3.6 Transportation

3.6.1 Affected Environment

This section presents information on the current transportation facilities and infrastructure, including the roadway system, transportation safety, aviation, and bicycles and pedestrians. River navigation is addressed in Section 3.8.

3.6.1.1 Roadway System

Design Standards

As discussed in Section 1.2.2.2 (Highway Design Standards) of Chapter 1, the American Association of State Highway and Transportation Officials publishes national standards for roadway design (2004). The current and projected conditions for the Sterling Highway in the project area, as discussed in Chapter 1, are not consistent with the design standards of a rural principal arterial. Roadway design elements, such as curves, widths of lanes and shoulders, and areas along the road intended to remain clear for visibility and safety, have deficiencies in the project area. Table 1.2-4 shows the standards and the percentage of the existing Sterling Highway in the project area that meets the standard.

Travel Patterns

The Sterling Highway is a major travel corridor for the Kenai Peninsula and provides the only road access to the western Kenai Peninsula. During the peak summer travel season, traffic on the Sterling Highway consists of nearly 17 percent recreational vehicles and 7 percent trucks and heavy trucks, with private automobiles making up the majority of the remaining traffic. Two distinct types of drivers use the roadway: (1) the driver who travels the highway frequently and knows the roadway and (2) the occasional traveler who may not be familiar with the roadway. Mixing the two populations during high-traffic periods often causes frustration for the frequent traveler and confusion for the occasional traveler. Several commenters on the Draft Supplemental Environmental Impact Statement (EIS) identified a noticeable increase in heavy truck traffic (including multi-trailer trucks) from increased industrial activity at the refinery in Nikiski.

Recreational users of the Seward Highway use a variety of vehicles, including the occasional school bus with equipment trailer.

(Photo courtesy of Dan Burden)

Roads or trails that provide access to various areas within the Cooper Landing community, most of them maintained by the State or the Kenai Peninsula Borough (Borough), are described below and illustrated on Map 3.6-1.

Sterling Highway. The Sterling Highway is a paved, State-maintained, two-lane highway that passes through Cooper Landing, connects to the Seward Highway to the east, and continues west to Homer. For more on the conditions of the highway, see Chapter 1.

Quartz Creek Road. This secondary gravel, State-maintained (about 3 miles) road provides access from the Sterling Highway to Crescent Lake Trail, Kenai Lake, Quartz Creek and Crescent Creek campgrounds, Cooper Landing Airport, home sites, businesses, and Forest Service, U.S. Department of Agriculture (Forest Service), State, and Borough lands on which mining and recreational activities occur.

Snug Harbor Road. This secondary gravel, State-maintained (about 4 miles) road provides access from the Sterling Highway to the eastern end of the Russian Lakes Trail, Cooper Lake, home sites, businesses, churches, senior citizen housing, and Forest Service, State, and Borough lands on which logging and recreational activities occur.

Bean Creek Road. This secondary gravel, State-maintained (about 2 miles) road provides access from the Sterling Highway to home sites, businesses, the Kenai Princess Lodge, the Cooper Landing School, the library, a gun club, Borough lands on which recreational activities occur, and other side roads, including Slaughter Ridge Road.

Skilak Lake Road. This secondary gravel, State-maintained road provides access through the Kenai National Wildlife Refuge (KNWR) Skilak Wildlife Recreation Area to Skilak Lake and to other smaller lakes, campgrounds, and multiple trailheads. It is a large loop of road that connects in two places to the Sterling Highway—at Milepost (MP) 58 at the western end of the project area and farther west, beyond the Kenai Mountains and outside the project area. Originally constructed as the Sterling Highway in 1947, the road was left in place when the highway was straightened in the 1980s.

Other small roads in the area include:

Shackelford Creek Road. This Borough gravel and dirt road was built for access to wood-cutting areas off Snug Harbor Road and is used principally as a trail.

Slaughter Ridge Road. This Borough gravel road was built for access to wood-cutting areas off Bean Creek Road. It has been improved to Borough standards for a short distance to a cul-de-sac; the continuing road transitions into the Bean Creek Trail.

Cooper Lake Dam Access Road. This unimproved dirt road leaves the south side of Sterling Highway near MP 49.6. It was created to provide access across Chugach National Forest (CNF) lands for Chugach Electric Association to construct and maintain the Cooper Lake dam. Land near the road's lower end has transferred to the Borough and is open to public use, but it is not a Borough-maintained road. At the current CNF boundary, the road is closed to public use by motorized vehicles, but is used under permit by the dam operators for maintenance and is open to the public for use as a non-motorized trail.

Russian River Campground Road. This paved Forest Service road leads to the Russian River Campground, the western end of Russian River Trail and to Russian River Anglers Trail, and wood-cutting areas off Sterling Highway.

Schooner Bend Road. This is a Forest Service administrative road that has a gate and generally is not open to public vehicles. The road may be used for hiking and skiing only.

Forest Service Logging Roads (also known as West Juneau Road and Chunkwood Road). These gravel roads were built for access to wood-cutting areas off the Sterling Highway, near the trailhead for the Resurrection Pass Trail. The Forest Service classifies these as roads but closes them to motorized vehicles except snowmobiles in winter.

Planned Improvements

The *2016–2019 Alaska Statewide Transportation Improvement Program* (STIP) (DOT&PF 2015a) lays out the Alaska Department of Transportation and Public Facilities' (DOT&PF's) 4-year plan for State and Federally funded transportation improvements. The STIP covers interstate, State, and local highways; bridges; ferries; and public transportation projects that implement Federal requirements and the DOT&PF's mission and policies, including support of economic development. The DOT&PF coordinates with local governments, Alaska Native Tribes, other State and Federal agencies, and the public to develop the STIP. Projects included in the STIP undergo a competitive selection process and represent the State's top priorities to serve Alaska residents and strengthen the transportation system.

This project, Sterling Highway MP 45–60, is included in the STIP (Need ID 2673), with $22 million in funding projected for design in Federal Fiscal Year 2018 and $247 million in funding identified following Federal Fiscal Year 2019.

Pullouts

Approximately 25 formal and informal pullouts and parking areas occur within the existing Sterling Highway right-of-way in the project area. See Map 3.6-2 for locations and estimated parking capacities. Most of these areas were not designed for parking but are gravel areas used informally. Pullout sizes vary. Estimated parking capacity ranges from two standard vehicles to greater than 30 vehicles, with a cumulative total of about 215 parking spaces for standard vehicles. During busy summer fishing periods, recreationists use some pullouts for parking and overnight camping. Traffic turning onto and off of the highway at pullouts contributes to traffic inefficiency. The pullouts provide a way to accommodate drivers' need for rest or emergency stops on a highway with little or no shoulders, and they help accommodate high demand for recreational parking. The *North and South Sterling Byways Corridor Partnership Plan* (Jensen Yorba Lott, Inc. 2008) prepared for DOT&PF calls for coordination with the Sterling Highway MP 45-60 Project to close some pullouts and include new pullouts. See also Sections 3.2.1.7 and 3.2.7 for information on the plan.

Accessibility

Accessibility is the ease for drivers, pedestrians, and bicyclists to reach their desired destinations from a main highway. The existing Sterling Highway has developed with numerous driveways and side roads connecting directly to the highway, and access has not been controlled. Driveways provide important access to homes, businesses, and government administrative sites. However, the number of driveways has contributed substantially to current congestion and safety problems.

Between MP 45 and MP 60, 123 driveways, pullouts, and side roads connect to the Sterling Highway (see Map 1.2-5 in the Purpose and Need chapter). 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. This is a density of access points that rivals urban areas, where speed limits are posted below 55 miles per hour (mph) due to these types of conflicts. Allowing multiple

access points increases the ability for vehicles to enter and exit the highway. However, multiple access points also decrease the ability of a highway to support through-traffic and can create unsafe conditions.

Level of Service

The travel patterns within the project area, combined with traffic volumes (see Section 1.2.2.1), roadway deficiencies (described in Section 1.2.2.2), and the high number of access points, create traffic congestion. See Section 1.2.2.1 and Map 1.2-3 for a description of the existing traffic and resulting level of service (LOS) for the existing Sterling Highway.

3.6.1.2 Transportation Safety

The Sterling Highway originally connected settlement points at Cooper Landing to points east and west. The community existed before the highway; however, once the highway was constructed, the community grew around the highway, with several new roads and a multitude of driveways. At the same time, the Borough population grew, and traffic through Cooper Landing bound for other destinations increased. Highway improvements on most of the Seward and Sterling highways accommodated the desires of through-drivers to travel efficiently at consistent highway speeds, but the project area has become a bottleneck for through-traffic.

Ultimately, these changes have led to safety issues. As stated in Chapter 1, Purpose of and Need for the Project, portions of the project area exceed the statewide average crash rate and the statewide average crash severity. The many curves, narrow lanes, lack of shoulders and clear zones, heavy summer recreational traffic, multitude of intersecting side streets and driveways, and lack of passing opportunity that characterize the project area lead to driver frustration, run-off-road crashes (including truck rollovers that have spilled hazardous materials into waters that drain into the Kenai River), head-on collisions, vehicle-wildlife collisions, and pedestrian and bicycle safety issues. These issues are discussed in the Purpose and Need chapter, particularly Sections 1.2.2.2 and 1.2.2.3. Highway Safety Improvement Program (HSIP) work in 2007/2008 added a flashing light at each end of Gwin's curve (MP 52) and continuous HSIP signing from MP 50–58. To date this appears to have helped in reducing crashes on this S-curve next to the Kenai River. It should be noted that these improvements were intended as an interim measure and not a long-term fix to the risk of crashes as traffic grows. MP 45, which does not rise as high in the HSIP analysis of curves and crashes to warrant a beacon project (like that installed at MP 52), will have a combination speed advisory/curve warning sign installed under the HSIP National Highway System Warning and Delineation Project. That project addresses sharp curves along all the four main highways: Sterling, Seward, Parks, and Glenn highways (DOT&PF 2010b).

During initial project scoping, the public identified transportation safety as a concern, particularly during winter months. The topography of the project area, with high mountains north and south and a low, east-west valley between them, means that the valley often is shaded from direct sun, particularly in mid-winter when the sun angle is low and limited to a short arc to the south. South-facing mountain slopes at higher elevations generally receive more sun than lower slopes and substantially more sun than north-facing slopes (HDR 2011e). Elevation also affects temperature and may affect precipitation amounts or whether it falls as rain or snow. Shading, temperature, and snow conditions all can affect the road surface conditions and maintenance needs. The potential for poor road conditions during winter months, combined with the current

design of the roadway (narrow lanes, curves, and limited shoulders), create the potential for unsafe travel.

Traffic safety engineering completed for this project included analysis of 2012 crashes for purposes of comparison. See Table 3.6-1. The analysis is based on roadway design characteristics but does not include factors such as wildlife collisions. The existing crashes reported in Chapter 1 indicate an average of about 30 crashes per year over a ten-year period. When wildlife collisions are removed, the modeled crash numbers calibrate well with the actual numbers.

Table 3.6-1. 2012 Predicted crashes for existing conditions

Total crashes per ear	Fatal and injury crashes per year	Property damage only crashes per year
24.5	8.1	16.5

3.6.1.3 Aviation

The Quartz Creek Airport, located on Quartz Creek Road (see Map 3.6-1) in Cooper Landing, is a State-owned, 2,200-foot by 60-foot gravel/dirt runway. The Quartz Creek Airport currently averages 38 aircraft operations per month. Three single-engine planes are based on the field. Eighty-nine percent of the aviation activity is transient, and 11 percent is used for local general aviation (AirNav 2011).

Floatplanes can land on Kenai Lake and many backcountry lakes. Most floatplane operations on the lake occur in the project area at the western end of the lake, where there are lake-front residences.

3.6.1.4 Pedestrians and Bicycles

A growing number of pedestrians and bicyclists travel along the Sterling Highway, though there are minimal established pedestrian or bicycle pathways located within the project area, and no shoulders on the Sterling Highway in the project area. There is a short segment of gravel trail within the northern edge of the DOT&PF right-of-way west of the Cooper Landing Bridge and a pedestrian walkway across the bridge. A paved pathway was built in 2015 along Snug Harbor Road for access to and from the core of Cooper Landing.

Pedestrian and bicycle accommodation is very poor in most of Cooper Landing and along the existing highway. During summer, when more people might walk or bicycle and when many recreational visitors are staying in Cooper Landing, the highway traffic also is highest. Pedestrians and cyclists often must wait long periods to cross the highway, and there is little or no space along the highway's edge suitable for walking or bicycling. Motorists passing pedestrians or cyclists on the highway edge have little space to pass safely between the person on the edge and oncoming traffic.

Because of increasing tourism and traffic levels, pedestrian and bicycle safety continues to be an issue of concern for Cooper Landing residents. In April 2010, the *Cooper Landing, Alaska, Walkable Community Project* plan (LDN 2010a) was incorporated into the *Kenai Peninsula Borough Comprehensive Plan* by the Assembly (Ordinance 2010-13). See detail in Section 3.2.1.6 in Land Use Plans and Policies. The *Walkable Community Project* echoed themes found also in the *North and South Sterling Byways Corridor Partnership Plan* (Jensen Yorba Lott, Inc.

2008) for improving the character of the community for walkers and bicyclists, as well as for motorists.

3.6.2 Environmental Consequences

This section describes effects of the project alternatives on the transportation system in the project area. It addresses effects on roadway system travel patterns and accessibility, transportation safety, aviation, and pedestrians and bicycles. Transportation Safety sections make reference to modeling and statistical analysis done for this project. This was done for intersections and highway segments using the AASHTO Highway Safety Manual Predictive Method.

3.6.2.1 No Build Alternative

Direct and Indirect Impacts

Roadway System

Design Standards: Under the No Build Alternative, the design of the highway would not change. No other improvements to meet design standards would be constructed.

Travel Patterns: Under the No Build Alternative, travel patterns relative to the existing Sterling Highway would not change. Travel patterns related to secondary roads and other roads would also not change.

Pullouts: All of the approximately 25 existing pullouts and parking areas would continue to exist in the Sterling Highway right-of-way in the project area. No change would be expected to occur. The cumulative total of approximately 215 parking spaces in these pullouts would remain available. Some pullouts do not function well for efficient or safe highway functionality during busy periods, and this circumstance would continue.

Accessibility: Under the No Build Alternative, no changes would be made to the level of access control along the highway, and no improvement would be made to resolve traffic conflict points at intersections with public roads and private driveways. This would be inconsistent with the *Alaska Strategic Traffic Safety Plan* to preserve Alaska's main roads, which advocates limiting and controlling access for main roads and highways (DOT&PF 2012a). Under the No Build Alternative, the number of access points would likely increase from new development within the community (see Section 3.27.4 for descriptions of future projects in the area).

Level of Service: Under the No Build Alternative, the highway would continue to be congested and to have inadequate capacity to accommodate current and projected future traffic.

Existing conditions and inadequacies would be exacerbated by anticipated growth in traffic. As described in Section 1.2.2.1 (Highway Traffic and Congestion) of Chapter 1, the projected (2043) traffic would result in the entire highway in the 15-mile project area functioning at LOS D (100 percent of the roadway would operate at LOS D (Lounsbury 2014); see Figure 1.2-1 and Map 1.2-3). DOT&PF would like as much of the highway to operate above LOS D as possible. Because the LOS is expected to decline as predicted traffic volumes increase, highway congestion would become a greater issue.

Transportation Safety

The existing Sterling Highway does not meet current design standards (see Chapter 1), which are established principally to enhance safety. If no improvements are made, DOT&PF anticipates the rate of deaths and major injuries due to crashes would rise to rank with some of the worst corridors in the State. Modeling and analysis for this project based on highway geometry and traffic volumes indicates the No Build Alternative in 2043 would have about 33 crashes per year, of which 11 per year will involve fatalities and injuries and 22 per year will involve only property damage without injury. The predicted crash rate for the No Build Alternative is 1.57 total crashes per million vehicle miles traveled. These numbers are based on engineering analysis of highway features such as shoulders, clear zones, passing lanes, and turning lanes. They are similar to, but not exactly the same as, actual crash numbers as they are computed based on a predictive analysis process. It is likely that the Sterling Highway MP 45–60 area would be designated a Highway Safety Corridor by 2043. DOT&PF and the Department of Public Safety are then tasked by law with the responsibility of reducing these crashes. Also, because of poor LOS and a high percentage of the existing highway not meeting current design standards, highway and traffic safety are anticipated to worsen, resulting in a greater possibility of frustrated and erratic drivers taking unnecessary chances when attempting to pass slower traffic, thereby increasing the dangers of head-on collisions.

Aviation

No aircraft operation impacts are anticipated under the No Build Alternative. The Quartz Creek Airport and floatplane operations on Kenai Lake would be unaffected.

Pedestrians and Bicyclists

The existing highway would continue to accommodate pedestrians and bicyclists poorly, particularly in the core area of Cooper Landing.

3.6.2.2 Issues Applicable to the Build Alternatives

This section describes impact issues common to all of the build alternatives. Although the actual impacts may be somewhat different among the build alternatives, as described in the following alternative-specific subsections, this section presents a summary of impacts and a comparison of alternatives for transportation-related resources.

Direct and Indirect Impacts

Roadway System

Design Standards: Each build alternative would be designed to meet current design standards when practicable. While all build alternatives meet the standards for a rural principal arterial, there is a distinction that can be made between "desirable" levels of meeting the standards, and acceptable or minimum levels. The design speed for this project is 60 mph due to rolling terrain as the alternatives move through the valley and across mountainsides. While all curves meet the minimum standard, some curves can accommodate the more desirable 65 mph speed or higher. These are not indications of the speed limit that would be posted, but of how safe the curves are and how easily drivers can maintain consistent highway speeds. All build alternatives are designed to avoid vertical grades exceeding 6 percent. Table 3.6-2 presents various design factors for each alternative and indicates how well the alternative meets the standard. The table

also presents information on passing lanes and intersections, which are not standards, but which help indicate the efficiency of the alternative.

Table 3.6-2. Build alternative design factor comparison

	No Build/ Existing	Cooper Creek	G South	Juneau Creek	Juneau Creek Variant
Horizontal Curves[a]					
Total number of horizontal curves	43	27	25	21	22
Number of curves meeting minimum curve radius standard for 65 mph	15	23	24	20	21
Number of curves meeting minimum curve radius standard for 60 mph (1,330 feet)	22	27	25	21	22
Number of curves not meeting standards for 60 mph	21	0	0	0	0
Grades					
Percent (%) of length above maximum grade (> 6% grade)	0	0	0	0	0
Percent (%) of length at 5.9-6% grade (steep)	0	9	8	2	0
Percent (%) of length > 5% grade (hilly)	--[b]	9	14	16	26
Passing Lanes					
Percent (%) of length with passing lane	0	28	25	43	40
Intersections [c]					
Number of intersections of side roads, driveways, and pullouts	123	47	23	12	13

[a] The design speed criterion for this project is 60 mph. It is desirable to design curves to handle higher speeds, and much of the build alternatives are capable of 65 mph or more. The No Build/Existing was analyzed using these modern design standards.

[b] No as-built data are available for detailed vertical grade analyses on the existing highway. There may be short segments above 5% within the existing alignment.

[c] Includes driveways, trailhead pullouts and parking areas, side road intersections, and informal pullouts currently used for parking (under No Build/Existing only). Build Alternative estimates include proposed new pullout/parking areas and intersections with the "old" highway.

Travel Patterns: Data compiled in the Sterling Highway, Alaska, Origin-Destination Study *(TSI 2001)* indicate that under any of the four build alternatives, 30 percent of traffic would continue to travel through town rather than taking the new alignment. Interpretation of the data provided in the Origin-Destination Study suggests that vehicles that stop for fewer than 2 hours (6 percent of vehicles surveyed) and a portion of vehicles that stop for more than 2 hours (31 percent of vehicles surveyed) would be less likely to travel into Cooper Landing if any of the alternatives were available. Some of these travelers, who currently do stop in and around Cooper Landing, may change their travel patterns in favor of more direct travel and fewer stops.

Overall, the build alternatives are not expected to change traffic volumes traveling east and west, the overall traffic volume, traffic growth rate, or the mix of vehicle types. The build alternatives, however, would remove through-traffic (estimated at 70 percent of all traffic) from all or a portion of the commercial area of Cooper Landing (approximately MP 47 to 50) and from all or a portion of the primary recreation corridor (approximately MP 50 to 55). The new alignment

under each alternative would leave a portion of this area as the "Old Sterling Highway," where there would be less traffic than there is today. There are minor differences in travel distances between the existing highway/No Build Alternative and the build alternatives, and these differences would not be expected to factor into meaningful distinctions in travel time through the project area if a vehicle were to travel through without interaction with other traffic. However, greater differences would be expected when overall traffic was relatively heavy, such as typical summer traffic. In that case, slower local traffic would be expected to use the old highway, and through traffic to use the new highway (under any alternative). To the extent that any given alternative avoided the many destinations in the community and the popular recreation destinations along the Kenai River west of the community, through traffic mostly would not conflict with traffic turning onto or off of the highway. Passing lanes would allow freedom for drivers to pass slower traffic frequently. The speed limit is expected to be a consistent 55 mph on all of the build alternatives, rather than varying (35, 45, 50, and 55 mph), as it does on the "old" highway. There would be little incentive for the through-driver to follow the "old" highway.

Through traffic that is larger vehicles, including commercial trucks, vehicles towing trailers, and RVs, is anticipated to use the new highway for the reasons stated above and for several other reasons: (a) to avoid the need to stop and turn twice to get off the main highway and then back on, and the need to accelerate a cumbersome vehicle back to cruising speed, (b) to avoid the narrow roadway, where it is easy to drop the back wheel of a long vehicle off the pavement[1] or to scrape a trailer on the numerous guardrails[2] and where maneuvering a large vehicle against oncoming traffic leaves little room for error, and (c) to avoid the need to change speed or stop multiple times for other drivers who may be looking for a destination, waiting for a gap in oncoming traffic to turn off the road, turning onto the road and needing to get up to speed, or just taking in the view. In winter, when traffic is lighter and road conditions sometimes worse, drivers of larger vehicles may occasionally elect to use the "old" route to avoid fresh snow or freezing conditions at the higher elevations of the segments built on a new alignment. This is expected to be rare, particularly because the main highway is expected to have higher priority for road maintenance such as snow clearing and sanding. See also discussions of road safety below in this section under the subheading Transportation Safety.

Maintenance: Although the build alternatives would not physically alter the segment of "Old Sterling Highway" under each alternative, maintenance and operation of the "old highway" through Cooper Landing and through the primary recreation corridor would remain the responsibility of DOT&PF. Maintenance priority for tasks such as snow plowing would remain with the main highway (the new alternative), and the "old" segment would have lower priority than it has today.

Pullouts: Each of the build alternatives would result in a reduced number of pullouts in the project corridor. None of the informal pullouts along the segment of "old" highway would be affected. However, wherever the existing alignment was reconstructed, existing informal pullouts would be eliminated, with few exceptions. Under every alternative, the pullout and parking area for Fuller Lakes Trail (#23 on Map 3.6-2; approximately MP 57.1) would remain,

[1] Noted in Alaska Department of Environmental Conservation situation reports of statewide truck rollovers and tanker spills as a cause of such rollover crashes.

[2] Observation during the course of this project indicated that, when the existing highway was resurfaced in 2014-2015 and old guardrails were refurbished or replaced, the guardrails were almost immediately scratched and dented by trucks.

as would the parking lot for the KNWR visitor contact station (#25, approximately MP 57.9). A limited number of others would be exceptions under some alternatives, as further discussed in the subsections below. In general, new shoulders would provide space for emergency stopping needs, so the existing pullouts would not be needed for this purpose. Pullouts are used by recreationalists to park for access to adjoining public lands and, in some cases, the Kenai River. Those that would be retained even where the highway would be reconstructed would provide for parking needs requested by agencies that manage adjacent lands.

Where the build alternatives would be constructed on new alignment, DOT&PF plans to control access. No new driveways or pullouts would be permitted in these areas, other than the following:

- Cooper Creek Alternative: Stetson Creek Trail pullout in the right-of-way ("A" on Map 3.6-2).
- G South Alternative: Bean Creek Trail pullout in the right-of-way ("B" on Map 3.6-2), and separate summer parking lot for Bean Creek Trail outside the right-of-way ("C").
- Juneau Creek alternatives: Bean Creek Trail pullout in the right-of-way ("D" on Map 3.6-2), and separate summer parking lot for Resurrection Pass Trail outside the right-of-way ("E" on Map 3.6-2).

In addition, potential future access points acknowledged by DOT&PF and FHWA, could be constructed by others:

- Access via parallel ramps (diamond interchange) at either or both of the grade-separated crossings of Forest Service roads within State Management Unit 395.
- Access via driveway or minor side road at CIRI Tract A, as indicated in an agreement ratified by the Russian River Land Act (Juneau Creek Alternative would include an access point off the south side of the highway; Juneau Creek Variant Alternative would include an access point off each side of the highway).

Access points for Unit 395 and Tract A would not be reserved as part of this project, because development plans are not yet known. But DOT&PF and FHWA have evaluated them in Section 3.27 for cumulative impacts in case landowners make application for direct access in the future.

Table 3.6-3 shows the changes in pullouts and associated parking spaces that are part of this project.

While this project would not alter existing pullouts on the "old" highway segments, removing 70 percent of traffic on the "old" highway would make these pullouts easier and safer to use.

Although the methods applied to removing or adding pullouts are consistent, the impacts differ by build alternative because each alternative would reconstruct a different length of the existing highway alignment. Therefore, more pullouts would be eliminated under the Cooper Creek and G South alternatives, which would use greater lengths of the existing highway than the Juneau Creek alternatives.

Table 3.6-3. Pullouts along the build alternatives

	No Build/ Existing	Cooper Creek	G South	Juneau Cr. & Juneau Cr. Variant
Pullouts *(total number of existing pullouts is 25[a])*				
Existing pullouts eliminated *(with reference to specific pullouts numbered on the map)*	0	15 *# 1-5,12, 14-19, 21, 22 & 24*	11 *# 1, 12, 14-19, 21, 22 & 24*	4 *# 1, 21, 22 & 24*
Existing pullouts remaining unchanged[b] *(with reference to specific pullouts numbered on the map)*	25	8 *# 6-11, 23 & 25*	12 *# 2-11, 23 & 25*	20 *# 2-19, 23 & 25*
New or rebuilt pullouts/parking provided[b]	0	3 *# A, 13 & 20*	4 *# B, C, 13 & 20*	3 *# D, E & 20*
Parking spaces within pullouts *(approximate number of existing parking spaces within pullouts is 215)*				
Existing informal parking spaces eliminated	0	97	108	54
Existing informal parking spaces remaining unchanged	215	75	90	144
New formal parking spaces provided (including new parking and rebuilt existing parking)	NA	Total=58 # A (capacity 15), # 13 (capacity 26), & # 20 (capacity 17)	Total=62 # B (capacity 15) # C (capacity 30), #13 (capacity 26), & #20 (capacity 17)	Total=81 # D (capacity 15), # E (capacity 49), & # 20 (capacity 17)

[a] Pullouts within the right-of-way of the existing Sterling Highway. This includes a formal parking lot for the KNWR visitor contact station (#25 on Map 3.6-2).

[b] The second row under "Pullouts" represents existing pullouts that would remain along the unaffected segment of the "Old Sterling Highway." Segments in which the existing alignment would be rebuilt would eliminate existing pullouts, with the exception of the pullout at Fuller Creek Trail (#23 on Map 3.6-2) and KNWR visitor contact station (#25). The third row under "Pullouts" indicates pullouts that would be entirely new or would be rebuilt.

Accessibility: Under all the build alternatives, accessibility for Cooper Landing businesses, residents, and government recreation and administrative sites along the "Old Sterling Highway" is expected to improve due to the shift of through traffic to a new alignment.

Roads in the project area that extend from the Sterling Highway to developed areas, recreational destinations, or areas managed for habitat and forestry purposes by CNF and that would be affected by the build alternatives are shown on Map 3.6-3. Within the project area, existing intersection conflict points would either be improved or remain the same, depending on the point that a build alternative leaves or re-joins the existing highway alignment.

Table 3.6-4 identifies what would occur under each build alternative for each conflict point.

Table 3.6-4. Impacts of alternatives on existing intersection conflict points

Major Intersections	Approximate Milepost	No Build	Cooper Creek	G South	Juneau Creek	Juneau Cr. Variant
Sunrise Inn	44.8	●	■	■	■	■
Quartz Creek Road	44.9	●	■	■	■	■
Cooper Landing driveways north of Kenai River	47.5–47.7	●	■	★	★	★
Bean Creek Road	47.7	●	■	★	★	★
Snug Harbor Road	48	●	■	★	★	★
Cooper Landing driveways south of Kenai River	48–49.4	●	★	★	★	★
Cooper Landing driveways—west end of Cooper Landing	49.8–50.3	●	★	★	★	★
Cooper Creek Campground	50.9	●	★	★	★	★
Gwin's Lodge	52.0	●	■	■	★	★
Russian River Campground/K'Beq	52.7	●	■	■	★	★
Resurrection Pass Trail	53.1	●	■	■	New TH	New TH
Schooner Bend Road	53.3	●	■	■	★	★
Sportsman's Landing/Ferry	54.9	●	■	■	★	■[a]
Fuller Lakes Trail	57.4	●	■	■	■	■
KNWR Visitor Contact Station	58.5	●	■	■	■	■
Skilak Lake Road/ Jim's Landing	58.7	●	■	■	■	■
Total number of intersections and driveways	NA	123	47	23	12	13

● = Existing conflict does not change; driveway/side road directly connecting to highway slows traffic and is a safety concern.

■ = Physical changes to intersection such as turn lanes, wider shoulders, better sight distances, and driveway/side road consolidation improves function and safety.

★ = No physical changes to intersection; 70% of through-traffic avoids conflict point due to new road alignment; reduced traffic in this area improves function and safety.

New TH: The Juneau Creek and Juneau Creek Variant alternatives would include a new trailhead at their crossing of the Resurrection Pass National Recreation Trail, so the traffic impact of an intersection would exist, but it would be similar to the "improved" intersections (squares), built to current standards.

[a] The Juneau Creek Variant Alternative would avoid direct connection to the Sportsman's Landing driveway, but the driveway would be improved on the old highway as part of an overall configuration of the old highway and the new highway in the immediate area of the driveway.

Note: This table addresses existing intersections, driveways, and pullouts. It also includes new intersections with the "old" Sterling Highway and proposed pullouts and trailheads associated with the build alternatives.

Under each build alternative, DOT&PF would include a "controlled access" facility on the segment of each alternative built on new alignment. DOT&PF would acquire access rights and would formally plat and record these access rights with the Borough. This would mean that no public roads or private driveways would be connected directly to the new segments of roadway beyond those identified in this document. DOT&PF examined the need for intermediate access points, including points where the new alignments cross existing or platted roads and the potential for access on section line easements. It was determined there was no need for direct access from the new highway that could not be served from the existing highway. Roads intersected by "new highway" segments of each alternative would be crossed with overpasses (bridges or large culverts) to maintain continuity and to allow access for potential future development or use. Any future additions or changes to access would have to be submitted by DOT&PF to FHWA for approval through a separate NEPA process and decision. Requiring this level of review would prevent induced growth from compromising the functionality of the highway facility and would direct local access needs to the local road system.

Many section lines on State and Borough lands have easements along them, meaning the government or the public may have rights to use them for roads and utilities. Because there are no current plans identifying roads needing to use the section line easements in the project area, and because alternate access exists in these areas via existing and platted roads, DOT&PF is not planning any overpasses or underpasses of these easements, and no highway ramps or other access points have been designated for section line easements. The only planned driveway connections from the new highway are those associated directly with the project (one or two pullouts or trailheads for each alternative).

Level of Service: All build alternatives offer traffic improvements when compared to the existing alignment. The highway's capacity to accommodate current and projected traffic volumes would be increased, and therefore the road segment LOS would be improved. The improved LOS achieved by all build alternatives would be due to the separation of through-traffic and local traffic, improved highway geometry, and additional passing opportunities (HDR 2008a). As a result of improved traffic flow, travelers would benefit from reduced travel times. With less congestion and less delay, vehicles would be able to travel more quickly and safely through the project area. Specific LOS improvements for each build alternative are discussed in the sections below.

All intersection movements are expected to operate at an acceptable LOS for all alternatives. For local travel within Cooper Landing and at recreational facilities, all build alternatives would lead to improved opportunities for turning on and off the highway by reducing traffic on the "old highway." Where the build alternatives construct on new alignment, the intersections at locations that would become the "old" Sterling Highway result in mainly LOS A (see Table 3.6-5). In these ways, all build alternatives would better accommodate both through-traffic and traffic bound for local destinations.

Table 3.6-5. Intersection LOS comparison (2043)

Sterling Highway intersection	No Build/ Existing	Cooper Creek	G South	Juneau Creek	Juneau Creek Variant
New Sterling Highway/Old Sterling Highway (MP 46.3)	N/A	N/A	B	B	B
Bean Creek (north)	C	C	B	B	B
Bean Creek (south)	B	C	A	A	A
Snug Harbor Rd	B	C	A	A	A
King Salmon Dr (Kenai River boat launch)	B	A	A	A	A
Towle Cir (Hamilton's Place)	B	A	A	A	A
New Sterling Highway/Old Sterling Highway (MP 51)	N/A	B	B	N/A	N/A
New Sterling Highway/Old Sterling Highway (MP 55/56)	N/A	N/A	N/A	B	B

Transportation Safety: The existing Sterling Highway does not meet current design standards (see Chapter 1), which are meant to enhance safety. Roadway improvements implemented as part of the project are anticipated to reduce the rate of crashes in the project area under all build alternatives by separating local traffic, which makes frequent stops and turns, from faster moving through-traffic in a portion of the project area. The portion with separated traffic varies by alternative. For each build alternative, the entire alternative would be built to current rural principal arterial geometric standards as described in Chapter 2.

Engineering analysis completed for each alternative predicted the number of crashes of different types for 2043. Table 3.6-6 and Table 3.6-7 report the results. Table 3.6-6 reports the modeled crashes for the new National Highway System route—the Sterling Highway as it would exist when the project was complete. Table 3.6-7 reports the modeled results for the new highway and the "old" Sterling Highway as a system. This allows for different comparisons to the No Build Alternative. The No Build Alternative would continue to carry 100 percent of highway traffic, which is a mix of through-traffic and traffic bound for local destinations. The new highway under each build alternative, where it is built on a new alignment, would carry the through traffic, and local traffic would remain on the "old" highway. A majority of traffic (70%) would use the new highway, but it is difficult to compare the crash rate directly with the No Build Alternative because the No Build would continue to carry 100 percent of traffic. Thus both analyses were undertaken, and both show substantial safety benefits would result from any of the build alternatives.

The numbers of crashes are statistically based on analysis of road features such as shoulders, clear zones, passing lanes, and turning lanes and are not based on actual number of crashes in the corridor (as examples, collisions with wildlife and collisions solely related to icy conditions are not considered in the model). Design standards are principally meant to enhance safety, and the analysis indicates substantial decreases in the number of crashes would result, no matter which alternative is selected. Differences between the Build alternatives are smaller because they each bring the new highway up to current standards. While the tables show the safety benefits for 2043, it is expected that the benefits would begin at the time the new highway was opened to

traffic. In Table 3.6-7, the Juneau Creek alternatives show the greatest safety improvement on the future National Highway System route, which is the focus of this project.

Table 3.6-6. Predicted numbers of crashes (2043) by alternative for the new highway only, Milepost 45–60

	No Build Alt.	Cooper Creek Alt.	G South Alt.	Juneau Creek Alt.	Juneau Cr. Variant Alt.
Total Crashes/Year	33.2	12.4	11.4	9.8	10.0
Fatal and Injury Crashes/Year	10.9	4.1	3.7	3.2	3.3
Property Damage Only Crashes/Year	22.3	8.3	7.6	6.6	6.8
Percent Difference From Total No-Build Crashes	--	-62.5%	-65.7%	-70.5%	-69.7%

Note: For each alternative, the segment built on a new alignment would carry 70% of the system traffic, with the other 30% continuing to use the "old" highway segment for access to Cooper Landing or recreation sites. Therefore, the Percent Difference is best used as a way to compare among the Build alternatives; it is less accurate as a measure of change from the No Build Alternative, which would continue to carry 100% of traffic, but it does reflect the change in expected crashes/safety from the perspective of through-travelers.

Table 3.6-7. Predicted numbers of crashes (2043) by alternative for the new highway and old highway considered as a system, Milepost 45–60

	No Build	Cooper Creek	G South	Juneau Creek	Juneau Creek Variant
Total Crashes/Year	33.2	15.5	15.6	16.8	16.9
Fatal and Injury Crashes/Year	10.9	5.1	5.1	5.5	5.5
Property Damage Only Crashes/Year	22.3	10.3	10.5	11.3	11.4
Percent Difference From Total No-Build crashes	--	- 53.4%	-53.1%	-49.3%	-48.9%

The results in Table 3.6-7 show substantial improvements for all build alternatives when the new highway and old highway are considered as a system and compared to the No Build Alternative. In this case, the Cooper Creek and G South alternatives show the greatest reduction in crashes by a small margin. This is attributed to more length of the existing highway being improved and therefore more of the total traffic benefitting from the improvements. However, this prediction does not consider the influence of mixed through and local travel on conflicts, accessibility, and mobility in the Cooper Landing developed area. The Juneau Creek alternatives remove through-traffic from more of the developed/recreation area than other alternatives, particularly more than the Cooper Creek Alternative. In addition, speed is not a variable in the computer model. Therefore, the model does not account for the differential travel speeds and driving behaviors between local-access and through-travelers on the "old" highway. This mix can lead to an increase in crashes due to the differing driver behaviors and expectations. See also the discussion of the expected new travel pattern, including by vehicle size and season, above under the Travel

Patterns subheading. The number of crashes, correlated with the traffic levels (miles traveled on the highway in the project area), results in a crash rate. Crash rates are calculated for similar highways statewide. Table 3.6-8 reports the predicted crash rate for each alternative and for the No Build Alternative in 2043. Any of the build alternatives would result in a substantially lower crash rate than the No Build Alternative, with minor differences among the build alternatives.

Table 3.6-8. Future predicted crash rates (2043), Milepost 45–60

	No Build	Cooper Creek	G South	Juneau Creek	Juneau Creek Variant
Total Crashes/Year*	30.5	11.2	10.6	9.2	9.5
Total Crashes/Million VMT	1.57	0.69	0.67	0.61	0.62
Statewide average crash rate (Crashes per million VMT)	2.3	2.3	2.3	2.3	2.3
Percent difference from statewide average	-31.8%	-70.1%	-70.8%	-73.6%	-72.9%

*To calculate the crash rate, this table considers modeled crashes on highway segments but not modeled crashes at intersections. The analysis averaged the crash rate calculated for multiple different segments of the highway (segments are based on proposed highway grades, lanes, and other characteristics).

Overall, as a result of improving the main highway to rural principal arterial standards, the driving experience would be made similar to the experience on adjacent sections of the Sterling Highway. When driving conditions are standardized along a roadway, drivers know better what to expect, can anticipate changes in traffic, and are more able to respond to potential hazards. Therefore, the improved continuity of the roadway would improve safety. Based on improvements anticipated in the highway design throughout any of the alternatives, a reduction in the number of crashes of 62 percent to 71 percent is expected, depending on the alternative. Providing passing lanes, wide shoulders, object-free clear zones, and traversable side slopes is expected to minimize the number and severity of crashes. Crashes would be expected to continue to occur on the "old" highway segment under each alternative as well, but this segment would benefit from a 70 percent decrease in traffic volume.

A shadow analysis was performed for all build alternatives (HDR 2011e). Generally, the alternatives located on the north side of the Kenai River valley (a portion of the G South, Juneau Creek, and Juneau Creek Variant alternatives) with south-facing exposure would receive more sun than alternatives located to the south (i.e., Cooper Creek Alternative and a portion of G South Alternative) with north-facing exposure and in the shadow of mountains. Less road icing may occur on the alternatives with greater sun exposure than on the existing highway. Generally, at any given elevation, it is likely that snow and ice would melt off sooner on south-facing slopes than on north-facing slopes. These factors should enhance highway safety. However, factors such as elevation of alternatives and other physical conditions (such as wind exposure) can affect road conditions relative to snow and ice formation, so none of the build alternatives is expected to stand out as dramatically more or less safe as a result of environmental factors.

Aviation

No permanent aircraft operation impacts are anticipated under any of the build alternatives. The Quartz Creek Airport and floatplane operations on Kenai Lake and access to the facility would be unaffected.

Pedestrians and Bicycles

Each alternative would have 8-foot shoulders and would better accommodate bicyclists than the Sterling Highway does today, with more room to maneuver and greater safety. Cyclists wishing to stay in the Cooper Landing area could use the old highway, which would remain without substantial shoulders but would have lower traffic volumes. Overall, connectivity for bicyclists would be improved in the project area by providing wide shoulders throughout the length of each alternative.

Construction Issues

Roadway System

For all alternatives, construction would occur over up to five construction seasons, with some ongoing work possible year round. As described below under Mitigation, construction would be accomplished under a Traffic Control Plan to minimize the temporary impacts on traffic and circulation. Impacts could include localized congestion, traffic delays, and queuing during construction. Also, short detours would occur. Use of pilot cars through construction zones is likely, and short-duration nighttime closures may be necessary. For any drivers, and particularly for local land and business owners and others who drive the route regularly, these impacts are likely to lead to frustration and feelings of wasted time for the length of construction, which will span multiple years. The construction phase for the segment built on a new alignment would have the least of these impacts, and those alternatives with relatively long segments built on a new alignment would minimize traffic impacts during construction.

Movement of construction materials would result in increases in truck traffic through Cooper Landing, which could further exacerbate already-congested conditions. Assuming that the contractor uses a typical dump truck that can haul 10–12 cubic yards of material, there could be 20 trucks hauling 10 loads (200 truckloads) each day in the project area during construction periods (primarily snow-free times).

Use of staging, material extraction, and material disposal sites would be temporary, occurring during construction. Access to many of these areas would be from the new alignment and internal to the project, without affecting existing roads. Construction-related truck traffic on the existing Sterling Highway and possibly on other existing minor roads would occur.

Aviation

The operation of aircraft at Quartz Creek Airport would be unaffected by construction, although ground access to the airport could be altered or affected during construction. The contractor would be required to provide access to the Quartz Creek area, including the airport. Minor delays in access could occur during some phases of construction, such as driveway rebuilding and paving efforts. The contractor would submit a notice of construction activity to the Federal Aviation Administration to ensure that construction was compatible with aviation activities and that cranes or other obstructions to airspace were located far enough away to avoid impact to aircraft using the airport (the nearest use of cranes would likely be at Cooper Landing Bridge

under the Cooper Creek Alternative [3 miles from the airport] and Juneau Creek Bridge sites for the G South Alternative [5 miles] and both Juneau Creek alternatives [6 miles]).

Pedestrians and Bicyclists

Where the existing alignment would be reconstructed, under any of the build alternatives, pavement would be removed and traffic would be funneled to one lane with traffic required to follow pilot cars. The existing highway is not particularly bike and pedestrian friendly and thus has relatively little use by bicyclists and pedestrians, but for those who do use the existing alignment, conditions would be generally less favorable during the construction phase. Construction of the build alternatives would have relatively little impact on pedestrians and bicyclists along the "Old Sterling Highway," but construction vehicles, some of them large, would add traffic on the "old" highway and thereby degrade the pedestrian and bicycle experience. Somewhat greater disturbances may occur at points where the new alignments leave or rejoin the "Old Sterling Highway." Temporary detours would be required where new alignments cross existing trails. Those impacts are discussed in Section 3.8, Park and Recreation Resources, and Chapter 4, Section 4(f).

Mitigation

Construction of any of the build alternatives has the potential to impact transportation, travel patterns, and accessibility through the project area. To reduce the number and magnitude of such impacts, the contractor would consult with local businesses and land management agencies to create a Traffic Control Plan. The Traffic Control Plan would preemptively outline detours and other traffic modification strategies to ensure that access to businesses and government sites would be retained, delays would be minimized, and traffic flow would be maintained throughout the project corridor during construction.

To further reduce construction impacts, construction activities that conflict with access would be scheduled outside high-use summer periods, to the extent possible. In addition, notification of any construction activities and potential road closures would be given well in advance. Of particular concern is access to popular recreation sites in the area. DOT&PF would closely coordinate with the land and resource management agencies during the design phase to ensure access and operational concerns associated with popular recreation sites and associated administrative sites would be reflected in construction plans and specifications. For instance, special attention would be given to minimizing impacts to access and use of the Sportsman's Landing-Russian River Ferry, the U.S. Fish and Wildlife Service (USFWS) visitor contact station, the Fuller Lakes Trailhead, Forest Service campgrounds and trails, and the turn onto Skilak Lake Road/Jim's Landing during highway construction.

To ensure traffic patterns are settled and to help encourage maximum use of the new highway by through-traffic, DOT&PF would examine the functional classification of the "old" highway and examine the appropriate speed limits for its segments. DOT&PF would undertake the road classification process so that it is complete by the time the new highway is open to traffic, and would undertake the speed study in the first year of operation and set new speed limits as warranted. The "old" highway segment is anticipated to be reclassified as a collector or minor arterial, and any speed adjustment would be to a lower speed limit.

3.6.2.3 Cooper Creek Alternative

Direct and Indirect Impacts

Travel Patterns

The Cooper Creek Alternative would route 70 percent of traffic onto the segment built on a new alignment south of the community. This through traffic would avoid conflicts with a portion of the community's driveways but would not avoid those north of Kenai River and would not avoid conflict with local traffic at most of the recreation destinations west of the community. See greater discussion above in Section 3.6.2.2.

Accessibility

The Cooper Creek Alternative would relieve congestion through the portion of the Cooper Landing central business district and would provide improved traffic flow for through-traffic from Snug Harbor Road west to about MP 52 by routing most through-traffic to the south on a new alignment (see Map 3.6-4). Even though through-traffic would bypass this portion of Cooper Landing, there are several facilities that would be affected by access changes. Under this alternative, several measures would help facilitate orderly access to these facilities while maintaining the flow of through-traffic, including:

- Construction of turning lanes at Sportsman's Landing (MP 55)
- Construction of turning lanes at the entrance to the Russian River Campground (MP 52.7)
- Construction of turning lanes at Snug Harbor Road and the existing Sterling Highway (MP 48)
- Construction of a T-shaped intersection with turning lanes at Bean Creek Road (MP 47.6)

A trailhead access pullout would be established for the Stetson Creek Trail on the Cooper Creek Alternative near where the new alignment would cross the Stetson Creek Trail (see Chapter 4 for detail). Also, an existing pullout located just west of MP 53 that serves as winter parking for access to the Resurrection Pass Trail would be retained rather than eliminated. It would be somewhat reconfigured. An existing pullout within KNWR at approximately MP 55.6 or 56.7 would be reestablished with an equal amount of parking; it is anticipated to be designed with a single driveway and would not be plowed in winter.

Level of Service

The amount of traffic accessing facilities on the existing Sterling Highway during the height of summer would continue to contribute to variable traffic speeds and delays. The LOS would be an improvement over current conditions. The Cooper Creek Alternative would be designed to accommodate the projected increase in traffic forecasted for 2043. Passing lanes would be provided for both eastbound and westbound traffic in many sections, which would contribute to this improved LOS. Map 3.6-4 shows the LOS for both directions of travel and intersections. Table 3.6-9 reports the levels of service for the various segments and reports the LOS as a percentage of the entire alternative length. The Cooper Creek Alternative would result in a greater percentage of the total roadway functioning above LOS D (60.8%) than under the existing conditions (0%). Furthermore, the segment of existing roadway that would be bypassed would completely operate at LOS C because of reduced traffic volumes.

Table 3.6-9. Level of service – Cooper Creek Alternative, 2043

Segment	Direction	% of Total Length[a]	Level of Service[b]
1	Eastbound	7.3	D
	Westbound	7.3	C
2	Eastbound	5.1	D
	Westbound	5.1	C
3	Eastbound	7.3	C
	Westbound	7.3	C
4	Eastbound	3.6	C
	Westbound	3.6	C
5	Eastbound	16.4	D
	Westbound	16.4	C
6	Eastbound	10.2	D
	Westbound	10.2	C

[a] The project area is about 15 miles long. "Total Length" includes both directions of travel and therefore is approximately 30 miles.

[b] Level of service is a term used to describe roadway operations using letter grades ranging from A (best) to F (worst). See definition in Section 1.2.2.1. Source: Lounsbury (2014). Note that in the Lounsbury report, Tables 21A and 21B, the segments are numbered in the opposite order from those in this Final EIS.

Transportation Safety. The Cooper Creek Alternative would result in a predicted 62.5 percent reduction in crashes on the main highway in 2043, compared to the No Build Alternative. See Table 3.6-6, above, for comparison among alternatives.

Construction Impacts

This alternative follows the existing highway from MP 45 to 47.8 and MP 51.3 to 60. Approximately 11.5 of 15 miles of the existing highway would be rebuilt, meaning that pavement would be removed, the earth embankment and side slopes would be reconfigured using heavy equipment, and new pavement would be placed. During this process, drivers on the affected portions would be re-routed onto temporary gravel lanes and subject to delays while waiting for a pilot car. The remaining 3.5 miles of the existing highway, including the western portion of the Cooper Landing community, would not be rebuilt but likely would experience some construction-related traffic (e.g., dump trucks hauling gravel). For that portion of the existing highway that would be reconstructed within Cooper Landing, congestion, queuing/pilot cars, and dust and noise from heavy equipment and pile driving would affect local movements, such as trips to visit neighbors, to go to the post office or a place of business, or to commute to work. Repeated trips with repeated impacts would be most noticeable within Cooper Landing but would apply outside the community for people who would regularly use road segments subject to reconstruction.

The two bridge replacements on the existing highway alignment would contribute to potential construction-related impacts:

- **Cooper Landing Bridge Replacement**. It would likely take two construction seasons to build the replacement bridge and remove the existing bridge. Traffic would be

accommodated during construction, either on the existing bridge or on an adjacent temporary bridge, but would sometimes experience delays or need to follow a pilot car.

- **Schooner Bend Bridge Replacement**. Construction of the new bridge and demolition of the existing bridge is expected to take two construction seasons. Traffic would be accommodated during construction on the existing bridge, and the old bridge would not be removed until the new bridge was in use. However, vehicles might experience delays in the bridge construction area.

Floatplane take-off and landing operations at the mouth of Kenai Lake could be affected by construction of the replacement Cooper Landing Bridge. Cranes used to drive pilings, remove temporary pilings, and place bridge girders would extend much higher than is common in the area, creating a potential obstruction for aircraft.

Construction of the Cooper Creek Alternative would include river restrictions and closures associated with construction of these bridges. Construction of the Cooper Landing Bridge would require closures and timing restrictions at the Cooper Landing Boat Launch. Restrictions at the Schooner Bend Bridge would be for boaters passing under the old and the new bridge sites.

Construction activity associated with the Cooper Creek Alternative would require temporary closure of the Cooper Lake Dam Road for several hours to a full day several times, primarily for placement of a bridge over the Cooper Lake Dam Road. This would temporarily limit access for the Forest Service and Chugach Electric Association to maintain Cooper Lake Dam and Stetson Creek diversion pipeline facilities.

Mitigation

Mitigation and commitments common to construction of all alternatives are described above in Section 3.6.2.2. Mitigation specifically related to construction of the Cooper Creek Alternative is detailed below.

- **Sportsman's Landing and the Russian River Ferry Facilities.** The construction contractor would be required to maintain public access to Sportsman's Landing and the Russian River Ferry facilities during the summer high-use period. For the Cooper Creek Alternative, temporary use of the northern edge of the parcel would occur without closure of the access road. Any temporary closure during placement of fill or pavement across the entrance would be limited to low-use periods at night and outside the prime fishing season. Notice of closures would be given to area land management agencies (USFWS, Forest Service, Alaska Department of Fish and Game [ADF&G], Alaska Department of Parks and Outdoor Recreation [DPOR]/Kenai River Center), posted on site, posted in nearby public buildings, and published in Anchorage and Kenai Peninsula newspapers and posted on DOT&PF's construction web site (www.alaskanavigator.org).
- **Cooper Landing Boat Launch and Day Use Area.** Temporary impacts to the boat launch ramp would be minimized by requiring construction contractors to stage construction elsewhere unless absolutely required on the boat launch ramp for construction immediately adjacent to the ramp. Access to the day use area and boat launch ramp would be retained during the peak summer use season (approximately June 15–August 15). If the entire area were closed for brief periods in spring/early summer or in late summer/fall, notice of intent to temporarily close the ramp would be given to permitted Kenai River guides and land management agencies; posted on site and at area

campgrounds and other boat launch ramps; and published in Anchorage and Kenai Peninsula newspapers. The provision of temporary boat ramp facilities was discussed with Kenai River Special Management Area managers but no suitable location was identified. Further consultation with the DPOR would be undertaken to determine if a reasonable site could be located on public or private land.

- **Cooper Lake Dam Road.** The construction contractor would be required to coordinate temporary closures with the Forest Service and Chugach Electric Association. Temporary closures would be timed to avoid conflicts with dam or pipeline maintenance.
- **Other Recreation Facilities.** Access to Russian River Campground, K'Beq Heritage Site, Resurrection Pass Trail and Fuller Lakes Trail, the KNWR visitor contact station, and the turn onto Skilak Lake Road/Jim's Landing may be impacted during construction activities. To minimize any impacts, primary construction activities that conflict with access would be scheduled outside high-use summer periods, to the extent possible. Access would be maintained except for short closures at less active times.
- **Forest Administrative Access.** Access to lower-use Forest Service administrative sites, such as Schooner Bend Road, West Juneau Road, and Broadview Guard Station, would generally be maintained. Any temporary closures would be coordinated with the Forest Service.
- **Cooper Landing Bridge and Schooner Bend Bridge.** The two bridge replacements over the Kenai River (the Cooper Landing Bridge and Schooner Bend Bridge) would contribute to potential construction-related impacts. It would likely take two construction seasons to build the replacement bridges and remove the existing bridges. Traffic would be accommodated during construction either on the existing bridge or on an adjacent temporary bridge.
- **Airport Operations.** To lessen the impact of the presence of the cranes relative to airport operations, the contractor would be required to light and flag the cranes to enhance visibility and to submit a notice of construction activity to the Federal Aviation Administration to ensure that construction is compatible with aviation activities.

3.6.2.4 G South Alternative

Direct and Indirect Impacts

Travel Patterns

The G South Alternative would route 70 percent of traffic onto the segment built on a new alignment north of the community. This through traffic would avoid conflicts with virtually all of the community's driveways but would not avoid conflict with local traffic at most of the recreation destinations west of the community. See greater discussion above in Section 3.6.2.2.

Accessibility

The G South Alternative would relieve congestion through the entire Cooper Landing central business district and would provide improved traffic flow for through-traffic by routing most through-traffic to the north. Even though most through-traffic would drive around Cooper Landing, all traffic would be combined in the area farther west where there are a number of facilities (campgrounds, trail heads, boat launch ramps, and interpretive sites) that would be

affected by changes to their access. Under this alternative, the following measures would help to provide for orderly access to these facilities while maintaining the flow of through-traffic:

- Construction of east- and west-bound turning lanes at Sportsman's Landing (MP 55)
- Construction of east- and west-bound turning lanes at the entrance to the Russian River Campground (MP 52.7)

A new trailhead access point would be established near where the G South Alternative crosses the Bean Creek Trail to provide better access (see Chapter 4 for detail), and a pullout would be provided nearby that would allow for winter parking for access to the trail. An existing pullout located just west of MP 53 that serves as winter parking for access to the Resurrection Pass Trail would be retained rather than eliminated, and somewhat reconfigured. An existing pullout within KNWR at about MP 55.6 would be reestablished with an equal amount of parking; it is anticipated to be designed for summer use (not plowed in winter) for recreational access via cars and motorhomes/trailers.

Level of Service

The amount of traffic accessing these facilities during the height of summer would continue to contribute to variable traffic speeds and delays for through-traffic. The LOS would be an improvement over current conditions. The G South Alternative would be designed to accommodate the projected increase in traffic forecasted for 2043. Passing lanes would be provided for both eastbound and westbound traffic in many sections, which would contribute to this improved LOS. Map 3.6-5 shows the LOS for both directions of travel and intersections. Table 3.6-10 reports the levels of service for the various segments and reports the LOS as a percentage of the entire alternative length. The G South Alternative would result in a greater percentage of the total roadway functioning above LOS D (69.2%) than under the existing conditions (0%). Furthermore, the segment of existing roadway that would be bypassed would completely operate at LOS C because of reduced traffic volumes.

Table 3.6-10. Level of service – G South Alternative, 2043

Segment	Direction	% of Total Length[a]	Level of Service[b]
1	Eastbound	6.6	D
	Westbound	6.6	C
2	Eastbound	4.0	C
	Westbound	4.0	B
3	Eastbound	11.6	C
	Westbound	11.6	B
4	Eastbound	3.6	C
	Westbound	3.6	B
5	Eastbound	14.9	D
	Westbound	14.9	C
6	Eastbound	9.3	D
	Westbound	9.3	C

[a] The project area is about 15 miles long. "Total Length" includes both directions of travel and therefore is approximately 30 miles.
[b] Level of service is a term used to describe roadway operations using letter grades ranging from A (best) to F (worst). See definition in Section 1.2.2.1.
Source: Lounsbury (2014). Note that in the Lounsbury report, Tables 21A and 21B, the segments are numbered in the opposite order from those in this Final EIS.

Transportation Safety. The G South Alternative would result in a predicted 65.7 percent reduction in crashes on the main highway in 2043, compared to the No Build Alternative. See Table 3.6-6, above, for comparison among alternatives.

Construction Impacts

The G South Alternative follows the existing alignment from MP 45 to 46.3 and MP 51.9 to 60. Approximately 9.4 of 15 miles of the existing highway would be rebuilt, meaning that pavement would be removed, the earth embankment and side slopes would be reconfigured using heavy equipment, and new pavement would be placed. During this process, drivers on the affected portions would be re-routed onto temporary gravel lanes and subject to delays while waiting for a pilot car. The remaining 5.6 miles of the existing highway, in the area of the Cooper Landing community, would not be rebuilt but would experience construction-related traffic (e.g., dump trucks hauling gravel). Local businesses that use the downstream boat launch sites, or any drivers who repeatedly use those highway segments that would be reconstructed, would be repeatedly subjected to delays, unpaved stretches, and other frustrations of construction.

Schooner Bend Bridge would be replaced. Construction of the new bridge and demolition of the existing bridge is expected to take two construction seasons. Traffic would be accommodated during construction on the existing bridge, and the old bridge would not be removed until the new bridge was in use. However, vehicles might experience delays in the bridge construction area.

Construction of the G South Alternative would include river restrictions and closures associated with construction of a new bridge over the Kenai River west of Juneau Creek, and with replacement of the Schooner Bend Bridge.

Mitigation

Mitigation and commitments common to construction of all alternatives is described above in Section 3.6.2.2. Mitigation specifically related to construction of the G South Alternative is detailed below.

- **Sportsman's Landing and the Russian River Ferry Facilities.** Under the G South Alternative, the construction contractor would be required to maintain public access to Sportsman's Landing and the Russian River Ferry facilities during the summer high-use period. Temporary use of the edge of the northern edge of the parcel would occur without closure of the access road. Any temporary closure during placement of fill or pavement across the entrance would be limited to low-use periods at night and outside the prime fishing season. Notice of any closure would be given to area land management agencies (USFWS, Forest Service, ADF&G, DPOR/Kenai River Center), posted on site, posted in nearby public buildings, and published in Anchorage and Kenai Peninsula newspapers.
- **Other Recreation Facilities.** Access to Russian River Campground, K'Beq Heritage Site, Resurrection Pass Trail and Fuller Lakes Trail, the KNWR visitor contact station, and the turn onto Skilak Lake Road/Jim's Landing may be impacted during construction activities. To minimize any impacts, primary construction activities that conflict with access would be scheduled outside high-use summer periods, to the extent possible. Access would be maintained except for short closures at less active times.

- **Forest Administrative Access.** Access to lower-use administrative sites, such as Schooner Bend Road, West Juneau Road, and Broadview Guard Station would generally be maintained. Any temporary closures would be coordinated with the Forest Service.
- **Schooner Bend Bridge**. The Schooner Bend Bridge replacement on the existing highway alignment would contribute to potential construction-related impacts. Traffic would be accommodated during construction either on the existing bridge or on an adjacent temporary bridge. The pilings for the spans of the temporary construction bridge would be placed to allow for continued navigation of the river, and sufficient vertical clearance would be provided on the temporary bridges and the permanent bridges for ease of navigation.

3.6.2.5 Juneau Creek and Juneau Creek Variant Alternatives

Direct and Indirect Impacts

Travel Patterns

The two Juneau Creek alternatives would route 70 percent of traffic onto the segment built on a new alignment north of the community and north of most recreation destinations. This through traffic would avoid conflicts with virtually all of the community's driveways and with local traffic at most of the recreation destinations west of the community. The western junction of the Juneau Creek Variant Alternative and the "old" highway would occur right at Sportsman's Landing/Russian River Ferry, one of the area's most heavily used recreation destinations, but the access would be off the "old" highway rather than the new highway. The Juneau Creek Alternative would avoid this area entirely. See greater discussion of travel patterns above in Section 3.6.2.2.

Accessibility

The Juneau Creek (preferred alternative) and Juneau Creek Variant alternatives would include a new corridor north of the existing roadway between MP 46.3 and 55.6 (Juneau Creek Alternative) or MP 55 (Juneau Creek Variant Alternative) and would route through-traffic around the most congested sections of the existing highway, including the Cooper Landing central business district and many recreational facilities, which would result in a more consistent flow of through-traffic at typical highway speeds. Traffic destined for Cooper Landing or the many recreational facilities located along the Kenai River would use the "old" highway and would encounter much lower traffic volumes. The "old" highway would remain a winding, lower-speed road suitable for access to the Kenai River and the core recreation area.

A remnant logging road on the east side of Bean Creek would be crossed by the Juneau Creek and Juneau Creek Variant alternatives. Approximately 300 feet of logging road would be bisected. The bisected portion north of the proposed alignment disappears where the terrain gets steep along base of the mountains.

Where these alternatives would cross State Management Unit 395 and CIRI Tract A, DOT&PF and FHWA acknowledge that future access may be desired. The Forest Service, in comments on the Draft Supplemental EIS, indicated a better decision for Forest management might be to allow a direct connection from the Juneau Creek Alternative to Unit 395. It would be possible in the future for the Alaska Department of Natural Resources or the Borough to request a connection, and this document evaluates environmental impacts of such access in Section 3.27.

These alternatives would provide a pullout to access the Bean Creek Trail and new access to the Resurrection Pass National Recreation Trail by the construction of a new trailhead near the crossing of the trail. This new trailhead would be built in close coordination with the Forest Service (see Chapter 4 for details). An existing pullout within KNWR at about MP 55.6 would be reestablished with an equal amount of parking; it is anticipated that it would be designed with a single driveway and would not be plowed in winter. Under the Juneau Creek Alternative, which reroutes the existing alignment in this area to make an intersection with the new alignment, this pullout would be located on the rerouted existing alignment.

The Juneau Creek and Juneau Creek Variant alternatives are the only alternatives that provide through-traffic a means to bypass Sportsman's Landing. This area can become busy and congested during peak salmon fishing season. The Juneau Creek Alternative would tie into the "old" highway west of Sportsman's Landing, while the Juneau Creek Variant Alternative would bridge over the "old" highway, bypassing Sportsman's Landing and creating an intersection on the north side of the new highway just north of Sportsman's Landing. Both alternatives would provide access to Sportsman's Landing via the "Old" Sterling Highway. Under the Juneau Creek Variant Alternative, the "old" highway and the Sportsman's Landing driveway would be slightly realigned.

Level of Service

The Juneau Creek and Juneau Creek Variant Alternatives would be designed to accommodate the projected increase in traffic forecasted for 2043. Passing lanes would be provided for both eastbound and westbound traffic in many sections, which would contribute to this improved LOS. Map 3.6-6 and Map 3.6-7 shows the LOS for both directions of travel and intersections for these two alternatives.

Table 3.6-11 reports the levels of service for the various segments and reports the LOS as a percentage of the entire alternative length. The Juneau Creek and Juneau Creek Variant alternatives would result in a greater percentage of the total roadway functioning above LOS D (83.2% and 82%, respectively) than under the existing conditions (0%). Furthermore, the segment of existing roadway that would be bypassed would completely operate at LOS C because of reduced traffic volumes.

Table 3.6-11. Level of service – Juneau Creek Alternatives, 2043

Segment	Direction	Juneau Creek Alternative		Juneau Creek Variant Alternative	
		% of Total Length[a]	Level of Service[b]	% of Total Length[a]	Level of Service[b]
1	Eastbound	7.0	D	7.5	D
	Westbound	7.0	C	7.5	C
2	Eastbound	4.2	C	4.5	C
	Westbound	4.2	B	4.5	B
3	Eastbound	4.5	C	4.9	C
	Westbound	4.5	B	4.9	B
4	Eastbound	10.5	C	11.3	C
	Westbound	10.5	C	11.3	C
5	Eastbound	14.0	C	11.3	C
	Westbound	14.0	C	11.3	C

Segment	Direction	Juneau Creek Alternative		Juneau Creek Variant Alternative	
		% of Total Length[a]	Level of Service[b]	% of Total Length[a]	Level of Service[b]
6	Eastbound	9.8	D	10.5	D
	Westbound	9.8	C	10.5	C

[a] The project area is about 15 miles long. "Total Length" includes both directions of travel and therefore is approximately 30 miles.

[b] Level of service is a term used to describe roadway operations using letter grades ranging from A (best) to F (worst). See definition in Section 1.2.2.1.

Source: Lounsbury (2014). Note that in the Lounsbury report, Tables 21A and 21B, the segments are numbered in the opposite order from those in this EIS.

Transportation Safety. The Juneau Creek Alternative would result in a predicted 70.5 percent reduction in crashes on the main highway in 2043, compared to the No Build Alternative. For the Juneau Creek Variant Alternative, the reduction would be 69.7 percent. See Table 3.6-6, above, for comparison among alternatives.

Construction Impacts

The Juneau Creek alternatives would follow a portion of the 15-mile length of existing highway in the project area, as follows:

- Juneau Creek Alternative: MP 45 to approximately MP 46.3 and MP 55.8 to MP 60, for a total of 5.5 miles.
- Juneau Creek Variant Alternative: MP 45 to approximately 46.3 and MP 55 to MP 60, for a total of 6.3 miles.

Approximately 5.5 and 6.3 miles, respectively, of the existing highway would be rebuilt under the Juneau Creek and the Juneau Creek Variant alternatives, meaning that pavement would be removed, the earth embankment and side slopes would be reconfigured using heavy equipment, and new pavement would be placed. During this process, drivers on the affected portions would be re-routed onto temporary gravel lanes and subject to delays while waiting for a pilot car. The remaining 9.5 and 8.7 miles of the existing highway, in an area encompassing virtually all of the Cooper Landing community and recreation sites westward to Sportsman's Landing, would not be rebuilt but would experience some construction-related traffic (for example, dump trucks hauling gravel). Local businesses that use the downstream boat launch sites, or any drivers who repeatedly use those highway segments that would be reconstructed, would be repeatedly subjected to delays, unpaved stretches, and other frustrations of construction.

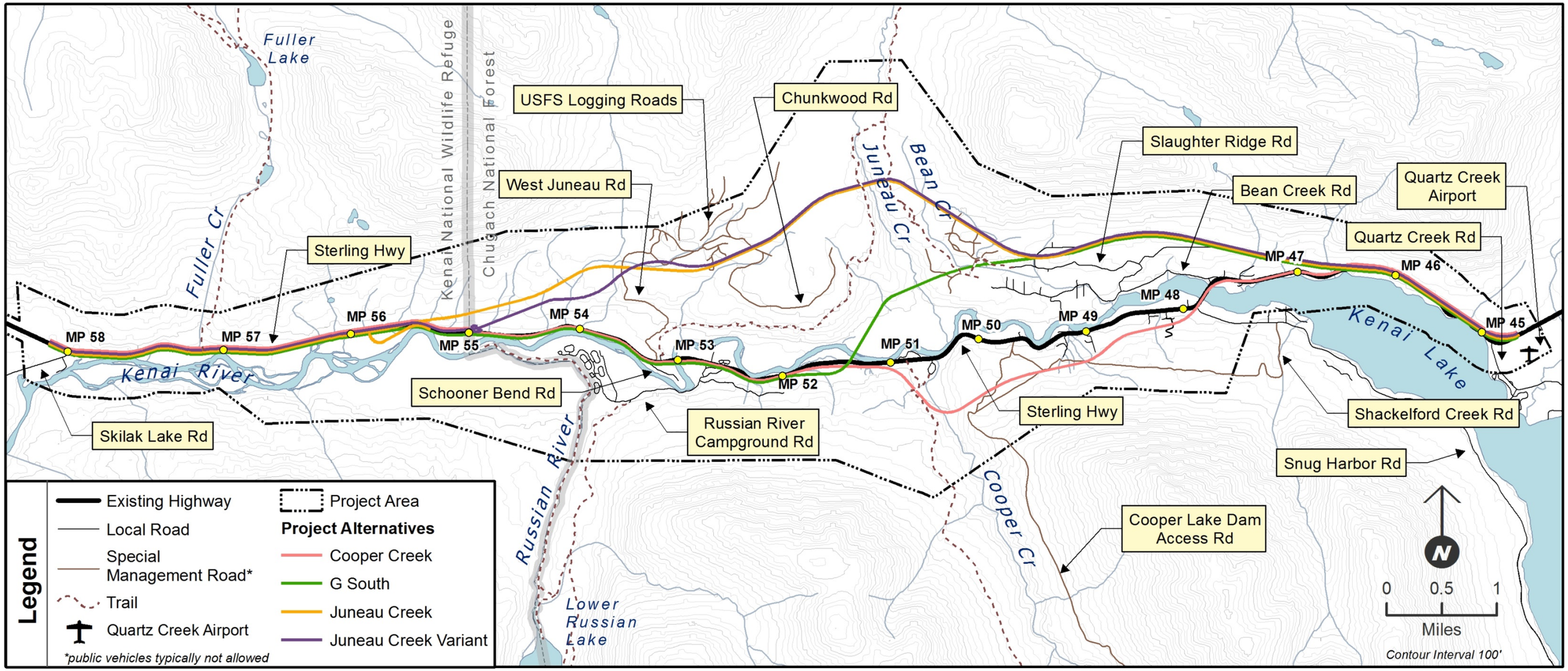
Under these two alternatives, the construction contractor may desire access to the alignment via West Juneau Road, which is typically closed to public use by motorists (but open for walking, horseback riding, and seasonal snowmobile use). If the Forest Service granted access, construction activity could close the road to general public uses and alter the timing of Forest management uses of the road. Use of the road for construction access would require a Forest Service special use permit subject to Forest Service stipulations and approval.

These alternatives would not include new construction or replacement of any bridges on the existing highway alignment, minimizing traffic impacts.

Mitigation

Mitigation and commitments common to construction of all alternatives is described above in Section 3.6.2.2. Mitigation specifically related to construction of the Juneau Creek and Juneau Creek Variant alternatives is detailed below.

- **Sportsman's Landing and the Russian River Ferry Facilities.** Under the Juneau Creek Variant Alternative, the construction contractor would be required to maintain public access to Sportsman's Landing and the Russian River Ferry facilities during the summer high-use period. Temporary use of the parcel would be carried out without closing the access road, or with alternative access while the access road was reconfigured, unless construction was in winter, and would be coordinated with ADF&G and USFWS. Any temporary closure during construction would be limited to low-use periods at night and outside the prime fishing season. Notice of any closure in the spring-summer-fall use season would be given to area land management agencies (USFWS, Forest Service, ADF&G, DPOR/Kenai River Center), posted on site, posted in area public buildings, and published in Anchorage and Kenai Peninsula newspapers. These measures do not apply to the Juneau Creek Alternative, because it is located farther north, away from Sportsman's Landing.
- **Other Recreation Facilities.** Access to Fuller Lakes Trail, the KNWR visitor contact station, and the turn onto Skilak Lake Road/Jim's Landing may be impacted during construction activities. To minimize any impacts, primary construction activities that conflict with access would be scheduled outside high-use summer periods, to the extent possible. Access would be maintained except for short closures at less active times.
- **Forest Administrative Access.** Access would generally be maintained to lower-use administrative sites, such as Broadview Guard Station. Any temporary closures would be coordinated with the Forest Service.



Map 3.6-1. Transportation features in the project area [Updated]

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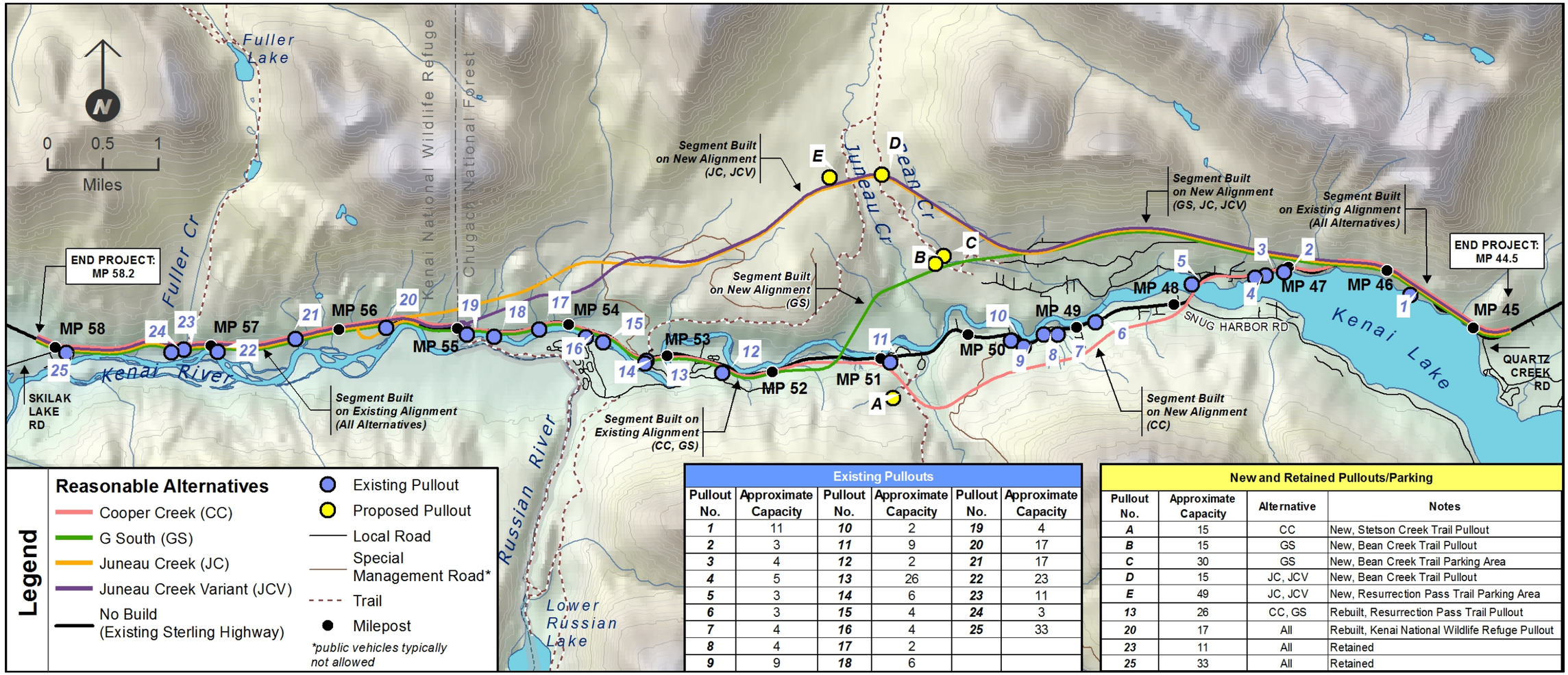

Existing Pullouts

Pullout No.	Approximate Capacity	Pullout No.	Approximate Capacity	Pullout No.	Approximate Capacity
1	11	***10***	2	***19***	4
2	3	***11***	9	***20***	17
3	4	***12***	2	***21***	17
4	5	***13***	26	***22***	23
5	3	***14***	6	***23***	11
6	3	***15***	4	***24***	3
7	4	***16***	4	***25***	33
8	4	***17***	2		
9	9	***18***	6		

New and Retained Pullouts/Parking

Pullout No.	Approximate Capacity	Alternative	Notes
A	15	CC	New, Stetson Creek Trail Pullout
B	15	GS	New, Bean Creek Trail Pullout
C	30	GS	New, Bean Creek Trail Parking Area
D	15	JC, JCV	New, Bean Creek Trail Pullout
E	49	JC, JCV	New, Resurrection Pass Trail Parking Area
13	26	CC, GS	Rebuilt, Resurrection Pass Trail Pullout
20	17	All	Rebuilt, Kenai National Wildlife Refuge Pullout
23	11	All	Retained
25	33	All	Retained

Map 3.6-2. Pullouts in project area [Updated]

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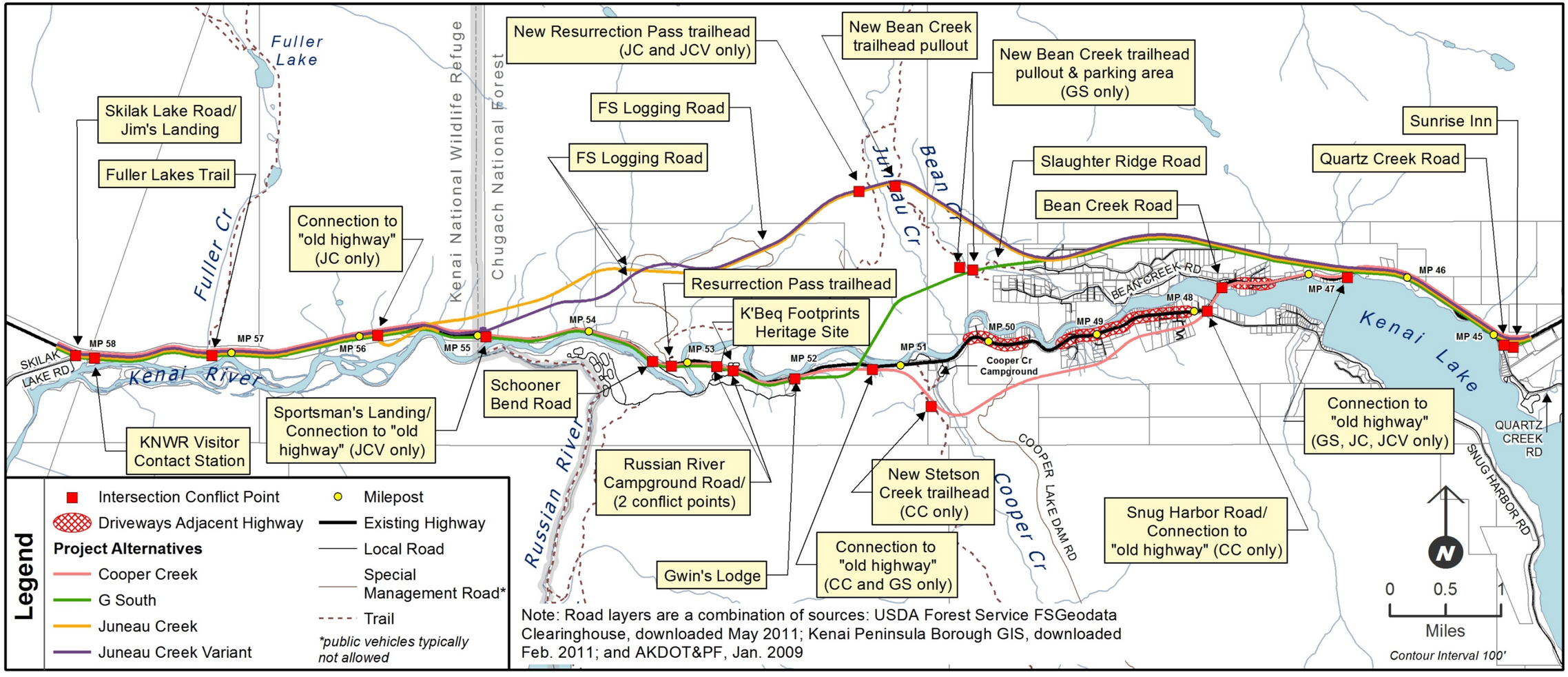

Map 3.6-3. Major intersection conflicts in the project area [Updated]

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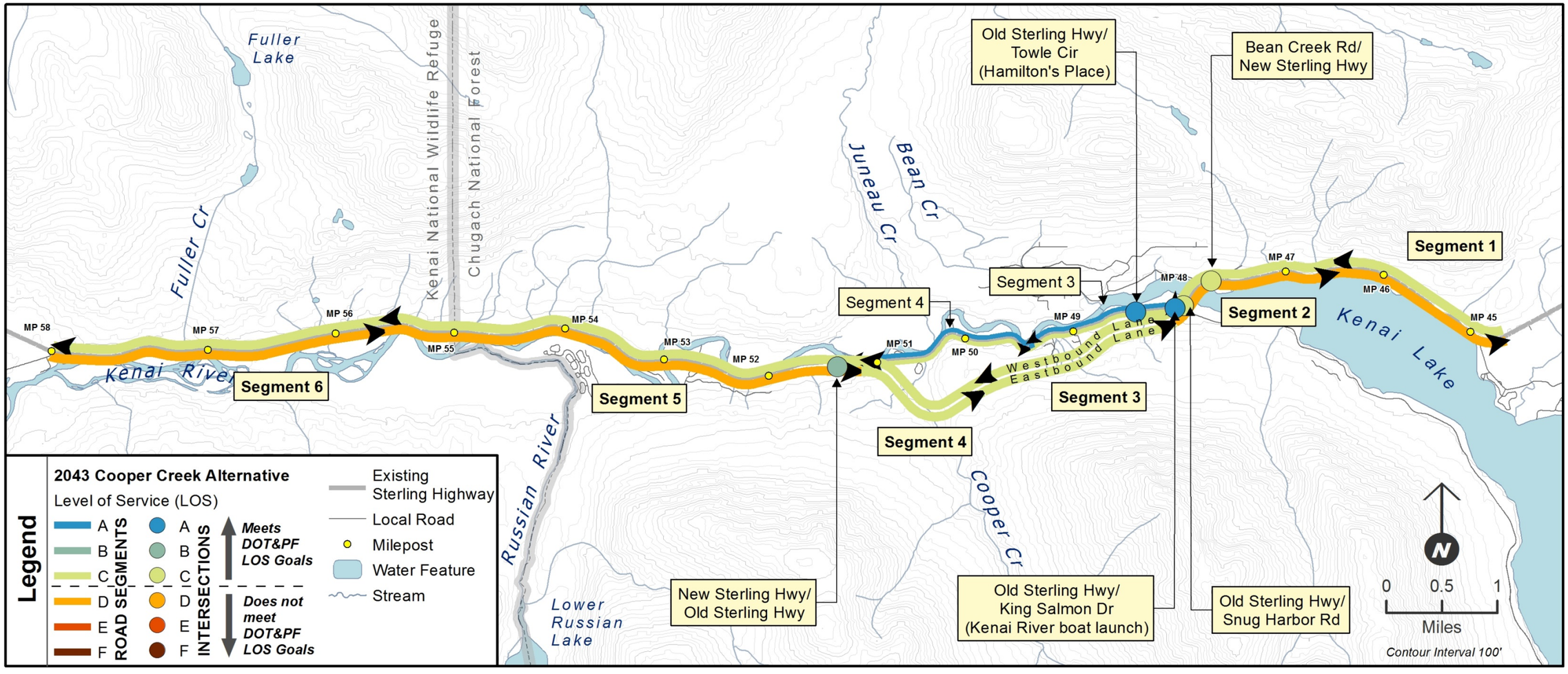

Map 3.6-4. Cooper Creek Alternative 2043 level of service

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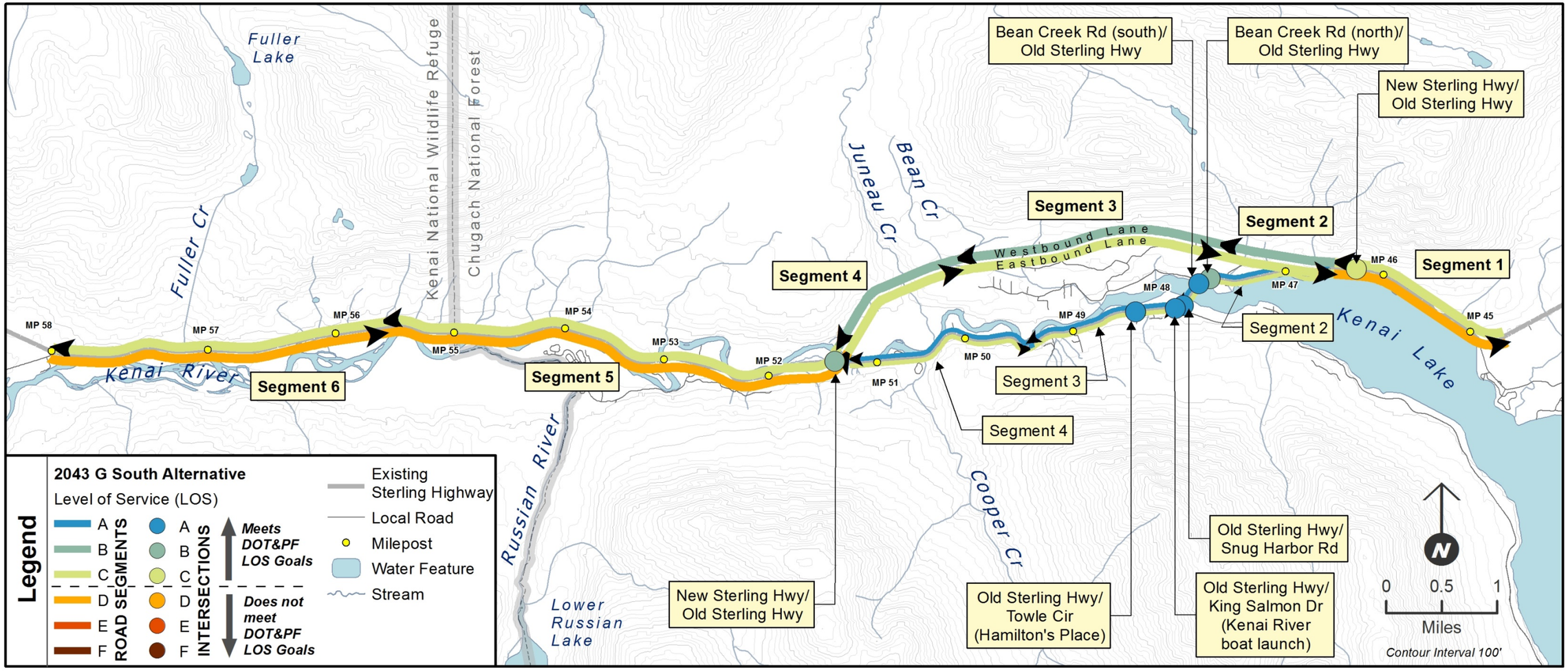

Map 3.6-5. G South Alternative 2043 level of service

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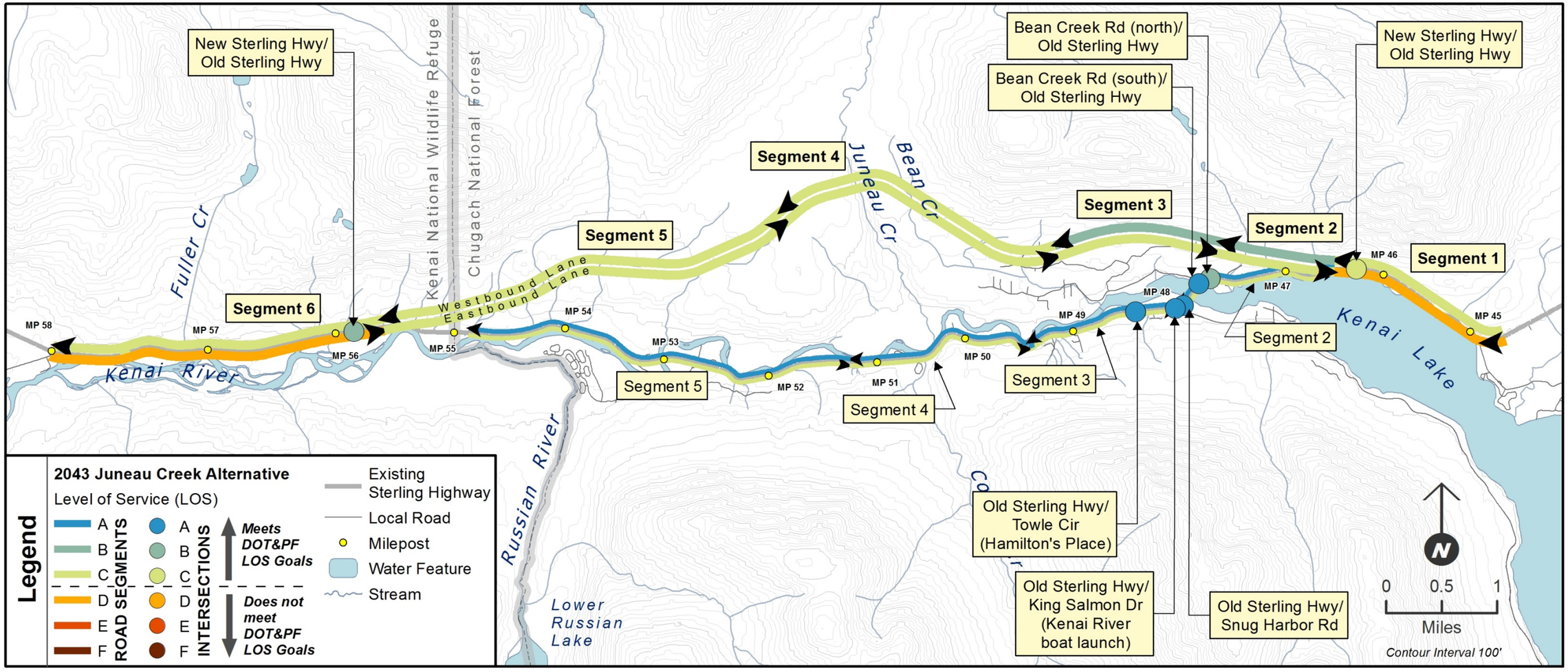

Map 3.6-6. Juneau Creek Alternative 2043 level of service

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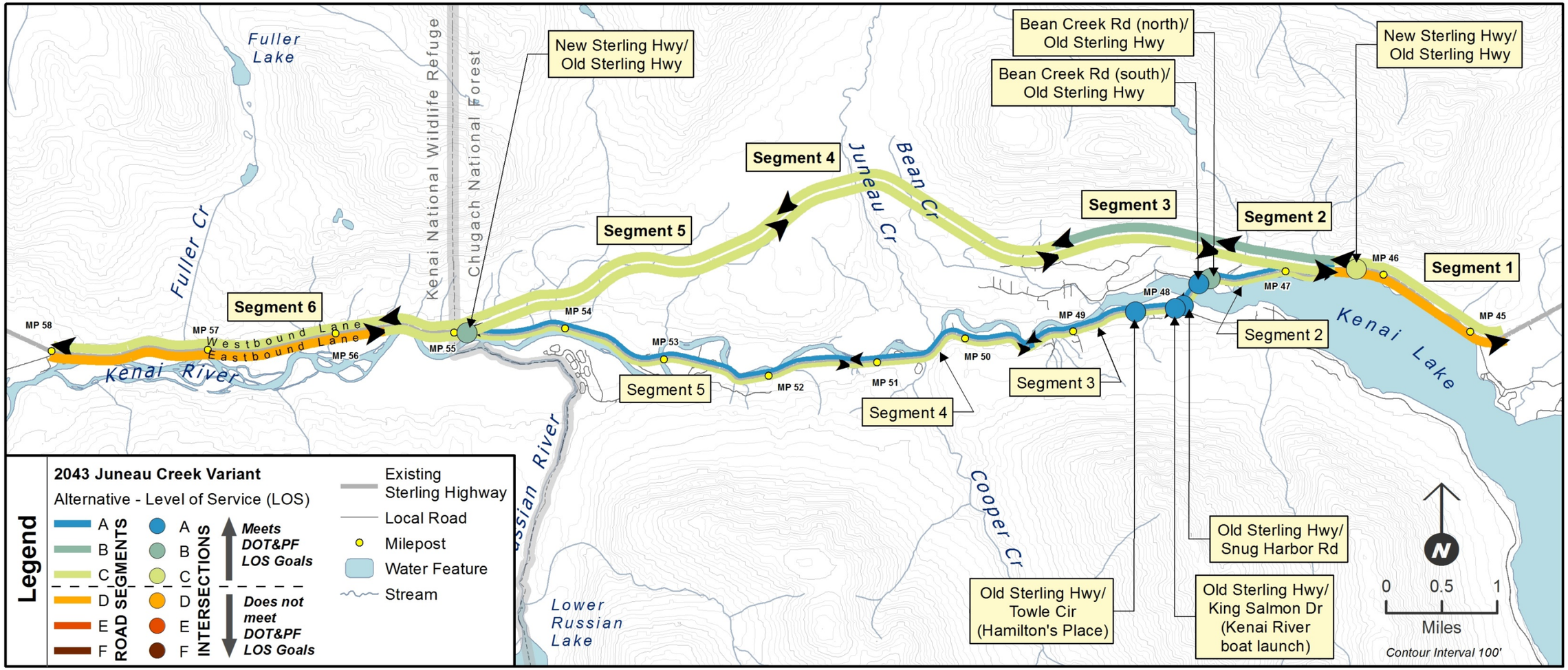

Map 3.6-7. Juneau Creek Variant Alternative 2043 level of service

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