STERLING SAFETY CORRIDOR IMPROVEMENTS, MP 82.5 TO 94

FINAL ENVIRONMENTAL ASSESSMENT

FEDERAL NO. 0A33026/STATE NO. CFHWY00130

DECEMBER 2021

Prepared By:
Alaska Department of Transportation
and Public Facilities

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.

This Final Environmental Assessment is based on the Draft Environmental Assessment that was publicly distributed for comment in August 2021.

Text changes to the document (not including page numbers, document dates, or titles) are identified by red underlined text for additions, and ~~red strikethrough text~~ for deletions.

Stakeholder coordination documentation since approval of the Environmental Assessment is included in appendix F.

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Project Numbers:
Federal: 0A33026; State: CFHWY00130

Authored By:
The State of Alaska
Department of Transportation and Public Facilities

This Action Complies With:
Executive Order (E.O.) 12898, Environmental Justice;
E.O. 11988, Floodplain Management;
E.O. 11990, Protection of Wetlands;
E.O. 1593, Protection and Enhancement of the Cultural Environment;
E.O. 13007, Indian Sacred Sites;
E.O. 13175, Consultation and Coordination with Indian Tribal Governments; and
E.O. 13112, Invasive Species, as amended by E.O. 13751

Recommended for Public Availability by:

12/15/21
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The project proposes to improve the Sterling Highway between Sterling and Soldotna to improve safety, reduce congestion, and increase travel efficiency. The Preferred Alternative would construct a four-lane divided highway, with a depressed median from approximately Handley Street in Sterling to Kleeb Loop in Soldotna, with each end transitioning to a four-lane highway divided with a center two-way left-turn lane to tie back into the existing lane configurations. Additional improvements include median breaks with dedicated left-turn lanes, frontage road and pedestrian facility construction, utility relocations, vegetation clearing, drainage improvements, and roadside hardware upgrades.

TITLE VI POLICY STATEMENT

The State of Alaska Department of Transportation and Public Facilities (DOT&PF) hereby gives public notice that it is the policy of the DOT&PF to assure full compliance with Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, and related statutes and regulations in all programs and activities. Title VI and related nondiscrimination statutes require that no person in the United States of America shall, on the grounds of race, color, sex, national origin, disability, or age, be excluded from the participation in, be denied the benefits of, or be otherwise subjected to discrimination under, any program or activity for which the DOT&PF receives federal financial assistance.

Persons with hearing impairments may call 1-800-770-8973 to submit comments or request information.

LIMITATIONS ON CLAIMS NOTICE

Per Section 1308 of the Federal Highway Administration Moving Ahead for Progress in the 21st Century Act (MAP-21), a Federal agency may publish a notice in the Federal Register, pursuant to 23 U.S.C. §139(l)(1), indicating that one or more Federal agencies have taken final action on permits, licenses, or approvals for a transportation project. If such notice is published, claims seeking judicial review of those Federal agency actions shall be barred unless such claims are filed within 150 days after the date of publication of the notice or within such shorter time period as is specified in the Federal laws pursuant to which judicial review of the Federal agency action is allowed. If no notice is published, then the periods of time that otherwise are provided by the Federal laws governing such claims will apply.

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ACRONYMS AND ABBREVIATIONS

AADT	Annual Average Daily Traffic
ACS	American Community Survey
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AKEPIC	Alaska Exotic Plants Information Clearinghouse
AMHS	Alaska Marine Highway System
ANHP	Alaska Natural Heritage Program
APDES	Alaska Pollutant Discharge Elimination System
ATV	All-Terrain Vehicles
AWC	Anadromous Waters Catalog
BCC	Birds of Conservation Concern
BLM	Bureau of Land Management
BMP	Best Management Practice
CDP	Census Designated Place
CEQ	Council on Environmental Quality
CES	Central Emergency Services
CFR	Code of Federal Regulation
CGP	Construction General Permit
CO	Carbon Monoxide
COS	City of Soldotna
CRC	Cultural Resources Consultants, LLC
CTWLTL	Center Two-Way Left-Turn Lane
CWA	Clean Water Act
dB	Decibels
dBA	A-Weighted Decibels
DHHS	U.S. Department of Health and Human Services
DOT&PF	Department of Transportation and Public Facilities
DPOR	Department of Parks and Outdoor Recreation
EA	Environmental Assessment
EJScreen	Environmental Justice Screening and Mapping Tool
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FONSI	Finding of No Significant Impact
GMU	Game Management Unit
HPZ	Habitat Protection Zone
HMCP	Hazardous Materials Control Plan
KNWR	Kenai National Wildlife Refuge
KPB	Kenai Peninsula Borough
$L_{eq(h)}$	Hourly Equivalent Noise Level
LOS	Level of Service
LWCF	Land and Water Conservation Fund
MLW	Division of Mining, Land, and Water

MP	Milepost
MPH	Miles Per Hour
MVC	Moose-Vehicle Collision
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NHS	National Highway System
NMFS	National Marine Fisheries Service
NPS	National Park Service
NRCS	National Resources Conservation Service
ORV	Off-Road Vehicle
PDD	Preliminary Decision Document
PER	Preliminary Engineering Report
REC	Recognized Environmental Condition
ROW	Right-of-Way
RY	Regulatory Year
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SMA	Special Management Area
SPCC	Spill Prevention, Control, and Countermeasures Plan
SRA	State Recreation Area
SRS	State Recreation Site
STIP	Statewide Transportation Improvement Program
SWPPP	Stormwater Pollution Prevention Plan
TCP	Traffic Control Plan
TDM	Traffic Demand Model
TSC	Traffic Safety Corridor
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
WOTUS	Waters of the U.S.

1 PROJECT INTRODUCTION AND PURPOSE AND NEED

1.1 Location

The Alaska Department of Transportation and Public Facilities (DOT&PF) has assumed the responsibilities of the Federal Highway Administration (FHWA) under 23 U.S.C. 327, and is proposing to reconstruct approximately 11.5 miles of the Sterling Highway between Sterling [milepost (MP) 82.5] and Soldotna (MP 94) (Figure 1.1). The project is located primarily within the Kenai Peninsula Borough in southcentral Alaska, while the last two miles are located within Soldotna city limits. The majority of proposed improvements are anticipated to fit within the existing right-of-way (ROW) and substantial changes in road location would not occur. Chapter 2 of this document provides a detailed description of the proposed improvements.

1.2 Sterling Highway Importance

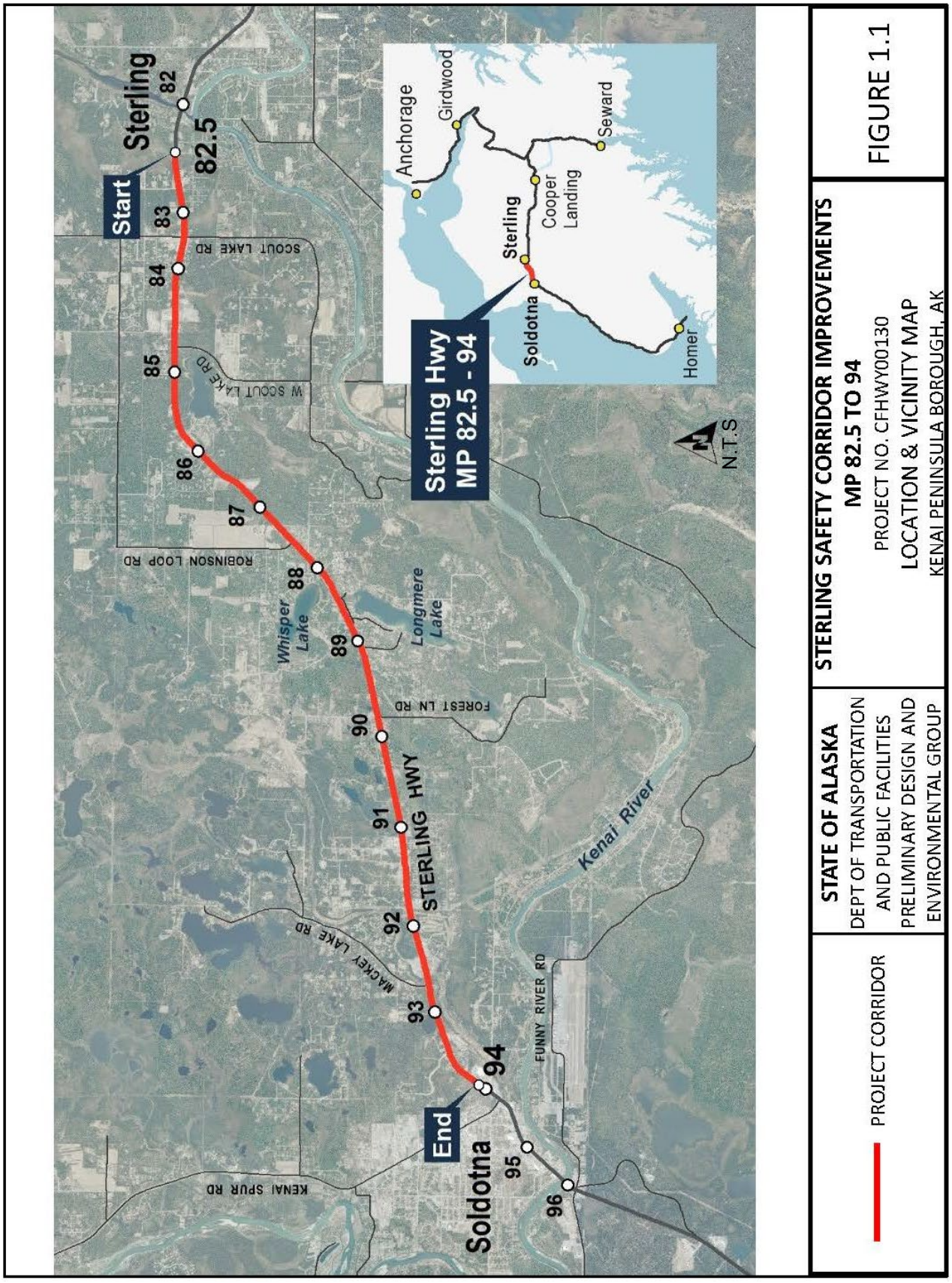
The Sterling Highway's primary purpose is to safely and efficiently accommodate the movement of people and goods throughout the region. As the only road connection between the western Kenai Peninsula and the rest of the state, it provides critical support for local economies and supports thousands of private, recreational, and commercial travelers every day. In addition, the highway is the only connection for people accessing the Alaska Marine Highway System (AMHS) in Homer, which services communities on Kodiak Island, the Alaska Peninsula, and the Aleutian Islands. The route experiences heavy seasonal fluctuations due to tourist and recreational traffic during the summer months.

1.3 Existing Highway Description

The Sterling Highway is one of Alaska's interstate highways and part of the National Highway System (NHS). The highway stretches 138 miles from its beginning at the Seward Highway junction to its end in Homer.

Within the proposed project limits, the Sterling Highway is a rural two-lane road consisting of two 12-foot lanes, eight-foot paved shoulders, and 6:1 side slopes, with left-turn lanes at major cross-street intersections. The posted speed limit is 55 miles per hour (mph) with reductions to 45 mph through Sterling and 35 mph through Soldotna. There are several horizontal and vertical curves throughout the proposed project corridor and the majority of existing ROW is cleared of woody vegetation. There are no bridges and only one stream (Soldotna Creek) passes underneath the road in a culvert. Stormwater drainage is supported by open ditches and culverts at natural drainage areas. No dedicated passing lanes or slow-vehicle turnouts exist, but there are several areas striped for passing. Informal trails created by all-terrain vehicles (ATV) parallel the highway corridor, but there are no formal non-motorized facilities. There are approximately 55 side streets and 115 driveways with direct highway access (HDL 2015b).

As-built plans indicate existing ROW width varies between 200 and 300 feet. Land adjacent to the roadway consists of a mixture of residential, commercial, retail, industrial, and institutional properties, while many of the adjacent lots remain undeveloped. The area is characterized by level to rolling topography that is generally free from permafrost and dominated by mixed spruce (*Picea sp*.) and birch (*Betula sp*.) forests.


Sterling
Start
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SCOUT LAKE RD
W SCOUT LAKE RD
ROBINSON LOOP RD
FOREST LN RD
MACKEY LAKE RD
FUNNY RIVER RD
KENAI SPUR RD
STERLING HWY
Whisper Lake
Longmere Lake
Kenai River
Sterling Hwy MP 82.5 - 94
Anchorage
Girdwood
Seward
Sterling
Cooper Landing
Soldotna
Homer
N
N.T.S
PROJECT CORRIDOR
STATE OF ALASKA
DEPT OF TRANSPORTATION AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
LOCATION & VICINITY MAP
KENAI PENINSULA BOROUGH, AK
FIGURE 1.1

Several utilities exist within the project corridor including the Homer Electric Association, Enstar Natural Gas Co., Alaska Communications, and General Communications Inc.

1.4 Previously Completed Improvements Along the Corridor

DOT&PF has taken the following actions to maintain or improve the proposed project corridor since initial construction of the highway was completed in 1950:

- Routine maintenance - ongoing since initial construction
- Driving surface converted from gravel to asphalt - 1957
- Section within Sterling (MP 79-83) converted to a four-lane facility with center two-way left-turn-lane - 1991
- Section between Sterling and Soldotna received widened shoulders, improved horizontal and vertical alignments, and improved clear zone - 1991
- Soldotna to Forest Lane resurfaced – 2009
- Highway designated a Traffic Safety Corridor – 2009
- Centerline and shoulder rumble strips added - 2010
- Forest Lane to Sterling resurfaced and new guardrail, signing, and striping added - 2011
- Signing for headlights, REDDI, mileposts, curves, guardrail, and roadside delineation - 2011
- Dynamic speed signs, power service, and pads installed - 2013 to 2015
- Added left-turn lanes at the Jim Dahler/Forest Lane intersection (MP 89.8) - 2017-2018

1.5 Purpose of the Proposed Project

The purpose of the proposed project is to *improve safety* and *reduce congestion* for people and freight traveling along the Sterling Highway between Sterling and Soldotna. If implemented, this proposed project would provide highway travelers a safe and reliable roadway that supports efficient movement of goods, services, and people, while accommodating the seasonal increase of tourist and recreational traffic through the design year of 2050.

1.6 Why is this project needed?

The proposed project is needed to address the identified safety issues and heavy congestion on the highway. Traffic volumes have increased by over 400% (1977-2006) due to community population growth, and increased recreational and tourism traffic. This contributes to the roadway being over capacity. Congestion peaks during daily peak commuter periods and the summer months, most specifically in July when daily traffic more than doubles. The lack of parallel corridors to move traffic and the high number of intersections and driveways compound the congestion issues. Without improvements, this situation will continue to worsen as traffic volumes continue to grow. In addition, this segment of the Sterling Highway has a higher than average incidence of crashes involving fatalities and major injuries. Due to its crash history, the section of the Sterling Highway between MP 83 and 93 was designated as a Traffic Safety Corridor (TSC) on July 1, 2009.

Traffic safety corridors are designated safety zones, similar to a school zone or a work zone, within stretches of highway with unacceptably high incidences of fatal and major injury crashes. There are currently four TSCs within the state of Alaska: Seward Highway MP 87-117, Parks Highway MP 44.5-53, Knik/Goose Bay Road MP 0.6-17.2, and Sterling Highway MP 83-93.

The purpose of designating a TSC is to reduce the rate of such crashes and may target factors such as reckless or aggressive driving, driving under the influence, unsafe passing or unsafe speeds. Typical strategies for TSC implementation include increased driver education, increased traffic enforcement and double traffic fines, and addressing existing engineering deficiencies. They are frequently used as temporary measures until additional road construction projects can mitigate underlying problems. Safety corridor designation can be removed when the fatal and major injury rate per mile falls below the statewide average for a three-year period, or if traffic enforcement agencies agree it is no longer effective or necessary.

The following documents define the project need:

- Safety: *Safety Corridor Study - Sterling Highway: MP 83-93, Sterling to Soldotna* (April 2008)
- Congestion: *Sterling Highway Safety Corridor Study: Sterling to Soldotna Draft Traffic Analysis Report* (February 2018)

1.7 Need 1: Safety

The need for improving safety on the Sterling Highway is established in the 2008 TSC study, which was conducted by DOT&PF. The purpose of a TSC study is to identify roadway segments with above average incidences of high severity (fatal and major injury) crashes by analyzing data on types, locations, conditions, and causes of collisions. The Sterling Highway TSC, prepared using data from 1977-2006, identified the following safety related issues within the proposed project corridor:

- Fatal and major injury accidents over twice the threshold established for traffic safety corridor designation
- Fatal and major injury accident rate of 13.2 per 100 million vehicle-miles, well above the threshold of 9.9214 for consideration as a traffic safety corridor
- There were 27 collisions resulting in 32 fatalities
- Fatal accident rate is 239% higher than the 2004 national fatal accident rate
- Total accident rate is 188% higher than the statewide 1999-2006 eight year average
- Nearly 67% of the fatal collisions are head-on
    - This is significantly over-represented when compared with 2003 statewide data showing 15.7% of fatal crashes involve vehicles colliding head-on
- 1,780 collisions were reported during the ‘77-‘06 time period
- The following fatal accident conditions are over represented when compared to 2003 statewide fatal collision data:
    - Dark and twilight hours
    - Improper lane use/change
        - 33% of the Sterling Highway fatal collisions cited improper lane use/change compared with a statewide average of 5.90%
    - Straight grade alignment
        - This is a strong indicator of the need for passing lanes or a divided highway

Increased traffic volumes, particularly during summer months, sometimes difficult winter driving conditions, along with a lack of passing opportunities may have contributed to poor driver

behavior and the higher incidence of head-on type accidents. These poor driver behaviors can make driving hazardous for travelers along this segment who encounter other drivers not obeying the traffic control devices, including the posted speed limit and no passing striping.

Traffic Safety Corridor designation is intended to be a short-term measure to address existing safety concerns until long-term solutions are in place. The per-mile injury rate indicates crash concentration while the per-vehicle mile crash rate is an indication of facility safety. If both thresholds are exceeded, there is a good chance safety countermeasures will substantially reduce crashes. Strategies to alleviate fatal and major injury crashes were implemented shortly after TSC designation, including installing special signage, increasing enforcement and penalties for traffic violations, and employing education-based measures directed at driver behavior.

The most current audit of the TSC released in 2017 found that high severity and fatal/major injury crash rates have fallen 58% overall since implementation of these safety measures. The total fatal and major injury crashes per year have decreased 45%, while crashes per hundred million vehicle miles have decreased 72% since TSC designation. However, per the 2017 audit, fatal and major injury crashes remain a serious problem despite these improvements and the short-term measures are not sustainable in maintaining traffic safety improvement. Long-term, major roadway projects are desirable to make lasting changes by addressing the underlying safety issues and preventing crash rates along the corridor from worsening. Per the 2017 audit, divided highway construction is a recognized method for permanent crash reductions, and studies have shown divided highway concepts minimize conflicts and more permanently sustain similar levels of serious crash reduction compared to interim Safety Corridor treatments (DOT&PF 2017).

Additionally, the short-term measures implemented after TSC designation do not address the need to reduce congestion along the project corridor as the corridor is currently exceeding capacity. As discussed in Section 1.8, the overarching need to address these serious safety problems is highlighted by projected increases in traffic volumes over the next 30 years. Per the 2017 TSC audit, long-term major roadway projects are also desirable to address traffic volume growth.

The proposed project corridor has been identified by DOT&PF as one of the top segments of concern for moose-vehicle collisions (MVC) in the State of Alaska, based on reported crash density per mile data from 2006 to 2010. Additionally, the 2018 Traffic Analysis Report identified 193 MVCs between 2000 and 2010, and indicates the frequency of crashes was statistically significant when compared to the statewide average of MVCs. Collision data indicate 80% of these MVCs occurred during dark and twilight conditions. Currently, MVCs remain a safety concern needing to be addressed.

1.8 Need 2: Congestion

As a rural interstate, the Sterling Highway's primary purpose is to move large volumes of traffic at high speeds from one area to another while providing reasonable access to adjacent properties. However, current and forecast traffic volumes exceed the current roadway's capacity. High traffic volumes combined with numerous access points and lack of passing lanes causes unacceptable congestion within the project area. As congestion levels continue to rise, the ability

to accomplish a trip with a minimum expenditure of time and effort (travel efficiency) is expected to continue deteriorating.

The traffic analysis report determined that congestion along the proposed project corridor is caused by:

- Traffic volume increase of over 400% since the 1970's
- Heavy traffic during peak travel periods confined to two lanes
    - Traffic volumes are almost 150% higher during the summer months
- Two-lane roadway inadequate for current and forecast traffic volumes
- Numerous commercial/private driveways and at-grade local road intersections
- Multiple competing uses for the only highway connection, local vs through, recreational vs commercial, tourist vs all uses
- Slower moving vehicles (i.e. heavy trucks, recreational vehicles, tourists) with limited opportunity for faster vehicles to pass
- No auxiliary passing lanes or slow-vehicle-turnouts

Traffic impacts resulting from these conditions include:

- Long queues forming behind slower moving vehicles
- Substantial travel delays, especially during peak travel times
- Reduced travel speeds
- Frustrated drivers taking unnecessary risk to pass in an unsafe manner.
- Reduction in travel efficiency
- Through traffic is forced to slow or halt while waiting for turning traffic

The project corridor was divided into six traffic segments for the purposes of analysis to more accurately discern segment volume-related needs, as detailed in Table 1.1. Segment break points were selected based on their traffic contributions to the Sterling Highway. In 2015, project corridor annual average daily traffic (AADT) counts for the six segments ranged from 5,931 to 14,646 vehicles per day, far exceeding its design capacity. For this reason, the proposed project must include additional travel lanes in each direction. The DOT&PF estimates unabated segment traffic volumes will range from 7,200 to 17,700 vehicles per day by design year of 2050 (Table 1.1). This is an approximate 21% increase based on a 0.55% growth rate, developed through a linear regression model that used historical traffic as the dependent variable and area population and an independent variable which then projected 2050 populations. Without improvements the above mentioned traffic impacts will continue to worsen.

Table 1.1: Annual Average Daily Traffic Count (AADT)

Sterling Highway Segment*	Base-Year 2015 (vehicles/day)	Construction Year 2030 (vehicles/day)	Mid-Year 2040 (vehicles/day)	Design-Year 2050 (vehicles/day)
Moose River Bridge to Swanson River Road	5,931	6,400	6,800	7,200
Swanson River Road to West Scout Lake Road	8,349	9,100	9,600	10,100
West Scout Lake Road to Robinson Loop Road	8,349	9,100	9,600	10,100
Robinson Loop Road to Jim Dahler Road	8,577	9,300	9,800	10,400

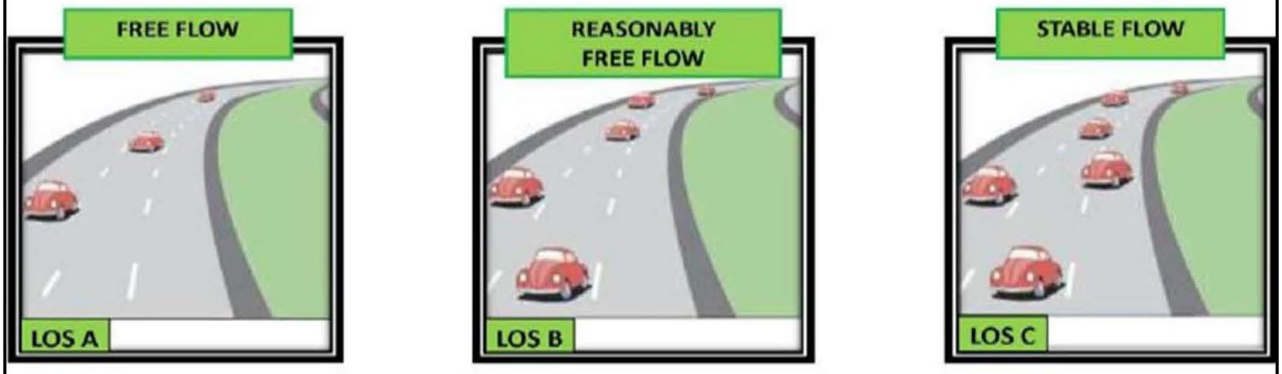
Jim Dahler Road to Mackey Lake Road	10,046	10,900	11,500	12,200
Mackey Lake Road to Kenai Spur Highway	14,646	15,900	16,800	17,700

*For analysis purposes, the project corridor was divided into six segments to more accurately discern segment volume-related need, as intersecting roads generate traffic and can drive future transportation project programming.

The traffic analysis report describes congestion levels in the project area as a series of letter grades from A to F that are known as the roadway level-of-service (LOS). Level-of-service A represents excellent conditions where traffic is free flowing, while LOS F represents failure conditions with extreme congestion and drivers experiencing stop and go traffic. LOS B through E describe progressively worsening traffic conditions. Figure 1.2 is a visual representation of each LOS and Table 1.2 displays the current roadway LOS and how it will change if the highway is not improved. The forecast design year LOS is unacceptable according to the 2001 AASHTO Policy on Geometric Design of Highways and Streets. As stated in the policy, rural interstates should generally be designed to achieve a minimum LOS C for the project's design year. Although not reflected in the AADT LOS, current peak travel times (morning and evening commute, weekends, holidays, tourist season), frequently result in severe congestion along this corridor equivalent to a LOS F.

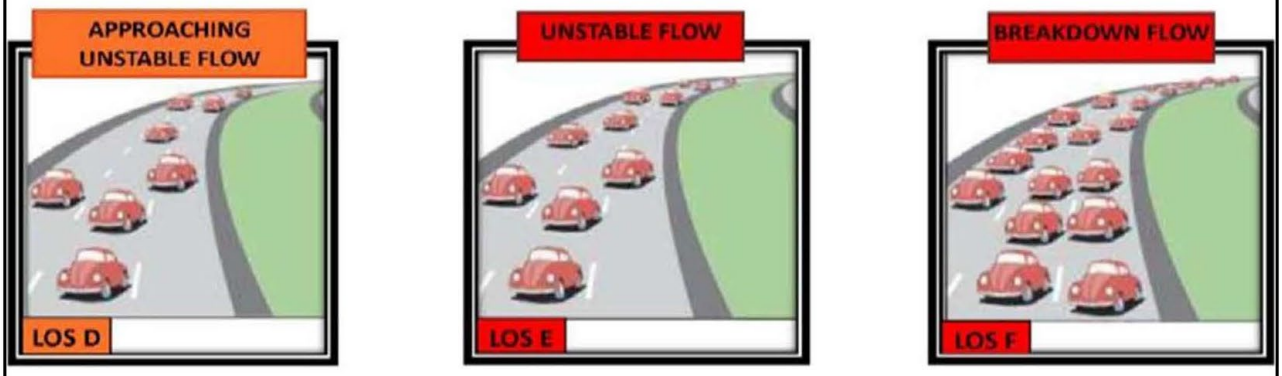
LEVEL-OF-SERVICE (LOS)

LEVEL-OF-SERVICE (LOS) – TERM USED TO DESCRIBE ROADWAY AND INTERSECTION TRAFFIC OPERATIONS USING "LETTER GRADES" RANGING FROM A (BEST) TO F (WORST)



LOS C OR BETTER IS RECOMMENDED NATIONWIDE FOR ARTERIAL ROADS BY AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS.

LOS D, LOS E, AND LOS F DO NOT MEET THE RECOMMENDATION.



Source: DOT&PF Kenai Spur Highway Rehabilitation Reconnaissance Engineering Report, October 2013

STATE OF ALASKA DEPT OF TRANSPORTATION AND PUBLIC FACILITIES PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP	**STERLING SAFETY CORRIDOR IMPROVEMENTS** PROJECT NO. CFHWY00130 VISUALIZATION OF LEVEL OF SERVICE KENAI PENINSULA BOROUGH, AK	FIGURE 1.2

Table 1.2 Roadway Level of Service without Improvements*

Sterling Highway Segment	Base Year 2015	Construction Year 2030	Mid-Design Life 2040	Design-Year 2050
Moose River Bridge to Swanson River Road	D	D	D	D
Swanson River Road to West Scout Lake Road	C	D	D	D
West Scout Lake Road to Robinson Loop Road	D	D	D	D
Robinson Loop Road to Jim Dahler Road	C	D	D	D
Jim Dahler Road to Mackey Lake Road	D	E	E	E
Mackey Lake Road to Kenai Spur Highway	E	E	E	E

*Based on AADT

1.9 Project Objectives

NEED 1 - Safety

- Long-term, sustained reduction of overall crash rates
  - Particularly high severity and head-on collision crash rates
- Reduce moose-vehicle collisions

NEED 2 - Congestion

- Increase LOS
- Shorten travel times
- Increase travel efficiency
- Safely and efficiently balance the demands on mobility and access to adjacent land parcels and local streets

2 ALTERNATIVES

Five build alternatives and a no build alternative were developed and evaluated for their ability to meet the project purpose and needs: to address safety and congestion problems. All alternatives investigated generally follow the existing Sterling Highway alignment with slight variations to lane and median configurations. This section describes the alternatives development process, which includes the No Build and Preferred Alternatives, as well as those alternatives that were considered but dismissed from further evaluation. Only the No Build and Preferred Alternatives are evaluated in this EA. Consideration of the No Build Alternative is required under NEPA regulations as a benchmark for comparison of the environmental effects for the alternatives.

2.1 Alternative Evaluation Criteria

FHWA cites the following criteria in 23 CFR 771.111(f) to ensure meaningful evaluation of practicable alternatives, and to avoid commitments to transportation improvements before their full evaluation. The environmental review will cover a broad area around the proposed transportation improvement. Actions evaluated under NEPA shall:

1. Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
2. Have independent utility or independent significance, that is, be usable and be a reasonable expenditure of funds even if no additional transportation improvements are made in the area; and
3. Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

2.1.1 Criteria 1: Logical Termini

The Sterling Highway is a 138-mile interstate highway connecting western Kenai Peninsula communities to Anchorage and the rest of the state's road system. The highway within the vicinity of the proposed project area provides access to many popular recreational activities and communities for tourists and residents, especially during the summer months. The proposed project termini approximately match those of the Sterling Highway TSC, with additional length to tie back into the exiting road configurations in Sterling and Soldotna. The proposed project begins at Greatland Street (MP 82.5), west of the Moose River Bridge in the community of Sterling, and generally trends southwest for 11.5 miles to Devin Drive (MP 94) within Soldotna city limits. There is sufficient overall length within the proposed project area to analyze and address environmental issues on a broad scope.

The DOT&PF has long recognized the need to improve safety and mobility for the portion of the Sterling Highway between Sterling and Soldotna due to increased traffic from community growth, recreation, and tourism. An environmental assessment (EA) was completed in the early 1980s to widen the Sterling Highway between MP 79 and MP 94 from a two-lane configuration to a four-lane divided facility. ROW for a majority of the proposed expansion was purchased in 1989-90, prior to the project being divided into two phases for construction. Construction for Phase I began in 1991, expanding the highway within Sterling to a four-lane facility with a center two-way left-turn lane (CTWLTL) and improving the two-lane section between Sterling and Soldotna to include widened shoulders, improved horizontal and vertical curve alignments,

and an improved clear zone. Phase II included expanding the remaining portion of highway between Sterling and Soldotna to a four-lane divided facility, but was never constructed (HDL 2015b).

Similar to Sterling, the highway within Soldotna is four lanes wide with a CTWLTL. The northern and southern termini were selected to tie into the expanded highway sections within the communities of Sterling and Soldotna, respectively.

2.1.2 Criteria 2: Independent Utility

Independent utility is based on a project's ability to provide benefit regardless of any other transportation improvements in the area. The project's value or use cannot be dependent on other nearby improvements and a proposed project does not have independent utility if other improvements are needed to make it beneficial.

This project would improve the safety and capacity of the important surface transportation link between the communities of Sterling and Soldotna. The proposed project is fully functional on its own and would satisfy the purpose and needs identified in Section 1independently and without reliance upon any other transportation improvements being constructed.

2.1.3 Criteria 3: Foreseeable Improvements

A project should not restrict or influence alternative selection of other foreseeable transportation improvements in the area. The Sterling Highway is the primary surface transportation link between the communities of Sterling and Soldotna and the proposed project improvements would not restrict consideration of alternatives for any other reasonably foreseeable transportation improvements. DOT&PF has been upgrading the Sterling Highway in recent years, including sections in the vicinity of the proposed project area. Recently constructed projects include the Sterling Highway MP 58-79 Rehabilitation project just to the east, completed in 2019, and the HSIP: Sterling Highway MP 97-118 Shoulder Widening project just to the west of the proposed project, completed in 2020. Per review of available resources (including DOT&PF project status documentation, the Statewide Transportation Improvement Program, and the Statewide Long-Range Transportation Plan), no foreseeable DOT&PF projects appear to be in development or design within the vicinity of the proposed project area. However, three potential projects have been identified in the KPB's comprehensive and transportation plans as future priorities necessary to increase mobility in the area, though no specific projects are yet in development: Sports Lake Road and Robinson Loop Road extensions and a Turnagain Arm crossing from Sterling to Chickaloon Bay to Potter's Marsh. Additionally, two nearby federally-funded transportation improvement projects are currently in design that would likely be traffic generators for the proposed project corridor: Phase II of the Kenai Spur Highway Rehabilitation project and the Sterling Highway Reconstruction, MP 45-60 (Cooper Landing Bypass) project. In its 30-year design life, the proposed project would neither restrict, nor be made unnecessary by, any of these projects.

2.2 Alternatives

Project development for the proposed corridor was originally initiated in the early 1980s, with an Environmental Assessment (1983) analyzing widening the Sterling Highway between MP 79 and MP 94. As discussed above, Phase I of the project began construction in 1991 to widen the

highway within Sterling and improve the two-lane facility from Sterling to Soldotna. As Phase II was never constructed and a significant amount of time had passed since the construction of Phase I, the project was reinitialized in the early 2010s as a state-funded mobility and safety enhancement study.

A Preliminary Decision Document (PDD) was completed in 2014 which identified, evaluated, and provided recommendations regarding alternatives or combination of alternatives that would improve safety and traffic flow for the portion of the Sterling Highway between Sterling and Soldotna (HDL 2014b). Following completion of the PDD, a Preliminary Engineering Report (PER) was developed in 2015 to summarize the preliminary purpose and need, development of alternatives, engineering analyses performed, and recommendations for the proposed project corridor (HDL 2015b).

The following alternatives were considered in the PDD and PER (Figure 2.2.1):

Alternative A: Four-Lane, Divided with a Depressed Median
Upgrade the existing highway to a four-lane divided highway with a depressed center median. This alternative would not change the existing four-lane with CTWLTL section in the community of Sterling at the beginning of the project. The typical section consists of two 12-foot travel lanes in each direction, 8-foot outside shoulders, four-foot inside shoulders, and a 30-foot depressed center median.

Alternative B: Four-Lane, Divided with a CTWLTL or Raised Median
Upgrade the existing highway to a four-lane highway with a CTWLTL and/or a raised median. The typical section consists of two 12-foot travel lanes in each direction, a 16-foot CTWLTL, and 8-foot outside shoulders.

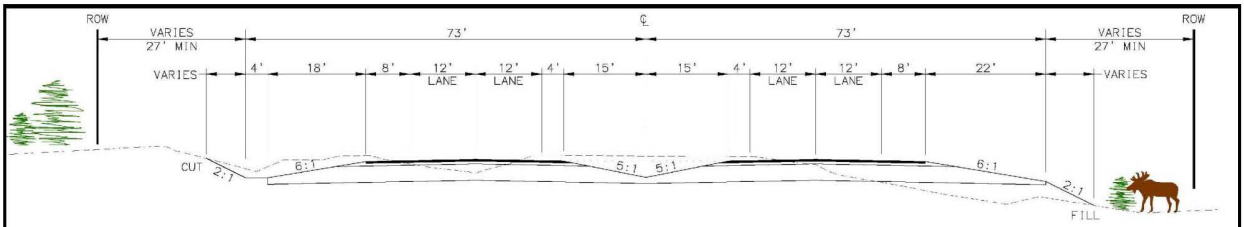
Alternative C: Two-Lane, Divided with a Depressed Median
Upgrade the highway with a depressed center median, but not additional travel lanes. The typical section consists of one 12-foot travel lane in each direction, eight-foot outside shoulders, four-foot inside shoulders, and a 30-foot depressed center median.

Alternative D: Two-Lane, Divided with a Depressed Median with Alternating Pass Lanes
Construct a divided two-lane highway with a depressed center median. Under this alternative, alternating passing lanes between the north and south sides of the roadway would be added. The typical section consists of 12-foot travel lanes in each direction, eight-foot outside shoulders, four-foot inside shoulders, and a 30-foot depressed center median.

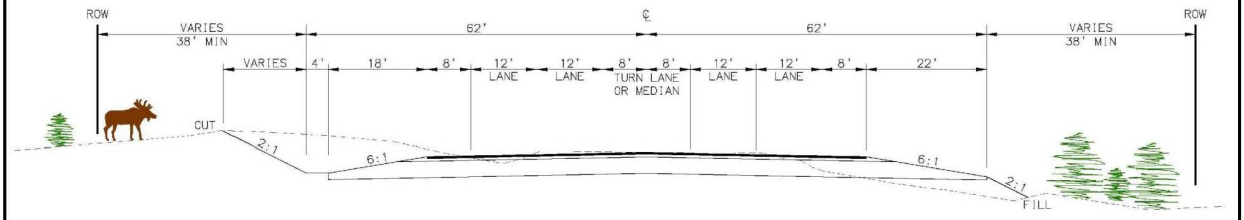
Alternative E: Four-Lane, Divided with an F-Shaped Barrier
Construct a four-lane highway with an “F-shaped” barrier between opposing lanes of traffic. The typical section consists of two 12-foot travel lanes in each direction, eight-foot outside shoulders, eight-foot inside shoulders, and a two-foot “F-shaped” concrete barrier.

Travel Demand Management (TDM)
The TDM alternative seeks to increase existing highway efficiency through application of policies and different strategies to reduce the use of single occupancy private vehicles. This has often been considered a cost-effective way to manage the increasing capacity of roadways. Under a TDM alternative, the following actions would typically be considered, either individually or in combination:

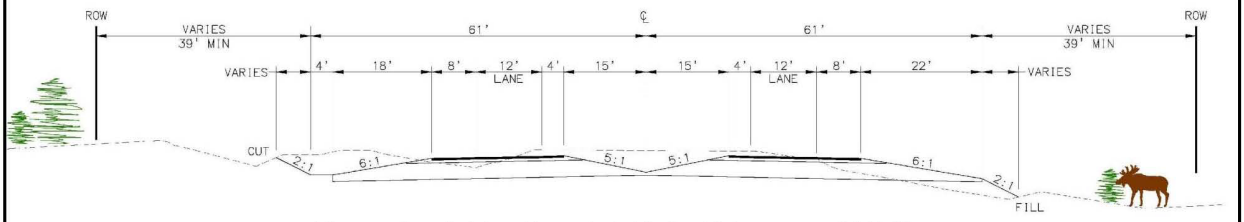
- Ride sharing and fringe parking
- Bus and/or high occupancy vehicle lanes
- Improved transit services
- Traffic signal timing optimization
- Resurfacing and roadway rehabilitation



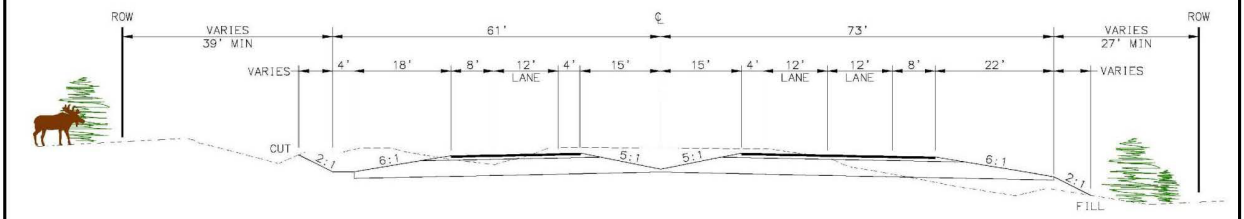
Alternative A: Four-Lane, Divided with Depressed Median



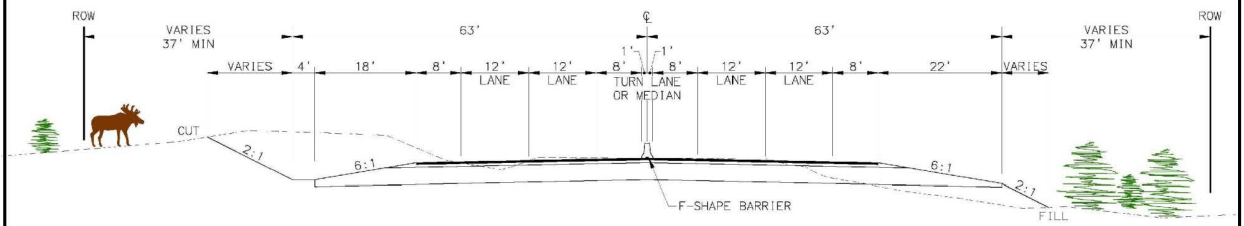
Alternative B: Four-Lane, Divided with Two-Way Left-Turn Lane or Raised Median



Alternative C: Two-Lane, Divided with Depressed Median



Alternative D: Two-Lane, Divided with Depressed Median with Alternating Passing Lane



Alternative E: Four-Lane, Divided with F-Shaped Barrier

STATE OF ALASKA DEPT OF TRANSPORTATION AND PUBLIC FACILITIES PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP	**STERLING SAFETY CORRIDOR IMPROVEMENTS** **MP 82.5 TO 94** PROJECT NO. CFHWY00130 ALTERNATIVE TYPICAL SECTIONS KENAI PENINSULA BOROUGH, AK	FIGURE 2.2.1

2.3 Alternative Development Considerations

Per the PDD, a comparison of the design alternatives focuses on identifying which area of concern is satisfied with which alternative. Although the basis for the evaluation of criteria generally comes directly from the purpose and need for the project, additional criteria are considered, including engineering, land use conformance, environmental impacts, social impacts, costs, and maintenance considerations. To be considered a viable alternative, it must feasibly satisfy many different criteria. Designs that do not sufficiently satisfy the purpose and need of this project, or that do not reasonably improve on areas of concern, are not studied further.

2.3.1 Safety

A crash-based analysis calculates values for the following categories to rate the effectiveness of each alternative at reducing the rate of fatal and major injury crashes:

- Crash reduction (number of crashes and percent reduction using 2014 values developed by the American Association of State Highway and Transportation Officials [AASHTO])
- Dollar value of reduced crashes (the dollar value for crashes is calculated using 2013 costs developed by the National Safety Council)

Improving safety can also be accomplished by reducing congestion, increasing capacity, and mitigating hazards associated with turning movements. These factors can be evaluated as part of traffic criteria, and also as potential solutions on a case-by-case basis at particular intersections or segments, but are not included in the overall evaluation of roadway alternatives.

The total crash reduction ranges from a low of -8.2% with Alternative B to -22.4% with Alternative D as shown in Table 2.3.1. The translated cost savings for each alternative ranges from approximately $11 million to more than $33 million.

Alternatives A and D rank highest for improving safety and are considered statistically similar in the crash-based analysis. A depressed median between two opposing lanes of traffic substantially reduces the potential for severe head-on collisions and eliminates angle crashes at low volume driveways and streets by prohibiting left turns. However, Alternative D scores slightly better because the single lane portions of the divided highway between alternating passing lanes will experience less sideswipe crashes and shoulder rumble strips have been found to be more effective on single-lane roadways than on multi-lane roadways.

Alternative B scored the lowest of all alternatives. The center two-way left-turn lane has been shown to not be an effective way to reduce head on crashes. They are only recommended in an urban setting where operating speeds are relatively low (25-45 mph). (AASHTO Green Book 2004, Ch 7 & 9).

Alternative C does not perform as well as the multi-lane alternatives because it eliminates the ability for vehicles to pass one another, resulting in vehicles slowing to make a right turn becoming more likely to be struck from behind.

Alternative E does not perform as well as divided highway options with a depressed median since the proximity of the concrete barrier will result in crashes with the barrier, which is more severe than crashes with a depressed median. This alternative does, however, reduce head-on,

rear-end, and angle crashes. Openings at intersections require crash attenuators at the exposed barrier ends.

Table 2.3.1: Summary of Crash Reductions and Alternatives Evaluation for Safety

Criteria	Alternatives					
	No Build	A	B	C	D	E
Total Crash Reduction	0%	-21.7%	-8.2%	-13.1%	-22.4%	-19.4%
Dollar Value of Reduced Crashes in 2013 Dollars	$0	$32.5M	$11.1M	$20.2M	$33.3M	$28.7M
Reduces Serious Crashes (Fatal + Major Injury)	✓	✓	✓	✓	✓	✓

✓ = Most Favorable ✓ = Less Favorable ✓ = Least Favorable

2.3.2 Capacity

The traffic capacity analysis determines the LOS for each roadway alternative for the design year of 2050, as shown in Table 2.3.2.

Table 2.3.2: Level of Service (LOS) Recommendations

Functional Class	Appropriate LOS for Specified Terrain Type*			
	Rural	Rural Rolling	Rural Mountainous	Urban and Suburban
Freeway	B	B	C	C
Arterial (includes Interstate)	B	B	C	C
Collector	C	C	D	D
Local	D	D	D	D

*** AASHTO Green Book 2004, Ch 2**

The road segments analyzed in this report are rural class, and the Sterling Highway is functionally classified as an Interstate, which is a subcategory of the Arterial class. Therefore, the recommended target LOS is B or greater for specific highway segments and LOS C or better for intersections for the life of the project (until year 2050).

The No Build alternative and Alternative C do not add any additional lanes to address congestion and capacity, resulting in a reduction in the LOS in the design year. Alternative D adds alternating passing lanes, but shows limited benefit to capacity and does not result in a LOS of B or greater. Alternatives A, B, and E all increase the capacity of the roadway by adding additional lanes in both directions and providing passing opportunities without crossing into oncoming lanes. Additional lanes will reduce the congestion during peak times, increasing the capacity to a LOS of A (Table 2.3.3). Alternatives A, B, and E are rated highest.

Table 2.3.3: Summary of 2050 Capacity Analysis and Alternatives Evaluation for Traffic Capacity

Sterling Highway Segment	Alternatives					
	No Build	A	B	C	D	E
Moose River Bridge to Swanson River Road	D	A	A	D	D	A

Sterling Highway Segment	Alternatives					
	No Build	A	B	C	D	E
Swanson River Road to West Scout Lake Road	D	A	A	D	B	A
West Scout Lake Road to Robinson Loop Road	D	A	A	D	C	A
Robinson Loop Road to Jim Dahler Road	D	A	A	D	C	A
Jim Dahler Road to Mackey Lake Road	E	A	A	E	C	A
Mackey Lake Road to Kenai Spur Highway	E	A	A	E	E	A
Improves Overall Capacity	✓	✓	✓	✓	✓	✓

✓ = Most Favorable ✓ = Less Favorable ✓ = Least Favorable

2.3.3 Mobility

The DOT&PF is responsible for designing, constructing, and maintaining streets and highways to ensure safe and efficient travel. As part of the NHS, the Sterling Highway's primary function is providing mobility on a statewide level, with a secondary function of local area service. The Sterling Highway is defined as an Interstate and all side streets in the project area are defined as local roads, with the exception of Mackey Lake Road, Robinson Loop Road, Swanson River Road, and Scout Lake Road, which are defined as Minor Collector roads.

Road functional classifications establish a hierarchy of roads to provide a balance between mobility and access:

- Arterial - Arterials emphasize mobility and are designed to carry large volumes at an efficient speed.
- Collector - Collector roads gather and distribute trips between local streets and arterials.
- Local Road - Local roads are oriented towards access to homes and businesses at the terminal ends of a trip.

The current classification of the Sterling Highway is an interstate/arterial. The FHWA defines an arterial roadway as providing the highest level of service and mobility for the longest distance, while providing some degree of access control. This classification is important for this section of the highway because it allows for the efficient movement of traffic between the major centers of population and services in Soldotna and Sterling. The mobility of the Sterling Highway is compromised due to capacity and access issues. The future design of the road is recommended to emphasize higher mobility, low degree of access, and reasonable travel times and average speed goals statewide.

Alternatives that emphasize higher mobility, low degree of access, and reasonable travel times and average speeds rate the highest. The No Build Alternative and Alternative B rate the lowest because they have complete uncontrolled access to and from the highway. Alternatives A, C, D, and E, provide some access control by limiting left turns across the highway to median openings, but still allow right- in/right-out access at driveways and side streets. The No Build Alternative and Alternative C will have the longest travel times and lowest travel speeds because the facility

will be congested and over capacity. Alternative D will improve the travel speeds by providing some passing opportunities. Alternative B adds sufficient lanes to provide capacity, but will likely require the speed limit to be reduced to 45 mph, which will not meet the speed limit goals of an interstate highway. Alternatives A and E will provide the most reasonable travel times and average speeds through the corridor (Table 2.3.4).

Table 2.3.4: Alternatives Evaluation for Mobility

	Alternatives					
Criteria	**No Build**	**A**	**B**	**C**	**D**	**E**
Access Control	✓	✓	✓	✓	✓	✓
Reasonable Travel Times/Speeds	✓	✓	✓	✓	✓	✓

✓ = Most Favorable ✓ = Less Favorable ✓ = Least Favorable

2.3.4 Engineering

The constructability of each roadway alternative is evaluated to determine which alternatives have the most or least engineering constraints associated with them (Table 2.3.5). The technical challenges faced when implementing any of the proposed alternatives vary depending on the design chosen, and have an effect on the amount of time, materials, and equipment needed to develop and construct complex roadway designs.

Geometry

Roadway alternatives that require addressing steep topography, complex horizontal and vertical alignments, and angled approaches to intersections and bridges require complicated and less efficient designs to address these engineering challenges. The roadway alternatives identified for this study are not expected to result in an appreciable difference in roadway geometry, and therefore, roadway geometry is not evaluated.

Hydrology and Drainage

The hydrology and drainage of each roadway alternative will consider the number of stream crossings, large culverts, area of impervious surface, and how storm water will be handled. Each alternative identified in this study will have the same number of stream crossings and large culverts. Therefore, only areas of impervious surface and how storm water will be handled will be evaluated.

All the alternatives add impervious surface except the No Build Alternative. However, Alternatives A, C, and D add the grass-lined depressed median down the center that will provide additional treatment and infiltration opportunities. Alternatives B and E have the most impervious surface and requires all the water to drain to outside ditches.

Soils and Geological Hazards

This criterion includes considerations for soils and geological hazards. Soils considerations include the potential for each alternative to encounter frost-susceptible, peat-rich, poor-drained, or other soils less favorable for construction. Alternatives that require the use of complex or steep topography requiring large cuts and fills are generally less favorable than level or rolling terrain for designing highways. The roadway alternatives identified for this study are not

expected to result in an appreciable difference in soils and geological hazards, and therefore, soils and geological hazards are not evaluated.

Utilities

Conflicts with existing utilities can lead to the need for relocation or realignment of the utilities, which adds cost and potential engineering complications to the project. This criterion evaluates each alternative's impact on existing utilities.

Alternatives that expand the roadway footprint horizontally from its existing location have the most potential to conflict with existing utilities. All alternatives except for the No Build Alternative would impact buried underground facilities crossing the roadway. Alternative A will likely impact some utility poles where the ROW narrows, requiring the poles to be embedded deeper into cut slopes or requiring acquisition of additional ROW. Alternative A would also have the greatest number of potential impacts with telecommunications, including BFO cable, and natural gas. Alternatives B, C, D, and E would have minimal overall impacts to electric, telecommunications, and natural gas utilities.

Right-of-Way

Alternatives that expand the roadway footprint outside of the existing ROW can add significant cost and delays to the project, as well as have adverse impacts to neighboring properties that may need to be acquired and/or relocated. This criterion evaluates each alternative's need for additional ROW.

The No Build Alternative will not require additional ROW acquisitions, and additional ROW under Alternatives B and C is not likely as well. Alternatives A and D involve more substantial widening of the roadway and are likely to require at least a minimal amount of additional ROW.

Table 2.3.5: Alternatives Evaluation for Engineering Considerations

	Alternatives					
Criteria	**No Build**	**A**	**B**	**C**	**D**	**E**
Hydrology and Drainage	✓	✓	✓	✓	✓	✓
Utility Relocation	✓	✓	✓	✓	✓	✓
Right-of-Way Acquisition	✓	✓	✓	✓	✓	✓

✓ = Most Favorable ✓ = Less Favorable ✓ = Least Favorable

2.3.5 Maintenance and Operations

The DOT&PF's Maintenance and Operations personnel are responsible for the day-to-day operation and maintenance of the State's transportation system. This includes the safe and efficient maintenance and operation of over 5600 miles of state owned roadways, 252 rural airports, 845 bridges and 720 State owned and/or managed buildings. Maintenance personnel are stationed at 80 maintenance facilities across the State ranging from Ketchikan in Southeast Alaska to Barrow on the north-slope to Adak in the Aleutian Islands…Alaska's transportation system lies within one of the most extreme and challenging environments on the planet. Alaska is a land of extremes with temperatures ranging from 100F to -80F, snowfalls as high as 974 inches of snow at Thompson Pass, and 80% of the State is under laid by ice-rich permafrost. Maintenance activities are conducted in a geographically diverse climate ranging from maritime to arctic."

Maintenance of the Sterling Highway is a DOT&PF responsibility. Adding lanes to the existing highway and associated right and left turning lanes, traffic signals, intersection lighting, signs, etc. will increase maintenance and operation costs of the road.

The No Build Alternative and Alternative C will not increase the number of lane miles to be maintained. Alternatives A, C, and D are favorable regarding snow removal as the depressed median can be used to store snow in winter months. Alternative B is less favorable because there is more road area to remove snow from, and it will all have to be moved to the outside edge of the road. Alternative E is the least favorable due to the maintenance of the F-shaped barrier and the more difficult snow removal (Table 2.3.6).

Table 2.3.6: Alternatives Evaluation for Maintenance Considerations

	Alternatives					
Criteria	**No Build**	**A**	**B**	**C**	**D**	**E**
Maintenance and Operations	✓	✓	✓	✓	✓	✓

✓ = Most Favorable ✓ = Less Favorable ✓ = Least Favorable

2.3.6 Land Use and Social Impacts

To evaluate each alternative for its effect on land use, the following evaluation criteria are assessed:

Consistency with Land Use/Transportation plans

A common source of concern with roadway expansion projects is related to the balance that must be achieved between the need for a safe and efficient travel corridor and the need for amenities and features desired by the public. This commonly includes concerns over access to adjacent neighborhoods, collector roads, schools, businesses, and other destinations; speed limits; and pedestrian and bicycle facilities. A favorable alternative must also be able to incorporate some or all of the goals of state and local transportation plans (e.g., *Envision Soldotna 2030*, *Kenai Peninsula Borough Comprehensive Plan*, and *Let's Get Moving 2030*, DOT&PF's current statewide long-range transportation plan).

The No Build Alternative would provide the least number of benefits that are defined in local and state planning documents because it would not improve safety for through traffic or local traffic and would not increase capacity. Although Alternatives A through E all have the potential to improve these conditions, Alternative A most closely aligns with KPB's Comp plan and DOT&PF's long-range transportation plan.

Social Impacts

Potential social impacts are noise pollution, residential displacement, and business impacts. A preliminary identification of existing noise impacts has been completed for this study, although none of the alternatives have been modeled and impacts are not included in this evaluation. The potential for noise impacts induced by any of the alternatives will be evaluated during the design phase.

Therefore, the evaluation of social impacts will focus primarily on the potential to impact businesses and neighborhoods as a result of ROW acquisition, changes to access, and changes to travel patterns.

The No Build Alternative and Alternative B are rated as most favorable for social impacts because they do not reduce access to adjacent neighborhoods and businesses (Table 2.3.7). Alternatives A, C, D, and E are rated slightly lower due to the likely reduction in the number of access points through median breaks along the highway.

Table 2.3.7: Alternatives Evaluation for Land Use Considerations

	Alternatives					
Criteria	**No Build**	**A**	**B**	**C**	**D**	**E**
Land Use/Transportation Plans	✓	✓	✓	✓	✓	✓
Social Impacts	✓	✓	✓	✓	✓	✓

✓ = Most Favorable ✓ = Less Favorable ✓ = Least Favorable

2.3.7 Environmental Resources

To evaluate each alternative for its effect on environmental resources within the study area, the following evaluation criteria were preliminarily assessed:

- Impacts to Cultural Resources
- Impacts to Wetlands
- Impacts to Fish and Wildlife
- Impacts to Invasive Species
- Impacts to Floodplains
- Effects on Hazardous Materials
- Impacts to Parks, Recreation Area, and Wildlife Refuges

The preliminary evaluation of impacts considers the potential impacts each roadway alternative would have on the resources present within the study area. Where available for each resource, impacts are quantified by overlaying preliminary catch limits developed for each alternative over Geographic Information System shapefiles delineating and/or mapping the boundary or location of the resource. Wetland boundaries are based on mapping completed for the 2014 Preliminary Jurisdictional Determination.

All build alternatives involve expansion of the existing highway's horizontal footprint and would have similar direct impacts to all resource categories (Table 2.3.8). All build alternatives would have a potential indirect impact to cultural resources within and adjacent to the study area; would have minor or no impacts on fish and wildlife habitat, floodplains, and parks, recreation areas, and wildlife refuges; and would have a minor impact on at least one wetland area. All build alternatives would require mitigation measures to reduce the spread of invasive species and reduce the risk of encountering hazardous materials during construction. Discussion of the affected environment and environmental consequences related to the Preferred Alternative can be found in Chapter 3.

Table 2.3.8: Preliminary Alternatives Evaluation for Environmental Resources

Criteria	Alternatives					
	No Build	A	B	C	D	E
Cultural Resources	✓	✓	✓	✓	✓	✓
Wetlands	✓	✓	✓	✓	✓	✓
Fish and Wildlife	✓	✓	✓	✓	✓	✓
Invasive Species	✓	✓	✓	✓	✓	✓
Floodplains	✓	✓	✓	✓	✓	✓
Hazardous Materials	✓	✓	✓	✓	✓	✓
Parks, Rec Areas, Wildlife Refuges	✓	✓	✓	✓	✓	✓

✓ = Most Favorable ✓ = Less Favorable ✓ = Least Favorable

2.3.8 Pedestrian and Bicycle Accommodation

Accommodating the needs of non-motorized users is evaluated under two criteria: The ability for pedestrians and bicyclists to cross from one side of the highway to the other and the ability to accommodate a dedicated pedestrian facility, as summarized in Table 2.3.9.

Pedestrian Crossing

Pedestrian crossing of very wide roadways relies heavily on the availability of median refuges, which has a downstream effect on the resulting delay caused by waiting for breaks in traffic or signal changes. These factors reflect the quality of the pedestrian experience and alternatives that require the least delay are rated highest.

The performance of the pedestrian crossing criterion is defined by the average delay experienced and the resulting level of service to the pedestrian. Each alternative was evaluated for the delay and resulting LOS experienced during the design year of 2050.

Accommodation of Dedicated Pathway Facilities

The optimum configuration of dedicated multi-use pathways requires more space between the roadway and the ROW edge than may be available. Thus, a two-lane roadway would more easily accommodate a pathway separated from the roadway by the optimal distance (22 feet) than a wider four-lane roadway.

The evaluation of each alternative's ability to accommodate a multi-use pathway separated from the roadway by the optimum distance is directly related to the design width alternative from the centerline of the roadway to the outside edge of the clear zone. Therefore, the No Build Alternative and Alternatives B and C, rate higher than Alternatives A, D, and E.

Table 2.3.9: Pedestrian Crossing Performance (LOS) and Alternatives Evaluation for Pedestrian/Bicycle Accommodations

Highway Segment/Criteria	Alternatives					
	No Build	A	B	C	D*	E
Moose River Bridge to Swanson River Road	D	C	F	B	B C	C
Swanson River Road to West Scout Lake Road	D	C	F	B	C C	C

Highway Segment/Criteria	Alternatives					
	No Build	A	B	C	D*	E
West Scout Lake Road to Robinson Loop Road	D	C	F	B	C C	C
Robinson Loop Road to Jim Dahler Road	F	D	F	B	C C	D
Jim Dahler Road to Mackey Lake Road	F	E	F	C	D C	E
Mackey Lake Road to Kenai Spur Highway	F	F	F	C	F E	F
Pedestrian Crossing	✓	✓	✓	✓	✓	✓
Accommodates Pathway	✓	✓	✓	✓	✓	✓

*** Alternative D was evaluated for both directions. Left column = westbound, right column = eastbound**

✓ = Most Favorable ✓ = Less Favorable ✓ = Least Favorable

2.3.9 Cost

A preliminary cost estimate for each alternative has been developed that takes into account the anticipated expenses for roadway design, construction, utility relocations, and acquisitions and relocations of properties for additional ROW. Alternatives range in estimated cost from $53 million (Alternative C) to $74 million (Alternative E), as summarized in Table 2.3.10.

Table 2.3.10: Preliminary Cost Estimate Comparison

Component	Alternatives					
	No Build	A	B	C	D	E
Design ($)	0	2,568,700	2,622,450	2,098,000	2,301,300	2,908,500
Construction ($)	0	61,910,300	63,200,600	50,557,000	55,467,000	70,106,500
Utility Relocation ($)	0	875,000	625,000	625,000	750,000	625,000
ROW Acquisition ($)	0	600,000	0	0	600,000	0
Total Cost ($)	0	65,954,000	66,448,000	53,280,000	59,115,000	73,640,000
Total Cost Favorability	✓	✓	✓	✓	✓	✓

✓ = Most Favorable ✓ = Less Favorable ✓ = Least Favorable

2.4 Summary of Alternative Analysis

The need for a project that improves safety, capacity, and mobility issues on the Sterling Highway from Sterling to Soldotna is illustrated by the high rate of serious crashes and congestion occurring during peak traffic periods. Several options for improving these conditions within this highway corridor were identified during development of the PDD and PER.

The criteria presented in Section 2.3 presents the different constraints and values that must be balanced when considering which improvements to carry forward into design. The purpose and need for the project is inherently included in the safety, capacity, and mobility criteria, and is given significant weight. Other specific categories were also included in the criteria to more clearly understand the overall favorability of each alternative. A summary of the evaluation for

all the criteria is presented in Table 2.4.1. After screening, only the No Build Alternative and the Preferred Alternative were selected for further evaluation.

Table 2.4.1: Summary and Comparison of Alternatives

Criteria	Alternatives					
	No Build	A	B	C	D	E
Safety	✓	✓	✓	✓	✓	✓
Capacity	✓	✓	✓	✓	✓	✓
Mobility	✓	✓	✓	✓	✓	✓
Engineering	✓	✓	✓	✓	✓	✓
Maintenance and Operations	✓	✓	✓	✓	✓	✓
Land Use	✓	✓	✓	✓	✓	✓
Environmental Resources	✓	✓	✓	✓	✓	✓
Pedestrian and Bicycle Accommodation	✓	✓	✓	✓	✓	✓
Cost	✓	✓	✓	✓	✓	✓
✓ = Most Favorable	**✓ = Less Favorable**			**✓ = Least Favorable**		

2.4.1 No Build Alternative

The National Environmental Policy Act (NEPA) and Council on Environmental Quality regulations at 40 CFR 1502.14(d) require the analysis of a No Build Alternative for the environmental document. The No Build Alternative would leave the Sterling Highway in its current condition, which provides a baseline to compare against other build alternatives. Under the No Build Alternative, the Sterling Highway would remain a two-lane undivided roadway along its existing alignment within the project corridor. Beyond routine maintenance, improvements would occur only in response to safety issues under the Highway Safety Improvement Program.

The following needs would not be addressed by the No Build Alternative:

- Roadway capacity and reduced traffic flow
- Traffic congestion
- Reduced mobility of people and freight
- High overall crash rate, including high severity and head-on crashes
- Limited passing opportunities
- Access management

The No Build Alternative does not address capacity, congestion, or safety issues throughout the corridor and does not meet the purpose and need of this project. Current traffic congestion and safety concerns would persist and likely worsen as traffic volumes continue to increase.

2.4.2 Preferred Alternative

The Preferred Alternative for the proposed project corridor is a combination of Alternatives A and B, as described above (Figures 2.4.1-9). With the Preferred Alternative, the highway will transition from the four-lane, divided with a CTWLTL section at the beginning of the project to the proposed four-lane, divided with a depressed median section at approximately Handley Street

in Sterling. The proposed four-lane, divided with a depressed median section will then transition back to the four-lane, divided with a CTWLTL section near Kleeb Loop to the end of the project in Soldotna.

The four-lane, divided with a depressed median highway section will consist of two 12-foot lanes in each direction, eight-foot paved outside shoulders, four-foot paved inside shoulders, separated by a 30-foot wide grass lined ditch. Adjacent to the highway, a separated 10-foot wide multi-use pathway will be installed on the north side of the highway. The pedestrian facilities will meet Americans with Disabilities Act accessibility guidelines, including maximum grade, cross slope, and width. The four-lane, divided highway with a CTWLTL sections will consist of two 12-foot lanes in each direction, a 16-foot CTWLTL, standard curb and gutter, and sidewalk on both sides of the highway to match existing conditions within Sterling and Soldotna. Side slopes along the highway will be 6:1 to the clear zone with 2:1 slopes outside the clear zone. Steeper slopes up to 1.5:1 will be used outside the clear zone where necessary to avoid property and environmental impacts. The depressed median will have 5:1 side slopes and will be 3-feet in depth to provide drainage and snow storage.

The proposed project corridor would be developed as a partial limited access facility with allowable access points defined by breaks in controlled access lines. The Preferred Alternative does not eliminate any existing individual property's access onto the highway; however, the proposed median would restrict movement at driveways and at some approach road intersections to right-in/right-out maneuvers. Median openings will be provided approximately every half mile for U-turns and access to side streets. Right-turn auxiliary lanes will be provided for eastbound traffic at S. Jawle Street, Isbell Street, Forest Lane, St. Theresa Road, and W Scout Lake Road. Driveway and minor side street access will be limited by the depressed median to right-in/right-out only movements. None of the intersections warrant traffic signals and side streets along the project corridor will be stop controlled. These controls, along with deliberate intersection design and location, would allow traffic to flow in more predictable and safer patterns throughout the area.

A two-lane, two-way frontage road on the north side of the highway from Jawle Street to Pine Street will help consolidate local traffic to one median opening at-grade intersection and help accommodate truck access to Lynden Transport at Pine Street. Additionally, the intersection of the Sterling Highway and Solid Rock Road will be realigned opposite Isbell Street. The addition of the frontage road and realigning Solid Rock Road will reduce indirect movements, such as U-turns, by providing additional access to the median openings at Jawle and Isbell.

Scout Lake Road will also be realigned in the Preferred Alternative. The existing Scout Lake will be realigned opposite Lois Street along the section line. Moving Scout Lake Road to the median opening at Lois Street will reduce indirect movements, such as U-turns, and will remove the road from bisecting Scout Lake State Park land. Additional information regarding the realignment of Scout Lake Road, and improvements to the Scout Lake Road State Recreation Area can be found in the Recreation and Section 4(f) Resources section 3.12.

The frontage roads and major side streets will consist of two 11-foot lanes and 5-foot paved outside shoulders. Side slopes will be 4:1 to the clear zone with 2:1 slopes outside the clear zone. The areas adjacent to the project corridor are developing rapidly and the Preferred Alternative has identified opportunities to consolidate access to developing properties. It is reasonable to

expect that demands and opportunities for further connectivity will be become apparent during final design.

The general alignment will follow the existing highway. All horizontal curves exceed the minimum design standards for new construction and no grades exceed 4.0%. The highway will be widened throughout the four-lane section of the highway. The proposed project corridor has a rolling terrain and will require minor raising and lowering of the highway throughout the project to allow for the widening.

Culverts are located throughout the length of the project. To accommodate the highway widening and other improvements, the drainage design will include replacing existing crossing culverts, installing inlets in the median to collect runoff from the grass-lined depressed median, and deepening/widening the grass lined ditches adjacent to the roadside. The existing culvert at Soldotna Creek was designed to accommodate a four-lane highway and therefore no in-water work or culvert modifications for Soldotna Creek are proposed. Generally, the proposed roadway improvements will not significantly change existing draining patterns. Drainage and water quality is further discussed in the Water Quality section 3.7.

Analysis indicated the Preferred Alternative meets the project purpose and need. Additional through-lanes would provide capacity to accommodate forecast design-year traffic. Peak-hour traffic congestion would be reduced. Access management, median construction, and decreased congestion and delays would improve safety and efficiency. The Preferred Alternative was selected because it provides considerable safety, capacity, and efficiency advantages, and it effectively balances competing demands for through-traffic mobility, local access, and public safety.

2.4.3 Alternatives Dropped from Further Consideration

Alternative C: Two-Lane, Divided with a Depressed Median
Alternative C will significantly improve the safety of the highway, but will not improve capacity or mobility. The highway will be widened the least with this alternative, and therefore has the least impacts to utilities, ROW, maintenance and operations, and environmental resources. The desirable multi-use pathway can most likely be added without impacting utilities and ROW. The cost is the least of all build alternatives. Alternative C does not meet the purpose and need, and is not recommended to be carried forward to design.

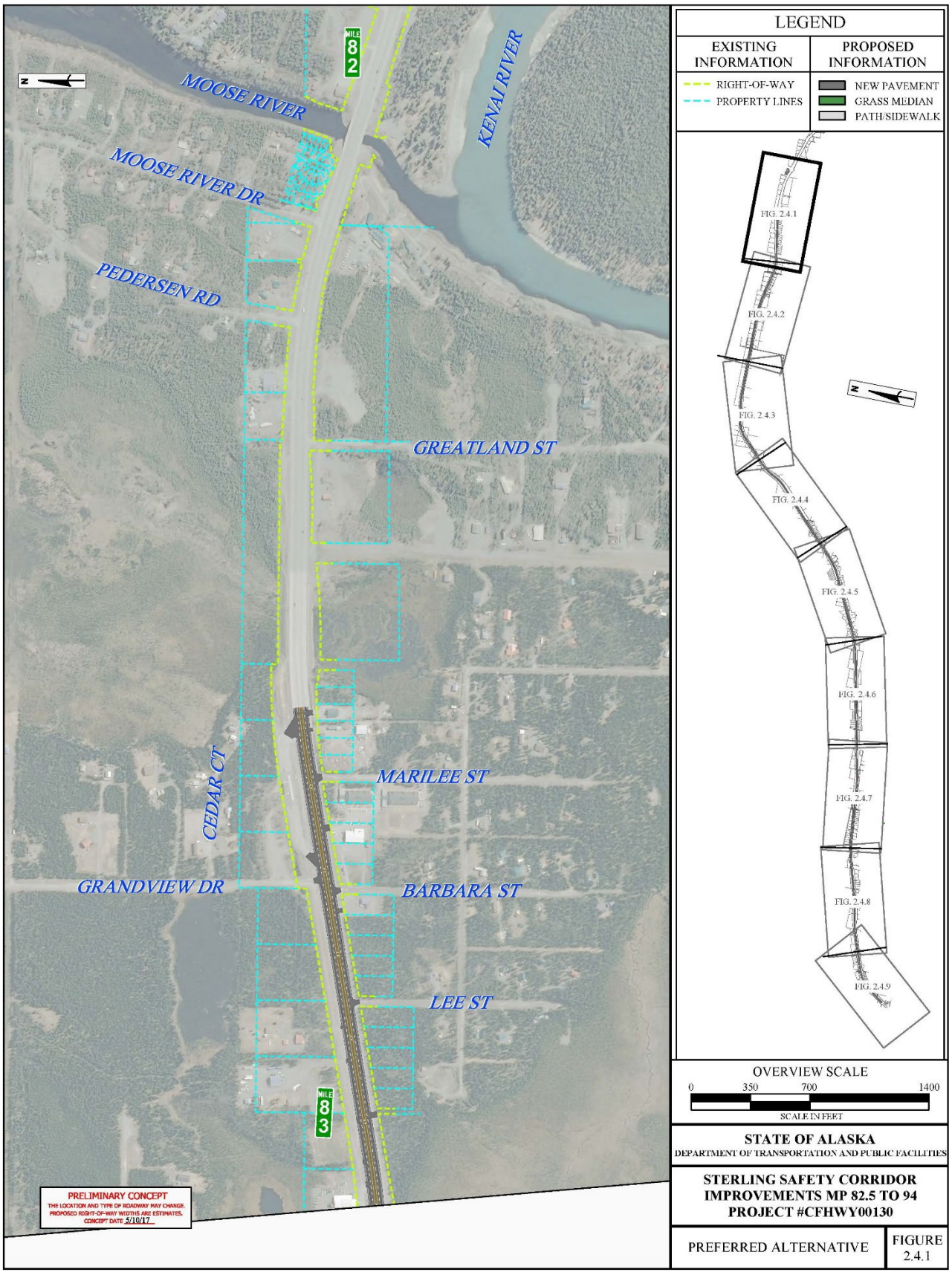
Alternative D: Two-Lane, Divided with a Depressed Median with Alternating Pass Lanes
Alternative D will significantly improve the safety of the highway, but will only slightly improve capacity and mobility. The highway will be widened more than Alternative C, but less than Alternatives A, B, and E. Therefore, it was ranked in the middle for impacts to utilities, ROW, environmental resources, and pedestrian/bicycle accommodations. The cost is slightly more than Alternative C. Alternative D does not meet the purpose and need, and is not recommended to be carried forward to design.

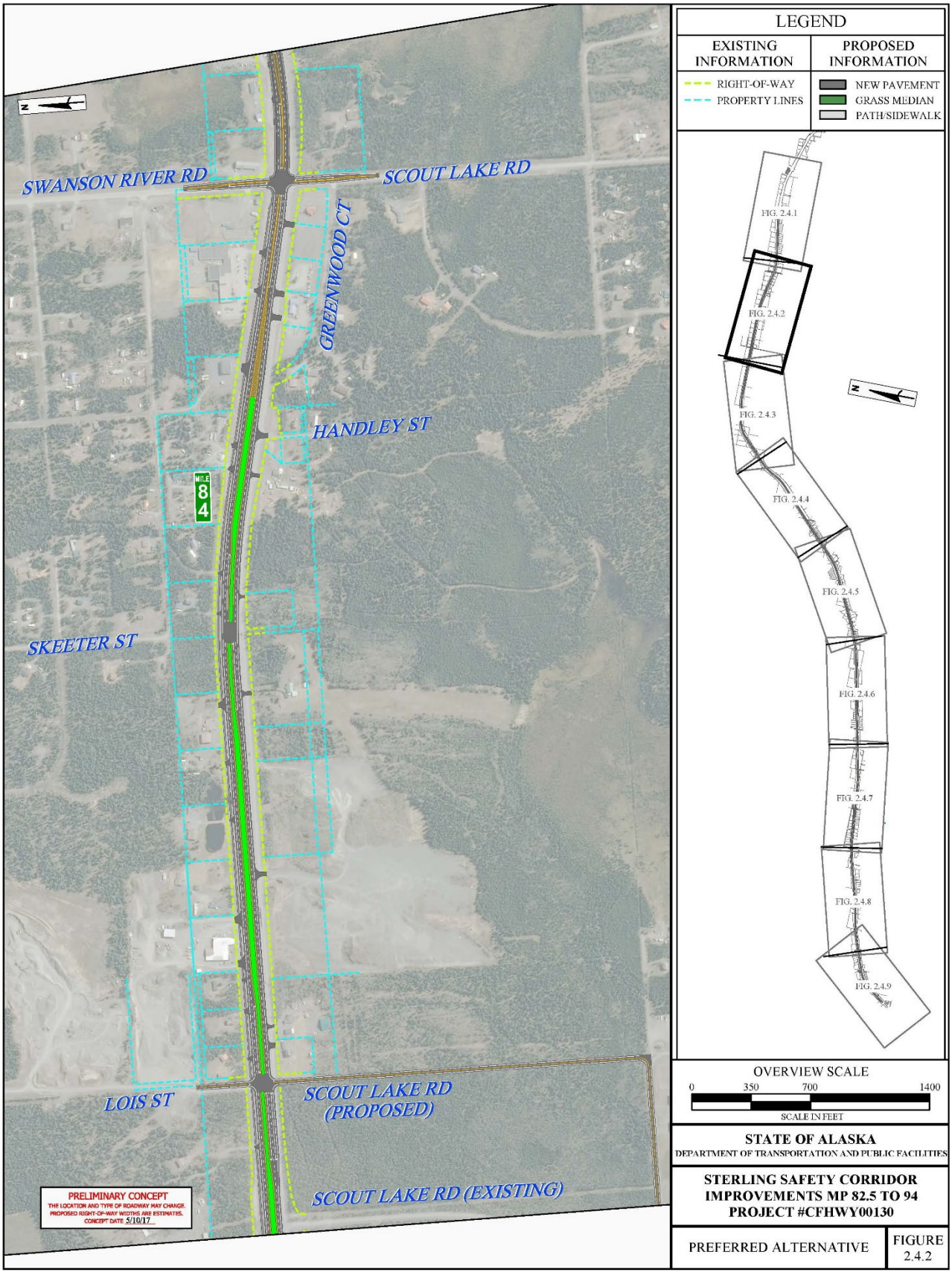
Alternative E: Four-Lane, Divided with an F-Shaped Barrier
Alternative E meets the purpose and need of improving the safety, capacity, and mobility of the highway. It is very similar to Alternative A, except the F-shaped barrier allows the narrowest width of all 4-lane alternatives. The F-shape barrier lessens the safety benefit, increases the maintenance and operations, and has the highest cost. Alternative E is not recommended for the

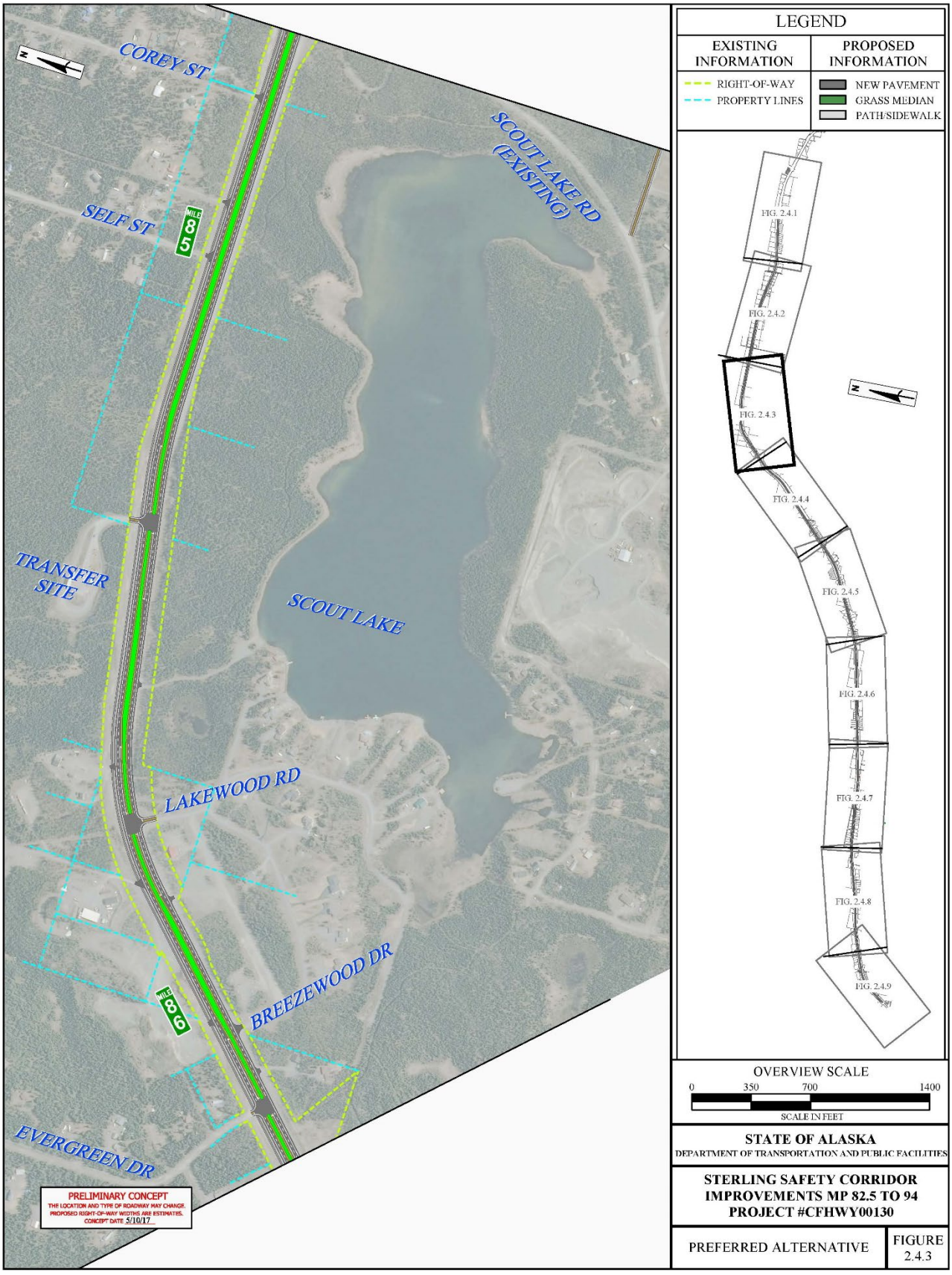
entire corridor, but may be considered during design for isolated locations where less widening proves cost effective.

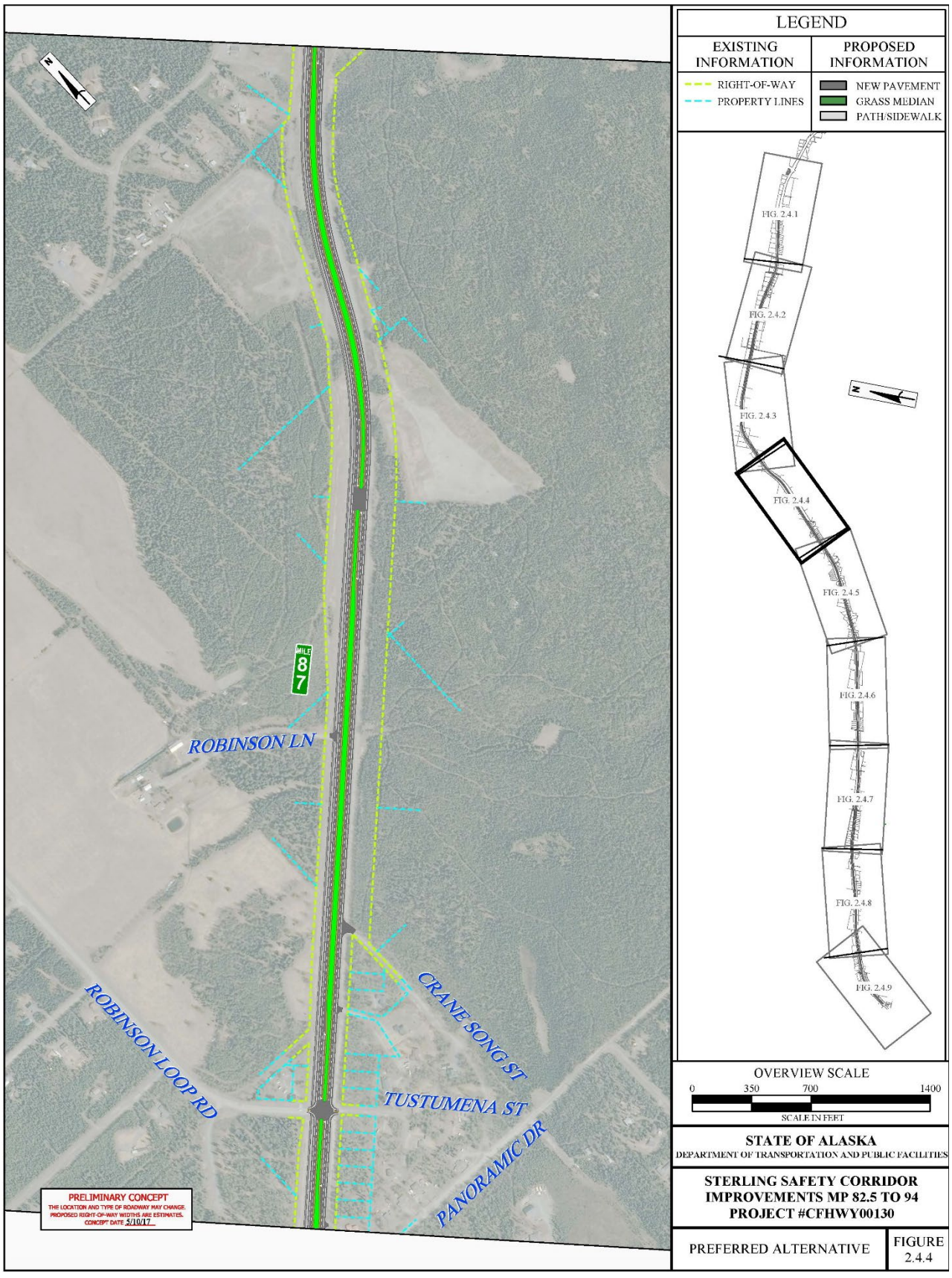
Travel Demand Management (TDM)

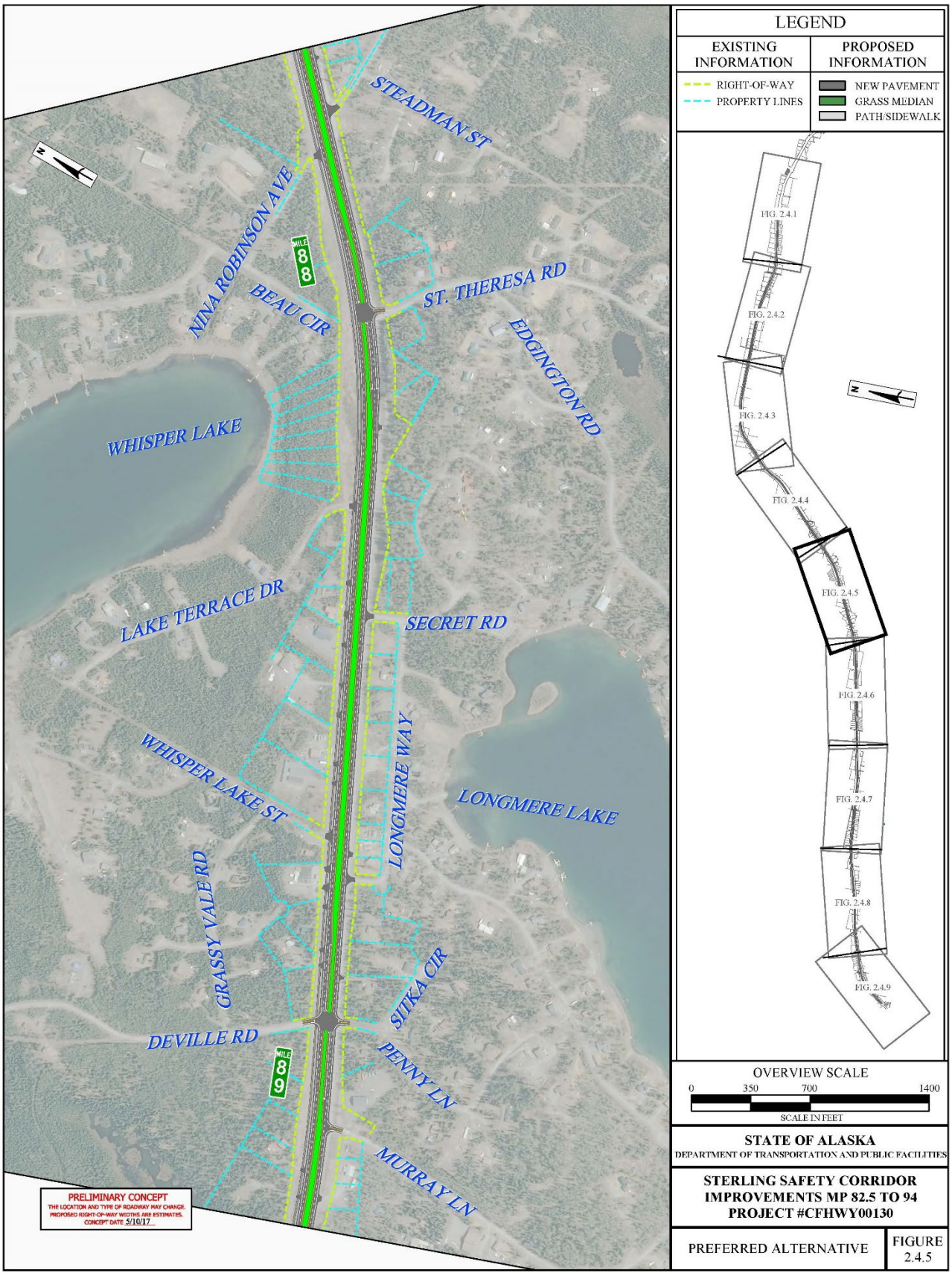
Since most of the study area is considered rural, and high volumes of seasonal recreational and tourism related traffic contribute to the over-capacity issues seen on the roadway, a TDM alternative would not be a cost-effective or viable solution. A TDM system would also not result in the crash reduction benefits sought by this study. For these reasons, a TDM alternative was dropped from consideration during development of the PDD.

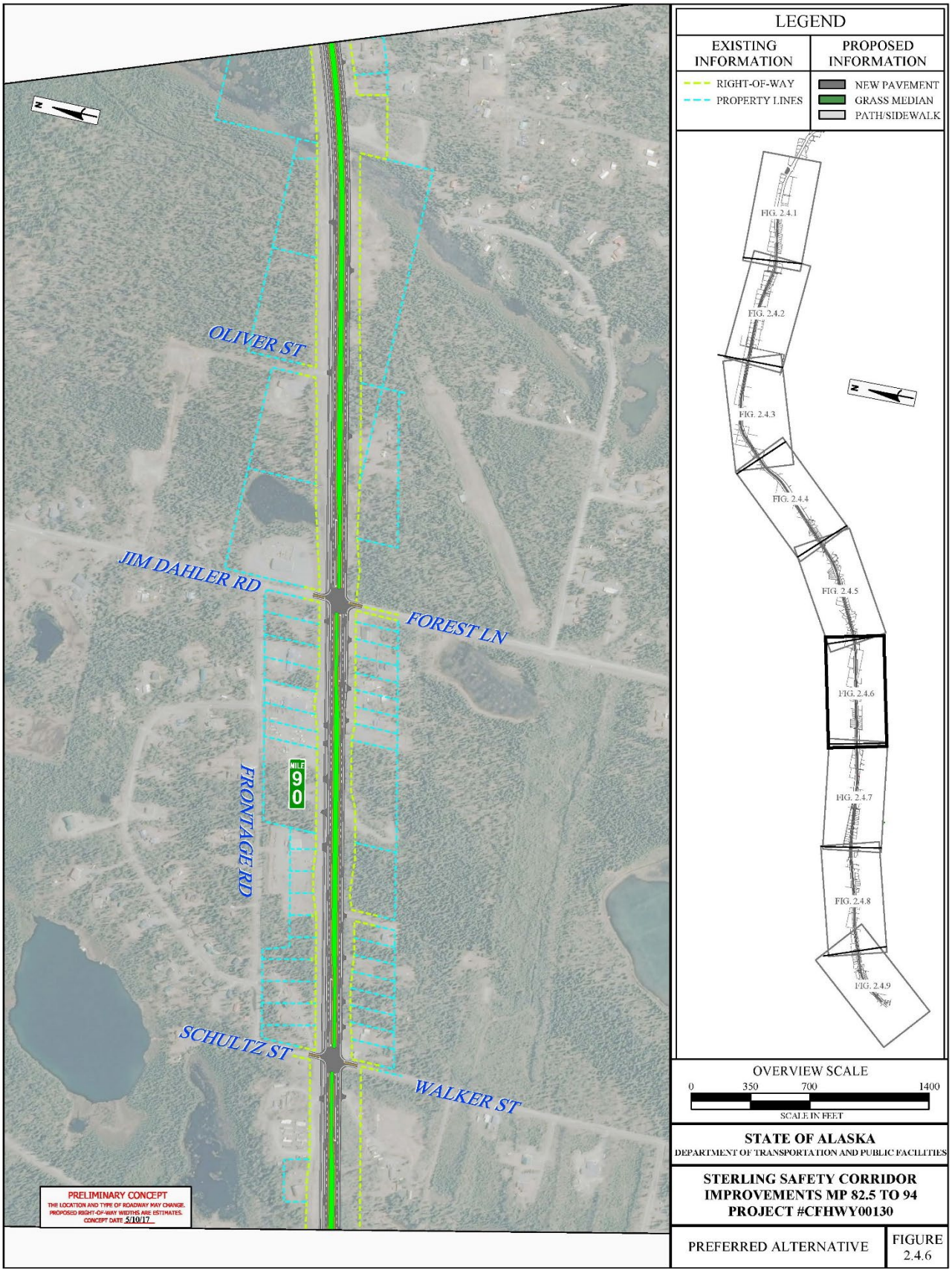

MOOSE RIVER
KENAI RIVER
MOOSE RIVER DR
PEDERSEN RD
GREATLAND ST
CEDAR CT
MARILEE ST
GRANDVIEW DR
BARBARA ST
LEE ST
MILE 82
MILE 83
PRELIMINARY CONCEPT
THE LOCATION AND TYPE OF ROADWAY MAY CHANGE.
PROPOSED RIGHT-OF-WAY WIDTHS ARE ESTIMATES.
CONCEPT DATE 5/10/17
LEGEND
EXISTING INFORMATION
RIGHT-OF-WAY
PROPERTY LINES
PROPOSED INFORMATION
NEW PAVEMENT
GRASS MEDIAN
PATH/SIDEWALK
FIG. 2.4.1
FIG. 2.4.2
FIG. 2.4.3
FIG. 2.4.4
FIG. 2.4.5
FIG. 2.4.6
FIG. 2.4.7
FIG. 2.4.8
FIG. 2.4.9
OVERVIEW SCALE
0 350 700 1400
SCALE IN FEET
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT #CFHWY00130
PREFERRED ALTERNATIVE
FIGURE 2.4.1

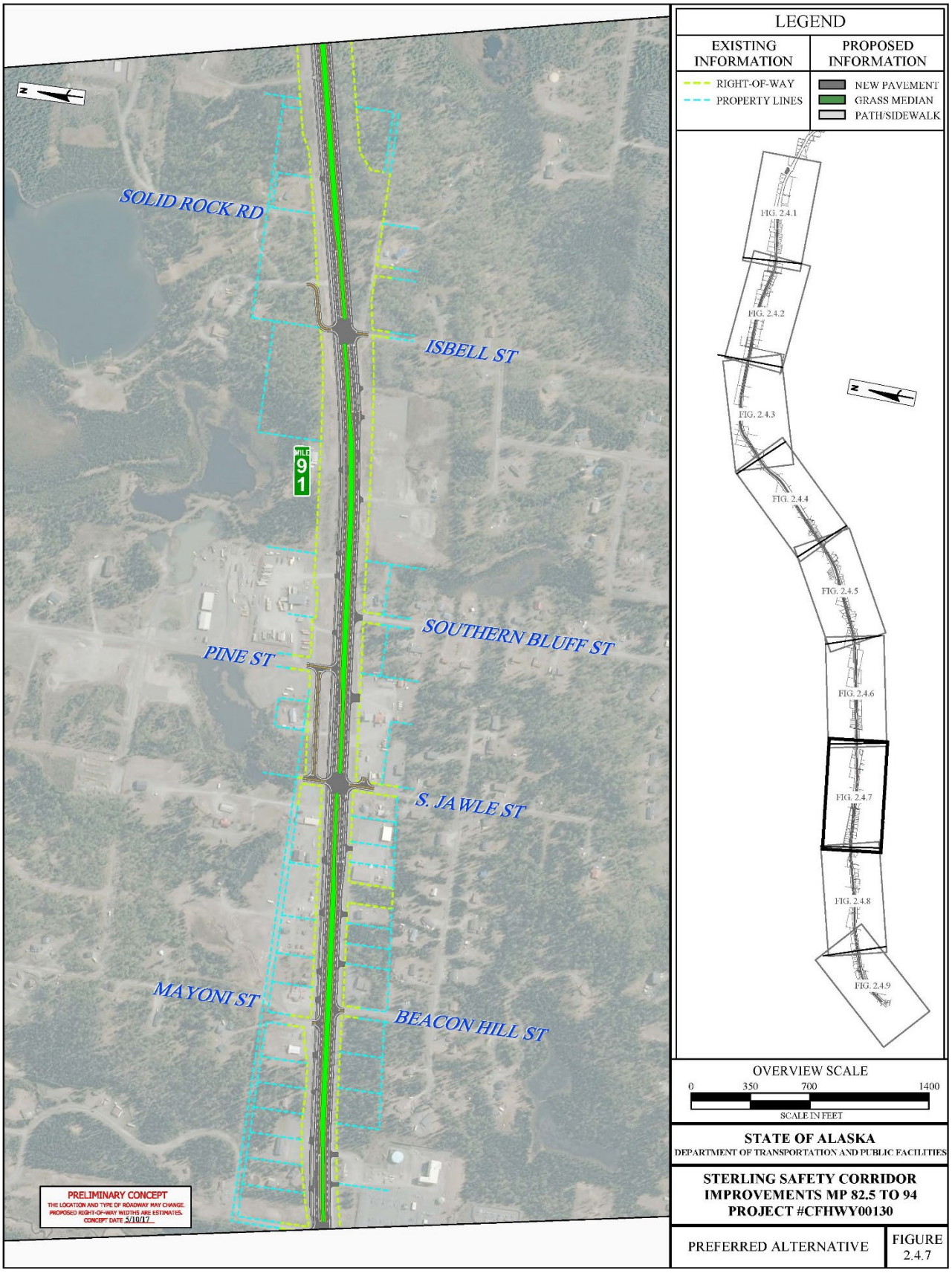

SWANSON RIVER RD
SCOUT LAKE RD
GREENWOOD CT
HANDLEY ST
MILE 84
SKEETER ST
LOIS ST
SCOUT LAKE RD (PROPOSED)
SCOUT LAKE RD (EXISTING)
PRELIMINARY CONCEPT
THE LOCATION AND TYPE OF ROADWAY MAY CHANGE. PROPOSED RIGHT-OF-WAY WIDTHS ARE ESTIMATES.
CONCEPT DATE 5/10/17
LEGEND
EXISTING INFORMATION
RIGHT-OF-WAY
PROPERTY LINES
PROPOSED INFORMATION
NEW PAVEMENT
GRASS MEDIAN
PATH/SIDEWALK
FIG. 2.4.1
FIG. 2.4.2
FIG. 2.4.3
FIG. 2.4.4
FIG. 2.4.5
FIG. 2.4.6
FIG. 2.4.7
FIG. 2.4.8
FIG. 2.4.9
OVERVIEW SCALE
0 350 700 1400
SCALE IN FEET
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT #CFHWY00130
PREFERRED ALTERNATIVE
FIGURE 2.4.2

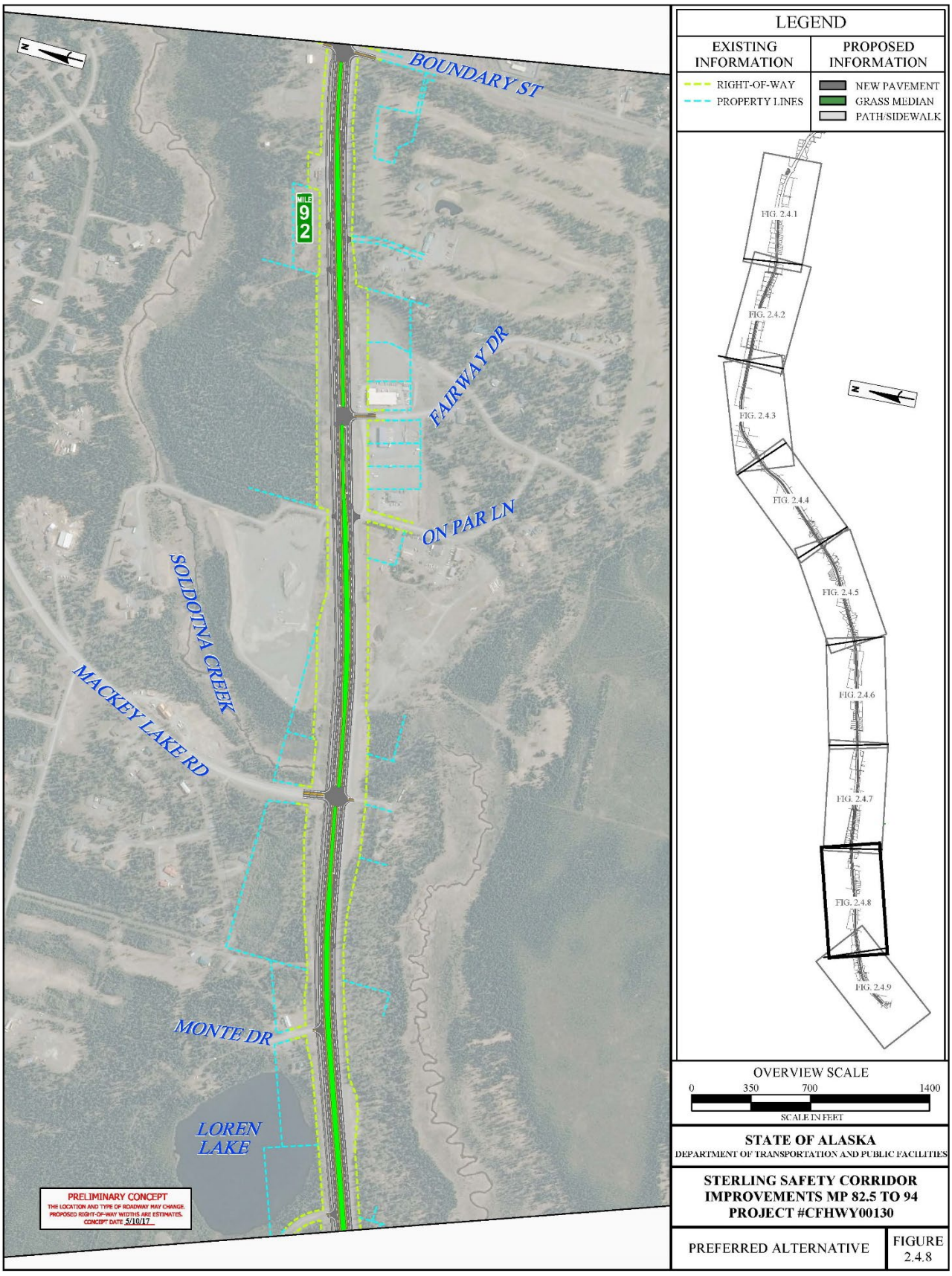

COREY ST
SELF ST
MILE 85
SCOUT LAKE RD (EXISTING)
TRANSFER SITE
SCOUT LAKE
LAKEWOOD RD
BREEZEWOOD DR
MILE 86
EVERGREEN DR
PRELIMINARY CONCEPT
THE LOCATION AND TYPE OF ROADWAY MAY CHANGE.
PROPOSED RIGHT-OF-WAY WIDTHS ARE ESTIMATES.
CONCEPT DATE 5/10/17
LEGEND
EXISTING INFORMATION
RIGHT-OF-WAY
PROPERTY LINES
PROPOSED INFORMATION
NEW PAVEMENT
GRASS MEDIAN
PATH/SIDEWALK
FIG. 2.4.1
FIG. 2.4.2
FIG. 2.4.3
FIG. 2.4.4
FIG. 2.4.5
FIG. 2.4.6
FIG. 2.4.7
FIG. 2.4.8
FIG. 2.4.9
OVERVIEW SCALE
0 350 700 1400
SCALE IN FEET
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT #CFHWY00130
PREFERRED ALTERNATIVE
FIGURE 2.4.3


LEGEND
EXISTING INFORMATION
RIGHT-OF-WAY
PROPERTY LINES
PROPOSED INFORMATION
NEW PAVEMENT
GRASS MEDIAN
PATH/SIDEWALK
FIG. 2.4.1
FIG. 2.4.2
FIG. 2.4.3
FIG. 2.4.4
FIG. 2.4.5
FIG. 2.4.6
FIG. 2.4.7
FIG. 2.4.8
FIG. 2.4.9
MILE 87
ROBINSON LN
ROBINSON LOOP RD
CRANE SONG ST
TUSTUMENA ST
PANORAMIC DR
PRELIMINARY CONCEPT
THE LOCATION AND TYPE OF ROADWAY MAY CHANGE. PROPOSED RIGHT-OF-WAY WIDTHS ARE ESTIMATES. CONCEPT DATE 2/10/17
OVERVIEW SCALE
0 350 700 1400
SCALE IN FEET
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT #CFHWY00130
PREFERRED ALTERNATIVE
FIGURE 2.4.4


STEADMAN ST
NINA ROBINSON AVE
MILE 88
BEAU CIR
ST. THERESA RD
EDGINGTON RD
WHISPER LAKE
LAKE TERRACE DR
SECRET RD
WHISPER LAKE ST
LONGMERE WAY
LONGMERE LAKE
GRASSY VALE RD
SITKA CIR
DEVILLE RD
MILE 89
PENNY LN
MURRAY LN
PRELIMINARY CONCEPT
THE LOCATION AND TYPE OF ROADWAY MAY CHANGE. PROPOSED RIGHT-OF-WAY WIDTHS ARE ESTIMATES.
CONCEPT DATE 5/10/17
LEGEND
EXISTING INFORMATION
RIGHT-OF-WAY
PROPERTY LINES
PROPOSED INFORMATION
NEW PAVEMENT
GRASS MEDIAN
PATH/SIDEWALK
FIG. 2.4.1
FIG. 2.4.2
FIG. 2.4.3
FIG. 2.4.4
FIG. 2.4.5
FIG. 2.4.6
FIG. 2.4.7
FIG. 2.4.8
FIG. 2.4.9
OVERVIEW SCALE
0 350 700 1400
SCALE IN FEET
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT #CFHWY00130
PREFERRED ALTERNATIVE
FIGURE 2.4.5


OLIVER ST
JIM DAHLER RD
FOREST LN
FRONTAGE RD
MILE 90
SCHULTZ ST
WALKER ST
PRELIMINARY CONCEPT
THE LOCATION AND TYPE OF ROADWAY MAY CHANGE.
PROPOSED RIGHT-OF-WAY WIDTHS ARE ESTIMATES.
CONCEPT DATE 5/10/17
LEGEND
EXISTING INFORMATION
RIGHT-OF-WAY
PROPERTY LINES
PROPOSED INFORMATION
NEW PAVEMENT
GRASS MEDIAN
PATH/SIDEWALK
FIG. 2.4.1
FIG. 2.4.2
FIG. 2.4.3
FIG. 2.4.4
FIG. 2.4.5
FIG. 2.4.6
FIG. 2.4.7
FIG. 2.4.8
FIG. 2.4.9
OVERVIEW SCALE
0 350 700 1400
SCALE IN FEET
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT #CFHWY00130
PREFERRED ALTERNATIVE
FIGURE 2.4.6


SOLID ROCK RD
ISBELL ST
MILE 91
SOUTHERN BLUFF ST
PINE ST
S. JAWLE ST
MAYONI ST
BEACON HILL ST
PRELIMINARY CONCEPT
THE LOCATION AND TYPE OF ROADWAY MAY CHANGE.
PROPOSED RIGHT-OF-WAY WIDTHS ARE ESTIMATES.
CONCEPT DATE 5/10/17
LEGEND
EXISTING INFORMATION
RIGHT-OF-WAY
PROPERTY LINES
PROPOSED INFORMATION
NEW PAVEMENT
GRASS MEDIAN
PATH/SIDEWALK
FIG. 2.4.1
FIG. 2.4.2
FIG. 2.4.3
FIG. 2.4.4
FIG. 2.4.5
FIG. 2.4.6
FIG. 2.4.7
FIG. 2.4.8
FIG. 2.4.9
OVERVIEW SCALE
0 350 700 1400
SCALE IN FEET
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT #CFHWY00130
PREFERRED ALTERNATIVE
FIGURE 2.4.7


BOUNDARY ST
MILE 92
FAIRWAY DR
ON PAR LN
SOLDOTNA CREEK
MACKEY LAKE RD
MONTE DR
LOREN LAKE
PRELIMINARY CONCEPT
THE LOCATION AND TYPE OF ROADWAY MAY CHANGE.
PROPOSED RIGHT-OF-WAY WIDTHS ARE ESTIMATES.
CONCEPT DATE 5/10/17
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PROPERTY LINES
PROPOSED INFORMATION
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GRASS MEDIAN
PATH/SIDEWALK
FIG. 2.4.1
FIG. 2.4.2
FIG. 2.4.3
FIG. 2.4.4
FIG. 2.4.5
FIG. 2.4.6
FIG. 2.4.7
FIG. 2.4.8
FIG. 2.4.9
OVERVIEW SCALE
0 350 700 1400
SCALE IN FEET
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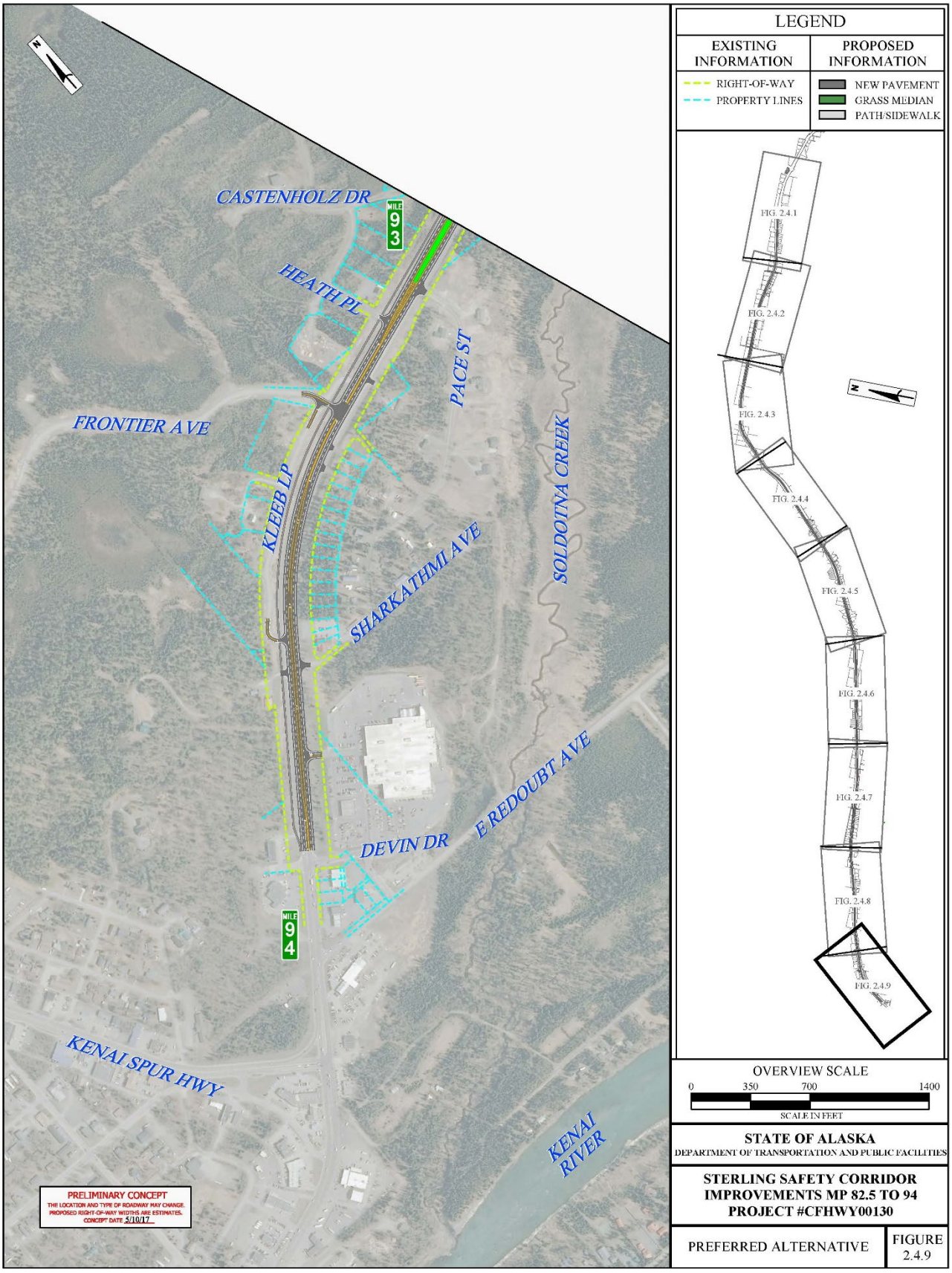
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT #CFHWY00130
PREFERRED ALTERNATIVE
FIGURE 2.4.8


CASTENHOLZ DR
MILE 93
HEATH PL
PACE ST
FRONTIER AVE
KLEEB LP
SOLDOTNA CREEK
SHARKATHMI AVE
DEVIN DR
E REDOUBT AVE
MILE 94
KENAI SPUR HWY
KENAI RIVER
PRELIMINARY CONCEPT
THE LOCATION AND TYPE OF ROADWAY MAY CHANGE.
PROPOSED RIGHT-OF-WAY WIDTHS ARE ESTIMATES.
CONCEPT DATE 5/10/17
LEGEND
EXISTING INFORMATION
RIGHT-OF-WAY
PROPERTY LINES
PROPOSED INFORMATION
NEW PAVEMENT
GRASS MEDIAN
PATH/SIDEWALK
FIG. 2.4.1
FIG. 2.4.2
FIG. 2.4.3
FIG. 2.4.4
FIG. 2.4.5
FIG. 2.4.6
FIG. 2.4.7
FIG. 2.4.8
FIG. 2.4.9
OVERVIEW SCALE
0 350 700 1400
SCALE IN FEET
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT #CFHWY00130
PREFERRED ALTERNATIVE
FIGURE 2.4.9

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Environmental Categories without Project-Imposed Consequences

As part of the scoping and environmental analysis conducted for the proposed project, the following environmental impact categories were considered, but no adverse impacts were identified. There is no further discussion regarding these issues in this chapter.

Air Quality
The proposed project area is not within a nonattainment area for any of the EPA main criteria pollutants, including those most associated with mobile sources: carbon monoxide (CO), ozone, and particulate matter.

Coastal Barriers
No coastline, landforms, or coastal barriers that provide protection for diverse aquatic habitats are within the project vicinity.

Coastal Zone
The Alaska Coastal Management Program sunset at 12:01 AM, Alaska Standard Time, July 1, 2011, per AS 44.66.030. As a result, there are no longer any designated coastal zones in Alaska.

Cultural Resources
The proposed project was developed in accordance with Section 106 of the National Historic Preservation Act. As part of the consultation process, DOT&PF coordinated with the State Historic Preservation Office (SHPO), City of Soldotna (COS), Kenai Peninsula Borough (KPB), Cook Inlet Region, Inc., Kenaitze Tribe, Salamatoff Tribal Council, and the Kenai Natives Association, and conducted an archaeological and architectural survey of the proposed project area. Results of these efforts indicated that, while there was one historic property eligible for listing on the National Register of Historic Places within the indirect Area of Potential Effect, the proposed project activities would have no effect on historic properties. On February 2, 2021, the SHPO concurred with a finding of no historic properties affected for the proposed project. Copies of all consultation materials and the survey report are included in Appendix A.

Farmland
No prime, unique, or farmlands of statewide importance have been designated in the State of Alaska. DOT&PF consulted with the National Resources Conservation Service (NRCS) to determine if the proposed project area contains any locally important farmlands. On January 21, 2020, the NRCS determined that while soils and farmlands of local importance are located adjacent to the project corridor, the proposed project will not result in any farmland impacts or conversion of agricultural lands to non-agricultural uses (Appendix F).

Anadromous, Resident, and Essential Fish Habitat
The Alaska Department of Fish and Game (ADF&G) *Catalog of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes* (reviewed October 29, 2019) identifies one anadromous and resident fish stream in the project area, Soldotna Creek (AWC 244-30-10010-2039). Soldotna Creek also qualifies as essential fish habitat per the Magnuson-Stevens Fishery Conservation and Management Act. It passes underneath the highway in a culvert that is of sufficient length to accommodate the wider road surface and no in-water work, culvert

modifications, or other impacts to the riparian habitat are proposed. For this reason there will be no adverse effects to anadromous, resident, or essential fish habitat. The creek has potential to receive storm water runoff from the proposed project which is discussed in the water quality section 3.7. Measures to prevent impacts from storm water runoff during construction are identified in the construction impacts section 3.16.

Floodplains

The proposed project is located on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) 020012 2045C (as revised December 6, 1999), 020012 2065A (effective date: May 19, 1981), and 020012 2070A (effective date: May 19, 1981). Per DOT&PF review of the FEMA FIRMs on October 29, 2019, the subject section of the Sterling Highway bisects one Zone A flood hazard area located at Soldotna Creek; however, the footprint of the highway is not within the flood hazard area. Zone A flood hazard areas are subject to inundation by the 1% annual chance flood, also known as a base flood or 100-year flood, but do not yet have recorded or calculated base flood elevations (i.e. calculated water surface elevations to which a flood is anticipated to rise during the base flood). The existing Soldotna Creek culvert and Sterling Highway embankment footprint are wide enough to accommodate the improvements and no work within the flood hazard area will occur.

The remainder of the proposed project corridor is located within unmapped Zone D flood hazard areas, or areas of undetermined but possible flood hazards. Additional Zone C flood hazard areas, or areas of minimal flooding, are located just east of the proposed project area around the Moose River and just to the west near the Sterling Highway and Kenai Spur Highway intersection; however, these are well outside the project limits. On November 15, 2019, the KPB Floodplain Administrator confirmed that the only potential areas of concern would be around Soldotna Creek and the Moose River, though no major concerns were evident (Appendix F). No impacts to floodplains are expected as a result of the proposed project.

Joint Development

The proposed project would not be developed or constructed in conjunction with any other projects.

Threatened and Endangered Species

No federally listed or proposed threatened or endangered species or associated critical habitat protected under U.S. Fish and Wildlife Service or National Marine Fisheries Service jurisdiction occurs within or near the proposed project area (ADF&G 2020, USFWS 2020a-b). One candidate species, the yellow-billed loon (*Gavia adamsii*), has the potential to be encountered in the project corridor (ADF&G 2020). However, the preferred habitat for this candidate species does not exist within the project area. The yellow-billed loon's nearest suitable habitat is in coastal waters of southern Alaska or in deep permanent lakes. State-listed endangered species include two birds and three marine mammals, none of which are known to occur in the project area. As such, the DOT&PF determined that the proposed project would have no effect on listed species or critical habitat.

Waterbodies

DOT&PF reviewed U.S. Geologic Survey Quad Maps, KPB Basic Map & Anadromous Waters Viewer, and aerial imagery from GoogleEarth (reviewed June 17, 2020) and found several waterbodies in the project area; however, the proposed project would not have any direct impacts

to them. There is potential for waterbodies to receive storm water runoff from the proposed project, which is discussed in the water quality section 3.7. Wetlands are also present in the project area, which are discussed in the wetlands section 3.10.

Wild and Scenic Rivers
No waterways within the proposed project vicinity are part of the National Wild and Scenic River System or under study for designation as a Wild and Scenic River.

3.2 Land Use and Transportation Plans

Land use and development within the project area are guided by the Kenai Peninsula Borough (KPB) and the communities of Soldotna and Sterling. The western end of the project from Devin Drive to Boundary Street is located within Soldotna city limits, while the remainder of the project is located within the KPB. The KPB is a second class borough with an adopted borough code guiding the borough's operations and responsibilities. Soldotna is a home rule city with an established municipal code under which the city operates. Sterling is an unincorporated community that does not have official boundaries and assumes no government powers. However, the Sterling Community Club is a non-profit organization that provides a voice for the community and facilitated development of a community action plan in 2004.

3.2.1 Zoning and Land Use

Existing land use and zoning adjacent to the project was determined by reviewing information from the COS comprehensive plan, the KPB online parcel viewer, KPB planning webpage and KPB Code. Land ownership is predominantly private with a few parcels owned by local or state government. The KPB is divided into two zoning districts, municipal and rural. Municipal districts include all areas within cities which have exercised zoning power through the adoption of a municipal ordinance. Soldotna has exercised their zoning power and land within city limits adjacent to the project area is a mixture of commercial, rural residential, and institutional. The rural district covers all other areas within the borough. According to borough code all land uses within the rural district shall be unrestricted except as otherwise provided in Title 21. Through Title 21, the Borough provides for local option zoning in areas where property owners wish to pursue greater restrictions on land use than otherwise provided for in Borough Code. There are several areas that have gone through the local zoning process, but none of them are located within the proposed project area of direct or indirect effects.

The majority of land use along the project corridor is residential, but there is a mix of commercial, industrial, and institutional as well. Approximately one-third of the land along the project corridor is undeveloped. Development density varies, with lot sizes ranging from approximately a quarter-acre up to several hundred acres. Other development in the area includes multi-family residences, community services, private businesses, adult entertainment, recreation, and churches (Figures 3.2.1-6).

3.2.2 Land Use and Transportation Plans

DOT&PF Statewide Transportation Improvement Program (STIP), 2020-2023
The STIP is the State's 4-year development program and is required by federal statutes (23 United States Code [U.S.C.] 135) to use federal funds. The proposed projects within the STIP are reviewed for consistency with other state and local land use and transportation plans. The STIP

identifies expanding the Sterling Highway from Soldotna to Sterling (Need ID 29913) as a four-lane highway. The STIP project description also includes a pathway and HSIP-funded safety improvements such as continuous illumination, medians, and center turn lanes.

KPB Transportation Plan, December 2003

The purpose of the KPB transportation plan is to update the transportation portion of the comprehensive plan. The Plan identifies the following goals for the borough's surface transportation system (this list does not include the goals that would be unaffected by the proposed project):

- To continue and improve maintenance and upgrading of borough roads
- To establish procedures and incentives to upgrade substandard roads and bridges within the Borough
- To establish a means by which the Borough can improve the likelihood that roads built as part of a residential development are constructed to borough standards
- To create trails or pedestrian walkways along highways and other busy roads, especially within communities
- To keep existing trails in public use as the Borough develops and as land is increasingly subdivided and improved

The plan identifies the Sterling Highway segments from Kalifornsky Beach Road to Robinson Loop Road and Robinson Loop Road to Skilak Lake Road as deteriorating in LOS and in need of improvement.

KPB Comprehensive Plan, November 2019

The KPB comprehensive plan doesn't specifically identify the proposed project, but it does incorporate by reference the entire KPB transportation plan and identifies several goals and objectives related to the proposed project.

- Preserve and improve quality of life in the KPB through increased access to local and regional facilities, activities, programs, and services
    - Encourage efficient use of land, infrastructure and services outside incorporated cities by prioritizing future growth in the most suitable areas
- Improving access to, from, and connectivity within the Kenai Peninsula borough
    - Ensuring new roads are developed in alignment with existing and planned growth and development
    - Improve and maintain existing infrastructure
    - Develop non-motorized pathways to connect communities with each other and with trails connecting to natural areas and open space
- Create more active and engaged KPB residents, local communities, and a more effective and efficient Borough government
    - Provide safe, efficient, and reliable bus transportation and pedestrian access routes for school age students in all communities

KPB Trail Plan, December 1998

The KPB trail plan identifies major trail related issues within the Borough and identifies policies, goals, and actions to address the issues. It is intended to be a tool for the Borough and other

agencies to use in identifying and preserving transportation and recreational trail corridors for public use.

Envision Soldotna 2030 – City of Soldotna Comprehensive Plan, May 2011

This plan provides Soldotna with guidance on how to shape development of the City's land resources, including highways and transportation facilities. It recognizes the influential role the Sterling Highway plays in shaping development and character of the community. The community's vision for the highway as it enters Soldotna is a safe, efficient, and aesthetically pleasing facility that serves as a positive first impression for travelers entering the city. There is a stated preference for narrower roadways to slow traffic and allow for wider landscaping beds and pedestrian facilities. However, planners recognize that proposals to enhance pedestrian crossing or improve aesthetics may conflict with DOT&PF's responsibility to efficiently move traffic.

The plan's highway and transportation goals relevant to the proposed project include:

- Improve the streetscape along the Sterling and Kenai Spur Highways
- Improve connectivity to the surrounding communities
- Improve motorized and non-motorized transportation routes throughout the City
- Address the safety and efficiency of non-motorized circulation near and across the Sterling Highway and Kenai Spur Highway
- Improve traffic circulation and parking opportunities along the Sterling and Kenai Spur Highways
- Soldotna will be pedestrian-friendly and aesthetically pleasing, and will give motorists a reason to slow down and stop in the City. The City's motorized and pedestrian transportation network will be safe, efficient, and well-maintained year-round.

Soldotna Recreation & Trails Master Plan, January 2014

This plan provides Soldotna a framework for development of quality recreation and trail facilities. Community outreach conducted during preparation of the plan found that safe and comfortable pedestrian amenities are especially needed along the Sterling Highway from Skyview High School to the Golf Course and beyond. Although, part of this is outside of the project limits, there remains a large stretch within the project limits. Some of the plan's guiding principles and stated goals related to non-motorized transportation are:

- Add or improve pedestrian facilities to provide more safe and comfortable connections between destinations in town, and beyond
- Coordinate with DOT&PF to include a separated multi-use paved trail along Sterling Highway from Devin Drive to Solid Rock Road in new highway design and construction
    - Partner with the Borough and other organizations to advocate for the trail - (lobby senators, representatives)
- Coordinate with DOT&PF to include a paved separated trail on at least one side of the Sterling Highway between Devin Drive and Boundary Avenue.

Soldotna Safe Routes to School, May 2014

This plan only focused on areas within a half-mile radius of schools within Soldotna. The proposed project limits are well outside of this boundary and thus information contained in the plan is not applicable to the proposed project.

Sterling Community Action Plan, May 2004

The transportation section of this plan recognizes the importance of the Sterling Highway as the primary transportation corridor for the community. Improvements identified in the plan include:

- Widen the highway to four lanes between Sterling and Soldotna
- Develop non-motorized trails

Other improvements identified in the plan, but outside the scope of this project include:

- Construct a Kenai River bridge crossing to Funny River
- Cooper Landing Sterling Highway Bypass
- Improve existing roads
- Redo intersection at Sterling Post Office / Sterling Highway

It is also noted in the plan that citizens of Sterling dislike the lack of passing lanes on the Sterling Highway.

3.2.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not appreciably impact existing land use and zoning in the area. Without improvements, congestion along the Sterling Highway would continue to worsen as development and population growth continues. The congestion will reduce mobility throughout the corridor and could slow residential and commercial development in the area. The No Build Alternative is not consistent with area land use and transportation plans.

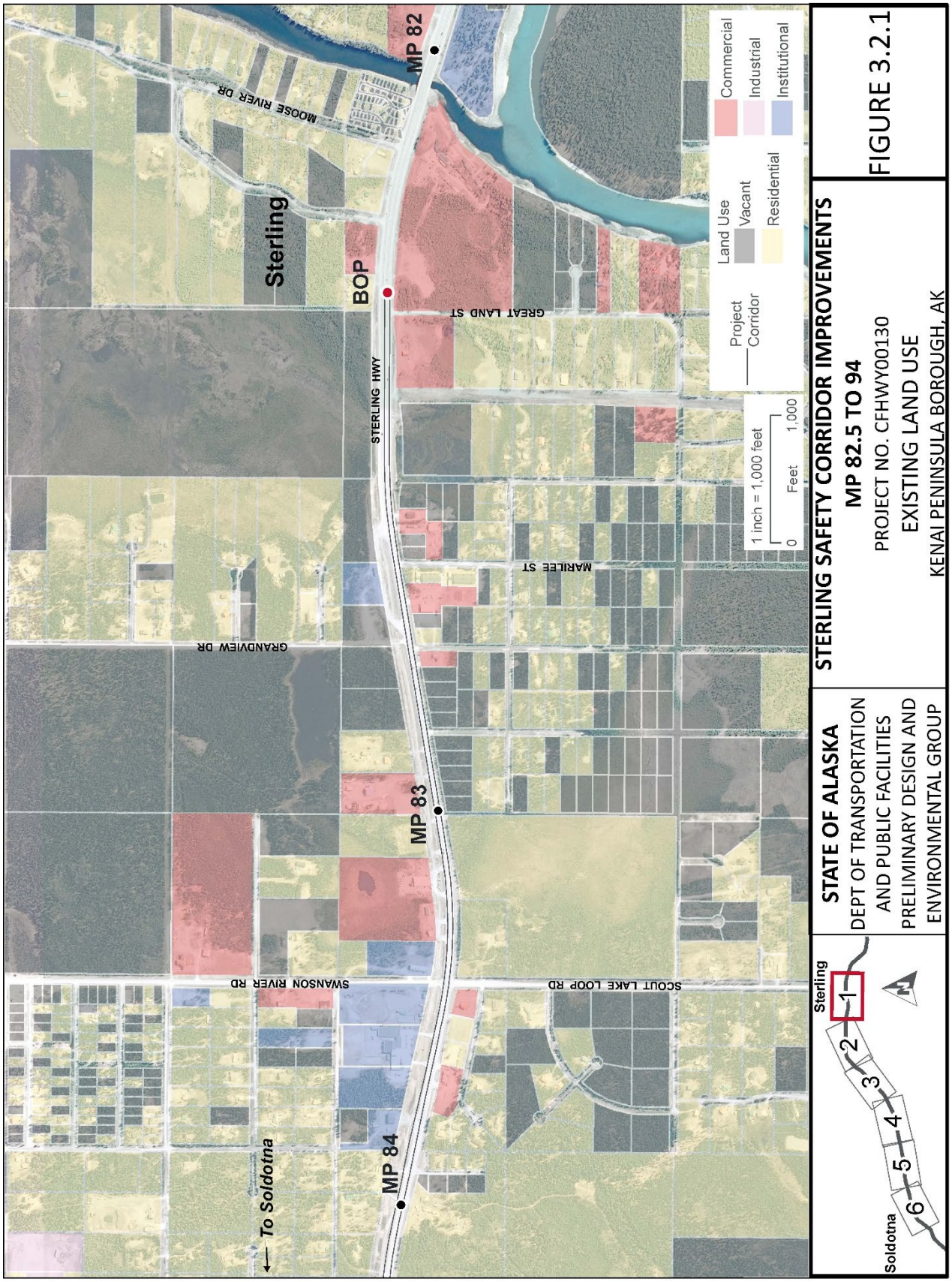
Preferred Alternative

The Preferred Alternative would require acquisition of approximately 4.88 acres of land currently undeveloped or utilized for commercial or residential purposes. The acquired property's land use designation would permanently change to a transportation use. Required ROW acquisition would slightly reduce the amount of land available for commercial and residential uses along the highway. There is sufficient undeveloped buildable land along the corridor to support predicted residential and commercial development in the area. The anticipated change in land use would be negligible.

Construction of the Preferred Alternative doesn't preclude development of any adjacent lands and may facilitate residential and commercial development in the area due to improved and safer access. It would reduce some of the side effects of population growth by decreasing congestion and increasing safety. Construction of a separated multi-use pathway would allow safer access to and from neighborhoods, commercial districts, and businesses. In order to balance growth with the goals of the affected communities, local planning groups, including the KPB, COS, and Sterling community will need to take the lead in governing how and where development occurs and construction of adjacent road networks.

By implementing access management techniques, the Preferred Alternative reduces congestion and enhances safety of the Sterling Highway. Access management techniques consist of a non-traversable median with regularly spaced median breaks. Preserving the function of this arterial route protects the investment of public funds associated with proposed roadway improvements.

The Preferred Alternative is consistent with local land use and development plans and would support the goals and objectives stated therein. Most of the above listed plans include improvements or upgrades to the Sterling Highway and support reducing the congestion of arterial roadways. On arguably the most important benefit of this project, safety improvements, the project is consistent with all plans. Additionally, the STIP includes widening the Sterling Highway to accommodate predicted traffic volumes with appropriate safety engineering strategies.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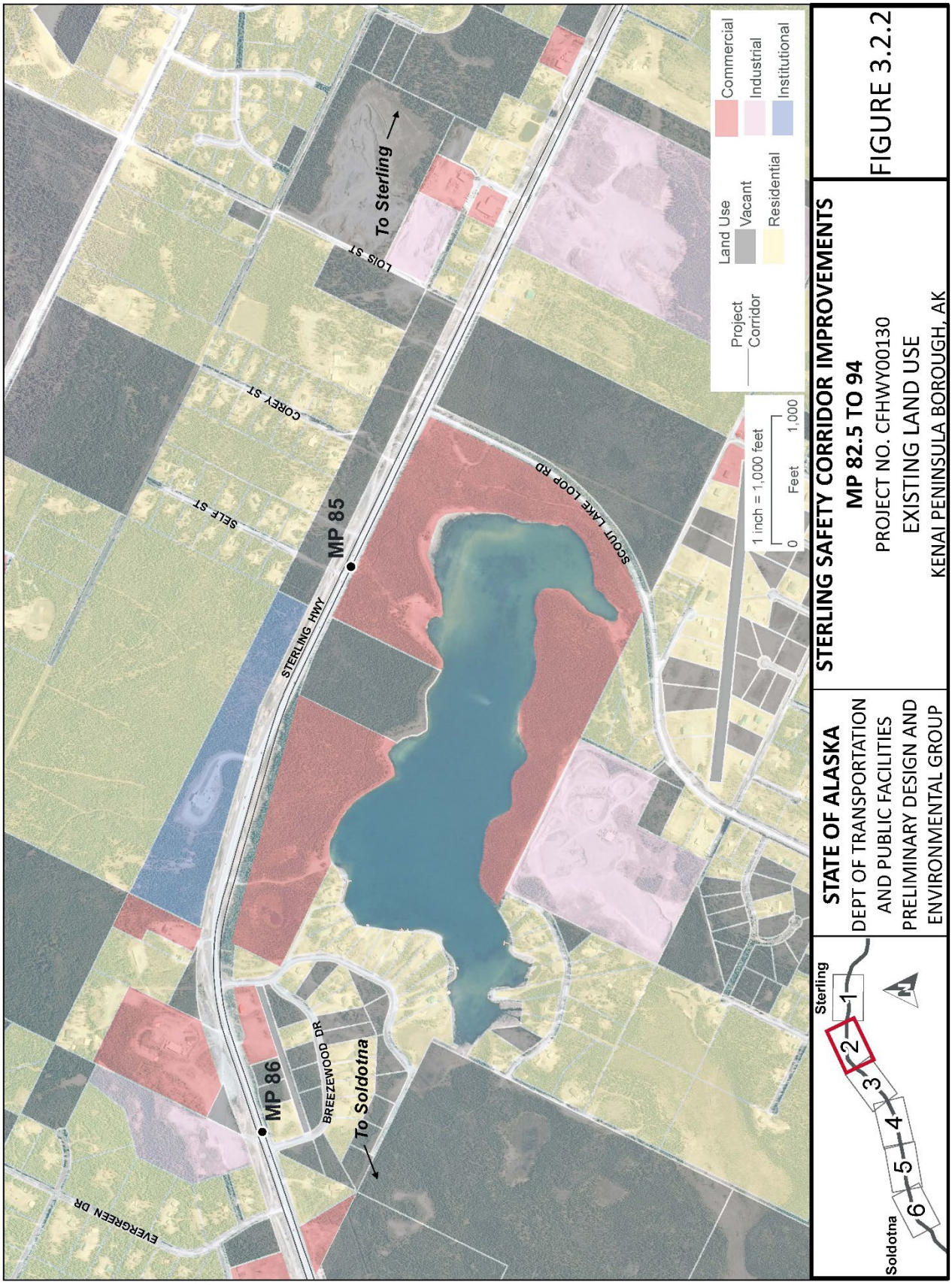
PROJECT NO. CFHWY00130
EXISTING LAND USE
KENAI PENINSULA BOROUGH, AK
FIGURE 3.2.1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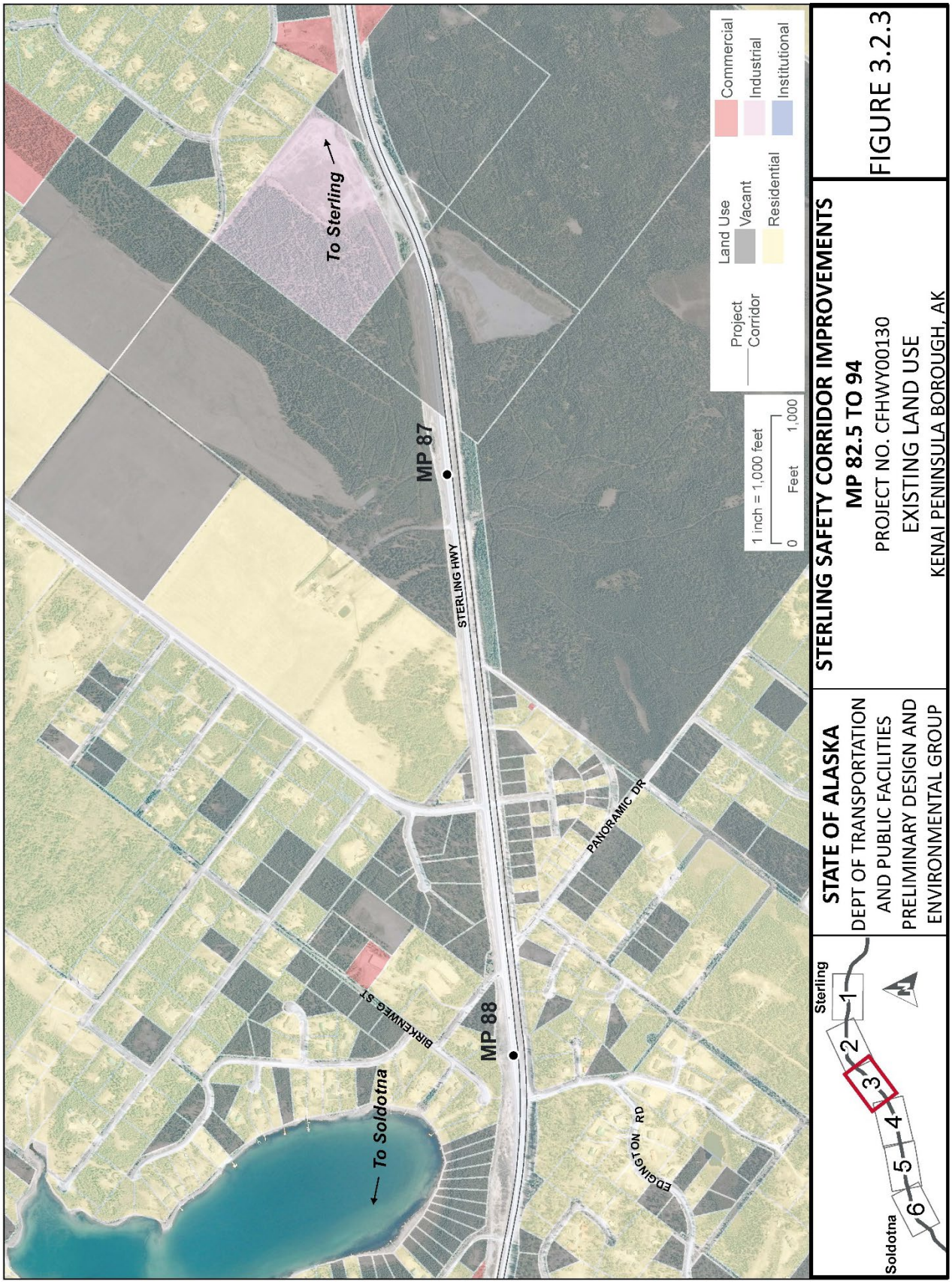
MP 82.5 TO 94
PROJECT NO. CFHWY00130
EXISTING LAND USE
KENAI PENINSULA BOROUGH, AK
FIGURE 3.2.2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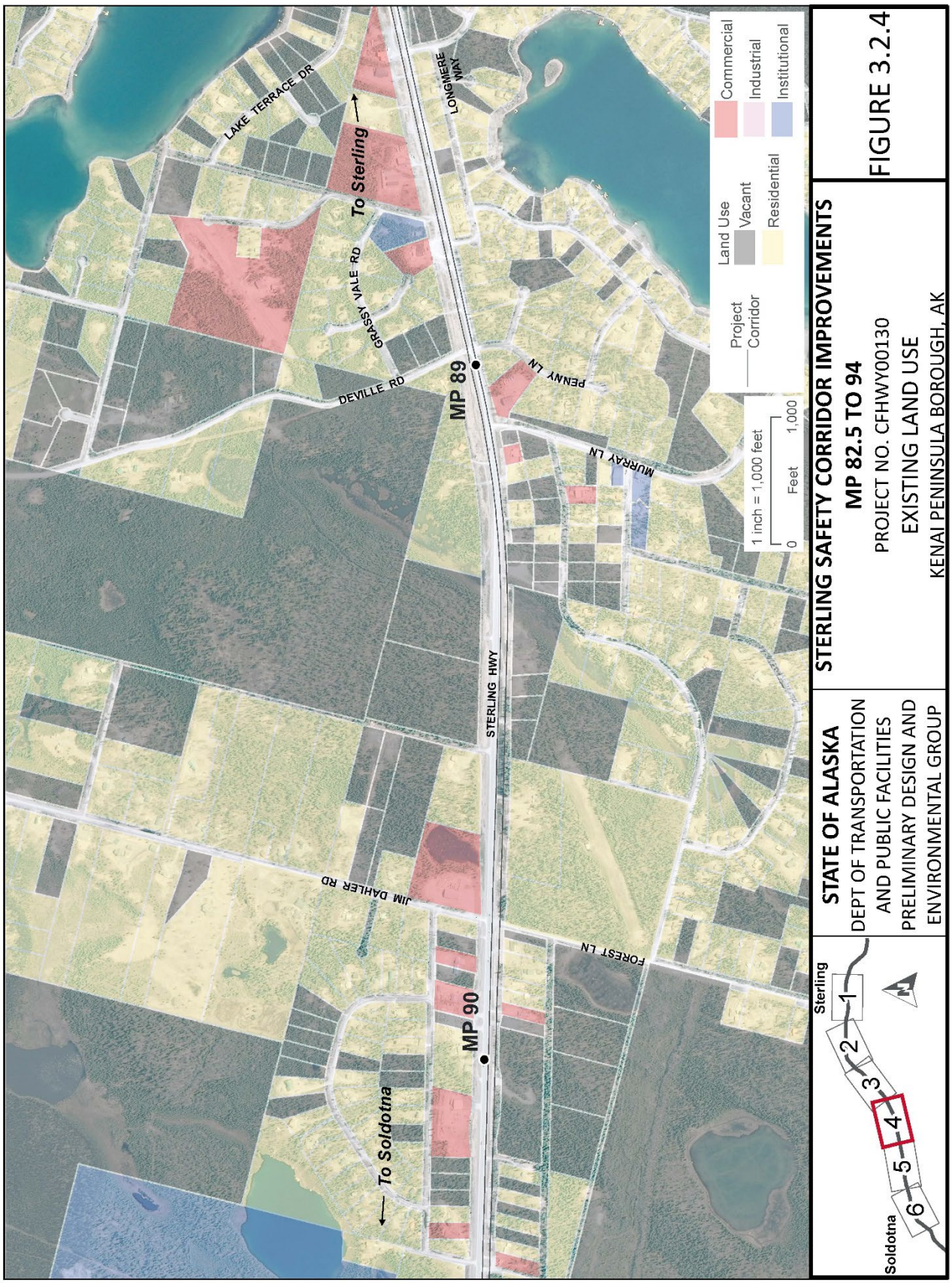
PRELIMINARY DESIGN AND
ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
EXISTING LAND USE
KENAI PENINSULA BOROUGH, AK
FIGURE 3.2.3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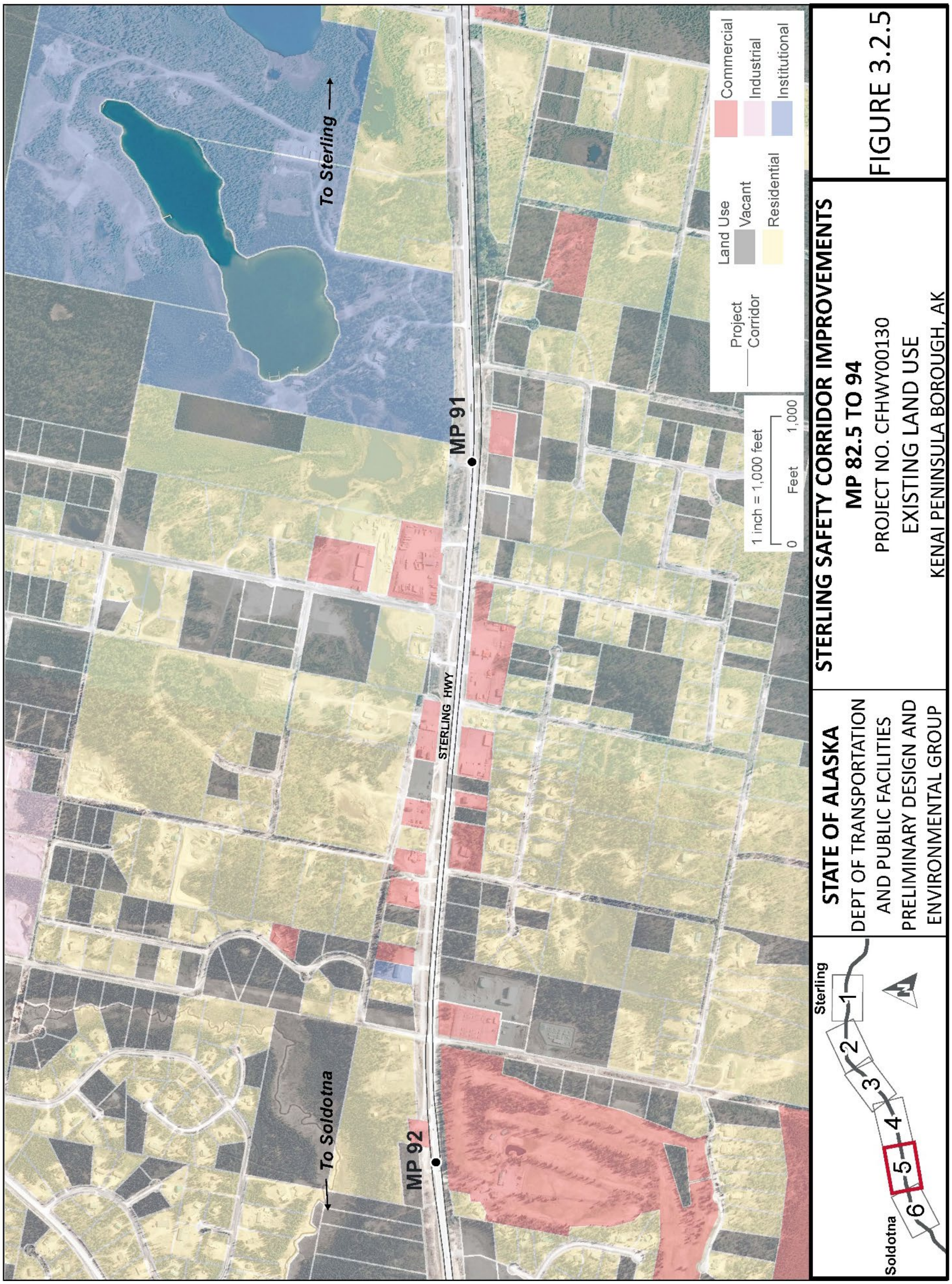
PROJECT NO. CFHWY00130
EXISTING LAND USE
KENAI PENINSULA BOROUGH, AK
FIGURE 3.2.4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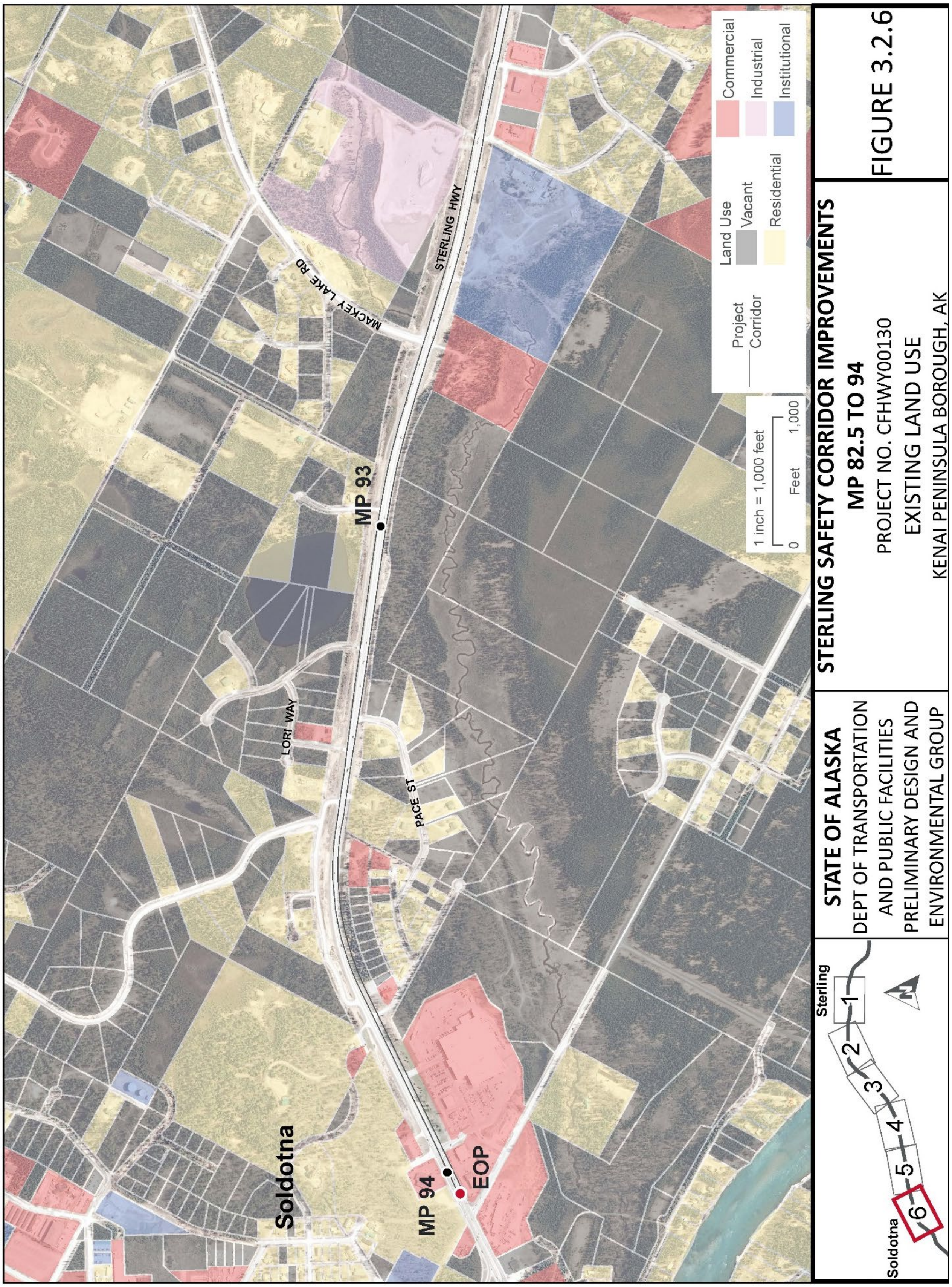
DEPT OF TRANSPORTATION AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
EXISTING LAND USE
KENAI PENINSULA BOROUGH, AK
FIGURE 3.2.5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DEPT OF TRANSPORTATION AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
EXISTING LAND USE
KENAI PENINSULA BOROUGH, AK
FIGURE 3.2.6

3.3 Socioeconomics

All socioeconomic data used in this analysis came from the U.S. Census Bureau, the American Community Survey (ACS), the EPA Environmental Justice Screening and Mapping Tool (EJScreen) mapping tool, or the Alaska Department of Labor and Workforce Development. Geographic boundaries for the study area are the beginning and end of the project corridor, as shown on Figure 1.1. The study area for data from the EJScreen mapper is bounded by a 0.5 mile radius around the proposed project centerline. For comparison purposes, information is also provided for the KPB and the State of Alaska.

3.3.1 Population

Alaska's population grew nearly 33% from 1990 to 2019, while the KPB population increased 43% and the COS increased nearly 22%. Over the same 29 years, the Sterling Census Designated Place (CDP) population increased nearly 58%. Table 3.3.1 presents historic population trends for the project area.

Table 3.3.1: Historic Population Trends in the Area

Location	Population from U.S. Census 1990	2000	2010	2019* Estimate	Annual Growth Rate, 1990-2019
Ridgeway CDP‡	2,018	1,932	2,022	2,194	0.3%
City of Soldotna	3,482	3,759	4,163	4,233	0.7%
Sterling CDP	3,802	4,705	5,617	5,994	2.0%
Kenai Peninsula Borough	40,802	49,691	55,400	58,708	1.5%
State of Alaska	550,043	626,932	710,231	731,007	1.1%

*Because U.S. Census information is on a decennial cycle, 2019 numbers are estimates from the Alaska Department of Labor and Workforce Development, Research and Analysis Section

‡ Ridgeway CDP is the area bound by Soldotna to the south, the Kenai National Wildlife Refuge to the north, the Kenai River to the west, and Soldotna Creek to the east

3.3.2 Business and Employment

Tourism is the fastest growing industry in the KPB and the proposed project corridor supports a large percentage of the overland traffic related to tourism. Other major industries include oil and gas, commercial fishing, government, and retail. Oil and gas workers travel to the North Slope to work, as well as to Kenai, Nikiski, and other production and processing areas (KPB 2019). The summer influx of both resident and non-resident recreational enthusiasts are becoming a larger part of the economy as well. Businesses in the project area include motels, hotels, hostels, bed and breakfast homes, trailer and RV parks, restaurants, carving and craft stores, grocery stores, liquor stores, furniture stores, beauty salons, gas stations, tackle shops, gift shops and general merchandise shops, fishing charters and lodges, laundromats, rental companies, heavy equipment services, construction material suppliers, large retail stores, and other small businesses.

Soldotna is a leader for trade and service businesses in the Central Peninsula area and is home to several of the top ten employers in the KPB. It is located in a strategic position along the Sterling Highway for many businesses because of the large volume of people that travel through the area.

Table 3.3.2 provides a summary of employment information in the project region and the State, while Table 3.3.3 presents employment by industry in the COS, Sterling CDP, and the KPB.

Employment trends are similar for all three areas with Trade, Transportation and Utilities and Educational and Health Services being the top employment sectors.

Table 3.3.2: 2016 Employment Information

	Residents Employed	Average Annual Earnings	Unemployment Claimants
Ridgeway CDP	962	$48,973	115
City of Soldotna	1,951	$44,219	281
Sterling CDP	2,416	$50,967	321
Kenai Peninsula Borough	23,214	$42,767	3,444
State of Alaska	304,556	$42,994	38,054

Source: ADLWD, Research and Analysis Section

Table 3.3.3: 2016 Employment by Sector

	Percent of Total Employed		
Industry	City of Soldotna	Sterling CDP	KPB
Natural Resources and Mining	9.2	14.3	10.3
Construction	4.6	7.7	6.4
Manufacturing	2.5	2.9	3.6
Trade, Transportation, and Utilities	21.2	17.3	20.0
Information	0.8	1.0	1.1
Financial Activities	3.1	3.1	2.8
Professional and Business Services	3.6	5.0	5.4
Educational and Health Services	21.6	19.1	15.2
Leisure and Hospitality	11.5	9.2	10.8
State Government	4.6	4.7	5.4
Local Government	13.9	12.0	15.4
Other	3.3	3.6	3.4

Source: ADLWD, Research and Analysis Section

3.3.3 Neighborhoods

The project connects the communities of Sterling and Soldotna, with development density varying along the corridor. Approximately two-thirds of adjacent lands have been developed, with a majority consisting of residential properties. Forty subdivisions have been developed adjacent to the proposed project, with several including additions and replats to expand beyond the original subdivision limits (KBP 2020). The pattern of the subdivided parcels, additions, and replats indicate that most subdivisions and neighborhoods were platted using the highway as a boundary or divider. This is evidenced by a majority of the subdivisions being developed on a single side of the highway (i.e. are not divided or bisected by the highway). In addition to institutional and recreational properties, the remaining one-third of adjacent land consists of several privately-owned undeveloped tracts, indicating there is considerable room for future residential and commercial development.

3.3.4 Travel Patterns

The Sterling Highway is the sole land connection for communities in the western half of the Kenai Peninsula to Anchorage, Seward, and the Interior of Alaska. The highway also serves as

the gateway to several recreational opportunities for tourists and residents from the MOA and Kenai Peninsula. As the sole land connection within the western Kenai Peninsula, the Sterling Highway often experiences access and congestion problems, which is especially evident during daily peak commuter periods and during the summer months when traffic volumes are heavy.

Within Sterling and Soldotna, the highway configuration is five lanes: two lanes in each direction with a center two-way left turn lane. However, within the 11.5-mile project corridor, the highway transfers down to a two-lane facility with no passing lanes, limited passing opportunities, and dedicated left turn lanes at major collector-road intersections only. Current access to commercial and residential properties adjacent to the roadway is via local road intersections and private driveways. Though some intersections along the corridor have dedicated left-turn lanes, the majority of intersections are accessed via the through lane. To access these intersections, drivers must wait for gaps in oncoming traffic to make left turns, while holding up all through traffic in their lane. Right turning drivers do not block through traffic, but they slow it down.

The lack of passing opportunities and minimal left turn lanes throughout the project corridor contribute to reduced mobility as well as increased congestion and travel times, especially during the summer months. The combination of longer travel times and congestion result in frustrated drivers taking unnecessary risks, leading to the corridor having a high rate of fatal and major injury crashes.

3.3.5 Community & Public Facilities

Community facilities generally include (but are not limited to) schools, parks, trails, law-enforcement facilities, fire stations, and government offices. Though a majority of community facilities are located within the communities of Sterling and Soldotna, a variety are located within the vicinity of the project area as well, including churches, emergency service centers, parks and recreation areas, schools, and community centers. One school is located within the Sterling CDP, Sterling Elementary School, while several more are located within the Soldotna city limits and are attended by students living out in the KPB. These include Soldotna Elementary, Soldotna Montessori Charter School, Marathon School, Soldotna Prep, Skyview Middle School, and Soldotna High School.

Law enforcement in the project area is handled by the COS Police Department within city limits and the Alaska State Troopers within the KPB and Sterling CDP. Emergency fire and medical response services are provided from KPB Central Emergency Services (CES) Stations 1, 2, & 3. CES Station 1 is located in Soldotna, Station 2 is at the end of Mackey Lake Road, and Station 3 is at the western edge of Sterling. No medical facilities are located within the project corridor but several are located within the City of Soldotna, including the Central Peninsula Hospital, Peninsula Internal Medicine, Urgent Care of Soldotna, Alaska Family Medical Clinic, Peninsula Health Center, Peninsula Community Health Services, among others.

Other public facilities located in the project area include the Soldotna Animal Hospital, Sterling Community Center, Sterling Senior Citizens Center, Birch Ridge Golf Course, Longmere Lake Boat Launch, and Scout Lake State Recreation Site. Swanson River Road within the project area provides access to several campgrounds, hiking and canoe trails, and other recreational facilities. The project corridor also provides access to several recreational facilities located along the Kenai

River, including the Izaak Walton Campground and Morgan's Landing State Recreation Area, as well as the Kenai River Special Management Area.

3.3.6 Environmental Justice (EJ)

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, directs Federal agencies to take appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law.

A study area of 0.5 mile from the proposed project centerline was used for this analysis because it is unlikely that environmental justice populations would experience disproportionately high and adverse project effects beyond this boundary. The EPA EJScreen tool was used to generate a demographic summary report for the study area using information from the 2013-2017 American Community Survey. Results of the report are shown in comparison to neighboring geographic regions in Table 3.3.4.

Table 3.3.4: Environmental Justice Information within 0.5 mile of the Project Corridor

		EJScreen Study Area	Ridgeway CDP	City of Soldotna	Sterling CDP	Kenai Peninsula Borough	State of Alaska
Population		1,787	2,194	4,233	5,994	58,367	731,007
Average Household size*		Not a report product	2.6	2.6	2.7	2.6	2.8
Median Household Income		Not a report product	$96,705	$68,662	$77,098	$65,279	$76,114
Race	**American Indian/AK Native (%)**	2	4.8	4.7	1.4	7.3	14.2
	White (%)	88	83.8	91.1	87.7	83.6	65.3
	Black (%)	0	0	0	0.4	0.5	3.2
	Asian (%)	2	0	0.6	2.5	1.5	6.2
	Native Hawaiian/Pacific Islander (%)	0	0	0	0	0.3	1.2
	Hispanic (%)	2	6.1	1.3	1.6	4.0	6.8
	Other (%)	1	2.9	0	1.1	0.7	1.4
	Two or More (%)	7	8.6	3.6	6.9	6.0	8.5

*Data in this table obtained from 2013-2017 American Community Survey accessed through the ADLWD, Research and Analysis webpage except for Average Household Size obtained from 2010 U.S. Census

As defined by the CEQ, a minority population is either (a) the minority population of the affected area exceeds 50 percent, or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population, or other appropriate geographical analysis. Based on this definition and the information presented in Table 3.3.4, there are no minority populations in the project area.

FHWA Order 6640.23A defines "low-income" as a person whose household income is at or below the U.S. Department of Health and Human Services (DHHS) poverty guidelines. The poverty guidelines are based on household size. Table 3.3.5 shows the 2019 DHHS Alaska Poverty guidelines and Table 3.3.4 shows the average house hold size in the project region ranges from 2.6 to 2.7 individuals per household. Therefore, households in the study area must have a median household income below $26,660 to be considered a low-income population. Although the report generated by the EPA's EJScreen mapper does not include median household income or average household size, it is reasonable to use the information from the neighboring geographic areas.

Table 3.3.5: 2019 DHHS Poverty Guidelines for Alaska

Size of Family Unit	Poverty Guideline
1	$15,600
2	$21,130
3	$26,660
4	$32,190
5	$37,720
6	$43,250
7	$48,780
8	$54,310

For families/households with more than 8 persons, add $5,530 for each additional person.
Source: Federal Register, Vol. 84, No. 1167, February 1, 2019, pp. 1167-1168.

No minority or low-income populations have been identified that would be impacted by the proposed project and in accordance with the provisions of EO 12898 and FHWA Order 6640.23, no further EJ analysis is required.

3.3.7 Environmental Consequences

No Build Alternative

The No Build Alternative would have no effect on socioeconomic conditions along the project corridor. Access to all adjacent residential properties, churches, recreation areas, and businesses would not change. Travel conditions for private, public, and commercial traffic would likely continue to deteriorate as volumes increase and LOS decreases. Future development may be curtailed or delayed due to the increasingly difficult travel conditions.

Preferred Alternative

Social

The Preferred Alternative is not likely to cause an appreciable change in community cohesion along the Sterling Highway. The existing layout of neighborhoods is already separated by the highway and while the new facility will roughly double the roadway size, excessive disruption to neighborhoods is not anticipated because separation already exists. Adverse effects to neighborhoods along the project are not expected.

Community cohesion within adjacent neighborhoods and along the project as a whole, may improve due to safer travel conditions and consolidated access points. School boundaries, recreation areas, churches, and other essential components of a community are not expected to experience permanent adverse effects from the project. Benefits will include improved traffic

flow, less congestion, and safer access to schools, neighborhoods, businesses, and services throughout the corridor. Wait times for vehicles turning on to or off of the Sterling Highway will be shortened and merging with local traffic would be safer.

Police, fire, and other emergency services will be able to respond to emergencies quicker and more efficiently due to the additional lanes and improved traffic flow. In addition, vehicle incidents requiring emergency services will likely decrease due to the improved safety features of the road. The primary safety feature being additional lanes, consolidated access points, and a non-traversable median. However, it is possible these features could potentially have an adverse effect on response times as emergency services travelling in the opposite direct of an incident may be required to drive beyond the location of an incident to a median opening to perform a U-turn.

Local travel patterns will change following completion of construction due to consolidation of access points and creation of a non-traversable median with breaks for access. Some of the adjacent properties will be converted to right-in, right-out access with dedicated U-turn opportunities at median breaks. Although right-turns followed by U-turns could slightly increase travel times, it is a substantial safety improvement that reduces driver stress by requiring attention to only one traffic direction when merging onto the roadway. This access pattern increases safety by reducing the frequency of right-angle and left-turn crashes. Social interactions within the project area would not be affected as a result of the proposed access management.

Disproportionately high and adverse effects to low-income or minority populations (EJ populations) will not occur because neither of these population groups were identified within 0.5 mile of the project area. These particular population groups may exist outside of this area of examination, but the proposed project has no potential for impacts beyond that range and no further research was conducted.

Economic

The Preferred Alternative would change access to commercial areas by limiting the number of locations where turning and crossing movements could occur. Median breaks and dedicated turn lanes remove turning vehicles from through lanes and create safer access to adjacent properties. Driveway access would be combined or limited to connections with existing or extended frontage roads where feasible. In locations without frontage roads, driveway access would be limited to right-in-right-out movements. Constructing the proposed project would improve safety by reducing right-angle and left turn collisions, as well as encroachment collisions such as head-on and sideswipe crashes.

The proposed project will take several years to construct and offer local residents a multitude of employment opportunities through the contractor and sub-contractors building the project. Workers employed during the construction phase of the proposed project are expected to be locally or regionally available and housing impacts are unlikely. Construction worker spending would temporarily create additional jobs and boost local business revenues. The KPB tax revenues are likely to increase due to the sales tax collected on additional spending.

The changes in access and improved travel conditions are anticipated to result in economic benefits because commercial and consumer travel times will decrease. Improved travel

conditions could facilitate additional residential development which would increase the KPB tax base. The new access patterns will provide adequate and safe access options to properties on both sides of the road via median breaks and U-turn movements. Design of the Preferred Alternative will accommodate all commercial traffic. Economic impacts to commercial properties will be negligible after construction. The project doesn't preclude any commercial or residential development in currently undeveloped lands along the roadway; however it will encourage local governments to actively engage in their responsibility to regulate adjacent land use and access by requiring construction of frontage and local collector roads to intersection access points.

While business access may be perceived as more limited under this alternative, research presented in the FHWA pamphlet *Safe Access is Good for Business*, indicates that access management projects do not adversely affect the long-term success of either "destination" (i.e., customers plan to visit in advance of the trip) or "drive-by" (i.e., customers frequent more on impulse or while driving by) businesses. The FHWA reviewed "before and after" studies conducted in several states and found that business along highways where access has been managed do as well or better after the projects are completed (FHWA 2006). When access is managed, customers adapt to the changes and continue to shop at certain businesses. Turn lanes at median openings and signalized intersections provide customers safer, more appealing locations to access businesses. Access management reduces congestion, improves traffic flow, and facilitates vehicle movement from one business to another.

3.4 Right-of-Way and Relocation

The existing DOT&PF ROW along the Sterling Highway between MP 82.5 and 94 varies between 200 and 300 feet wide. An initial ROW acquisition effort was undertaken in 1988 specifically to accommodate the reconstruction and expansion of the highway between Sterling and Soldotna. Among these ROW acquisitions, one full parcel acquisition, a commercial property, was subsequently leased back to the original owner until the DOT&PF receives authorization to advertise the proposed project from the FHWA and begins soliciting bids for construction. Relocation resources have been made available to the lessee and DOT&PF continues to abide by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended.

3.4.1 Environmental Consequences

No Build Alternative

The No Build Alternative would not require any additional ROW along the Sterling Highway and no additional residents or businesses would require relocation. The business located on the DOT&PF-leased parcel would remain in place and continue operation.

Preferred Alternative

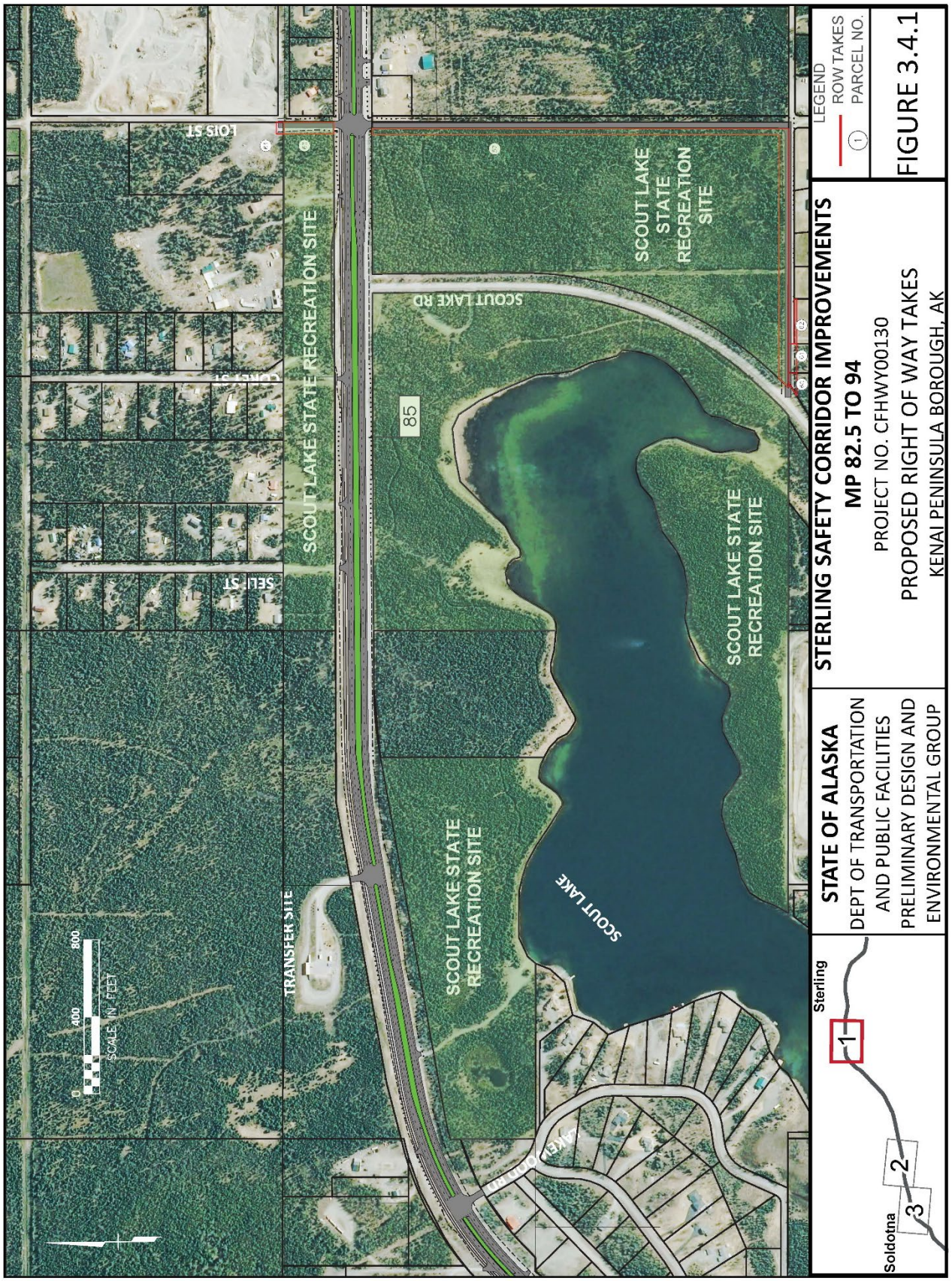
To the extent practicable, the Preferred Alternative would be constructed within the existing DOT&PF ROW; however, additional ROW would be required to construct side streets and frontage roads. The Preferred Alternative would require nine partial and one full property acquisitions, totaling 4.88 acres, as detailed in Table 3.4.1 and Figures 3.4.1-3. The full acquisition is a KPB-owned undeveloped property (Parcel 4), and is approximately 0.31 acre in size. The remaining nine partial acquisitions are all considered "sliver takes" that affect

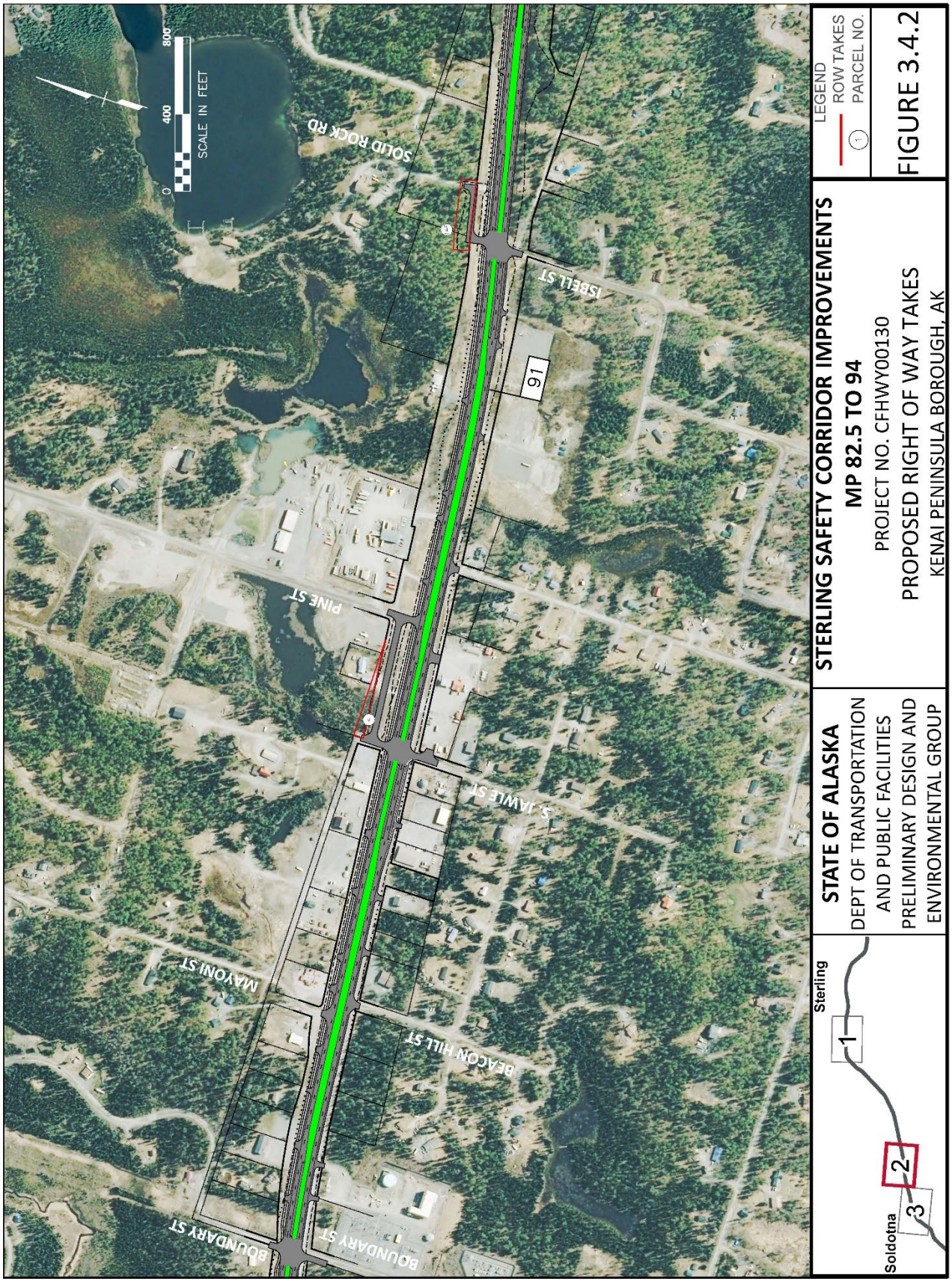
residential, commercial, and undeveloped properties along the corridor, totaling 4.57 acres. Other than diminished lot size, no impacts to those parcels affected by partial acquisition are anticipated. As the full acquisition involves an undeveloped property, no residential or further business relocations would be required.

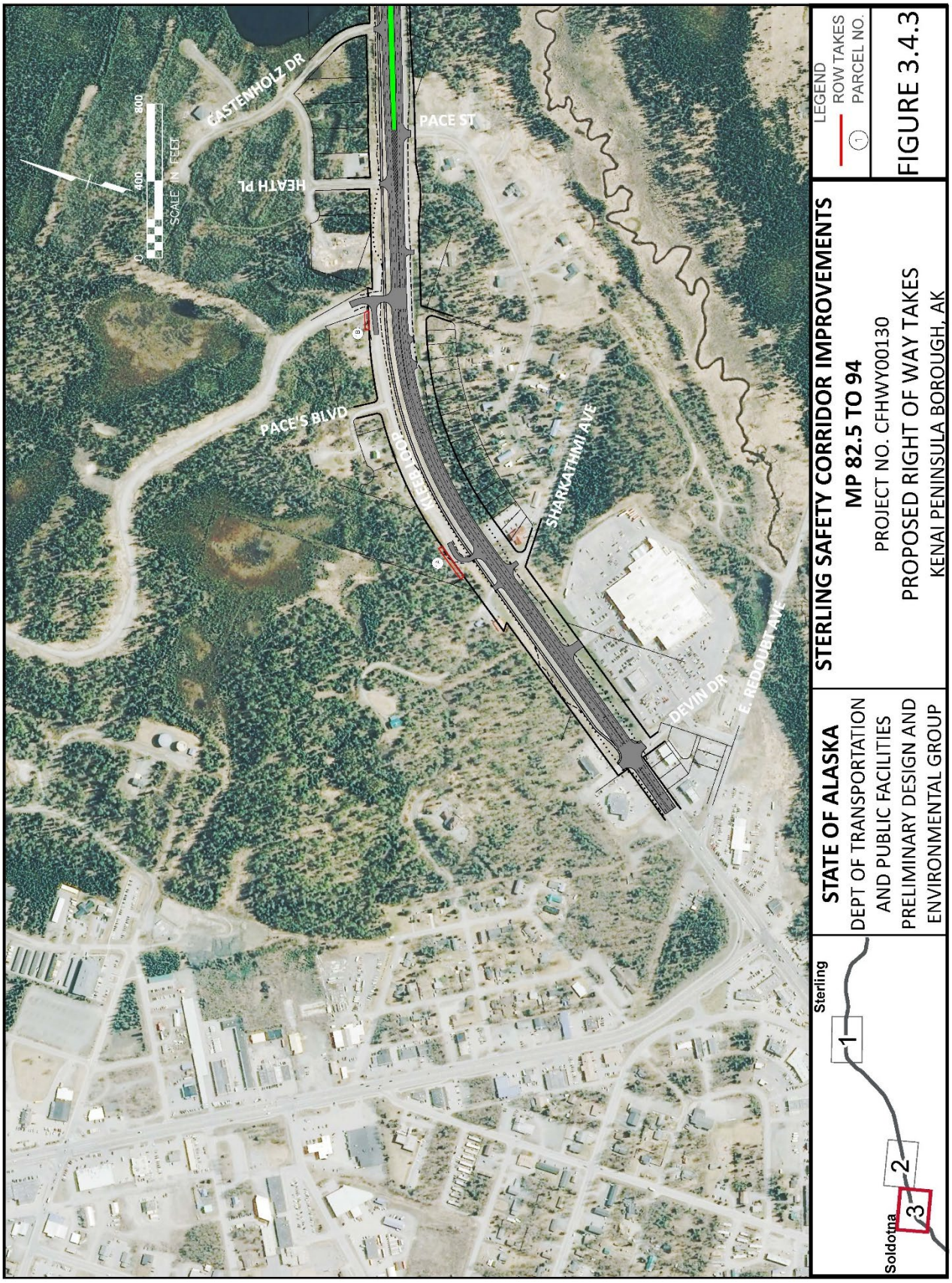
The locations and area of ROW acquisition are based on preliminary design information and will be revised during final design of the project. All acquisitions of properties as a result of the proposed project would be conducted in accordance with the Uniform Act, as amended. Though not currently applicable, relocation resources are available to all residential and business relocates without discrimination. Restitution to private property owners would be at the amount believed to be just compensation, per 49 CFR 24.104. Compliance with the Uniform Act is designed to mitigate the adverse effects of relocation and persons not satisfied with the relocation payments or assistance offered by the Department may file an appeal.

Table 3.4.1: Approximate Right-of-Way Impacts under the Proposed Action

Parcel Number	Site Address	Owner	Property Type	Total Area of Parcel (acres)	Area to be Acquired (acres)	Approximate % of Parcel to be Acquired
1A	N/A	Private	Residential	6.00	0.09	1.56
1B	43450 Kleeb Loop	Private	Residential	2.23	0.04	1.92
4	N/A	KPB	Residential	0.31	0.31	100
14F	36251 Solid Rock Rd	Solid Rock Ministries, Inc.	Other	62.41	0.69	1.11
57	N/A	Alaska State Parks	Other	40.00	3.03	7.57
60	37970 Scout Lake Loop Rd	Private	Residential	1.82	0.08	4.51
61	36261 Blexes Ave	Private	Residential	1.00	0.15	14.94
62	N/A	Scooter's Landing Properties, LLC	Commercial	1.38	0.07	5.07
63	36150 Sterling Hwy	Alaska State Parks	Other	15.00	0.36	2.40
64	N/A	Private	Residential	7.00	0.06	0.79
			TOTAL	**137.15**	**4.88**	


SCOUT LAKE STATE RECREATION SITE
SCOUT LAKE RD
SCOUT LAKE
TRANSFER SITE
FOIS ST
SELL ST
85
0
400
800
SCALE IN FEET
LEGEND
ROW TAKES
PARCEL NO.
FIGURE 3.4.1
STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
PROPOSED RIGHT OF WAY TAKES
KENAI PENINSULA BOROUGH, AK
STATE OF ALASKA
DEPT OF TRANSPORTATION
AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND
ENVIRONMENTAL GROUP
Sterling
Soldotna
1
2
3


SCALE IN FEET
0
400
800
SOLID ROCK RD
ISBELL ST
91
PINE ST
S. JAWLE ST
MAYONI ST
BEACON HILL ST
BOUNDARY ST
BOUNDARY ST
LEGEND
ROW TAKES
PARCEL NO.
STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
PROPOSED RIGHT OF WAY TAKES
KENAI PENINSULA BOROUGH, AK
STATE OF ALASKA
DEPT OF TRANSPORTATION
AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND
ENVIRONMENTAL GROUP
Sterling
Soldotna
1
2
3
FIGURE 3.4.2


CASTENHOLZ DR
HEATH PL
PACE ST
PACE'S BLVD
KATEEL CT
SHARKATHMI AVE
DEVIN DR
E. REDOUBT AVE
0
400
800
SCALE IN FEET
LEGEND
ROW TAKES
PARCEL NO.
FIGURE 3.4.3
STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
PROPOSED RIGHT OF WAY TAKES
KENAI PENINSULA BOROUGH, AK
STATE OF ALASKA
DEPT OF TRANSPORTATION
AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND
ENVIRONMENTAL GROUP
Sterling
Soldotna
1
2
3

3.5 Considerations Relating To Pedestrians and Bicyclists

There are very few pedestrian or bicycle facilities located within the proposed project area. Sidewalks only exist in short lengths along the urban sections at each end of the project, which further continue through the communities of Sterling and Soldotna. The only other options are the shoulder or informal ATV/multi-use trails running through ROW; however, there are no established or dedicated pedestrian or bicycle facilities within the remainder of the project area. The current roadway shoulder width is eight feet, and although not striped as a bike lane, it meets AASHTO's minimum shoulder width for bicycle traffic. There are established crosswalks at the only signalized intersection within the project corridor, at Devin Drive.

3.5.1 Environmental Consequences

No Build Alternative

The No Build Alternative would have no effect on pedestrian and bicyclist facilities and no improvements for pedestrians and bicyclists would occur.

Preferred Alternative

The proposed project would improve non-motorized transportation by constructing a separated, 10-foot wide, paved multi-use pathway on the north side of the highway to serve pedestrians and bicyclists. A minimum separation of 10 feet between the mainline edge of pavement and pathway (providing at least 18 feet of separation from any travel lane) would be part of the design. The pathway will meet Americans with Disabilities Act accessibility guidelines, including maximum grade, cross slope, and width. Additionally, the number of vehicle-pedestrian conflict points would be reduced by consolidating driveways that directly access the Sterling highway and realigning other approaches to frontage roads.

However, access to the pathway for user groups on the south side of the highway will become more difficult because they will have to traverse two additional traffic lanes, though the median could be utilized as a pedestrian refuge allowing the road to be crossed in stages. Improving the LOS along the corridor would also result in reduced congestion, which would allow for more crossing opportunities. Use of the median in winter months is expected to be more difficult, as the median would likely be used for plowed snow storage. Further residential and local road development should continue to address non-motorized transportation options and access.

3.6 Invasive Species

Invasive species are those species non-native to the ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm, or harm to human health. They originate from another region and are able to thrive because the natural predators, diseases, or other biological mechanisms from its former habitat are missing in the new environment. Once established they can overcome native species in their environment and permanently change the structure and function of ecosystems by hybridizing with native species, altering soil and water composition, and degrading water quality. Noxious weeds are invasive species that have been designated by federal or State government as injurious to public health, agriculture, recreation, wildlife, or property. In aquatic systems, established invasive plants can restrict or impede fish migration and damage fish habitat. The majority of invasive species have been identified near populated areas. As people and equipment move about, roadway systems

often provide a way to transport invasive species to new locations and then spread throughout the landscape.

The Alaska Natural Heritage Program (ANHP) maintains the Alaska Exotic Plants Information Clearinghouse (AKEPIC) database which contains information on over 390 non-native plant species found in Alaska. The State of Alaska regulates and manages the spread of invasive and noxious weed species that could pose a public health risk or harm the agricultural industry. The State has prohibited 14 and restricted 9 noxious weeds (11 AAC 34.020). Prohibited species are harmful to public health and the environment and are often very difficult to control or eradicate. Prohibited species cannot be sold or grown in the state. Restricted species are generally considered as nuisances or economically detrimental, but can be controlled more easily.

The AKEPIC database identified 18 invasive plant species within approximately one mile of the proposed project corridor (ACCS 2020b). Of those identified, one State of Alaska prohibited noxious weed was found, Orange Hawkweed (*Hieracium aurantiacum L.*). Two of the 18 species are State of Alaska restricted noxious weeds, Yellow Toadflax (*Linaria vulgaris P. Mill.*) and Bird Vetch (*Vicia cracca L. ssp. cracca*). In addition, the State of Alaska has established a quarantine for Canadian Waterweed (*Elodea canadensis*), which is known to exist in Longmere and Scout Lakes. The quarantine prohibits importation, transport, purchase, sale, offer for sale, distribution, or intentional introduction of this species in Alaska. The USDOI BLM identifies Bird Vetch, Orange Hawkweed, and Canadian Waterweed as high priority invasive species as well.

3.6.1 Environmental Consequences

No Build Alternative

The No Build Alternative would have no effect on the current status of non-native and invasive plant species in the project corridor. No invasive species would be introduced into the proposed project area by roadway construction activities. Existing invasive species may continue to grow and be transported throughout the state on vehicles, people, or wildlife travelling through the area. Normal roadside vegetation management activities would continue.

Preferred Alternative

Preferred Alternative construction activities such as clearing, grubbing, excavation, and material or equipment import/export could introduce or further spread invasive species throughout the project corridor and the state. Non-native species may be inadvertently introduced to the project area or off-site waste disposal sites by transportation of infested fill and waste materials. Construction equipment could serve as a carrier for the dispersal of non-native/invasive weeds from outside the project area and further the spread within the project area. Invasive species and/or seeds can easily be transported on the wheels of construction equipment. Similarly, seed mixes, landscaping materials, and erosion control devices could contain invasive species.

Additional clearing would cause the permanent loss of some native vegetation adjacent to the existing highway. This could change the composition of vegetation or alter ecological integrity and provide a more suitable environment for invasive species.

Due to the unlikelihood of impacts to or from non-native wildlife, bird, or aquatic species as a result of the Preferred Alternative, only invasive plant species have been addressed herein.

Impact Minimization Measures

In compliance with EO 13112 - Invasive Species, and subsequent guidance from FHWA, the landscaping and erosion control measures included in the project will not use or contain any invasive species. The following measures are typical construction practices employed by DOT&PF to avoid and minimize the introduction and spread of invasive species. These measures are typically included in soil stabilization and revegetation plans identified in the contractor's Stormwater Pollution Prevention Plan (SWPPP) and required by the ADEC Construction General Permit (CGP).

- All construction equipment and vehicles would be washed prior to being brought on site to remove dirt, seeds, roots, and other plant fragments to prevent any invasive species from being brought onto the project or into Alaska.
- All construction equipment and vehicles would be washed on site to remove dirt, seeds, roots and other plant fragments to prevent any invasive species from leaving the project area.
- Any erosion control materials made from straw or hay (e.g. wattles, bales of hay, etc.) would be made from certified weed free straw or hay. If certified materials are not available, locally produced products would be utilized to minimize potential importation of new weed propagules from outside Alaska.
- All disturbed areas would be reseeded with certified weed-free seed and vegetated with native species per the ADNR publication, *Alaska Coastal Revegetation & Erosion Control Guide*

3.7 Water Quality

Based on review of the KPB Basic and Anadromous Waters mappers, there are three surface waterbodies located within or directly adjacent to the project area with any appreciable chance to receive storm water from the proposed project: Soldotna Creek, Loren Lake, and an unnamed pond east of Jim Dahler Road (Figure 3.7.1). Soldotna Creek is a small stream that passes underneath the highway through a 14.5-foot structural metal plate pipe arch culvert, Loren Lake is approximately 13 acres in size and approximately 150 feet from the existing edge of pavement, and the unnamed pond is approximately 2 acres in size and approximately 60 feet from the existing edge of pavement. Due to the system of ditches and vegetation between the road and these water bodies, and the fact that storm water from the roadway is not concentrated and directed to them, there is no direct discharge to these waters. There are several additional surface waters located within approximately 500-1,000 feet of the proposed project, however they are separated from the project by a variety of ditches, vegetated areas, and/or developed residential/commercial areas that make the potential for them to receive storm water low. Multiple wetlands also exist adjacent to the roadway or within ROW along the project corridor and are discussed in the wetlands section 3.10. Soldotna Creek is not a navigable water according to the USCG or USACE definitions. The 2010 ADEC Impaired waters List does not show any impaired waters within or near the project area.

Storm water within the project area sheet flows off the roadway and into adjacent vegetated drainage ditches and swales. Once it leaves the roadway, the storm water is directed to ponds in low areas or wetlands where it evaporates or infiltrates into the ground. There is one storm drain system adjacent the project area, running southwest into Soldotna from Devin Drive, which

drains south out of the project area. Roadway cross culverts and approach culverts are present at multiple locations along the corridor (HDR 2015). Topography in the project area consists of gently rolling hills with flowing waters generally heading in a south-westerly direction and ultimately into the Kenai River and Cook Inlet.

The project area lies on terrain composed mainly of glacial till soils (generally silty or sandy loam with gravel or larger erratics), with scattered pockets of low-lying, poorly drained organic soils (HDR 2015). Well logs demonstrate groundwater depths along the project corridor range from approximately 17 feet to over 120 feet below ground surface (ADNR 2020b). According to the ADEC Drinking Water Protection Map, there are numerous drinking water wells located in the project vicinity.

The project area is located in the gulf coast transitional climate zone, characterized by a semi-arid atmosphere, long, cold winters, and mild summers (DCRA 2020). Precipitation generally occurs as snow in the winter months and rain during the spring, summer, and fall; although midwinter rain events are not uncommon. Data from the Western Regional Climate Center shows the mean annual precipitation in Sterling is approximately 18 inches, with 61 inches of snow on average each winter.

3.7.1 Environmental Consequences

No Build Alternative

Under the No Build Alternative, current storm water drainage patterns would remain intact, and impacts to water quality from the highway facility would be unchanged. Any existing stormwater drainage problems would persist.

Preferred Alternative

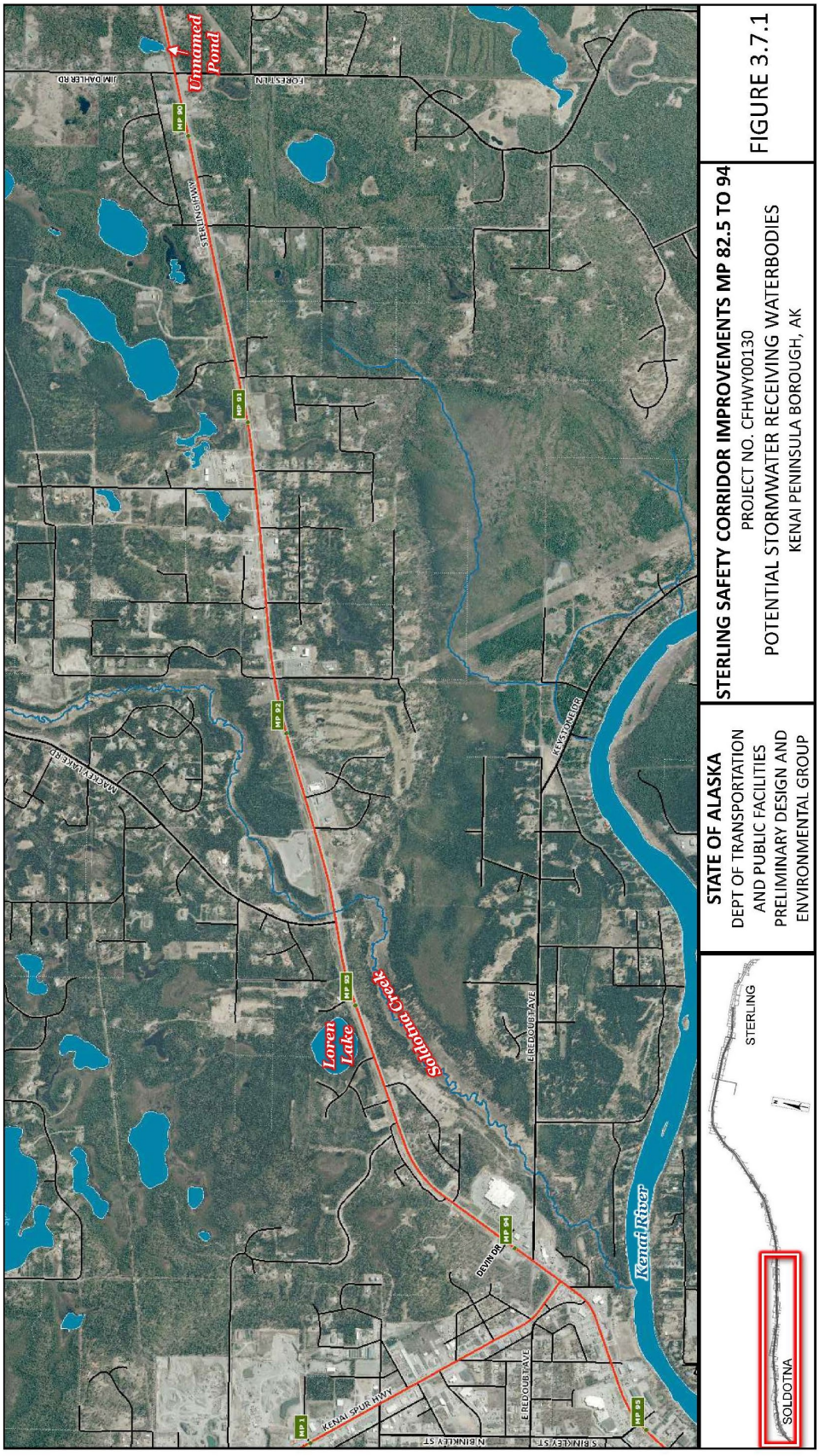
The proposed project would not have any permanent adverse impacts on water quality in the project area, including Soldotna Creek, Loren Lake, and the unnamed pond east of Jim Dahler Road. All improvements would maintain the existing drainage patterns and changes from existing water quality conditions in the project area are not likely. The existing culvert at Soldotna Creek is of sufficient length to accommodate a four-lane highway and therefore no in-water work or culvert modifications for Soldotna Creek are proposed. Since no storm water will be discharged directly to surface waters, and all improvements would be constructed well above ordinary high water of all surface waters in the project area, impacts to water quality are not anticipated.

The Sterling Highway currently consists of approximately 78 acres of impervious surface area within the project limits and would expand to approximately 128 acres after construction. However, the improved drainage facilities will be designed to handle the increased storm water runoff. The drainage design will include new or replaced cross-drain culverts and larger vegetated ditches adjacent to the roadside. Additionally, the new lanes will be crowned to direct a portion of the runoff into the center grass-lined median, providing additional treatment and infiltration opportunities. Where grades are steep enough, culvert outlets will receive protection measures to dissipate energy, reduce runoff velocity, and decrease the erosion potential of storm water runoff.

Impacts to drinking water wells in the area are not likely, as all improvements would be made without excavating to depths that hit ground water. No surface well structures will be impacted by the improvements.

Operational effects may result from stormwater runoff, landscaping maintenance activities, and spills from vehicle accidents. Pollutants in stormwater runoff from roadways typically include sediment and suspended solids, nutrients, toxic metals, oil, and grease. The preferred method for flow control/ runoff treatment is natural dispersion and infiltration. The majority of this project proposes to provide flow control and treatment by natural dispersion and infiltration. Roadway runoff would sheet flow off the paved surfaces onto the constructed vegetated slopes and existing natural areas within Alaska DOT&PF ROW. If any areas are unsuitable for natural dispersion, a different best management practice (BMP) would be used i.e. compost amended vegetated filter strips, media filter drain and as a last resort, ponds.

Construction-related impacts to water quality are detailed in Section 3.16. Water quality would generally be expected to return to existing conditions post-construction.


Unnamed Pond
Lorem Lake
Soldotna Creek
Kenai River
STERLING HWY
KENAI SPUR HWY
E REDOUBT AVE
N BINKLEY ST
S BINKLEY ST
DEVIN DR
MACKEY LAKE RD
KEYSTONE DR
JIM DAHLER RD
FOREST LN
MP 82
MP 83
MP 92
MP 93
MP 94
MP 1
STERLING
SOLDOTNA
STATE OF ALASKA
DEPT OF TRANSPORTATION AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT NO. CFHWY00130
POTENTIAL STORMWATER RECEIVING WATERBODIES
KENAI PENINSULA BOROUGH, AK
FIGURE 3.7.1

3.8 Permits

Construction of the Preferred Alternative will potentially require the following permits:

- USACE, CWA Section 404 Individual Permit
  - Permit authorizes the discharge of dredged and fill material into jurisdictional Waters of the U.S., including wetlands, as described in Section 3.10.

- ADEC, CWA Section 401 Water Quality Certification
  - Provides ADEC the opportunity to review Section 404 individual permits and ensure water quality is adequately protected via a water quality assurance certification

- ADEC, APDES Construction General Permit for Discharges from Large and Small Construction Activities
  - Required for projects that disturb greater than one acre of soil and there is potential for storm water to leave the project and enter waters of the U.S.

- ADNR Division of Mining, Land, and Water (MLW) Land Use Permit
  - Permit authorizes construction-related activities occurring on MLW-managed lands, such as staging yards, storage areas, and man camps

- KPB Conditional Use Permit
  - Permit authorizes work, such as vegetation clearing and riprap placement, within the limits of a habitat protection zone (HPZ). The HPZ is defined as a 50-foot horizontal buffer from ordinary high water on either side of a protected waterbody

3.9 Highway Traffic Noise

Noise is defined as unwanted or excessive sound and is measured in decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies of sound are given more or less "weight." The A-weighted scale, denoted as dBA, corresponds to the sensitivity range for human hearing. All noise levels referred to in this report are stated as hourly equivalent noise level ($L_{eq(h)}$), in terms of dBA. The $L_{eq(h)}$ is defined as the average noise level, on an energy basis, for a stated period of time (in this case, one hour).

Ambient noise level changes of 3 dBA are considered to be at the threshold of perceptible change for most adults with normal hearing, as shown in Table 3.9.1.

Table 3.9.1: Logarithmic Nature of Sound

Change in $L_{eq(h)}$ Sound Level	Perceived Loudness in the Natural Environment
+/- 3 dBA	Barely perceptible change
+/- 5 dBA	Readily perceptible change
+/- 10 dBA	Considered twice or half as loud

Source: HDR 2020

Traffic noise in the project area is primarily a result of traffic flows on the Sterling Highway, with secondary traffic noise associated with the local roadway network. The Sterling Highway is

the only road connection between western Kenai Peninsula communities and the remaining Alaska road system. It carries commercial, recreation, and tourism traffic, in addition to being the main residential road that connects the communities of Sterling and Soldotna. It is often used by other residents of Southcentral Alaska, including residents from Anchorage, Seward, Kenai, Homer, and other Kenai Peninsula communities. The Sterling Highway provides access between the Sterling and Anchorage areas and beyond, and because of this, it has relatively steady traffic flow year-round and during the summer season in particular.

A traffic noise analysis was performed to identify existing and predicted future traffic noise levels associated with the project, determine if impacts occur, and evaluate abatement measures for feasibility and reasonableness where impacts occur (Appendix B). Noise was evaluated in compliance with the FHWA Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR 772) and the 2018 DOT&PF Noise Policy, which describes the implementation of the FHWA noise regulations in Alaska. For the purpose of determining noise impacts, FHWA assigns different types of land uses to different categories based on the type of activities occurring in each respective land use (e.g., residences, schools, churches, commercial land, and undeveloped land). Noise abatement criteria (NAC) are then assigned to each activity category, representing the maximum traffic noise levels that allow uninterrupted use within each activity category. Table 3.9.2 lists the seven land use activity categories and the NAC associated with each.

Table 3.9.2: FHWA Land Use Categories and NAC

Activity Category	NAC ($L_{eq(h)}$ dBA)	Evaluation Location	Land Use Activity Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where preserving those qualities is essential if the area is to continue to serve its intended purpose
B	67	Exterior	Residential
C	67	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F
F	None	N/A	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail

Activity Category	NAC ($L_{eq(h)}$ dBA)	Evaluation Location	Land Use Activity Description
			facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	None	N/A	Undeveloped lands that are not permitted

Source: 23 CFR 772, Table 1

According to 23 CFR 772.5, a traffic noise impact occurs when predicted noise levels approach or exceed the NAC established for a receptor's land use category or substantially exceeds existing traffic noise levels. The DOT&PF Noise Policy further defines "approach" as a noise level within one dBA of the NAC. The noise policy defines a "substantial increase" as an increase in noise level of 15 dBA or greater over existing levels.

The project area is characterized by a mix of residential (Land Use Category B); places of worship, a campground/RV park, a recreational site (the Scout Lake State Recreation Site), a school (the Sterling Elementary School), and a golf course (Land Use Category C); a medical center (Land Use Category D); commercial and retail properties (Land Use Category E); a weigh station (Land Use Category F); and undeveloped lands (Land Use Category G). There are a number of gift shop/tourist-related businesses along the highway in the project area but many of these do not appear to have exterior areas where frequent human use occurs. Most institutional land uses were modeled at their outdoor use areas as Category C land uses. One medical center with no outdoor use areas was modeled to predict interior noise as a Category D land use. No Category A land uses were identified in the project area.

The traffic noise analysis took ambient noise measurements at 10 locations and modeled existing and design year (2050) No Build and Preferred Alternative noise levels at 151 locations along the project corridor. Under the existing condition, traffic noise levels ranges from 50 to 67 $L_{eq(h)}$ dBA. As shown in Table 3.9.3, three of the modeled receivers (R-53, R-81, and R-81b), representing four residential receptors, currently exceed the Category B NAC with noise levels of 66 to 67 dBA. Figures 3.9.1-6 show noise receiver and measurement locations.

Table 3.9.3: Measured and Modeled Peak Hour Noise Levels for the Existing, No Build Alternative, and Build Alternative Conditions

Monitoring and/or Receiver Site	Land Use Description	Activity Category	Category NAC (dBA)	Number of Receptors	Existing Noise Levels (dBA)[1]	No Build Alternative Noise Levels (dBA)[1]	Build Alternative Noise Levels (dBA)[1]
R-1	Residential	B	67	3	55	56	59
R-2	Residential	B	67	3	54	55	57
R-3	Residential	B	67	1	60	61	58
R-4	Residential	B	67	1	62	63	61
R-5	Residential	B	67	1	58	59	58
R-6	Residential	B	67	1	54	55	58
R-7	Residential	B	67	1	58	59	60
R-8	Residential	B	67	1	52	53	53
R-9	Residential	B	67	1	64	65	**67**
R-10	Residential	B	67	1	61	62	65
R-11	Residential	B	67	3	64	65	65

Monitoring and/or Receiver Site	Land Use Description	Activity Category	Category NAC (dBA)	Number of Receptors	Existing Noise Levels (dBA)[1]	No Build Alternative Noise Levels (dBA)[1]	Build Alternative Noise Levels (dBA)[1]
R-12	Residential	B	67	1	58	59	62
R-13	Residential	B	67	1	53	54	55
R-14	Residential	B	67	1	53	54	56
R-15	Residential	B	67	1	55	56	58
R-16	Residential	B	67	1	55	56	58
R-17	Residential	B	67	1	64	65	**66**
R-18/M-9	Place of worship	C	67	1	59	60	62
R-19	Residential	B	67	1	62	63	65
R-20	Residential	B	67	1	54	55	56
R-21	Residential	B	67	1	54	55	56
R-22	Residential	B	67	2	54	55	56
R-23	Residential	B	67	2	54	55	55
R-24	Residential	B	67	1	54	54	56
R-25	Residential	B	67	1	54	54	56
R-26	Residential	B	67	1	51	52	53
R-27	Residential	B	67	1	53	54	56
R-28	Residential	B	67	1	59	60	62
R-29	Commercial	E	72	1	65	66	67
R-30	Residential	B	67	1	60	61	63
R-31	Residential	B	67	1	59	60	63
R-32	Residential	B	67	1	54	55	57
R-33	Residential	B	67	1	54	54	56
R-34	Residential	B	67	1	61	62	61
R-35	Residential	B	67	2	50	51	50
R-36	Residential	B	67	1	50	51	50
R-37	Residential	B	67	1	55	56	59
R-38/M-6	Residential	B	67	1	59	60	61
R-39	Residential	B	67	1	59	60	59
R-40	Residential	B	67	1	55	56	61
R-41	Residential	B	67	1	60	61	59
R-42	Residential	B	67	4	59	59	58
R-43	Residential	B	67	4	63	64	62
R-44	Residential	B	67	1	59	60	56
R-45	Residential	B	67	3	57	57	55
R-46	Residential	B	67	1	57	57	54
R-47	Residential	B	67	1	55	56	61
R-48	Residential	B	67	1	53	54	60
R-49	Residential	B	67	1	58	59	65
R-50	Residential	B	67	2	59	60	**66**
R-51	Residential	B	67	1	57	58	63
R-52/M-5	Residential	B	67	1	60	61	**68**
R-53	Residential	B	67	1	**67**	**68**	65
R-54	Residential	B	67	1	56	57	59
R-55	Residential	B	67	1	54	54	59
R-56	Residential	B	67	1	61	62	65
R-57	Residential	B	67	1	64	65	**66**
R-58	Residential	B	67	1	62	62	65
R-59	Residential	B	67	1	55	56	59

Monitoring and/or Receiver Site	Land Use Description	Activity Category	Category NAC (dBA)	Number of Receptors	Existing Noise Levels (dBA)[1]	No Build Alternative Noise Levels (dBA)[1]	Build Alternative Noise Levels (dBA)[1]
R-60	Residential	B	67	1	63	63	65
R-61	Residential	B	67	1	60	61	64
R-62	Residential	B	67	1	53	54	57
R-63	Residential	B	67	1	52	53	55
R-64	Residential	B	67	1	64	64	65
R-65	Residential	B	67	1	62	63	64
R-66	Residential	B	67	1	55	55	57
R-67	Residential	B	67	1	65	**66**	**66**
R-68	Residential	B	67	1	57	57	57
R-69	Residential	B	67	1	56	57	55
R-70	Residential	B	67	2	52	53	53
R-71	Residential	B	67	1	54	55	53
R-72	Residential	B	67	1	53	54	57
R-73	Residential	B	67	1	58	59	62
R-74	Residential	B	67	1	64	65	**66**
R-75	Residential	B	67	1	63	64	**66**
R-76	Residential	B	67	1	65	**66**	**67**
R-77	Residential	B	67	1	62	63	63
R-78	Residential	B	67	1	52	53	53
R-79	Residential	B	67	1	54	55	55
R-80	Residential	B	67	1	64	65	**66**
R-81	Residential	B	67	1	**66**	**67**	**67**
R-81b	Residential	B	67	2	**66**	**67**	**67**
R-82	Residential	B	67	1	55	55	57
R-83	Residential	B	67	2	56	57	54
R-84	Residential	B	67	1	53	53	50
R-85	Residential	B	67	1	58	58	53
R-86	Residential	B	67	1	54	55	59
R-87	Residential	B	67	1	56	57	62
R-88	Residential	B	67	1	59	60	**66**
R-89	Residential	B	67	1	59	60	64
R-90	Residential	B	67	1	53	54	57
R-91	Residential	B	67	1	61	62	**66**
R-92/M-4	Residential	B	67	1	59	60	65
R-93	Residential	B	67	2	52	53	57
R-94	Residential	B	67	2	54	55	59
R-95	Residential	B	67	1	55	55	59
R-96	Residential	B	67	1	54	55	58
R-97	Residential	B	67	1	56	57	61
R-98	Residential	B	67	1	53	54	54
R-99	Residential	B	67	1	56	57	57
R-100/M-3	Residential	B	67	1	58	59	62
R-101	Residential	B	67	1	54	54	58
R-102	Residential	B	67	1	53	54	55
R-103	Residential	B	67	1	62	63	63
R-104	Residential	B	67	2	52	53	53
R-105	Residential	B	67	2	55	56	58
R-106	Residential	B	67	1	55	56	58

Monitoring and/or Receiver Site	Land Use Description	Activity Category	Category NAC (dBA)	Number of Receptors	Existing Noise Levels (dBA)[1]	No Build Alternative Noise Levels (dBA)[1]	Build Alternative Noise Levels (dBA)[1]
R-107	Section 4(f) Site	C	67	1	51	52	55
R-108	Residential	B	67	1	59	60	62
R-109	Residential	B	67	1	64	65	**66**
R-110/M-2	Residential	B	67	1	57	58	60
R-111/M-8	Residential	B	67	1	64	65	65
R-112	Residential	B	67	1	63	64	64
R-113	Residential	B	67	1	60	61	64
R-114	Residential	B	67	1	58	58	60
R-115	Residential	B	67	1	58	59	61
R-116	Residential	B	67	1	56	57	59
R-117	Residential	B	67	1	56	57	57
R-118	Residential	B	67	1	61	62	63
R-119	Residential	B	67	1	56	57	59
R-120	Campground	C	67	1	62	63	64
R-121	Residential	B	67	1	55	56	59
R-122	Residential	B	67	1	64	65	65
R-123	Residential	B	67	1	61	62	62
R-124	Residential	B	67	1	56	57	57
R-125	Residential	B	67	1	59	59	61
R-126	Residential	B	67	1	57	57	59
R-127	Residential	B	67	1	54	55	55
R-128/M-10	School	C	67	1	52	53	56
R-129	Residential	B	67	1	54	55	56
R-130	Residential	B	67	1	54	55	55
R-131	Residential	B	67	1	55	56	55
R-132	Residential	B	67	1	55	56	55
R-133	Residential	B	67	1	54	55	56
R-134	Residential	B	67	1	54	55	57
R-135	Residential	B	67	1	52	53	55
R-136	Residential	B	67	1	52	53	54
R-137/M-1	Residential	B	67	1	59	60	62
R-138	Residential	B	67	1	54	54	55
R-139	Residential	B	67	1	59	60	60
R-140	Residential	B	67	1	57	58	58
R-141	Residential	B	67	1	60	61	60
R-142	Residential	B	67	1	59	59	59
R-143	Residential	B	67	1	58	59	59
R-144	Residential	B	67	1	55	56	56
R-145	Residential	B	67	1	63	64	64
R-146	Recreation Area	C	67	1	61	62	63
R-147	Commercial	E	72	1	62	62	65
R-148	Senior Center	C	67	1	63	64	65
R-149	Medical Facility	D	52	1	44	44	44
R-150/M-7	Restaurant	E	72	1	61	61	65

[1]Noise levels in **RED** approach or exceed the NAC

Source: HDR 2020

A portion of the project area is undeveloped in nature. To provide information to local officials on the suitability of undeveloped parcels for different types of future land uses under the 2050 Preferred Alternative, the distance from the centerline of the Sterling Highway to the appropriate impact thresholds for different land use types were predicted using a simplified, straight line roadway with no topographical effects to noise propagation. This information can be found in Table 12-1 of Appendix B.

3.9.1 Environmental Consequences

No Build Alternative

Under the 2050 No Build Alternative, the existing two-lane roadway configuration would remain without improvement. Traffic noise would increase relative to the existing condition as a result of increased traffic volumes over time on area roadways. No Build noise levels are predicted to increase up to 1 dBA over the existing conditions, with noise levels in the project area ranging from 51 to 68 dBA $L_{eq(h)}$. Five receivers (R-53, R-67, R-76, R-81, and R-81b), representing six residential receptors, are predicted to experience noise impacts under the No Build Alternative, as they approach or exceed the Category B NAC. The No Build Alternative wouldn't consider any abatement measures and affected receivers would continue to experience noise impacts.

Preferred Alternative

Under the Preferred Alternative, traffic noise at most locations would increase due to increased traffic volumes, increased roadway width, and minor alignment alterations, which would result in reduced setback distances for several receptors. In other areas, traffic noise levels would decrease due to the Preferred Alternative being located further from the existing Sterling Highway alignment. Noise levels would range from 50 to 68 dBA $L_{eq(h)}$, resulting in a decrease of 5 dBA to an increase up to 8 dBA compared to existing conditions. Under the Preferred Alternative, noise levels at fifteen receivers (R-9, R-17, R-50, R-52, R-57, R-67, R-74, R-75, R-76, R-80, R-81, R-81b, R-88, R-91, and R-109), representing seventeen residential receptors, would approach or exceed the Category B NAC by the project design year of 2050.

Temporary construction noise would result from the construction activities anticipated under the Preferred Alternative only. Noise levels for these activities can be expected to range from approximately 70 to 100 dBA at sites 50 feet from the activities (Table 3.9.4).

Table 3.9.4: Typical Construction Noise Levels (dBA)

Types of Activities	Types of Equipment	Range of Noise Levels at 50 Feet (dBA)
Materials Handling	Concrete mixers	75-87
	Concrete pumps	81-83
	Cranes (movable)	76-87
	Cranes (derrick)	86-88
Stationary Equipment	Pumps	69-71
	Generators	71-82
	Compressors	74-87
Impact Equipment	Blasting[1]	95-101
	Pile Driver[1]	83-88
	Pneumatic wrenches	81-98
	Rock drills	77-96

Types of Activities	Types of Equipment	Range of Noise Levels at 50 Feet (dBA)
Land Clearing	Bulldozer	82-94
	Dump truck	80-93
Grading	Scraper	77-96
	Bulldozer	86-88
Paving	Paver	82-94
	Dump truck	75-87

Source: U.S. Environmental Protection Agency, 1971, unless otherwise noted
[1]Source: FHWA, Roadway Construction Noise Model User's Guide, 2006

Mitigation

In accordance with the DOT&PF Noise Policy, noise abatement measures were considered and evaluated for acoustic feasibility and reasonableness for all impacted receptors. Acoustic feasibility deals primarily with physics and engineering considerations (i.e., can a substantial noise reduction be achieved, given the conditions of a specific location; is the ability to achieve noise reduction limited by factors such as topography, access requirements for driveways or ramps, the presence of cross streets, or other noise sources in the area). Noise abatement measures are considered feasible if:

1. A minimum of 5 dBA or more reduction is achieved for at least 50% of front row dwelling units.
2. They don't create a safety hazard to the driving public.

Reasonableness is a more subjective criterion than feasibility. It implies that common sense and good judgment were applied in arriving at a decision for abatement. Reasonableness is based on a number of factors, not just one criterion. FHWA noise regulations define three mandatory reasonableness factors that must be evaluated for a noise abatement measure to be considered reasonable: cost effectiveness, viewpoints of the property owners and benefitted residents, and noise reduction design goals.

Noise abatement measures are considered reasonable if:

1. They are cost effective, having a cost per benefitted receptor of less than or equal to $38,000. A benefitted receptor is defined as the recipient of an abatement measure that receives a noise reduction at or above the minimum threshold of 5 dBA.
2. They have greater than 60% approval from property owners and affected residents.
3. A DOT&PF design goal of 7 dBA reduction can be achieved for 50% of front row dwellings.

Noise abatement measures to reduce highway vehicle noise can take a number of physical or operational forms. The most common and cost-effective approach to mitigating highway noise is the construction of traditional noise walls or barriers. Other methods include roadway alignment changes, truck restrictions, speed restrictions, and the acquisition of real property to create a buffer between a highway and the nearest noise sensitive land uses.

Realigning the Sterling Highway to increase the setback between existing land uses and the highway would involve considerable expense, and it is very unlikely to be able to meet the reasonableness criteria per benefited receptor due to the relatively low development density in the project area. Similarly, the cost of acquiring real property and displacing existing residents

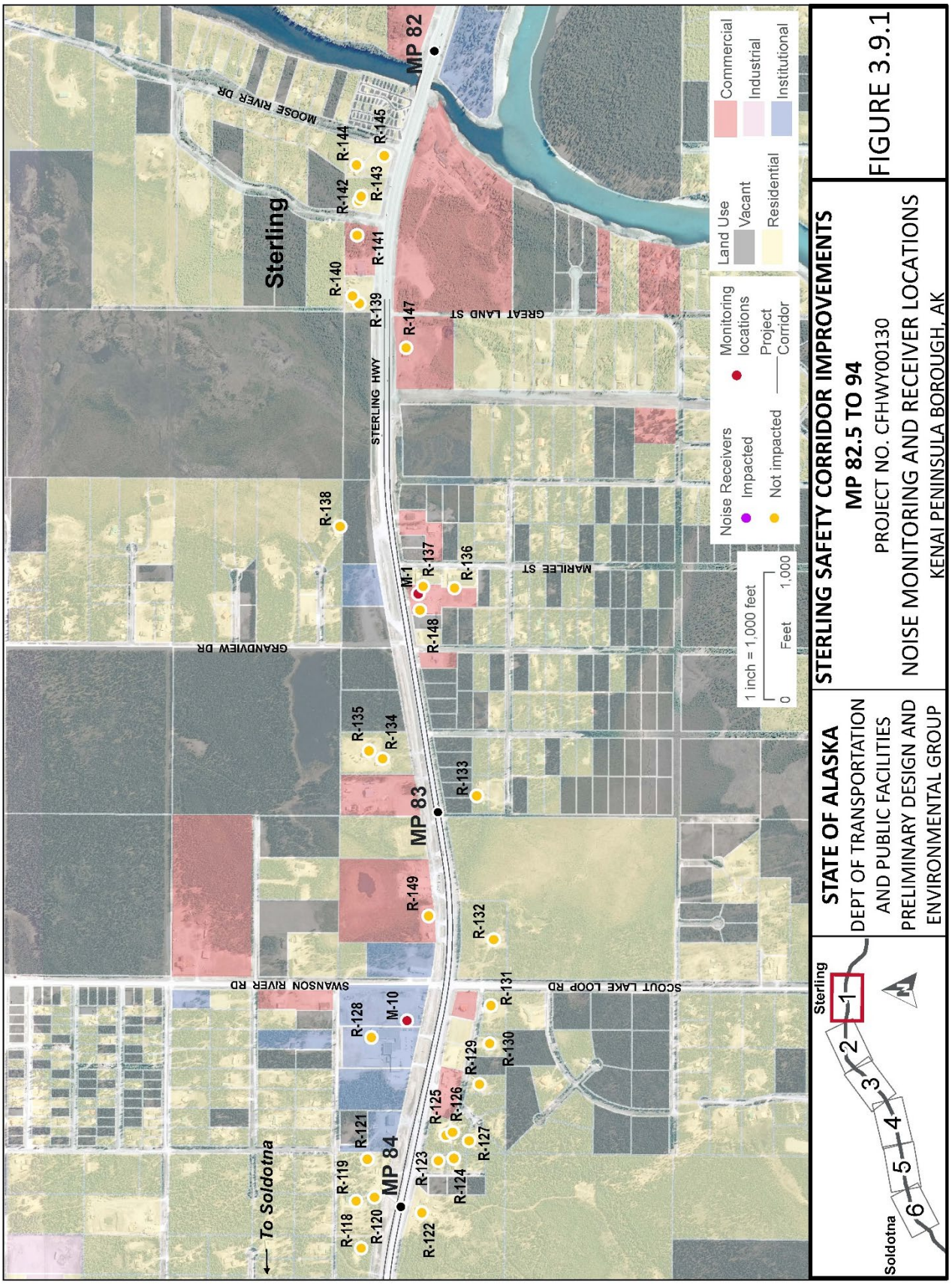
and businesses would be very unlikely to be able to meet the reasonableness criteria per benefited receptor allowable by the DOT&PF Noise Policy. In addition, restrictions on the ability of trucks to use the Sterling Highway, as well as overall speed restrictions, would be counter to the primary function of this important freight and transportation route in this part of Alaska.

Noise barriers were evaluated at all impacted receivers for the purposes of mitigating predicted noise impacts. For a noise barrier to be effective, it must be of sufficient length and height to block the line of sight from the receptor to the roadway. A 5 dBA reduction in traffic noise is possible only when the line of sight to a roadway, in this case the Sterling Highway, from an impacted receptor is blocked. In cases where it is not possible to block the line of sight between the highway and the receptor, either because of differences in elevation due to topography or gaps need to be left in the wall to allow access to properties, noise reductions (e.g. a 5 dBA reduction to be considered "benefitted" by the wall per the DOT&PF Noise Policy) typically cannot be attained. In addition, where isolated impacts occur (i.e., single impacts that are not clustered with other adjacent impacts), noise barrier length parallel to the highway typically needs to be at least four times the perpendicular distance of the receptor to the highway in order to produce the level of noise reduction required to begin to show a benefit per the DOT&PF Noise Policy. In cases where there is only one impact to mitigate, wall costs quickly exceed the allowable cost per residence of $38,000, making the wall unreasonable.

For Receivers 17, 50, 52, 57, 74, 75, 91, and 109, uncontrolled access directly onto the Sterling Highway in front of or adjacent to the properties means that noise mitigation could not break the line of sight from the highway making the 5 dBA reduction unattainable and thus not considered feasible. For Receivers 9, 67, and 76, the length of wall that would be required (at least four times the distance of the receptor to the highway) would not meet the cost reasonableness criterion for single, impacted properties. For Receivers 80, 81, 81b, and 88, barriers between the receivers and the roadway were found to result in a 5 dBA or more reduction at all impacted receptors; therefore, a noise barrier would be feasible. However, the walls would cost significantly more than $38,000 per benefitted receiver, exceeding the reasonable amount established in the DOT&PF Noise Policy.

As a result of the feasibility and reasonableness analyses, noise mitigation is not recommended for any of the impacted receivers. Additional information regarding the feasibility and reasonableness analyses, including discussions of each individual impacted receiver and the associated worksheets, can be found in Appendix B.

These noise abatement recommendations are preliminary and based upon the feasibility and reasonableness analyses completed at the time of the environmental document. Final recommendations for noise abatement will be based upon the feasibility and reasonableness analysis conducted during the detailed design of the project.


Sterling
MP 82
MP 83
MP 84
To Soldotna
STERLING HWY
GREAT LAND ST
MARILEE ST
GRANDVIEW DR
SWANSON RIVER RD
SCOUT LAKE LOOP RD
MOOSE RIVER DR
R-118
R-119
R-120
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R-136
R-137
R-138
R-139
R-140
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R-142
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R-144
R-145
R-147
R-148
R-149
M-1
M-10
Noise Receivers
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Not impacted
Monitoring locations
Project Corridor
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Vacant
Residential
Commercial
Industrial
Institutional
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STATE OF ALASKA
DEPT OF TRANSPORTATION AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
NOISE MONITORING AND RECEIVER LOCATIONS
KENAI PENINSULA BOROUGH, AK
FIGURE 3.9.1
Sterling
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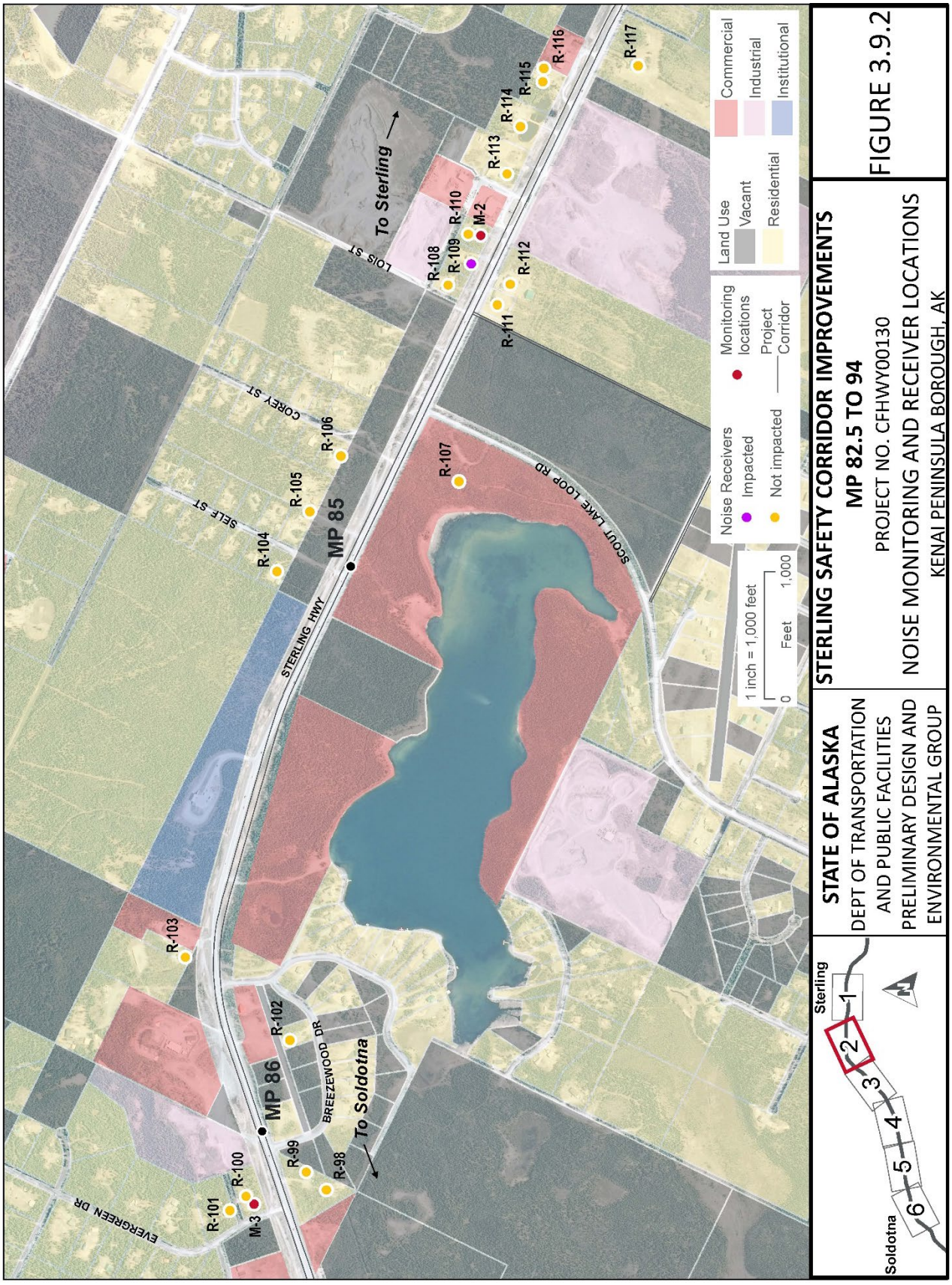
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To Sterling
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STERLING HWY
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COREY ST
SELF ST
SCOUT LAKE LOOP RD
BREEZEWOOD DR
EVERGREEN DR
Noise Receivers
Impacted
Not impacted
Monitoring locations
Project Corridor
Land Use
Vacant
Residential
Commercial
Industrial
Institutional
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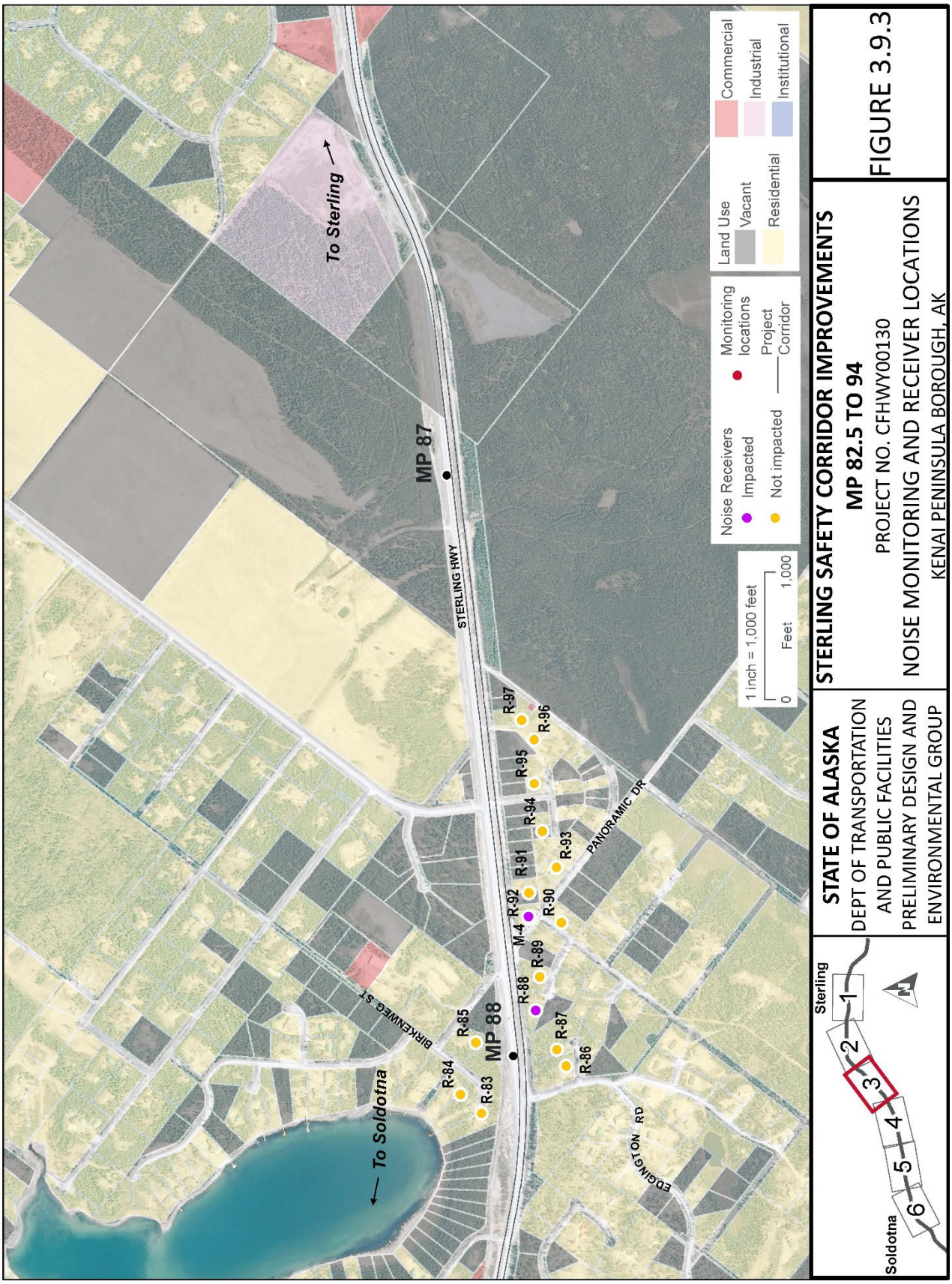
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
NOISE MONITORING AND RECEIVER LOCATIONS
KENAI PENINSULA BOROUGH, AK
FIGURE 3.9.2


To Sterling
To Soldotna
MP 87
MP 88
STERLING HWY
BIRKENWEG ST
PANORAMIC DR
EDGINGTON RD
R-83
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R-85
R-86
R-87
R-88
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R-94
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R-96
R-97
Noise Receivers
Impacted
Not impacted
Monitoring locations
Project Corridor
Land Use
Vacant
Residential
Commercial
Industrial
Institutional
1 inch = 1,000 feet
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STATE OF ALASKA
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PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP
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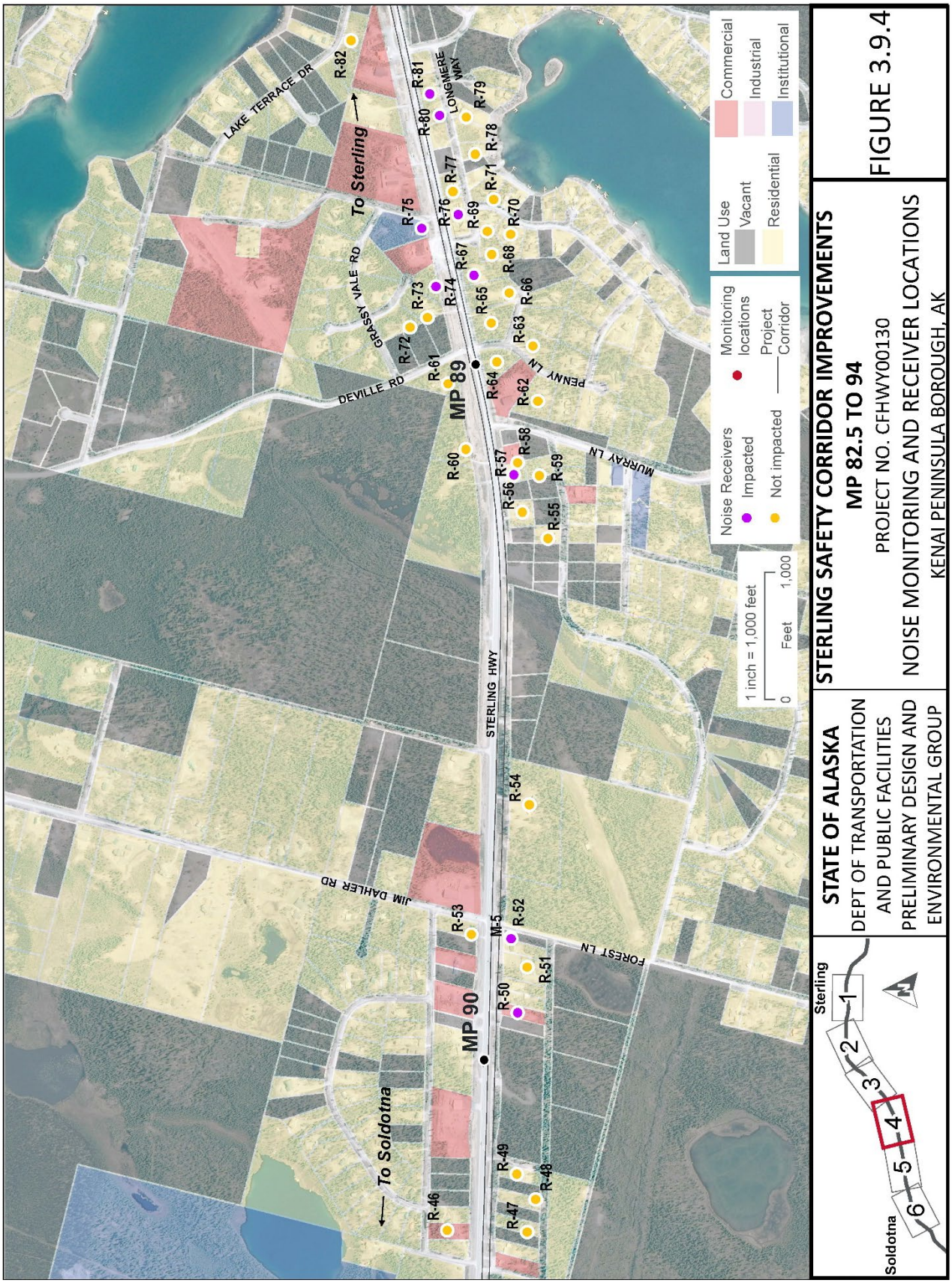
MP 82.5 TO 94
PROJECT NO. CFHWY00130
NOISE MONITORING AND RECEIVER LOCATIONS
KENAI PENINSULA BOROUGH, AK
FIGURE 3.9.3


LAKE TERRACE DR
To Sterling
LONGMERE WAY
GRASSY VALE RD
DEVILLE RD
PENNY LN
MURRAY LN
STERLING HWY
JIM DAHLER RD
FOREST LN
To Soldotna
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MP 90
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R-46
Land Use
Vacant
Residential
Commercial
Industrial
Institutional
Noise Receivers
Impacted
Not impacted
Monitoring locations
Project Corridor
1 inch = 1,000 feet
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STATE OF ALASKA
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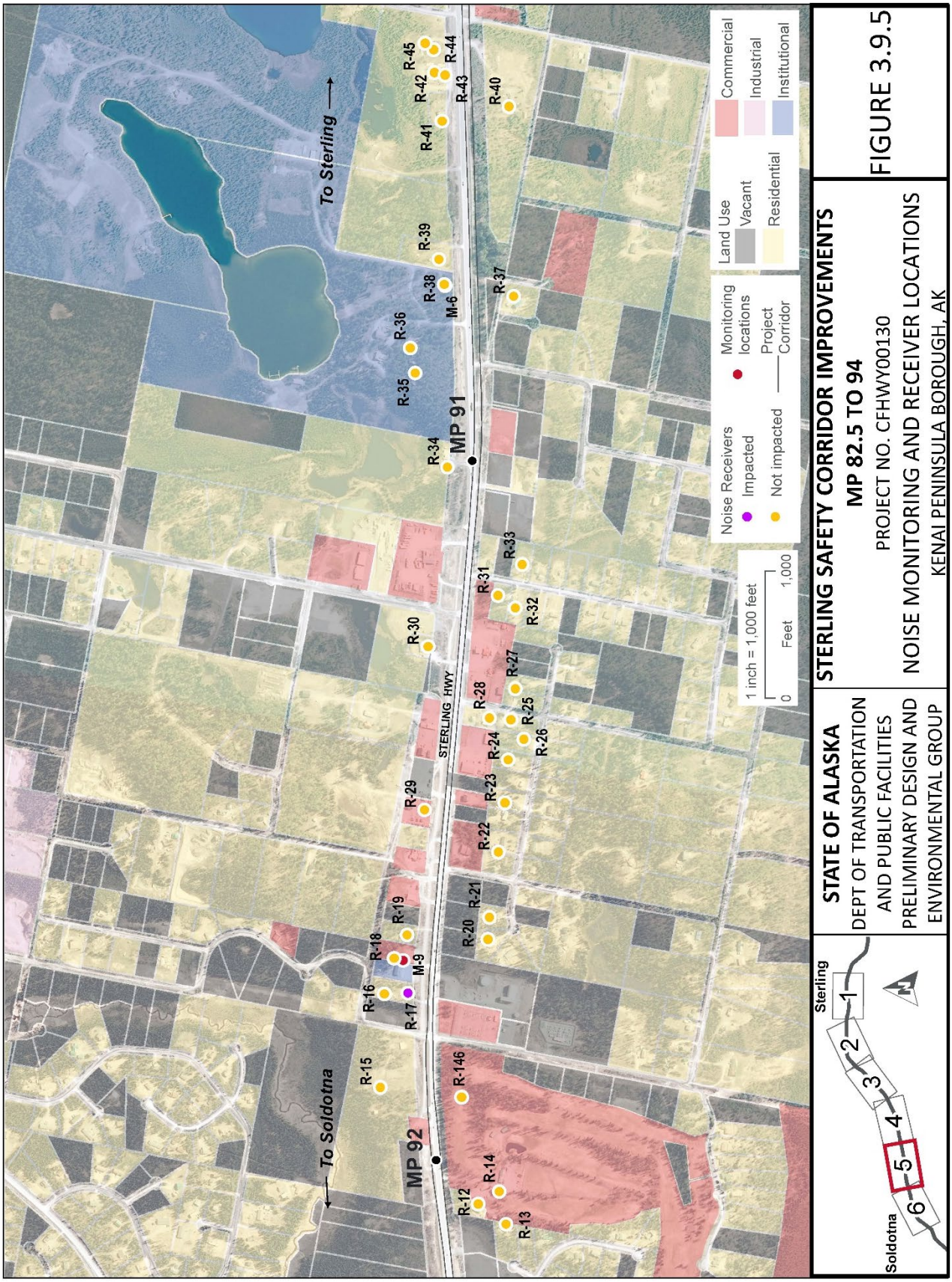
MP 82.5 TO 94
PROJECT NO. CFHWY00130
NOISE MONITORING AND RECEIVER LOCATIONS
KENAI PENINSULA BOROUGH, AK
FIGURE 3.9.4


To Sterling
To Soldotna
MP 91
MP 92
STERLING HWY
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R-41
R-42
R-43
R-44
R-45
R-146
M-6
M-9
Noise Receivers
Impacted
Not impacted
Monitoring locations
Project Corridor
Land Use
Vacant
Residential
Commercial
Industrial
Institutional
1 inch = 1,000 feet
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Sterling
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STATE OF ALASKA
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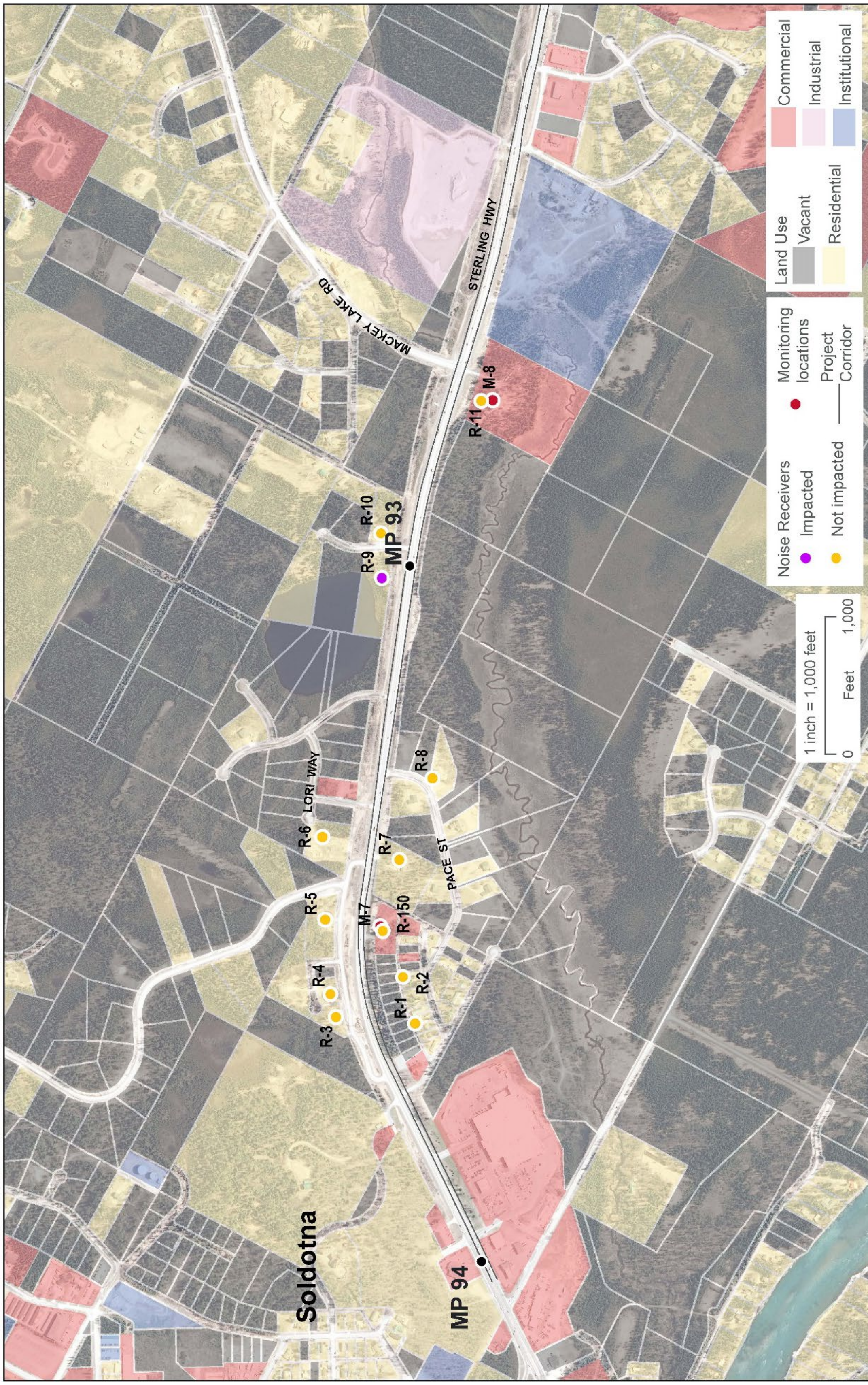
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
NOISE MONITORING AND RECEIVER LOCATIONS
KENAI PENINSULA BOROUGH, AK
FIGURE 3.9.5



STATE OF ALASKA
DEPT OF TRANSPORTATION AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP

STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
NOISE MONITORING AND RECEIVER LOCATIONS
KENAI PENINSULA BOROUGH, AK

FIGURE 3.9.6

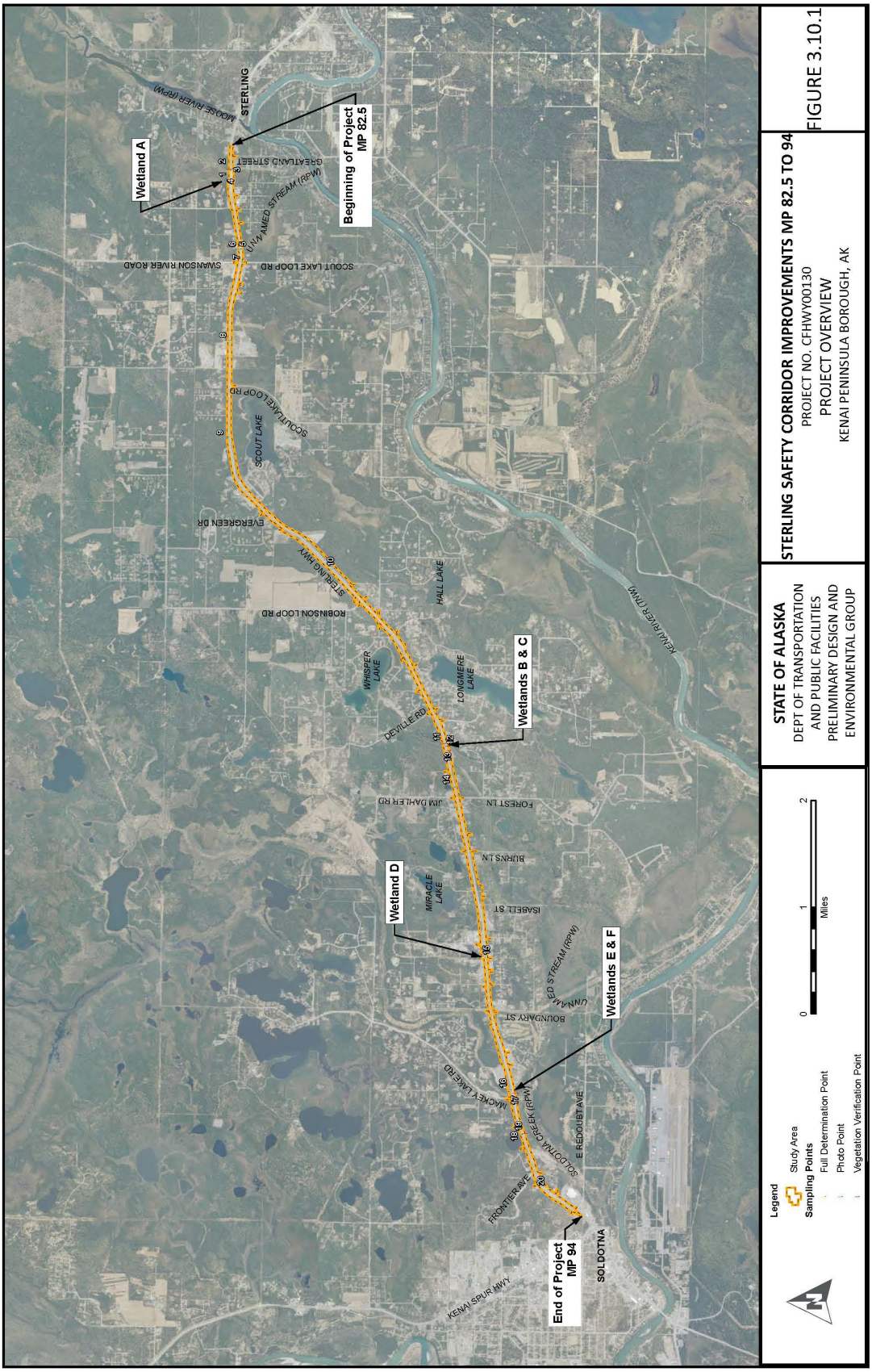
3.10 Wetlands and Waters of the U.S.

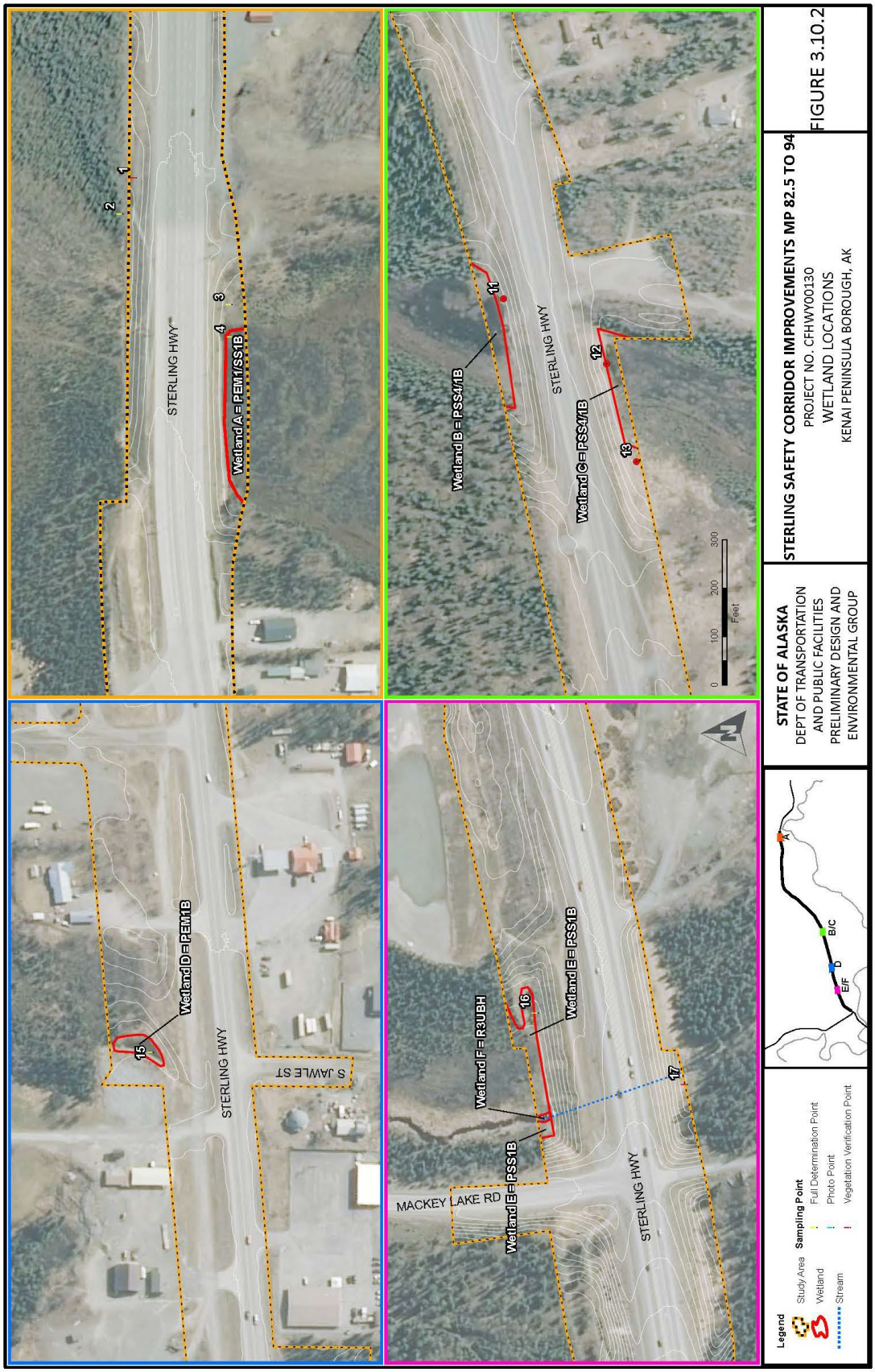
Under the Navigable Waters Protection Rule (effective June 22, 2020), the U.S. Army Corps of Engineers (USACE) refined and simplified the definition of waters of the U.S. (WOTUS) to the following four categories, per 33 CFR 328.3 and 85 FR 22250:

1. Territorial seas and traditional navigable waters;
2. Tributaries of such waters;
3. Lakes, ponds, and impoundments of jurisdictional WOTUS; and
4. Wetlands adjacent to jurisdictional WOTUS, such that:
    a. The wetland abuts, or touch at least one point or side of the jurisdictional water
    b. The wetland is inundated by flooding from the jurisdictional water in a typical year
    c. The wetland is physically separated from the jurisdictional water only by a natural berm, bank, dune, or similar natural feature
    d. The wetland is physically separated from the jurisdictional water by an artificial dike, barrier, or similar artificial structure so long as the structure allows for a direct hydrologic surface connection between the wetland and jurisdictional water in a typical year

To identify waters of the U.S. within the project corridor subject to the jurisdiction of the USACE, a field investigation was performed during the summer of 2013 in accordance with the 1987 USACE *Wetlands Delineation Manual* three-parameter method of determining an area's wetland status and methods described in the 2007 *Alaska Regional Supplement* (HDL 2014e). The study area consisted of the area within existing ROW boundaries, beginning at the Sterling Highway's intersection with Greatland Street in Sterling and ending approximately 1,200 feet northeast of the Sterling Highway's intersection with the Kenai Spur Highway. The study area extends approximately 200 feet north and south of the highway at secondary streets. The results of the field investigation are presented in the *Preliminary Jurisdictional Determination Report and Functional Assessment*, contained in Appendix C. The report has not yet been submitted to USACE and all jurisdictional determinations are considered preliminary.

Of the 347.93 acres mapped, 1.07 total acres of wetlands and streams were identified (Figures 3.10.1-3). Of the total, 0.55 acre was preliminarily determined to be jurisdictional wetlands with 0.10 acre other jurisdictional WOTUS, while 0.42 acre was non-jurisdictional. The 0.55 acre is comprised of two distinct wetland areas, including one palustrine emergent wetland (freshwater wetland dominated by rooted herbaceous plants), identified as Wetland A in the included figures, and one palustrine scrub-shrub wetland (freshwater wetland with needle leaved evergreen scrub and broad leaved deciduous shrubs), identified as Wetland E. Wetland A is connected by surface hydrology to a large wetland complex north of the highway that abuts the Moose River, a tributary to the Kenai River, a traditionally navigable water. Wetland E directly abuts Soldotna Creek, another tributary to the Kenai River. For these reasons, DOT&PF determined that these are jurisdictional wetlands under Section 404 of the Clean Water Act. The 0.10 acre of other WOTUS is Soldotna Creek, identified as Wetland F. Wetlands B-D do not appear to have a surface water or wetland connection to a jurisdictional WOTUS, and are preliminarily determined to be non-jurisdictional. The total mapped area of wetlands, waterbodies, and uplands is detailed in Table 3.10.1.


Wetland A
Beginning of Project MP 82.5
STERLING
MOOSE RIVER (RPW)
GREATLAND STREET
UNNAMED STREAM (RPW)
SWANSON RIVER ROAD
SCOUT LAKE LOOP RD
SCOUT LAKE
EVERGREEN DR
STERLING HWY
ROBINSON LOOP RD
HALL LAKE
KENAI RIVER (TNW)
WHISPER LAKE
LONGMERE LAKE
DEVILLE RD
Wetlands B & C
JIM DAHLER RD
FOREST LN
BURNS LN
Wetland D
MIRACLE LAKE
ISABELL ST
UNNAMED STREAM (RPW)
BOUNDARY ST
Wetlands E & F
MACKEY LAKE RD
SOLDOTNA CREEK (RPW)
E REDOUBT AVE
FRONTIER AVE
End of Project MP 94
SOLDOTNA
KENAI SPUR HWY
Legend
Study Area
Sampling Points
Full Determination Point
Photo Point
Vegetation Verification Point
0
1
2
Miles
STATE OF ALASKA
DEPT OF TRANSPORTATION
AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND
ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT NO. CFHWY00130
PROJECT OVERVIEW
KENAI PENINSULA BOROUGH, AK
FIGURE 3.10.1


STERLING HWY
Wetland A = PEM1/SS1B
Wetland B = PSS4/1B
Wetland C = PSS4/1B
Wetland D = PEM1B
Wetland E = PSS1B
Wetland F = R3UBH
MACKEY LAKE RD
S JAWLE ST
Feet
0
100
200
300
Legend
Study Area
Wetland
Stream
Sampling Point
Full Determination Point
Photo Point
Vegetation Verification Point
STATE OF ALASKA
DEPT OF TRANSPORTATION AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT NO. CFHWY00130
WETLAND LOCATIONS
KENAI PENINSULA BOROUGH, AK
FIGURE 3.10.2

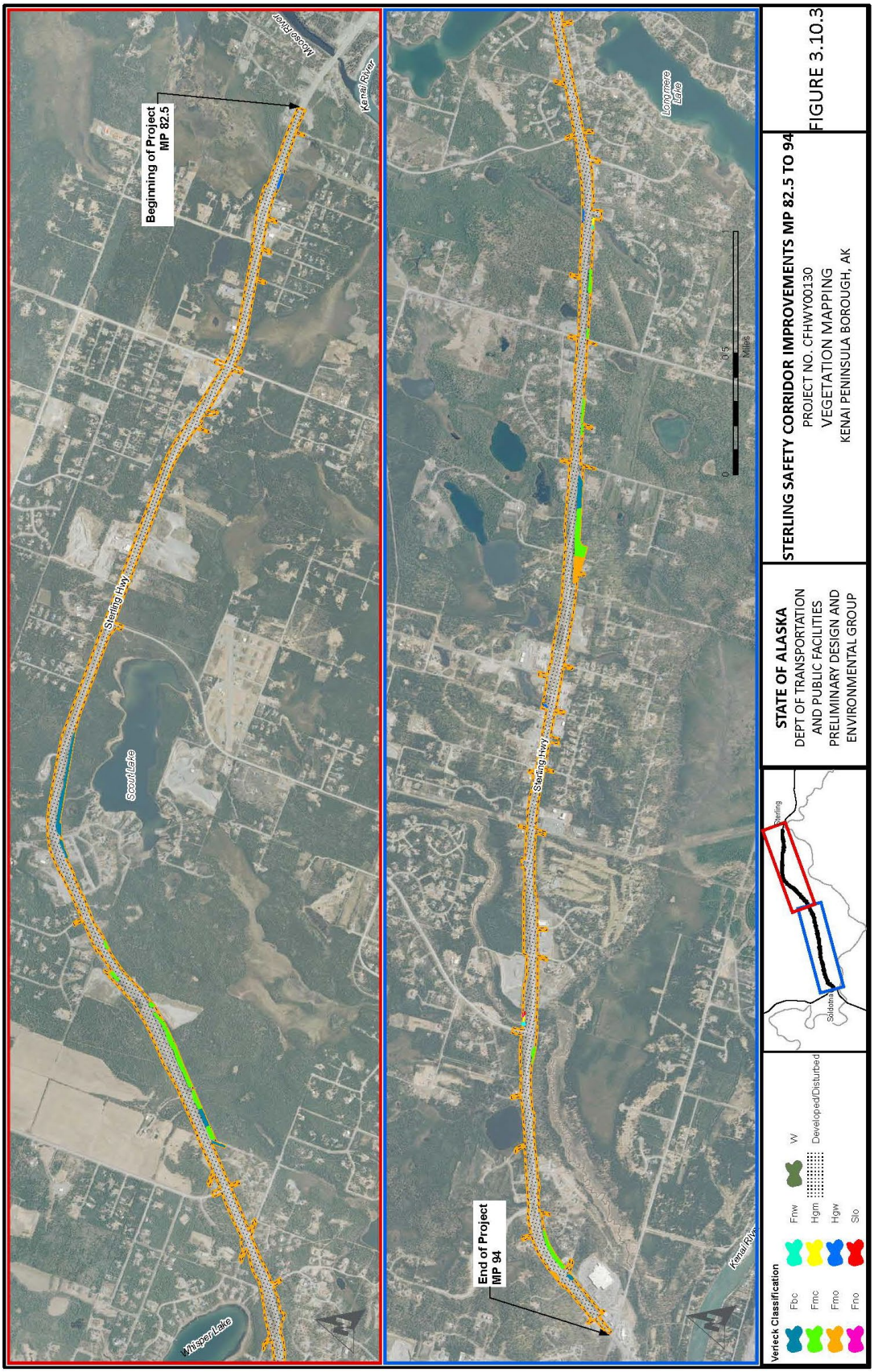

Beginning of Project MP 82.5
Moose River
Kenai River
Sterling Hwy
Scout Lake
Whisper Lake
Longmere Lake
End of Project MP 94
Kenai River
0 0.5 Miles
Veneck Classification
Fbc
Fmc
Fmo
Fno
Fnw
Hgm
Hgw
Slo
W
Developed/Disturbed
Sterling
Soldotna
STATE OF ALASKA
DEPT OF TRANSPORTATION
AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND
ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT NO. CFHWY00130
VEGETATION MAPPING
KENAI PENINSULA BOROUGH, AK
FIGURE 3.10.3

Table 3.10.1: Mapped Wetland Types in the Project Area

Preliminary Jurisdictional Status	Wetland ID	Wetland Type	Cowardin Classification	Functional Rating	Mapped Area (Acre)	Percent of Mapped Area (%)
Jurisdictional WOTUS	Wetland A	Palustrine Emergent	PEM1/SS1B	Moderate	0.34	0.10
	Wetland E	Palustrine Scrub-Shrub	PSS1B	High	0.21	0.06
	Wetland F	Perennial Stream	R3UBH	High	0.10	0.03
Non-Jurisdictional	Wetland D	Palustrine Emergent	PEM1B	N/A	0.08	0.02
	Wetlands B and C	Palustrine Scrub-Shrub	PSS4/1B	N/A	0.34	0.10
		Upland	U	N/A	346.86	99.69
				Total Acreage	347.93	100

Source: HDL 2014b

3.10.1 Mapped Wetland Functions and Values

Habitats with high function and value were Soldotna Creek (Wetland F) and the associated riparian, palustrine scrub-shrub wetland (Wetland E). Soldotna Creek is listed in the ADF&G Anadromous Waters Catalog (AWC # 244-30-10010-2039) and is known to support coho (*Oncorhynchus kisutch*), Chinook (*Oncorhynchus tshawytscha*), and sockeye salmon (*Oncorhynchus nerka*), Dolly Varden (*Salvelinus malma*), Pacific lamprey (*Lampetra tridentata*), and Steelhead trout (*Oncorhynchus mykiss*) (ADF&G Division of Habitat 2020). High functions and values in all categories are typically inherent in unfragmented and relatively undisturbed stream systems and associated riparian areas. Wetland A at the east end of the project area likely provides important flood flow attenuation services because of its upstream wetland connection to the Moose River where storm flows can be received and the apparent absence of surface outlets down watershed (storm flows are stored in shallow water tables rather than flooding other surface waters) and provides a moderate overall level of function. Though not included in the analysis, Wetlands B-D are likely considered to have moderate to low function and value due to their lack of uniqueness or contribution to fish and wildlife habitat and hydrologic functions.

The rationale for function and value assignments for each wetland type are included with the functional assessment forms contained in Appendix C. Table 3.10.2 summarizes the functions and values provided by each wetland type. Categories marked "Y" indicate that value or function is likely to be present or providing an appreciable or important ecosystem service.

Table 3.10.2: Function and Value Categories for Jurisdictional Wetlands in the Project Area

Function	Wetland Type (Cowardin Classification)		
	PEM1/SS1B (Wetland A)	PSS1B (Wetland E)	R3UBH (Wetland F)
Flood Flow Regulation	Y	Y	Y
Sediment, Nutrient, and Toxicant Removal	Y	Y	Y

Function	Wetland Type (Cowardin Classification)		
	PEM1/SS1B (Wetland A)	PSS1B (Wetland E)	R3UBH (Wetland F)
Erosion Control and Shoreline Stabilization		Y	Y
Production of Organic Matter and its Export	Y	Y	Y
General Habitat Suitability	Y	Y	Y
General Fish Habitat		Y	Y
Native Plant Richness	Y	Y	Y
Educational, Scientific, Recreational, or Subsistence Use		Y	Y
Uniqueness and Special Status		Y	Y

Source: HDL 2014b

3.10.2 Environmental Consequences

No Build Alternative

The No Build Alternative would not impact wetlands or other waters of the U.S. No improvements would occur and existing conditions would be maintained.

Preferred Alternative

Under the Preferred Alternative, approximately 0.37 acre of palustrine wetland from Wetlands C and D would be lost due to widening the highway from the existing two lanes, to four lanes with a center median (Figure 3.10.4). The amount of wetlands affected would not substantially affect the overall availability of wetlands on a regional scale, nor would the project substantially affect the functionality of the remaining wetlands within the project corridor or the Kenai River watershed.

Avoidance, Minimization, and Mitigation

Mitigation of potential impacts would be required for impacts to wetlands and water bodies under jurisdiction of USACE resulting from the Preferred Alternative. In accordance with 33 CFR Part 325.1(d)(7) and Emergency Order 11990 (*Protection of Wetlands*), wetland mitigation must describe how impacts to waters of the U.S. are to be avoided, minimized, and compensated.

Avoidance

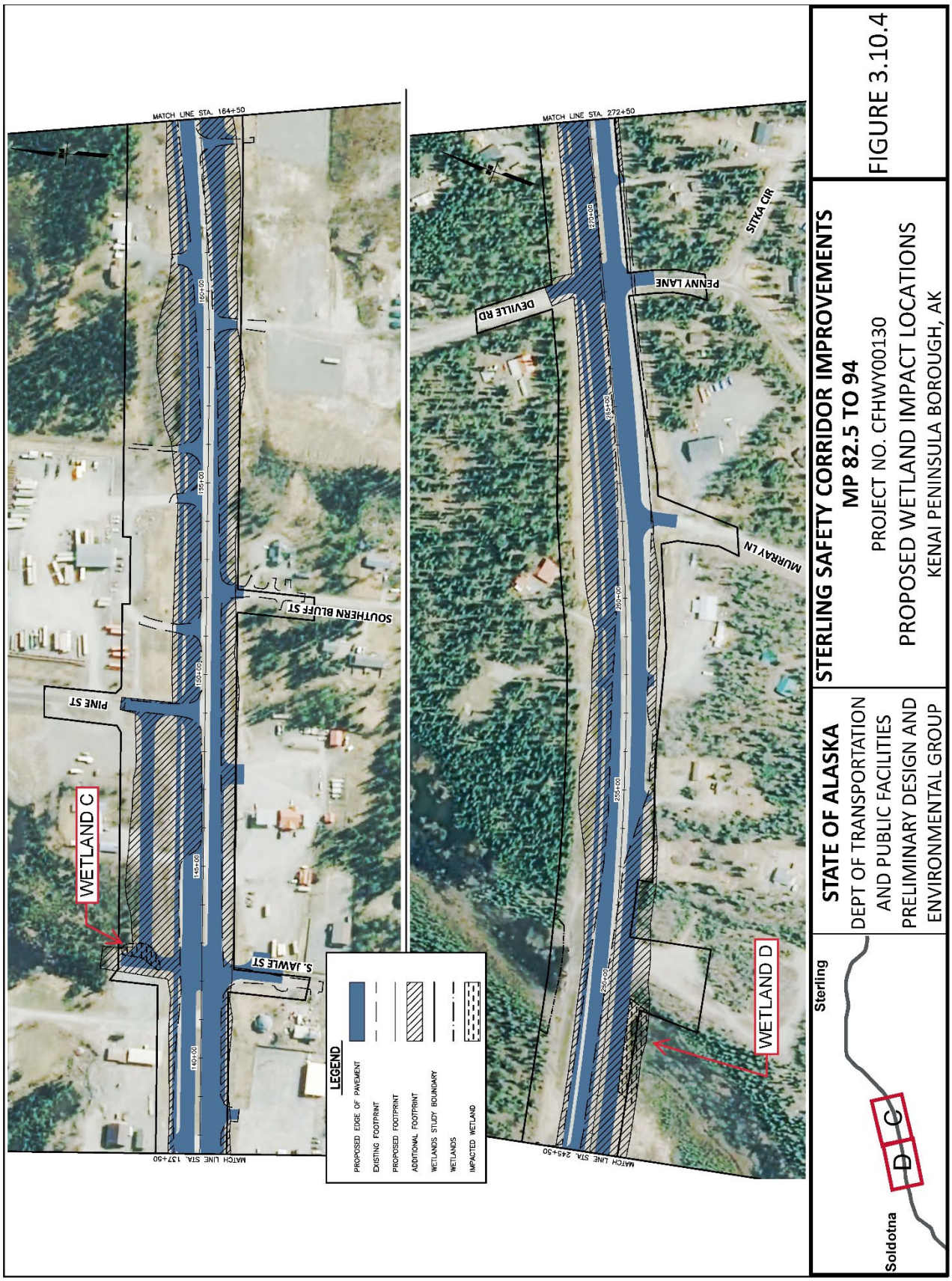
The linear nature of the roadway and existing ROW width eliminate any practicable alternatives that would provide total avoidance of wetland impacts as the wetlands are located directly adjacent to the existing toe of the highway embankment. The project will utilize all available ROW space to locate the upgraded facility. In order to totally avoid impacts to the wetland, the Sterling Highway would need realignment. Realignment would greatly increase the cost of construction, substantially increase the amount of ROW acquisitions, and may impact other wetlands in the general vicinity of the highway. The Preferred Alternative is the least environmentally damaging practicable alternative.

Minimization

To minimize unavoidable impacts to wetlands, the design for the proposed project would utilize existing facilities to the maximum extent practicable, rather than constructing a new road on a new alignment. The pathway and road embankments will be pulled in as tight as state and federal design standards allow to minimize the project footprint, including steepening slopes to 2:1 and utilizing guardrail in the vicinity of the wetlands.

Compensatory Mitigation

Compensation for unavoidable impacts to WOTUS shall be provided in accordance with USACE guidance, which requires a mitigation plan based on the functions and values of the affected wetlands, and compensatory mitigation for federally-funded projects. If impacted wetlands are determined to be jurisdictional, DOT&PF will likely purchase mitigation bank credits or use an in-lieu fee program to compensate for the permanent loss of wetlands. Debits incurred by project impacts and credits appropriate for compensation will be calculated during design using appropriate methodology.


MATCH LINE STA. 164+50
MATCH LINE STA. 272+50
SOUTHERN BLUFF ST
PINE ST
S. JAWLE ST
DEVILLE RD
PENNY LANE
SITKA CIR
MURRAY LN
WETLAND C
WETLAND D
MATCH LINE STA. 137+50
MATCH LINE STA. 245+50
LEGEND
PROPOSED EDGE OF PAVEMENT
EXISTING FOOTPRINT
PROPOSED FOOTPRINT
ADDITIONAL FOOTPRINT
WETLANDS STUDY BOUNDARY
WETLANDS
IMPACTED WETLAND
Sterling
Soldotna
D
C
STATE OF ALASKA
DEPT OF TRANSPORTATION AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
PROPOSED WETLAND IMPACT LOCATIONS
KENAI PENINSULA BOROUGH, AK
FIGURE 3.10.4

3.11 Wildlife and Migratory Birds

3.11.1 Existing Environment

Terrestrial wildlife in the project area may include, but is not limited to, the following species: moose (*Alces alces*), fox (*Vulpes vulpes*), northern red-backed vole (*Myodes rutilus*), meadow vole (*Microtus pennsylvanicus*), marten (*Martes americana*), weasels (*mustela* spp.), ermine (*Mustela erminea*), arctic ground squirrel (*Spermophilus parryii*), northern flying squirrel (*Glaucomys sabrinus yukonensis*), red squirrel (*Tamiasciurus hudsonicus*), brown bear (*Ursus arctos*), black bear (*Ursus americanus*), coyote (*Canis latrans*), lynx (*Lynx canadensis*), wolf (*Canis lupus*), porcupine (*Erethizon dorsatum*), and snowshoe hare (*Lepus americanus*) (HDL 2014c). Due to the existing anthropogenic influence along the entire corridor it is unlikely that most of these species would regularly be found near the roadway. At any time however, it is possible to encounter any of these species in the project area as they migrate from one area to another.

A mix of developed and undisturbed native land exists adjacent to the roadway. Development is a blend of residential, commercial, industrial, and institutional, and accounts for approximately 60-70 percent of adjacent land. Undeveloped forested habitat along the road corridor makes up the remainder, totaling approximately 19 acres, and is primarily a mix of broad and needle leaf forests and low and tall scrub and open meadow areas (HDL 2014a). A very small percentage (<0.2%) of the project corridor meets the USACE definition of wetland. Within a few miles of the project exists a wider variety of habitat and wetlands with less development that wildlife may migrate between.

The proposed project is located within the southern portion of ADF&G Game Management Unit (GMU) 15A, which covers the entirety of the northwest portion of the Kenai Peninsula, down to the Kenai River which forms its southernmost boundary (Figure 3.11.1). Alaska Department of Fish and Game moose population estimates for GMU 15A over the twelve year period from 2001-2013 show a decrease from approximately 1,942 to 1,569 individuals. During the five year period from regulatory year (RY) 2008 (July 1, 2008 to June 30, 2009) to RY 2012 (July 1, 2012 to June 30, 2013), the yearly average of moose killed within GMU 15A increased to 96 from the previous five-year average of 83. Most of the vehicle-killed moose were cows and calves (Herreman 2018). Death numbers from moose-vehicle collisions (MVCs) likely fluctuate depending on the amount of snow fall and availability of browse species, and are likely increasing due to the increasing volume of traffic over time within the GMU.

Moose are of particular concern within the project area because they present a substantial safety issue when congregating within highway ROW or crossing the traveled way. The highway ROW is generally cleared of vegetation and provides easier mobility for moose, especially in heavy snow years. The cleared ROW also promotes early successional vegetation growth that is an important part of a moose's diet and eliminating moose browse within highway ROW is prioritized on routes with MVC rates. As a result of this, measures to reduce the number of moose-vehicle interactions are given consideration when constructing and maintaining state highways.

Existing DOT&PF MVC information shows that collision frequencies exceed the 75th percentile thresholds between approximately MP 87 and 93, as identified in the April 2014 DOT&PF

memorandum titled "Moose-Vehicle Collisions Priority List 2006-2010". Within this area, MVCs averaged approximately 10 collisions per year. Averaged over the 6-mile length of concern, the frequency is approximately 1.7 collisions per mile per year.

A variety of avian species, both resident and migratory, may be found within the project area. Some of the species include woodpeckers (*Picoides* spp.,) boreal owl (*Aegolius funerus*), spruce grouse (*Falcipennis Canadensis*), chickadees (*Parus* spp.), sparrows (*Melospiza melodia* and *Zonotrichia leucophrys*), bald eagles (*Haliaeetus leucocephalus*), and ravens (*Corvus corax*) (HDL 2014c). The Migratory Bird Treaty Act (16 USC 703-712) protects these and essentially any other native species that may be encountered by making it illegal to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations.

Additional and similar protections are provided to bald and golden (*Aquila chrysaetos*) eagles by the Bald and Golden Eagle Protection Act [16 USC 668-668(c)]. There are no known nests near the project area based on window surveys of the project area conducted by DOT&PF staff during summer 2020. Bald eagles in Alaska generally nest in marine and freshwater coastal areas and in southcentral Alaska, they generally nest in cottonwood trees near water. Habitat types near the project roadway are not ideal, but have potential to support eagle nests, especially in the vicinity of Soldotna Creek and the east end of the project near the Moose and Kenai Rivers. The project area will be surveyed for the presence of eagles or their nests prior to construction in order to avoid impacts to nests or nesting birds.

3.11.2 Species of Conservation Concern

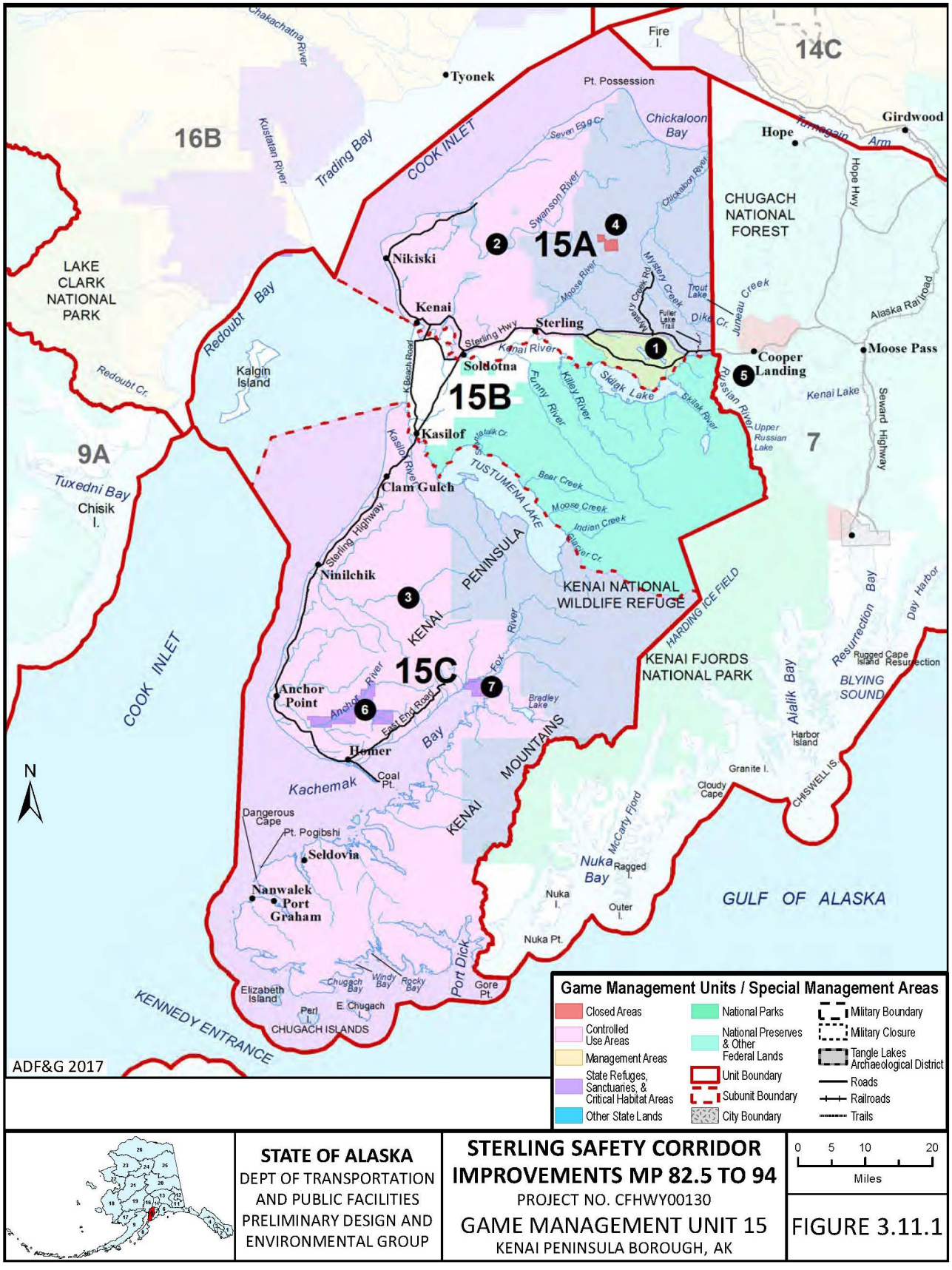
The State of Alaska addresses the needs of species with special conservation concerns through the 2015 Alaska Wildlife Action Plan, which identifies Species of Greatest Conservation Need (SGCN) and prioritizes conservation actions and research. In addition, the ANHP collects, synthesizes, and validates information on Alaska's animal and plant species of concern and their habitats, ecosystems of concern, and invasive species. Together, these two sources of information can be used to identify species of special concern not included in federal or state endangered species lists. USFWS further identifies species of migratory birds of conservation concern (BCC) at the federal level (USFWS 2008). Habitat for several ADF&G-designated SGCNs and USFWS-designated BCCs is potentially present within the proposed project area (Table 3.11.1).

Table 3.11.1: Species of Special Conservation Concern

Common Name	Scientific Name	Agency
Bald Eagle	*Haliaeetus leucocephalus*	USFWS BCC
Fox Sparrow	*Passerella iliaca*	USFWS BCC
Gray-cheeked thrush	*Catharus minimus*	ADF&G SGCN
Hudson bay sedge	*Carex heleonastes*	ADF&G SGCN
Kittlitz's Murrelet	*Brachyramphus brevirostris*	USFWS BCC
Lesser Yellowlegs	*Tringa flavipes*	USFWS BCC
Little brown myotis	*Myotis lucifugus*	ADF&G SGCN
Marbled Godwit	*Limosa fedoa*	USFWS BCC
Marbled Murrelet	*Brachyramphus marmoratus*	USFWS BCC
Northern saw-whet owl	*Aegolius acadicus*	ADF&G SGCN

Common Name	Scientific Name	Agency
Olive-sided flycatcher	*Contopus cooperi*	ADF&G SGCN
Olive-sided Flycatcher	*Contopus cooperi*	USFWS BCC
Rufous Hummingbird	*Selasphorus rufus*	USFWS BCC
Short-billed Dowitcher	*Limnodromus griseus*	USFWS BCC
Short-eared Owl	*Asio flammeus*	USFWS BCC
Wood frog	*Lithobates sylvaticus*	ADF&G SGCN
Yukon floater	*Anodonta beringiana*	ADF&G SGCN

Sources:
ADF&G 2015
ACCS 2020b
USFWS 2008



STATE OF ALASKA
DEPT OF TRANSPORTATION AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP

STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT NO. CFHWY00130
GAME MANAGEMENT UNIT 15
KENAI PENINSULA BOROUGH, AK

FIGURE 3.11.1

3.11.2 Environmental Consequences

No Build Alternative

The No Build Alternative would not alter current conditions for terrestrial and avian species in the project area. There would be no direct loss of habitat, and the frequency with which road maintenance activities result in disturbance of animals in the analysis area would remain unchanged.

Preferred Alternative

Impacts to wildlife and species of conservation concern would primarily result from the loss and further fragmentation of habitat. Most native vegetation has been cleared from the ROW for the majority of the proposed project corridor. However, to construct the proposed improvements, approximately 83 acres of vegetation, including 19 acres of undeveloped forested habitat, would be cleared. Habitat would be permanently lost through roadway expansion, construction of frontage roads, and construction of a median to separate opposing traffic directions. Some individuals will likely be displaced as a result of the roadway expansion and frontage road construction; however, the abundance of similar habitat in the near vicinity will provide those individuals with the opportunity to relocate. Therefore, potential impacts to wildlife and species of conservation concern would be negligible. The increased lane count and 30-foot median will increase the distance that wildlife have to traverse to cross the roadway. This may exacerbate habitat fragmentation conditions already in place from the existing road. The addition of lanes and associated reduction in congestion could increase the travel speed within the project corridor and increase the rate of MVC. However, the proposed improvements are expected to reduce the frequency and rate of MVCs because of vegetation clearing within the ROW.

Migratory birds may be directly impacted by land clearing operations if conducted during the nesting season. If active nests (nests with eggs or young) are present within the construction limits, they could be crushed or harmed by clearing operations or adult birds may permanently abandon the nests. Although some habitats adjacent to the highway would be lost, adverse effects to nesting birds is expected to be negligible because they commonly nest in close proximity to human developments and would likely continue to nest near the highway. Construction activities may disturb breeding and foraging in the project area. However, the surrounding areas provide similar habitat and with the minimization measures discussed below, potential impacts to these species would be negligible.

Implementation of the Preferred Alternative would not eliminate wildlife populations or substantially reduce wildlife population densities in the region.

Impact Minimization Measures

The following measures may be incorporated into the project design to avoid potentially adverse effects on wildlife:

- Clearing and grubbing will not be conducted within the USFWS recommended time period of May 1 to July 15 for avoiding vegetation clearing to prevent impacts to migratory birds, except as permitted by, federal, state, and local laws and approved by the DOT&PF Project Engineer
- The project area would be surveyed for the presence of eagles and/or their nests prior to construction in order to avoid impacts to nests or nesting birds. If active bald or golden

eagle nests are found within the project area, a primary zone of a minimum 330 feet will be maintained as an undisturbed habitat buffer around nesting eagles. If topography or vegetation does not provide an adequate screen or separation, the buffer will be extended to 0.25 mile, or a sufficient distance to screen the nest from human activities. Within the secondary zone (between 330 and 660 feet), no obtrusive facilities or major habitat modifications shall occur. If nesting occurs in sparse stands of trees, treeless areas, or where activities would occur within line-of-sight of the nest, this buffer shall extend up to 0.5 miles. No blasting, logging, or other noisy, disturbing activities within the primary or secondary zones would occur during the nesting period (Feb 1 – August 31). If active bald or golden eagle nests are discovered during construction within 660 feet of the project area, construction activities will cease and USFWS would be contacted for guidance on how to proceed.

- Clearing and removing or stunting moose browse to 50 feet off the roadway or to the ROW limits where feasible

3.12 Recreation and Section 4(f) Resources

The Kenai Peninsula is highly scenic, extremely productive in terms of fishing, and attractive to a range of recreation uses, from fishing and boating enthusiasts to hikers and sightseers enjoying scenic views. Recreation activities in the study area and its vicinity are primarily water-based and include fishing and boating on the Kenai River. According to the 1998 Kenai River Comprehensive Management Plan, approximately 18 percent of all fishing effort in the Kenai River drainage occurs in areas adjacent to the project corridor. Land based activities occurring within the immediate project area include camping, hiking, and sightseeing.

3.12.1 Section 4(f)/6(f) Resources

Section 4(f) of the U.S. DOT Act of 1966, as amended, prohibits use of certain parks, recreation areas, wildlife refuges, or historic properties for transportation projects unless there is “no prudent and feasible alternative” and the project includes “all possible planning to minimize harm,” or the impacts are considered “*de minimis*.” A *de minimis* impact involves the use of Section 4(f) property that is generally minor in nature. FHWA defines a *de minimis* impact as one that, after taking into account avoidance, minimization, mitigation and enhancement measures, results in no adverse effect to the activities, features, or attributes qualifying a park, recreation area, or refuge for protection under Section 4(f). For historic properties, a *de minimis* impact is one that results in a Section 106 determination of "no adverse effect" or "no historic properties affected."

Use of Section 4(f) land includes both direct and indirect effects on protected lands. A direct effect would most commonly be purchase of protected lands for road ROW. An indirect effect is the concept of "constructive use," which involves substantial impairment of a protected property due to the proximity of a transportation project.

Section 6(f), under 36 CFR 59, is a Land and Water Conservation Fund (LWCF) program that provides assistance to states. Section 6(f) of this act prohibits the conversion of property acquired or developed with these grants to a non-recreational purpose without the approval of the Department of the Interior's National Park Service (NPS). Section 6(f) directs the NPS to assure that replacement lands of equal value, location, and usefulness are provided as conditions to such

conversions. Consequently, when the DOT&PF proposes conversions of Section 6(f) land for highway projects, replacement lands will be necessary. Each property listed below was assessed for Section 6(f) applicability, in addition to Section 4(f).

The KPB has classified substantial portions of its lands as recreation and preservation areas. The Sterling Highway provides access to a variety of State and Federal recreation areas that are popular hunting, fishing, camping, and hiking destinations. There are ten public parks, recreation areas, wildlife refuges, and historic properties directly adjacent to or in close proximity to the study area that are eligible for protection under Section 4(f) (Figures 3.12.1-2):

- Kenai National Wildlife Refuge

  The Kenai National Wildlife Refuge (KNWR) is located in the vicinity of the project corridor, though no portion of the proposed project are located directly adjacent to or travels through the KNWR. The KNWR is a Section 4(f) property managed by the United States Fish and Wildlife Service (USFWS). State law concurrently makes the same area a State Game Refuge and may apply Refuge status to State-owned lands within the boundaries of the Federally-owned Refuge. Review of the LWCF Coalition website lists the KNWR as a recipient of LWCF funds, making it subject to Section 6(f) law.

- Kenai River Special Management Area

  The Kenai River Special Management Area (SMA) was established in 1984 with the purpose of protecting the overall health of the Kenai River. The Kenai River SMA contains more than 105 miles of rivers and lakes, and is popular for float trips and fishing. A designated State Park Unit includes numerous recreational areas along the Kenai River and its tributaries. The Kenai River SMA is separated into three different regions known as the lower river, middle river, and upper river (ADNR DPOR 2020a). The proposed project corridor exists solely within the middle river section of the Kenai River SMA.

- Scout Lake Recreation Site

  The Scout Lake State Recreation Site (SRS) co-owned and managed by the Alaska Department of Natural Resources-Department of Parks and Outdoor Recreation (ADNR DPOR) and ADNR Division of Mining, Land, and Water (ADNR MLW). The SRS borders Scout Lake and consists of 164 acres, split between four separate parcels, featuring a wooded trail along the lake and two access areas located within the central and western parcels. The central parcel features a day use area with a gravel parking lot; picnic sites with fire rings; outhouses; a picnic shelter able to accommodate up to twenty-five people; and access to Scout Lake for swimming, fishing, and non-motorized boating opportunities (ADNR DPOR 2020b). The western parcel features an informal parking area within DOT&PF ROW and is gated off to vehicular traffic. The lake access within the western parcel is a popular swimming destination for local residents and features an outhouse and access to the wooded hiking trail. The eastern parcel is approximately 40 acres in size and is undeveloped, with no public facilities or improvements. Similarly, the northern parcel measures approximately 15 acres and is undeveloped, save for several unpaved access roads to residential areas north of the parcel. Though not part of the SRS, Scout Lake is approximately 95 acres in size, is relatively shallow with a maximum depth of twenty feet, and is popular for swimming and fishing with ADF&G regularly stocking

the lake with arctic grayling, coho salmon, and rainbow trout (ADF&G Division of Sport Fisheries 2020). Access to the day use area is provided from the Sterling Highway at approximately MP 85, via Scout Lake Road.

- Morgan's Landing State Recreation Area

  Morgan's Landing SRA is managed by ADNR DPOR and is located within the Kenai River SMA. Morgan's Landing SRA is a 279-acre camping and day use area providing visitors with the opportunity to fish, boat/float the river, camp, and observe wildlife. Primary avenues of access to the recreation area are through Scout Lake Loop Road and Panoramic Drive (Sterling Highway between MP 83.5 to 88 respectively). This SRA is listed by the ADNR as receiving funding from the LWCF therefore, making it subject to Section 6(f) law.

- Izaak Walton Campground

  Izaak Walton Campground is managed by ADNR-DPOR and is located within the Kenai River SMA. The campground is eight acres in size and hosts 31 campsites. It is located at MP 82 along the Sterling Highway and provides activities such as boating, picnicking, and camping. This campground is listed by the ADNR as receiving LWCF funding and therefore, is subject to Section 6(f) law (HDL 2014d).

- Longmere Lake Boat Launch

  Longmere Lake Boat Launch is situated at the northwest end of Longmere Lake, a popular sport fishing location. Both Longmere Way and Secret Road provide access to the boat launch off the Sterling Highway between MP 88 and 89. This lake is stocked annually with rainbow trout and managed by ADF&G (HDL 2014d).

- Swiftwater Park

  Swiftwater Park is maintained by the COS and is accessed just past MP 94, at the intersection of East Redoubt Avenue and the Sterling Highway. Swiftwater Park consists of a campground and boat launch, and is included in the Kenai River SMA. This area borders the banks of the Kenai and has 40 campsites, large day-use area with parking, and over 800 feet of elevated boardwalk available for public use. This park is listed by the ADNR as receiving LWCF funding and therefore, is subject to Section 6(f) law (HDL 2014d).

- Soldotna Creek Park

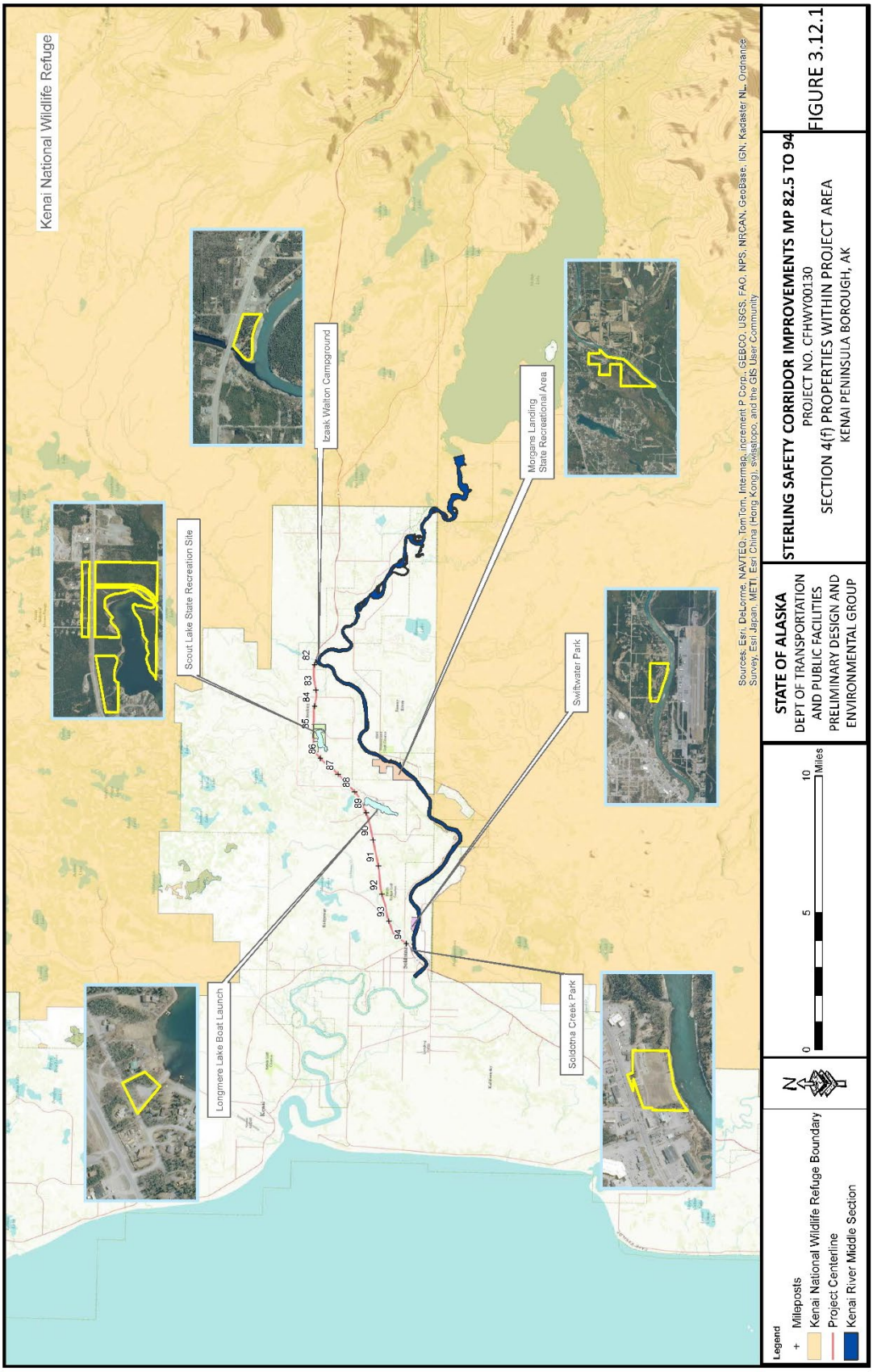
  Soldotna Creek Park is maintained by the COS and can be accessed from States Avenue between MP 94 and 95 along the Sterling Highway. The park is a five-acre day use park, adjacent to the mouth of Soldotna Creek. It has over 500 feet of elevated boardwalk with river access stair units (City of Soldotna, 2013b). This park is listed by the ADNR as receiving LWCF funding and therefore, is subject to Section 6(f) law (HDL 2014d).

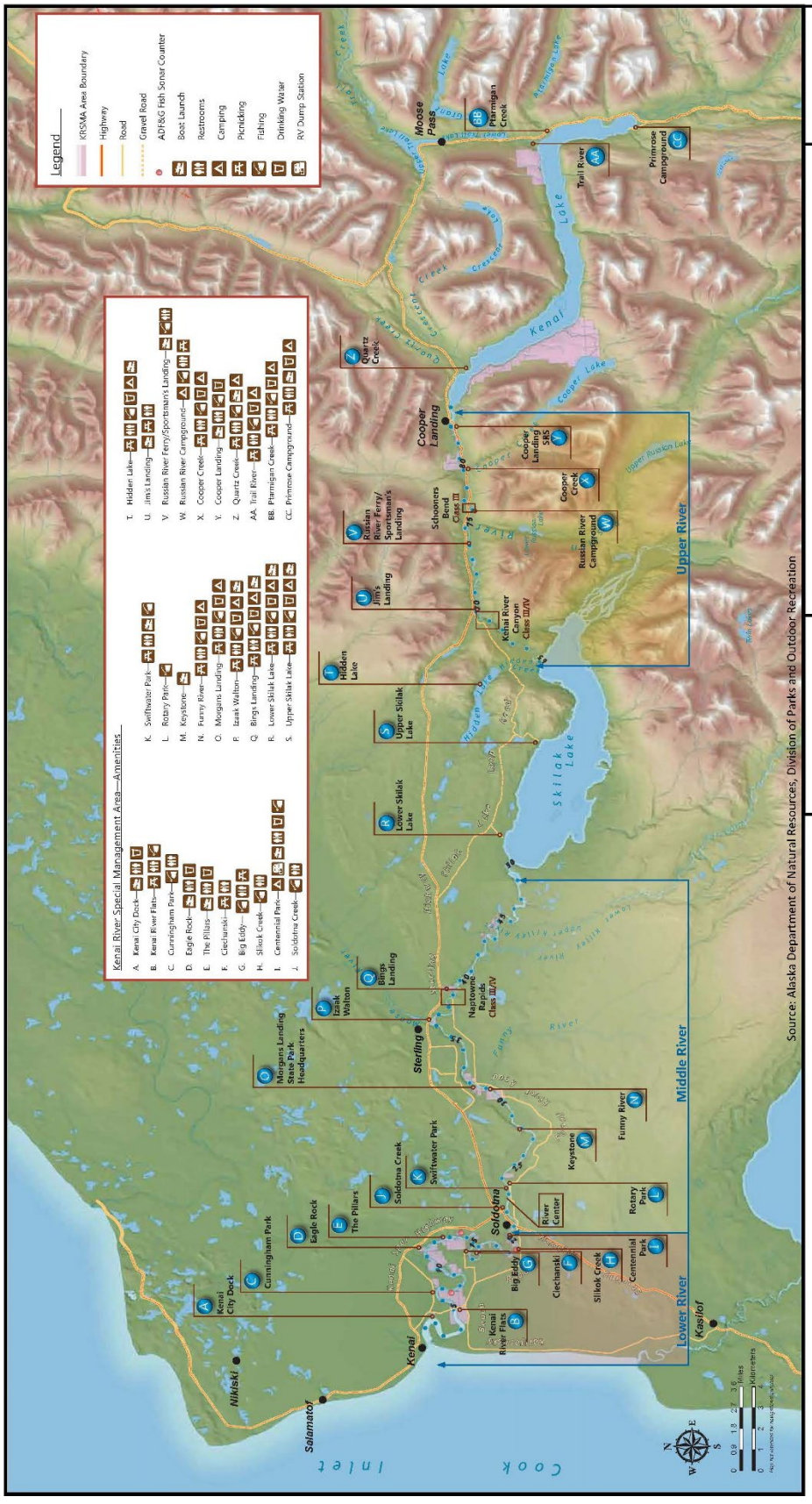
- Historic Properties

  Cultural Resource Consultants (CRC), LLC, conducted a cultural resource survey during the summer of 2013 to identify historic properties within the project area. The cultural resource survey identified 29 historic properties within the project's study area.

However, only two properties were determined to be eligible for listing in the National Register of Historic Places and therefore subject to Section 4(f): Culturally Modified Tree Grove (KEN-00632) and Original Sterling School or Homesteader's School (KEN-00095). On February 2, 2021, the SHPO concurred with DOT&PF's finding of no historic properties affected for the proposed project.

Another recreation facility adjacent to the study area is the Birch Ridge Golf Course located at MP 92; however, the course is privately owned and managed.


Kenai National Wildlife Refuge
Scout Lake State Recreation Site
Izaak Walton Campground
Morgans Landing State Recreational Area
Swiftwater Park
Longmere Lake Boat Launch
Soldotna Creek Park
62
83
84
85
86
87
88
89
90
91
92
93
94
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community
Legend
Mileposts
Kenai National Wildlife Refuge Boundary
Project Centerline
Kenai River Middle Section
N
0
5
10
Miles
STATE OF ALASKA
DEPT OF TRANSPORTATION AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT NO. CFHWY00130
SECTION 4(f) PROPERTIES WITHIN PROJECT AREA
KENAI PENINSULA BOROUGH, AK
FIGURE 3.12.1



STATE OF ALASKA
DEPT OF TRANSPORTATION
AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND
ENVIRONMENTAL GROUP

STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT NO. CFHWY00130
KENAI RIVER SPECIAL MANAGEMENT AREA MAP
KENAI PENINSULA BOROUGH, AK

FIGURE 3.12.2

3.12.2 Environmental Consequences

No Build Alternative

Under the No Build Alternative, no impacts or uses of Section 4(f) properties would occur. However, the purpose and needs identified for the project would not be satisfied. Congestion and safety issues would persist as no road improvements or realignments would occur, no frontage roads would be constructed, and no accesses would be consolidated. The proposed enhancements to recreation resources adjacent to the highway would also not be completed.

Preferred Alternative

Most of the proposed upgrades would occur within the existing DOT&PF ROW, however the Preferred Alternative would require a Section 4(f) use of Scout Lake SRS (Figures 3.12.3-4). No other Section 4(f)- or 6(f)-protected properties would experience a use or conversion of use as a result of the Preferred Alternative. Scout Lake Road is the primary access route for several residential areas south of the SRS and would be realigned to the east to the reconstructed Lois Street and Sterling Highway intersection to allow access to a median opening and left turns to and from the highway. A permanent acquisition of approximately 3.38 acres would be required from the two undeveloped park parcels to realign Scout Lake Road and reconstruct the Lois Street and Sterling Highway intersection. To complete the realignment, approximately 3.02 acres would be required from the eastern parcel, representing 7.55 percent of the total parcel area. To complete the intersection reconstruction, approximately 0.36 acre would be required from the northern parcel, which represents 2.4 percent of the total parcel area. Additional work within and adjacent to the SRS is also proposed as minimization, mitigation, and enhancement measures to offset the proposed impacts to the park, and is described in the next section.

As the impacts would be limited to the two unimproved parcels, where no public facilities have been developed, the proposed project is expected to result in only minor alterations to the scenic environment of the park from decreased traffic along the existing alignment. The new Scout Lake Road alignment will not be visible to users of the SRS and the realigned road would consist of a two-lane minor collector facility, similar to the existing Scout Lake Road alignment. After construction, lighter traffic volumes coupled with the mitigation and enhancement measures described in the next section are expected to result in a more secluded feel within the park and the scenic esthetic of the project area would be maintained.

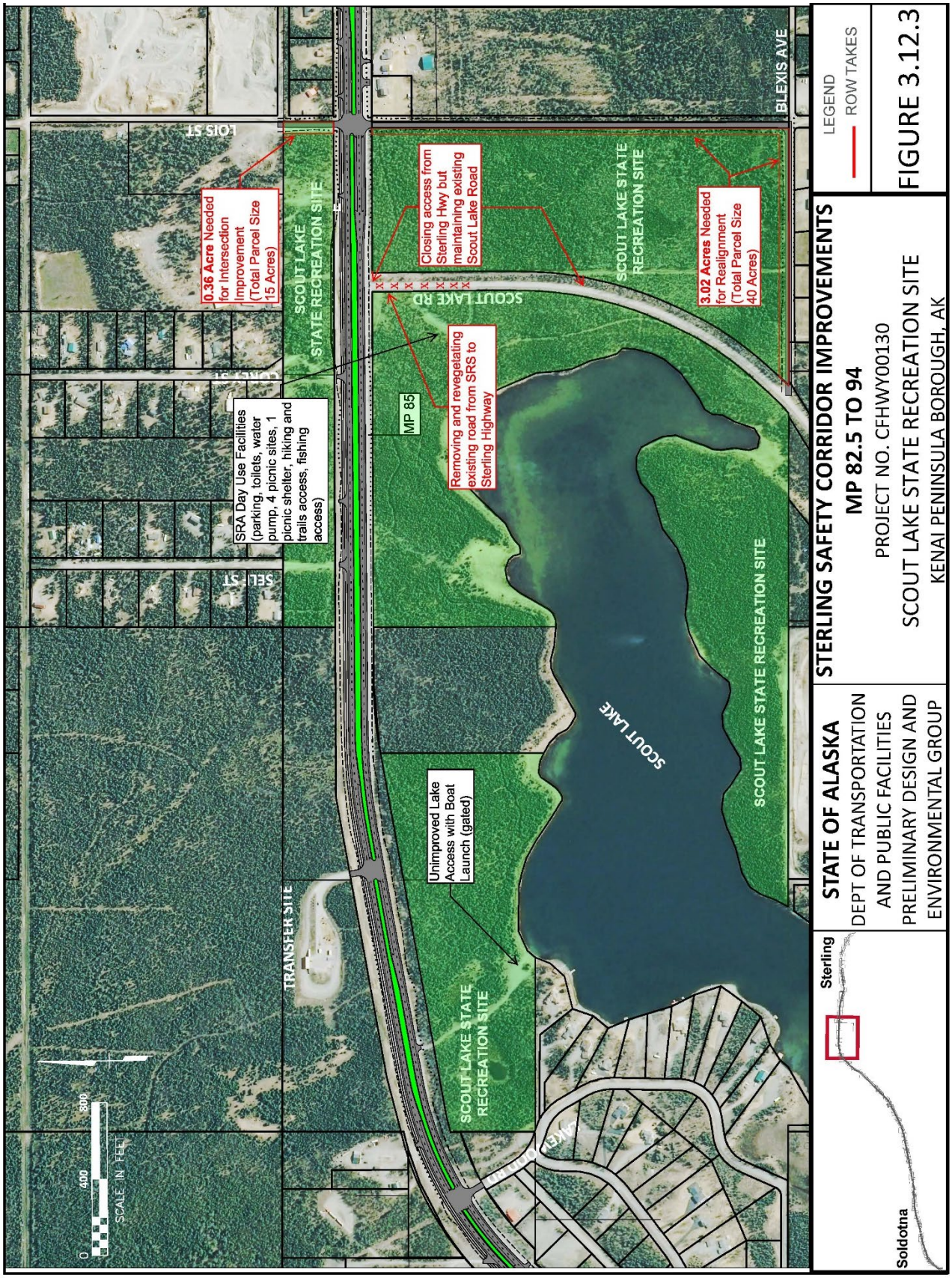
Because the impacts from the Preferred Alternative are expected to be minor, DOT&PF ~~is proposing~~ proposed a *de minimis* impact finding for Scout Lake SRS, and ~~a draft *de minimis* form can be found in Appendix D~~ conducted the public review concurrent with the public review of the Draft EA. The ADNR DPOR and MLW concurred with the *de minimis* finding on November 9 and 10, 2021, respectively. On November 12, 2021, the DOT&PF Statewide NEPA Program Manager determined the Preferred Alternative will have a *de minimis* impact on Scout Lake SRS. The Section 4(f) consultation documentation, including the *De Minimis* Impact Finding, can be found in Appendix D.

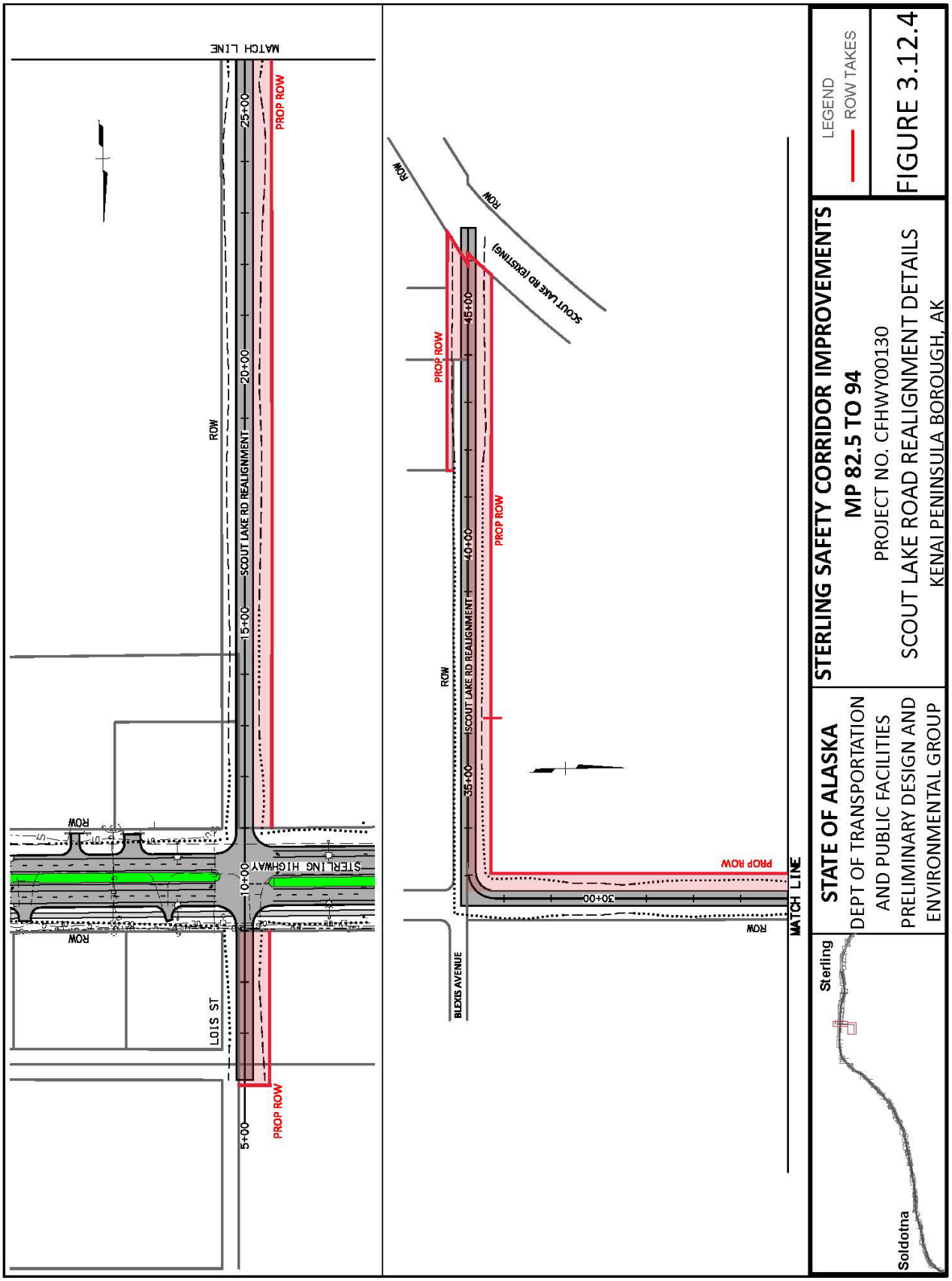
Minimization, Mitigation, and Enhancement Measures

Several minimization, mitigation, and enhancement measures were identified and considered in consultation with ADNR DPOR and MLW during the decision to pursue the *de minimis* impact finding. To offset the proposed impacts associated with realigning Scout Lake Road, the

following minimization, mitigation, and enhancement measures would be conducted at Scout Lake SRS:

- Utilizing section line easements directly east and south of the SRS to construct the realignment and intersection reconstruction to minimize the area of impact
- Reducing the audio and visual influences of the highway, eliminating through traffic, and encouraging continuity of the central and eastern parcels of the SRS, making the SRS facilities feel more secluded by:
    - Removing the Sterling Highway access point for the existing alignment by extending the fill slope berm south of the highway across the driveway
    - Obliterating and revegetating the existing alignment from the SRS parking lot to the extended berm
- Upgrading and moving the SRS access gates and welcome sign to the intersection of the new and old alignments, effectively making the existing Scout Lake Road alignment the new SRS access road
- Replacing, upgrading, and installing new SRS directional signs along the Sterling Highway and within the neighborhood street network
- Re-grading the existing SRS parking lot, which has deteriorated and become badly potholed


0.36 Acre Needed for Intersection Improvement (Total Parcel Size 15 Acres)
SCOUT LAKE STATE RECREATION SITE
FOIS ST
SRA Day Use Facilities (parking, toilets, water pump, 4 picnic sites, 1 picnic shelter, hiking and trails access, fishing access)
SEL ST
MP 85
Removing and revegetating existing road from SRS to Sterling Highway
Closing access from Sterling Hwy but maintaining existing Scout Lake Road
SCOUT LAKE RD
3.02 Acres Needed for Realignment (Total Parcel Size 40 Acres)
BLEXIS AVE
TRANSFER SITE
Unimproved Lake Access with Boat Launch (galed)
SCOUT LAKE
SCOUT LAKE STATE RECREATION SITE
SCALE IN FEET
0
400
800
Sterling
Soldotna
STATE OF ALASKA
DEPT OF TRANSPORTATION AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
SCOUT LAKE STATE RECREATION SITE
KENAI PENINSULA BOROUGH, AK
LEGEND
ROW TAKES
FIGURE 3.12.3


MATCH LINE
PROP ROW
25+00
20+00
ROW
SCOUT LAKE RD REALIGNMENT
15+00
STERLING HIGHWAY
10+00
ROW
LOIS ST
5+00
PROP ROW
ROW
SCOUT LAKE RD (EXISTING)
PROP ROW
45+00
40+00
SCOUT LAKE RD REALIGNMENT
35+00
ROW
PROP ROW
30+00
ROW
MATCH LINE
BLEXIS AVENUE
LEGEND
ROW TAKES
FIGURE 3.12.4
STERLING SAFETY CORRIDOR IMPROVEMENTS
MP 82.5 TO 94
PROJECT NO. CFHWY00130
SCOUT LAKE ROAD REALIGNMENT DETAILS
KENAI PENINSULA BOROUGH, AK
STATE OF ALASKA
DEPT OF TRANSPORTATION
AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND
ENVIRONMENTAL GROUP
Sterling
Soldotna

3.13 Hazardous Materials

A Phase 1 Environmental Site Assessment (ESA) was conducted in 2014 to review past and present land use practices, site operations, and conditions for the subject and nearby properties to evaluate if there are recognized environmental conditions (REC) on the Subject Property or whether potential RECs may occur due to documented impacts or activities at adjacent or surrounding properties (HDL 2015a). The subject property consists of the Sterling Highway beginning at the highway's intersection with Greatland Street in Sterling (MP 82.5) and ending approximately 1,200 feet northeast of the Highway's intersection with the Kenai Spur Highway (MP 94). The Subject Property extends from ROW to ROW and approximately 200 feet north and south of the Sterling Highway along secondary streets.

The ESA performed the following activities to obtain information about the subject property:

- A reconnaissance of the subject property and surrounding properties on July 22-24, 2013, to assess current usage, unusual conditions, drainage patterns, and debris
- A review of historical aerial imagery, including photographs from 1950, 1977, and 1984
- A review of available information on soils, geology, and hydrology in the vicinity of the subject property
- A review of data obtained from a search conducted by Environmental Data Resources (EDR) of federal, state, and local databases that meet the government records' search requirement for ASTM Standard Practice for Environmental Sites Assessments, E1527-05

The EDR search area included the subject property and all properties within a one-mile radius. Hazardous material releases beyond a one-mile radius of the project area are considered unlikely to impact the project. Site reconnaissance was conducted for the subject property only.

Results of the ESA indicate 12 parcels within a one-mile radius that might have soil or groundwater contamination and are considered potential REC sites. All but two of these sites were excluded from further consideration based on area topography and assumed groundwater gradient. However, the following two parcels were identified as being situated within close proximity and up-gradient of the subject property (Figures 3.13.1-4).

- SS&T Tesoro, 41598 Sterling Highway, Soldotna, AK, ADEC Hazard ID: 23003
  SS&T Tesoro is located north of the Sterling Highway, between Jawle Street to the east and Beacon Hill Street to the west (Map ID 10; Figure 3.13.3). This active site is the result of petroleum releases from the underground storage tanks (USTs) and pump islands at the former gas station. Based on consultation with ADEC, as well as review of ADEC records, there is no evidence of contamination migrating off site and there is no reason to suspect surface soil contamination (upper ten feet of soil) within DOT&PF ROW.

- ZipMart Store, 38525 Swanson River Rd., Sterling, AK, ADEC Hazard ID: 23620
  According to ADEC records, an approximately 2500-foot long groundwater petroleum contamination plume originating from the former ZipMart store has migrated off site to southwest and intersects the Sterling Highway between Barbara Street to the east and Swanson River Road to the west (Map ID 11; Figure 3.13.1-4). An estimated 50,000 gallons of gasoline fuel leaked from two gasoline USTs and significantly contaminated soil and groundwater. The Zipmart Store site is the only one identified in the ESA as

having a REC with potential to impact the subject property. According to the ESA, additional site information can be obtained from ADEC.

The remaining parcels identified in the ESA that were excluded from further consideration are not expected to pose a risk, based on the ADEC remediation status or distance/down-gradient location from the subject property.

The ESA recommends that DOT&PF implement environmental monitoring during subsurface excavation work within the section of roadway affected by the ZipMart Store contamination (described above and shown on Figure 3.13.1-4). The complete ESA can be found in Appendix E.

A follow-up review of the online ADEC Contaminated Sites map on May 7, 2020 identified one additional active site in the vicinity of the subject property was added after the ESA was completed:

- Soldotna Y Chevron USTs 6-9, 44024 Sterling Highway, Soldotna, AK, ADEC Hazard ID: 26352
  Consultation with ADEC Contaminated Sites Program indicated no concerns due to the distance from subject property to the site (Map ID 13; Figure 3.13.3). No other active sites or sites with a status of cleanup complete – institutional controls were identified.

3.13.1 Environmental Consequences

No Build Alternative

There would be no potential for affecting hazardous waste with the No Build Alternative because no ground disturbing activities would occur.

Preferred Alternative

The Preferred Alternative would not require any ROW acquisitions of identified REC parcels. However, grading and excavation activities during construction would likely occur in the vicinity of the Zipmart Store site. Based on consultation with ADEC on November 7, 2019, no issues with the Zipmart Store contamination plume are expected unless excavation to the groundwater table occurs.

Because the currently proposed ROW acquisitions are subject to change during final design, impacts to REC properties will be reevaluated during the final design process. The recommendation for further evaluation of the sites identified in the ESA will be revisited when it is more certain where ROW acquisition and/or grading and excavation activities will occur. Depending on the extent of excavation, a Phase II site assessment may be necessary to provide a definitive description of contamination type and extent. There is no prudent or feasible alternative for avoidance of these sites. Soils found to be contaminated and affected by the project will be managed and disposed of in accordance with applicable local, state, and federal laws and regulations and in a manner that will protect human health and environment.

Potential impacts to human health and safety from hazardous materials are expected to be minimal as a result of constructing the Preferred Alternative. Some fuels, lubricants, hydraulic fluids, and related items will be present on site during construction, but management of these materials will be done in accordance with local, state, and federal regulations. Post construction

hazardous waste conditions will not change from what currently exists. These conditions may improve if hazardous waste is encountered during construction because construction contract specifications would require the contractor to remove and dispose of hazardous materials in accordance with local, state, and federal laws and regulations.

Prior to commencing construction, the contractor would prepare a site-specific Hazardous Materials Control Plan (HMCP). The HMCP contains project specific details for how the contractor will prevent spills of hazardous materials and control the situation if a release should occur. If contamination is found during construction, the ADEC would be notified and response efforts would be handled in accordance with an ADEC-approved Corrective Action Plan. Detailed BMPs and housekeeping measures would be outlined in the contractor's SWPPP and HMCP. The contractor would be required to practice proper hazardous material storage and handling and adhere to DOT&PF emergency response procedures. All work would stop immediately and the site would be secured to prevent unauthorized access. Appropriate regulatory authorities must be notified immediately. Phone numbers of the National Response Center and 911 emergency services would be accessible at work sites.

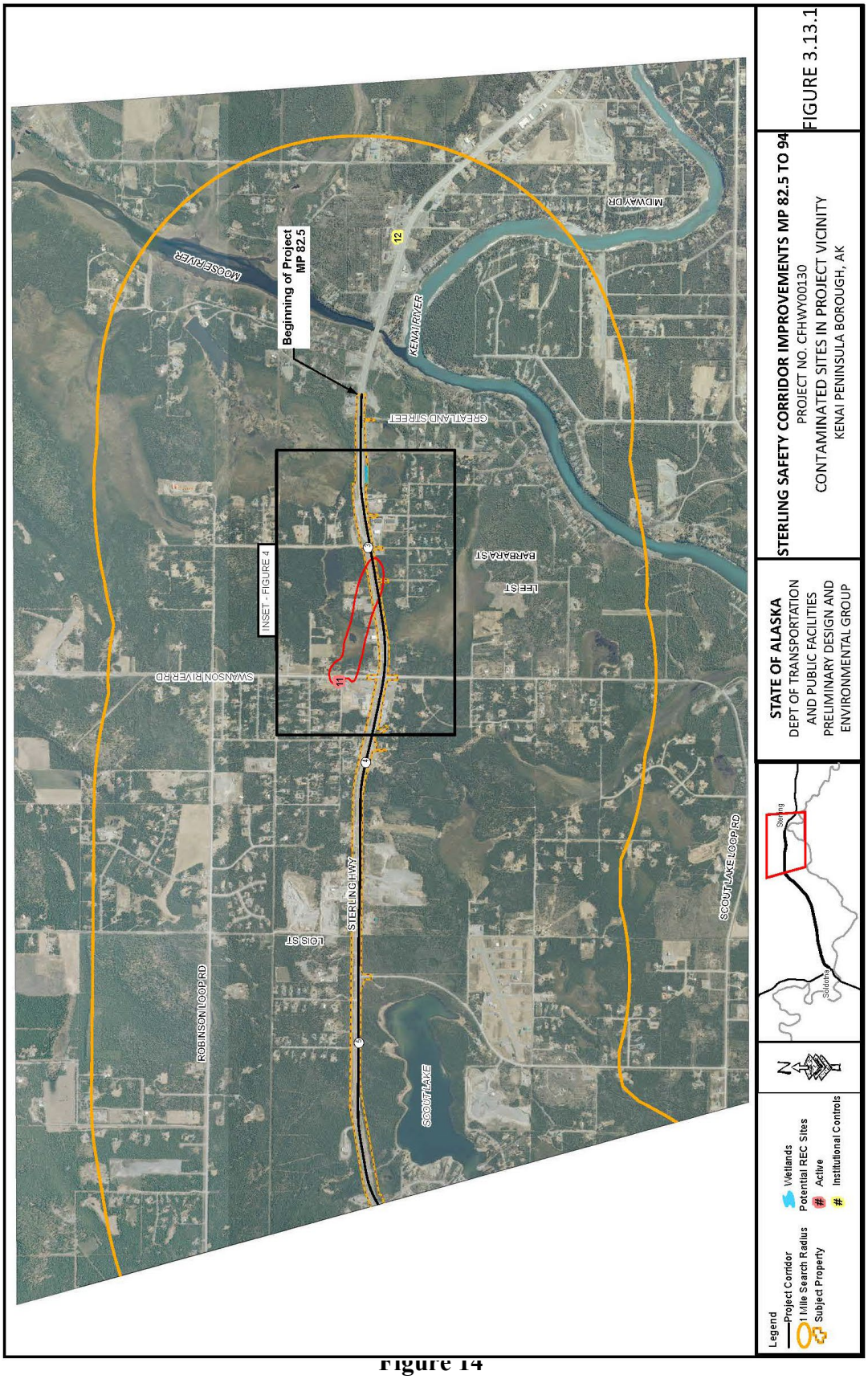
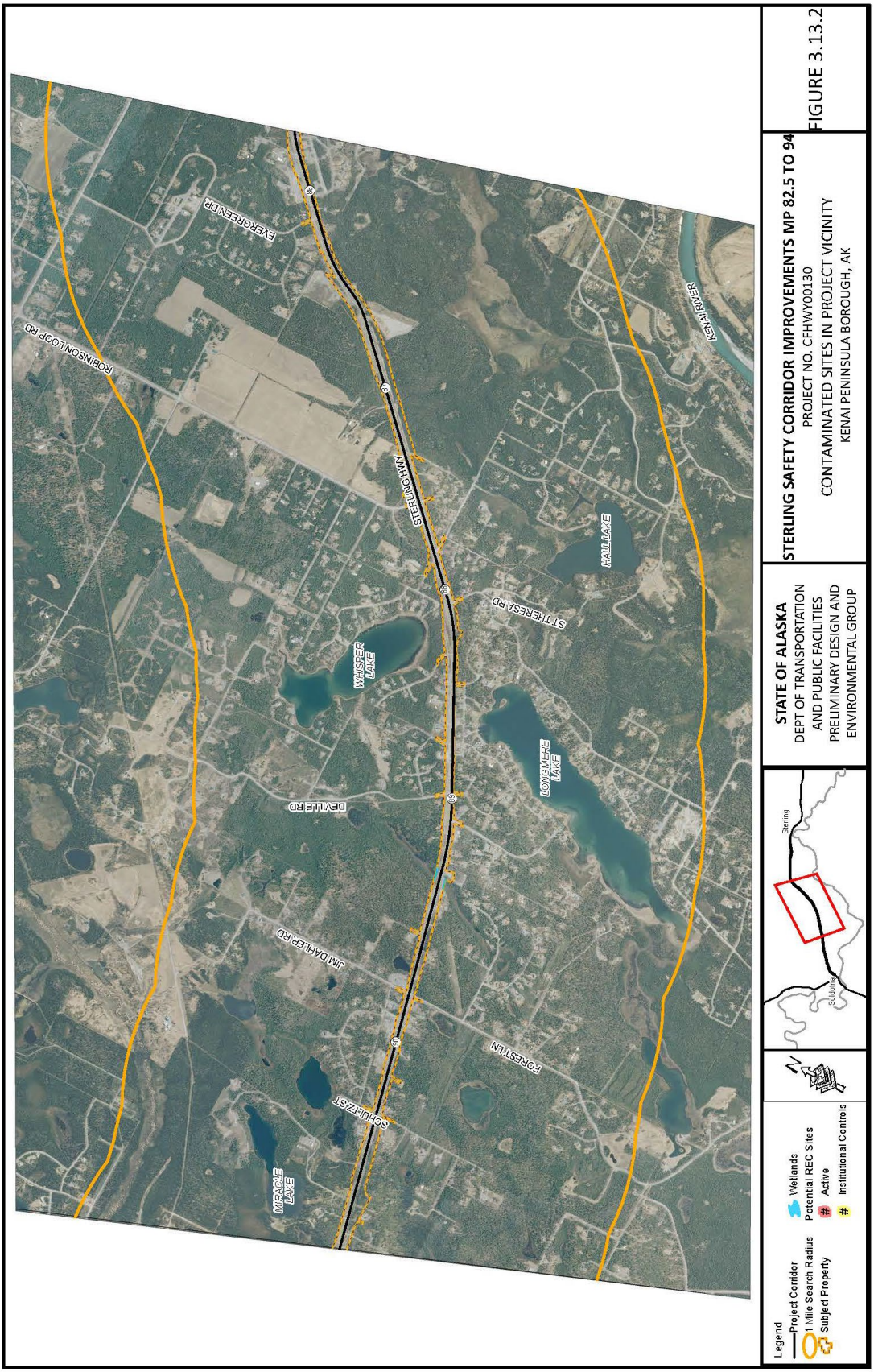
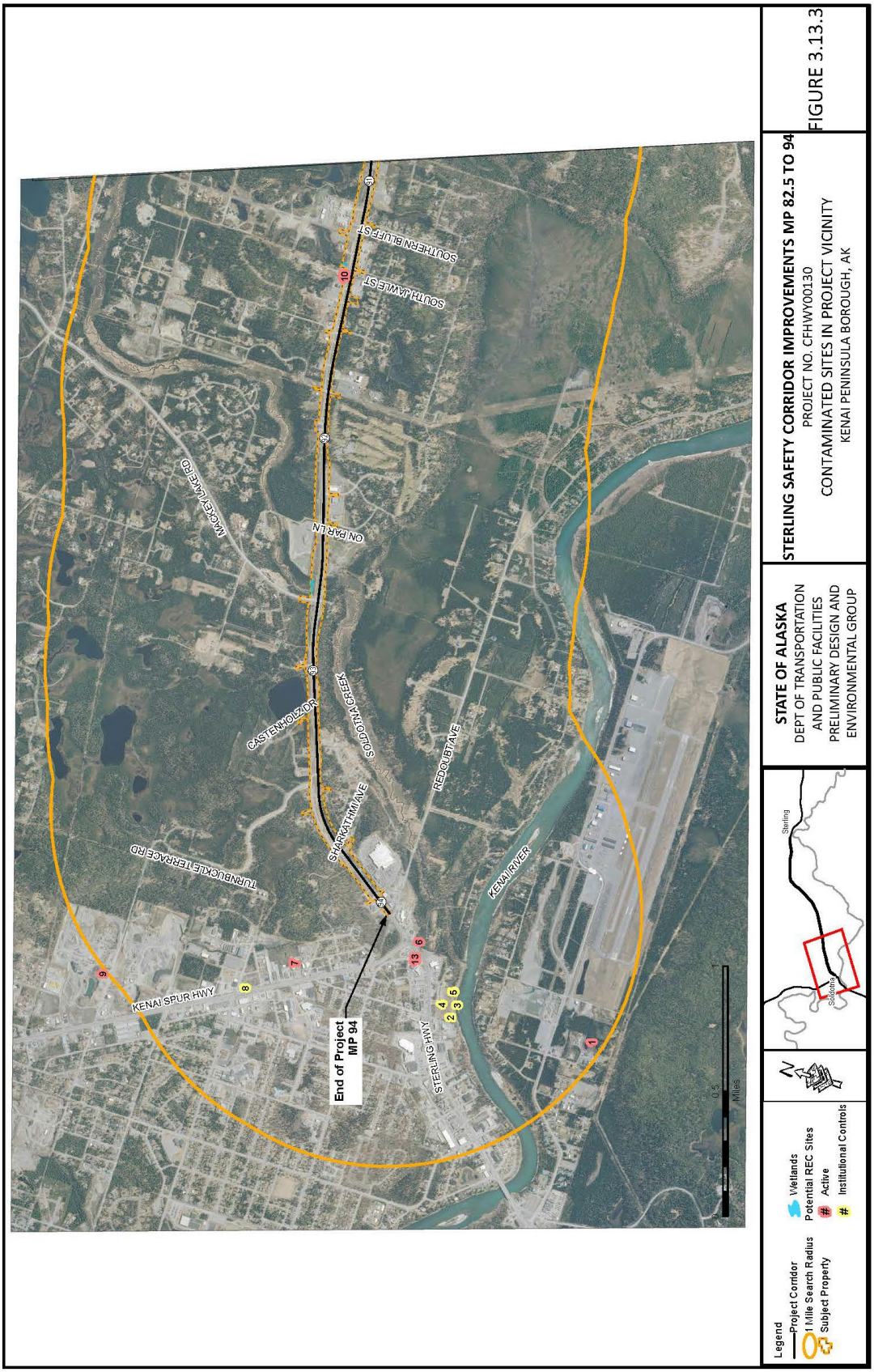
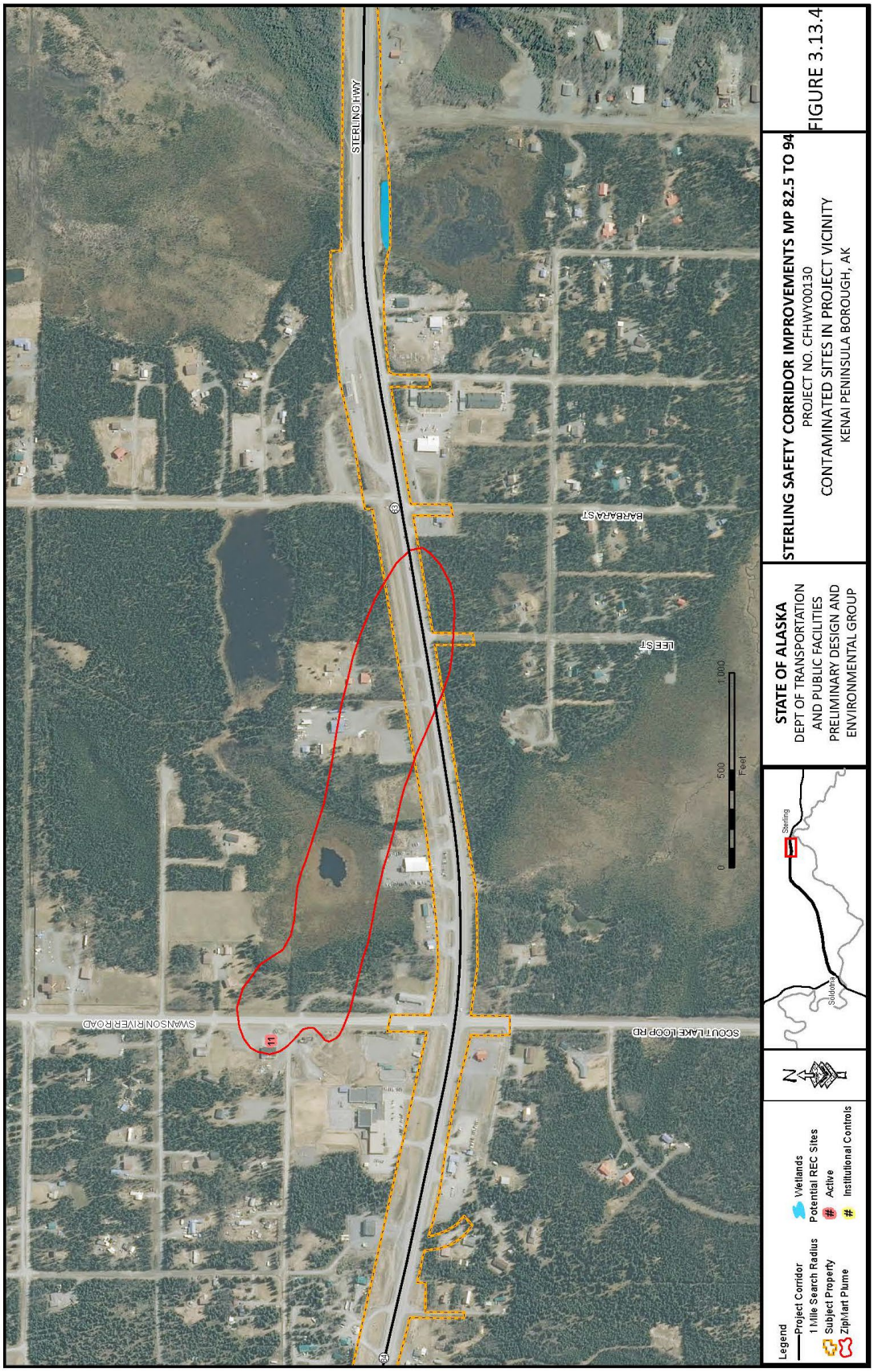

Beginning of Project MP 82.5
MOOSE RIVER
KENAI RIVER
MIDWAY DR
GREATLAND STREET
BARBARA ST
LEE ST
INSET - FIGURE 4
SWANSON RIVER RD
STERLING HWY
LOIS ST
ROBINSON LOOP RD
SCOUT LAKE
SCOUT LAKE LOOP RD
Legend
Project Corridor
1 Mile Search Radius
Subject Property
Wetlands
Potential REC Sites
Active
Institutional Controls
N
STATE OF ALASKA
DEPT OF TRANSPORTATION
AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND
ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT NO. CFHWY00130
CONTAMINATED SITES IN PROJECT VICINITY
KENAI PENINSULA BOROUGH, AK
FIGURE 3.13.1

Figure 14


EVERGREEN DR
ROBINSON LOOP RD
KENAI RIVER
STERLING HWY
HALL LAKE
ST THERESA RD
WHISPER LAKE
LONGMERE LAKE
DEVILLE RD
JIM DAHLER RD
FOREST LN
SCHULTZ ST
MIRACLE LAKE
Legend
Project Corridor
1 Mile Search Radius
Subject Property
Wetlands
Potential REC Sites
Active
Institutional Controls
Sterling
Soldotna
STATE OF ALASKA
DEPT OF TRANSPORTATION
AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND
ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT NO. CFHWY00130
CONTAMINATED SITES IN PROJECT VICINITY
KENAI PENINSULA BOROUGH, AK
FIGURE 3.13.2


SOUTHERN BLUFF ST
SOUTH LAWLE ST
MACKEY LAKE RD
ON PAR LN
CASTEN HOLZ DR
SOLDOTNA CREEK
REDOUBT AVE
SHARKATHM AVE
TURNBUCKLE TERRACE RD
KENAI RIVER
KENAI SPUR HWY
STERLING HWY
End of Project MP 94
0.5
Miles
Legend
Project Corridor
1 Mile Search Radius
Subject Property
Wetlands
Potential REC Sites
Active
Institutional Controls
STATE OF ALASKA
DEPT OF TRANSPORTATION AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT NO. CFHWY00130
CONTAMINATED SITES IN PROJECT VICINITY
KENAI PENINSULA BOROUGH, AK
FIGURE 3.13.3


STERLING HWY
BARBARA ST
LEE ST
SWANSON RIVER ROAD
SCOUT LAKE LOOP RD
0
500
1,000
Feet
Legend
Project Corridor
1 Mile Search Radius
Subject Property
ZipMart Plume
Wetlands
Potential REC Sites
Active
Institutional Controls
N
Sterling
Soldotna
STATE OF ALASKA
DEPT OF TRANSPORTATION
AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND
ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS MP 82.5 TO 94
PROJECT NO. CFHWY00130
CONTAMINATED SITES IN PROJECT VICINITY
KENAI PENINSULA BOROUGH, AK
FIGURE 3.13.4

3.14 Visual

The Sterling Highway within the project area is a fairly linear two-lane roadway with a paved asphalt surface and one traffic signal. Highway travelers experience a view shed consisting of commercial/industrial development, residential areas, and birch/spruce forest along both sides of the road. As the project area is predominantly comprised of developed and disturbed land (i.e. roadway surfaces, cleared ditches, side slopes, and back slopes), native vegetation represents less than 6% of the corridor. There is also evidence of long term ATV travel along both sides of the road for its entire length. The width of cleared vegetation is generally dependent on ROW width and varies from 200 to 300 feet throughout the project corridor. Overhead utility lines exist along the entire length. At the eastern end of the project, the setting and view shed of the Sterling Highway is rural community. As you move south and west from Sterling, the setting maintains more of a rural residential or commercial feeling with some forested areas along the ROW limits. Contributing to the rural feeling are several residential lots that are approximately one acre or greater in size. There are also a handful of larger lots developed for industrial use. The forested areas and existing development generally confine views from the roadway to within the ROW. East bound travelers are exposed to limited views of the Kenai Mountains depending on their trajectory, but the mountains are generally not a substantial part of the view. Existing topography is relatively flat in the northeastern portion of the project and gently rolling terrain is more prevalent in the southwestern portion. No street illumination is present within the project area. While portions of the Sterling Highway are designated scenic byways, the segment between Sterling and Soldotna is not, nor does it traverse other scenic view sheds.

3.14.1 Environmental Consequences

No Build Alternative

Under the No Build Alternative no road improvements would occur and the visual setting would remain unchanged. Existing development trends affecting the view shed in the project area would continue in their current status.

Preferred Alternative

The Preferred Alternative would more than double the width of the road between Sterling and Soldotna. The overall appearance and character would change from a rural two-lane road to a divided arterial roadway. The four-lane configuration will look and feel like a large transportation corridor. Road widening would follow the existing alignment with very slight adjustments. The remaining native vegetation within DOT&PF ROW, approximately 19 acres, will be cleared to enhance roadside safety and provide better visibility of moose and other hazards, though some cleared areas may be perceived as narrower due to the substantially wider roadway (HDL 2014a). The linear nature of the road would remain the same, defined by the flat to rolling terrain and by the surrounding forested areas and adjacent buildings and infrastructure. Existing views for travelers and area residents will not appreciably change but the feel of the roadway will be decidedly more urban as opposed to the existing two-lane country road. However, the high volumes of existing traffic along the Sterling Highway likely detract from the rural feeling and improved traffic flow may actually restore some of that feeling by providing a perceived reduction in traffic densities. Residential lot sizing is regulated by the local government (KPB and COS) and is not expected to change as a result of the proposed project.

Visual impacts were only considered along the road corridor itself because the relatively flat topography and vegetated areas limit the extent of these impacts.

Minimization Measures

Measures to minimize visual impacts include contouring the final project area to match existing natural conditions to the maximum extent practicable and revegetating disturbed areas outside of the clear zone. Within the clear zone, disturbed areas will be revegetated with grasses to discourage moose browsing and increase visibility. These activities would return the disturbed ground to a vegetated state and help break up the linear features along the road with vegetation that is appropriate for the local environment. Dust control BMPs would be implemented during the construction phase to increase visibility and reduce air pollution. The remainder of the area would be reclaimed to its original landscape.

3.15 Energy

Energy requirements for the existing facility are primarily associated with the fuel needed to operate the motor vehicles travelling along the highway. Fuel consumed by facility users is variable depending on the type of vehicle, travel speed, and the geometry, congestion and condition of the facility. Other operational energy requirements include the raw materials and fuels necessary to maintain a functional and safe roadway.

3.15.1 Environmental Consequences

No Build Alternative

The No Build Alternative would not directly affect the rate or quantity of energy consumption. However, energy consumption would continue to rise in conjunction with area growth and development. Congestion issues would continue to worsen, potentially contributing to an increase in energy consumption as transit times increase. As the facility continues to age, energy consumption related to maintenance activities would also increase. Without addressing the roadways safety problems, energy costs related to fatal and major injury crashes may continue.

Preferred Alternative

The Preferred Alternative would result in greater energy consumption than the No Build Alternative due to the raw materials, fuel, and equipment necessary to build and maintain the expanded facility. However, the improved facility should reduce operational energy requirements over the design life of the upgraded roadway. Reduced operational energy requirements would most likely result from a reduction in fuel consumption resulting from decreasing congestion and a reduction in traffic delays.

3.16 Construction Impacts

Construction of the Preferred Alternative would result in temporary impacts to air and water quality, noise levels along the roadway, transportation flow, and local businesses. Construction impacts will last as long as it takes to build the project. The Department will require the contractor to take all practicable steps towards minimizing these impacts to the extent practicable and also require compliance with all applicable federal, state, and local laws, permit stipulations, and contract specifications. Public involvement measures would continue through the construction process to minimize traveler impacts as much as possible. The project would likely

be constructed in phases to minimize impacts. Each section below discusses probable impacts and potential mitigation measures.

3.16.1 Air Quality

Air quality may degrade during construction because of increased vehicle emissions and fugitive dust and particulate matter. Fugitive dust and particulate matter are typically introduced as a result of site preparation, clearing, cut-and-fill activities, grading, material transportation and stockpiling. Emissions from construction equipment contain air pollutants such as CO, nitrogen oxides, volatile organic compounds, and soot particulate. High concentrations of these chemicals may affect human health and ecosystems; however, levels of these pollutants are not expected to exceed air quality standards during construction. Increased traffic congestion may also contribute to increases in exhaust pollutant concentrations.

Implementation of the following minimization measures would be used to reduce adverse air quality impacts during construction. A SWPPP in accordance with the ADEC APDES CGP for storm water discharge from construction sites would be followed during construction to minimize the amount of loose soils available for air transport. This may include vehicle track out reduction, watering, sweeping, and stabilization of all disturbed ground to suppress loose soil and prevent fugitive dust. Construction equipment and vehicles will be properly tuned and maintained, and unnecessary idling would be prohibited.

3.16.2 Water Quality

Construction-related impacts to water quality are not likely to be a major concern for this project because there are only three surface waterbodies with any appreciable chance to receive storm water from the proposed project, Soldotna Creek, Loren Lake, and the unnamed pond east of Jim Dahler Road. Soldotna Creek passes underneath the highway in a pipe arch culvert, Loren Lake is approximately 150 feet from the existing edge of pavement, and the unnamed pond is approximately 60 feet from the existing edge of pavement. There are several additional surface waters located within approximately 500-1,000 feet of the proposed project, however they are separated from the project by a variety of ditches, vegetated areas, and/or developed residential/commercial areas that make the potential for them to receive storm water low. Wetlands also exist adjacent to the roadway or within ROW at multiple locations along the project corridor. Impacts to water quality would generally result from earthwork, clearing and grading activities, paving, stockpiling, accidental equipment leaks or spills, material transport, and storm water runoff. These activities would expose loose soils to wind and rain erosion until those areas are temporarily or permanently stabilized. New ground disturbance could increase sedimentation and increase turbidity of receiving waters, but every effort would be made to prevent this. Surface runoff could carry additional nutrients or contaminants from cars and construction equipment. No culvert replacements or other work in flowing waters are proposed. Any impacts to water quality resulting from construction activities will subside once work is complete.

Measures will be taken to avoid and/or minimize potential impacts to water quality in accordance with the DOT&PF contract specifications, required permits, and permit special conditions and stipulations. The primary water quality protection measure will be preparation and implementation of a contractor prepared SWPPP in accordance with the APDES CGP and DOT&PF contract specification 641 – Erosion, Sediment, and Pollution Control. The SWPPP

will also contain a HMCP and Spill Prevention, Control, and Countermeasures Plan to address spills or leaks of hazardous materials. In accordance with the DOT&PF 641 specification, the SWPPP must be approved by the Department prior to beginning work. The SWPPP would identify all receiving waters and specify the structural and procedural BMPs that would be utilized during construction to prevent erosion and untreated runoff from reaching nearby water bodies. All vehicles, trucks, and heavy equipment would be kept within construction limits and operated in a manner that limits unnecessary ground disturbance. Equipment would be routinely inspected and serviced to prevent leaks and accidental spills. If leaks or spills should occur, all contaminated material and soils would be contained and disposed of in an approved offsite location. Based on implementation of these measures, construction activities under the Preferred Alternative would not likely result in adverse effects on water quality or stream flow in the project area.

3.16.3 Noise

Construction equipment, vehicles, power tools and personnel will increase noise levels during the construction process.

For all Type I federally funded projects, it is the policy of DOT&PF to:

a) Identify land uses or activities potentially affected by noise from construction of the project.
a) Determine the measures needed to minimize or eliminate adverse construction noise impacts to the community
b) Incorporate abatement measures in the plans and specifications

To comply with this policy, the Department will 1) comply with all local noise rules, regulations, and ordinances, 2) require proper maintenance of all construction vehicles and equipment, including presence of mufflers in acceptable working condition, 3) ensure haul routes are located away from residential areas, 4) limit noisy procedures to daytime hours whenever possible, 5) position stationary equipment as far as possible from noise sensitive receivers, 6) limit unnecessary equipment idling, 7) notify the public of upcoming construction activities, and 8) incorporate abatement measures into the contract plans and specifications.

3.16.4 Transportation Flow

Construction-related activities would cause temporary inconvenience to the traveling public. This may include, but is not limited to, altered traffic patterns, longer travel times, and limited or altered access to businesses and residences. Public and institutional transportation services would temporarily experience similar delays and detours. Other roads in the vicinity of the project may experience increased traffic volumes as travelers try to avoid the construction area.

Efforts to minimize impacts to transportation flow will primarily consist of a requirement that the contractor implement a traffic control plan (TCP). The goal of a TCP is to maximize efficiency of travel for roadway users while minimizing delays and providing detours when necessary. The public, affected local schools, public service organizations and emergency personnel would be notified in advance of construction activities and potential road closures. Access to all adjacent properties, public facilities, and recreation areas will be maintained at all times. All impacts to transportation flow would cease once construction is complete.

3.16.5 Economic

Economic impacts during construction would be primarily related to business patrons avoiding the area because of anticipated construction delays and congestion. Access will be available to all businesses during construction; however it may be limited or altered to accommodate construction activities. The contractor and DOT&PF will maintain open lines of communication with all affected parties and keep the public informed of delays or detours through newspaper ads, signage, and other community outreach methods. Construction detours and delays would be localized and short in duration, therefore not permanently affecting or restricting economic vitality within the project area.

3.16.6 Wildlife and Migratory Birds

Construction activities would cause temporary disturbance to wildlife and habitat in the project area. Clearing and grading activities may result in injury, mortality, or temporary displacement of wildlife, particularly smaller animals that are not mobile enough to avoid the area. Larger, more mobile wildlife species have the ability to avoid clearing activities and move into adjacent habitat. Increased noise, dust levels, and human activity during construction would potentially disrupt normal foraging and breeding behavior of wildlife species adjacent to the construction area. However, these impacts would be localized and short-term and minor in impact.

3.17 Relationship of Local Short-Term Uses vs. Long-Term Productivity

An important component of constructing highway improvement projects is creating a balance between the project's benefits and potential impacts to the environment. Local short-term use of the environment should be commensurate with maintenance and enhancement of long-term productivity as a result of the project. The Sterling Highway is a designated safety corridor and has one of the highest severe and fatal crash rates in Alaska. Nearly 67% percent of fatal crashes on the highway are head-on collisions. The proposed project is expected to reduce those crashes and dramatically improve safety for all roadway users. In addition, current and predicted future use of the Sterling Highway greatly exceeds its present capacity. Roadway users now experience long delays and bumper to bumper traffic during summer peak travel times.

3.17.1 Environmental Consequences

No Build Alternative

The No Build Alternative would not result in a short-term use of the environment. However, there would also be no safety improvements or congestion relief along the existing roadway. Crash rates, including head-on collisions, would remain high and the long term efficiency of the roadway would be diminished by increasing traffic and congestion. Maintenance activities would continue short-term use of the environment without providing the level of long-term productivity enhancement that the Preferred Alternative would accomplish.

Preferred Alternative

Short-term uses of the environment associated with the proposed project would include changes in access, increases in energy consumption, higher noise levels, decreased air and water quality, and longer travel times. These impacts would only exist during the construction period and are minor relative to the benefits provided to all roadway users during the 20-year design life of the improved road. The proposed improvements are based on State and local plans which consider

the need for present and future traffic requirements within the context of present and future land use development. Commercial, recreational, and commuter traffic will enjoy increased capacity and improved safety along the corridor with the new facility. The proposed project would enhance the quality of life for local residents and commuters by creating a safer transportation system and encouraging the long-term productivity and viability of the community.

3.18 Irreversible and Irretrievable Commitment of Resources

Construction of the Preferred Alternative would require the irreversible and irretrievable commitment of natural, physical, human, and fiscal resources. The additional land necessary to accommodate the larger footprint is approximately 95 acres. This land is considered an irreversible commitment for as long as the highway facility is in use. If the highway is ever determined to be unnecessary, or a greater need arises for use of the land, it could be converted to another use. At present, there is no reason to believe such a conversion will ever be necessary or desirable.

Considerable amounts of labor, fossil fuels, and construction materials such as aggregate, gravels, and bituminous materials would be expended during construction of the proposed project. Additionally, large amounts of labor and natural resources are necessary to produce construction materials. These materials are generally not retrievable; however some construction materials could be reused at a later date if the highway is ever determined to be unnecessary. Construction materials are not in short supply and their use will not have an adverse effect upon continued availability of these resources. Preliminary estimates indicate the project would require approximately 31,000 cubic yards of asphalt, 790,000 cubic yards of borrow materials, and 790,000 cubic yards of excavation.

Expenditure of federal funds, which is estimated to total approximately $77,250,000 in current year dollars, will be irretrievably committed to the project. After construction, continual funding would be required to adequately maintain the highway. The commitment of these resources is expected to improve the transportation system and benefit residents in the immediate area, State, and region. These benefits include: improved accessibility and safety, reducing delay, and greater availability of quality services which are anticipated to outweigh the commitment of the required resources.

3.19 Cumulative Impacts

The Council on Environmental Quality (CEQ) defines a cumulative impact as: "…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time (40 CFR 1508.7)."

The method for determining the cumulative impacts of the proposed project is based on *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997). It includes:

- Definition of spatial (geographic) and temporal (time frame) boundaries of the analysis.

- Identification of past, present, and Reasonably Foreseeable Future Actions within the spatial and temporal boundaries and their potential environmental effects on resources directly or indirectly affected by the Proposed Action.

For this analysis, only the Proposed Action is addressed when considering cumulative impacts. Per FHWA technical guidance, resources that do not have a reasonable possibility of being affected by the Proposed Action were not evaluated for cumulative impacts (FHWA 1987). Because the No Action alternative has little to no direct or indirect impacts, no incremental impacts are anticipated to contribute to the cumulative case. After extensive public and agency outreach, and analysis of impacts to environmental resources, the following areas were selected for analysis of cumulative impacts due to the potential for direct or indirect impacts:

- Land use
- Invasive Species
- Noise
- Wetlands
- Wildlife
- Recreation and Section 4(f) Resources
- Visual

3.19.1 Spatial and Temporal Boundaries for Cumulative Impacts Analysis

The geographic area of analysis used to assess cumulative impacts for most resources is the same as the project area, described in detail in Chapter 1 and shown on Figure 1.1.

The time frame for the cumulative impacts analysis includes past and future. The temporal boundary for past development is 1950, when the Sterling Highway was completed. The temporal boundary for future development is based on the project design year, which is 2050.

3.19.2 Past, Present, and Reasonably Foreseeable Future Actions

Table 3.19.1 identifies past, present, and reasonably foreseeable future actions likely to occur between now and the 2050 project design year within vicinity of the geographic boundaries. The list is primarily composed of transportation projects sponsored by DOT&PF, KPB, COS, and Community of Sterling. However, it's possible that other major private or public infrastructure and development projects affecting similar resources as this proposed project will occur. Most of the listed projects are included in the most current KPB Transportation Plan, the Alaska STIP, and the COS Comprehensive and Recreation and Trails Plans. Although the KPB, COS, and Community of Sterling projects are included in the respective planning documents, these are considered long-term goals and no specific project or proposal has yet reached a stage of planning or development.

Table 3.19.1: Past, Present, and Reasonably Foreseeable Future Actions

Action	Sponsor	Description	Anticipated Construction Year
Kenai National Wildlife Refuge	U.S. Fish and Wildlife Service	Kenai National Wildlife Refuge was first established as the Kenai National Moose Range in 1941 to protect moose. In 1980, the Alaska National Interest Lands Conservation Act changed the name and purpose of the refuge. The refuge now exists to protect wildlife populations, the variety of habitats they need to survive, and for you, the visitor, to enjoy (USFWS 2020c)	N/A
Sterling Highway Construction	Alaska Road Commission	Construction of a two-lane gravel highway from the Seward Highway at Tern Lake to Homer	1947-1950
Sterling Highway MP 58-79 Grading, Paving, Drainage, and Guardrail	DOT&PF Proj. #: F-021-2(20)	Rehabilitate the Sterling Highway by widening the embankment and driving lanes, adding shoulders, improving drainage and regrading ditches, adding guardrail, regrading the embankment, improving the structural section.	1981-1982
Sterling Highway Soldotna to MP 79, Phase I	DOT&PF Proj. #: F-021-2(16) & (19)	Rehabilitate the Sterling Highway by widening the Highway within the community of Sterling to a four-lane facility with a CTWLTL and upgrading the highway between Sterling and Soldotna to include widened shoulders, improved horizontal and vertical curve alignments, and an improved clear zone. ROW for a majority of the proposed four-lane divided facility between Sterling and Soldotna was also purchased under this project.	1990s
Sterling Highway MP 37-45	DOT&PF Proj. #: 51994	Reconstruct the Sterling Highway from Wye intersection with the Seward Highway to Quartz Creek Road.	2000
Sterling Highway Rut Repair, MP 90-94	DOT&PF Proj. #: 51046	Surface repaving from Forest Lane to Soldotna.	2009
Sterling Highway MP 82-90 Resurfacing	DOT&PF Proj. # 52493	Resurface approximately 8 miles of the Sterling Highway, including grading, paving, signing, and striping improvements.	2011
HSIP: National Highway System Delineation; HSIP: Small SPOT Improvements	DOT&PF Proj. #: 51289; 59838	Upgrades to curves, guardrail, roadside delineation, and signing consistency along the Sterling Highway. Constructed with the other HSIP project that upgraded headlight, Report Every Dangerous Driver Immediately (REDDI), and milepost signing.	2011
Sterling Highway MP 45-58 Resurfacing; Kenai Peninsula Flood October 2002 Permanent Repairs, Ph II	DOT&PF Proj. #: 52081; 56938	Resurface approximately 13 miles of the Sterling Highway, including grading, drainage, paving, signing, and striping improvements. Project was constructed with the flood repair project at Sterling Highway MP 55.3. Improvements included slope stabilization via regrading and revegetating	2013

Action	Sponsor	Description	Anticipated Construction Year
		the embankment, as well as repaving and striping the roadway.	
Safety Corridors: Sterling Highway Speed Signs GF	DOT&PF Proj. # 53425	Installation of dynamic speed signs, electrical power service, and support pads.	2013-2015
Soldotna: Funny River Road Improvements	DOT&PF Proj. #: Z537500000	Rehabilitate 4000' of pavement, provide consistent shoulders on both sides of the road and provide drainage improvements.	2017
HSIP: Sterling Highway MP 89.9 Left Turn Lane (parent project: HSIP: CR Traffic Safety Corridor Left Turn Lanes)	DOT&PF Proj. #: CFHWY00155 (Parent Proj. # Z570880000)	Install left-turn lanes at the Sterling Highway and Jim Dahler Road/Forest Lane intersection (MP 89.9). Additional work included adjustments to the Jim Dahler Road and Forest Lane approaches and roadway widening to accommodate the new turn lanes.	2017-2018
Sterling Highway: MP 58-79, Skilak Lake Rd-Sterling Rehabilitation and Passing Lanes	DOT&PF Proj. #: Z549900000	Rehabilitate Sterling Hwy from MP 58 (near Skilak Lake Rd) to MP 79 (near Sterling). Improvements include resurfacing, widening shoulders and adding passing lanes where appropriate, wildlife-vehicle mitigation where cost effective, and replacing the culvert at the East Fork Moose River with a Bridge.	2017-2020
Kalifornsky Beach Road: MP 16-22.2 Resurfacing and Signalization	DOT&PF Proj. #: Z597780000	Repave approximately 6.2 miles of K-Beach Road from the Sterling Highway to Bridge Access Road. Signalization of the intersections of K-Beach Road with Gaswell Road and Ciechanski Road, as well as a signal interconnect between the existing and proposed signals.	2018
HSIP: Sterling Highway Shoulder Widening, MP 97-118	DOT&PF Proj. #: Z589800000	Improve 21 miles of the Sterling Highway, between Soldotna and Clam Gulch, by widening shoulders, replacing culverts with a bridge, installing rumble strips, replacing culverts and regrading ditches, and installing guardrail.	2018-2020
Kenai Spur Highway Rehabilitation	DOT&PF Proj. #: Z545940000	Rehabilitate the Kenai Spur Highway between Sports Lake Road and Swires Road by widening to a four lane highway with a center left turn lane.	2018-2023
Beaver Loop Road Improvements	DOT&PF Proj. #: Z534560000	Repave Beaver Loop Road, from the Kenai Spur Highway to Bridge Access Road in Kenai. Additional work would include grade adjustments, construction of a pedestrian pathway, drainage improvements, utility work, and roadside hardware improvements.	2018-2023 (to be constructed with Kenai Spur Highway Rehab.)
Sterling Highway MP 45-60 Sunrise Inn to Skilak Lake Road Reconstruction	DOT&PF Proj. #: Z530140000	Reconstruct the Sterling Highway between Quartz Creek Road and Skilak Lake Road to a new alignment north of Cooper Landing. Improvements include a new Resurrection Pass trailhead parking area, an overlook at Juneau Creek Falls, new bridge across	2020-2025

Action	Sponsor	Description	Anticipated Construction Year
		Juneau Creek, and several wildlife crossing structures.	
Sterling Highway MP 57 Erosion Protection	DOT&PF Proj. #: Z584030000	Install erosion protection and realign the Sterling Highway as necessary near MP 57 to prevent highway embankment damage due to recent shifting of the Kenai River.	2020-2025 (to be constructed with Sterling Highway MP 45-60)
Soldotna Community Connections	DOT&PF Proj. #: CFHWY00687	Add connections between Soldotna Creek Park, Swiftwater Park, and neighboring commercial and residential areas by paving and adding new ADA-compliant trails and pathways. This includes paving 3300 feet of trails within Soldotna Creek Park and connecting to existing trails, pathways, and sidewalks to complete a pathway segment between Soldotna Creek and Swiftwater Parks with connections to the commercial area on the south side of the Sterling Highway.	Undetermined
Scout Lake SRS Development	DNR DPOR	Develop Scout Lake SRS to include a campground in the eastern parcel, develop a trail system to connect the park parcels, and develop the unimproved lake access area in the western parcel. Additional developments including updating park amenities including picnic tables, covered picnic area, and restrooms.	Undetermined
Sports Lake Road Extension	KPB	Extend Sports Lake Road from the Kenai Spur Highway east along the section line to the vicinity of Whisper Lake.	Undetermined
Robinson Loop Road Extension	KPB	Extend Robinson Loop Road west along the section line to connect with the Kenai Spur Highway.	Undetermined
Turnagain Arm Crossing: Chickaloon Bay to Potter's Marsh	KPB	Construct a new route from the Sterling Highway near Sterling that would parallel an existing gas line along the western edge of the Kenai Mountains, pass through the Kenai National Wildlife Refuge to reach the eastern edge of Chickaloon Bay. Then construct a connection across Turnagain Arm to meet up with the Seward Highway near the Potter area of south Anchorage. The route between Sterling and Potter would be about 57 miles (reduced from the current 130 miles) and would require 50 or more miles of new construction. The crossing itself would be in excess of six miles, likely consisting of a long causeway and bridge combination.	Undetermined
Western Peninsula Railroad Extension	KPB	Railroad extension from Moose Pass to Kenai/Soldotna or Homer parallel to the Sterling Highway, requiring between 65 miles	Undetermined

Action	Sponsor	Description	Anticipated Construction Year
		(to Soldotna) and 140 miles (to Homer) of new track.	
Boundary Street Extension	COS	Extend Boundary Street along the section line to connect Keystone Drive and the Sterling Highway.	Undetermined
Commercial Development	COS	Per the Soldotna Comprehensive Plan, two commercial development focus areas are identified in the vicinity of the intersection of the Sterling and Kenai Spur Highways and the Sterling Highway and Binkley Street intersection. These areas could be the focus of future development/redevelopment efforts to concentrate commercial and retail activity, create commercial synergy and provide a more pedestrian-friendly experience.	Undetermined
Soldotna Area Trail Extensions	COS	Per the Soldotna Recreation and Trails Master Plan, several proposed trails are identified throughout the city, including new paved multi-use trail connections between Foothill Road and Devin Drive, Redoubt Avenue and Kenai Spur Highway, Mullen Drive and Devin Drive. Several highway pedestrian crossings and potential pedestrian river crossings are also identified.	Undetermined
Sterling Community Park	Community of Sterling	Per the Sterling Community Plan, work with KBP and State to acquire and develop property on Scout Lake for a Sterling community park.	Undetermined

3.19.3 Land Use

Increased development and urbanization in the study area has affected the overall number, size, and type of land use in the area. Comparison of historical and current aerial photography clearly shows the transformation of the area from predominately undeveloped vegetated lands to residential, commercial, industrial and recreational land uses (Figures 3.19.1-2). The land has transformed from being sparsely populated with a total population of 4,831 people in the KPB in 1950 to currently more than 58,700 people (KPB 2020b). While much of the land adjacent to major roadways is developed, a great deal of land in the study area remains undeveloped. The developed land is primarily rural residential with some commercial, community service, and recreational uses. Land in the study area is predominately in private ownership, with some lands owned by the KPB, federal, or state entities.

Past actions that have shaped the baseline condition, and in some cases continue to exert a persisting influence on the baseline, include the following:

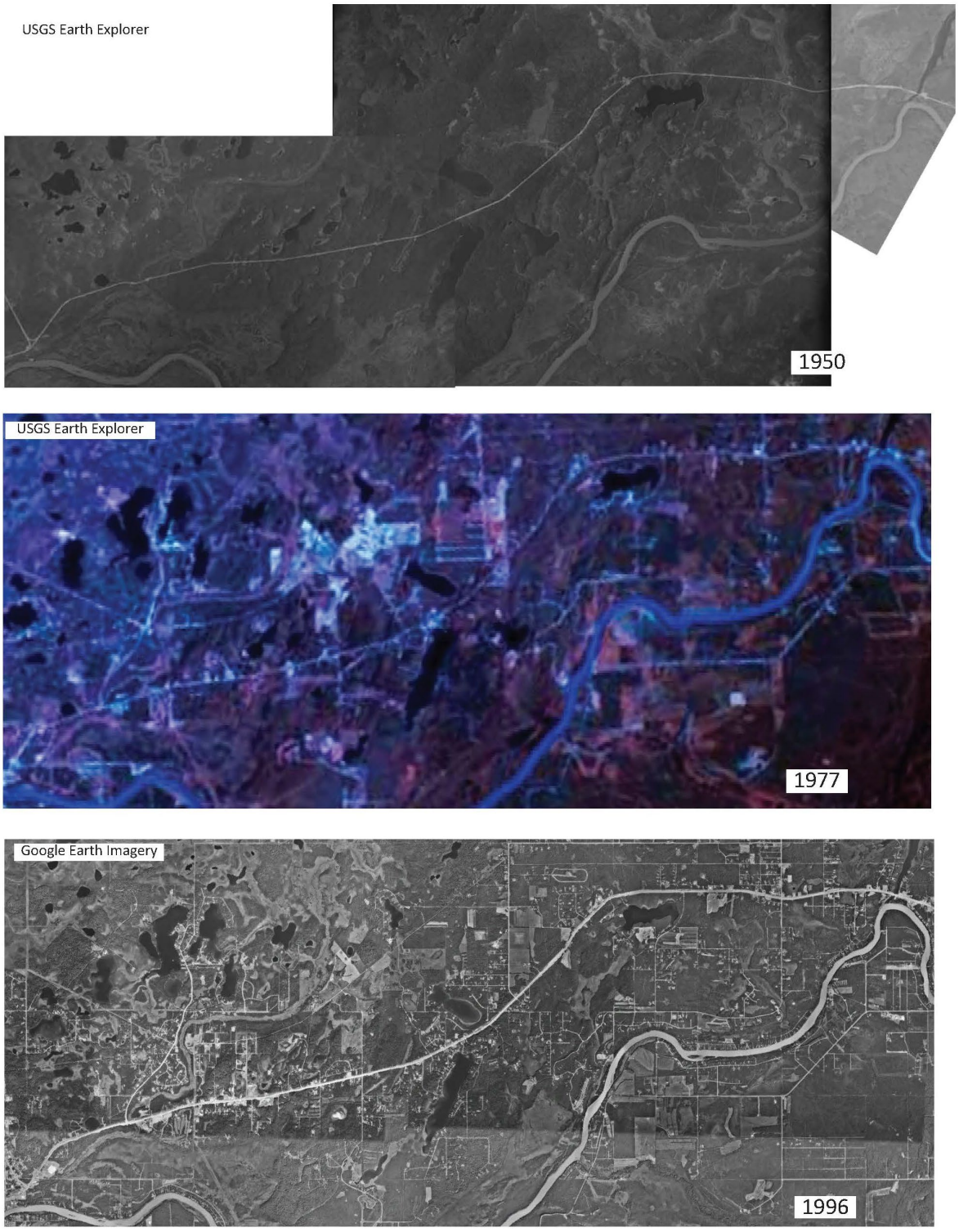
- Oil and gas extraction activities
- Gravel extraction and material sites
- Commercial and recreational fishing along the Kenai River
- Sterling Highway completed, 1950

- Kenai National Wildlife Refuge established, 1980
- Trans Alaska Pipeline operational, 1977
- Residential and commercial growth, 1980s to the present

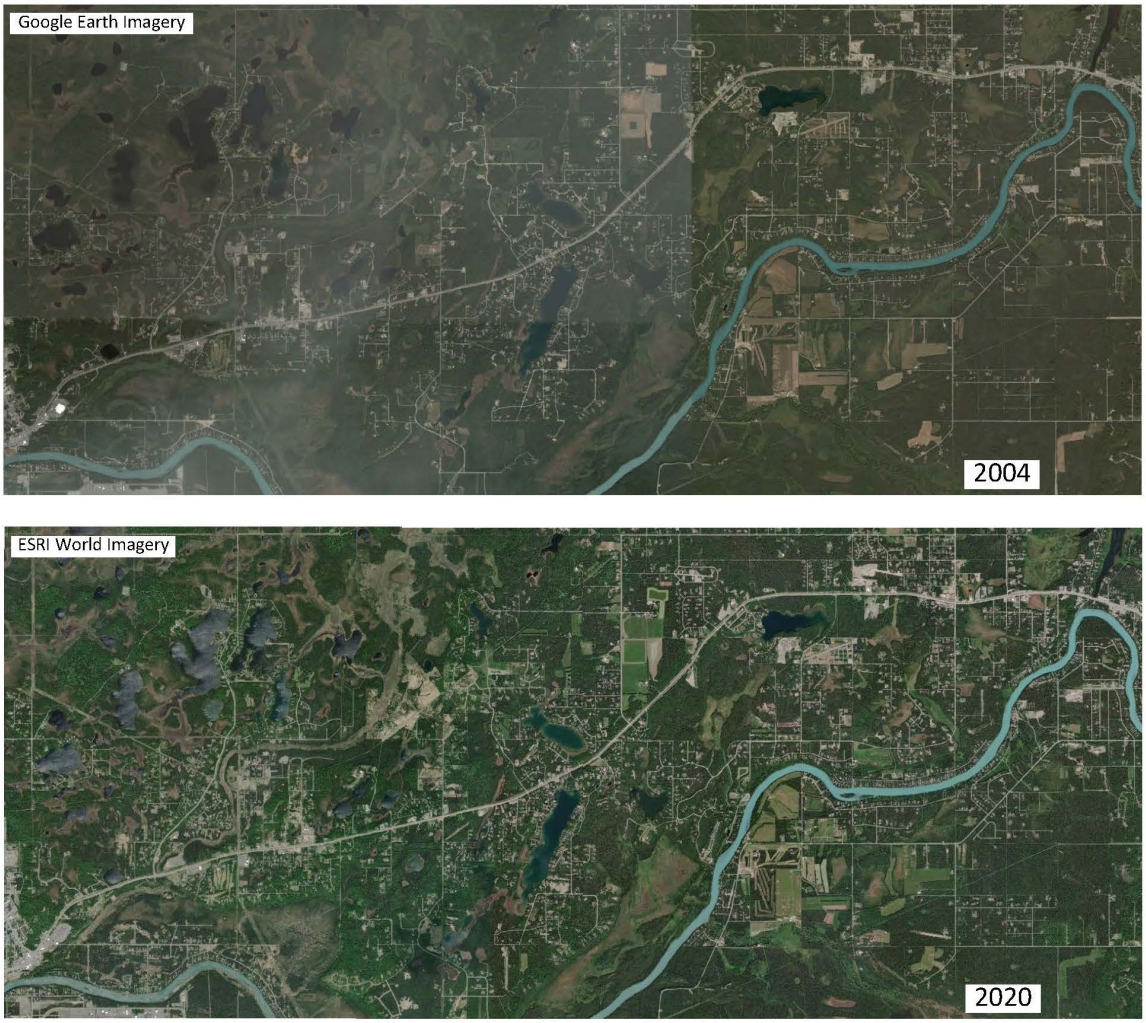
Preferred Alternative Impacts

As development in the area continues, land use will continue to change from undeveloped and rural residential to higher-density residential and commercial areas. The projected growth is expected to have a much greater impact on land use than the direct and indirect effects of the proposed project. The proposed project would convert 4.88 acre of land from residential, commercial, and undeveloped land uses to transportation uses. However, the changes in land use are expected to be negligible, especially when compared with the potential for changes in land use from potential future transportation projects on new alignments which would require substantially more ROW acquisition and convert all of the acquired land to strictly transportation uses. The ROW acquisitions would slightly reduce the amount of available residential and commercial land adjacent to the highway; however, there is sufficient supply of undeveloped, buildable land available to support predicted residential or commercial growth in the project area. The project may also facilitate an increase in commercial or industrial development in the area by improving safe access to parcels adjacent to the highway.

The Preferred Alternative may also facilitate residential development in the area and lead to a minor increase in residential land use designations. The project would reduce some of the negative effects of population growth such as congestion and related safety issues. Realignment and consolidation of highway access points, as well as construction of the pedestrian pathway would allow for safer access to and from neighborhoods, commercial districts, and businesses. The rural setting, coupled with improved mobility, may be more desirable to those wishing to obtain recreational property and/or those wishing to permanently relocate to a smaller community contributing to more urban and suburban sprawl. The proposed project's contribution to the cumulative changes in land use in the study area is expected to be minimal.



STATE OF ALASKA DEPT OF TRANSPORTATION AND PUBLIC FACILITIES PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP	**STERLING SAFETY CORRIDOR IMPROVEMENTS** **MP 82.5 TO 94** PROJECT NO. CFHWY00130 LAND USE CHANGES OVER TIME KENAI PENINSULA BOROUGH, AK	FIGURE 3.19.1



STATE OF ALASKA DEPT OF TRANSPORTATION AND PUBLIC FACILITIES PRELIMINARY DESIGN AND ENVIRONMENTAL GROUP	**STERLING SAFETY CORRIDOR IMPROVEMENTS** **MP 82.5 TO 94** PROJECT NO. CFHWY00130 LAND USE CHANGES OVER TIME KENAI PENINSULA BOROUGH, AK	FIGURE 3.19.2

3.19.4 Invasive Species

Past, present, and reasonably foreseeable future actions that may affect the presence of invasive species within the project area include road construction and maintenance, utility line construction and maintenance (including hazard tree removal), and residential, recreational, and commercial development. These activities could result in alteration or removal of vegetation, introduction and spread of noxious weeds, and/or disturbance of soil conditions. Revegetation efforts associated with the Preferred Alternative, combined with efforts by agencies to control noxious weeds in the project area, would minimize invasive species impacts. Incremental impacts from the Preferred Alternative, when added to the past, present, and reasonably foreseeable future actions, would not result in measurable invasive species impacts.

3.19.5 Noise

Traffic noise in the project area is primarily a result of traffic flows on the Sterling Highway, with secondary traffic noise associated with the local roadway network. The Sterling Highway is the only road connection between western Kenai Peninsula communities and the remaining Alaska road system. It carries commercial, recreation, and tourism traffic, in addition to being the main residential road that connects the communities of Sterling and Soldotna. It is often used by other residents of Southcentral Alaska, including residents from Anchorage, Seward, Kenai, Homer, and other Kenai Peninsula communities. The Sterling Highway provides access between the Sterling and Anchorage areas and beyond, and because of this, it has relatively steady traffic flow year-round and during the summer season in particular. Under existing conditions, four residential properties are currently impacted by traffic noise as modeled levels exceed the noise abatement criteria. With no improvements, this is expected to rise to six residential properties by the design year of 2050.

Preferred Alternative Impacts

Under the Preferred Alternative, 17 residential properties would experience traffic noise impacts – including three of the four currently impacted (Figures 3.9.1-6). Traffic noise at most locations would increase due to increased traffic volumes, increased roadway width, and minor alignment alterations, which would result in reduced setback distances for several receptors. However, in other areas, traffic noise levels would decrease due to the Preferred Alternative being located further from the existing Sterling Highway alignment.

Many of the reasonably foreseeable future projects aim to add connectivity between local road networks and destinations in Soldotna and Sterling. These projects would allow new east-west travel options while allowing commuters to avoid the Sterling Highway. As roads on new alignments would likely result in noticeable increases in noise levels, these potential future projects would need to take responsibility for any impacts through extensive planning, stakeholder coordination efforts, and abatement if necessary. However, the redirection of local traffic away from the Sterling Highway would likely temper noise level increases from the Preferred Alternative. As such, the proposed project's contribution to the cumulative changes in noise levels within the study area is expected to be minimal.

3.19.6 Wetlands

Within the greater Lower Kenai River watershed, in which the entirety of the study area resides, there are thousands of acres of pristine wetlands that haven’t been disturbed by human action

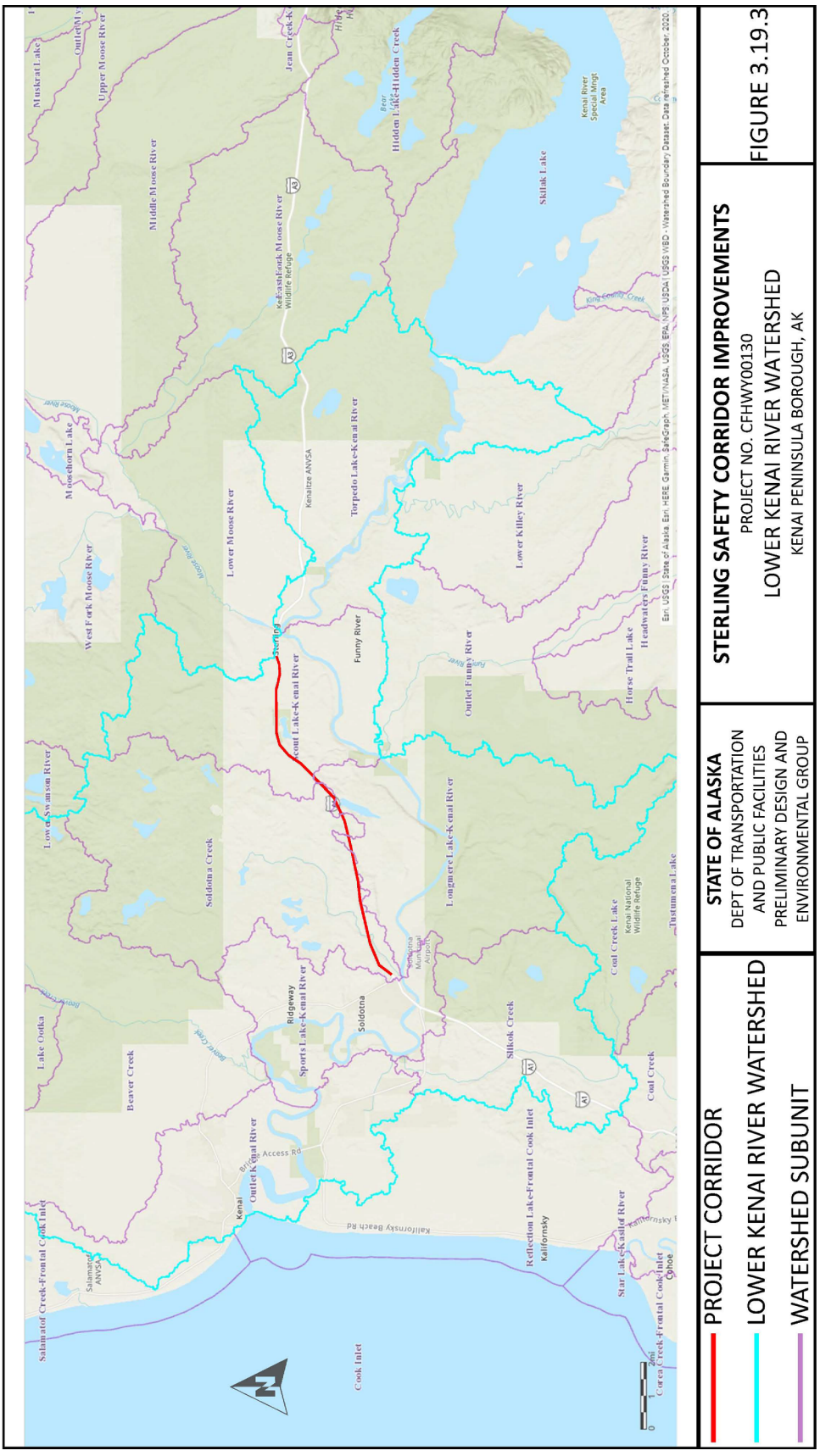
(Figure 3.19.3). However, growth within the study area since the '50s has contributed to the loss of wetlands and certainly affected their ecological function and values. Wetlands are generally avoided as areas for building because they don't provide a solid, dry foundation with which to build upon. However, as the population increases, it is safe to assume that further development will likely impact them due to space limitations.

Growth-induced development and expansion in the study area have affected the overall number, size, and ecological function and value of wetlands within the project vicinity. Wetland losses resulting from land clearing for residences, recreational areas, agriculture, utilities, and transportation projects have occurred, but the availability of uplands has held wetland impacts to negligible levels.

Preferred Alternative Impacts

Wetland impacts from the proposed project are a small part of the cumulative impacts to wetlands within the larger Kenai River and Moose River watersheds. However, the proposed project will likely have some influence on future development along the highway corridor because it will be able to handle increased traffic volumes, and residential and commercial development will continue within the study area. Future development will likely impact remaining wetlands in the area and further the effects of fragmentation and degradation of wetland function and values. If development continues in accordance with Section 404 of the Clean Water Act and the USACE current mitigation policies, future wetland impacts will most certainly be less severe. Specifically, the *2008 Compensatory Mitigation for Losses of Aquatic Resources* rule requires avoidance of wetlands when possible and minimization and compensation for all unavoidable impacts to wetlands. Compliance with this rule would result in less fill being placed in wetlands from future development.

The amount of wetlands affected by the Preferred Alternative would not substantially affect the overall availability of wetlands on a regional scale, nor would the project substantially affect the functionality of the remaining wetlands within the Kenai River and Moose River watersheds. Cumulative impacts from past, present, and reasonably foreseeable actions, combined with those of the Preferred Alternative, would not have a substantial cumulative adverse effect on wetlands.


PROJECT CORRIDOR
LOWER KENAI RIVER WATERSHED
WATERSHED SUBUNIT
STATE OF ALASKA
DEPT OF TRANSPORTATION
AND PUBLIC FACILITIES
PRELIMINARY DESIGN AND
ENVIRONMENTAL GROUP
STERLING SAFETY CORRIDOR IMPROVEMENTS
PROJECT NO. CFHWY00130
LOWER KENAI RIVER WATERSHED
KENAI PENINSULA BOROUGH, AK
FIGURE 3.19.3
Cook Inlet
Kenai River Special Management Area
Skilak Lake
Hidden Lake-Hidden Creek
Jean Creek-K
Muskrat Lake
Upper Moose River
Middle Moose River
Moosehorn Lake
West Fork Moose River
Lower Moose River
Lower Swanson River
Soldotna Creek
Beaver Creek
Lake Ooka
Ridgeway
Sports Lake-Kenai River
Soldotna
Kenai
Outlet Kenai River
Access Rd
Salamatof Creek-Frontal Cook Inlet
Salamatof ANVSA
Kalifornsky Beach Rd
Kalifornsky
Reflection Lake-Frontal Cook Inlet
Star Lake-Eastland River
Ohoe
Corea Creek-Frontal Cook Inlet
Silkok Creek
Coal Creek
Coal Creek Lake
Kenai National Wildlife Refuge
Tustumena Lake
Longmere Lake-Kenai River
Sterling
Sterling Hwy
Scout Lake-Kenai River
Funny River
Outlet Funny River
Horse Trail Lake
Headwaters Funny River
Lower Killey River
Torpedo Lake-Kenai River
Kenaitze ANVSA
Kenai National Wildlife Refuge
Kelly Lake-Moose River
Bear Creek
King County Creek
Esri, USGS | State of Alaska, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA | USGS WBD - Watershed Boundary Dataset: Data refreshed October, 2020
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2mi

3.19.7 Wildlife

The geographic area of influence for the proposed project when considering cumulative impacts on moose populations is expanded to the ADF&G Game Management Unit (GMU) 15A (Figure 3.11.1). Because the unit covers a large geographic area and the Kenai River acts as a natural barrier at the southern border of the unit, it is unlikely that project impacts on moose populations will extend beyond this boundary. Moose populations in the area have varied over time, primarily influenced by wildfire dynamics and winter conditions within the management unit. Populations were described as abundant throughout the 1950s and 1960s, even exceeding carrying capacity by the late 1960s. Within GMU 15A, moose populations have fluctuated from 5,900 in 1971 to 2,500 in 1975, and rebounding to 3,000 in 1982 (Harper 2014). Since 1991, the moose population within GMU 15A has continually declined, predominantly due to land management policies limiting the periodicity and severity of wildfires and beneficial wildfire-induced habitat turnover (Herreman 2018). To address the declining moose populations, the ADF&G Board of Game identified the unit as an intensive management area in 1999. However, the most recent population estimate in 2013 was 1,569, well below the established objective of 3,000-3,500 moose, and populations are expected to remain below objectives without unit-wide habitat turnover (Herreman 2018). However, it's possible the 2019 Swan Lake Fire, which burned over 167,000 acres in the southeast portion of GMU 15A, could result in enough habitat turnover to improve future moose population numbers.

Although wildfires dynamics and winter conditions have been the primary influences on moose populations within GMU 15A, anthropogenic impacts on the landscape have continued to exert an increasing influence on area moose populations. Currently, the largest impacts on the GMU 15A moose population are declining habitat quality and deaths caused by collisions with motor vehicles (Herreman 2018). Development within the unit has steadily reduced the availability and quality of habitat. In response to ongoing development in the project area, traffic volumes and transportation facilities continue to grow and negatively impact moose through moose-vehicle collisions. During the five year period from regulatory year (RY) 2008 (July 1, 2008 to June 30, 2009) to RY 2012 (July 1, 2012 to June 30, 2013), the yearly average of moose killed within GMU 15A increased to 96 from the previous five-year average of 83 (Herreman 2018). Death numbers from moose-vehicle collisions (MVCs) likely fluctuate depending on the amount of snow fall and availability of browse species, and are likely increasing due to the increasing volume of traffic over time within the GMU.

Existing DOT&PF MVC information shows that collision frequencies exceed the 75th percentile thresholds between MP 87 and 93, as identified in the April 2014 DOT&PF memorandum titled "Moose-Vehicle Collisions Priority List 2006-2010". Within this area, MVCs averaged approximately 10 collisions per year. Averaged over the 6-mile length of concern, the frequency is approximately 1.7 collisions per mile per year.

Preferred Alternative Impacts

Forecast human population increases and accompanying development within the KPB will exacerbate the existing habitat segmentation and ongoing loss of habitat. Several of the reasonably foreseeable future actions listed in Table 3.19.1 will have similar impacts on moose populations and habitat. Those projects that propose to construct roads on new alignment would likely pass through areas that provide ideal moose habitat. These projects would introduce new disturbance and human presence in previously undisturbed settings and would likely have a

much greater impact than projects improving already existing facilities. The cumulative impacts from these projects will contribute a far greater cumulative impact to moose than the proposed project which is improving an existing facility. The cumulative effect of all the reasonably foreseeable future actions would likely be adverse to moose populations because they will continually segment and destroy habitat and force the animals into smaller and smaller areas. MVCs are likely to increase through increased interaction between moose and highway facilities and the increased mileage of roads will serve to constrict wildlife movement. In addition, the moose will attempt to avoid habitat near roadways and other human development and force more of them into smaller amounts of prime habitat.

The contribution from the proposed project to cumulative impacts in the area will be minimal because the existing highway, although less than half the size of the Preferred Alternative, already carries a large volume of traffic and functions as a barrier or deterrent to moose migration. Some moose habitat will be permanently lost because widening will require additional land be permanently converted to a transportation use. In addition to this, improved travel conditions are likely to support further development in the area and continue displacing moose.

Habitat loss and alteration could result in a reduction of the carrying capacity for area moose populations. Some alterations could enhance moose habitat by increasing browse. The negative effects of future development on moose habitat and populations in the study area are mitigated to a degree by the amount of undeveloped and protected lands that surround the area. The Kenai National Wildlife Refuge protects a total of 1.92 million acres of habitat across the entirety of GMU 15, with over 614,000 acres located within GMU 15A. Native allotment land and State-owned lands also protect important moose habitat.

The proposed project's contribution to cumulative impacts on moose habitat and mortality are expected to be minimal. About 83 acres of vegetative clearing, including 19 acres of undeveloped forested habitat, will occur as a result of the proposed project. The amount of habitat loss is negligible when viewed against the area of existing habitat that will likely be developed within the foreseeable future. It is expected the addition of lanes and associated reduction in congestion could increase the travel speed within the project corridor as well as the rate of moose-vehicle collisions. However, ROW clearing could offset this and decrease potential moose mortality with greater visibility and reduced moose browse availability.

3.19.8 Recreation and Section 4(f) Resources

The State of Alaska, KPB, and USFWS have dedicated substantial portions of western Kenai Peninsula lands as recreation and preservation areas, to which the Sterling Highway primarily provides access. Recreation opportunities are abundant in the vicinity of the study area as recreation and tourism play such key roles in the economies of the KPB, COS, and Community of Sterling. Opportunities include boating, fishing, hunting, hiking, camping, sightseeing, and wildlife viewing among many others. There are ten public parks, recreation areas, wildlife refuges, and historic properties directly adjacent to or in close proximity to the study area that are eligible for protection under Section 4(f) (Figures 3.12.1-2).

Preferred Alternative Impacts

Impacts from the proposed project are expected to be a minor part of the cumulative impacts to recreation areas and use of Section 4(f)-protected properties within the study area vicinity. As the

proposed project would not result in a use or conversion of use of any LWFC-funded properties, the Preferred Alternative would have no effect on the cumulative impacts to Section 6(f)-protection resources. Overall, the reasonably foreseeable future actions listed in Table 3.19.1 are expected to result in a net benefit to overall recreation resources within the study area, especially with the expansion of local pedestrian and bicycle trail networks. Though the KPB doesn't currently manage recreation areas or facilities within the study area, expanded access to recreation areas and improved coordination with local, state, and federal governments in development of new recreation areas are listed as goals in the KPB comprehensive plan. Similarly, the COS Recreation and Trails Master Plan includes both expanding and developing new recreation facilities as well as forming a multi-agency, multi-organization team to collectively promote, and provide for recreation opportunities and facilities in the Soldotna area. As long as federally-funded transportation projects continue in accordance with Section 4(f) of the U.S. DOT Act and Section 6(f) of the Land and Water Conservation Fund, future impacts to and uses of area parks, recreation facilities, wildlife refuges, and historic properties will certainly be minimized and mitigated as necessary. Cumulative impacts from past, present, and reasonably foreseeable future actions, combined with those of the Preferred Alternative, would not have a substantial cumulative adverse effect on recreation areas or to the activities, features, or attributes that qualifies a park, recreation area, refuge, or historic property for protection under Section 4(f).

3.19.9 Visual

Past, present, and reasonably foreseeable future actions that may affect the visual quality of the analysis area include road construction and maintenance, residential development on private land, and commercial development. As residential populations have grown along Sterling Highway, the character of the corridor has slowly changed from a gravel road with little to no visible development, to a paved two-lane roadway carrying thousands of cars daily and all manner of development visible from the road. Effects on visual quality from the Preferred Alternative, when added to other past, present, and reasonably foreseeable future actions, would likely contribute to the transformation from a more rural and forested feel along the road to one that is more urban and developed.

3.20 Summary of Environmental Commitments

The following is a summary of the environmental commitments made in this EA.

3.20.1 Air Quality

A SWPPP in accordance with the ADEC APDES CGP for storm water discharge from construction sites would be followed during construction to minimize the amount of loose soils available for air transport. This may include vehicle track out reduction, watering, sweeping, and stabilization of all disturbed ground to suppress loose soil and prevent fugitive dust. Construction equipment and vehicles would be properly tuned and maintained, and unnecessary idling would be prohibited.

3.20.2 Cultural Resources

If unanticipated historic, cultural, or archeological resources are discovered during construction, all work that may impact these resources shall stop immediately, and the contractor shall notify

the Project Engineer. Work would not resume at these sites until a Section 106 consultation is conducted with SHPO

3.20.3 Socioeconomics

Access to all adjacent properties, businesses, public facilities, and recreation areas would be maintained at all times; however, access to some properties may be limited or altered to accommodate construction activities. Construction detours and delays would be localized and short in duration, therefore not permanently affecting or restricting economic vitality within the project area.

The contractor and DOT&PF would maintain open lines of communication with all affected parties and keep the public informed of delays or detours through newspaper ads, signage, and other community outreach methods.

3.20.4 Invasive Species

Landscaping and erosion control measures included in the project would not use or contain any invasive species.

The following measures would be included in soil stabilization and revegetation plans identified in the contractor's Stormwater Pollution Prevention Plan (SWPPP) and required by the ADEC Construction General Permit (CGP):

- All construction equipment and vehicles would be washed prior to being brought on site to remove dirt, seeds, roots, and other plant fragments to prevent any invasive species from being brought onto the project or into Alaska.
- All construction equipment and vehicles would be washed on site to remove dirt, seeds, roots and other plant fragments to prevent any invasive species from leaving the project area.
- Any erosion control materials made from straw or hay (e.g. wattles, bales of hay, etc.) would be made from certified weed free straw or hay. If certified materials are not available, locally produced products would be utilized to minimize potential importation of new weed propagules from outside Alaska.
- All disturbed areas would be reseeded with certified weed-free seed and vegetated with native species per the ADNR publication, Alaska Coastal Revegetation & Erosion Control Guide.

3.20.5 Water Quality

Prior to construction, the contractor would prepare a DOT&PF-approved SWPPP in accordance with the APDES CGP and DOT&PF contract specification 641 – Erosion, Sediment, and Pollution Control. The SWPPP would also contain a HMCP and Spill Prevention, Control, and Countermeasures (SPCC) Plan to address spills or leaks of hazardous materials. The SWPPP would identify all receiving waters and specify the structural and procedural BMPs that would be utilized during construction to prevent erosion and untreated runoff from reaching nearby water bodies.

All vehicles, trucks, and heavy equipment would be kept within construction limits and operated in a manner that limits unnecessary ground disturbance. Equipment would be routinely inspected

and serviced to prevent leaks and accidental spills. If leaks or spills should occur, all contaminated material and soils would be contained and disposed of in an approved offsite location.

3.20.6 Noise

The DOT&PF and construction contractor would comply with all local noise rules, regulations, and ordinances. Measures to control construction-related noise would include requiring proper maintenance of all construction vehicles and equipment, including presence of mufflers in acceptable working condition; ensuring haul routes are located away from residential areas; limiting noisy procedures to daytime hours whenever possible; positioning stationary equipment as far as possible from noise sensitive receivers; and limiting unnecessary equipment idling.

The public would be notified in advance of upcoming construction activities.

3.20.7 Wildlife and Migratory Birds

Clearing and grubbing would not be conducted within the USFWS recommended time period of May 1 to July 15 for avoiding vegetation clearing to prevent impacts to migratory birds, except as permitted by, federal, state, and local laws and approved by the DOT&PF Project Engineer.

Clearing and removing or stunting moose browse to 50 feet off the roadway or to the ROW limits where feasible.

3.20.8 Bald and Golden Eagles

The project area would be surveyed for the presence of eagles and/or their nests prior to construction in order to avoid impacts to nests or nesting birds. If active bald or golden eagle nests are found within the project area, a primary zone of a minimum 330 feet would be maintained as an undisturbed habitat buffer around nesting eagles. If topography or vegetation does not provide an adequate screen or separation, the buffer would be extended to 0.25 mile, or a sufficient distance to screen the nest from human activities. Within the secondary zone (between 330 and 660 feet), no obtrusive facilities or major habitat modifications shall occur. If nesting occurs in sparse stands of trees, treeless areas, or where activities would occur within line-of-sight of the nest, this buffer shall extend up to 0.5 miles. No blasting, logging, or other noisy, disturbing activities within the primary or secondary zones would occur during the nesting period (Feb 1 – August 31). If active bald or golden eagle nests are discovered during construction within 660 feet of the project area, construction activities would cease and USFWS would be contacted for guidance on how to proceed.

3.20.9 Recreation and Section 4(f) Resources

To offset the proposed impacts associated with realigning Scout Lake Road, the following would be conducted at Scout Lake SRS:

- Reducing the audio and visual influences of the highway, eliminating through traffic, and encouraging continuity of the central and eastern parcels of the SRS, making the SRS facilities feel more secluded by:
    - Removing the Sterling Highway access point for the existing alignment by extending the fill slope berm south of the highway across the driveway.

    - Obliterating and revegetating the existing alignment from the SRS parking lot to the extended berm.
- Upgrading and moving the SRS access gates and welcome sign to the intersection of the new and old alignments, effectively making the existing Scout Lake Road alignment the new SRS access road.
- Replacing, upgrading, and installing new SRS directional signs along the Sterling Highway and within the neighborhood street network.
- Re-grading the existing SRS parking lot, which has deteriorated and become badly potholed.

3.20.10 Hazardous Materials

Prior to construction, the contractor would prepare and implement a site-specific HMCP and SPCC in accordance with ADEC requirements and DOT&PF contract specifications to address storage and handling of hazardous materials, including fuel and lubricants and spill response.

All construction waste would be managed and disposed of in accordance with all state and federal solid-waste-management laws and regulations.

In the event that contaminated soil or groundwater is encountered during construction, the contractor shall immediately notify the Project Engineer, and all work shall stop until coordination with the ADEC in accordance with 18 Alaska Administrative Code 75.300 has been completed. All contamination would be handled and disposed of in accordance with an ADEC-approved corrective action plan.

3.20.11 Visual

Dust control BMPs would be implemented during the construction phase to increase visibility and reduce air pollution.

3.20.12 Transportation Flow

The contractor would be required to produce and implement a traffic control plan (TCP) to minimize operational traffic delays and providing effective detours during construction when necessary.

The public, affected local schools, public service organizations and emergency personnel would be notified in advance of construction activities and potential road closures.

Access to all adjacent properties, public facilities, and recreation areas would be maintained at all times.

4 COMMENTS AND COORDINATION

The development of this project began in 2013 with preliminary scoping and the initiation of environmental and preliminary engineering studies. Over the course of project development and preparation of this environmental assessment, DOT&PF sought agency and public input on the proposed project to ensure awareness, receive input from potentially affected partners, identify resource agency concerns, and to develop project alternatives that reflect this input. This section summarizes issues raised by the resource agencies and public. Agency and public involvement is an ongoing process and will continue through the design and construction phases.

Refer to Appendix F for detailed scoping information including the Scoping Summary Report which discusses the scoping methods used, issues and concerns identified, and comments received along with their sources and associated DOT&PF responses. Comments were received from a variety of stakeholders including local residents, resource agency representatives, local government officials, and interested organizations. Comments received during the public involvement process were individually addressed, generally in the same manner they were received, and will be considered through final design and incorporated to the extent practicable given the project scope, purpose, and need.

Outreach activities included the following:

- Scoping letters to resource agencies
- Public scoping meetings, mobile meetings, and open houses
- Project website which provides a mechanism for the public to post comments, sign-up for a project update e-mail list, find locations and times of upcoming public meetings, view proposed alternatives, and find contact information for the project team
- Newspaper, television, and radio advertisements encouraging comments and advertising upcoming public meetings
- Project comment e-mail address which was included in advertisements, notifications, mailers, and comment forms
- Presence at Anchorage Transportation Fairs
- Mail and e-mail information distribution lists for the public, government, and elected officials which included 3,500 mail addresses and 200 email addresses
- Presentations and meetings with local government officials and city councils

4.1 Agency Scoping and Coordination

The Scoping Summary Report found in Appendix F documents the results of the formal public and agency scoping activities conducted during the scoping phase, including all comments received and associated responses. Agency scoping was conducted through a variety of activities, including meetings, presentations, and formal scoping letters.

Key agencies or organizations that have been contacted for this project is listed in Table 4.1.1 below.

Table 4.1.1: Resource Agency Stakeholders

Level	Agency/Entity
Federal Agencies	Bureau of Indian Affairs Bureau of Land Management (BLM) National Marine Fisheries Service (NMFS) National Oceanic and Atmospheric Administration U.S. Army Corps of Engineers (USACE) U.S. Department of Agriculture (USDA) U.S. Environmental Protection Agency (USEPA) U.S. Forest Service (Seward Ranger District) U.S. Fish and Wildlife Service (USFWS) U.S. National Park Service (NPS)
State Agencies	AK Department of Commerce, Community, & Economic Development AK Department of Environmental Conservation (ADEC) • Division of Spill Prevention and Response, Contaminated Sites • Division of Water • Division of Air Quality AK Department of Fish and Game (ADF&G) • Division of Habitat • Division of Wildlife Conservation AK Department of Natural Resources (ADNR), • Division of Parks & Outdoor Recreation (DPOR) • DPOR State Historic Preservation Officer (SHPO) • Division of Mining, Land, & Water (MLW) • Division of Agriculture Alaska State Troopers
Local Agencies	Kenai Peninsula Borough (KPB) KPB Kenai River Center City of Soldotna (COS) City of Kenai Homer Soil and Water Conservation District Area legislators and elected officials Central Emergency Services Sterling Community Club
Native Entities	Cook Inlet Region, Inc. Chugach Alaska Corporation Kenai Natives Association, Inc. Salamatoff Native Association, Inc. Chugachmiut, Inc. Kenaitze Indian Tribe Qutekcak Native Tribe

A summary of agency scoping activities is included in Table 4.1.2, and documentation of all agency coordination can be found in Appendix F. Summaries of agency responses received is also provided in Table 4.1.3.

Table 4.1.2: Summary of Agency Scoping Activities

Date	Activity	Description
September 4, 2013	Agency scoping letter distribution	Solicited input from agency stakeholders, requesting the following: • Further analysis needed to evaluate sensitive resources potentially impacted by the proposed project • Regulatory permits/clearances required by your agency • Any concerns or issues your agency or organization might have with the proposed project
December 10, 2013	Briefing with KPB and COS	Discussed project details with agency personnel, including general overview, alternatives, and challenges
June 24, 2014	Briefing with KPB and COS	Discussed project details with agency personnel again
October 29, 2019	Agency scoping letter distribution	Re-solicited input from agency stakeholders due to time passed since initial effort
June 11, 2020	Site visit with DNR DPOR	Discussed potential use of and impacts to Scout Lake SRA, as well as potential mitigation and enhancement measures with DPOR Kenai/Prince William Sound Area Superintendent
December 10, 2020	Follow-up scoping with DNR MLW	Solicited input regarding Scout Lake Road State Recreation Site (SRS) and the Section 4(f) process

Outside of dedicated agency scoping activities, resource agency personnel and State and local elected officials also attended several of the public meetings discussed in Section 4.2 below.

Table 4.1.3: Summary of Agency Scoping Responses

Date	Agency	Comment Summary
September 9, 2013	NMFS	No comments or concerns
December 27, 2013	Kenaitze Indian Tribe	Expressed support for the project and requested opportunities to provide input and guidance prior to ground disturbing activities due to traditional use of the area by the Kenaitze.
November 7, 2019	ADEC Contaminated Sites Program	Stated no concern about surface soil or groundwater contamination from the Zipmart Store and SS&T Tesoro Station sites as long as excavation is limited to the upper 10 feet of soil and above the groundwater table.
November 15, 2019	KPB Floodplain Administrator	Stated the only floodplains located within the project area were located around Soldotna Creek and Moose River, but there were no major concerns regarding the project.
November 26, 2019	ADF&G Division of Habitat	Expressed concern about sport fishing access at Longmere Lake if accesses are converted to right-in right-out only. Requested nearest median openings be designed to safely accommodate boat trailer U-turns. Confirmed any in-water work

Date	Agency	Comment Summary
		at Soldotna Creek will require an ADF&G Title 16 Fish Habitat Permit.
November 26, 2019	KPB Kenai River Center	Stated construction activity within the habitat protection zone (within 50 horizontal feet of ordinary high water) of Soldotna Creek would require a Conditional Use Permit
December 13, 2019	USEPA	Expressed support for the project and offered the following general recommendations regarding the NEPA process: • Include a reasonable range of alternatives • Appropriately assess environmental impacts and mitigation efforts, including climate adaptation • Discuss consistency with land use plans and assess environmental justice • Coordinate with tribal governments Also recommended incorporating wildlife crossings into the project design due to the high abundance of moose populations in the area.
December 13, 2019	COS Public Works Department	Expressed support for the project and offered the following comments: • Maintain left turn access as much as possible • Ensure any eliminated driveways have alternate access • Support for separated, paved multi-use pathway and providing connection to existing trail systems • Suggested pedestrian crossings and a pedestrian pathway on the south side of the highway • Suggested signalization of the Mackey Lake intersection • Suggested improvements to Kleeb Loop • Requested consultation with vegetation clearing within city limits • Stated maintenance of any additional frontage roads within city limits would be the responsibility of the State
December 20, 2019	DNR MLW	Offered the following comments: • Three MLW-managed material sites are located within project boundaries and construction materials may be acquired through sale contract • Land use permits would be required for staging, storage, and man camp activities located on MLW-managed lands • Request for Moose River access not be restricted during construction or maintenance and to provide a plan for public portage if restriction is necessary

Date	Agency	Comment Summary
		• Easements would be required for any improvements within MLW-managed lands outside DOT&PF ROW • Notification that MLW co-manages the Scout Lake SRS with DNR DPOR and should be included in Section 4(f) consultations
January 22, 2020	USDA Natural Resources Conservation Service	Provided a soils report for the project area and notified DOT&PF that soils/farmlands of local importance are located in the corridor. However, no additional impacts are foreseen as the project does not propose to convert any of those lands into non-agricultural uses.
May 7, 2020	ADEC Contaminated Sites Program	Stated no concern about contamination from the Soldotna Y Chevron site.

Agency comments were considered during development of the environmental document and have been addressed as needed in the associated Affected Environment and Environmental Consequences sections. Comments will be further assessed in the project design phase and incorporated to the highest extent practicable, given the project scope, purpose, and need. Copies of all agency coordination correspondence including DOT&PF responses, scoping materials, and presentation materials can be found in Appendix F.

4.2 Public Scoping and Coordination

Public scoping and coordination activities for the proposed project were devised to involve stakeholders via community information sharing throughout project development, as well as periodic updates to community organizations and groups. This included two mobile meetings, four public open houses, a project website, newspaper advertisements, and announcements via mail, e-mail, radio, and television. The Department also staffed a booth at annual Anchorage and Matanuska-Susitna (Mat-Su) Transportation Fairs. A summary of public involvement activities and outreach techniques for the project is outlined in Table 4.2.1. Appendix F contains documentation for all public involvement and outreach activities, including individual comments and associated responses.

Table 4.2.1: Summary of Public Scoping and Outreach Activities

Date	Activity	Description
Ongoing	Project website: www.sterlinghighway82to94.com/	Provides a mechanism for the public to post comments, sign up for project updates, find locations and times of upcoming public meetings, view proposed alternatives, and find contact information for the project team
Ongoing	Project comment email addresses: sterlinghwy@brooks-alaska.com info@sterlinghighway82to94.com	Provides a means for submitting public input electronically
Ongoing	Posts on DOT&PF social media pages: www.facebook.com/AlaskaDOTPF twitter.com/AlaskaDOTPF	Provides a venue to post project announcements, provide interactive notices of public meetings, or other project activity to followers. This tool allows people who may not normally

Date	Activity	Description
		participate in any other way to comment or ask questions informally and get an official response
July 16-23, 2013	PSA posted in ADN, Homer News, on DOT&PF Online Public Notice website, Facebook, and Twitter	Announced mobile public meetings in Soldotna and Sterling
July 18-21, 2013	PSA broadcast on local radio and television stations	Reminder about mobile meetings
July 21, 2013	Email update	Reminder about mobile meetings
July 22-23, 2013	Mobile meetings in Soldotna and Sterling	Share project information and seek experiences, comments, and suggestions from the public during peak commuter and tourist season
July 29, 2013	Article published in Peninsula Clarion	Summarized mobile meetings and comments received. Provided project website for public to continue providing input electronically
December 4, 6, & 9, 2013	Display advertisement in the Peninsula Clarion	Announced public open house in Soldotna
December 10, 2013	Public Open House 1	Share project information and collect stakeholder input on alternatives, proposed impacts, and schedule
December 11, 2013	Article published in Peninsula Clarion	Summarized the open house and comments received. Provided project website for public to continue providing input electronically
June 24-25, 2014	Public Open House 2-3	Share project information, present the draft Preliminary Decision Document, and collect stakeholder input on alternatives, proposed impacts, and schedule
June 25, 2014	Article published in Peninsula Clarion	Summarized the draft Preliminary Decision Document, including the alternatives evaluated, and discussed the project needs and schedule
January 28, 2016	Public Open House 4	Share project information, present the draft Preliminary Engineering Report, and collect stakeholder input on alternatives, proposed impacts, and schedule
February 4, 2016	Anchorage Transportation Fair	Share project information and collect general public input on alternatives, proposed impacts, and schedule
February 21, 2016	Article published in Alaska Dispatch News	Detailed the project history, including State ownership of the land under Good Time Charlies in Soldotna
September 13, 2016	Mat-Su Transportation Fair	Share project information and collect general public input on alternatives, proposed impacts, and schedule
September 5, 2018	Mat-Su Transportation Fair	Share project information and collect general public input on alternatives, proposed impacts, and schedule

Date	Activity	Description
February 6, 2019	Anchorage Transportation Fair	Share project information and collect general public input on alternatives, proposed impacts, and schedule
November 25-29, 2019	Notice of Intent to Begin Engineering and Environmental Studies posted on DOT&PF Online Public Notice website, in the Anchorage Daily News, and in the Peninsula Clarion	Described project and requested stakeholder input
February 25, 2021	Kenai Transportation Fair	Displayed video update describing project description, status, and next steps.

Project Website

The website provides a mechanism for the public to post comments, sign-up for a project update e-mail list, find locations and times of upcoming public meetings, view proposed alternatives, and find contact information for the project team. The project website is a useful tool to keep in constant contact with the public, for relaying information regarding the current project schedule, and posting progress documents. Project team contact information provided a mechanism for those interested in the project to send e-mails. The site was developed using DOT&PF's project website template and contained the following basic information:

- Home/Project Overview
- Schedule
- Public and Agency Meetings
- Documents and Reports
- Public Involvement/Comments
- Online Contact Form
- Project Team

An interactive map was also developed to provide a more effective tool that allows users to place their comment at a particular location on a map. This tool was available on the project website home page and garnered 118 comments.

Project Mailing Lists

The project team developed a mailing list and email distribution list of interested public, area property owners, residents, government entities, elected officials and agencies for use throughout scoping. This enabled the project team to quickly and efficiently disseminate up-to-date project information and announcements for public involvement opportunities. The list included over 3,500 U.S. Postal Service addresses and 200 email addresses.

Mobile Public Meetings

Mobile meetings were planned in the communities of Soldotna and Sterling to actively seek information from the public during peak commuter and tourist season. Graphics of the project corridor were provided and individuals were encouraged to share their experiences, comments, and suggestions on the need for this project, potential improvement ideas, safety concerns, and any other issues they may have about the transportation corridor. Comments were collected on

project maps and team member notes. Combined attendance for all four mobile meetings totaled approximately 150 people and 113 written comments were received by the team.

Public Open Houses
Four public open houses were held to gather feedback on the project. Community members were given a presentation about the project and invited to review the display graphics and ask the project staff questions. Attendees were asked to identify a cross-section preference, provide the team with an explanation of why the particular alternative was their preference, and provide comments on the draft PDD and PER. Attendance for all four meetings totaled approximately 193 people and 59 written comments were received by the team.

The following topics were covered in the presentations:

- Meeting purpose
- Existing alternatives
- Project description and need for improvements
- Identification of cross section alternatives
- Environmental resources
- Project schedule
- Public process/opportunities to be involved

Materials available at public meetings included a project fact sheet, comment sheet, an aerial photo of the corridor, and display boards that showed potential highway cross-sections under consideration in the PDD and PER. Meeting materials are available in Appendix F.

Anchorage Transportation Fair
The project was one of several Sterling Highway corridor projects presented at the annual Anchorage Transportation Fair. The event emphasized projects being completed by DOT&PF, the Municipality of Anchorage, Alaska Railroad Corporation and others within the Municipality of Anchorage. In addition, since Anchorage is Alaska's largest city, projects on the main corridors—Parks Highway, Seward Highway, Glenn Highway and Sterling Highway were also presented. In 2016, staff manned a table for each corridor containing applicable project fact sheets. The staff were also able to answer questions about the projects. In 2019, a fact sheet was provided, but the project did not have a designated booth. Meeting materials are available in Appendix F.

Mat-Su Transportation Fair
Project fact sheets were also presented at the annual Mat-Su Transportation Fair, which emphasizes projects being completed by DOT&PF, the Mat-Su Borough, Alaska Railroad Corporation and others within the Matanuska-Susitna Borough.

Kenai Transportation Fair
A video update was displayed at the annual Kenai Transportation Fair, which emphasized projects being completed by DOT&PF, the KPB, and others within the Kenai Peninsula Borough.

4.2.1 Public Comments

Over 250 comments were gathered from the mobile meetings, public open houses, Transportation Fairs, and the project website's interactive map and comment e-mail inbox. All

comments received were carried forward for consideration in project development and, where appropriate, project staff responded. Documentation for all public comments and associated responses can be found in Appendix F.

Comments received during development of the EA indicate a large majority of stakeholders support improvements to the Sterling Highway. Local users of the roadway acknowledge the increasing levels of congestion and delay, as well as the number of crashes and fatalities and generally expressed a strong desire for improvements that will increase safety and decrease travel time.

4.2.2 Summary of Comments by Category

Public comments have been organized by topic and summarized below. Copies of all comments received for the project and responses provided are included in Appendix F.

Alternatives to Consider
Commenters suggested various alternatives for the team to consider as they prepared the safety corridor study including:

- Fit an alternative to the existing ROW so you can build something faster
- 3 lanes – two travel lanes, center two-way left-turn lane (CTWLTL)
- 2 lanes with major intersection turn lanes and passing lanes where appropriate
- 5 lanes – two travel lanes each direct, CTWLTL (like Sterling)
- 4 lane divided with frontage/parallel routes where feasible
- Grassy depressed median
- Jersey barrier median where ROW narrows
- Multi-use pathway/trail – include in all alternatives to accommodate bicycles and pedestrians away from the road
- Spread traffic around, build the bridge over the Kenai to connect to Funny River Road

Access
Commenters identified areas for access improvements including desire for left and right turn lanes at major intersections and acceleration lanes at Mackey Lake Road and other side streets. It was requested that a median opening be maintained at On Par Lane for fire response access from the Forestry building. There were also concerns about U-turns and access to business for large trucks and recreational vehicles.

Stakeholders also described the difficulty entering the highway and turning left to exit the highway. The U.S. Forest Service underscored this concern and the problems it created when responding to emergencies. Most commenters related the problem with the high seasonal traffic in the area and said it was the cause of the frequent “passing on the right” behavior observed on the Sterling Highway.

Business Impacts
Businesses operating along the corridor expressed concerns with improvements that would limit customer access. These stakeholders also tended to support a five-lane cross section for a portion (Sterling to McKay Road) or the entire corridor. Some felt that knowing what the long-term solution was, either five-lane or four-lane divided highway, would provide some certainty for

business planning. A four-lane divided highway, it was commented, would restrict access to businesses and potentially put them out of business.

Cost
There was concern about the cost of the project considering the current fiscal situation.

Drainage
Drainage issues were pointed out on the Sterling Highway near Solid Rock Bible Camp and near Big Johns Chevron Station.

Environmental
A resident who lives on Whisper Lake was concerned the lots along the southern portion of the lake may be used as a gravel source. She did not want any disruption to the lake as there is a lot wildlife use. She was also concerned about lake water levels and did not want to see them change. There was concern about moose crossing the highway and if any moose crossings or other types of crash mitigation would be constructed as part of this project.

Frontage or Backage Roads
Stakeholders suggested the use of frontage roads or parallel corridors to spread the traffic out and reduce the volume on the Sterling Highway. Frontage and backage roads in the area were studied by DOT&PF in a separate project.

Lighting
Area stakeholders expressed a desire for lighting at the intersections and side roads only. While they understood the project team's recommendation to light the entire corridor to mitigate moose collisions, some desired less lighting.

Maintenance
DOT&PF should do a better job maintaining and replacing pavement markings and provide better sanding during winter months.

Moose Crash Mitigation
Commenters requested that DOT&PF clear ROW and add lighting for moose/vehicle collision mitigation.

Noise
There were complaints about noise generated by the rumble strips in passing zones.

Non-Motorized Users
In addition to accommodating the needs of motorists, the project must consider non-motorized users such as walkers and bikers. Stakeholder-suggested alternatives included the following:

- Multi-use pathway/trail: include in all alternatives to accommodate bicycles and pedestrians away from the road. The multi-use pathway should be separated from the roadway wherever possible to increase safety factor.
- Wider shoulders for the length of the project
- Most commenters suggested a trail be separated from the road
- Overpasses, underpasses, or at grade crossing locations
- Consider both recreational and commuter bicyclists

- Paved pathway on one side, gravel on the other side for all-terrain vehicles (ATV)

Off-Road Vehicle Use
Residents and highway users shared observations of off-road vehicle (ORV) use along the corridor including ATVs, snow machines, and motorcycles (dirt bikes). Many characterized the drivers of these vehicles as youth (ages between 8 and 14 years old). Many felt the youth riders used the roadside because they were too young to get a driver's license. Stakeholders suggested accommodating these users in the ROW and were concerned about private property encroachments if they were not accommodated within the ROW. Stakeholders also spoke of safety concerns when ORVs stir up dust along the corridor obscuring highway users' vision. Some commenters felt these vehicles should not be permissible on the Sterling Highway.

Pavement Markings and Signage
Reflective lane markings are needed to clearly delineate the edges and centerline of the road. Requests were made for DOT&PF to review the placement of speed limit signs entering and exiting the Sterling area - better placement would lead to better compliance.

Project Delivery Schedule
Area stakeholders sought to understand the project development process and why projects took so long. Stakeholders wanted to know why projects took so long to build when the roads were in dire need of improvement. Many stakeholders wanted DOT&PF to proceed with improvements "immediately."

Safety and Safety Corridor
Concern for safety of all users including motorists, pedestrians, bicyclists, tourists, ORV users, etc. Stakeholders were aware of the safety corridor designation and shared stories of fatal crashes, injury crashes, and near misses. They mentioned prevalent behavior such as speeding, passing on the right at intersections, tailgating, and lack of headlight use, and a seeming lack of enforcement. Commenters also spoke of the tourists who are generally unfamiliar with the area and potentially increasing the risk. The commenters suggested safety improvements including: banning cell phones, slowing traffic, banning some vehicles, and increased enforcement.

When the road is upgraded, the "Safety Corridor" designation should be removed. Most of the public feel the reason for the designation is not as much about safety but it is more government control.

School Buses and School Zones
Stakeholders noted that Kenai Peninsula School District buses stop on the Sterling Highway to pick up and drop off students. In the past, this has taken place in the shoulder of the road. Current practice has the school bus stopping in the travel lane. Requests were made for school bus pullouts within the corridor to increase safety.

A Sterling Community Center representative requested better school zone flashing lights that are bright and are not obstructed by other objects along the highway and crosswalks at Swanson River Road/Scout Lake Road to provide more safety to pedestrians near Sterling Elementary School.

Sight Distance
Lower hillcrest height in area of Evergreen Drive.

Speed
Speeding is a problem on the Sterling Highway and expressed concerns regarding increase speed with a four-lane divided highway.

Support for Project
Many comments were heard in support of the project.

Traffic Volume
Stakeholders shared their observations of higher summer traffic, particularly traffic increases coinciding with salmon dip-netting on the Kenai River and special events such as the Salmonstock/Salmonfest music festival held annually in Ninilchik. Other commenters felt the traffic volumes were high for a two-lane roadway at all times of the year.

Traffic Signals
Sterling area stakeholders suggested installation of a traffic signal at the Sterling Highway intersection with Swanson River Road to facilitate ingress and egress to the new Sterling Community Center, the Sterling School, Baptist Church, and for workers at the Swanson River oil fields. Commenters also wanted to see a traffic signal at Mackey Lake Road.

4.3 Stakeholder Involvement Subsequent to Approval of the Draft EA

~~To be completed once public has an opportunity to comment prior to EA approval.~~

The DOT&PF Statewide Environmental Office (SEO) approved the Draft EA for public availability on July 14, 2021. The Draft EA was subsequently made available to the public; local community groups; local, state, and federal government agencies; and resource agencies. The formal comment period began August 8, 2021 and ran through September 24, 2021, for a total of 47 days. Stakeholder involvement activities are identified in Table 4.3.1 below.

Table 4.3.1: Stakeholder Involvement Activities Subsequent to Approval of the Draft EA

Date	Activity
July 14, 2021	Draft EA approved for public availability
August 4, 2021	Approved Draft EA and appendices uploaded to project website
August 7, 2021	Copies of Draft EA placed in Soldotna Public Library and DOT&PF Central Region office at 4111 Aviation Avenue in Anchorage, AK
August 8, 2021	Notice of Draft EA Availability and Public Hearing ad posted in Peninsula Clarion
August 10, 2021	Notice of Draft EA Availability and Public Hearing ad posted on the DOT&PF Online Public Notice website
August 12, 2021	Notice of Draft EA Availability and Public Hearing and links to the Draft EA on the project website submitted to resource agencies
August 17, 2021	Postcard notice of Draft EA availability and public hearing sent to mailing list
September 1, 2021	Second Notice of Draft EA Availability and Public Hearing ad posted in Peninsula Clarion
September 1, 2021	E-Newsletter sent to project website subscribers
September 2-8, 2021	Notice of Draft EA Availability and Public Hearing ad on KSKA-FM

Date	Activity
September 8, 2021	Information kiosk set up at Soldotna Safeway
September 8, 2021	Open forum public hearing
September 9, 2021	Virtual public meeting
September 24, 2021	Draft EA comment period closed

The open forum public hearing on September 8, 2021 and virtual public meeting on September 9, 2021 included informational displays on the project schedule, development and alternatives evaluation, description of the Preferred Alternative, and next steps. Project team members were present to discuss the project and answer questions, and included: the project manager, consultant coordinator, and environmental analyst, as well as staff from the Public Involvement consultant. Written comment forms were available during the public hearing and several times throughout both meetings, the project website and email address were provided to encourage written comments via email. A court reporter was present during the public hearing to receive verbal comments from stakeholders. Public involvement documentation, including sign-in sheets, fact sheets, outreach efforts, meeting infographics, and presentation slides are included in Appendix F.

4.3.1 Stakeholder Comment Summary

Approximately 20 formal comments were received from the information kiosk, public hearing, virtual public meeting, telephone, and the project website's comment e-mail inbox, though several additional informal comments were made during in-person interactions. As with stakeholder involvement activities prior to Draft EA approval, all comments received were carried forward for consideration in project development and, where appropriate, project staff responded. Comments received during the public hearing were generally in support of the proposed improvements, though not all attendees agreed. However, local users of the roadway continued to acknowledge the increasing levels of congestion and delay, as well as the number of crashes and fatalities and generally expressed a strong desire for improvements that will increase safety and decrease travel time. Public comments have been organized by topic and summarized below. Agency comments and DOT&PF responses have been summarized in Table 4.3.2. Copies of all comments and associated responses are included in Appendix F.

Access and Business Impacts
Commenters identified areas for access improvements including desire for left and right turn lanes at several intersections. Multiple comments were received in opposition to accesses changing to right-in-right-out and the proposed median breaks requiring U-turns. Some commenters expressed concern that the Preferred Alternative would negatively impact future growth of the community.

Frontage Roads
Stakeholders suggested the use of frontage roads or parallel corridors to spread the traffic out and reduce the volume on the Sterling Highway. Frontage and connection roads will likely be evaluated during the design phase.

Moose Crash Mitigation
Commenters expressed concern that increased road width and traffic speeds may increase moose-vehicle collisions. Many asked about mitigation efforts such as clearing the ROW and increased lighting.

Noise
Commenters felt the current traffic noise is already too high and worry that the expanded roadway would exacerbate the issue. Some commenters felt the noise produced during construction would be significant for those who live adjacent the highway.

Project Design
Several commenters expressed dislike for the proposed alternative's grassy depressed median and suggested having the CTWLTL be extended throughout the length of the project. Some felt traffic lights would help with traffic flow, while others felt the project was not needed and the purpose and need were inaccurate.

Project Schedule
Many commenters asked about why the project was taking so long to go to construction, and several wanted to know what activities have occurred since the project was last presented several years ago. Some expressed frustration with the perceived lack of progress.

Safety
Concern for safety of all users including motorists, pedestrians, bicyclists, tourists, ORV users, etc.

Speed
Comments were received indicating several felt the speed limit was too high and would like to see the new design incorporate a lower speed limit throughout the project corridor.

Support for Project
Many comments were heard in support of the project.

ROW Impacts
Several commenters expressed concern they may lose property to ROW acquisitions, though most concerned stakeholders' properties were not identified as needed for the proposed improvements

Table 4.3.2: Summary of Agency Comments and DOT&PF Responses

Date	Agency	Comment Summary	DOT&PF Response
September 15, 2021	KPB River Center	Should work be done at Soldotna Creek or Moose River a KPB Floodplain Permit would be required. Additionally, if work within 50-foot Habitat Protection Districts, a Conditional Use Permit would be required.	Noted, thank you.

Date	Agency	Comment Summary	DOT&PF Response
September 22, 2021	DEC Contaminated Sites Program	Provided program standard comments to consider during design, including information regarding contaminated sites with Cleanup Complete and Informational status.	Noted. DOT&PF will continue to work with relevant agencies during the design process. Prior to construction, a Hazardous Materials Control Plan will be developed which will include instructions on what to do should unexpected soil or groundwater contamination be encountered.
September 23, 2021	EPA	Provided recommendations related to aquatic resources, water quality, air emissions, climate change, and ecological connectivity.	EPA's recommendations are noted, however there is insufficient design information to address them at this time. EPA's recommendations will be carried forward for consideration during project design.

5 LIST OF PREPARERS

This EA was prepared by staff at DOT&PF with support from several consulting agencies, as listed in Table 5.1.

Table 5.1: List of EA Preparers

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Heather Campfield	HDL	Consultant Environmental Analyst; Development of Preliminary Decision Document and Preliminary Engineering Report
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Various Staff	HDR	Noise Analysis Consultant
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