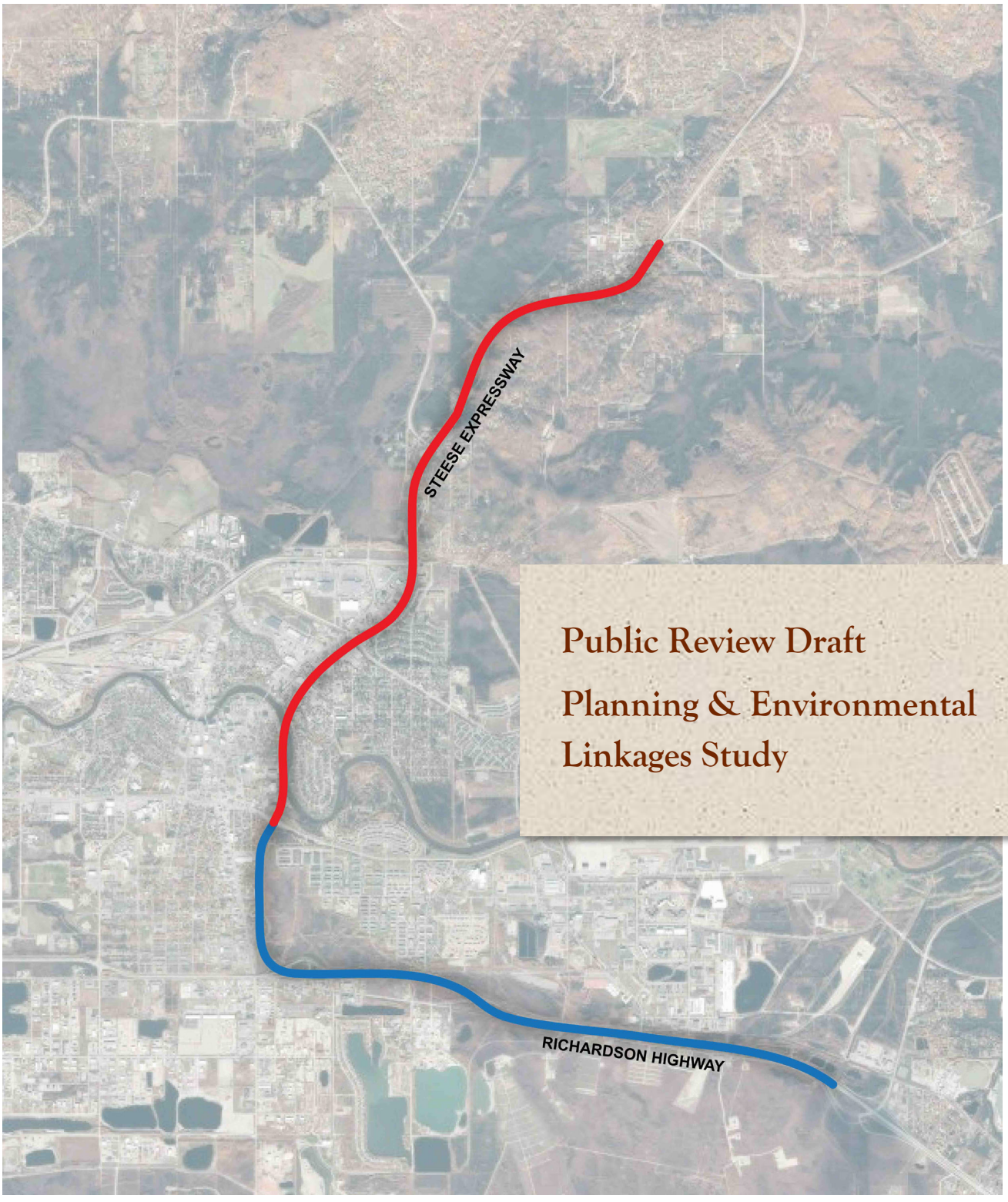
Richardson Highway/Steese Expressway Corridor



Public Review Draft

Planning & Environmental Linkages Study

AKSAS Project No. 60799 ■ Federal Project No. NH-000S(781)

PUBLIC REVIEW DRAFT

RICHARDSON HIGHWAY/STEESE EXPRESSWAY CORRIDOR

PLANNING AND ENVIRONMENTAL LINKAGES STUDY REPORT

FAIRBANKS, AK

DOT&PF Project No. 60799

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Abbreviations and Acronyms

ADEC ..... Alaska Department of Environmental Conservation
ADF&G ..... Alaska Department of Fish and Game
ADLWD ..... Alaska Department of Labor and Workforce Development
ADNR ..... Alaska Department of Natural Resources
ADT ..... Average Daily Traffic
AFB ..... Air Force Base
AHRS ..... Alaska Heritage Resources Survey
AM ..... morning
APDES ..... Alaska Pollutant Discharge Elimination System
APE ..... Area of Potential Effect
ARRC ..... Alaska Railroad Corporation
BGPA ..... Bald and Golden Eagle Protection Act
CAA ..... Clean Air Act
CDS ..... Coordinated Data System
CE ..... Categorical Exclusion
CFR ..... Code of Federal Regulations
CHP ..... Commission on Historic Preservation
CMAQ ..... Congestion Mitigation and Air Quality Improvement
CO ..... Carbon Monoxide
COA ..... Class of Action
CWA ..... Clean Water Act
DOT ..... Department of Transportation
DOT&PF ..... State of Alaska Department of Transportation and Public Facilities
DPOR ..... Division of Parks and Outdoor Recreation
EA ..... Environmental Assessment
EFH ..... Essential Fish Habitat
EIS ..... Environmental Impact Statement
ESA ..... Endangered Species Act
FEDC ..... Fairbanks Economic Development Corporation
FEMA ..... Federal Emergency Management Agency
FHWA ..... Federal Highway Administration
FIRM ..... Flood Insurance Rate Map
FMATS ..... Fairbanks Metropolitan Area Transportation System
FMP ..... Fishery Management Plan
FNG ..... Fairbanks Natural Gas
FNSB ..... Fairbanks North Star Borough
FONSI ..... Finding of No Significant Impact
FTA ..... Federal Transit Administration
GVEA ..... Golden Valley Electric Association
HCM ..... Highway Capacity Manual
HOV ..... High-Occupancy Vehicles
HSIP ..... Highway Safety Improvement Program
IC ..... Institutional Controls
IGU ..... Interior Gas Utility
IPAC ..... Information, Planning, and Conservation System
JE ..... Johansen Expressway
LOS ..... Level of Service

LRTP ..... Long Range Transportation Plans
LWCF ..... Land and Water Conservation Fund
MAP-21 ..... Moving Ahead for Progress in the 21st Century Act
MBTA ..... Migratory Bird Treaty Act
MFCMA ..... Magnuson-Stevens Fishery Conservation and Management Act
MOU ..... Memorandum of Understanding
MP ..... Milepost
mph ..... miles per hour
MPO ..... Metropolitan Planning Organizations
MTP ..... Metropolitan Transportation Plan
NAAQS ..... National Ambient Air Quality Standards
NAC ..... Noise Abatement Criteria
NEPA ..... National Environmental Policy Act
NHL ..... National Historic Landmark
NHPP ..... National Highway Performance Program
NHS ..... National Highway System
NMFS ..... National Marine Fisheries Service
NPDES ..... National Pollutant Discharge Elimination System
NRHP ..... National Register of Historic Places
PEL ..... Planning and Environmental Linkages
PM ..... evening
PM_{10} and $PM_{2.5}$ ..... Particulate Matter
PTR ..... Permanent Traffic Recorder
RH ..... Richardson Highway
ROW ..... Right-of-Way
SE ..... Steese Expressway
SFHA ..... Special Flood Hazard Area
SHPO ..... State Historic Preservation Office
SHSP ..... Strategic Highway Safety Plan
SIP ..... State Air Quality Implementation Plan
STP ..... Surface Transportation Program
STRAHNET ..... Strategic Highway Network
TA ..... Transportation Alternatives
TAPS ..... Trans-Alaska Pipeline System
TCM ..... Transportation Control Measure
TMDL ..... Total Maximum Daily Load
TMR ..... Tanana Mines Railroad
U.S. ..... United States
U.S.C. ..... United States Code
USACE ..... United States Army Corps of Engineers
USCG ..... United States Coast Guard
USEPA ..... United States Environmental Protection Agency
USFWS ..... United States Fish and Wildlife Service
V/C ..... Volume to Capacity

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Executive Summary

The Richardson Highway and Steese Expressway are major transportation facilities in the Fairbanks North Star Borough (FNSB). The Borough serves as the Interior Alaska transportation hub and these highways are essential to the statewide transport of freight. The Alaska Department of Transportation and Public Facilities (DOT&PF) evaluated the Richardson-Steese corridor through the Fairbanks urbanized area to identify safety and mobility deficiencies and the most effective solutions to address these deficiencies. The Planning and Environmental Linkages (PEL) process was used to incorporate public and agency input and environmental resource information early in the transportation analysis to develop solutions that can be moved into implementation in a streamlined manner.

The objectives of this PEL study were to:

- identify cost-effective corridor-wide improvements to address existing and projected traffic congestion and safety issues,
- conduct a preliminary assessment of environmental effects from proposed improvements,
- involve the public and agencies throughout the planning process,
- document the planning process and decisions to support future project-level environmental reviews, and
- streamline implementation of recommended improvements.

This PEL study report documents the identification of traffic and safety deficiencies, the development of potential improvements, the public and agency outreach efforts, and the evaluation of three alternative concepts for the corridor.

Purpose and Need for Improvements

The purpose of the PEL study and its recommendations is to improve transportation performance within the corridor by identifying improvements that will enhance safety and mobility, maintain adequate access, provide efficient freight movements, and improve air quality. The purposes are described further below.

Safety

- Improve safety for all modes by reducing the frequency and severity of crashes, particularly at intersections, consistent with the safety performance goals in the Strategic Highway Safety Plan (SHSP).
- Upgrade transportation infrastructure to meet current DOT&PF design standards where practicable.

Mobility/Access

- Reduce traffic delay and congestion to achieve level of service (LOS) C or better for current and projected traffic volumes.
- Provide traffic mobility while maintaining access to adjacent land uses and access across the corridor for all travel modes.
- Improve non-motorized mobility along and across the corridor.

Freight

- Provide efficient freight transportation through the corridor by reducing congestion, minimizing at-grade railroad crossings, and reducing vertical clearance obstructions.

Environmental

- Improve air quality by reducing traffic congestion and vehicle idle times at intersections.

The traffic analysis identified the following deficiencies that need to be addressed to provide safe and efficient transportation within the corridor.

Safety: Improve traffic safety, particularly at intersections.

- Four of the seven intersections have higher crash rates than the statewide average for similar facilities.
- The greatest number of crashes occurred at the signalized intersections in the middle portion of the corridor, including 3rd Street, Airport Way, College Road, and Trainor Gate Road.
- The Trainor Gate Road intersections with Old Steese Highway and Steese Expressway have elevated crash rates. The railroad crossing at Trainor Gate Road limits intersection control options at these intersections.
- Non-motorized crossings of Steese Expressway are limited to at-grade signalized intersections, which are multi-lane, congested intersections with high potential for pedestrian-vehicle conflicts.

Mobility/Access: Reduce traffic congestion and delay while maintaining appropriate access onto and across the corridor. Non-motorized access across the corridor needs to be improved.

- Four of the seven signalized intersections do not currently meet an acceptable LOS during the morning peak hour and two of these intersections do not currently meet an acceptable LOS during the evening peak hour.
- All signalized intersections except 10th Avenue, and the Chena Hot Springs Road ramps are not expected to meet acceptable LOS in the morning peak hour by 2030.
- Key segments on the Steese Expressway do not meet acceptable LOS during peak periods.
- At-grade rail crossings add to delay and congestion in the corridor.
- The corridor provides access into the main business areas of Fairbanks. In addition, the rapidly-developing commercial area near the intersection of Johansen Expressway and Steese Expressway is designated by the FNSB as one of just a few “Urban Preferred Commercial Areas.” This land use designation provides for a high level of commercial development and needs sufficient access to support the high level of commercial activity. The corridor needs to provide for efficient access onto and off the expressway near this commercial area.
- The corridor separates some residential areas from the central business district; sufficient access across the corridor for motorized and non-motorized modes is desired.
- Non-motorized facilities in the corridor are limited and discontinuous; the Richardson-Steese corridor serves as a barrier to east-west movements.

Freight: Improve the efficiency of freight movements through the corridor.

- The Richardson Highway and the Steese Expressway are identified as critical freight infrastructure in the Fairbanks Metropolitan Area Transportation System (FMATS) Metropolitan Transportation Plan (MTP). Fairbanks is a key transportation hub in Interior Alaska and the "doorway" to the Dalton Highway and the North Slope oil fields.
- Freight and oversized load movements through the corridor are inefficient because large loads must divert around structural impediments like traffic signal mast arms.
- Non-exempt freight trucks must completely stop at railroad track crossings, slowing freight movements through the corridor.
- Insufficient distance between the railroad crossing and left-lane exit at Old Richardson Highway prevents trucks from using this exit to access the industrial area south of the highway.

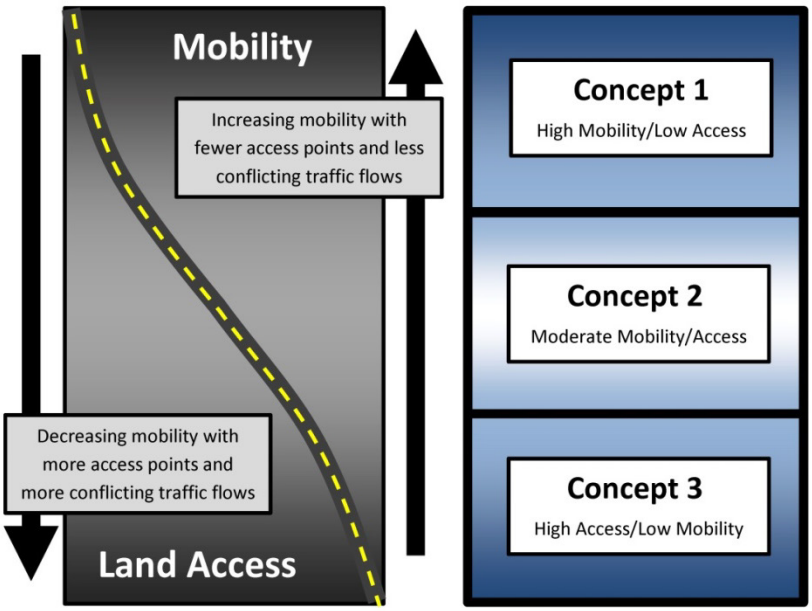
Environmental: Address traffic congestion to improve air quality.

- Traffic congestion at signalized intersections and trucks/buses stopping at railroad crossings result in increased idling and higher vehicle emissions.
- The central portion of the corridor is in an area that is under a maintenance plan for carbon monoxide (CO).
- The entire corridor is in an area that does not meet federal air quality standards for particulate matter ($PM_{2.5}$).

Corridor Improvement Concepts

The goals for this corridor are to accommodate safe and efficient traffic flows through the area and to maximize the benefits of public investment in the corridor to meet future traffic demands while minimizing adverse effects on social and environmental resources. With numerous closely-spaced intersections in the corridor, each of which has multiple potential solutions to resolve congestion and safety issues to varying degrees, a wide variety of improvement alternatives and combinations of alternatives was conceivable.

As a framework for evaluating and selecting the alternatives, three concepts with varying levels of mobility and access were defined as shown.



<u>Concept 1 – High Mobility, Low Access</u>

Concept 1 prioritizes efficient movement of through traffic along the corridor to improve mobility. It upgrades the corridor to a freeway-type facility,

provides acceptable capacity during peak periods, and allows for 55 mile per hour (mph) travel speeds throughout the corridor. It also operates with the least congestion and delay, and has the highest potential safety benefit in comparison to other concepts.

Concept 1 replaces existing signalized intersections with grade-separated interchanges. It also includes new frontage roads where needed to provide access between the proposed interchanges.

Concept 2 – Moderate Mobility, Moderate Access

The objective of Concept 2 is to improve mobility, but maintain access in some of the more highly-developed urban areas. Specifically, Concept 2 proposes interchanges at most major intersections to replace signalized intersections, but differs from Concept 1 by maintaining the signalized intersections at 3rd Street, College Road, and Trainor Gate Road. Concept 2 has a moderate reduction in congestion and delay along the Steese Expressway corridor, but preserves most of the existing access.

Concept 3 – Low Mobility, High Access

Concept 3 prioritizes access to the properties along the Steese Expressway and de-prioritizes mobility for through traffic. This alternative assumes all existing signals will be upgraded with auxiliary lanes where feasible, but they will all continue to be at-grade intersections. The collector road network is also expanded along the Steese Expressway by extending Old Farmers Loop Road southward to intersect with the Old Steese Highway intersection at Johansen Expressway.

This concept has the lowest reduction in congestion and delay, but it preserves and increases access to the greatest degree. Under Concept 3, the Steese Expressway corridor from Johansen Expressway to Airport Way would not operate at minimum design standards for intersection delay. This concept proposes that maintaining existing access is more important than resolving congestion.

Preferred Concept

Improvement alternatives were developed specifically to address the deficiencies identified in the purpose and need, to be consistent with other state policies such as the SHSP, and to address public input. The transportation deficiencies and the proposed improvement projects discussed in Chapter 5 were presented to stakeholders and the public at workshops and an open house early in the study process. Once the projects were re-evaluated in the context of corridor-wide concepts, the concepts were presented at subsequent workshops and another open house. Information on how well each concept met the purpose and need for corridor improvements, as well as the potential environmental issues associated with each concept, was presented.

Screening criteria were developed to reflect the purpose and need statements for the corridor developed based on input from stakeholders, resource agencies, and the public. Each improvement concept and its individual projects were evaluated based on the ability to meet the purpose and need as well as other considerations including environmental effects. Table ES.1 lists the 19 screening criteria used for this PEL study. A summary of the screening results for each concept is provided below.

Table ES. 1 Concept Comparison Matrix

Criteria			CONCEPT 1 High Mobility/ Low Access	CONCEPT 2 Moderate Mobility/ Moderate Access	CONCEPT 3 High Access/ Low Mobility
Purpose and Need	1	Resolves areas of elevated crashes and crash severity	●	◒	○
	2	Improves mobility (capacity and operations)	●	◒	○
	3	Maintains existing travel patterns and driveway locations	○	◒	●
	4	Improves non-motorized safety, access, and connectivity	●	◒	○
	5	Improves movement of freight	●	◒	○
	6	Improves air quality in the corridor	●	◒	○
Other Considerations	7	Minimizes ROW acquisition	◒	◒	◒
	8	Minimizes impacts to existing utilities	○	○	◒
	9	Improves access management	●	◒	○
	10	Avoids impacts to historic resources	◒	◒	◒
	11	Avoids impacts to habitat	◒	◒	○
	12	Avoids fill in wetlands	◒	◒	○
	13	Avoids contaminated sites	◒	◒	◒
	14	Minimizes noise impacts	◒	◒	◒
	15	Improves water quality	◒	◒	○
	16	Avoids 4(f) and 6(f) resources	◒	◒	○
	17	Improves infrastructure sustainability and longevity	●	◒	○
	18	Cost effective and fiscally responsible; minimizes long-term maintenance and operation costs	●	◒	○
	19	Estimated cost	**$204.5M**	**$181.3M**	**$149.5M**

● - Most Favorable/Least Adverse Effect ◒ - Favorable/Moderate Adverse Effect ○ - Not Favorable/Most Adverse Effect

Based on the analysis of the concepts, Concept 1 (High Mobility/Low Access) was determined to best meet the purpose and needs for the corridor. It would provide the greatest improvement to traffic operations, including reducing congestion and reducing factors that contribute to high crash rates. Construction of interchanges toreplace the signalized intersections will require right-of-way (ROW) acquisition in some locations and will reduce the level of direct access that some properties enjoy with Steese Expressway. Interchange designs would be refined to minimize ROW acquisition needs and other potential impacts to the greatest extent practicable. Access to the corridor from areas where signalized intersections are removed (10th Street, 3rd Street, College Road) would be available via frontage roads to adjacent interchanges. Since access would not be restricted on these frontage roads, some nearby properties may actually have improved access with the frontage road system.

Concept 1 has the greatest improvement to air quality due to the reduced congestion along the corridor. The concept's potential to affect other environmental resources, such as water quality, wetlands, and cultural resources, are similar to the other concepts since all concepts would require some level of construction and improvements at these intersections.

Recommendation and Implementation

Table ES.2 summarizes the proposed improvements in Concept 1 and provides information on the logical termini, timeframe for improvements, preliminary class of action for National Environmental Policy Act (NEPA) documentation, and cost.

Table ES. 2 Recommendations for Implementation of Concept 1

Project Description[1]	Project Limits	Proposed Timeframe[2] (dependent on funding availability)	Preliminary COA[3]	Cost
Richardson Highway MP 359 Grade-Separated Facility	RH MP 359-360.2	Short range	TBD	$37,000,000
Airport Way Interchange/Frontage Road	RH MP 361.4-SE MP 0.6	Medium range	TBD	$32,000,000
3rd Street/College Road Split Diamond Interchange	SE MP 0.6-1.3	Medium range	TBD	$55,000,000
Trainor Gate Road Grade-Separated Facility	SE MP 1.1-1.6	Medium range	TBD	$19,500,000
Johansen/Steese Expressways Interchange	SE MP 1.75-2.5	Short range	TBD	$25,000,000
Johansen Expressway Widening	JE MP 4.5-5.6	Medium range	TBD	$8,000,000
Farmers Loop Road Interchange	SE MP 2.2-3.2	Long range	TBD	$28,000,000

Notes:
[1]Old Steese Highway Improvements and Chena Hot Springs Road Interchange Ramp Improvements are not included as they are currently under design.
[2] Proposed Timeframe (for construction):
Short range: 2015 to 2020
Medium range: 2021 to 2030
Long range: 2031 to 2040
[3] TBD: To be determined through consultation with Federal Highway Administration
Abbreviations:
COA – Class of Action; MP – Mile Post
RH – Richardson Highway; SE – Steese Expressway; JE – Johansen Expressway

1.0 Introduction to Planning and Environmental Linkages Study

1.1 Study Objectives

The Richardson Highway and Steese Expressway are primary transportation facilities in the Fairbanks vicinity. Earlier studies have identified potential improvements to these highways, but a substantial amount of time has passed, and land use and transportation conditions in the Fairbanks area have changed. To make the most efficient use of public transportation funds for corridor improvements, the State of Alaska Department of Transportation and Public Facilities (DOT&PF) conducted a Planning and Environmental Linkages (PEL) study to re-evaluate the higher-volume segments of these highways where they approach and route through the Fairbanks urbanized area (hereafter referred to as the Richardson-Steese corridor, see Figure 1). The objectives of this study were to:

- identify cost-effective corridor-wide improvements to address existing and projected traffic congestion and safety issues,
- conduct a preliminary assessment of environmental effects from proposed improvements,
- involve the public and agencies throughout the planning process,
- document the planning process and decisions to support future project-level environmental reviews, and
- streamline implementation of recommended improvements.

This PEL study evaluated existing and projected transportation and environmental conditions, defined corridor needs, identified conceptual engineering solutions to address corridor needs, and prepared a planning-level analysis of the environmental and engineering impacts of proposed solutions. The study identified specific transportation improvement projects and timeframes for implementation, and the recommendations from this study will be incorporated into the Fairbanks Metropolitan Area Transportation System (FMATS) Metropolitan Transportation Plan (MTP). Agency and public involvement was integrated into the planning analysis with the intent of streamlining the environmental review processes for projects that move forward from this study.

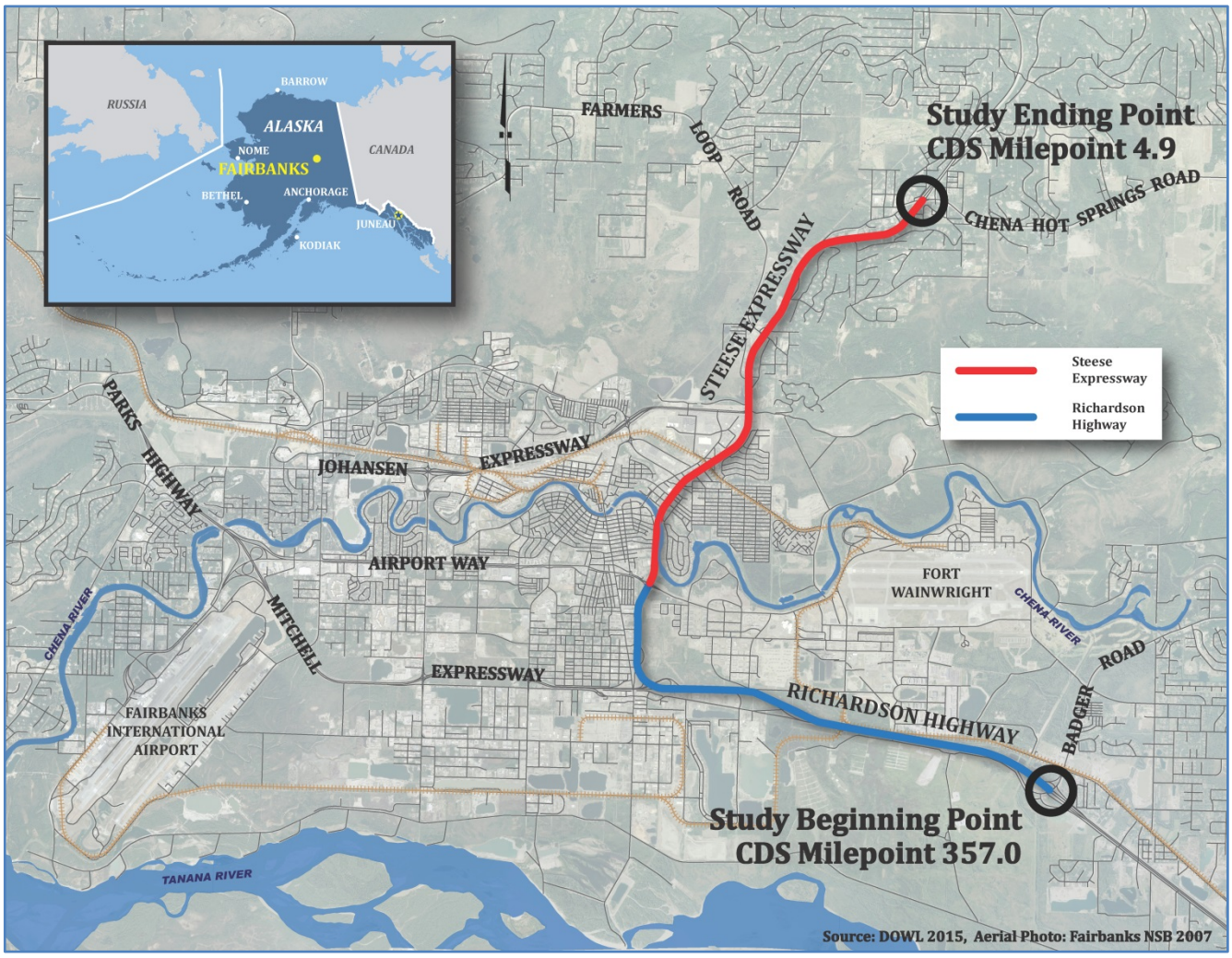
1.2 PEL Study Process and Intent

The PEL process is a collaborative and integrated approach to transportation planning and project implementation. The goals of this PEL process were to improve planning-level and project-level decision making, minimize duplication of effort during project-level environmental compliance efforts, and streamline project delivery timeframes. The PEL process achieved these goals by incorporating consideration of the natural and human environment, coordination with resource agencies and the public, and clear documentation of decisions and rationales into the planning process. The planning process will be linked through incorporation of planning information, analysis, and products into future project-level environmental reviews.

The transportation planning process typically looks at transportation networks at a broader system level and identifies transportation issues and needs to be addressed. For example, a corridor study evaluates a number of potential improvements that would work together to improve operations throughout the corridor. Recommendations from the corridor plan are then incorporated into the MTP, often as individual projects. As

each project moves forward for implementation, it enters the environmental review process required under the National Environmental Policy Act (NEPA).

Figure 1 Study Corridor



Findings from this study will be used to make preliminary determinations regarding the appropriate level of NEPA documentation (i.e., categorical exclusion, environmental assessment, or environmental impact statement) required for future projects.

Federal Highway Administration (FHWA) guidance on PEL identifies several products developed during the transportation planning process that overlap with elements of the project-level NEPA review. The planning document can provide the basis for several NEPA elements such as:

- purpose and need,
- range of reasonable alternatives,
- screening/evaluation of alternatives to carry forward,
- documentation of environmental baseline, and
- preliminary analysis of potential environmental effects.

This planning process identified the purpose and need for needed improvements in the corridor by analyzing traffic circulation and safety issues and identifying deficiencies to be addressed. The plan identified potential solutions to address the deficiencies and evaluated these alternatives on both their effectiveness in addressing the deficiencies as well as their potential for environmental effects. Recommendations for specific improvements were developed based on that evaluation. While the planning process evaluated alternatives at a more conceptual level, the planning analysis can provide basic information to support the project-level NEPA review process.

Because the planning process included opportunities for agency and public involvement and clearly documented the planning process and decision rationales, these elements will be transferable from the planning process into future NEPA processes. Incorporation of these planning products into project-level NEPA reviews allows for an early determination of the appropriate level of NEPA documentation for each project with the intent of streamlining completion of the project-level NEPA review. The PEL study for the Richardson-Steese corridor is intended to provide a basis for project-level NEPA reviews and for eliminating preliminary concepts from further evaluation.

1.3 PEL Corridor Study Elements

The Richardson-Steese corridor PEL study included the following elements:

- documentation of environmental baseline,
- identification of concerns and issues to be addressed (purpose and need),
- identification of potential improvements to address concerns and issues (alternatives),
- screening and evaluation of alternatives,
- evaluation of potential environmental effects, and
- public and agency involvement.

The Richardson-Steese corridor PEL study was initiated in 2012. The initial element of the study was a traffic analysis completed in 2012-2013. The traffic analysis used the Fairbanks MTP TransCAD model to create and refine a localized traffic model for analysis of existing and future traffic in the corridor. This effort identified near-term (2015), mid-term (2030), and long-term (2040) operational deficiencies and potential engineering solutions for the study corridor. The results of this effort are documented in the *Richardson Highway/Steese Expressway Traffic Engineering Report* (Appendix A).

An extensive public and agency stakeholder involvement effort was conducted to obtain input on the traffic analysis and the deficiencies identified, potential solutions (improvement concepts), and the potential effects of each concept. The outreach effort included three public open-house meetings and four agency working group meetings. Initial corridor improvement concepts were presented to agencies, workshop attendees, and the public. The concepts were then refined to address public and agency comments, and to identify individual projects included within each improvement concept. A more detailed discussion of the public and stakeholder involvement process is included in Chapter 3 of this report.

This PEL study report documents the study process, summarizes the findings of the corridor analyses and the evaluation of the planning-level improvement concepts, estimates costs of individual projects, documents the preliminary environmental effects review for proposed improvements, and recommends a plan for implementation of the preferred corridor concept. The study report is organized as follows.

- Chapter 2 summarizes existing environmental and transportation conditions within the corridor vicinity.
- Chapter 3 documents public and agency involvement in the study.
- Chapter 4 provides the purpose and need for corridor improvements.
- Chapter 5 describes improvement concepts identified for the study.
- Chapter 6 provides a preliminary assessment of potentially-affected environmental resources.
- Chapter 7 documents the screening and evaluation of improvement concepts.
- Chapter 8 discusses implementation of the corridor study recommendations.

1.4 Study Corridor

Due to its central location, the Fairbanks North Star Borough (FNSB) is the transportation, trade, and service center for the vast interior and northern regions of Alaska. Within the borough, the Richardson-Steese corridor serves as a key transportation system in eastern Fairbanks, providing connectivity between Fairbanks, North Pole, Fort Wainwright, Eielson Air Force Base (AFB), and road-connected areas north of Fairbanks, including the North Slope oil fields. The corridor is part of the National Highway System (NHS) and is designated Alaska Route 2. As illustrated in Figure 2, this corridor is a critical part of the statewide freight network and provides a link with the George Parks, Elliott, Dalton, and Alaska Highways to connect Fairbanks with Valdez, Prudhoe Bay, Anchorage, Canada, and the continental United States.

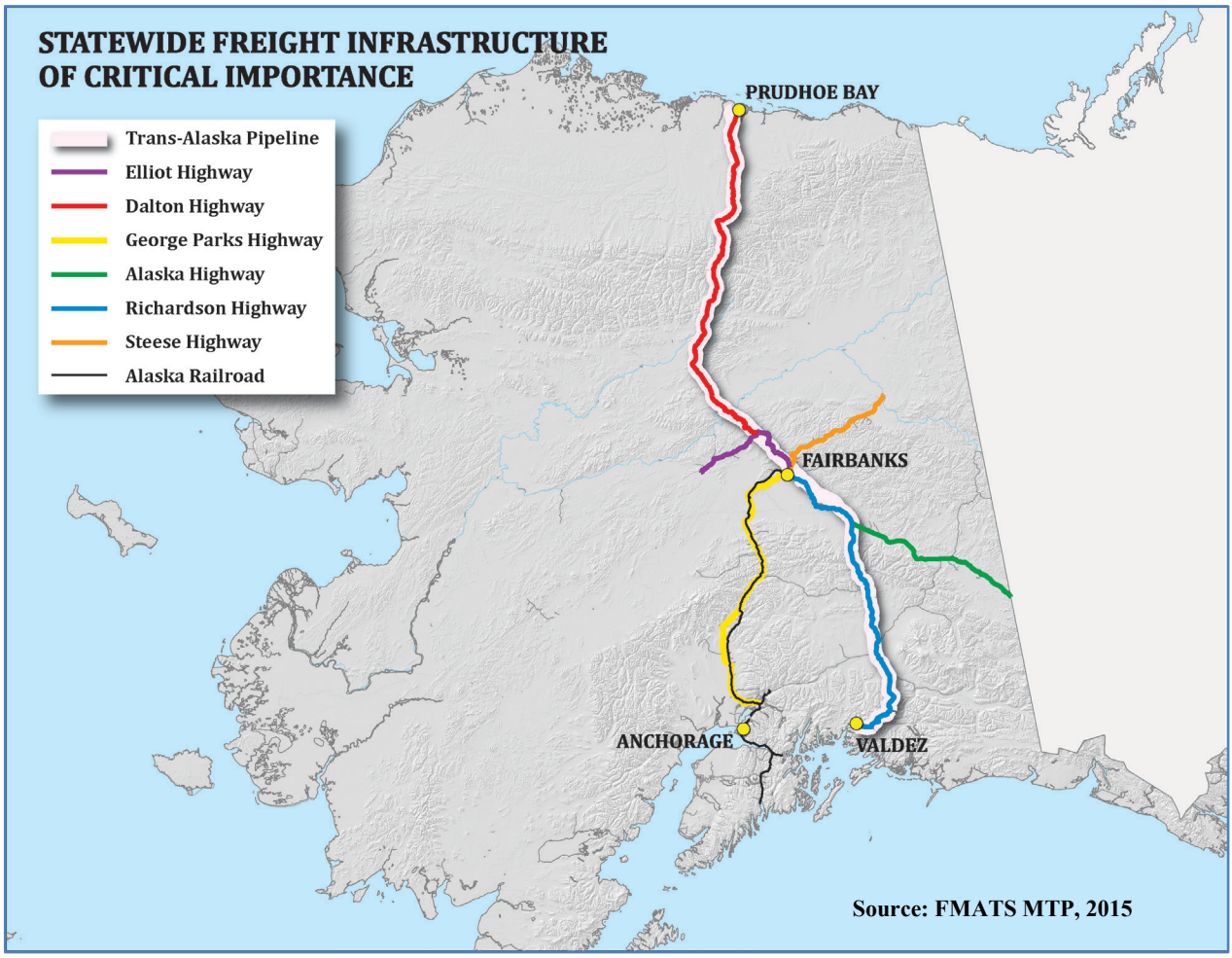
The Richardson-Steese corridor is also part of the Strategic Highway Network (STRAHNET). STRAHNET is a system of public highways that provide for essential movement of military personnel and equipment to and from military bases during both peacetime and war. This corridor provides a strategic surface transportation connection for transporting military personnel and equipment into and out of Fort Wainwright including movement of convoys to training exercise areas south and east of Fairbanks (United States [U.S.] Army Transportation Engineering Agency, 2015; FHWA, 2015a and 2015b; ASCG, 2006).

The corridor addressed in this study contains the area where the Richardson Highway and Steese Expressway transition from freeway interchanges coming into Fairbanks to a major arterial design with signalized intersections. As shown on Figure 1, the study corridor begins at the Richardson Highway milepost (MP) 357.0 (intersection with Badger Road) and ends at Steese Highway MP 4.9 (intersection with Chena Hot Springs Road). This study addressed the portions of the Richardson Highway and the Steese Expressway that are located in the most urbanized portion of Fairbanks.

This portion of the Richardson-Steese corridor within the Fairbanks urbanized area has:

- higher-volume cross streets;
- signalized intersections;
- higher motorized and non-motorized traffic volumes;
- more congested peak-hour conditions;
- traffic, access and safety deficiencies;
- narrower and more congested rights-of-way due to roadside elements, such as utilities, railroad crossing gates, signal poles, and sign posts; and
- a high level of use for shorter, non-commuting-type trips.

Figure 2 Statewide Freight Routes



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2.0 Regional Context and Corridor Conditions

2.1 Regional History and Context

2.1.1 Pre-history

Archaeological records date human activity in the Tanana Valley area back 11,000 years (Commission on Historic Preservation [CHP] et al., 2007). Athabascans, one of many groups of Alaska Natives, have lived in the Fairbanks area for thousands of years.

2.1.2 Gold Mining

Gold discoveries in 1902 started a minor gold rush into the area, bringing thousands of miners to what is now known as Fairbanks (CHP et al., 2007). During the early gold rush period, newcomers established towns and built a railroad along the banks of the Chena River. Miners, wanting to connect the steamboat docks on the Chena River to the mine sites north of the city, built the Tanana Mines Railroad (TMR) (Friends of the Tanana Valley Railroad). By 1905, gold was being mined on 1,500 creeks and by 1910, most of the easily-available gold had been mined. As mining output declined, so did the population, which dropped from 10,000 in 1910 to below 2,000 in 1920.

2.1.3 Railroad

Construction of the Federal Alaska Railroad began in 1915 (CHP et al., 2007). By 1919, a narrow gauge line linking Fairbanks and the north side of the river at Nenana was completed. In 1923, the narrow gauge line was converted to a standard line and the “golden spike” was driven connecting the rail line from Anchorage to Fairbanks. The Alaska Railroad was acquired from the federal government on January 5, 1985, and became the Alaska Railroad Corporation (ARRC), an independently-managed corporation owned by the State of Alaska (ARRC, 2015). The ARRC main line extends 470 miles from the all-season, deep-water port of Seward to its northern terminus in Fairbanks. From Fairbanks the railroad extends 28 miles eastward to Eielson AFB. ARRC provides both passenger and freight service to the FNSB. Passenger service is primarily a summer operation serving the tourism industry. Freight operations occur year-round from Seward to Fairbanks and on to Eielson AFB. One of the key commodities transported by rail is coal from the Usibelli Coal Mine in Healy to power generation plants in Fairbanks, Fort Wainwright, and Eielson AFB. Other common freight transported by rail includes oil field supplies for the North Slope, military supplies, refined petroleum products, cement, and fertilizer (ARRC, 2014).

2.1.4 Military

Several years prior to World War II, political and military leaders advocated building military bases in Alaska (ASCG, 2006). With the onset of World War II in 1939, Congress granted $4 million to construct a United States Army cold-weather experimental station at Fairbanks, which was named Ladd Field (later renamed Fort Wainwright). To provide an alternate to Ladd Field in times of ice fog, the U.S. Army built an auxiliary field south of Ladd Field, known as the 26-Mile Strip. This was the beginning of the military presence in Fairbanks.

In 1946, with the onset of the Cold War, attention turned toward building a large bomber base in the Alaska Interior (ASCG, 2006). The runway at Ladd Field, restricted by an oxbow in the Chena River, proved too short for the large jet aircraft coming into the Air Force inventory at the time and the decision was made to expand the Army’s 26-Mile Strip instead. The airport was later turned over to the Air Force, and renamed Eielson AFB.

Military projects during World War II, including the completion of the Alcan Highway, provided a burst of growth in the area.

The United States Army has been working to transform armed forces at Fort Wainwright to a soldier-centered integration of ground, air, and space systems operating across the entire spectrum of combat operations. This transformation has included construction of support training facilities such as a new barracks and company operations facilities. As part of this action, the Army transformed the Light Infantry Brigade at Fort Wainwright into the 172nd Stryker Brigade Combat Team. The mission of the Stryker Brigade, or Arctic Wolves, is to develop a well-trained team that can deploy rapidly to a designated contingency area of operation by air and conduct operations either as a separate Brigade Combat Team or under the control of a contingency force headquarters. Compared to a light infantry brigade, a Stryker Brigade Combat Team has approximately 29 percent more personnel (ASCG, 2006). Today, the military presence continues to be a major influence on growth and development in the Fairbanks area due to its importance in the regional economy and its contribution to the population of the FNSB.

2.1.5 Trans-Alaska Pipeline System

Construction of the Trans-Alaska Pipeline System (TAPS) began in 1975, after the 1973 oil crisis caused a sharp rise in oil prices in the United States and a desire to increase oil production domestically (ADNR, 2015). By 1977, the 800-mile pipeline from Prudhoe Bay to Valdez was complete. Construction of the pipeline allowed for development of the North Slope oil fields. This was another turning point event for Fairbanks. Its central location, rail yard facilities, road access to the North Slope and location near the pipeline route made it a logical support and logistics center for pipeline and oil field support operations. TAPS and North Slope development led to substantial population growth, increased employment, and increased land values in Fairbanks.

2.1.6 Transportation

Early road building by the Alaska Road Commission (predecessor to DOT&PF) focused on wagon roads, often replacing older trails to connect mining areas with navigable waterways, railroad lines, and ports (such as Valdez and Nome). Alaska's first highway was the Richardson Highway which connected Fairbanks with Valdez. Upgraded from a trail to a vehicular route by 1910, it served as the mail and supply route that connected the interior mining districts with the coast at the Valdez port. The longest highway in the territory and the only highway connecting the Pacific coast with the Interior, the Richardson Highway remained the most important freight and passenger route in Alaska through the 1930s. In the 1940s, substantial improvements to the Richardson Highway were made, although the road remained gravel-surfaced. Important roads branching from the Richardson Highway included the Elliott and Steese Highways, and the local road network surrounding Fairbanks. The Steese Highway, extending 162 miles from Fairbanks on the Tanana River to Circle on the Yukon River, provided a vital link to mining operations in that region. The Steese Highway vicinity was also used for the laydown area for the construction of the railroad. Throughout the 1950s, the roads were reconstructed and improved, including widening and paving. In the 1960s, most of the transportation projects in Alaska began to focus on urban areas like Anchorage and Fairbanks. In 1973, the Richardson Highway was connected to the Steese Highway through construction of the Steese Expressway. The Steese Expressway is aligned east of the former Steese Highway (now designated as the Old Steese Highway) between Johansen Expressway and Airport Way.

In the 1970s, the Alaska Highway system expanded with new connections. The Dalton Highway, starting north of Fairbanks and ending in Deadhorse, was built in 1974 to provide access for construction of the pipeline. The highway was originally built as an industrial haul road with no public access. In 1981, a portion of the Dalton Highway was opened to the public on a permit system. The highway was fully opened to the public in 1994. The highway provides the primary surface transportation of freight from the ports of Anchorage and Valdez, and the rail yards from Anchorage and Fairbanks, to the North Slope, which is the largest industrial area in the state. During the 1990s, the Richardson Highway was upgraded from Fairbanks to the main gate at Eielson AFB, making this stretch a four-lane divided road. Today, rapid commercial and industrial development of properties along the north and west side of Old Steese Highway, near the Old Steese Highway and Johansen Expressway intersection, is continuing to change the transportation system in the area. Proposed future projects, such as the Interior Energy Project to truck liquefied natural gas from the North Slope or Cook Inlet to Fairbanks, could result in more development and transportation demand along the corridor.

2.2 Human Environment and Social Context

2.2.1 Demographics

Demographics are quantifiable characteristics of a given population, providing a general overview of a population at a given time. Demographic information is important in planning for future projects because it can indicate where population is growing or declining, economic drivers, and income trends. These characteristics are used to help project how traffic demand will change in the future.

Population Characteristics

The FNSB population has typically followed the growth and decline of the regional economy. Rapid population growth occurred between 1970 and 1980 related to the construction of the 800-mile TAPS and the associated economic expansion. Population growth in the FNSB has been steady throughout the past decade, rising from an official population of 82,840 in 2000 to 97,581 in 2010 (Alaska Department of Labor and Workforce Development [ADLWD], 2015a). This represents a 17.8 percent increase over 10 years, or an average of 1.8 percent per year. More recently (2010-2014) population growth has been relatively flat (ADLWD, 2015b). Since 2000, the population has grown faster in some of the unincorporated portions of the FNSB than in the City of Fairbanks, resulting in more traffic from residents traveling into and out of Fairbanks from these areas (ADLWD, 2015c). The FNSB population is projected to continue to grow over the next 15 years, but at a decreasing rate. The growth rate for the FNSB population is projected at 1.25 percent for 2012-2017, 1.10 percent from 2017-2022, and 0.80 percent from 2022-2027 (ADLWD, 2014).

Minority and Low-income Populations

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, signed by the President of the United States on February 11, 1994, directs federal agencies to take steps to identify and address disproportionately high and adverse effects of federal projects on minority and low-income populations to the greatest extent practicable.

The United States Environmental Protection Agency (USEPA) Environmental Justice View was used to identify areas of minority and low-income populations within the corridor vicinity. The area west of Richardson Highway between Mitchell Expressway and Airport Way, and some areas west of the Steese Expressway, are characterized by a larger percentage of low-income and/or minority populations compared to the remainder of the Fairbanks area.

Economic Characteristics

Annual average total employment in the FNSB increased from 34,600 in 2001 to 39,000 in 2013 (ADLWD, 2015d). Employment grew annually from 2001 through 2008, but decreased from 2008 to 2009. Employment increased annually again from 2009 through 2012, but decreased in 2013 and 2014. Employment is projected to increase by 0.5 percent in 2015 (ADLWD, 2015e). The unemployment rate in the FNSB has ranged from 5.3 percent to 7.1 percent over the last decade, with a rate of 5.8 percent for 2013. The FNSB unemployment rate has consistently been lower than the statewide unemployment rate (ADLWD, 2015f).

Per capita personal income in the FNSB grew more than 50 percent from 2000 to 2013, from $29,416 to $45,313 (United States Bureau of Economic Analysis, 2015). The 2000 Census reported that 7.8 percent of individuals in the FNSB were below the poverty level compared to 9.4 percent statewide (U.S. Census Bureau, 2015a). The poverty rate for individuals from 2009-2013 was estimated at 8.4 percent compared to a statewide rate of 9.9 percent (U.S. Census Bureau, 2015b).

Military, state government, and civilian federal government jobs have been the bedrock of the economy for over three decades (ADLWD, 2015e). While these areas have declined over the last two years, job losses in these areas are expected to be minimal in 2015. Military employment in the FNSB includes approximately 7,400 jobs on Fort Wainwright and 2,700 jobs on Eielson AFB including both military and civilian employees (Defense Manpower Data Center, 2013). Overall, military activities in the Fairbanks area generate 11,552 jobs including direct, indirect, and induced employment (Fairbanks Economic Development Corporation [FEDC], 2015). Military-related jobs account for 30 percent of all jobs in the Fairbanks area and employment on the military bases tends to pay higher-than-average wages.

The recent changes to eliminate refining operations at the Flint Hills Refinery, one of the FNSB's largest employers, resulted in an estimated loss of 80 manufacturing jobs. However, construction associated with new retail development and road construction added 200 new jobs in 2014. Retail expansion resulted in 50 new jobs in 2014 and is projected to add an additional 100 jobs in 2015. Much of this new retail employment is expected to be located in the shopping district west of the Steese Expressway.

2.2.2 Land Ownership, Land Use, and Development

Land in the corridor vicinity is under both private and public ownership. Land use can be characterized as a combination of urban, suburban, and rural development, as illustrated in Figure 3.

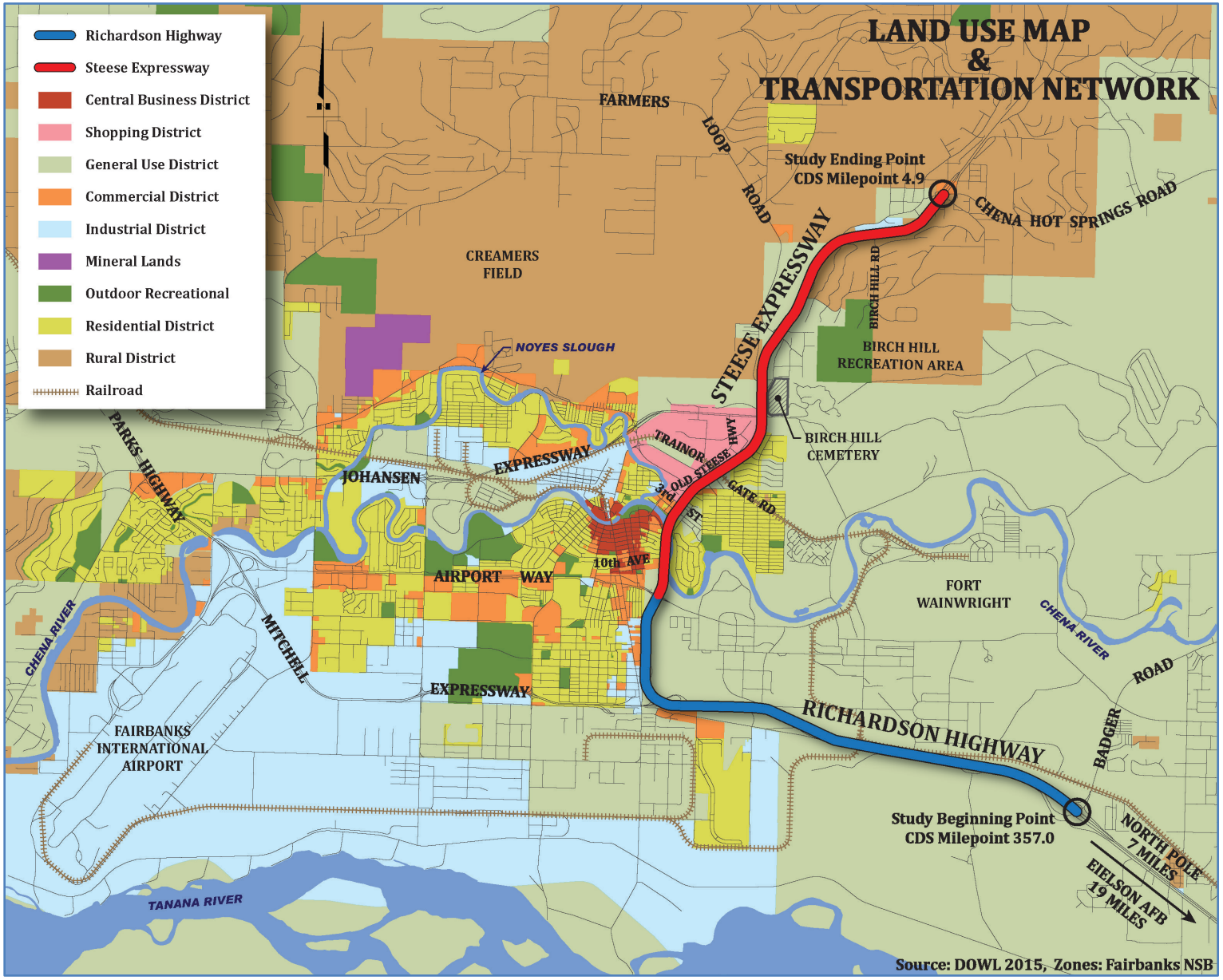
Badger Road to Airport Way

The majority of land use in this segment consists of Fort Wainwright on the north and east side of the corridor. The corridor crosses the ARRC right-of-way (ROW) south of Fort Wainwright in this segment. South of Airport Way and west of Richardson Highway is an area of general commercial and light industrial uses, mixed with multi-family housing.

Airport Way to Johansen Expressway

In this segment of the corridor, land use consists of single-family, two-family, and multi-family residential development located east of the Steese Expressway (Island Homes, Hamilton Acres and Shannon Park Subdivisions). A church is located on 3rd Street east of the Steese Expressway and another is located on Adak east of the Steese Expressway and south of Trainor Gate Road. The AT&T/Alascom ball field is located just northwest of the Airport Way/Steese Expressway intersection.

Figure 3 **Land Use Map**



The central business district, general commercial, office, and some residential use occur west of the Steese Expressway. The Eastside Historic District and Historic Clay Street Cemetery are located between 4th and 7th Avenue on the west.

The Steese Expressway parallels the Chena River for a short distance just north of Airport Way, and the corridor crosses the ARRC ROW near the Steese Expressway and Trainor Gate Road intersection, north of the Chena River. The area immediately adjacent to the Steese Expressway from Chena River to the Johansen Expressway is designated as an "urban preferred commercial area" in the FNSB comprehensive plan.

Rapid commercial development has occurred over the last 15 years in the area west of the Steese Expressway, in the Bentley Trust area. Commercial uses in this area include major regional retail attractions, such as Walmart, Fred Meyer, Sportsman's Warehouse, Home Depot, Lowes and Walgreens, combined with a wide variety of restaurants, small retail stores, hotels, and industrial facilities. The rapid growth in this area has increased traffic congestion and resulted in the need for upgrades to and expansion of the collector and arterial road network.

Johansen Expressway to Chena Hot Springs Road

From Johansen Expressway north to Chena Hot Springs Road, land use adjacent to the highway generally consists of low-density residential and other uses allowed in the general use zoning category. Community sewer and water systems are not available in this area, leading to lower-density development. West of the Steese Expressway is Creamer's Field Migratory Waterfowl Refuge and the Creamer's Dairy historic site which are accessed via College Road. Two churches are located just southeast of the Johansen/Steese Expressways intersection and the Birch Hill Cemetery is located northeast of this intersection. The 47-acre cemetery was laid out in 1938 as a secondary option to the Clay Street Cemetery. There is a church and school located east of the Steese Expressway between Johansen Expressway and Farmers Loop Road and another located east of the Steese Expressway/Farmers Loop Road intersection. The Birch Hill Recreation Area is located east of the highway and is accessed via Birch Hill Road off of the Farmer's Loop Road and Steese Expressway intersection. A solid waste transfer station is located northwest of the Farmer's Loop Road intersection. This solid waste station is used by area residents who do not have commercial garbage pickup and is also one of the FNSB recycling collection points.

Other Land Use Considerations

Fort Wainwright

Fort Wainwright is located entirely within the city limits of Fairbanks to the east of the downtown area. Approximately 13,000 acres of land within the main post are available for troop housing, maintenance, administration, community support facilities, and open space. However, much of this land is unsuitable for housing development because of environmental constraints such as wetlands. The remaining land within the installation boundaries is dedicated to training use. The land uses surrounding Fort Wainwright to the west vary from residential and commercial to industrial and institutional. To the north, south and east, land uses include undeveloped/vacant and sparsely-populated areas.

Many Fort Wainwright employees live off the base and commute via the Richardson Highway and/or Steese Expressway. Gaffney Road provides access from the base into the corridor near the Steese Expressway intersection with Airport Way. Although the gate on Gaffney Road is the main gate into the base, Trainor Gate Road serves as another important entrance onto the base. The base's south gate off of the Richardson

Highway is currently closed, but base access in this area may be improved if improvements near the Old Richardson Highway/Richardson Highway area are constructed.

As discussed previously, the corridor is part of the military STAHNET system and is used to transport personnel and equipment to training areas and for other deployments. According to the 2006 *Fairbanks North Star Borough Joint Land Use Study*, there are some community concerns regarding slow-moving convoys on the Richardson Highway sometimes impeding traffic. However, the convoys are infrequent and do not affect road capacity (ASCG, 2006). Residents have also expressed concern about the possible loss of major travel routes in case of emergency road closure due to base activities.

North Pole

The City of North Pole is located just southeast of Fairbanks along the Richardson Highway. North Pole is the only incorporated community in the borough other than Fairbanks. North Pole is located just south and east of Fairbanks along the Richardson Highway on the east side of Fort Wainwright. The population of North Pole has grown at a rate of just under 1 percent per year over the last four years, totaling 2,198 in 2014 (ADLWD, 2015g). This accounts for about 2 percent of the total borough population. The transportation, trade and utilities industry accounts for the highest percentage of employment for North Pole residents (25 percent). Many North Pole residents use the Richardson-Steese corridor to access commercial areas and workplaces in Fairbanks. North Pole is home to a PetroStar refinery and the Flint Hills facility, which recently closed refinery operations but still operates as a petroleum product tank farm.

Eielson Air Force Base

Eielson AFB is located 22 miles southeast of the City of Fairbanks along the Richardson Highway. Except for the residential land located in the community of Moose Creek northwest of the base, the land uses surrounding Eielson AFB vary from open/agriculture/low density to recreational and publicly-owned military reservation. Many Eielson AFB employees live off the base in the Fairbanks area and use the corridor to commute to and from work.

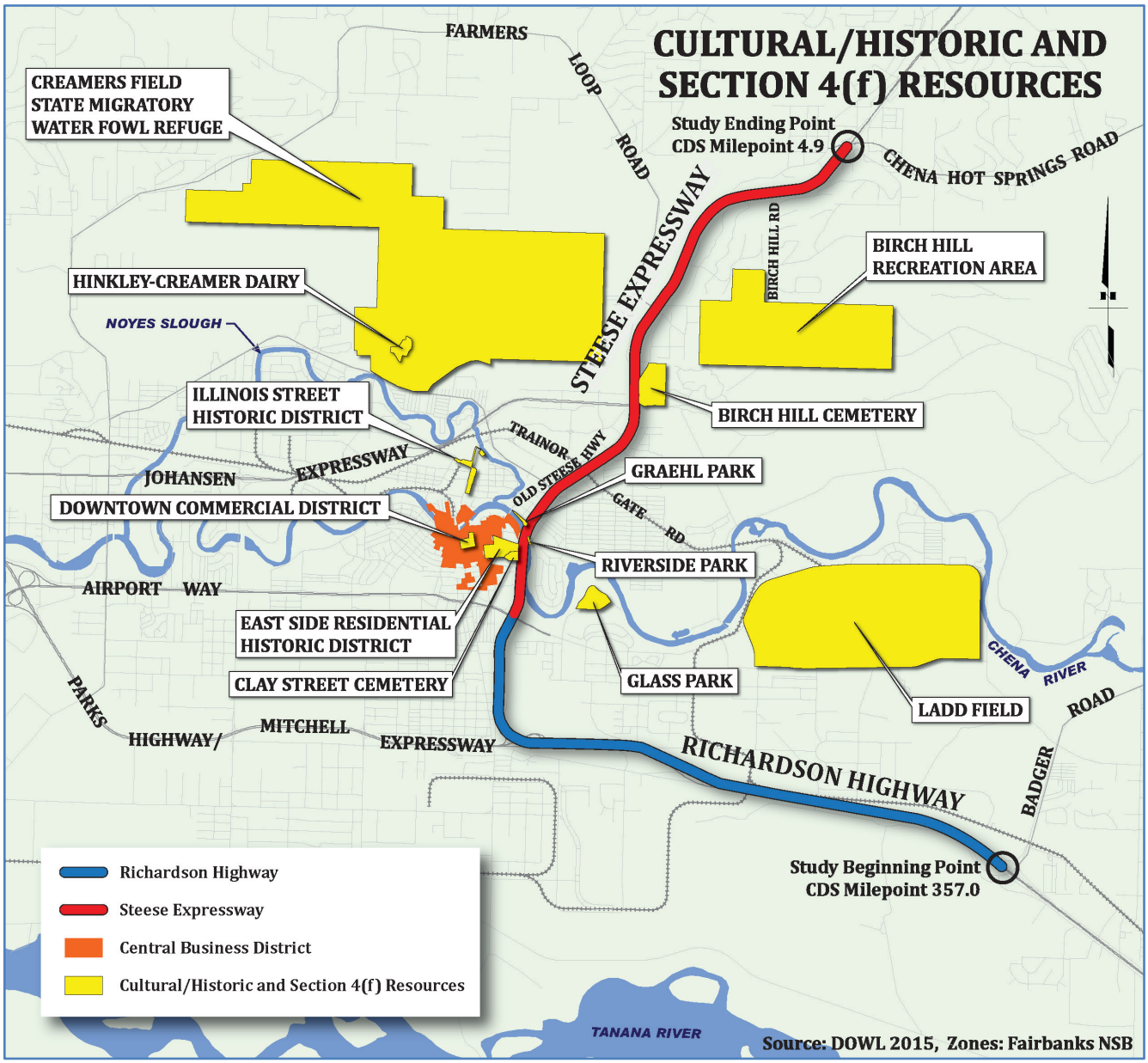
2.2.3 Cultural/Historic Resources

Significant historic resources are afforded special consideration by Section 106 of the National Historic Preservation Act of 1966, as amended. Historic resources may include archaeological artifacts or features, and historic standing structures more than 45 years old. Significant historic resources are those that are listed or may be eligible for inclusion on the National Register of Historic Places (NRHP). For the purposes of this study, only properties listed on the NRHP or officially eligible for the NRHP are listed as previously-identified historic sites.

If proposed improvement projects move forward for implementation, cultural resources will be surveyed in the projects' Areas of Potential Effect (APEs) and consultation with the State Historic Preservation Office (SHPO) would occur. Additional sites may be identified, and previously-identified sites may be evaluated for eligibility for the NRHP during that process. The FNSB CHP, established by ordinance in 1986, would be asked to provide input during the Section 106 cultural resource evaluation process.

The Alaska Department of Natural Resources (ADNR) Office of History and Archaeology database identified the following NRHP-listed properties within the corridor vicinity (see Figure 4).

Figure 4 Cultural/Historic and Section 4(f) Resources



Clay Street Cemetery

The Clay Street Cemetery (Alaska Heritage Resources Survey [AHRS] Site No. FAI-164) is listed on the NRHP. The cemetery is located at the end of 5th Avenue, and is bounded on the south by 7th Avenue, and on the north by 4th Avenue. Burials at this cemetery represent a broad spectrum of Alaskan pioneers who made significant contributions between the period of exploration and the settlement of the sub-arctic region extending from the Canadian Yukon to the Bering Sea.

Illinois Street Historic District

The Illinois Street Historic District (AHRS Site No. FAI-00349) is listed on the NRHP. The District is located between the 300-700 blocks of Illinois Street. The District contains the site of the Fairbanks Exploration Company's 1925 industrial complex which signaled the start of large-scale corporate mining in Fairbanks.

Ladd Field

Ladd Field National Historic Landmark (NHL) is located within the Fort Wainwright Army Post. Ladd Field was established in 1940 originally as a cold-weather experimental station and was Alaska's first army airfield. The NHL is located east and south of the Gaffney Road/Trainer Gate Road intersection.

Hinkley-Creamer Dairy

Creamer's Dairy (Hinkley's Dairy) (AHRS Site No. FAI-085) was listed on the NRHP in 1977. It is located between Farmer's Loop and College Road and contains 12 acres of the original dairy site and structures. It is the only group of pioneer dairy farm buildings in Interior Alaska.

Eastside Residential Historic District

The Eastside Residential Historic District (AHRS Site No. FAI-01917) extends from Noble Street on the west to the Steese Expressway on the east, 7th Avenue on the south, and a dogleg from 4th Avenue to Dunkel Street and across 2nd Avenue to the north. This District was surveyed as part of the Cultural Resource Survey and Historic Building Documentation for the Noble Street Upgrade Project in October 2008. The District was determined to be eligible in 2010 as its residential features illustrate the first two generations of permanent residential development in the downtown area. The AHRS database states that the boundaries shown are provisional and have not been finalized. The District includes the Clay Street Cemetery.

Downtown Commercial District

The Downtown Commercial Historic District (AHRS Site No. FAI-01918) is roughly bounded by 1st Avenue starting at the New Horizons building, then running south to the southern side of 2nd Avenue, west to Cushman Street, south on Cushman to 4th Avenue, east along 4th Avenue to Lacey Street, north along Lacey to 2nd Avenue, east on the north side of 2nd to the Polaris building, and back to the point of beginning at 1st Avenue. This District was surveyed as part of the Cultural Resource Survey and Historic Building Documentation for the Noble Street Upgrade Project in October 2008. The District was determined to be eligible in 2010 for its association with and embodiment of the economic development of the core of the Fairbanks downtown area.

2.2.4 Section 4(f) and Section 6(f)

Section 4(f) refers to the original section within the U.S. Department of Transportation Act of 1966 which established the requirement for consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development. The law, now codified in 49 United States Code (U.S.C.) §303 and 23 U.S.C. §138, is implemented by the NHL through the Code of Federal Regulations (CFR) at 23 CFR 774. Section 4(f) applies to projects that receive funding from or require approval by an agency of the U.S. Department of Transportation. Before approving a project that uses Section 4(f) property, FHWA must either (1) determine that the impacts are *de minimis*, or (2) undertake a Section 4(f) evaluation. If the Section 4(f) evaluation identifies a feasible and prudent alternative that completely avoids Section 4(f) properties, it must be selected. If there is no feasible and prudent alternative that avoids all Section 4(f) properties, FHWA has the discretion to select an alternative that causes the least overall harm. FHWA must also find that all possible planning to minimize harm to the Section 4(f) property has occurred.

Section 4(f) properties include publicly-owned public parks, recreation areas, wildlife or waterfowl refuges, and any publicly- or privately-owned historic site listed or eligible for listing on the NRHP. Use of a Section 4(f) property occurs: (1) when land is permanently incorporated into a transportation facility; (2) when there is a

temporary occupancy of land that is adverse in terms of the statute's preservation purpose; or (3) when there is a constructive use. A constructive use occurs when a project's proximity impacts are so severe that the protected activities, features, or attributes of a property are substantially impaired. The regulation lists various exceptions and limitations applicable to this general definition.

The FNSB Parks and Recreation website and the Alaska Department of Fish and Game (ADF&G) website identify the following public parks, recreation areas, and wildlife refuges located within the corridor vicinity (see Figure 4):

- Graehl Park, Front Street and Fortymile Street (west of Chena River Bridge);
- Riverside Park, 90 Slater Drive (east of Chena River Bridge);
- Birch Hill Recreation Area;
- Glass Park, Building 4050, Fort Wainwright; and
- Creamer's Field State Migratory Waterfowl Refuge, College Road.

Three non-public properties in the corridor may also be eligible for Section 4(f) protection. The AT&T/Alascom ball field northwest of the Airport Way/Steese Expressway intersection is not publically owned, but it is maintained and operated by FNSB Parks and Recreation. When a public entity manages a private facility, it may be determined to be a Section 4(f) resource. Further consultation with FHWA would be needed to make a determination on this facility. Similarly, FHWA guidance on Section 4(f) indicates that areas protected as habitat and open space under conservation easements may also qualify for Section 4(f) protection. There is a conservation area northwest of the Johansen/Steese Expressway intersection that may qualify for Section 4(f) protection. This area is discussed in Section 2.3.6 below. Finally, Birch Hill Cemetery is not publically owned and is not on the NRHP, but was identified as a potentially historic site during stakeholder outreach for this study. If the cemetery is evaluated and found eligible for the NRHP, it would be considered a Section 4(f) property. FHWA guidance on Section 4(f) indicates that in rare cases, some properties that are not on or eligible for the NRHP may be considered Section 4(f) properties if local officials provide formal documentation of the site's local significance.

The National Land and Water Conservation Fund (LWCF) Act, or Section 6(f), was enacted to preserve, develop, and assure the quality and quantity of outdoor recreation resources. Section 6(f) protection applies to all projects that impact recreational lands purchased or improved with LWCF funds. The Secretary of the Interior must approve any conversion of LWCF property to a use other than public, outdoor recreation. The Division of Parks and Outdoor Recreation (DPOR) of the ADNR was consulted regarding LWCF properties in the Fairbanks area. There are 11 parks within the FNSB that received LWCF investment: two in North Pole and nine in Fairbanks. The closest LWCF property to the corridor is the Birch Hill Recreation Area, located approximately one mile to the northeast of the Farmers Loop Road and Steese Interchange.

2.3 Natural Environment and Physical Context

The following sections outline information about the natural environmental and physical context of the corridor based on database reviews and published documentation. Site-specific field investigations may be needed for specific projects that move forward for implementation from this study.

2.3.1 Climate

Fairbanks' climate is classified as subarctic continental, with long, cold winters and short, warm summers. The climate is characterized by extreme seasonal variations in temperature, with winters typically experiencing long periods of sub-zero temperatures and summers occasionally reaching into the 90s. From 1981 to 2010, the mean temperature in January in Fairbanks averaged 1°F and in July averaged 61°F (Western Regional Climate Center, 2015). From 1976 to 2012, the highest daily extreme temperature reached 93°F and the lowest temperature reached -55°F. Precipitation in Fairbanks has ranged from as much as 22 inches in 1990 to as low as 9 inches in 1987 and from 1976 to 2012 averaged 12 inches a year.

Fairbanks is surrounded on three sides by hills. Cold air from higher elevations sinks to the valley floor resulting in temperature inversions. These inversions result in poor air quality due to emissions from cars, home heating, and industrial sources such as power plants and refineries. Occasional chinook events cause ice fog, freezing rain, and road icing events during the winter months.

The length of the day varies significantly over the course of the year. The shortest day is December 21 with 3:42 hours of daylight; the longest day is June 20 with 21:49 hours of daylight. Winter darkness, paired with ice fog and icy road conditions, frequently results in poor driving conditions.

2.3.2 Geology and Soils

Several geotechnical investigations have been completed for projects along and adjacent to the Richardson-Steese corridor. The following reports are the basis of this existing conditions summary:

- Gaffney Road to Farmers Loop Road (Alaska Department of Highways [ADH], 1972);
- Farmers Loop Road to Fox (ADH, 1976);
- Badger Interchange (DOT&PF, 2001);
- Richardson Highway Weigh Stations (Shannon & Wilson Inc., 2006);
- Steese Highway Resurfacing (DOT&PF, 2012a); and
- Old Steese Highway Upgrade (DOT&PF, 2015a).

Fairbanks is located in the Tanana Lowland, part of the Cordilleran Geosyncline, between the Alaska and the Brooks Mountain Ranges. Bedrock in this region ranges from Cretaceous intrusive granite to Paleozoic and Precambrian schist, quartzite, and gneiss with visible outcrops north of Fairbanks and on Fort Wainwright. The surficial geology of the area contains extensive, well-sorted floodplain, terrace, and alluvial fan deposits associated with the Tanana River and its tributaries. The alluvium may be up to 500 feet thick in some parts of the region. The deposits are comprised of sands, gravels, and localized areas of silt.

Typical subsurface conditions are relatively consistent within the corridor vicinity. Depth of fill varies across developed areas, however, the native mineral soil conditions generally consist of one to 10 feet of soft silts with organic material (peat, roots, wood), overlying loose to medium dense sands and gravels with varying amounts of silt (0 to 15 percent).

Asphalt thickness in the Richardson-Steese corridor is generally 2 to 2.5 inches, although borings of the Steese Expressway occasionally encountered asphalt 4 inches thick, and asphalt patches up to 16 inches thick. The asphalt pavement is underlain by 3 to 5 feet of fill comprised of poorly to well-graded gravels with sand. Below the fill material, and at the surface in unpaved areas, silty soils overlie relatively clean sands and gravels. The

silts and sands are alluvial in origin and their thicknesses vary greatly across the project. Depth to groundwater varies from approximately 10 to 25 feet and permafrost is intermittently present across the corridor vicinity at depths of approximately 20 to 40 feet below ground surface. The groundwater table can fluctuate seasonally by several feet and may be directly affected by surface water bodies, such as the Chena River. Most reports indicate that thaw instability and settlement are high concerns across the Fairbanks region. Liquefaction is also a concern due to high silt and water contents.

Richardson Highway – Badger Road to Cushman Street

Generally, asphalt pavement and fill overlie silts or silt-rich soils to a depth of 3 to 9 feet. Silty sand, sand and clean gravels underlie the silts. Where encountered, groundwater was observed at depths between 8 and 12 feet. Permafrost was encountered under undisturbed vegetation at depths of 3 to 7 feet.

Richardson-Steese – Mitchell Expressway to Johansen Expressway

Generally, 1 to 2 feet of fill material overlies 3 to 12 feet of silt followed by loose to dense sands and gravels. In unpaved areas, up to one foot of organic matter overlies organic silt to 6 to 10 feet thick. Groundwater is generally at depths of 12 to 15 feet below the ground surface and permafrost was encountered at depths of 15 to 24 feet.

Steese Expressway - Johansen Expressway to Chena Hot Springs Road

The Steese Expressway has been resurfaced several times, and has multiple layers of buried asphalt and geotextile. The highway is underlain by 8 to 36 inches of base course comprised of poorly graded sand with silt and gravel. The embankment fill material consists of poorly-graded sands and gravels with varying amounts of silt. Neither permafrost nor ice was noted in the 2012 resurfacing report, but it is generally accepted that there is discontinuous permafrost in the Fairbanks area, and several feet of active layer. Groundwater, when encountered, was at approximately 15 feet of depth.

2.3.3 Water Bodies

The U.S. Coast Guard (USCG) has jurisdiction over the location and clearances of bridges on navigable waters under 33 CFR 114. The U.S. Army Corps of Engineers (USACE) also has regulatory authority over structures and work in navigable waters under 33 CFR parts 320, 322 and 325.

Fairbanks is located in the lower portion of the Chena River watershed. In 2011, the entire length of the Chena River was determined to be navigable per 33 CFR 33 CFR 2.36(A)(2) by the USACE. The headwaters of the Chena River begin in the White Mountains about 90 miles east of Fairbanks, and the river flows southwest to its confluence with the Tanana River in western Fairbanks. The Steese Expressway crosses the Chena River at the southern extent of the expressway, just north of 3rd Avenue.

The Noyes Slough is a side branch of the Chena River and diverges from the Chena River approximately 0.3 mile west of the Steese Highway, loops under the Johansen Expressway near College Road and rejoins the Chena River just upstream from the University Avenue Bridge.

2.3.4 Water Quality

The Clean Water Act (CWA) establishes the basic structure regulating discharges of pollutants into waters of the United States and regulating water quality of surface waters.

Under the CWA, each state is required to monitor water quality, characterize its waterbodies, and list any waterbodies that do not meet water quality standards. Waterbodies are assigned to categories determined by the degree to which water quality goals are attained. The Chena River is listed as a Category 5 waterbody for sediment pollution, and Noyes Slough is listed as a Category 5 waterbody for sediment and petroleum products (Alaska Department of Environmental Conservation [ADEC], 2010). Category 5 waterbodies do not meet water quality standards and require management through a Total Maximum Daily Load (TMDL) process, which analyzes pollution sources and calculates the amount or "load" of that specific pollutant that the water can receive and still maintain Water Quality Standards.

In 2011, ADEC completed a TMDL document for petroleum hydrocarbons, oil, and sheens that identified strategies for reducing sheens in Noyes Slough, which set pollutants at zero discharge (ADEC, 2011). No TMDLs have been established to date for sediment in either water body, but these impairments are currently being reviewed by the State. Noyes Slough also has a TMDL for residue/debris.

The CWA also regulates storm water discharges into navigable waters and such discharges must be permitted under the National Pollutant Discharge Elimination System (NPDES). In Alaska, the State has primacy for implementing the NPDES program and does so under the Alaska Pollutant Discharge Elimination System (APDES). APDES Municipal Separate Storm Sewer System (MS4) permits AKS-053406 and AKS-053414 for the Fairbanks Urbanized Area authorize storm water discharges from roadside storm drains to Chena River and Noyes Slough.

2.3.5 Fish and Wildlife

Multiple federal laws have been established to protect wildlife, including the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act (BGPA), and the Magnuson-Stevens Fishery Conservation and Management Act (MFCMA). The United States Fish and Wildlife Service (USFWS) online information, planning, and conservation system (IPAC), ADF&G Anadromous Waters Catalog and state endangered species and species of special concern list, and the National Marine Fisheries Service (NMFS) marine mammal species range and critical habitat interactive map were consulted in September 2014 to determine the presence of protected species and habitat within the corridor vicinity.

The MFCMA provides for the conservation and management of the nation's fishery resources through the preparation and implementation of fishery management plans (FMPs). These plans identify essential fish habitat (EFH) and call for EFH impacts to be minimized to the extent practicable. Federal agencies must consult with NMFS on actions that might adversely affect EFH. EFH includes anadromous fish habitat.

There are no federally-listed species, critical habitats, or national wildlife refuges located within the vicinity, although Creamer's Field State Migratory Waterfowl Refuge is located west of the corridor on College Road. The refuge consists of 1,800 acres and is managed by ADF&G.

Several migratory birds of conservation concern may breed in the vicinity, including Arctic tern, lesser yellowlegs, olive-sided flycatcher, rusty blackbird, and solitary sandpiper.

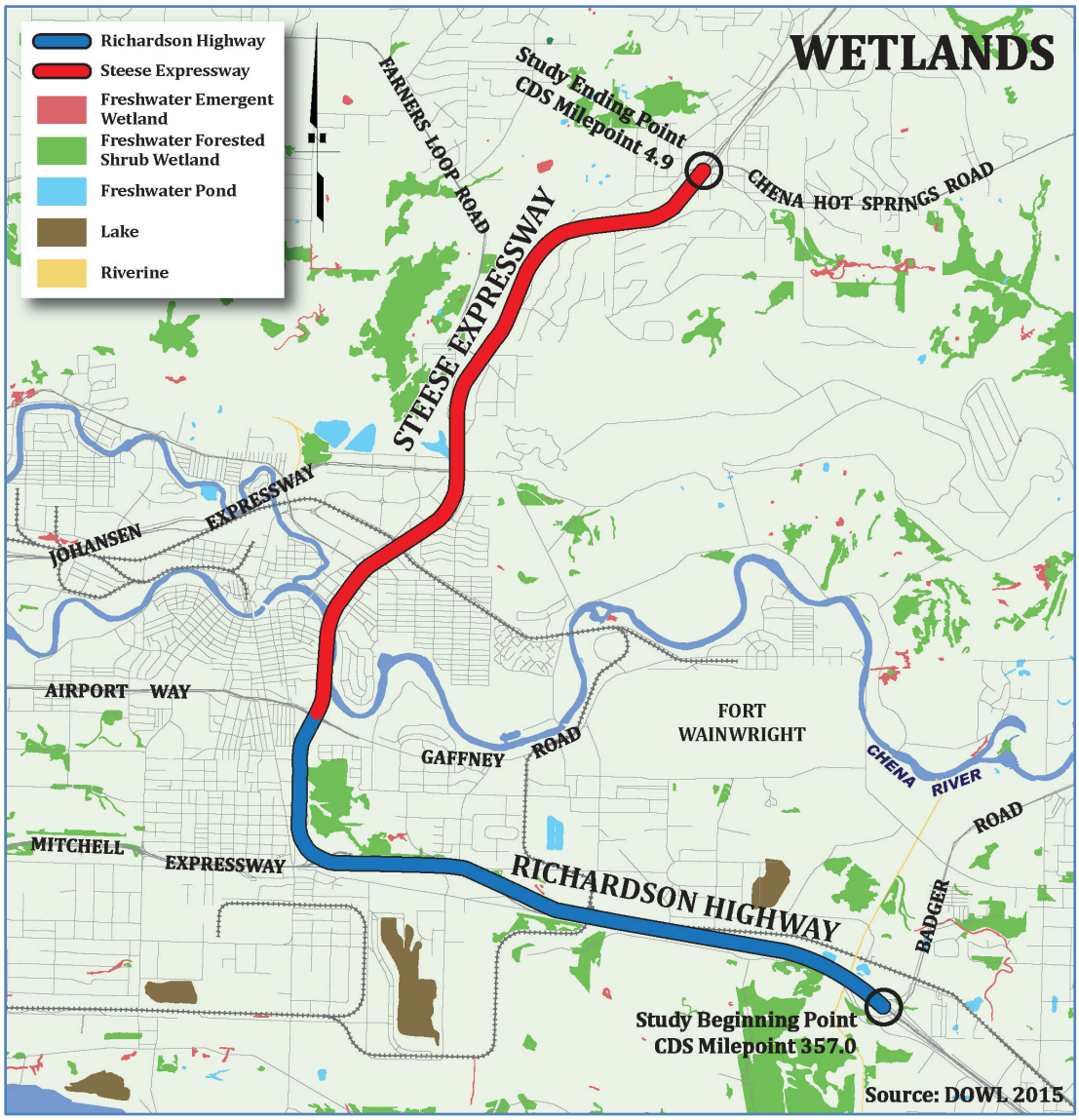
The Chena River and Noyes Slough are known to contain anadromous fish species. Sloughs in the Fairbanks area are important to Arctic grayling spawning and rearing habitat. The Arctic grayling is an important species for sport fishing in Interior Alaska. Because of the increase in urbanization and development along the slough, and resulting increases in sediment loads in these waters, degradation of fish spawning and rearing habitat has occurred (TetraTech, 2011). Construction in the Chena River would require an ADF&G fish habitat permit and an EFH consultation with the NMFS.

2.3.6 Wetlands

Wetland resources are protected under CWA Section 404 and Executive Order 11990 Protection of Wetlands.

The USFWS National Wetlands Inventory was consulted to determine the potential for wetland resources in the corridor vicinity. Figure 5 illustrates wetlands identified in the Fairbanks area, the majority of which are palustrine scrub/shrub and palustrine scrub/shrub emergent mix wetlands mostly occurring in the roadside ditches along the Richardson Highway and west of the Steese Expressway/Farmer's Loop Road intersection.

Figure 5 Wetlands



A wetland conservation area is located along the west side of the Steese Expressway between the Johansen Expressway and Farmers Loop Road Extension incorporating open water and high-value wetlands. This area is under a conservation restriction that prohibits fill and other activities without express permission from the USACE. The USFWS has noted that this area provides important habitat for migratory birds and the rusty blackbird, a State species of concern. FHWA guidance on Section 4(f) indicates that this area may qualify as a Section 4(f) property as it is protected for open space and wildlife habitat. Finally, since this area was used as compensation for other wetland effects, impacts to this area could require additional mitigation and/or compensation for both loss of the compensation for the earlier effects and the effects of the specific road improvement project.

2.3.7 Air Quality

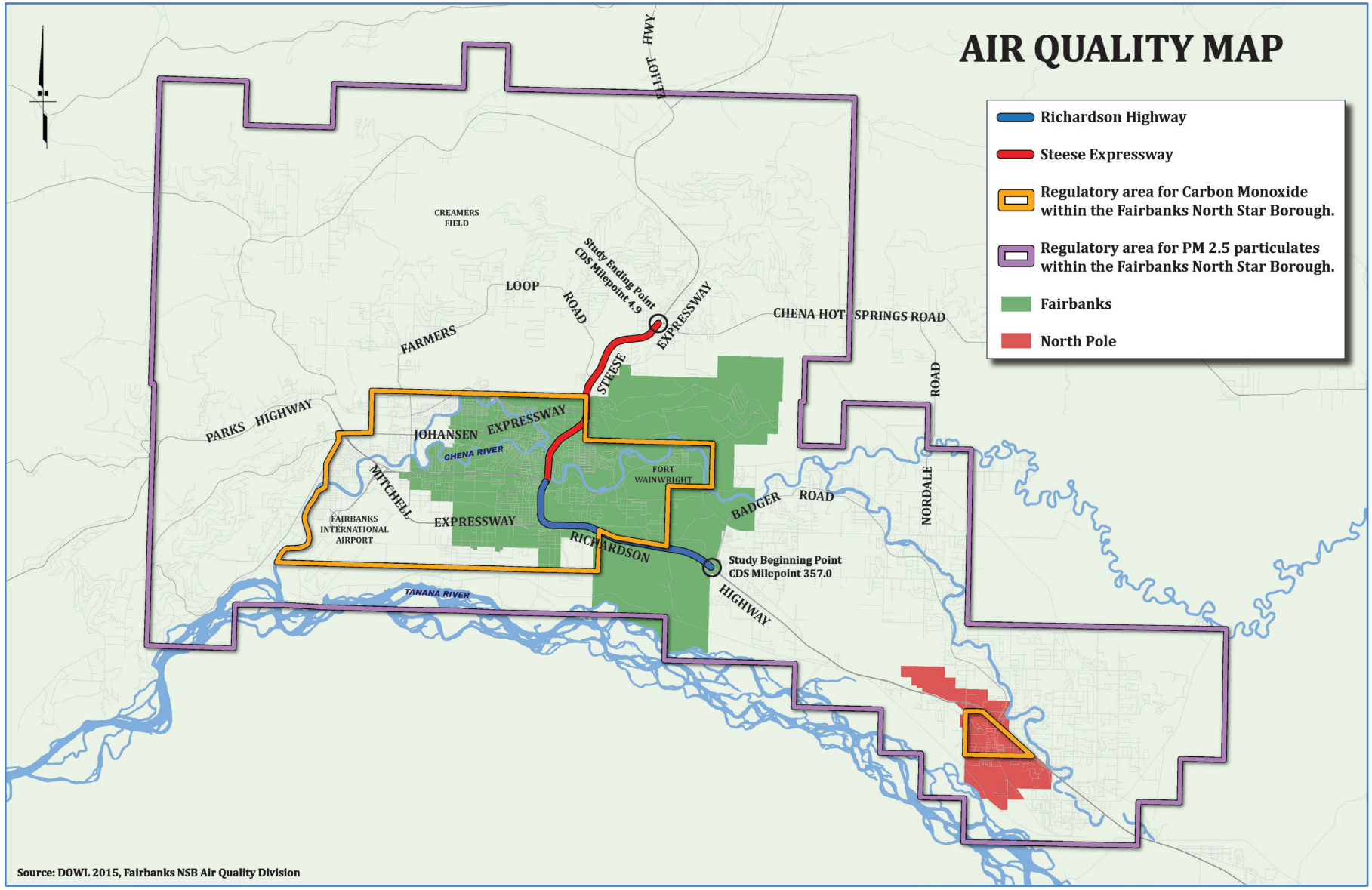
The Clean Air Act (CAA) of 1970 and associated amendments require the USEPA to develop and enforce regulations to protect air quality and reduce air pollution. The USEPA has established national ambient air quality standards (NAAQS) for six criteria pollutants, including carbon monoxide (CO), nitrogen dioxide, ozone, particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide, and lead. USEPA designates areas that do not meet the NAAQS as non-attainment, and classifies them according to their degree of severity. States that fail to attain the NAAQS for any of the criteria pollutants are required to submit state implementation plans that outline actions to improve air quality and achieve compliance with the NAAQS. Non-attainment areas are reclassified as maintenance areas once standards are met. Maintenance plans are developed for these areas to identify actions needed to successfully remain compliant.

A portion of the Fairbanks/North Pole area is designated as a CO maintenance area, and a larger portion has been designated as a $PM_{2.5}$ (fine particulate matter) non-attainment area (Figure 6). The entire corridor is located within the $PM_{2.5}$ non-attainment boundary and a substantial portion within the CO maintenance boundary.

In an effort to ensure that transportation development and improvements do not adversely impact regional air quality, projects listed in the MTP must conform with the transportation control measures (TCMs) of the most recent State Air Quality Implementation Plan (SIP). This is called transportation conformity. Conformity determinations are ultimately made by FHWA and the Federal Transit Administration (FTA). Metropolitan Planning Organizations (MPO) make initial conformity determinations for plans and programs in metropolitan areas. Outside MPO areas, state departments of transportation (DOTs) typically conduct conformity analyses associated with specific projects. FMATS is the designated MPO for the urbanized portion of the FNSB, including the cities of Fairbanks and North Pole, and is responsible for regional transportation planning and conformity analyses.

A conformity determination by an MPO indicates that the total emissions projected for the area's MTP is within the on-road mobile source emissions limits ("budgets") established by the SIP. Transportation control measures must be implemented in a timely fashion and state and local agencies must be consulted on data, modeling, and other issues related to the determination. For project-level conformity, the determination shows that the project is consistent with the regional conformity determination and that potential localized emissions impacts on health-based pollutant standards are addressed.

Figure 6 Air Quality Regulatory Boundaries



Options to control and reduce emissions from motor vehicles come under the category of TCMs. The CAA defines TCMs as actions that may be taken to reduce emissions from mobile sources. In addition, there are other measures such as vehicle controls, fuel-based standards, and inspection and maintenance programs that may also help areas reduce mobile source emissions. CAA Section 108 (F1)(1)(A) TCMs include the following:

- programs for improved public transit;
- restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high-occupancy vehicles (HOV);
- employer-based transportation management plans, including incentives;
- trip-reduction ordinances;
- traffic flow improvement programs that achieve emissions reductions;
- fringe and transportation corridor parking facilities serving multiple-occupancy vehicle programs or transit service;
- programs to limit or restrict vehicle use in downtown areas or other areas of emission concentration particularly during periods of peak use;
- programs for the provision of all forms of high-occupancy, shared-ride services;
- programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place;
- programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas;
- programs to control extended idling of vehicles;
- reducing emissions from extreme cold-start conditions;
- employer-sponsored programs to permit flexible work schedules;
- programs and ordinances to facilitate non-automobile travel, provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel, as part of transportation planning and development efforts of a locality, including programs and ordinances applicable to new shopping centers, special events, and other centers of vehicle activity;
- programs for new construction and major reconstruction of paths, tracks, or areas solely for use by pedestrian or other non-motorized means of transportation when economically feasible and in the public interest; for purposes of this clause, the Administrator shall also consult with the Secretary of the Interior; and
- programs to encourage removal of pre-1980 vehicles.

2.3.8 Noise

Federal regulations (23 CFR 722), Procedures for Abatement of Highway Traffic Noise and Construction Noise, outline criteria for evaluating noise impacts. The regulations require highway agencies to investigate traffic noise impacts for:

- areas adjacent to a proposed highway in a new location, or
- areas adjacent to reconstruction of an existing highway if the reconstruction would significantly change the horizontal or vertical alignment or increase the number of through-traffic lanes.

Per the DOT&PF Noise Policy (DOT&PF, 2011), substantial horizontal and/or vertical alteration of an existing highway, which halves the distance between the traffic noise source and the closest receptor, and/or removes shielding exposing the line of sight between the receptor and the traffic noise source, the addition of through traffic lanes, the addition of auxiliary lanes, the addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange, and/or restriping of existing pavement for the purposes of adding a through-traffic lane would require a traffic noise study to determine if the project would result in an increase in traffic noise levels and reasonable noise abatement measures. If the highway agency identifies impacts, it must consider abatement. Highway agencies must incorporate all feasible and reasonable noise abatement into the project design. Table 1 lists the FHWA noise abatement criteria (NAC), which represent the upper limit of acceptable highway traffic noise for various types of land uses and human activities.

Types of land uses and human activities within the corridor vicinity subject to traffic noise impact analysis include residential developments, cemeteries, places of worship, schools, trails, recreation areas, hotels, offices, and Section 4(f) properties. Residential areas adjacent to the Richardson-Steese corridor would be the most vulnerable to traffic noise impacts. Noise studies may be required as part of the project-level NEPA review for implementation of specific projects.

Table 1 FHWA Activity Categories and Corresponding Noise Abatement Criteria

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

Source: 23 CFR 772, Table 1 – Noise Abatement Criteria.

2.3.9 Floodplains

Executive Order 11988 requires federal agencies to avoid adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. The 100-year floodplain (areas adjacent to waterbody subject to inundation by the 1 percent annual chance flood) of rivers is typically regulated, either through the Federal Emergency Management Agency (FEMA), or a local agency. The FNSB Department of Community Planning administers floodplain development through ordinance by requiring a permit for any development within flood hazard areas or floodways.

Flooding in Alaska is a common, naturally-occurring, but potentially destructive event resulting from unusual precipitation, ice jams, or coastal storm surges. Damage typically is limited to the floodplain of a waterbody, and altering the floodplain or development within the floodplain can exacerbate flood damage.

FEMA maps special flood hazard areas (SFHAs) on flood insurance rate maps (FIRMs). SFHAs are those areas that would be inundated by the flood event that has a 1 percent change of occurring in any given year. These SFHAs include a number of different flood zones, including Zone A and Zone AE. FIRM maps for the area were consulted to determine the extent of floodplains located in the corridor vicinity. The corridor crosses the Chena River floodplain (Zone AE) where the Steese Expressway Bridge spans the Chena River and there are mapped floodplain areas (Zone A) on either side of the Steese Expressway north of the Chena River. There are also Zone A floodplain areas south of the Richardson Highway near the railroad line.

Any work on the Chena River Bridge would require improvements to be constructed within the adopted regulatory floodway of the Chena River. The proposed modification of the Richardson Highway/Old Richardson Highway interchange and railroad grade separation project may require work within a SFHA (Zone A) south of the Richardson Highway. Measures to minimize the impact of transportation development within the floodplain and to restore and preserve the natural and beneficial values served by the floodplains would be fostered during project development and the NEPA process.

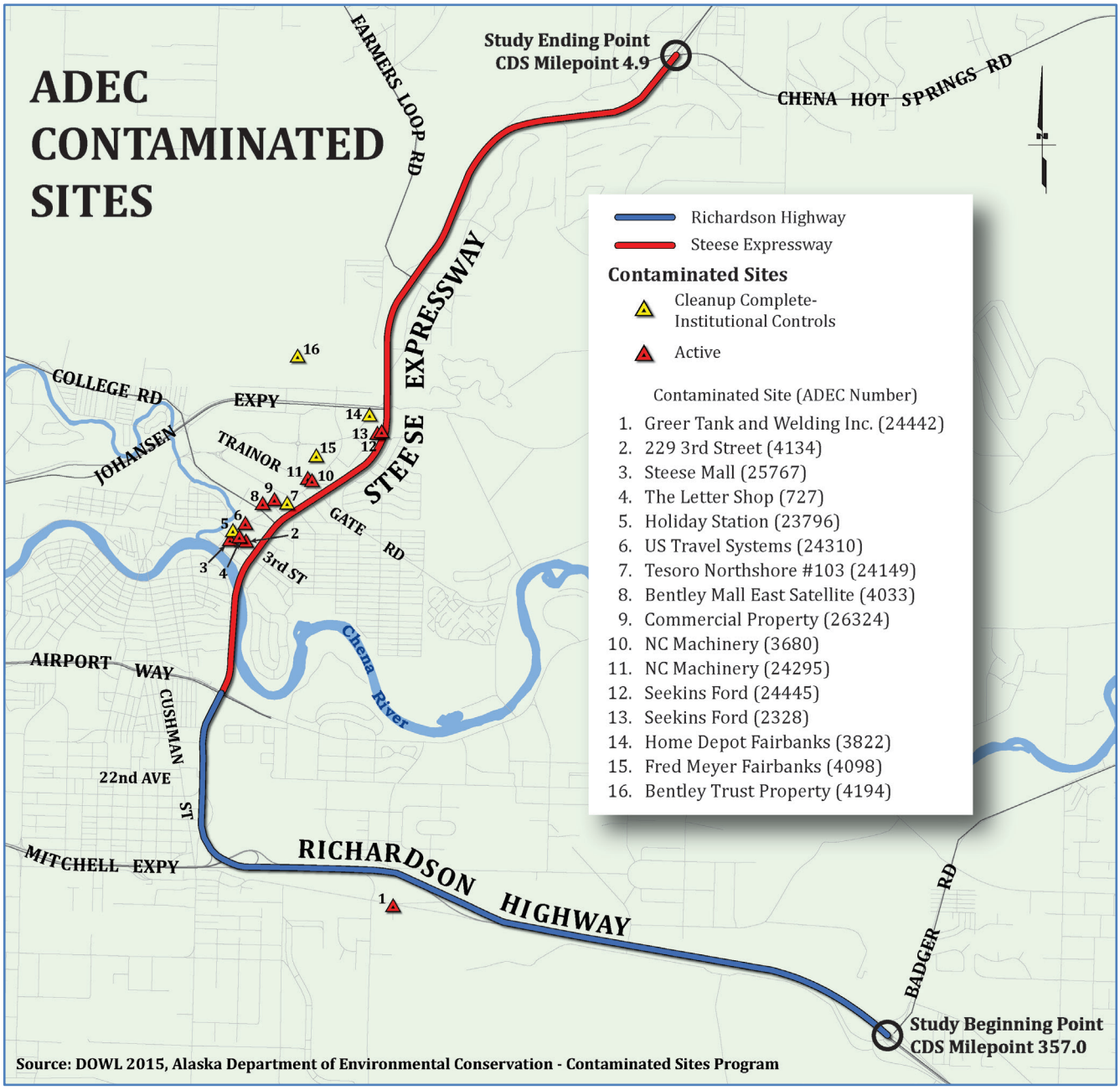
2.3.10 Hazardous Waste and Contaminated Sites

Part of the due diligence for any construction project is to identify potentially-contaminated sites in order to avoid excavating where soil disturbance is prohibited, or to avoid unknowingly subjecting a contractor to hazardous materials. To understand these risks, a search of the ADEC contaminated sites database was conducted to determine the types of contamination documented within 500 feet of the corridor or in the vicinity of proposed improvements to cross streets and intersections (ADEC, 2015). There are 12 active sites and 3 sites with institutional controls (ICs). Active sites and sites with institutional controls usually require coordination with ADEC if construction is on or immediately adjacent to the site boundary.

Active sites are those where contamination is present and it being investigated and/or remediated. ICs on a contaminated site are established to place conditions on site use and to protect people and the environment from exposure to oil and hazardous substances during the cleanup process. ICs may also be implemented when contaminants remain after cleanup is completed to the extent practical. High-risk site IC types include equitable servitudes, conservation easements, and compliance orders. Lower-risk sites may have public informational IC types, including deed notices, ADEC online database notations, and letters to the landowner. Most ICs will have use restrictions and possible monitoring requirements, and these may include soil or groundwater monitoring, groundwater use restrictions, air quality monitoring, maintenance of engineering controls like fencing or asphalt caps, and soil and groundwater removal restrictions.

Figure 7 shows the location of active sites and sites with ICs in the vicinity of the corridor.

Figure 7 Contaminated Sites



2.3.11 Invasive Species

Executive Order 13112 directs federal agencies to prevent introduction of invasive species, to control the spread of these species, and to minimize the harm caused by them. To comply with Executive Order 13112, proposed federal actions (including funding) must include measures to minimize the introduction or spread of invasive species.

Invasive plants are classified as non-native vegetation capable of producing viable offspring in large quantities, coupled with the extraordinary potential to establish and spread in natural regions (University of Alaska Anchorage, 2005). Invasive species typically occur in high-trafficked or disturbed areas, particularly urban centers and transportation corridors. Management and regulation over the establishment and distribution of

invasive and noxious species is critical, as they can destroy indigenous habitat, out-compete less vigorous natural vegetation, and accrue significant financial burdens for land managers to eradicate when restoring affected environments to their natural function.

According to the University of Alaska Exotic Plants Information Clearinghouse, there are at least 20 documented invasive species in the study corridor, with the most common including the common dandelion (*Taraxacum officinale*); narrowleaf hawksbeard (*Crepis tectorum*); common groundsel (*Senecio vulgaris*); and foxtail barley (*Hordeum jubatum*). In September 2010, isolated populations of an aquatic invasive plant, common waterweed (*Elodea canadensis*), were documented in the Chena River.

Precautionary measures to prevent the spread of invasive species include using weed-free or locally-produced erosion control materials, and reseeding all disturbed areas with certified weed-free seed and vegetated with native species in accordance with the ADNR revegetation manual.

2.4 Transportation Context

2.4.1 Roadway Characteristics

Within the study corridor, the Richardson Highway is functionally classified as an Urban Interstate, and the Steese Expressway is classified as Urban Other Principal Arterial. The Richardson-Steese corridor is generally two lanes in each direction divided by a depressed median or raised median barrier. Posted speeds range from 55 miles per hour (mph) within the northern and southern portions of the corridor, to 45 mph between Airport Way and Trainor Gate Road.

Roadway classification relates to the relative level of access and mobility provided by a facility. The term *access* is used to define the ability of motorists to enter or exit the highway to and from adjacent lands and intersecting roadways. Greater levels of access are typically prioritized on collector and local roadways with lower functional classifications. Greater access is accompanied by slower speeds to accommodate safe movements at intersections. The term *mobility* references the efficient movement of traffic along interstate and arterial roadways with higher functional classifications, as indicated by low average delay, higher travel speeds, and minimized travel times for motorized vehicles. Access points and turning movements on high-mobility corridors are discouraged, and priority is given to through movements on the mainline compared to intersecting roadways. Interchanges, frontage roads, and controlled access are characteristic of high-mobility corridors.

Within the Richardson-Steese corridor, access is controlled on both sides of the roadway. Full access control is provided in the southern and northern portions of the corridor, with a stop-controlled intersection at Old Richardson Highway west of the existing railroad crossing, and interchanges at Badger Road, Mitchell Expressway, and Chena Hot Springs Road. A series of seven closely-spaced at-grade signalized intersections occur along the Steese Expressway within the middle portion of the corridor.

Figure 8 illustrates eleven intersecting roadways within the corridor, and provides the intersection type, its functional classification, and NHS status.

Figure 8 Intersections

2.4.2 Right-of-Way (ROW) and Access Management

The ROW of the corridor varies significantly as shown in Figure 9. The Richardson Highway ROW ranges from 260-315 feet along most of the corridor, widening to 1,682 feet at the Airport Way intersection. The Steese Expressway ROW varies from 119 feet to more than 700 feet along most of the corridor. The Steese Expressway ROW is narrowest between the Chena River Bridge and Trainor Gate Road. This also happens to be one of the most developed areas along the corridor with a mixture of residential, commercial and other sensitive land uses (such as cemeteries and parks) as described in Section 2.2.1.

Figure 9 Corridor ROW (Sheet 1)

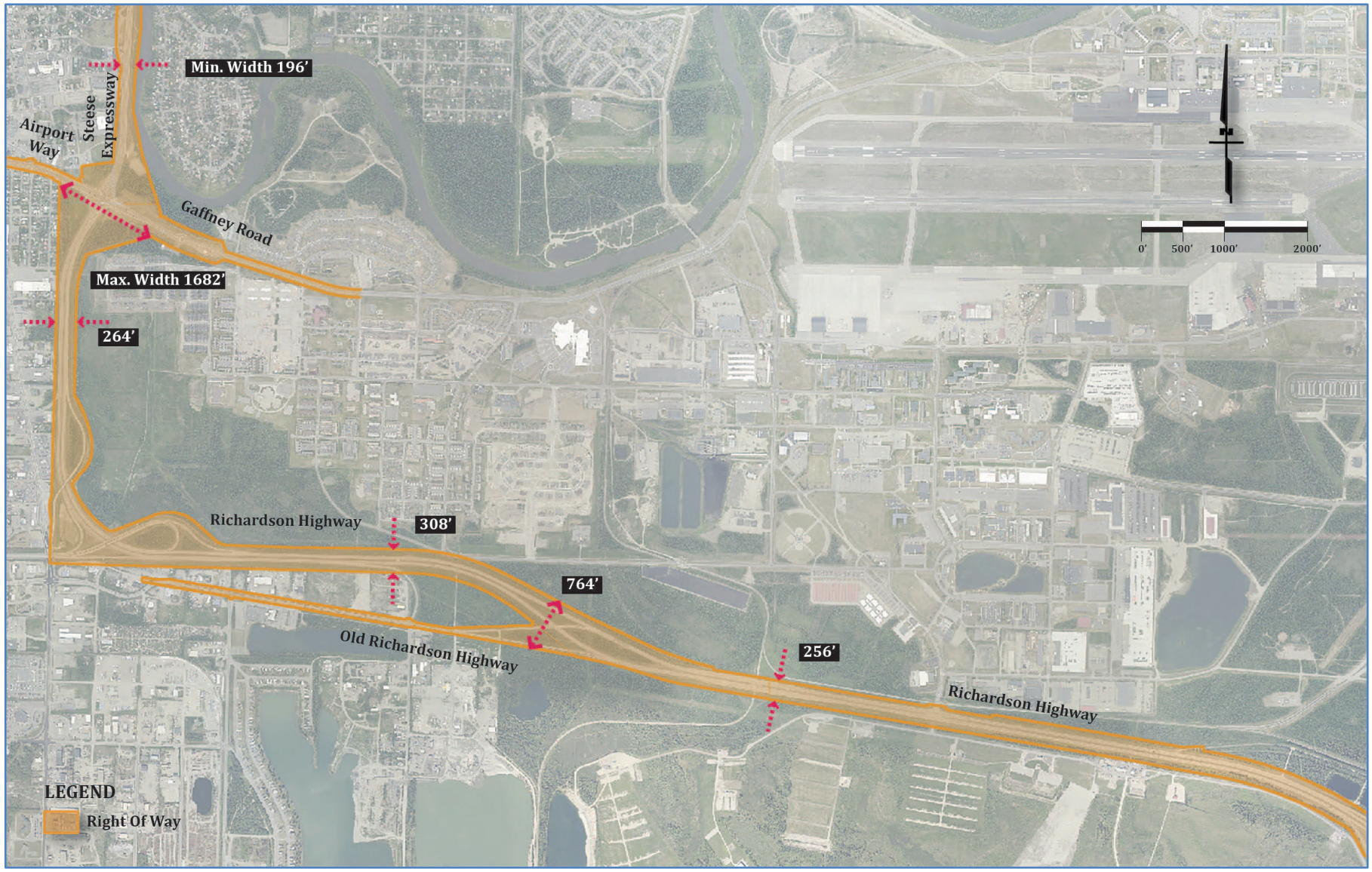


Figure 9 Corridor ROW (Sheet 2)

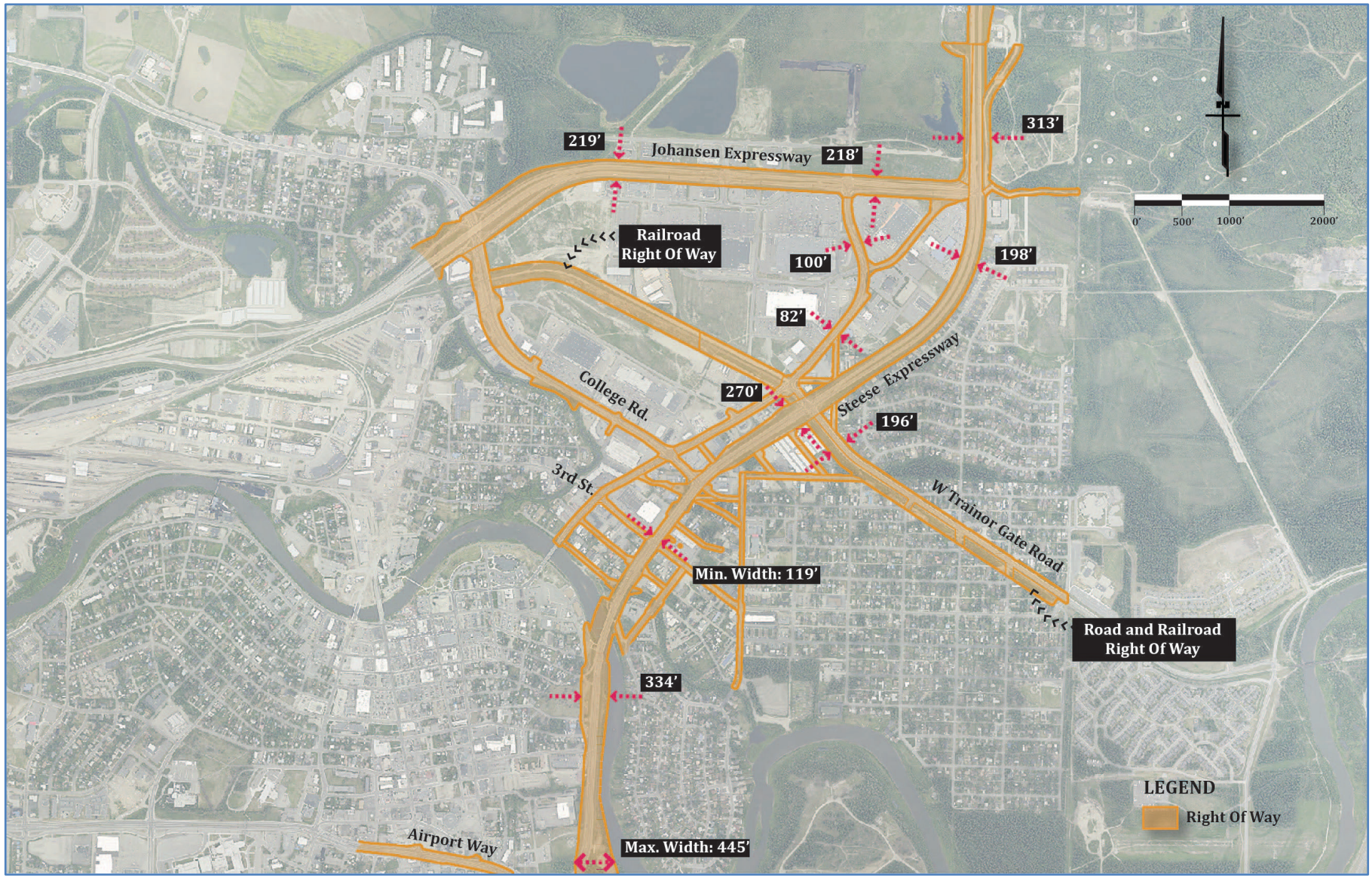
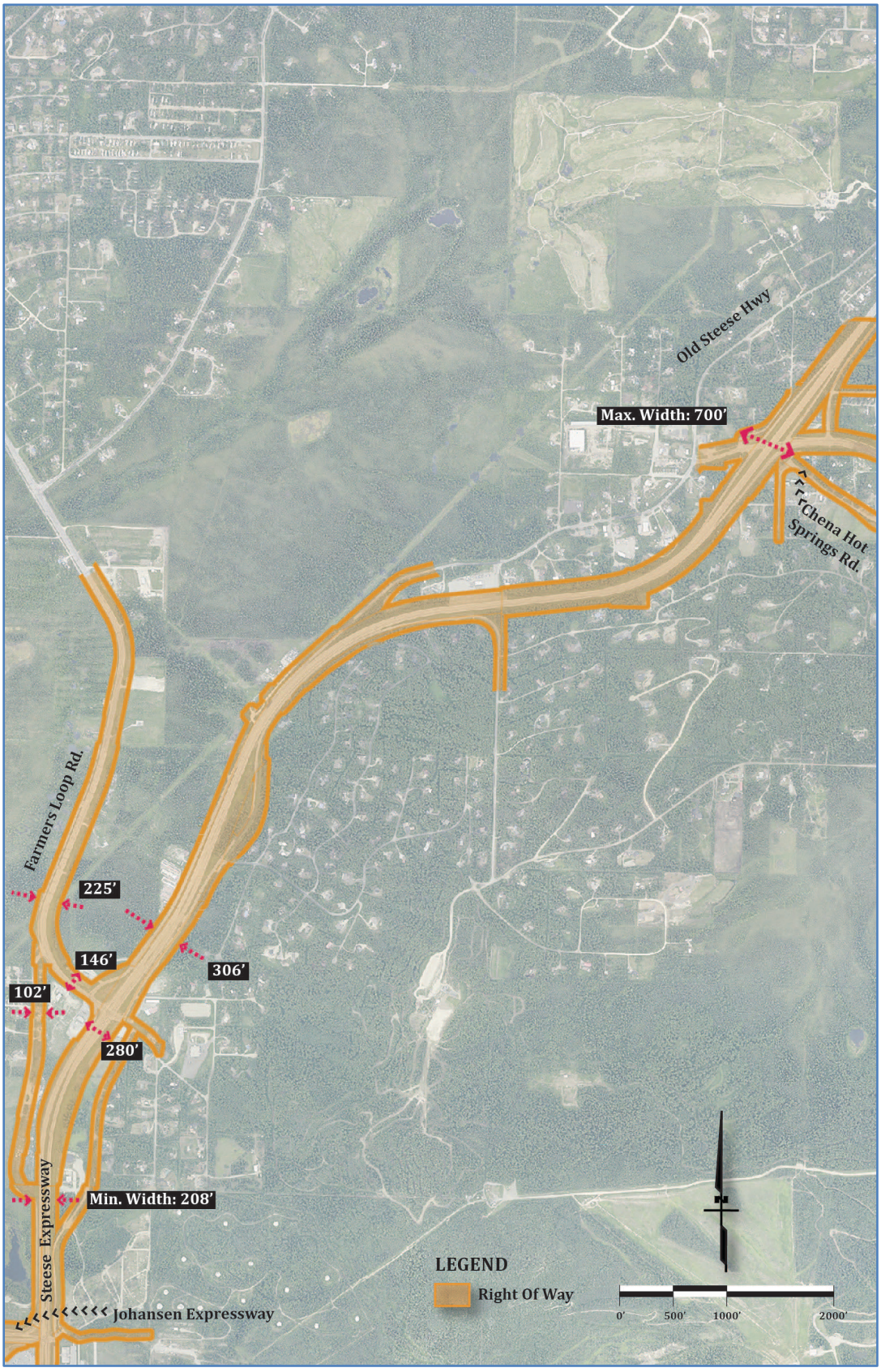
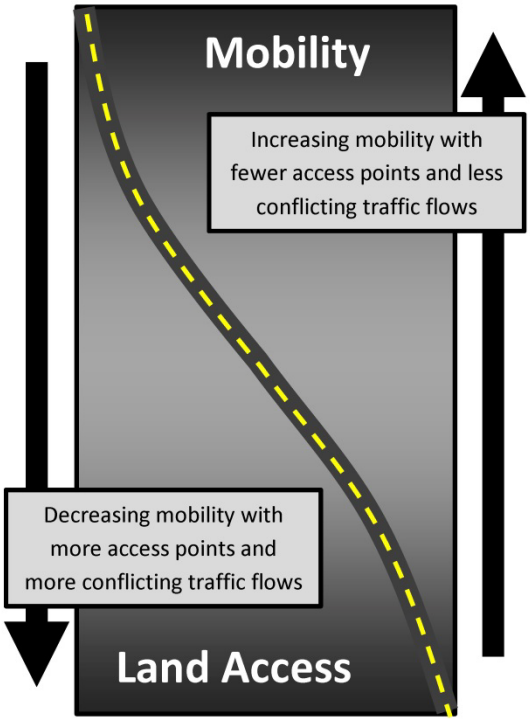


Figure 9 Corridor ROW (Sheet 3)



2.4.3 Access Management

The two primary functions of a transportation facility are mobility and access. Lower level facilities like local roads and side streets provide a high level of access but lower mobility. These roads operate at lower speeds which makes it safer to enter and exit the road from side streets and driveways but results in slower traffic movement. The main function of major transportation facilities, like the Richardson Highway and Steese Expressway, is to move traffic over long distances at high speeds. The ability to move traffic quickly along the corridor decreases as the number of access points onto the corridor increases.



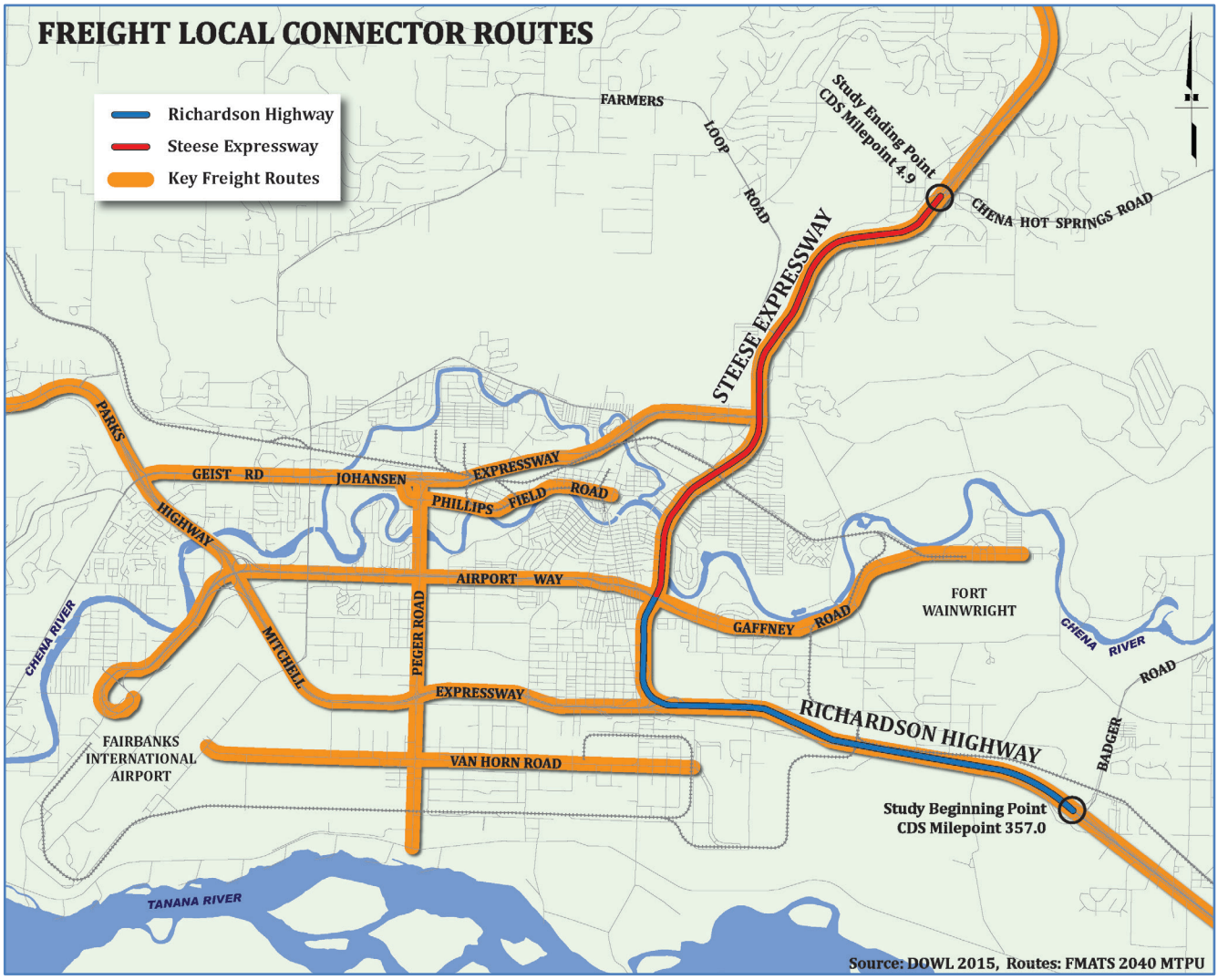
Access control restricts the number of places where vehicles can access these facilities, by limiting driveways and closely-spaced cross roads. Reducing the number of places where vehicles enter the corridor from driveways and side streets reduces the potential for crashes and allows traffic to flow through the corridor without interruption. By controlling access points, the roadway capacity is increased, crashes are reduced, and motorist travel time is shortened.

Access to the corridor is controlled with no direct driveway access. Vehicle access onto the corridor is only provided at the eleven intersections shown in Figure 8. Although there is no driveway access on the corridor, the closely-spaced intersections between Airport Way and Trainor Gate Road continue to increase the crash potential and slow traffic through the central portion of the corridor.

2.4.4 Roadway Users

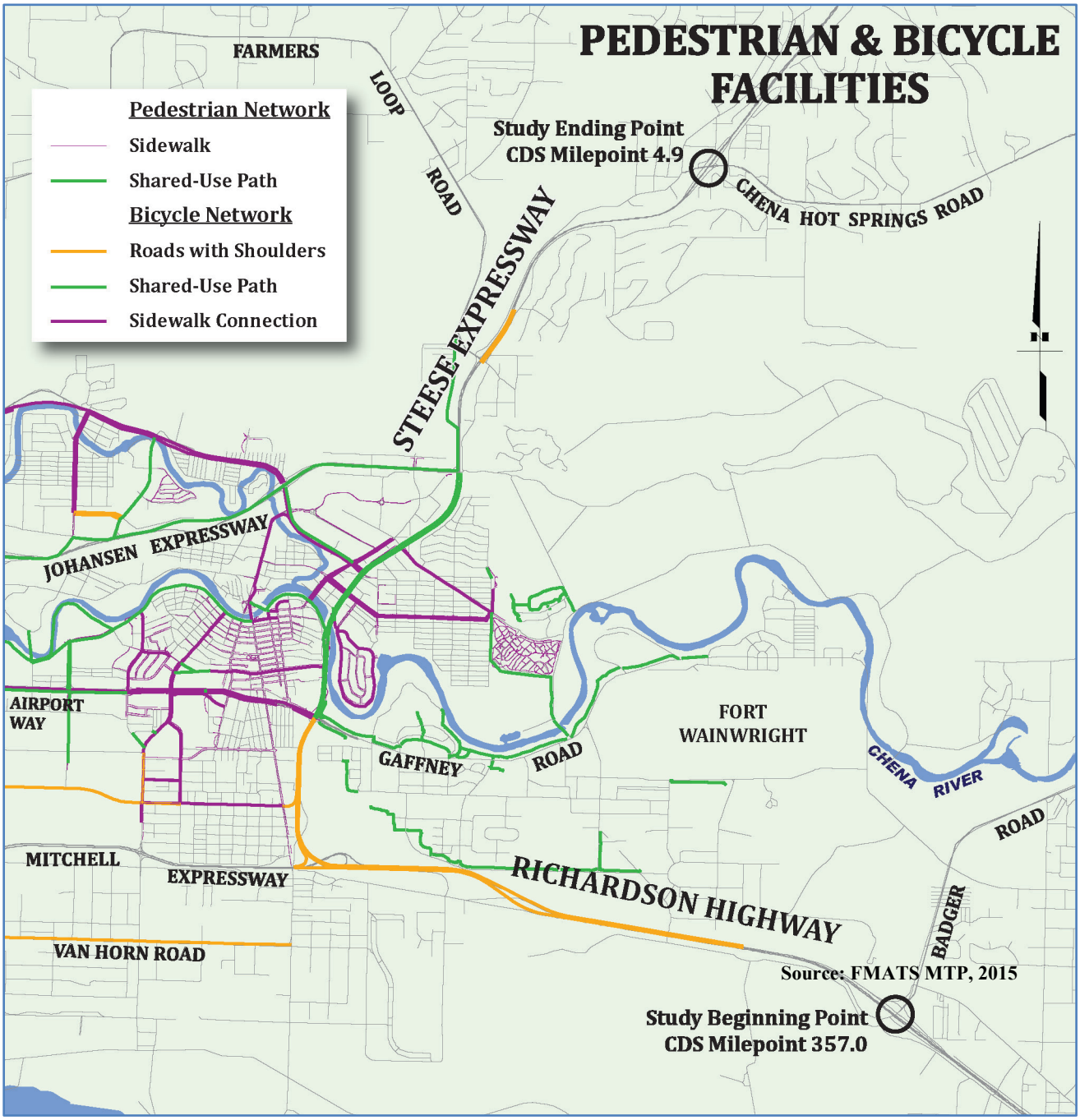
The Richardson-Steese corridor is primarily used by motorized vehicles, with passenger vehicles dominating the traffic stream. Traffic distribution is primarily passenger vehicles (93 percent) with approximately 7 percent heavy vehicles. The Richardson-Steese corridor also serves as a truck route, providing efficient movement of freight between Fairbanks and points north and east. Figure 10 illustrates freight routes within the Fairbanks vicinity. Although only 8 percent of the traffic distribution is comprised of heavy vehicles, the corridor is a critical freight route supporting the oil fields on the North Slope.

Figure 10 Fairbanks Area Freight Routes



A shared pathway runs along both sides of the Steese Expressway from Airport Way to Lazelle Road (FMATS, 2015). Controlled-access security fencing restricts non-motorized corridor crossings to the major signalized cross streets and the riverside trail that crosses under the highway at Chena River. Bicycle/pedestrian facility improvement projects are currently underway from Steese Expressway to Front Street and along Birch Hill Road to provide access to the Birch Hill Recreational Trail System. A future bicycle/pedestrian path is planned on the Richardson Highway from MP 356 to 362. Figure 11 illustrates existing pedestrian and bicycle facilities in the Fairbanks area.

Figure 11 Pedestrian and Bicycle Facilities



2.4.5 Traffic Volumes and Operations

Priority within the corridor is for through traffic to accommodate higher-volume through movements. Peak traffic volumes occur in the morning and evening commute time periods.

Permanent Traffic Recorders

Permanent traffic recorders (PTRs) are located throughout the DOT&PF Northern Region and provide year-round, hourly traffic volume data used to monitor traffic patterns, adjust signal timing, and as input for transportation planning and engineering projects. Two PTRs are located within the corridor, one on the

Richardson Highway near 3 Mile Road and the other on the Steese Expressway at the Chena River Bridge (DOT&PF, 2012b). Several other PTRs are located on roads which feed into the corridor including Badger Loop Road, Airport Way, College Road, Johansen Expressway, and Farmers Loop Road.

Operational Analysis

The Traffic Engineering Report prepared for this corridor study is provided in Appendix A. The traffic analysis evaluated daily intersection turning movements and segment volumes to identify intersection, segment, and total network performance for the years 2015, 2030, and 2040. The effort was based on the TransCAD model developed for the FMATS MTP, with modifications for current land use trends and updated traffic growth patterns. The TransCAD model data for the area surrounding Richardson-Steese corridor was exported into Synchro and SimTraffic to create a more localized traffic model that employs methodology from the Highway Capacity Manual (HCM) (2000-2010) to evaluate intersection and segment operations.

The HCM intersection operation analysis methodology has two key components: average control delay and volume-to-capacity (v/c) ratio. These characteristics are used to define the operational effectiveness of an intersection, which is generally described in terms of level of service (LOS). LOS describes the quality of traffic operations and is graded from A to F, with LOS A representing free-flow conditions and LOS F representing severe congestion with stop-and-go conditions. The DOT&PF standard for acceptable operations is typically LOS C.

Table 2 presents the results of the traffic analysis for the major corridor intersections. The following conclusions can be drawn from these results.

- Morning (AM) peak-hour operations are generally worse than evening (PM) peak-hour operations throughout the corridor.
- The Airport Way, 3rd Street, Trainor Gate Road, and Johansen Expressway intersections currently fail (LOS D or worse) during one or both peak hours of the day.
- With the exception of the 10th Avenue and Badger Road intersections, all of the remaining corridor intersections are expected to fail (LOS D or worse) by 2030 during one or both peak hours of the day.

Table 3 presents the results of the traffic analysis for roadway segments along the corridor.

- Northbound/eastbound segments generally perform better than southbound/westbound segments, with the exception of the 10th Avenue to 3rd Street and College Road to Trainor Gate Road segments.
- The northbound 10th Avenue to 3rd Street, northbound College Road to Trainor Gate Road, southbound Airport Way to 10th Avenue, and southbound 3rd Street to College Road segments currently fail to meet acceptable LOS during one or both the AM and PM peak periods.
- Four to six northbound and southbound segments fail to meet acceptable LOS in 2030 and 2040 during one or both peak periods.

Table 2 Intersection Level of Service

Intersecting Roadway	Level of Service (AM)			Level of Service (PM)		
	2015	2030	2040	2015	2030	2040
Badger Road/WB	❖	❖	❖	❖	❖	❖
Badger Road/EB	❖	❖	❖	❖	❖	❖
Old Richardson Highway	❖	❖	❖	❖	❖	❖
Airport Way	F	F	F	F	F	F
10th Avenue	A	A	A	B	A	B
3rd Street	E	F	F	F	B	D
College Road	B	E	F	C	B	C
Trainor Gate Road	E	F	F	C	D	D
Johansen Expressway	D	D	F	C	D	E
Farmers Loop Road	C	F	F	B	E	E
Chena Hot Springs Road/SB	B	D	F	A	B	C
Chena Hot Springs Road/NB	A	D	E	A	A	A

❖ Approach control incompatible with HCM methodology.
Acceptable LOS is defined as C or better. Unacceptable LOS is defined as D or worse.
LOS determined using Synchro Version 8.0, build 806, revision 61 (8.0.806.61) for 2015 values, and Version 8.0, build 803, revision 743 (8.0.803.743) for 2030 and 2040 values.

Table 3 Segment Level of Service

Segment	Northbound or Eastbound						Southbound or Westbound					
	(AM)			(PM)			(AM)			(PM)		
	2015	2030	2040	2015	2030	2040	2015	2030	2040	2015	2030	2040
Badger Road to Cushman Street	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖	❖
23rd Avenue to Airport Way	C	E	E	C	D	E	❖	❖	❖	❖	❖	❖
Airport Way to 10th Avenue	B	B	B	C	B	C	F	F	F	F	F	F
10th Avenue to 3rd Street	D	D	D	F	C	D	B	A	B	C	B	B
3rd Street to College Road	C	D	D	C	C	D	F	F	F	F	F	E
College Road to Trainor Gate Road	F	E	E	C	E	E	C	F	F	E	D	E
Trainor Gate Road to Johansen Expressway	A	B	B	C	B	C	C	D	F	C	C	C
Johansen Expressway to Farmers Loop Rd.	A	A	A	A	A	A	B	F	F	B	D	E
Farmers Loop Rd. to Chena Hot Springs Rd.	❖	❖	❖	❖	❖	❖	A	C	D	A	A	A

❖ Approach control incompatible with Highway Capacity Manual methodology.
Acceptable LOS is defined as C or better. Unacceptable LOS is defined as D or worse. LOS determined using Synchro Version 8.0, build 806, revision 61 (8.0.806.61) for 2015 values, and Version 8.0, build 803, revision 743 (8.0.803.743) for 2030 and 2040 values.

2.4.6 Roadway Geometry and Other Corridor Features

Roadway Geometry

The Richardson-Steese corridor is generally two lanes in each direction divided by a depressed median or raised median barrier. Auxiliary lanes (including interstate merge/diverge ramps and right/left-turn lanes for at-grade intersections) are provided throughout the corridor. For a short stretch beyond the corridor limits, both highways transition to a freeway-type facility with full access control and interchanges, before transitioning again to a rural cross section.

Utilities and Highway Lighting

Overhead utilities are generally out of the clear zone and occur along the south side of Richardson Highway and intermittently along the west and east sides of Steese Expressway. Appendix B contains utility system maps consulted for this study. The following utilities are present within the corridor.

- Fairbanks Natural Gas (FNG) provides natural gas service to some portions of the Fairbanks urban area. Its pipes cross the Richardson-Steese corridor near the Steese Expressway/Airport Way, Steese Expressway/College Road and Steese/Johansen Expressways intersections.
- Golden Valley Electric Association (GVEA) provides electric service within the corridor, and its power lines run along alternating sides of the corridor, crossing the corridor in multiple locations.
- GCI provides voice, video, and data communication services within the corridor. Its fiber optics cable lines parallel much of the corridor, and cross the roadway in multiple locations.
- Alaska Communications provides telecommunication services within the corridor. Its service lines run along alternating sides of the corridor, crossing the corridor in multiple locations.
- AT&T Alascom trunk lines occur in the corridor. The AT&T main office is located on the corner of Airport Way/Steese Expressway.
- Golden Heart Utilities (formerly Fairbanks Municipal Utilities System) water and sewer facilities cross and run longitudinal between Airport Way and Johansen Expressway. A water pump station is located at the corner of College Road/Steese Expressway.
- Interior Gas Utility (IGU) is proposing to construct a natural gas transmission line likely to parallel the Richardson Highway portion of the corridor.
- A U.S. Army communications duct bank crosses the corridor at Airport Way.

Highway lighting is provided intermittently in the northern and southern portions of the corridor, with continuous lighting provided in the portion of the corridor characterized by signalized intersections, specifically from Mitchell Expressway to College Road. Intersection lighting is provided at Trainor Gate Road, Johansen Expressway, and Farmers Loop Road.

Drainage

The northern and southern portions of the corridor are characterized by a rural cross section, and roadway runoff generally drains to roadside ditches, vegetated areas along the roadway, and vegetated swales between the divided driving lanes. Culverts and intermittent catch basins convey drainage in some locations.

The middle portion of the corridor exhibits an urban cross section, with curb and gutter generally on both sides of the highway and around the median, and storm drains on the east side of the roadway. The storm drain system outfalls primarily to the Chena River and Noyes Slough and is permitted under APDES permit (AKS-053406).

Roadside Safety Measures

Access control fencing is provided throughout the majority of the corridor, and guardrail is provided intermittently. Shoulder rumble strips occur in the southern portion of the corridor from the beginning of the corridor at MP 357.0 to approximate MP 359.5 just west of the railroad crossing (see railroad facilities illustrated in Figure 3), and in the northern portion of the corridor from approximate MP 2.1 north of Johansen Expressway to the end of the corridor at MP 4.9. Warning flasher signs are located on the south end of the

Steese Expressway at Airport Road and farther north in the corridor at Farmers Loop Road to alert motorists that they are approaching signalized intersections. A flashing speed feedback sign is located on the Steese Expressway near Trainor Gate Road.

Rail Facilities

The northern terminus of the ARRC main line is at Eielson AFB, east of Fairbanks. ARRC has a rail yard and depot in Fairbanks located west of the Steese Expressway off the Johansen Expressway. As noted in Table 4, there are two at-grade rail crossings in the study corridor: 1) a spur crossing of the Richardson Highway south of Fort Wainwright at approximate MP 359.2 that provides access to the mainline from industrial areas south of the highway, and 2) a mainline crossing near Trainor Gate Road at approximate MP 1.35 (see Figure 3).

Table 4 Rail Crossings

Crossing Number	Crossing Name	Railroad MP	Highway MP	Crossing Type	Crossing Protection	Daily Train Movements
868428J	Richardson Highway	H0.20	359.2	Gated	Reflective cross bucks, gates	2
868296B	Steese Expressway	G1.92	1.35	Active	Reflective cross bucks	6-10

The railroad gates are typically down for less than 10 minutes during each train crossing and approximately half of the Steese Expressway train movements occur at night. The railroad signal control equipment is coordinated with the traffic signals on the Steese Expressway. ARRC provides DOT&PF a connection from the railroad signal control box for DOT&PF's use in programing the traffic signals to preempt the normal signal sequence when a train is approaching.

Structures

Table 5 lists bridges and culverts located within the corridor and the locations are shown on Figure 12. There are five prestressed concrete deck bulb (i.e., tee beam) bridges, one steel stringer/girder bridge, and three sets of steel culverts. Three of the bridges (Numbers 1912, 1707, and 1706) are overcrossing structures conveying an intersecting route over the Richardson Highway in the vicinity of Mitchell Expressway. The remaining three bridges carry the Richardson Highway and Steese Expressway over intersecting roadways and the Chena River. The structures range in age from 13 to 38 years, and range from 50-foot-long culverts to the 579-foot-long bridge crossing the Chena River.

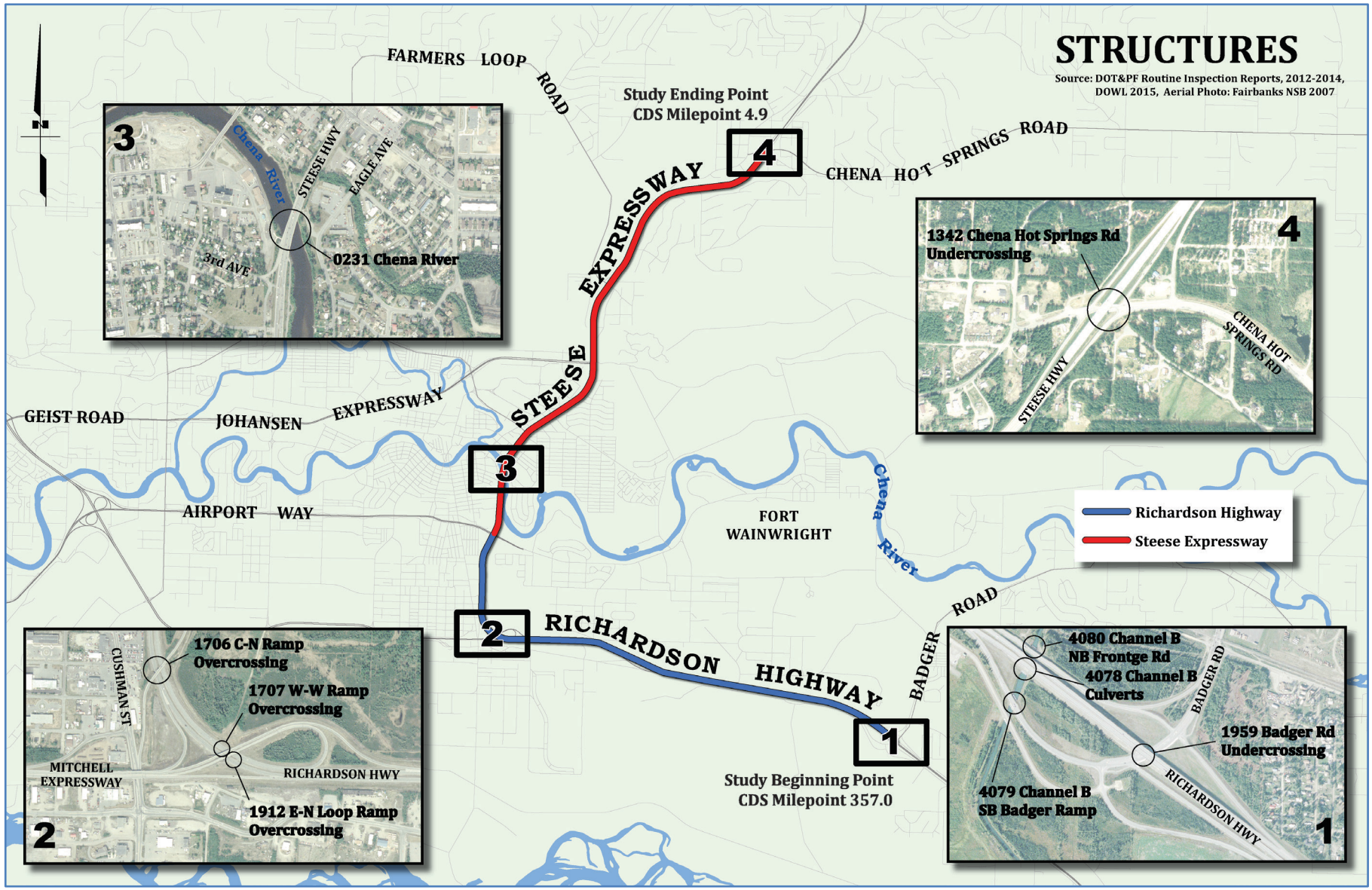
Of the 18 rated bridge elements (including deck, superstructure, and substructure condition for each bridge), 14 elements are in very good or good condition and 4 elements are rated satisfactory or fair.

Table 5 Structures

Bridge Number	Description	CDS Route Name and Number	CDS MP	Year Built	Length (feet)	Width (feet)	Lanes On Structure	Lanes Under Structure	Main Span Material/Design	Deck Condition[c]	Superstructure Condition[c]	Substructure Condition[c]
1959	Badger Road Undercrossing	Richardson Highway 190000	355.4	2002	140.0	79.3	4	4	Prestressed Concrete Tee Beam	Very Good (7-9)	Very Good (7-9)	Very Good (7-9)
4078	Channel B Culverts	Richardson Highway 190000	360.7	2002	50.0	[a]	4	0	Steel Culvert	NA	NA	NA
4079	Channel B SB Badger Ramp			2002	50.0	[a]	1	0	Steel Culvert	NA	NA	NA
4080	Channel B NB Frontage Road			2002	50.0	[a]	1	0	Steel Culvert	NA	NA	NA
1912	E-N Loop Ramp Overcrossing	Parks Highway 170123	0.1	1994	173.0	24.9	1	4	Prestressed Concrete Tee Beam	Very Good (7-9)	Fair (5-6)	Satisfactory (5-6)
1707	W-W Ramp Overcrossing	Parks Highway 170122	0.4	1988	174.9	24.9	1	4	Prestressed Concrete Tee Beam	Very Good (7-9)	Satisfactory (5-6)	Very Good (7-9)
1706	C-N Ramp Overcrossing	Mitchell Expressway 18013	0.1	1988	161.1	24.6	1	4	Prestressed Concrete Tee Beam	Very Good (7-9)	Very Good (7-9)	Good (7-9)
0231	Chena River	Steese Highway 150000	0.6	1977	579.1	85.6	4	0	Steel Stringer/ Girder	Good (7-9)	Good (7-9)	Good (7-9)
1342	Chena Hot Springs Undercrossing	Steese Highway 150000	4.8	1978	104.0	79.7	4[b]	2	Prestressed Concrete Tee Beam	Satisfactory (5-6)	Good (7-9)	Good (7-9)

Source: DOT&PF Routine Inspection Reports, 2012-2014. NA: Not applicable. [a] Unknown widths (not identified on inspection reports). [b] Chena Hot Springs Undercrossing structure is a four-lane bridge (which is not reflected in 2012 inspection report). [c] Per the 2013 Alaska Bridge Report, DOT&PF classifies the condition of Alaska bridges using numerical rankings (7-9=good; 5-6=fair; 0-4=poor). Bridges in the good condition category may have minor problems that can be addressed with preservation or maintenance practices. Bridges in the fair condition category are structurally sound, but show minor deterioration, cracking, spalling, or scour that can be corrected through repair. Bridges in the poor condition category show advanced deterioration, may not be structurally sound, and are candidates for rehabilitation or replacement and may require weight or lane restrictions.

Figure 12 Structures



2.4.7 Crash History

Crash data for the corridor were obtained from the DOT&PF Northern Region for 2008 through 2012, and a safety analysis of crash frequency and crash severity was completed for nine intersections. Frequency references the number of crashes for a given location within a specified time period. Severity relates to fatalities, injuries, and property damage associated with each crash. Of the 500 total crashes occurring within the 2008-2012 data analysis period, approximately 71 percent resulted in property damage, 26 percent resulted in minor injury, 2 percent resulted in major injury, and 0.4 percent (two crashes) resulted in a fatality (Table 6). DOT&PF continues to monitor crash data, and is aware of additional fatalities that have occurred within the study area in more recent years. The analysis for this PEL study predated the most recent fatal crashes.

Table 6 Crash Severity at Intersection (2008-2012)

Intersecting Roadway	Severity				TOTAL	Total Entering ADT (5-year Average)	Intersection Crash Rate	Statewide Average Crash Rate
	Fatality	Major injury	Minor injury	Property Damage				
Old Richardson Highway	0	0	0	0	**0**	13,290	0.00	0.47
Airport Way	0	1	26	66	**93**	38,826	1.31	1.47
10th Street	0	1	15	22	**38**	28,042	0.74	1.01
3rd Street	0	3	29	90	**122**	35,046	1.91	1.47
College Road	1	2	15	70	**88**	31,125	1.55	1.47
Trainor Gate Road	0	1	20	50	**71**	24,000	1.62	1.47
Johansen Expressway	1	1	12	30	**44**	28,186	0.86	1.47
Farmers Loop Road	0	2	11	22	**35**	21,581	0.89	1.47
Chena Hot Springs NB Ramps	0	0	1	3	**4**	11,546	0.19	0.47
Chena Hot Springs SB Ramps	0	1	2	2	**5**	5,237	0.52	0.47
TOTAL	**2**	**12**	**131**	**355**	**500**			
Percentage	**0.4%**	**2.4%**	**26.2%**	**71.0%**	**100%**			

Source: DOT&PF, 2015b. ADT: Average Daily Traffic. Highlighted cells indicate intersection crash rates that are greater than statewide average crash rates.

The greatest number of crashes occurred at the signalized intersections in the middle portion of the corridor. The majority occurred at 3rd Street, Airport Way, College Road, and Trainor Gate Road (with 122, 93, 88, and 71 crashes, respectively).

Table 6 presents a comparison between the crash rate for intersections within the study corridor and the statewide average crash rate for similar intersections. The crash rate provides an effective tool to measure the relative safety at a particular intersection. Intersection crash rate is calculated as the ratio of crash frequency (i.e., crashes per year) to vehicle exposure (i.e., the number of vehicles entering the intersection). By considering traffic volumes at an intersection, the crash rate provides an objective measure to compare similar intersections. A higher crash rate indicates a greater relative safety issue. Table 6 indicates that four of the study intersections have higher crash rates than the statewide average crash rate for similar facilities, with rates approximately 5 to 30 percent higher than the statewide average (see highlighted cells). The 3rd Street intersection has the highest crash rate in the study corridor, followed by Trainor Gate Road and College Road.

The crash summary also illustrates the safety benefits of interchanges in comparison to at-grade signalized intersections.

One of the emphasis areas in the 2013 Alaska Strategic Highway Safety Plan (SHSP) is to reduce fatalities and serious injuries resulting from intersection-related roadway crashes (DOT&PF, 2012c). The SHSP identifies implementation of infrastructure projects as a key action to address the number and severity of intersection crashes. It notes that appropriate access management and intersection control are effective measures to improve safety performance at intersections. A separate emphasis area focuses on reducing fatalities, serious injuries, and hospitalizations for bicyclists and pedestrians. Appropriate bicycle and pedestrian facilities can reduce conflicts, increase mobility, reduce congestion, and improve service and safety for all modes. This PEL study was conducted to assist DOT&PF in achieving crash-reduction goals identified in the SHSP.

2.4.8 Identified Improvement Projects

Several projects in the corridor vicinity are currently identified in the FMATS 2040 MTP, including some that were identified as part of this PEL corridor study (Table 7). Inclusion in these plans doesn't guarantee funding, but represents an intention to construct these projects, consistent with current needs, priorities, and funding. Relevant non-FMATS projects are also included in Table 7.

Table 7 Projects in Corridor Vicinity in FMATS 2040 MTP

Project Timeframe	Project Name	Project Number	Project Description
Short Range Projects	Richardson Highway MP 356-362 Bicycle/ Pedestrian Path	Non-FMATS; Short range project #56	Construct a paved bicycle/pedestrian path on the Richardson Highway at MP 356-362, starting from the Richardson Highway/Airport Way intersection, continuing along the Richardson Highway to the Badger Loop North Bound Ramp, and terminating at the Badger Road/Old Richardson Highway intersection.
	Richardson Highway MP 359 Railroad Overpass	Non-FMATS; Short range project #42	Construct a grade-separated crossing at MP 359 of the Richardson Highway and a pedestrian underpass east of the railroad crossing.
	Steese Highway and 3rd Street Widening	Non-FMATS; Short range project #40	Major upgrade of Steese Expressway and 3rd Street intersection and reconstruction of 3rd Street.
	Old Steese Highway – Second Street to Trainor Gate Road	Short range project #1	Widening of Old Steese Highway and new pedestrian facilities on both sides of road.
	Wendell Avenue Bridge	Non-FMATS; Short range project #54	Rehabilitate or replace Wendell Avenue Bridge, widen sidewalks and provide pedestrian/bicycle access from Graehl Park to the bridge along the north side and to existing facilities on the south side.
	Steese Expressway to Front Street Bicycle/Pedestrian Path	Short range project #18	Construct a bicycle/pedestrian path from the Steese Expressway separated path to Front Street.
	Birch Hill Bicycle and Pedestrian Facility	Short range project #19	Construct a bicycle/pedestrian path along Birch Hill Road to allow safe access to the Birch Hill Recreational Trail System.

Project Timeframe	Project Name	Project Number	Project Description
Short Range Projects	Steese Expressway/Chena Hot Springs Road Ramp Termini Roundabouts	Non-FMATS; Short range project #41	Construct roundabouts at the interchange ramp termini for Steese Expressway at Chena Hot Springs Road.
Medium Range Projects	Airport Way Interchange and 10th Avenue Frontage Road	Non-FMATS; Medium range project #34	Construct an interchange at Airport Way and Steese Expressway. Remove the signalized intersection at Steese Expressway and 10th Avenue and construct a frontage road from 10th Avenue to the Airport Way/Steese Expressway Interchange.
	College Road and 3rd Street Improvements	Non-FMATS; Medium range project #33	Evaluation and construction of capacity and safety improvements between University Avenue and Old Steese Highway.
	Steese Highway/ Johansen Expressway	Non-FMATS; Medium range project #44	Investigate potential improvements to make this signalized intersection crossing better for non-motorized users.
	Johansen/Steese Expressways Interchange at Steese Expressway	Non-FMATS; Medium range project #32	Construct grade-separated interchange at Johansen/Steese Expressways intersection and realign adjacent accesses as needed to accommodate the interchange.
	Farmers Loop-Chena Hot Springs Road Trail Connection	Non-FMATS; Medium range project #41	Construct a shared use path between Farmers Loop Road and Chena Hot Springs Road. This will connect the Farmers Loop Bicycle / Pedestrian Facility to the Chena Hot Springs multi-use trail
Long Range Projects	Old Richardson Highway Interchange	Non-FMATS; Long range project #29	Construct an interchange at Richardson Highway and Old Richardson Highway. This may include additional access to Fort Wainwright.
	Trainor Gate Road Grade-Separated Facility	Non-FMATS; Long range project #33	Remove 4-way intersection at Trainor Gate Road and Steese Expressway and construct a one-way access ramp between Steese Expressway and Old Steese Highway. Construct a frontage road connecting Trainor Gate Road to Hamilton Avenue and 3rd Street. Remove west leg of Trainor Gate Road intersection of Old Steese Highway. Construct grade-separated railroad crossings near the Steese Expressway and Old Steese Highway intersections and a grade-separated pedestrian crossing over Steese Expressway.
	Old Steese Highway/Farmers Loop Road	Long range project #15	Investigate potential to improve intersection crossing for non-motorized users.
	Farmers Loop Road Interchange at Steese Expressway	Non-FMATS; Long range project #28	Construct grade-separated interchange at Farmers Loop/Steese Expressway intersection. Realign adjacent accesses as needed to accommodate interchange.

Source: FMATS, 2015; DOT&PF, 2015c.

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3.0 STAKEHOLDER AND PUBLIC COORDINATION

Outreach efforts throughout the development of the PEL study have included coordination with the general public, as well as key stakeholders and resource agencies. Details of the outreach effort are discussed below. Meeting notes and documentation are included in Appendix C.

Initially a total of 30 potential improvements along the corridor were presented for public, stakeholder, and agency consideration. Multiple possible alternative solutions were identified at various locations, resulting in a large number of potential improvement scenarios. As the outreach process evolved, it was apparent that the project goals and objectives were not clear for the stakeholders to effectively evaluate alternatives and provide meaningful input. To resolve this issue, the project goals were re-evaluated and improvement alternatives were grouped into three corridor concepts prioritizing varying levels of traffic mobility and roadway access. Concept 1 prioritized mobility over access, Concept 2 attempted to balance mobility and access, and Concept 3 prioritized access over mobility. These corridor concepts form the basis for the PEL study and are described in greater detail in later chapters.

3.1 Agency Scoping

Preliminary environmental scoping letters were sent to resource and other agencies in February 2012 requesting information on environmental resources in the corridor vicinity as well as other input on community and economic goals. Follow-up scoping letters were sent in February 2014, when more information was available on improvement concepts and potential environmental resource effects. Agencies were asked to provide information on known environmental resources or issues of concern that should be considered in the study and for other relevant input. Agencies were also invited to participate in the open houses and workshops throughout the study development.

Scoping comments were typically specific to the resources under the jurisdiction of each responding agency. Some of the comments and concerns expressed through agency scoping are noted below. More detailed information on the scoping process is included in Appendix C.

FNSB Community Planning

- The area immediately adjacent to the Steese Expressway from the Chena River to the Johansen Expressway is one of a few designated “urban preferred commercial areas” in the FNSB; highway access to this area should be maintained.
- Private property rights were heavily emphasized in the FNSB Comprehensive Plan and should be considered during project development; ROW acquisition from private owners should be minimized.
- Aesthetics of road corridors should be considered and features such as jersey barriers and chain link fences should be limited or avoided.
- Accommodations for pedestrians and bicyclists are emphasized in the FNSB Comprehensive Plan. Accommodations across the corridor for pedestrians and bicyclists are needed to provide access to residential and commercial developments on the east and west sides of the Richardson-Steese corridor.

City of Fairbanks

- Additional information on ROW acquisition is needed, including whether takes would be partial or full and whether ROW acquisition would affect private or public lands.
- The Chena River is no longer impaired by petroleum hydrocarbons and does not have a TMDL.
- There are no industrial operations or properties between Airport Way and Johansen Expressway and the only military infrastructure in this area is the entrance gate to Fort Wainwright.
- More information is needed on the number of lanes to be added, utility modifications, access controls, and improvement footprints.

USFWS

- There are no threatened or endangered species in the project area.
- There is an eagle nest located within 2.5 miles of the corridor.
- Impacts to or fragmentation of the high-value wetlands and bird habitat near the northwest corner of Steese Expressway and Johansen Expressway should be avoided.
- Land clearing should be avoided during migratory bird nesting season.

Fort Wainwright

- Consider the need for pedestrian access to the small arms complex south of the Richardson Highway when evaluating improvements in this area.
- Improved access across Richardson Highway can reduce travel time for military vehicles accessing the small arms complex and increase pedestrian access, reducing vehicle emissions.
- Some schools are located on federal lands at Fort Wainwright.
- Fort Wainwright has mapping of wetlands and watercourses on military lands.
- There are strict storm water runoff requirements for federal land development and copies of storm water pollution prevention plans for projects should be provided to Fort Wainwright.
- There is an Executive Order that prohibits federal agencies from carrying out activities that promote the introduction or spread of invasive species.

3.2 Public Open House Meetings

Three open-house public meetings were held to share study information and gather input from the public. Public meetings were advertised in the Fairbanks Daily News-Miner, on the DOT&PF Northern Region Facebook page, and on the KUAC Community Events online calendar. Meeting information was also distributed to the FMATS Policy Committee, Technical Committee, and support staff.

A study website containing graphics, frequently asked questions, meeting information, public comment summaries, and preliminary environmental impacts analyses was hosted by DOT&PF Northern Region (www.dot.alaska.gov/nreg/richardson-steese). This website was updated with graphics, presentations, and related documents after each PEL workshop or public meeting.

The first open house, held on June 24, 2013, at the Noel Wien Library auditorium, presented the study objective and preliminary analyses. Representatives from the study team were available to discuss study details, clarify information, and answer questions. Study materials included displays of corridor zones,

proposed improvements, and a large aerial roll plot of the study corridor. Nineteen people signed in at the meeting.

Comments/concerns expressed at the meeting included the following.

- New or improved interchanges are needed throughout the study corridor.
- New or improved roundabouts should/should not be incorporated into future projects.
- Concerns were expressed about impacts to existing residences and businesses along the corridor.

The second open house, held on October 8, 2013, at the Noel Wien Library Auditorium, presented three corridor concepts and gathered feedback on the improvement concepts and individual projects. Representatives from the study team were available to discuss study details, clarify information, and answer questions. Study materials included graphics depicting three concepts (high mobility/low access, moderate mobility/moderate access, and low mobility/high access). Thirty-six people signed in at the meeting.

Comments/questions from the meeting included the following.

- How do these concepts affect areas outside of the study corridor?
- More north/south arterials are needed in the corridor.
- When do environmental assessments occur?

A third "super" open house was held on April 22, 2014, in conjunction with numerous transportation improvements in the Fairbanks area. This meeting was held at the Hutchison Career Center. The study team spoke at length with approximately 30 to 40 people and had an opportunity to gather meaningful input on which of the three concepts they preferred. A majority of attendees expressed a preference for the mobility provided in Concepts 1 and 2, however two individuals preferred Concept 3. Of those who said mobility should be a priority, Concept 2 was preferred.

Comments/concerns expressed at the meeting included the following.

- Concerns about impacts from widening turn lanes and congestion around the area of College Road and 3rd Street.
- Concerns about freight mobility and a suggestion that new interchanges along the project corridor should be designed with larger height and weight loads in mind.

3.3 Other Public Input

Public input on the project was also received via phone calls, e-mails, and comment forms received between public meetings. These comments included the following.

- Support for improved signal timing throughout the corridor.
- Support for realignment of railroad facilities to the perimeter of Fairbanks.
- Support for improved/additional non-motorized and transit facilities.
- Support for investment in large-scale, long-term improvements instead of smaller, short-term fixes.
- Support for grade-separated railroad crossings.

FINAL OPEN HOUSE PLACEHOLDER

3.4 Stakeholder Workshops

Four PEL workshops were held to discuss preliminary concepts with representatives from cities, FNSB, FMATS, and other industry stakeholders in the corridor (including fire, police, railroad, military, utilities, and transportation representatives). Workshops were held on June 19, July 22, and October 22, 2013, and April 1, 2014. The purpose of the first two PEL workshops was to present the findings of the draft traffic engineering report, identify locations not meeting capacity requirements, and to submit preliminary concepts for individual intersections and corridors to mitigate identified deficiencies. At the third PEL workshop three concepts were presented and modified based on feedback received. Individual improvements meeting the concept goals were identified and evaluated independently to determine their ability to meet the corridor study purpose and need.

Comments and feedback from various stakeholders included the following.

FNSB Community Planning

- Support for collaboration between state transportation development and local planning priorities.
- Concern that mobility-priority projects will adversely impact access and safety in local business and residential areas.
- Concern about ROW acquisition of areas adjacent to the corridor and potential economic impacts to those neighborhoods.

City of Fairbanks

- A future fire station site is proposed near the Johansen/Steese Expressway intersection.
- Concerns about eliminating emergency access to/from 10th Avenue, as that is a primary emergency response route for both police and fire departments.

Fort Wainwright

- Interest in the possibility of a new access gate in the City Lights Boulevard/Lazelle Road area. This could result in closing the Trainor Gate Road access point and could change the number of vehicles using the main gate.
- Interest in improving access to small arms area south of Richardson Highway.

FMATS

- Support for increased non-motorized amenities within the corridor.
- Concerns about how projects would affect air quality issues.

Alaska Railroad

- Support for considering grade separation of railroad crossings.
- Support for eliminating the West Trainor Gate Road link between the Old Steese Highway and Helmericks Avenue.

Freight Industry Representatives

- Truck and freight traffic through the corridor will continue to increase as a result of continued development on the North Slope.
- Trucks hauling hazardous materials have to stop at the railroad crossings, increasing the risk of rear-end crashes.

Alaska Railroad Corporation

In addition to the workshops described above, a diagnostic team was assembled to evaluate railroad crossing deficiencies and develop consensus with regard to recommended improvements for three at-grade crossings in the project corridor (Richardson Highway, Steese Expressway, and Old Steese Highway). This evaluation was conducted in accordance with the Alaska Policy on Railroad/Highway Crossings adopted by ARRC and DOT&PF in 1988. The diagnostic team met on November 25, 2013, and December 17, 2013. The team analyzed existing conditions and conducted a future-conditions assessment to determine a course of action based on the planned improvements in the project corridor.

The diagnostic team determined that grade separation of all three crossings should be considered to meet mobility and access demands within the corridor when funding is available. The diagnostic team report is included as Appendix D.

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4.0 Purpose, Needs, and Other Considerations

4.1 Purpose and Need Development

This PEL study comprehensively considers traffic mobility, circulation, and safety issues within the Richardson-Steese corridor to develop a long-term, coordinated plan for improvements that will address identified issues in a cost-effective manner. The study began with a traffic analysis to evaluate current and projected traffic operations and deficiencies. The traffic analysis identified operational deficiencies that need to be addressed over the next 25 years and provided background information for development of the purpose and need statement for proposed improvements. DOT&PF shared this information with local government representatives, relevant environmental agencies, and the public, and solicited feedback on the purpose of potential improvements and the deficiencies that need to be addressed.

4.2 Purpose

The purpose of the PEL study and its recommendations is to improve transportation performance within the corridor by identifying improvements that will enhance safety and mobility, maintain adequate access, provide efficient freight movements, and improve air quality. The purposes are described further below.

Safety

- Improve safety for all modes by reducing the frequency and severity of crashes, particularly at intersections, consistent with the safety performance goals in the SHSP.
- Upgrade transportation infrastructure to meet current DOT&PF design standards where practicable.

Mobility/Access

- Reduce traffic delay and congestion to achieve LOS C or better for current and projected traffic volumes.
- Provide traffic mobility while maintaining access to adjacent land uses and access across the corridor for all travel modes.
- Improve non-motorized mobility along and across the corridor.

Freight

- Provide efficient freight transportation through the corridor by reducing congestion, minimizing at-grade railroad crossings, and reducing vertical clearance obstructions.

Environmental

- Improve air quality by reducing traffic congestion and vehicle idle times at intersections.

4.3 Needs

The traffic analysis identified the following deficiencies that need to be addressed to provide safe and efficient transportation within the corridor.

Safety: Improve traffic safety, particularly at intersections.

- Four of the seven intersections have higher crash rates than the statewide average for similar facilities.

- The greatest number of crashes occurred at the signalized intersections in the middle portion of the corridor, including 3rd Street, Airport Way, College Road, and Trainor Gate Road.
- The Trainor Gate Road intersections with Old Steese Highway and Steese Expressway have elevated crash rates. The railroad crossing at Trainor Gate Road limits intersection control options at these intersections.
- Non-motorized crossings of Steese Expressway are limited to at-grade signalized intersections, which are multi-lane and congested intersections, with a high potential for pedestrian-vehicle conflicts.

Mobility/Access: Reduce traffic congestion and delay while maintaining appropriate access onto and across the corridor. Non-motorized access across the corridor needs to be improved.

- Four of the seven signalized intersections do not currently meet acceptable LOS standards during the morning peak hour, and two of these intersections do not currently meet an acceptable LOS during the evening peak hour.
- All signalized intersections except 10th Avenue and the Chena Hot Springs Road ramps are not expected to meet acceptable LOS in the morning peak hour by 2030.
- Key segments on the Steese Expressway do not meet acceptable LOS during peak periods.
- At-grade rail crossings add to delay and congestion in the corridor.
- The corridor provides access into the main business areas of Fairbanks. In addition, the rapidly-developing commercial area near the intersection of Johansen Expressway and Steese Expressway is designated by FNSB as one of just a few "Urban Preferred Commercial Areas." This land use designation provides for a high level of commercial development and needs sufficient access to support the high level of commercial activity. The corridor needs to provide for efficient access onto and off the expressway near this commercial area.
- The corridor separates some residential areas from the central business district; sufficient access across the corridor for motorized and non-motorized modes is desired.
- Non-motorized facilities in the corridor are limited and discontinuous; the Richardson-Steese corridor serves as a barrier to east-west movements.

Freight: Improve the efficiency of freight movements through the corridor.

- The Richardson Highway and the Steese Expressway are identified as critical freight infrastructure in the FMATS MTP. Fairbanks is a key transportation hub in Interior Alaska and the "doorway" to the Dalton Highway and the North Slope oil fields.
- Freight and oversized load movements through the corridor are inefficient because large loads must divert around structural impediments such as traffic signal mast arms.
- Non-exempt freight trucks must completely stop at railroad track crossings, slowing freight movements through the corridor.
- Insufficient distance between the railroad crossing and left-lane exit at Old Richardson Highway prevents trucks from using this exit to access the industrial area south of the highway.

Environmental: Address traffic congestion to improve air quality.

- Traffic congestion at signalized intersections and trucks/buses stopping at railroad crossings result in increased idling and higher vehicle emissions.
- The central portion of the corridor is in an area that is under a maintenance plan for CO.
- The entire corridor is in an area that does not meet federal air quality standards for $PM_{2.5}$.

4.4 Project Implementation Constraints

Although the purpose and need for the study are to address safety, mobility, access and environmental concerns, there are many other factors that must be considered when designing and implementing specific projects to meet the corridor purpose and need. Social and environmental factors and fiscal responsibility help constrain the range of solutions that are feasible for implementation.

4.4.1 ROW Acquisition

Road improvements to increase mobility and safety often require acquisition of additional ROW to accommodate additional lanes, expanded intersections, interchanges or other modifications. The Steese Expressway ROW narrows between the Chena River Bridge and Trainor Gate Road and additional room is likely to be needed in some areas to construct frontage roads and interchanges.

Minimizing ROW acquisition was emphasized as a priority during public outreach activities. Improvements proposed to meet the purpose and need described above need to take the limited ROW into consideration and could require use of designs that incorporate specific features (such as retaining walls, tight diamond interchanges, and use of the local road grid in lieu of frontage roads) to minimize ROW needs.

In those areas where ROW acquisition will be required, early identification of potential ROW needs can reduce future ROW acquisition costs and minimize relocation requirements. Early identification allows ROW needs to be incorporated into planning and development decisions in areas adjacent to the corridor and allows for early acquisition of ROW to avoid escalating costs.

ROW acquisition for proposed projects in the corridor would be conducted under the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and applicable state law. As part of the federal regulations governing acquisition of property, 23 CFR 710.501 provides a process for approving early acquisitions, including federally-funded acquisitions, which were first authorized in Section 1302 of MAP-21. The new authority for federally-funded early acquisitions provides an additional tool for states to deliver projects efficiently and cost-effectively and should be used where possible in areas where ROW acquisition is needed for proposed improvements. In addition, 23 CFR 710.503 allows states to protectively buy property when development is imminent and would be detrimental to proposed projects or for hardship acquisitions when property owners meet certain criteria.

If DOT&PF and FHWA work collaboratively and efficiently to use all available options for acquiring property, including early, protective and hardship acquisitions where appropriate, projects can be implemented in a more timely manner.

4.4.2 Social and Environmental Impacts

In addition to the social and socioeconomic effects discussed in the ROW section above, other social and environmental issues were raised during the PEL study outreach process, including potential wetland impacts, water and air quality concerns, wildlife habitat issues, and other issues. As each project moves forward, additional outreach will occur and specific design and construction measures will be considered to address site-specific environmental factors for each project, such as:

- measures to avoid, minimize and mitigate potential effects on wetlands and Waters of the U.S.;
- measures to avoid impacts to historic resources and public recreation lands;
- best management practices to minimize the potential for storm water pollution during both construction and long-term operations;
- measures to minimize hazardous material spills during construction and development of plans for addressing potential contamination found during construction;
- measures to avoid vegetative clearing during bird nesting periods; and
- measures to avoid the introduction or spread of invasive species during construction.

4.4.3 Fiscal Responsibility

State and federal agencies are facing increased pressure on transportation infrastructure funding sources, increasing the need for the most efficient use of transportation funds. Access management on major transportation facilities, like the Richardson Highway and Steese Expressway, can optimize the value of investments in these facilities by maximizing their capacity and reducing crash hazards. Maintaining the through capacity on these roads means that the dollars invested in improvements provide greater benefits over a longer period of time. Poor access management results in more frequent need for investment in improvements that provide short-term benefits but do not meet the long-term capacity needs of the facility.

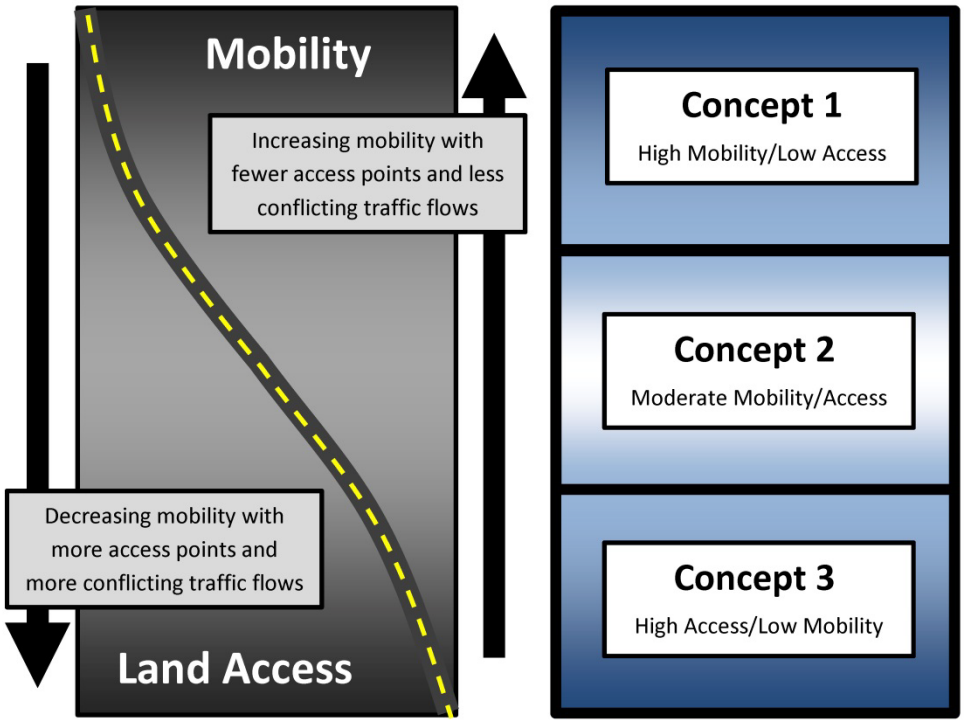
As mentioned above, early identification of areas where ROW acquisition may be needed can also reduce the cost of acquiring ROW for long-term improvement needs. Acquiring land that is undeveloped is more cost effective than acquiring these lands later when the lands have been developed and/or costs for the land have increased.

5.0 Improvement Concepts

The goals for this corridor are to accommodate safe and efficient traffic flows through the area and to maximize the benefits of public investment in the corridor to meet future traffic demands while minimizing adverse effects on social and environmental resources. With numerous closely-spaced intersections in the corridor, each of which has multiple potential solutions to resolve congestion and safety issues to varying degrees, a wide variety of improvement alternatives and combinations of alternatives was conceivable. Although individual projects within the corridor could be completed independently to achieve location-specific goals, improvements to the broader system can be accomplished more efficiently if planned in the context of the overall goals and objectives for the corridor.

As a framework for evaluating and selecting complimentary and non-conflicting project alternatives, three corridor concepts with varying levels of mobility and access were defined as shown in Figure 13 and described below.

Figure 13 Relationship of Mobility and Access



As discussed in Chapter 2, access control on major transportation facilities, like the Richardson-Steese corridor, creates a safer, more efficient roadway. Reducing the number of cross streets and driveways that directly intersect the highway is the primary means of controlling access. By prioritizing through traffic movements on the corridor and using side streets or frontage roads to provide local access to properties, motorists can arrive at their destinations more quickly and safely. Although access control may seem like an inconvenience because it often changes travel patterns and requires longer or less direct routes to reach some destinations, the improved traffic flow will make most trips quicker and overall travel time usually improves as congestion is reduced and mobility increases.

Communities and property owners are often concerned about how access management and changes to travel patterns could affect commercial businesses. FHWA has studied businesses in areas where access management has been implemented and found that most businesses continue to do well after access control projects are implemented (FHWA, 2006). This is particularly true for destination businesses, such as big box stores and popular restaurants. Motorists tend to avoid areas with high traffic congestion and perceived high crash potential, which is bad for business. Improving safety and travel time can increase the attractiveness of destinations, resulting in more business opportunities. In addition, the market area for many commercial businesses depends on the travel time to the businesses. Shortening travel time from areas outside Fairbanks to local businesses can increase the market area for these businesses.

5.1 Concept 1 – High Mobility, Low Access

Concept 1 prioritizes efficient movement of through traffic along the corridor to improve mobility. It upgrades the corridor to a freeway-type facility, provides acceptable capacity during peak periods, and allows for 55 mph travel speeds throughout the corridor. It also operates with the least congestion and delay, and has the highest potential safety benefit in comparison to other concepts. Many of these proposed improvements are already included in the FMATS MTP (see Table 7).

This concept replaces existing signalized intersections with grade-separated interchanges. It uses the existing road grid network supplemented by new frontage roads where needed to provide access between the proposed interchanges. For the sake of assessing potential impacts, the interchange forms assumed in the individual projects below are varying configurations of diamond interchanges. This form is familiar to Fairbanks and Alaska motorists, has a relatively small to moderate footprint, is capable of accommodating the traffic volumes envisioned on the Richardson-Steese corridor, and easily accommodates the use of frontage roads. In all concepts, the interchanges will require more detailed analysis to verify the interchange form and determine the exact lane configuration.

Proposed projects for Concept 1 are:

- Richardson Highway MP 359 Grade-Separated Facility,
- Airport Way Interchange and 10th Avenue Frontage Road,
- 3rd Street and College Road Split Diamond Interchange,
- Trainor Gate Road Grade-Separated Facility,
- Old Steese Highway Improvements,
- Johansen/Steese Expressways Interchange,
- Johansen Expressway Widening,
- Farmers Loop Road Interchange, and
- Chena Hot Springs Road Interchange Ramp Improvements.

5.1.1 Richardson Highway MP 359 Grade-Separated Facility

The proposed Richardson Highway MP 359 Grade-Separated Facility project would replace the existing at-grade intersection of Old Richardson and Richardson Highways with a grade-separated interchange. For analysis purposes and to minimize the need for ROW acquisition, a tight diamond interchange was considered. This project would likely require realignment of a portion of Old Richardson Highway and may include construction of a new gated access to Fort Wainwright, if desired.

The project would also replace the at-grade railroad crossing southeast of the existing intersection of Old Richardson and Richardson Highways with a grade-separated crossing co-located with the interchange or at a separate location. This project may also include the construction of a pedestrian underpass for use by Fort Wainwright personnel. The pedestrian undercrossing project would have a separate purpose and need and could be constructed independently, but is being grouped with the Richardson Highway MP 359 Grade-Separated Facility project for the purposes of this analysis based on their close proximity to one another, and due to the potential economies of scale that would result from constructing the improvements concurrently. For example, if the diamond interchange concept were constructed, the planned pedestrian undercrossing could be replaced with a roadside pedestrian facility on the new overpass or be included as a separate undercrossing that could easily be incorporated when raising the Richardson Highway over the railroad crossing.

The proposed improvements on the Richardson Highway are shown in Figure 14.

5.1.2 Airport Way Interchange and 10th Avenue Frontage Road

The Airport Way Interchange and 10th Avenue Frontage Road project consists of constructing an interchange at the existing intersection at Airport Way, removing the existing access to Steese Expressway from 10th Avenue, and constructing a frontage road that links 10th Avenue to the Airport Way southbound off-ramp. The interchange type considered for this concept was a diamond because it will easily accommodate the frontage roads and it minimizes the need for ROW acquisition.

The 10th Avenue/Steese Expressway intersection is currently a signalized intersection that allows turning movements in all directions. Since 10th Avenue is only 1,900 feet (0.36 mile) away from Airport Way, separate interchanges cannot be accommodated at both intersections. Airport Way is the higher-priority intersection, so this concept proposes closing direct access to 10th Avenue from the Steese Expressway and constructing a one-way southbound frontage road along the west side of Steese Expressway. This frontage road would allow access to Steese Expressway from 10th Avenue via the Airport Way intersection which is approximately 1/3 mile south of 10th Avenue.

Assuming the Fire Station remains on 10th Avenue for the foreseeable future, emergency response times will need to be taken into consideration as part of any substantial modifications to the 10th Avenue intersection with Steese Expressway. If the signalized intersection at 10th Avenue/Steese Expressway is eliminated, emergency vehicles responding to calls north of 10th Avenue would first need to drive about 1/3 mile south on a frontage road from 10th Avenue to access the Steese Expressway. They would then use the Airport Way interchange to route northward. A detailed response time model has not been completed, but it is estimated that the overall improvement in travel time on the Steese Expressway that would result from eliminating the six signalized intersections (as part of Concept 1) and raising the speed limit to 55 mph on Steese Expressway is likely to offset most if not all of the additional 40+/- seconds of out-of-direction travel.

The proposed improvements are shown in Figure 15.

Figure 14 Concept 1 - Richardson Highway MP 359 Grade-Separated Facility

Figure 15 Concept 1 - Airport Way Interchange and 10th Avenue Frontage Road

5.1.3 3rd Street and College Road Split Diamond Interchange

The intersections of College Road and 3rd Street are less than 900 feet apart. With this close spacing, independent interchanges are not feasible because the on/off ramps would overlap, not allowing sufficient length for vehicles to enter/exit Steese Expressway. Since both roads are arterial intersections and closure of one or the other was not considered reasonable, a split diamond is the best interchange form for these two intersections. A split diamond uses frontage roads or quadrant streets to connect two closely-spaced overpasses with each having a single pair of on/off ramps. In the case of College Road and 3rd Street, a pair of on/off ramps would be located north of College Road and another pair south of 3rd Street. Supplemental one-way frontage roads could allow traffic to travel between the College Road and 3rd Street ramps. These frontage roads would be constructed as close to the expressway as possible to minimize the need for additional ROW. Alternatively, existing side streets could form a quadrant-style travel path to the interchange to reduce the potential need for additional ROW acquisition even further. To avoid reconstruction of the Chena River Bridge, the southbound on-ramp would be constructed at less than the desirable merge length, or a separate single lane bridge structure would be constructed parallel to the existing bridge to carry the southbound on-ramp over the Chena River before merging with the Steese Expressway through lanes (see Figure 16).

The on-going 3rd Street Widening Project addresses the more immediate capacity needs on 3rd Street between Old Steese Highway and Hamilton Avenue. The current improvements to 3rd Street were envisioned prior to and are complimentary in function to the future 3rd Street and College Road Split Diamond Interchange project. They are adjacent and partially overlapping projects but are not segments of the same project. The current project will help to mitigate congestion on 3rd Street until the future interchange project can be developed.

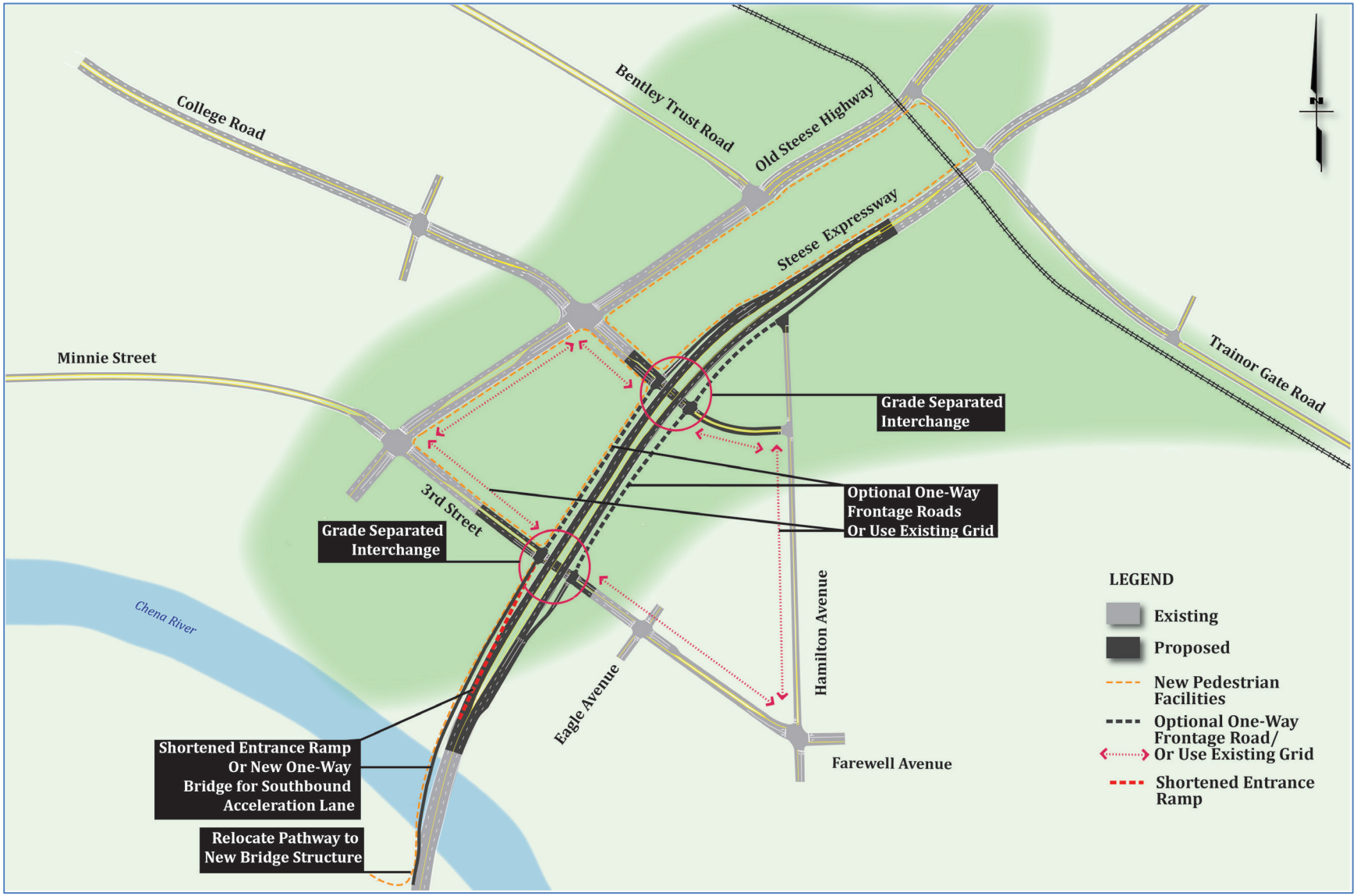
5.1.4 Trainor Gate Road Grade-Separated Facility

Improvements in the Trainor Gate Road area are needed to resolve congestion and safety concerns within this short segment between Old Steese Highway and Steese Expressway. Two options are considered at this intersection.

Option 1 is to grade separate the railroad by elevating the tracks over the Old Steese Highway and the Steese Expressway, remove the signal at the intersection with Steese Expressway, convert Trainor Gate Road to a one-way westbound road, and construct the following:

- a one-way off-ramp to Old Steese Highway from southbound Steese Expressway,
- a one-way on-ramp from Trainor Gate Road to northbound Steese Expressway,
- a two-way frontage road from College Road to Trainor Gate Road on the east side of the Steese Expressway,
- a new pedestrian overcrossing to enable the residential neighborhood east of Steese Expressway to access Old Steese Highway, and
- auxiliary lanes at the intersection of College Road/Old Steese Highway to address diversion of traffic from Trainor Gate Road to College Road.

Figure 16 Concept 1 – 3rd Street and College Road Split Diamond Interchange



Option 1 (as shown in Figure 17) is as close to an ideal solution as practicable with the exception that two-way access on Trainor Gate Road is eliminated. Concerns raised as part of the public outreach on the Old Steese Highway Upgrade project with regard to Trainor Gate Road have led to consideration of another option. Option 2 would:

- construct a grade-separated interchange with Steese Expressway passing over Trainor Gate Road and the railroad tracks,
- maintain two-way access on Trainor Gate Road,
- route pedestrian traffic under Steese Expressway alongside Trainor Gate Road, and
- construct one-way frontage roads to connect southward to the College Road interchange.

Option 2 (see Figure 18) maintains two-way access on Trainor Gate Road, but it likely permanently maintains the at-grade railroad crossing with Old Steese Highway and replaces the at-grade crossing of Steese Expressway with at-grade crossings of the on/off ramps from the interchange. As part of the agency outreach, ARRC voiced opposition to alternatives that would preclude grade separation of the railroad crossing.

5.1.5 Old Steese Highway Improvements

The proposed Old Steese Highway Improvements project is in the preliminary design phase and is likely to upgrade Old Steese Highway to a four- or five-lane cross section from Bentley Trust Road to Johansen Expressway (see Figure 19). These improvements are needed to address existing congestion and safety concerns on the Old Steese Highway, as well as future traffic growth in this rapidly-developing area.

5.1.6 Johansen/Steese Expressways Interchange and Johansen Expressway Widening

The Johansen/Steese Expressways Interchange project consists of replacing the existing signalized intersection with a grade-separated interchange. To accommodate the projected traffic volumes and to minimize the need for ROW acquisition, the interchange form considered for this analysis was a standard diamond, with the Steese Expressway passing over the Johansen Expressway. Variations of the diamond such as a single point or diverging diamond would also work well in this location and would have a similar footprint. Due to the high southbound right-turn travel demand during the morning peak hour, a direct ramp or a dual southbound right-turn lane is needed at the Steese Expressway southbound ramp/Johansen Expressway intersection. Furthermore, Fort Wainwright has expressed possible interest in a future base entrance in the vicinity of this intersection, which could easily be accommodated as an east leg to the interchange.

The Johansen Expressway Widening project consists of reconstructing Johansen Expressway from the existing Johansen Expressway off-ramp for College Road to the Steese Expressway to provide for the addition of a third westbound lane. The project also includes upgrades to the Hunter Street and Old Steese Highway intersections. These upgrades are needed to allow for the dual southbound right-turn lane proposed for the Johansen/Steese Expressways Interchange, and should be completed before or concurrent to the interchange construction.

The proposed improvements are shown in Figure 20.

Figure 17 Concept 1 - Trainor Gate Road Grade-Separated Facility – Option 1

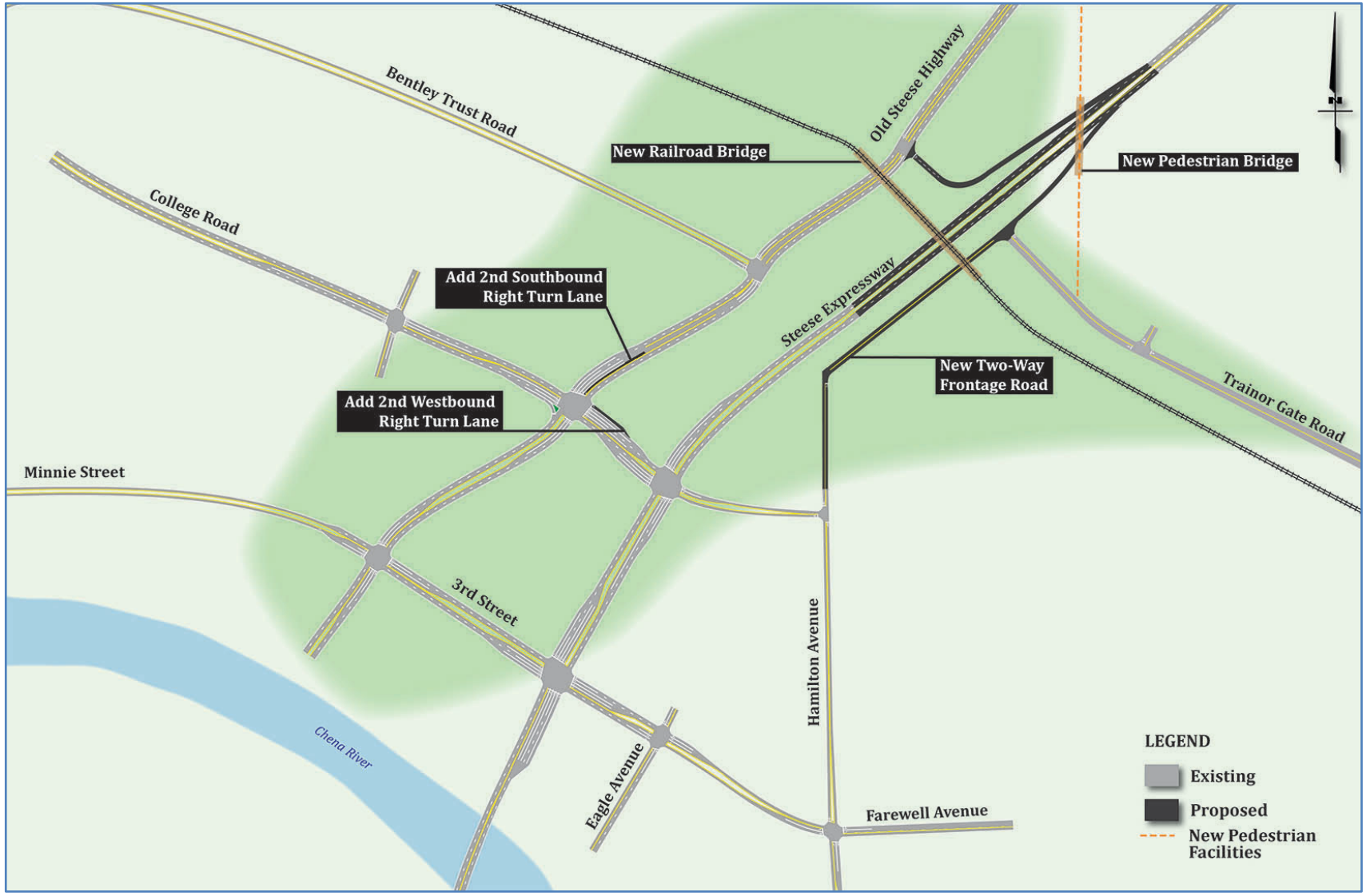
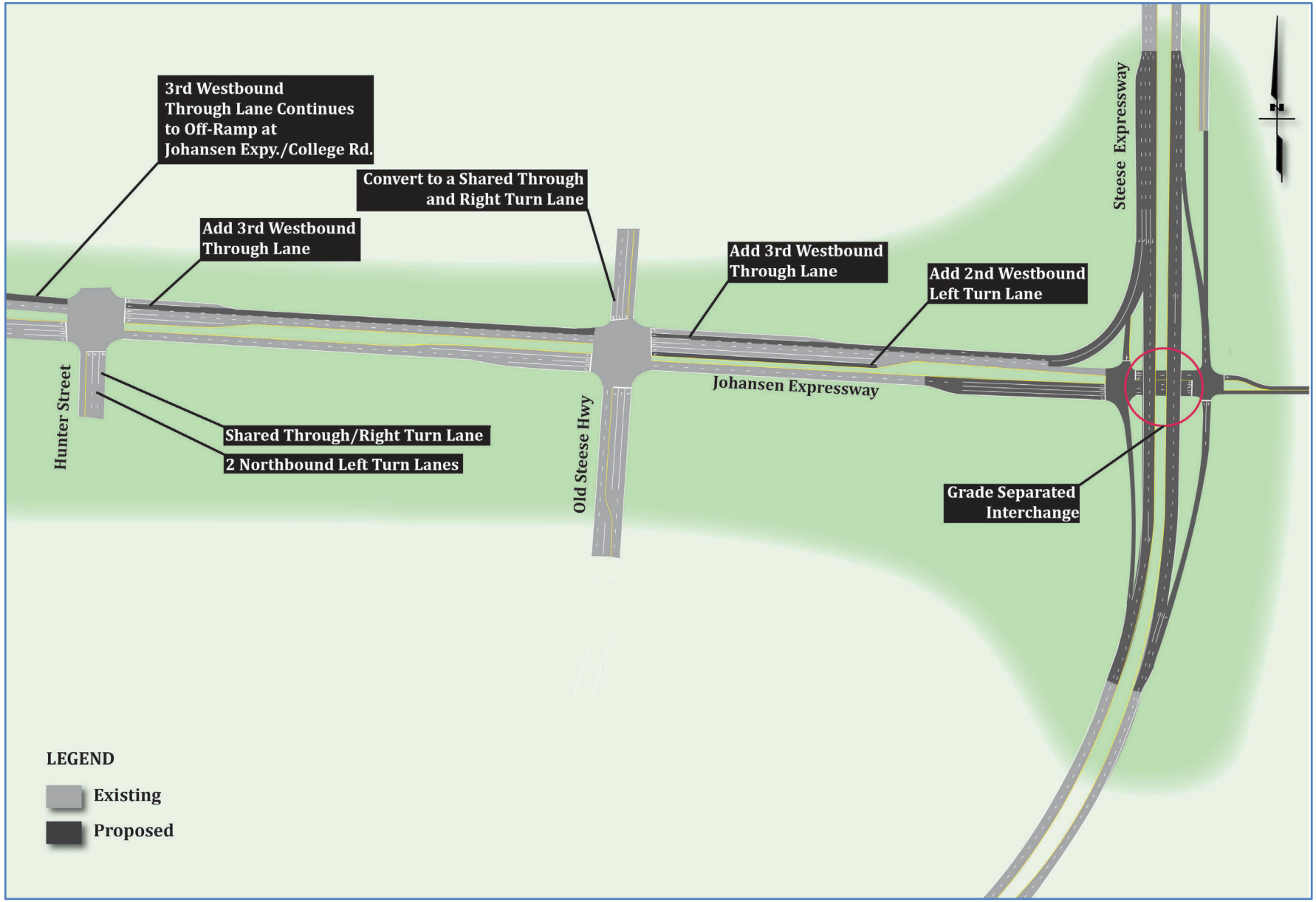


Figure 18 Concept 1 - Trainor Gate Road Grade-Separated Facility – Option 2

Figure 19 Concept 1 - Old Steese Highway Improvements

Figure 20 Concept 1 - Johansen/Steese Expressways Interchange and Johansen Expressway Widening



5.1.7 Farmers Loop Road Interchange

The Farmers Loop Road Interchange project consists of reconstructing the existing signalized intersection as a grade-separated interchange. For analysis purposes, a standard diamond interchange with roundabouts at the ramp intersections is considered to be the most likely and most cost-effective form at this location; other types of diamond interchanges such as a single point would also be an effective solution with a similar footprint.

In order to accommodate the grade separation required for the interchange, the intersections of Old Steese Highway and Birch Hill Road will need to be realigned and reconstructed further from the existing intersection. Realignment of the Old Steese Highway to create a four-legged roundabout intersection at the current Farmers Loop Extension intersection is also recommended. Access to the transfer station will be relocated to the new Old Steese Highway alignment and an existing driveway to a privately-owned gas station at the existing Old Steese Highway intersection will also need to be relocated to access the site via Farmers Loop Extension. Birch Hill Road will require realignment to connect to the existing City Lights Boulevard/Fairhill Drive intersection.

The proposed improvements for the Farmers Loop Road Interchange project are shown in Figure 21.

5.1.8 Chena Hot Springs Road Interchange Ramp Improvements

Improvements to the Steese Expressway ramp termini at Chena Hot Springs Road are currently under design to address safety concerns identified as part of the Highway Safety Improvement Program (HSIP). Roundabouts are being constructed at the ramp intersections to resolve the safety concerns (Figure 22). These roundabouts will have a supplemental benefit of resolving congestion issues at these intersections for the foreseeable future.

5.2 Concept 2 – Moderate Mobility, Moderate Access

The objective of Concept 2 is to improve mobility but maintain access in some of the more highly-developed urban areas. Specifically, Concept 2 proposes interchanges at most major intersections to replace signalized intersections, but differs from Concept 1 by maintaining the signalized intersections at 3rd Street, College Road, and Trainor Gate Road. Concept 2 has a moderate reduction in congestion and delay along the Steese Expressway corridor, but preserves most of the existing access.

Proposed projects within the corridor that are consistent with the objectives of Concept 2 include:

- Richardson Highway MP 359 Grade-Separated Facility,
- Airport Way Interchange and 10th Avenue Frontage Road,
- Trainor Gate Road Grade-Separated Facility,
- Old Steese Highway Improvements,
- Johansen/Steese Expressways Interchange,
- Johansen Expressway Widening,
- Farmers Loop Road Interchange, and
- Chena Hot Springs Road Interchange Ramp Improvements.

Figure 21 Concept 1 - Farmers Loop Road Interchange

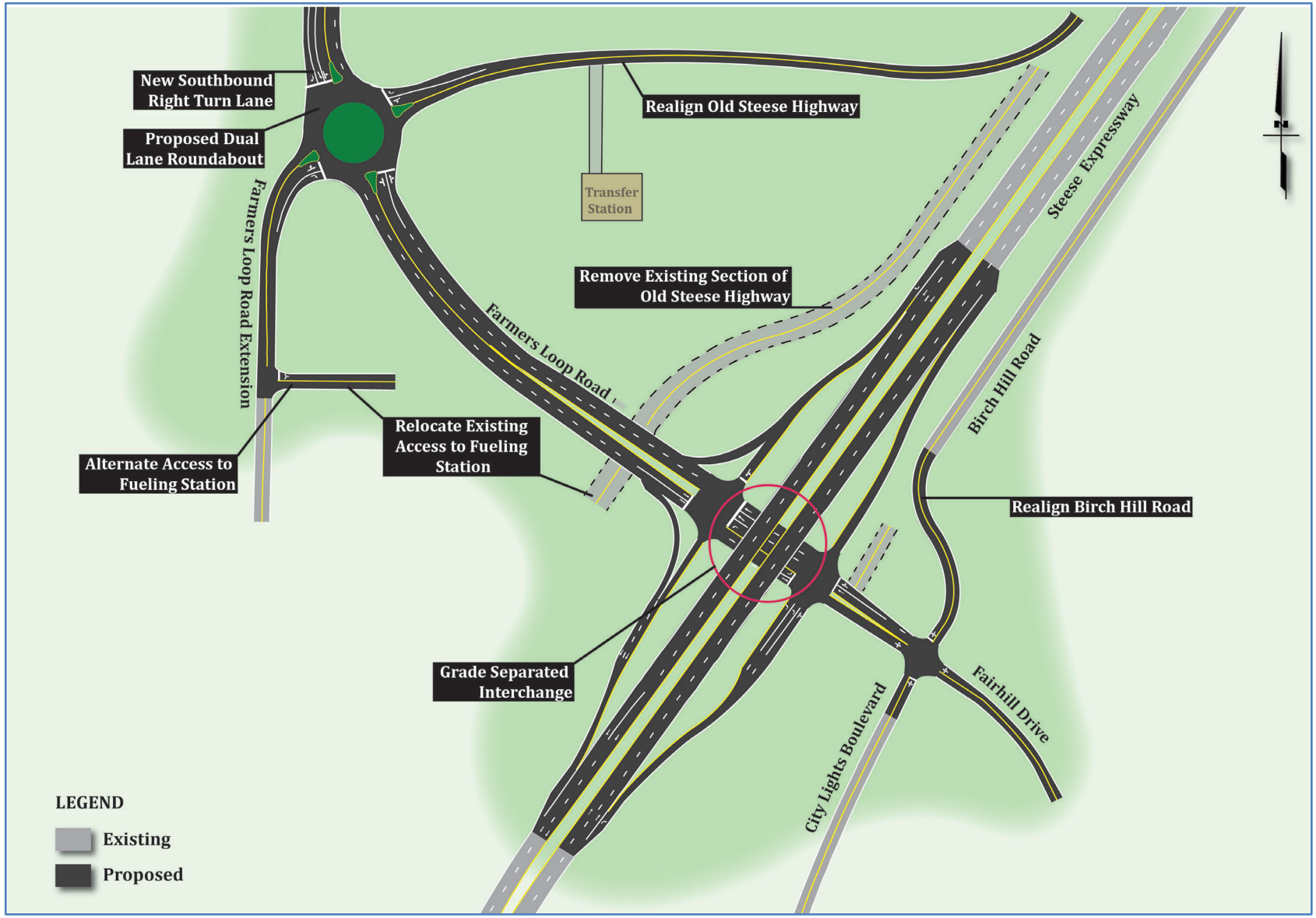
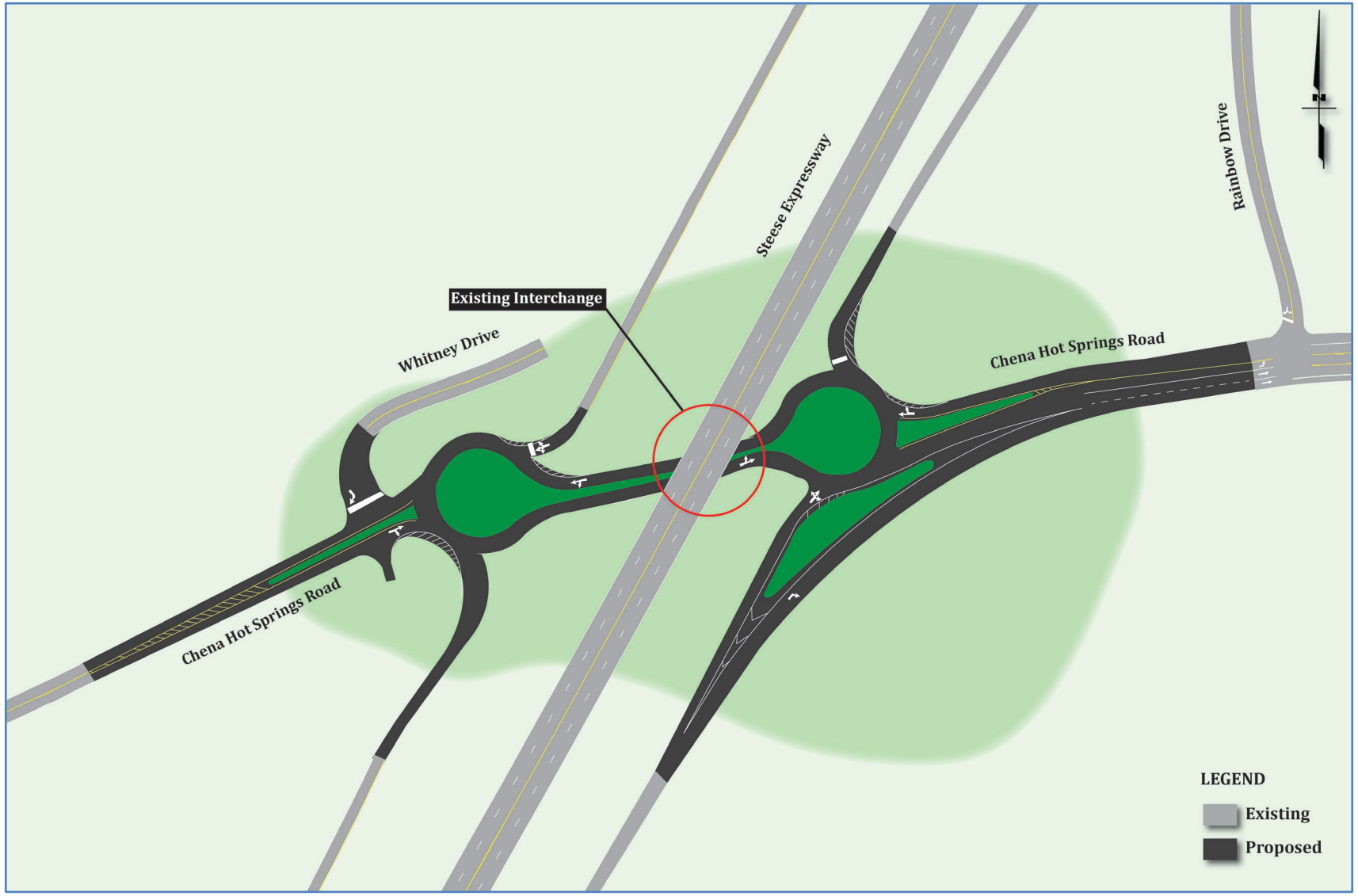


Figure 22 Concept 1 – Chena Hot Springs Road Interchange Ramp Improvements



5.2.1 Richardson Highway MP 359 Grade-Separated Facility

The proposed improvements at Old Richardson Highway and at the railroad crossing at Richardson Highway MP 359 would be the same as discussed under Concept 1 and shown on Figure 14.

5.2.2 Airport Way Interchange and 10th Avenue Frontage Road

The Airport Way Interchange and 10th Avenue Frontage Road project for this concept is the same as described under Concept 1 and shown on Figure 15.

5.2.3 Trainor Gate Road Grade-Separated Facility

Under Concept 2, the access to Trainor Gate Road would convert to a one-way westbound facility between Steese Expressway and Old Steese Highway, but the signalized intersection at Steese Expressway would remain. This configuration would resolve the congestion and safety issues on Trainor Gate Road with minimal impacts to local access and turning movements on the Steese Expressway. The grade-separated railroad crossings would be constructed over both the Old Steese Highway and Steese Expressway. Similar to Concept 1 Trainor Gate Road Grade-Separated Facility Option 1, the railroad overpasses could be constructed independently of the road modifications. The proposed improvements for Trainor Gate Road for Concept 2 are shown in Figure 23.

5.2.4 Old Steese Highway Improvements

The proposed Old Steese Highway Corridor Improvements project for Concept 2 would be the same as described for Concept 1 and shown on Figure 19.

5.2.5 Johansen/Steese Expressways Interchange and Johansen Expressway Widening

The Johansen Expressway improvements are the same as described under Concept 1 and shown on Figure 20.

5.2.6 Farmers Loop Road Interchange

The Farmers Loop Road Interchange improvements for Concept 2 are the same as described under Concept 1 and shown on Figure 21.

5.2.7 Chena Hot Springs Road Interchange Ramp Improvements

The Chena Hot Springs Road Road Interchange Ramp Improvements for Concept 2 are the same as described under Concept 1 and shown on Figure 22.

Figure 23 Concept 2 - Trainor Gate Road Improvements

5.3 Concept 3 – Low Mobility, High Access

Concept 3 prioritizes access to the properties along the Steese Expressway and de-prioritizes mobility for through traffic. This alternative assumes all existing signals will be upgraded with auxiliary lanes where feasible, but they would all continue to be at-grade intersections. The collector road network would also be expanded along the Steese Expressway by extending Old Farmers Loop Road southward to intersect with the Old Steese Highway intersection at Johansen Expressway.

This concept has the lowest reduction in congestion and delay, but it preserves and increases access to the greatest degree. Under Concept 3, the Steese Expressway corridor from Johansen Expressway to Airport Way would not operate at minimum design standards for intersection delay. This concept proposes that maintaining existing access is more important than resolving congestion.

Proposed projects within the corridor that are consistent with the objectives of Concept 3 include:

- Richardson Highway Flyover and Richardson Highway MP 359 Railroad Overpass,
- Airport Way/Steese Expressway Intersection Improvements,
- College Road Left Turn Lane and Steese Expressway Widening,
- Old Steese Highway Corridor Improvements,
- Johansen Expressway Widening and Intersection Improvements,
- Farmers Loop Road Extension and Farmers Loop Road/Steese Expressway Intersection Improvements, and
- Chena Hot Springs Road Interchange Ramp Improvements.

5.3.1 Old Richardson Highway Flyover/Richardson Highway MP359 Railroad Overpass

Concept 3 would construct a flyover at the Richardson/Old Richardson Highway intersection instead of an interchange. The proposed Richardson Highway Flyover project would allow northbound highway traffic to exit onto Old Richardson Highway via a right-lane exit, removing the existing left-turn lane, and constructing a flyover structure to eliminate several conflict points. A grade-separated railroad crossing and pedestrian underpass would also be constructed just east of the existing intersection at MP 359. The railroad crossing and pedestrian underpass would best be constructed as part of a single project, but they could be a separate project from the Old Richardson Highway Flyover project as long as they were constructed first to avoid substantial re-work in construction of the flyover. The proposed Richardson Highway Flyover and Richardson Highway MP 359 Railroad Overpass projects are shown in Figure 24.

5.3.2 Airport Way/Steese Expressway Intersection Improvements

Under Concept 3, the Airport Way intersection would remain an at-grade signalized intersection. To improve the intersection operation, dual left-turn lanes and channelized right-turn lanes would be constructed on all approaches. The width of the intersection would increase accordingly, likely requiring two-phased pedestrian crossings and adding significant time to the signal cycle length. The signal is not anticipated to operate at an acceptable LOS during the design or future years. However, this concept would preserve existing access to Airport Way and maintain the existing intersection with 10th Avenue. The proposed Airport Way/Steese Expressway Intersection Improvements project is shown on Figure 25.

Figure 24 Concept 3 - Old Richardson Highway Flyover and Richardson Highway MP 359 Railroad Overpass

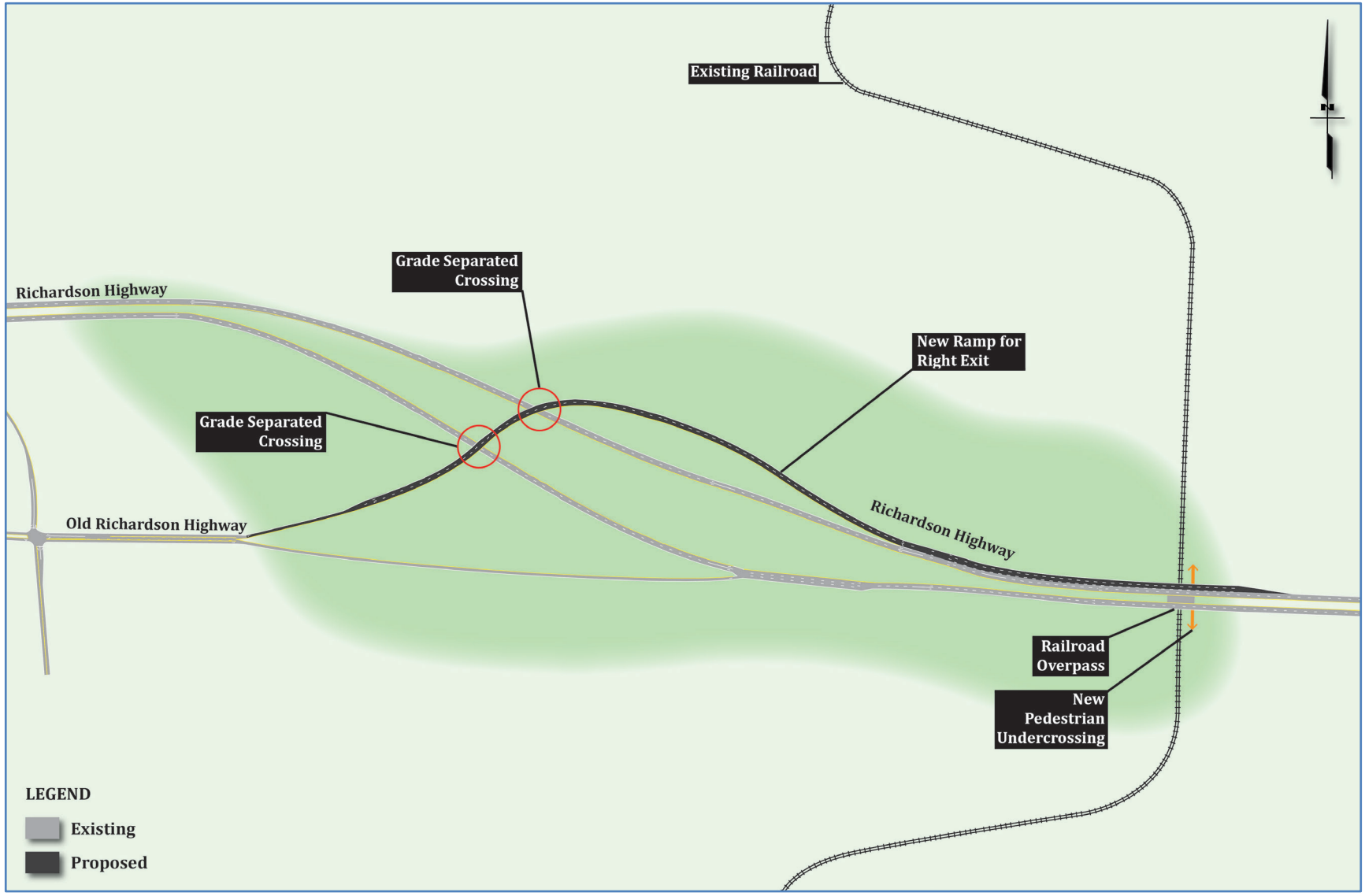
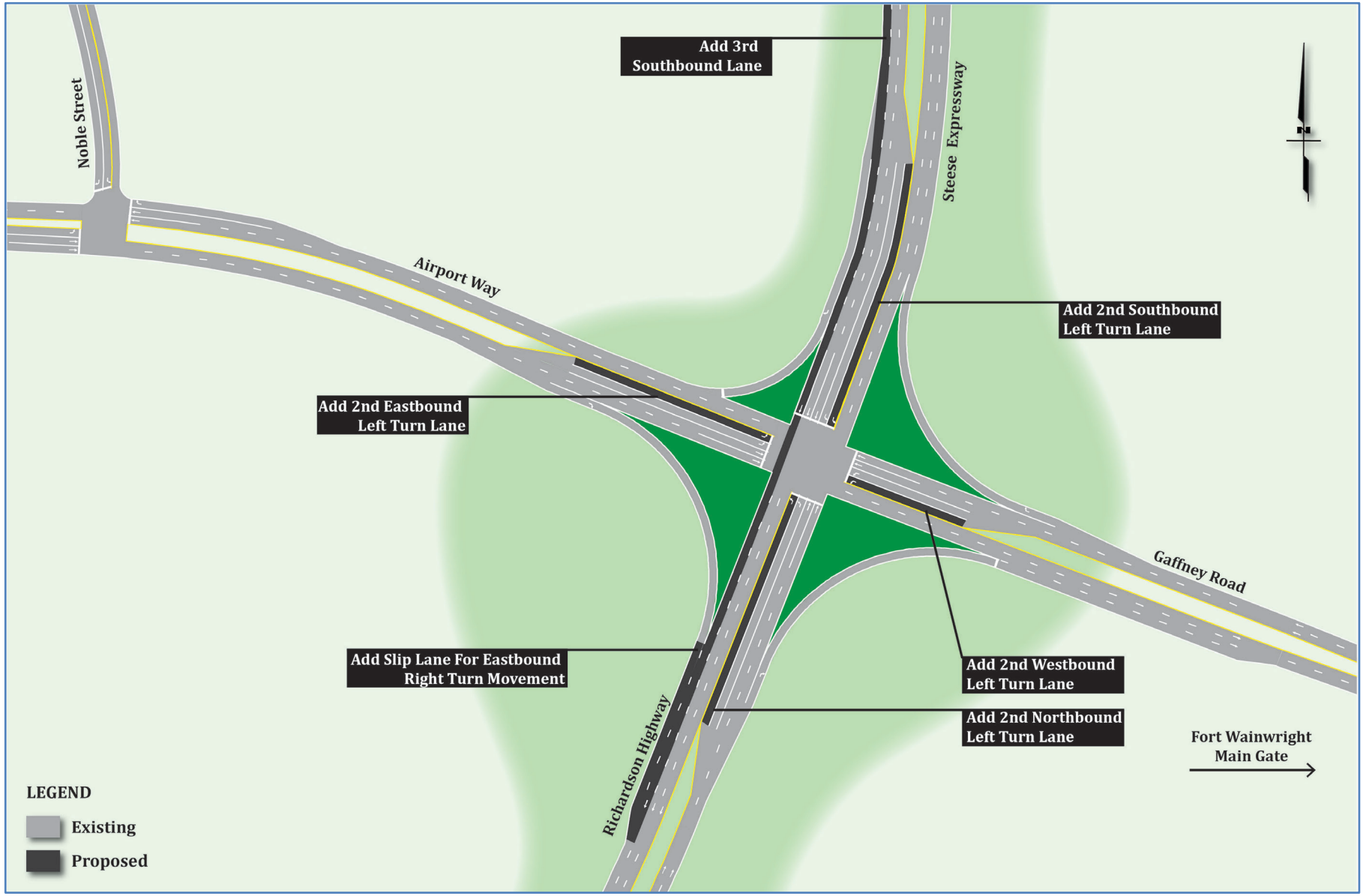


Figure 25 Concept 3 - Airport Way/Steese Expressway Intersection Improvements



5.3.3 College Road Left Turn Lane and Steese Expressway Widening

Concept 3 preserves existing access at the Trainor Gate Road, College Road, and 3rd Street intersections with the Steese Expressway. To address the most severe delays that would result from maintaining this access and to prevent intersection queues from exceeding available space between intersections, additional southbound through capacity and select auxiliary lanes are necessary. Accordingly, this project includes the construction of a southbound through lane from just north of Farmers Loop Road to Airport Way. Widening through existing signalized intersections would require ROW acquisition and reconstruction of the signals and replacement of the existing signal poles along Steese Expressway. The proposed widening would also require the replacement of the existing Chena River Bridge. An additional northbound left-turn lane at College Road/Steese Expressway would also be needed to address the unmet demand to access the Old Steese Highway due to congestion at the Trainor Gate Road intersection.

The improvements proposed for the segments between 3rd Street and Trainor Gate Road are shown in Figure 26. Widening for the 3rd southbound lane beyond the limits of Figure 26 can also be seen on Figures 25 and 27.

5.3.4 Old Steese Highway Improvements

The proposed Old Steese Highway Improvements project for Concept 3 would be the same as under Concepts 1 and 2 (Figure 19).

5.3.5 Johansen Expressway Widening and Intersection Improvements

Under Concept 3, the Johansen Expressway would require greater capacity improvements than presented under Concepts 1 and 2. In order for the Johansen/Steese Expressway intersection to remain a signalized intersection, a new connection between Old Farmers Loop Road and Old Steese Highway would be needed to enable these shorter trips to bypass the Steese Expressway. This connection would generate substantial traffic crossing and egressing the Johansen Expressway. To maintain acceptable delay on the Johansen Expressway, the road would need to be widened as shown in Concepts 1 and 2, and improvements to the Old Steese Highway and Hunter Street intersections would also be required. This includes adding turning lanes and through lanes at both locations to accommodate the new through and turning traffic.

The Concept 3 improvements to the Johansen Expressway are shown on Figure 27.

Figure 26 Concept 3 - College Road Left Turn Lane and Steese Expressway Widening

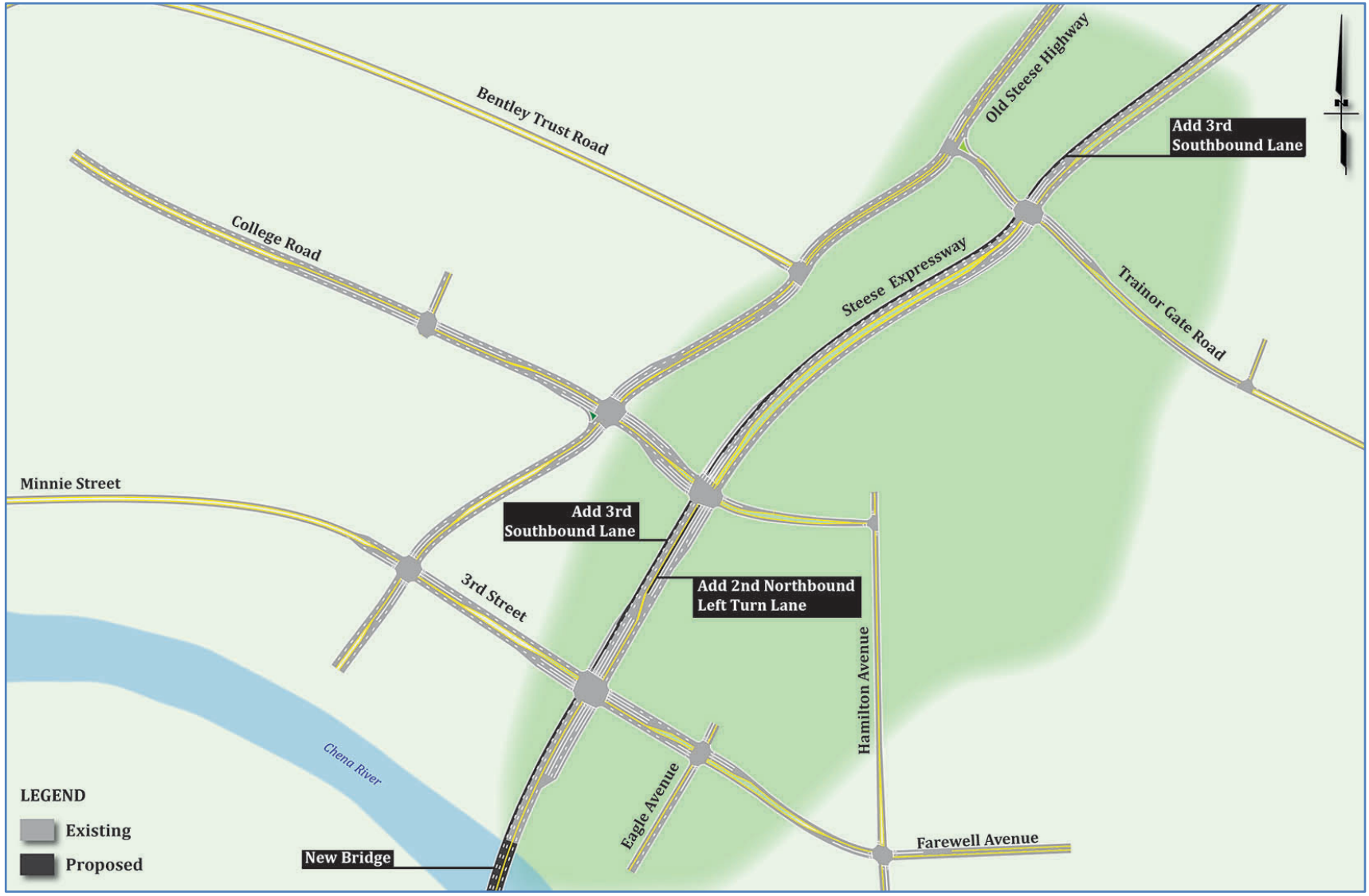


Figure 27 Concept 3 - Johansen Expressway Widening and Intersection Improvements

5.3.6 Farmers Loop Road Extension/Farmers Loop Intersection Improvements

Concept 3 proposes an extension of Old Farmers Loop Road southward to connect to Old Steese Highway and Harold Bentley Avenue. The corridor would consist of a two-lane roadway, with improvements to the local and collector street infrastructure north of the Johansen Expressway, including intersection improvements at Harold Bentley Avenue/Northside Drive and additional southbound capacity on Northside Drive. The intersection improvements considered for this analysis were roundabouts, but stop-controlled intersections may be acceptable in these locations as well. This proposed extension would expand the collector road network accessing businesses along the Johansen Expressway and Old Steese Highway to completely bypass the Steese Expressway.

Also included under Concept 3, the Farmers Loop Road/Steese Expressway intersection would be upgraded to include additional turn lanes as well as a channelized eastbound right-turn lane from Farmers Loop Road. Access to the fueling station west of the intersection would be preserved, but Old Steese Highway would be reconstructed to intersect Farmers Loop Road at the existing Farmers Loop Extension intersection.

A roundabout at this new four-legged intersection is considered part of this realignment of the Old Steese Highway (Figure 27). The proposed improvements related to the extension of Farmers Loop Road and the proposed Farmers Loop Road Intersection Improvements are jointly shown on Figures 27 and 28, respectively.

5.3.7 Chena Hot Springs Road Interchange Ramp Improvements

The Chena Hot Springs Road Road Interchange Ramp Improvements for Concept 3 are the same as described under Concept 1 and shown on Figure 22.

Figure 28 Concept 3 - Farmers Loop Road Extension and Farmers Loop Road/Steese Expressway Intersection Improvements

5.4 Summary of Alternatives

Table 8 shows a comparison of the projects included in each concept. The table also indicates whether the project has been included in previous Long Range Transportation Plans (LRTPs) or MTPs, or is in the current MTP.

Table 8 Comparison of Projects by Concept

Improvements	Projects Included in Concepts			In Previous MTPs?[1]
	1 High Mobility/ Low Access	2 Moderate Mobility/ Moderate Access	3 Low Mobility/ High Access	
Richardson Highway MP 359 Grade-Separated Facility	X	X		2005-2025 LRTP/2010-2035 MTP/2040 MTP
Old Richardson Highway Flyover			X	2005-2025 LRTP
Richardson Highway Railroad Overpass	X	X	X	2005-2025 LRTP/2010-2035 MTP/2040 MTP
Airport Way Interchange/10th Avenue Frontage Road	X	X		2040 MTP
Airport Way/Steese Expressway Intersection Improvements			X	
Old Steese Highway Improvements	X	X	X	2005-2025 LRTP/2010-2035 MTP
3rd Street/College Road Split Diamond Interchange	X			2005-2025 LRTP/2010-2035 MTP/2040 MTP
College Road Left Turn Lanes/Steese Expressway Widening			X	2005-2025 LRTP/2010-2035 MTP
Trainor Gate Road Grade-Separated Facility	X			2010-2035 MTP/2040 MTP
Trainor Gate Road Intersection Improvements		X		2040 MTP
Johansen/Steese Expressways Interchange	X	X		2005-2025 LRTP/2010-2035 MTP/2040 MTP
Johansen Expressway Widening	X	X	X	2040 MTP
Johansen Expressway Intersection Improvements			X	
Farmers Loop Road Interchange	X	X		2040 MTP
Farmers Loop Road Extension /Farmers Loop Road Intersection Improvements			X	
Chena Hot Springs Road Interchange Ramp Improvements	X	X	X	2040 MTP

Note: [1] In some cases, only a portion of the project was included in the LRTP/MTP.
Source: FMATS, 2005; 2010; and 2015.

6.0 Potentially-impacted Resources

Chapter 2 of this document summarized existing environmental conditions within the study corridor. This chapter summarizes the results of environmental research and public involvement related to the social and environment resources that would potentially be affected by proposed improvements discussed in Chapter 5. The environmental resources researched were based on the characteristics of the study area and on input from stakeholders. The resources that were considered are generally consistent with NEPA, its implementing regulations, and with FHWA and DOT&PF environmental review guidelines. The resources addressed in this section include:

- land use and development;
- ROW acquisition;
- Socioeconomics;
- cultural/historic resources;
- Section 4(f) recreation areas;
- water bodies;
- water quality;
- fish and wildlife;
- wetlands;
- air quality;
- noise;
- floodplains;
- utilities;
- hazardous materials; and
- invasive species.

The improvements included in each concept are only identified at a conceptual level. Accordingly, the analysis presented in this Chapter was conducted at a screening level to determine the resources of greatest concern in areas of proposed improvements. This overview is intended to provide information for preliminary consideration of the appropriate level of NEPA documentation for proposed improvement projects. When design progresses on any individual improvement project, further review will occur to confirm resources of concern and potential levels of effect.

6.1 Human Environment

6.1.1 Land Use and Development

The proposed improvements are primarily within existing ROWs, but some improvements could affect adjacent lands through ROW acquisition, changes in traffic patterns, changes in noise, or other effects. As discussed in Chapter 2, the corridor is characterized by a variety of adjacent land uses, including developed residential and commercial uses and sensitive land uses, such as schools, churches and cemeteries.

The FNSB Regional Comprehensive Plan identifies goals for land use, transportation infrastructure and economic development. The proposed improvements to these key local and regional transportation facilities are intended to support these goals, as described below.

Retention and maintenance of private property rights is a land use goal for the borough. The proposed improvements would be designed to minimize the potential effects on private properties through ROW acquisition.

Strengthening and expanding the existing economy is an economic goal, including maintaining Fairbanks as the transportation hub and center of economic activity for Interior Alaska. The proposed improvements are intended to provide more efficient transportation into and through Fairbanks, to support its role as an economic and transportation center. Improvements proposed in Concept 1 and 2 in particular, remove obstacles to freight transportation and increase overall mobility.

The transportation and infrastructure goals include having a safe, efficient, multi-modal transportation system that anticipates community growth. The proposed improvements are designed to improve the safety and efficiency of the transportation system, including non-motorized and rail mode facilities.

Existing land uses could potentially be affected by increased traffic noise where the elevation of the road changes, where lanes are moved closer to existing structures, and where existing vegetation is removed. Residences, churches, schools, cemeteries, and passive recreation areas are considered noise-sensitive land uses. Concept 1 and 2 include construction of interchanges in various areas and associated improvements include potential frontage roads and other improvements. Concept 3 includes construction of an additional lane of traffic along the Steese Expressway. Each concept contains elements that may change traffic patterns and change the elevation of portions of the road and or railroad. Further analysis of potential changes in noise levels is warranted as proposed projects move forward.

The potential for effects on existing land uses from ROW acquisition are discussed in detail in the following section. Other potential effects could result from transportation improvements that change traffic patterns or access to developed sites. The changes in traffic patterns and access routes that result from Concepts 1 and, to a lesser extent Concept 2, may be an inconvenience to some motorists, but the overall improvements in safety and traffic congestion throughout the corridor are expected to offset the out-of-direction travel and the net impact to the transportation network is an overall decrease in delay. Concept 3 and the signalized intersections in Concept 2 will experience substantial additional delay over the next 20 years, and the ability to expand or improve the transportation network in 20 or 30 years will be more more difficult and the impacts will be more significant as development and congestion increase.

6.1.2 ROW Acquisition

Public Law 91-646, the “Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970” or the Uniform Act, provides important protections and assistance for people affected by federally-funded projects. The Uniform Act is designed to provide for fair and equitable treatment for people whose real property is being acquired, or who must move as a result of projects receiving federal funds.

Most improvements proposed would occur within existing ROWs, however, there is the potential that some ROW would be required for some intersection improvements and/or access roads. In most cases where ROW is needed, it is typically only partial takes rather full-property acquisitions based on the conceptual level of analysis conducted for this study. DOT&PF would evaluate additional measures to reduce or eliminate the need for ROW acquisition as projects move into design. For example, the existing road grid may be used to provide access to new interchanges in place of new frontage roads in some areas. Any ROW acquisition for proposed improvements would be conducted in accordance with the Uniform Act.

This analysis discusses the land uses and ownerships adjacent to the proposed improvements to identify properties that could potentially be impacted.

Richardson Highway MP 359 Grade-Separated Facility

Old Richardson Highway would need to be realigned to connect to either of the grade-separated options proposed in Concepts 1 through 3. Realignment of the railroad line and possibly construction of a new gated access into Fort Wainwright may require alignment changes on Fort Wainwright lands. No private land acquisition is anticipated.

Airport Way

Concepts 1 and 2 propose the construction of an interchange at Airport Way and interchange ramps primarily within the existing ROW. A new frontage road is proposed between Airport Way and 10th Avenue that could require partial ROW acquisition from four properties, including the AT&T/Alascom ball field, a federal office building, and commercial properties.

Concept 3 proposes a third southbound lane on the Steese Expressway through the area, an additional southbound left-turn lane on the expressway and additional left-turn lanes on Airport Way and Gaffney Road. These improvements would likely require ROW acquisition along the Steese Expressway. In addition to the four properties mentioned above, two additional commercial properties and two residential properties may be affected. The Clay Street Cemetery is located in this area but would not likely be impacted by ROW acquisition.

3rd Street and College Road

Concept 1 would construct a split diamond interchange with new ramps south of 3rd Street and north of College Road. A new structure (one-way bridge) over the Chena River may be used to accommodate the southbound acceleration lane for traffic coming onto the Steese Expressway from 3rd Street and the non-motorized pathway. Alternatively, an acceleration lane with a shortened merge length may be used to avoid constructing a new one-way bridge structure. The acceleration lane would be lengthened at some point in the future if the Chena River Bridge is reconstructed. The existing road network could function as a quadrant-style interchange where the roads parallel to the Steese Expressway provide connectivity between overpasses. As traffic volumes increase, one-way frontage roads would be constructed between 3rd Street and College Road and narrow strips of ROW acquisition (partial takes) would likely be needed to supplement the already narrow Steese Expressway ROW in this area.

The Steese Expressway ROW is narrowest in the area between 3rd Street and Trainor Gate Road, increasing the potential for ROW acquisition effects on adjacent properties. The Concept 1 improvements could potentially require some ROW acquisition from Graehl Park, if a bridge structure is constructed for the acceleration lane for traffic entering the Steese Expressway southbound from 3rd Street. ROW acquisition may also impact commercial and residential properties on either side of the expressway, particularly if frontage roads are constructed between 3rd Street and College Road. The properties most likely to be impacted would be those adjacent to the 3rd Street and College Road intersections. Another potential frontage road is proposed from Hamilton Avenue to Trainor Gate Road. This could require ROW acquisition from commercial and vacant properties near Hamilton Avenue and Adak Avenue. ROW acquisition may be avoided if the existing road grid can be used in place of proposed frontage roads.

Concept 2 proposes additional turn lanes on the Steese Expressway at both the 3rd Street and College Road intersections and additional turn lanes on 3rd Street and College Road. This may require additional property for ROW to construct turn lanes. ROW acquisition may potentially affect those commercial and residential properties directly adjacent to the 3rd Street and College Road intersections.

Concept 3 would require the construction of a third southbound lane on Steese Expressway from Johansen Expressway to Airport Way. ROW acquisition for this concept would likely affect commercial and residential properties along much of the west side of Steese Expressway.

Trainor Gate Road

Steese Expressway widens again near Trainor Gate Road. The wide ROW in this area may allow most of the proposed improvements in each of the concepts to occur within the exiting ROW. Construction of potential frontage roads in Concept 1 along the east side of the Steese Expressway could require some partial ROW acquisition.

Johansen Expressway

Concept 1 and 2 would replace the existing Johansen/Steese Expressway intersection with a grade-separated interchange, including a dual southbound right-turn lane. Johansen Expressway would be widened to add a third westbound lane and additional turn lanes.

Although the Steese Expressway ROW is fairly wide in this area, some ROW acquisition could be required at the Johansen/Steese Expressway intersection. Properties in the vicinity of this intersection include a commercial vehicle dealership and a church.

The Johansen Expressway ROW appears to be wide enough to accommodate the proposed changes for this road.

For Concept 3, the existing signalized intersection at Johansen/Steese Expressways would remain, but Farmers Loop Road would be extended south to Harold Bentley Avenue to bypass the Johansen/Steese Expressway intersection. Johansen Expressway would be widened as described for the other concepts.

Property needed for ROW for the Concept 3 extension of Farmers Loop Road would impact residential and commercial properties along the proposed extension route.

Concept 3 would also add a third southbound through lane on Steese Expressway through this area. Given the wide ROW in this area, ROW acquisition may not be needed to accommodate this lane.

Farmer's Loop Road

Concept 1 and 2 would reconstruct the interchange as a grade-separated interchange. The intersections of Old Steese Highway and Birch Hill Road would require realignment to accommodate the interchange. Old Steese Highway would be realigned to connect to Farmers Loop Road. Birch Hill Road would be realigned to connect to City Lights Boulevard. There appears to be sufficient ROW for most of the improvements to the Steese Expressway and Farmers Loop Road. The realignment of Birch Hill Road may require some ROW acquisition from one or two commercial properties near the intersection of Birch Hill Road and Fairhill Road. Access to an existing fueling station on Farmers Loop Road would also need to be relocated and may require ROW acquisition from a residential property on Farmers Loop Road Extension. The relocation of

the Old Steese Highway would require ROW acquisition from public lands near the Farmers Loop Transfer Station.

Concept 3 would upgrade the existing Farmers Loop Road intersection to include additional turn lanes, and realign Old Steese Highway to connect with Farmers Loop Road. ROW acquisition would be required for the realignment of Old Steese Highway near the Farmers Loop Transfer Station.

Old Steese Highway and Chena Hot Springs Road

Improvements to the Old Steese Highway and the Chena Hot Springs Road intersection are currently under design and are needed regardless of the concept selected for the Richardson-Steese corridor.

6.1.3 Socioeconomics

Social and economic effects associated with the proposed corridor improvements include safety and mobility effects, effects on travel routes and access, and economic effects such as employment and wages.

The proposed improvements would improve safety, increase mobility and accessibility, reduce congestion, and improve freight operations along the Richardson Highway and Steese Expressway. Concept 1 provides the greatest benefits in terms of safety, mobility, and freight movement. Concept 2 also improves safety and mobility, but impediments to freight movement and at-grade signalized intersections would result in less improvement. Concept 3 retains existing access and travel patterns but does not provide the safety and mobility benefits achieved with the other concepts.

Proposed interchanges under Concept 1 would change travel patterns and in some cases property access. The interchange at Airport Way would eliminate access onto the Steese Expressway from 10th Avenue, resulting in travel pattern and access changes in that area. Emergency vehicles from the downtown area would need to travel south to access the Steese Expressway northbound. The removal of signalized intersections on the Steese Expressway and reduced congestion are expected to make response times to incidents north of 10th Avenue comparable to current response times.

Similarly, the interchange configuration for 3rd Street and College Road would change travel patterns in this area and could increase traffic volumes on existing collectors like Farewell Avenue, Hamilton Avenue, 3rd Street and Old Steese Highway as travelers use the grid network to move between the 3rd Street and College Road overpasses.

Concepts 1 and 2 both propose potential modifications to access on Trainor Gate Road. As one of the more congested and crash-prone areas, numerous restrictions to traffic movements have occurred over the years in this area and the problems have persisted. Concepts 1 and 2 both lean toward converting Trainor Gate Road to a one-way road in the westbound direction. This change would divert traffic to/from the Bentley Trust area to other routes such as Johansen Expressway, Helmericks Avenue, and/or College Road. The residential neighborhood to the east of Steese Expressway in the vicinity of Trainor Gate Road has expressed concerns both for and against this this change. Of concern is the limited option for accessing the residential area for both motorized and non-motorized traffic. In response to these concerns, a pedestrian overpass and a optional interchange configuration at Trainor Gate Road (Options 1 and 2, respectively) were added to Concept 1.

The most substantial road realignment would occur on the Old Steese Highway between the Steese Expressway and Farmers Loop Road. This would change access to commercial properties adjacent to the Farmers Loop Road/Steese Expressway intersection.

The travel pattern and access changes described above are anticipated to cause stress in the short term, as motorists adjust to the new patterns, traffic volumes on adjacent streets, and changes in the level of congestion along the corridor. Improved travel times along the corridor are anticipated to offset some or all of the adverse effects of route changes and required out-of-direction travel.

Under Concepts 1 and 2, pedestrian access would be improved at the grade-separated intersections, as pedestrians would have signalized crossings of much lower-volume and lower-speed roads to cross in comparison to the Steese Expressway and Richardson Highway. Concept 1 includes a pedestrian overpass across the Steese Expressway north of Trainor Gate Road to access the high-demand Bentley Trust area, and all concepts propose an additional pedestrian undercrossing to accommodate Fort Wainwright pedestrian traffic near the railroad crossing on the Richardson Highway.

Travel pattern and access changes are less severe under Concept 2, as full signalized intersections would be maintained at 3rd Street and College Avenue. Concept 2 is the same as Concept 1 for other improvement areas.

Travel pattern and access changes would be minimal under Concept 3, as signalized intersections would be maintained throughout most of the corridor. Concept 3 would change the alignment of the Old Steese Highway and Farmers Loop Extension and would change access to the fueling station on Farmers Loop Road.

The projects would have mixed, short-term impacts on the local economy. The overall cost of improvements ranges from $204.5 million for Concept 1 to $150 million for Concept 3. Improvements would be phased over the next 5 to 20 years depending on project funding availability. Construction expenditures and employment generated by these expenditures would also be spread over several years. During construction, the project would employ construction workers, contractors, and workers in industries that provide supplies and support. The projects would support the local and regional economy through employment and wage income as improvements are constructed. Project payrolls would increase local household income, business revenues, and may increase income for local businesses, but would not have substantial or long-term impacts on regional income levels.

As the improvements would be implemented over time and given the on-going nature of infrastructure improvements in the region, implementation of proposed improvements would not represent a major change to existing conditions in the regional or local economy.

Construction-related activities would most likely result in altered traffic patterns, short-term traffic delays, and limited accessibility to businesses and residences in the vicinity of each project as the projects are implemented. Public services may be temporarily impacted due to delays and detours. Traffic plans would be developed in consultation with stakeholders and property owners to minimize the effects of construction on business operations and residents.

6.1.4 Cultural/Historic Resources

The NRHP and the AHRS were researched to identify the properties eligible for the NRHP listed or officially on the NRHP within the corridor (see Figure 4). The Clay Street Cemetery and Eastside Residential Historic District are eligible properties located adjacent to the Steese Expressway (ADNR, 2013). Each of the concepts may require some ROW acquisition in the vicinity of these properties as described above. Additional analysis and consultation with SHPO would be required as part of project implementation for improvements in the Airport Way/10th Avenue area.

Other improvement areas do not appear to be adjacent to known eligible properties; however there is the potential for unidentified and unevaluated cultural resources to be present in unsurveyed areas. Project-specific surveys may be required to facilitate official evaluations of NRHP-eligibility for areas affected to assess specific project impacts.

6.1.5 Section 4(f) Recreation Areas

Graehl Park lies west of the Steese Expressway on the north bank of the Chena River. This park may be affected by construction of the interchange proposed for 3rd Street under Concept 1. It may also be affected under Concept 3, which requires additional of a third southbound lane on the Steese Expressway.

All concepts could impact the ball field located north of Airport Way at the Steese Expressway. Although the ball field is privately owned, it may qualify for protection under Section 4(f) since it is operated and maintained for public use by FNSB Parks and Recreation. Similarly, the conservation area northwest of the Johansen/ Steese Expressway intersection may also qualify as a Section 4(f) resource even though it is not publically owned. This property would rquire further consultation with FHWA to determine if it would meet the standards for a Section 4(f) property.

Separate evaluations of publicly-owned parks, trails, and open space lands will be conducted to determine if there are any properties that qualify for protection under Section 4(f). Impacts to public recreation areas must be avoided unless there are no prudent and feasible alternatives to the use, and if used, measures must be implemented to minimize the harm to the facility.

6.2 Natural Environment

6.2.1 Water Bodies

As discussed in Chapter 2, the Chena River is a navigable water body and proposed improvements to the Chena River Bridge would require a USCG review and permit. Concept 1 could require a new separate structure for the acceleration lane for traffic accessing the Steese Expressway southbound from 3rd Street. Concept 3 would require the additional of a third southbound lane on the bridge. Therefore, it is likely that a bridge permit would be required for Concepts 1 and 3. Concept 2 is not anticipated to require changes to the bridge.

6.2.2 Water Quality

Each concept proposes improvements to road facilities in the corridor and would increase the amount of impervious surface in the corridor and the quantity of storm water runoff draining to local receiving waters. Most of the corridor is located within the Fairbanks Urbanized Area covered by APDES Permit No. AKS-053406. Under this permit, public projects disturbing an acre or more must ensure that controls are in place to prevent or minimize water quality impacts. DOT&PF policy for projects within the Fairbanks Urbanized Area is that design must follow criteria set forth in the Fairbanks & North Pole Storm Water Management Program Guide (Cities of Fairbanks and North Pole, 2010).

Construction activities may cause a temporary degradation of water quality. Clearing and grading activities would expose soils to wind and rain erosion until those areas can be temporarily or permanently stabilized. New ground disturbance could increase sedimentation and increase turbidity of all receiving waters. Implementation of best management practices for minimizing storm water impacts would reduce the potential for water quality effects during construction.

6.2.3 Fish and Wildlife

Resources of concern in the corridor vicinity include wildlife and bird habitat as well as fish habitat in the Chena River.

Although most of the proposed improvements would occur in developed or disturbed areas, improvements on the north and south ends of the corridor could affect undeveloped lands. Vegetation clearing, grubbing, and other site preparation and construction activities could adversely affect wildlife habitat and nesting areas for birds. The USFWS and ADF&G have indicated that projects in the vicinity of the Johansen/Steese Expressway intersection and along Farmers Loop Road Extension have the potential to affect high-value bird habitat in the conservation area northwest of the intersection and to affect other non-developed lands in this area that provide habitat. The conservation area provides nesting and foraging habitat for the Rusty Blackbird, a State species of concern, as well as other migratory birds.

Concepts 1 and 2 propose a new interchange at the Johansen/Steese Expressway intersection, an additional lane and turn lane along Johansen Expressway, and a new southbound right-turn lane on the Steese Expressway that may have some adverse effects on this area. Concept 3 proposes surface improvements at the Johansen/Steese Expressway, an additional lane and turn lanes on Johansen Expressway, and a new southbound right-turn lane on the Steese Expressway, as well as an extension of Farmers Loop Extension to a roundabout at the northern end of the Old Steese Highway. The Concept 3 improvements are more likely to adversely affect the conservation area.

To reduce the risk of inadvertent nest destruction, vegetation clearing, grubbing, and other site preparation and construction activities would be conducted outside of the spring and summer, using guidelines developed by the USFWS.

Forested riparian areas that could be used for roosting and nesting by bald eagles are present in the vicinity of the corridor. Prior to construction of proposed improvements, surveys would be conducted for eagle nests in the vicinity of proposed projects. To avoid disturbing nesting bald eagles, DOT&PF, in consultation with USFWS, would maintain distance buffers around nests, maintain landscape buffers around nests, and construction activities would be conducted outside of the bird nesting timeframe, using guidelines developed by the USFWS.

ADF&G's Anadromous Waters Catalog lists the Chena River as spawning habitat for chum salmon, and spawning and rearing habitat for Chinook salmon. Concept 1 may require a new structure across the Chena River to accommodate an acceleration lane for traffic entering the Steese Expressway southbound from 3rd Street. Concept 3 would require replacement of the bridge over the Chena River to accommodate a third southbound lane on the Steese Expressway. Concept 2 would not require changes to the existing bridge or new structures. Construction in the Chena River would require an ADF&G fish habitat permit and EFH consultations with NMFS.

6.2.4 Wetlands

Wetlands have been identified in the corridor study area on the south side of the Richardson Highway and east of the Richardson Highway south of Airport Way, as well as on the west side of the Steese Expressway north of the Johansen Expressway. Most of the wetlands are palustrine scrub/shrub, however, near the Johansen/Steese Expressway intersection are two higher-value palustrine emergent wetlands. The larger of

the palustrine emergent wetlands has been placed in a conservation easement to provide habitat for the Rusty Blackbird. The USFWS has specifically identified concerns regarding potential effects to these high-value wetlands. This area also has the potential to be considered a Section 4(f) property as discussed previously.

The relocation of the railroad proposed under Concepts 1 and 2 of the Old Richardson Highway project would potentially affect palustrine scrub/shrub wetlands. The proposed extension of Farmers Loop Road to the Old Steese Highway under Concept 3 would potentially affect the large palustrine emergent wetland north of the Johansen/Steese Expressway intersection that supports migratory birds and birds of conservation concern.

Construction of a new structure (Concept 1) or replacement of the bridge (Concept 3) over the Chena River is likely to require the discharge of dredge or fill material into the Chena River.

6.2.5 Air Quality

Vehicle emissions are increased when there is traffic congestion during peak periods. Vehicles idling when stopped at signalized intersections also increase vehicle emissions. Any action that alleviates congestion and vehicle idling improves regional and local air quality. Concept 1 would result in the greatest reduction in congestion and vehicle idling, resulting in the greatest potential benefit to air quality. Concept 2 would also reduce vehicle emissions and improve air quality. Concept 3 reduces congestion and vehicle idling the least, with the least benefit to air quality.

6.2.6 Noise

Changes to road elevation, road footprints, intersection controls, or traffic patterns have the potential to change traffic noise or vibration impacts to sensitive land uses, such as residences, parks and schools. State and federal transportation agencies have established thresholds for evaluating noise effects and whether there is a need for mitigation.

The DOT&PF Noise Policy specifies that a noise analysis is required for all Type I projects if noise sensitive receptors are present within the project area. A Type I project consists of a proposed federal or state project for construction of a highway on a new location or the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment, increases the number of through lanes, and/or adds or relocates interchange lanes or ramps. Most of the improvements proposed under each of the concepts would qualify as Type I projects and a noise analysis is likely to be required for each project.

6.2.7 Floodplains

Projects that require alterations to the 100-year floodplain and/or work in the floodway require a floodplain permit from the FNSB Department of Community Planning. Concept 1 may require a new structure over the Chena River Bridge and frontage roads/acceleration lanes between the river and 3rd Street. Concept 3 would require a third southbound lane on the Steese Expressway in this area. Concept 2 would not likely require any work in the floodplain.

6.2.8 Utilities

This section provides a general summary of apparent project impacts to existing utilities based on review of utility system maps. The type and location of conflicts are discussed below, but the ability to resolve the utility conflicts through relocation or through geometric (horizontal or vertical) changes is difficult to assess at the planning level and will need to be reviewed during project design.

Restrictions on utility locations and access are increased in controlled access corridors. When an existing highway corridor is converted to controlled access, as proposed in Concepts 1 and 2, utilities must be relocated outside of the controlled-access limits of the corridor and its entrance/exit ramps. Exceptions can be made in rare instances where terrain or other environmental considerations make moving the utility impractical, but only if the utility can be accessed safely without adversely affecting traffic operations and safety or damaging the highway or highway structures.

The construction of new interchanges under Concept 1 would result in rerouting and/or replacement of buried and overhead facilities. Given that Concept 1 expands controlled access along the corridor, it is assumed that all utilities would be relocated outside the controlled access limits of the corridor.

- Several communication, cable, fiber optic and power lines are located near the ROW limits on either side of the Richardson Highway, and short segments along both sides of the Steese Expressway with buried crossings at most of the proposed interchange locations.
- At least nine water main crossings and three sewer main crossings of the Steese Expressway are located between Chena River and Johansen Expressway. Additionally, water mains are located on the western side of Steese Expressway (under the pathway) between Chena River and 3rd Street and also along the eastern side of Steese Expressway between College Road and Trainor Gate Road. Many of the crossings are located at intersections and most are likely to require relocation due to their age, the increased depth of burial that would result from fill needed for construction of the interchange, and subsequent inaccessibility. Use of FHWA funds for the corridor will likely require that measures be taken to more stringently control the access for utilities in the corridor, such as requiring relocation and/or removal of vaults, manholes, and other maintenance features to avoid having to access these facilities in the controlled access areas.
- Existing and planned (future) natural gas distribution lines may also be affected by construction of the proposed interchanges. IGU's high-pressure steel transmission line alignment is expected to run within the Richardson Highway ROW. FNG's expanded distribution network would also likely cross the corridor at several locations north of the Chena River.

Concept 2 would have similar impacts to the existing buried and overhead utilities except in the vicinity of 3rd Street and College Road where existing at-grade intersections would remain. The existing utilities in this area (including 6 water main crossings and a parallel water main from Chena River to 3rd Street) may not have to be relocated or reconstructed.

Concept 3 would likely have the least impact on existing utilities and require the least relocation and replacements, though the magnitude of construction work and the area disturbed would still be substantial. Construction of the third southbound lane on the Steese Expressway would likely impact most of the water mainlines, lighting and electrical lines as the other concepts, and may impact other utilities not located at the intersections. Similarly, the Airport Way intersection expansion would likely impact many of the same utilities affected by Concepts 1 and 2. Few if any utilities are impacted by the extension of Farmers Loop Extension to Harold Bentley Avenue.

6.2.9 Hazardous Waste and Contaminated Sites

A total of 16 contaminated sites were identified within 500 feet of the corridor or in the vicinity of other proposed improvements to cross streets or intersections (see Figure 7). Most of these contaminated sites are unlikely to be affected by proposed improvements. However, proposed improvements along the Old Steese Highway and Johansen Expressway and near the Johansen/Steese Expressway intersection in all concepts are in close proximity to known sites and may require additional research to determine whether there is the potential to encounter contamination. The extension of Farmers Loop Extension in Concept 3 would also require additional research on contaminated sites near the intersection with the Old Steese Highway.

6.2.10 Invasive Species

Any construction project has the potential to introduce new invasive species to the project site on construction equipment or by importing fill containing invasive species. Invasive species already within the project area could colonize newly-disturbed areas and could also be spread beyond the study area to earth/debris disposal sites, by transport within excavated earth and debris. Measures to control invasive species would need to be implemented during construction to minimize the potential for the introduction or spread of invasive species.

6.3 Permits and Authorizations

The following permits and authorizations are likely be required for implementation of proposed improvements.

- A USACE Section 404 permit would be required for any projects requiring dredge or fill below the ordinary high water mark of any waterbody or within any wetland.
- An APDES General Permit for Large and Small Construction Activities would be required for all projects disturbing 1.0 acre or more.
- A FNSB Flood Hazard Permit would be required for work in the Chena River and for any work affecting the Zone A SFHAs north of the river and south of the Richardson Highway near the railroad line.
- A USCG bridge permit and a USACE Section 10 permit may be required for reconstruction of the Chena River Bridge or construction of a new structure for an acceleration lane.
- Consultation with the NMFS regarding impacts to essential fish habitat may be required for work in the Chena River.
- Concurrence from the SHPO regarding impacts to historic resources would be required.
- A Fish Permit from the ADF&G would be required for work below the ordinary high water mark of the Chena River.
- FHWA Section 4(f) consultations and approvals would be required for projects affecting public recreation resources, such as Graehl Park and possibly the AT&T/Alascom ball field, the wetland conservation area northwest of Johansen/Steese Expressway intersection, or Birch Hill Cemetery.

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7.0 Improvement Analysis

7.1 Screening and Decision Process

Improvement alternatives were developed specifically to address the deficiencies identified in the purpose and need, to be consistent with other State policies such as the SHSP, and to address public input. The transportation deficiencies and the proposed improvement projects discussed in Chapter 5 were presented to stakeholders and the public at workshops and an open house early in the study process. Once the projects were re-evaluated in the context of corridor-wide concepts, the concepts were presented at subsequent workshops and another open house. Information on how well each concept met the purpose and need for corridor improvements as well as the potential environmental issues associated with each concept was presented.

Screening criteria were developed to reflect the purpose and need statements for the corridor developed based on input from stakeholders, resource agencies, and the public. Each improvement concept and its individual projects were evaluated based on the ability to meet the purpose and need as well as other considerations including environmental effects. Table 9 lists the 19 screening criteria used for this PEL study. A summary of the screening results for each concept is provided below.

Table 9 Concept Comparison Matrix

Criteria			CONCEPT 1 High Mobility/ Low Access	CONCEPT 2 Moderate Mobility/ Moderate Access	CONCEPT 3 High Access/ Low Mobility
Purpose and Need	1	Resolves areas of elevated crashes and crash severity	●	◒	○
	2	Improves mobility (capacity and operations)	●	◒	○
	3	Maintains existing travel patterns and driveway locations	○	◒	●
	4	Improves non-motorized safety, access, and connectivity	●	◒	○
	5	Improves movement of freight	●	◒	○
	6	Improves air quality in the corridor	●	◒	○
Other Considerations	7	Minimizes ROW acquisition	◒	◒	◒
	8	Minimizes impacts to existing utilities	○	○	◒
	9	Improves access management	●	◒	○
	10	Avoids impacts to historic resources	◒	◒	◒
	11	Avoids impacts to habitat	◒	◒	○
	12	Avoids fill in wetlands	◒	◒	○
	13	Avoids contaminated sites	◒	◒	◒
	14	Minimizes noise impacts	◒	◒	◒
	15	Improves water quality	◒	◒	○
	16	Avoids 4(f) and 6(f) resources	◒	◒	○
	17	Improves infrastructure sustainability and longevity	●	◒	○
	18	Cost effective and fiscally responsible; minimizes long-term maintenance and operation costs	●	◒	○
	19	Estimated cost	$204.5M	$181.3M	$149.5M

● - Most Favorable/Least Adverse Effect ◒ - Favorable/Moderate Adverse Effect ○ - Not Favorable/Most Adverse Effect

7.1.1 Concept 1 – High Mobility, Low Access

Concept 1 best meets the purpose and needs described in Chapter 4 as summarized below. It improves mobility and reduces congesting, and brings the LOS at all intersections up to an acceptable range through 2040. It also improves safety by reducing the frequency and severity of crashes on the corridor and eliminating stop-and-go traffic that can result in rear-end crashes. Reducing congestion and idle time at signals also reduces vehicle emissions which improves air quality. Many of the proposed improvements in Concept 1 are already included in the FMATS MTP (see Table 7).

Safety

Concept 1 improves traffic safety, particularly at intersections. This concept best complies with the recommendations in the SHSP for addressing the frequency and severity of crashes at intersections by improving access control (decreasing access points) along the corridor.

- Crash frequency and severity would be reduced by replacing at-grade intersections with grade-separated interchanges.
- Constructing grade-separated railroad crossings would reduce crashes and roadside hazards associated with at-grade railroad crossings, including rear-end hazards from trucks stopping at these crossings. Exposure of pedestrians/bicycles to traffic at higher-volume and higher-speed signalized intersections would be reduced, as pedestrians and bicyclists could be accommodated through the use of underpasses or overpasses, and signalized crossings would be at the ramp intersections and not across the mainline.
- Crossing distances for pedestrians and bicyclists would be shorter at interchange ramps than at existing signalized intersections.

Mobility/Access

Concept 1 reduces traffic congestion and delay and maintains access onto and across the corridor. This concept is the most consistent with the SHSP recommended action to increase freeway miles to increase mobility for people and goods.

- Eliminating at-grade signalized intersections allows traffic to flow more efficiently through the corridor as vehicles would not need to stop at signals and trucks and buses would not need to stop at railroad crossings.
- The freeway-type facility results in a high LOS for projected traffic volumes, reducing the time needed for traffic to move through the corridor. Overall travel time and network delay would be lower than under Concepts 2 and 3.
- All Steese Expressway and Richardson Highway intersections are anticipated to operate at an acceptable LOS through the design year (2040).
- Access to adjacent side streets would change from existing conditions, but decreased congestion, higher speeds on the freeway, and reduced delay would offset the out-of-direction travel and result in lower overall travel time.
- Although direct access to the Steese Expressway is reduced in some areas, frontage roads would provide access from these areas to the expressway. Frontage roads actually improve access, as properties may be allowed future direct driveway access onto the frontage road as opposed to having to use local roads to access the Steese Expressway.

- Grade-separated facilities for non-motorized travel provides safer pedestrian and bicycle travel across the corridor.

Freight

Concept 1 eliminates impediments to efficient freight transport through the corridor.

- Elimination of traffic signals allows for taller freight loads to pass through the corridor by removing the traffic signal masts that block tall loads.
- Travel time for freight movements through the corridor would be more efficient by replacing traffic signals with interchanges. This efficiency is achieved by eliminating stops at intersections as well as enabling a higher, more consistent posted speed on the Richardson-Steese corridor.
- Freight operations may become more efficient as freight movements can be scheduled throughout the day versus the current scheduling to avoid the congested day-time conditions in the corridor.
- Constructing grade-separated railroad crossings eliminates the need for freight trucks to stop at railroad tracks.

Environmental

Concept 1 reduces traffic congestion to help improve air quality.

- Interchanges reduce vehicle emissions by reducing congestion and delay in the corridor which reduces stop-and-go traffic and vehicle idle times.

Other Considerations

In addition to meeting the purpose and need for the project, the concepts were evaluated against other considerations, such as environmental effects, cost and fiscal responsibility. These considerations are discussed below for Concept 1.

ROW Acquisition: Although most improvements proposed appear to fit within existing ROW, Concept 1 may require ROW acquisition for some proposed improvements. In particular, interchanges and possible frontage roads may require ROW acquisition west of the Steese Expressway north of Airport Way and near the 3rd Street and College Road intersections with the Steese Expressway. The proposed interchange at Johansen Expressway could also require a small amount of ROW acquisition. Improvements at Farmers Loop Road would require new ROW from public lands to relocate the Old Steese Highway and from private lands for realignment of Birch Hill Road and a new access to a fueling facility on Farmers Loop Road.

Utilities: Construction of interchanges at most intersections would likely require relocation or replacement of the utilities. Numerous utilities are located within or cross the corridor in these areas as described in Section 6.2.8.

Improves Access Management: Concept 1 improves access management on the Steese Expressway by removing at-grade intersections and reducing the number of access points onto the Expressway. These effects would be most noticeable in the vicinity of 10th Avenue and between 3rd Street and Trainor Gate Road. Frontage roads or the existing road grid would be used to route traffic to interchanges for expressway access. Access to a fueling station would change near Farmers Loop Road. While this improves corridor operations, it would result in changes to travel patterns and access routes in the vicinity of the expressway. While these changes may be inconvenient at first for motorists, the improved safety and travel time on the corridor are

expected to result in an overall net benefit for motorists traveling through the corridor or accessing nearby properties. If frontage roads are constructed, properties adjacent to the controlled access facilities may have improved site access with the potential for driveways onto the frontage roads.

Historic Resources: Most improvements would occur within existing ROW minimizing the potential to affect historic resources. Consultation with SHPO would be required to obtain concurrence that there are no effects.

Wildlife Habitat: Most improvements are in areas that are already developed or disturbed. Effects on vegetation and habitats are anticipated to be minor. Construction of the 3rd Street interchange could require a one-way bridge structure for a freeway on-ramp, requiring work in the Chena River. Consultations with ADF&G and NMFS would occur regarding the potential for EFH effects.

Wetlands: Improvements on Steese Expressway between Johansen Expressway and Farmers Loop Road may affect wetlands.

Contaminated Sites: Proposed improvements near the Johansen Expressway may have the potential to affect contaminated sites in this area.

Noise: Construction of interchanges and potential frontage roads may result in noise effects to nearby residences particularly between Airport Way and College Road. Additional design detail would be needed to determine the potential for and extent of effects.

Water Quality: Implementation of best management practices during construction can minimize the potential for erosion and sediment discharge during construction. Improvements proposed would address storm water collection and discharge consistent with the APDES storm water permit for the area.

Section 4(f): Improvements to Airport Way may affect the AT&T Alascom ball field located northwest of the intersection. Although this is a privately-owned facility, it is maintained by the FNSB and used by the public which could result in a determination that it is a Section 4(f) resource. Construction of an interchange at 3rd Street would require an acceleration ramp for traffic entering the Steese Expressway southbound. Improvements in this area may potentially affect Graehl Park. Impacts to the conservation are northwest of the Johansen/Steese Expressways intersection may also require Section 4(f) analysis.

Infrastructure Sustainability and Longevity: Upgrading the central part of the corridor to freeway standards and improving access control on these facilities would enhance the capacity of the system, resulting in more sustainable and long-lasting infrastructure.

Cost Effectiveness/Fiscal Responsibility: Concept 1 results in a freeway facility that will promote economic development and an efficient transportation network. The resulting freeway would have ample capacity and would require the least future re-work of all of the concepts and will be more efficient to operate and maintain. Future capacity will be inherent in the network and the necessary transportation infrastructure will be completed prior to additional development advancing on the corridor that may have to be acquired for ROW.

Estimated Cost: The cost for Concept 1 is $204.5 million.

7.1.2 Concept 2 – Moderate Mobility, Moderate Access

Concept 2 is very similar to Concept 1 and thus meets many of the needs identified, but does not address the congestion and safety issues in the most congested portion of the corridor. Prior to the design year, additional improvements are needed to meet minimum LOS criteria and the impacts of those improvements will increase as congestion and development increase. The key differences between Concepts 1 and 2 are described by topic below.

Safety

Concept 2 improves traffic safety at some intersections, but signalized intersections would remain at 3rd Street and College Road. This concept moves the State toward the goals of the SHSP, but not to same the degree as Concept 1.

- Maintaining at-grade intersections within an otherwise access-controlled freeway corridor has the potential to result in additional crashes as drivers are transitioning from free-flowing fast traffic into congested areas with stopping traffic. This is both non-intuitive and frustrating to motorists.
- Crash frequency and severity would likely continue at or above the current rates at the signalized intersections. Rates could increase in the transition areas between signalized intersections and the interchanges.
- The red signal phase stopping traffic along the Steese Expressway would be maintained and the potential for rear-end crashes at these intersections would not decrease.
- Expanded lanes and intersections at the remaining signalized intersections would result in wider road surfaces increasing the crossing distance for pedestrians and bicyclists.

Mobility/Access

Concept 2 improves traffic mobility to some degree, but congestion would continue in the vicinity of 3rd Street, College Road and Trainor Gate Road.

- Mobility would be impeded by traffic signals at these intersections.
- The at-grade signalized intersections would continue to have unacceptable LOS during peak hours, resulting in congestion and delay.
- Existing access in the vicinity of 3rd Street and College Road would not change. Trainor Gate Road would have similar changes to Concept 1.

Freight

Some impediments to efficient freight movements would continue under Concept 2.

- Traffic signal masts would continue to limit the potential for oversized loads, requiring these to divert around a portion of the corridor.
- At-grade signalized intersections would continue to result in congestion and delay reducing freight efficiency.

Environmental

Concept 2 would result in continued traffic congestion at signalized intersections and high vehicle emissions.

- Stop-and-go traffic would continue to occur near signalized intersections resulting in traffic congestion and delay. These delays result in increased vehicle idle times and increased vehicle emissions.

Other Considerations

ROW Acquisition: As with Concept 1, some ROW may be needed on the west side of Steese Expressway north of Airport Way. This concept may not require ROW acquisition near the 3rd Street and College Road intersections with the Steese Expressway. ROW acquisition needs at the proposed Johansen/Steese Expressways Interchange and Farmers Loop Road would be the same as described for Concept 1.

Utilities: The level of utility conflicts and costs associated with utility relocation or replacement would be similar to that of Concept 1. Utility conflicts in the area of College Road and 3rd Street may be somewhat less than those of Concept 1.

Improves Access Management: Concept 2 would have similar access management changes as Concept 1 with the exception that no access changes would occur at 3rd Street/Steese Expressway and College Road/Steese Expressway.

Historic Resources: Most improvements would occur within existing ROW, minimizing the potential to affect historic resources. Consultation with SHPO would be required to obtain concurrence that there are no effects.

Wildlife Habitat: Most improvements are in areas that are already developed or disturbed. Effects on vegetation and habitats are anticipated to be minor. No work in the Chena River would be required for this concept.

Wetlands: Improvements on Steese Expressway between Johansen Expressway and Farmers Loop Road may affect wetlands.

Contaminated Sites: Proposed improvements near the Johansen Expressway may have the potential to affect contaminated sites in this area.

Noise: Preservation of the signalized intersections at 3rd Street and College Road would sustain high noise levels for stop-and-go traffic. Construction of interchanges and potential frontage roads near Airport Way would result in positive and negative noise effects to nearby residences. Additional design detail would be needed to determine the potential for and extent of effects.

Water Quality: Implementation of best management practices during construction can minimize the potential for erosion and sediment discharge during construction. Improvements proposed would address storm water collection and discharge consistent with the APDES storm water permit for the area.

Section 4(f): Improvements to Airport Way may affect the AT&T Alascom ball field located northwest of the intersection. Graehl Park would not be affected.

Infrastructure Sustainability and Longevity: Concept 2 is essentially a longer progression toward Concept 1. It constructs all of the same improvements except at the 3rd and College intersections. This concept sidesteps some of the more sensitive access issues in the corridor by delaying them until a future project. The consequence of this delay is that much of the benefit of the freeway corridor on the Richardson-Steese corridor is delayed until free-flowing, higher-speed traffic is made feasible by future projects. This concept does not meet LOS requirements in the more urban parts of the corridor and does not provide the same long-term benefits as Concept 1.

Cost Effectiveness/Fiscal Responsibility: Concept 2 is not as cost effective as Concept 1 because most of the mobility and safety benefits of Concept 1 are not fully achieved by Concept 2. Also, by the end of the design

year (2040), the solutions to the congestion issues at 3rd Street and College Road will not have changed and the costs and development impacts to make those changes will be even more significant.

Estimated Cost: The cost for Concept 2 is $181.3 million.

7.1.3 Concept 3 – Low Mobility, High Access

Concept 3 does not meet the purpose and need for the corridor as traffic congestion would continue to limit mobility throughout the corridor, crashes would not be reduced, and impediments to efficient freight movements would not be resolved.

Safety

Concept 3 does not adequately address the roadway factors that result in high crash rates. This concept does not help move the State toward the safety goals in the SHSP.

- Conflict points and crash severity at major intersections would not be reduced with at-grade intersections but would likely increase as congestion increases, additional lanes are constructed, and driver frustration increases.
- The at-grade railroad crossing near Trainor Gate Road would continue to disrupt traffic, particularly as large trucks and buses have to stop at these crossings, increasing the risk of rear-end crashes.
- Signalized intersections would continue to stop traffic on Steese Expressway, increasing the potential for rear-end and other related crashes.
- Additional auxiliary lanes at the at-grade intersections increases the crossing widths for pedestrians and bicycles. The increase in lanes increases the crossing time needed for pedestrians which increases the exposure of pedestrians to motorized traffic.

Mobility/Access

Concept 3 does not adequately address the mobility need for the corridor.

- Mobility would be impeded as traffic would continue to need to stop at traffic signals resulting in stop-and-go traffic and increased congestion and delays.
- Posted speeds in the Richardson-Steese corridor would not change.
- Large trucks and buses would need to continue to stop at railroad crossings, slowing traffic in these areas.
- Efforts to increase capacity would create wide intersections with high pedestrian clearance intervals that decrease the efficiency of the signal network and reduces the cost effectiveness of the capacity measures.
- At-grade signalized intersections would continue to have poor LOS through 2030 and 2040. As congestion increases, motorists will divert to other local and collector streets.

Freight

Concept 3 would not improve freight efficiencies through the corridor.

- Traffic signal masts would continue to limit the potential for oversized loads, requiring these to divert around a portion of the corridor.
- At-grade signalized intersections would continue to result in congestion and delay, reducing freight efficiency.

Environmental

Concept 3 would result in continued traffic congestion and high vehicle emissions.

- Stop-and-go traffic would continue to occur near signalized intersections resulting in traffic congestion and delay which increases vehicle emissions.
- Vehicle idle times would be longer with signalized intersections increasing vehicle emissions.

Other Considerations

ROW Acquisition: ROW acquisition along much of the west side of the Steese Expressway would be required to add the third southbound lane on the Steese Expressway from Johansen Expressway to just south of Airport Way. Additional ROW would be required for the extension of Farmers Loop Extension to connect with Old Steese Highway. Corner easements/acquisitions are likely in areas where auxiliary lanes are added to existing signalized intersections.

Utilities: Concept 3 may require less relocation and replacement of utilities at major intersections. However, construction of the third lane on the Steese Expressway could result in other utlity conflicts in areas between interchanges.

Access Changes: Concept 3 results in the least change to existing access, but also has the least potential for improvements to access. Lots currently isolated by controlled access lines would not have the option of driveway access onto a frontage road network.

Historic Resources: Most improvements would occur within existing ROW, minimizing the potential to affect historic resources. Consultation with SHPO would be required to obtain concurrence that there are no effects.

Wildlife Habitat: Most improvements are in areas that are already developed or disturbed. Effects on vegetation and habitats are anticipated to be minor. Addition of a third southbound lane on the Steese Expressway would require replacement of the Chena River Bridge. This would require a Section 10 permit from USACE, a bridge permit from USCG, an ADF&G fish habitat permit, and possibly EFH consultation.

Wetlands: Improvements on Steese Expressway between Johansen Expressway and Farmers Loop Road may affect wetlands. This concept has the greatest potential to affect the wetland conservation area northwest of the Johansen/Steese Expressway intersection.

Contaminated Sites: Proposed improvements near the Johansen Expressway may have the potential to affect contaminated sites in this area.

Noise: Construction of the Farmers Loop Extension and the additional southbound lane on the Steese Expressway could result in changes to noise levels. Maintaining all of the signalized intersections also maintains the high noise levels that results from the stop-and-go traffic. Additional design detail would be needed to determine the potential for and extent of effects.

Water Quality: Implementation of best management practices during construction can minimize the potential for erosion and sediment discharge during construction. Improvements proposed would address storm water collection and discharge consistent with the APDES storm water permit for the area.

Section 4(f): Construction of the third southbound lane on the Steese Expressway and the bridge replacement over the Chena River may affect Graehl Park.

Infrastructure Sustainability and Longevity: Concept 3 is the opposite of infrastructure sustainability and longevity. Rather, the objective of this concept is specifically to extract out of the existing infrastructure the last ounce of capacity that can be achieved from prior investments. New investment will address only the most severe congestion issues. After 20 years of Concept 3, there will be little capacity remaining in the network and substantial investment will be needed.

Cost Effectiveness/Fiscal Responsibility: Much of the improvements that are included in Concept 3 are not needed if the Richardson-Steese corridor is eventually converted to a freeway, including the third lane on Steese Expressway, the bridge reconstruction, and the additional auxiliary lanes. All of this work is wasted if 20 years from now, the decision is made to convert the Richardson-Steese corridor to a freeway-type facility. From this perspective, Concept 3 is the least cost effective of all the concepts, despite the fact that the estimated cost of Concept 3 is much less than the other concepts. Concept 3 performs poorly and is the traffic equivalent of putting a bandage on a compound fracture. Eventually, the bandages will need to be removed and thrown away and surgery will be needed to repair the real problems.

Estimated Cost: The cost for Concept 3 is $149.5 million.

7.2 Preferred Concept

Based on the concept analysis, Concept 1 (High Mobility/Low Access) was determined to best meet the purpose and needs for the corridor. It would provide the greatest improvement to traffic operations, including reducing congestion and reducing factors that contribute to high crash rates. Construction of interchanges to replace the signalized intersections will create a long-term benefit to the Fairbanks transportation network by constructing a freeway segment that will enhance capacity, reduce delay, enable higher speeds, and improve safety. Concept 1 will require ROW acquisition in some locations and will reduce the level of direct access that some properties enjoy with Steese Expressway, but these impacts will be more than offset by the overpasses and frontage road network that will provide greater ability for motorized and non-motorized traffic to cross Steese Expressway and reduce overall travel times in the Richardson-Steese corridor. Interchange designs would be refined to minimize ROW acquisition needs and other potential impacts to the greatest extent practicable. Access to the corridor from areas where signalized intersections are removed (10th Street, 3rd Street, College Road) would be available via frontage roads to adjacent interchanges. Since access would not be restricted on these frontage roads, some nearby properties may actually have improved access with the frontage road system.

Concept 1 provides the greatest improvement to air quality due to reduced congestion along the corridor. The concept's potential to affect other environmental resources, such as water quality, wetlands, noise, and cultural resources, are similar to the other concepts since all concepts would require some level of construction and improvements at these intersections. Concept 1 was selected as the preferred concept for the reasons described above. The individual projects that constitute Concept 1 and their planning-level cost estimates are provided in Table 10. As shown in Table 10, most of the proposed improvements in this concept are already included in the current FMATS MTP.

Table 10 Preferred Concept -- Project List and Cost Estimate Summary

Proposed Projects	Estimated Cost (2014 $)	In Current MTP?[1]
Richardson Highway MP 359 Grade-Separated Facility	$37,000,000	Yes
Airport Way Interchange/10th Avenue Frontage Road	$32,000,000	Yes
3rd Street/College Road Split Diamond Interchange	$55,000,000	Yes[1]
Trainor Gate Road Grade-Separated Facility	$19,500,000	Yes[1]
Johansen/Steese Expressways Interchange	$25,000,000	Yes
Johansen Expressway Widening	$8,000,000	Yes[1]
Farmers Loop Road Interchange	$28,000,000	Yes
TOTAL	**$204,500,000**	

Note: Costs include 20 percent for preconstruction and construction phase services. The list does not include the Old Steese Upgrade or the Chena Hot Springs Road projects that are already in progress with identified funding sources.

[1] Some projects in the MTP are not specific as to the type of improvements at these intersections.

8.0 Next Steps

8.1 Logical Termini for Specific Projects

Federal regulations (23 CFR 771.111(f)) outline three general principles to be used in defining a highway project to ensure meaningful alternatives evaluation and avoid commitments to transportation improvements before they are fully evaluated. It notes actions evaluated in NEPA compliance documentation shall:

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

Further FHWA guidance defines logical termini as "(1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts" (FHWA, 1993). Each defined project must serve an identified need, and meet that need on its own without forcing other immediate transportation improvements within the remainder of the facility. Table 11 lists individual projects and proposed termini for Concept 1.

Table 11 Proposed Project Termini

Improvement Project	Beginning Point	Ending Point	Rationale
Richardson Highway MP 359 Grade-Separated Facility	RH MP 359	RH MP 360.2	¼ mile east of existing rail crossing to ½ mile west of Old Richardson Highway intersection
Airport Way Interchange/10th Avenue Frontage Road	RH MP 361.4	SE MP 0.6	½ mile south of Airport Way intersection to ¼ mile north of 10th Avenue intersection
3rd Street/College Road Split Diamond Interchange	SE MP 0.6	SE MP 1.3	¼ mile south of 3rd Street to Trainor Gate Road
Trainor Gate Road Grade-Separated Facility	SE MP 1.1	SE MP 1.6	College Road to ¼ mile north of Trainor Gate Road
Johansen/Steese Expressways Interchange	SE MP 1.75	SE MP 2.25	¼ mile south of Johansen Expressway to ½ mile north of Johansen Expressway
Johansen Expressway Widening	JE MP 4.5	JE MP 5.6	College Road to Steese Expressway
Farmers Loop Road Interchange	SE MP 2.2	SE MP 3.2	½ mile either side of Farmers Loop intersection

Notes: The list does not include the Old Steese Upgrade or the Chena Hot Springs Road projects that are already in progress.
RH – Richardson Highway; SE – Steese Expressway; JE – Johansen Expressway

8.1.1 Richardson Highway MP 359 Grade-Separated Facility

The logical termini for the proposed Richardson Highway Grade-Separated Facility are one-quarter mile east of the existing rail crossing near MP 359 to one-half mile west of the Old Richardson Highway intersection. These termini meet the three NEPA compliance project criteria as described below.

1. The endpoints identified are rational end points for the transportation improvements and a review of their environmental impacts.
   - The proposed termini are logical for the project purpose and need to improve safety and mobility on the Richardson Highway portion of the corridor. Construction of a consolidated, grade-separated facility to reduce conflicts associated with vehicle traffic crossing the railroad tracks addresses this need. This project would provide grade-separated facilities for the Old Richardson Highway, the railroad crossing, and a pedestrian crossing of the Richardson Highway.
   - The proposed termini are rational for the environmental review as the project area affected would be limited to the existing rail crossing planned for removal as well as the portion of the highway affected by construction of embankments to accommodate the grade separations, including the ramps onto and off of the Richardson Highway. No environmental effects would be expected outside this area.
   - The environmental effects associated with this project do not overlap with any other project in Concept 1.
2. The project has independent utility. It would be usable and a reasonable expenditure even if no additional transportation improvements were made.
   - This project independently provides substantial safety and mobility benefits, regardless of whether other corridor improvements occur. Replacement of the at-grade railroad crossing with a grade-separated railroad crossing benefits both safety and mobility as trucks and buses would not need to stop at the crossing and vehicle/rail conflicts would be eliminated. The project would also provide a safer and more efficient exit to the Old Richardson Highway for freight transport and other users.
   - This project does not require any other improvements to occur. It addresses the safety and mobility deficiencies in the area.
3. This project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.
   - This project does not change or reduce the potential range of alternatives for any other foreseeable transportation improvements.

8.1.2 Airport Way Interchange/10th Avenue Frontage Road

The logical termini for the proposed Airport Way Interchange/10th Avenue Frontage Road are one-half mile south of the existing Airport Way intersection to the southern abutment of the Chena River Bridge.

1. The endpoints identified are rational end points for the transportation improvements and a review of their environmental impacts.
   - The proposed termini are logical for the project purpose and need to improve safety and mobility on corridor. Construction of an interchange at Airport Way and a frontage road to 10th Avenue would remove the two closely-spaced, at-grade signalized intersections. This project would

improve mobility by eliminating the need for through-traffic to stop at Airport Way or 10th Avenue, and is anticipated to reduce the current crash frequency and severity at both intersections.

- The proposed termini are rational for the environmental review as the project area affected would be limited to the areas affected by construction of embankments to accommodate the grade separations, including the ramps onto and off of the highways. No environmental effects would be expected outside this area.
- The environmental effects associated with this project do not overlap with any other recommended project in Concept 1. The northern termini is south of the Chena River bridge. The next closest project is located over one-half mile away and across the Chena River from this project.

2. The project has independent utility. It would be usable and a reasonable expenditure even if no additional transportation improvements were made.
   - This project independently provides safety and mobility benefits, regardless of whether other corridor improvements occur. Removal of the at-grade intersection benefits both safety and mobility as vehicles would no longer need to stop at the intersections, and the anticipated crash frequency and severity are expected to decrease. The interchange will also improve non-motorized use by reducing the width of crosswalks and separating the crossings from the higher speed traffic on Steese Expressway.
   - This project does not require any other improvements or related project to occur. It addresses the safety and mobility deficiencies in the area.
3. This project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.
   - This project does not change or reduce the potential range of alternatives for any other foreseeable transportation improvements.

8.1.3 3rd Street and College Road Spilt Diamond Interchange

The logical termini for the proposed 3rd Street and College Road Split Diamond Interchange project are one-quarter mile south of the existing 3rd Street and northward to Trainor Gate Road.

1. The endpoints identified are rational end points for the transportation improvements and a review of their environmental impacts.
   - The proposed termini are logical for the project purpose and need to improve safety and mobility on corridor. Construction of this interchange would remove the two closely-spaced, at-grade signalized intersections. This would improve mobility by eliminating the need for through-traffic to stop at 3rd Street or College Road, and is anticipated to reduce the current frequency and severity of crashes.
   - The proposed termini are rational for the environmental review. The project area includes the areas affected by construction of embankments to accommodate the grade separations, including the ramps onto and off of the highways. No environmental effects would be expected outside this area.
   - The area of environmental effects associated with this project may overlap with the environmental effects area associated with the proposed Trainor Gate Road Grade-Separated Facility project. The area between Trainor Gate Road and College Road would be a transition area for both projects to

match in with the existing Steese Expressway. This overlap would need to be addressed in the Cumulative Effects section of the environmental document for this project. However, the 3rd Street and College Road Split Diamond Interchange project is not dependent or reliant in any way on the improvements at Trainor Gate Road, and does not require those improvements be constructed. Consequently, the two projects each have independent utility and are not considered connected actions.

2. The project has independent utility. It would be usable and a reasonable expenditure even if no additional transportation improvements were made.
   - This project independently provides safety and mobility benefits, regardless of whether other corridor improvements occur. Removal of the at-grade intersection benefits both safety and mobility, as vehicles would not need to stop at the intersections and the current potential for crashes and high crash severity is reduced.
   - This project does not require any other improvements to occur. It addresses the safety and mobility deficiencies in the area.
3. This project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.
   - This project does not change or reduce the potential range of alternatives for any other foreseeable transportation improvements.

8.1.4 Trainor Gate Road Grade-Separated Facility

The logical termini for the proposed Trainor Gate Road Grade-Separated project are College Road and one-quarter mile north of Trainor Gate Road. This project also includes the intersection of College Road with Old Steese Highway.

1. The endpoints identified are rational end points for the transportation improvements and a review of their environmental impacts.
   - The proposed termini are logical for the project purpose and need to improve safety and mobility on corridor. Construction of a grade-separated facility at Trainor Gate Road would reduce current conflicts associated with vehicle traffic crossing the at-grade railroad tracks. Mobility would also improve since trucks and buses would no longer need to stop at the railroad tracks.
   - The proposed project also includes changes on the Old Steese Highway and College Road to accommodate revisions in traffic patterns associated with the improvements at Trainor Gate Road.
   - The proposed termini are rational for the environmental review. The project area of effect includes areas affected by construction of embankments to expressway. The project area of effect would also include the sections along Old Steese and College Road affected by construction. No environmental effects would be expected outside this area.
   - The affected area associated with this project may overlap with the environmental effects area associated with the proposed 3rd Street and College Road project. This overlap would need to be addressed in the Cumulative Effects section of the environmental document for this project. However, the Trainor Gate Road Grade-Separated Facility project is not dependent on the 3rd Street and College Road Split Diamond Interchange and does not require those improvements be constructed. Accordingly, the two projects have independent utility and are not considered connected actions.

2. The project has independent utility. It would be usable and a reasonable expenditure even if no additional transportation improvements were made.
    - This project independently provides safety and mobility benefits regardless of whether other corridor improvements occur. Grade-separating vehicle traffic from the railroad crossing benefits both safety and mobility as it eliminates vehicle/train conflicts and the need for trucks and buses to stop at the railroad crossing. Eliminating the at-grade rail crossing and the signalized intersection improves mobility and reduces the current frequency and severity of crashes.
    - This project addresses the safety and mobility deficiencies on this portion of the corridor only, and no other corridor improvements would be needed.
3. This project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.
    - This project does not change or reduce the potential range of alternatives for any other foreseeable transportation improvements.

8.1.5 Johansen/Steese Expressways Interchange

The logical termini for the proposed Johansen/Steese Expressways Interchange project are one-quarter mile south and one-half mile north of the existing intersection.

1. The endpoints identified are rational end points for the transportation improvements and a review of their environmental impacts.
    - The proposed termini are logical for the project purpose and need to improve safety and mobility on corridor. Construction of this interchange would remove the at-grade signalized intersection. This would improve mobility by eliminating the need for through-traffic to stop at the Johansen Expressway intersection, and improve expressway-to-expressway mobility by reducing intersection delay. The proposed interchange is also anticipated to reduce the current frequency and severity of crashes.
    - The proposed termini are rational for the environmental review. The project area of effect includes areas impacted by construction of embankments to accommodate the grade separations, and ramps onto and off of the expressways. No environmental effects would be expected outside this area.
    - The affected area associated with this project may overlap with the environmental effects area associated with the proposed Johansen Expressway Widening projects. These overlaps would need to be addressed in the Cumulative Effects section of the environmental document for this project. However, the Johansen Interchange project is not dependent neither on the improvements on the Johansen Expressway, and does not require those improvements be constructed. Accordingly, the three projects each have independent utility and are not considered connected actions.
2. The project has independent utility. It would be usable and a reasonable expenditure even if no additional transportation improvements were made.
    - This project independently provides safety and mobility benefits regardless of whether other corridor improvements occur.
    - This project does not require any other improvements to occur. It addresses safety and mobility deficiencies in the area.

3. This project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.
    - This project does not change or reduce the potential range of alternatives for any other foreseeable transportation improvements.

8.1.6 Johansen Expressway Widening

The logical termini for the proposed Johansen Expressway Widening project are College Road to the Steese Expressway.

1. The endpoints identified are rational end points for the transportation improvements and a review of their environmental impacts.
    - The proposed termini are logical for the project purpose and need to improve mobility in the high traffic demand area near the Steese Expressway intersection. Construction of these improvements would add a third westbound lane for traffic coming off of the Steese Expressway, and provide turn lanes to reduce congestion and crash potential related to turning vehicles.
    - The proposed termini are rational for the environmental review. The project area includes the areas affected by construction along the Johansen Expressway. No environmental effects would be expected outside this area.
    - The affected area associated with this project may overlap with the environmental effects area associated with the proposed Johansen Interchange project. This overlap would need to be addressed in the Cumulative Effects section of the environmental document. However, this project is not dependent on the Johansen Interchange project, and does not require those improvements be constructed. Accordingly, the two projects have independent utility and are not considered connected actions.
2. The project has independent utility. It would be usable and a reasonable expenditure even if no additional transportation improvements were made.
    - This project independently provides safety and mobility benefits regardless of whether other corridor improvements occur.
    - This project does not require any other improvements to occur. It addresses the safety and mobility deficiencies in the area..
3. This project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.
    - This project does not change or reduce the potential range of alternatives for any other foreseeable transportation improvements.

8.1.7 Farmers Loop Interchange

The logical termini for the proposed Farmers Loop Interchange project are one-half mile north and south of the existing intersection.

1. The endpoints identified are rational end points for the transportation improvements and a review of their environmental impacts.

    - The proposed termini are logical for the project purpose and need to improve safety and mobility on this portion of the corridor. Construction of this interchange would remove an at-grade

signalized intersection. This would improve mobility by eliminating the need for through traffic to stop at the Farmers Loop Road intersection, and is anticipated to reduce the current frequency and severity of crashes at this intersection.

- The proposed termini are rational for the environmental review. The project area of effect includes the areas affected by construction of embankments to accommodate the grade separations, including ramps onto and off of the expressway and associated access improvements to a fueling station on Farmers Loop Road. No environmental effects would be expected outside this area.
- The affected area associated with this project does not overlap with any other recommended project. The next closest project is located over three-quarters of a mile away at the Johansen Expressway.

2. The project has independent utility. It would be usable and a reasonable expenditure even if no additional transportation improvements were made.

- This project independently provides safety and mobility benefits regardless of whether other corridor improvements occur.
- This project does not require any other improvements to occur. It addresses the safety and mobility deficiencies in the area.

3. This project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

- This project does not change or reduce the potential range of alternatives for any other foreseeable transportation improvements.

8.2 Preliminary Classes of Action

For every federally-funded transportation project, the environmental review process begins with determination of the class of action (COA), or level of NEPA documentation required for the project. The COA is based upon the scale of the project, the level of public controversy, and the anticipated level of effects on social and environmental resources. Projects which are minor or routine, such as road resurfacing, and not anticipated to have significant effects may be addressed through a categorical exclusion (CE) or an environmental assessment (EA) and finding of no significant impact (FONSI). Projects that are likely to have significant impacts, like new highway corridors, require a more detailed environmental impact statement (EIS) to document the environmental effects.

NEPA is a federal agency requirement and typically the federal agency makes the COA determination and is responsible for ensuring compliance with the agency's NEPA regulations. The transportation law passed in 2005 changed this and allowed FHWA to assign the responsibility for NEPA reviews for the lowest class of action, the CE. FHWA and the State of Alaska signed a Memorandum of Understanding (MOU) in 2009 assigning responsibility for determining whether some federally-funded transportation projects can be classified as a CE and for conducting the environmental review and consultation processes needed to document the CE review and approval. The MOU assigns DOT&PF these responsibilities for projects that are listed in FHWA's regulations that list actions that normally qualify as a CE.

Federal regulations (23 CFR 771.117(a)) define CEs as "actions which meet the definition contained in 40 CFR 1508.4, and, based on past experience with similar actions, do not involve significant environmental impacts."

The regulations also provide lists of actions that meet the criteria for CEs and normally do not require further NEPA approvals by the FHWA (23 CFR 771.117 (c) and (d). Included in this list are projects that do not include construction, pedestrian and bicycle baths or lanes, and projects that would take place entirely within the existing operational ROW (23 CFR 771.117(c)(22)). Existing operational ROW refers to "right-of-way that has been disturbed for an existing transportation facility or is maintained for a transportation purpose. This area includes the features associated with the physical footprint of the transportation facility (including the roadway, bridges, interchanges, culverts, drainage, fixed guideways, and mitigation areas) and other areas maintained for transportation purposes such as clear zone, traffic control signage, landscaping, any rest areas with direct access to a controlled access highway, areas maintained for safety and security of a transportation facility, parking facilities with direct access to an existing transportation facility, transit power substations, transit venting structures, and transit maintenance facilities. Portions of the ROW that have not been disturbed or that are not maintained for transportation purposes are not in the existing operational ROW."

Chapter 2 described the social and environmental setting for the corridor and Chapter 6 provided an overview of the likely effects of proposed improvement projects on those resources. Although this overview was based on improvement concepts and not final design, it provides the FHWA with information to determine whether a proposed project is likely to have significant impacts and allows a preliminary assessment of the appropriate class of action.

The preliminary determination of the appropriate class of action is pending consultation with the FHWA on the proposed improvements.

8.3 Funding

8.3.1 Programmed Funds

The FMATS 2040 MTP identifies programmed funding for future FMATS and non-FMATS improvements in the Richardson-Streese corridor (Table 12).

Table 12 Programmed Funding for Identified Improvement Projects in Corridor Vicinity

Project Timeframe	Project Name	Project Number	Spending Plan $ Million
Short Range Projects (2015-2020)	Richardson Highway MP 356-362 Bicycle/ Pedestrian Path	Non-FMATS; Short range project #56	$2.6
	Richardson Highway MP 359 Railroad Overpass	Non-FMATS; Short range project #42	$13.5
	Steese Highway and 3rd Street Widening	Non-FMATS; Short range project #40	$13.4
	Old Steese Highway – Second Street to Trainor Gate Road	Short range project #1	$3.0
	Wendell Avenue Bridge	Non-FMATS; short range project #54	$18.2
	Steese Expressway to Front Street Bicycle/Pedestrian Path	Short range project #18	$0.9
	Birch Hill Bicycle and Pedestrian Facility	Short range project #19	$2.6
Medium Range Projects (2021-2030)	Airport Way Interchange and 10th Avenue Frontage Road	Non-FMATS; Medium range project #34	$36.0
	College Road and 3rd Street Improvements	Non-FMATS; Medium range project #33	$68.0
	Johansen/Steese Expressways Interchange at Steese Expressway (including non-motorized facility)	Non-FMATS; Medium range project #32/44	$25.0
	Farmers Loop-Chena Hot Springs Road Trail Connection	Non-FMATS; Medium range project #41	$3.7
Long Range Projects (2031-2040)	Old Richardson Highway Interchange	Non-FMATS; Long range project #29	$25.0
	Trainor Gate Road Grade-Separated Facility	Non-FMATS; Long range project #33	$19.5
	Old Steese Highway/Farmers Loop Road Study (improvements not yet identified)	Long range project #15	N/A
	Farmers Loop Road Interchange at Steese Expressway	Non-FMATS; Long range project #28	$31.5

Source: FMATS, 2015

8.3.2 Potential Future Funding Sources

DOT&PF administers a number of programs funded from state and federal sources. The Highway and Transportation Funding Act of 2014 extended surface transportation programs, including federal-aid highway programs, under the Moving Ahead for Progress in the 21st Century Act (MAP-21) from October 1, 2014, through May 31, 2015. As future improvements are considered, funding eligibilities and categories will need to be evaluated under future funding guidelines.

8.3.2.1 National Highway Performance Program

The National Highway Performance Program (NHPP) provides funding for the NHS, including the Interstate System and non-Interstate NHS roads and bridges. The purpose of the NHS is to provide an interconnected system of principal arterial routes serving major population centers, international border crossings, intermodal

transportation facilities and other major travel destinations; meet national defense requirement; and serve interstate and interregional travel. The NHS includes all Interstate routes, a large percentage of urban and rural principal arterials, the defense strategic highway network, and strategic highway connectors.

Activities eligible for NHS funding include construction, reconstruction, resurfacing, restoration, and rehabilitation of segments of the NHS roadway; construction, replacement, rehabilitation, preservation and protection of bridges on the National Highway System; and projects or part of a program supporting national goals for improving infrastructure condition, safety, mobility, or freight movements on the NHS. Operational improvements as well as highway safety improvements are also eligible. Other miscellaneous activities that may qualify for NHS funding include bikeways and pedestrian walkways, environmental mitigation, restoration and pollution control, infrastructure based intelligent transportation systems, traffic and traveler monitoring and control, and construction of intra or inter-city bus terminals serving the NHS.

8.3.2.2 Surface Transportation Program

Under MAP-21, Surface Transportation Program (STP) funds are federally apportioned to Alaska and allocated to various programs to finance transportation projects on public roads within the state. STP funds may be used for a wide range of transportation improvement projects and activities, including roadway reconstruction and rehabilitation, bridge construction and inspection, highway and transit safety infrastructure, environmental mitigation, carpooling, and bicycle and pedestrian transportation facilities. Facilities within the corridor, such as College Road and Old Steese Highway, are eligible recipients under this program.

8.3.2.3 Highway Safety Improvement Program

The goal of the HSIP is to significantly reduce traffic fatalities and serious injuries on public roadways. Projects or activities selected for completion under the HSIP program must either correct or improve a hazardous roadway location or feature or address a highway safety problem. HSIP projects and activities must also be consistent with the Alaska Strategic Traffic Safety Plan, a federally-required document that must be updated every five years. The improvements to the Steese Expressway ramp termini at Chena Hot Springs Road are being funded as an HSIP project.

8.3.2.4 Congestion Mitigation and Air Quality Improvement Program

The Congestion Mitigation and Air Quality Improvement (CMAQ) Program was developed to help state and local governments meet CAA requirements. CMAQ funds can be used for a wide array of activities, such as:

- projects that improve traffic flow,
- projects that shift demand to non-peak hours, and
- establishment or operation of a traffic monitoring, management, and control facility.

In states like Alaska with air quality nonattainment and maintenance areas, a percentage of the CMAQ apportionment can be used on any STP project statewide.

8.3.2.5 Transportation Alternatives

The Transportation Alternatives (TA) Program focuses on non-motorized transportation users and enhancements to the transportation system. The program funds projects such as the development of bicycle and pedestrian paths and interpretive waysides, as well as historic preservation, vegetation management, and

environmental mitigation activities. Projects such as a pedestrian overpass crossing on the Steese Expressway or a pedestrian tunnel east of the MP 359 railroad crossing would qualify for funding under the TA Program.

8.3.2.6 Railway-Highway Crossings Program

MAP-21 established an annual set-aside of HSIP funding to specifically target the elimination of hazards at railway-highway crossings. Alaska's apportionment of these funds is relatively small (e.g., $1.1M in FY 2014), but these funds are eligible for projects at all public crossings. Fifty percent of Alaska's apportionment is dedicated for the installation of protective devices and the remainder can be used for any hazard elimination project.

8.3.2.7 State General Funds

With legislative and executive approval, state general funds can be allocated to individual projects as part of the annual capital budget. The availability of state general funds is difficult to forecast; these funds are more-commonly available when State revenues are high and surplus funds are considered for discretionary projects. Projects fully funded with State general funds typically have greater flexibility in sequencing the design/ environmental tasks since following FHWA policies and procedures is not required.

8.3.2.8 General Obligation Bonds

The State may also choose to issue voter-approved bonds to fund projects in a similar manner to State general funds at the discretion of the state legislative and executive leadership. The primary difference is that the State pays for these projects over a 20-year period rather than out of a one-time allocation. Bond-funded projects typically follow the same process as general fund projects, although the funding requires greater coordination since the bonds are not typically sold until they are needed for individual projects.

8.4 Prioritization of Individual Projects

Implementation of proposed improvements would be phased based on a number of factors including availability of sufficient ROW, availability of project funding, level of environmental effect and public controversy, and benefits to traffic mobility and safety.

DOT&PF intends to prioritize implementation of projects with the Richardson Highway MP 359 Grade-Separated Facility and the Johansen/Steese Expressways Interchange for the following reasons.

Richardson Highway MP 359 Grade-Separated Facility

- The Richardson Highway MP 359 Grade-Separated Facility is located in an area with a minimal need for ROW acquisition, allowing the project to move forward quickly. While the Johansen/Steese Expressways Interchange may require some minor ROW acquisition, ROW acquisition is not expected to be as complex in this area as it will likely be in the central portion of the corridor where the ROW width is narrower and acquisition is likely to be more complex with the potential to delay project implementation.
- The Richardson Highway/Old Richardson Highway intersection is a high priority because it is a stop-controlled left turn off of a freeway-style highway. This is not consistent with the functional hierarchy of the road and it raises safety concerns. Because some motorists feel uncomfortable making this maneuver, they take extra care, so the crash rate is not elevated as would be predicted at this

intersection. However, the potential for and concerns regarding higher speed, higher severity crashes at this intersection raise it higher on the priority list.

- Richardson Highway MP 359 Grade-Separated Facility also eliminates an at-grade railroad crossing of a 4-lane, 55 mph highway, and removes the need for freight vehicles to stop at the crossing. This results in high benefits to safety, mobility and freight transport efficiency, and is more consistent with the functional hierarchy of an expressway.

Johansen/Steese Expressways Interchange

- The Johansen/Steese Expressways Interchange is one of the highest priorities because it is the intersection of the two highest functional classification roads (expressways) in the corridor. An interchange transition from expressway to expressway provides a more predictable and consistent feel for motorists, and is the most efficient transition between the two expressways.
- The Johansen/Steese Expressways Interchange is located in the area with the most development growth potential given the Urban Preferred Commercial area located near the intersection. This commercial area attracts high levels of travelers from areas outside the City and the interchange will facilitate getting travelers into and out of this area. Completing this interchange will also provide capacity to accommodate the detours and phasing that will be needed when constructing the improvements elsewhere in the corridor.
- Traffic demand at the Johansen/Steese Expressways intersection has one highly directional movement for commuters. There is high southbound (Steese) to westbound (Johansen) demand in the morning peak hour and high eastbound (Johansen) to northbound (Steese) demand in the evening peak hour. The eastbound to northbound demand in the evening peak hour operates at LOS E or F and exceeds the available storage in the left turn lanes. The immediate need to relieve this congestion adds to the short term priority for this interchange.

Accordingly, DOT&PF intends to pursue the Richardson Highway MP 359 Grade-Separated Facility and the Johansen/Steese Expressways Interchange project first as indicated in Table 13.

Table 13 Prioritization of Individual Projects

Improvement Project	Proposed Timeframe (dependent on funding availability)
Richardson Highway MP 359 Grade-Separated Facility	Short Range
Airport Way Interchange/Frontage Road	Medium Range
Old Steese Highway Improvements	Underway
3rd Street/College Road Split Diamond Interchange	Medium Range
Trainor Gate Road Grade-Separated Facility	Medium Range
Johansen/Steese Expressways Interchange	Short Range
Johansen Expressway Widening	Medium Range
Farmers Loop Road Interchange	Long Range
Chena Hot Springs Road Interchange Ramp Improvements	Underway

8.5 Integration with Future NEPA Efforts

The PEL study process is intended to streamline implementation of recommended improvements by facilitating early consideration of environmental constraints and feedback from interested parties. The following planning products developed during the study process may be directly incorporated into future NEPA efforts:

- environmental baseline information,
- purpose and need for future improvements,
- range of potential alternative improvements,
- screening outcomes and preferred concept,
- potential environmental effects,
- avoidance, minimization, and mitigation options, and
- documented public, stakeholder, and agency feedback.

Incorporation of these planning products into project-level NEPA reviews allows for an early determination of the appropriate level of NEPA documentation for each project with the intent of streamlining completion of the project-level NEPA review. The PEL study for the Richardson-Steese corridor is intended to provide a basis for project-level NEPA reviews and for eliminating preliminary concepts from further evaluation.

8.6 Implementation

The next steps in implementation of the proposed corridor improvements are listed below:

- coordinate with FHWA on COA if necessary,
- secure funding for design and environmental review,
- complete design and NEPA review/permitting,
- compete final design,
- acquire ROW if needed, and
- construct improvements.

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APPENDICES DELIVERED AS SEPARATE FILES.