COPPER RIVER HIGHWAY

ROUTE ALTERNATIVES STUDY

COPPER RIVER HIGHWAY

Route Alternatives Study

Department of Transportation and Public Facilities – Northern Region

JUNE 2025

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ACRONYMS & ABBREVIATIONS

ADF&G..... Alaska Department of Fish and Game
AHRS.....Alaska Heritage Resources Survey
AOP .....Aquatic Organism Passage
BUILD..... Better Utilizing Investments to Leverage Development
CLG .....Certified Local Government
CRHTMP .....Copper River Highway Transportation Master Plan
CRWP.....Copper River Watershed Plan
DOT&PF.....Department of Transportation and Public Facilities
EA ..... Environmental Assessment
FHWA-WFL..... Federal Highway Administration – Western Federal Lands
FLAP..... Federal Lands Access Program
FONSI.....Finding of No Significant Impact
HSIP ..... Highway Safety Improvement Program
LEDPA..... Least Environmentally Damaging Practicable Option
LRTP.....Long Range Transportation Plan
MOA ..... Memorandum of Agreement
MP .....Milepost
MS ..... Material Site
NBI#..... National Bridge Inventory Number
NEPA..... National Environmental Policy Act
NRHP .....National Register of Historic Places
OHW.....Ordinary High Water
PEL ..... Planning and Environmental Linkages
PWS ..... Prince William Sound
PWSTP .....Prince William Sound Transportation Plan
ROW ..... Right of Way
RPI ..... Rural Project Initiative
STBG..... Surface Transportation Block Grant
TEC ..... The Eyak Corporation
TIFIA .....Transportation Infrastructure Finance and Innovation Act
USGS.....United States Geological Survey

1.0 INTRODUCTION

This study has been developed for the State of Alaska Department of Transportation and Public Facilities (DOT&PF) and Federal Highway Administration, Western Federal Lands (FHWA-WFL) to guide future decisions and provide information on potential alternatives for improvements to the Copper River Highway between approximately milepost (MP) 27 (also known as Flag Point) through MP 51 (north of the Million Dollar bridge). Infrastructure on the Copper River Highway has been extensively damaged over the last several years because of the natural rerouting of the Copper River and flood events that have washed out or eroded the highway and other structures. This study report summarizes analyses completed to understand potential alternatives available to repair and improve infrastructure along the highway corridor.

This study commenced as a Planning and Environmental Linkages (PEL) study in 2018. As the study progressed it was augmented by an additional planning effort, the Copper River Highway Transportation Master Plan, which led to be more broad public involvement effort and five project recommendations for the broader Copper River Highway Corridor (MP 0-51). As time has passed the DOT&PF has opted to document the analysis as a Route Alternatives Study owing to the details of the projects and associated costs differing across the project groups, the changing conditions over time along the Copper River Highway, and the high planning level cost estimate of the projects evaluated, which means they are unlikely to be implemented within the five-year window intended following the completion of a PEL Study.

The Copper River Highway within the study area includes 12 bridges and approximately 25 stream culverts, the majority of which are within anadromous waters that provide aquatic connectivity to important habitat within the Copper River watershed, which is responsible for draining over 24,000 square miles of land. In addition to these stream culverts there are likely many more cross-drainage culverts that are part of the roadway embankment. The Copper River Watershed is considered one of the most important fisheries in the State, providing ideal habitat for spawning and rearing for all five species of Pacific salmon and a significant resource for subsistence access and commercial fishing.

The area is traditional lands for the Native Village of Eyak, providing access to important subsistence areas and lands essential for physical, economic, traditional and cultural well-being. Additionally, tribal members live, camp and hunt along the highway.

The area is also a valued tourist destination, providing access to the Childs Glacier Recreation Area and Campground, Miles Glacier, and the Million Dollar bridge, which was added to the National Register of Historic Places (NRHP) in 2000. The Childs Glacier Recreation Area and Campground were regarded as an important community asset, where families would gather to participate in recreational activities, picnicking, fishing, watching the Glacier's calve, and socializing with other community members. Now, access to this location is difficult and costly given road vehicle travel is not possible beyond MP 27.

Over the years, the area has experienced various impacts to the transportation infrastructure including a major earthquake, erosion, and washouts, as further detailed on the timeline (Figure 1). All these conditions are considered as part of evaluating and recommending transportation improvements to either re-establish a contiguous route or invest in smaller improvements that retain more constrained access to resources.

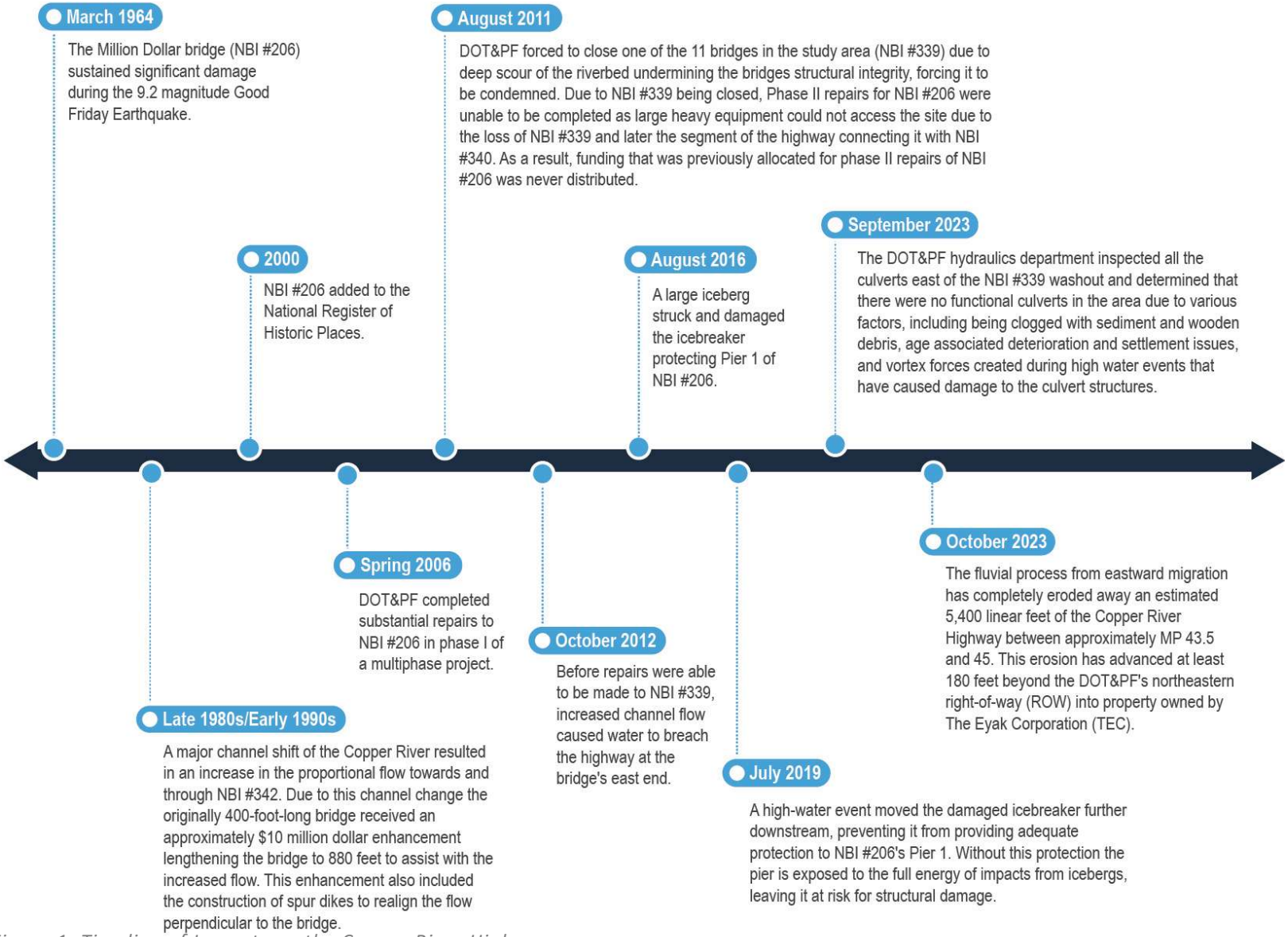


Figure 1. Timeline of Impacts on the Copper River Highway

1.1 Area Overview

The Study Area (Figure 2) extends along the Copper River Highway from Flag Point bridge, located at approximately MP 27, and terminates at approximately MP 51 on the right bank of Abercrombie Creek, north of the Million Dollar bridge. Land within the study area extends into the flanks of the Chugach Mountains on both sides of the Copper River and between the highway corridor, from Flag Point (approx. MP 27) north to the Million Dollar Bridge (National Bridge Inventory Number (NBI#) 206). These boundary termini have been selected for their proximity to resources, critical habitats, and ability to avoid the duplication of study efforts.

The Copper River Highway progresses in a generally north-easterly area through the study area. The highway alignment follows the railbed of the Copper River and Northwestern Railway, which ran from Cordova to the Kennecott mine, near McCarthy within Wrangell-St Elias National Park for the transportation of copper ore. The last ore train used the line in 1938, and the Kennecott Corporation subsequently donated the railroad right-of-way (ROW) to the United States for use as a public highway. The highway construction was started in 1953, and by 1964 the road extended from Cordova to the Million Dollar bridge. The 1964 Good Friday earthquake damaged 28 bridges along the road which delayed construction, and by 1972 the highway extended to MP 72, approximately 20 miles south of Chitina. The final 20-mile section has not been constructed, meaning the highway is primarily used for access to recreation activities and resources, some private and Native owned properties, and subsistence use.

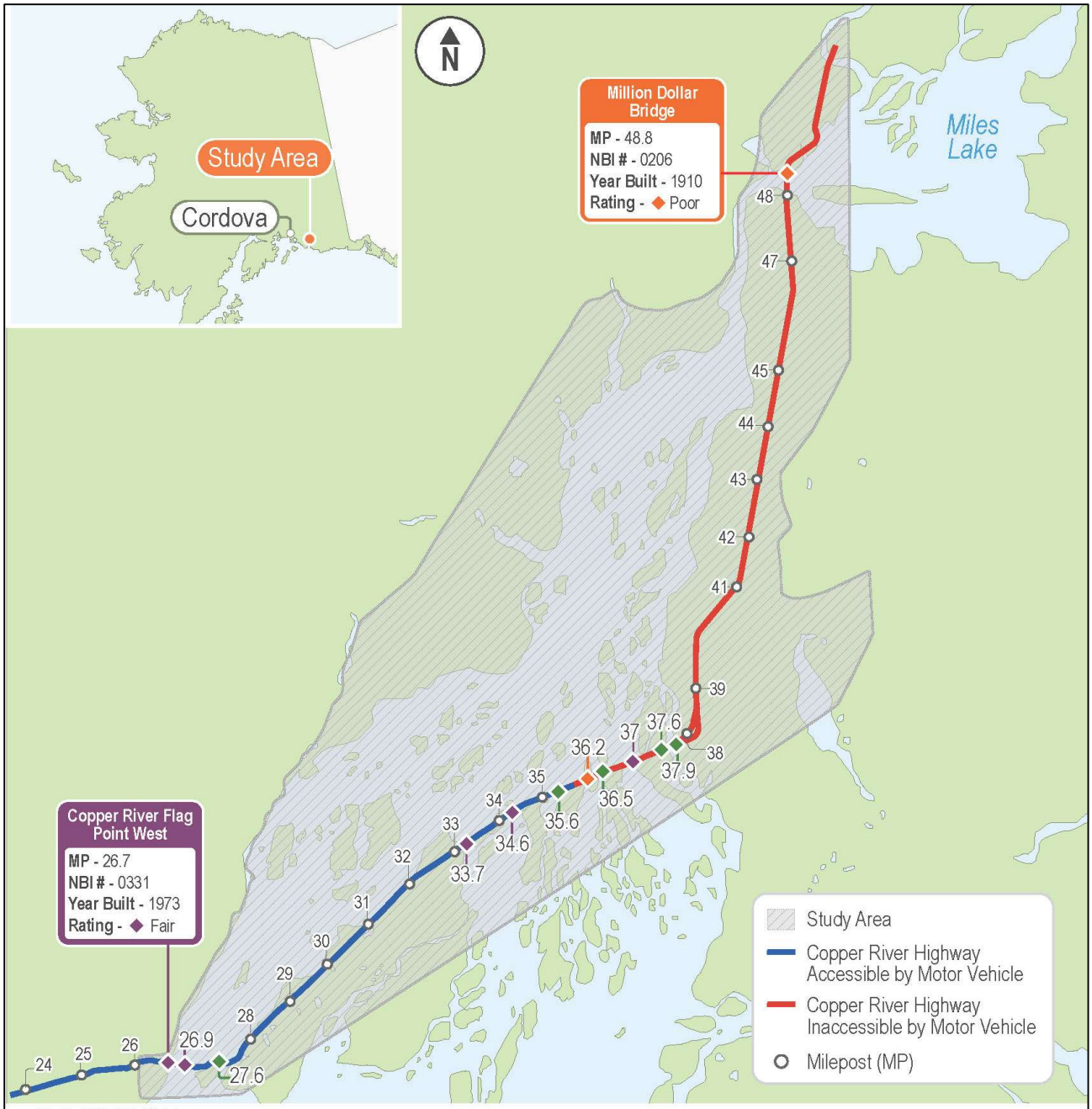
The northern boundary of the study area is at Abercrombie Creek, located within Section 32, Township 13 South, Range 4 East, Copper River Meridian, USGS Quad map Cordova C-2. It was selected as the highway is in comparatively good condition north of NBI# 206 until it reaches Abercrombie Creek, where the highway has been washed out. Additionally, there is an existing materials site near Abercrombie Creek.

The southern boundary of the study area coincides with the northern boundary of the Copper River Delta Critical Habitat Area, which was included to support the assessment of potential impacts to the habitat area.

The eastern boundary of the study area extends slightly into the Chugach Mountains, where potential new material sources may be located to support potential improvement or remediation projects.

The western boundary was selected to enable the evaluation of a temporary overland route to construct a new bridge to replace NBI# 339, as existing highway access is not accessible due to a washout. This boundary also provides the opportunity to examine the potential to construct an entirely new road along the flanks of the Chugach mountains, above the active Copper River floodplain on its west side.

The south-western boundary at Flag Point, located within Section 32, Township 16 South, Range 2 East, Copper River Meridian, U.S. Geological Survey (USGS) Quad map Cordova B-3, was selected based on a 2011 Copper River Watershed Project (CRWP). The CRWP along with partnering agencies, conducted an evaluation to identify high priority aquatic organism passage (AOP) culvert improvement projects in the Copper River watershed. This evaluation assessed the culverts south of Flag Point along the Copper River Highway, leaving the culverts north and east of Flag Point unassessed. The Flag Point terminus provides an opportunity to avoid re-evaluating culverts that have already been assessed, and to assess additional culverts as part of this study.



Alaska DOT&PF Bridges

MP	Bridge Name	National Bridge Inventory # (NBI)	Year Built	Rating 2024
48.8	Million Dollar Bridge	0206	1910	Poor
37.9	Copper Delta	0345	1977	Good
37.6	Copper Delta	0344	1977	Good
37.0	Copper Delta	0342	1977	Fair
36.5	Copper Delta	0340	1977	Good
36.2	Copper Delta	0339	1977	Poor
35.6	Copper Delta	0336	1977	Good
34.6	Copper Delta	0334	1977	Fair
33.7	Copper Delta	0333	1977	Fair
27.6	Copper River Round Island Channel Bridge	0332	1973	Good
26.9	Copper River Flag Point East	1187	1973	Fair
26.7	Copper River Flage Point Flag West	0331	1973	Fair

Figure 2. Copper River Highway Study Area

2.0 PURPOSE OF STUDY

This route alternatives study will identify, evaluate, and advance opportunities to address extensive damage sustained to the Copper River Highway over the last several years because of the natural rerouting of the Copper River and flood events that have washed out the highway. It will consider transportation connections along the Copper River Highway and the surrounding area, and work with stakeholders and the community to receive feedback on what improvement projects are most desired.

The study identifies and evaluates opportunities to reconnect Copper River Highway to enhance connectivity, quality of life, and economic opportunities for Cordova and surrounding settlements through responsible infrastructure development and repair. The study team worked with stakeholders, tribes, and the community to understand what repairs and investments are desired and should move forward to a National Environmental Policy Act (NEPA) and design phase. Transportation investments in the area would meet the following objectives:

- Re-establish access along Copper River Highway for connection between Cordova and subsistence lands, recreation opportunities, tourism destinations, and public lands and resources
- Re-create tourism and economic development opportunities to the Million Dollar bridge and the Childs Glacier recreation area and campground
- Create opportunities to strengthen cultural exchange, share traditional knowledge, and enhance access to subsistence resources and activities

The Copper River Highway follows an historic railbed for more than 50 miles in a generally eastward direction from Cordova and provides access to a range of recreation and tourism activities as well as subsistence and access to traditional lands. The highway has sustained extensive damage over the last several years because of the rerouting of the Copper River and flood events that have washed out the highway and bridges. The lack of all-season surface transportation connection has created undesirable conditions that benefit from resolution including:

- Year-round, reliable, and cost-effective transportation of goods and services
- Opportunities for tourism and economic development
- Access to public lands, traditional lands, and subsistence resources

3.0 CURRENT CONDITIONS

Current conditions include provisions of state, regional and local plans, the existing transportation infrastructure, local trends and characteristics, emergency services and safety, cultural and environmental considerations, and maintenance and operations.

3.1 State, Regional and Local Plans

3.1.1 Statewide Long-Range Transportation Plan

The most recent Statewide Long-Range Transportation Plan (LRTP), *Alaska Moves 2050* was released as a draft for public review in 2023, where it remains at the time of this study**.** The Statewide LRTP includes a broad range of goals, including safety, mobility and access, economic vitality, state of good repair, resiliency, and sustainability.

The adopted LRTP, *Let's Keep Moving 2036*, also includes goals addressing new facilities, modernization, system preservation, system management and operations, economic development, safety and security, livability, community and the environment, and transportation system performance.

3.1.2 Prince William Sound Transportation Plan

The Prince William Sound Transportation Plan (PWSTP) was approved on July 15, 2001. The plan forecasts regionally-significant transportation system needs over a twenty-year period (2001 – 2021) and recommends improvements to meet those needs. The PWSTP notes the incomplete nature of the Copper River Highway north of the Million Dollar bridge, and identifies three alternatives to complete a highway connection to Chitina:

1. A Tasnuna River route that would follow the Tasnuna River Valley west for 23 miles, extend through Marshall Pass, and meet the Richardson Highway at mile 22.5 near Thompson Pass. The 2001 capital cost estimate included an estimated $182 million for construction and a yearly operating cost of $1.13 million.
2. A Tiekel River route which crosses the Tasnuna River and continues north along the Copper River to the Tiekel River and follows the old Copper River and Northwestern railway bed from mile 82 to mile 101. Once meeting the confluence of the Tiekel River the route would turn west and run through the Tiekel River Valley and intersect with the Richardson Highway at mile 46. The 2001 capital cost estimate includes an estimated $206 million for construction and a yearly operating cost of $1.16 million.
3. A Wood Canyon route following the same path as the Tiekel route to mile 101, except this route would continue north along the west bank of the Copper River, through the Wood Canyon, and into Chitina following the original railroad route rather than going through the Tiekel River Valley. The 2001 capital cost estimate included an estimated $237 million and a yearly operating cost of $1.31 million.

Further consideration of this connection was stopped owing to very high capital costs relative to other highway projects in Alaska, potential impacts on environmental and subsistence resources, lack of consensus from impacted communities (Cordova and Chitina) on the route, high maintenance and operations costs, and the continued need for ferry service in Prince William Sound.

The Prince William Sound Transportation Plan is due to be updated, and this effort is programmed to commence in late 2025.

3.1.3 Copper River Highway Transportation Master Plan

The 2023 Copper River Highway Transportation Master Plan (CRHTMP) guides future decisions on transportation and land use development for the entirety of the Copper River highway corridor (from the Alaska Marine Highway Ferry Terminal (MP 0) to Abercrombie Creek (MP 51), just past the Million Dollar bridge. This plan details existing conditions, analyzes needs, and develops recommendations based on community vision and input. The document serves as a foundation for future project planning, environmental review, and funding.

The CRHTMP includes a figure depicting the land ownership within the Copper River Delta flanking the Copper River Highway (Figure 3).

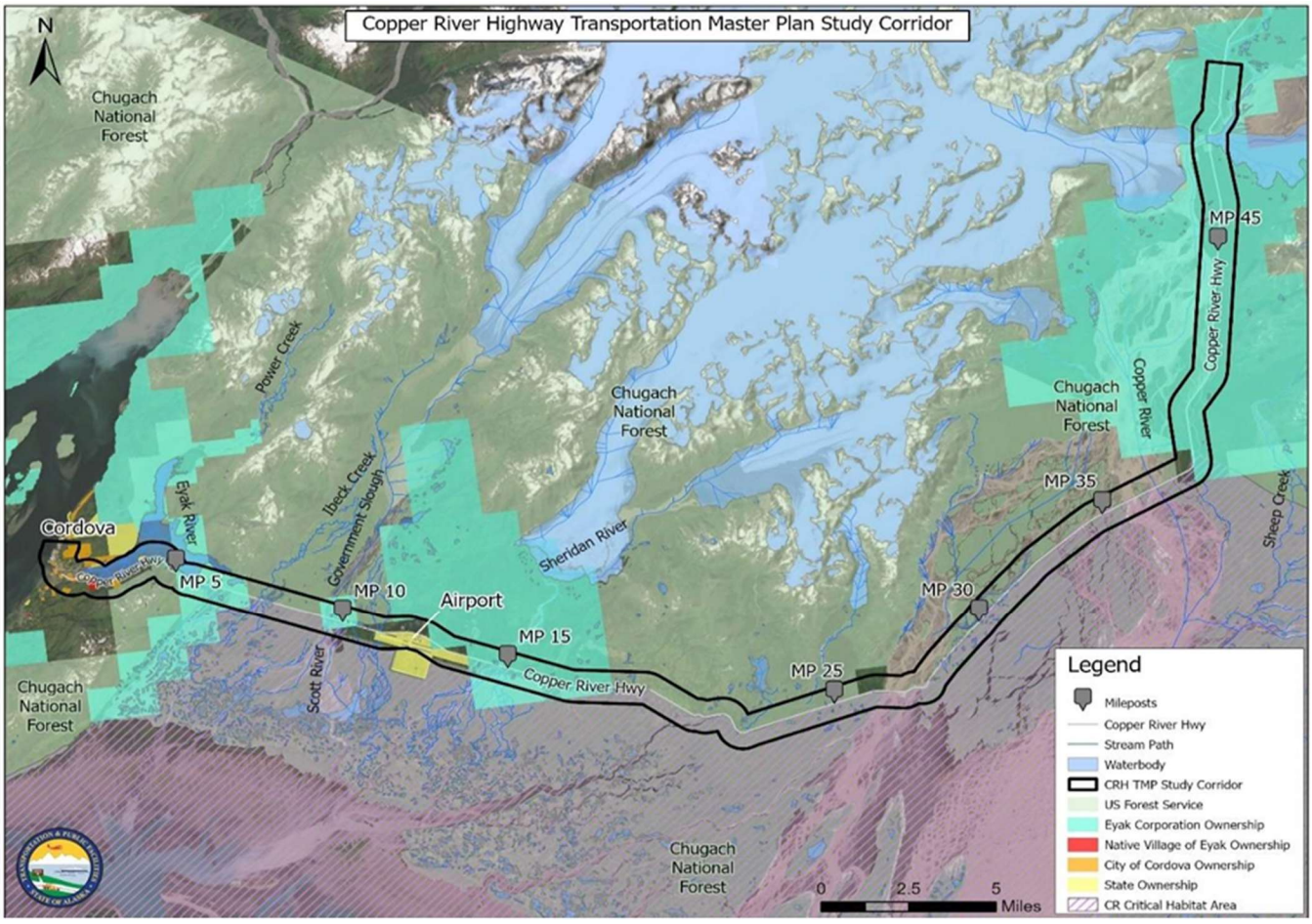


Figure 3. Land Ownership Along Copper River Highway Corridor

The CRHTMP noted that seasonal use at the Million Dollar bridge and Childs Glacier has reduced from 8,000 to 1,000 visitor days because of bridge closures and other roadway damage. It assesses ideas about what the public would like to see as long-term transportation and infrastructure improvements, but it does not provide specific

analyses of that they would entail. The plan considered more than 85 projects, ideas, and needs, which were consolidated and scored by a Stakeholder Advisory Committee to identify the top five recommended projects:

- **Project 1:** Improve parking at the Ibeck Creek and at heavily used fishing locations or widen existing narrow shoulder
- **Project 1:** Widen shoulder/separate bike path and safety improvements from MP 0 – MP 13 (Cordova Airport)
- **Project 3:** Replace and maintain 36-Mile Bridge (NBI# 339), clear brush, snow, and repair washout; provide access to land beyond MP 36
- **Project 4:** Repair and maintain access to the Million Dollar Bridge and subsistence and recreational areas past MP 51
- **Project 5:** Replace failing culverts and culverts inhibiting fish passage
- These projects are further described at a conceptual level, with planning-level cost estimates. Projects 3, 4, and 5 are included in the Route Alternatives Study area.

3.1.4 City of Cordova Comprehensive Plan

The 2019 City of Cordova Comprehensive Plan serves as a community resource and guide. The comprehensive plan offers recommendations that protect what residents value most about Cordova while also benefiting and enhancing the quality of life for current and future residents. The comprehensive plan is a community-driven tool that provides direction to community leaders, residents, funders, and other partners.

Strategies identified in the comprehensive plan that are relevant to this study include:

- **Strategy 1 of the Quality-of-Life Goals:** supports expanding and improving Cordova's indoor and outdoor recreation opportunities which includes restoring access to Childs Glacier and the Million Dollar bridge.
- **Strategy 3 of the Economic Development Strategies and Actions:** focuses on promoting small-scale tourism and recreation, including increasing the supply of both short and long-term camping options.

3.2 Transportation Infrastructure

3.2.1 Overview

The Copper River Highway progresses in a generally east-northeasterly direction from Cordova to its terminus at MP 51, just past the Million Dollar bridge. The highway alignment follows the railbed of the Copper River and Northwestern Railway, which ran from Cordova to the Kennecott mine, near McCarthy within Wrangell-St Elias National Park for the transportation of copper ore. The last ore train used the line in 1938, and the Kennecott Corporation subsequently donated the railroad ROW to the United States for use as a public highway. The highway construction started in 1953, and by 1964 the road extended from Cordova to the Million Dollar bridge. The 1964 Good Friday earthquake damaged 28 bridges along the road which delayed construction, and by 1972 the highway extended to MP 72, approximately 20 miles south of Chitina. The final 20-mile section has not been constructed.

The Copper River Highway crosses the active alluvial plain of the lower Copper River at Flag Point, MP 27, and extends through approximately MP 38. The highway's alignment then turns in a north-south direction and runs along the eastern side of the Copper River's alluvial plain until it crosses the river at the Million Dollar bridge.

The Copper River Highway is classified as a Major Collector roadway up to NBI# 339 at MP 36 with a maximum posted speed of 55 miles per hour. Between MP 36 and 51, the highway does not have a classified service level. DOT&PF's ROW varies from 100 to 150 feet along either side of the Copper River Highway (150-feet typical) and much of the ROW is not extensively developed. There are also access points to United States Forest Service trailheads, campgrounds, and boat launches along the length of the highway, although several are now inaccessible.

Traffic volumes along the highway are considered very low. The count station at MP 16 of the Copper River Highway measures approximately 200 vehicles per day, and the count station at MP 26 measures approximately 50 vehicles per day. It should be noted for context that Merle K. Mudhole Smith Airport is located at MP 13 and the Cordova Landfill is located at MP 17, which helps to account for the sharp drop in traffic between the count stations at MP 16 and MP 26.

3.2.2 Highway Conditions

The Copper River Highway is paved for the first 12 miles from Cordova and the rest is gravel. The highway past MP 36 has been de facto abandoned since 2011 due to erosion of the approach to bridge NBI# 339. In 2012, the increased channel flow breached the highway at the bridge's east end, which over time resulted in the land and segment of the roadway between NBI# 339 and NBI# 340 to be completely eroded away to the point it is now an active channel with a width of 1,100 feet.

In addition, one of the main channels of Copper River has been migrating eastward toward the Copper River Highway and is now threatening and directly impacting segments of the highway from around MP 39 through MP 45. As of September 2019, approximately 2,875 feet of the highway has been lost to erosion along this segment and the erosion limits have advanced beyond the DOT&PF ROW. The erosion is also threatening to wash out a segment of the highway between MP 43.5 and MP 44. During high water events the roadway is often overtopped by the river at various locations between MP 38 and MP 43.5 due to the road's low elevation.

3.2.3 Bridges

Within the study area there are 12 bridges, including the Million Dollar Bridge as detailed in Table 1 (also refer to Figure 2).

Table 1. Bridges within Study Area

MP	Bridge Name	National Bridge Inventory Number (NBI#)	Year Built	Rating 2024
48.8	Million Dollar Bridge	0206	1910	Poor
37.9	Copper Delta	0345	1977	Good
37.6	Copper Delta	0344	1977	Good
37.0	Copper Delta	0342	1977	Fair
36.5	Copper Delta	0340	1977	Good
36.2	Copper Delta	0339	1977	Poor
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MP	Bridge Name	National Bridge Inventory Number (NBI#)	Year Built	Rating 2024
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27.6	Copper River Round Island Channel Bridge	0332	1973	Good
26.9	Copper River Flag Point East	1187	1973	Fair
26.7	Copper River Flag Point West	0331	1973	Fair

Eleven (11) of the bridges cross the lower Copper River Delta and range in length from 240 feet to 1,200 feet. Some have spur dikes installed to minimize erosion. The Million Dollar Bridge crosses the Copper River between Miles Glacier and Childs Glacier. Its location means it is vulnerable to glacial calving and icebergs, which can cause damage to the bridge's piers.

The Million Dollar bridge, a resource listed on the NRHP, is 1,550 feet long and was temporarily repaired after sustaining major damage in the 1964 earthquake using a system of I-beams and planks. A permanent repair occurred in 2005. In 2016, a large iceberg struck one of the icebreakers protecting the bridges first pier. The damaged icebreaker moved downstream during a high-water event in 2019 and currently offers no protection to the first pier, which creates the potential for structural damage from future iceberg strikes. In addition, computer analysis indicates that Piers 1 and 2 are vulnerable to failure, partially due to the variable quality of the concrete, which has cold joints at unknown locations throughout the piers and no rebar reinforcement. Further detail on the characteristics of the Million Dollar Bridge is in Section 6.5.

Image 1. Million Dollar Bridge

Bridge NBI# 339 has been closed since August 2011 due to safety concerns as deep scouring in the river channel has undermined the bridge support piers. Subsequent erosion from the river channel has completely washed away the land segment of the highway that connected NBI# 339 with NBI# 340, and the road is currently closed at Flag Point (MP 27) for traffic safety reasons.

3.2.4 Stream Culverts

In addition to the various bridges, there are 25 stream culverts within the study area, the majority of which have been damaged from a range of factors, including age (Table 2).

Image 2. Culverts in the Copper River Highway Corridor

Table 2. Recorded Stream Culvert Data

Culvert HUC Code	Approximate Diameter (in Feet)	Approximate Length (in Feet)	RGG Rating	Survey Date
20100512	5	46.5	Red	6/24/2010
20100513	4	43	Gray	7/28/2002
20100514	4	46	Red	7/28/2002
20100515	3	*	Gray	7/28/2002
20100516	3	49	Gray	7/28/2002
20100517	3	6	Red	7/28/2002
20100518	4	58	Gray	7/28/2002
20100519	3	89	Gray	7/28/2002
20100520	4	60	Gray	7/28/2002
20100521	3	85	Gray	7/29/2002
20100522	4	60	Red	7/29/2002
20100523	25	80	Black	10/11/2010
20100525	10	*	Black	7/29/2002
20100526	6	40	Black	7/29/2002
20100527	4	*	Black	7/29/2002
20100528	5	60	Black	10/11/2010
20100529	4	*	Black	7/29/2002
20100530	3	75	Gray	7/29/2002
20100531	3	*	Gray	7/29/2002
20100533	3	75	Gray	7/29/2002
20100534	4	60	Gray	7/29/2002

Culvert HUC Code	Approximate Diameter (in Feet)	Approximate Length (in Feet)	RGG Rating	Survey Date
20100535	4	*	Gray	7/29/2002
20100536	4	*	Black	7/29/2002
20100537	4	*	Black	7/29/2002
20100538	4	*	Black	7/29/2002
20100539	4	86	Red	7/29/2002
*Culvert lengths denoted as *, indicate the approximate length is unknown.*				

The Alaska Department of Fish and Game (ADF&G) has evaluated these 25 stream culverts and determined that none of them are likely to be adequate for fish passage requirements, and six are critically inadequate for fish passage.

DOT&PF and ADF&G have a memorandum of agreement (MOA) regarding the design, permitting, and construction of stream culverts for fish passage. This agreement requires that where DOT&PF and ADF&G have determined that stream culverts are the appropriate stream crossing structure and are used in fish-bearing waters, they are designed and installed to provide efficient fish passage and to ensure statewide consistency in Title 16 permitting of stream culvert-related work. As none of the stream culverts in the study area are likely to be adequate for fish passage requirements, they need to be evaluated and replaced to meet the requirements of the MOA.

Maintaining the existing transportation infrastructure throughout the study area has proven to be extremely challenging, primarily due to the powerful dynamics of the Copper River's fluvial processes, including scour of the streambed, deposition of sediments, channel migrations, and loss of streambanks to erosion as well as the remote location of the area. Except for the Million Dollar bridge, the damage to the Copper River Highway's infrastructure can be directly attributed to the changes in the alluvial system of the lower Copper River.

3.3 Transportation Trends and Characteristics

The Copper River Highway is a historic transportation link for the residents of Cordova, the Prince William Sound (PWS) region, and the Copper River Valley basin. Since the 1950s, the eastern portion of the highway has been used to access hunting, subsistence, and recreational lands as well as Native allotments.

Over time the highway's bridge and roadway infrastructure has succumbed to natural and environmental challenges and is currently impassible beyond MP 36. Notwithstanding this, the highway remains an iconic and significant resource for the area's economic, environmental, and social future. Prior to August 2011, the Copper River Highway provided access to recreation and subsistence resources from Cordova to Abercrombie Creek and the Million Dollar bridge, passing through world class scenic wilderness. Following the road closure, access to these resources is difficult and visitors are encouraged to work with outfitters to access tourist attractions.

3.4 Emergency Services and Safety Considerations

There are three community-based healthcare facilities in the area, the Cordova Community Medical Center and Primary Care Clinic which are publicly owned, and the Ilanka Health Center run by the Native Village of Eyak. In addition, the Cordova Volunteer Fire Department provides emergency/ambulance services. The City of Cordova maintains a police department and the Alaska State Troopers have a Wildlife Trooper post in Cordova.

3.5 Environmental Considerations

3.5.1 Overview

Environmental considerations associated with the study area are summarized in Appendix 2, which addresses resource categories under NEPA. Key resource considerations include biological resources and Section 4(f) resources, which are briefly summarized below.

3.5.2 Biological Resources

The area provides particularly important habitat for biological resources, including migratory birds and as one of the most important salmon fisheries in Alaska. The salmon migrating into the Copper River are a significant resource for subsistence, commercial and sport fisheries. Subsistence-caught fish provide an important food staple for rural residents and are an integral part of Alaska Native culture.

3.5.3 Section 4(f) Resources

Section 4(f) of the US Department of Transportation Act of 1966 is a federal policy that requires in part, that special efforts be made to preserve the natural beauty of the countryside and public parks and recreational lands, wildlife and waterfowl refuges, and historical sites. Section 4(f) properties include significant publicly owned public parks, recreation areas, and wildlife or waterfowl refuges, or any publicly or privately owned historic site listed as eligible for listing on the National Register of Historic Places. There are three potential Section 4(f) resources within the study area:

- **Million Dollar Bridge:** The Million Dollar Bridge is an Alaska Heritage Resource Survey (AHRS)-listed resource and is eligible for listing on the National Register of Historic Places.
- **Child's Glacier Campground:** The site is managed by the United States Forest Service and is a campground/recreation area open to the public during summer months (June 10th-September 30th). The campground includes camping sites, drinking water, toilets, fire rings, food lockers, grills, interpretative displays, picnic area and pavilion, and a glacier viewing platform/overlook.
- **Copper River Delta Critical Habitat Area:** This area is designated as a critical habitat area and managed by ADF&G. It is open to most public uses including hunting, trapping, fishing, wildlife watching, hiking, boating, snow machining and camping.

3.6 Operations and Maintenance

The Copper River Highway is managed by DOT&PF to where it is closed to vehicular traffic near NBI# 339. Beyond this location there is minimal to no maintenance. There is a DOT&PF-owned maintenance facility in Cordova.

4.0 PUBLIC AND AGENCY INVOLVEMENT

Public and agency involvement efforts for the Copper River Highway Route Alternatives Study included engagement for a Planning and Environmental Linkages (PEL) Study and a broader public involvement effort associated with the Copper River Highway Transportation Master Plan. These efforts and associated feedback are summarized below.

4.1 Planning and Environmental Linkages Study

4.1.1 Public Involvement

Public involvement activities with a focus on improvements to the Copper River Highway corridor began in December 2019 when DOT&PF hosted a public meeting for the PEL Study. The meeting was on December 17, 2019, at the Cordova Center, Cordova and 44 participants signed the attendance form. The goals of the meeting were:

- To receive feedback on the purpose and need for the PEL Study
- To receive input on alternatives to address project elements
- To receive input on which project elements should be completed first, and the sequencing of other project elements

Feedback received included:

- Concern was raised about the economic impact to Cordova associated with the washout of NBI# 339 bridge, particularly when combined with a reduction in Alaska Marine Highway System ferry services calling at Cordova
- Recreational access to areas along Copper River Highway is now a lot more challenging since the closure of the road at NBI# 339
- Concern about the feasibility of all the work as the river is going to keep moving, and weather events that are going to have an increasing impact on infrastructure
- Concern about the amount of infrastructure that is failing along the Copper River Highway (and the associated “snowballing” of costs and impacts), and what the plan is if the Million Dollar Bridge catastrophically fails
- Desire to prioritize repairs to the Million Dollar Bridge owing to downstream risks to landowners and assets
- Concerns about the lead-based paint on the Million Dollar Bridge and its impact on the Copper River Fishery if the bridge collapses into the river

Feedback forms returned as part of the open house indicated a preference for prioritizing repairs to NBI# 339 and then subsequent repairs traveling north along the highway (MP 43.5 washout, repairs to the Million Dollar Bridge) to enable access to be opened for recreational use and to mobilize construction equipment and personnel to undertake the needed repairs. Discussion also considered the need to repair and replace culverts along the highway, and some stakeholders raised a need to evaluate whether all the culverts were still needed

and to remove those that were no longer in use. Several resource agencies also attended the open house and provided their feedback, which is captured in the above summary.

4.1.2 Agency Engagement

The DOT&PF submitted consultation requests to Alaska Native Tribes, government agencies, and Alaska Native Corporations in January 2022 and met with the Native Village of Eyak Tribal Council, the Eyak Corporation, the United States Forest Service, and the City of Cordova.

4.2 Copper River Highway Transportation Master Plan

When the Copper River Highway Transportation Master Plan effort began in 2022, DOT&PF developed a broader Public Involvement Plan that provided for a more extensive public involvement effort and "dovetailed" with the PEL Study.

4.2.1 Stakeholder Advisory Committee

A Stakeholder Advisory Committee was established to represent the broad interests in the plan, with representatives including:

- Native Village of Eyak
- City of Cordova
- United States Forest Service
- Alaska Department of Fish and Game
- Alaska Department of Natural Resources, Division of Mining, Land and Water
- Copper River Watershed Project
- Chugach Alaska Native Corporation
- The Eyak Corporation
- Prince William Sound Economic Development District
- Cordova Chamber of Commerce
- Local Businesses
- University of Alaska Land Management
- Recreation Users
- City Elected Officials

The Stakeholder Advisory Committee met and advised at three points throughout the Master Plan, including providing commend on proposed project ranking criteria and ranking identified projects.

4.2.2 Public Involvement

DOT&PF hosted a public meeting in January 2022, which was attended by more than 25 community members, which explored the vision for the Copper River Highway in 2047 and beyond. The meeting also discussed needs to be addressed and potential projects.

An online survey gathered input from individuals who were unable to attend the open house, which received more than 85 individual comments in categories including recreation infrastructure, access, commercial development, pedestrian and bicycle infrastructure, fish and wildlife passage, and other improvements.

A second public meeting was held in September 2023, which sought comments on the draft Transportation Master Plan. The plan recommended replacing the bridges at NBI# 339 and NBI# 340 with a new single span bridge, reinstating access to subsistence and recreation areas past MP 51, and replacing failing culverts and culverts inhibiting fish passage as priorities three through five respectively of the top five ranked projects.

5.0 NEEDS ASSESSMENT

5.1 Needs Identified

The Copper River Highway follows an historic railbed for more than 50 miles in a generally eastward direction from Cordova and provides access to a range of recreation and tourism activities as well as subsistence and access to traditional lands. The highway has sustained extensive damage over the last several years because of the natural rerouting of the Copper River and flood events that have washed out the highway and bridges. The lack of all-season surface transportation connection has created undesirable conditions that benefit from resolution including:

- Year-round, reliable, and cost-effective transportation of goods and services
- Opportunities for tourism and economic development
- Access to public lands, traditional lands, and subsistence resources

5.2 Potential Projects

The following potential projects have been considered to address the needs identified:

- Re-establish public access across NBI# 339 and its associated washout at approximate MP 36.
- Re-establish public access across the segment of the Copper River Highway that has been completely eroded away by the Copper River, between approximate MP 44 through MP 45.
- Acquire ROW as needed to address the loss of the highway segment between approximate MP 44 through MP 45.
- Repair or replace the icebreaker at Pier 1 of the Million Dollar Bridge and complete any necessary repairs to this bridge to address its current Poor condition rating.
- Replace culverts that are not in compliance with the MOA between the ADF&G and DOT&PF for the design, permitting, and construction of fish passage culverts.
- Expand or develop new material sites, including consideration of a potential granite quarry on land owned by The Eyak Corporation (TEC) (surface estate) and Chugach Native Corporation (subsurface).
- Determine logistics required to get any heavy equipment needed to construct the projects to their respective sites, including development of project staging area(s) for construction materials, fuel, equipment, and possible work camps.

5.3 Screening and Prioritizing Alternatives

A broad range of alternatives were considered as part of this study. In addition to evaluating different alternatives for each project, a No Build alternative was considered to provide a baseline of what transportation infrastructure conditions would potentially be if no investments were made and to provide a comparison for each of the different alternatives.

The following criteria were used in the consideration and evaluation of alternatives:

- The alternative would need to last at least 20 years or more with normal routine maintenance
- The alternative is reasonable under NEPA
- The alternative is financially reasonable and feasible
- The alternative is technically feasible and able to be constructed taking into consideration cost, existing technology, and logistics
- The alternative minimizes impacts on identified sensitive areas

The results of the alternative screening and prioritization are summarized in Section 6 of this report and in Appendix 3.

6.0 ALTERNATIVES

6.1 Overview

The DOT&PF identified four projects that could potentially be implemented to reconstruct, repair, or replace the damaged transportation infrastructure along the Copper River Highway. Projects identified are:

- Re-establish access across NBI# 339 and washout
- Replace or remove culverts
- Reconstruct or re-align the Copper River Highway at the MP 43.5 wash-out
- Million Dollar Bridge

For each of these potential projects several alternatives were identified to accomplish the project. These alternatives were evaluated at a high level to identify a recommended alternative to accomplish the project. A No Build alternative was also considered for each project to serve as a baseline to evaluate what the existing transportation infrastructure conditions are, and what would likely occur if no investments are made.

In addition to projects to reinstate damaged infrastructure along Copper River Highway, two additional projects were identified to generate materials for the repairs, or to support the completion of the work:

- Expand or develop new materials sites
- Temporary overland route within the study area

Several alternatives to accomplish these projects were considered, together with a No Build alternative.

The analysis further considered what would be needed to decommission the Copper River Highway instead of completing the repair projects.

The alternatives listed in Table 3 provide a complete list of the projects evaluated, including summaries of each project, number of alternatives, and recommendation. A more detailed description of each of the recommended alternatives is then provided. Details of alternatives that are not recommended are included in Appendix 3.

Table 3. Summary of Project Areas, Alternatives, and Recommendations

Re-Establish Access Across NBI# 339 and Washout	
Project Alternatives	**Recommendation**
Alternative 1: New 1,540 Bridge	Not Recommended
Alternative 2: New 1,400 Bridge	Recommended Alternative
Alternative 3: Repairing and Extending NBI# 339	Not Recommended
Alternative 4: Suspension Bridge	Not Recommended
Alternative 5: Stay Cable Bridge	Not Recommended
Alternative 6: Aerial Ropeway/Tram System	Not Recommended
No Build	
Replace or Remove Culverts	
Project Alternatives	**Recommendation**
Alternative 1: Replace Culverts	Recommended Alternative
No Build	
Reconstruct or Re-Align the Copper River Highway at the MP 43.5 Wash-Out	
Project Alternatives	**Recommendation**
Alternative 1: Reconstruct Road on Original Alignment	Not Recommended
Alternative 2: Construct New Road East of Washout (Shorter Section)	Not Recommended
Alternative 3: Construct New Road East of Washout (Longer Section)	Not Recommended
Alternative 4: Reconstruct Road on Original Alignment with Higher Elevation	Recommended Alternative
No Build	
Million Dollar Bridge	
Project Alternatives	**Recommendation**
Alternative 1: Reconstruct Ice Breaker at Pier 1	Recommended Alternative
Alternative 2: Install Steel-Casted Drilled Shafts to Replace Ice Breaker at Pier 1	Not Recommended
Alternative 3: Riprap or Dolosse to Protect Piers 1 and 2	Not Recommended
Alternative 4: Pre-Cast Concrete Ice Breaker or Caisson	Not Recommended
Alternative 5: Closed Cell Sheet Pile Around Pier 1	Not Recommended
Alternative 6: Drill/Pin Icebreaker in Place	Recommended Alternative
Alternative 7: Steel Cage Addition to Steel Piles Around Pier 2	Not Recommended
Alternative 8: Complete Repairs to Million Dollar Bridge	Recommended Alternative
No Build	
Expand or Develop New Materials Sites	
Project Alternatives	**Recommendation**
Alternative 1: Develop Two Material Sources	Recommended Alternative
Alternative 2: Use/Expand Existing Materials Sites	Not Recommended
No Build	
Temporary Overland Route within Study Area	
Project Alternatives	**Recommendation**
Alternative 1: Temporary Work Trestle Spanning Washout at NBI# 339	Recommended Alternative

Alternative 2: Construct Ice Road to Cross Channel at NBI# 339	Not Recommended
Alternative 3: Ice Road on Broad, Shallow Delta Near NBI# 339	Not Recommended
Alternative 4: Low Flow Period Temporary Work Trestle Spanning Washout at NBI# 339	Not Recommended
Alternative 5: Overland Route on West Side of Copper River	Not Recommended
Alternative 6: New Road Above Copper River Active Flood Plain	Not Recommended
Alternative 7: Airstrip on Copper River Highway	Not Recommended
No Build	
Staging of Work on the Copper River Highway	
Project Alternatives	**Recommendation**
Alternative 1: Reconstruct, Repair, or Replace the Damaged Infrastructure Along Copper River Highway	Recommended Alternative
No Build	

6.2 Re-Establish Access Across NBI# 339 and Washout

Bridge NBI# 339 was closed in 2011 at MP 36 for safety reasons because the deep scour occurring in this river channel has undermined the bridge support piers. Subsequent erosion from this river channel has completely washed away the land and segment of the highway that previously connected NBI# 339 with NBI# 340 (Figure 4). Currently, the width of the active channel at ordinary high water (OHW) is about 1,110 feet.

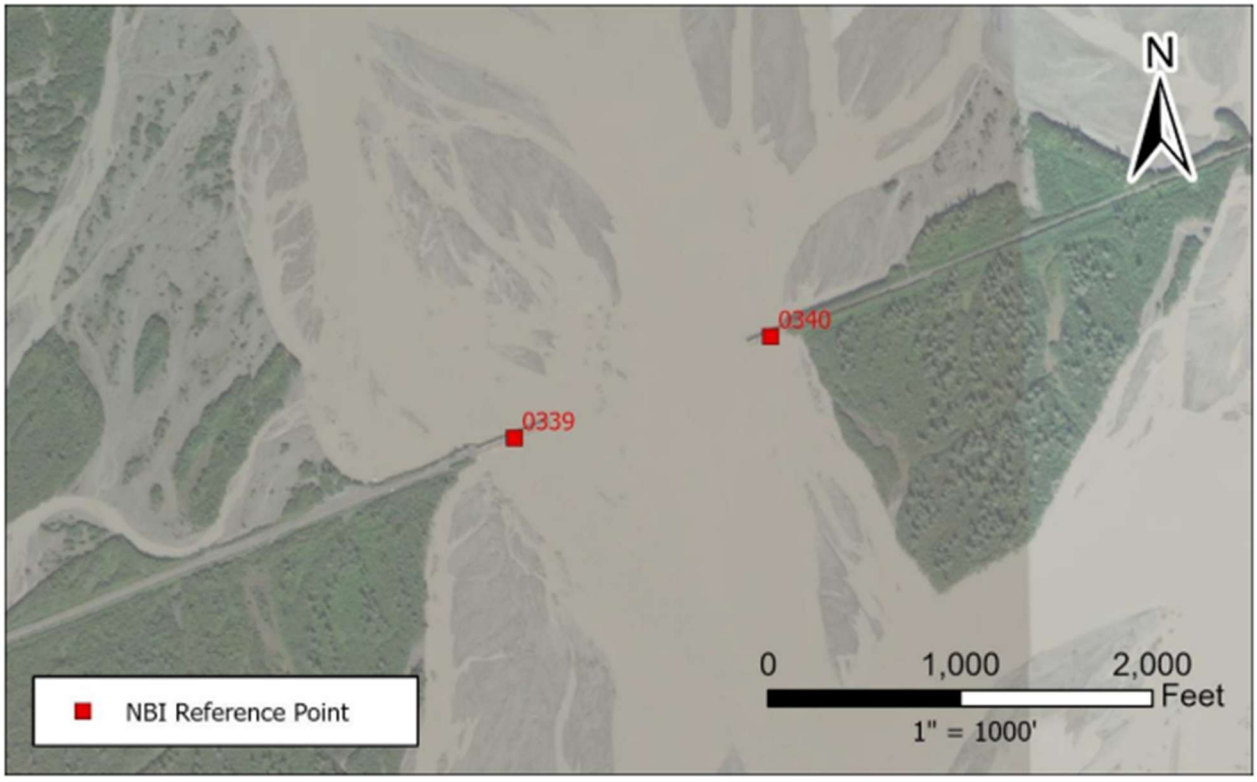

Figure 4. NBI# 339 and Associated Wash-Out

6.2.1 Recommended Alternative: New 1,400 Foot Bridge

6.2.1.1 Overview

This alternative proposes a new bridge that is 1,750 feet long and 35 feet wide. NBI# 339 and NBI# 340 would be removed completely as part of this alternative. Additional work would be needed to reconstruct approach roadway sections, rehabilitate guide bank requirements, install riprap, and mitigate the impacts of ongoing erosion and river migration.

6.2.1.2 Construction

Early analyses provided high level detail on the proposed construction methodology. Two construction access trestles would be constructed along the same alignment as the proposed replacement bridge, one trestle on each side of bridge. The trestles would include rails for the primary hoisting equipment to travel on, which would be a 225-ton straddle carrier gantry crane. As segments of the permanent bridge superstructure are completed those segments will provide the access road required for all material handling. Using this method of construction would allow the new bridge and its associated trestles to remain inside DOT&PF's ROW. As the construction season is short and the site is remote, all equipment would need to be flown or barged into the site and construction would depend on river flows, which tend to be substantial. Traffic control is not likely to be required as the road is not currently connected and is in use.

6.2.1.3 Potential Impacts

As the alternative can remain within DOT&PF's ROW, potential impacts associated with the construction of this alternative are considered minimal. The construction approach would be dependent on water flows, as the river has a substantial flow in this location which is impacted by flood events and general weather conditions. This is also likely to impact the duration of the construction season and construction planning should assume a short construction window.

6.2.1.4 Cost Estimate

The 2025 planning level cost estimate for this alternative amounts to $180 Million (Refer to Appendix 4 for detailed cost estimate details). This amount includes the bridge and all associated work (road embankment, riprap armoring, etc.), and has a contingency amount of 10 percent.

6.3 Repair or Replace Stream Culverts

There are approximately 25 stream culverts with the study area. Most of these stream culverts are within anadromous waters that provide aquatic connectivity to important habitat. On September 13, 2022, DOT&PF inspected all the stream culverts east of the NBI# 339 washout and determined that none of the culverts were functioning, due to a variety of factors including being clogged with sediment and woody debris, age associated deterioration and settlement issues, and vortex forces created during high water events that have damaged the culvert structures.

The non-functioning stream culverts mean that fish passage through the study area is blocked. The impedance of fish passage limits access to critical habitat by both season and life stage, which can limit the number of fish a watershed can support. Furthermore, undersized, or failed stream culverts also interrupt ecological processes and reshape stream system form and function. The community of Cordova has ranked replacing failing stream

culverts and culverts that inhibit fish passage as one of their top five priorities in the Copper River Highway Transportation Master Plan.

6.3.1 Replace Culverts

6.3.1.1 Overview

The DOT&PF proposes to replace the culverts within the Copper River Highway area. The new replacement culverts will meet current design standards for conveyance of water during a 50-year flood event (two percent probability of occurring in any given year).

Culverts that require fish passage will be designed in coordination with the ADF&G and in accordance with the *MOA between Alaska Department of Fish and Game and Alaska Department of Transportation and Public Facilities for the Design, Permitting, and Construction of Culverts for Fish Passage*, August 3, 2001.

The identified culverts within the study area have a diameter between three feet and 12 feet, and variable lengths (refer to Table 2 for available culvert information).

6.3.1.2 Construction

Replacing the culverts will require heavy equipment, logistical support, construction materials, and personnel to be able to access the site. Currently, overland transport access is not possible past MP 36 (NBI# 339 and its associated washout).

6.3.1.3 Potential Impacts

No impact analysis is provided for this alternative.

6.3.1.4 Cost Estimate

Hydraulic modeling of the Copper River stream channels or tributaries where culverts are located has not been completed, meaning detailed culvert engineering designs and their cost estimates are not able to be developed. The 2025 planning level cost estimate assumes that all culverts would be capable of providing fish passage and costs vary depending on the diameter. Refer to Appendix 4 for further details. The total project cost is estimated to be $20 Million to replace all the culverts if all the work was accomplished as a single project.

Diameter	Cost per linear foot
4-foot	$700.00
5-foot	$965.00
12-foot	$4,000.00

6.4 Reconstruct or Re-Align the Copper River Highway at MP 43.5 Wash-Out

One of the main channels of the Copper River has been migrating eastward over the last 40 years, which has impacted the Copper River Highway. As of October 19, 2023, the fluvial process from the eastward migration has completely eroded away about 5,400 linear feet of the highway between approximately MP 43.5 and MP 45 and its limits have advanced at least 180 feet beyond DOT&PF's northeastern ROW boundary into property owned

by TEC. Erosion impacts are ongoing and will likely increase over time. The DOT&PF's Right-of-Way at this location is 300 feet (150 feet from each side of the road's centerline). In 2019, TEC posted "No Trespassing" signs along with area of ongoing erosion, largely due to public safety concerns and liability issues associated with the dangers of accessing this area.

In addition to the erosion issues, high water events often overtop the highway at various locations between MP 38 through MP 43.5, which was anticipated and evaluated through a hydraulics study by DOT&PF and USGS. This study concluded that raising the road's elevation by five (5) feet between MP 38 through MP 43.5 would address the potential of the road being overtopped.

6.4.1 Recommended Alternative: Reconstruct Road on Original Alignment with Higher Elevation

6.4.1.1 Overview

This alternative raises the elevation of the roadway grade by five (5) feet, starting at MP 38 and continuing to MP 43. At MP 43 a new road segment would be constructed east around the washout and tie back in near MP 45, for a total length of 2.5 miles.

Class III riprap would be installed along the west side of the road's new embankment from MP 38 through MP 43 to armor the road from the Copper River.

6.4.1.2 Construction

This alternative will require heavy equipment, logistical support, construction materials, and personnel to be able to access the site. Currently, overland transport access is not possible past MP 36 (NBI# 339 and its associated washout). DOT&PF's material specification for Class III riprap includes the requirements that over 50 percent of the rocks weigh more than 700 pounds and up to 10 percent of rocks need to weigh more than 1,400 pounds.

6.4.1.3 Potential Impacts

Through a cooperative water study agreement with the DOT&PF, the USGS completed an evaluation of effects that could result from raising the road grade five (5) feet higher along the area of MP 38 through MP 43.

As part of this study, the USGS used their Survey Flow and Sediment Transport with Morphologic Evolution of Channels model to simulate water-surface elevation through this area for three flow scenarios, 116,000 cubic feet per second (ft^3/s), 174,000 ft^3/s, and 400,000 ft^3/s. Based on this analysis the USGS concluded that the Copper River Highway would not be overtopped by the river if the road's elevation was raised five (5) feet along the area of MP 38 through MP 43.17.

This alternative would meet the criteria of lasting 20 or more years. Raising the road grade from MP 38 through MP 44 would be a safeguard against travelers being stranded if the river overtops the roadway during a high-water event.

The analysis concluded this option would be the least environmentally damaging practicable alternative (LEDPA) when compared to having to reconstruct or reroute this segment of roadway should it be lost to the impending erosion that is occurring in this area as it would remain largely within the existing ROW.

6.4.1.4 Cost Estimate

The 2025 planning level cost estimate for this alternative is $35 Million.

6.5 Million Dollar Bridge

The Million Dollar Bridge is located at MP 48 of the Copper River Highway and is listed on the NRHP and is a multi-span Pennsylvania Truss Bridge originally constructed as a rail bridge and later converted to a road bridge. The bridge was constructed in the early 1900s and spans 1,500 feet of the Copper River. Construction commenced in April 1909, and the bridge was in full service by July 1909. Ice calving from the Miles Glacier meant the bridge needed to withstand icebergs up to 20 feet in height moving with the 7.2 miles per hour current. The river's range is 24 feet in height, and the bed of the river is loose sand and gravel to a depth of 20 feet[1].

The bridge is constructed with four spans, Span 1 at 400 feet, Span 2 at 300 feet, Span 3 at 450 and Span 4 at 400 feet, which are mounted on three piers. Piers 1 and 2 required detached icebreakers to protect the structure from icebergs.

The bridge sustained considerable damage in the 1964 Good Friday Earthquake, resulting in Span 4 slipping off its foundation. This was temporarily repaired until 2003 when permanent repairs commenced to replace Pier 3, which had been damaged beyond repair. After its completion, the DOT&PF raised the fallen span, Span 4, back onto the new Pier 3. The DOT&PF also replaced the damaged and missing bridge members with newly fabricated parts, which resembled, to extent practicable, the original bridge materials and installation methods to maintain historic integrity. The repairs were not completed however, which include additional repairs to the damaged bridge structure and seismic retrofits on Piers 1 and 2.

In August 2016, a large iceberg struck and damaged the icebreaker protecting Pier 1 of the bridge. A high-water event in July 2019 moved this icebreaker further downstream, which means it is not currently protecting Pier 1 and making it vulnerable to damage from iceberg strikes. In addition, there is concern that Pier 2 is vulnerable to similar damage and requires remedial work to maintain its position and the protection it offers long term.

6.5.1 Recommended Alternative: Complete Repairs to Million Dollar Bridge

6.5.1.1 Overview

This alternative will complete repairs to the damaged bridge structure following the 1964 earthquake. It will also install seismic retrofits on Pier 1 and Pier 2 and rehabilitate deteriorated bridge components that have occurred because the bridge is an old structure and has not been maintained since 2005.

6.5.1.2 Construction

Heavy equipment, logistical support, construction materials, and personnel need to access the site. Overland transport is not currently possible past MP 36 (NBI# 339 and its associated washout).

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[1] *Alfredo O. Quinn (1995). Iron Rails to Alaskan Copper. D'Aloguin Publishing Co. p. 91,117–130,183–189.*

Work includes drilling vertical holes down through the entire length of Pier 1 and Pier 2 and through their respective caissons. The borings would be drilled from the bridge deck using diamond core or air rotary drilling techniques. High-strength post-tensioning anchor rods, having dimensions of 110 feet long by 1-3/8" diameter, would then be installed inside these borings. The anchor rods would increase the piers' external overturning resistance as well as their internal flexural- and shear- strength. After the rods are installed, pressurized grouting techniques would be used to inject cement grout, through tremie pipe, to fill any voids within the caissons' cofferdam cribs and any voids within the gravel of the caissons' working chambers, as well as filling the annulus of the borings within the piers.

Additional work includes installing frictional pendulum bearings on Pier 1 and Pier 2 for seismic isolation of the bridge's superstructure, like the bearing already installed on Pier 3, which provides for seismic resiliency. In order to install these bearings, the bridge spans will need to be lifted, and the existing bearings removed and replaced using a bracket system. The seismic retrofitting and realignment of the bridge's superstructure will also require the back wall of the south abutment (Abutment 1) to be adjusted to allow room for the superstructure to move during an earthquake. At that time, repairs of cracks and spalls on this abutment would be completed.

Other work to restore the bridge's structural integrity include, where needed, repairs or replacements of the bridge's bottom chords, bottom laterals, missing bolts, tie-rods, and concrete corbels. The bridge would also be painted to protect its steel from rusting.

6.5.1.3 Potential Impacts

In February 2002, a Finding of No Significant Impact (FONSI) for Copper River Highway Million Dollar Bridge (Project No. BH-0851(62)/60803) was made for this alternative. A re-evaluation will be needed to confirm the proposed actions against the original Environmental Assessment (EA). Work proposed that was not part of the original EA includes seismic retrofitting of the bridge and repainting the bridge. Testing indicates that the current paint is lead-based, so mitigation will be required to manage the environmental impacts associated with the lead paint removal.

6.5.1.4 Cost Estimate

This alternative has a 2025 planning level cost estimate of $70 Million (refer to Appendix 4).

6.5.2 Recommended Alternative: Reconstruct Ice Breaker at Pier 1

6.5.2.1 Overview

This alternative proposes to reconstruct the ice breaker at Pier 1 using flat, precast concrete slabs that would be stacked or "pancaked" on top of each other.

6.5.2.2 Construction

This alternative will require heavy equipment, logistical support, construction materials, and personnel to be able to access the site, which is challenging because overland transportation access is currently not possible past MP 36 (NBI# 339 and its associated washout).

Reconstructing the icebreaker using the precast concrete slab approach outlined above requires that each slab have guide holes to keep them aligned as they are lowered through steel piles that would be installed around

the ice breaker's original caisson. After all the stacking is complete, the guide holes in the slabs would be grouted with concrete. A temporary work trestle would be required to construct this structure.

6.5.2.3 Potential Impacts

It is not clear whether this alternative is covered by the FONSI to complete repairs to the Million Dollar Bridge. A re-evaluation will be needed to confirm the proposed actions against the original EA, which could, depending on the scope of this addition, address the reconstruction of the ice breaker.

6.5.2.4 Cost Estimate

A planning level cost estimate of $25 Million for each ice breaker is provided, which was affirmed in 2025 (refer to Appendix 4).

6.6 Expand or Develop Materials Sites

Many of the projects recommended in this study require additional earthen material for construction. These materials are limited in the general vicinity of the study area, and materials need to meet DOT&PF's standard material specifications for their intended purpose. It is also advantageous for material sites to be located as close to the project site as possible to reduce the cost of hauling materials and associated environmental impacts.

6.6.1 Recommended Alternative: Develop Two Materials Sites

6.6.1.1 Overview

Two material sources have been identified within the study area.

Existing Material Site 851-015-5

Material Site (MS) 851-015-5 is located north of the Million Dollar Bridge, between approximate MP 50 to MP 51 of the Copper River Highway (Figure 5).

The material at MS 851-015-5 is unconsolidated colluvium and reworked glacier till that was deposited in the outwash plain of the nearby Grinnell Glacier. The material within this site meets standard material specifications and there are sufficient quantities, with the exception of riprap, which could be used to provide the earthen material necessary to construct many of the recommended projects.

Because MS 851-015-5 is located north of the Million Dollar Bridge, haul trucks will need to cross the bridge to access the site. Since the driving surface of the bridge deck is only 20 feet wide and its vertical clearance is about 16 feet, this limits the size of material trucks that can access the site. It would also limit the size of heavy equipment needed to obtain material at the site.

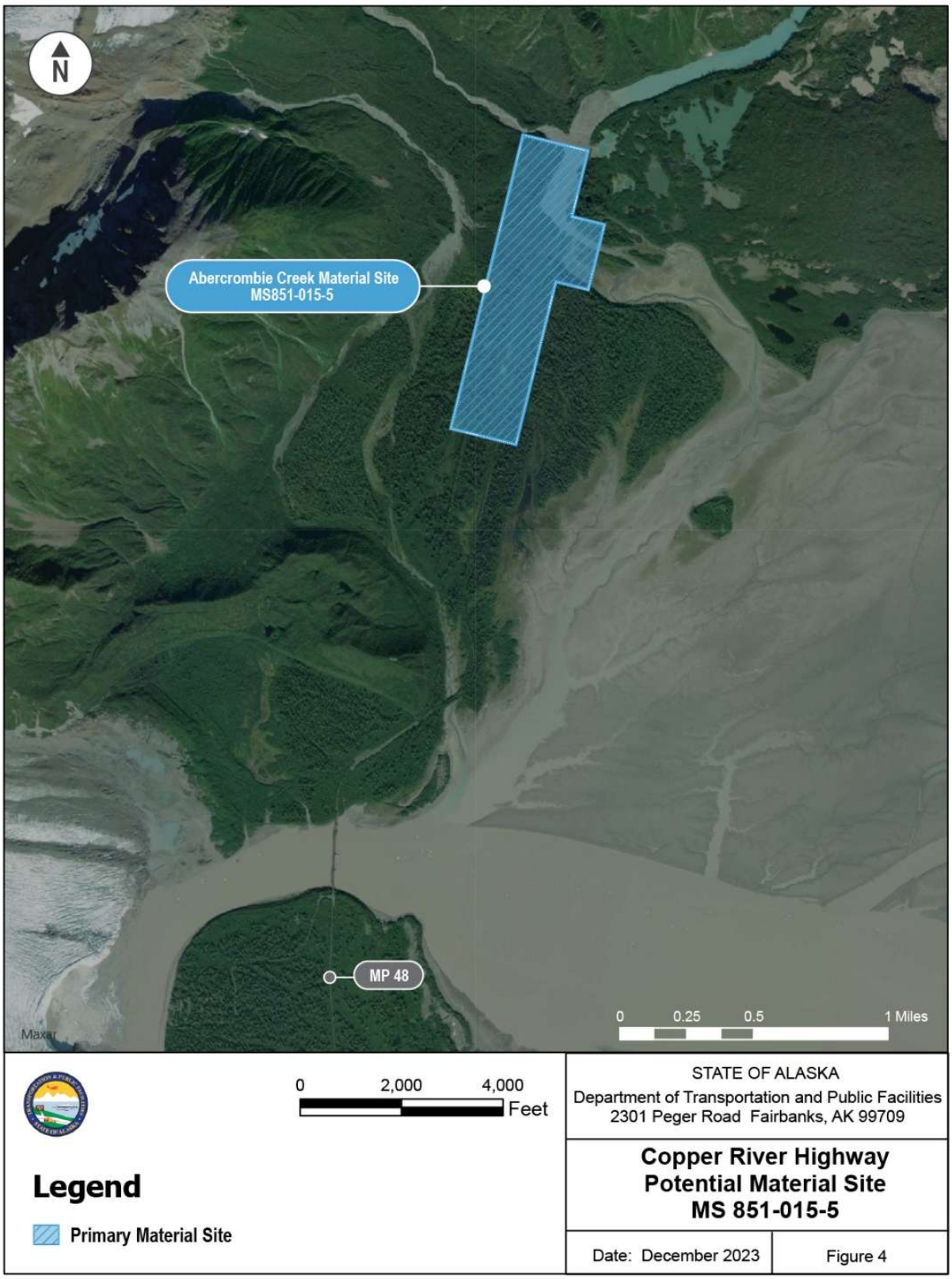

Figure 5. Material Site 851-015-5

Goat Mountain Glacial Valley Material Site

The second site is an undeveloped bedrock feature located at the mouth of the glacial valley that cuts through Goat Mountain near the proposed new highway alignment around the MP 43 washout (Figure 6). TEC owns the surface estate and Chugach Alaska Corporation owns the subsurface estate of this site. Preliminary material testing indicates materials that exceed the thresholds for both the Standard Highway Material Specifications and the Standard Airport Material Specifications. This site is also capable of producing all class sizes of riprap.

6.6.1.2 Construction

MS 851-015-5 already exists so no additional construction impacts are anticipated other than using equipment to extract materials.

No detailed analysis has been completed on how the new material site at Goat Mountain Glacial Valley would be constructed.

6.6.1.3 Potential Impacts

Existing Material Site 851-015-5

A potential impact of MS 851-015-5 is created because the site's northern boundary encompasses a portion of Abercrombie Creek, an anadromous stream identified as rearing habitat for chinook, sockeye, and coho salmon. However, potential impacts to this stream could be mitigated by not mining any material from within the active floodplain of Abercrombie Creek and by maintaining a minimum buffer of at least 100 feet between the quarry and Abercrombie Creek. MS 851-015-5 also has a shallow groundwater table, which means that any excavation depths approaching 10 feet below the ground surface will likely encounter the groundwater table.

Goat Mountain Glacial Valley Material Site

Potential impacts of creating the Goat Mountain Glacial Valley material site include the need for blasting to mine materials from the site and the need to construct a haul road measuring approximately 0.6 miles in length across land owned by TEC to access the Copper River Highway near MP 43. The site is located at the mouth of a glacial valley that forms the headwaters of Clear Creek, which is an anadromous stream and the impacts on this waterway would need to be evaluated as part of creating this materials site.

6.6.1.4 Cost Estimate

No cost estimates are provided for these material sites.

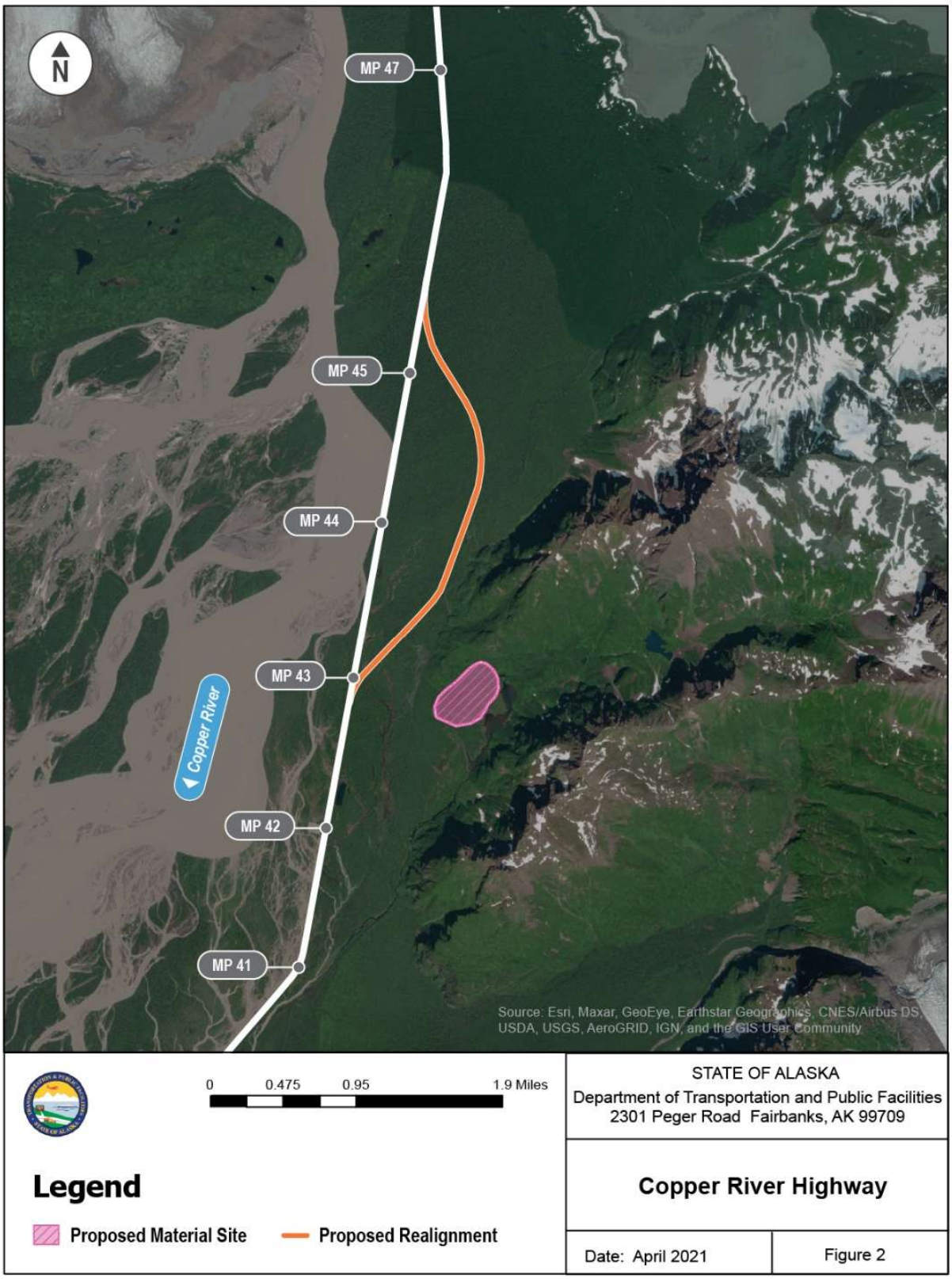

Figure 6. Goat Mountain Glacial Valley Material Site

6.7 Staging of Work on the Copper River Highway

The DOT&PF cannot leave the Copper River Highway in a state of disrepair because of federal and state regulations. Analysis was conducted to determine whether to decommission the highway and associated structures, or whether to reconstruct, repair, or replace the damaged infrastructure. This analysis also considered the sequencing of work to enable the repair work to be completed in a logical manner.

Two options exist for approaching the Copper River Highway, which depend on available funding sources and the priority of work in the overall program of projects managed by DOT&PF. Option 1 would see a continuation of the status quo, whereby funds are not programmed for work and repairs, removal, or remediation occurs when structural failure occurs. Option 2 provides for repairs to be undertaken in a sequenced manner to support the remediation and replacement of damaged infrastructure along the highway. The recommended work sequence is:

- **First project - Re-establish Access Across NBI# 339 and Washout:** This project is recommended as the first project as access along Copper River Highway is blocked at this location. Completing this project will re-establish road access and improve the ability to mobilize equipment for other repairs along the Copper River Highway.
- **Second project - Reconstruct or Re-Align the Copper River Highway at MP 43.5 Wash-Out:** This project is recommended as the second project as the highway is also blocked at this location. Completing this project will re-establish road access beyond the wash-out to the Million Dollar Bridge.
- **Concurrent second or independent third project – Repair or Replace Stream Culverts:** Dependent on approach, it would be beneficial to replace stream culverts as the road is rehabilitated to maintain access and stability. However, if DOT&PF chooses to address all the stream culverts at the same time, it is recommended that this should be the third project in priority.
- **Fourth project – Million Dollar Bridge:** This project should be the last project in priority as addressing the other projects will provide vehicular access for the mobilization of equipment and personnel to complete the repairs to the Million Dollar Bridge.

7.0 POTENTIAL FUNDING SOURCES

7.1 Potential Funding Sources – Apportioned or Allocated Funds

This chapter summarizes potential funding sources that may be pursued to advance projects based on alternatives recommended in this study. The availability and applicability of funding sources will depend on apportionments available, funding programs available, and whether the project is something that meets the criteria of specific programs (Table 4). It should be noted that this route alternative study has been completed during a time that the status of many federal funding programs is uncertain. The study team has put together as comprehensive of a list of funding opportunities as possible. It should be noted that there is remarkably high demand for funds programmed through apportionment or allocation, and these funds are generally directed toward projects that have the highest need or serve a large population.

The planning level cost estimates have been developed using 2025-dollar values and are high-level owing to the low level of design associated with each of the projects. Construction costs have estimated significantly over the last five years, and this escalation should be factored into any future grant applications. In addition, the environment along Copper River Highway continues to change, which could change project parameters and alter costs for the projects recommended in this study.

Table 4. Potential Funding Sources – Apportioned or Allocated Funds

Fund	Purpose	Eligible Recipients
Federal Lands Access Program (FLAP)	Program supports improving facilities and access to, through, or within Federal or Tribal lands. Funds are generally limited and will likely need to be matched with other funding opportunities. A select amount of funding is apportioned to States and then distributed after review and ranking of projects.	Allocated to States
Bridge Formula Program	Supports bridge replacement, rehabilitation, preservation, protection, and construction.	Apportioned to States
Highway Safety Improvement Program (HSIP)	Supports projects to reduce traffic fatalities and serious injuries on public roads.	Apportioned to States
National Highway Freight Program	Supports the efficient movement of freight.	Apportioned to States
Surface Transportation Block Grant (STBG)	Supports projects that preserve and improve conditions and performance on Federal-aid highways and bridges.	Apportioned to States
Tribal Transportation Program	Supports safe and adequate transportation and public road access. Project area infrastructure must be listed in the Tribal Transportation Infrastructure Improvement Program.	Apportioned to Tribes
Transportation Alternative Program	Supports smaller-scale transportation projects including bike and pedestrian facilities, turnouts and viewing areas, environmental	Set aside under STBG Program

Fund	Purpose	Eligible Recipients
	mitigation related to habitat connectivity, and recreational trails	
Certified Local Government Grants/Historic Preservation Grants	These grants are administered through the Office of History and Archaeology and reviewed by the Alaska Historical Commission. The grants are for historic preservation projects, must be matched, and are awarded on a competitive basis. 60/40 match.	Applications are prioritized for Certified Local Governments (CLG), Cordova, Alaska is a CLG

7.1.1 Potential Funding Sources – Competitive Grants

Competitive transportation grants are awards given to projects that improve transportation systems. Many of these grants are available through the United States Department of Transportation, and others may be available through Tribal or State transportation programs (Table 5). Grant opportunities available as of 2025 are summarized below. Grants from private organizations are marked with an asterisk (*). The availability and applicability of grants will depend on availability and whether the project is something that meets the criteria of specific grant programs. It should be noted that this route alternative study has been completed during a time that the status of many federal funding programs is uncertain.

Table 5. Potential Funding Sources – Competitive Grants

Fund	Purpose	Eligible Recipients
Bridge Investment Program	Focuses on existing bridges in poor condition.	States, local governments, Tribes, Federal agencies
Denali Commission – Transportation Program Grants*	Supports basic road improvement projects that connect rural communities and the state highway system as well as provide enhancements to rural economic development.	Non-profits, local and state governments, Tribes, Tribal organizations
Rasmussen Foundation*	Offers Community Support Grants ranging from $35,000 to $250,000 and Legacy Grants which are over $250,000. Projects shall be strategically important and innovative solutions to issues of community or statewide significance.	Non-profits, local and state governments, Tribes, Tribal organizations
Seventh Generation Fund*	Supports projects that strengthen indigenous identity by revitalizing cultural lifeways, language, creativity, and food sovereignty.	Tribes, Tribal organizations, and non-profits
National Culvert Removal, Replacement, and Restoration Grant Program (Culvert Aquatic Organism Passage Program)	Supports replacement, removal or repairing culverts that provide fish passage for anadromous fish.	Tribes, states, local governments

Fund	Purpose	Eligible Recipients
National Scenic Byways Program	Supports facility improvements, safety upgrades, and interpretive information for scenic byways.	States and Tribes
Nationally Significant Federal Lands and Tribal Projects Program	Supports construction-related funding for projects within, adjacent to, or accessing Federal and Tribal lands.	Tribes, states, local governments
Better Utilizing Investments to Leverage Development (BUILD) Grants	Supports capital improvements for surface transportation that has a significant local or regional impact.	Tribes, states, local governments
Rural Surface Transportation Grant Program	Supports projects to improve and expand surface infrastructure to increase connectivity and improve the safety and reliability of moving people and freight.	Tribes, states, local governments
Tribal High Priority Projects Program	Supports completion of highest priority projects for facilities listed on the National Tribal Transportation Facility Inventory list.	Federally recognized tribes or governmental subdivision
Tribal Transportation Program Bridge Program	Supports improvement of Tribally owned and non-Tribally owned bridges in poor condition that have been identified as a Tribal transportation facility.	Federally recognized Tribes
Tribal Transportation Safety Fund	Addresses transportation safety issues identified by Tribes.	Federally recognized Tribes
U.S. Economic Development Administration Public Works Program	Supports distressed communities to revitalize, expand, and upgrade physical infrastructure.	Non-profits, local governments, Tribes, Tribal organizations, State

Department of Defense Innovative Readiness Training	A military training opportunity exclusive to the US and its territories. This opportunity offers joint training opportunities to increase military deployment readiness by partnering with communities to complete health care, construction, transportation, or cybersecurity assistance.
	• Community match is required
	  ○ Military provides training, personnel, supplies, and equipment
	  ○ Community is responsible for services and support through
		Communities in the US and its territories. Can not be an individual.

Fund	Purpose	Eligible Recipients
	volunteers, materials, and venue. • Projects must result in at least 100 hours of training • Must not compete with the private sector, non-competition clause • Must not include commercial development • Military members cannot provide law enforcement during IRT missions • IRT authorities cannot be used to respond to natural or human-caused disasters	
Alaska Mental Health Trust*	Partnership grants are a one-time grant with a one-year term and provide funds up to $50,000.	Foundations, government agencies, tribal entities, non-profits, and corporations that serve Trust beneficiaries.
National Park Service – Tribal Heritage Grants	Assists Tribes, Alaskan Native Village/Corporations, and Native Hawaiian Organizations in protecting and promoting their unique cultural heritage and traditions. These grants do not require a non-federal match. The Federal Year 2024 had an award ceiling of $75,000 and a floor of $15,000.	Assists Tribes, Alaskan Native Village/Corporations, and Native Hawaiian Organizations

7.1.2 Potential Funding Sources Using State of Alaska Funding Programs

Additional funding opportunities may be available using State-allocated funds, as summarized in Table 6. It should be noted that these funds are extremely limited in both availability and size.

Table 6. Potential Funding Sources – State of Alaska Funding Programs

Fund	Purpose	Eligible Recipients
Community Bridge Investment Program	Supports replacing, repairing, or protecting NBI bridges or culverts	Local governments
Community Development Block Grants	Provided through the Department of Commerce, Community, and Economic Development. Supports planning and project grants to address issues detrimental to health and safety of community residents and reduce costs of services.	Local governments
State of Alaska Capital and Operating Budgets	Supports DOT&PF operations and special projects	State agencies

7.1.3 Potential Funding Using Lending Programs

The rural location of the Copper River Highway qualifies it for a Transportation Infrastructure Finance and Innovation Act (TIFIA) Rural Project Initiative loan, which provides significant savings compared to other TIFIA loans (Table 7).

Table 7. Potential Funding - TIFIA Rural Project Initiative Loan Overview

Fund	Purpose	Eligible Recipients
TIFIA Rural Project Initiative	This is a **LOAN** program, to help improve transportation infrastructure in America's rural communities. The Build America Bureau of the DOT provides loans in support of a variety of transportation projects under the Transportation Infrastructure Finance and Innovation Act (TIFIA), The Rural Project Initiative (RPI) allows small communities to be able to access financing through TIFIA. These loans offer the following incentives: • Loans for up to 49 percent of the project's eligible costs (compared to 33 percent under the traditional TIFIA • Fixed interest rates equal to one half of the U.S. Treasury rate of equivalent maturity of the loan at the time of closing (traditional TIFIA loans have interest rates equal to the U.S. Treasury rate) • For projects under $75 million in total cost, the ability to waive advisor fees, which can amount to hundreds of thousands of dollars (available funding for this benefit is limited and first comes first awarded).	State and local governments, transit agencies, private entities, special authorities, and state infrastructure banks.

8.0 NEXT STEPS

Two options exist for approaching the Copper River Highway, which depend on available funding sources and the priority of work in the overall program of projects managed by DOT&PF. Option 1 would see a continuation of the status quo, whereby funds are not programmed for work and repairs, removal, or remediation occurs when structural failure occurs. Option 2 provides for repairs to be undertaken in a sequenced manner to support the remediation and replacement of damaged infrastructure along the highway. The recommended work sequence is:

- **First project - Re-establish Access Across NBI# 339 and Washout:** This project is recommended as the first project as access along Copper River Highway is blocked at this location. Completing this project will re-establish road access and improve the ability to mobilize equipment for other repairs along the Copper River Highway.
- **Second project - Reconstruct or Re-Align the Copper River Highway at MP 43.5 Wash-Out:** This project is recommended as the second project as the highway is also blocked at this location. Completing this project will re-establish road access beyond the wash-out to the Million Dollar Bridge.
- **Concurrent second or independent third project – Repair or Replace Stream Culverts:** Dependent on approach, it would be beneficial to replace stream culverts as the road is rehabilitated to maintain access and stability. However, if DOT&PF chooses to address all the stream culverts at the same time, it is recommended that this should be the third project in priority.
- **Fourth project – Million Dollar Bridge:** This project should be the last project in priority as addressing the other projects will provide vehicular access for the mobilization of equipment and personnel to complete the repairs to the Million Dollar Bridge.

Recommendations for implementation of the Route Development Study:

- Implementing alternatives dependent on needs, community aspirations, and funding availability
- Supporting community conversations on the future of the Copper River Highway and how to provide transportation access to Cordova, communities, and land uses along the highway