APPENDIX J

Environmental Overview Memorandum

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Environmental Overview Memorandum

Egan Drive and Yandukin Drive Intersection Improvements

IRIS Program No. SFHWY00079
Federal Project No. 0003208

Juneau, Alaska

April 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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Acronyms

ADA	Americans with Disabilities Act
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
AHRS	Alaska Heritage Resources Survey
AKEPIC	Alaska Exotic Plants Information Clearinghouse
APE	Area of Potential Effects
BMP	Best Management Practices
CBJ	City and Borough of Juneau
CFR	Code of Federal Regulations
DOT&PF	Alaska Department of Transportation and Public Facilities
E-Y	Egan Drive and Yandukin Drive Intersection/Glacier-Lemon Road
EO	Executive Order
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
HSIP	Highway Safety Improvement Program
IPaC	Information, Planning, and Consultation
LMP	Limited Maintenance Plan
MLLW	Mean Lower Low Water
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
PEL	Planning and Environmental Linkage

PM_{10}	Particulate Matter with an Aerodynamic Diameter of 10 Micrometers
ROW	Right-of-way
SEAL	Southeast Alaska Land Trust
SEO	Statewide Environmental Office
SHPO	State Historic Preservation Officer
STIP	Statewide Transportation Improvement Program
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TNM	Traffic Noise Model
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
VPD	Vehicles per Day

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Introduction

This memorandum has been prepared as part of a Planning and Environmental Linkages (PEL) study. It follows the regulations identified in 23 Code of Federal Regulations (CFR) 450 and guidance prepared by the Federal Highway Administration (FHWA).

The purpose of this memorandum, consistent with 23 CFR 450.212 and 450.318, is to document certain planning products that are planned to be used in subsequent National Environmental Policy Act (NEPA) processes. These products are:

- Description of the environmental setting
- Preliminary identification of environmental impacts
- Description of environmental mitigation

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Alaska Department of Transportation & Public Facilities (DOT&PF) pursuant to 23 United States Code (USC) 327 and a Memorandum of Understanding dated November 3, 2017, and executed by FHWA and DOT&PF.

Project Description

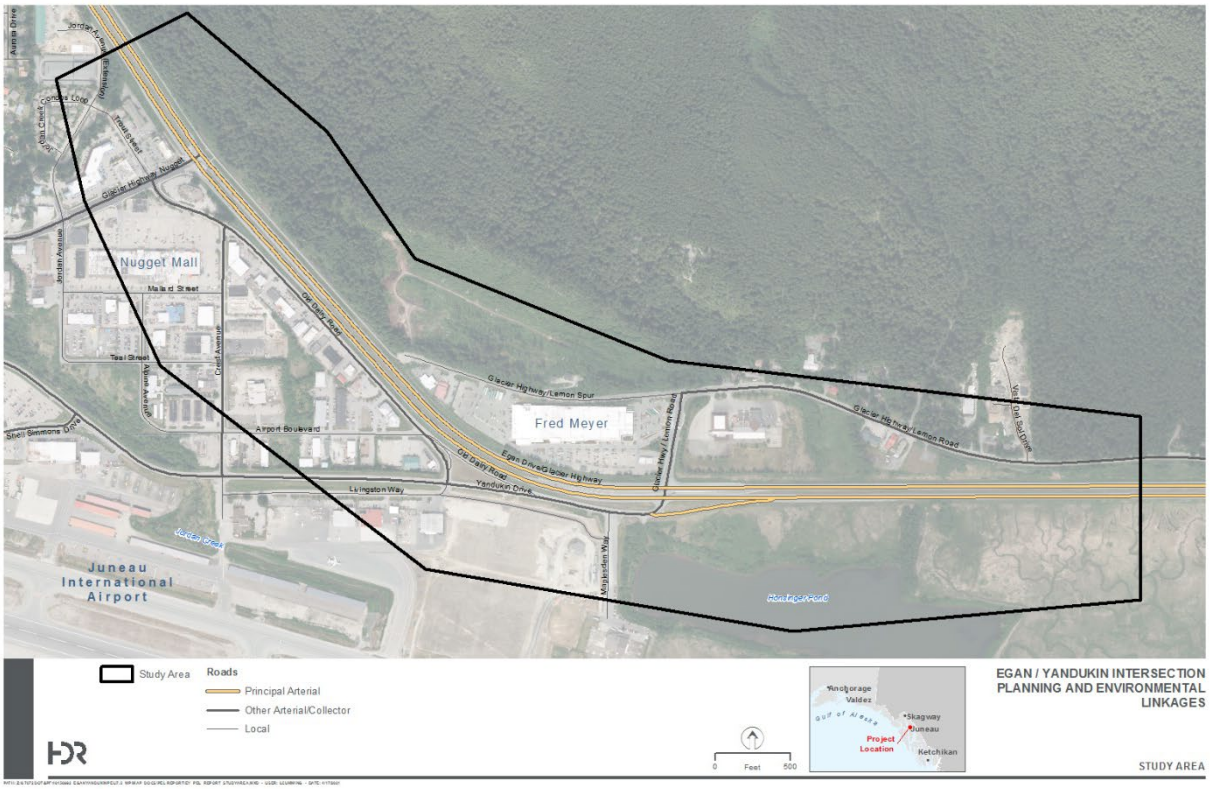
In response to concerns about safety and the need for alternate driving routes in case of crashes at the intersection of Egan and Yandukin Drives (E-Y intersection) in Juneau, Alaska, DOT&PF is planning improvements for transportation users.

This environmental overview, developed as part of the PEL process, is meant to provide an overview and description of the existing environmental conditions in the proposed study area. In addition, it provides a high-level overview of potential impacts, mitigation, and public/agency concerns for the ten build alternatives that were included in the Level 2 screening process. See the Alternatives section for a description of the ten build alternatives.

Study Area

The study area for the project is shown in Figure 1.

Figure 1: Study Area



Purpose and Need

DOT&PF developed a purpose and need statement for the project based on project conditions and input from the public and other stakeholders. The purpose and need identified below may be adopted in a future NEPA process for the recommended alternatives(s). The SEO agreed to this purpose and need statement on September 23, 2020.

Purpose

The purpose of the Egan and Yandukin Intersection 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 E-Y 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% of all crashes involved some sort of injury.

- **Alternative 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, the Juneau International Airport, Mendenhall Valley, and points further 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 miles 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 of the project include:

- 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 with transportation improvements.
- 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.

Alternatives

The project team developed a range of alternatives that were identified based on technical considerations and stakeholder input. Pre-screening was conducted on the range of alternatives to eliminate those with fatal flaws. The remaining alternatives were subject to a two-level screening process:

- **Level 1 Screening:** Each alternative was ranked qualitatively based on how well they met the project purpose and needs and their impacts on environmental, social, or economic resources compared to existing conditions.
- **Level 2 Screening:** Five alternatives were selected to advance to the next level of screening, which is a more in-depth, quantitative ranking of alternatives against each other. Criteria used were based on project purpose and needs and their impacts on environmental, social, or economic resources, as further described in the Level 2 Screening Results Memorandum.

The five alternatives that advanced to Level 2 screening are:

- Mobility Alternative: the Highway Safety Improvement Program (HSIP) Interim Action with the addition of Median Crossovers and a Grade Separated Pedestrian Crossing (INT-1, ELE-4, ELE-7)
- Partial Access Signalized Intersection (INT-2, ELE-4)

- Full Access Signalized Intersection (INT-3, ELE-4)
- Two Signalized T-intersections (INT-6)[1]
- Diamond Interchange with Two-way Frontage Road to Glacier-Nugget (OVP-2, ELE-5)

These alternative designs are fully defined in the Range of Alternatives White Paper.

In order to provide a more complete analysis of compatible design elements that address the need for alternative driving routes in the event the Egan Drive is blocked, the project team elected to analyze two variants of each of the five alternatives that advanced to Level 2 Screening:

- Inclusion of median crossovers (ELE-4)
- Inclusion of a Two-way Frontage Road to Glacier-Nugget (ELE-5)

Impacts on environmental resources from these ten build alternatives are assessed in this Environmental Overview.

Environmental Resources

This section summarizes existing conditions of each environmental resource in the study area, the potential impacts of implementing each alternative in Level 2 screening, public or agency concerns regarding that resource and possible impacts from ten alternatives, and potential mitigation and steps needed when the final recommended alternative(s) are evaluated during the NEPA process.

The impacts discussed for each resource are based on conceptual-level design and available data; no fieldwork was conducted to gather additional resource impacts data. As the design is advanced and refined during the subsequent NEPA and preliminary design processes, alternative-specific impacts may change. Where precise impacts data is not available, this report makes impact assumptions that may be greater than impacts identified during more detailed design and subsequent field studies.

Primary Findings Summary

The primary findings from the environmental analysis of existing conditions are summarized in Table 1.

[1] The Two Signalized T-intersections (INT-6) alternative is not analyzed with the inclusion of median crossovers (ELE-4), because the design inherently provides a similar alternative diving route when Egan Drive is blocked.

Table 1: Primary Findings of Environmental Analysis of Existing Conditions

Resource	Methodology/Data Source Used	Present in or Near Study Area? / Impacts	Next Steps
Floodplains/Drainage	Secondary data from FEMA	Yes/Yes	• Finalize impact assessment • Coordinate with CBJ for permitting • Prepare public involvement and technical report in compliance with EO 11988
Water Quality (Groundwater and Surface Water)	Secondary data from ADEC	Yes/Yes	• Conduct impact assessment • Incorporate stormwater management measures into final design • Prior to bid, DOT will prepare an Erosion and Sediment Control Plan • Prior to construction, the contractor will be required to prepare ADEC Construction General Permit required SWPPP
Wetlands and Waters of the United States	Secondary data from USFWS	Yes/Yes	• Conduct wetland delineation and functional assessment • Conduct impact assessment, development of avoidance alternatives if practicable, identification of mitigation measures • Submit permit application to USACE (if required)
Vegetation and Invasive Species	Secondary data from ADF&G	Yes/Yes	• Inventory invasive species • Include BMPs in construction contract
Threatened and Endangered Species and Wildlife	Secondary data from USFWS, IPaC, and ADF&G	Yes/Yes (Bald Eagles)	• Conduct bald eagle nest survey • Conduct impact assessment • Conduct agency coordination as necessary

Resource	Methodology/Data Source Used	Present in or Near Study Area? / Impacts	Next Steps
Historic, Archaeological, and Paleontological	Review of the AHRS	Yes/No direct impacts, possible indirect impacts (noise, visual)	• Consult with Alaska SHPO, tribes, and other consulting parties • Define APE • Conduct field survey to identify cultural resources in the APE • Determine eligibility for listing on the NRHP and effect (both direct and indirect) of eligible resources from the project • If adverse effects to eligible resources, consult to avoid, minimize, or mitigate impacts. • Prepare Memorandum of Agreement if adverse effects are identified
Socioeconomic Characteristics and Environmental Justice	EJSCREEN data plus online mapping review	Yes/Yes	• Finalize impact assessment • Determine if any impacts are high and adverse for Environmental Justice populations • Identify mitigation • Conduct targeted outreach • Prepare NEPA documentation
Transportation	Traffic counts, safety data	Yes/Yes	• Confirm travel demand forecasts • Conduct impact assessment (LOS analysis, intersection analyses, safety analysis, access changes) • Define mitigation (signalization, pedestrian/bicycle accommodations, bus stop) • Coordinate with CBJ, property owners • Prepare NEPA documentation
Land Use	High-level review	Yes/Yes	• Confirm impact assessment • Prepare NEPA documentation

Resource	Methodology/Data Source Used	Present in or Near Study Area? / Impacts	Next Steps
Economic and Right-of-Way	High-level review	Yes/Yes	• Prepare ownership mapping • Confirm impact assessment • Describe mitigation for economic impacts and ROW • Prepare NEPA documentation
Recreational/Section 4(f)	High-level identification	Yes/Unknown	• Confirm Section 4(f) applicability • Coordinate with USFS (Official with Jurisdiction) regarding Tongass National Forest, if needed. • Finalize impact assessment • Determine if feasible and prudent alternatives exist • Identify all possible planning to minimize harm • Determine Section 4(f) documentation requirements • Finalize Section 4(f) determination, coordinating with SEO
Visual Resources	High-level review	Yes/Yes	• Conduct visual impact analysis • Identify mitigation • Prepare NEPA documentation
Noise	High-level review	Yes/Unknown	• Conduct FHWA TNM using new plan and profile plus new future year traffic volumes and speeds • Identify whether a noise impact occurs • Conduct feasibility and reasonableness analysis for noise abatement, if needed • Coordinate with SEO for review of Noise Technical Report
Air Quality	ADEC data	Yes/No	• Conduct impact assessment • Incorporate future projects into STIP

Resource	Methodology/Data Source Used	Present in or Near Study Area? / Impacts	Next Steps
Hazardous Materials	ADEC Contaminated Sites Data Portal and Underground Storage Tank Database	Yes/No	• Perform Environmental Site Assessment prior to construction if contaminated sites are suspected near or within the project footprint. • Identify mitigation, if needed
Cumulative	Online research, review of existing impacts data	Yes / Yes	• Confirm assessment included in this Memo

Notes: AHRS = Alaska Heritage Resources Survey; ADEC = Alaska Department of Environmental Conservation; ADF&G = Alaska Department of Fish and Game; APE = Area of Potential Effects; BMP = Best Management Practices; CBJ = City and Borough of Juneau; EO = Executive Order; FEMA = Federal Emergency Management Agency; IPaC = Information, Planning, and Consultation; LOS = Level of Service; NRHP = National Register of Historic Places; ROW = right-of-way; SHPO = State Historic Preservation Officer; STIP = Statewide Transportation Improvement Program; SWPPP = Stormwater Pollution Prevention Plan; TNM = Traffic Noise Model; USFS = U.S. Forest Service; USFWS = U.S. Fish and Wildlife Service; USACE = U.S. Army Corps of Engineers

Resources Not Reviewed

The Farmland impacts category was not reviewed because it is not applicable to this study area.

Floodplains/Drainage

Methodology

The information summarized below represents data reviewed from the final pending Flood Insurance Rate Map (FIRM) developed by the Federal Emergency Management Agency (FEMA) and the City and Borough of Juneau (CBJ) (CBJ 2020a), and the 2015 U.S. Fish and Wildlife Service (USFWS) study, “Stormwater in the Lower Jordan Creek Watershed” (USFWS 2015).

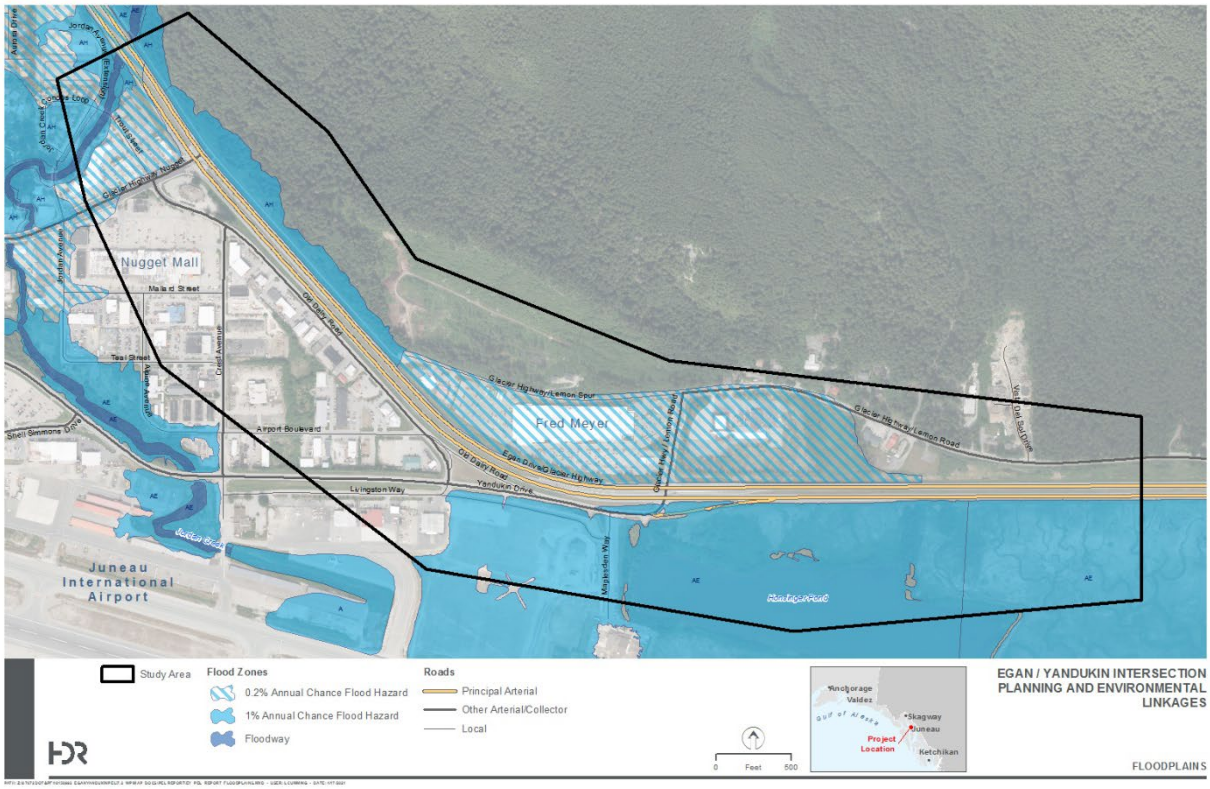
Description of Existing Conditions

Water resources within in the study area include an unnamed perennial stream that flows down the hillside, through a culvert under the Glacier Highway, across an open field, and under Egan Drive. A dredged pond, known as Honsinger Pond, is situated south of the E-Y intersection. Just outside the study area is Jordan Creek, a perennial stream that originates on the slopes of Thunder Mountain, crosses Egan Drive north of the Glacier/Egan (“Nugget”) intersection, and flows through a largely industrial area before its flow is routed under the airport runway through a culvert, and continues south, eventually into an estuary in the Mendenhall Wetlands State Game Refuge (Refuge).

Flood hazard zones, defined by FEMA Flood FIRMs, are located adjacent to both sides of Egan Drive (Figure 2). The north side of Egan Drive to Glacier Highway has a 0.2% annual chance of

flooding, or 1% annual chance of flooding with an average depth of less than one foot (Zone X). West of that area, still on the north side of Egan Drive, there is a flood hazard zone area with a 1% annual chance of shallow flooding (Zone AH), which has a flood elevation of 29 feet Mean Lower Low Water (MLLW). The areas south of Egan Drive and along both sides of Yandukin Drive's intersection with Egan Drive has a 1% annual chance flooding (Zone AE) with a base flood elevation of 24 feet MLLW. West of the study area, there is a regulatory floodway (Zone AE, 1% annual chance flooding) that follows 3.1 miles of Jordan Creek between the Juneau International Airport (near the runway) and 1,300 feet above Amalga Street.

Figure 2: Flood Hazard Map



Stormwater in the study area originates from impervious surfaces such as roads, parking lots, and roofs. It is generated during precipitation events or melting snow and ice. When stormwater does not infiltrate into the ground or evaporate, it typically flows as runoff, carrying sediment and pollutants into the streams and waterbodies. On the south side of Egan Drive, the USFWS inventoried the stormwater drainage system using CBJ data and identified a mix of curb and gutter, catchments, swales, and stormwater ditches.

Impacts

No alternatives would impact a regulated floodway. It is anticipated that each alternative may encroach on or impact a flood hazard area. The alternatives would add additional impervious surface, which would affect stormwater quality and quantity.

Resource of Public or Agency Concern / Agency Coordination
No specific comments or concerns about floodplains have been expressed by public and agency stakeholders at this time.

Possible Mitigation
Mitigation measures that would be considered include limiting the extent of any fill or widening of the roadway to avoid impacts into adjacent flood hazard areas.

Next Steps
Per Executive Order (EO) 11988, Floodplain Management, the project will need to avoid adverse impacts associated with the use or modification of the floodplains. If there are impacts, the project would follow the process as described in the EO. Coordination with the CBJ would be required for all floodplains permitting.

If there are floodplains impacts, the FIRM would need to be revised by a Conditional Letter of Map Revision prior to construction and a Letter of Map Revision after construction.

Water Quality

Methodology
Alaska Department of Environmental Conservation (ADEC) documents impaired waterbodies and proposed improvement plans. Data for the study area was evaluated from two reports: the "Total Maximum Daily Load (TMDL) to Address the Sediment and Interstitial Dissolved Oxygen Impairments in Jordan Creek, Alaska", developed by ADEC in September 2009 (ADEC 2009) and "Jordan Creek Watershed Recovery and Management Plan", written by Samia Savell of the USDA Natural Resources Conservation Service in partnership with ADEC and the Mendenhall Watershed Partnership in January 2006 (Savell 2006).

Description of Existing Conditions
Jordan Creek is a small, clearwater stream located in Mendenhall Valley, originating in the steep mountain slopes. The Jordan Creek watershed is a subwatershed of the Mendenhall Valley. Upper Jordan Creek refers to areas upstream of Egan Drive, and Lower Jordan Creek generally refers to areas downstream of Egan Drive. The western end of the study area is part of the Jordan Creek watershed. The eastern end generally flows toward the Refuge and Gastineau Channel.

In 1998, Jordan Creek was added to Alaska's list of 303(d) impaired waterbodies for high sediment loads, low dissolved oxygen, and debris. Roads, recreation, urban development, and stormwater runoff were identified as nonpoint sources of pollution. The excess sediment in the creek leads to poor survival of salmon eggs. Sampling and restoration efforts include water quality monitoring, stream cleanup events, and stormwater best management practices (BMPs).

A TMDL study is a process through which pollution sources are identified. The study analyzes pollution sources of a waterbody and calculates the amount or load of that specific pollutant that the water can receive and still maintain water quality standards. For Jordan Creek, TMDLs were completed for debris in 2005. In 2009, TMDLs for dissolved gas and sediment were added and

Jordan Creek was removed from the Section 303(d) list of impaired waters and moved to the Category 4a list of impaired water with an approved TMDL. Regular water quality monitoring and reporting continues for Jordan Creek.

Impacts

Each alternative would add pavement to the Jordan Creek watershed and could have water quality impacts. The Diamond Interchange with Two-Way Frontage Road to Glacier Nugget would have the most amount of increased impervious surface. Increased amounts of impervious surface may increase sediments, as well as heavy metals from brakes, salts from winter maintenance, and oils and grease. Winter maintenance sanding may increase sediments that could make their way into the waterways.

Increased amounts of paved surface will increase stormwater volumes. Table 2 summarizes the increase of impervious surface added to the study area by alternative. These estimates do not include areas that replace existing paved surfaces with new pavement.

Table 2: Increase of Impervious Surface Added to the Study Area by Alternative

Alternative	Additional Paved Surface (acres)
No Build	0.0
Mobility with median crossovers	1.99
Mobility with Glacier Lemon Spur Extension	4.57
Partial Signal with median crossovers	2.13
Partial Signal with Glacier Lemon Spur Extension	4.71
Full Signal with median crossovers	3.25
Full Signal with Glacier Lemon Spur Extension	5.83
2 Signalized T-Intersections	3.39
2 Signalized T-Intersections with Glacier Lemon Spur Extension	7.31
Diamond Interchange with median crossovers	5.2
Diamond Interchange with Glacier Lemon Spur Extension	7.78

Resource of Public or Agency Concern / Agency Coordination

Existing TDMLs and management plans identify Jordan Creek water quality as an area of concern. This issue was discussed with the agency and community stakeholder groups.

Possible Mitigation

Stormwater management would be incorporated into any project alternative design, per CBJ and DOT&PF typical practices. This could include designing and constructing swales or other retention methods, and operational measures addressing snow disposal locations and street sweeping. ADEC General Permit compliance would be required for construction of each alternative; a Stormwater Pollution Prevention Plan (SWPPP) would be developed to manage stormwater during construction.

Mitigation measures could include sediment fences and other sediment and erosion protection measures during construction. Design measures could include designing vegetated swales, or sediment traps to reduce the loads reaching Jordan Creek and other stormwater pathways. Stormwater runoff may be directed to existing wetlands and/or drainage control structures prior to entering a waterbody to reduce sediment loads. Operational measures may include increased street sweeping and increased stormwater system maintenance.

Next Steps

During a subsequent NEPA process, an impact assessment would occur to specifically identify the potential water quality and stormwater impacts of the recommended alternative. Any activity that may result in a discharge into waters of the United States must apply to ADEC for a Section 401 of the Clean Water Act State Water Quality Certification, unless the project qualifies for an U.S. Army Corps of Engineers (USACE) nationwide permit.

Wetlands and Waters of the United States

Methodology

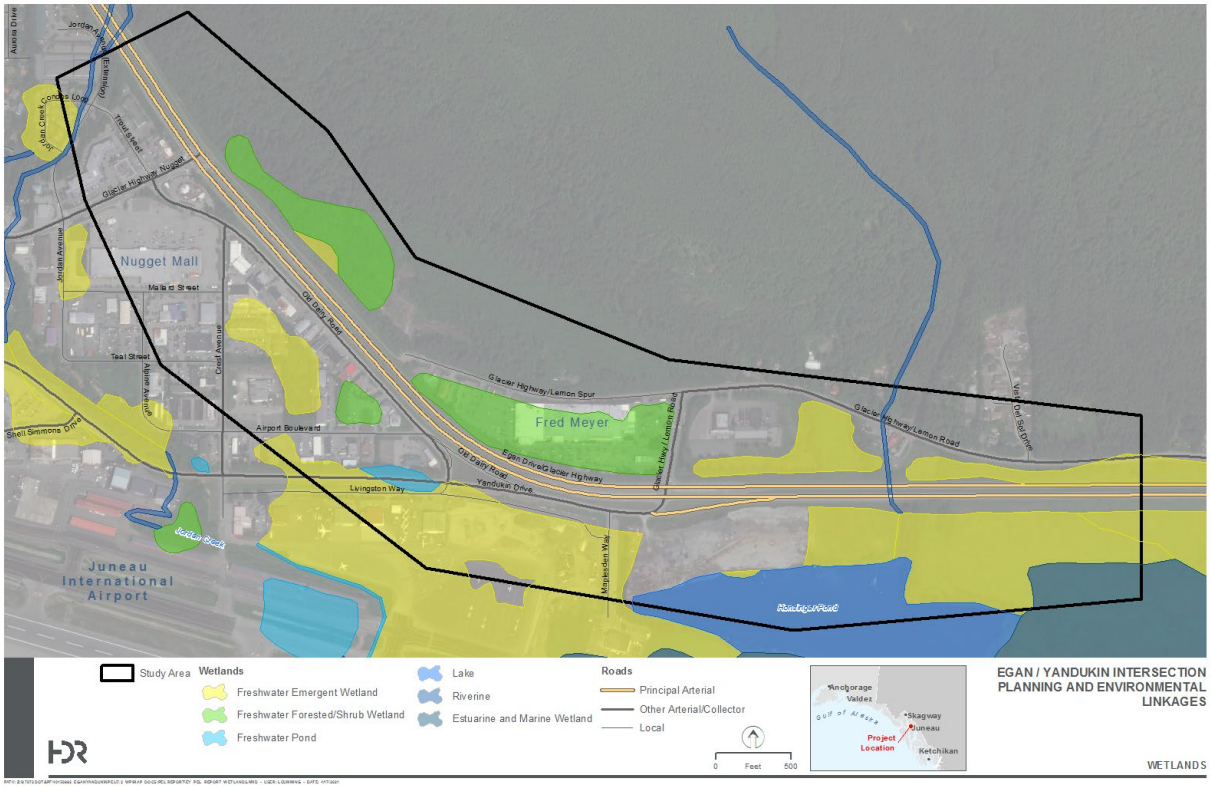
National Wetlands Inventory (NWI) mapping from the USFWS was reviewed to identify wetland complexes within the study area.

Description of Existing Conditions

Freshwater forested/shrub wetlands were present where the existing Fred Meyer building and parking lot and Old Dairy Road is sited, as well as the hillside above Egan Drive between the Fred Meyer and the Nugget intersection. Freshwater emergent wetlands align both sides of Egan Drive to the east of Fred Meyer, along the flats. Lacustrine wetlands, encompassing Honsinger Pond, are present south of the project intersection. Wetlands are shown in Figure 3 and Appendix A.

Mendenhall Wetlands State Game Refuge is a large estuarine wetland complex that abuts the southern edge of the study area. A section of estuarine wetlands adjacent to Honsinger Pond was sold to a non-profit conservation consortium, Southeast Alaska Land Trust (SEAL), as mitigation for the proposed filling of the emergent and lacustrine wetlands within the Honsinger industrial park area. A permit for wetland fill has been granted by USACE to allow industrial development underway around Honsinger Pond. Construction activities have begun and may have already filled certain areas that are listed in the NWI (and displayed on Figure 3) as wetlands.

Figure 3: Wetlands in the Study Area



Impacts

Each build alternative would impact wetlands as mapped in the NWI. Table 3 identifies type and acreages, assuming that existing paved development that is shown on Figure 3 as wetland has already been filled.

Table 3: Wetland Impacts by Alternative

Alternative	Wetland Type(s)	Wetlands Impacted (Acres)
No Build	None	0.0
Mobility with median crossovers	Forested/Shrub	0.1
Mobility with Glacier Lemon Spur Extension	Forested/Shrub	3.4
Partial Signal with median crossovers	Emergent	0.1
Partial Signal with Glacier Lemon Spur Extension	Emergent; Forested/Shrub	3.4
Full Signal with median crossovers	Emergent; Lacustrine	2.8

Alternative	Wetland Type(s)	Wetlands Impacted (Acres)
Full Signal with Glacier Lemon Spur Extension	Emergent; Lacustrine; Forested/Shrub	6.1
2 Signalized T-Intersections	Emergent; Lacustrine	4.0
2 Signalized T-Intersections with Glacier Lemon Spur Extension	Emergent; Lacustrine; Forested/Shrub	7.3
Diamond Interchange with median crossovers	Emergent; Lacustrine	4.6
Diamond Interchange with Glacier Lemon Spur Extension	Emergent; Lacustrine; Forested/Shrub	7.9

The USACE has very specific criteria they use to assess different alternatives and their impacts on wetlands and other Waters of the United States. Appendix B of this document contains an assessment of each of the alternatives using the criteria set out in the Clean Water Act.

Resource of Public or Agency Concern / Agency Coordination
Agency stakeholders participating in Agency Workgroup meetings held as a part of the PEL process are concerned about the presence and impacts to area wetlands, based on the understanding that wetlands have important functions and value to habitat and flood protection and the USACE statutory responsibility to protect wetlands.

Possible Mitigation
Mitigation measures would include additional design refinement to avoid and minimize impacts. Measures would be employed during construction to stake edges, protect wetlands from pollutants generated during construction, and restore areas of temporary impacts as soon as possible. Compensatory mitigation may be required by the USACE for any alternative that impacts wetlands.

Next Steps
During the subsequent NEPA process, wetlands in the study area would be delineated and a functional assessment analysis performed. A field evaluation would identify what areas remain jurisdictional wetlands. A delineation report would be prepared in compliance with EO 11990, Protection of Wetlands, and the project team would coordinate its content with the USACE and identify any necessary Section 404 permits. Design measures would identify opportunities to avoid and minimize impacts.

Vegetation and Invasive Species

Methodology

This section is based on a review of the University of Alaska Anchorage, Alaska Center for Conservation Science database and mapping application, Alaska Exotic Plants Information Clearinghouse (AKEPIC), which provides geospatial information for non-native plant species in Alaska (ACCS, UAA 2020), and the Invasiveness Ranking System for Non-Native Plants of Alaska (Carlson et al. 2008)

Description of Existing Conditions

Vegetation within the heart of the study area is primarily disturbed grasses and shrubs, common to roadside areas. The surrounding area canopy is closed Sitka spruce-western hemlock forest (Viereck et al. 1992), with an understory of salmonberry, blueberry, devil's club, ferns, skunk cabbage, horsetail and other herbaceous plans. Riparian areas may be populated by alder, willow, sedges and grasses. As the topography flattens near the airport and Refuge, the trees diminish as sedges and grasses become the dominant plant types in the wetland and estuarine environment.

Non-native plant occurrences are noted on the AKEPIC data portal within the study area. These include white and alsike clovers, annual and Canada bluegrasses, big chickweed, dandelion, common plantain, common tansy, corn spurry, creeping buttercup, curly dock, orange hawkweed, pineappleweed, reed canarygrass, and tall buttercup. Of these, reed canarygrass and orange hawkweed are the most invasive.

Impacts

The alternatives would result in the removal of vegetation to accommodate the alternative. Most alternatives would affect disturbed grasses or areas immediately adjacent to improvements. Permanent vegetation impacts would be similar to those presented in Table 2, which summarizes additional paved surfaces by alternative. In addition to permanent removal of vegetation, temporary vegetation impacts would occur. However, the area disturbed during construction would be revegetated with native species.

Resource of Public or Agency Concern / Agency Coordination

No specific comments or concerns about vegetation and invasive species have been expressed by public and agency stakeholders at this time.

Possible Mitigation

DOT&PF typically employs mitigation measures to revegetate disturbed surfaces with native seeds, free of noxious weeds. Inventorying the presence of noxious weeds and eradicating where possible prior to construction could reduce the presence after construction completes.

Next Steps

During subsequent analyses, the study area will be surveyed for the presence of noxious weeds. BMPs will be required during construction activities.

Threatened and Endangered Species and Wildlife

Methodology

Wildlife information was identified using the Jordan Creek Watershed Recovery and Management Plan (Savell 2006), Audubon Society descriptions of Important Bird Areas in Alaska, Mendenhall Wetlands (Audubon Society 2020), the Alaska Department of Fish and Game (ADF&G) Anadromous Waters Catalog (Giefer and Blossom 2020), and ADF&G online descriptions of the Refuge (ADF&G 2020). The USFWS Information for Planning and Consultation (IPaC) online tool was queried using the study area to identify threatened and endangered species (USFWS 2020).

Description of Existing Conditions

The USFWS does not list threatened or endangered species within the study area, nor does it identify migratory birds of conservation concern at the location (USFWS 2020).

Waterfowl, shorebirds, raptors, and songbirds frequent the area, but are particularly numerous in and around the Refuge (Savell 2006). According to Audubon Society (2020), it is a key migratory waterfowl and shorebird stopover location along coastal Alaska. A total of 230 species of birds have been documented in the Refuge wetlands, which represents 77% of the 300 bird species seen in the entire Juneau area (Armstrong and Gordon 2002 in Audubon Society 2020). Bald eagles, ravens, and crows are often viewed near and along roadways.

Small mammals, such as porcupine, red squirrel, voles, and mice are likely year-round residents in the study area. Large mammals such as black bear, Sitka black-tailed deer, and mountain goats live or cross through areas on the north side of the study area for parts of the year.

The Alaska Department of Fish and Game conducted two fish habitat surveys of the study area (November 2019 and September 2020; see Appendix C) There are several fish-bearing streams and conveyances within the study area, as shown below in Figure 4. One is an unnamed drainage (ADF&G stream catalog number 111-50-10625) that descends from the hillside east of Lemon Spur/ Glacier Highway and makes its way under Glacier Highway and Egan Drive via a culvert south toward the Mendenhall Wetlands complex. It contains habitat supporting coho salmon rearing between the wetlands and the hillside. Several other unnamed and unnumbered conveyances exist throughout the project area that support anadromous and resident fish. Just west of the study area is Jordan Creek (stream number 111-50-10620), which supports coho, sockeye, pink, and chum salmon; Dolly Varden; and cutthroat trout.

Impacts

No impacts are anticipated to threatened and endangered species. Minor impacts to small mammal wildlife habitat may occur where vegetated areas are permanently removed and replaced with pavement or revegetated with native species.

As shown in Table 4, each build alternative would impact both anadromous and resident fish bearing streams. Generally, alternatives which include the Glacier Lemon Spur Extension would

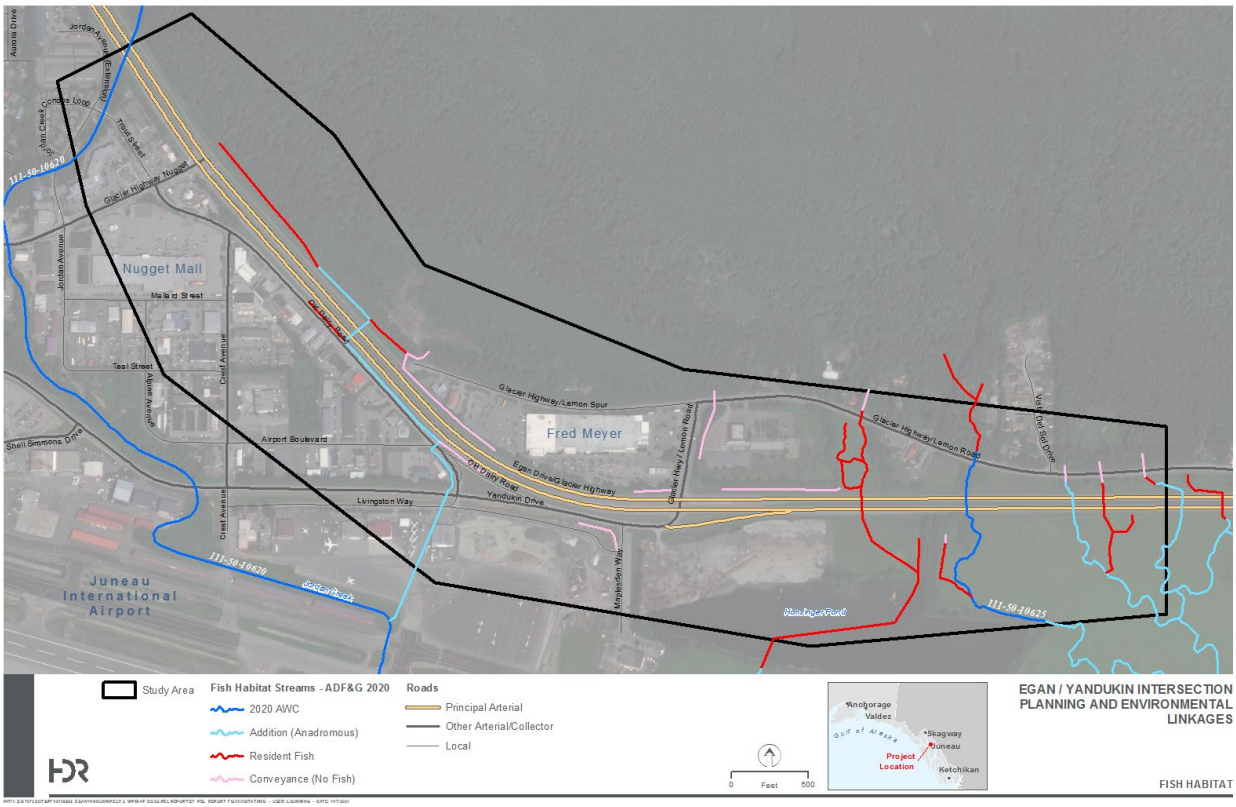
impact more linear feet of fish streams than those alternatives that include the median crossovers components.

Temporary impacts to water quality as a result of increased erosion and sediment during construction may result in minor impacts to the streams.

Table 4: Fish Stream Impacts

Alternative	Anadromous Fish Stream (Linear Feet)	Resident Fish Stream (Linear Feet)	Total Fish Stream Impacts (Linear Feet)
No Build	0	0	0
Mobility with median crossovers	65	42	107
Mobility with Glacier Lemon Spur Extension	559	1,347	1,906
Partial Signal with median crossovers	48	85	133
Partial Signal with Glacier Lemon Spur Extension	542	1,389	1,931
Full Signal with median crossovers	48	42	90
Full Signal with Glacier Lemon Spur Extension	542	1,347	1,889
2 Signalized T-Intersections	168	160	328
2 Signalized T-Intersections with Glacier Lemon Spur Extension	710	1,507	2,217
Diamond Interchange with median crossovers	48	183	231
Diamond Interchange with Glacier Lemon Spur Extension	1,488	542	2,030

Figure 4: Project Area Fish Use Map



Resource of Public or Agency Concern / Agency Coordination

Impact to fish habitat and streams was mentioned as an agency concern during the Agency Group meetings held during the PEL process.

Possible Mitigation

Mitigation measures could include avoidance of land clearing activities during nesting seasons, revegetation of disturbed areas with native species, and use of BMPs during construction to minimize sedimentation. Modifications to water conveyances and streams may be required to be designed in a way that maintains or improves fish passage. For example, the culvert identified as being impacted by the 2 Signalized T-Intersections alternatives as “gray” in the ADF&G fish passage database and may be currently impeding fish passage. A project in the area may provide the opportunity to improve fish passage.

Next Steps

During subsequent NEPA processes, DOT&PF will coordinate with resource agencies to identify whether any species of special status or concern are present. An aerial or ground-level survey for bald eagle nests will be performed prior to construction. A permit will be required if construction activities will disturb bald eagles or take an active nest. Should any in-water or above water work be required, DOT&PF will need to consult with ADF&G and obtain the necessary fish habitat permits.

Historic, Archaeological, and Paleontological

Methodology

The Alaska Heritage Resources Survey (AHRS), maintained by the Alaska Office of History and Archaeology, was reviewed for the study area in July 2020. No field surveys have been conducted.

Description of Existing Conditions

A review of the AHRS identified four potentially historic resources and no archaeological or paleontological resources in the study area or its 0.25-mile buffer area (see Table 5). Three have not been evaluated for eligibility for listing in the National Register of Historic Places (NRHP; JUN-00501, JUN-00502, JUN-00503; see Figure 5). The fourth potentially historic resource (JUN-01107) was previously evaluated and found not eligible for listing in the NRHP. The Alaska State Historic Preservation Officer (SHPO) concurred with this eligibility determination.

Table 5: Historic Sites in the Buffered Study Area

AHRS #/Name	Description	NRHP Eligibility
JUN-00501 Danner Residence	This building was the summer home of George and Rosa Danner, who established the Mendenhall Dairy in 1917. It is located at 7630 Glacier Highway, within the study area.	This building is associated with the early dairy industry in Juneau. It has not undergone a Determination of Eligibility.
JUN-00502 Mendenhall Dairy Milk House	This building supported the milk house and cooling room for the Mendenhall Dairy. Numerous additions have all but obscured the original structure. It is located at 7691 Glacier Highway, within the study area.	This building is associated with the early dairy industry in Juneau. It has not undergone a Determination of Eligibility.
JUN-00503 Mendenhall Dairy Barn	This barn replaced the original 1923 barn for the Mendenhall Dairy in 1934. Very few modifications have been made to the building since its original construction. It is located at 7671 Glacier Highway, within the study area.	This building is associated with the early dairy industry in Juneau. it has not undergone a Determination of Eligibility.
JUN-01107 Trout Street Bridge	This bridge was originally constructed from salvaged steel parts from the 1935 Gastineau Channel Bridge, with a modern, pre-fabricated concrete structure. SHPO was consulted regarding replacement of the bridge in 2010. It is located northwest, and outside, of the study area but within the 0.25-mile buffer area.	This bridge was determined not eligible in 2010, and the SHPO concurred.

Figure 5: Photographs of Mendenhall Dairy Milk House (JUN-00502) and Mendenhall Dairy Barn (JUN-00503)

2011 Photo of JUN-00502 (right) and JUN-00503 (left), looking west from Glacier Highway; obtained from Google Streetview

Undated Photo of JUN-00502 (right) and JUN-00503 (left); obtained from https://beta.juneau.org/library/museum/gastineau-channel-memories-browse/entry/17491

Impacts

None of the ten alternatives under consideration is anticipated to have a direct impact on the three potentially historic resources (JUN-00501, JUN-00502, JUN-00503) in the study area. These resources are located east and north of the alternatives, outside of their direct impact area. Indirect impacts to these resources from noise and visual intrusions could occur during construction; however, these impacts would be temporary and minimal. Given the existing conditions of these resources and their location in regards to the project alternatives, the alternatives would likely not affect the resources' integrity of location, setting, design, materials, workmanship, feeling, and association in a way that would make them not eligible for listing in the NRHP.

Trout Street Bridge (JUN-01107), which has been determined not eligible for listing in the NRHP, is located to the northwest, and outside, of the study area but within the 0.25 buffer area. Given its condition, ineligibility for the NRHP, and location relative to the project alternatives, no effect from any of the project alternatives is anticipated.

Resource of Public or Agency Concern / Agency Coordination

The SHPO suggested in comments during Agency Meeting #2 (June 30, 2020) that preliminary research could be done regarding the ages of buildings in the built environment based on tax records to get the number of historic age buildings in the area. This research could be done as part of historic identification efforts during the next steps, once a recommended alternative proceeds to the NEPA process and Section 106 of the National Historic Preservation Act compliance is required. The SHPO also suggested that impact to historic resources should be considered as one of the screening criteria for screening alternatives. This suggestion was incorporated by the project team.

Possible Mitigation
The following mitigation measures could be considered:

- Route construction traffic away from the identified historic resources to avoid or minimize temporary visual and noise impacts to these buildings during construction
- Retain trees/vegetation that screen these properties from the E-Y intersection to minimize visual and noise impacts

Next Steps
Several steps are required for paleontological, archaeological, and historic resources during the subsequent NEPA and associated Section 106 of the National Historic Preservation Act processes. DOT&PF will be required to:

- Consult with the SHPO, tribes and tribal entities, and other identified consulting parties as they define the study area of Potential Effect (APE);
- Identify cultural resources in the APE, including the research of building age based on tax records;
- Determine NRHP eligibility and effects from the project on cultural resources in the APE; and
- Identify ways to avoid, minimize, or mitigate adverse effects to NRHP-eligible resources in the APE.

Socioeconomic Characteristics and Environmental Justice

Methodology
The identification of businesses, residences, and community resources was based on a review of online maps and stakeholder input. The environmental justice analysis was performed using the U.S. Environmental Protection Agency's (EPA) EJSCREEN tool (EPA 2020).

Description of Existing Conditions
Businesses, Residences, and Community Resources

There are a number of businesses near the study area, including two large retail areas (Fred Meyer and Nugget Mall) in addition to smaller retail businesses. The study area includes an urgent care facility, multiple veterinary care centers, and one church. The Glacier Fire Station is approximately 3,000 feet west of the E-Y intersection. There is a small amount of residential development along Glacier Highway in the study area. There are no known existing schools in or near the study area. A day care facility is permitted at the Juneau Christian Center, with a capacity of 13 children and staff, located at the corner of Glacier Highway and Glacier Highway/Lemon Road.

There are two low-income housing complexes, operated by St. Vincent de Paul, approximately 0.6 mile west of the E-Y intersection (approximately 0.3 mile south of the Glacier-Nugget intersection). The St. Vincent de Paul family shelter is also at that location. In addition to transitional living, the shelter includes the Sobering Center, the Dan Austin Center (which

provides resources for people who are looking for ways into housing), Ida's Attic (which provides free clothes for the homeless), and a community center.

Plans exist to relocate Glory Hall, a homeless shelter and soup kitchen, from downtown to a location adjacent to the study area, near the intersection of Teal Street and Alpine Avenue. The new facility would include approximately 40 emergency shelter beds, a day room that would accommodate 120 people, and offices.

The Juneau Animal Shelter is approximately 1,500 feet east of the E-Y intersection.

Environmental Justice

According to the EPA's EJSCREEN tool (EPA 2020), the study area consists of two census block groups[2] (one north and one south of Egan Drive). Both block groups have a higher percent of minority population than the State of Alaska, which is 38% minority (see Table 6). In terms of low-income population, the block group south of Egan Drive has a lower percentage of low-income population than the State of Alaska, while the block group north of Egan Drive has a higher percentage (see Table 7).

Table 6: Minority Population

Block ID	Block Group	State
021100004001	56%	38%
021100003003	70%	38%

Table 7: Low-income Population

Block ID	Block Group	State
021100004001	47%	25%
021100003003	10%	25%

Impacts

The alternatives under consideration would improve safety by reducing the number of crashes that occur in the area. This would reduce traffic delays associated with a crash. The improvements would also provide alternative access through this area should a crash occur, improving traffic flow, mobility, and quality of life. This would also improve conditions for emergency vehicles. The improvements would provide enhanced non-motorized facilities

[2] Please note that the block groups consist of a much larger area than the study area. The area immediately around the proposed project is believed to have little or no residential population, so the data may not accurately reflect existing conditions.

(pedestrian bridge or enhanced at-grade crossing), which would also improve safety, mobility, and business access.

Improved mobility in the area could have a small indirect benefit to local businesses. The St. Vincent de Paul facilities (and the relocated Glory Hall) could benefit as they would have better pedestrian access to Fred Meyer.

Potential impacts or benefits to low-income or minority populations in or near the study area would include:

- Reduced air pollution associated with congestion or idling traffic, but increased air pollution associated with more paved surfaces
- Increased motorized and non-motorized safety
- Improved quality of life for pedestrians and cyclists because of better facilities and access across Egan Drive
- Noise impacts (unknown at this time)
- Potential support for housing plans for all incomes identified in the *Lemon Creek Area Plan* associated with the Glacier Lemon Spur Extension

Resource of Public or Agency Concern / Agency Coordination
The project team specifically reached out to organizations whose clients tend to be frequent transit users. Socioeconomic and environmental justice concerns raised by the public and agencies include:

- Need for additional ROW if an interchange at Glacier-Nugget intersection is recommended
- Equity considerations
- Engagement of transit users in the process

Possible Mitigation
Mitigation measures that could be considered include:

- ROW and relocation benefits defined in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended
- Enhancements at bus stops for bus riders
- Improved access to bus stops for bus riders
- Improved non-motorized facilities for pedestrians and bicyclists
- Revegetation of disturbed areas
- Additional outreach to transit users
- Additional coordination with organizations whose clients rely on transit services such as St. Vincent de Paul, Southeast Alaska Independent Living, REACH, Catholic Social Services, Polaris House, Juneau Housing First, AWARE, Salvation Army, Front St. Clinic, and the Southeast Alaska Regional Health Consortium.

Next Steps

During the subsequent NEPA process, a full environmental justice analysis may be undertaken to determine if the project would cause disproportionately high and adverse impacts to low-income and minority populations. This process will include specialized outreach to low-income and minority communities, including those facilities serving communities located in the study area. Mitigation will be incorporated into the project to reduce any impacts that are identified.

Transportation

Methodology

The section was based on a review of existing plans, the Capital Transit website (Capital Transit 2020), and the *Traffic Analysis and Alternative Concepts Report* (Kinney Engineering, LLC 2019).

Description of Existing Conditions

Egan Drive is a four-lane, divided principal arterial roadway running generally north-south. It carries approximately 30,000 vehicles per day (VPD). Egan Drive connects downtown Juneau with the Mendenhall Valley and Juneau International Airport, as well as with the University of Alaska Southeast and the Auke Bay Ferry Terminal.

Yandukin Drive is a major collector roadway, carrying approximately 2,500 VPD to Juneau International Airport and other commercial and residential locations.

Lemon Road/Glacier Highway is a minor arterial roadway. Volumes on the short segment between Fred Meyer and Juneau Christian Center are typically around 7,500 VPD.

On the segment of Lemon Road/Glacier Highway that runs parallel to Egan Drive between the Sunny Point Interchange and Yandukin Drive, the volumes are approximately 4,500 VPD.

Glacier Highway, in front of Nugget Mall, is a minor arterial roadway and carries approximately 8,200 VPD.

The number of crashes at the E-Y intersection are of concern. Between 2005 and 2017, there were 86 crashes at this location. There are no fatalities associated with traffic accidents at this intersection. Left-turn crashes from Egan Drive are the predominant crash type of concern. Crashes are more likely when roads are icy, snowy, or wet, particularly during winter. According to the crash data, 52% of crashes at this intersection occur in November, December, and January. Crashes are more likely during rush hour, especially during periods of darkness. For additional information about crashes in the area, please see the *Traffic Analysis and Alternative Concepts Report*.

Currently, there are no designated pedestrian crossings at the E-Y intersection. However, there are a variety of sidewalks, separated pathways, and bicycle lanes within the study area, as shown in Figure 6. While the existing infrastructure provides continuous coverage (through sidewalks and other facilities) along the study area roadways, the only pedestrian/bicycle connection across Egan Drive is at the Glacier Highway/Nugget intersection.

Figure 6: Existing Pedestrian and Bicycle Facilities

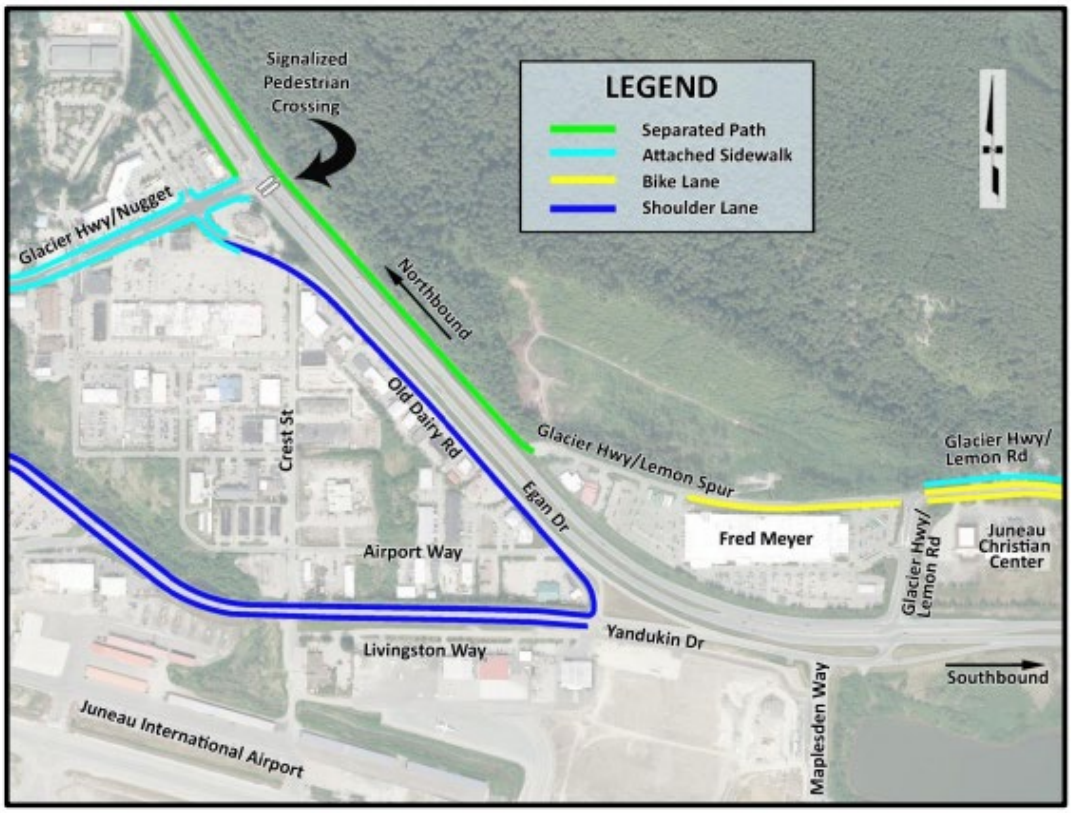
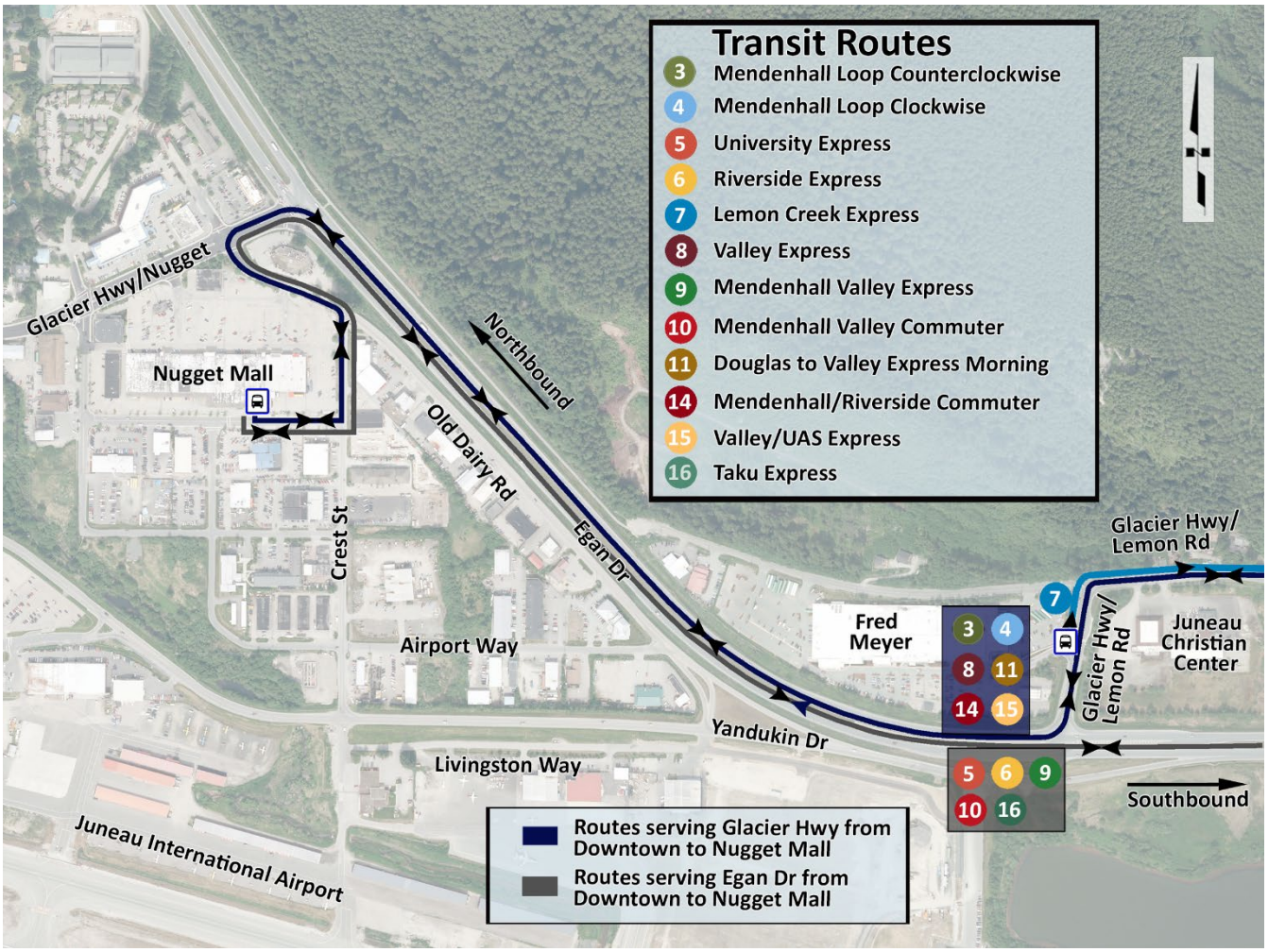


Figure 7 shows the two bus stops serving the area. One is on Glacier Highway/Lemon Road near Fred Meyer (E-Y intersection). The area around this bus stop was recently upgraded to connect to the sidewalk from Fred Meyer. There is another bus stop at Nugget Mall. Eleven bus routes typically pass through the study intersection[3]. Five of the routes travel northbound/southbound along Egan Drive between the Nugget Mall and downtown. The other routes traverse Glacier Highway/Lemon Road near Fred Meyer and continue to/from downtown on Glacier Highway/Lemon Road and to/from the Nugget Mall on Egan Drive. At the study intersection, these routes make a westbound right turn when traveling towards the Mendenhall Valley/Nugget Mall and make a southbound left turn when traveling towards the Lemon Creek Area/Downtown.

[3] As of October 2020, Capital Transit has been providing modified service due to the COVID-19 pandemic.

Figure 7: Juneau Capital Transit Route Map



Impacts

The alternatives would improve safety in the corridor, which would reduce associated travel delays. This would improve travel time reliability for vehicles and transit.

All alternatives include alternative driving routes, which would improve mobility in the area and improve emergency vehicle access when Egan Drive is blocked.

All alternatives improve mobility for non-motorized users.

The four alternatives that use Median Crossovers are not expected to have an impact on transit routes. Access to and from the bus stop near Fred Meyer would be improved.

It is expected that construction would result in some temporary delays and service disruptions for transit users in the study area.

Resource of Public or Agency Concern / Agency Coordination

Transportation-related concerns raised by the public and agencies during the study, generally in order of most mentions to least, include:

- Improving connectivity and adding an additional route is important
- Safety is a significant concern at this intersection
- Adding a stoplight could be a benefit, or it could unnecessarily delay traffic
- Adding an overpass could be a benefit
- Eliminating left turns at the intersection would improve safety
- Traffic signal slowing traffic too much
- Potential benefits that will result from the alternative
    - Are the benefits worth the cost?
    - Is the improvement really needed as the problems are caused by driver behavior rather than intersection design?
- Safety for non-motorized users
- Traffic delays caused by vehicle crashes
- Potential loss of the bicycle path
- Lack of pedestrian crossing at the E-Y intersection, and accessibility to Fred Meyer
- Americans with Disabilities Act (ADA) accessibility of non-motorized improvements
- Capital Transit access to Fred Meyer
- Snow removal
    - Can the alternatives accommodate snow removal?

Possible Mitigation

To address the permanent and temporary impacts, mitigation measures that could be considered include:

- Additional amenities at transit facilities
- Maintenance of transit service during construction
- Maintenance of non-motorized access during construction

Next Steps

Next steps need to include close coordination with Capital Transit, non-motorized user groups, and social service providers to design the improvements in a manner that better accommodates transit and non-motorized users. Additional work on the Glacier Lemon Spur Extension alternatives will be needed to determine if this improvement would result in access changes to Trout Street or Old Dairy Road.

Land Use

Methodology

The identification of land use in the study area is based on a review of online maps, CBJ Geographic Information System (GIS) data, and stakeholder input.

Description of Existing Conditions

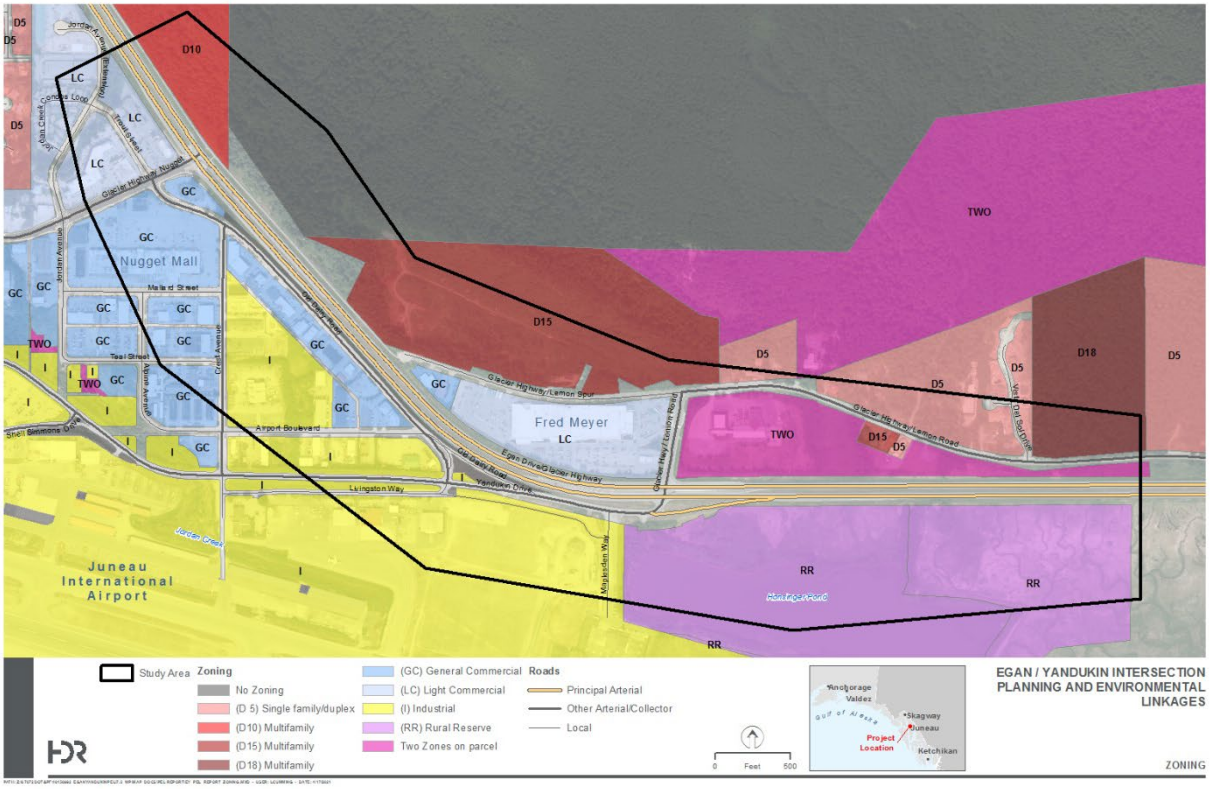
The study area is predominately commercial/retail land uses. Other land uses in the area include undeveloped, industrial, airport, and institutional (church). On the northwestern corner of Egan Drive and Glacier Highway/Lemon Road, there is a large retail development (Fred Meyer), while the northeastern corner is the Juneau Christian Center. The Juneau International Airport is on the southwestern corner of Egan and Yandukin. The area south of Egan Drive (between the airport and Egan Drive) is a mixture of industrial and commercial development. The commercial development includes small-scale retail, larger big-box type stores, and restaurants. There are also multiple hotels in this area.

The project area is included in the *CBJ Comprehensive Plan* and the *Lemon Creek Area Plan*. The *CBJ Comprehensive Plan* supports the Glacier Lemon Spur Extension (Glacier Highway from its current termini to the McNugget intersection). The *Lemon Creek Area Plan* identifies the Glacier Lemon Spur Extension as one of its priority actions.

Several other plans were examined during the PEL study to determine proposed alternative's consistency with stated goals and objectives: *Juneau Safe Routes to School Plan*, *Airport Sustainability Master Plan – Juneau International Airport*, *City and Borough of Juneau (CBJ) Non-Motorized Transportation Plan*, *CBJ Transit Plan*, and CBJ *Area-Wide Plan*.

Zoning districts in the area include Rural Residential (RR), Industrial (I), General Commercial (GC), Light Commercial (LC), Multifamily (D15), and Multifamily (D10) (see Figure 8;CBJ 2020b).

Figure 8: Zoning



Impacts

The ten alternatives under consideration for Level 2 Screening are generally consistent with existing land use plans and zoning. The five alternatives with the Glacier Lemon Spur Extension are more consistent with the *CBJ Comprehensive Plan* and the *Lemon Creek Area Plan* because these plans support the connection. This connection would provide a secondary route through the Lemon Creek area to reduce the complete reliance on Egan Drive and allow for support to land uses discussed in the *Lemon Creek Area Plan*. Both Two Signalized T-Intersections alternatives would convert part of the Honsinger Pond private property to a transportation land use. This property is currently under development so the specific impacts are not known at this time.

During the screening process, plan impacts were scored qualitatively based on whether the alternative was consistent with the following plans: *CBJ Comprehensive Plan*, *Lemon Creek Area Plan*, *Juneau Safe Routes to School Plan*, *Airport Sustainability Master Plan – Juneau International Airport*, *City and Borough of Juneau (CBJ) Non-Motorized Transportation Plan*, *CBJ Transit Plan*, and *CBJ Area-Wide Plan*. An alternative was considered consistent with a plan if it accomplished a stated goal or project described in a plan or if a plan did not state a goal or project in the study area.

Table 8: Plan Impacts

Alternative	CBJ Comprehensive Plan	Lemon Creek Area Plan	Juneau Safe Routes to School Plan	Airport Sustainability Master Plan	CBJ Non-Motorized Transportation Plan	CBJ Transit Plan	CBJ Area-Wide Transportation Plan
No Build			x				
Mobility with median crossovers			x	x		x	
Mobility with Glacier Lemon Spur Extension	x	x	x	x		x	
Partial Signal with median crossovers			x	x		x	
Partial Signal with Glacier Lemon Spur Extension	x	x	x	x		x	
Full Signal with median crossovers			x			x	
Full Signal with Glacier Lemon Spur Extension	x	x	x			x	
2 Signalized T-Intersections			x	x		x	
2 Signalized T-Intersections with Glacier Lemon Spur Extension	x	x	x	x		x	
Diamond Interchange with median crossovers			x			x	x
Diamond Interchange with Glacier Lemon Spur Extension	x	x	x			x	x

Note: x signifies consistency with plan

Resource of Public or Agency Concern / Agency Coordination

Land use related concerns raised by the public and agencies include that the Bucknell property is currently under development. Coordination with the property owner has occurred to determine impacts to this development.

Possible Mitigation

At this time, no mitigation for land use is needed.

Next Steps

During the subsequent NEPA process, specific land use impacts will be assessed.

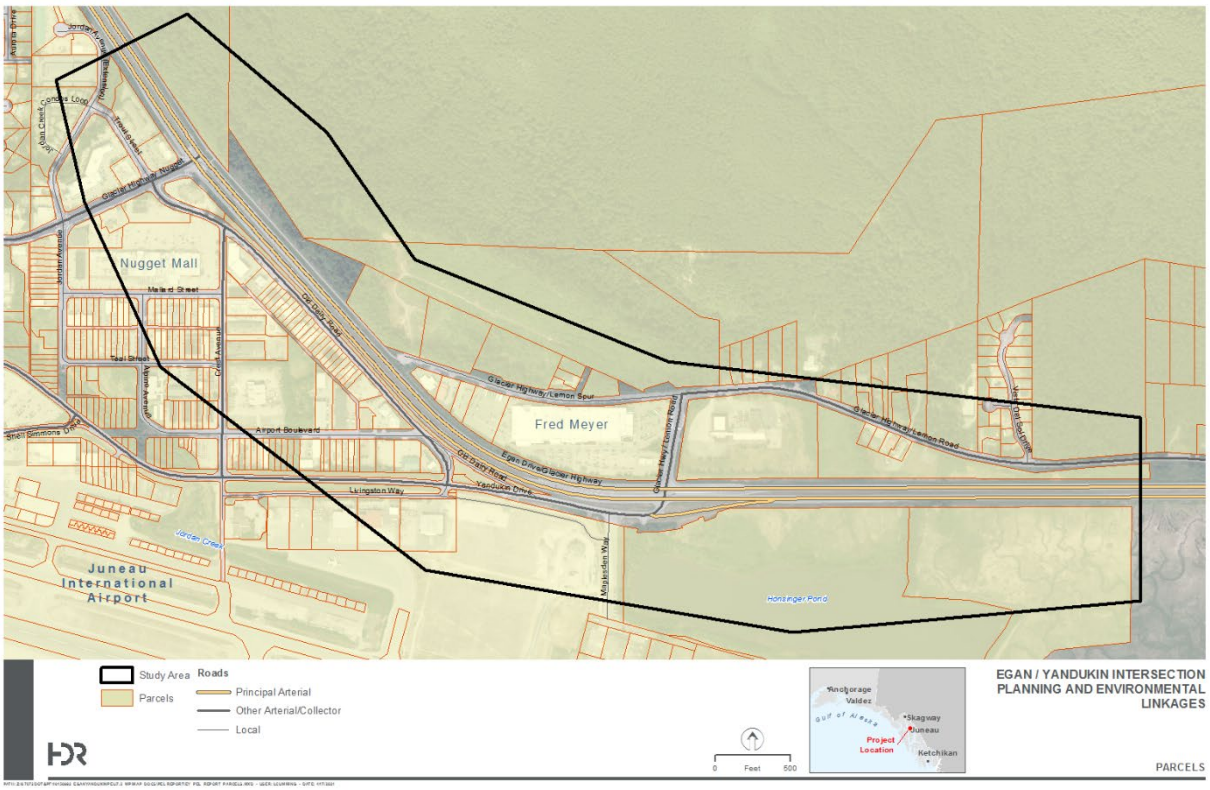
Economic and Right-of-Way

Methodology
This section is based on a review of online mapping and CBJ data.

Description of Existing Conditions
Most of the property in the area is either commercial or industrial in use. Property boundaries are shown in Figure 9.

Property tax and sales tax revenue are relatively important revenue sources for CBJ. Hotel/motel taxes are a relatively minor income source.

Figure 9: Property Boundaries



Impacts
During the PEL process, every attempt was made to avoid or minimize the need to acquire ROW for the project. Of the ten alternatives under consideration, additional ROW is needed for seven alternatives (see Table 9). Both Diamond Interchange alternatives would require ROW in all four quadrants of the E-Y intersection. All five alternatives that extend Glacier Highway would require ROW north of Egan Drive. The Two Signalized T-Intersections with Glacier Lemon Spur Extension would also require ROW south of Egan Drive to accommodate the extension of Yandukin Drive.

Table 9: Property to be Acquired

Alternative	Property to be Acquired (acres)
No Build	0.0
Mobility with median crossovers	0.34
Mobility with Glacier Lemon Spur Extension	7.11
Partial Signal with median crossovers	0.0
Partial Signal with Glacier Lemon Spur Extension	7.11
Full Signal with median crossovers	4.70
Full Signal with Glacier Lemon Spur Extension	11.47
2 Signalized T-Intersections	11.44
2 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

The ROW needed from private property owners would be considered an adverse impact to these owners. This is not expected to have an impact on local employment. The loss of property tax revenue would have a negligible impact on CBJ. The proposed project would not be expected to have an impact on sales tax or hotel/motel tax revenue.

It is likely that there would be long-term economic benefits realized by local businesses because customers would have better access to their business. This is due to the reduction in traffic congestion caused by a crash, which currently negatively affects decisions to access a business.

The two Diamond Interchange alternatives will have a negative impact on business visibility. The guardrail or concrete barriers on the overpass would obstruct portions of the Fred Meyer, Juneau Christian Center, and Honsinger Pond private properties. The elevated roadway also obstructs people from viewing businesses on the other side of Egan Drive.

The two T Signalized T-Intersections alternatives are likely to have a negative impact on the Bucknell property. This property is currently under development so the specific impacts are not known at this time.

The Glacier Lemon Spur Extension would provide enhanced access to properties adjacent to the new road. This would be an economic benefit to these properties, which are planned for a mix of residential and commercial uses.

Resource of Public or Agency Concern / Agency Coordination
Economic- and ROW-related concerns raised by the public and agencies include:

- Access to Fred Meyer
- Business visibility
- Need for additional ROW

A concern was raised by representatives of the Juneau International Airport about alternatives that would need land from the airport. The Northeast Development in the *Airport Sustainability Master Plan* identifies land needed from the Full Access Signalized Intersection and Diamond Interchange alternatives as being slated for hangars/facilities on the large aircraft parking apron. The Federal Aviation Administration Headquarters office oversees any property release from an airport. The process required is complex and time-consuming and could end without the release being approved, potentially resulting in schedule delays and higher costs for the construction of an alternative that impacts airport property.

A concern was raised by the private property owner southeast of the E-Y intersection. They have development plans for their recently acquired property, and they intend to begin construction in 2021. They would not support an alternative that would impact their property development: the Partial Access Signalized Intersection alternative would be preferable; the Full Access Signalized Intersection and Diamond Interchange alternatives would render their property useless for their intended use. The ROW acquisition process for either of the two latter alternatives would likely be costly and time-consuming.

The U.S. Forest Service (USFS) stated that modification of a Public Land Order would be necessary if USFS land would need to be converted to ROW to construct the Glacier Lemon Spur Extension. The USFS would need to complete a NEPA process in order to transfer this land; the USFS could potentially adopt DOT&PF's NEPA documentation, although USFS's process requirements are likely more extensive.

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

Possible Mitigation
Ongoing conversations with property owners, businesses, and residents potentially affected by the project would be a critical part of future project development during the subsequent NEPA process. These conversations would help DOT&PF identify design details to avoid or minimize potential economic impacts of reduced visibility and property acquisition. Any property acquisition would conform to the requirements set forth in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and the Uniform Relocation Act Amendments of 1987 (as amended).

Given the nature of the corridor, construction would also have temporary impacts on study area businesses. Typical mitigation measures that could be considered include:

- Maintaining business access
- Establishing communications between the businesses and construction team
- Installing additional signage
- Conducting public outreach to let the wider region know that the area is open for business

Next Steps
During the subsequent NEPA process, for the alternative(s) that requires property acquisition there will be a discussion on a property-by-property basis. Discussions may also need to occur with the Juneau International Airport.

During the subsequent NEPA process, a full and final analysis of property to be acquired and impacts to businesses will be conducted. Additional work on the Glacier Lemon Spur Extension alternatives will be needed to determine if this improvement would result in access changes to Trout Street or Old Dairy Road and resulting potential business and residential impacts.

Recreation / Section 4(f)

Methodology
A high-level effort was conducted to identify parks and recreation areas, which along with wildlife refuges and historic properties comprise Section 4(f) resources.

Section 4(f)

Section 4(f) is a federal environmental protection statute specific to U.S. Department of Transportation-funded projects that prohibits the use of land from publicly owned parks, recreation areas, wildlife and waterfowl refuges, or historic sites for transportation projects unless specific criteria are satisfied. Section 4(f) protections for parks apply when the property is 1) publicly owned, 2) generally open to the public, and 3) significant as determined by the Officials with Jurisdiction. DOT&PF has assumed FHWA's responsibility for Section 4(f) approvals under the 23 USC 327, NEPA Assignment Program (see also 23 CFR 774.3). DOT&PF may not approve the use of a Section 4(f) property unless it can make a determination that there is no feasible and prudent avoidance alternative to the use of land from the property and the action includes all possible planning to minimize harm to the property resulting from such use, or that the use of the property, including any measures to minimize harm, will have a *de minimis* impact on the property.

If any projects move forward into NEPA analysis from the PEL study, DOT&PF will be responsible for determining whether Section 4(f) applies, and if so, which approval option is appropriate. The SEO has reviewed the *Preliminary Section 4(f) Applicability Research Memo*, contents of which are included below. Their comments were incorporated into that memo, and they have no additional comments, as documented via email on December 3, 2020. The memo

is not available for public distribution because it contains sensitive information about cultural resources.

Description of Existing Conditions

Multiple parks, recreation areas, and refuges are located in the study area. These areas are summarized in Table 10.

Table 10: Parks, Recreation Areas, and Wildlife and Waterfowl Refuges in the Study Area

Property	Description	Ownership	Open to the Public	Recommended Section 4(f) Applicability
Honsinger Pond	Area directly south of Egan-Yandukin intersection, east of the airport	Various *Private*	N/A Industrial	No
Honsinger Wetlands	32-acre parcel south of Egan Drive, north and east of Honsinger Pond, directly west of Mendenhall Wetlands	SEAL *Private*	N/A Intent to provide public access	No
Mendenhall Wetlands State Game Refuge	4,000-acre refuge along 9 miles of shoreline in Gastineau Channel	State of Alaska *Public*	Yes	Yes
Glacier Highway Bike Pathway	Non-motorized, separated pathway on the north side of Egan Drive, from the termination of Lemon Spur to Mendenhall Loop Road	DOT&PF *Public*	Yes	No
Tongass National Forest	National forestland on the northwest side of Fred Meyer, uphill of Egan Drive, managed for semi-remote recreation and minerals	USDA Forest Service *Public*	Yes	Unknown

N/A = Not Applicable

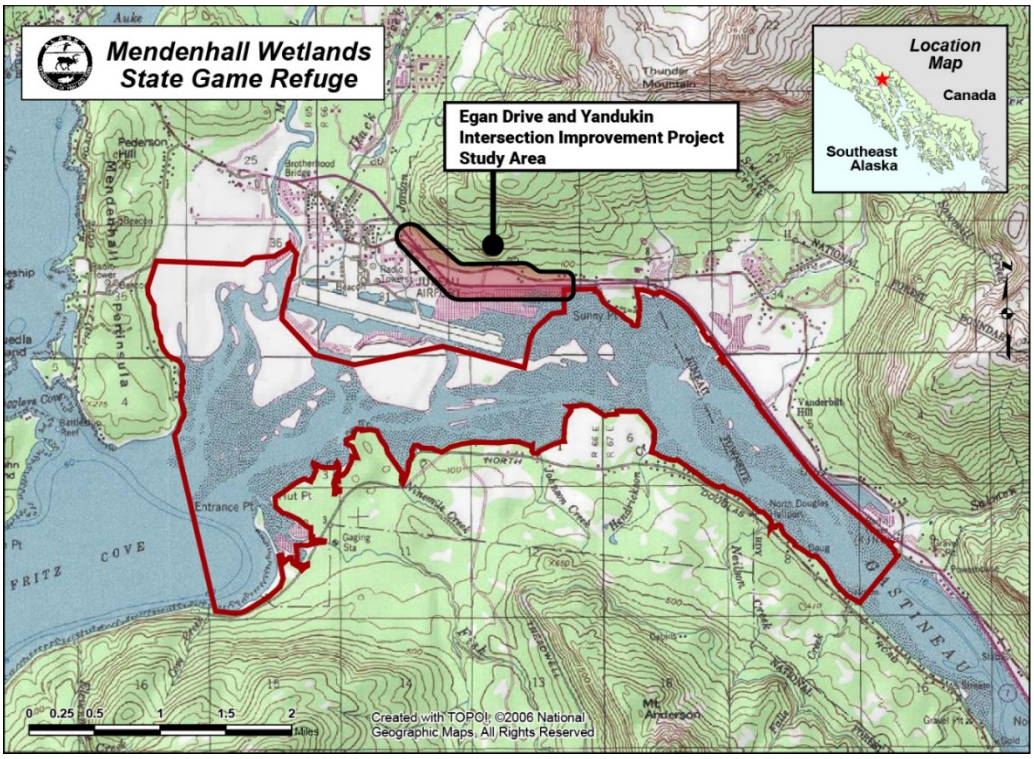
The Glacier Highway Bike Pathway is a non-motorized, separated pathway along the north side of Egan Drive from Lemon Spur to Mendenhall Loop Road. It is a publicly owned facility that is primarily used for transportation and is an integral part of the local transportation system. The requirements of Section 4(f) would not apply to this bike pathway since its primary use is for transportation and not recreation, qualifying it for an exception to the requirement for Section 4(f) approval, listed at 23 CFR 774.113 (f)(4), "Trails, paths, bikeways, and sidewalks that are part of the local transportation system and which function primarily for transportation."

Honsinger Pond, a dredged pond, and the adjacent Honsinger Wetlands (Figure 10), located south of the E-Y intersection, were sold to SEAL as part of the mitigation plan for fill in the Honsinger Pond industrial area (see discussion in the Wetlands section). As they are not publicly owned, Section 4(f) does not apply to these properties.

Figure 10: Honsinger Wetlands

The Mendenhall Wetlands State Game Refuge (Refuge), located south of the study area (Figure 11), is a property afforded Section 4(f) protections under 23 CFR 774.11(i). The *Mendenhall Wetlands State Game Refuge Management Plan* (ADF&G 1990) identifies circumstances under which a transportation corridor may be established on or through Refuge lands; however, there is no formal designation for the transportation corridor and, should one be proposed, it would require Section 4(f) approval. Figure 12 is a map of public access points to the Refuge; however, the study area does not encompass any Refuge access points, with the nearest to the east at Sunny Point.

Figure 11: Mendenhall Wetlands State Game Refuge



Source: http://www.adfg.alaska.gov/static/lands/protectedareas/mendenhallwetlands/pdfs/mendenhall_boundary.pdf

Figure 12: Mendenhall Wetlands State Game Refuge Access Points

Source: https://www.adfg.alaska.gov/static/lands/protectedareas/mendenhallwetlands/pdfs/mendenhall_wetlands_public_access_map.pdf

USFS manages federal lands within the Tongass National Forest, which are located east of Egan Drive near the intersection of Egan Drive and Glacier Highway. These lands are characterized by their "mostly natural" setting, and they are identified in the 2016 Forest Plan (USFS 2016a) as managed for semi-remote recreation, with an overlay land use designation to encourage mineral exploration and development (2016 Record of Decision, Land Use Designations Map; USFS 2016b). While the area is managed for recreation, it does not contain recreation facilities nor public access to recreation trails or facilities.

For a publicly-owned, multiple-use land holding to be subject to the requirements of Section 4(f), the primary purpose of the land as defined in an official management plan must be for public park, recreation, or wildlife and waterfowl refuge purposes and determined to be significant for such purposes (FHWA 2012: Question 4). Coordination with the Official with Jurisdiction (the USFS in this case) has begun and will continue during the subsequent NEPA process. Understanding the primary purpose, current and planned functions of the property in question and the significance of that property will be important in determining its Section 4(f) applicability.

There are no improvements that used funding from the Land and Water Conservation Fund. Therefore, Section 6(f) likely does not apply to this project.

Impacts

The Glacier Highway Bike Pathway, along the north side of Egan Drive from Lemon Spur to Mendenhall Loop Road, is a publicly owned facility primarily used for transportation and is an integral part of the local transportation system. Therefore, it would likely not be considered a Section 4(f) resource.

Honsinger Pond and Honsinger Wetlands would be impacted by all alternatives. However, as discussed in the Wetlands section, the USACE has granted a permit for wetland fill to allow industrial development around Honsinger Pond. Construction activities have begun, and these areas could have already been filled.

None of the alternatives are anticipated to use any lands within the Refuge. In addition, the study area does not encompass any Refuge access points, so no alternatives would affect access to the Refuge.

A small portion of federal lands within the Tongass National Forest, located east of Egan Drive near the intersection of Egan Drive and Glacier Highway, would be impacted by alternatives that include the Glacier Lemon Spur Extension. While the area is managed for recreation, it does not contain recreation facilities nor public access to recreation trails or facilities. Assuming it qualifies as a Section 4(f) property, the impacts to it could be considered *de minimis* because of the size of the property that might be needed for transportation uses compared to the overall size of the USFS parcel designated for remote recreation. Coordination with USFS regarding potential impacts is ongoing and would continue through the NEPA process.

Resource of Public or Agency Concern / Agency Coordination
Public and agency comments regarding recreation pertain primarily to bicyclist and pedestrian facilities and safety. Commenters are concerned that the alternatives provide safe facilities. No comments were received regarding Section 4(f) resources; however, this is a concern to SEO since they have responsibility to make sure the project (during the NEPA phase) complies with the requirements of Section 4(f).

Possible Mitigation
Possible mitigation measures could include:

- Include BMPs during construction to reduce impacts from sedimentation and invasive plants
- Minimize impacts to properties through design techniques
- Revegetate using approved materials adjacent to properties

Next Steps
Next steps, as required for parks and recreation areas under Section 4(f) are as follows:

- Confirm all Section 4(f) properties in the study area, both existing and planned
- Continue to coordinate with the Official with Jurisdiction (USFS) for the Tongass National Forest during the subsequent NEPA process
- Define uses of these properties
- If an individual Section 4(f) Evaluation is determined to be needed, determine if a feasible and prudent alternative exists (see 23 CFR 774.17 for a definition of what constitutes a feasible and prudent alternative)
- Identify all possible planning measures to minimize harm to the properties
- Coordinate with the Official with Jurisdiction over the property
- Determine the correct type of Section 4(f) documentation to pursue, including an Individual Section 4(f) Evaluation (note, feasible and prudent alternatives to the use of the property will need to be developed), a *de minimis* impact (note, official with jurisdiction will need to concur with the finding that the project does not adversely affect the attributes that qualify the properties for protection under Section 4(f)), an enhancement exception (see note for *de minimis*), or a net benefit (because of the improved access and safety associated with wider walks)
- Prepare documentation of the Section 4(f) Evaluation in accordance with 23 CFR 774

Visual Resources

Methodology
A high-level effort was conducted to identify sensitive receptors and potential noise impacts, including reviewing aerial and street level photography and stakeholder comments.

Description of Existing Conditions
The study area varies in visual character. Commercial/retail use (big-box and small/stand-alone stores, restaurants, hotels, veterinary clinics) dominate the viewscape in the study area. Fred

Meyer and its associated buildings and parking are northwest of the E-Y intersection. Other land use includes undeveloped and industrial land, the airport, and a church complex. The Juneau International Airport is southwest of the E-Y intersection. The Juneau Christian Center is northeast of the E-Y intersection. Some portions of the study area appear to be denser/visually cluttered (such as the area between the airport and Egan Drive), while others appear more open or undeveloped (e.g., the Honsinger Pond and Wetlands area).

Impacts
Eight of the ten project alternatives would not significantly change the visual landscape in the study area as they do not significantly change the road vertically or horizontally, and therefore will not change views of the road nor views from the road. The two Diamond Interchange alternatives would affect the visual landscape, introducing an overpass with guardrail or concrete barriers. These alternatives would obstruct views of portions of the Fred Meyer, Juneau Christian Center, and Honsinger Pond private properties. The overpass would also obstruct people's views of businesses on the other side of Egan Drive. In general, users of the road, as well as those viewing the road from other viewpoints, would still see an expanse of pavement and vehicles, edged by commercial, airport, and religious properties. Temporary visual impacts would occur during construction, including more construction vehicles, construction/detour signage, and material removals or stockpiles.

Resource of Public or Agency Concern / Agency Coordination
Public and agency comments regarding visual resources expressed the following concerns:

- Impacts of the project on the viewshed, specifically views from the Juneau Christian Center and Fred Meyer
- Visual impacts of elevating the roadway for an overpass (like at Sunny Point)
- Sightlines and limited views of parts of the travelway and driveways
- Safety issues associated with visibility/sightlines
- Overpass/interchange alternatives affecting views of wetlands, Douglas Island, and the Gastineau Channel
- Impacts on the views for travelers arriving in Juneau and leaving the Juneau International Airport

Commenters requested renderings of the alternatives so the public can understand how viewscapes would change as a result of the project. While renderings are not currently available, they could be considered once the NEPA process has begun.

Possible Mitigation
Possible mitigation for visual impacts could include:

- Select colors, treatments, and landscaping/vegetation to blend with adjacent surroundings
- Screen material stockpiles used during construction

Next Steps

Next steps for visual resources could include:

- During the NEPA process, a full visual impact assessment will be performed, which may include renderings of alternatives
- During the design process, aesthetic streetscape improvements could be investigated, including business visibility and signage, landscape materials selection, design elements/streetscape furnishings (e.g., planters, benches, trash receptacles), and lighting

Noise

Methodology

A high-level review of online maps was conducted to identify potential sensitive receptors.

Description of Existing Conditions

Identified noise-sensitive land uses located within and near the study area include a church, residential areas, hotels, and open space areas.

The primary existing noise source in the study area is traffic noise from Egan Drive. However, aircraft and helicopter noise is also heard due to the proximity of the Juneau International Airport. Noise levels were not measured but existing levels are believed to be consistent with similar areas in close proximity to roads carrying high traffic volumes.

Impacts

The *DOT&PF Noise Policy* defines traffic noise impacts as design year build conditions that create a substantial noise increase over existing noise levels or design year build condition noise levels that approach or exceed the Noise Abatement Criteria (DOT&PF 2018). A substantial noise increase would be considered an increase in design year noise levels of 15 or more dBA over the existing noise level (for a Type I project).

The two Diamond Interchange alternatives would likely be considered a Type I project because of substantial vertical alternation. The Glacier Lemon Spur Extension component would likely be considered a Type I project because it is the construction of a highway on a new location. The other alternatives would likely be Type II projects. DOT&PF does not participate in the voluntary Type II noise program.

Resource of Public or Agency Concern / Agency Coordination

To date, no public or agency concerns have been identified regarding noise impacts.

Possible Mitigation

The *DOT&PF Noise Policy* (DOT&PF 2018) identifies when mitigation measures are to be considered. According to the policy, traffic noise abatement measures are to be considered when traffic noise impacts have been identified through the noise analysis process. Noise abatement measures must be found to be both feasible and reasonable to be included in a proposed project.

Construction noise would be subject to local regulations and ordinances.

Next Steps
Confirm that alternative(s) that advance to the subsequent NEPA process do or do not qualify as a Type I project. If the alternative(s) under considering is a Type I project, a noise study may be required to determine if there is a noise impact and if any mitigation is appropriate. The type of analysis performed as part of the noise study will be coordinated with the SEO prior to the study start.

Air Quality

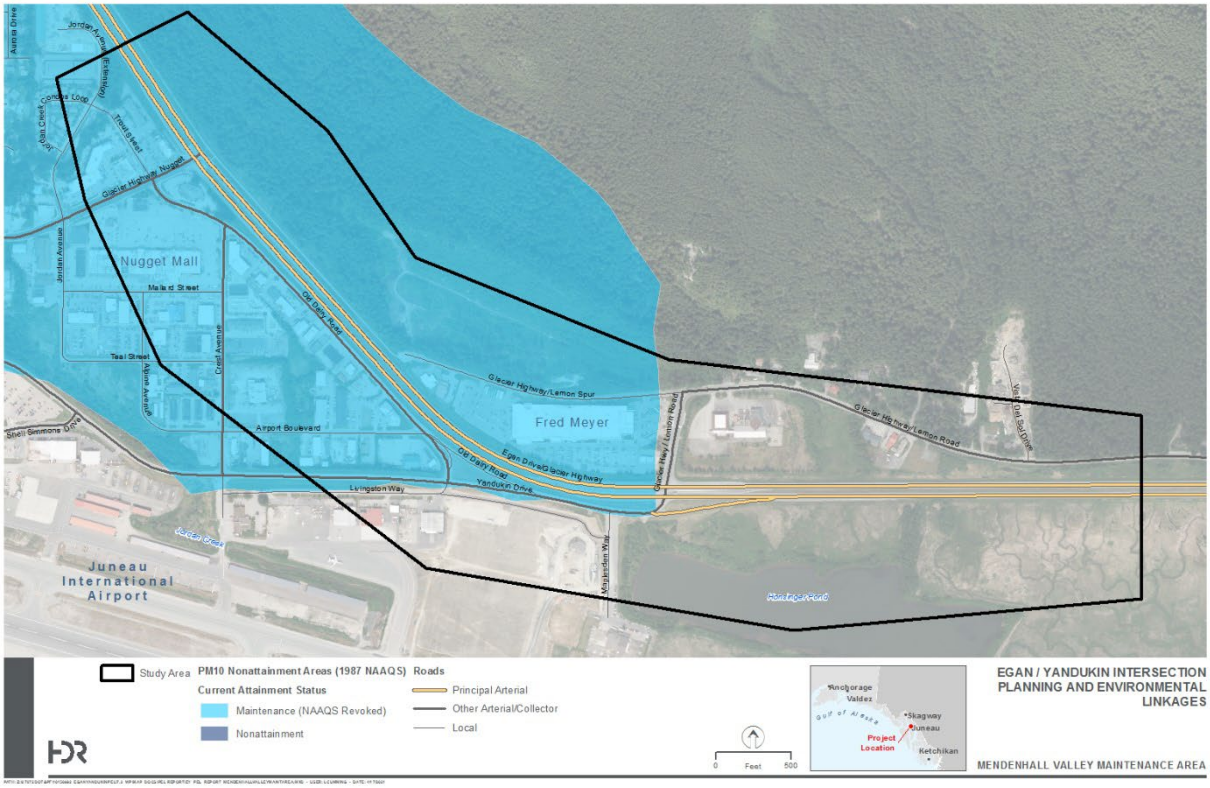
Methodology
This section is based on a review of the State of Alaska's Limited Maintenance Plan (LMP) for the Mendenhall Valley Nonattainment Area (ADEC 2020b).

Description of Existing Conditions
EPA designated Mendenhall Valley as an area of moderate nonattainment for National Ambient Air Quality Standard (NAAQS) for particulate matter with an aerodynamic diameter of 10 micrometers (PM_{10}) or less in 1991. Particulate matter pollution is a public health issue because these particles are small enough to penetrate deep into the lungs to cause health problems. Sources of PM_{10} include dust and soot, which can come from paved roads, unpaved roads, unvegetated lots, glacial silts, wood smoke, heating devices, and forest fires.

The State of Alaska has a LMP for the Mendenhall Valley nonattainment area, which outlines the control measures and contingency measures in place. The EPA approved the plan and re-designated the area to attainment for the PM_{10} NAAQS, effective July 2013. The State has prepared a second LMP per regulations and conducted public outreach on the proposed 2020 LMP in June 2020.

The Mendenhall Valley maintenance area extends from the northern boundary of the Juneau International Airport north through the Mendenhall Valley to the southern edge of the Mendenhall Glacier. It includes part of the study area, as shown in Figure 13.

Figure 13: Mendenhall Valley Air Quality Maintenance Area



Impacts

Air quality impacts could occur from an increased amount of pavement needing winter sanding, which could result in increased PM_{10} emissions, from re-entrained dust. The project alternatives would not increase forecasted traffic volumes or change anticipated traffic vehicle mix. Therefore, it would not be anticipated that other NAAQS emissions levels, such as carbon monoxide, would be impacted.

Each build alternative would add pavement that would be subject to additional winter sanding, which may contribute to re-entrained dust particles and, as a result, may increase PM_{10} emissions.

The alternative Two Signalized T-intersections with Diamond Interchange with Two-Way Frontage Road to Glacier Nugget would have the greatest increase in pavement area subject to winter sanding.

Table 11 summarizes the increase in pavement area subject to winter sanding. These estimates do not include areas that replace existing paved surfaces with new pavement.

Temporary impacts to air quality would likely occur during construction.

Table 11: Increase in Pavement Area Subject to Winter Sanding

Alternative	Additional Winter Sanding Area (acres)
No Build	0.0
Mobility with median crossovers	1.4
Mobility with Glacier Lemon Spur Extension	1.48
Partial Signal with median crossovers	1.79
Partial Signal with Glacier Lemon Spur Extension	1.87
Full Signal with median crossovers	2.29
Full Signal with Glacier Lemon Spur Extension	2.36
2 Signalized T-Intersections	1.64
2 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

Resource of Public or Agency Concern / Agency Coordination
Public stakeholders identified increased road dust as an issue of concern during public workshops. In addition, the ADEC expressed concerns about transportation conformity.

Possible Mitigation
The Mendenhall Valley maintenance area relies on the measures that include sweeping and sanding mitigation programs, dust suppressants, and reducing speeds. CBJ and DOT&PF work to optimize sanding and deicing materials to maximize road safety and minimize the entrainment of fine dust in the air. These programs would continue as part of the proposed 2020 LMP currently under review.

Next Steps
Because the study area is within the boundaries of a maintenance area, a transportation conformity analysis is required. This includes:

- Conducting an analysis to determine if a PM_{10} quantitative hot spot analysis will be required; it is unlikely this will be required since the project will not result in a significant number of or significant increase in diesel vehicles
- Conducting either a quantitative or qualitative assessment of likely PM_{10} emissions
- Coordinating with the SEO and ADEC

- Making sure the project (with correct design scope) is in the Statewide Transportation Improvement Program (STIP)

Hazardous Materials

Methodology
The identification of hazardous materials was based on an October 2020 search of the State of Alaska Contaminated Sites database to identify known spills and contaminated soils and water within and adjacent to the study area (ADEC 2020a). A review of the study area map was also conducted to identify additional sites that have a high potential of containing hazardous materials.

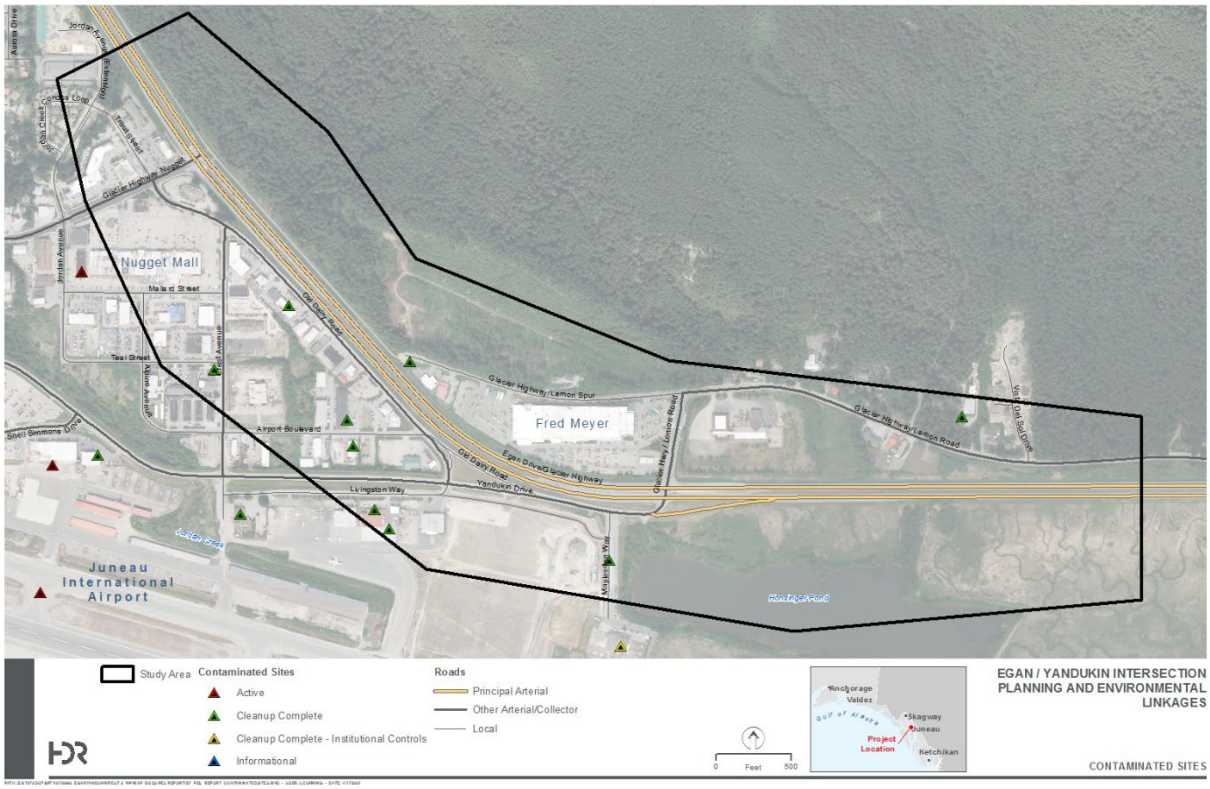
Description of Existing Conditions
The database search identified multiple sites with historic petroleum contamination from underground and aboveground storage tanks that have been cleaned up and closed per ADEC (Figure 14).

The Juneau Heliport at the east side of the airport had petroleum-contaminated soils. While soils were removed and treated off-site, some residual soil contamination was left in place, and there are groundwater use restrictions. It is considered closed with institutional controls, and construction activities that would disturb soils and groundwater movements may require ADEC consultation.

There are multiple active sites at the Juneau International Airport. However, the closest active site (approximately 220 feet) to the study area is the former Capital City Cleaners at the Nugget Mall, where soil and groundwater are contaminated with volatile organic compounds: Perchloroethylene, tetrachloroethylene , and 1,2- Dichloroethylene. The site has a soil vapor extraction system to mitigation the potential for vapor intrusion.

Fred Meyer operates a fuel stop at the southeast corner of its parking lot (8181 Glacier Highway). It has three underground storage tanks (USTs) in use for gasoline and diesel. While there are no reported spills or contaminated sites associated with the USTs, the presence of petroleum products at that location being stored and dispensed regularly is a condition recognized as a potential environmental concern. Multiple USTs are permanently out of use (closure status unknown), at Temsco Helicopters (1650 Maplesden Way), immediately southwest of Honsinger Pond. One 8,000-gallon kerosene UST remains in use.

Figure 14: Hazardous Materials Locations



Impacts

Any build alternative that would result in disturbing soils and groundwater in the study area could impact known contaminated soils. Construction of the Diamond Interchange alternative may impact the fuel stop at Fred Meyer. It is unknown whether this alternative would require the relocation of the UST or fuel stop entirely.

Resource of Public or Agency Concern / Agency Coordination

No specific comments or concerns about hazardous materials have been expressed by public and agency stakeholders at this time.

Possible Mitigation

Should any previously unknown contaminated soils and waters be encountered during construction, DOT&PF would work with ADEC to determine a plan of action. Typically, this could include testing, removal and remediation as feasible, and monitoring. DOT&PF requires contractors to follow BMPs to properly store, transport, and contain hazardous substances during construction to avoid spills and leaks. If excavation dewatering occurs within 1,500 feet of a contaminated site, an excavation dewatering permit would be obtained.

Next Steps
If contamination is known or suspected, DOT&PF typically performs a Phase I environmental site assessment to identify potential hazardous material concerns and required mitigation during the NEPA process.

Cumulative Impacts

NEPA and its implementing regulations (40 CFR 1508.7), as well as the implementing regulations for PEL studies (23 CFR 450.212), require federal agencies to identify and analyze the direct, indirect, and cumulative impacts of a proposed action in sufficient detail to make an informed decision. A cumulative impact analysis at this stage of project development can be useful to identify any cumulative impacts that could be of concern and potential mitigation options. Cumulative impacts result when the impacts of an action are added to the impacts of other actions, including past, present, and reasonably foreseeable future actions.

Methodology
The cumulative impact analysis was performed by identifying past, present, and reasonably foreseeable future actions initiated by any entity (e.g., other federal, state, tribal, or local government of private entities) in the study area. These were then assessed to determine if these, when combined with the project impacts, result in significant impacts to an environmental resource.

Impacts
Past actions that affect the resources in the study area include the development of Juneau International Airport and Egan Drive, development near Auke Bay and Mendenhall Valley, growth of the tourism industry, and related activities. This has resulted in changes in land use and increases in traffic along the corridor, as well as impacts to wetlands, wildlife, and other natural features.

Present and future actions that may impact resources in or near the study area include:

- Juneau International Airport has a number of infrastructure and planning projects underway. Most of these are expected to have little or no environmental impact because of their location or their limited scope.
- The Honsinger Pond private property, located at the southeast corner of the E-Y intersection, is currently being developed as a commercial/light industrial development.
- DOT&PF and CBJ have renewed interest in considering a new crossing to Douglas Island. Previous work on this project has indicated that a possible location for the crossing could be near the study area.

Resources in the study area that would be affected by ongoing transportation and land use development include water quality, wetlands, floodplains, vegetation, air quality, and transportation. When combined with past, present, and future activities, resources in the study area that could have a cumulative impact include water quality and air quality. Increased demand is also likely to be placed on vehicle travel, non-motorized facilities, and transit facilities.

The present and future actions planned in the study area will affect natural resources (water quality, wetlands, floodplains, air quality) and socioeconomic resources.

Because each of the project alternatives would result in increased impervious area, effects to the water quality status of Jordan Creek are a concern. In addition, increased impervious area results in the need for more winter sanding, which could have a negative effect on air quality. However, water quality mitigation may reduce the cumulative effect as a result of the federal action on water quality. Cumulative effects as a result of the federal action, when added to past, present, and reasonably foreseeable future actions are not expected to result in significant cumulative effects to water quality and air quality because of mitigation and because of the relatively small additional impervious area when compared to likely impacts of the future land development.

Resource of Public or Agency Concern / Agency Coordination
To date, no public or agency concerns have been identified specific to cumulative impacts.

Possible Mitigation
No mitigation has been identified.

Next Steps
These preliminary findings will be reassessed during the subsequent NEPA process when additional environmental analysis will be conducted, along with additional resource agency coordination and public engagement.

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Appendix A: Resource Maps by Alternative

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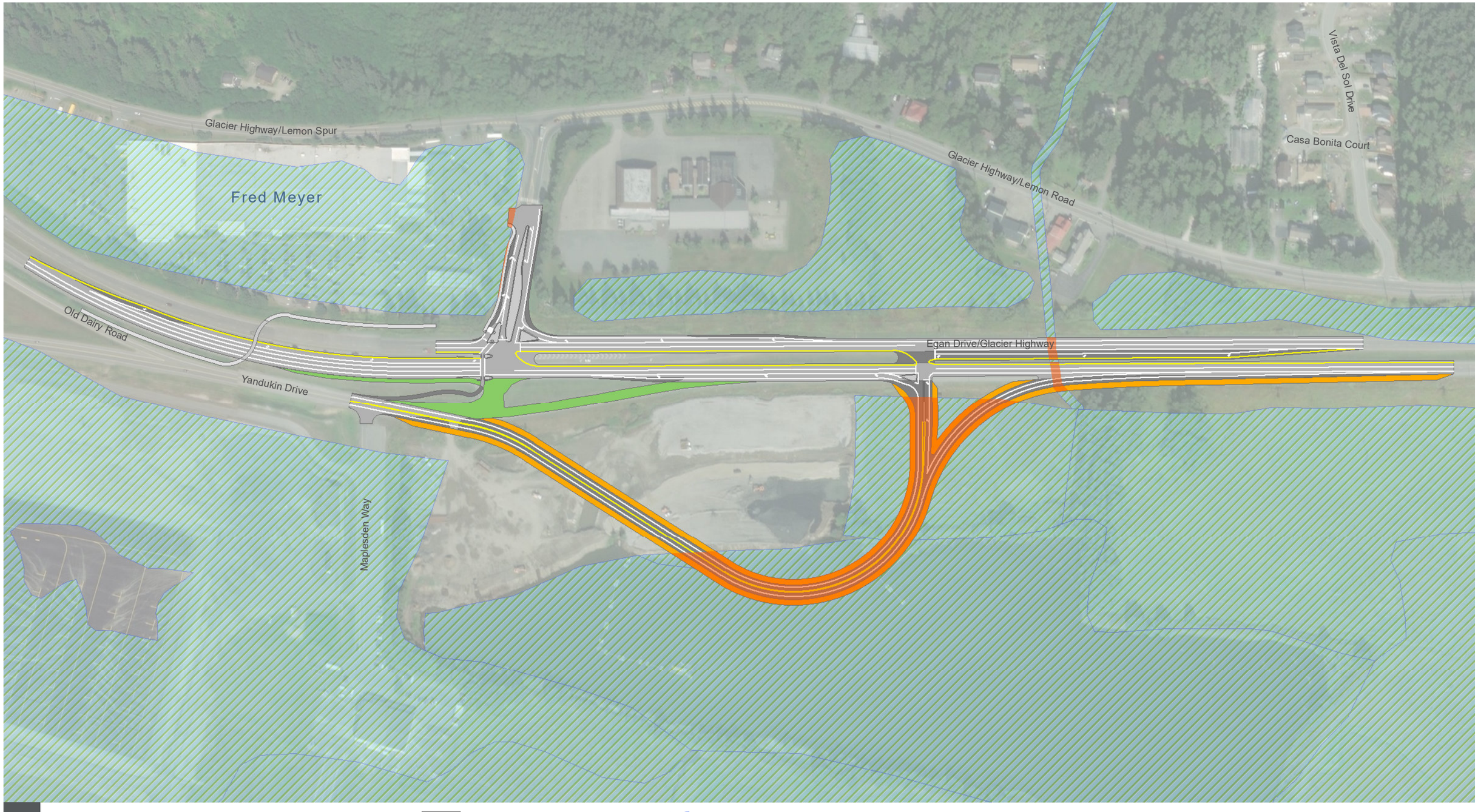


2T Intersections Footprints

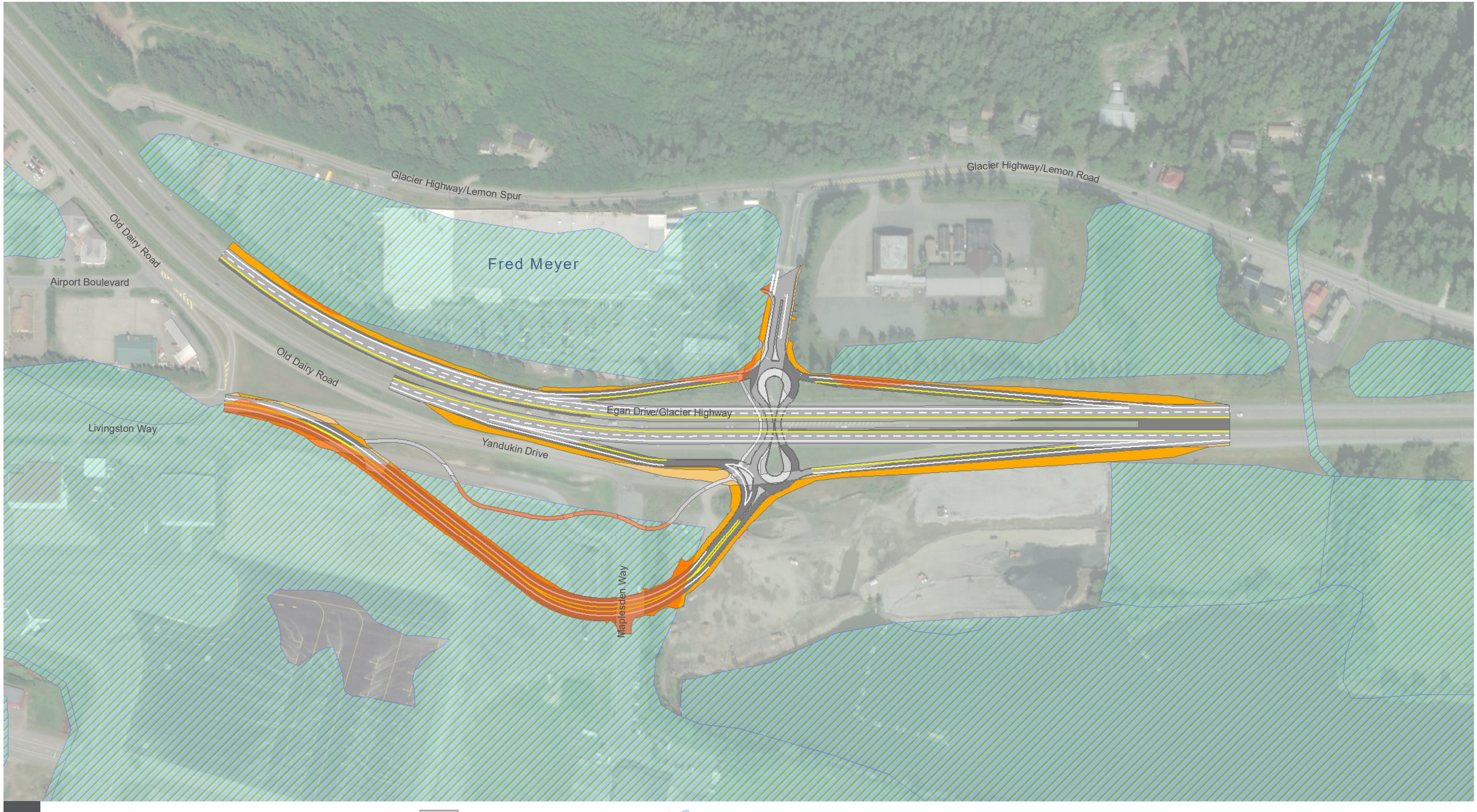
- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Grass - remove existing asphalt
- Cut/Fill
- NWI Wetlands
- Wetlands Impact Areas

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

0 Feet 250

ALTERNATIVE "2T INTERSECTIONS" WETLAND IMPACTS

FIGURE 8A



Diamond Interchange Footprints

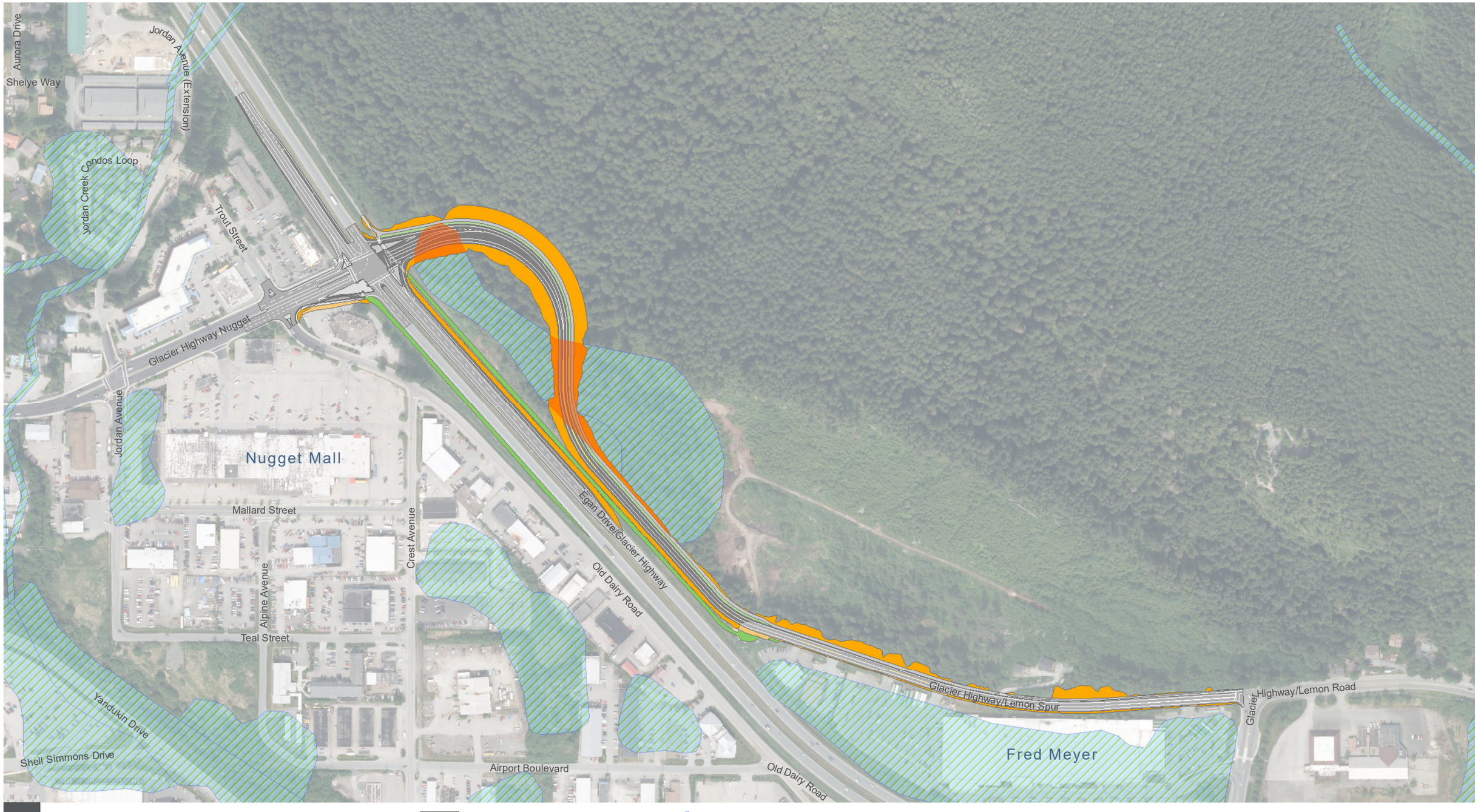
- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Cut/Fill over existing paved area
- Cut/Fill
- NWI Wetlands
- Wetlands Impact Areas

0 Feet 250

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "DIAMOND INTERCHANGE" WETLAND IMPACTS

FIGURE 8B



Extension to Nugget Footprints

- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Grass over existing natural area
- Grass - remove existing asphalt
- Cut/Fill over existing paved area
- Cut/Fill
- NWI Wetlands
- Wetlands Impact Areas

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "EXTENSION TO NUGGET" WETLAND IMPACTS

FIGURE 8C

0 Feet 333

PATH: Z:\07072 DOT&PF\10150992_EGANYANDUKINPEL\7.2_WP\MAP_DOCS\ENVIRONMENTALOVERVIEW\IMPACTS\EY_PEL_ENVIRONMENTALOVERVIEW_WETLANDIMPACTS_EXTNUGGET.MXD - USER: SNORTON - DATE: 12/15/2020

Glacier Highway/Lemon Spur

Glacier Highway/Lemon Road

Fred Meyer

Old Dairy Road

Old Dairy Road

Egan Drive/Glacier Highway

Livingston Way

Yandukin Drive

Mapiesden Way

Full Access Signal Footprints

- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Grass - remove existing asphalt
- NWI Wetlands
- Wetlands Impact Areas

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "FULL ACCESS SIGNAL" WETLAND IMPACTS

FIGURE 8D

0 Feet 175

Glacier Highway/Lemon Spur

Glacier Highway/Lemon Road

Fred Meyer

Airport Boulevard

Old Dairy Road

Old Dairy Road

Egan Drive/Glacier Highway

Livingston Way

Yandukin Drive

Maplesden Way

Mobility Alternative Footprints

- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete

- NWI Wetlands
- Wetlands Impact Areas

0 Feet 175

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "MOBILITY ALTERNATIVE" WETLAND IMPACTS

FIGURE 8E

Partial Access Signal Footprints

- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Grass - remove existing asphalt
- NWI Wetlands
- Wetlands Impact Areas

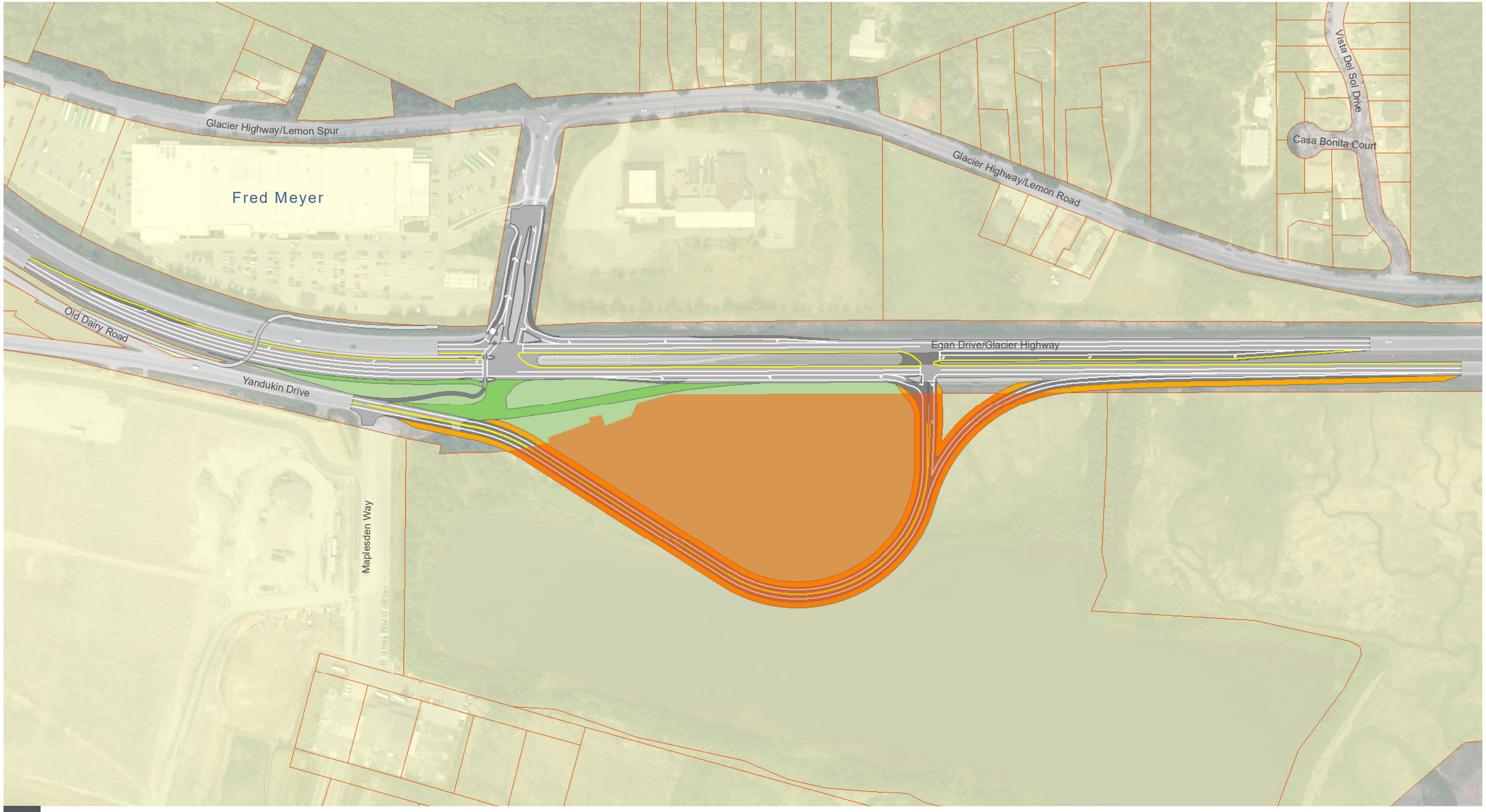
HDR

0 Feet 175

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "PARTIAL ACCESS SIGNAL" WETLAND IMPACTS

FIGURE 8F



2T Intersections Footprints

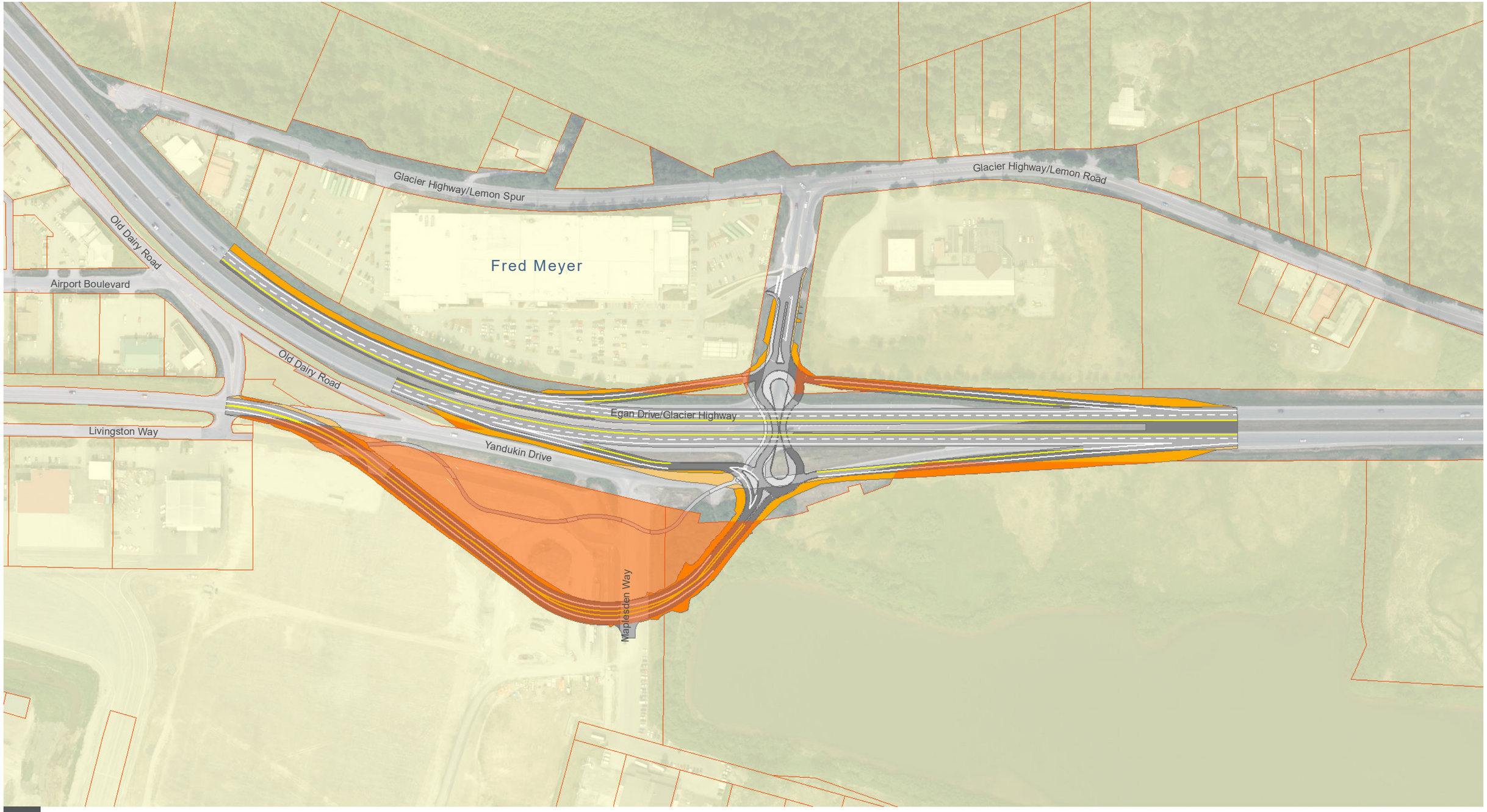
- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Grass - remove existing asphalt
- Cut/Fill
- Parcels
- ROW Acquisition Impact Areas

0 Feet 250

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "2T INTERSECTIONS" ROW ACQUISITION IMPACTS

FIGURE 9A



Diamond Interchange Footprints

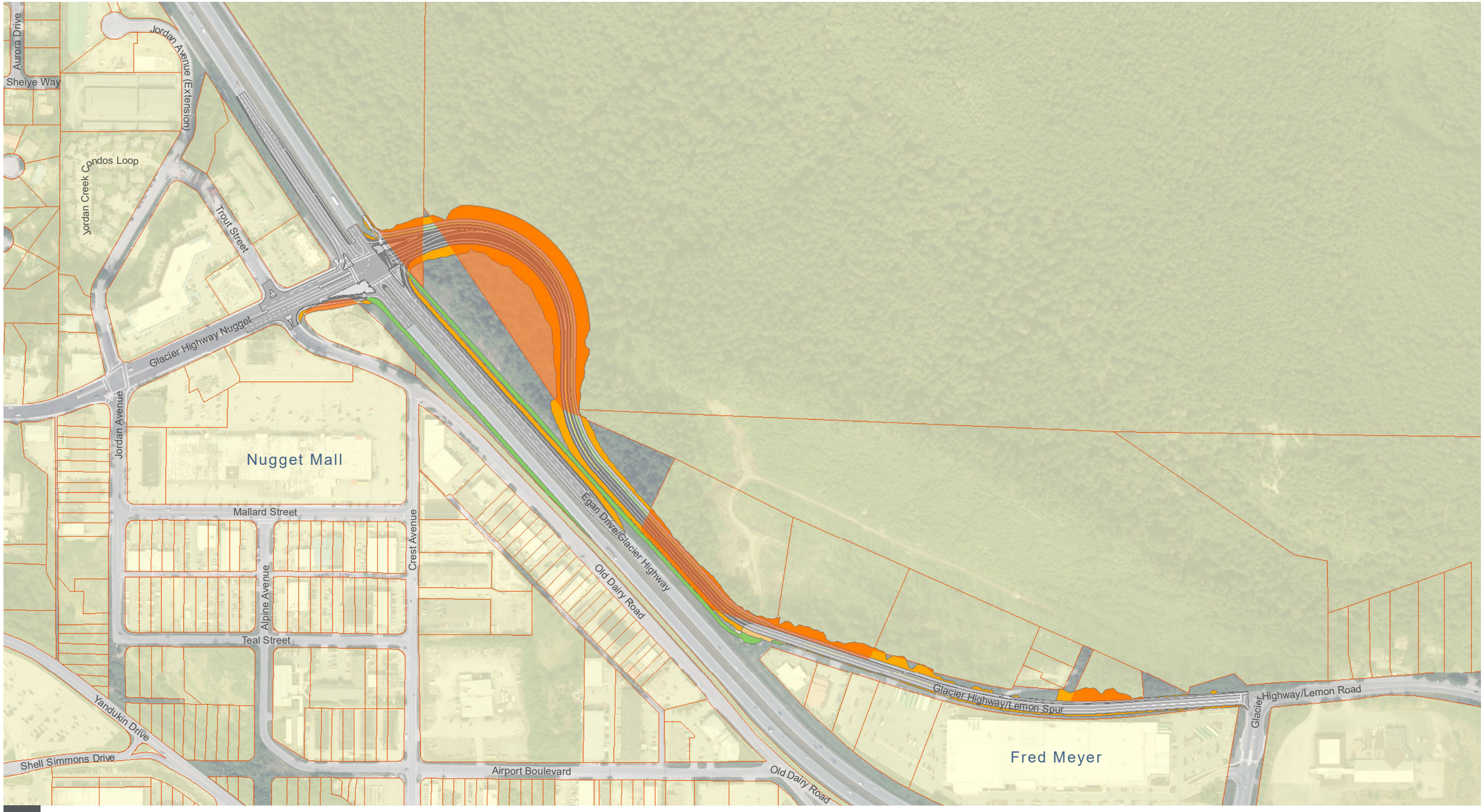
- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Cut/Fill over existing paved area
- Cut/Fill
- Parcels
- ROW Acquisition Impact Areas

0 Feet 250

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "DIAMOND INTERCHANGE" ROW ACQUISITION IMPACTS

FIGURE 9B



Extension to Nugget Footprints

- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Grass over existing natural area
- Grass - remove existing asphalt
- Cut/Fill over existing paved area
- Cut/Fill
- Parcels
- ROW Acquisition Impact Areas

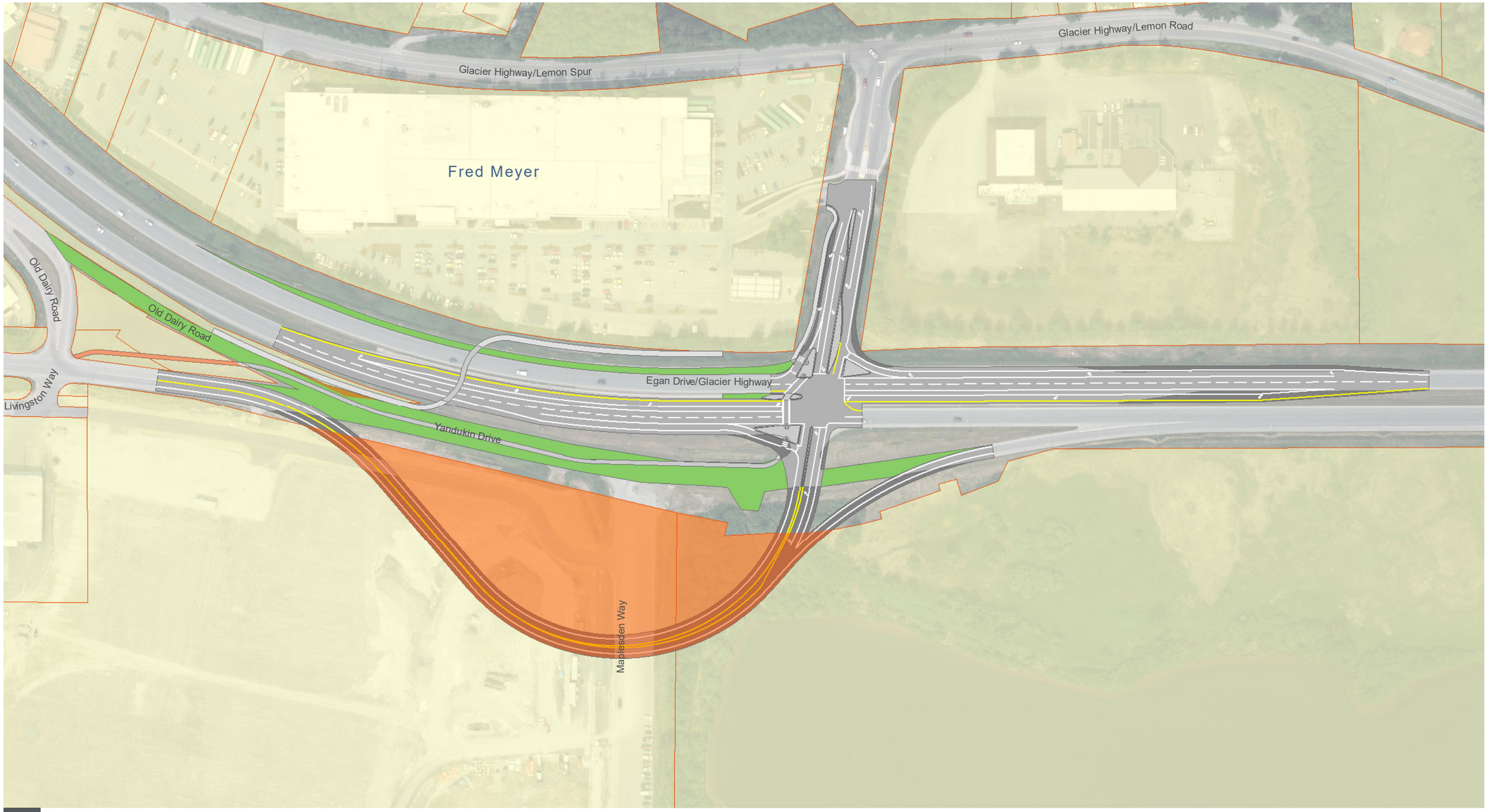
0 Feet 333

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "EXTENSION TO NUGGET" ROW ACQUISITION IMPACTS

FIGURE 9C

PATH: Z:\07072 DOT&PF\10150992_EGANYANDUKINPEL\7.2_WP\MAP_DOCS\ENVIRONMENTALOVERVIEW\IMPACTS\EY_PEL_ENVIRONMENTALOVERVIEW_ROWIMPACTS_EXTNUGGET.MXD - USER: SNORTON - DATE: 11/9/2020



Full Access Signal Footprints

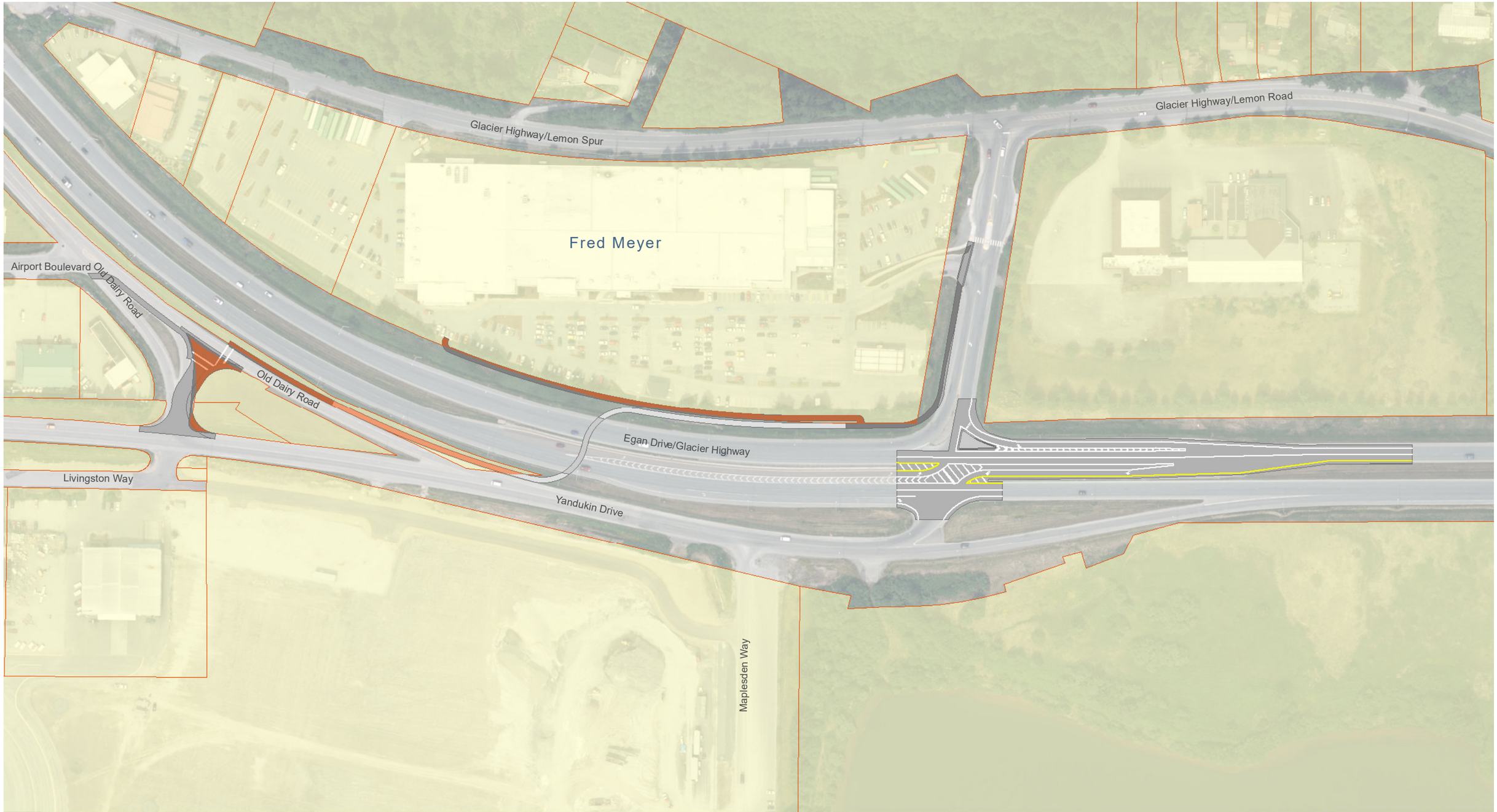
- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Grass - remove existing asphalt
- Parcels
- ROW Acquisition Impact Areas

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

0 Feet 175

ALTERNATIVE "FULL ACCESS SIGNAL" ROW ACQUISITION IMPACTS

FIGURE 9D



Mobility Alternative Footprints

- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete

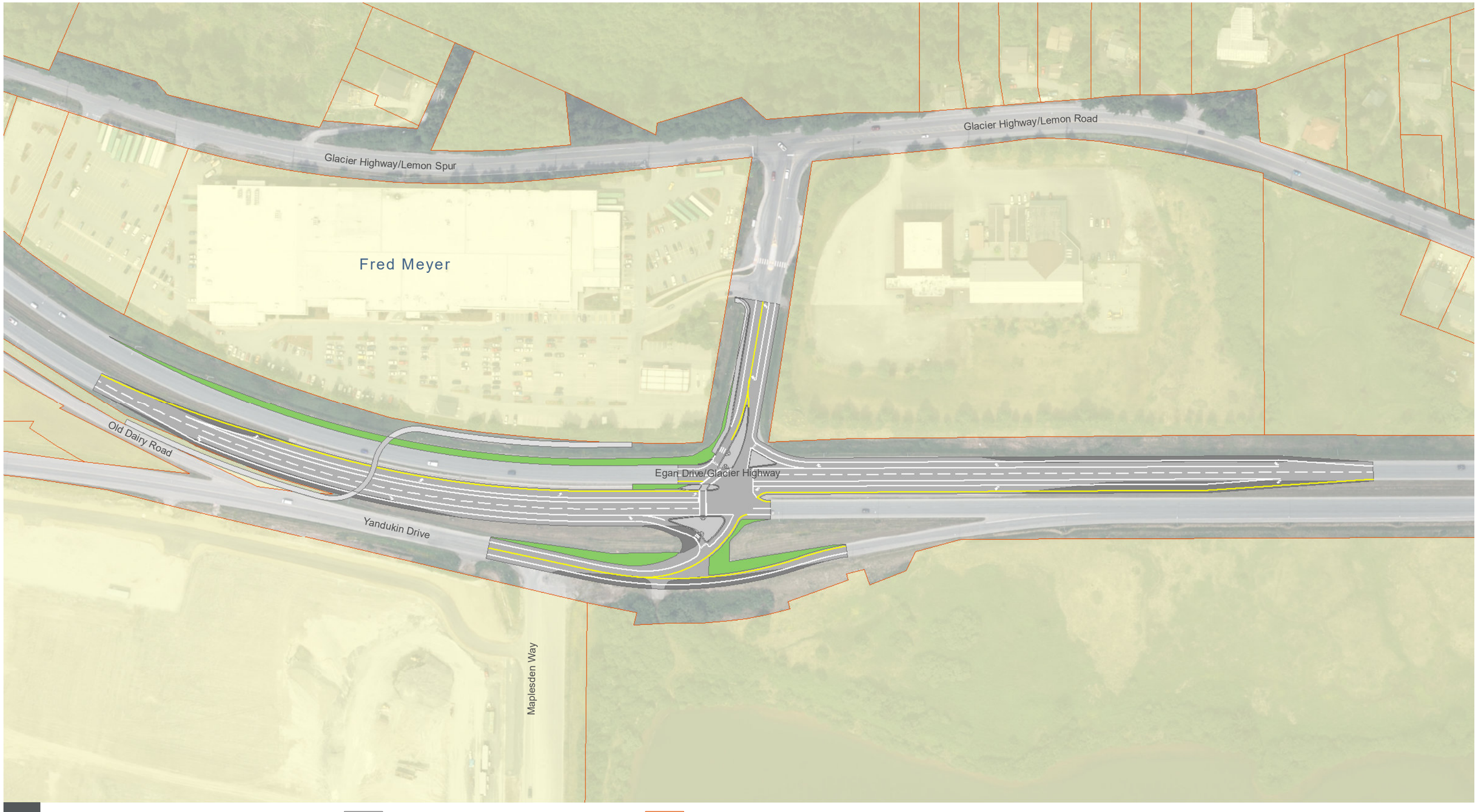
- Parcels
- ROW Acquisition Impact Areas

0 Feet 175

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "MOBILITY ALTERNATIVE" ROW ACQUISITION IMPACTS

FIGURE 9E



Partial Access Signal Footprints

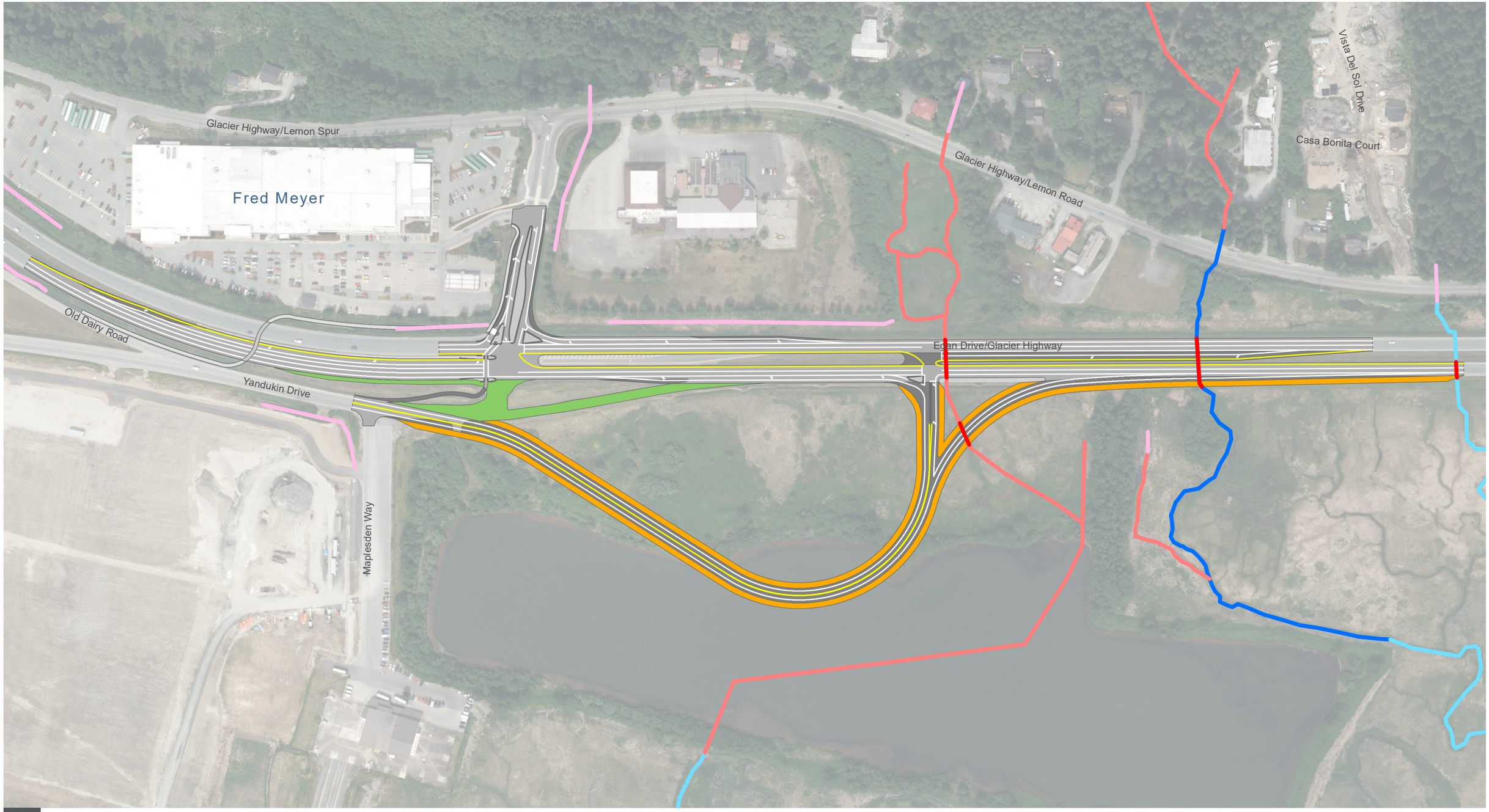
- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Grass - remove existing asphalt
- Parcels
- ROW Acquisition Impact Areas

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

0 Feet 175

ALTERNATIVE "PARTIAL ACCESS SIGNAL" ROW ACQUISITION IMPACTS

FIGURE 9F



2T Intersections Footprints

- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Grass - remove existing asphalt
- Cut/Fill

Fish Habitat Streams - ADF&G 2020

- 2020 AWC
- Addition (Anadromous)
- Resident Fish
- Conveyance (No Fish)
- Impacted Stream Segment

0 Feet 250

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "2T INTERSECTIONS" STREAM IMPACTS

FIGURE 10A

Glacier Highway/Lemon Spur

Glacier Highway/Lemon Road

Fred Meyer

Old Dairy Road

Airport Boulevard

Old Dairy Road

Egan Drive/Glacier Highway

Livingston Way

Yandukin Drive

Mapleston Way

Diamond Interchange Footprints

- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Cut/Fill over existing paved area
- Cut/Fill

Fish Habitat Streams - ADF&G 2020

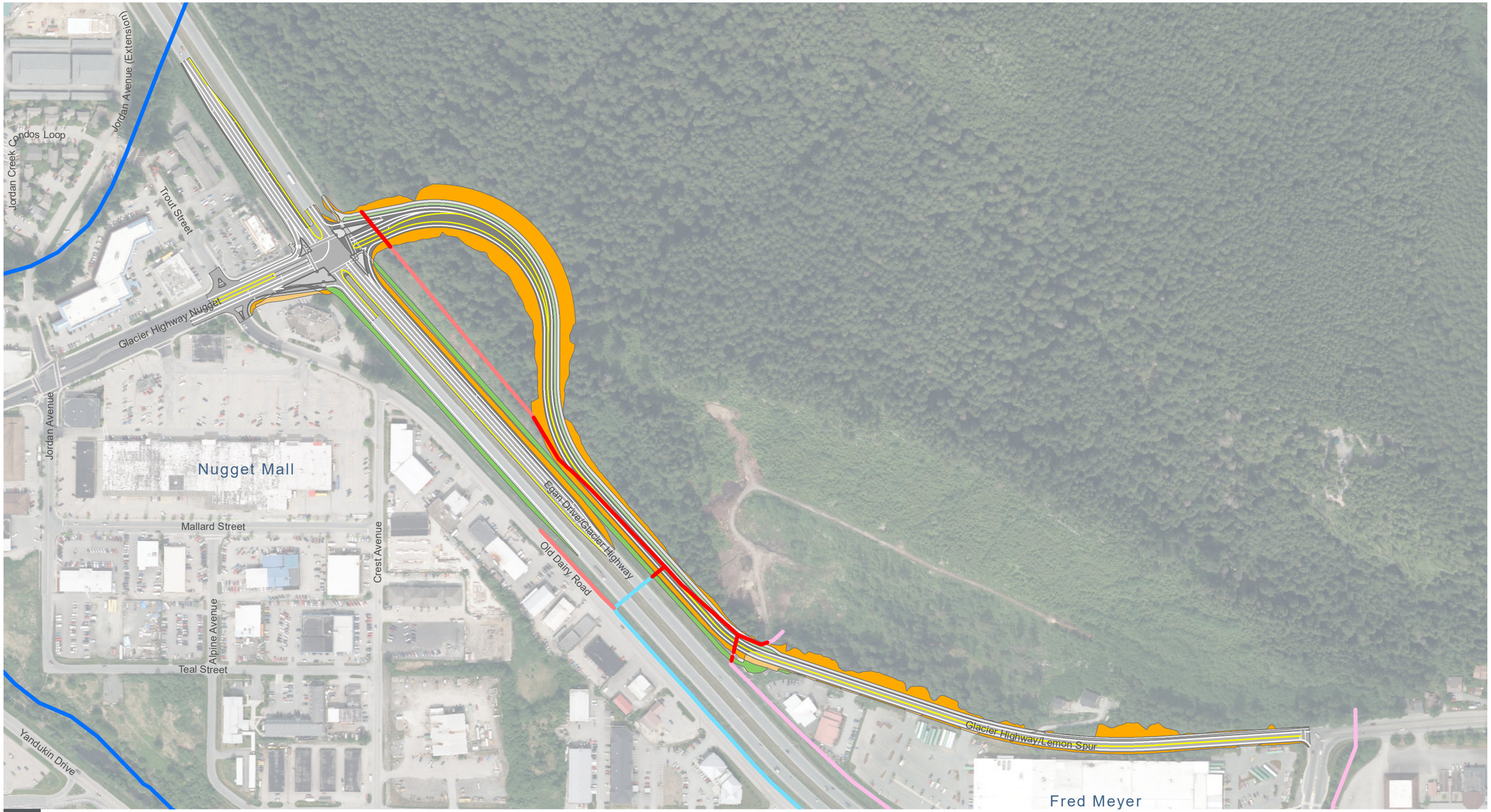
- 2020 AWC
- Addition (Anadromous)
- Resident Fish
- Conveyance (No Fish)
- Impacted Stream Segment

0 Feet 250

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "DIAMOND INTERCHANGE" STREAM IMPACTS

FIGURE 10B



Extension to Nugget Footprints

- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Grass over existing natural area
- Grass - remove existing asphalt
- Cut/Fill over existing paved area
- Cut/Fill

Fish Habitat Streams - ADF&G 2020

- Impacted Stream Segment
- 2020 AWC
- Addition (Anadromous)
- Resident Fish
- Conveyance (No Fish)

0 Feet 300

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "EXTENSION TO NUGGET" STREAM IMPACTS

FIGURE 10C

Glacier Highway/Lemon Spur

Glacier Highway/Lemon Road

Fred Meyer

Old Dairy Road

Old Dairy Road

Livingston Way

Egan Drive/Glacier Highway

Yandukin Drive

Mapplesden Way

Full Access Signal Footprints

- Asphalt over existing asphalt
- New asphalt
- Sidewalk_Concrete over existing pavement
- New Sidewalk/Concrete
- Grass - remove existing asphalt

Fish Habitat Streams - ADF&G 2020

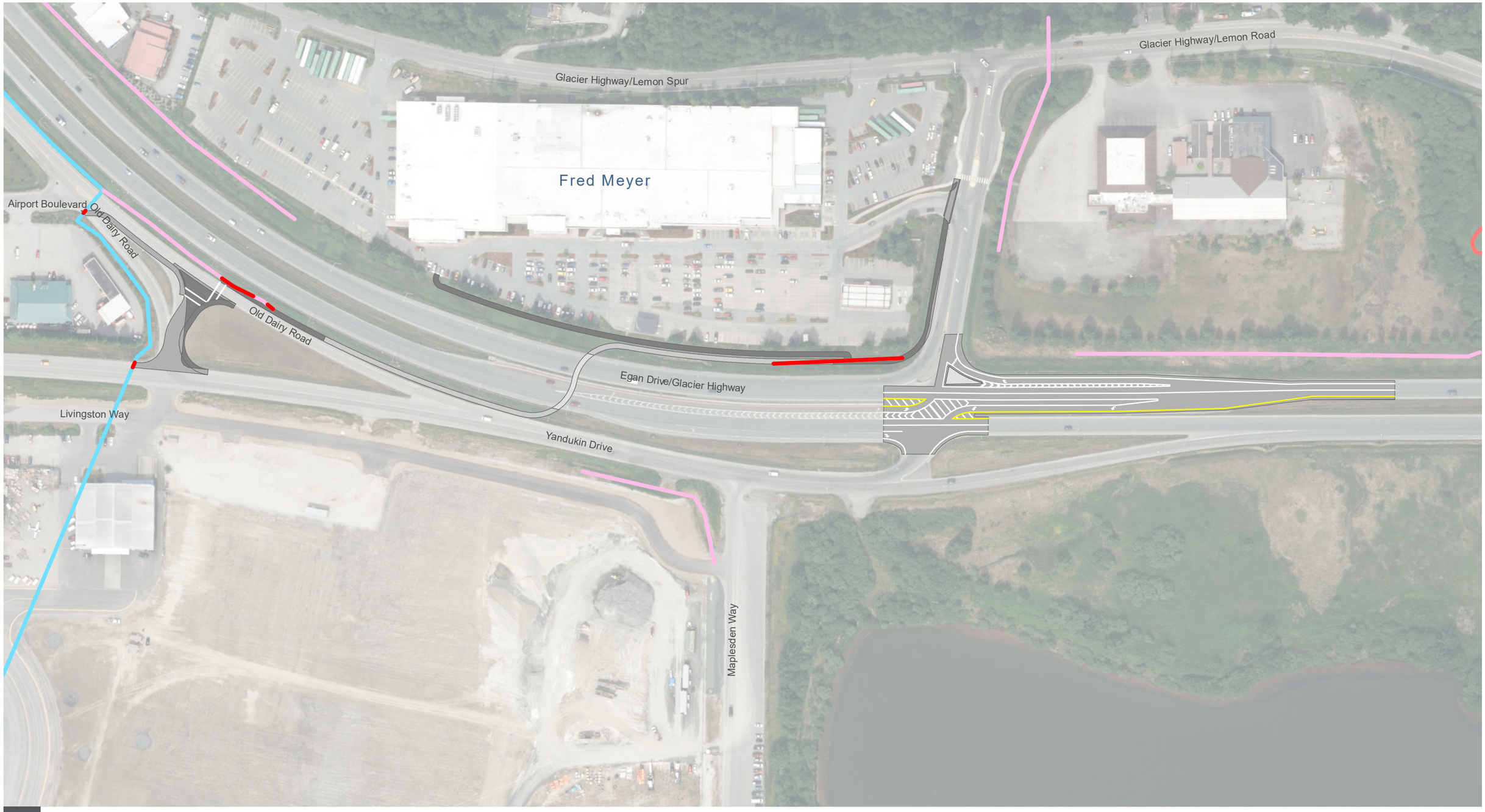
- Addition (Anadromous)
- Resident Fish
- Conveyance (No Fish)

0 Feet 175

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "FULL ACCESS SIGNAL" STREAM IMPACTS

FIGURE 10D



Mobility Alternative Footprints

- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete

Fish Habitat Streams - ADF&G 2020

- Impacted Stream Segment
- Addition (Anadromous)
- Resident Fish
- Conveyance (No Fish)

0 Feet 175

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "MOBILITY ALTERNATIVE" STREAM IMPACTS

FIGURE 10E

Glacier Highway/Lemon Spur

Glacier Highway/Lemon Road

Fred Meyer

Old Dairy Road

Yandukin Drive

Egan Drive/Glacier Highway

Maplesden Way

Partial Access Signal Footprints

- Asphalt over existing asphalt
- New asphalt
- Sidewalk/Concrete over existing pavement
- New Sidewalk/Concrete
- Grass - remove existing asphalt

Fish Habitat Streams - ADF&G 2020

- Impacted Stream Segment
- Resident Fish
- Conveyance (No Fish)

0 Feet 175

EGAN / YANDUKIN INTERSECTION PLANNING AND ENVIRONMNETAL LINKAGE

ALTERNATIVE "PARTIAL ACCESS SIGNAL" STREAM IMPACTS

FIGURE 10F

Appendix B: Information on Eliminating Alternatives to Support the U.S. Army Corps of Engineer's 404(b)(1) Guidelines

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Information on Eliminating Alternatives to support the USACE's 404(b)(1) Guidelines

	Alternative	Advanced or Dismissed	Reasons for Advancing or Dismissing	Purpose and Need (P&N)	Cost & Logistics	Wetland and Waterbodies Impacts
CLS-1 with ELE-7	SB Left Closure at E-Y and 2-Way Frontage Rd to Nugget + ped over/underpass	Dismissed	Alternative impacts wetlands and requires substantial ROW (both public and private). Not as responsive to purpose and need as other alternatives because more delay is expected on Egan Drive compared to No Build. Plus crash frequency may increase at Nugget intersection.	Crash frequency reduced at Egan-Yandukin but may increase at Nugget. Crash severity conflicts reduced. Adds pedestrian facilities to cross Egan Drive. Adds alternative route in corridor. Traffic delays along Egan Drive corridor would be increased.	Medium costs; construction logistics can maintain existing most traffic patterns and capacity until complete; pedestrian over/underpass construction would be logistically difficult during active traffic; ROW acquisitions considered achievable.	Impacts to wetlands anticipated along frontage road extension. Possible stream/conveyance impacts.
CLS-2 with ELE-7	Median Closure at E-Y and 2-Way Frontage Rd to Nugget + ped over/underpass	Dismissed	Alternative impacts wetlands and requires substantial ROW (both public and private). Not as responsive to purpose and need as other alternatives because more delay is expected on Egan Drive compared to No Build. Plus crash frequency may increase at Nugget intersection.	Crash frequency reduced at Egan-Yandukin but may increase at Nugget. Crash severity conflicts reduced. Adds pedestrian facilities to cross Egan Drive. Adds alternative route in corridor. Traffic delays along Egan Drive corridor would be increased.	Medium costs; most roadway construction logistics can maintain existing traffic patterns and capacity until complete; pedestrian over/underpass construction would be logistically difficult during active traffic; ROW acquisitions considered achievable.	Impacts to wetlands anticipated along frontage road extension. Possible stream/conveyance impacts.
CLS-3 with ELE-7	Median Closure at E-Y, Interchange at Nugget + ped over/underpass	Dismissed	Alternative impacts wetlands, substantial ROW is needed, and businesses would likely experience reduced visibility. Not as responsive to purpose and need as other alternatives because delay may occur along Egan Drive.	Crash frequency and crash severity reduced. Adds pedestrian facilities to cross Egan Drive. Adds alternative route in corridor. Traffic delays along Egan Drive corridor would be increased.	High costs; construction can be phased or timed to minimize traffic impacts, but delays would be anticipated; ROW acquisitions and relocations considered difficult and contentious.	Impacts to wetlands anticipated at Nugget interchange and frontage road extension. May require lengthening Jordan Creek culvert and increased stormwater impacts into Jordan Creek. Possible stream/conveyance impacts.
INT-1 with ELE-4 & ELE-7	HSIP Interim Actions + Median Crossover + Ped Over/Underpass	Advanced	Ranked as one of the highest, alternative meets baseline purpose and needs with no additional delay on Egan Drive and with minimal ROW needed and no wetland or other jurisdictional water impacts.	Crash frequency and crash severity reduced. Adds pedestrian facilities to cross Egan Drive. Offers directed detour options during crash congestion rather than alternate route. Travel time along Egan Drive corridor similar to existing.	Medium costs, roadway construction logistics can maintain existing traffic patterns and capacity until complete; pedestrian over/underpass construction would be logistically difficult during active traffic; ROW acquisitions considered achievable.	Minor impacts to jurisdictional wetlands in ditches and swales along roadway. Possible stream/conveyance impacts
INT-2 with ELE-4	Partial Access Signalized Intersection + Median Crossover	Advanced	Ranked as one of the highest, alternative meets baseline purpose and needs while staying within the existing ROW and not impacting wetlands. While more delay is expected compared to No Build, it is suspected that it would have less delay compared to a full access signal (INT-3).	Angle crashes would decrease but rear end crashes would increase. Crash severity reduced. Signal provides time for pedestrians to cross Egan Drive. Offers directed detour options during crash congestion rather than alternate travel route. Travel time and delays along Egan Drive corridor would increase.	Medium costs; Minor construction detours and delays; ROW acquisition considered achievable	Minor impacts to jurisdictional wetlands in ditches and swales along roadway. No impacts to streams.
INT-3 withELE-4	Full Access Signalized Intersection + Median Crossover	Advanced	Ranked as one of the highest, alternative meets baseline purpose and needs with minimal ROW acquisition needed and no wetlands impacted, but is expected to have more delay compared to No Build. Alternative is similar to INT-4 but provides more access to businesses on both sides to Egan Drive.	Angle crashes would decrease but rear end crashes would increase. Crash severity reduced. Signal provides time for pedestrians to cross Egan Drive. Offers directed detour options during crash congestion rather than alternate travel route. Travel time and delays along Egan Drive corridor would increase.	Medium costs; Minor construction detours and delays; ROW acquisition considered achievable	Impacts to jurisdicational wetlands. Some existing wetlands already permitted for fill/filled from commercial/industrial project. No impacts to streams.
INT-4 with ELE-4 & ELE-7	Move Signalized Intersection from Nugget to E-Y + Median Crossover + Ped Over/Underpass at Nugget	Dismissed	The Right-In-Right-Out movement at Glacier-Nugget provides less access to residences and businesses along Glacier-Nugget Highway, negatively affecting ongoing economic conditions. Negative impacts to businesses are substantial. Benefits of alternative are comparable to a full signal at E-Y (INT-3) which does not remove the signal at Glacier-Nugget.	Angle crashes would decrease but rear end crashes would increase. Crash severity reduced. Signal provides time for pedestrians to cross Egan Drive. Offers directed detour options during crash congestion rather than alternate travel route. Travel time and delays along Egan Drive corridor would increase.	Medium costs; ROW acquisition and business impacts considered high. Some businesses may not be able to be viable; pedestrian over/underpass construction would be logistically difficult during active traffic	No impacts to jurisdictional wetlands or waterbodies anticipated. Possible stream/conveyance impacts.
INT-5 with ELE-5	Roundabout Intersection + One-way or Two-way Frontage Road to Glacier-Nugget	Dismissed	Alternative impacts substantial acreage of wetlands and requires substantial ROW. More delay is expected on Egan Drive compared to No Build, thus not fully meeting purpose and need.	Crashes at Egan-Yandukin would reduce, but may increase at Glacier-Nugget. Crash severity reduced. Signalized pedestrian crossing allows crossing of Egan Drive. Adds alternate travel route in corridor. Travel time and delays along Egan Drive corridor would increase.	High costs; ROW acquisitions considered substantial, although likely achievable; phased construction and detours would be necessary	Wetlands impacts anticipated along frontage road extension and E-Y intersection expansion. Likely to be largest wetland impact by acreage among alternatives. No streams impacted.

INT-6	Two Signalized T-Intersections	Advanced	Ranked among the second highest. Alternative improves access to businesses on either side of Egan Drive. An alternate route is provided during a crash without needing manual power to set up temporary traffic control devices (considered an advantage over the median crossover treatment). No wetland impacts are expected; wetlands near the area have previously been permitted for fill.	Crash frequency and crash severity reduced. Signalized pedestrian crossing allows crossing of Egan Drive. Detour options provided in separating into two intersections. Travel time and delays along Egan Drive corridor would increase.	Medium costs; ROW acquisition considered substantial but achievable;	Impacts to jurisdicational wetlands. Some existing wetlands already permitted for fill/filled from industrial project. No streams impacted.
INT-7 with ELE-4	Relocate Intersection to Southeast of Church with signal + Median Crossover	Dismissed	Substantial ROW acquisition is needed with impacts to wetlands and more delay is expected for Egan Drive traffic compared to No Build, thus not fully meeting purpose and need.	Crash frequency and severity reduced. Signal provides time for pedestrians to cross Egan Drive, although further away from likely origin and destinations. Offers directed detour options during crash congestion rather than alternate travel route. Travel time and delays along Egan Drive corridor would increase.	Medium costs; Construction likely capable of maintaining existing traffic patterns and capacity until complete; ROW acquisition considered substantial but achievable	Wetland impacts anticipated along north side of Egan Drive; south side Egan Drive wetlands already permitted for fill/filled from industrial/commercial project. No streams impacted.
INT-8 with ELE-4	Diverted Left Turn or Continuous Flow Intersection + Median Crossover	Dismissed	While businesses would be more accessible, substantial ROW is needed with impacts to wetlands and more delay is expected for Egan Drive traffic compared to No Build, thus not fully meeting purpose and need.	Crash frequency and severity reduced. Signal provides time for pedestrians to cross Egan Drive. Offers directed detour options during crash congestion rather than alternate travel route. Travel time and delays along Egan Drive corridor would increase.	High costs; ROW acquisition considered substantial	Potential wetland impacts along north side of Egan Drive; south side Egan Drive wetlands already permitted for fill/filled from industrial project. No streams impacted.
INT-9	Diverging Diamond Intersection Pair	Dismissed	Alternative has the most negative impacts compared to the other alternatives. ROW and wetlands are impacted, more vehicle delay is expected, and businesses would be less accessible. This alternative does not fully meet purpose and need. It is also more costly.	Angle crashes would decrease but rear end crashes would increase. Crash severity reduced. Signalized pedestrian crossing allows crossing of Egan Drive. Adds alternate travel route in corridor. Travel time and delays along Egan Drive corridor would increase, access to businesses reduced.	High costs; ROW acquisition considered substantial; Construction delays and detours lengthy; ROW acquisition considered substantial and difficult	Impacts to wetlands anticipated along frontage road extension. South side Egan Drive wetlands already permitted for fill/filled from industrial project.No streams impacted.
OVP-1 with ELE-4	Single Point Urban Interchange + Median Crossover	Dismissed	Alternative is ranked slightly less than other overpass alternatives since it only partially conforms to adopted land use plans. Compared to OVP-2 and OVP-3, alternative has longer pedestrian crossings and is not as flexible or sustainable if changing conditions indicate the need for a new configuration for the interchange in the future. It has high costs and would be logistically difficult.	Crash frequency and crash severity reduced. Signalized pedestrian crossing allows crossing of Egan Drive at Yandukin. Offers directed detour options during crash congestion rather than alternate travel route. Travel time and delays along Egan Drive corridor would decrease.	High costs; ROW acquisitions considered substantial; Bridge construction over active traffic would be logistically difficult.	Minor wetland impacts along north side of Egan Drive; south side Egan Drive wetlands already permitted for fill/filled from industrial/commercial project. Possible stream/conveyance impacts.
OVP-2 with ELE-5	Diamond Interchange + One-way or Two-way Frontage Road to Glacier-Nugget	Advanced	Ranked among the second highest. Alternative has more flexibility and sustainability compared to OVP-1 as it can be converted to a different configuration in the future while staying within a diamond interchange footprint. It also has high costs and is logistically difficult.	Crash frequency and crash severity reduced. Pedestrian crossing will be shorter and at lower vehicle speeds than existing. Offers directed detour options during crash congestion rather than alternate travel route. Travel time and delays along Egan Drive corridor would decrease.	High costs; ROW acquisition and business relocation considered difficult but achievable; Bridge construction over active traffic would be logistically difficult.	Minor wetland impacts along north side of Egan Drive; south side Egan Drive wetlands already permitted for fill/filled from industrial project. Possible stream/conveyance impacts.
OVP-3	Split Diamond Interchange Pair	Dismissed	Ranked among the second highest. Alternative has higher environmental impacts on built facilities and cost of elevated structures compared to OVP-2. It impacts wetlands and streams. Considered less sustainable than OVP-2 because ROW outside the built interchange footprint could be impacted if the intersection needs to be changed in the future. It has high costs and is logistically difficult.	Crash frequency and crash severity reduced. Adds pedestrian facilities to cross Egan Drive. Adds alternative route in corridor. Traffic time and delays along Egan Drive corridor would decrease. Reduces visibility of businesses.	High costs; ROW acquisition and business relocation considered difficult; Bridge construction over active traffic would be logistically difficult. Does not provide similar design flexibility or design sustainability as other overpass alternatives.	Impacts to wetlands anticipated along frontage road extension and northeast side of Egan-Yandukin intersection; south side Egan Drive wetlands already permitted for fill/filled from industrial/commercial project. May have culvert and stream impacts to Jordan Creek. Possible stream/conveyance impacts.

Appendix C: Trip reports, Egan and Yandukin Intersection Improvement Project Fish Use, Alaska Department of Fish and Game, January 14, 2020, and December 22, 2020

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MEMORANDUM

State of Alaska

Department of Fish and Game
Habitat Section

TO:	Christy Gentemann Environmental Impact Analyst (DOT&PF)	DATE:	December 22, 2020
		FILE:	Egan & Yandukin Intersection Improvements
THRU:	Kate Kanouse Southeast Regional Supervisor	SUBJECT:	Egan and Yandukin Intersection Improvement Project Fish Use
FROM:	Jesse Lindgren JL Habitat Biologist	PHONE NO:	(907) 465-1635

On September 1, 2020, Fish and Wildlife Technicians Claire Delbecq and Nicole Legere and I resurveyed streams during high water to follow up on fish use surveys conducted in 2019[a] for the Department of Transportation and Public Facilities' proposed Egan and Yandukin Drive intersection improvement project (DOT&PF No. SFHWY00079). Our field work resulted in eight nominations to the anadromous waters catalog (AWC; Table 1). Appendix A documents our fish presence findings within the project area, identifies streams as specified in the 2020 AWC, additions pending acceptance to the AWC, supporting resident fish, and conveyance with no fish observed. Work conducted below the ordinary high-water line of anadromous and resident fish streams will require a fish habitat permit.

Table 1.–Nominations submitted to the AWC (attached).

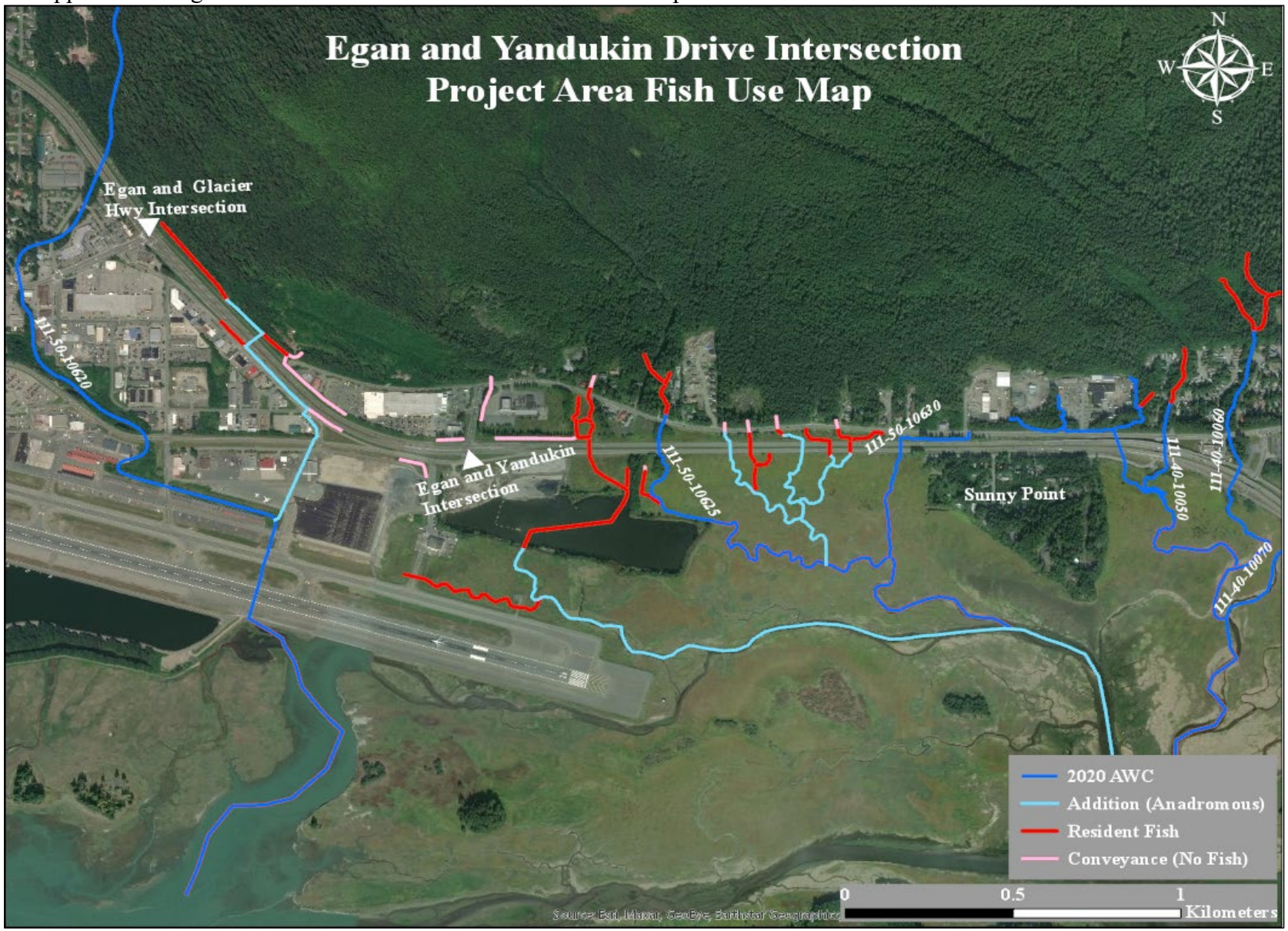
Nomination #	Nomination
20-997	111-50-10620 Tributary 1 Addition
20-1004	111-50-10625 Route Correction
20-1020	111-50-10625 Tributary 1 Addition
20-1022	111-50-10625 Tributary 2 Addition
20-1023	111-50-10625 Tributary 3 Addition
20-1024	111-50-10625 Tributary 4 Addition
20-1025	111-50-10630 Route Correction
21-512	North Gastineau Channel Uncataloged Stream

[a] Jesse Lindgren, Habitat Biologist II, to Kate Kanouse, Southeast Regional Supervisor, ADF&G Habitat Section. Memorandum: Egan and Yandukin Intersection Improvement project fish use (DOT&PF No.SFHY00079); dated January 14, 2020.

Email cc:

Al Ott, ADF&G Habitat, Fairbanks
ADF&G Habitat Staff, Douglas
Dan Teske, ADF&G SF, Douglas
Dave Harris, ADF&G CF, Douglas
Roy Churchwell, ADF&G WC, Douglas
Teri Camery, CBJ, Juneau
Doug Cooper, USFWS, Anchorage
Habitat Conservation Division, NMFS, Juneau
Ben Soiseth, USACE, Fairbanks
Jim Brown, DOT&PF, Juneau

Appendix A.–Egan and Yandukin Drive intersection fish use map.



111-50-10620 Tributary 1 ADDITION

Water body name: **Survey date:** 9/1/2020
Watershed: Mendenhall Wetlands -Frontal Gastineau Channel **Species & Lifestage:**
MTR:C040S066E **Quad:** Juneau B-2
Findings: We surveyed this uncataloged stream using minnow traps and GPS and found juvenile coho salmon. We ended this survey when the stream channel was poorly defined and fanned out. (Table 1; Figures 1, 2).
Recommendations: Add Stream No. 111-50-10620 Tributary 1 to the anadromous waters catalog for rearing and present coho salmon (Figure 3).
Nomination: 20-997

Table 1.–111-50-10620 Tributary 1 survey data.

Waypoint	Latitude	Longitude	Notes	Stream Width ft	Stream Substrate	Habitat Features	Gradient %	Sample Effort	Sample Results
2874	58.3611	-134.5701						MT	2 CO 5 SB
2868	58.3624	-134.5708	Significant ponded water		Fine Organic			MT	3 CO 20 SB
2867	58.3629	-134.5716	Ponded water stops starts to stop along road. Stream comes in off hillside 30ft back. Seems to majority source of water with conveyances coming off of developed land.						

Figure 1.–Juvenile coho salmon captured at waypoint 2868.

Figure 2.–Stream No. 111-50-10620 Tributary 1 at waypoint 2868.

Figure 3.–111-50-10620 Tributary 1 addition map.

111-50-10625 CORRECTION

Water body name: **Survey date:** 09/01/2020
Watershed: Mendenhall River-Frontal Gastineau Channel **Species & Lifestage:** COr
MTR:C040S066E **Quad:** Juneau B-2
Findings: We surveyed this cataloged stream using minnow traps and GPS and captured juvenile coho salmon and found that the stream path is incorrectly mapped. The stream course was verified using imagery and data collected in the field (Table 1; Figures 1–3).
Recommendations: Correct Stream No. 111-50-10625 in the anadromous waters catalog to reflect the field verified stream path (Figure 4).
Nomination: 20-1004

Table 1.–111-50-10625 survey data.

Waypoint	Latitude	Longitude	Notes	Stream Width ft	Stream Substrate	Habitat Features	Gradient %	Sample Effort	Sample Results
4189	58.3570	-134.5493	Ponded water stops starts to stop along road. Stream comes in off hillside 30ft back. Seems to majority source of water with conveyances coming off of developed land.				0-1	MT	9 CO 10 DV
2873	58.3581	134.5488	Glacier gardens stream under Egan drive slipline culvert 2-3ft wide. Almost completely full of water						
4176	58.3592	134.5486	3-4ft falls upstream of culvert						
4177	58.3601	134.5487	Set MT at base of pool. Sediment is soft and squishy. Appears to have been deposited recently.					MT	3 DV

Figure 1.–Coho captured at waypoint 4189.

Figure 2.–Upstream view of Stream No. 111-50-10625 at waypoint 4189.

Figure 3.–Downstream view of Stream No. 111-50-10625 at waypoint 4189.

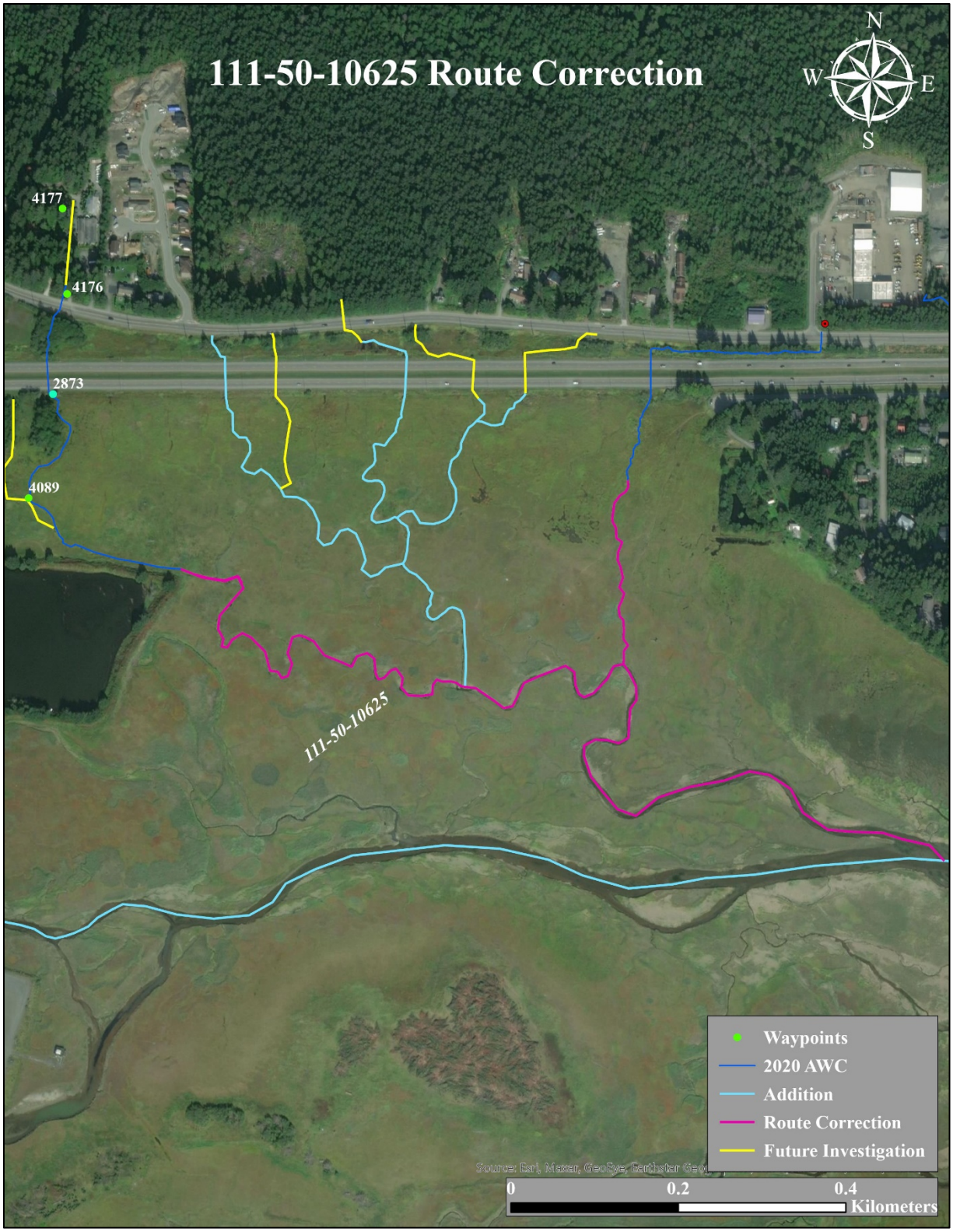


Figure 4.–111-50-10625 route correction map.

111-50-10625 TRIBUTARY 1 ADDITION

Water body name: **Survey date:** 11/5/2019
Watershed: Mendenhall Wetlands -Frontal Gastineau Channel **Species & Lifestage:**
MTR:C040S066E **Quad:** Juneau B-2
Findings: We surveyed this uncataloged stream using minnow traps, a backpack electrofisher and GPS and found juvenile coho salmon. We ended this survey were the stream channel goes under the road and ponds along the ditch (Table 1; Figures 1–3).
Recommendations: Add Stream No. 111-50-10625 Tributary 1 to the anadromous waters catalog for rearing and present coho salmon (Figure 4).
Nomination: 20-1020

Table 1.–111-50-10625 Tributary 1 survey data.

Waypoint	Latitude	Longitude	Notes	Stream Width ft	Stream Substrate	Habitat Features	Gradient %	Sample Effort	Sample Results
4108	58.3564	-134.5418	EF down to confluence. In brackish water. Minnow trap upstream.		Fine Organic		0-1	EF	5 SB 1 SC
4106	58.3582	-134.5417					1-2	EF	2 CO
4083	58.3588	-134.5423	Ponds along highway ditch.					MT	12 CO 25 SB

Figure 1.–Juvenile coho salmon captured at waypoint 4083.

Figure 2.–Stream No. 111-50-10625 Tributary 1 at waypoint 4108.

Figure 3.– Flooded area of Stream No. 111-50-10625 Tributary 1 at upper extent of survey, waypoint 4083.

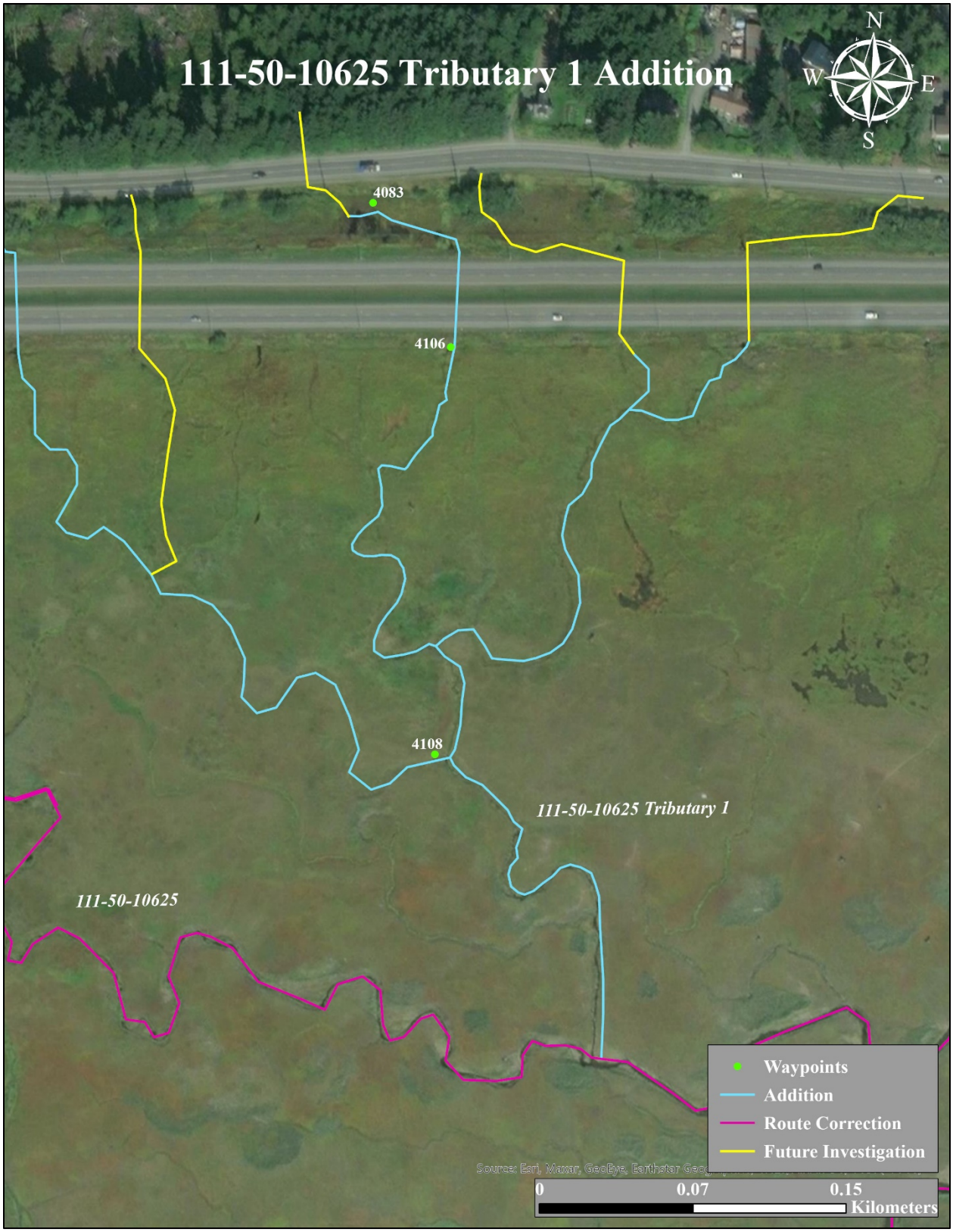


Figure 4.–111-50-10625 Tributary 1 addition map.

111-50-10625 TRIBUTARY 2 ADDITION

Water body name: **Survey date:** 9/1/2020
Watershed: Mendenhall Wetlands -Frontal Gastineau Channel **Species & Lifestage:**
MTR:C040S066E **Quad:** Juneau B-2
Findings: We surveyed this uncataloged stream using a backpack electrofisher and GPS and captured juvenile coho salmon. We ended this survey where the stream channel goes under the road and the channel is not well defined (Table 1; Figures 1, 2)
Recommendations: Add Stream No. 111-50-10625 Tributary 2 to the anadromous waters catalog for rearing and present coho salmon (Figure 3).
Nomination: 20-1022

Table 1.–111-50-10625 Tributary 2 survey data.

Waypoint	Latitude	Longitude	Notes	Stream Width ft	Stream Substrate	Habitat Features	Gradient %	Sample Effort	Sample Results
4108	58.3564	-134.5418	EF down to confluence. In brackish water. Minnow trap upstream.		Fine Organic		0-1	EF	5 SB 1 SC
4117	58.3582	-134.5453	One minnow trap set for 1.5 hours.	0-1	Fine Organic		0-1	EF	30 SB
4081	58.3587	-134.5456		6-8	Small Gravel				
4102	58.3588	-134.5455	EF between frontage road and highway during higher water, water level still not very deep. Limited habitat	4-6				EF	
2869	58.3588	-134.5456	High water with rain	2-4	Small Gravel Fine Organic		2-4	EF	2 CO

Figure 1.–Juvenile coho salmon captured at waypoint 2869.

Figure 2.–Stream No. 111-50-10625 Tributary 2 at waypoint 4117.

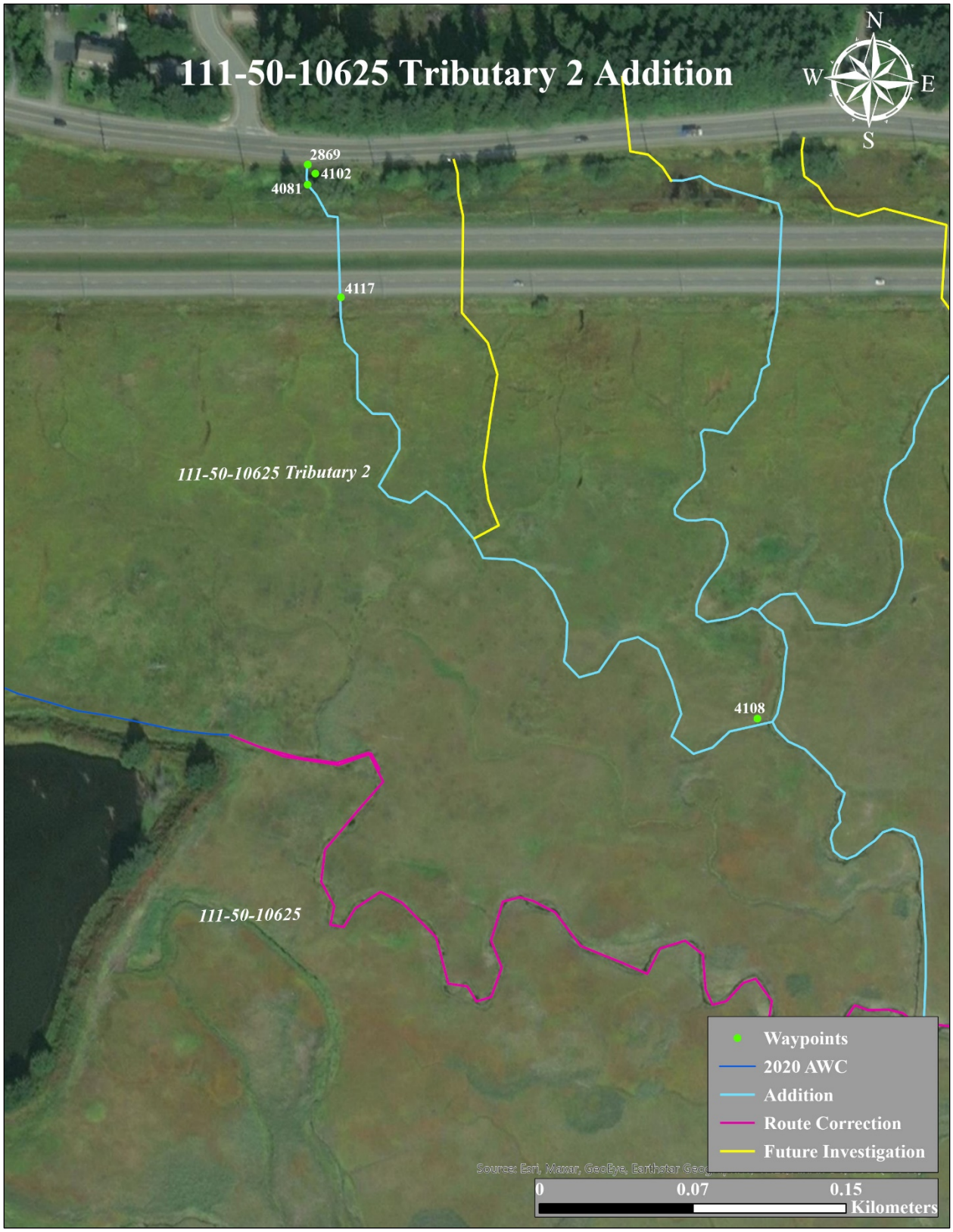


Figure 3.–111-50-10625 Tributary 2 addition map.

111-50-10625 TRIBUTARY 3 ADDITION

Water body name: **Survey date:** 11/5/2019
Watershed: Mendenhall Wetlands -Frontal Gastineau Channel **Species & Lifestage:**
MTR:C040S066E **Quad:** Juneau B-2
Findings: We surveyed this uncataloged stream using minnow traps, a backpack electrofisher and GPS and captured juvenile coho salmon. We ended this survey where the stream channel goes under the road and the channel is not well defined (Table 1; Figures 1–3)
Recommendations: Add Stream No. 111-50-10625 Tributary 3 to the anadromous waters catalog for rearing and present coho salmon (Figure 4).
Nomination: 20-1023

Table 1.–111-50-10625 Tributary 3 survey data.

Waypoint	Latitude	Longitude	Notes	Stream Width ft	Stream Substrate	Habitat Features	Gradient %	Sample Effort	Sample Results
4104	58.3586	-134.5392	1.5 ft perched culvert with 4-5 ft wide and 2-3 ft deep jump pool. Culvert is sliplined and smooth.		Fine Organic		1-2	EF	2 CO 1 DV 1 SC
2872	58.3588	-134.5381	Fished at high water	2-4	Small Gravel			EF	20 DV
4085	58.3589	-134.5380	Worth future investigation for coho with electrofisher					MT	14 DV
4098	58.3589	-134.5377			Small Gravel Sand	Large Pool Spawning Substrate	1-2	EF	12 DV

Figure 1.–Juvenile coho salmon captured at WP 4104.

Figure 2.–Stream No. 111-50-10625 Tributary 3 at WP 4085.

Figure 3.–Perched culvert on the stream at WP 4104.

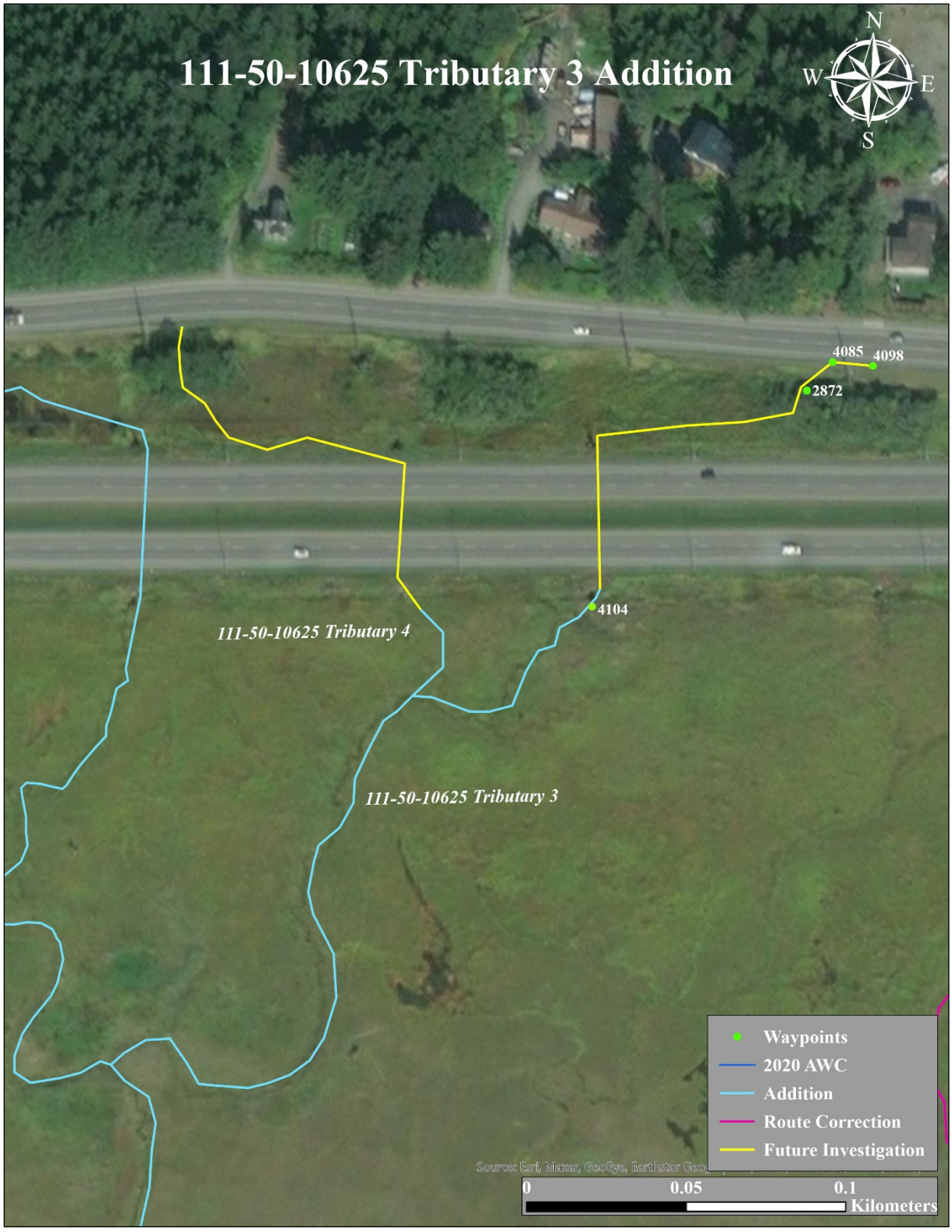


Figure 4.–111-50-10625 Tributary 3 addition map.

111-50-10625 TRIBUTARY 4 ADDITION

Water body name: **Survey date:** 9/1/2020
Watershed: Mendenhall Wetlands -Frontal Gastineau Channel **Species & Lifestage:**
MTR:C040S066E **Quad:** Juneau B-2
Findings: We surveyed this stream using minnow traps, a backpack electrofisher, and GPS and captured juvenile coho salmon. We ended this survey where the stream channel goes under the road and the channel is not well defined (Table 1; Figures 1, 2)
Recommendations: Add this stream to the anadromous waters catalog for rearing and present coho salmon (Figure 3).
Nomination: 20-1024

Table 1.–111-50-10625 Tributary 4 survey data.

Waypoint	Latitude	Longitude	Notes	Stream Width ft	Stream Substrate	Habitat Features	Gradient %	Sample Effort	Sample Results
4105	58.3568	-134.5402	2 CO captured but unable to get a photo for second CO.	2-4	Fine Organic		0-1	EF	2 CO 1 DV 1 SB
4084	58.3588	-134.5415	Worth future investigation at high water with electrofisher		Small Gravel Fine Organic		0-1	MT	
2871	58.3589	-134.5414	Fishing at high water	2-4				EF	No Fish
4100	58.3589	-134.5415	EF between frontage road and highway.	4-6	Small Gravel Sand		2-4	EF	No Fish

Figure 1.–Juvenile coho salmon captured at waypoint 4105.

Figure 2.–Channel at waypoint 4100.

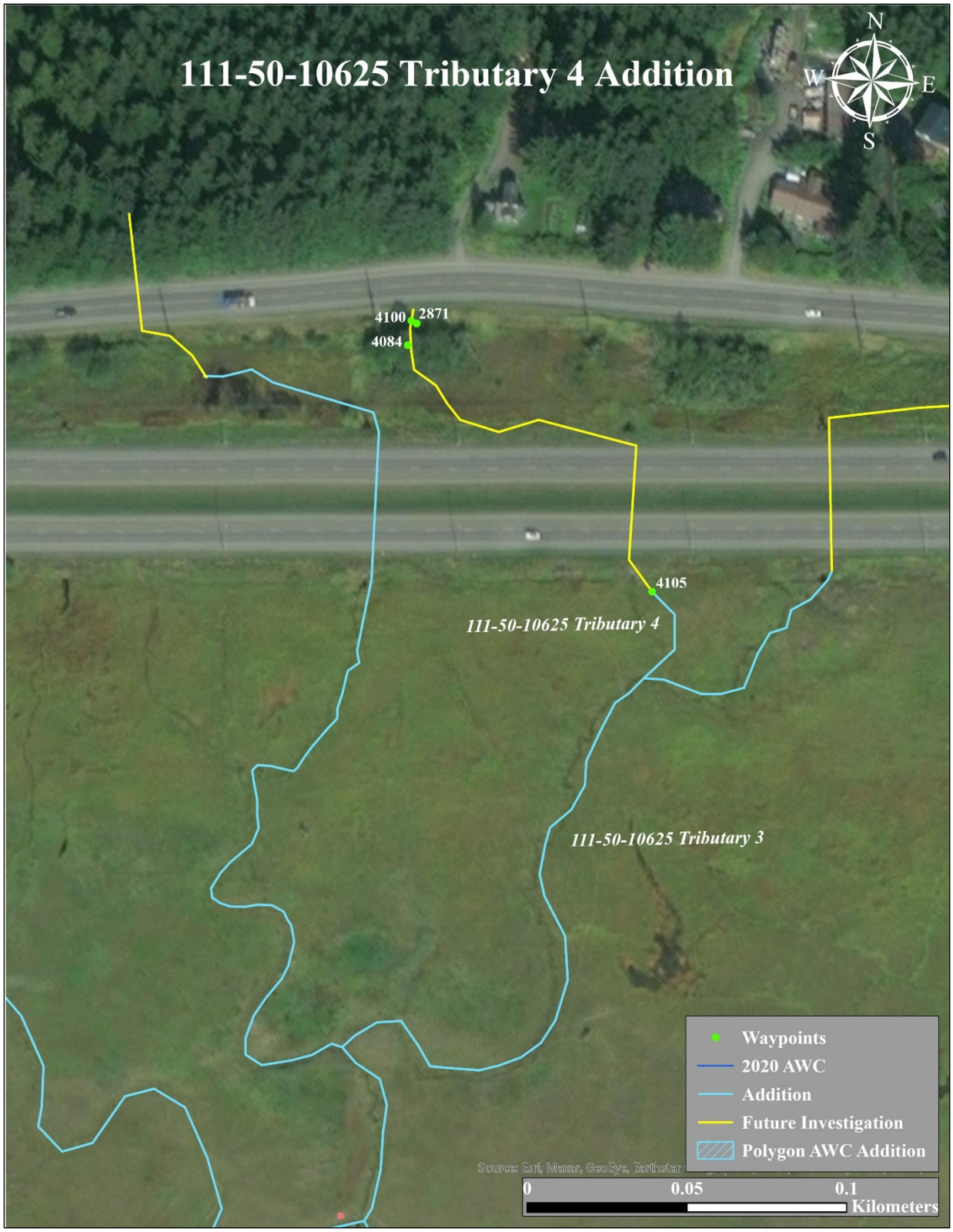


Figure 3.–111-50-10625 Tributary 4 addition map.

111-50-10630 CORRECTION

Water body name: **Survey date:** 11/19/2019
Watershed: Mendenhall River-Frontal Gastineau Channel **Species & Lifestage:** COr
MTR:C040S066E **Quad:** Juneau B-2
Findings: We surveyed this cataloged stream using a GPS and found that the stream path is incorrectly mapped. We verified the stream course using imagery and data collected in the field (Table 1).
Recommendations: Correct Stream No. 111-50-10630 in the anadromous waters catalog to reflect the field verified stream path. (Figure 1).
Nomination: 20-1025

Table 1.–111-50-10630 survey data.

Waypoint	Latitude	Longitude	Notes	Stream Width ft	Stream Substrate	Habitat Features	Gradient %	Sample Effort	Sample Results
4119	58.3559	-134.5368	Cataloged stream channel. Extend nomination into the intertidal area.				0-1		

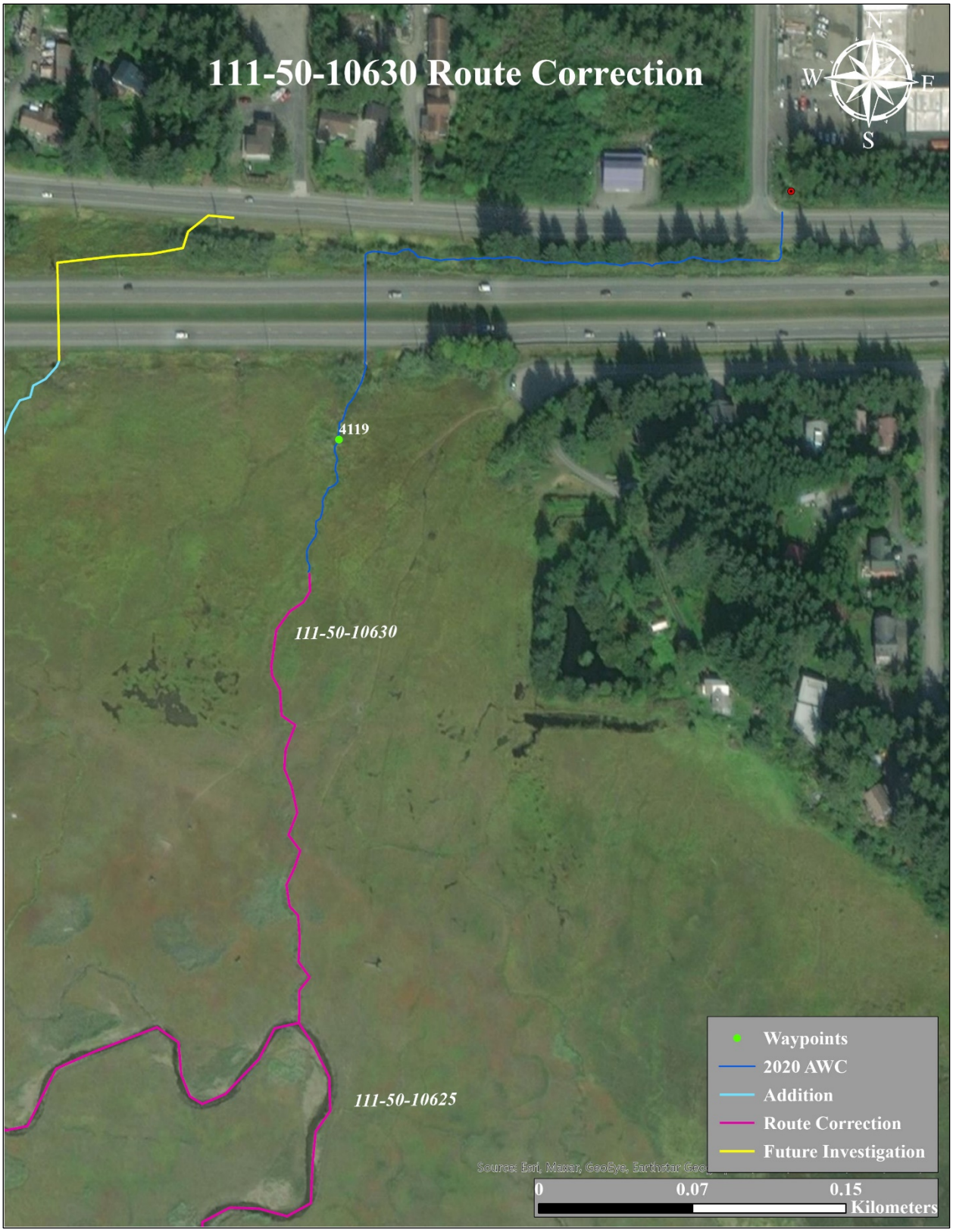


Figure 1.–111-50-10630 Route Correction map.

NORTH GASTINEAU CHANNEL UNCATALOGED STREAM ADDITION

Water body name: **Survey date:** 11/5/2019
Watershed: Mendenhall Wetlands-Frontal Gastineau Channel **Species & Lifestage:**
MTR:C040S066E **Quad:** Juneau B-2
Findings: We surveyed this stream using minnow traps and GPS and captured juvenile coho salmon. We ended this survey when the stream channel entered manmade pond (Table 1; Figures 1–4).
Recommendations: Add this stream to the anadromous waters catalog for rearing and present coho salmon (Figure 5).
Nomination: 21-512

Table 1.–North Gastineau Channel Uncataloged Stream survey data.

Waypoint	Latitude	Longitude	Notes	Stream Width ft	Stream Substrate	Habitat Features	Gradient %	Sample Effort	Sample Results
4086	58.3554	-134.5558	At outlet pipe from dredged pond. There is a gap in the pipe for coho to swim through.		Fine Organic		0-1	MT	2 CO 1 SC
4087	58.2554	-134.5558	No CO captured in pond likely still salt water influenced on big tides. Swans are still in the area.				0-1	MT	50 SB

Figure 1.–Juvenile coho salmon captured at waypoint 4086.

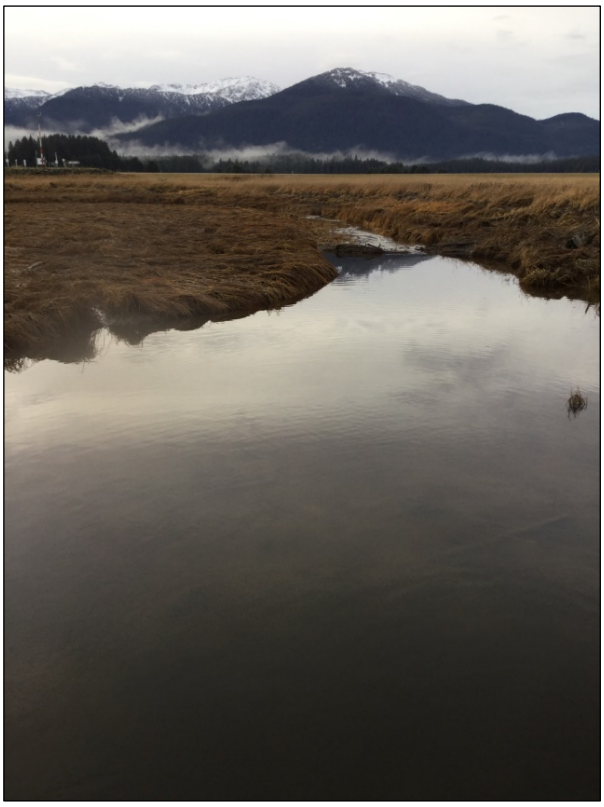


Figure 2.–Uncataloged Stream at waypoint 4086.

Figure 3.–Outlet pipe from dredged pond at waypoint 4086.

Figure 4.–Dredge pond at waypoint 2087.

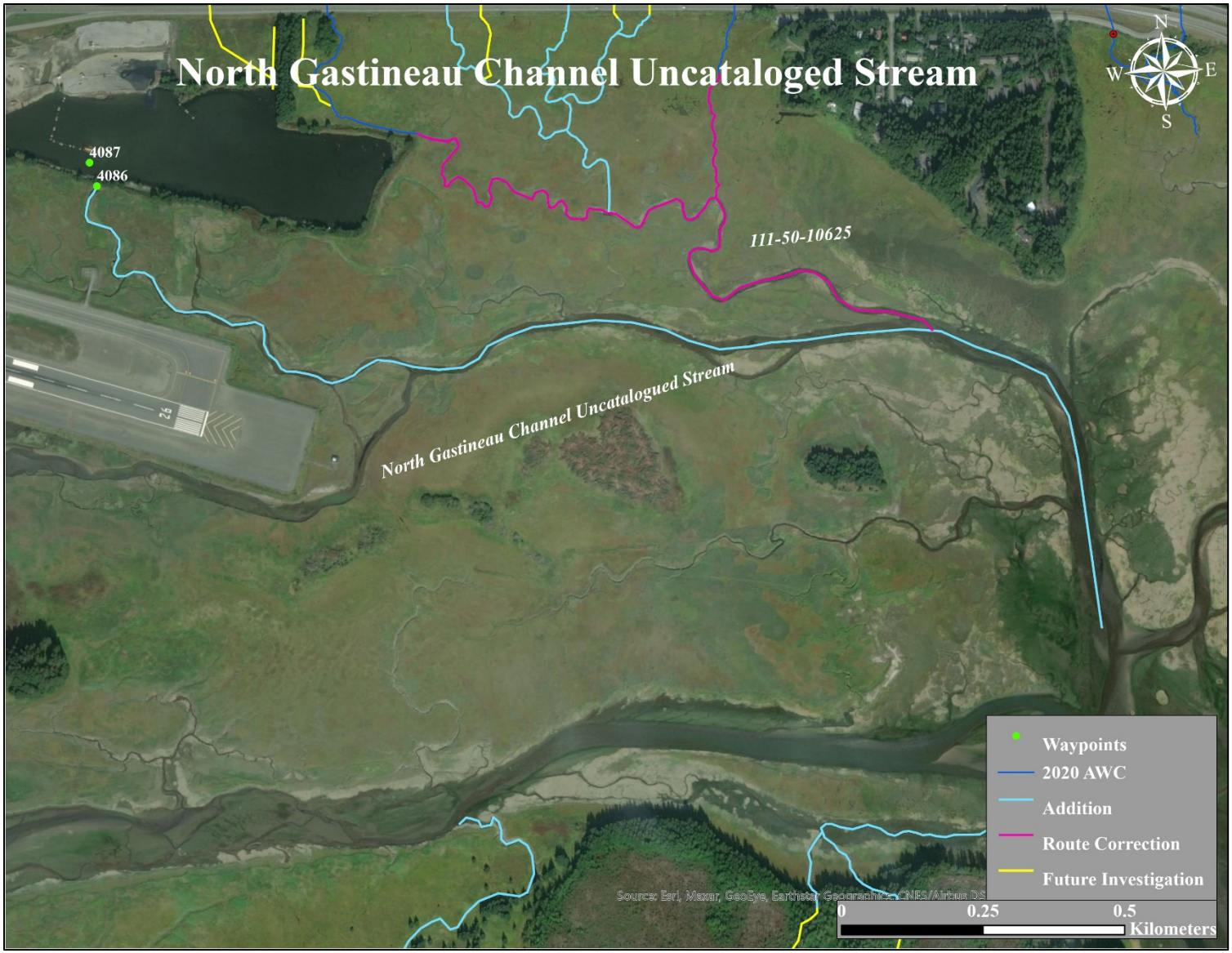


Figure 5.– North Gastineau Channel Uncataloged stream addition.

MEMORANDUM

State of Alaska
Department of Fish and Game
Habitat Section

TO: Kate Kanouse
Southeast Regional Supervisor

DATE: January 14, 2020

FILE: 58.3583 W, 134.5587 N

SUBJECT: Egan and Yandukin Intersection Improvement Project Fish Use (DOT&PF No. SFHWY00079)

FROM: Jesse Lindgren JL
Habitat Biologist

PHONE NO: (907) 465-1635

On November 5 and 14, 2019, Fish and Wildlife Technician Marc Heifetz, Habitat Biologist Kelsey Dean, and I surveyed the Department of Transportation and Public Facilities' proposed Egan and Yandukin Drive intersection improvement project area (DOT&PF No. SFHWY00079) to inform the National Environmental Policy Act Planning and Environmental Linkages study (Figures 1–4). Appendix A documents our findings of fish presence within the project area identifying streams as those used by anadromous or resident fish, or conveyance (no fish). We will complete additional sampling in summer during high flows to identify the upper extent of anadromous and resident fish use in streams. Pending the summer sampling results, I will update the fish use map in a future trip report and submit nominations to the anadromous waters catalog.

Figure 1.–Juvenile coho salmon captured 0.57 miles east of Egan Yandukin intersection.

Figure 2.–Stream survey on Egan Drive 0.57 miles east of Egan Yandukin intersection.

Figure 3.–Dolly Varden char captured 0.75 miles east of Egan Yandukin intersection.

Figure 4.–Stream survey on Egan Drive 0.21 miles east of Egan Yandukin intersection.

Email cc:

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Teri Camery, CBJ, Juneau
Doug Cooper, USFWS, Anchorage
Habitat Conservation Division, NMFS, Juneau
Ben Soiseth, USACE, Fairbanks
Emily Haynes, DOT&PF, Juneau

Appendix A.–Egan and Yandukin Drive intersection fish use map.