

BUILD Grant

2020



Sterling Highway Phase 1B

Alaska Department of Transportation
& Public Facilities



Cover Page

Project Name	Sterling Highway 45-47 Phase 1B
Project Description	This grant will provide about half of the funding to build mile point 45-60 of the Sterling Highway, including building shoulders to standard, fixing the geometry of the existing alignment and providing a new divided pathway for non-motorized traffic.
Urban/Rural	Rural
Urbanized Area	
Capital or Planning	Capital
Project Type	Road - New Capacity
Primary Project Location Zip Code	99572
Project Previously Submitted?	Yes - INFRA
Prior BUILD/TIGER Funds Awarded to Project?	No
FY20 INFRA or PIDP Applications?	Yes – INFRA
Amount Requested	\$25,000,000
Total Project Cost	\$55,000,000
Total Federal Funding	\$54,500,000
Total Non-Federal Funding	\$500,000
Tribal Government?	No
Tribal Benefits?	Yes - Direct tribal benefits
Private Corporation Involvement	Yes - directly involves or benefits a private corporation
Private Corporation Name(s)	Private Freight Shippers, Charter Boat and Tourism Companies, Cruise Ship Lines
TIFIA/RRIF?	No
Department Financing Program?	Yes
Designated Opportunity Zone?	The project is fully located within an Opportunity Zone
Citations Found at BUILD Grant webpage	

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Table of Contents

Program Description	1
Project History	1
Project Purpose and Need	3
Project Details	3
Project Impact	5
Project Location	7
Grant Funds, Sources and Uses of Project Funds	7
Primary Selection Criteria	8
Economic Competitiveness	8
Freight Movement	11
Quality of Life	12
Safety	14
Environmental Sustainability	16
Secondary Criteria	17
Innovation	17
Partnerships	18
Environmental Risks	18
Project Schedule	18
Financial Commitment	19
Risk Mitigation	19
Benefit Cost Analysis	20

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Program Description

The Alaska Department of Transportation and Public Facilities is pursuing a project to route the Sterling Highway from Mile Post 45 to Mile Post 47 around the small community of Cooper Landing and upgrade the design of that highway to modern highway standards for safety and design. This \$50 million project would remove or reduce unsafe conflicts and reduce highway congestion, increase recreational and commercial opportunities in the region and decrease the risk of major hazardous waste spills on the highway that would threaten a world class fishery resource.

This project is one piece of a larger \$400 million multi-phase effort to bring the last remaining section of this important NHS route to be significantly upgraded since Alaska Statehood up to modern design standards. That project would also construct the largest single span bridge in the state over Juneau Creek.

Sterling Highway MP 45-47 Phase 1B would reconstruct the east end of the existing roadway with 12' lanes and 8' shoulders, roadway curves designed for highway speeds with passing lanes, and intersections for the existing Cooper Landing road beginning in 2021 and be completed by 2024. The Sterling Highway Project received a Record of Decision¹ from the Federal Highway Administration (FHWA) in 2018 and project readiness information is provided later in this document.

This project satisfies the BUILD Grant primary criteria for safety, economic competitiveness, environmental sustainability, quality of life and secondary criteria of project innovation. Each of these criteria is discussed in greater detail later in this document.

A Benefit Cost Analysis for this segment of the project was performed by HDR Inc, a design consultant firm that has worked extensively with the Alaska DOT&PF. Based on the analysis presented in the BCA, the project is expected to generate \$43.81 million in discounted benefits, and \$43.56 million in discounted capital costs, using a 7 percent real discount rate. Therefore, the project is expected to generate a Net Present Value of \$0.24 million and a Benefit/Cost Ratio of 1.01. The BCA is discussed in more detail later in this document and it is attached as an appendix.



Source: Alaska DOT&PF

Project History

The surface transportation system in Alaska is relatively modest when compared to the Lower 48, where the Eisenhower Highway System linked nearly every community from the Atlantic to the Pacific oceans and major highways dramatically reduced travel times for motorists. Alaska has 17,000 miles of public

¹ [FHWA Record of Decision, May 31, 2018.](#)

roads yet as of 2009 only 31 percent of those miles are paved². Despite being the largest state in the U.S., Alaska has only 2,229 miles of National Highway System roads. Nearly all of our state's NHS system came into existence as either a national priority or in pursuit of valuable natural resources that helped secure our statehood in 1959 and has financed it since.

The Sterling Highway is typical in this regard. Much of its early history between 1870 and the early 1920s was carved out of a series of trails in mostly unsuccessful pursuits of gold other minerals or furs. By 1941 a year round maintained gravel road had been established between Cooper Landing and Moose Pass and within 10 years would finally link the western Kenai Peninsula to Anchorage³ with a "modern highway" by the standards of that time.

Several studies in the 1980s and 1990s looked at routes for the proposed highway. In 2000, DOT&PF and FHWA began the Sterling Highway Milepost (MP) 45-60 Supplemental Environmental Impact Statement (EIS). Environmental studies, engineering, and public involvement efforts were conducted from 2000 to 2018, resulting in final selection of the Juneau Creek Alternative.

The existing characteristics of the highway do not meet current design standards for a rural principal arterial road. This portion of the highway is narrow and curvy, with steep grades. It lacks sufficient shoulders, and available sight distances are inadequate.

Phase 1B of Sterling Highway MP 45-60 project is 2.5 miles, between MP 45 to 47 of the Highway. This project will:

- Widen the two traffic lanes from 11 foot lanes to 12 foot lanes;
- Widen the shoulders from 0-2 feet to 8 feet;
- Add a 12 foot westbound passing lane that transitions to an eastbound passing lane;
- Add a pedestrian / cycling trail;
- Significant "straightening" of the road;
- Reduce the number of private driveways that have access to the highway;
- Install highway culverts;
- Install additional signage;
- Construct a three legged stop-controlled intersection; and
- Increase the posted speed from 40 mph to 60 mph.

The Sterling Highway is classified as a "Rural Principal Arterial" and is part of the Interstate Highway System. It begins at the junction of the Seward Highway at Tern Lake and runs for approximately 142 miles along the western coast of the Kenai Peninsula through the Chugach National Forest and Kenai National Wildlife Refuge terminating at Homer.

² [Alaska DOT&PF Certified Public Road Mileage Report.](#)

³ Sterling Highway Final EIS, Chapter 3.9; Historic and Archaeological Preservation 2018, pp-3-224-3-228.

Project Purpose and Need

DOT&PF has affected major upgrades of most of the Sterling Highway over the years to keep pace with the growing surface transportation pressures that have come from tourism, oil and natural gas extraction and commercial fishing and a relatively diversified economy along the western Kenai Peninsula.

However, the multi-phase Sterling Highway redesign from MP45-60 is the last segment of the highway that is substantially unchanged from its original construction, creating a bottleneck at Cooper Landing. Among the problems identified:

- A constricted valley between the Kenai River and steep mountain walls
- Narrow, two lane curvy highway design
- Traffic congestion
- Many driveways and side roads
- Conflicts between local traffic and through-traffic
- Elevated crash rate
- Risk of contaminant spills into the Kenai River

There are three interrelated needs this project will address:

- **Need 1: Reduce Highway Congestion.** The construction of multiple driveways and connecting side streets over time, combined with a curvy, constrained alignment with little passing opportunity and increasing traffic volumes, has led to considerable congestion that is forecast to worsen in future years. As a result, the highway performs below a desirable level of service for a rural principal arterial that is a component of the NHS.
- **Need 2: Meet Current Highway Design Standards.** Existing characteristics of the Sterling Highway do not meet current design standards for a rural principal arterial road. Sterling Highway Milepost 45-60 Project ROD Page 2 May 31, 2018 The existing highway contains curves, shoulders, guardrail, and clear zones1 that do not meet current design standards.
- **Need 3: Improve Highway Safety.** Due to the interrelated effects of highway congestion and outdated highway design characteristics, sections of the project area have a higher than-average number of traffic crashes and a greater severity of crashes when compared to the statewide average.

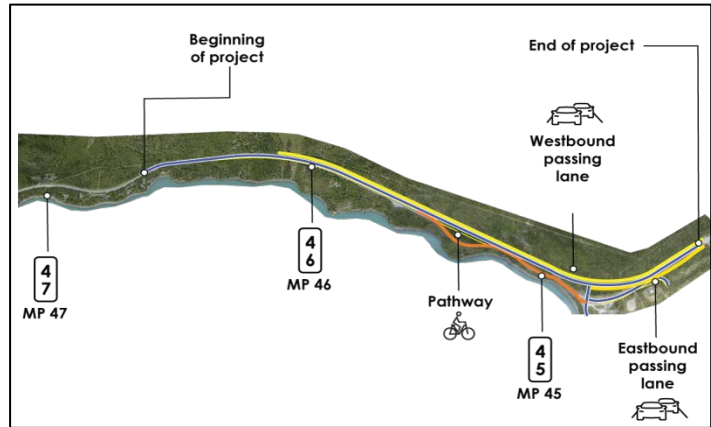
Project Details

The Phase 1B portion of this project for which the BUILD Grant would support would establish the controlled access intersection between Cooper Landing and the Sterling Highway begin construction on the new road alignment.

Phase 1B involves new highway and pathway construction from MP 45 to MP 47 and is the eastern segment of the larger Sterling Highway MP 45-60 project. The project is constrained by the Kenai Lake to the south, and the steep slopes of the Kenai Mountains to the north, and factor into design decisions and construction activities. The new highway is shifted north of the current highway, or into the mountain side, to straighten out the route by removing the sharp curves and providing additional area for the wider highway. The new highway grades are less steep.

Sterling Highway Phase 1B BUILD Grant 2020

The existing highway between MP 45 and MP 47 consists of two 11-foot lanes with shoulders that are less than 2 feet. The new highway consists of two westbound (WB) and one eastbound (EB) traffic lanes. Traffic lanes and shoulders are 12 feet and 8 feet wide respectively; an improvement over the current lane and shoulder widths. The new highway features wider and less steep sideslopes beyond the paved shoulder edge and minimizes new guardrail locations as much as possible.

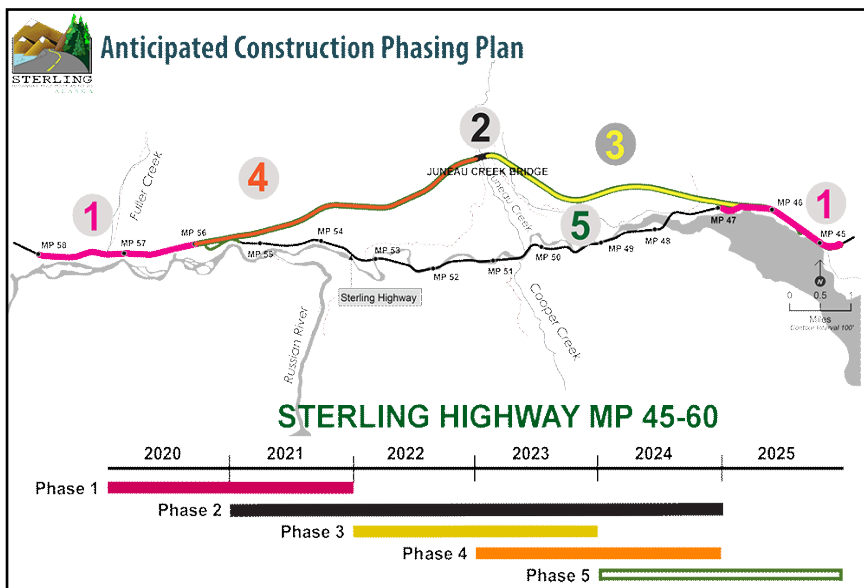


Source: Alaska DOT&PF Planning Section

There are two Tee type intersections associated with the new highway: 1) Quartz Creek Road (MP 44.9) is an intersection reconstruction; and 2) a new intersection at MP 46.5, connecting the current Sterling Highway (referred to as Old Sterling) with the new highway, providing access into Cooper Landing from the east. Intersection improvements consist of left and right turn lanes for vehicles turning from the new highway onto the approach roads and an auxiliary (acceptance lane) for right turning vehicles from the approach roads onto the new highway.

The project area of Phase 1B. It includes passing lanes, an exit and bicycle path for recreational users.

A 10-foot-wide pathway begins near MP 44.9 and extends to MP 47. The 2.5-mile-long pathway is located on the south side of the new highway and generally follows the route of the current highway once it has been abandoned and traffic uses the new highway. Near MP 45.6, there is a pathway undercrossing, where pathway users can pass under the new highway to access the local trail network on the north side of the highway. The pathway undercrossing consists of a 14-foot diameter, structural plate pipe, with the bottom filled and paved to provide a smooth, passable surface.



Source: Alaska DOT&PF

Additional improvements that are common for new highway construction include: roadside ditches and culverts for drainage; pavement; driveway reconstructions; signing; and topsoil and seeding. Unique improvements due to the project context include: rock excavations; mechanically stabilized earth retaining walls; and anchored wire mesh soil stabilization.

Lastly, because the current highway must remain open to traffic while the new highway is being constructed, some of the Phase 1B improvements will need to be completed as part of future MP 45-60 construction phases.

Project Impact

The importance of this highway to the region of this highway cannot be understated. It is the primary supply route for the population centers of Kenai, Soldotna, Kasilof, Clam Gulch, Ninilchik, Anchor Point, Homer and Kachemak. In addition, ferry service, water taxis and commercial aviation link this portion of the Kenai Peninsula to Seldovia, Kachemak Bay State Park & Wilderness and portions of Kodiak Island making it not only an important supply chain for the borough but a regional hub for outlying islands.

Kenai Peninsula Borough has an estimate population of 58,000 and being about a three hour drive from the state's population center of Anchorage⁴, it is a popular weekend destination for urban Alaska residents besides being a major tourism destination for out-of-state travelers.

Sport and personal use fishing in Southcentral Alaska generate total sales of \$581 million that support 6,100 "full-time equivalent" or "average annual" jobs. Sport and personal use salmon fishing in Upper Cook Inlet, which encompasses this portion of the Kenai Peninsula, generates total annual sales of some \$316 million (2006 dollars) that support 3,400 average annual jobs in the region⁵. More than one third of all summer fishing trips in the state were made to the Kenai Peninsula, and the two most popular destinations were the Kenai and Russian rivers⁶.

Commercial fishing is also an important component of the region's economy and the Sterling Highway is vital to getting fish to either overland markets or to larger freight handling centers in Anchorage. In 2018 Kenai Peninsula commercial fishermen landed 19.1 million pounds of seafood for an ex-vessel value, the dollar amount received from processors, of \$22.8 million. Processors reported selling 14.7 million pounds of seafood that same year valued at \$54.2 million⁷.

Sport and commercial fishing are important industries to the region that depend heavily on surface transportation for shipping and access, the Kenai Peninsula has an economy that is more diversified than many of the remote areas typical of Alaska. Some of the most important industries include, health care, professional services, maritime trades, and agriculture⁸.

The Cook Inlet Basin provides almost all of the natural gas used in the state for heating and power production and in 2018 it accounted for 83 million cubic feet of volume. Oil production in the region accounted for about 400,000 barrels a month in 2019. There are two main oil and gas companies in the region, Marathon Petroleum which operates a natural gas liquefaction plant in Nikiski, and Hilcorp,

⁴ Anchorage to Kenai Web Search, May 11, 2020.

⁵ [Economic Value of Sport, Personal Use, and Commercial Salmon Fishing in the Upper Cook Inlet](#). 2008. Kenai River Sportfishing Association

⁶ Economics of Sport Fishing in Alaska. Institute of Social and Economic Research, University of Alaska Anchorage, prepared for the Alaska Department of Fish & Game, December 1999..

⁷ Alaska Department of Fish & Game COAR Data generated May 5, 2020.

⁸ Kenai Peninsula Economic Development District Inc. [Regional Overview](#).

which operates most of the offshore platforms in Cook Inlet. Direct employment in this industry is about 470 jobs, according to 2018 Alaska Department of Labor and Workforce Development statistics.

About 293,000 tourists visited the western Kenai Peninsula in 2016⁹ spending on average \$367 per person. Borough wide, about \$301.2 million is pumped into the economy each year by cruise ship passengers and independent travelers for food, lodging, guiding and other entertainment. While independent travelers are typically a small portion of the tourism traffic, these industries depend heavily



Courtesy KTVA Television

A Crash on the Seward Highway at MP 47 closes traffic in June 2018. This section of the highway is two-lane with no shoulders and would be upgraded to multiple lanes with shoulders.

on a safe and dependable surface transportation route for both consumer traffic and supply.

Central Peninsula Hospital and South Peninsula Hospital feature oncology and surgical centers that are important to the regional and outlying populations. And the number of farms in the Kenai Peninsula has grown by 60 percent since 2007, with the sale of flowers, nursery and greenhouse products currently accounting for about \$1.671 Million (KPEDD).

Cooper Landing, an unincorporated community of 289 people, is located about 100 miles south of Anchorage at the confluence of Kenai Lake and the Upper Kenai River (at about MP 48). The local economy is based largely on recreation and tourism and the community is an important destination for Kenai River and Russian River anglers. Over the years several new roads and a multitude of private driveways have sprung up along the two-lane Sterling Highway in this area, creating dangerous traffic conflicts and congestion.

The existing highway becomes congested during summer, lanes and shoulders are narrow, horizontal curves are sharp, and the road surface is deteriorating, and the corridor can become somewhat treacherous for drivers, pedestrians, and wildlife. Traffic volumes in summer result in the corridor providing a low level of service (LOS). Volumes spike during June, July, and August as users travel to the Kenai Peninsula to recreate. Cooper Landing is a very popular destination, as it is home to many fishing and tourism-centered businesses.

While the purpose and need of this project are based on roadway characteristics and traffic volumes, this project is obligated to mitigate adverse impacts to important resources such as the Kenai River, recreational assets, and wildlife habitat that this community depends upon.

⁹ Alaska Visitor Statistics Program, DCCED and McDowell Group (2016 data)

Project Location

The project area is in the heart of the Kenai Mountains project’s starting and stopping points for construction would be the intersection of the existing Sterling Highway with Quartz Creek Road on the east and the intersection with Skilak Lake Road on the west. The limits of construction activities would be MP 44.5 to 58.2.

The location of the new Juneau Creek Bridge has not been established yet, but it will be approximately at 60°N 29’ and 149° W 53’. The proposed highway would diverge from the existing highway alignment at MP 46.3 and climb the hillside to the west for approximately 1.2 miles at a 5 percent grade, then level out for another 1.2 miles, then climb 2 miles at a 4.3 percent grade before arriving at the Juneau Creek Canyon.

The Sterling Highway Phase 1B project location begins at approximately MP 47 and its geospatial location is N 60° 49.51’ and W 1149.78’.



Source: Alaska DOT&PF Mapping Division

Grant Funds, Sources and Uses of Project Funds

The Sterling Highway Phase 1B project is an approved project included in the Alaska STIP and key funding sources have been identified to ensure the completion of this project. The State of Alaska pledges to provide the 9.03% non-Federal matching funds as is required by our FHWA program. The source of these funds will be the State General Funds.

Table 1 provides an overall budget for the Phase 1B portion of the Sterling Highway Project in as specific detail as is possible. This project will be using an innovative Construction Manager/General Contractor project delivery method to complete and so breaking some projected budget estimates is not possible. A general overview of the estimated costs from Design to Construction is provided. BUILT Grant funds would be used for construction activities in Phase 1B. Spending to date is for information purposes and DOT&PF understands that it is not germane to this BUILD Grant request.

Alaska Project costs to date have been approximately \$1 million and those costs have been subtracted from the budget detail in **Table 2** below. This project anticipates using about \$25 million in BUILD Grant funds to fund construction activities in Fiscal Year 2022 and 2023 respectively.

Alaska DOT&PF anticipates spending \$25 million in BUILD funds, combined with \$25.7

Table 1

Overview of Project Costs by Category		
	Spent to Date	Cost to complete
Design (since ROD)	\$1,670,764	\$804,671
Right of Way		\$3,000,000
Utility Relocation		\$1,000,000
Construction		\$48,000,000
Total	\$1,670,764	\$52,804,671

Source: Alaska DOT&PF Central Region Planning Section

Sterling Highway Phase 1B BUILD Grant 2020

million in other federal funds and \$2.7 million in non-federal funds to complete this phase of the project. The general division of funding categories for the entire \$53 million project would be 47 percent BUILD funds, 48 percent other federal funds and 5 percent non-federal funds.

Table 2

Phase IB Construction Cost Detail						
<i>In Millions</i>	FFY 2019	FFY 2020	FFY 2021	FFY 2022	FFY 2023	Total Budget**
Cost Estimate						
Current Estimate	\$1.00	\$2.50	\$13.00	\$30.00	\$8.00	\$53.50
Funding						
AC						\$0.00
State Match						\$0.00
Build Grant				\$17.5	\$7.5	\$25.00
Existing NHPP	\$0.90	\$2.26				\$3.16
Existing State Match	\$0.10	\$0.24				\$0.34
Unidentified source in the STIP*			\$13.00	\$30.00	\$8.00	\$51.00
Additional NHPP Needed						\$0.00
Additional State Match Needed						\$0.00
Total Proposed Funding	\$1.00	\$2.50	\$13.00	\$30.00	\$8.00	\$53.50

Source: Alaska DOT&PF Central Region Planning Section

*NHPP Funds anticipated for this category

** Less FFY2019 Spending

BUILD Grant funds would be used to pay for Contractor activities that include, clearing and grubbing, removal of structures and obstructions, removal of pavement and culvert pipe, common excavation, rock excavation, rockfall mitigation, aggregate base course, mechanically stabilized earth walls, structural plate pipe 168” diameter, CSP 72 inch pipe and 24” HDPE. More detailed budget information can be found in an appendix item located at the [BUILD Grant webpage](#).

Primary Selection Criteria

Economic Competitiveness

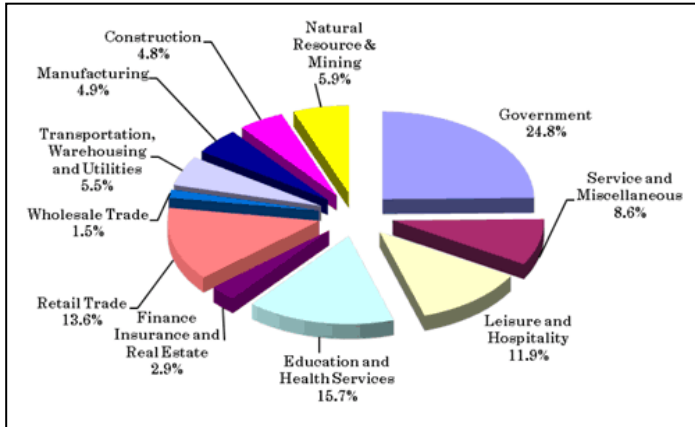
Tourism is the fastest-growing industry in the Borough and has emerged as a dynamic sector of the economy, as in many parts of Alaska. From 1994 to 2004, the number of visitor arrivals to the State of Alaska increased 55 percent from 931,400 to 1,447,400¹⁰. Since then, the number of out-of-state visitors has increased slightly. Between May 2010 and April 2011, an estimated 1.75 million¹¹ Tourism-related employment and seasonal businesses provide the majority of employment in the Borough.

¹⁰ Northern Economics. 2004. Alaska Visitor Arrivals, Summer 2003. Department of Community and Economic Development: Anchorage, Alaska.

¹¹ McDowell Group. 2010. Economic Impact of Alaska's Visitor Industry. Prepared for the State of Alaska, Department of Commerce, Community, and Economic Development, Office of Economic Development: Juneau, Alaska

The tourism industry in Alaska generates substantial income for the State and generates employment in a variety of industries such as transportation, retail trade, and services.

The Alaska Department of Community, Commerce, and Economic Development (ADCCED) total visitor industry employment, labor income, and spending in Alaska between October 2008 and September 2009 was estimated at \$3.4 billion (McDowell Group 2010).



Source: Alaska Department of Labor & Workforce Development

Fishing and outdoor recreation combined with the lake, river, and mountain scenery, drive much of the local economy. Cooper Landing is the only location between Summit Lake, Moose Pass, and Sterling that provides services to highway travelers. Many bed and breakfast inns, resorts, and fishing lodges in Cooper Landing accommodate visitors. The economy is seasonal and experiences a fluctuation of annual employment, as businesses reduce the number of employees or close entirely during the winter.

The 86-room Kenai Princess Lodge, located in Cooper Landing, employs approximately 100 people in the summer and 8 people in the winter. The lodge accommodates Princess Cruise ship passengers and other visitors. Flight-seeing trips and floatplane trips are available locally as well.

Most businesses in the project area are clustered in the central commercial area of Cooper Landing (MP 47–50), but a few lodges, dining establishments, and gas stations occur outside the community along the highway. Highway-based businesses, such as gas stations, grocery and general merchandise stores, restaurants, and motels, are more dependent on highway vehicle traffic and spontaneous stops.

The government sector represented 24.8 percent of Borough employment in 2010. Local and State government employment is heavily dependent on area population, demand for government services, and available revenue. Nearly one-fourth of workers in the Borough are employed by Federal, State, and local governments and earn more than Borough average wages. Local government workers represent two-thirds of the government sector and have earnings closer to the Borough-wide average.

Government employment and spending play key roles in the Borough (See **Table 3**). Government jobs accounted for \$227 million in total wages in the Borough in 2010, and an average of 25.9 percent of employment during the entire 17-year period (1994 to 2010).

Table 3

Kenai Peninsula Borough 2010 Employment and Earnings			
Type of Employment	Average Monthly Employment for 2010	Total Annual earnings (\$)	Average Monthly Earnings (\$)
Total employment	19,123	787,672,297	3,432
Private ownership	14,384	560,012,972	3,245
Goods-producing	2,994	203,928,030	5,677

Sterling Highway Phase 1B BUILD Grant 2020

Natural resources and mining	1,135	103,439,364	7,596
Construction	926	55,716,054	5,015
Manufacturing	933	44,772,612	4,000
Service-providing	11,390	356,084,942	2,605
Trade, transportation, and utilities	3,930	137,676,579	2,919
Information	230	9,725,795	3,532
Financial activities	546	26,353,805	4,020
Professional and business services	576	23,555,735	3,407
Education and health services	3,011	102,973,341	2,850
Leisure and hospitality	2,267	37,790,983	1,389
Other services	824	17,834,272	1,804
Government services	4,740	227,659,325	4,003
Federal	451	30,304,123	5,605
State	1,270	62,552,096	4,104
Local	3,019	134,803,106	3,721

Source: ADOLWD (2011).

Commercial fishing and processing provide an estimated 3,600 direct jobs and an additional 3,700 secondary jobs and account for \$328 million in wages paid to residents engaged in the activity. Southcentral residents also earn more than half their gross fishing income from fisheries outside the region. The Bristol Bay driftnet fishery was the main source of income for residents in 2018, in addition to longlining and salmon fisheries statewide. The seafood industry as a whole directly employs 11,500 workers as a result of seafood caught and processed in the region¹².

Anchorage is unquestionably a critical hub for high-value fresh seafood shipments, seafood workers and fisheries management work that all benefits the regional economy.

A dependable surface transportation link between the communities in the Kenai Peninsula Borough and the important supply chains in Anchorage and points north is vital to sustaining and fueling new growth in tourism, recreation and commercial fishing. The Kenai Peninsula Borough is unique in that its economy is diversified enough to withstand nationwide and statewide downturns, however it is also heavily dependent on its supply chain in Anchorage for sustained growth. Transportation difficulties would have downstream effects on the major industries in the region which would have ripple effects on support industries and government, education and health care employment.

A NHS highway built to modern design specifications and with passing lanes and controlled access for its length makes the movement of supplies and visitors more efficient and promotes the growth of further traffic with less fear that traffic snarls or accidents will disrupt these activities for miles.

¹² [The Economic Value of Alaska's Seafood Industry](#). January 2020. The McDowell Group.

Freight Movement

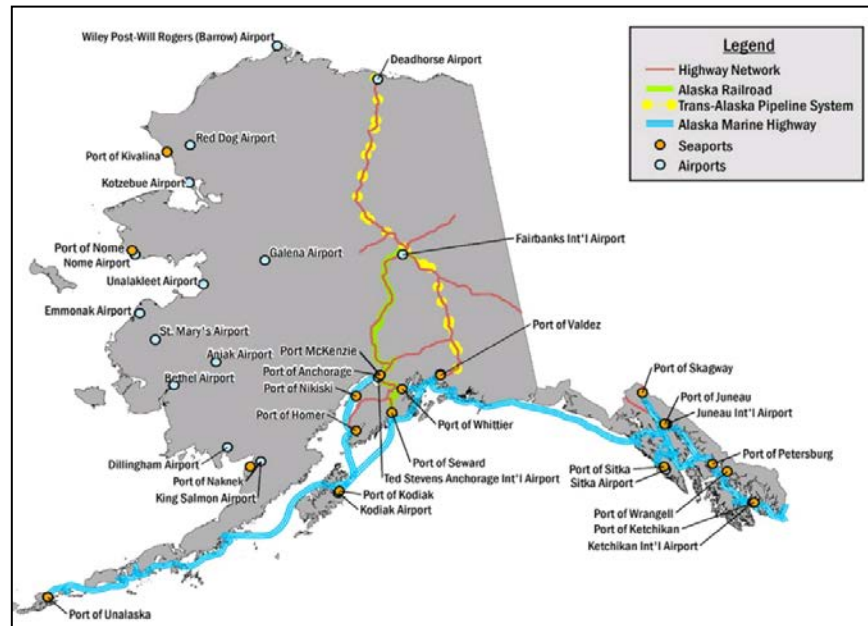
Freight movement was critical to Alaska's initial settlement and development, and it remains extremely important today. Over 90 percent of discretionary revenues collected by the State come from the production of petroleum, and large shares of the State's workforce and wages are directly linked to freight dependent industries. Alaska has large quantities of petroleum, zinc, coal, copper, gold, rare earth metals, and other valuable commodities that are in high demand around the world.

Mining and fishing are key industries that provide

employment for many Alaskans. Almost all of these products are exported to other states and countries. Alaska produces few of the consumer goods its workforce and population require, so these goods must be imported from other states and countries. As a result, Alaska's overall economy and quality of life depend on freight transportation "supply chains" that span the State, the nation, and the world.

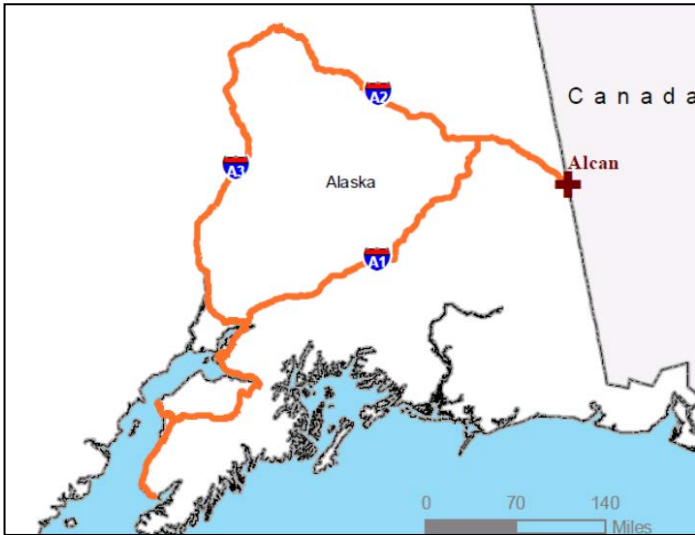
The Sterling Highway, running south from the Seward Highway Wye, is the only surface transportation connection to the lower Kenai Peninsula, an area about the size of West Virginia. There is no parallel route or railroad. All freight is carried by truck on the Sterling Highway to or from the Port of Anchorage, the Port of Homer or the Port of Nikiski where it is brought by container ship. This makes the Sterling highway uniquely valuable and vulnerable for the movement of goods through Alaska.

As part of the National Highway Freight Network in Alaska, as well as the Alaska Multimodal Freight Network, it functions as the sole overland connection between ports, cities and airports connecting this part of Alaska to trade with the rest of the US and International trade partners. The Alaska Multimodal Freight Network emphasizes transportation infrastructure that plays a critical role in supporting the economy of the state, allowing it to export valuable natural resources and import indispensable consumer products that improve quality of life. Links and nodes were selected as part of this network because they handle significant quantities of freight, in tonnages or value, without which large segments of the state's economy could not operate. Coal, wood products, seafood, gravel and ore, mining by-products are all carried overland on the Sterling Highway south to Homer to be shipped off at the port.



Courtesy WSP/Parsons Brinckerhoff

Alaska's Multimodal Freight Network



Courtesy: USDOT

Map of Federally-Designated Portions of Alaska's National Highway Freight Network.

Ferries reaching the port of Homer deploy military personnel, their families, vehicles and household goods from the lower 48 states, where they reach military bases in Anchorage or Fairbanks through the highway system.

The demand for freight transportation is driven by the amount and type of economic activity—in essence, commerce trade in goods. Demand for freight transportation arises from producing industries and consumers. Producing industries need access to inputs—raw materials, machinery and equipment, components, packaging, etc.—and access to markets where their products are sold. Consumers need access to basic necessities such as shelter, food, fuel, vehicles, clothing, appliances and electronics,

construction and building materials, and other supplies and property. In Alaska, the major producing industries include petroleum extraction, mining, commercial fishing and processing, construction, and power generation. Alaska also has a large government (particularly military) presence that requires the shipment of equipment, machinery, fuels, and supplies.

Alaska is characterized by a dramatic imbalance between its produced and consumed commodities—most of what Alaska produces is exported to other states and other countries, while most of what Alaska consumes is provided by other states and other countries. This creates an especially strong dependence on effective trading connections and services.

Alaska is a very large state with very long supply chains. Freight exported from Alaska must usually be moved long distances, from extraction and production facilities to ports and airports; freight imported must be distributed from a few critical gateway ports and airports to users distributed throughout the entire state. This means that more freight has to move more miles to serve Alaska than any other state.

Alaska has a unique geographic position midway between the lower 48 states and Asia, and serves as a gateway for pass-through air cargo. Alaska's freight infrastructure and its economic activity related to the handling of pass-through freight are therefore linked to larger global trades.

The Sterling Highway 45-47 Phase 1b project, serves the goals of reducing truck congestion and improving travel time reliability and safety in rural areas and through a key corridor, especially for movement to/from ports, airports, and major freight trip generators.

Quality of Life

The Kenai and Russian rivers, associated area campgrounds, and area trails—along with private commercial businesses that cater to recreationalists—combine with natural scenery to define the Cooper Landing area and to draw recreation users from around the state and tourists from around the world for

sport fishing, camping, mountain biking, hiking, hunting, and other recreational pursuits. Multiple designated park and recreation sites owned and managed by several State and Federal agencies populate the project area, particularly in a 4-mile stretch of the Kenai River valley between the mouth of Cooper Creek and the mouth of the Russian River (approximately existing highway milepost [MP] 51 to MP 55).

The recreational character of the upper Kenai River area/project area includes a combination of a spectacular natural landscape; public lands managed in large part for recreation, including developed public recreation facilities; private commercial properties (e.g., lodges) and businesses operating on public lands under permit; and relative ease of access via the Sterling Highway for the majority of the state's population and visitors (compared to much of Alaska, which is without roads).

The community of Cooper Landing is an integral part of the recreational landscape, with its many lodging options and fishing/floating outfitters and guides.

Primary areas along the highway where recreation is concentrated include the support services, guides, and lodges in the community and on private lands along the river, and a concentration of mostly public recreation sites in the MP 51–55 area (mouth of Cooper Creek to mouth of the Russian River).

The private and public sites accessed directly from the highway throughout the project area from east to west, include:

- Commercial services located at Quartz Creek, and access via Quartz Creek Road to campgrounds outside the project area Sterling Highway MP 45–47
- Commercial services, lodges, and guide services located in MP 47–48 portion of Cooper Landing (northeast of the Cooper Landing Bridge)
- Cooper Landing Boat Launch and Day Use Area
- Commercial services, lodges, and guide services located in the MP 48–50.5 portion of the Cooper Landing (southwest of the Cooper Landing Bridge)
- Cooper Creek Public Camp and Picnic Ground (recreation withdrawal, Tracts A and B; Tract B south of the highway provides access to Stetson Creek Trail, as well) • Stetson Creek Trail alternative access
- Gwin's Lodge
- Russian River Campground/trailhead for Russian Lakes Trail and Russian River Angler's Trail
- K'Beq Footprints Heritage Site • Trailhead for Resurrection Pass Trail
- Sportsman's Landing-Russian River Ferry area
- Trailhead for Fuller Lakes Trail
- Kenai National Wildlife Refuge (KNWR) visitor contact station
- Jim's Landing off Skilak Lake Road, which also provides access to KNWR recreation sites outside the project area.

The Alaska Division of Parks and Outdoor Recreation requires park use permits for commercial fishing and float guides operating on the Kenai River. The number of guides on the Kenai River has remained steady at about 340, with approximately 350 registered vessels and 130 drift boats. The estimated

number of visitors boating the upper stretch of the river during a typical summer is around 25,000, according to a KNWR study.

The Russian River flows south of the highway some 12 miles to its confluence with the Kenai River at MP 55 of the existing Sterling Highway. From the confluence upstream about 2.5 miles the lower Russian River, like the adjoining Kenai River, is recognized as one of the busiest fishing rivers in Alaska. The Russian River is the most popular clear-water sockeye salmon fishery in Alaska, with a 10-year average of 60,965 angler-days per year for sockeye salmon alone. More than 1,000 anglers per day can be found fishing the Russian River/Kenai River confluence, and demands made on the Russian River fish population are sometimes greater than the resource can provide¹³. (HDR and USKH 2013)

Although major use of Forest Service campgrounds and other Forest Service facilities in the project area is related to sport fishing and boating, other activities include; scenic driving (as high as 200,000 visitors annually on both the Sterling and Seward highways), hiking and trail use (9,000 to 13,000 annual average of users who signed registers at four area trails), and use of public recreational cabins (around 1,500 annually). Some activities that occur in the CNF are harder to quantify, including snowmobiling, hunting, horseback riding, mountain biking, and remote dispersed off-trail activities in general (HDR and USKH 2013).

Resurrection Pass National Recreation Trail is the most prominent trail in the project area and connects Cooper Landing to a trailhead near Hope. The Forest Service estimates total use of the Resurrection Pass Trail system at 10,000 visitors annually.

The Kenai National Wildlife Refuge is a 1.97 million acre refuge managed but the US Fish & Wildlife Refuge. The *Kenai National Wildlife Refuge Final Revised Comprehensive Conservation Plan* estimates that approximately 1.2 million people travel on the Sterling Highway through the Kenai National Wildlife Refuge each year, and an estimated 300,000 visitors spend extended periods of time in the refuge. Refuge-wide, a 2006 study reported that 659,525 “visits” were made to the KNWR, more than any other refuge in Alaska (HDR and USKH 2013).

Safety

Because of the topography and roadway architecture, the project area has a high crash history and, the crashes in that area were found to be slightly more severe on average than those elsewhere in the state.

A crash analysis for the project area was performed by evaluating historical crash data (2000–2009) for the Sterling Highway from MP 45 to 60, and comparing the project area crash evaluation to crash data for the entire Sterling Highway as well as to the state as a whole.¹⁴

¹³ Recreation Analysis. Prepared for the Alaska Department of Transportation and Public Facilities, Sterling Highway MP 45–60 Project: Anchorage, Alaska. January 2013. USKH and HDR.

¹⁴ [Appendix A Crash Analysis Traffic Crash Data Analysis](#) (February 2014). Prepared for DOT&PF. January 2018.

Between 2000 and 2009, with the exception of year 2006, the project area (MP 45 to 60) had a higher percentage of major injury (i.e., incapacitating injury) and fatality crashes when compared to the statewide average.

Fatal injury crashes in the project area were higher than the statewide average for years 2002, 2003, 2004, and 2007. Within the project area, MP 51.3 to MP 58.2 saw the most crash activity overall (See Table 3).

Table 3

Crash Rate By Segment (2000-2009)			
Sterling Highway Project Segments	Crash Rate^a	Statewide Average Rate^b	Percent above/below the Statewide Fatal Injury Average
MP 44.5 - 46.59	1.53	1.80	-17.6%
(MP 46.6 - 47.79)	1.38	1.80	-30.4%
(MP 47.8 - 49.39)	1.31	1.80	-37.4%
(MP 49.40 - 51.29)	1.25	1.80	-44.0%
(MP 51.3 - 55.09)	2.46	1.80	+26.8%
(MP 55.1 - 58.2)	2.38	1.80	+24.7%
^a The crash rate is the number of crashes per million vehicle miles. ^b The statewide average rate for all crashes for rural other principal arterials roads per million vehicle miles traveled. Source: 2009 Alaska Traffic Crashes, June 2012, DOT&PF. ¹⁵			

This reconstruction project would relocate MP 52 to a new alignment and the entirety of the segments would be generally straighter and built to highway standards (which includes controlled access, wider shoulders and passing lanes) that should reasonably expect lower overall crash rates.

Although there was less traffic in the winter, there were more crashes during the winter, when snow and ice were likely present and darkness more prevalent, as Table 4 illustrates.

Table 4

Project Area Seasonal Crash Rate (2000-2009)			
Season	Average Daily Traffic	Total Crashes	Crash Rate (CPMVM)
Winter (Nov.–Mar.)	1,635	153	4.13
Summer (Apr.–Oct.)	4,353	150	1.07
<i>CPMVM = crash rate per million vehicle miles</i>			

While some crashes in the project area are the results of driver error, existing highway design can contribute to crashes as well. Sharp curves, narrow lane and shoulder widths, lack of clear zones, and a proliferation of access points can all contribute to crashes.

Engineering analysis completed for the project predicted the number of crashes of different types in the design year (2043) based on the design deficiencies covered earlier¹⁶. Without this project, the analysis predicts approximately 33 crashes in 2043. A cost analysis was performed over a 20-year period from

¹⁵ [2009 Alaska Traffic Crashes](#). DOT&PF Division of Program Development. June 2012.

¹⁶ See Appendix A.

2024–2043 predicts a total of 604; of which 8 fatal crashes, 33 major injury crashes, and 153 minor injury crashes resulting in a total cost of \$87.25 million (Appendix A, pp-8).

Curves that do not meet current design standards impede the ability of drivers to see upcoming hazards and reduce the time available to stop or slow down when hazards become visible. Similarly, the visibility required to pass safely and efficiently is hindered. Although 90 percent of the highway in the project area is designated “no passing,” motorists are often seen passing in areas where passing is prohibited.

All shoulder widths within the project area are narrower than rural principal arterial design standards, and 91 percent of the roadway has less than 12-foot-wide lanes. In the project area, there is a high concentration of head-on crash locations, where records indicate there have been two or more head-on crashes per mile from 2001 to 2007¹⁷.

Inadequate clear zones could contribute to moose-related crashes that make up 12 percent of the crashes in the project area. And in the most densely settled part of Cooper Landing (approximately between MP 47.0 and MP 51.0), there are 76 driveways and street intersections. These numerous access points can contribute to rear-end and angle crashes when vehicles waiting to make left turns onto driveways or side streets are struck by vehicles following them

Environmental Sustainability

Realigning the highway and bringing it up to standards has a direct impact on the environmental sustainability of a world class salmon fishery in the pristine Kenai River adjacent the highway.

The US Department of Energy notes that homes in the Lower 48 are heated through a myriad of methods, primarily through inexpensive electricity generation or natural gas. However, the Kenai Peninsula, like many places in Alaska, still relies on home heating oil that is either shipped in on barges or trucked in down the Sterling Highway. In the Kenai Peninsula Borough, those communities and governments heavily reliant on heating oil include Seward, Seldovia, Homer, Nanwalek, Port Graham, Tyonek and the Kenai Peninsula Borough School District as well as most of the unincorporated regions of the Borough.

Yet the shipment of hazardous materials such as fuel oil and other chemicals used in industrial applications when the Sterling Highway was first constructed. The Alaska Department of Environmental Conservation, which tracks hazardous material spills, documented 14 separate incidents within the area of the Sterling Highway MP 45-60, including one spill in excess of 8,000 gallons of diesel fuel at MP 52¹⁸.

The risk of vehicle crashes that would result in pollutants in the Kenai River or adjoining wetlands and connected waterways, particularly the risk of tanker trucks containing fuel or other chemicals overturning or otherwise spilling their loads, was a substantial concern voiced by residents and others during scoping for this project.

¹⁷ Personal communication between Central Region Traffic Engineer Scott Thomas (DOT&PF) and HDR Alaska, Inc. 2011.

¹⁸ Sterling Highway MP 45–60 Project Final EIS Chapter 3, pp-3-360

The Kenai River Comprehensive Management Plan (DNR, ADF&G, KPB 1997, see Section 3.2), which was endorsed by all land management agencies along the Kenai River, recommends that “public road construction projects in upland areas should be located away from the Kenai River” and advocates for a general setback standard of 300 feet for all non-water-dependent public facilities development adjacent to the river. A hazardous waste spill would not only pollute local drinking water sources and harm indigenous species, it could have devastating effects on the important Kenai River fishery.

The risk of crashes would be reduced substantially compared to the No Build Alternative. The Juneau Creek Alternative alignment would be approximately 26 percent within 500 feet of Tier I streams, and approximately 16 percent would be within 300 feet. It would be about 25 percent within 500 feet, and 16 percent of the total would be within 300 feet of the Tier I water bodies. Both of these alternatives have moderate exposure to steep side slopes and high exposure to wetlands.

However, these alternatives provide separation from the Kenai River and other Tier I streams over the longest distance, likely providing responders more time to protect the Kenai River in the event of a spill in these separated locations.

Secondary Criteria

Innovation

This is the first project for Central Region DOT that will be procured using the innovative alternative project delivery method, also known as CM/GC for highway construction. This method involves the department hiring a contractor early on in the design stage to provide feedback as a Construction Manager (CM) and continue to be involved through construction as the General Contractor (GC). The CM/GC method offers many potential benefits including shorter overall project completion duration, improved risk identification and mitigation responses, increased utilization of innovation design/construction techniques, and improved construction conflict identification and management.

The Sterling Highway MP 45-47 Project is the perfect project for the department to procure using GM/GC due to its many unique challenges as well as its accelerated construction schedule.

One of the most unique challenges is the construction of possibly the State of Alaska’s largest single span bridge over Juneau Creek. During the EIS, several bridge types were explored, including Cable Stay, Simple Span Steel Truss, Segmental Concrete Box Girder, and a Steel Tied Arch. The length or span of the bridge is going to rely heavily on the geotechnical information that is gathered during the summer of 2020. Juneau creek canyon has showed signs of instability in the form of recent rockslides and large cracks running parallel to the canyon edges. Due to this preliminary geotech investigation, it was advised to place the bridge abutments 200’ back from the edge of the canyon. Suggesting the bridge will need to span approximately 825 feet.

The GM/GC method will allow the contractor to provide input and consider innovative and cost savings ways to overcome most of these obstacles. Throughout the design process, at any time, the designer and contractor can negotiate any amount of work to go out and construct once it becomes feasible. This

allows the contractor and design team to tailor the construction around potential risks and provide cost savings to the department.

Partnerships

The Alaska Department of Transportation and Public Facilities is the project sponsor. The Federal Highway Administration (FHWA) is the principal funding partner for this project. The Alaska Department of Natural Resources, Alaska Department of Fish and Game, U.S. Army Corps of Engineers, U.S. Coast Guard, U.S. Department of Agriculture; Forest Service and U.S. Fish and Wildlife Service are cooperating agencies.

Environmental Risks

Project Schedule

The highway project is currently underway and on schedule. Construction is anticipated to begin with minor work as early as fall 2021 and being complete in 2023. The NEPA process was completed in 2018 and no further federal reviews are necessary to advance the project. A list of major milestones can be found in **Table 5** later in this section. The following paragraphs outline in broad terms the Department’s readiness activities to date and anticipated in the future.

Design is currently at approximately 75 percent design level and scheduled to be complete in the spring of 2021.

Preliminary Right of Way acquisition has been prepared. It is anticipated that 14 parcels will be affected including one full acquisition required. The acquisition will be largely fee simple from 4 private owners and the Kenai Peninsula Borough. Management transfer between State of Alaska departments of 5 different parcels will be required and are included in the 14. Utility relocation is anticipated to be largely concurrent with construction.

Kenai Peninsula Borough will approve the Acquisition Plat. That is anticipated to occur in August 2020. Aside from FHWA issuing Authority to Proceed for the Right of Way Acquisition, Utility Relocation and Construction there are no other deliverables anticipated.

PS&E approval is marked by executing the DSR, certifying and executing the PS&E and is anticipated to occur following the Right of Way acquisition, being completed in early July 2021

Construction funds will be obligated in 2021. Completing this project is integral to meeting the schedule on the larger program and the Sterling MP 45- 60 Reconstruction project.

Table 5

Sterling Highway Readiness Schedule		
Milestone	Actual Completion Date	Anticipated Completion Date
NEPA (executed Record of Decision)	5/31/2018	✓
Plans In Hand (75% design)	3/25/2020	✓

Table 5

Sterling Highway Readiness Schedule		
Milestone	Actual Completion Date	Anticipated Completion Date
Pre PSE Review (95% design)	2/4/2020	✓
Final PSE (design)		4/31/2021
Right of Way Acquisition Authority to Proceed	7/15/2020	✓
Right of Way Acquisition Complete		6/30/2021
Utility Relocation Authority to Proceed	9/15/2020	✓
Utility Relocation Complete		8/15/2022
Construction Authority to Proceed		8/15/2021
Construction Complete		10/1/2023

Source: DOT&PF Central Region Planning Division

Financial Commitment

The Alaska DOT&PF Initial Financial Plan was finalized and approved December 28, 2017 by the project manager. A copy of this report is included in this grant application as an appendix item¹⁹. That document demonstrates DOT&PF’s commitment to complete the project and demonstrates sound financial planning, as required by United States Code Section 106(h) of Title 23, as amended by Section 1503(a)(4) of Moving Ahead for Progress in the 21st Century Public Law 112-141.

The Sterling Highway project is in the STIP (Need ID: 2673) with funding obligated beyond FFY2023. DOT&PF, with the support of Federal funding, expects to have sufficient revenues to complete the project. Adjustments would need to be made to the STIP to allocate the correct supplemental amount to fund each phase of the project with sufficient cash flow.

Risk Mitigation

During the EIS process, measures were negotiated with the respective agencies to mitigate impacts to from the project including but not limited to: Noise, Visual, Wildlife, Vegetation, Recreational, Construction Impacts, wetland impacts, economic impacts, historic and archaeological impacts, utilities, air quality, and fish habitat impacts. These risks and their associated mitigation measures can be found in Section III of the Record of Decision. It is included as an appendix item in this document.

A formal CSRA and analysis had not been performed on this project. However, some risks have been identified that pose a threat to the cost and schedule of the project:

- Geotechnical
- Environmental permitting
- ROW acquisition

¹⁹ Appendix Item. [Alaska DOT&PF Initial Financial Plan](#), 2018.

- Weather (winter shutdown)
- Impacts to the traveling public
- Delayed decision making
- Contractor access and staging
- Delays in material procurement
- Contractor non-performance

DOT&PF developed a Risk Register Matrix for this project that includes identified risks and mitigation strategies to assure project delivery. The Risk Register Matrix is presented as an appendix item.

Financial risks of this project were considered in the Department's financial plan. The two overall types of risks that affect the project are (1) level and timing of funding and (2) project schedule and cost. The risk strategy assumes the Highway Trust Fund, which is Alaska's primary source for surface transportation costs, will remain stable. Motor fuel taxes and other truck-related taxes that support the trust fund are uncertain. Continued Congressional support for the Highway Trust Fund is essential to mitigate the financial risks of this project not moving forward. Additionally, the State General Fund, used to match FHWA funding and support the Statewide Transportation Improvement Program will require approval from the Legislature and Governor for its continues future support.

Benefit Cost Analysis

A Benefit Cost Analysis for Phase 1B was developed by HDR Inc. includes the monetized benefits and costs measured following USDOT guidance, as well as the quantitative and qualitative merits of the project. A BCA provides estimates of the anticipated benefits that are expected to accrue from a project over a specified period and compares them to the anticipated costs of the project. Costs include both the resources required to develop the project and the costs of maintaining the new or improved asset over time. Estimated benefits are based on the projected impacts of the project on both users and non-users of the facility, valued in monetary terms.

The specific methodology developed for this application was developed using the BCA guidance developed by USDOT and is consistent with the BUILD program guidelines. In particular, the methodology involves:

- Establishing existing and future conditions under the build and no-build scenarios;
- Assessing benefits with respect to the selection criteria identified in the Notice of Funding Opportunity (NOFO);
- Measuring benefits in dollar terms, whenever possible, and expressing benefits and costs in a common unit of measurement;
- Using USDOT guidance for the valuation of travel time savings, safety benefits and reductions in air emissions, while relying on industry best practice for the valuation of other effects; and
- Discounting future benefits and costs with the real discount rates recommended by USDOT (7 percent, and 3 percent for sensitivity analysis).

A summary of the anticipated BCA outcomes is presented below. The full BCA report is attached as an appendix item.

Table 6

Summary of BCA Outcomes			
Project Evaluation Metric	*Undiscounted	*Present Value at 7% Discount Rate	*Present Value at 3% Discount Rate
Total Benefits	\$160.95	\$43.81	\$86.76
Total Costs	\$52.43	\$43.56	\$48.33
Net Present Value	\$108.52	\$0.24	\$38.42
Benefit / Cost Ratio	3.07	1.01	1.79
Internal Rate of Return (%)	3.54%		

Source : HDR Inc.

**All dollar amounts in millions in 2018 dollars*

Phase 1B will significantly reduce congestion and travel times, result in an estimated \$11.6 million in hazardous spill costs over the life cycle of the project and result in safety benefits to motorists and non-motorists recreating in the area. The construction of the passing lane and the straightening of the road can be expected to generate accident cost savings benefits to travelers. Over the lifecycle of the analysis, the project will save an estimated 4.17 million person hours. The project will help avoid 2.4 fatal, 11.6 major injury, 49 minor injury, and 94 Property Damage Only (PDO) collisions.



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