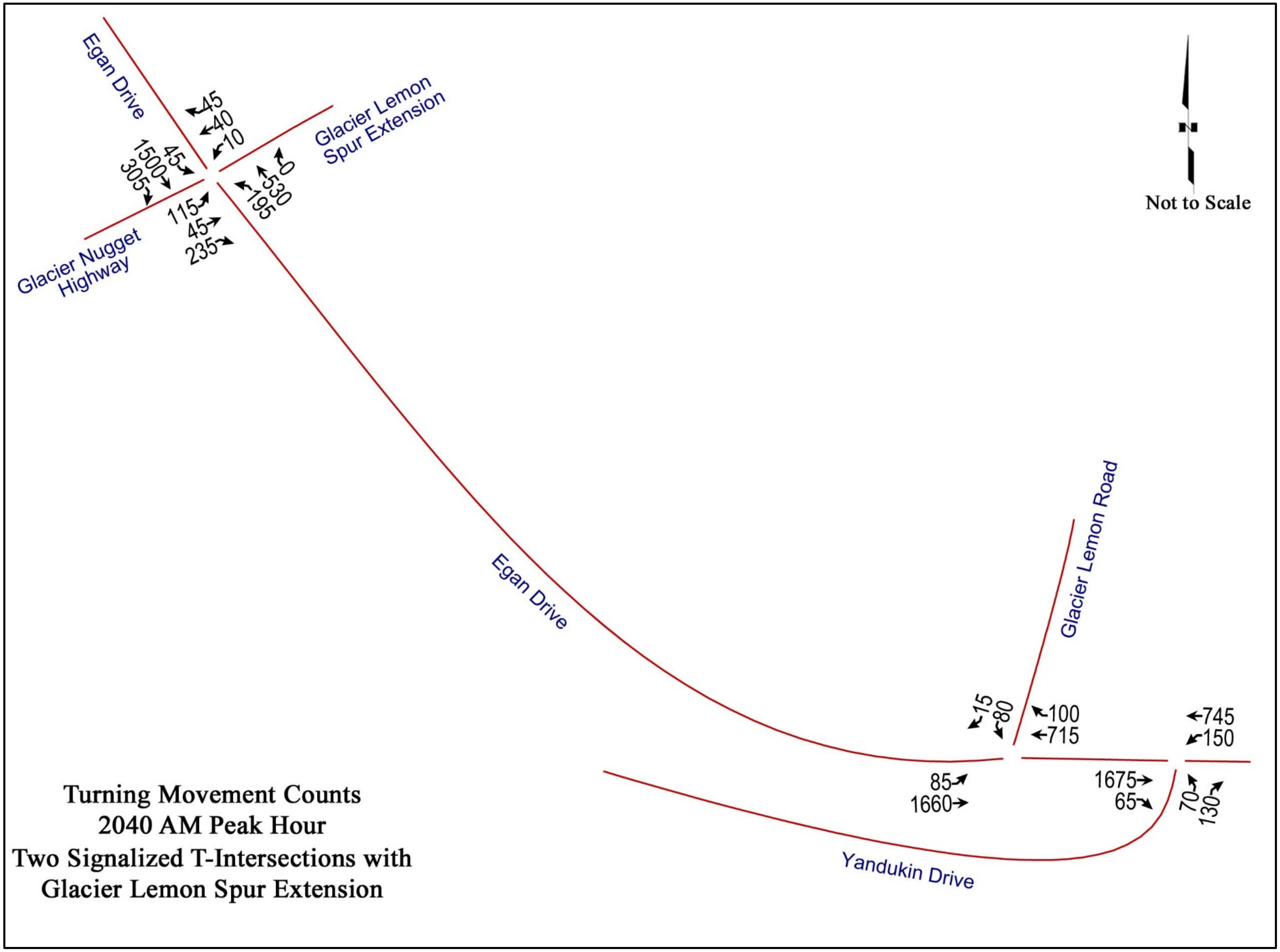


Figure D-11: Turning Movement Volumes – Two Signalized T-Intersections with Glacier Lemon Spur Extension, 2040 AM Peak

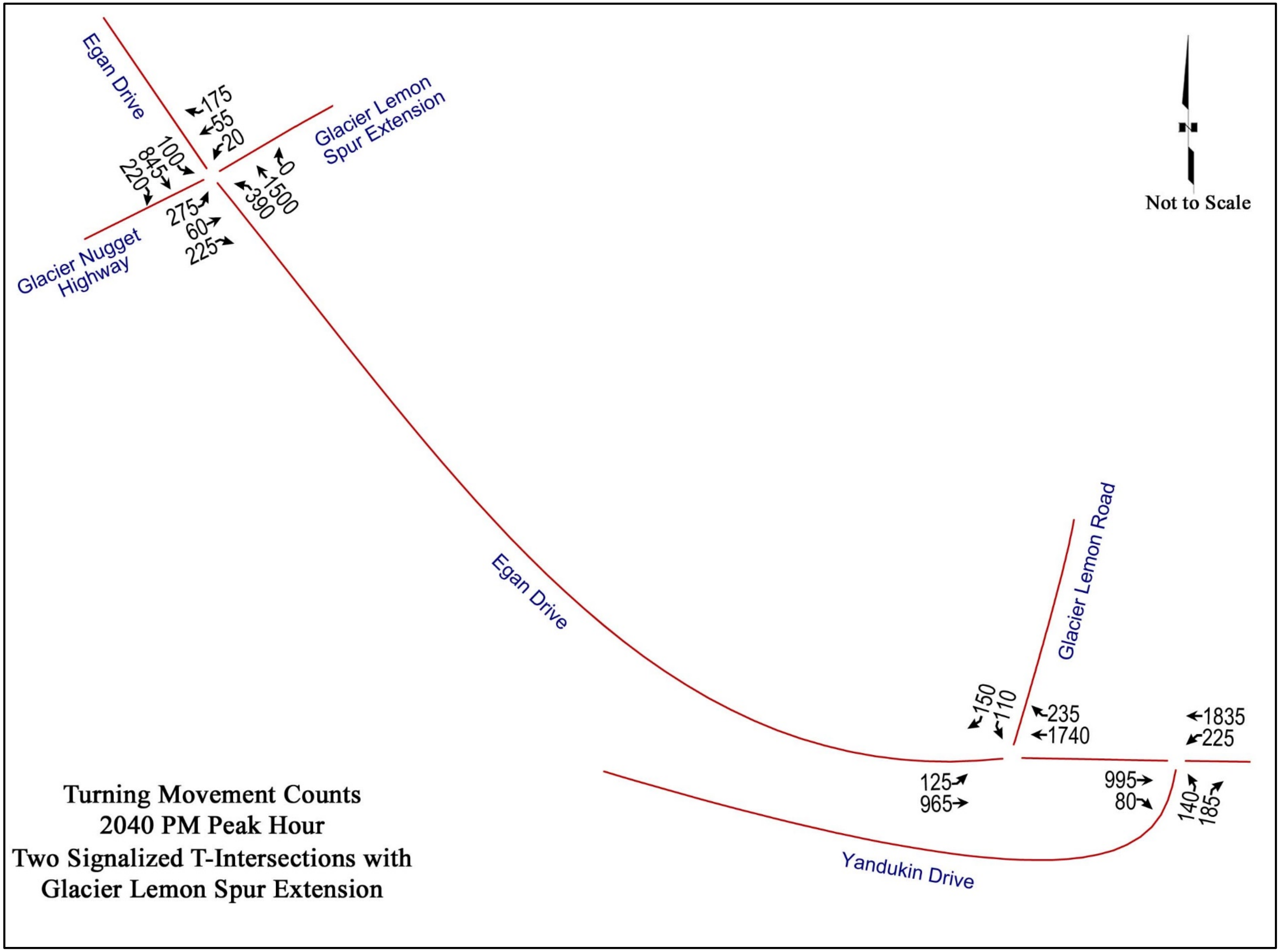


Figure D-12: Turning Movement Volumes – Two Signalized T-Intersections with Glacier Lemon Spur Extension, 2040 PM Peak

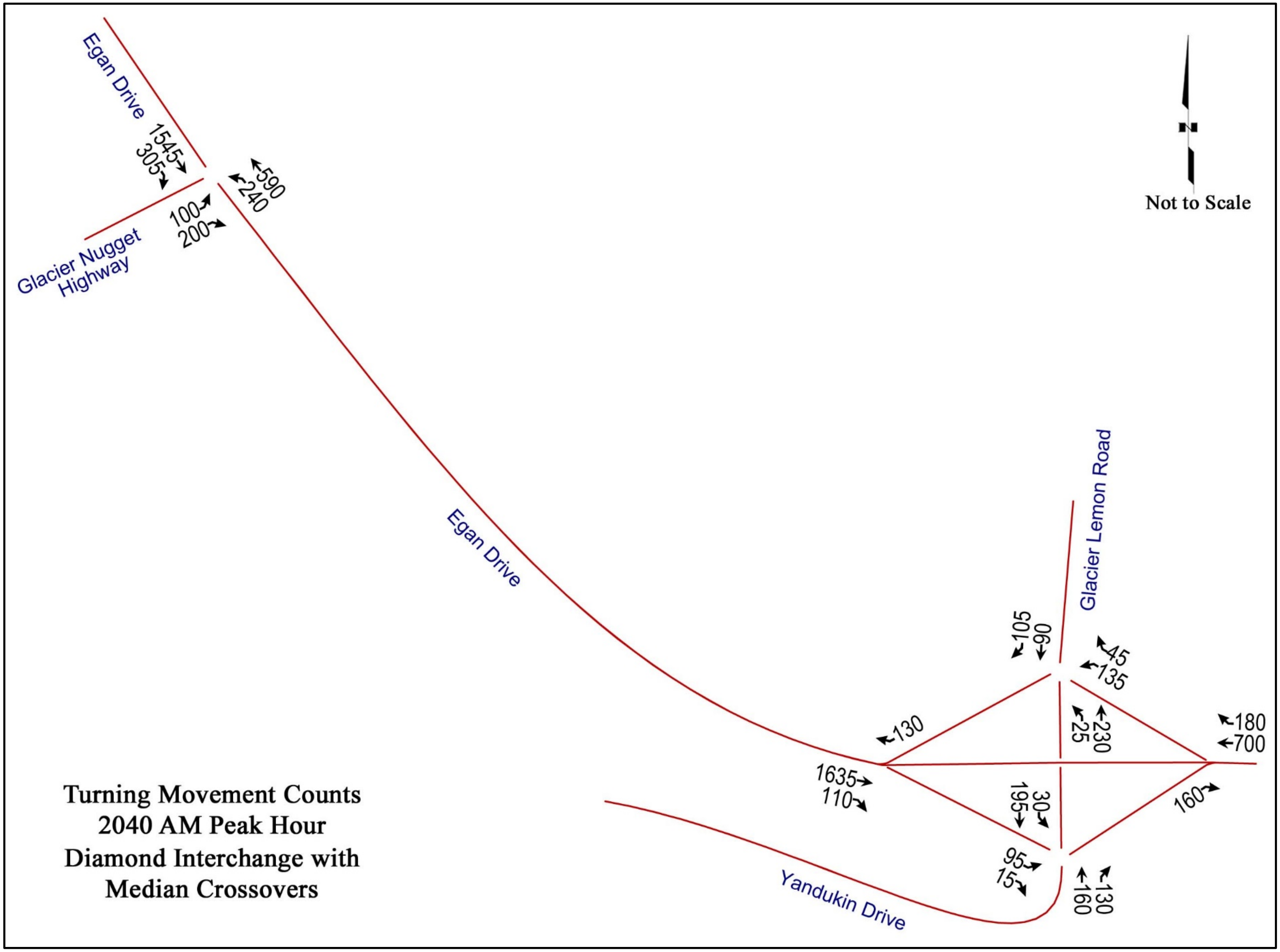


Figure D-13: Turning Movement Volumes – Diamond Interchange with Median Crossovers, 2040 AM Peak

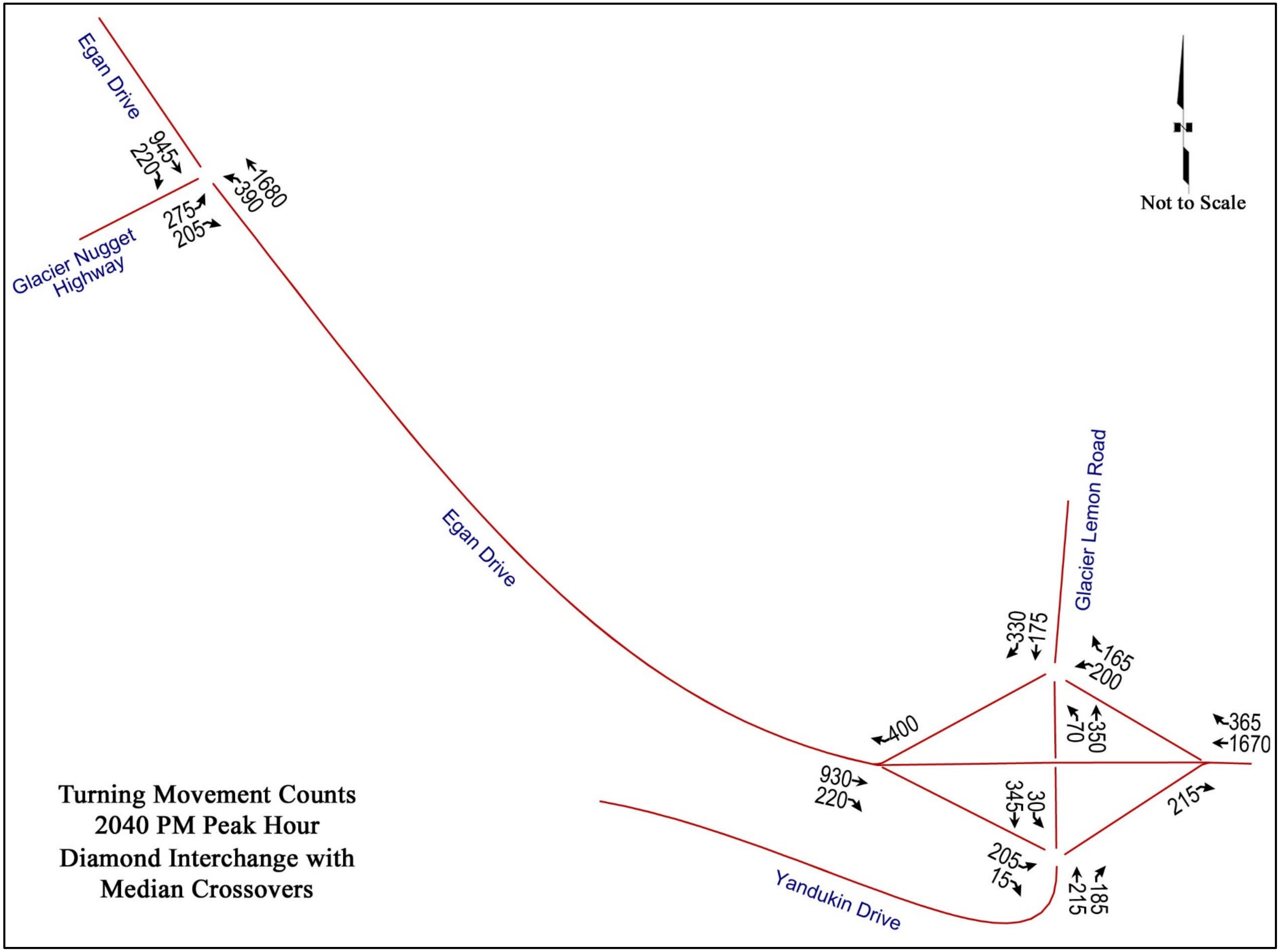


Figure D-14: Turning Movement Volumes – Diamond Interchange with Median Crossovers, 2040 PM Peak

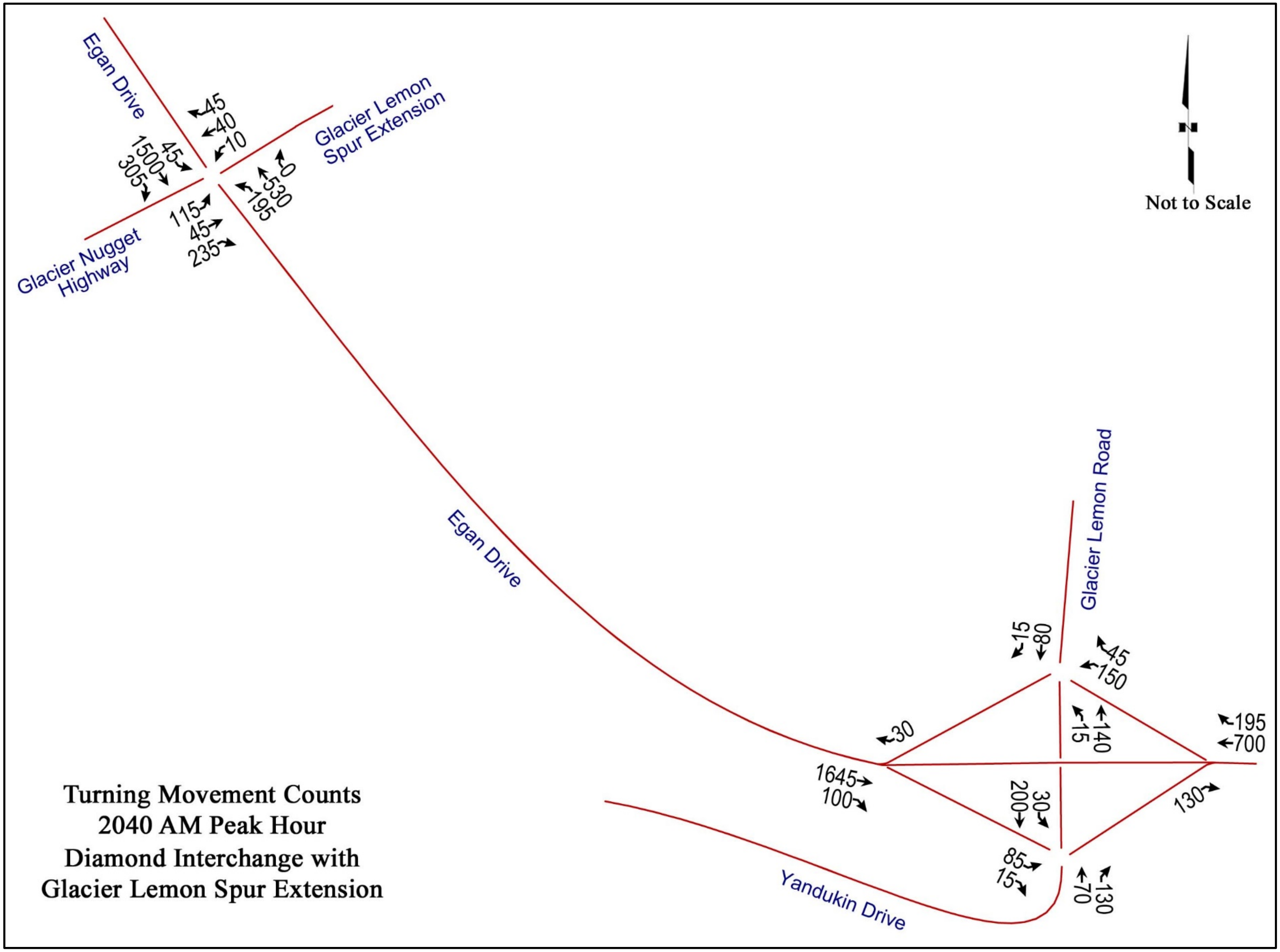


Figure D-15: Turning Movement Volumes – Diamond Interchange with Glacier Lemon Spur Extension, 2040 AM Peak

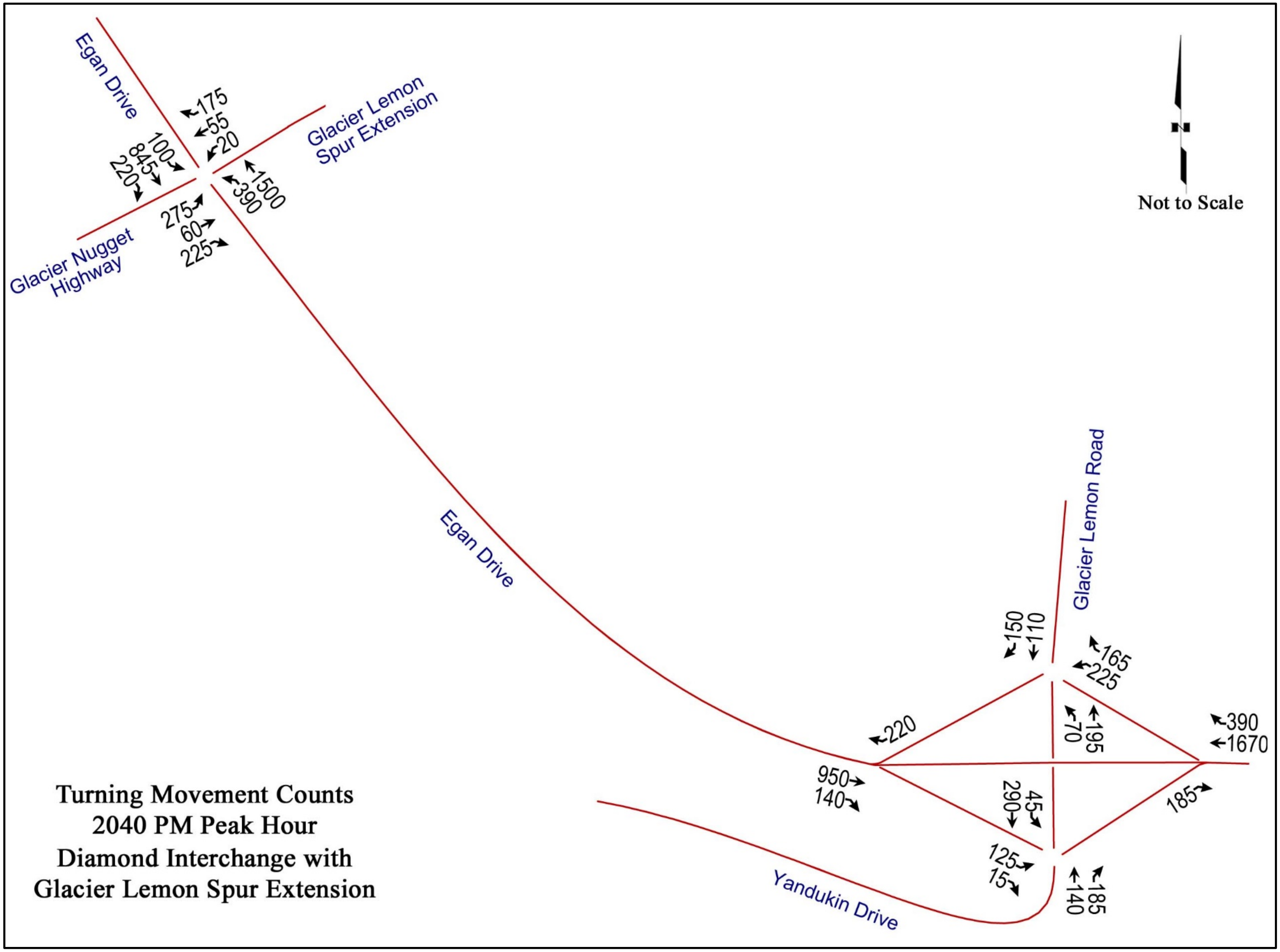


Figure D-16: Turning Movement Volumes – Diamond Interchange with Glacier Lemon Spur Extension, 2040 PM Peak

Appendix E TDM and ITS Programs

Traffic Demand Management (TDM) and Intelligent Transportation Systems (ITS) elements were considered as part of this project because of the benefits they could provide. Potential TDM elements would meet project purpose and need by reducing traffic volumes on Egan Drive and spreading travel more evenly throughout the day (reducing traffic congestion and travel times, especially at peak hours). Potential ITS tools would improve safety by notifying users of road conditions, provide estimates of delay when a crash occurs, and reduce speed limits.

As per the U.S. Department of Transportation Federal Highway Administration website on Organizing and Planning for Operations (https://ops.fhwa.dot.gov/plan4ops/trans_demand.htm), TDM is defined as a set of strategies aimed at maximizing traveler choices:

> "Managing demand is about providing travelers, regardless of whether they drive alone, with travel choices, such as work location, route, time of travel and mode. In the broadest sense, demand management is defined as providing travelers with effective choices to improve travel reliability."

This project incorporates TDM elements and provides corresponding benefits in the following ways: 1) it provides travelers with a new alternate **route** on the Glacier Lemon Spur Extension, and 2) it provides improved connectivity for pedestrians and bicyclists (**mode**).

The 2020 pandemic has drastically changed how people work, with telework replacing the traditional workplace for many people (**work location**). A TDM measure that has not been incorporated into this project would be to develop long-term telework options at agencies and businesses where telework has been a successful model. It is estimated that the COVID pandemic has reduced traffic by 20 to 30 percent based on the overall percentage volume changes recorded by continuous count stations in the Alaska Department of Transportation and Public Facilities (DOT&PF) Southcoast Region over a 6-week period (March 23 to April 23, 2020). It is hard to estimate what the traffic reduction would be if telework replaced the traditional workplace long term, as it would depend on how many people switched to telework and on whether it was a full-time or part-time telework schedule (go into the office 1 to 2 days per week). Measurement of the effectiveness of this TDM measure would require collaboration from state agencies and local businesses to track and record data about how many people have switched to telework and what the estimated decrease in traffic due to telework would be. This TDM measure could be a sustainable, lower-cost solution with improvements to the road network (decreased congestion during peak hours), decreased fuel consumption, and lower costs to agencies and businesses who would require small traditional work offices. For those who still work in the traditional workplace, this measure could be paired with agencies/businesses allowing alternate work start/end times other than traditional 8:00 AM to 5:00 PM schedule to further spread travel demand and improve travel reliability.

The DOT&PF has an ITS program known as Iways, which was launched in 2000. The DOT&PF website describes ITS in two ways: 1) when used in the plural, ITS refers to transportation products, services, and systems that are based on computers, communications, and electronics; and 2) when used in the singular, ITS refers to a system that integrates all modes of the existing transportation system that move people and goods.

Benefits to a good ITS program include improved safety (cost savings, time saving, and literal saving of lives), reduced delay (time savings), reduced emissions (reduced environmental impact), and reduced fuel consumptions (cost savings). The ITS Joint Program Office provides a factsheet on the benefits of ITS programs (https://www.its.dot.gov/factsheets/benefits_factsheet.htm). The fact sheet first lists problems identified in our national transportation system:

- **Safety:** In 2011, there were 5.3 million crashes and 2.2 million injuries.
- **Mobility:** In 2010, every urban traveler spent the equivalent of nearly one full work week stuck in traffic.
- **Environment (wasted fuel):** In 2010, wasted fuel topped 1.9 billion gallons, equivalent to approximately 2 months of flow from the Trans Alaska Pipeline.

The fact sheet describes how ITS can solve these problems and benefit transportation systems. The ITS technologies that are or would be applicable to the Egan Drive at Yandukin Drive-Glacier Lemon Road Intersection (E-Y) project area are:

- **Red Light Camera:** Benefits appear to primarily be in the area of safety, with high national estimates of more than $1 billion
- **Traffic Signal Coordination:** Synchronize multiple intersections to enhance operation of one or more direction movements in a system, with high annual mobility estimates of $276.5 million (there is currently signal coordination for signals in the Mendenhall Valley area)
- **Traveler Information Systems:** Includes internet websites, telephone hotlines, television and radio, with high annual mobility estimates of $543.1 million

The already-established Iways program has projects that are current or completed, as listed in Table E-1. This table also delineates how this project proposes to incorporate elements from the existing Iways projects and identifies which Iways projects are currently operational in the Juneau area.

Table E-1: ITS Elements/Projects Applicable to or Proposed in Project Area

ITS Project	Applicability to Egan-Yandukin
511 Traveler Information	Alaska 511 includes Juneau; four 511 road cameras are operational in Juneau (two on Egan Drive, one on North Douglas Highway, and one on Mendenhall Loop Road)
Alaska Marine Highway System Ferry Tracking	There is a ferry terminal in Juneau, at Glacier Highway at Auke Bay; vessels can be tracked at FerryAlaska.com
Alaska Land Mobile Radio	Used by DOT&PF Maintenance and Operations crews
Automated Vehicle Identification E-Screening	N/A
Bridge Scour Detection System	N/A; no apparent scour detection locations in Juneau
Portable Message Boards	**Proposed** under the No Build alternative to seasonally alert drivers of reduced speed limit; could also be used for other purposes
Research Projects	Unknown
Road Weather Information System (RWIS)	RWIS station located on Egan Drive/Glacier Highway at Milepost 3, south of project intersection
Thompson Pass Smart Snowblower & Snowplow	N/A

ITS Project	Applicability to Egan-Yandukin
Traffic Signal Electronics Modernization (flashing yellow arrow)	Flashing yellow arrows are **proposed** for side street left turns (from Yandukin Drive and Glacier Lemon Road) under Full Access Signal and Two Signalized T-Intersections alternatives

N/A = not applicable

To develop ITS projects, Iways has created the Alaska Iways ITS Architecture that conforms to the broader National ITS Architecture, which is used as a framework for the design, development, and implementation of ITS technologies (http://iways.alaska.gov/architecture.shtml). This architecture provides guidance and a means to coordinate and integrate ITS projects in the state. Among the Iways resources available, there are available fact sheets; an architecture *Use and Maintenance Guide;* an *Alaska Iways Architecture Update*, a *Final Report;* and the Turbo Architecture program (software applications that aid in development of regional and project ITS architectures) with a *How to Access and Use Turbo Architecture.*

The first step in planning is to understand which category potential ITS projects will fall into. The ITS projects and potential projects in the E-Y project area fit into the Iways potential project list as shown in Table E-2.

Table E-2: ITS Projects/Potential Projects

Project Categories	Potential Projects	Service Area
Traveler Information System	• Detector systems[1] • Probe data systems[1] • Dynamic message sign[2] • 511 website mobile services[1]	• Traffic management • Traveler information • Public transportation • Winter maintenance • Data archive
Signal Improvements	• Intersection upgrades[2] • Corridor upgrades • Retiming[2] • Central control • Transit signal priority • Emergency preemption	• Traffic management • Incident and emergency management • Traveler information • Data archive
Transit ITS Operations	• Automated vehicle location deployment[1] • Automated passenger count system • Fare collection upgrade • Bus safety and collision avoidance system	• Public transportation • Traveler information • Data archive
Carpooling and Vanpooling Systems	• Dynamic ride matching	• Traffic management • Traveler information • Data archive
Non-Motorized ITS and Operations	• Safety warning systems	• Traffic management • Traveler information • Data archive
Freeway Management	• Detection and surveillance system • Traffic management center	• Traffic management • Traveler information

Project Categories	**Potential Projects**	**Service Area**
	• Ramp metering • Active traffic management	• Data archive
Emergency Management, Incident Management	• Emergency signal preemption • Emergency center – transportation center links	• Traffic management • Public transportation • Incident and emergency management • Data archive
Road Weather Management	• Road weather information systems[1] • Mobile sensors • Winter maintenance decision support[1]	• Winter maintenance • CVO & Freight • Incident and emergency management • Traveler information • Data archive
Construction and Work Zones	• Work zone monitoring systems • Active traffic management (e.g., variable speed limits or advisories)[1]	• Traffic management • Winter maintenance • Traveler information • Data archive

[1] Current Iways projects

[2] Projects analyzed as part of the Level 2 alternatives

Appendix F Engineer’s Cost Estimates

00079 - Egan and Yandukin Inx. Imp. - PEL Study
Alternatives Estimated Planning Level Costs

Alternative	Design Percentage	Design Cost	ROW	Utilities	Construction	Total
No Build	0%	$ -	$ -	$ -	$ -	$ -
Mobility (Pedestrian Bridge) #	*16%*	*$ 464,659*	*$ 377,370*	*$ -*	*$ 2,967,850*	*$ 3,809,879*
Mobility with median crossovers	*15%*	*$ 699,991*	$ 377,370	$ -	$ 4,564,010	$ 5,641,371
Mobility with Lemon Spur extension	*12%*	*$ 2,675,492*	$ 802,138	$ 180,700	$ 22,943,245	$ 26,601,575
Partial Signal	*15%*	*$ 919,486*	*$ 12,500*	*$ -*	*$ 6,119,239*	*$ 7,051,225*
Partial Signal with Pedestrian Bridge	*14%*	*$ 1,311,502*	$ 389,870	$ -	$ 9,087,089	$ 10,788,460
Partial Signal with median crossovers	*15%*	*$ 1,134,697*	$ 12,500	$ -	$ 7,715,398	$ 8,862,596
Partial Signal with median crossovers & Pedestrian Bridge	*14%*	*$ 1,507,764*	$ 389,870	$ -	$ 10,683,248	$ 12,580,882
Partial Signal with Lemon Spur extension	*11%*	*$ 2,878,518*	$ 437,269	$ 180,700	$ 26,094,633	$ 29,591,120
Partial Signal with Lemon Spur extension & Pedestrian Bridge	*10%*	*$ 3,102,125*	$ 814,638	$ 180,700	$ 30,658,643	$ 34,756,106
Full Signal	*14%*	*$ 1,341,739*	*$ 4,149,665*	*$ 162,066*	*$ 9,327,694*	*$ 14,981,163*
Full Signal with Pedestrian Bridge	*14%*	*$ 1,695,665*	$ 4,527,035	$ 162,066	$ 12,295,544	$ 18,680,310
Full Signal with median crossovers	*14%*	*$ 1,536,465*	$ 4,149,665	$ 162,066	$ 10,923,854	$ 16,772,050
Full Signal with median crossovers & Pedestrian Bridge	*13%*	*$ 1,871,443*	$ 4,527,035	$ 162,066	$ 13,891,704	$ 20,452,247
Full Signal with Lemon Spur extension	*10%*	*$ 3,044,410*	$ 4,574,434	$ 342,766	$ 29,303,089	$ 37,264,698
Full Signal with Lemon Spur extension & Pedestrian Bridge	*10%*	*$ 3,161,201*	$ 4,951,803	$ 342,766	$ 32,270,939	$ 40,726,708
2 Signalized T-Intersections	*12%*	*$ 2,386,977*	*$ 10,698,382*	*$ 162,066*	*$ 19,249,728*	*$ 32,497,153*
2 Signalized T-Intersections with Pedestrian Bridge	*12%*	*$ 2,623,115*	$ 11,075,752	$ 162,066	$ 22,217,578	$ 36,078,511
2 Signalized T-Intersections with Lemon Spur extension	*8%*	*$ 3,296,862*	$ 11,123,151	$ 342,766	$ 39,225,123	$ 53,987,901
2 Signalized T-Intersections with Lemon Spur extension & Pedestrian	*8%*	*$ 3,295,864*	$ 11,500,521	$ 342,766	$ 42,192,973	$ 57,332,123
Diamond Interchange	*6%*	*$ 3,302,898*	*$ 6,159,661*	*$ 217,618*	*$ 55,048,303*	*$ 64,728,480*
Diamond Interchange with median crossovers	*6%*	*$ 3,398,668*	$ 6,159,661	$ 217,618	$ 56,644,462	$ 66,420,409
Diamond Interchange with Lemon Spur extension	*6%*	*$ 4,501,422*	$ 6,584,430	$ 398,318	$ 75,023,697	$ 86,507,867

Print Date: 2/8/2021

ENGINEER'S ESTIMATE State of Alaska Department of Transportation & Public Facilities Southcoast Region	Egan Yandukin Inx. Improvements Mobility Alternative AKSAS No.: Federal No.: Version ID: Printed: 12/20/2020

ITEM NO.	Description	Unit	Quantity	Unit Price	Amount
201.0009.0000	CLEARING AND GRUBBING	ACRE	1	$ 14,200.76	$ 13,444.10
202.0002.0000	REMOVAL OF PAVEMENT	SQUARE YARD	3,386	$ 10.00	$ 33,858.00
203.0003.0000	UNCLASSIFIED EXCAVATION	CUBIC YARD	2,020	$ 20.00	$ 40,400.00
203.0006.0000	BORROW	TON	3,220	$ 30.00	$ 96,600.00
203.0009.0000	OBLITERATION OF ROADWAY	SQUARE YARD	899	$ 6.00	$ 5,394.40
301.0001.00D1	AGGREGATE BASE COURSE, GRADING D-1	TON	410	$ 55.00	$ 22,550.00
306.0001.0000	ATB	TON	490	$ 150.00	$ 73,500.00
306.0002.5228	ASPHALT BINDER, GRADE PG 52-28	TON	23	$ 900.00	$ 20,700.00
401.0001.002B	HMA, TYPE II; CLASS B	TON	510	$ 160.00	$ 81,600.00
401.0004.5828	ASPHALT BINDER, GRADE PG 58-28	TON	29	$ 900.00	$ 26,100.00
504.0003.0000	FURNISH AND ERECT PEDESTRIAN BRIDGE	LUMP SUM	ALL REQ'D	$ 500,000.00	$ 500,000.00
504.MF60.0001	ADA BRIDGE RAMPS	LUMP SUM	ALL REQ'D	$ 275,000.00	$ 275,000.00
505.0005.0000	FURNISH STRUCTURAL STEEL PILES	LF	280	$ 250.00	$ 70,000.00
505.MF02.2405	PILE, DRIVEN	EACH	10	$ 11,000.00	$ 110,000.00
608.0001.0004	CONCRETE SIDEWALK, 4 INCHES THICK	SQUARE YARD	40	$ 100.00	$ 4,000.00
608.0001.0006	CONCRETE SIDEWALK, 6 INCHES THICK	SQUARE YARD	900	$ 110.00	$ 99,000.00
608.0003.0000	ASPHALT SIDEWALK	SQUARE YARD	1,646	$ 30.00	$ 49,366.67
608.0006.0000	CURB RAMP	EACH	5	$ 5,000.00	$ 25,000.00
609.0002.0001	CURB AND GUTTER, TYPE 1	LINEAR FOOT	55	$ 45.00	$ 2,475.00
615.0001.0000	STANDARD SIGN	SQUARE FOOT	300	$ 150.00	$ 45,000.00
615.0006.0000	SALVAGE SIGN	EACH	10	$ 125.00	$ 1,250.00
618.0002.0000	SEEDING	POUND	33	$ 125.00	$ 4,125.00
620.0001.0000	TOPSOIL	SQUARE YARD	3,656	$ 15.00	$ 54,838.67
640.0001.0000	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	ALL REQ'D	$ 247,000.00	$ 247,000.00
641.0001.0000	EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D	$ 13,000.00	$ 13,000.00
641.0003.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D	$ 25,000.00	$ 25,000.00
641.0004.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	CONTINGENT SUM	ALL REQ'D	$ 7,000.00	$ 7,000.00

ENGINEER'S ESTIMATE	Egan Yandukin Inx. Improvements
	Mobility Alternative
State of Alaska	AKSAS No.:
Department of Transportation	Federal No.:
& Public Facilities	Version ID:
Southcoast Region	Printed: 12/20/2020

ITEM NO.	*Description*	*Unit*	*Quantity*	*Unit Price*	*Amount*
641.0007.0000	SWPPP MANAGER	LUMP SUM	ALL REQ'D	$ 15,000.00	$ 15,000.00
642.0001.0000	CONSTRUCTION SURVEYING	LUMP SUM	ALL REQ'D	$ 75,000.00	$ 75,000.00
642.0013.0000	THREE PERSON SURVEY PARTY	CONTINGENT SUM	ALL REQ'D	$ 17,500.00	$ 17,500.00
643.0002.0000	TRAFFIC MAINTENANCE	LUMP SUM	ALL REQ'D	$ 124,000.00	$ 124,000.00
643.0003.0000	PERMANENT CONSTRUCTION SIGNS	LUMP SUM	ALL REQ'D	$ 40,000.00	$ 40,000.00
643.0007.0000	TRAFFIC CONE/TUBULAR MARKER	EACH	200	$ 75.00	$ 15,000.00
643.0025.0000	TRAFFIC CONTROL	CONTINGENT SUM	ALL REQ'D	$ 149,000.00	$ 149,000.00
643.0032.0000	FLAGGING	CONTINGENT SUM	ALL REQ'D	$ 37,010.96	$ 37,010.96
644.0001.0000	FIELD OFFICE	LUMP SUM	ALL REQ'D	$ 25,000.00	$ 25,000.00
644.0006.0000	VEHICLE	LUMP SUM	ALL REQ'D	$ 20,000.00	$ 20,000.00
645.0001.0000	TRAINING PROGRAM, 1 TRAINEES / APPRENTICES	LABOR HOUR	500	$ 20.00	$ 10,000.00
646.0001.0000	CPM SCHEDULING	LUMP SUM	ALL REQ'D	$ 4,000.00	$ 4,000.00
670.2002.0000	MMA PAVEMENT MARKINGS, INLAID	LUMP SUM	ALL REQ'D	$ 31,000.00	$ 31,000.00
Project Summary	Pay Items:	36 Items		Subtotal	$ 2,508,712.80
	Minus Contractor Furnished CENG Items				$ (45,000.00)
				Exc Subtotal	$ 2,463,712.80
	Construction Engineering (Percentage)	15%		CENG	$ 369,556.91
				Subtotal	$ 2,833,269.71
	Indirect Cost Allocation Plan (ICAP)	4.75%			$ 134,580.31
	TOTAL PARTICIPATING				$ 2,967,850.02
	Project Total				$ 2,967,850.02

Egan Yandukin Inx. Improvements	201.0003.0000 CLEARING AND GRUBBING	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	1	ACRE
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		37,490.00	sf
Contingency	10%	3749	sf
Total		41239	sf
Quantity		**0.95**	**ac**

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	202.0002.0000 REMOVAL OF PAVEMENT	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	3,386	SQUARE YARD
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		27,702.00	sf
Total		27702	sf
Contingency	10%	2770.2	sf
Total		30472	sf
Quantity		**3386**	**sy**

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	203.0003.0000 UNCLASSIFIED EXCAVATION	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**2,020**	**CUBIC YARD**
Project No. /		
Mobility Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Assuming vertical excavation within new roadway, pathway, and sidewalk embankments.

ROAD AND PATHWAYS				
PLAN AREA (SF)	*DEPTH (FT)*	*VOLUME (CF)*	*VOLUME (CY)*	*REMARKS / ASSUMPTIONS*
19,743.00	2.5	49,357.50	1,828.06	

Shrink/Swell Factor 10% 182.81 CY

Subtotal Volume 2,010.86 CY

total (CY) 2,010.86

Round up to nearest 10 CY 2,020

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Egan Yandukin Inx. Improvements	203.0006.0000 BORROW	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	3,220	TON
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Estimating Factor: 2 TONS/CY

Roadway and Pathway, excluding median crossovers, Embankment				
Roadway New Embankment		4,933.00		
Pathway		14,810.00		
ACAD Area From Civil3D		19,743.00	SF	
Thickness		2	FT	
Volume		39,486.00	CF	
	=	1,462.44	CY	
Shrink/Swell Factor	10%	146.24	CY	
Total Volume		1,608.69	CY	
Quantity		3,220	TON	*Rounded up to nearest ten tons

TOTAL: 3,220 TON

Calculated By	GMD	Date	11/5/2020
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KINNEY ENGINEERING, LLC
3909 Arctic Blvd, Ste 400
Anchorage, AK 99503
907.346.2373

Egan Yandukin Inx. Improvements	203.0009.0000 OBLITERATION OF ROADWAY	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**899**	**SQUARE YARD**
Project No. /		
Mobility Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Area from ACAD		7,356.00
Total		7356
Contingency	10%	735.6
Total		8092
Quantity		**899**

Calculated By	GMD	Date	11/4/2020
Checked By	GMC	Date	12/15/2020

KINNEY ENGINEERING, LLC
3909 Arctic Blvd, Ste 400
Anchorage, AK 99503
907.346.2373

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	301.0001.00D1 AGGREGATE BASE COURSE, GRADING D-1	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**410**	**TON**
Project No. /		
Mobility Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Estimating Factor: 2 TONS/CY

Pathway				
ACAD Area From Civil3D		14,810.00	SF	
Thickness		0.33	FT	
Volume		4937	CF	
	=	183	CY	
Shrink/Swell Factor	10%	18	CY	
Total Volume		201	CY	
Quantity		410	TON	*Rounded up to nearest ten tons

TOTAL 410 TONS

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	306.0001.0000 ATB	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	490	TON
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

ESTIMATING FACTOR 2 TONS/CY

Roadway				
ACAD Area From Civil3D		23,871.00	SF	
Thickness		0.25	FT	
Volume		5968	CF	
	=	221	CY	
Shrink/Swell Factor	10%	22	CY	
Total Volume		243	CY	
Quantity		490	TON	*Rounded up to nearest ten tons

TOTAL: 490 TON

Calculated By	GMD	Date	11/5/2020
Checked By	GMC	Date	12/15/2020

KINNEY ENGINEERING, LLC
3909 Arctic Blvd, Ste 400
Anchorage, AK 99503
907.346.2373

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	306.0002.5228 ASPHALT BINDER, GRADE PG 52-28	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	23	TON
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

From 306(1)	490	TONS	
4.5% of 306(1)	23	TONS	*Rounded up to whole ton

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	401.0001.002B HMA, TYPE II; CLASS B	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	510	TON
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Estimating Factor: 115 LB/SY-INCH

Roadway				
ACAD Area From Civil3D		23,871.00	SF	
=		2652.33333	SY	
Thickness		3.00	IN	
Volume		7957	SY-IN	
Shrink/Swell Factor	10%	796	SY-IN	
Total Volume		8,753	SY-IN	
Quantity		510	TON	*Rounded up to nearest ten tons

TOTAL: 510 TON

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	401.0004.5828 ASPHALT BINDER, GRADE PG 58-28	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	29	TON
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

From 401(1b) quantity:	510	TONS	
Estimating Factor:	5.5%	Weight of 401(1b) quantity	
401(4) Quantity:	29	TONS	*Rounded to nearest whole ton

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	.0003.0000 FURNISH AND ERECT PEDESTRIAN BRID	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	ALL REQ'D	LUMP SUM
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

ASSUME PROJECT PED BRIDGE IS TWICE AS LONG

PREVIOUS BIDS AVERAGE =	$	220,096
ASSUMED COST =	$	440,192
PROJECT ESTIMATED COST =	$	500,000

Calculated By	JAM	Date	11/2/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	504.MF60.0001 ADA BRIDGE RAMPS	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	ALL REQ'D	LUMP SUM
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

2019 AVERAGE BID OF 3'X48' STEEL GANGWAY	$	48,500	LS
=	$	336.81	SF
PROJECT RAMP WIDTH =		10	FT
RAMP LENGTH =		400	FT
RAMP AREA =		4,000	SF
COST PER RAMP =	$	1,347,222	
COST FOR BOTH RAMPS =	$	2,694,444	
ESTIMATE COST =	$	275,000	

Calculated By	JAM	Date	11/2/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	505.0005.0000 FURNISH STRUCTURAL STEEL PILES	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	280	LF
Project No. /		
Mobility Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

ASSUME	24" DIA	
ASSUME	20	FT ABOVE GROUND
ASSUME	15	FT BELOW GROUND
ASSUME	8	PILES (6 FOR MAIN SPAN, 4 FOR RAMPS BUT HALF HEIGHT)
TOTAL LF	**280**	

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
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KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	505.MF02.2405 PILE, DRIVEN	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	10	EACH
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

ASSUME 24" DIA

ASSUME 10 PILES (6 FOR MAIN SPAN, 4 FOR RAMPS BUT HALF HEIGHT)

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	08.0001.0004 CONCRETE SIDEWALK, 4 INCHES THIC	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	40	SQUARE YARD
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

ACAD Area From Civil3D	332.00	SF
=	37	SY
Quantity	40	TONS

TOTAL: 40 TON

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	08.0001.0006 CONCRETE SIDEWALK, 6 INCHES THIC	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	900	SQUARE YARD
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

ACAD Area From Civil3D	8,067.00	SF
=	896	SY
Quantity	900	TONS

TOTAL: 900 TON

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	608.0003.0000 ASPHALT SIDEWALK	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	1,646	SQUARE YARD
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Estimating Factor: 115 LB/SY-INCH

Pathway				
ACAD Area From Civil3D		14,810.00	SF	
=		1645.55556	SY	
Thickness		2.00	IN	
Volume		3291	SY-IN	
Shrink/Swell Factor	10%	329	SY-IN	
Total Volume		3,620	SY-IN	
Quantity		210	TON	*Rounded up to nearest ten tons

Calculated By	JAM	Date	11/2/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	608.0006.0000 CURB RAMP	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	5	EACH
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

2 ramps at Fred Meyers Driveway

3 ramps at new old Dairy t-intersection

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	609.0002.0001 CURB AND GUTTER, TYPE 1	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	55	LINEAR FOOT
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

ACAD Length From Civil3D	55	LF	

Calculated By	JAM	Date	11/2/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	618.0002.0000 SEEDING	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**33**	**POUND**
Project No. /		
Mobility Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

From 620(1) Topsoil quantity	3,656	SY
Multiply by 9 SF/SY	32903.2	SF
ESTIMATING FACTOR:	0.001	LB/SF
QUANTITY: (Rounded up to whole pound)	33	LB

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	620.0001.0000 TOPSOIL	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	3,656	SQUARE YARD
Project No. /		
Mobility Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		29,912.00	sf
Contingency	10%	2,991	sf
Total		32,903	sf
Quantity		**3,656**	**sy**

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

SKIPS_RATI 0.25

670.2002.0000 MMA PAVEMENT MARKINGS, INLAID																		
4" WHITE (LF)	4" WHITE SKIP	4" WHITE DOT	8" WHITE (LF)	8" WHITE DOT	4" YELLOW (LF)	4" DY (LF)	4" YELLOW SKIP	12" W (SF)	18" Y (SF)	18" W (SF)	24" W (SF)	TURN ARROW (EACH)	THRU/LEFT ARROW (EACH)	ONLY (EACH)	Total Symbols (EA)	EQUIV. 4" LENGTH (FT)	Transverse markings (SF)	
522	0		510		748						597				0	2290	597	
522	**0**	**0**	**510**	**0**	**748**	**0**	**0**	**0**	**0**	**0**	**597**	**0**	**0**	**0**	**0**	**2,290**	**597**	
															$ 850.00	$ 8.00	$ 20.00	
														Totals	$ -	$ 18,320.00	$ 11,940.00	$ 30,260.00

ENGINEER'S ESTIMATE State of Alaska Department of Transportation & Public Facilities Southcoast Region	Egan Yandukin Inx. Improvements Median Crossovers Alt AKSAS No.: Federal No.: Version ID: Printed: 12/20/2020

ITEM NO.	Description	Unit	Quantity	Unit Price	Amount
201.0003.0000	CLEARING AND GRUBBING	ACRE	1	$ 15,000.00	$ 20,701.14
203.0003.0000	UNCLASSIFIED EXCAVATION	CUBIC YARD	5,820	$ 20.00	$ 116,400.00
203.0006.0000	BORROW	TON	9,320	$ 30.00	$ 279,600.00
306.0001.0000	ATB	TON	1,170	$ 150.00	$ 175,500.00
306.0002.5228	ASPHALT BINDER, GRADE PG 52-28	TON	53	$ 900.00	$ 47,700.00
401.0001.002B	HMA, TYPE II; CLASS B	TON	1,210	$ 160.00	$ 193,600.00
401.0004.5828	ASPHALT BINDER, GRADE PG 58-28	TON	67	$ 900.00	$ 60,300.00
615.0001.0000	STANDARD SIGN	SQUARE FOOT	25	$ 150.00	$ 3,750.00
618.0002.0000	SEEDING	POUND	15	$ 125.00	$ 1,875.00
620.0001.0000	TOPSOIL	SQUARE YARD	1,640	$ 15.00	$ 24,600.00
640.0001.0000	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	ALL REQ'D	$ 132,000.00	$ 132,000.00
641.0001.0000	EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D	$ 7,000.00	$ 7,000.00
641.0003.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D	$ 14,000.00	$ 14,000.00
641.0004.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	CONTINGENT SUM	ALL REQ'D	$ 4,000.00	$ 4,000.00
642.0001.0000	CONSTRUCTION SURVEYING	LUMP SUM	ALL REQ'D	$ 40,000.00	$ 40,000.00
643.0002.0000	TRAFFIC MAINTENANCE	LUMP SUM	ALL REQ'D	$ 67,000.00	$ 67,000.00
643.0025.0000	TRAFFIC CONTROL	CONTINGENT SUM	ALL REQ'D	$ 80,000.00	$ 80,000.00
670.2002.0000	MMA PAVEMENT MARKINGS, INLAID	LUMP SUM	ALL REQ'D	$ 57,000.00	$ 57,000.00
Project Summary	Pay Items:	18 Items		Subtotal	$ 1,325,026.14
	Minus Contractor Furnished CENG Items				$ -
				Exc Subtotal	$ 1,325,026.14
	Construction Engineering (Percentage)	15%		CENG	$ 198,753.92
				Subtotal	$ 1,523,780.06
	Indirect Cost Allocation Plan (ICAP)	4.75%			$ 72,379.55
	TOTAL PARTICIPATING				$ 1,596,159.61
	Project Total				$ 1,596,159.61

Egan Yandukin Inx. Improvements	201.0003.0000 CLEARING AND GRUBBING	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	1	ACRE
Project No. /		
Median Crossovers Alt	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		54651	sf
Contingency	10%	5465	sf
Total		60116	sf
Quantity		**1.38**	**ac**

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	JAM	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	203.0003.0000 UNCLASSIFIED EXCAVATION	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	5,820	CUBIC YARD
Project No. /		
Median Crossovers Alt	TOTAL QUANTITY	UNIT OF MEASURE

Median Crossover Embankment				
Area from 203.0006.0000		57,134.00	SF	
Thickness		2.5	FT	
Volume		142,835.00	CF	
	=	5,290.19	CY	
Shrink/Swell Factor	10%	529.02	CY	
Subtotal Volume		5,819.20	CY	

Total Volume	5,819.20	CY	
Round up to nearest 10 CY	5,820	CY	

Calculated By	GMD	Date	11/5/2020
Checked By	JAM	Date	12/15/2020

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Fairbanks Cushman Street Bridge	203.0006.0000 BORROW	
State of Alaska Department of Transportation & Public Facilities - Northern Region	9,320	TON
Project No. 663012 / Z622070000		
Preliminary PS&E	TOTAL QUANTITY	UNIT OF MEASURE

Estimating Factor: 2 TONS/CY

Median Crossover Embankment				
ACAD Area From Civil3D		57,134.00	SF	
Thickness		2	FT	
Volume		114,268.00	CF	
	=	4,232.15	CY	
Shrink/Swell Factor	10%	423.21	CY	
Total Volume		4,655.36	CY	
Subtotal weight		9,320.00	TON	Roundup nearest 10 Tons

TOTAL: 9,320 TON

Calculated By	GMD	Date	11/5/2020
Checked By	JAM	Date	12/15/2020

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KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	306.0001.0000 ATB	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	1,170	TON
Project No. /		
Median Crossovers Alt	TOTAL QUANTITY	UNIT OF MEASURE

ESTIMATING FACTOR 2 TONS/CY

Roadway				
ACAD Area From Civil3D		57,134.00	SF	
Thickness		0.25	FT	
Volume		14284	CF	
	=	529	CY	
Shrink/Swell Factor	10%	53	CY	
Total Volume		582	CY	
Quantity		1,170	TON	*Rounded up to nearest ten tons

TOTAL: 1,170 TON

Calculated By	GMD	Date	11/5/2020
Checked By	JAM	Date	12/15/2020

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Anchorage, AK 99503
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KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	306.0002.5228 ASPHALT BINDER, GRADE PG 52-28	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	53	TON
Project No. /		
Median Crossovers Alt	TOTAL QUANTITY	UNIT OF MEASURE

From 306(1)	1,170	TONS	
4.5% of 306(1)	53	TONS	*Rounded up to whole ton

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	JAM	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	401.0001.002B HMA, TYPE II; CLASS B	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**1,210**	**TON**
Project No. /		
Median Crossovers Alt	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Estimating Factor: 115 LB/SY-INCH

Roadway				
ACAD Area From Civil3D		57134	SF	
=		6348.22222	SY	
Thickness		3.00	IN	
Volume		19045	SY-IN	
Shrink/Swell Factor	10%	1,904	SY-IN	
Total Volume		20,949	SY-IN	
Quantity		1,210	TON	*Rounded up to nearest ten tons

TOTAL: 1,210 TON

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	JAM	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	401.0004.5828 ASPHALT BINDER, GRADE PG 58-28	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	67	TON
Project No. /		
Median Crossovers Alt	TOTAL QUANTITY	UNIT OF MEASURE

From 401(1b) quantity:	1,210	TONS	
Estimating Factor:	5.5%	Weight of 401(1b) quantity	
401(4) Quantity:	67	TONS	*Rounded to nearest whole ton

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	JAM	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	618.0002.0000 SEEDING	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	15	POUND
Project No. /		
Median Crossovers Alt	TOTAL QUANTITY	UNIT OF MEASURE

From 620(1) Topsoil quantity	1,640	SY
Multiply by 9 SF/SY	14760	SF
ESTIMATING FACTOR:	0.001	LB/SF
QUANTITY: (Rounded up to whole pound)	15	LB

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	JAM	Date	12/15/2020	

Egan Yandukin Inx. Improvements	620.0001.0000 TOPSOIL	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	1,640	SQUARE YARD
Project No. /		
Median Crossovers Alt	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD:	12,800.00	SF
Convert to SY:	1,422.22	SY
15% Contingency:	213.3	SY
Total topsoil area:	1,635.56	SY
Round up to nearest 10 SY:	1,640	SY

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	JAM	Date	12/15/2020	

SKIPS_RATI 0.25

670.2002.0000 MMA PAVEMENT MARKINGS, INLAID

4" WHITE (LF)	4" WHITE SKIP	4" WHITE DOT	8" WHITE (LF)	8" WHITE DOT	4" YELLOW (LF)	4" DY (LF)	4" YELLOW SKIP	12" W (SF)	18" Y (SF)	18" W (SF)	24" W (SF)	TURN ARROW (EACH)	THRU/LEFT ARROW (EACH)	ONLY (EACH)	Total Symbols (EA)	EQUIV. 4" LENGTH (FT)	Transverse markings (SF)
					1457										0	1457	0
					1798.0										0	1798	0
					1491.0										0	1491	0
					2371.0										0	2371	0
0	**0**	**0**	**0**	**0**	**7,117**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7,117**	**0**
															$ 850.00	$ 8.00	$ 20.00
														Totals	$ -	$ 56,936.00	$ -

$ 56,936.00

ENGINEER'S ESTIMATE State of Alaska Department of Transportation & Public Facilities Southcoast Region	Egan Yandukin Inx. Improvements Two-Way Frontage Road AKSAS No.: Federal No.: Version ID: Printed: 12/20/2020

ITEM NO.	*Description*	*Unit*	*Quantity*	*Unit Price*	*Amount*
201.0003.0000	CLEARING AND GRUBBING	ACRE	8.88	$ 15,000.00	$ 133,193.56
202.0001.0000	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LUMP SUM	ALL REQ'D	$ 50,000.00	$ 50,000.00
202.0002.0000	REMOVAL OF PAVEMENT	SQUARE YARD	26,072.93	$ 10.00	$ 260,729.33
202.0003.0000	REMOVAL OF SIDEWALK	SQUARE YARD	676.62	$ 15.00	$ 10,149.33
202.0008.0000	REMOVAL OF INLET	EACH	3.00	$ 500.00	$ 1,500.00
202.0009.0000	REMOVAL OF CURB AND GUTTER	LINEAR FOOT	750.20	$ 12.00	$ 9,002.40
203.0003.0000	UNCLASSIFIED EXCAVATION	CUBIC YARD	140,540.40	$ 20.00	$ 2,810,808.00
203.0006.0000	BORROW	TON	60,610.00	$ 30.00	$ 1,818,300.00
203.0009.0000	OBLITERATION OF ROADWAY	SY	5,742.61	$ 6.00	$ 34,455.67
301.0001.00D1	AGGREGATE BASE COURSE, GRADING D-1	TON	1,290.00	$ 55.00	$ 70,950.00
306.0001.0000	ATB	TON	7,090.00	$ 150.00	$ 1,063,500.00
306.0002.5228	ASPHALT BINDER, GRADE PG 52-28	TON	320.00	$ 900.00	$ 288,000.00
401.0001.002B	HMA, TYPE II; CLASS B	TON	6,970.00	$ 160.00	$ 1,115,200.00
401.0004.5240	ASPHALT BINDER, GRADE PG 52-40	TON	384.00	$ 900.00	$ 345,600.00
401.0009.0000	LONGITUDINAL JOINT DENSITY PRICE ADJUSTMENT	CONTINGENT SUM	ALL REQ'D	$ 27,000.00	$ 27,000.00
501.2005.0000	CAST IN PLACE RETAINING WALL	CUBIC YARD	1,701.03	$ 500.00	$ 850,513.89
603.0001.0036	CSP 36-INCH	LINEAR FOOT	500.00	$ 250.00	$ 125,000.00
603.0003.0036	END SECTION FOR CSP 36-INCH	EACH	10.00	$ 650.00	$ 6,500.00
604.0005.0000	INLET, TYPE A	EACH	3.00	$ 4,000.00	$ 12,000.00
606.0006.0000	REMOVING AND DISPOSING OF GUARDRAIL	LINEAR FOOT	150.00	$ 15.00	$ 2,250.00
608.0001.0004	CONCRETE SIDEWALK, 4 INCHES THICK	SQUARE YARD	215.00	$ 100.00	$ 21,500.00
608.0001.0006	CONCRETE SIDEWALK, 6 INCHES THICK	SQUARE YARD	1,310.00	$ 110.00	$ 144,100.00
608.0003.0000	ASPHALT SIDEWALK	SQUARE YARD	4,624.00	$ 30.00	$ 138,720.00
608.0006.0000	CURB RAMP	EACH	16.00	$ 5,000.00	$ 80,000.00
609.0002.0001	CURB AND GUTTER, TYPE 1	LINEAR FOOT	1,417.00	$ 45.00	$ 63,765.00
615.0001.0000	STANDARD SIGN	SQUARE FOOT	478.23	$ 150.00	$ 71,733.75
615.0006.0000	SALVAGE SIGN	EACH	18.00	$ 125.00	$ 2,250.00
618.0002.0000	SEEDING	POUND	261.00	$ 125.00	$ 32,625.00
620.0001.0000	TOPSOIL	SQUARE YARD	28,893.70	$ 15.00	$ 433,405.50
640.0001.0000	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	ALL REQ'D	$ 1,663,000.00	$ 1,663,000.00
641.0001.0000	EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D	$ 84,000.00	$ 84,000.00

ENGINEER'S ESTIMATE **State of Alaska** **Department of Transportation** **& Public Facilities** **Southcoast Region**	Egan Yandukin Inx. Improvements Two-Way Frontage Road AKSAS No.: Federal No.: Version ID: Printed: 12/20/2020

ITEM NO.	*Description*	*Unit*	*Quantity*	*Unit Price*	*Amount*
641.0003.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D	$ 167,000.00	$ 167,000.00
641.0004.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	CONTINGENT SUM	ALL REQ'D	$ 42,000.00	$ 42,000.00
641.0007.0000	SWPPP MANAGER	LUMP SUM	ALL REQ'D	$ 15,000.00	$ 15,000.00
642.0001.0000	CONSTRUCTION SURVEYING	LUMP SUM	ALL REQ'D	$ 499,000.00	$ 499,000.00
642.0013.0000	THREE PERSON SURVEY PARTY	CONTINGENT SUM	ALL REQ'D	$ 17,500.00	$ 17,500.00
643.0002.0000	TRAFFIC MAINTENANCE	LUMP SUM	ALL REQ'D	$ 832,000.00	$ 832,000.00
643.0003.0000	PERMANENT CONSTRUCTION SIGNS	LUMP SUM	ALL REQ'D	$ 40,000.00	$ 40,000.00
643.0025.0000	TRAFFIC CONTROL	CONTINGENT SUM	ALL REQ'D	$ 998,000.00	$ 998,000.00
643.0032.0000	FLAGGING	CONTINGENT SUM	ALL REQ'D	$ 60,000.00	$ 60,000.00
644.0001.0000	FIELD OFFICE	LUMP SUM	ALL REQ'D	$ 25,000.00	$ 25,000.00
644.0006.0000	VEHICLE	LUMP SUM	ALL REQ'D	$ 20,000.00	$ 20,000.00
645.0001.0000	TRAINING PROGRAM, 1 TRAINEES / APPRENTICES	LABOR HOUR	500.00	$ 20.00	$ 10,000.00
646.0001.0000	CPM SCHEDULING	LUMP SUM	ALL REQ'D	$ 25,000.00	$ 25,000.00
660.0001.0000	TRAFFIC SIGNAL SYSTEM COMPLETE, EGAN DR AND GLACIER	LUMP SUM	ALL REQ'D	$ 862,000.00	$ 862,000.00
660.0003.0000	HIGHWAY LIGHTING SYSTEM COMPLETE, EGAN DR AND GLACIER	LUMP SUM	ALL REQ'D	$ 840,000.00	$ 840,000.00
661.0001.0000	LOAD CENTER, TYPE 1	EACH	2.00	$ 25,000.00	$ 50,000.00
670.2002.0000	MMA PAVEMENT MARKINGS, INLAID	LUMP SUM	ALL REQ'D	$ 355,000.00	$ 355,000.00
Project Summary	Pay Items:	48 Items		Subtotal	$ 16,627,251.43
	Minus Contractor Furnished CENG				$ (45,000.00)
				Exc Subtotal	$ 16,582,251.43
	Construction Engineering (Percentage)	15%		CENG	$ 2,487,337.71
				Subtotal	$ 19,069,589.14
	Indirect Cost Allocation Plan (ICAP)	4.75%			$ 905,805.48
	TOTAL PARTICIPATING				$ 19,975,394.63
	Project Total				$ 19,975,394.63

Egan Yandukin Inx. Improvements	201.0003.0000 CLEARING AND GRUBBING	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	9	ACRE
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		351631	sf
Contingency	10%	35163	sf
Total		386794	sf
Quantity		**8.88**	**ac**

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	202.0002.0000 REMOVAL OF PAVEMENT	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	26,073	SQUARE YARD
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		66947	sf	end of lemon
		138170	sf	egan and nugget
		3083	sf	path on east leg
		5124	sf	parking lot SW corner
Total		213324	sf	
Contingency	10%	21332.4	sf	
Total		234656	sf	
Quantity		**26073**	**sy**	

Calculated By	JAM	Date	11/4/2020
Checked By	GMC	Date	12/18/2020

KINNEY ENGINEERING, LLC
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KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	202.0003.0000 REMOVAL OF SIDEWALK	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	677	SQUARE YARD
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		4011	sf	medians @ nugget
		1525	sf	sidewalk @ SW leg
Total		5536	sf	
Contingency	10%	554	sf	
Total		6090	sf	
Quantity		**677**	**sy**	

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	202.0008.0000 REMOVAL OF INLET	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	3	EACH
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

SW CORNER	3

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	202.0009.0000 REMOVAL OF CURB AND GUTTER	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**750**	**LINEAR FOOT**
Project No. /		
Two-Way Frontage Road	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Area from ACAD		260	LF	SW corner
		262	lf	SW median
		160	lf	NW median
Total		682	LF	Total
Contingency	10%	68.2	LF	
Quantity		750	LF	

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

Egan Yandukin Inx. Improvements	203.0003.0000 UNCLASSIFIED EXCAVATION	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	140,540	CUBIC YARD
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

Total Volume Table

Station	Fill Area	Cut Area	Fill Volume	Cut Volume	Cumulative Fill Vol	Cumulative Cut Vol
146+06.71	0.00	68.74	0.00	16.55	12951.42	127763.90

Qty from ACAD		127764	CY
Contingency	10%	12776.4	CY
Total Qty		140540.4	CY

Calculated By	JAM	Date	11/4/2020
Checked By	GMC	Date	12/18/2020

KINNEY ENGINEERING, LLC
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Anchorage, AK 99503
907.346.2373

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	203.0006.0000 BORROW	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**60,610**	**TON**
Project No. /		
Two-Way Frontage Road	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Estimating Factor: 2 TONS/CY

Roadway				
ACAD Area From Civil3D		155348	SF	
Thickness		2	FT	
Volume		310696	CF	
	=	11507	CY	
Shrink/Swell Factor	10%	1,151	CY	
Total Volume		12,658	CY	
Quantity		25,320	TON	*Rounded up to nearest ten tons

Pathway				
ACAD Area From Civil3D		41616	SF	
Thickness		2	FT	
Volume		83231	CF	
	=	3083	CY	
Shrink/Swell Factor	10%	308	CY	
Total Volume		3,391	CY	
Quantity		6,790	TON	*Rounded up to nearest ten tons

Fill				
ACAD Volume From Civil3D		12951	CY	
Shrink/Swell Factor	10%	1,295	CY	
Total Volume		14,246	CY	
Quantity		28,500	TON	*Rounded up to nearest ten tons

TOTAL: 60,610 TON

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	203.0009.0000 OBLITERATION OF ROADWAY	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	5,743	SY
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		16573	sf	west side
		30412	sf	east side
Total		46985	sf	
Contingency	10%	4698.5	sf	
Total		51684	sf	
Quantity		**5743**	**sy**	

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

Egan Yandukin Inx. Improvements	301.0001.00D1 AGGREGATE BASE COURSE, GRADING D-	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**1,290**	**TON**
Project No. /		
Two-Way Frontage Road	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Estimating Factor: 2 TONS/CY

Pathway				
ACAD Area From Civil3D		47164	SF	
Thickness		0.33	FT	
Volume		15721	CF	
	=	582	CY	
Shrink/Swell Factor	10%	58	CY	
Total Volume		640	CY	
Quantity		1,290	TON	*Rounded up to nearest ten tons

TOTAL 1,290 TONS

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373	KINNEY ENGINEERING, LLC
Checked By	GMC	Date	12/18/2020		

Egan Yandukin Inx. Improvements	306.0001.0000 ATB	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	7,090	TON
Project No. /		
Two-Way Frontage Road	**TOTAL QUANTITY**	**UNIT OF MEASURE**

ESTIMATING FACTOR 2 TONS/CY

Roadway				
ACAD Area From Civil3D		347807	SF	
Thickness		0.25	FT	
Volume		86952	CF	
	=	3220	CY	
Shrink/Swell Factor	10%	322	CY	
Total Volume		3,542	CY	
Quantity		7,090	TON	*Rounded up to nearest ten tons

TOTAL: 7,090 TON

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	306.0002.5228 ASPHALT BINDER, GRADE PG 52-28	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	320	TON
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

From 306(1)	7,090	TONS	
4.5% of 306(1)	320	TONS	*Rounded up to whole ton

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	401.0001.002B HMA, TYPE II; CLASS B	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	6,970	TON
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

Estimating Factor: 115 LB/SY-INCH

Roadway				
ACAD Area From Civil3D		330138	SF	
=		36682	SY	
Thickness		3.00	IN	
Volume		110046	SY-IN	
Shrink/Swell Factor	10%	11,005	SY-IN	
Total Volume		121,051	SY-IN	
Quantity		6,970	TON	*Rounded up to nearest ten tons

TOTAL: 6,970 TON

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	401.0004.5240 ASPHALT BINDER, GRADE PG 52-40	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	384	TON
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

From 401(1b) quantity:	6,970	TONS	
Estimating Factor:	5.5%	Weight of 401(1b) quantity	
401(4) Quantity:	384	TONS	*Rounded to nearest whole ton

Calculated By	JAM	Date	11/17/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	)1.0009.0000 LONGITUDINAL JOINT DENSITY PRICE ADJUSTME	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	ALL REQ'D	CONTINGENT SUM
Project No. /		
Preliminary PS&E	TOTAL QUANTITY	UNIT OF MEASURE

LOCATION	LINEAR FOOT
Approx. length of lanes	18000

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

Egan Yandukin Inx. Improvements	501.2005.0000 CAST IN PLACE RETAINING WALL	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	1,701	CUBIC YARD
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

STATION	*HEIGHT*	*AVERAGE HT*	*LENGTH*	*AREA*
108+60	0			
109+00	33	17	40	660
109+50	46	40	50	1,975
110+00	33	40	50	1,975
110+50	71	52	50	2,600
111+00	60	66	50	3,275
111+50	70	65	50	3,250
112+00	63	67	50	3,325
112+50	69	66	50	3,300
113+00	46	58	50	2,875
113+50	37	42	50	2,075
114+00	32	35	50	1,725
114+50	0	16	50	800
			Estimated Face Area =	27,835 SF
			Assumed Thickness =	1.5 FT
			Volume =	41,753 CF
			=	1,546 CY
		Contingency	10%	155 CY
			Quantity =	1,701 CY

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

Egan Yandukin Inx. Improvements	08.0001.0006 CONCRETE SIDEWALK, 4 INCHES THIC	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	215	SQUARE YARD
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

ACAD Area From Civil3D	1931	SF	
=	215	SY	EBRT sidewalk
Quantity	215	TONS	*Rounded up to nearest 5 SY

TOTAL: 215 TON

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

Egan Yandukin Inx. Improvements	08.0001.0006 CONCRETE SIDEWALK, 6 INCHES THIC	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	1,310	SQUARE YARD
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

ACAD Area From Civil3D	11770	SF	Medians and curb ramps
=	1308	SY	
Quantity	1310	TONS	*Rounded up to nearest 5 SY

TOTAL: 1,310 TON

Calculated By	JAM	Date	11/4/2020
Checked By	GMC	Date	12/18/2020

KINNEY ENGINEERING, LLC
3909 Arctic Blvd, Ste 400
Anchorage, AK 99503
907.346.2373

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	608.0003.0000 ASPHALT SIDEWALK	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	4,624	SQUARE YARD
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

Estimating Factor: 115 LB/SY-INCH

Pathway				
ACAD Area From Civil3D		41616	SF	
=		4624	SY	
Thickness		2.00	IN	
Volume		9248	SY-IN	
Shrink/Swell Factor	10%	925	SY-IN	
Total Volume		10,173	SY-IN	
Quantity		590	TON	*Rounded up to nearest ten tons

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	608.0006.0000 CURB RAMP	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	16	EACH
Project No. /		
Two-Way Frontage Road	TOTAL QUANTITY	UNIT OF MEASURE

4 ramps at SW corner
4 ramps at NW corner
4 ramps at NE corner
2 ramps at SE corner
2 ramps at Glacier Lemon-Frontage Rd intersection

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	608.0006.0000 CURB RAMP	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	5,000.00	$/EACH
Project No. /		
Two-Way Frontage Road	ESTIMATED UNIT PRICE	

Quantity this estimate: 16

PROJECT		Engr's Est	Low Bidder	2nd Bidder	3rd Bidder	Avg. Bidders
Year, Project	2015	$1,600.00	$548.00	$1,200.00	$900.00	$882.67
Project	College Rd Rt Turn lanes					
Quantity	4					
Year, Project	2017	$3,500.00	$5,500.00	$7,000.00	$5,000.00	$5,833.33
Project	Seward Rd Improvements					
Quantity	1					
Year, Project	2016	$4,000.00	$5,500.00	$6,200.00	$4,000.00	$5,233.33
Project	Alyeska hwy Resurfacing					
Quantity	3					
Year, Project	2015	$2,400.00	$1,200.00	$1,060.00	$850.00	$1,036.67
Project	College Rd PP					
Quantity	9					

AVERAGE: 3,246.50 $/EACH

USE: 5,000.00 $/EACH

Calculated By	JAM	Date	3/12/2018	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	LML	Date	5/13/2020	

KINNEY ENGINEERING, LLC

Item Number: 608.0006.0608(6)
Item Name: CURB RAMP
Unit: EACH
Total Qty: 0

Egan Yandukin Inx. Improvements	609.0002.0001 CURB AND GUTTER, TYPE 1	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**1,417**	**LINEAR FOOT**
Project No. /		
Two-Way Frontage Road	**TOTAL QUANTITY**	**UNIT OF MEASURE**

ACAD Length From Civil3D	1417	LF	

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	618.0002.0000 SEEDING	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**261**	**POUND**
Project No. /		
Two-Way Frontage Road	**TOTAL QUANTITY**	**UNIT OF MEASURE**

From 620(1) Topsoil quantity	28,894	SY
Multiply by 9 SF/SY	260043.3	SF
ESTIMATING FACTOR:	0.001	LB/SF
QUANTITY: (Rounded up to whole pound)	261	LB

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	620.0001.0000 TOPSOIL	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	28,894	SQUARE YARD
Project No. /		
Two-Way Frontage Road	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Area from ACAD		236403	sf
Contingency	10%	23640.3	sf
Total		260043	sf
Quantity		**28894**	**sy**

Calculated By	JAM	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

Egan Yandukin Inx. Improvements	660.0001.0000 TRAFFIC SIGNAL SYSTEM COMPLETE, EGAN DR AND GLACIER HW	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**ALL REQ'D**	**LUMP SUM**
Project No. /		
Two-Way Frontage Road	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Work Description	Units	Qty
Sawcut trench	LF	1,000
Controller Cabinet Foundation	EA	1
Signal Mast Arm Pole Foundation	EA	4
Signal Pedestal Pole Foundation	EA	3
Combination Signal/Luminaire Pole	EA	4
Signal Pedestal Pole	EA	3
Luminaire Arm, 15' Length	EA	4
Signal Mast Arm, 25' Length	EA	1
Signal Mast Arm, 35' Length	EA	1
Signal Mast Arm, 40' Length	EA	2
2" Steel Conduit (GRSC)	LF	1,100
3" Steel Conduit (GRSC)	LF	1,500
Type IA Junction Box	EA	4
Type II Junction Box	EA	2
Type III Junction Box	EA	2
Conductor, 2C #14 AWG	LF	1,525
Conductor, 3C #20 AWG	LF	750
Conductor, 3C #6 AWG	LF	15
Conductor, 3C #8 AWG	LF	730
Conductor, 5C #14 AWG	LF	5,300
Conductor, 1C #8 AWG	LF	2,000
Conductor, 1C #6 AWG	LF	15
APT MATRIX 2	LF	1,340

Work Description	Units	Qty
Eight-Phase Controller Unit	EA	1
Optical Preemption Detector (All Types)	EA	4
12 3-Face LED Signal Head Overhead Mount	EA	11
12 3-Face LED Signal Head Side Mount	EA	8
Radar Detector	EA	6
Pedestrian LED Signal Head W/Countdown	EA	8
Pedestrian Pushbutton Assembly	EA	8
Luminaire, LED Roadway	EA	4
Remove Signal Combination Pole	EA	4
Salvage Controller	EA	1
Remove or Salvage Controller Base	EA	1

Calculated By	JAM	Date	11/4/2020
Checked By	GMC	Date	12/18/2020

KINNEY ENGINEERING, LLC
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Egan Yandukin Inx. Improvements	0.0003.0000 HIGHWAY LIGHTING SYSTEM COMPLETE, EGAN DR AND GLACIER HW	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**ALL REQ'D**	**LUMP SUM**
Project No. /		
Two-Way Frontage Road	**TOTAL QUANTITY**	**UNIT OF MEASURE**

ITEM DESCRIPTION	UNIT	QUANTITY
Trench and Backfill	LF	4,000
Steel Conduit 3-inch	LF	
Steel Conduit 2-inch	LF	4,000
Steel Conduit 1-inch	LF	
1-inch LFMC	LF	
Junction Box Type IA	EA	20
Junction Box Type II	EA	
3c#8 Conductor	LF	4,000
3c#6 Conductor	LF	
1c#8 Ground Conductor	LF	4,000
1c#6 Ground Conductor	LF	
Remove and relocate existing light pole	EA	1
Concrete light pole foundation	EA	20
Light pole	EA	20
LED luminaire	EA	20
Luminaire mast arm	EA	20
Ped Light pole, luminaire, foundation	EA	

Calculated By	GMD	Date	11/6/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/18/2020	

KINNEY ENGINEERING, LLC

SKIPS_RATI 0.25

670.2002.0000 MMA PAVEMENT MARKINGS, INLAID																		
4" WHITE (LF)	4" WHITE SKIP	4" WHITE DOT	8" WHITE (LF)	8" WHITE DOT	4" YELLOW (LF)	4" DY (LF)	4" YELLOW SKIP	12" W (SF)	18" Y (SF)	18" W (SF)	24" W (SF)	TURN ARROW (EACH)	THRU/LEFT ARROW (EACH)	ONLY (EACH)	Total Symbols (EA)	EQUIV. 4" LENGTH (FT)	Transverse markings (SF)	
															0	0	0	
10801.0	2119.0		4505.0	823.0	12807.0			57	1467	219	1629	22			22	33559	3372	
10,801	**2,119**	**0**	**4,505**	**823**	**12,807**	**0**	**0**	**57**	**1,467**	**219**	**1,629**	**22**	**0**	**0**	**22**	**33,560**	**3,372**	
															$ 850.00	$ 8.00	$ 20.00	
														Totals	$ 18,700.00	$ 268,480.00	$ 67,440.00	$ 354,620.00

ENGINEER'S ESTIMATE **State of Alaska** **Department of Transportation** **& Public Facilities** **Southcoast Region**	Egan Yandukin Inx. Improvements Partial Signal Alternative AKSAS No.: Federal No.: Version ID: Printed: 12/20/2020

ITEM NO.	*Description*	*Unit*	*Quantity*	*Unit Price*	*Amount*
201.0009.0000	CLEARING AND GRUBBING	ACRE	1	$ 13,089.39	$ 11,422.15
202.0002.0000	REMOVAL OF PAVEMENT	SQUARE YARD	25,904	$ 10.00	$ 259,043.89
203.0003.0000	UNCLASSIFIED EXCAVATION	CUBIC YARD	3,820	$ 20.00	$ 76,400.00
203.0006.0000	BORROW	TON	6,023	$ 30.00	$ 180,698.22
306.0001.0000	ATB	TON	4,320	$ 150.00	$ 648,000.00
306.0002.5228	ASPHALT BINDER, GRADE PG 52-28	TON	195	$ 900.00	$ 175,500.00
401.0001.002B	HMA, TYPE II; CLASS B	TON	4,470	$ 160.00	$ 715,200.00
401.0004.5828	ASPHALT BINDER, GRADE PG 42-50	TON	246	$ 900.00	$ 221,400.00
608.0001.0004	CONCRETE SIDEWALK, 4 INCHES THICK	SQUARE YARD	228	$ 100.00	$ 22,800.00
608.0001.0006	CONCRETE SIDEWALK, 6 INCHES THICK	SQUARE YARD	711	$ 110.00	$ 78,210.00
608.0006.0000	CURB RAMP	EACH	9	$ 5,000.00	$ 45,000.00
609.0002.0001	CURB AND GUTTER, TYPE 1	LINEAR FOOT	1,219	$ 45.00	$ 54,855.00
615.0001.0000	STANDARD SIGN	SQUARE FOOT	300	$ 150.00	$ 45,000.00
615.0006.0000	SALVAGE SIGN	EACH	45	$ 125.00	$ 5,625.00
615.9000.0000	FLASHING WARNING SIGN	EACH	2	$ 12,000.00	$ 24,000.00
618.0002.0000	SEEDING	POUND	27	$ 125.00	$ 3,375.00
620.0001.0000	TOPSOIL	SQUARE YARD	2,917	$ 15.00	$ 43,758.00
640.0001.0000	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	ALL REQ'D	$ 512,000.00	$ 512,000.00
641.0001.0000	EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D	$ 26,000.00	$ 26,000.00
641.0003.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D	$ 52,000.00	$ 52,000.00
641.0004.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	CONTINGENT SUM	ALL REQ'D	$ 13,000.00	$ 13,000.00
641.0007.0000	SWPPP MANAGER	LUMP SUM	ALL REQ'D	$ 15,000.00	$ 15,000.00
642.0001.0000	CONSTRUCTION SURVEYING	LUMP SUM	ALL REQ'D	$ 154,000.00	$ 154,000.00
642.0013.0000	THREE PERSON SURVEY PARTY	CONTINGENT SUM	ALL REQ'D	$ 17,500.00	$ 17,500.00
643.0002.0000	TRAFFIC MAINTENANCE	LUMP SUM	ALL REQ'D	$ 257,000.00	$ 257,000.00
643.0003.0000	PERMANENT CONSTRUCTION SIGNS	LUMP SUM	ALL REQ'D	$ 40,000.00	$ 40,000.00
643.0025.0000	TRAFFIC CONTROL	CONTINGENT SUM	ALL REQ'D	$ 308,000.00	$ 308,000.00

ENGINEER'S ESTIMATE	Egan Yandukin Inx. Improvements
	Partial Signal Alternative
State of Alaska	AKSAS No.:
Department of Transportation	Federal No.:
& Public Facilities	Version ID:
Southcoast Region	Printed: 12/20/2020

ITEM NO.	*Description*	*Unit*	*Quantity*	*Unit Price*	*Amount*
643.0032.0000	FLAGGING	CONTINGENT SUM	ALL REQ'D	$ 60,000.00	$ 60,000.00
644.0001.0000	FIELD OFFICE	LUMP SUM	ALL REQ'D	$ 25,000.00	$ 25,000.00
644.0006.0000	VEHICLE	LUMP SUM	ALL REQ'D	$ 20,000.00	$ 20,000.00
645.0001.0000	TRAINING PROGRAM, 1 TRAINEES / APPRENTICES	LABOR HOUR	500	$ 20.00	$ 10,000.00
646.0001.0000	CPM SCHEDULING	LUMP SUM	ALL REQ'D	$ 8,000.00	$ 8,000.00
660.0001.0000	TRAFFIC SIGNAL SYSTEM COMPLETE, EGAN DR / YANDUKIN	LUMP SUM	ALL REQ'D	$ 625,000.00	$ 625,000.00
660.0003.0000	HIGHWAY LIGHTING SYSTEM COMPLETE, EGAN AND YANDUKIN	LUMP SUM	ALL REQ'D	$ 106,000.00	$ 106,000.00
661.0001.0000	LOAD CENTER, TYPE 1	EACH	1	$ 25,000.00	$ 25,000.00
670.2002.0000	MMA PAVEMENT MARKINGS, INLAID	LUMP SUM	ALL REQ'D	$ 241,000.00	$ 241,000.00
Project Summary	Pay Items:	36 Items		Subtotal	$ 5,124,787.26
	Minus Contractor Furnished CENG Items				$ (45,000.00)
				Exc Subtotal	$ 5,079,787.26
	Construction Engineering (Percentage)	15%		CENG	$ 761,968.08
				Subtotal	$ 5,841,755.34
	Indirect Cost Allocation Plan (ICAP)	4.75%			$ 277,483.38
	TOTAL PARTICIPATING				$ 6,119,238.72
	Project Total				$ 6,119,238.72

Egan Yandukin Inx. Improvements	201.0003.0000 CLEARING AND GRUBBING	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	1	ACRE
Project No. /		
Partial Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		34556	sf
Contingency	10%	3455.6	sf
Total		38012	sf
Quantity		**0.87**	**ac**

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	202.0002.0000 REMOVAL OF PAVEMENT	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**25,904**	**SQUARE YARD**
Project No. /		
Partial Signal Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Area from ACAD		211945	sf
Total		211945	sf
Contingency	10%	21194.5	sf
Total		233140	sf
Quantity		**25904**	**sy**

Calculated By	GMD	Date	11/5/2020
Checked By	GMC	Date	12/15/2020

KINNEY ENGINEERING, LLC
3909 Arctic Blvd, Ste 400
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KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	203.0003.0000 UNCLASSIFIED EXCAVATION	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	3,820	CUBIC YARD
Project No. /		
Partial Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Assuming vertical excavation within new roadway, pathway, and sidewalk embankments.

NEW ROADWAY EMBANKMENT				
PLAN AREA (SF)	*DEPTH (FT)*	*VOLUME (CF)*	*VOLUME (CY)*	*REMARKS / ASSUMPTIONS*
34,442.00	2.5	86,105.00	3,189.07	excluding median crossovers

Shrink/Swell Factor	10%	318.91	CY
Subtotal Volume		3507.98	CY

NEW SIDEWALK EMBANKMENT				
PLAN AREA (SF)	*DEPTH (FT)*	*VOLUME (CF)*	*VOLUME (CY)*	*REMARKS / ASSUMPTIONS*
3,031.00	2.50	7,577.50	280.65	

Shrink/Swell Factor	10%	28.06	CY
Subtotal Volume		308.71	CY

total (CY)	3,816.69
Round up to nearest 10 CY	3,820

Calculated By	GMD	Date	11/5/2020
Checked By	GMC	Date	12/15/2020

KINNEY ENGINEERING, LLC
3909 Arctic Blvd, Ste 400
Anchorage, AK 99503
907.346.2373

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	203.0006.0000 BORROW	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**6,023**	**TON**
Project No. /		
Partial Signal Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Estimating Factor: 2 TONS/CY

Roadway, excluding median crossovers, Embankment				
ACAD Area From Civil3D		34,442.00	SF	
Thickness		2	FT	
Volume		68884.00	CF	
	=	2,551.26	CY	
Shrink/Swell Factor	10%	255.13	CY	
Total Volume		2,806.39	CY	
Subtotal weight		5,612.77	TON	

New Sidewalk Embankment				
ACAD Area From Civil3D		2,519.00	SF	No digouts for porkchop medians
Thickness		2	FT	
Volume		5,038.00	CF	
	=	186.59	CY	
Shrink/Swell Factor	10%	18.66	CY	
Total Volume		205.25	CY	
Subtotal weight		410.50	TON	

TOTAL: 6,023 TON

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	306.0001.0000 ATB	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**4,320**	**TON**
Project No. /		
Partial Signal Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

ESTIMATING FACTOR 2 TONS/CY

Roadway				
ACAD Area From Civil3D		211,696.00	SF	
Thickness		0.25	FT	
Volume		52924.00	CF	
	=	1960	CY	
Shrink/Swell Factor	10%	196	CY	
Total Volume		2,156	CY	
Quantity		4,320	TON	*Rounded up to nearest ten tons

TOTAL: 4,320 TON

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	306.0002.5228 ASPHALT BINDER, GRADE PG 52-28	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	195	TON
Project No. /		
Partial Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

From 306(1)	4,320	TONS	
4.5% of 306(1)	195	TONS	*Rounded up to whole ton

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	401.0001.002B HMA, TYPE II; CLASS B	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	4,470	TON
Project No. /		
Partial Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Estimating Factor: 115 LB/SY-INCH

Roadway				
ACAD Area From Civil3D		211,696.00	SF	
=		23521.7778	SY	
Thickness		3.00	IN	
Volume		70565	SY-IN	
Shrink/Swell Factor	10%	7,057	SY-IN	
Total Volume		77,622	SY-IN	
Quantity		4,470	TON	*Rounded up to nearest ten tons

TOTAL: 4,470 TON

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	401.0004.5828 ASPHALT BINDER, GRADE PG 42-50	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	246	TON
Project No. /		
Partial Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

From 401(1b) quantity:	4,470	TONS	
Estimating Factor:	5.5%	Weight of 401(1b) quantity	
401(4) Quantity:	246	TONS	*Rounded to nearest whole ton

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	08.0001.0004 CONCRETE SIDEWALK, 4 INCHES THIC	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**228**	**SQUARE YARD**
Project No. /		
Partial Signal Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

ACAD Area From Civil3D	2,044	SF	
=	227	SY	
Quantity	228	TONS	*Rounded up to nearest 5 SY

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

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Egan Yandukin Inx. Improvements	08.0001.0006 CONCRETE SIDEWALK, 6 INCHES THIC	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	711	SQUARE YARD
Project No. /		
Partial Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

ACAD Area From Civil3D	6,392.00	SF	Includes medians and porkchop islands
=	710.22	SY	
Quantity	711	TONS	*Rounded up to nearest 5 SY

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

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Egan Yandukin Inx. Improvements	608.0006.0000 CURB RAMP	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	9	EACH
Project No. /		
Partial Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

3 ramps on NE corner

2 ramps on ped refuge

2 ramps on NW corner

2 ramps on Fred Meyer driveway

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373	KINNEY ENGINEERING, LLC
Checked By	GMC	Date	12/15/2020		

Egan Yandukin Inx. Improvements	609.0002.0001 CURB AND GUTTER, TYPE 1	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**1,219**	**LINEAR FOOT**
Project No. /		
Partial Signal Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

ACAD Length From Civil3D	1219	LF	

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	618.0002.0000 SEEDING	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	27	POUND
Project No. /		
Partial Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

From 620(1) Topsoil quantity	2,917	SY
Multiply by 9 SF/SY	26254.8	SF
ESTIMATING FACTOR:	0.001	LB/SF
QUANTITY: (Rounded up to whole pound)	27	LB

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	620.0001.0000 TOPSOIL	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	2,917	SQUARE YARD
Project No. /		
Partial Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		23,868.00	sf
Contingency	10%	2,387	sf
Total		26,255	sf
Quantity		**2,917**	**sy**

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	AFFIC SIGNAL SYSTEM COMPLETE, EGAN DR / YAN	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	ALL REQ'D	LUMP SUM
Project No. /		
Partial Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Work Description	Units	Qty
Sawcut trench	LF	750
Controller Cabinet Foundation	EA	1
Signal Mast Arm Pole Foundation	EA	2
Signal Pedestal Pole Foundation	EA	2.00
Combination Signal/Luminaire Pole	EA	2
Signal pole	EA	0
Signal Pedestal Pole	EA	2
Luminaire Arm, 15' Length	EA	2
Signal Mast Arm, 45' Length	EA	2
2" Steel Conduit (GRSC)	LF	825
3" Steel Conduit (GRSC)	LF	1,125
Type IA Junction Box	EA	2
Type II Junction Box	EA	2
Conductor, 2C #14 AWG	LF	1,144
Conductor, 3C #20 AWG	LF	563
Conductor, 3C #6 AWG	LF	15
Conductor, 3C #8 AWG	LF	548
Conductor, 5C #14 AWG	LF	3,975
Conductor, 1C #8 AWG	LF	1,500
Conductor, 1C #6 AWG	LF	15

Work Description	Units	Qty
APT MATRIX 2	LF	1,005
Radio Ethernet communications devices	EA	2
Eight-Phase Controller Unit	EA	1
Optical Preemption Detector (All Types)	EA	2
12 3-Face LED Signal Head Overhead M	EA	4
12 3-Face LED Signal Head Side Mount	EA	2
12 4-Face LED Signal Head Overhead M	EA	2
12 4-Face LED Signal Head Side Mount	EA	2
Radar Detector	EA	4
Pedestrian LED Signal Head W/Countdo	EA	2
Pedestrian Pushbutton Assembly	EA	2
Luminaire, LED Roadway	EA	2

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	JAM	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	660.0003.0000 HIGHWAY LIGHTING SYSTEM COMPLETE, EGAN AND YANDUKIN	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	ALL REQ'D	LUMP SUM
Project No. /		
Partial Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

ITEM DESCRIPTION	UNIT	QUANTITY
Trench and Backfill	LF	550
Steel Conduit 3-inch	LF	0
Steel Conduit 2-inch	LF	550
Steel Conduit 1-inch	LF	
1-inch LFMC	LF	
Junction Box Type IA	EA	3
Junction Box Type II	EA	0
3c#8 Conductor	LF	600
3c#6 Conductor	LF	0
1c#8 Ground Conductor	LF	600
1c#6 Ground Conductor	LF	0
Remove and relocate existing light pole	EA	3
Concrete light pole foundation	EA	3
Light pole	EA	
LED luminaire	EA	3
Luminaire mast arm	EA	0
Ped Light pole, luminaire, foundation	EA	

All relocated LPs get new LED luminaires.

10% contingency included in cable and conduit quantities to account for unknown routing

Calculated By	GMD	Date	11/5/2020
Checked By	JAM	Date	12/15/2020

KINNEY ENGINEERING, LLC
3909 Arctic Blvd, Ste 400
Anchorage, AK 99503
907.346.2373

SKIPS_RATI **0.25**

670.2002.0000 MMA PAVEMENT MARKINGS, INLAID																		
4" WHITE (LF)	4" WHITE SKIP	4" WHITE DOT	8" WHITE (LF)	8" WHITE DOT	4" YELLOW (LF)	4" DY (LF)	4" YELLOW SKIP	12" W (SF)	18" Y (SF)	18" W (SF)	24" W (SF)	TURN ARROW (EACH)	THRU/LEFT ARROW (EACH)	ONLY (EACH)	Total Symbols (EA)	EQUIV. 4" LENGTH (FT)	Transverse markings (SF)	
5791	2106		6198		3092	543.0		1154	283.5	180	605	15			15	22892	2223	
5,791	**2,106**	**0**	**6,198**	**0**	**3,092**	**543**	**0**	**1,154**	**284**	**180**	**605**	**15**	**0**	**0**	**15**	**22,892**	**2,223**	
															$ 850.00	$ 8.00	$ 20.00	
														Totals	$ 12,750.00	$ 183,136.00	$ 44,460.00	$ 240,346.00

ENGINEER'S ESTIMATE **State of Alaska** **Department of Transportation** **& Public Facilities** **Southcoast Region**			Egan Yandukin Inx. Improvements Full Signal Alternative AKSAS No.: Federal No.: Version ID: Printed: 12/20/2020		
ITEM NO.	*Description*	*Unit*	*Quantity*	*Unit Price*	*Amount*
201.0009.0000	CLEARING AND GRUBBING	ACRE	3	$ 40,500.00	$ 109,350.00
202.0002.0000	REMOVAL OF PAVEMENT	SQUARE YARD	32,065	$ 10.00	$ 320,648.06
203.0003.0000	UNCLASSIFIED EXCAVATION	CUBIC YARD	10,280	$ 20.00	$ 205,600.00
203.0006.0000	BORROW	TON	14,662	$ 30.00	$ 439,868.00
203.0009.0000	OBLITERATION OF ROADWAY	SQUARE YARD	8,025	$ 6.00	$ 48,148.95
301.0001.00D1	AGGREGATE BASE COURSE, GRADING D-1	TON	300	$ 55.00	$ 16,500.00
306.0001.0000	ATB	TON	5,300	$ 150.00	$ 795,000.00
306.0002.5228	ASPHALT BINDER, GRADE PG 52-28	TON	239	$ 900.00	$ 215,100.00
401.0001.002B	HMA, TYPE II; CLASS B	TON	5,480	$ 160.00	$ 876,800.00
401.0004.5828	ASPHALT BINDER, GRADE PG 52-40	TON	302	$ 900.00	$ 271,800.00
608.0001.0004	CONCRETE SIDEWALK, 4 INCHES THICK	SQUARE YARD	230	$ 100.00	$ 23,000.00
608.0001.0006	CONCRETE SIDEWALK, 6 INCHES THICK	SQUARE YARD	750	$ 110.00	$ 82,500.00
608.0003.0000	ASPHALT SIDEWALK	SQUARE YARD	1,217	$ 35.00	$ 42,587.22
608.0006.0000	CURB RAMP	EACH	9	$ 5,000.00	$ 45,000.00
609.0002.0001	CURB AND GUTTER, TYPE 1	LINEAR FOOT	1,924	$ 45.00	$ 86,580.00
615.0001.0000	STANDARD SIGN	SQUARE FOOT	300	$ 150.00	$ 45,000.00
615.0006.0000	SALVAGE SIGN	EACH	45	$ 125.00	$ 5,625.00
615.9000.0000	FLASHING WARNING SIGN	EACH	2	$ 12,000.00	$ 24,000.00
618.0002.0000	SEEDING	POUND	87	$ 125.00	$ 10,875.00
620.0001.0000	TOPSOIL	SQUARE YARD	9,650	$ 15.00	$ 144,752.67
640.0001.0000	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	ALL REQ'D	$ 779,000.00	$ 779,000.00
641.0001.0000	EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D	$ 39,000.00	$ 39,000.00
641.0003.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D	$ 78,000.00	$ 78,000.00
641.0004.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	CONTINGENT SUM	ALL REQ'D	$ 20,000.00	$ 20,000.00
641.0007.0000	SWPPP MANAGER	LUMP SUM	ALL REQ'D	$ 15,000.00	$ 15,000.00
642.0001.0000	CONSTRUCTION SURVEYING	LUMP SUM	ALL REQ'D	$ 234,000.00	$ 234,000.00
642.0013.0000	THREE PERSON SURVEY PARTY	CONTINGENT SUM	ALL REQ'D	$ 17,500.00	$ 17,500.00
643.0002.0000	TRAFFIC MAINTENANCE	LUMP SUM	ALL REQ'D	$ 390,000.00	$ 390,000.00

ENGINEER'S ESTIMATE **State of Alaska** **Department of Transportation** **& Public Facilities** **Southcoast Region**			Egan Yandukin Inx. Improvements Full Signal Alternative AKSAS No.: Federal No.: Version ID: Printed: 12/20/2020		
ITEM NO.	*Description*	*Unit*	*Quantity*	*Unit Price*	*Amount*
643.0003.0000	PERMANENT CONSTRUCTION SIGNS	LUMP SUM	ALL REQ'D	$ 40,000.00	$ 40,000.00
643.0025.0000	TRAFFIC CONTROL	CONTINGENT SUM	ALL REQ'D	$ 468,000.00	$ 468,000.00
643.0032.0000	FLAGGING	CONTINGENT SUM	ALL REQ'D	$ 60,000.00	$ 60,000.00
644.0001.0000	FIELD OFFICE	LUMP SUM	ALL REQ'D	$ 25,000.00	$ 25,000.00
644.0006.0000	VEHICLE	LUMP SUM	ALL REQ'D	$ 20,000.00	$ 20,000.00
645.0001.0000	TRAINING PROGRAM, 1 TRAINEES / APPRENTICES	LABOR HOUR	500	$ 20.00	$ 10,000.00
646.0001.0000	CPM SCHEDULING	LUMP SUM	ALL REQ'D	$ 12,000.00	$ 12,000.00
660.0001.0000	TRAFFIC SIGNAL SYSTEM COMPLETE, EAGAN DR / YANDUKIN	LUMP SUM	ALL REQ'D	$ 870,000.00	$ 870,000.00
660.0003.0000	HIGHWAY LIGHTING SYSTEM COMPLETE, EGAN AND YANDUKIN	LUMP SUM	ALL REQ'D	$ 608,000.00	$ 608,000.00
661.0001.0000	LOAD CENTER, TYPE 1	EACH	1	$ 25,000.00	$ 25,000.00
670.2002.0000	MMA PAVEMENT MARKINGS, INLAID	LUMP SUM	ALL REQ'D	$ 269,000.00	$ 269,000.00
AWP Compare	Pay Items:	38 Items		Subtotal	$ 7,788,234.89
	Minus Contractor Furnished CENG				$ (45,000.00)
				Exc Subtotal	$ 7,743,234.89
	Construction Engineering (Percentage)	15%		CENG	$ 1,161,485.23
				Subtotal	$ 8,904,720.12
	Indirect Cost Allocation Plan (ICAP)	4.75%			$ 422,974.21
	TOTAL PARTICIPATING				$ 9,327,694.33
	Project Total				$ 9,327,694.33

Egan Yandukin Inx. Improvements	201.0003.0000 CLEARING AND GRUBBING	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	3	ACRE
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Areas from ACAD polylines. Any area outside of existing pavement that has proposed pavement:	106,034.00	SF
Convert to ACRE:	2.43	ACRE
10% Contingency:	2.68	ACRE
Round up to nearest tenth ACRE:	2.70	ACRE

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	202.0002.0000 REMOVAL OF PAVEMENT	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	32,065	SQUARE YARD
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		262,348.41	sf
Total		262348	sf
Contingency	10%	26234.8409	sf
Total		288583	sf
Quantity		**32065**	**sy**

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	203.0003.0000 UNCLASSIFIED EXCAVATION	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	10,280	CUBIC YARD
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Assuming vertical excavation within new roadway, pathway, and sidewalk embankments.

NEW ROADWAY EMBANKMENT				
PLAN AREA (SF)	*DEPTH (FT)*	*VOLUME (CF)*	*VOLUME (CY)*	*REMARKS / ASSUMPTIONS*
87,450.00	2.5	218,625.00	8,097.22	

Shrink/Swell Factor	10%	809.72	CY
Subtotal Volume		8,906.94	CY

NEW PATHWAY EMBANKMENT				
PLAN AREA (SF)	*DEPTH (FT)*	*VOLUME (CF)*	*VOLUME (CY)*	*REMARKS / ASSUMPTIONS*
10,951.00	2.5	27,377.50	1,013.98	

Shrink/Swell Factor	10%	101.40	CY
Subtotal Volume		1,115.38	CY

NEW SIDEWALK EMBANKMENT				
PLAN AREA (SF)	*DEPTH (FT)*	*VOLUME (CF)*	*VOLUME (CY)*	*REMARKS / ASSUMPTIONS*
2,523.00	2.50	6,307.50	233.61	Assume all 6" swlk for planning level est.

Shrink/Swell Factor	10%	23.36	CY
Subtotal Volume		256.97	CY

total (CY)	10,279.30
Round up to nearest 10 CY	10,280

Calculated By	GMD	Date	11/4/2020
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KINNEY ENGINEERING, LLC
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KINNEY ENGINEERING, LLC

Fairbanks Cushman Street Bridge	203.0006.0000 BORROW	
State of Alaska Department of Transportation & Public Facilities - Northern Region	14,662	TON
Project No. 663012 / Z622070000		
Preliminary PS&E	TOTAL QUANTITY	UNIT OF MEASURE

Estimating Factor: 2 TONS/CY

New Roadway Embankment				
ACAD Area From Civil3D		87,450.00	SF	
Thickness		2	FT	
Volume		174,900.00	CF	
	=	6,477.78	CY	
Shrink/Swell Factor	10%	647.78	CY	
Total Volume		7,125.56	CY	
Subtotal weight		14,251.11	TON	

New sidewalk embankment				
ACAD Area From Civil3D		2,523.00	SF	
Thickness		2	FT	
Volume		5,046.00	CF	
	=	186.89	CY	
Shrink/Swell Factor	10%	18.69	CY	
Total Volume		205.58	CY	
Subtotal weight		411.16	TON	

TOTAL: 14,662 TON

Calculated By	GMD	Date	11/4/2020
Checked By	GMC	Date	12/15/2020

KINNEY ENGINEERING, LLC
3909 Arctic Blvd, Ste 400
Anchorage, AK 99503
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Egan Yandukin Inx. Improvements	203.0009.0000 OBLITERATION OF ROADWAY	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	8,025	SQUARE YARD
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		65658	sf
			sf
Total		65658	sf
Contingency	10%	6565.76578	sf
Total		72223	sf
Quantity		**8025**	**sy**

Calculated By	GMD	Date	11/4/2020
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KINNEY ENGINEERING, LLC
3909 Arctic Blvd, Ste 400
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Egan Yandukin Inx. Improvements	301.0001.00D1 AGGREGATE BASE COURSE, GRADING D-	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**300**	**TON**
Project No. /		
Full Signal Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Estimating Factor: 2 TONS/CY

Pathway				
ACAD Area From Civil3D		10951	SF	
Thickness		0.33	FT	
Volume		3650	CF	
	=	135	CY	
Shrink/Swell Factor	10%	14	CY	
Total Volume		149	CY	
Quantity		300	TON	*Rounded up to nearest ten tons

TOTAL 300 TONS

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

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Egan Yandukin Inx. Improvements	306.0001.0000 ATB	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**5,300**	**TON**
Project No. /		
Full Signal Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

ESTIMATING FACTOR 2 TONS/CY

Roadway				
ACAD Area From Civil3D		259,734.00	SF	
Thickness		0.25	FT	
Volume		64,933.50	CF	
	=	2405	CY	
Shrink/Swell Factor	10%	240	CY	
Total Volume		2,645	CY	
Quantity		5,300	TON	*Rounded up to nearest ten tons

TOTAL: 5,300 TON

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	306.0002.5228 ASPHALT BINDER, GRADE PG 52-28	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	239	TON
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

From 306(1)	5,300	TONS	
4.5% of 306(1)	239	TONS	*Rounded up to whole ton

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	401.0001.002B HMA, TYPE II; CLASS B	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	5,480	TON
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Estimating Factor: 115 LB/SY-INCH

Roadway				
ACAD Area From Civil3D		259,734.00	SF	
=		28,859.33	SY	
Thickness		3	IN	
Volume		86,578.00	SY-IN	
Shrink/Swell Factor	10%	8,658	SY-IN	
Total Volume		95,236	SY-IN	
Quantity		5,480	TON	*Rounded up to nearest ten tons

TOTAL: 5,480 TON

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	401.0004.5828 ASPHALT BINDER, GRADE PG 52-40	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	302	TON
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

From 401(1b) quantity:	5,480	TONS	
Estimating Factor:	5.5%	Weight of 401(1b) quantity	
401(4) Quantity:	302	TONS	*Rounded to nearest whole ton

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	08.0001.0004 CONCRETE SIDEWALK, 4 INCHES THIC	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	230	SQUARE YARD
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

ACAD Area From Civil3D	2,050.00	SF	
=	227.78	SY	
Quantity	230	TONS	*Rounded up to nearest 5 SY

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	08.0001.0006 CONCRETE SIDEWALK, 6 INCHES THIC	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	750	SQUARE YARD
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

ACAD Area From Civil3D	6,712.00	SF	Area from ACAD. Includes medians and porkchop islands:
=	745.78	SY	
Quantity	750	TONS	*Rounded up to nearest 5 SY

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
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KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	608.0003.0000 ASPHALT SIDEWALK	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	1,217	SQUARE YARD
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Estimating Factor: 115 LB/SY-INCH

Pathway				
ACAD Area From Civil3D		10,951.00	SF	
=		1,216.78	SY	
Thickness		2.00	IN	
Volume		2434	SY-IN	
Shrink/Swell Factor	10%	243	SY-IN	
Total Volume		2,677	SY-IN	
Quantity		160	TON	*Rounded up to nearest ten tons

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	608.0006.0000 CURB RAMP	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	9	EACH
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

2 ramps in NE raised island
1 ramp in Old Dairy sidewalk
2 ramps in ped refuge island
2 ramps in new sidewalk along N leg of intersection
2 ramp across fred meyer driveway

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	608.0006.0000 CURB RAMP	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	5,000.00	$/EACH
Project No. /		
Full Signal Alternative	ESTIMATED UNIT PRICE	

Quantity this estimate: 9

PROJECT		Engr's Est	Low Bidder	2nd Bidder	3rd Bidder	Avg. Bidders
Year, Project	2015	$1,600.00	$548.00	$1,200.00	$900.00	$882.67
Project	College Rd Rt Turn lanes					
Quantity	4					
Year, Project	2017	$3,500.00	$5,500.00	$7,000.00	$5,000.00	$5,833.33
Project	Seward Rd Improvements					
Quantity	1					
Year, Project	2016	$4,000.00	$5,500.00	$6,200.00	$4,000.00	$5,233.33
Project	Alyeska hwy Resurfacing					
Quantity	3					
Year, Project	2015	$2,400.00	$1,200.00	$1,060.00	$850.00	$1,036.67
Project	College Rd PP					
Quantity	9					

AVERAGE: 3,246.50 $/EACH

USE: 5,000.00 $/EACH

Calculated By	JAM	Date	3/12/2018	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	LML	Date	5/13/2020	

Item Number: 608.0006.I 608(6)
Item Name: CURB RAMP
Unit: EACH
Total Qty: 9

Egan Yandukin Inx. Improvements	609.0002.0001 CURB AND GUTTER, TYPE 1	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**1,924**	**LINEAR FOOT**
Project No. /		
Full Signal Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

ACAD Length From Civil3D	1,924	LF	

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	609.0002.0001 CURB AND GUTTER, TYPE 1	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**45.00**	**$/LINEAR FOOT**
Project No. /		
Full Signal Alternative	**ESTIMATED UNIT PRICE**	

Quantity this estimate: 1,924

PROJECT	Engr's Est	Low Bidder	2nd Bidder	3rd Bidder	Avg. Bidders
2019	N/A	$45.00	$45.00	Price	$45.00
JNU RIVERSIDE / STEPHEN RICHARDS CONGESTION MITIGATION					
143 LF					
2020	N/A	$40.00	Price	Price	$40.00
JNU MENDENHALL LOOP RD. IMPROVEMENTS					
5061 LF					
2018	N/A	$40.00	$40.00	Price	$40.00
JNU INDUSTRIAL BLVD WIDENING AND SIDEWALK & GLACIER HWY INDUSTRIAL BLVD IMPROVEMENTS					
2640 LF					
2019	N/A	$50.00	Price	Price	$50.00
JNU EGAN DRIVE IMPROVEMENTS - MAIN STREET TO 10TH STREET					
12150 LF					

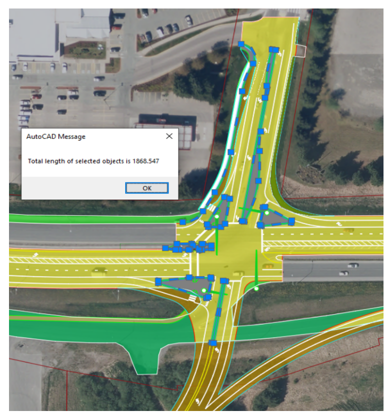
AVERAGE: 43.75 $/LINEAR FOOT

USE: 45.00 $/LINEAR FOOT

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By		Date		

KINNEY ENGINEERING, LLC

Item Number: 609.0002.(609(2)
Item Name: CURB AND GUTTER, TYPE 1
Unit: LINEAR FOOT
Total Qty: 1,924
PLUS LENGTH ACROSS FRED MEYER DRIVEWAY 55



Egan Yandukin Inx. Improvements	618.0002.0000 SEEDING	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	87	POUND
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

From 620(1) Topsoil quantity	9,650	SY
Multiply by 9 SF/SY	86851.6	SF
ESTIMATING FACTOR:	0.001	LB/SF
QUANTITY: (Rounded up to whole pound)	87	LB

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	620.0001.0000 TOPSOIL	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	9,650	SQUARE YARD
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		78,956.00	sf
Contingency	10%	7,896	sf
Total		86,852	sf
Quantity		**9,650**	**sy**

Calculated By	GMD	Date	11/4/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	FFIC SIGNAL SYSTEM COMPLETE, EAGAN DR / YAN	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	ALL REQ'D	LUMP SUM
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

Work Description	Units	Qty
Sawcut trench	LF	1,000
Controller Cabinet Foundation	EA	1
Signal Mast Arm Pole Foundation	EA	4
Signal Pedestal Pole Foundation	EA	2
Combination Signal/Luminaire Pole	EA	4
Signal Pedestal Pole	EA	2
Luminaire Arm, 15' Length	EA	4
Signal Mast Arm, 25' Length	EA	1
Signal Mast Arm, 30' Length	EA	1
Signal Mast Arm, 45' Length	EA	2
2" Steel Conduit (GRSC)	LF	1,100
3" Steel Conduit (GRSC)	LF	1,500
Type IA Junction Box	EA	4
Type II Junction Box	EA	2
Type III Junction Box	EA	2
Conductor, 2C #14 AWG	LF	1,525
Conductor, 3C #20 AWG	LF	750
Conductor, 3C #6 AWG	LF	15
Conductor, 3C #8 AWG	LF	730
Conductor, 5C #14 AWG	LF	5,300
Conductor, 1C #8 AWG	LF	2,000
Conductor, 1C #6 AWG	LF	15
APT MATRIX 2	LF	1,340

Work Description	Units	Qty
Radio Ethernet communications devices	EA	2
Eight-Phase Controller Unit	EA	1
Optical Preemption Detector (All Types)	EA	4
12 3-Face LED Signal Head Overhead Mount	EA	6
12 3-Face LED Signal Head Side Mount	EA	4
12 4-Face LED Signal Head Overhead Mount	EA	4
12 4-Face LED Signal Head Side Mount	EA	4
Radar Detector	EA	6
Pedestrian LED Signal Head W/Countdown	EA	2
Pedestrian Pushbutton Assembly	EA	2
Luminaire, LED Roadway	EA	4

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373	KINNEY ENGINEERING, LLC
Checked By	INITIALS	Date	DATE		

Egan Yandukin Inx. Improvements	660.0003.0000 HIGHWAY LIGHTING SYSTEM COMPLETE, EGAN AND YANDUKIN	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**ALL REQ'D**	**LUMP SUM**
Project No. /		
Full Signal Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

ITEM DESCRIPTION	UNIT	QUANTITY
Trench and Backfill	LF	3,410
Steel Conduit 3-inch	LF	0
Steel Conduit 2-inch	LF	3,410
Steel Conduit 1-inch	LF	
1-inch LFMC	LF	
Junction Box Type IA	EA	18
Junction Box Type II	EA	0
3c#8 Conductor	LF	3,410
3c#6 Conductor	LF	0
1c#8 Ground Conductor	LF	3,410
1c#6 Ground Conductor	LF	0
Remove and relocate existing light pole	EA	6
Concrete light pole foundation	EA	11
Light pole	EA	5
LED luminaire	EA	11
Luminaire mast arm	EA	5
Ped Light pole, luminaire, foundation	EA	7

Assuming 2 relocated LPs to be used along realigned Yandukin. The rest are just slightly relocated from EX.

All relocated LPs get new LED luminaires.

10% contingency included in conduit and cable quantities to account for unknown routing.

Calculated By	GMD	Date	11/5/2020
Checked By	GMC	Date	12/15/2020

KINNEY ENGINEERING, LLC
3909 Arctic Blvd, Ste 400
Anchorage, AK 99503
907.346.2373

KINNEY ENGINEERING, LLC

SKIPS_RATI **0.25**

670.2002.0000 MMA PAVEMENT MARKINGS, INLAID																	
4" WHITE (LF)	4" WHITE SKIP	4" WHITE DOT	8" WHITE (LF)	8" WHITE DOT	4" YELLOW (LF)	4" DY (LF)	4" YELLOW SKIP	12" W (SF)	18" Y (SF)	18" W (SF)	24" W (SF)	TURN ARROW (EACH)	THRU/LEFT ARROW (EACH)	ONLY (EACH)	Total Symbols (EA)	EQUIV. 4" LENGTH (FT)	Transverse markings (SF)
7803	1950		4787		2851	2368.0		1106		270	883	23			23	25452	2259
7,803	**1,950**	**0**	**4,787**	**0**	**2,851**	**2,368**	**0**	**1,106**	**0**	**270**	**883**	**23**	**0**	**0**	**23**	**25,452**	**2,259**
															$ 850.00	$ 8.00	$ 20.00
														Totals	$ 19,550.00	$ 203,616.00	$ 45,180.00

$ 268,346.00

ENGINEER'S ESTIMATE **State of Alaska** **Department of Transportation** **& Public Facilities** **Southcoast Region**	Egan Yandukin Inx. Improvements Two Signalized T-Intersections AKSAS No.: Federal No.: Version ID: Printed: 12/20/2020

ITEM NO.	*Description*	*Unit*	*Quantity*	*Unit Price*	*Amount*
201.0003.0000	CLEARING AND GRUBBING	ACRE	8	$ 15,000.00	$ 123,930.30
202.0002.0000	REMOVAL OF PAVEMENT	SQUARE YARD	42,415	$ 10.00	$ 424,147.51
202.0003.0000	REMOVAL OF SIDEWALK	SQUARE YARD	243	$ 15.00	$ 3,640.48
202.0009.0000	REMOVAL OF CURB AND GUTTER	LINEAR FOOT	542	$ 12.00	$ 6,501.34
203.0003.0000	UNCLASSIFIED EXCAVATION	CUBIC YARD	6,400	$ 26.00	$ 166,400.00
203.0006.0000	BORROW	TON	103,870	$ 30.00	$ 3,116,100.00
203.0009.0000	OBLITERATION OF ROADWAY	SY	3,662	$ 6.00	$ 21,970.67
301.0001.00D1	AGGREGATE BASE COURSE, GRADING D-1	TON	100	$ 55.00	$ 5,500.00
306.0001.0000	ATB	TON	9,180	$ 150.00	$ 1,377,000.00
306.0002.5228	ASPHALT BINDER, GRADE PG 52-28	TON	414	$ 900.00	$ 372,600.00
401.0001.002B	HMA, TYPE II; CLASS B	TON	9,320	$ 160.00	$ 1,491,200.00
401.0004.5240	ASPHALT BINDER, GRADE PG 52-40	TON	513	$ 900.00	$ 461,700.00
603.0001.0036	CSP 36-INCH	LINEAR FOOT	300	$ 250.00	$ 75,000.00
603.0003.0036	END SECTION FOR CSP 36-INCH	EACH	8	$ 650.00	$ 5,200.00
608.0001.0004	CONCRETE SIDEWALK, 4 INCHES THICK	SQUARE YARD	285	$ 100.00	$ 28,500.00
608.0001.0006	CONCRETE SIDEWALK, 6 INCHES THICK	SQUARE YARD	1,325	$ 110.00	$ 145,750.00
608.0003.0000	ASPHALT SIDEWALK	SQUARE YARD	369	$ 30.00	$ 11,076.67
608.0006.0000	CURB RAMP	EACH	9	$ 5,000.00	$ 45,000.00
609.0002.0001	CURB AND GUTTER, TYPE 1	LINEAR FOOT	1,983	$ 45.00	$ 89,212.50
615.0001.0000	STANDARD SIGN	SQUARE FOOT	463	$ 150.00	$ 69,506.25
615.0006.0000	SALVAGE SIGN	EACH	17	$ 125.00	$ 2,125.00
615.9000.0000	FLASHING WARNING SIGN	EACH	2	$ 12,000.00	$ 24,000.00
618.0002.0000	SEEDING	POUND	313	$ 125.00	$ 39,125.00
620.0001.0000	TOPSOIL	SQUARE YARD	34,744	$ 15.00	$ 521,165.33
640.0001.0000	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	ALL REQ'D	$ 1,602,000.00	$ 1,602,000.00
641.0001.0000	EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D	$ 81,000.00	$ 81,000.00
641.0003.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D	$ 161,000.00	$ 161,000.00
641.0004.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	CONTINGENT SUM	ALL REQ'D	$ 41,000.00	$ 41,000.00

ENGINEER'S ESTIMATE **State of Alaska** **Department of Transportation** **& Public Facilities** **Southcoast Region**	Egan Yandukin Inx. Improvements Two Signalized T-Intersections AKSAS No.: Federal No.: Version ID: Printed: 12/20/2020

ITEM NO.	*Description*	*Unit*	*Quantity*	*Unit Price*	*Amount*
641.0007.0000	SWPPP MANAGER	LUMP SUM	ALL REQ'D	$ 15,000.00	$ 15,000.00
642.0001.0000	CONSTRUCTION SURVEYING	LUMP SUM	ALL REQ'D	$ 481,000.00	$ 481,000.00
642.0013.0000	THREE PERSON SURVEY PARTY	CONTINGENT SUM	ALL REQ'D	$ 17,500.00	$ 17,500.00
643.0002.0000	TRAFFIC MAINTENANCE	LUMP SUM	ALL REQ'D	$ 802,000.00	$ 802,000.00
643.0003.0000	PERMANENT CONSTRUCTION SIGNS	LUMP SUM	ALL REQ'D	$ 40,000.00	$ 40,000.00
643.0025.0000	TRAFFIC CONTROL	CONTINGENT SUM	ALL REQ'D	$ 962,000.00	$ 962,000.00
643.0032.0000	FLAGGING	CONTINGENT SUM	ALL REQ'D	$ 60,000.00	$ 60,000.00
644.0001.0000	FIELD OFFICE	LUMP SUM	ALL REQ'D	$ 25,000.00	$ 25,000.00
644.0006.0000	VEHICLE	LUMP SUM	ALL REQ'D	$ 20,000.00	$ 20,000.00
645.0001.0000	TRAINING PROGRAM, 1 TRAINEES / APPRENTICES	LABOR HOUR	500	$ 20.00	$ 10,000.00
646.0001.0000	CPM SCHEDULING	LUMP SUM	ALL REQ'D	$ 25,000.00	$ 25,000.00
660.0001.000A	TRAFFIC SIGNAL SYSTEM COMPLETE, EGAN DR / OLD DAIRY	LUMP SUM	ALL REQ'D	$ 677,000.00	$ 677,000.00
660.0001.000B	TRAFFIC SIGNAL SYSTEM COMPLETE, EGAN DR / YANDUKIN	LUMP SUM	ALL REQ'D	$ 603,000.00	$ 603,000.00
660.0003.0000	HIGHWAY LIGHTING SYSTEM COMPLETE, EGAN AND YANDUKIN	LUMP SUM	ALL REQ'D	$ 1,332,000.00	$ 1,332,000.00
661.0001.0000	LOAD CENTER, TYPE 1	EACH	2	$ 25,000.00	$ 50,000.00
670.2002.0000	MMA PAVEMENT MARKINGS, INLAID	LUMP SUM	ALL REQ'D	$ 394,000.00	$ 394,000.00
Project Summary	Pay Items:	44 Items		Subtotal	$ 16,024,851.05
	Minus Contractor Furnished CENG				$ (45,000.00)
				Exc Subtotal	$ 15,979,851.05
	Construction Engineering (Percentage)	15%		CENG	$ 2,396,977.65
				Subtotal	$ 18,376,828.70
	Indirect Cost Allocation Plan (ICAP)	4.75%			$ 872,899.36
	TOTAL PARTICIPATING				$ 19,249,728.06
	Project Total				$ 19,249,728.06

Egan Yandukin Inx. Improvements	201.0003.0000 CLEARING AND GRUBBING	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	8	ACRE
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		327176	sf
Contingency	10%	32717.6	sf
Total		359894	sf
Quantity		**8**	**ac**

Calculated By	JAM	Date	11/2/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	202.0002.0000 REMOVAL OF PAVEMENT	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	42,415	SQUARE YARD
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		347030	sf
Total		347030	sf
Contingency	10%	34702.97792	sf
Total		381733	sf
Quantity		**42415**	**sy**

Calculated By	JAM	Date	11/2/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	202.0003.0000 REMOVAL OF SIDEWALK	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	243	SQUARE YARD
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		1986	sf	sidewalk and medians
Total		1986	sf	
Contingency	10%	199	sf	
Total		2184	sf	
Quantity		**243**	**sy**	

Calculated By	JAM	Date	11/2/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	202.0009.0000 REMOVAL OF CURB AND GUTTER	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**542**	**LINEAR FOOT**
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		493	LF	around medians
Total		493	LF	Total
Contingency	10%	49.25256	LF	
Quantity		542	LF	

Calculated By	JAM	Date	11/2/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	203.0003.0000 UNCLASSIFIED EXCAVATION	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	6,400	CUBIC YARD
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

REALIGNED YANDUKIN LEG - CUT

PATHWAY BETWEEN EGAN AND REALIGNED YANDUKIN						
X-AREA (SF)	*LENGTH (FT)*	*VOLUME (CF)*	*DISTANCE ALONG RD CL (FT)*			*REMARKS / ASSUMPTIONS*
94	291	27,354	0	-	291	2.5' Exc Both Sides
YANDUKIN REALIGNMENT						
PLAN AREA	*DEPTH*	*VOLUME*	*DISTANCE ALONG RD CL (FT)**			*REMARKS / ASSUMPTIONS*
5,539	3	13,848	0	-	92	2.5' Box Cut
X-AREA (SF)	*LENGTH (FT)*	*VOLUME (CF)*	*DISTANCE ALONG RD CL (FT)*			*REMARKS / ASSUMPTIONS*
79	349	27,571	92	-	441	3' Exc LT Side; 3' Fill RT Side
-	162	-	441	-	603	5' Fill Both Sides
-	1,185	-	603	-	1,788	10' Fill Both Sides
-	118	-	1,788	-	1,906	5' Fill LT Side; 5' Box Fill RT Side1
234	210	49,140	1,906	-	2,116	3' Exc Both Sides
SB RAMP ONTO EGAN						
X-AREA (SF)	*LENGTH (FT)*	*VOLUME (CF)*	*DISTANCE ALONG RD CL (FT)***			*REMARKS / ASSUMPTIONS*
-	120	-	0	-	120	5' Box Fill LT Side; 5' Fill RT Side1
65	347	22,555	120	-	467	3' Exc LT Side; 5' Fill RT Side
13	1,131	14,138	467	-	1,598	2.5' Box Cut LT Side; 5' Fill RT Side

	total (CF)	154,605		
	total (CY)	5,726		
Contingency	10%	573	CY	
Total Qty		6,400	CY	*Rounded up to nearest 200 CY

* Starting at Existing Yandukin Connection Heading SB

** New SB Ramp onto Egan

[1] NB Signal and SB Ramp adjacent to eachother; therefore, shares the daylight

Calculated By	JAM	Date	11/2/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	203.0006.0000 BORROW	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**103,870**	**TON**
Project No. /		
Two Signalized T-Intersections	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Estimating Factor: 2 TONS/CY

Roadway Outside of existing Road				
ACAD Area From Civil3D		164814	SF	
Thickness		2	FT	
Volume		329628	CF	
	=	12208	CY	
Shrink/Swell Factor	10%	1,221	CY	
Total Volume		13,429	CY	
Quantity		26,860	TON	*Rounded up to nearest ten tons

Pathway				
ACAD Area From Civil3D		5870	SF	
Thickness		2	FT	
Volume		11740	CF	
	=	435	CY	
Shrink/Swell Factor	10%	43	CY	
Total Volume		478	CY	
Quantity		960	TON	*Rounded up to nearest ten tons

Fill				
Estimated Volume		34567	CY	SEE NEXT SHEET
Shrink/Swell Factor	10%	3,457	CY	
Total Volume		38,024	CY	
Quantity		76,050	TON	*Rounded up to nearest ten tons

TOTAL: 103,870 TON

Calculated By	JAM	Date	11/2/2020
Checked By	GMC	Date	12/15/2020

KINNEY ENGINEERING, LLC
3909 Arctic Blvd, Ste 400
Anchorage, AK 99503
907.346.2373

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	203.0006.0000 BORROW	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	103,870	TON
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

REALIGNED YANDUKIN LEG - FILL

PATHWAY BETWEEN EGAN AND REALIGNED YANDUKIN						
X-AREA (SF)	*LENGTH (FT)*	*VOLUME (CF)*	*DISTANCE ALONG RD CL (FT)*			*REMARKS / ASSUMPTIONS*
-	291	-	0	-	291	2.5' Exc Both Sides
YANDUKIN REALIGNMENT						
PLAN AREA	*DEPTH*	*VOLUME*	*DISTANCE ALONG RD CL (FT)**			*REMARKS / ASSUMPTIONS*
-	3	-	0	-	92	2.5' Box Cut
X-AREA (SF)	*LENGTH (FT)*	*VOLUME (CF)*	*DISTANCE ALONG RD CL (FT)*			*REMARKS / ASSUMPTIONS*
7	349	2,443	92	-	441	3' Exc LT Side; 3' Fill RT Side
175	162	28,350	441	-	603	5' Fill Both Sides
675	1,185	799,875	603	-	1,788	10' Fill Both Sides
125	118	14,750	1,788	-	1,906	5' Fill LT Side; 5' Box Fill RT Side1
	210	-	1,906	-	2,116	3' Exc Both Sides
SB RAMP ONTO EGAN						
X-AREA (SF)	*LENGTH (FT)*	*VOLUME (CF)*	*DISTANCE ALONG RD CL (FT)***			*REMARKS / ASSUMPTIONS*
108	120	12,960	0	-	120	5' Box Fill LT Side; 5' Fill RT Side1
53	347	18,391	120	-	467	3' Exc LT Side; 5' Fill RT Side
50	1,131	56,550	467	-	1,598	2.5' Box Cut LT Side; 5' Fill RT Side
	total (CF)	933,319				
	total (CY)	34,567				

* Starting at Existing Yandukin Connection Heading SB

** New SB Ramp onto Egan

[1] NB Signal and SB Ramp adjacent to eachother; therefore, shares the daylight

Calculated By	JAM	Date	11/2/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

KINNEY ENGINEERING, LLC

Egan Yandukin Inx. Improvements	203.0009.0000 OBLITERATION OF ROADWAY	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	3,662	SY
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		29960	sf
			sf
Total		29960	sf
Contingency	10%	2996	sf
Total		32956	sf
Quantity		**3662**	**sy**

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Checked By	GMC	Date	12/15/2020	

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Egan Yandukin Inx. Improvements	301.0001.00D1 AGGREGATE BASE COURSE, GRADING D-1	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	100	TON
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

Estimating Factor: 2 TONS/CY

Pathway				
ACAD Area From Civil3D		3498	SF	
Thickness		0.33	FT	
Volume		1166	CF	
	=	43	CY	
Shrink/Swell Factor	10%	4	CY	
Total Volume		48	CY	
Quantity		100	TON	*Rounded up to nearest ten tons

TOTAL 100 TONS

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Egan Yandukin Inx. Improvements	306.0001.0000 ATB	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	9,180	TON
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

ESTIMATING FACTOR 2 TONS/CY

Roadway				
ACAD Area From Civil3D		450439	SF	
Thickness		0.25	FT	
Volume		112610	CF	
	=	4171	CY	
Shrink/Swell Factor	10%	417	CY	
Total Volume		4,588	CY	
Quantity		9,180	TON	*Rounded up to nearest ten tons

TOTAL: 9,180 TON

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Egan Yandukin Inx. Improvements	306.0002.5228 ASPHALT BINDER, GRADE PG 52-28	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	414	TON
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

From 306(1)	9,180	TONS	
4.5% of 306(1)	414	TONS	*Rounded up to whole ton

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Egan Yandukin Inx. Improvements	401.0001.002B HMA, TYPE II; CLASS B	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	9,320	TON
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

Estimating Factor: 115 LB/SY-INCH

Roadway				
ACAD Area From Civil3D		441632	SF	
=		49070.2222	SY	
Thickness		3.00	IN	
Volume		147211	SY-IN	
Shrink/Swell Factor	10%	14,721	SY-IN	
Total Volume		161,932	SY-IN	
Quantity		9,320	TON	*Rounded up to nearest ten tons

TOTAL: 9,320 TON

Calculated By	JAM	Date	11/2/2020
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Egan Yandukin Inx. Improvements	401.0004.5240 ASPHALT BINDER, GRADE PG 52-40	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	513	TON
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

From 401(1b) quantity:	9,320	TONS	
Estimating Factor:	5.5%	Weight of 401(1b) quantity	
401(4) Quantity:	513	TONS	*Rounded to nearest whole ton

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Egan Yandukin Inx. Improvements	08.0001.0006 CONCRETE SIDEWALK, 4 INCHES THIC	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**285**	**SQUARE YARD**
Project No. /		
Two Signalized T-Intersections	**TOTAL QUANTITY**	**UNIT OF MEASURE**

ACAD Area From Civil3D	2523	SF	
=	280	SY	
Quantity	285	TONS	*Rounded up to nearest 5 SY

TOTAL: 285 TON

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Egan Yandukin Inx. Improvements	08.0001.0006 CONCRETE SIDEWALK, 6 INCHES THIC	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	1,325	SQUARE YARD
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

ACAD Area From Civil3D	11909	SF	Medians and curb ramps
=	1323	SY	
Quantity	1325	TONS	*Rounded up to nearest 5 SY

TOTAL: 1,325 TON

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Egan Yandukin Inx. Improvements	608.0003.0000 ASPHALT SIDEWALK	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	369	SQUARE YARD
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

Estimating Factor: 115 LB/SY-INCH

Pathway				
ACAD Area From Civil3D		3323	SF	
=		369	SY	
Thickness		2.00	IN	
Volume		738	SY-IN	
Shrink/Swell Factor	10%	74	SY-IN	
Total Volume		812	SY-IN	
Quantity		50	TON	*Rounded up to nearest ten tons

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Egan Yandukin Inx. Improvements	608.0006.0000 CURB RAMP	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	9	EACH
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

2 ramps on each end of ped path between Yandukin and Egan

2 ramps at Egan ped refuge

3 ramps at NE corner

2 ramps at Fred Meyer driveway

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Egan Yandukin Inx. Improvements	609.0002.0001 CURB AND GUTTER, TYPE 1	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	1,983	LINEAR FOOT
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

ACAD Length From Civil3D	1983	LF	

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Egan Yandukin Inx. Improvements	618.0002.0000 SEEDING	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**313**	**POUND**
Project No. /		
Two Signalized T-Intersections	**TOTAL QUANTITY**	**UNIT OF MEASURE**

From 620(1) Topsoil quantity	34,744	SY
Multiply by 9 SF/SY	312,699	SF
ESTIMATING FACTOR:	0.001	LB/SF
QUANTITY: (Rounded up to whole pound)	313	LB

Calculated By	JAM	Date	11/2/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	GMC	Date	12/15/2020	

Egan Yandukin Inx. Improvements	620.0001.0000 TOPSOIL	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	34,744	SQUARE YARD
Project No. /		
Two Signalized T-Intersections	TOTAL QUANTITY	UNIT OF MEASURE

Area from ACAD		284,272	sf
Contingency	10%	28,427	sf
Total		312,699	sf
Quantity		**34,744**	**sy**

Calculated By	JAM	Date	11/2/2020
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Egan Yandukin Inx. Improvements	FIC SIGNAL SYSTEM COMPLETE, EGAN DR / OLD D	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**ALL REQ'D**	**LUMP SUM**
Project No. /		
Full Signal Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Work Description	Units	Qty
Sawcut trench	**LF**	750
Controller Cabinet Foundation	**EA**	1
Signal Mast Arm Pole Foundation	**EA**	3
Signal Pedestal Pole Foundation	**EA**	2
Combination Signal/Luminaire Pole	**EA**	2
Signal pole	**EA**	1
Signal Pedestal Pole	**EA**	2
Luminaire Arm, 15' Length	**EA**	2
Signal Mast Arm, 25' Length	**EA**	1
Signal Mast Arm, 45' Length	**EA**	2
2" Steel Conduit (GRSC)	**LF**	825
3" Steel Conduit (GRSC)	**LF**	1,125
Type IA Junction Box	**EA**	3
Type II Junction Box	**EA**	2
Type III Junction Box	**EA**	1
Conductor, 2C #14 AWG	**LF**	1,144
Conductor, 3C #20 AWG	**LF**	563
Conductor, 3C #6 AWG	**LF**	15
Conductor, 3C #8 AWG	**LF**	548
Conductor, 5C #14 AWG	**LF**	3,975
Conductor, 1C #8 AWG	**LF**	1,500
Conductor, 1C #6 AWG	**LF**	15

Work Description	Units	Qty
APT MATRIX 2	LF	1,005
Radio Ethernet communications devices	EA	2
Eight-Phase Controller Unit	EA	1
Optical Preemption Detector (All Types)	EA	3
12 3-Face LED Signal Head Overhead M	EA	5
12 3-Face LED Signal Head Side Mount	EA	3
12 4-Face LED Signal Head Overhead M	EA	1
12 4-Face LED Signal Head Side Mount	EA	1
Radar Detector	EA	5
Pedestrian LED Signal Head W/Countdo	EA	2
Pedestrian Pushbutton Assembly	EA	2
Luminaire, LED Roadway	EA	2

Calculated By	GMD	Date	11/5/2020	KINNEY ENGINEERING, LLC 3909 Arctic Blvd, Ste 400 Anchorage, AK 99503 907.346.2373
Checked By	JAM	Date	12/15/2020	

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Egan Yandukin Inx. Improvements	AFFIC SIGNAL SYSTEM COMPLETE, EGAN DR / YAN	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	**ALL REQ'D**	**LUMP SUM**
Project No. /		
Full Signal Alternative	**TOTAL QUANTITY**	**UNIT OF MEASURE**

Work Description	Units	Qty
Sawcut trench	**LF**	750
Controller Cabinet Foundation	**EA**	1
Signal Mast Arm Pole Foundation	**EA**	3
Combination Signal/Luminaire Pole	**EA**	2
Signal pole	**EA**	1
Luminaire Arm, 15' Length	**EA**	3
Signal Mast Arm, 25' Length	**EA**	1
Signal Mast Arm, 45' Length	**EA**	2
2" Steel Conduit (GRSC)	**LF**	825
3" Steel Conduit (GRSC)	**LF**	1,125
Type IA Junction Box	**EA**	3
Type II Junction Box	**EA**	2
Type III Junction Box	**EA**	1
Conductor, 2C #14 AWG	**LF**	1,144
Conductor, 3C #20 AWG	**LF**	563
Conductor, 3C #6 AWG	**LF**	15
Conductor, 3C #8 AWG	**LF**	548
Conductor, 5C #14 AWG	**LF**	3,975
Conductor, 1C #8 AWG	**LF**	1,500
Conductor, 1C #6 AWG	**LF**	15

Work Description	Units	Qty
APT MATRIX 2	LF	1,005
Eight-Phase Controller Unit	EA	1
Optical Preemption Detector (All Types)	EA	3
12 3-Face LED Signal Head Overhead M	EA	5
12 3-Face LED Signal Head Side Mount	EA	3
12 4-Face LED Signal Head Overhead M	EA	1
12 4-Face LED Signal Head Side Mount	EA	1
Radar Detector	EA	5
Luminaire, LED Roadway	EA	3

Calculated By	GMD	Date	11/5/2020
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Egan Yandukin Inx. Improvements	660.0003.0000 HIGHWAY LIGHTING SYSTEM COMPLETE, EGAN AND YANDUKIN	
State of Alaska Department of Transportation & Public Facilities - Southcoast Region	ALL REQ'D	LUMP SUM
Project No. /		
Full Signal Alternative	TOTAL QUANTITY	UNIT OF MEASURE

ITEM DESCRIPTION	UNIT	QUANTITY
Trench and Backfill	LF	6,600
Steel Conduit 3-inch	LF	0
Steel Conduit 2-inch	LF	6,600
Steel Conduit 1-inch	LF	
1-inch LFMC	LF	
Junction Box Type IA	EA	33
Junction Box Type II	EA	0
3c#8 Conductor	LF	6,600
3c#6 Conductor	LF	0
1c#8 Ground Conductor	LF	6,600
1c#6 Ground Conductor	LF	0
Remove and relocate existing light pole	EA	9
Concrete light pole foundation	EA	33
Light pole	EA	24
LED luminaire	EA	33
Luminaire mast arm	EA	24
Ped Light pole, luminaire, foundation	EA	

33 new LP locations. Assume relocates will be used at these proposed locations.

All relocated LPs get new LED luminaires.

10% contingency included in conduit and cable quantities to account for unknown routing

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SKIPS_RATI **0.25**

670.2002.0000 MMA PAVEMENT MARKINGS, INLAID																	
4" WHITE (LF)	4" WHITE SKIP	4" WHITE DOT	8" WHITE (LF)	8" WHITE DOT	4" YELLOW (LF)	4" DY (LF)	4" YELLOW SKIP	12" W (SF)	18" Y (SF)	18" W (SF)	24" W (SF)	TURN ARROW (EACH)	THRU/LEFT ARROW (EACH)	ONLY (EACH)	Total Symbols (EA)	EQUIV. 4" LENGTH (FT)	Transverse markings (SF)
															0	0	0
12342.0	5538.0		7034.0	1442.0	10523.0			24	317	1883	901	22			22	39039	3125
12,342	**5,538**	**0**	**7,034**	**1,442**	**10,523**	**0**	**0**	**24**	**317**	**1,883**	**901**	**22**	**0**	**0**	**22**	**39,039**	**3,125**
															$ 850.00	$ 8.00	$ 20.00
														Totals	$ 18,700.00	$ 312,312.00	$ 62,500.00

$ 393,512.00

Appendix G Consistency with Local Transportation and Land Use Plans

Memo

Date:	Monday, December 28, 2020
Project:	Juneau – Egan Drive and Yandukin Intersection Improvements PEL Study DOT&PF Project Number SFHWY00079
To:	Project File
From:	Laurie Cummings, AICP CTP, ENV SP, HDR
Subject:	**Level 2 Screening – Consistency with Local Transportation and Land Use Plans**

This memo documents the results of HDR's analysis to determine how the ten alternatives under consideration in the Level 2 screening are consistent with local transportation plans.

Summary of Results

Table 1 summarizes how each of the ten project alternatives is or is not consistent with the five transportation plans that cover the Egan/Yandukin project area.

Table 1: Alternatives and Consistency with Transportation Plans

Alternative	Juneau Safe Routes to School Plan	Airport Sustainability Master Plan	Juneau Non-Motorized Transportation Plan	CBJ Transit Development Plan	CBJ Area-Wide Transportation Plan
Mobility Alternative with Median Crossovers	x	x		x	
Mobility Alternative with Glacier Highway Extension	x	x		x	
Partial Access Signalized Intersection with Median Crossovers	x	x		x	
Partial Access Signalized Intersection with Glacier Highway Extension	x	x		x	
Full Access Signalized Intersection with Median Crossovers	x			x	
Full Access Signalized Intersection with Glacier Highway Extension	x			x	
Two Signalized T-intersections	x	x		x	
Two Signalized T-intersections with Glacier Highway Extension	x	x		x	
Diamond Interchange with Median Crossovers	x			x	x
Diamond Interchange with	x			x	x

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Alternative	Juneau Safe Routes to School Plan	Airport Sustainability Master Plan	Juneau Non-Motorized Transportation Plan	CBJ Transit Development Plan	CBJ Area-Wide Transportation Plan
Two-way Frontage Road to Glacier-Nugget					

x signifies consistency with plan

Juneau Safe Routes to School Plan

All alternatives are consistent with this plan as it does not recommend any improvements in the project area. (Sheinberg Associates et al. 2012)

Airport Sustainability Master Plan – Juneau International Airport

All alternatives are within the 175-foot mean sea level horizontal surface but outside the 150-foot approach surface. No alternatives would conflict with these surfaces. (AECOM and Sheinberg Associates 2018)

An analysis of each alternative follows:

- Mobility Alternative with Median Crossovers
  - Improvements appear to be outside the airport boundary
  - Consistent with this plan as it maintains the existing right-of-way (ROW) and road elevation
- Mobility Alternative with Glacier Highway Extension
  - Improvements appear to be outside the airport boundary
  - Consistent with this plan as it maintains the existing ROW and road elevation
- Partial Access Signalized Intersection with Median Crossovers
  - Improvements appear to be outside the airport boundary
  - Consistent with this plan as it maintains the existing ROW and road elevation
- Partial Access Signalized Intersection with Glacier Highway Extension
  - Improvements appear to be outside the airport boundary
  - Consistent with this plan as it maintains the existing ROW and road elevation
- Full Access Signalized Intersection with Median Crossovers
  - Would require ROW from the airport property
- Full Access Signalized Intersection with Glacier Highway Extension
  - Would require ROW from the airport property
- Two Signalized T-Intersections

- Would require ROW from property identified as to be acquired by the airport. This land has been identified as City and Borough of Juneau (CBJ) Rural Reserve and is currently owned by “Bicknell Inc.” This area is to “remain undeveloped unless as allowed under City Code.”

* Two Signalized T-Intersections with Glacier Highway Extension
  - Would require ROW from property identified as to be acquired by the airport. This land has been identified as CBJ Rural Reserve and is currently owned by “Bicknell Inc.” This area is to “remain undeveloped unless as allowed under City Code.”
* Diamond Interchange with Median Crossovers
  - Would require changes within the airport boundary
  - Would require ROW from property identified as to be acquired by the airport. This land has been identified as CBJ Rural Reserve and is currently owned by “Bicknell Inc.” This area is to “remain undeveloped unless as allowed under City Code.”
  - May require ROW from Lease Areas 1 through 6. According to this plan, these lease areas are currently undeveloped. The loss of these lease areas has the potential to reduce airport revenues. Additional analysis would be needed to determine how much, if any, of these lease lots would need to be acquired and the impact the loss of this leasable area would have on airport operations.
  - Would also require land from the parking area near the TEMSCO Helicopters lease area. This parking area does not have direct access to the airport terminal and is unlikely to have an impact on airport or TEMSCO operations.
* Diamond Interchange with Two-way Frontage Road to Glacier-Nugget
  - Would require changes within the airport boundary
  - Would require ROW from property identified as to be acquired by the airport. This land has been identified as CBJ Rural Reserve and is currently owned by “Bicknell Inc.” This area is to “remain undeveloped unless as allowed under City Code.”
  - May require ROW from Lease Areas 1 through 6. According to the plan, these lease areas are currently undeveloped. The loss of these lease areas has the potential to reduce airport revenues. Additional analysis would be needed to determine how much, if any, of these lease lots would need to be acquired and the impact the loss of this leasable area would have on airport operations.
  - Would also require land from parking area near the TEMSCO Helicopters lease area. This parking area does not have direct access to the airport terminal and is unlikely to have an impact on airport or TEMSCO operations.

Juneau Non-Motorized Transportation Plan

This plan included the following recommendations in the project area (Sheinberg Associates 2009):

- Project #28 – McNugget Intersection
    - Add signs and continental crosswalk markings
    - Consider adding additional crosswalk across Egan Drive on the west side
- Project #35 – Fred Meyer to Bus Stop (High Priority)
    - The Alaska Department of Transportation and Public Facilities (DOT&PF) did not allow a crosswalk at this location
    - Need to find a solution to make crossing safer for pedestrians
- Project #38 - Old Dairy Road (Glacier Highway to Crest Street) (Mid and Low Priority)
    - Signs and pavement markings required
- Project #40 – Glacier Highway (Fred Meyer to Separated Path along Egan Drive) (Mid and Low Priority)
    - Signs and pavement markings required
    - Regular maintenance required
- Project #55 – Coastal Trail (Yandukin Drive to Twin Lakes Path) (Mid and Low Priority)
    - At least 10 feet wide and paved

An analysis of each alternative follows:

- Mobility Alternative with Median Crossovers
    - Does not implement Project #28
    - Does not implement Project #35
    - Does not implement Project #38
    - Does not implement Project #40
    - Does not implement Project #55
- Mobility Alternative with Glacier Highway Extension
    - Does not implement Project #28
    - Does not implement Project #35
    - Does not implement Project #38
    - Does not implement Project #40
    - Does not implement Project #55
- Partial Access Signalized Intersection with Median Crossovers
    - Does not implement Project #28

- Does not implement Project #35
- Does not implement Project #38
- Does not implement Project #40
- Does not implement Project #55

- Partial Access Signalized Intersection with Glacier Highway Extension
  - Does not implement Project #28
  - Does not implement Project #35
  - Does not implement Project #38
  - Does not implement Project #40
  - Does not implement Project #55

- Full Access Signalized Intersection with Median Crossovers
  - Does not implement Project #28
  - Does not implement Project #35
  - Does not implement Project #38
  - Does not implement Project #40
  - Does not implement Project #55

- Full Access Signalized Intersection with Glacier Highway Extension
  - Does not implement Project #28
  - Does not implement Project #35
  - Does not implement Project #38
  - Does not implement Project #40
  - Does not implement Project #55

- Two Signalized T-Intersections
  - Does not implement Project #28
  - Does not implement Project #35
  - Does not implement Project #38
  - Does not implement Project #40
  - Does not implement Project #55; no non-motorized improvements identified along the new segment of Yandukin Drive

- Two Signalized T-Intersections with Glacier Highway Extension
  - Does not implement Project #28
  - Does not implement Project #35
  - Does not implement Project #38
  - Does not implement Project #40
  - Does not implement Project #55; no non-motorized improvements identified along the new segment of Yandukin Drive

- Diamond Interchange with Median Crossovers
  - Does not implement Project #28; intersection will be replaced but additional non-motorized improvements have not been identified
  - Does not implement Project #38
  - Does not implement Project #35
  - Does not implement Project #40;
  - Does not implement Project #55

- Diamond Interchange with Two-way Frontage Road to Glacier-Nugget
  - Does not implement Project #28; intersection will be replaced but additional non-motorized improvements have not been identified
  - Does not implement Project #38
  - Does not implement Project #35
  - Does not implement Project #40;
  - Does not implement Project #55

CBJ Transit Development Plan

According to this plan (Nelson/Nygaard Consulting Associates Inc. 2014):

- The project area is to be used by the following routes:
  - 1 Valley Local
  - 1X Valley Express
  - 2X Auke Bay Express

- Use of Nugget Mall as a transfer station will continue
- Travel times have been increasing so maintaining convenient transfers is harder

An analysis of each alternative follows:

- Mobility Alternative with Median Crossovers
  - Anticipated to improve travel time and travel time reliability along Egan Drive, which will improve ability to make transfers at Nugget Mall for Route 1
  - Improved access to Yandukin Drive, which will improve ability to make transfers at Nugget Mall for Routes 1X and 2X

- Mobility Alternative with Glacier Highway Extension
  - Anticipated to improve travel time and travel time reliability along Egan Drive, which will improve ability to make transfers at Nugget Mall for Route 1
  - Improved access to Yandukin Drive, which will improve ability to make transfers at Nugget Mall for Routes 1X and 2X

    - Would require the bus stops near Fred Meyer to be relocated. The relocated bus stops would increase the walking distance to Fred Meyer, the Juneau Christian Center, and the Egan/Yandukin intersection.
    - Would allow Route 1 to be re-routed along Glacier Highway
        - Not in this plan, but this re-route could be a benefit as it would keep transit on Glacier Highway and avoid Egan Drive

- Partial Access Signalized Intersection with Median Crossovers
    - Anticipated to improve travel time and travel time reliability along Egan Drive, which will improve ability to make transfers at Nugget Mall for Route 1
    - Improved access to Yandukin Drive, which will improve ability to make transfers at Nugget Mall for Routes 1X and 2X

- Partial Access Signalized Intersection with Glacier Highway Extension
    - Anticipated to improve travel time and travel time reliability along Egan Drive, which will improve ability to make transfers at Nugget Mall for Route 1
    - Improved access to Yandukin Drive, which will improve ability to make transfers at Nugget Mall for Routes 1X and 2X
    - Would require the bus stops near Fred Meyer to be relocated. The relocated bus stops would increase the walking distance to Fred Meyer, the Juneau Christian Center, and the Egan/Yandukin intersection.
    - Would allow Route 1 to be re-routed along Glacier Highway
        - Not in this plan, but this re-route could be a benefit as it would keep transit on Glacier Highway and avoid Egan Drive

- Full Access Signalized Intersection
    - Anticipated to improve travel time and travel time reliability along Egan Drive, which will improve ability to make transfers at Nugget Mall for Route 1
    - Improved access to Yandukin Drive, which will improve ability to make transfers at Nugget Mall for Routes 1X and 2X

- Full Access Signalized Intersection with Glacier Highway Extension
    - Anticipated to improve travel time and travel time reliability along Egan Drive, which will improve ability to make transfers at Nugget Mall for Route 1
    - Improved access to Yandukin Drive, which will improve ability to make transfers at Nugget Mall for Routes 1X and 2X
    - Would require the bus stops near Fred Meyer to be relocated. The relocated bus stops would increase the walking distance to Fred Meyer, the Juneau Christian Center, and the Egan/Yandukin intersection.
    - Would allow Route 1 to be re-routed along Glacier Highway

        - Not in this plan, but this re-route could be a benefit as it would keep transit on Glacier Highway and avoid Egan Drive

- Two Signalized T Intersections
    - Anticipated to improve travel time and travel time reliability along Egan Drive which will improve ability to make transfers at Nugget Mall for Route 1
    - Improved access to Yandukin Drive which will improve ability to make transfers at Nugget Mall for Routes 1X and 2X.

- Two Signalized T Intersections with Glacier Highway Extension
    - Anticipated to improve travel time and travel time reliability along Egan Drive, which will improve ability to make transfers at Nugget Mall for Route 1
    - Improved access to Yandukin Drive, which will improve ability to make transfers at Nugget Mall for Routes 1X and 2X
    - Would require the bus stops near Fred Meyer to be relocated. The relocated bus stops would increase the walking distance to Fred Meyer, the Juneau Christian Center, and the Egan/Yandukin intersection.
    - Would allow Route 1 to be re-routed along Glacier Highway
        - Not in this plan, but this re-route could be a benefit as it would keep transit on Glacier Highway and avoid Egan Drive

- Diamond Interchange with Median Crossovers
    - Anticipated to improve travel time and travel time reliability along Egan Drive which will improve ability to make transfers at Nugget Mall for Route 1
    - Improved access to Yandukin Drive which is likely to improve travel time reliability for Routes 1X and 2X. Impacts on travel time unknown at this time so impacts to transit riders unknown at this time.
    - Improved access at Glacier Nugget intersection likely to improve travel time/travel time reliability for Route 1. This should improve ability to make transfers at Nugget Mall

- Diamond Interchange with Two-way Frontage Road to Glacier-Nugget
    - Anticipated to improve travel time and travel time reliability along Egan Drive, which will improve ability to make transfers at Nugget Mall for Route 1
    - Improved access to Yandukin Drive, which is likely to improve travel time reliability for Routes 1X and 2X. Impacts on travel time is unknown at this time, so impacts to transit riders is unknown at this time.
    - Improved access at the Glacier Nugget intersection is likely to improve travel time/travel time reliability for Route 1. This should improve the ability to make transfers at Nugget Mall.

- Would require the bus stops near Fred Meyer to be relocated. The relocated bus stops would increase the walking distance to Fred Meyer, the Juneau Christian Center, and the Egan/Yandukin intersection.
- Would allow Route 1 to be re-routed along Glacier Highway
    - Not in this plan, but this re-route could be a benefit as it would keep transit on Glacier Highway and avoid Egan Drive

CBJ Area-Wide Transportation Plan

This plan recommends that CBJ "develop plans and construct Egan Drive grade separated interchanges at yet unidentified locations between 10th/Egan and Riverside Drive (CBJ 2001). Interchanges will include pedestrian and bicycle facilities to provide better crossing and connectivity opportunities." In addition, "a series of interchanges, at or near current intersections, along Egan Drive is recommended. Interchanges would establish Egan Drive as a "free flow" expressway, removing traffic signals that interrupt the movement of through traffic."

An analysis of each alternative follows:

- Mobility Alternative with Median Crossovers
    - Does not implement this plan as it maintains Egan/Yandukin as an at-grade intersection
- Mobility Alternative with Glacier Highway Extension
    - Does not implement this plan as it maintains Egan/Yandukin as an at-grade intersection
- Partial Access Signalized Intersection with Median Crossovers
    - Does not implement this plan as it maintains Egan/Yandukin as an at-grade intersection
- Partial Access Signalized Intersection with Glacier Highway Extension
    - Does not implement this plan as it maintains Egan/Yandukin as an at-grade intersection
- Full Access Signalized Intersection with Median Crossovers
    - Does not implement this plan as it maintains Egan/Yandukin as an at-grade intersection
- Full Access Signalized Intersection with Glacier Highway Extension
    - Does not implement this plan as it maintains Egan/Yandukin as an at-grade intersection

- Two Signalized T-Intersections
    - o Does not implement this plan as it maintains Egan/Yandukin as an at-grade intersection
- Two Signalized T-Intersections with Glacier Highway extension
    - o Does not implement this plan as it maintains Egan/Yandukin as an at-grade intersection
- Diamond Interchange with Median Crossovers
    - o Partially implements this plan as it replaces Egan/Yandukin with a grade-separated intersection. However, Egan/Glacier Highway is maintained as an at-grade intersection.
- Diamond Interchange with Two-way Frontage Road to Glacier-Nugget
    - o Partially implements this plan as it replaces Egan/Yandukin with a grade-separated intersection. However, Egan/Glacier Highway is maintained as an at-grade intersection.

References

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