11. TRANSPORTATION SAFETY AND DELAY

Chapter 11 describes the applicable rules, existing conditions, and impacts on transportation safety and delay associated with the proposed action and alternatives. Rail construction activities and operational support facilities, including proposed construction camps, construction staging areas, a passenger depot in Delta Junction, end-of-track facilities (maintenance facilities and loading dock), and communication towers, are included as part of the proposed action and alternatives, except for the No-Action Alternative.

The potential effects on rail and road transportation systems within the region are also addressed in this analysis. Rail systems analyzed in this Environmental Impact Statement (EIS) include both a portion of the existing Eielson Branch and the proposed rail line extension. The existing Eielson Branch from Fairbanks to the Chena River floodway is included because rail traffic on the proposed Northern Rail Extension (NRE) would use this portion of the existing rail line network to reach the Fairbanks rail yard. Road systems analyzed in the EIS include roads in the vicinity of the existing and proposed rail lines.

The safety and delay analyses consider the potential impacts of the construction and operation of the proposed action and alternatives on rail and road systems. Rail and road accidents and fatalities are examined in the safety analysis. The delay analysis examines the increased delay that would be experienced by vehicles at at-grade highway rail crossings as a result of increased rail traffic anticipated for the proposed Northern Rail Extension.

11.1 Applicable Regulations

Section 11.1 describes applicable rules and oversight agencies that pertain to rail transportation, hazardous materials transportation, and grade crossing safety.

11.1.1 Rail Transportation Safety

The Federal Railroad Administration (FRA) has regulatory jurisdiction over rail operations and safety. FRA regulates most aspects of rail line safety including operations, track, signaling, and rolling stock (*e.g.*, locomotives and passenger and freight cars) for common carrier rail lines that are part of the general rail line system of transportation (see 49 Code of Federal Regulations [CFR] Parts 200 through 299). For example, 49 CFR Part 238 establishes safety standards for passenger cars, Part 213 establishes track safety standards, and Part 236 provides requirements for signal and train control systems, including a block system of train control to ensure that no other train is given permission to enter a block occupied by a passenger train for passenger train operations over 49 mph. In addition, individual states oversee public safety, especially for highway/rail line crossings. Several rail line associations, including the Association of American Railroads (AAR), American Short Line and Regional Railroad Association (ASLRRA), and American Railway Engineering Maintenance-of-Way Association (AREMA), have also developed standards and practices for the industry.

The Federal Railroad Safety Act of 1970 (FRSA) gave the FRA Administrator rulemaking authority over all areas of rail line safety. Subsequently, the FRA issued rules covering a wide array of safety-critical rail line equipment, infrastructure, procedures and established enforcement tools for rail line companies and employees who violate these rules.

FRA enforces U.S. Department of Transportation (USDOT) rules that require shippers to transport hazardous materials in railcars designed to safely transport specified commodities (49 CFR Parts 171 through 180).

Rail line track safety standards (49 CFR Part 213) are based on classifications of track that determine maximum operating speed limits, inspection frequencies, maintenance tolerances, record keeping, and other requirements.

11.1.2 Hazardous Materials Transportation Safety

Several Federal agencies have established requirements for hazardous materials transportation on rail lines, as well as for emergency planning and spill response for hazardous materials. These agencies include USDOT, U.S. Environmental Protection Agency (USEPA), and Occupational Safety and Health Administration (OSHA).

USDOT rules include requirements for shipping and packaging containers for hazardous materials, emergency response information, and training. USDOT's FRA has authority to ensure the safe movement of rail traffic. Regulatory and enforcement powers of FRA are found at 49 CFR 200 through 240. USDOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) has established design standards and requirements, found in 49 CFR 171 and 179, for railcars used to transport hazardous materials.

USEPA rules address spill prevention and cleanup. Most USEPA rules address only fixed facilities rather than transport activities. However, USEPA rules in 40 CFR 263, Standards Applicable to Transporters of Hazardous Waste, specify immediate response actions, discharge cleanup, and other requirements for transporters of hazardous waste.

Finally, OSHA rules in 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, specify emergency response and clean-up operations for releases, or substantial threats of releases, of hazardous substances.

11.1.3 Grade Crossing Safety and Delay

The Federal Highway Administration (FHWA) and FRA have regulatory jurisdiction over safety at highway/rail grade crossings under the Highway Safety Act (HSA) and FRSA. USDOT has promulgated rules addressing grade crossing safety and provides funding for installation and improvement of warning devices. All warning devices installed at crossings must comply with FHWA's *Manual on Uniform Traffic Control* Devices (23 CFR Part 655, Subpart F). This manual provides standards for the types of warning devices that must be installed at all grade crossings. FRA has issued rules under its railroad safety authority that impose minimum standards for grade crossings (49 CFR Parts 234-36).

According to the *Railroad-Highway Grade Crossing Handbook* (FHWA, 2007b), "Jurisdiction over highway/rail grade crossings resides primarily with the States." The states perform onsite inspections and order safety improvements. USDOT maintains oversight and approval of state determinations. Thus, Section of Environmental Analysis (SEA) analyzed grade separation of highway/rail crossings based on FHWA guidelines, including the *Alaska Traffic* manual, which provides guidelines for improvements in grade crossing warning devices (ADOT&PF, 2005b). The guidelines include consideration of delay, highway classification, average daily traffic, number of trains per day, and train speed at grade crossings.

11.2 Affected Environment

Section 11.2 describes the existing safety and delay conditions on roads and rail facilities in the study area and the region. Section 11.2.1 describes the transportation region of influence; Section 11.2.2 describes the transportation safety environment; Section 11.2.3 describes the transportation delay environment; and Section 11.2.4 describes the grade crossing environment.

11.2.1 Transportation Region of Influence

The region of influence for transportation includes a portion of the existing Eielson Branch and the area of the proposed rail lines and associated facilities, as well as public roads in the vicinity of the Eielson Branch and proposed rail line extension. The region of influence includes the population centers of Fairbanks, North Pole, and Delta Junction, as well as rural and military training areas (Tanana Flats and Donnelly) in remote areas. The rail line would be within the Alaska Department of Transportation and Public Facilities (ADOT&PF) Northern Region.

Rail line construction would occur mostly in remote and rural areas. During rail line construction, new access roads to construction camps and construction staging areas would originate from nearby intersections with existing public roads. The region of influence is principally the vicinity of the proposed rail line extension, but also includes other roads that Alaska Railroad Corporation (ARRC) could use to supply materials, equipment, and workers during the construction phase. During construction, completed segments of the rail line could be used to transport materials to construction sites, camps, and staging areas.

The region of influence for rail line operations would also include the existing Eielson Branch rail line between the Fairbanks Intermodal Facility and Depot (FBX) and Milepost 20.18 (near Chena Flood Road) where the NRE would connect to the Eielson Branch.

11.2.2 Transportation Safety Environment

Rail Transportation Safety

ARRC carried over 7.6 million tons of freight using its 525-mile rail system in 2006. Its main route runs northward from Seward on the Gulf of Alaska through Anchorage, Wasilla, Talkeetna, and Denali before reaching the FBX, from where it continues along the Eielson Branch to Eielson Air Force Base (AFB) (ARRC, 2008a).

Table 11-1 presents a summary of existing rail traffic over ARRC's Eielson Branch between FBX and the proposed connection to the NRE. To facilitate analysis in the EIS, SEA divided this portion of the Eielson Branch into four segments. Segment 1 starts at FBX in northern Fairbanks and runs generally southeast until the turn-off to the Fairbanks airport. Segment 2 continues from the airport turn-off to the southeastern corner of Fort Wainwright at the location of a proposed new offloading facility. Segment 3 continues to the Flint Hills Resources North Pole Refinery. Finally, Segment 4 continues from the North Pole Refinery to Chena Flood Road.

Two trains per day transport coal to the Fairbanks airport. These trains run 5 to 6 days per week and operate on the Eielson Branch from FBX to the airport turn-off. One train per day transports coal to Eielson AFB and typically runs six times a week, half the time combined with a petroleum train to the North Pole Refinery. These combined trains are disassembled at the North Pole Refinery, from where the coal railcars continue to Eielson AFB. Petroleum trains that are

Table 11-1
Existing Daily Rail Traffic[a]

Train Type	Average Number of Daily Passbys	Average Train Length (feet)	Number of Locomotives	Approximate Number of Railcars	Eielson Segment[b]			
					1	2	3	4
Airport Train	1.571	1,750	1	30	✓			
AFB Coal Train	0.429	635	2	10	✓	✓	✓	✓
Petroleum/Coal Train	0.429	3,500	2	55	✓	✓	✓	
Petroleum Train	3.571	3,500	2	55	✓	✓	✓	

[a] Sources: ARRC, 2007b; URS, 2007
[b] Segment 1, FBX depot to Fairbanks airport turn-off; Segment 2, Airport turn-off to Southeast corner of Fort Wainwright; Segment 3, Southeast corner of Fort Wainwright to North Pole Refinery; Segment 4, North Pole Refinery to Chena Flood Road.

not combined with coal trains run four times daily on average on the Eielson Branch to the North Pole Refinery. All train counts represent passbys or one-way trains; and, therefore, include loaded and unloaded trains moving to and from their destinations.

Appendix K describes the general characteristics of rail line accidents in the United States and in Alaska. The accident rate, measured as the number of accidents per million train miles, over the most recent 5- and 10-year periods is lower for ARRC than the five largest rail lines in the Continental United States (Union Pacific, BNSF Railway, CSX Corporation, Norfolk Southern, and Kansas City Southern). It is also lower than the national average.

Between 1998 and 2007, ARRC has been involved in 31 accidents of different degrees of severity, eight of which have been in Fairbanks North Star Borough. One accident occurred on the Eielson Branch, where two railcars not containing hazardous materials derailed at a switching yard in July 1999 (FRA, 2008).

ARRC is involved in emergency preparedness training with local communities, including how to respond in case of a train accident or a hazardous material incident (ARRC, 2006b; ARRC, 2007c).

Hazardous Materials Transportation Safety

Based on the information presented in Table 11-1, ARRC moves approximately 110 loaded tank cars per day (on average) of refined petroleum products over the Eielson Branch between the North Pole Refinery and FBX. Between 1998 and 2007, no incidents involving hazardous materials in the region of influence occurred. During the same time, four accidents occurred involving trains that carried hazardous materials in Fairbanks North Star Borough. Two of those accidents involved one or two derailed railcars containing hazardous materials, but there was no release in either of those circumstances (FRA, 2008).

The ADOT&PF does not have formal emergency management standards for rail line emergency management. If a rail line accident affected the road system, ADOT&PF would initiate its emergency response according to its 2006 Incident Field Operations Guide (ADOT&PF, 2008a).

Highway Transportation Safety

Highway safety statistics for Alaska show that the fatality rate per 100 million vehicle-miles traveled is approximately 1.43 (2.07 in rural areas), which is slightly less than the national average (FHWA, 2005). Fatality rates are also measured based on population. Fairbanks North

Star Borough (FNSB) and Southeast Fairbanks Census Area, which includes Delta Junction, have annual fatality rates of 12.56 and 15.41 per 100,000 population, respectively, which are significantly lower than the national average of 23.36 (NHTSA, 2005). Statistics from the Alaska Highway Safety Office also indicate that vehicle-miles traveled fatality rates in Alaska have been decreasing over the past 10 years; whereas, fatality rates relative to population have remained constant (AHSO, 2006). Of all highway accidents in Alaska in 2002, less than 0.1 percent involved a rail line crossing (ADOT&PF, 2004).

11.2.3 Transportation Delay Environment

Generally, the main roads within the region of influence are two-lane roads, with the exception of some roads in Fairbanks and North Pole, as well as portions of Richardson and Alaska highways. Most roads within the region of influence are operating at level of service (LOS) A, which indicates free-flow conditions. Four roads are operating at LOS D: Old Steese Highway and Neely Road in Fairbanks, 3-Mile Gate south of Fort Wainwright Air Base, and 8th Avenue in North Pole.[1] Table K-2 in Appendix K characterizes the public roads at current highway-rail/at-grade crossings.

The volume of rail traffic on the Eielson Branch is an average of six or fewer trains per day, and trains typically operate at speeds of 20 miles per hour (mph) or less. Transit times are not limited by current rail traffic volumes. ARRC continues to study realigning and rehabilitating much of the Eielson Branch to improve the track geometry and transit times and reduce the number of grade crossings. The Fairbanks Metropolitan Area Transportation Systems Policy Committee has also supported realignment, but where or when realignments may occur is not known at this time.

11.2.4 Grade Crossing Environment

SEA reviewed the grade crossing conditions associated with the existing rail line that would be used under the proposed action and alternatives. Table 11-2 summarizes the number of existing public grade crossings along the portion of the Eielson Branch that would be used by anticipated passenger and freight rail traffic operating over the proposed NRE, along with the typical train speed and existing rail traffic. Current rail traffic at these grade crossings is all freight traffic. Appendix K includes a list of data sources used in the review of safety and delay conditions at existing grade crossings.

The *Fairbanks Metropolitan Area Transportation System Plan* recommends that two grade crossings be considered for grade separation within the region of influence: 3-Mile Crossing and Richardson Highway/Peridot Road (ADOT&PF, 2005a). As noted above, realignment of the Eielson Branch is under study and, if implemented, would be expected to result in closure or elimination of many existing grade crossings.

[1] Levels of service are defined by the *Highway Capacity Manual* 2000 (TRB, 2001). Appendix K includes more detailed information about how levels of service were determined.

Table 11-2
Existing Public Grade Crossings Along Eielson Branch[a]

Rail Segment[b]	Number of Grade Crossings	Existing Rail Traffic (trains/day)	Typical Train Speed (mph)
Segment 1	16	6	10–15
Segment 2	1	5	20
Segment 3	14	5	20
Segment 4	3	1	20

[a] Source: Alaska ARRC, 2005.
[b] Segments along Eielson Branch are described in Table 11-1.

11.3 Environmental Consequences

SEA analyzed the proposed action and alternatives in the context of the existing operational and safety conditions described in Section 11.2. Section 11.3 describes the transportation safety consequences related to construction and operation of the proposed NRE. This includes potential impacts due to rail and road accidents and fatalities. Section 11.3.1 describes rail transportation safety; Section 11.3.2 describes hazardous materials transportation safety; Section 11.3.3 describes road transportation safety; and Section 11.3.4 describes grade crossing safety. Proposed mitigation for impacts to transportation is presented in Chapter 20 of the EIS.

11.3.1 Rail Transportation Safety

SEA analyzed rail transportation safety for traffic on the proposed rail line and the continuation of this traffic over a portion of the existing rail line (Eielson Branch) to FBX.

The methods presented in Section 11.3.1 use both qualitative and quantitative components. The number of fatalities and accidents resulting from train travel were based on fatality and accident rates provided by FRA statistics. The rates were used in combination with the specifics of an operation (*e.g.*, number of trains, route length) to estimate the likelihood of accidents and fatalities.

Construction Impacts

Equipment and materials needed for construction of the proposed rail line extension would be transported by rail and/or road, with the relative use of road and rail dependent on the construction schedule and the approach selected by the construction contractor. SEA anticipates that the increased rail traffic during the construction period would be less than during operation (*i.e.*, fewer than 10 trains per day), discussed below, and potential impacts on safety also would be less.

Operations Impacts

Passenger and freight traffic over the proposed rail line would travel a total one-way distance ranging from about 95 to approximately 100 miles, depending on the alternative segments included, between FBX and Delta Junction. Given the similarities in the overall length of the possible combinations of the alternative segments, SEA analyzed the longest route alternative of 82 miles to provide a conservative estimate of the potential impacts.

This analysis includes both existing and proposed rail traffic. Besides the existing rail traffic presented in Table 11-1, there would be on average two proposed daily freight trains and eight proposed passenger trains along the entire route alternative.

Based on FRA statistics, the accident rate per train mile for ARRC is 1.62×10^{-6} based on the time period 2003–2007 (FRA, 2008). Because there were no fatalities from train accidents in Alaska during this time, the national fatality rate of 1.61×10^{-8} per train mile was used to calculate predicted fatalities. Given the anticipated rail traffic associated with proposed NRE, there would be a predicted 0.64 annual train accident on the proposed new rail line and the portion of the Eielson Branch that would be used by proposed NRE traffic. This would represent an increase of 0.59 predicted train accident per year as a result of the proposed rail line extension; the number of predicted fatalities would be negligible. Accidents and fatalities associated with highway-rail crossings are not included in these calculations because they are considered in the grade crossing safety analysis.

No-Action Alternative

Because no new construction or changes in rail operations would occur, SEA expects that rail-related accidents would be unchanged from current conditions.

11.3.2 Hazardous Materials Transportation Safety

SEA evaluated the potential impacts on hazardous materials transportation safety qualitatively due to (1) the limited quantity of hazardous materials anticipated to be transported on the proposed rail line, (2) the low population density of areas through which the rail line does and would run, and (3) the results of previous analyses conducted by SEA that indicate that the probability of a hazardous materials release would be extremely low (SEA, 2002).

An assessment of potential public safety consequences typically involves three basic steps: (1) identification of the hazardous materials expected to be transported, the volume carried per car, and their hazardous characteristics; (2) determination of the area and population potentially affected; and (iii) assessment of the nature and magnitude of the potential consequences.

SEA used the following information on hazardous materials transport on the proposed rail line for the analysis of operations (ARRC, 2007a):

- 42 railcars per year containing fuel (mix of gasoline and diesel fuel);
- 16 railcars per year containing propane; and
- 5 railcars per year containing chemicals (*e.g.*, fertilizers).

For the purposes of the assessment of potential health consequences, SEA considered the most densely populated area along the rail line, which would be the segment of the rail line located in Fairbanks. SEA then compared the conditions in this project to the conditions previously analyzed for similar projects.

Construction Impacts

No transport of hazardous materials associated with the new rail line during the construction phase has been proposed by ARRC, so no impacts are anticipated.

Operations Impacts

The potential consequences of a release depend on the accident location, the amount released, the material released, and the weather conditions at the time of the release. For rail traffic associated with the proposed rail line extension, the likelihood of a release is low due to the limited amount

of hazardous material shipments anticipated and the fact that railcars used for transportation of hazardous materials are designed to withstand various types of impacts. Even if a release were to occur, most would be small as a result of the railcars' design standards.

SEA previously analyzed rail transport of hazardous materials in situations involving many more railcars of flammable and/or toxic materials and in areas with much higher population densities and overall train traffic, and found the potential impacts to be low (SEA, 2002). Thus, SEA concludes that potential impacts of moving 63 hazardous material-containing railcars annually on the proposed rail line would be minimal.

No-Action Alternative

Because no new construction or changes in rail operations would occur, no change in rail safety is expected to result from the No-Action Alternative.

11.3.3 Road Transportation Safety

The road transportation safety analysis addresses road accidents and fatalities caused by additional traffic along local roads due to project-related traffic. Transportation safety at grade crossings is analyzed separately in Section 11.3.4.

The methods presented in Section 11.3.3 use qualitative considerations due to lack of specific information on traffic levels that would be needed to quantify road accidents and fatalities caused by the proposed rail line.

Construction Impacts

During the construction of the new rail line, personnel, equipment, and construction materials would be moved initially by truck and other vehicles, and could be moved by rail once portions of the rail line were completed. It is anticipated that construction materials and specialized equipment would be moved by rail where rail is available due to the generally lower cost. Some increased road traffic is expected during construction, however, and could lead to road accidents and fatalities.

If the proposed Tanana River bridge is constructed before the rail line, most road traffic from construction would occur on Richardson Highway. Construction materials would be transported from the existing Eielson Branch rail line to the bridge location. Average traffic volumes on this portion of Richardson Highway are approximately 10,000 vehicles per day. A quantitative estimate of potential construction traffic volumes is not available, but SEA anticipates that the volume of construction traffic would be small compared to existing vehicle traffic levels on Richardson Highway, and the potential impacts on roadway safety would be similarly small.

Operations Impacts

Operation of the proposed rail line extension would increase road traffic from rail workers going to and from work and individuals traveling by car to and from passenger rail stations in Fairbanks and Delta Junction. Given the approximately 100 miles between Fairbanks and Delta Junction, SEA anticipates that such traffic would be more than offset by the resulting reduction in vehicle miles traveled on Richardson Highway due to use of the rail passenger service. Reductions could also be realized because military vehicles could be transported to the training areas by rail, thereby reducing military vehicle traffic on Richardson Highway. Thus, SEA concluded that the potential impacts on road transportation safety by the proposed rail line extension would be minimal at worst and potentially positive.

No-Action Alternative

Because no new construction or changes in road operations or traffic would occur, no road transportation safety impacts are expected to result from the No-Action Alternative.

11.3.4 Transportation Delay

This section examines rail transportation delay, road transportation delay, and grade crossing delay. Proposed mitigation for impacts to transportation is presented in Chapter 20 of the EIS.

Rail Transportation Delay

Because construction and operation of the new rail line would place additional trains on the existing Eielson Branch, SEA examined potential consequences for rail delay from the increased traffic by comparing rail traffic volumes projected for the proposed rail line extension to existing traffic. SEA analyzed rail transportation delay qualitatively because existing rail traffic on the Eielson Branch is relatively low.

Construction Impacts

SEA examined the delay impacts of additional rail traffic related to rail line construction on existing rail traffic along the Eielson Branch. At present, there is an average of six freight trains or fewer per day on the existing rail line, depending on location. Based on the information provided by ARRC on the anticipated quantities of materials required for construction of the proposed NRE, SEA anticipates that additional train traffic associated with construction would average less than one train per day. SEA expects that ARRC would coordinate this limited, additional construction-related rail traffic with existing rail traffic to avoid delays, and therefore anticipates minimal delays.

Operations Impacts

SEA also examined the impacts of additional freight and passenger trains on existing rail traffic on the Eielson Branch. There would be two additional one-way freight trains and eight additional one-way passenger trains per day on the Eielson Branch as a result of the proposed rail line extension. Because the existing rail traffic volume on the Eielson Branch is relatively low—ranging from an average of one to six trains per day, depending on location—SEA does not expect that trains would experience noticeable delays as a result of the projected additional rail traffic. Furthermore, passenger trains, which represent the majority of new rail traffic, would run on a routine schedule, so coordination between existing freight trains and new passenger trains would be simplified. Thus, SEA concludes that potential impacts of additional freight and passenger trains on existing rail traffic would be minimal.

No-Action Alternative

Because no new construction or changes in rail operations would occur, no delay impacts on existing rail traffic are expected to result from the No-Action Alternative.

Road Transportation Delay

An adverse impact on road transportation delay within the region of influence could occur if construction or operation of the proposed rail line were to degrade road levels of service to unacceptable levels (below a service level of C) as a result of project-related traffic.

SEA assessed the impacts of the proposed rail line on roads within the region of influence qualitatively for two reasons. First, increased road traffic associated with the proposed rail line

extension would stem primarily from construction activities and depend on the construction schedule and approach the contractor selects, so quantitative estimates are not currently available. Second, most roads within the region of influence are currently operating at level of service A, which indicates either free-flow or near free-flow conditions. Appendix K, Section K.1.2, discusses existing annual average daily traffic data for the major roads within the region of influence. Baseline levels of service of the roads were determined using *Highway Capacity Manual* guidelines (TRB, 2001).

Construction Impacts

Construction of the proposed rail line would place some additional traffic on existing roads. Construction would generate vehicle trips and potentially increase delay caused by the movement of materials, equipment, and workers to and from work sites, construction staging areas, and construction camps. In addition, temporary delays might occur on portions of existing roads, such as Grieme Road/Old Richardson Highway and Old Valdez Trail, that ARRC proposes to widen to provide better access to the Tanana River bridge on Salcha Alternative Segments 1 and 2, respectively. Similarly, temporary delays might occur for traffic on Richardson Highway in the Salcha area during relocation of two sections of the highway that would be required for construction of Salcha Alternative Segment 2. Construction of both grade separated and highway/rail at-grade crossings on the various segments for the new rail line could also introduce temporary delays.

As the principal roadway in the region, Richardson Highway would carry most of the increased traffic. At present the highway is mainly operating at levels of service A or B, with an average daily traffic level ranging from approximately 10,000 vehicles per day near Eielson, where the largest increase in construction traffic would be expected, to approximately 2,000 vehicles per day in the Salcha area. Although specific estimates of road traffic resulting from construction are not available, SEA concludes that road delays would likely be limited given existing levels of service and capacity, with the possible exception of vehicle delays during grade crossing construction or roadway widening. Those delays would be temporary.

Operations Impacts

After construction of the rail line, rail support facilities would generate very limited additional road traffic from employees commuting to and from their homes. These facilities would include end-of-track, freight, and passenger facilities at Delta Junction.

Some impacts would result from drivers commuting to and from rail stations during boarding and alighting times, especially if they coincide with peak-hour traffic. Depending on the exact location of the rail stations, this could negatively affect the level of service on roads adjacent to the rail stations. In Fairbanks, where some of the main arterials are already operating at level of service D or worse, the rail station would be located in the FBX depot, and most likely the road access would be through the intersection of Danby Street and Johanssen Expressway, which are currently operating at level of service A. The same is true for the roads adjacent to the rail station locations proposed in Delta Junction.[2] Therefore, SEA anticipates that the impacts of road transportation delay from drivers' commutes to rail stations would be minimal.

Vehicle trips along Richardson Highway could decrease because some of the military and commercial freight hauled there could move on the proposed rail line. Vehicle trips on

[2] See Chapter 2 for the locations of the passenger stations proposed for Delta Alternative Segments 1 and 2.

Richardson Highway would also decrease to the extent that individuals use the new passenger rail service instead of driving. Because estimates of the number of individuals who would use the proposed rail service were not available, SEA did not attempt to quantify a potential reduction in the number of vehicle trips that could result from the new passenger rail service.

SEA anticipates that some transportation using trucks and automobiles would shift to the new rail service, which would decrease traffic volumes on Richardson Highway. SEA expects the resulting change in road transportation delay would be small due to the relatively low traffic volumes on the highway between North Pole and Delta Junction.

No-Action Alternative

Because no new construction or changes in road operations would occur, no delay impacts on existing roads are expected to result from the No-Action Alternative.

Grade Crossing Delay

Highway/rail at-grade crossings can be a source of delay to motorists because trains have movement priority. SEA examined the potential effects of the proposed NRE on vehicle delay at grade crossings on the existing Eielson Branch.

SEA conducted its grade crossing analysis according to FHWA's guidelines (FHWA, 2002). These guidelines take into account the frequency, length, and speed of trains, as well as the volume of road traffic and physical characteristics of roads at grade crossings (*e.g.*, road classification, number of lanes). The quantitative analysis of road transportation delay at existing public grade crossings took into consideration the existing rail traffic volumes included in Table 11-1. The analysis also considered the additional proposed rail traffic, including an average of two daily freight trains and eight daily passenger trains. Estimates of annual average daily vehicle traffic for each crossing were calculated for 2012. Further information on SEA's grade crossing analysis methods can be found in Appendix K.

The calculation of road transportation delay was limited to existing public grade crossings on the Eielson Branch due to the low traffic volume on private roads and roads that would be crossed at-grade by the proposed rail line. Therefore, the transportation delay analysis for future grade crossings is qualitative.

Construction Impacts

Construction of the new rail line would potentially cause vehicle delay at grade crossings on the Eielson Branch to the extent that construction would increase rail or vehicle traffic. SEA anticipates that the increased rail traffic during the construction period would be much less than during operations, discussed below, and potential delay impacts also would be less. SEA anticipates that increased vehicle traffic resulting from construction activities would be small in the context of existing traffic levels and the potential delay impacts would be minimal.

Operations Impacts

After construction of the new rail line, there would be additional freight and passenger rail traffic that would increase vehicle delay at grade crossings. SEA's grade crossing delay analysis shows that no change in level of service is anticipated at any grade crossing as a result of the proposed NRE. SEA estimates that the number of vehicles delayed by rail traffic would increase as a result of the proposed NRE from approximately 1 percent of all vehicles using the highway/rail at-grade crossings to approximately 1.6 percent and that the average delay experienced by each delayed vehicle would decrease from approximately 1.67 minutes per vehicle to 1.34 minutes per

vehicle (because the average train length would decrease). The average delay per vehicle for all vehicles in a 24-hour period as a result of the proposed NRE would range from 0.19 to 2.83 seconds. This would be an increase of 0.15 to 0.53 second from existing conditions. Estimated total delay experienced by drivers in a 24-hour period at all crossings analyzed would be approximately 50 hours, which would be an increase of approximately 10 hours from existing conditions. Approximately 15 percent of the increase in total estimated delay would occur at Neely Road, which is currently operating at level of service D due to high traffic volume for a two-lane road.

ARRC has proposed to grade separate crossings with major roads[3] (Richardson Highway, Alaska Highway), and all roads that would cross the new rail line at-grade have low traffic volumes.[4] The roads that would be crossed at-grade by the new rail line in aggregate have an estimated average daily traffic volume of approximately 2 percent of the existing crossings. Estimate delay for stopped vehicles would be less than 1 minute per vehicle and total estimated delay for all vehicles would be less than 10 minutes per day. Delay would be substantially lower at new crossings than existing crossings due to much lower average daily vehicle traffic and faster train speeds.

There could be some road delay impacts on response time for emergency vehicles resulting from blocked crossings. SEA analyzed the location of hospitals and fire stations in relation to the crossings that would have the greatest delay. In Fairbanks, where most of the estimated increase in grade crossing delay would occur, all hospitals are located southwest of the rail line. However, there are many alternate routes for emergency vehicles to cross the rail line should an emergency occur north of the tracks. There are two fire stations in Fairbanks, one on each side of the rail line. If a fire vehicle needed to cross the tracks when a train was passing, there would be many alternate routes. In North Pole and Delta Junction, the estimated increase in delay at grade crossings would be less than in Fairbanks, because of lower traffic volumes. Therefore, SEA anticipates that the operations impacts on emergency vehicle response time would be small.

As noted above, ARRC has been studying alternatives for realigning portions of the Eielson Branch between FBX and approximately Milepost 20. One of the purposes of the realignment initiative is to reduce the number of at-grade crossings. If the Eielson Branch is realigned in the future, then the increased delay times estimated here would be less.

Appendix K presents the location of each grade crossing, as well as the crossing delay per stopped vehicle, average delay for all vehicles, total number of vehicles delayed, and total daily delay for as well as the change in, average delay for existing and proposed conditions resulting from the proposed NRE.

No-Action Alternative

Because no new construction or changes in rail operations would occur, no change in delay from existing conditions is anticipated.

[3] Major roads refer to roads classified as arterials, freeways, expressways, or interstates.

[4] Some minor roads (collectors and local roads) would also be grade separated. These include Old Richardson Highway, Old Valdez Trail, and Ruger Trail.

11.3.5 Grade Crossing Safety

The grade crossing safety analysis evaluates predicted accident frequencies at grade crossings under the proposed action and alternatives. Accident frequency is typically measured as the number of accidents per year.

The Applicant has proposed to avoid some at-grade crossings of the new rail line alternative segments either by grade separating the crossings, or relocating or closing the road to avoid the need for a crossing. These roads include Richardson Highway, Cold Foot Court, Boondox Drive, and Old Valdez Trail on Salcha Alternative Segment 2; Richardson, Old Richardson, and Alaska highways, Emmaus Road, and Tanana Loop Road on Delta Alternative Segment 2; and Richardson Highway, Hammond Road, and Bear Avenue on Delta Alternative Segment 1.

SEA evaluated grade crossing safety by estimating future accident frequency under the proposed action and alternatives with FRA's Personal Computer Accident Prediction System (PCAPS) (FRA, 2007). The analysis took into account the accident history and frequency of trains at grade crossings, volume of vehicle traffic, existing safety devices at grade crossings, and other factors to determine the potential impacts of an increase in rail traffic. The quantitative analysis of accident frequencies at existing public grade crossings took into consideration the existing rail traffic volumes included in Table 11-1. The analysis also considered the additional proposed rail traffic, including two daily freight trains and eight daily passenger trains. Estimates for annual average daily traffic for each road crossing were calculated for the year 2012[5] and used in the analysis. Further information on SEA's grade crossings analysis methods can be found in Appendix K.

Calculation of projected accident frequencies was limited to existing public grade crossings along the Eielson Branch. Because the proposed potential grade crossings along the new rail line lack historical accident data, it was not possible to apply FRA's methods to calculate projected accident frequencies for these crossings. Therefore, the transportation safety analysis for future grade crossings is qualitative.

Construction Impacts

Construction of the new rail line would potentially impact safety at grade crossings on the Eielson Branch to the extent that construction would increase rail or vehicle traffic. SEA anticipates that the increased rail traffic during the construction period would be less than during operation (i.e., less than ten trains per day), discussed below, and that potential safety impacts also would be less. SEA anticipates that increased vehicle traffic resulting from construction activities would be small in the context of existing traffic levels and the potential safety impacts would be minimal.

Operations Impacts

SEA's grade crossing safety analysis indicates that the predicted accident frequency at each of the existing public at-grade crossings that would be crossed by rail traffic from the proposed rail line extension ranged from a minimum rate per year of 0.0093 and a maximum of 0.413. This translates into one predicted accident every 2.4 to 108 years, depending on the crossing. The total estimated increase in predicted accident frequency of 0.54 accident per year (from 1.18 to

[5] The Applicant has estimated that construction of the proposed rail line would take 3 to 4 years.

1.72) for all existing crossings that would be used by proposed NRE traffic is independent of the route of the rail line extension because the same existing crossings would be used for all routes.

Table 11-3 shows the five crossings with the largest estimated increase in predicted accident frequency as a result of the proposed NRE. According to FHWA guidelines on grade separation (FHWA, 2002), none of the crossings evaluated in this analysis would have a predicted accident frequency above 0.5, which is the level at which FHWA recommends grade separation; however, Old Steese Highway would have an accident frequency near the 0.5 threshold.

Table 11-3
Five Grade Crossings With the Largest Estimated Increase in Predicted Accident Frequency

	Accident Frequency (accidents/year) [a]		
Road	**Existing Conditions**	**Proposed NRE**	**Change**
Old Steese Highway	0.2692	0.4131	0.1439
Steese Expressway	0.1113	0.1350	0.0237
3-Mile Gate	0.1702	0.2166	0.0464
Cross Way Road	0.0643	0.0863	0.0221
Laurence Road	0.0153	0.0492	0.0339
8th Avenue	0.0469	0.0648	0.0180

[a] Predicted accident frequencies were calculated using FRA's Personal Computer Accident Prediction System (PCAPS) (FRA, 2007).

For the new grade crossings along the new rail line, ADOT&PF would determine the appropriate level of protection based on Federal and state rules and guidelines. For the new grade crossings, accident frequency rates cannot be calculated using FRA's accident prediction formula because of an absence of accident history information. For the roads that would be crossed at-grade by the new rail line, predicted accident frequency would be expected to be much lower than for the existing grade crossings because total estimated vehicle traffic at the new crossings would be less than 2 percent of that for the existing crossings for any of the alternative routes from North Pole to Delta Junction.

Appendix K presents the segment location of each grade crossing, along with the change in predicted accident frequency between the existing and proposed action scenario conditions.

No-Action Alternative

Because no new construction or changes in rail operations would occur, no safety impacts are expected to result from the No-Action Alternative when compared to existing conditions. The predicted accident frequency for the existing Eielson Branch exhibits a minimum rate per year of 0.0046 and a maximum of 0.27 for all highway-rail public grade crossings. This translates to a range of one accident every 3.7 to 219 years.