6 Transportation Analysis

6.1 Highway Transportation Analysis

The highway transportation analysis considers the following factors:

- Roadway Operations: planning assessment based on highway traffic forecasts.
- Safety: crash data assessment, special interest areas, safety plans (Highway Safety Improvement Program (HSIP), SHSP), and predictive safety improvements.
- Roadway Conditions and System Needs: roadway system needs, planned improvements, resource needs (i.e. pipeline), railroad (grade separation), and local community access.
- Maintenance & Operations: maintenance stations, deferred and preventive maintenance, and maintenance management systems.
- Pavement Preservation and Management: pavement preservation, pavement management, and weight restrictions.
- Security: border crossing and the Alyeska Pipeline.
- Tourism Enhancements: scenic byways and rest areas (signage and accessibility).

6.1.1 Roadway Capacity

Using the 2030 forecast traffic volumes, a comprehensive roadway capacity evaluation was completed for all of the major rural highways. A planning level assessment based on the existing highway characteristics and 2030 traffic forecasts revealed no major roadway capacity constraints. Under long-term conditions, all roadway facilities within the study area will continue to operate at a LOS C or better, with most facilities forecast to operate at LOS A and B. As discussed in *Section* **Error! Reference source not found.** *Highway Traffic Forecasts*, the potential impacts of future resource and economic development would have the greatest impact on rural highway operations. However, based on the future traffic operations assessment assuming a relatively average (i.e. medium growth) annual growth in highway traffic, traffic volumes would have to double or even triple on average in order to impact the capacity needs in the system.

6.1.2 Safety

An analysis of safety issues in the Interior was conducted as part of the *Transportation Analysis*. It builds upon the safety analysis documented in *Section* **Error! Reference source not found.** *Existing Highway System,* where a comparison of observed and critical crash rates (rate quality control method) was used to identify 27 locations on the existing roadway system with potential safety concerns. For each of these locations, the following steps were taken to complete the crash analysis and safety assessment.

1) A closer review of available crash and traffic volume data was conducted to identify locations where the rate quality control method may be overemphasizing the observed crash rate based on relatively low traffic volumes and no observable crash patterns or trends.

2) For those locations where the rate quality control method seemed appropriate, all available crash data was evaluated in more detail to identify crash patterns and specific trends.

3) Based on the assessment of crash data and follow-up field observations at key locations, either specific safety improvements were recommended or a strategy for addressing potential safety concerns was provided.

4) Existing studies and safety improvement plans were reviewed to identify any existing or planned improvements.

In addition to the safety issues identified through the rate-quality control method, several other highway segments were examined upon recommendation from DOT&PF staff familiar with local conditions. A similar process to that detailed above was used to analyze these segments and to develop a set of recommendations.

6.1.2.1 Assessment of Rate Quality Control Method

As with all rate based methods, locations with very low traffic volumes may be over-represented in the resulting ranking of sites. For this reason, highway segments identified through this method with low traffic volumes and fewer than five reported crashes with no identifiable trends were omitted from further analysis. Of the 27 locations identified under existing conditions, 15 highway segments were carried forward for additional analysis.

6.1.1.2 Crash Data Assessment

Crash data for each of the highway segments with potential safety concerns were reviewed to identify crash patterns and trends. For many of these highway segments there were no definitive patterns or trends, and therefore several mitigation options and strategies were provided for further consideration. These segments are summarized in Section 6.1.6 *Highway Corridor Assessment*.

6.1.1.3 Special Interest Areas

Although an evaluation of crash data is one method of identifying locations with potential safety concerns, many crashes go unreported for a variety of reasons (i.e. uninsured drivers and alcohol related crashes); therefore, other methods must be relied upon to pinpoint these locations. Field observations can reveal many highway safety related concerns, particularly locations with the potential for increased numbers of crashes or crash severity. In this manner, several highway locations were identified for further review and assessment. Available crash data for each of these special interest areas were reviewed along with anecdotal evidence of the issues, and recommended next steps were identified. These special interest areas are located along the Parks, Richardson and Taylor Highways and are summarized in Section 6.1.6 *Highway Corridor Assessment*.

6.1.1.4 Safety Plans

Funding for safety projects comes primarily from the State's Highway Safety Improvement Program (HSIP). The objective of this program is to identify and fund highway safety projects that maximize lives saved and injuries eliminated per dollar spent. Under this program, DOT&PF Traffic and Safety staff members identify locations with high accident rates on Alaska roads, evaluate corrective measures, fund the most cost-effective ones, and evaluate their effectiveness after the projects are completed. The most recent HSIP does not identify any projects within the study area.

The State's Strategic Highway Safety Plan (SHSP), completed in 2007, set out to detail the steps to reduce Alaska's most serious transportation safety problems. This comprehensive, data driven plan addresses the four "E's" of safety: Engineering, Education, Enforcement and Emergency Response. Rather than focus on specific locations, the SHSP lays out a set of strategies for

addressing a variety of safety-related issues. Specifically, the plan focuses on the following three "emphasis areas:"

1. **Driver Behavior** – Crashes involving impaired driving, speed and aggressive driving, young drivers, and unlicensed/suspended/revoked drivers;

2. **Special Users of the Transportation System** – Crashes involving pedestrians, motorcyclists, and bicyclists; and

3. **Highways** – Lane departure crashes, crashes at intersections, and crashes involving moose.

The following strategies outlined in the SHSP are focused on the emphasis areas of "Driver Behavior" and "Highways". The strategies identified in Table 6-1 and 2 apply generally across the Interior, and can be implemented broadly to reduce a variety of crashes.

Table 6-1 Driver Behavior Strategies (SHSP 2007)

I.D. Number	Strategy
Strategies for Reducing Crashes Involving Impaired Driving	
AL.1	Alaska Highway Safety Office (AHSO) and Alcohol Safety Action Program (ASAP) will structure and conduct a statewide alcohol assessment in FY 08
AL.2	Gain support for establishing a Governor's Road Safety Advisory Commission
AL.3	Continue to develop a DUI tracking system
AL.4	Study the issue of expanding the DUI vehicle impoundment to all communities
AL.5	Implement, track progress, and evaluate the effectiveness of the new driver licensing act which requires that drivers convicted of DUI carry a marked license during sentencing, probation, and/or parole
AL.6	Identify methods for reducing the number of blood test refusals – Tier II
AL.7	Strengthen Alcohol Beverage Commission (ABC) enforcement – Tier II
AL.8	Outreach to Health Care Professionals
Strategies for Reducing Crashes Involving Speed and Aggressive Driving	
AG.1	Consult with Department of Law regarding legislation defining aggressive driving
AG.2	Consult with Department of Law regarding possible implementation and evaluation of an aggressive driving law
AG.3	Traffic School
Strategies for Reducing Crashes Involving Young Drivers	
YD.1	Graduated driver license (GDL) law enforcement
YD.2	Study issues involved with legislative exemptions for young drivers in rural Alaska
YD.3	Educate the public and elected officials on the most recent research regarding effective GDL elements
YD.4	Driver Education Study
YD.5	Facilitate parental supervision of learners and intermediate drivers and encourage selection of

I.D. Number	Strategy
	safer vehicles for young drivers
Strategies for Reducing Crashes Involving Unlicensed/Revoked/Suspended Drivers	
USR.1	Develop an electronic employer notification process

Table 6-2 Highway Strategies (SHSP 2007)

I.D. Number	Strategy
General Strategies	
HG.1	Preserving Alaska's main road corridors
HG.2	Explicit consideration of safety in DOT&PF highway design
HG.3	Implement Highway Safety Corridor Program
Strategies for Reducing Run-off-road Crashes	
HR.1	Shoulder rumble strips
HR.2	Curve delineation
HR.3	Widen shoulders on rural two-lane highways
Strategies for Reducing Head-on Crashes	
HH.1	Centerline rumble strips
HH.2	Install passing lanes
HH.3	Headlights on at all times
HH.4	Install cable rail in medians of divided highways
Strategies for Reducing Intersection Crashes	
HI.1	Develop a comprehensive Access Management Policy
HI.2	Single-lane roundabouts
HI.3	Red light running countermeasures
HI.4	Pedestrian countdown timers
Strategies for Reducing Crashes Involving Moose	
HM.1	Get moose away from roads by managing adjacent habitat
HM.2	Get moose away from roads by managing roadside moose browse
HM.3	Provide safer wildlife crossings through roadway improvements
HM.4	Create winter connectivity snow trails and diversionary tree cutting to encourage moose to stay away from road surfaces

While the SHSP identifies centerline rumble strips as a strategy for reducing head-on crashes, DOT&PF Northern Region does not advocate the use of centerline rumble strips and has indicated a strong aversion for the following reasons:

1. The installation of rumble strip grooving at the pavement seam allows water to collect and penetrate into the base course. This penetration and subsequent freeze-thaw cycles increase pavement deterioration.

2. Centerline rumble strips make summer pavement patching challenging due to the potential liability incurred by removing a safety feature where it had been installed previously and the need for specialized equipment to reinstall rumble strips (if required) after patching operations are complete. Centerline rumble strips also reduce snow plow efficiency.

6.1.1.5 Access Management

Access management involves controlling access to state-owned rights-of-way through driveway permits and plat reviews. The goal is to minimize the number of access points on a given stretch of highway, since numerous driveways on a short length of highway can be a safety hazard. When a developer decides to subdivide a parcel of land there has to be a way for the property owners to access the highway system. Instead of allowing a separate driveway for each lot, DOT&PF prefers that an access road be constructed that connects the subdivision to the highway. This process begins when the developer submits preliminary plat's to DOT&PF for review. DOT&PF will normally make comments regarding access control if the proposed subdivision accesses a state right of way.

6.1.2 Roadway Conditions and System Needs

In addition to those segments identified through the safety assessment, other portions of highways were examined based on conversations with DOT&PF staff, field observations, existing conditions analysis, and past studies. Detailed summaries of these highway segments are provided in Section 6.1.6 *Highway Corridor Assessment*.

Many of these facilities are undivided two-lane roadways with segments of narrow shoulders, ditches, steep grades, poor surface conditions, and/or sharp horizontal/vertical curves. Speeding drivers or those unfamiliar with these roadways may have difficulty maneuvering through these sections, especially during winter conditions and low-light conditions where visibility is limited. Projects to repair these facilities range from a simple resurface/rehabilitation to a more involved and more expensive reconstruction. Project recommendations should fall under the following categories: Safety, Rehabilitation, or Reconstruction.

Table 6-3 summarizes roadway condition concerns and lists potential treatments.

Table 6-3 Roadway Condition Concerns and Potential Treatments

Roadway Geometry Concerns	Potential Treatments
Narrow Shoulders	• Provide additional shoulder width (roadway reconstruction)
Ditches	• Provide additional shoulder width (roadway reconstruction) • Fill ditches and provide for drainage • Install guardrails
Poor Surface Conditions	• New pavement or gravel surfacing
Sharp Horizontal/Vertical Curves	• Realign roadway to eliminate curvature • Install guardrail and/or chevron signs • Install advanced signing
Steep Grades	• Flatten slopes where possible • Install advanced signing
Lack of pedestrian/bicycle facilities	• Provide additional shoulder width (roadway reconstruction) • Construct multi-use pathways parallel to existing facilities

6.1.2.1 Planned Improvements

As summarized in Chapter **Error! Reference source not found.** *Transportation Inventory (Project Programming - Section* **Error! Reference source not found.***)*, the 2006-2009 STIP projects address many of the various transportation issues identified under this *Highway Transportation Analysis* section pertaining to roadway conditions, traffic operations, safety and pedestrian and bicycle needs.

In addition to the STIP project list, approximately $2.0 billion in infrastructure improvements (roads, bridges, airports, M&O facilities) have been identified to support the construction of the Alaska Natural Gas Pipeline along the Dalton, Elliott, Richardson and Alaska Highways.

As outlined in the *Highway Traffic Forecasts* section of this report, the potential for the Alaska Natural Gas Pipeline and Enstar Gas Pipeline would have the greatest near-term impact to the transportation system of any potential resource development. The anticipated increase in truck traffic would have a heavy impact on highway operations and the existing highway infrastructure.

Compared with the construction of the Trans-Alaska Pipeline System, the proposed Alaska Natural Gas Pipeline would result in significantly heavier truck loads. The gas pipeline would be buried, requiring heavy volumes of earth movement during construction. It would also involve

heavier pipes (0.5" versus 1.25"). These and other factors would place significant strain on affected facilities and additional maintenance would be required.

6.1.3 Highway Corridor Preservation & Management

Corridor preservation is vital to the overall mission of the DOT&PF. Pavement management programs provide significant benefits to highway agencies using data collection methods to monitor pavement conditions and make project recommendations. Corridor preservation mainly deals with the overall condition of the road corridor. Much of the information needed to determine the condition of the road corridor is collected by the maintenance and operations crews; however, some information is relayed to project planners by the traveling public. Information such as guardrail conditions, wayside and rest area conditions, brushing and signing improvements are just a few examples. Projects such as these can be conducted by maintenance crews, but some larger scale projects such as wayside improvements will have to go through STIP process.

6.1.3.1 Pavement Management Systems

The Pavement Management System (PMS) is used to monitor the pavement condition of state highways. General pavement conditions and recommendations are reported on an annual basis. Through the PMS, pavement data is collected and analyzed. The PMS provides information to support decisions regarding preventative maintenance, planning and budgeting decisions. Pavement ride quality and rutting conditions are surveyed annually (semi-annually for the more minor roads) during the summer months to assess current conditions and to predict future maintenance and project needs.

6.1.3.2 Pavement Preservation

Pavement preservation is a proactive approach to maintaining and improving safety and mobility along the highway system. In addition to prolonging useful pavement life, it can reduce the need for roadway rehabilitation and reconstruction that can be costly, time consuming and can create travel delays for motorists and the movement of goods and services. Pavement preservation programs generally consist of preventative maintenance, routine maintenance and minor rehabilitation.

6.1.3.3 Improvements to Pavement Preservations Practices

In 2005, a joint venture by the Federal Highway Administration (FHWA), National Center for Pavement Preservation (NCPP) and DOT&PF analyzed current pavement preservation practices within Alaska and published its findings in the *Pavement Preservation Technical Appraisal* report, September 2005. This report identified a variety of issues and areas for improvement such as providing more staff training and consistency in general terminology, improving upon public relations and education, and enhancing performance monitoring and research and development. For these and many other identified issues, a series of observations and recommendations were provided. Table 6-4 provides a summary of issues, observations and recommendations from the *Pavement Preservation Technical Appraisal* report.

Table 6-4 Pavement Preservation Practices

Issue	Observation	Recommendation
Terminology	Conflicting terminology is hindering effective communication.	Define, document, and distribute common terms to establish a common understanding base.
Preservation Guidelines	Current efforts are not tied to a recognizable program.	Create and establish pavement preservation guidelines.
Champion	Each entity makes continuous contribution to the programs, thus achieving synergy and ensuring success.	Need a champion to lead the endeavor to establish and extend a successful pavement preservation program.
Pavement Management System (PMS)	The PMS is viewed positively throughout the regions and a generally high confidence in its data is observed.	Provide sufficient additional staff resources to allow PMS capabilities to be extended, additional data to be collected and analyzed, candidate preservation strategies to be generated, and network optimization to be undertaken.
Training	Need and desire for training were found in the department.	Give training courses in Basic Pavement Preservation Concepts, Pavement Preservation for Maintenance and Construction Personnel, Treatments, Inspector Training, Preservation Strategies Development, and PMS.
Pavement Preservation Assistance	FHWA's division office has made limited assistance	FHWA's division office could be more active in helping ADOT & PF establish a genuine pavement preservation program.
Pavement Management System Usefulness	ADOT & PF is not taking full advantage from the benefits it should be able to gain from PMS.	Understand the capabilities of modern PMS and assess Alaska's Highway network.
Program Implementation	Lacks programmatic agreements for pavement preservation with FHWA Alaska Division and other resource agencies on safety and environmental projects.	Negotiate formal agreements with FHWA Division Office to allow issuance of blanket clearances when undertaking preservation projects.
Preservation Treatment	Centered on the application of hot mix asphalt (HMA) treatments in	Central Region should broaden its preservation treatments.

Issue	Observation	Recommendation
	Central Regions	
Tracking Life Extensions	Does not track pavement preservation performance and costs on a project on project basis.	Should establish formal procedures for tracking life extensions of pavement preservation treatments and costs of all projects.
Cost Effectiveness	Does not track cost effectiveness	Track performances and costs
Public Relations	The Alaska public and media do not appear to appreciate pavement preservation and its need.	Educate the public and use the media for this purpose.
Legislative Relations	Routinely keeps legislators informed about the efforts to minimize deficient pavements.	Exploit the legislative interests already displayed and aggressively promote the concept, emphasizing the long and short-term political and economic benefits.
Project Selection	Pavement preservation plays little or no part in project selection.	Evaluate the system as a whole and provide a list of candidate projects by categories together with intra-category quotas (percentage).
QC Uniformity	In one region, maintenance and construction forces use the same specifications, but they have different quality control procedures.	Quality control be standardized statewide.
Performance Monitoring	Does not track the life-extending values of pavement preservation treatments or track the expected performance of previous rehabilitation or reconstruction projects.	Begin tracking pavement longevity and performances of all projects constructed during the previous twenty years.
Research and Development	Has several needs related to research and development	Address the research areas in: • Life-extending benefit of pavement preservation treatment • When to apply pavement preservation treatment for maximum effectiveness • Longevity of reconstruction and rehabilitation project • Effective, non-destructive snow plowing techniques for chip-sealed pavement

These recommendations to enhance pavement preservation practices will improve roadway travel and reduce long-term maintenance costs. However, the rate of deterioration increases rapidly in the later years of a pavement's useable lifetime. With regular maintenance and under typical conditions (20-year useable pavement life), the first 40 percent drop in quality or roughness occurs within approximately 15 years, while the next 40 percent drop in quality occurs within the next 2 ½ years. Without regular preventive maintenance, pavement deterioration may accelerate and require early replacement. On average, every dollar spent on preventive maintenance when pavement quality is still fair, corresponds to four to five dollars required for major pavement rehabilitation or reconstruction that is required once the quality becomes very

poor. These factors make deferred maintenance very expensive and support the merits of an ongoing PMS.

6.1.3.4 Selection of Pavement Preservation Projects

The methodology used to select pavement preservation projects varies between DOT&PF regions. In general, project recommendations are largely based on a review of annual pavement conditions reported by the PMS and feedback from maintenance and operations crews. Each project recommendation is evaluated by DOT&PF Region staff and prioritized based on factors such as project location; safety and mobility impacts; estimated cost; and available resources and funding.

6.1.3.5 Freight Truck Transportation and Weight Restrictions

Many of Alaska's goods and products are shipped to/from/within Alaska by truck. The National Highway System serves the majority of the intrastate and interstate freight movements and these highways provide vital freight movement throughout the Interior. Due to the freeze-thaw cycles experienced by all of Alaska highways, weight restrictions are generally applied in the spring months (April through June) to sections of roadways that are susceptible to damage due to inadequate subsurface conditions.

As summarized in Chapter 3 *Transportation Inventory (3.1.4 Weight Restrictions / Freight Truck Transportation)*, the five most recent years of available data (2002 to 2006) were reviewed in an effort to identify general weight restriction trends/groupings that could be used to identify future improvement areas and/or potential problem areas. Based on an assessment of historical seasonal weight restriction data, no obvious trends or groupings were identified. As stated in Section 3.1.4 of this report, the duration and locations of weight restrictions along most highways can vary annually.

When road and bridge infrastructure is unable to support truck movements, trucks must either detour around the restricted roads or limit the weight of truck loads, both of which add to the cost of freight shipments and potentially the cost of goods to consumers. DOT&PF has recently begun exploring the feasibility of eliminating weight restrictions by improving weaker sections of highway. As programs aimed at eliminating weight restriction are further developed, these

programs should be integrated with other improvement programs that address capacity and safety needs.

A recent study focusing on eliminating weight restrictions along the Parks Highway estimated the cost to repair 10 highway segments, totaling 43.3 miles, to be approximately $65 million ($1.5 million per lane-mile). Levels of highway improvements and costs can vary significantly based on existing conditions, highway usage, annual weather conditions, and approach to construction and phasing. Several additional estimates have been prepared for highway improvements to eliminate weight restrictions along the Parks Highway ranging between $97 million and $115 million, based on different phased approaches.

6.1.4 Maintenance and Operations

Maintaining the State's highway infrastructure is a top priority, as it is vital to the safety of the traveling public and movement of goods and services. DOT&PF M&O responsibilities related to highway transportation include a wide variety of preventative upkeep and repairs to pavement, bridges, traffic signals, striping, street illumination, signs and guardrails. Additional responsibilities include snow removal and vegetation management. These responsibilities are carried out by M&O staff located at 26 maintenance stations throughout the study area.

As many of the highway needs identified by M&O staff are summarized under Section 6.1.2 *Roadway Conditions and System Needs*, the following section focuses on the needs of maintenance stations and provides recommendations for potential improvements. Also provided is an overview of the two major types of maintenance (deferred and preventative) and a summary of the new Maintenance Management System (MMS) being used by DOT&PF to streamline many existing tasks and to improve project tracking.

6.1.4.1 Maintenance Stations

Roads and bridges are not the only facilities requiring maintenance within the study area. The facilities that house equipment, machinery and M&O staff in remote locations also require maintenance and upkeep. These facilities are especially critical because of the extreme seasonal cold temperatures in Interior Alaska. Overall facility upgrades are essential to achieve adequate operating conditions at many of these maintenance stations. While several of these stations are functional due to the availability of local housing and services for M&O employees, major improvements are needed to ensure adequate M&O services continue to be available. Although

closures of maintenance stations occasionally occur due to inadequate facilities and/or lack of employees, this can overburden adjacent maintenance stations such as in the case of the East Fork and Cantwell stations. The East Fort station was responsible for approximately 31.1 miles of the Parks Highway and was closed in late 2001. The adjacent maintenance station located in Cantwell that once covered the M&O needs of approximately 36.9 miles of the Parks Highway is now responsible for approximately 68 miles of highway. Detailed summaries of maintenance station needs are provided in Section **Error! Reference source not found.** *Highway Corridor Assessments*.

6.1.4.2 Deferred Maintenance

Deferred maintenance is the practice of postponing annual maintenance activities to future years based on the priority of needs and available funding. Funds for deferred maintenance activities along Alaska's highways are supplied by State General Funds. Deferred maintenance primarily involves a variety of restoration, preservation and repair activities of the following roadway elements.

- pavement
- bridges
- gravel surfaces
- guardrails
- shoulders/slopes/ditches
- drainage
- paint striping
- lighting
- traffic signals
- vegetation management

The following is a summary of recent statistics regarding deferred maintenance.

- Of the four major areas that require deferred maintenance activities (aviation, harbors, highways, and public facilities), highways represent over half of the total deferred maintenance costs.

- The top three deferred maintenance activities for Northern Region are bridge repairs, pavement repairs, and environmental management.

6.1.4.3 Preventative Maintenance

Preventative maintenance is aimed at preserving and extending the useful life of existing highway infrastructure via cost-effective treatments. This type of maintenance effort is a proactive approach with goals of improving safety and mobility, reducing congestion and construction delays, and providing for longer lasting facilities. Preventative maintenance

treatments are applied to locations not necessarily with the highest needs, but rather at locations where these cost-effective treatments are used to prolong a facility's life.

Preventative maintenance projects can be drawn from the PMS, which identifies highway corridor and pavement needs. These projects are usually designed by M&O staff. Preventative maintenance can include the following roadway and bridge improvement activities.

- milling
- profiling
- micro-surfacing
- chip sealing
- seal coats
- joint and crack sealing
- joint repairs
- drain cleaning
- bridge painting/roadway striping
- deck rehabilitation
- seismic retrofit
- shoulder/slope/ditch repairs
- drainage restoration
- illumination
- guardrails
- pavement overlays

6.1.4.4 Maintenance Management System (MMS)

Over the past four years, DOT&PF has been transitioning to an MMS to automate, streamline and track many of the activities preformed by M&O staff. The MMS is currently being used to track and organize budget expenditures, deferred maintenance, budget requirements and services provided to the public. As this historical data continues to grow, much of this information will be used to improve existing processes and help forecast future highway needs and budgets. In addition, the MMS is also used to automate timesheet reporting and streamline work plans.

6.1.5 Security

Security planning is a rapidly growing component to many states' overall planning efforts. While security needs and priorities can vary widely from state to state, maintaining a well functioning highway system and coordinating security issues between state, regional and Federal agencies is critical to security planning.

The two border crossings that serve Alaska and Canada within the Interior, located along the Alaska Highway at Port Alcan and the Top of the World Highway at Poker Creek, play an integral role in highway security. The Port Alcan border crossing is operational year round with 24-hour service, while the Poker Creek border crossing provides daytime service from mid-May to late-October. Operations and maintenance of all border crossings are the responsibility of the US Customs and Border Protection (CBP), the largest component of the Department of

Homeland Security. These international borders are subject to all immigration and customs laws. Although the CBP is responsible for maintaining the roads at the border crossings during the winter months (i.e. plowing and salting), these efforts are closely coordinated and occasionally performed by DOT&PF M&O. According to M&O staff, the CBP is currently leading an effort to enhance security at both border crossings to improve vehicle monitoring at checkpoints.

6.1.6 Highway Corridor Assessment

6.1.6.1 Alaska Highway (Alaska Route 2)

The Alaska Highway is approximately 198 miles in length and provides an east/west connection between the US/Canada border and Delta Junction. The major connection points to neighboring highways are the Richardson Highway at MP 1422, Tok Cutoff Highway at MP 1314.7 and the Taylor Highway at MP 1301.7.

Traffic Volume Forecast and Roadway Capacity. Forecast year 2030 AADT along most of the corridor range between 800 and 2,000, with higher traffic volumes forecast near Delta Junction. Based on these forecast traffic volumes, a qualitative planning level assessment of the Alaska Highway reveals no major roadway capacity constraints over the near- and long-term.

Safety. The descriptions and potential treatments identified in Table 6-5 can help to address the highest priority safety concerns along the Alaska Highway.

Table 6-5 Crash Summary Analysis (2001-2006), Alaska Highway

Segment	Location (milepost)	Crash Summary / Contributing Factors	Potential Treatments / Corrective Measures / Strategies
1231 - 1234	-	No identifiable trends. 6 of 7 accidents involved driver inattention or inexperience	• Provide additional driver information/notification • Continue monitoring to identify any trends and isolate causes
1281 - 1286	1285	Three off-road crashes occurred at this curved and graded section of roadway.	• Install guardrail, chevrons, rumble strips and/or advance warning signs • Realign roadway to eliminate curvature
1406 - 1411	-	15 of 17 crashes involved animals	• Brush cutting to divert animal crossings

Beyond these highway segments, no special interest areas were identified for further analysis based on field observations or anecdotal evidence.

Roadway Conditions and System Needs. The Alaska Highway is paved throughout and in generally good condition; however, regular maintenance is needed on several highway segments

due to extremely poor foundations. Some of the worst pavement conditions are located near the border (MP 1222 to1236) and either side of Northway Junction (MP 1254 to 61 and MP 1265 to 71). The majority of the highway is 36 feet wide except near Tok where it is 40 feet wide. The 2006 *Pavement Management Report* indicates that 147 miles of this route have greater than six years of service life left, 31 miles have three to six years left, five miles have one to two years left and 13 miles have no service life left. Major infrastructure improvements will be needed along the Alaska Highway should the construction of the Alaska Natural Gas Pipeline move forward and parallel this facility.

Maintenance & Operations. Deferred and preventative maintenance needs identified by M&O staff are summarized in Table 6-6.

Table 6-6 Maintenance Project Needs, Alaska Highway*

Project	Estimated Cost
Deferred Maintenance	
Guardrail Repair/Replacement - Replace 630' and raise 430' of guardrail that has subsided and fallen away from the roadway at Dot Lake corner.	$100,000
Culvert Replacement (MP 1226-1266) - Replace 13 culverts.	$100,000
Total	$200,000
Preventative Maintenance	
Reclaim and Resurface (MP 1412-1422)	$5,500,000
Culvert Repair / Replacement	$3,000,000
Total	$8,500,000

*Based on year 2008 deferred maintenance and 2007 preventative maintenance project lists.

Also, general conditions at all three maintenance stations (Northway, Tok and Delta Junction) located along the Alaska Highway are marginal to substandard. Overall facility upgrades and improvements to shops and warm storage buildings are needed.

6.1.6.2 Dalton Highway (Alaska Route 11)

The Dalton Highway is primarily a north/south facility that begins at its intersection with the Elliott Highway and extends north to Deadhorse. The portion of the Dalton Highway in the study area is approximately 230 miles long.

Traffic Volume Forecast and Roadway Capacity: With an average annual growth of approximately 1 percent, the forecast year 2030 AADT along most parts of the Dalton Highway

are estimated to range between 300 to 500 AADT. However, with the potential construction of the Alaska Natural Gas Pipeline and Enstar Gas Pipeline, traffic volumes would increase considerably, particularly heavy vehicle volumes. Although no major roadway capacity constraints are anticipated over the near- and long-term, development of either pipeline would have a major impact on highway operations and the existing highway infrastructure.

Safety: A review of historical crash data did not reveal any major crash trends, and no specific areas (special interest areas) were identified for further analysis based on field observations or anecdotal evidence. However, several highway segments were identified as areas with system needs to improve highway mobility, accessibility, and/or general highway conditions.

Roadway Conditions and System Needs: Approximately 50 percent of the highway is unpaved (gravel surface) and generally travels though rounded hills and mountainous terrain. The majority of the highway is approximately 32 feet wide. Primary areas of improvement for the Dalton Highway are road geometry and culvert repairs. Poor road geometry, particularly segments with steep grades, can degrade highway mobility, accessibility and general highway conditions. Many segments along the Dalton Highway require reconstruction and possible new alignments. Culvert failures are also an area of concern that can create lengthy road closures and require extensive resources to repair. Two specific locations that require immediate culvert repairs are at Rosie Creek (MP 172) and Mark Creek (MP 345).

Maintenance & Operations: Primary maintenance issues along the Dalton Highway are permafrost, subsidence, increasing gravel-surfacing wear, intense truck traffic and weather events. The remoteness of the highway also creates challenges in maintaining the overall highway, especially in rural areas were transport of supplies and equipment may be difficult. Deferred and preventative maintenance needs identified by M&O staff are summarized in Table 6-7.

Table 6-7 Maintenance Project Needs, Dalton Highway*

Project	Estimated Cost
Deferred Maintenance	
Asphalt Repairs (Hot Mix) (MP 19-23) - Extend the life of the existing surface, provide a smoother and safer roadway, and reduce future maintenance costs.	$40,000
Dan Creek Bridge Decking - Replace worn sub deck and wearing surface.	$250,000
Total	$290,000
Preventative Maintenance	
Not available at this time.	-
Total	-

*Based on year 2008 deferred maintenance and 2007 preventative maintenance project lists.

Additional maintenance needs include facility upgrades to the shops and warm storage facilities at the Jim River maintenance station. The two remaining stations (Seven Mile and Coldfoot) are generally in adequate condition and no major improvements are currently needed.

6.1.6.3 Denali Highway (Alaska Route 8)

The Denali Highway is approximately 135 miles in length and provides an east/west connection between the Richardson and Parks Highways. The highway is generally closed between October 1 and mid-May.

Traffic Volume Forecast and Roadway Capacity. Forecast year 2030 AADT along the Denali Highway range between 300 and 400 and no major roadway capacity constraints are anticipated over the long-term.

Safety. A review of historical crash data did not reveal any major crash trends or areas of safety concern, and no special interest areas were identified for further analysis based on field observations or anecdotal evidence.

Roadway Conditions and System Needs: The highway terrain throughout the entire length is generally rolling to mountainous, and the majority of the highway is approximately 26 feet wide. As it leaves the Richardson Highway at Paxson, the grade abruptly increases into the foothills of the Alaska Range. The highway is only paved for the first 21 miles west of Paxson and 3 miles east of the Cantwell Junction. According to the 2006 *Pavement Condition Report,* 12 miles of the paved portion of this route have greater than six years of service life left, four miles have three to six years left, one mile has one to two years left and 4.5 miles have no service life left. Some of

the worst pavement conditions are located where there are paved turnouts and/or parking adjacent to the road. In addition to the general maintenance needs of the majority of the gravel surface, four of the nine bridges located along the Denali Highway are eligible for repair or replacement: Gulkana River (MP 0.2); Tangle River (MP 21.4); Rock Creek (MP 24.9); and Seattle Creek (MP 110.9).

Maintenance & Operations: Deferred and preventative maintenance needs identified by M&O staff are summarized in Table 6-8.

Table 6-8 Maintenance Project Needs, Denali Highway*

Project	Estimated Cost
Deferred Maintenance	
Brush Cutting - Cut brush back from road surface and reestablish sight distance on roads that have not been brush cut for several years.	$100,000
Gravel Resurfacing - Provide gravel resurfacing funds for the portion of Denali Highway that is within the Cantwell station coverage.	$100,000
Dust Control (Calcium Chloride Application) – Apply 100 tons.	$60,000
Culvert Rehabilitation/Installation - Reduce washouts, shoulder erosion and time spent steaming culverts each spring.	$100,000
Ditching Rehabilitation (MP 60-131) - Reestablish drainage in locations that cannot be reached with graders and slopers.	$125,000
Ditching (MP 60-131) - Reestablish drainage in locations that cannot be reached with graders and slopers.	$150,000
Sign Study and Installation - Conduct a sign study to locate all signs needed on this corridor.	$200,000
Chip Seal - The first section of the Denali Highway adjacent to the Parks Highway in Cantwell is in need of a single application chip seal to extend the life of the existing surface. The deteriorated condition of the existing chip seal results in a high maintenance cost. This project will extend the life of the existing surface, provide a smoother and safety roadway, and will reduce maintenance costs	$100,000
Total	$935,000
Preventative Maintenance	
Surface and Miscellaneous Improvements (MP 22-30)	$4,500,000
Total	$4,500,000

*Based on year 2008 deferred maintenance and 2007 preventative maintenance project lists.

Maintenance of the Denali Highway is conducted out of the Cantwell and Paxson stations. Although no immediate needs were identified by M&O staff for either maintenance station, the Cantwell station currently serves an area typically covered by two stations (Cantwell and East Fork). M&O staff has identified the reopening of the East Fork station on the Parks Highway as an immediate need to support the Denali Highway.

6.1.6.4 Edgerton Highway/McCarthy Road (Alaska Route 10 and 10E)

The Edgerton Highway begins at its intersection with the Richardson Highway and extends southeast for approximately 31 miles to Chitina. East of Chitina, the Edgerton Highway becomes McCarthy Road and is approximately 60 miles in length and terminates at McCarthy.

Traffic Volume Forecast and Roadway Capacity. Traffic volumes for year 2030 are estimated to be approximately 600 AADT. These volumes can be accommodated by the existing two-lane facility.

Safety. A review of historical crash data did not reveal any major crash trends or areas of safety concern. Also, no special interest areas were identified for further analysis based on field observations or anecdotal evidence.

Roadway Conditions and System Needs. The Edgerton Highway is a paved two-lane highway, while the majority of the McCarthy Road is gravel. The 2006 *Pavement Condition Report* indicates that 22.5 miles of the Edgerton Highway have greater than six years of service life left, five miles have three to six years left, four miles have one to two years left, and two miles have no service life left. Some of the worst pavement conditions are located near the beginning of the route and near MP 20. The general terrain of both facilities is rolling to mountainous with restrictions to vertical and horizontal roadway alignment. The Edgerton Highway and McCarthy Road are both in relatively good condition and no specific highway needs were identified beyond general roadway maintenance and bridge repair at the Chokosna River and Lakina River bridges.

Maintenance & Operations: Deferred and preventative maintenance needs identified by M&O staff are summarized in Table 6-9.

Table 6-9 Maintenance Project Needs, Edgerton Highway*

Project	Estimated Cost
Deferred Maintenance	
Surface Maintenance - Resurface sections that are damaged due to frost heaving.	$120,000
Total	$120,000
Preventative Maintenance	
Single E-chip (MP 0-16)	$800,000
Total	$800,000

*Based on year 2008 deferred maintenance and 2007 preventative maintenance project lists.

Maintenance of the Edgerton Highway/McCarthy Road is led out of the Chitina maintenance station. This station is in average condition and no major improvements are currently needed.

6.1.6.5 Elliott Highway (Alaska Route 2)

The Elliott Highway is a two-lane facility that connects the Steese and Dalton Highways (68 miles), and extends southwest from its connection with the Dalton Highway to Manley Hot Springs (86 miles).

Traffic Volume Forecast and Roadway Capacity. Year 2030 AADT along the Elliott Highway between the Dalton Highway and Manley Hot Springs is forecast to be approximately 150, and roughly 1,600 AADT between the Dalton Highway and Fox. Although no capacity constraints are anticipated along either highway segment over the long-term, potential resource development of natural gas in the North Slope could have a major impact on highway operations and infrastructure with construction of a new gas pipeline.

Safety., Crash descriptions and potential treatments to address the highest priority safety concerns along the Elliott Highway are summarized in Table 6-10.

Table 6-10 Crash Summary Analysis (2001-2006), Elliott Highway

Segment	Location (milepost)	Crash Summary / Contributing Factors	Potential Treatments / Corrective Measures / Strategies
0 - 3	-	Of the 16 crashes in this segment, 5 involve animals and 7 cross the shoulder or centerline. At least 7 crashes involve driver inattention or falling asleep. There is a variety of straight, curved, level, and graded sections.	• Provide additional driver information/notification • Continue monitoring to identify any trends and isolate causes
7 - 18	-	Of the 19 crashes, 5 involve animals, 8 involve off-road/ditch, and 5 are overturned vehicles. 16 of the crashes occurred on wet or icy conditions.	• Reduce speeds in icy/wet conditions. • Provide additional driver information/notification

Beyond these two highway segments, no specific areas (special interest areas) were identified for further analysis based on field observations or anecdotal evidence.

Roadway Conditions and System Needs. The Elliott Highway between the Steese and Dalton Highways is paved, generally 30 feet wide, and traverses rolling to mountainous terrain. This facility consists of a series of horizontal and vertical curves through the White Mountains, with many bumpy sections. The 2006 *Pavement Condition Report* indicates that one mile of road has more than five years of life and 32 miles have three to six years of life. Nineteen miles have one

to two years of life and 16 have no service life left. The highway segment between the Dalton Highway and Manley Hot Springs is gravel, generally 22 to 24 feet wide, and the terrain is generally rolling to mountainous. The gravel section is narrow, has no shoulders, and can be rough. Also, should the construction of the Alaska Natural Gas Pipeline move forward and parallel this facility between the Dalton Highway and Fox, infrastructure improvements such as roadway reconstruction and bridge repairs/replacement would be needed along its entire length.

Maintenance & Operations. Deferred and preventative maintenance needs identified by M&O staff are summarized in Table 6-11.

Table 6-11 Maintenance Project Needs, Elliott Highway*

Project	Estimated Cost
Deferred Maintenance	
Gravel Resurfacing	$100,000
Dust Control (Calcium Chloride Application) – Apply 100 tons.	$60,000
Culvert Rehabilitation/Repair/Installation	$100,000
Brush Cutting	$255,000
Total	$515,000
Preventative Maintenance	
Not available at this time.	-
Total	-

*Based on year 2008 deferred maintenance and 2007 preventative maintenance project lists.

The three maintenance stations within the study area are Fairbanks, Livengood, and Manley. The stations at Fairbanks and Livengood are generally in adequate condition; however M&O staff has identified needs at the Manley station. General conditions at the Manley station are marginal to substandard. Overall facility upgrades and improvements to the shops and warm storage are needed.

6.1.6.6 Glenn Highway (Alaska Route 1)

The Glenn Highway is approximately 187 miles in length and provides an east/west connection between Anchorage and Glennallen, where it connects with the Richardson Highway. Approximately 60 miles of this paved facility is located in the study area (MP 127 – 187).

Traffic Volume Forecast and Roadway Capacity. Traffic volumes for year 2030 are estimated to range between 1,300 and 4,000 AADT, with higher traffic volumes forecast near the Richardson Highway junction. Based on these forecast traffic volumes, a qualitative planning level assessment of portions of the Glenn Highway within the study area reveals no major roadway capacity constraints over the near- and long-term.

Safety. A review of historical crash data did not reveal any major crash trends or areas of safety concern, and no special interest areas were identified for further analysis based on field observations or anecdotal evidence.

Roadway Conditions and System Needs. General highway conditions are good within the study area; however, passing lanes are needed in select areas to improve highway mobility. The road width within the study area is generally 40 feet. The terrain between MP 127 and Glennallen is level to rolling with minimal restrictions to vertical or horizontal roadway alignment. The 2006 *Pavement Condition Report* indicates that 36.8 miles of this route have greater than six years of service life left, ten miles have three to six years left, seven miles have one to two years left, and six miles have no service life left. The areas where the pavement conditions are the worst (no service life) are areas where there are attractions for turning off and onto the highway. Those areas where there is only a year or two of pavement life left are also in areas where there are attractions or scenic turnouts. A particularly poor area of pavement is MP 172 to MP 178. This area either has only one to two years of pavement life or none.

Maintenance & Operations. Deferred and preventative maintenance needs identified by M&O staff are summarized in Table 6-12.

Table 6-12 Maintenance Project Needs, Glenn Highway*

Project	Estimated Cost
Deferred Maintenance	
Not available at this time.	N/A-
Preventative Maintenance	
Reclaim and Resurface (MP 127-135)	$4,500,000
Total	$4,500,000

*Based on year 2008 deferred maintenance and 2007 preventative maintenance project lists.

Maintenance of the segment of the Glenn Highway within the study area is led out of the Tazlina and Nelchina stations. No immediate needs were identified by M&O staff for either maintenance station.

6.1.6.7 Parks Highway (Alaska Route 3)

The Parks Highway is the primary facility connecting Anchorage to Fairbanks, while serving many other communities in between. It also provides access to Denali National Park, one of the largest attractors for tourism and recreation in the state. This facility accommodates the highest level of traffic volume of any roadway in the Interior. The portion of the Parks Highway in the study area begins at MP 128 (approximately 82 miles south of the Denali Highway) and extends north approximately 196 miles to Fairbanks. This highway serves as the western terminus of the Denali Highway at MP 210 in Cantwell.

Traffic Volume Forecast and Roadway Capacity. Year 2030 AADT along the Parks Highway between the study boundary (MP 128) and Nenana is forecast at approximately 4,700, and approximately 11,800 AADT between Nenana and Sheep Creek Road. No capacity constraints are anticipated along this highway over the near- and long-term.

Safety. The descriptions and potential treatments identified in Table 6-13 are based on the assessment of available crash data. They can help to address the highest priority safety concerns along the Parks Highway.

Table 6-13 Crash Summary Analysis (2001-2006), Parks Highway

Segment	Location (milepost)	Crash Summary / Contributing Factors	Potential Treatments / Corrective Measures / Strategies
214 - 216	215	6 of the 9 crashes involved guardrail or off-road incidents on this curved, graded section of roadway. 6 were caused by driver inattention and/or unsafe speeds.	• Install guardrail, chevrons, rumble strips, and/or advance warning signs • Realign roadway to eliminate curvature
295 - 297	297	Four crashes occurred at this curve related to inattention, inexperience, and unsafe speeds.	• Install guardrail, chevrons, rumble strips, and/or advance warning signs • Realign roadway to eliminate curvature
345 - 349	-	Of the 25 crashes, 9 involved running off the road or into the guardrail. 7 involved animals, and 3 were overturned. The roadway segment contains a rapid succession of curves and grades.	• Install guardrail, chevrons, rumble strips, and/or advance warning signs • Realign roadway to eliminate curvature

In addition to these highway segments, the following special interest areas were identified for further analysis based on field observations or anecdotal evidence.

6.1.6.7.1 Honolulu Hill (near Milepost 168) and East Fork (near Milepost 186)

Two areas of special interest on the Parks Highway are the roadway sections near Honolulu Hill and East Fork. Although both roadway sections have adequate shoulder widths (approximately 8 feet), the combination of sharp horizontal and vertical curves creates potential safety concerns for motorists. Both highway segments have sections of road with 6 percent grades and curves designed for travel speeds of 35 to 45 mph. Heavy truck traffic and winter conditions affect the overall safety of these highway segments.

6.1.6.7.2 McKinley Village (Milepost 231.0)

Another special interest area on the Parks Highway is the access point for McKinley Village and the Grizzly Bear Cabins and Campground, located approximately six miles south of the Denali National Park entrance. McKinley Village and the Grizzly Bear Campground are lodging facilities that also provide many outdoor recreational activities such as hiking, rafting, and bicycling. Access is provided along the Parks Highway via a single driveway located immediately south of the Nenana River crossing. Although a review of the crash data in this area revealed no apparent crash trends or patterns, this area has been identified for further review due to a combination of roadway grade, curvature, travel speeds, and type of vehicles entering/exiting the Parks Highway. Because the driveway is located at a sag point of the highway on a slight curve with a posted speed of 55 mph, there is concern about vehicles, particularly heavy vehicles (i.e. tour buses, recreational vehicles, and tractor trailers),

Parks Highway (northbound) - McKinley Village Main

Parks Highway (northbound) – Denali Park Entrance

entering/exiting the highway and potential conflicts with fast-moving vehicles traveling along the mainline. Potential low-cost improvements that can be explored are providing advance warning signs for an intersection ahead and speed reduction.

6.1.6.7.3 Denali Park Entrance (Milepost 237.5)

The entrance to the Denali National Park and Preserve is located along a relatively flat section of the Parks Highway, approximately 400 feet north of the Riley Creek Bridge. At this location the Parks Highway consists of a two-lane cross section with a dedicated southbound right-turn lane, varying shoulders, and a posted speed of 55 mph. During the summer months, the park entrance experiences its heaviest demand of traffic, particularly tour vans and trucks. This location is a safety concern because of the lack of an exclusive left-turn lane along the Parks Highway to provide refuge for northbound left-turning vehicles. Although shoulder width does exist for vehicles to slowly pass short standing-vehicle queues, this maneuver is not ideal or recommended.

Parks Highway (southbound) – Denali Park Entrance and Riley Creek Bridge

Parks Highway (southbound) – Riley Creek Bridge

While an exclusive northbound left-turn lane at the Parks Highway/Denali National Park Road intersection would separate turning traffic from the high-speed through traffic, constructing the turn lane would likely be a challenge due to the close proximity of the Riley Creek Bridge. In addition to widening the Parks Highway to accommodate a three-lane cross section, widening of the existing bridge structure would be needed. Because the historical crash data at this location

do not reveal any apparent trends and because of the likely high cost of widening Riley Creek Bridge, it is recommended that traffic conditions continue to be monitored at the Denali Park entrance. Traffic monitoring methods include using video technology to record daily traffic conditions or conducting a conflict study to further evaluate site concerns. It is also recommended that a left-turn lane warrant analysis be conducted, though traffic volumes are not the only factor used to justify need. A left-turn lane warrant analysis considers traffic volumes and the posted speed to evaluate whether a separate left-turn lane is recommended for traffic operations and/or safety.

6.1.6.7.4 S-Curves (Milepost 315 to 321)

The segment of highway just north of Nenana consists of a series of sharp curves that has contributed to approximately 30 reported crashes over the past five years. The primary crash type is vehicles traveling off the road into ditches or guardrails. Realignment of this highway segment may be the ultimate improvement; however, adequate funding is currently not available. Topography along this highway segment is mountainous and highway realignment will be costly. In lieu of this, oversized advance warning signs were installed to slow travel speeds and inform drivers of steep grades and sharp curves. Although the installation of oversized signage provides for a good interim solution to the safety issue, it is recommended that staff continue to monitor this highway segment and continue to pursue funding for future improvements.

Roadway Conditions and System Needs. The entire length of the Parks Highway is paved and the terrain varies from mountainous, rolling to level depending on which section of road is being traversed. The road within the study area is generally 40 feet in width and general highway conditions are good. Passing lanes are needed in select areas such as Healy and McKinley Village to improve highway mobility. Consequently, several locations were identified as potential or latent safety concerns in addition to those identified through the rate quality control method. The 2006 *Pavement Condition Report* indicates that 113 miles of this route have greater than six years of service life left, 24 miles have three to six years left, two miles have one to two years left and 12 miles have no service life left. Some of the worst pavement conditions are located roughly between MP 243 and 260 in areas where there may be problems with subgrade materials – frost heaves are prevalent.

Maintenance & Operations. Deferred and preventative maintenance needs identified by M&O staff are summarized in Table 6-14.

Table 6-14 Maintenance Project Needs, Parks Highway*

Project	Estimated Cost
Deferred Maintenance	
Sign Replacement - Replacement of sign due to snow removal wear and tear.	$290,000
Guardrail Upgrade	$1,150,000
Reclaim and Resurface (MP 251-265)	$500,000
Ditching - Re-establish drainage along both sides of the Parks Highway keep water away from the road base.	$290,000
Total	$2,230,000
Preventative Maintenance	
Resurface and Miscellaneous Improvements (MP 240 -248) - Glitter Gulch to Stampede	$4,200,000
Total	$4,200,000

*Based on year 2008 deferred maintenance and 2007 preventative maintenance project lists.

The 195-mile portion of the Parks Highway within the study area is maintained by M&O staff operating out of five maintenance stations. The majority of these stations are generally in adequate condition; however, M&O staff has identified needs at the Nenana station. General conditions at the Nenana station are marginal to substandard and overall facility upgrades and improvements to the shops and warm storage are needed. Although no immediate needs were identified by M&O staff for the Cantwell station, this station currently serves an area typically covered by two stations (Cantwell and East Fork) and M&O staff has identified the reopening of the East Fork station as an immediate need.

6.1.6.8 Richardson Highway (Alaska Route 2 and 4)

The Richardson Highway is approximately 368 miles in length and provides a north-south connection between Fairbanks and Valdez. Approximately 271 miles of the highway are located in the study area which begins along the Richardson Highway at MP 69 and ends at MP 340. The Richardson Highway junctions with five other highways; the Edgerton Highway (MP 82.5), the Glenn Highway (MP 115) at Glennallen, the Tok Cutoff (MP 128.6) at Gakona Junction, the Denali Highway (MP 185.5) at Paxson, and the Alaska Highway (MP 266) at Delta Junction.

Traffic Volume Forecast and Roadway Capacity. Year 2030 traffic volumes are forecast to be the highest along the highway segment between Laurence Road and the Alaska Highway at approximately 15,000 AADT. Daily traffic volumes along most other segments of the Richardson Highway are forecast between 1,500 and 4,500 AADT. Based on these forecast traffic volumes, a qualitative planning level assessment of the Richardson Highway reveals no major roadway capacity constraints over the near- and long-term.

Safety. The descriptions and potential treatments identified in Table 6-15 are based on the assessment of available crash data. They can help to address the highest priority safety concerns along the Richardson Highway.

Table 6-15 Crash Summary Analysis (2001-2006), Richardson Highway

Segment	Location (milepost)	Crash Summary / Contributing Factors	Potential Treatments / Corrective Measures / Strategies
148 - 151	150	No identifiable trend. 3 crashes occurred at this point, 1 overturn, 1 animal and 1 rear end. All occurred in dry, daylight conditions. 2 crashes were related to driver error.	• Continue monitoring to identify any trends and isolate causes
238 - 242	241	All 4 crashes were related to "out of control" driving (3 off-road, 1 overturn) due to inattention and unsafe speeds.	• Provide additional driver information/notification • Continue monitoring to identify any trends and isolate causes
271 - 274	274	4 intersection-related (angle) crashes at Rikas Rd. 3 crashes at Tanana River Bridge (2 ditch, 1 bridge rail) on ice/slush conditions.	• Provide advanced intersection notification • Remove obstructions to provide adequate sight distance
293 - 295	-	No identifiable trend. Of the 4 crashes, 3 involved animals and 1 was an off-road crash.	• Provide additional driver information/notification • Continue monitoring to identify any trends and isolate causes
295 - 300	300	6 of the 8 crashes were off-road/guardrail crashes at this curved and graded section of highway. Unsafe speeds and driver inattention played a role in 5 crashes.	• Install guardrail, chevrons, rumble strips, and/or advance warning signs • Realign roadway to eliminate curvature

In addition to these highway segments, the section of highway at Meiers Lake was identified as a special interest area needing further analysis based on field observations and anecdotal evidence.

6.1.6.8.1 Meiers Lake (near Milepost 171)

Average roadway widths along most sections of the Richardson Highway near Meiers Lake are approximately 24 feet, and the narrow cross section provides little to no shoulder width.

DOT&PF prefers a minimum shoulder width of six to eight feet. Shoulders are vital to the overall highway system as they add to the area of clear zone that protects drivers from roadside hazards (slopes, water, trees); provide a safe place for vehicles to stop for emergencies or mechanical difficulties; accommodate pedestrian and bicycle use; provide structural pavement support; and improve sight distance in cut sections.

In addition to the narrow roadway cross sections, the combination of sharp horizontal and vertical curves contributes to reasons why this is an area with potential safety concerns. Several highway sections have curves with radii of approximately 800 feet (35 to 40 mph travel posted speed) and grades of up to 7 percent.

Roadway Conditions and System Needs. The Richardson Highway is paved throughout and approximately 165 miles have greater than six years of service life left, 63 miles have three to six years left, 27 miles have one to two years left and 35 miles have no service life left, according to the 2006 *Pavement Condition Report.* Some of the worst pavement conditions are located north of Thompson Pass (MP 45 to 72) and south of Trims Maintenance Station (MP 128 to 183). Portions of the Richardson Highway between Gakona and Delta Junction are some of the highest priority safety areas in the Interior. The section of highway between MP 202 to 266 is narrow and consists of a series of sharp horizontal curves. Most of the highway is a two-lane undivided facility with narrow or non-existent shoulders. In addition, sharp horizontal and vertical curves, poor pavement conditions and sight distance provide further challenges to the traveling public.

Maintenance & Operations. Deferred and preventative maintenance needs identified by M&O staff are summarized in Table 6-16.

Table 6-16 Maintenance Project Needs, Richardson Highway*

Project	Estimated Cost
Deferred Maintenance	
Culvert Replacement (MP 130-150)	$200,000
Culvert Restoration (MP 289-341.5)	$30,000
Drainage Improvement - Remove debris/brush and re-create a flowline.	$95,000
Bridge Resurface - Mill and resurface Tiekel North, Tiekel South and Stuart Creek Bridges.	$120,000
Riprap Stockpiles	$200,000
Fence Repair - Repair fence along the highway between Eielson AFB and Fairbanks.	$30,000
Total	$675,000

Project	Estimated Cost
Preventative Maintenance	
Tazlina Wayside Erosion Control	$400,000
Double E-Chip Application and 1/2 Mile Reclaim and Pave (MP 27-42)	$1,100,000
Reclaim/Resurface and Miscellaneous Drainage Improvements (MP 65-74)	$5,500,000
Tonsina Hill Reconstruction (MP 79-81)	$2,000,000
Reclaim and Resurface (MP 82-86)	$2,300,000
Reclaim and Resurface (MP 174 – 184)	$4,800,000
Mill and Overlay (MP 265.8-275.5)	$5,500,000
Total	$21,600,000

*Based on year 2008 deferred maintenance and 2007 preventative maintenance project lists.

Of the seven maintenance stations located along the Richardson Highway, the Ernestine and Birch Lake stations were identified by M&O staff as needing overall facility upgrades and improvements to the shops and warm storage buildings.

6.1.6.9 Steese Highway (Alaska Route 6)

The Steese Highway begins in Fairbanks and extends northeast for approximately 162 miles to Circle. Approximately 151 miles of this highway is located in the study area, which begins at MP 11 near Fox.

Traffic Volume Forecast and Roadway Capacity. Year 2030 traffic volume forecasts are approximately 13,000 AADT between Fairbanks and Fox, and drop to 400 AADT near Circle. A qualitative planning level assessment of the Steese Highway reveals no major roadway capacity constraints over the near- and long-term.

Safety. Based on the assessment of crash data per the rate quality control method, the highway segment between MP 9 and 12 was identified as having potential safety concerns. Between year 2001 and 2006, seven crashes were reported on the Steese Highway at the intersection with Goldstream Road and four at the Elliott Highway intersection. The predominant crash type reported at each location is angle collisions. Sight distance should be evaluated at both locations and any obstructions should be removed. Also, advance intersection notification signs can be used to warn drivers of vehicles entering the mainline traffic stream. Other than this one highway segment, no special interest areas were identified for further analysis based on field observations or anecdotal evidence.

Roadway Conditions and System Needs. The first 44 miles of the Steese Highway are paved. The section of the Steese Highway between Fox and the Chatanika River Bridge (MP 39) is a two-lane minor arterial with a paved 28-foot width. The road is paved 24 feet wide with no shoulders from the Chatanika River Bridge (MP 39) to Boston Creek (MP 44). East of Boston Creek, the highway is a 28-foot-wide gravel road to Central (MP 128), and narrows to 22 feet for the remaining length to Circle. The majority of the Steese Highway, east of the Chatanika River Bridge has poor surface conditions and needs complete reconstruction to Circle.

Maintenance & Operations. Deferred and preventative maintenance needs identified by M&O staff are summarized in Table 6-17.

Table 6-17 Maintenance Project Needs, Steese Highway*

Project	Estimated Cost
Deferred Maintenance	
Brush Cutting (MP 101-162)	$190,000
Surface Repair (MP 128-162) - 5,000 cy of surface aggregate would finish off repairs to the washed out areas and locations that received new culverts this year.	$100,000
Drainage Improvements - Clean and reestablish most of the ditches between Central and Circle Hot Springs. Erosion has caused silt to fill up the ditches and plug culverts.	$150,000
Total	$440,000
Preventative Maintenance	
Not available at this time.	-
Total	-

*Based on year 2008 deferred maintenance and 2007 preventative maintenance project lists.

The two maintenance stations within the study area are located at Montana Creek and Central. These stations are in good condition and no major improvements were identified by M&O staff.

6.1.6.10 Taylor Highway (Alaska Route 5)

The Taylor Highway begins at its intersection with the Alaska Highway near Tetlin, and extends north to Eagle (approximately 160 miles). This highway connects with the Top of the World Highway at Jack Wade Junction (MP 96).

Traffic Volume Forecast and Roadway Capacity. Year 2030 traffic volumes along the Taylor Highway are forecast between 200 and 300 AADT. No major roadway capacity constraints are anticipated over the long-term.

Safety. A review of historical crash data did not reveal any major crash trends or areas of safety concern, and no special interest areas were identified for further analysis based on field observations or anecdotal evidence.

Roadway Conditions and System Needs. The Taylor Highway is considered to be in the worst condition of any highway in the Interior due to severe (seven to nine percent) grades, limited shoulders, and rough road conditions with frost heaves and pavement breaks. The first 64 miles of the highway are paved and the rest is gravel, with a general width of approximately 28 feet. Of the 64 miles of paved road, 18.5 miles of the road have more than six years of pavement life, 29.7 miles have three to six years, 7.3 miles have one to two years, and 8.5 miles have no pavement life left according to the 2006 *Pavement Condition Report*. Although the low traffic demand and seasonal nature of this roadway has historically reduced its priority ranking for transportation improvements, it is recommended that funding be sought to address the worst sections of the highway, particularly near MP 73. The highway segment between Chicken and Eagle is in very poor condition and needs reconstruction. North of Chicken, the Taylor Highway is a narrow two-lane facility with many sharp curves (switchbacks). Traversing this roadway section, particularly between Wye and Eagle, is very challenging for travel trailers and recreational vehicles. Several miles of one-lane road exist that need to be addressed.

Maintenance & Operations. Deferred and preventative maintenance needs identified by M&O staff are summarized in Table 6-18.

Table 6-18 Maintenance Project Needs, Taylor Highway*

Project	Estimated Cost
Deferred Maintenance	
Culvert Replacement -	$50,000
Stockpile Road Surfacing Material	$500,000
Vegetative Management	$400,000
Calcium Chloride Application – Reduces fugitive dust and binding the surface of the road. Safer road requiring less maintenance.	$200,000
Total	$1,150,000
Preventative Maintenance	
Reclaim, Resurface, and Base Stabilization (MP 43-48)	$3,500,000
Resurface and Base Stabilization (MP 55-57)	$1,300,000
Total	$4,800,000

*Based on year 2008 deferred maintenance and 2007 preventative maintenance project lists.

The three maintenance stations on the Taylor Highway are located at South Fork, O'Brien, and Eagle. General conditions at the South Fork station are marginal to substandard, and facility upgrades and improvements to the shops and warm storage are needed. Due to the seasonal nature of the Taylor Highway, the stations at O'Brien and Eagle are adequate; however, winter opening of this highway would trigger the need for all new maintenance stations.

6.1.6.11 Tok Cutoff (Alaska Route 1)

The Tok Cutoff is approximately 125 miles in length and provides a connection between the Richardson Highway (14 miles north of Glennallen) and the Alaska Highway at Tok.

Traffic Volume Forecast and Roadway Capacity. The year 2030 forecast traffic volumes are estimated to range between 600 and 800 AADT. Based on these traffic levels, no major roadway capacity constraints are anticipated over the near- and long-term.

Safety. A review of historical crash data did not reveal any major crash trends or areas of safety concern, and no special interest areas were identified for further analysis based on field observations or anecdotal evidence.

Roadway Conditions and System Needs. The Tok Cutoff is paved, with a general width of approximately 36 feet. The terrain varies from flat to rolling to mountainous. General highway conditions are good for the entire length of this facility; however, the area from MP 2 to MP 30 has very poor foundation conditions. Per the 2006 *Pavement Condition Report*, 48 miles of the Tok Cutoff pavement have more than six years of life, 18 miles have three to six years of life, 11 miles have one or two years of life and 50 miles have no pavement life left.

Maintenance & Operations. Deferred and preventative maintenance needs identified by M&O staff are summarized in Table 6-19.

Table 6-19 Maintenance Project Needs, Tok Cutoff Highway*

Project	Estimated Cost
Deferred Maintenance	
Vegetative Management	$50,000
Culvert Replacement	$50,000
Total	$100,000
Preventative Maintenance	
Localized Reconstruction/Drainage Improvements/Base Stabilization/Resurfacing (MP 0-2)	$1,750,000
Reconstruction, Drainage Improvements, Base Stabilization and Resurfacing (MP 5-24)	$13,000,000
Total	$14,750,000

*Based on year 2008 deferred maintenance and 2007 preventative maintenance project lists.

Additional maintenance needs include facility upgrades to the shops and warm storage facilities at the Slana maintenance station. This single station is responsible for all maintenance needs along the Tok Cutoff Highway.

Welcome sign near the Canadian Border along the Top of the World Highway

6.1.6.12 Top of the World Highway (Alaska Route 5)

The Top of the World Highway begins at its intersection with the Taylor Highway at Jack Wade Junction and extends east to the US/Canada Border (approximately 14 miles).

Traffic Volume Forecast and Roadway Capacity. Year 2030 traffic volumes along this highway are forecast at 150 AADT and no capacity improvements are anticipated over the long-term.

Safety. A review of historical crash data did not reveal any major crash trends or areas of safety concern, and no special interest areas were identified for further analysis based on field observations or anecdotal evidence.

Roadway Conditions and System Needs. The road surface is unpaved, with a general width of approximately 28 feet, and the terrain is rolling to mountainous. Poor surface conditions regularly plague the unpaved highway and routine gravel surfacing is needed.

Maintenance & Operations. The Top of the World Highway is maintained out of the South Fork station and facility upgrades and improvements to the shops and warm storage are needed.

6.2 Community Transportation System Analysis

While this study is not intended to focus on local community roads, the state recognizes that community road needs in the study area continue to grow. In the STIP criteria, the state prioritizes community dust control projects and access road projects to local airports and sanitation facilities.

In those communities with a Tribal government, there is Bureau of Indian Affairs available through the Indian Reservation Roads program. These funds can be used for planning, maintenance, road design, construction and transit projects. Approximately $2.4 million was available within the study area to tribal governments through the IRR program as shown in Table 6-20. This number fluctuates from year to year based on the BIA formula.

Table 6-20 BIA Road Program Funds for Tribes within the Study Area

Tribe/Community	2009 Annual IRR funds
Beaver	$42,275
Birch Creek	$50,280
Cantwell	$25,892
Chalkyitsik	$78,084
Cheesh-Na (Chistochina)	$44,564
Chitina	$29,331
Circle	$37,252
Dot Lake	$27,360
Eagle	$35,391
Fort Yukon	$173,954
Gakona	$34,649
Gulkana	$39,314
Kluti-Kaah	$44,513
Minto	$56,751
Nenana	$96,364
Northway	$69,984
Stevens	$233,277
Tanacross	$46,522
Tanana	$101,180

Tribe/Community	2009 Annual IRR funds
Tazlina	$207,147
Tetlin	$315,913
Venetie	$538,420
TOTAL	**$2,365,669**

Source: Bureau of Indian Affairs

Several local communities are developing transit programs. Gulkana has a bus line that runs between Gulkana and Copper Center. Copper River Native Association has funding for buses and would like to partner with Gulkana to develop and run a bus service cooperative. CRNA has vans to transport elders and others to go to medical appointments, but these vans are aging and will need to be replaced. The Native Village of Tetlin also has funds for transit. They want to buy the 14 passenger vans that provide service twice a week between Anchorage and Whitehorse. They hope to increase service timing on the route.

6.3 Aviation Analysis

The aviation system analysis considers the following factors:

- Airport Coverage: Is there an Interior community that needs an airport and lacks one? Are there other locations where new or improved airports are needed?

- Airport Roles: Are the classifications assigned to Interior airports by the 1996 Alaska Aviation System Plan adequate? Are there minimum facilities needed at any airport, based upon their roles? How might the natural gas pipeline and other economic development affect airport roles and facility needs?

- NPIAS (National Plan of Integrated Airport Systems)/DOT&PF inclusion/exclusion: Are there airports that are significant to the national airport system that are not included in the NPIAS? Are there NPIAS airports that are not significant to the national airport system? Are there airports that DOT&PF should acquire or divest?

- Other Issues: What are Interior aviation system needs concerning airspace, weather information and en route navigational aids, backcountry airports and emergency access, Postal Service hubs, and security?

6.3.6 Airport Coverage

A review of the Interior communities lacking road access found only one without an airport—Healy Lake. In truth, Healy Lake has an airport, but it is not registered with the FAA. 40 Mile Air serves Healy Lake under an Essential Air Service subsidy.

Several other Interior communities lack airports within their communities, but they are no more than approximately 60 road miles from a public use airport. These communities include Big Delta, Dot Lake, Ester, Fox, Gakona, Kenny Lake, Mendeltna, Mentasta Lake, Nelchina, Slana, Tazlina, Tonsina, and Two Rivers.

The *Copper Basin/Upper Tanana Valley Regional Airport Plan* recommended locating a new public use airport to serve small airplanes in the Pippin/Tonsina area along the Richardson Highway, near or south of the intersection with the Edgerton Highway. The number of unregistered, private airstrips is growing along this stretch of the Richardson, so a public use airport was recommended to meet the demand for aviation facilities and to avoid the land use issues associated with the high density of private airstrips that has occurred in the Matanuska-Susitna Borough. This Interior Alaska Transportation Plan supports that recommendation.

Some communities are under-served by their airports. These inadequate airports are Cantwell, Delta Junction, and Chistochina airports. Cantwell has a population of approximately 200. Its location at the intersection of the Parks and Denali Highways and proximity to Denali National Park is an advantage for future economic development. The Cantwell Airport is privately owned and has a gravel/dirt runway that is short, narrow, steep, and not in good condition. DOT&PF owns Summit Airport, also located in Cantwell. With a 3,840 by 80 foot-runway and a public owner, Summit Airport is better situated to serve Cantwell's future aviation needs, although some investment in markers, tiedowns, access road, and maintenance would be required.

Delta Junction and Big Delta have a combined population of nearly 1,800. While nearby Allen Army Airfield has long paved runways and instrument approaches, it is only available to civilian aviation for medevac and firefighting, or with a landing permit that may take up to a week to approve. The City of Delta Junction's airport is one of the study area's busiest, with 16 based aircraft, but it is limited by its 2,500-foot long unpaved, visual runway. Runway extension is constrained by the Richardson Highway and Trans Alaska Pipeline. The airport is not in the NPIAS, which means it does not have access to AIP grant funds. In the past, 40 Mile Air

provided scheduled service from Fort Greely's Allen Army Airfield and civilian GA aircraft were based there. After the announcement of Fort Greely's realignment in the mid-1990s, the FAA funded an airport master plan for Allen Army Airfield to become a joint military-civilian airport. The later National Missile Defense mission for Fort Greely led to many airport improvements, but changed the military's position on joint use. Future population growth in Delta Junction and Big Delta, along with economic development from the proposed natural gas pipeline, indicates this population center needs better access to Allen Army Airfield, or a better airport.

More than 300 people live along the Tok Cutoff, in Chistochina, Mentasta Lake, and Slana, and this corridor provides one of the two entrances into Wrangell-St. Elias National Park. Chistochina is the only public airport on the Tok Cutoff. It is used not only by residents, but also by National Park Service pilots and air taxis providing mountaineers and others access into the National Park and Preserve. However, Chistochina Airport is located too close to the Tok Cutoff to meet design standards. The *Copper Basin/Upper Tanana Regional Airport Plan* recommended relocating Chistochina Airport. The DOT&PF is studying its relocation to a site where it can better serve the needs of Chistochina and other communities along the Tok Cutoff.

Airport coverage would be degraded if the McKinley National Park Airport were closed to public use, as the National Park Service has considered in the past. Acoustic counting has proven that it is used steadily and daily through the summer and fall, and not just by NPS pilots. On the route between Fairbanks and Anchorage, McKinley National Park Airport provides an excellent location for precautionary landings in case of changing weather at Broad Pass. The Interior Alaska Transportation Plan opposes closing the airport to public use, while supporting NPS and aviation stakeholder cooperation to ensure the compatibility of aviation with the other Park activities.

6.3.7 Airport Roles

The role of an airport within an aviation system relates primarily to the population it serves and the type and amount of aviation activity it accommodates. The aviation forecasts in Chapter 5 found that projected future growth in passengers, cargo, and based aircraft will not appreciably change the roles Interior airports serve now.

To simplify the understanding of airport roles within a system, planners often classify airports, grouping together the airports that have similar roles and needs. The 1996 Alaska Aviation System Plan Update assigned three classifications to the state's airports: Regional, Community, and Local. *The Copper Basin/Upper Tanana Regional Airport Plan*, which overlapped the southern Interior study area, adopted the Regional and Community classifications, but subdivided the Local classification into Local-Major and Local-Minor. The majority of airports in that area were "Local," and they portrayed a wide enough range of roles to justify dividing them into two classes.

One reason for classifying airports is to establish performance objectives for individual airport classes. These performance objectives help identify development needs that are significant to the system and help measure future improvement in the performance of the airport system.

The 1996 Alaska Aviation System Plan Update identified minimum facility standards for Community airports. The DOT&PF has since modified one of the minimum standards in response to a new FAA requirement. The 3,000-foot minimum runway length standard was changed to meet the FAA requirement for a minimum 3,200 foot-long runway for an instrument approach.[1] The Northern Region DOT&PF has set 3,400 feet as a minimum standard runway length for Community Airports to coordinate with the standard 200 foot-spacing of runway edge lights and to meet the needs of many of the aircraft that FAR (Federal Aviation Regulation) Part 135 carriers use to serve these airports. The Alaska Aviation System Plan Update also set minimum apron and float sizes for Community airports. No minimum facility standards were set for the Regional and Local airport classifications. The Copper Basin/Upper Tanana Regional Airport Plan identified facilities and services appropriate for Regional, Community, Local-Major, and Local-Minor airport classifications.

This Interior Alaska Transportation Plan adopts the four classifications of the Copper Basin/Upper Tanana Regional Airport Plan and proposes a minimum number of facility objectives for the classifications. Figure 1 shows the recommended classifications for the Interior's public use airports.

[1] A shorter runway can have an instrument approach, with penalties to the approach minima.

Figure 1 Recommended Airport Classes

In addition to facility objectives, appropriate Airport Reference Codes (ARC) for airport design are identified for the classifications. The ARC is comprised of the Aircraft Approach Category (AAC) (a letter) and Airplane Design Group (ADG) (a Roman numeral) for the most demanding aircraft regularly using the airport. The FAA defines regular use as at least 500 annual itinerant operations (takeoffs and landings). Table 6-21 defines the various Aircraft Approach Categories and Airplane Design Groups. The ARC determines many FAA airport design standards, such as runway and taxiway width, runway safety area, object free area, and runway protection zone.

Table 6-21 Airport Reference Code Components

Aircraft Approach Category (AAC)		
Approach Category	Approach Speed	Typical Aircraft
A	Less than 91 knots	Cessna 150, 172, 206
B	91 to 120 knots	Beech 1900, King Air, DC-3, DC-6
C	121 to 140 knots	Boeing 727, 737, Gates Learjet
D	141 to 165 knots	Boeing 747, Gulfstream V
E	166 knots or more	
Airplane Design Group (ADG)		
Airplane Design Group	Wingspan	Typical Aircraft
I	Less than 49 feet	King Air, Cessna 150, 172, 206, Gates Learjet
II	49 to 78 feet	Beech 1900, King Air, Cessna Citation
III	79 to 117 feet	Boeing 727, 737, DC-3, DC-6, Gulfstream V
IV	118 to 170 feet	Boeing 757, DC-10
V	171 to 213 feet	Boeing 747
VI	214 to 261 feet	

Source: FAA Advisory Circular 150/5300-13, Airport Design

Airplane Design Group may be determined by tail height, if more demanding than wingspan:	
Airplane Design Group	Tail Height
I	Less than 20 feet
II	20 to 29 feet
III	30 to 44 feet
IV	45 to 59 feet
V	60 to 65 feet
VI	66 to 79 feet

Source: FAA Advisory Circular 150/5300-13, Airport Design

Another important factor for determining FAA design standards is the type of approach to the runway (visual or instrument). For runways with instrument approaches, airport design standards relate to the lowest visibility minimum.[2] For instrument approaches using traditional ground-based navigational aids, nonprecision approaches are those that provide horizontal, but not glidepath, guidance. Precision approaches, such as those using an Instrument Landing System (ILS), provide glidepath as well as horizontal guidance. With the three dimensional guidance that GPS can provide, the terms "nonprecision" and "precision" are becoming outdated. The implementation of WAAS (Wide Area Augmentation System) has made it possible for GPS-aided approaches to have nearly the same approach visibility minima as ILS approaches.

Most of the FAA's airport design standards differ if the approach visibility minimum is under or over ¾ mile. Some airport design standards, such as the requirement for a parallel taxiway, the need for approach lighting, and runway protection zone size, differ if the instrument approach visibility minimum is under or over one mile.

Required runway length does not directly relate to the ARC or instrument approach. Runway length is determined by location-specific conditions, such as elevation and temperature, and the specific aircraft type that regularly uses the airport. For rural Alaska airports lacking year-round

[2] The horizontal visibility minimum of a published instrument approach procedure is the distance from the airport at which a pilot must be able to see the runway environment and then land using the procedure. Instrument approaches also have vertical (cloud ceiling) minima, but they are not significant to airport design standards.

road access, the 500 operations threshold that defines regular use is sometimes reduced to provide for medevac and cargo aircraft access to the community.

6.3.2.1 Regional Airports

According to the 1996 Alaska Aviation System Plan Update, Regional airports:

1) are primary or secondary hubs for passenger, cargo, or mail traffic,
2) provide primary access to populations greater than 1,000, or
3) support economic activities or unusual requirements of regional or statewide significance.

The System Plan Update assigned four Interior airports to the Regional airport class. Fairbanks International, Fort Yukon, and Gulkana are three of the four airports that continue to serve as Regional airports. Nenana Municipal is not a hub and it does not serve a population greater than 1,000. Consequently, it should be removed from the Regional class.

A recommended addition to the Regional class is an airport serving the Tok area population. Tok Junction is now the busiest airport serving this community, but it has a short runway (approximately 2,500 feet). Options to provide a longer runway are constrained by existing community development and an adjacent landowner unwilling to sell. Tanacross Airport, 10 nautical miles from Tok Junction, is owned by the BLM. DNR uses the airport for wildland firefighting, since it has two runways approximately 5,000 feet long that accommodate their retardant aircraft. The Copper Basin/Upper Tanana Regional Airport Plan recommended Tok should have a Regional airport and recommended a study be undertaken to determine if Tok Junction, Tanacross, or a new airport should be developed into a Regional airport. Plans for the gas pipeline include establishing an office in Tok, suggesting further justification for a Regional airport that can accommodate large (over 12,500 pounds) passenger and cargo aircraft and corporate jets. This Interior Plan endorses the recommendation for a Regional airport to serve the Tok area.

A list of the recommended Regional class airports follows:

Fairbanks International
Fort Yukon
Gulkana
Tok (possibly Tok Junction or Tanacross)

Table 6-22 lists the facility objectives for Regional airports.

Table 6-22 Facility Objectives for Regional Airports

	Minimum	Ultimate
Airport Reference Code	B-II	C-III (or greater if justified)
Runway Length	4,000 feet	5,000 feet (or greater if justified)
Instrument Approach	at least 3/4 mile visibility minimum	lower than 3/4 mile visibility minimum

Source: WHPacific, Inc.

Airport deficiencies compared to the objectives in Table 6-2222 follow:

Fort Yukon: Best instrument approach visibility is 1 mile (for AAC A and B)[3]

Gulkana: Best instrument approach visibility is 1 mile (for AAC A, B, and C)

Tok: Tok Junction Airport runway length is 2,509 feet and the best instrument approach visibility is 1 mile (for AAC A); Tanacross has no instrument approach

In addition to the facilities listed in Table 6-22, Regional airports should ultimately have:

- A full length parallel taxiway serving the primary runway
- A crosswind runway if coverage is below the FAA's 95 percent threshold
- Landing areas for ski- and float-equipped aircraft
- Helipad or plan for the safe coexistence of helicopters with fixed wing aircraft
- Edge lighting for the primary runway and its taxiways
- Automated, real-time weather reporting
- Approach lights where required for the instrument approach and runway end identifier lights for other primary runway ends
- Visual glide slope indicators for both ends of the primary runway
- Compliance with FAA runway safety standards
- Adequate aircraft apron parking to accommodate transient aircraft and those based aircraft not housed in hangars
- Adequate lease land for the development of aviation businesses and hangars
- Both Avgas and Jet A fuel for sale
- Indoor waiting area for passengers and pilots with restroom access
- Snow removal equipment and building
- All-weather access road to the adjacent community

[3] Fort Yukon's runway is 5,810 by 150 feet, already of adequate size for ARC C-III. Other improvements to bring the airport to ARC C-III standards for an approach visibility minimum lower than ¾ mile should be considered in the $11 million airport improvement project programmed for FY 09 or later.

In the long-range planning for these airports, the potential for them to be certified under FAR Part 139 should be considered, including siting an aircraft rescue and firefighting facility for optimum response time.

6.3.2.2 Community Airports

Community airports are the main airports, heliports, or seaplane facilities that serve rural communities of at least 25 year-round residents.

The 1996 Alaska Aviation System Plan Update assigned 18 Interior airports to the Community airport class. Five of these airports serve communities whose populations have fallen below 25 or are not recognized as communities by DCED. These airports should be removed from the Community class: Boundary, Chandalar Lake, Chicken, Chisana, and Rampart. Chandalar Lake is located where Little Squaw Mining Company is exploring for gold, so the population there should be monitored in the future to determine if the airport should be reclassified as a Community airport.

As mentioned previously, the airport serving Healy Lake is not, but should be, registered with the FAA. The airport would meet the requirements of the Community class, since the population is over 25 (37 in 2007), and the airport is the main means of year-round access.

Listed below are the airports recommended for the Community class:

Arctic Village*
Beaver*
Birch Creek*
Central
Chalkyitsik*
Circle City
Eagle
Manley Hot Springs
McCarthy
Minto
Stevens Village*
Tanana (Ralph M Calhoun Memorial)*
Tetlin
Venetie*

*Communities lack year-round road access

Table 6-23 shows the facility objectives for Community airports.

Table 6-23 Facility Objectives for Community Airports

	Minimum for Community Airports with Year-Round Road Access	Minimum for Community Airports without Year-Round Road Access
Airport Reference Code	B-I	B-II
Runway Length	3,400 feet	4,000 feet
Instrument Approach	1 mile visibility minimum	1 mile visibility minimum

Source: WHPacific, Inc.

Airports that lack year-round road access have different facility objectives to allow large cargo aircraft carrying bulk fuel or other essential supplies to reach the community in the winter.[4] These cargo aircraft are generally ADG III, so parts of the airport used by these large cargo aircraft should be designed to accommodate them. In addition to the need for infrequent large cargo deliveries, these airports are more likely to receive air service in Piper Navajo and Beech 1900 aircraft, which require runway lengths of 3,700 feet and 4,000 feet, respectively.[5]

Airport deficiencies compared to the facility objectives in Table 6-23 are:

Birch Creek: No instrument approach

Central: No instrument approach; runway length of 2,700 feet is 700 feet short of recommendation

Circle City: No instrument approach; runway length of 3,000 feet is 400 feet short of recommendation

Eagle: No instrument approach

Manley Hot Springs: No instrument approach; runway length of 2,875 feet is 525 feet short of recommendation. (A $12 million project to relocate the runway and make other improvements is programmed for after FY 09.)

McCarthy: No instrument approach

Minto: No instrument approach; runway length of 2,000 feet is 1,400 feet short of recommendation; however, a $9 million project that includes runway relocation and lengthening is underway.

Stevens Village: No instrument approach

[4] Evert requires a minimum runway length of 4,000 feet for their C-46 and DC-6 cargo aircraft.

[5] Northwest Alaska Transportation Plan, February 2004.

Tetlin: No instrument approach; while the runway length of 3,300 feet is 100 feet short of the recommendation, it exceeds the FAA's requirement for an instrument approach and is adequate

Venetie: No instrument approach

In addition to the facilities listed in Table 6-23, Community airports should have:

- Edge lighting for the primary runway
- Automated, real-time weather reporting
- Runway end identifier lights
- Visual glide slope indicators
- Compliance with FAA runway safety standards
- Adequate aircraft apron parking to accommodate transient and based aircraft
- Adequate lease land for the development of an aviation business or hangar
- A shelter for passengers with restroom access
- Snow removal equipment and building
- All-weather access road to the community

6.3.2.3 Local Airports

According to the 1996 Alaska Aviation System Plan, all airports, heliports, or seaplane facilities that are not in the Regional or Community classes are Local airports. Consistent with the Copper Basin/Upper Tanana Regional Airport Plan, this Interior Alaska Transportation Plan recommends subdividing the Local class into Local-Major and Local-Minor, to convey the relative significance of their roles. The distinction should also help prioritize funding for capital and maintenance expenses.

Local-Major airports are used for special purposes that benefit the public, or used regularly for a variety of general aviation purposes by at least five pilots. The Interior airports recommended for the Local-Major classification are:

Allen Army Airfield
Boundary
Bradley Sky-Ranch (North Pole)
Cantwell
Central
Chandalar Lake
Chena River
Clear
Chicken
Chisana
Chistochina
Chitina
Circle Hot Springs
Clear
Coldfoot
Copper Center 2
Delta Junction
Healy River

Kantishna
Lake Louise
Livengood Camp
May Creek
McKinley National Park
Minchumina
Nenana Municipal
Northway
Prospect Creek
Rampart
Stampede
Tanacross and/or Tok Junction*
New Airport in Pippin/Tonsina Area

*If not selected to be the site of a Regional airport

No minimum facilities are recommended for Local-Major airports, although they should be improved to meet the FAA design standards for their appropriate ARC. For the majority of the Local-Major airports, the appropriate ARC is A-I or B-I; FAA design standards for these two ARC are the same. According to their Airport Layout Plans (ALP), the airports with more demanding ARCs than A-I/B-I are as follows:

Clear	B-II
Minchumina	B-II
Nenana Municipal	B-III
Northway	B-III
Rampart	B-II

Several airports lack FAA-required ALPs because they are not included in the NPIAS. Of the airports lacking ALPs, the probable ARCs that are more demanding than A-I/B-I are:

Allen Army Airfield	D-V (widebody jet aircraft delivering ground based interceptors)
Prospect Creek	B-III (Era's Dash 8 and other turboprops)
Tanacross	B-III (firefighting aircraft)

Local-Minor airports are used in one or more of the following ways:

1. regularly used by fewer than five private pilots for a variety of purposes
2. used mainly for emergency or precautionary landings, or
3. used infrequently by transient pilots for recreational flights.

The Interior airports recommended for the Local-Minor class are:

Black Rapids
Clear Sky Lodge
Clearwater
Coal Creek
Eureka Creek
Eva Creek
Glacier Creek
Gold King Creek
Horsfeld
Lake Louise Seaplane Base
Jakes Bar
Paxson
Porcupine Creek
Quail Creek
Road Commission Nr 1
Summit
Tazlina
Tazlina / Smokey Lake
Tok 2
Tolsona Lake
Totatlanika River
Wiseman

Most of these airports are owned by private entities or they are in the public domain (located on DNR or BLM lands, but not maintained as an airport by those agencies). Several are backcountry airstrips, which are discussed in more detail in a later section of this chapter.

Only Porcupine Creek and Wiseman are in the NPIAS, which makes them eligible for AIP grant funding. It is not likely that much improvement funding can be justified for any of the Local-Minor airports, except Summit, which, with some improvements, could grow to a Local-Major airport serving Cantwell.

Most Local-Minor airports require minimal maintenance, such as brush cutting, to keep them available for the type of aircraft that use them (short takeoff and landing aircraft in ARC A-I). Local-Minor airports that are particularly important for precautionary landings include Black Rapids and Paxson near Isabel Pass, and Summit near Broad Pass. Weather can change suddenly at these locations, leaving a VFR pilot with the need to make a precautionary landing rather than enter instrument conditions. DOT&PF owns Summit, the BLM owns Black Rapids, and a private lodge owns Paxson, although on a BLM lease. Gold King Creek is an airport recently transferred to DOT&PF from DNR that warrants moderate improvements for safety.

6.3.2.4 Airport Roles in Supporting Resource and Economic Development

Chapter 4 outlined impacts that resource and other economic development might have on the aviation system. Some of the Interior's Local airports are located where they could be used to support mineral exploration. However, no specific needs for airport improvement have been identified for the mineral industry.

Interior airports support the tourism industry. Study area airports used for flightseeing and other air tours include Arctic Village, Chitina, Coldfoot, Copper Center 2, Denali National Park, Fairbanks International, Fort Yukon, Gulkana, Healy River, Kantishna, McCarthy, Tok Junction, and Denali Air's private strip. Although flightseeing is very popular around Denali, the major airport used is Talkeetna, located outside the study area. Backcountry airstrips and lakes that are not registered as airports also support tourism in the study area.

Flightseeing aircraft are small (up to eight-seat, twin engine) and do not require more runway length than other aircraft using the same airports. Public airports supporting high levels of

tourism aviation should be improved to meet appropriate FAA design standards to enhance safety for pilots and passengers. The number of Interior flightseeing trips occurring at a single airport at peak times is far below the level that occurs when cruise ships are in port in Southeast Alaska. If flightseeing from an Interior airport were to grow to the level that occurs at a Southeast cruise port, additional aircraft parking apron and improvements for bus/van traffic would likely be needed.

Airports will support the construction of the proposed natural gas pipeline to the lower 48. According to a briefing to the State Legislature in June 2008, planners expect more dependence on air freight and more "just-in-time" delivery of materials than occurred during construction of the Trans Alaska Pipeline. Four study area airports were identified as needing improvements to support the pipeline construction: Prospect Creek, Livengood, Tok Junction, and Tanacross[6]. The DOT&PF prefers not to fund any improvements needed only to support pipeline construction with AIP grants, which require a maintenance commitment for 20 years. Of the four airports needing improvement for the pipeline, only Prospect Creek and Tok Junction are eligible for AIP grants. At this time, the specific improvements have not been identified.[7]

6.3.3 NPIAS and DOT&PF Inclusion/Exclusion

Error! Reference source not found. showed the Interior airports that are included in the NPIAS, and thus deemed significant to the national airport system. To be included in the NPIAS, an airport should have at least 10 based aircraft and be located more than 30 minutes by road from another NPIAS airport. Special circumstances, which are particularly relevant in Alaska, allow airports that do not meet the 10 based aircraft threshold to be in the NPIAS. Airports in remote areas that serve Native American communities or support nationally significant resources are eligible. In addition, any airport used by aircraft transporting the U.S. mail is eligible to be in the NPIAS.

[6] Happy Valley airstrip is not in the study area, but is also needed for pipeline construction. It is located along the Dalton Highway, but is not currently registered as an airport with the FAA.

[7] One project may be to bring Prospect Creek Airport's runway safety area into compliance with FAA standards. DOT&PF and the operator of the airport, Alyeska, want more safety area built out from the runway ends. If AIP grant funds extend the safety area, the DOT&PF will be committed to 20 years of maintenance.

While only the FAA decides which airports belong in the NPIAS, the FAA expects aviation system plans to recommend NPIAS inclusions and exclusions. Airports recommended for potential future inclusion in the NPIAS are:

- Bradley Sky Ranch (North Pole), if it has a municipal sponsor, due to the heavy use and strong growth projected for this airport in Chapter 5. It fulfills a niche role in accommodating light sport aircraft and ultralights for Fairbanks North Star Borough residents. It is better for large numbers of these slow aircraft to be based at a separate airport from Fairbanks International. Since Bradley Sky Ranch is a privately owned airport, this recommendation depends upon its transfer to a public sponsor, such as the City of North Pole, or its replacement with a publicly owned airport. The airport meets other NPIAS criteria, since it has more than 10 based aircraft and is more than 30 minutes' drive from another NPIAS airport.
- Delta Junction Airport, unless joint use can be accomplished with Allen Army Airfield, to provide an appropriate airport for the commercial and general aviation needs of this population center. Delta Junction Airport has more than 10 based aircraft and is more than 30 minutes' drive from another NPIAS airport.
- Tok area Regional airport. (Tok Junction Airport is in the NPIAS now; Tanacross Airport is not.)
- Relocated Chistochina Airport.

Airports recommended for exclusion from the NPIAS are:

- Porcupine Creek, a privately owned airport located less than 3 miles from the NPIAS airport at Coldfoot.
- Wiseman, because it is located only about 10 miles from the NPIAS airport at Coldfoot via the Dalton Highway.

DOT&PF encourages the transfer of its rural airports to eligible local sponsors, such as municipalities and tribal governments. However, this rarely occurs, since the cost of operating and maintaining the airports significantly exceeds the revenue from them. To facilitate airport transfers to local sponsors, the DOT&PF may need to assist local sponsors in obtaining insurance, training management and maintenance personnel, ensuring land use compatibility around the airport, and planning airport development.

The most recent transfer of an airport to the DOT&PF Northern Region was Gold King Creek, a backcountry strip south of Fairbanks and north of the Alaska Range. Gold King Creek Airport was transferred from DNR. Effective protection for backcountry airstrips on DNR and BLM land, particularly the airstrips needed for emergency/precautionary landings, may require the transfer of more airstrips to the DOT&PF.

Tanacross Airport may be transferred to DOT&PF, particularly if it is needed to support the gas pipeline construction. The airport is scheduled to transfer from BLM to DNR in 2011. The DOT&PF could ask for accelerated conveyance in case it is needed for the pipeline or another reason. Tanacross Airport is currently a Priority III conveyance request. If necessary, the DOT&PF could send BLM an emergency conveyance request, which would require approximately six weeks for approval.

6.3.4 Other Issues

6.3.4.1 Airspace

Most Interior airspace issues relate to military flying exercises. Large Military Operations Areas (MOA) cover most of the study area east of Fairbanks to the Canadian border. The Pacific Alaska Range Complex covers more than 60,000 square miles, an area larger than the state of New York, providing "premier training airspaces and ranges"[8] for the Air Force. MOAs are activated when training exercises occur and do not preclude civilian VFR traffic when active. The study area also contains restricted airspace that does prohibit civilian traffic, and controlled firing areas, where the military halts firing activity when civilian traffic is spotted.

The military seek to minimize disruption of commercial and general aviation, and Alaskan civilians recognize the importance of military training and the military's contribution to the state economy. However, recent growth in military activity and airspace use has raised concerns in the civilian aviation community:

- Following a Base Realignment and Closure (BRAC) 1995 decision to close Fort Greely, the base was chosen for the installation of ground-based interceptors to prevent ballistic missiles from entering U.S. airspace. In 2004, the first interceptor was installed at Fort

[8] Eielson Air Force Base Infrastructure Development in Support of RED FLAG-Alaska Environmental Assessment, August 2007.

Greely. Initially, the Army indicated there would be no Temporary Flight Restrictions (TFR) around the missiles, but TFRs have since been activated in times of elevated national security.

- In 2005, the Army significantly increased training activity in Alaska with more than 100 helicopters based at Fort Wainwright.
- The 2005 BRAC Commission saved Eielson from downsizing through appreciation of the base's proximity to the Pacific Alaska Range Complex. In 2006 Cope Thunder exercises were renamed Red Flag-Alaska to create a training experience similar in structure and intensity to Air Combat Command's Red Flag exercises at Nellis AFB. Part of the transition was the replacement of the F-16C/D aircraft based at Eielson with an aggressor squadron of F-16A aircraft.
- The Army developed a new live fire training area for Unmanned Aerial Vehicles (UAV) near Delta Junction in 2006.
- In late 2007, the Air Force proposed the temporary Delta MOA, which would fill in the gap in MOAs around Delta Junction and along the Alaska and Richardson Highways.
- In 2008, the Air Force proposed the Delta MOA become permanent.
- In 2009, the Army prepared a draft Environmental Impact Study to station up to 84 additional helicopters and conduct additional training in the study area.

The 11th Air Force proposed the Delta MOA, primarily because current Delta corridor restrictions prevent fighters from flying at the most likely altitudes for training in the delivery of precision munitions. IFR route V444 and other jet routes and Federal airways would not be available when the MOA is active, except for medevac, firefighting, and similar emergencies. The Delta MOA would be active a maximum of 60 days per year for major flying exercises occurring four times per year for two weeks at a time, up to 2-1/2 hours, twice per day.

The Aircraft Owners and Pilots Association (AOPA) has led the objections to the permanent Delta MOA, stating that it would remove the only corridor that bisects the Pacific Alaska Airspace Complex. When active, the MOA "severs the IFR airways between Fairbanks, Delta Junction, Northway, and Glennallen… and it subjects VFR traffic to increased exposure to high-

speed military traffic along a heavily travelled corridor."[9] While civilian VFR traffic can use active MOA airspace, most VFR pilots choose to avoid sharing airspace with fighter jets performing training maneuvers. IFR traffic, which includes all commercial air carrier flights and some GA aircraft, cannot pass through an active MOA. The alternative IFR route would require a detour of 390 nautical miles with a minimum en route altitude of 10,000 feet that requires two crossings of the Alaska Range. This is not practical or safe for many GA aircraft.

The Alaska Air Carriers Association has stated that when the temporary MOA was activated, medevac aircraft have been delayed from returning to their base, which affects their timely response to another incident. The Association believes that the MOA as proposed would have a continued negative impact on emergency medical air service and air commerce to the communities of the Upper Tanana Valley.

The Delta MOA could be detrimental to the establishment of new air service from Fairbanks to the lower 48 or the initiation of air service to Delta Junction. Particularly in this time of airline losses from rising fuel costs and high levels of system delay, an airline would not be amenable to rerouting nearly 400 nautical miles around the MOA or scheduling around 2-1/2 hour blocks of time. The gas pipeline will likely cause an increase of IFR traffic along this route, in corporate aircraft and passenger and cargo charters, even if scheduled flights do not.

Compromises are being worked on. To improve the situation for VFR pilots, Eielson Range Control operates SUAIS (Special Use Airspace Information Service) to provide pilots with nearly real-time information about MOA status, the approximate locations of military aircraft, and range activity. The AOPA has proposed the MOA be divided into a high and low complex, so that the entire area is not active at the same time.

DOT&PF is on the Alaska Civil-Military Aviation Council and should actively participate in the technical subcommittees tasked to find workable compromises. While aviation system users are represented on the Council and are diligent in identifying impacts to civil aviation, the State needs to be as diligent in identifying impacts on the civilian economy, such as air service restrictions.

[9] Letter to Mr. James W. Hostman, Elmendorf AFB, from Pete Lehmann, AOPA, April 30, 2008.

Not all airspace issues relate to the military. Other groups deploy UAVs, such as the Department of the Interior, CBP, and the University of Alaska. Until UAVs can sense and avoid aircraft, they will remain a concern for civil pilots. TFRs established around areas where UAVs fly can disrupt civil aviation traffic.

6.3.4.2 Weather Information and Enroute Navigation

Real-time weather information enhances aviation safety and efficiency. At airports with instrument approaches, an AWOS or ASOS weather report eliminates the remote altimeter penalty and, thereby, allows use of the published minimum descent altitude. Community airports that should have instrument approaches, but lack AWOS or ASOS equipment, are Beaver, Birch Creek, Central, and Circle,[10] Chalkyitsik, Manley Hot Springs, McCarthy, Minto, Stevens Village, and Venetie. Tok Junction and Prospect Creek are other airports that need real-time weather reporting equipment.

The FAA has installed several weather cameras across Alaska, which provide real-time video accessible to pilots on the Internet. Weather cameras reduce aviation accidents, save lives, and prevent unnecessary fuel usage. At the end of 2007, the FAA's weather camera program changed from a pilot program to a commitment to spend $102 million over the next 26 years for more weather camera installations in Alaska and for continued operation of existing cameras. Since the Interior weather cameras were inventoried (**Error! Reference source not found.**), another is operating, at Knob Ridge between Tok and Delta Junction, and one at the Yukon River Bridge northwest of Livengood. Consequently, there are ten FAA weather cameras in the study area now, and the FAA plans to install fourteen more:

FY 2009	Nenana
FY 2010	Delta Junction Airport
FY 2010	Mentasta
FY 2010	Murphy Dome
FY 2010	Tok
FY 2011	Beaver
FY 2011	Gulkana
FY 2011	Livengood

[10] Circle and Circle Hot Springs are approximately 25 nautical miles apart and are a shorter distance from Central. Potentially, one AWOS could serve all three airports.

FY 2011	Manley Hot Springs
FY 2011	Tazlina
FY 2012	Central
FY 2013	Chalkyitsik
FY 2013	Chistochina Airport
FY 2013	Prospect Creek

After these installations, the Community Airports lacking a weather camera will be Birch Creek, Circle City, McCarthy, Minto, Stevens Village, Tetlin, and Venetie.

Alaska's pioneering Capstone program has been folded into the FAA's nationwide NextGen program. As part of NextGen, the FAA is working to implement an Enroute RNAV (Area Navigation) Airway Structure by September 30, 2009. RNAV routes will allow IFR flight based on GPS WAAS technology. The Alaska Airmen's Association estimates 4,000 aircraft will have WAAS equipment installed in the next five years. The FAA in Alaska is consulting with aviation system users to identify and prioritize RNAV routes that will make it possible to fly at lower altitudes and reach new locations, without land-based navigational aid backup. First in consideration are medevac routes to 15 medical hubs that treat patients from outlying communities. Fairbanks is the medical hub for all the Interior study area except for McCarthy. Of 14 outlying Interior communities, six now have instrument approaches (Arctic Village, Beaver, Chalkyitsik, Fort Yukon, Minchumina, and Tanana). Two communities are being considered for an IFR upgrade (Circle City and Healy). Six others are listed as lacking instrument approaches (Birch Creek, McCarthy, Rampart, Stevens Village, Tetlin, and Venetie).[11]

While the FAA is implementing NextGen, it is also decommissioning older ground-based navigational aids to save money. Non-Directional Beacon (NDB), Very High Frequency Omnidirectional Range (VOR), and Direction Finder (DF) navigational aids are being decommissioned over time, too quickly in the opinion of some pilots who still rely on them. Airport sponsors and aviation system users need to monitor FAA's navigational aid decommissioning plans, particularly those navaids located at airports, to ensure they do not compromise safe and efficient air navigation.

[11] RNAV Routes in Alaska, Updated 6/25/08, www.faa.gov.

6.3.4.3 Backcountry Airstrips and Emergency Access

The value of backcountry airports has been recognized by the Governor's Aviation Advisory Council, which passed a resolution regarding them. The resolution states that backcountry airports on public lands provide a vital form of access for industrial, commercial, and recreational use. They often provide a staging area where larger aircraft transfer passengers and cargo to smaller aircraft that will land at unimproved off-field locations, and they play a role in public safety by providing emergency landing areas in the event of unanticipated weather conditions or mechanical problems. Backcountry airstrips are often poorly charted, making it difficult for pilots to get accurate information about them. Many of these airstrips fall under the jurisdiction of the DNR, who lacks the mandate or expertise to manage them.

The Council resolved that the DOT&PF should establish an office of Backcountry Airports, which should undertake an inventory of historical airstrips on State land to define a network of airstrips for continued access to public lands. The Council also resolved that key airstrips should be transferred from DNR to DOT&PF, as occurred recently with the Gold King Creek strip. Volunteers could maintain backcountry airstrips, since DOT&PF funds for maintaining their currently owned airports are already strained. Recent legislation[12] protects individuals and organizations that voluntarily construct, maintain, or operate airstrips from civil liability. The Experimental Aircraft Association in Anchorage provides a good model with their program to maintain backcountry strips in Wrangell-St. Elias National Park.

Emergency access is one of the roles of backcountry airstrips. However, natural disasters can and have created the need for emergency access by larger airplanes than can use backcountry or other Local class airports. Earthquake damage and flooding have cut off road access to Interior communities within the last ten years. The Emergency Operations Coordinator for the Mount Sanford Tribal Consortium has suggested to DOT&PF that 4,000-foot-long straight portions of the highways could be designated for emergency aircraft use. The dual use of roads as runways is an idea the US military has employed in places like Ramstein Air Base in Germany. Highways in rural Alaska have, on many occasions, served as emergency landing strips for small

[12] A state law in 2005 provided protection from many civil liability claims to volunteers maintaining airports. In early 2008, the Alaska Legislature passed S.B. 139, which clarifies that those who own and operate airstrips without receiving compensation have the same protections as volunteers.

airplanes. The practical application of the suggestion to designate portions of the highway as emergency runways depends on resolving several issues, such as funding to relocate light standards, signs, and other objects close to the highway; maintenance funding; and procedures/equipment for marking and lighting the highway for aircraft landings. Lights or markings on the highway must not cause a pilot in non-disaster conditions to think it is a runway.

It is recommended that the DOT&PF participate with other public agencies to protect backcountry airstrips and plan for emergency access to Interior communities in case of disaster.

6.3.4.4 Postal Service Hubs

The US Postal Service has proposed a change in hub airports in order to reduce their loss in providing mail service to rural Alaska communities. Postal hub airports are served by Part 121 mainline carriers using larger turboprop and turbojet airplanes. Mail is transferred at the hub to Part 135 carriers flying smaller piston and turboprop airplanes to the "spoke" airports. Consequently, facility needs, such as runway length/width and safety area size, can expand substantially if a postal spoke airport changes to a postal hub airport. When Emmonak was designated as a postal hub in 2002, the DOT&PF was forced to undertake several projects to make the runway safe for the resulting increase in traffic. Over $12,000,000 will have been spent to improve the airport, not including cost increases in maintenance and operations.

Initially, the Postal Service proposed Eagle and Tanana as hubs. The proposal has been modified so that no new hubs are proposed for the study area. Fort Yukon is already designated a postal hub, although no air carriers have chosen to provide mainline service.

DOT&PF will need to continue working with the Postal Service and air carriers with mail contracts, to ensure the impact of postal hub changes are recognized and the cost of airport improvements are considered.

6.3.4.5 Security

Civil aviation and airports are subject to Transportation Security Administration (TSA) regulations. Regulations regarding passenger and baggage screening apply to airports with scheduled service in aircraft with 30 seats and in chartered aircraft over 12,500 pounds. New TSA regulations for large cargo aircraft in 2007 increased the workload for DOT&PF's M&O

personnel and created apron congestion at some larger airports, due to the need to provide a secure area around the parked aircraft.

Nearly all the public use airports in the Interior are considered general aviation airports by the TSA. The TSA does not regulate general aviation airports, but has issued a guidance document for them. Recommendations are scaled to be appropriate for the security risk. Factors such as the size and number of airplanes and the proximity to large populations and security-sensitive installations determine the security risk at an airport. Excluding Fairbanks International, Interior airports do not have large or many aircraft based at them, and the Interior is lightly populated. However, there are several installations of high security sensitivity, including the Trans Alaska Pipeline, the proposed gas pipeline, and ground-based interceptors located at Fort Greely.

While the TSA recommends access control for most general aviation airports, the Interior climate makes fencing and electronic gates very difficult to maintain in good condition. On a case-by-case basis, full perimeter or partial fencing, electronic or manual gates, and signage should be installed at general aviation airports where people or vehicles that should not be on the airport are creating safety, vandalism, or theft problems. Even if they are not Commercial Service airports subject to TSA regulations, Regional class airports should have full perimeter fencing with locked gates around aircraft operating areas.

6.3.5 Summary of Aviation Analysis

The summaries of airport-specific needs are organized in the same manner as the inventory chapter, by regions: Upper Yukon Valley, Tanana Valley, Copper River Basin, Susitna Valley, Kuskokwim Valley, and Koyukuk Valley. A primary source of recommended capital improvement projects is the analysis of facility objectives associated with the airport classes. The other source of improvement projects are the DOT&PF's capital improvements programmed for Airport Improvement Program grants (**Error! Reference source not found.**). Finally, the public weighs in on needs. Postal Hubs and service was brought up. Shelters at remote airports are important and Capstone weather equipment should be standard at any new airport.

The tables that summarize the airport-specific analysis and recommendations address all airports in the NPIAS, all airports owned by the DOT&PF, plus a few other airports that have specific needs significant to the aviation system. The tables show rough order-of magnitude costs for the recommendations. These costs exclude procurement of snow removal and other equipment,

maintenance and deferred maintenance projects, and the construction of hangars and other privately funded facilities on leased airport property.

Table 6-24 summarizes airport needs in the Upper Yukon Valley. The Upper Yukon Valley contains 18 public use airports, of which 16 are in the NPIAS (including two owned by the Native Village of Venetie Tribal Government) and 15 are owned by the DOT&PF. The Upper Yukon Valley has the majority of Community Airports in the study area. Most of these Community Airports have sufficient runway lengths, but most lack instrument approaches. The largest investments needed in this region are to preserve runway, taxiway, and apron surfaces.

Table 6-24. Summary of Needs for Upper Yukon Valley Airports

Airport Name	NPIAS Level of Service	Analysis and Needs	Cost
*Arctic Village**	GA	Meets Community Airport Facility Objectives.	NA
Beaver	GA	Meets Community Airport Facility Objectives. Has resurfacing, grading, drainage project programmed.	$5,000,000
Birch Creek	GA	Instrument approach (1-mile min.). Has SRE Building programmed. Needs FAA to program weather camera. Will need resurfacing	$3,000,000
Boundary	GA	No Facility Objectives for Local-Major Airport	NA
Central	GA	700' Runway Extension; Instrument Approach (1-mile min.); Obstruction Removal. Will need resurfacing.	$2,500,000
Chalkyitsik	GA	Meets Community Airport Facility Objectives. Has reconstruction, apron, road relocation, lighting rehab, drainage, SRE Building project programmed.	$10,500,000
Chandalar Lake	GA	No Facility Objectives for Local-Major Airport	NA
Chicken	GA	No Facility Objectives for Local-Major Airport	NA
Circle City	GA	400' Runway Extension; Instrument Approach (1-mile min.). Has taxiway and apron rehab programmed. Needs FAA to program weather camera. Will need resurfacing	$5,000,000
Circle Hot Springs	GA	No Facility Objectives for Local-Major Airport	NA
Eagle	GA	Instrument approach (1-mile min.). Has resurfacing programmed.	$3,500,000

Airport Name	NPIAS Level of Service	Analysis and Needs	Cost
Fort Yukon	Commercial Service	Instrument Approach Improvement to ¾-mile min. Extensive improvement project (safety area, resurfacing, clearance, drainage) and SRE building programmed.	$15,550,250
Livengood Camp	Non-NPIAS	No Facility Objectives for Local-Major Airport. Improvements for gas pipeline support.	$3,000,000
Ralph M Calhoun Memorial (Tanana)	Commercial Service	Meets Community Airport Facility Objectives	NA
Rampart	GA	No Facility Objectives for Local-Major Airport, SRE Building Upgrade programmed	$150,000
Stevens Village	GA	Instrument approach (1-mile min.) Needs FAA to program weather camera. Will need resurfacing.	$3,500,000
*Venetie**	GA	Instrument approach (1-mile min.). Needs FAA to program weather camera. Will need resurfacing	$3,000,000

**Airports listed in italics are not owned by the DOT&PF*
Source: DOT&PF and WHPacific. Inc. Analysis

Table 6-25 summarizes airport needs in the Tanana Valley. The Tanana Valley contains most of the study area population and public use airports. Many of the public use airports are privately owned or backcountry strips without specific improvement recommendations, so only about one-third of the Tanana Valley airports are listed in Table 6-25. The capital improvement needs of Fairbanks International Airport are excluded from the table.

North Pole is a location where a NPIAS airport is needed, due to the large number of based aircraft and high population growth projected. Bradley Sky Ranch could be the North Pole NPIAS airport if it were transferred to public municipal ownership. Another NPIAS inclusion possibility is the City of Delta Junction's airport, so that this substandard airport can be improved or replaced, if joint use of Allen Army Airfield cannot be obtained.

The most expensive project listed in Table 6-25 is a Regional class airport to serve the needs of the Tok population, which might be an expansion of the DOT&PF-owned Tok Junction Airport, the Tanacross Airport, or a new airport. The DOT&PF has programmed a less expensive project for Tok Junction Airport to provide a runway longer than now exists, but the land acquisition required may not be feasible.

Table 6-25 Summary of Needs for Tanana Valley Airports

Airport Name	NPIAS Level of Service	Analysis and Needs	Cost
*Black Rapids**	Non-NPIAS	Important for emergency or precautionary landings, it is recommended DOT&PF work with BLM to ensure it remains open/safe.	NA
*Bradley Sky-Ranch**	Non-NPIAS	No Facility Objectives for Local-Major Airport. A North Pole area NPIAS airport is recommended particularly for light sport aircraft.	TBD
Chisana	GA	No Facility Objectives for Local-Major Airport	NA
Clear	GA	No Facility Objectives for Local-Major Airport	NA
Delta/Allen Army Airfield**	Non-NPIAS	Joint civilian/military use of Allen Army Airfield, or a better, NPIAS airport for Delta Junction is recommended.	TBD
Gold King Creek	Non-NPIAS	No Facility Objectives for Local-Minor Airport, but minor improvements are warranted.	$50,000
*Healy Lake**	Non-NPIAS	Needs to be recognized as an airport, and inspected through the FAA's 5010 program to identify any basic safety needs.	TBD
Healy River	GA	No Facility Objectives for Local-Major Airport	NA
Kantishna	GA	No Facility Objectives for Local-Major Airport	NA
Manley Hot Springs	GA	525' Runway Extension; Instrument Approach (1-mile min.); Obstruction Removal. Airport relocation programmed.	$13,800,000
Minto	GA	2,000' Runway Extension; Instrument Approach (1-mile min.); MIRL; AWOS; SRE Building; $7 million project to relocate/lengthen runway and make other improvements is underway. Needs FAA to program weather camera.	NA
*Nenana Municipal**	GA	No Facility Objectives for Local-Major Airport. Has runway rehab and fencing programmed. Will need resurfacing in longer –term future	$12,000,000
Northway	GA	No Facility Objectives for Local-Major Airport; $15.3 million project funded by FEMA is underway to fix earthquake damage; estimated completion 11/09.	NA
Tetlin	GA	Instrument approach (1-mile min.) Needs FAA to program weather camera.	$450,000
Tok Junction/ *Tanacross**	GA/*Non-NPIAS*	More runway length and better instrument approach. Recommend upgrades for Tok Junction, Tanacross, or another site for a Regional class airport to serve Tok area population. Improvements to support gas pipeline. Tok Junction has $7 mil runway & crosswind runway project programmed.	$35,000,000

**Airports listed in italics are not owned by the DOT&PF*

Table 6-26 summarizes airport needs in the Copper River Basin. Several of the public use airports are privately owned or backcountry airstrips without specific improvement recommendations. About two-thirds of the airports in the region are listed in Table 6-26. The

largest projects in the Copper River Basin are the relocation of the Chistochina Airport and improvements needed at Gulkana Airport.

Table 6-26 Summary of Needs for Copper River Basin Airports

Airport Name	NPIAS Level of Service	Analysis and Needs	Cost
Chistochina	Non-NPIAS	Airport Relocation Planned. No Facility Objectives for Local-Major Airport.	$10,000,000
Chitina	GA	No Facility Objectives for Local-Major Airport. Has SRE Building Upgrade programmed.	$150,000
Copper Center 2	Non-NPIAS	No Facility Objectives for Local-Major Airport	NA
Gulkana	GA	Instrument Approach Improvement to ¾-mile min. requiring approach lights, full parallel taxiway. Has apron & taxiway repaving programmed. Floatplane basin, runway rehabilitation needed.	$15,000,000
Lake Louise	GA	No Facility Objectives for Local-Major Airport; 2nd stage of runway rehab programmed.	$2,300,000
May Creek	GA	No Facility Objectives for Local-Major Airport	NA
McCarthy	GA	Instrument approach (1-mile min.); MIRL; Obstruction Removal. Needs FAA to program weather camera. Will need resurfacing.	$3,500,000
*Paxson**	Non-NPIAS	Important for emergency or precautionary landings, it is recommended DOT&PF work with Lodge & BLM to ensure it remains open/safe.	NA
Pippin/Tonsina (New Airport)	Non-NPIAS	Visual A turf airport	$2,000,000
Tazlina	Non-NPIAS	No Facility Objectives for Local-Minor Airport	NA

**Airports listed in italics are not owned by the DOT&PF*

Table 6-27 shows the single airport recommendation in the portion of the Susitna Valley that extends into the study area. This region has four Interior airports. None is in the NPIAS and only one is owned by DOT&PF (Summit).

Table 6-27 Summary of Needs for Susitna Valley Airports

Airport Name	NPIAS Level of Service	Analysis and Needs	Cost
Summit	Non-NPIAS	No Facility Objectives for Local-Minor Airport. Improvements in maintenance, access, markings, tiedowns needed for airport to function as Local-Major serving Cantwell.	$100,000

Table 6-28 shows the single airport recommendation in the portion of the Kuskokwim Valley that extends into the study area. This region only contains one public use airport.

Table 6-28 Summary of Needs for Kuskokwim Valley Airports

Airport Name	NPIAS Level of Service	Analysis and Needs	Cost
Minchumina	GA	No Facility Objectives for Local-Major Airport. Will need resurfacing, apron reconstruction.	$9,000,000

Table 6-29 shows the recommendations in the portion of the Koyukuk Valley that extends into the study area. The largest project is for Coldfoot to fix an erosion control problem.

Table 6-29 Summary of Needs for Koyukuk Valley Airports

Airport Name	NPIAS Level of Service	Analysis and Needs	Cost
Dalton-5 Mile Airport	Non-NPIAS	Not registered as an airport, this is a placeholder for airport improvements at Mile 61 of the Dalton Highway needed for gas pipeline support since Alyeska intends to close it	$1,000.000
Coldfoot	GA	No Facility Objectives for Local-Major Airport. Has project programmed for erosion control, lighting replacement, obstruction clearance.	$6,500,000
*Porcupine Creek**	GA	No Facility Objectives for Local-Major Airport. The need for this airport to be included in the NPIAS should be reevaluated.	NA
Prospect Creek	GA	No Facility Objectives for Local-Major Airport. Runway safety area and improvements for gas pipeline support.	$5,600,000
Wiseman	GA	No Facility Objectives for Local-Minor Airport. The need for this airport to be included in the NPIAS should be reevaluated.	NA

**Airports listed in italics are not owned by the DOT&PF*

6.4 Major Trail System Analysis

6.4.4 Trail Conditions

Most of the trails shown in **Error! Reference source not found.** are pioneer trails connecting neighboring villages to each other or to the road system. The trails tend to be used more in the winter, when frozen or snow-covered terrain provides a more solid surface for travel. Because of this, winter trail marking is very important in the study area.

6.4.1.1 Existing Winter Trail Marking

The DOT&PF Winter Trail Marking project has been ongoing for the past few years at a funding amount of about $200,000 a year. Most of the previous years' funding was spent in the far western part of the State, although some marking has occurred in the Minto-Manley area. . The TCC, which has been actively marking trails in the Interior, has indicated that their experience is very positive. Most villages have been enthusiastic about the trail marking projects. Local labor forces are generally the accepted method of implementing the trail marking program. The trail marking projects provide short term jobs for local residents.

6.4.1.2 Trail Marking Need

The most used winter trails should be analyzed for marking, especially if they are between villages or provide access to the highway system. Some trails may not need to be marked because they cross through heavily vegetated terrain where the trail has been cleared. Marking on trails that follow the rivers may also not be necessary.

6.4.2 Summary of Trail Recommendations

Many of the most used winter trails in the Interior are not marked. Travelers often rely on terrain features and traditional knowledge of trail location; however, those less familiar with the area could benefit from more clearly defined trails. Additionally, in poor weather when visibility is limited, marked trails provide a measure of safety to travelers who might otherwise stray off course.

It is recommended that DOT&PF continue to support trail marking efforts. The department should implement the following recommendations.

- Continue funding for the trail marking project

- Use local hire processes for installing trail markings to the extent feasible
- Establish maintenance agreements with local communities or tribal organizations

The communities served by trails should be consulted prior to implementation of any trail marking efforts. They may or may not feel the trail should be, or needs to be, marked.

Today, many of the Interior Alaska trails remain well traveled for traditional uses. Trails are also commonly used in the Interior for recreational dog mushing, snow machining and hiking. These trails are primarily pioneer trails and most are used in the winter only. Some trails, such as the trail between Venetie and Arctic Village, are used regularly for access to subsistence resources and to travel between the villages. The trail between the Dalton Highway and Stevens Village is also used regularly for subsistence activities and for travel between the village and the Dalton Highway where residents can travel to Fairbanks for supplies. While trail marking on these trails is limited there are few reports of search and rescue efforts for lost travelers.

In many other parts of the State where winter travel by trail is common, there is a growing trail marking system, generally consisting of wooden tripods lashed together with wire. The markers are placed 200-400 feet apart and often reflective tape is used to enhance visibility during low light and inclement weather conditions. Many of these trail markings were erected as part of DOT&PF trail marking projects.

In the Interior, winter trails often follow rivers or connect between lakes. There also is generally more vertical relief in the Interior and blowing snow is less problematic than in some of the flatter, windier areas of the State and therefore trail markings are not as critical in the Interior as in other parts of Alaska.

6.4.2.1 Existing Winter Trail Marking Project

The DOT&PF Winter Trail Marking project was ongoing for three years for about $200,000 a year. Most of the funding was spent in the far western part of the State, although some marking occurred in the Minto-Manley area. To limit DOT&PF exposure to increased maintenance costs, trail marking projects require a maintenance agreement with a local entity, usually a Tribe or City, to maintain the trail marking system once constructed. Table 6-30 shows trails and the timetable for marking those trails.

Table 6-30 Trail Marking Project

TO - FROM	Miles	Planned	Complete	Comments
Manley to Minto	50	2008/2009	Yes	
Manley to Nenana	120	No		
Manley to Tanana	65	2005/2006	Yes	Stakes delivered fall 2005.
Northway to Tetlin	30	No		
Northway to Tenmile Hill	10	No		
Birch Creek to Ft. Yukon	20	2008/2009	Yes	Marking trail halfway to Ft. Yukon
Minto to Nenana	40	No		
Dot Lake to Fish Lake	15	No		
Tetlin to Tok	40	No		
Total	**1**			

6.4.2.2 Existing Trails

In 2009, TCC, under a contract with DOT&PF marked 30-40 miles of trails in the Manley, Birch Creek and Circle areas.

6.4.2.3 Proposed Trails

There are several proposed trails within the study area that are desired by local communities and there is local support to continue the trail staking project.

6.5 Railroad System Analysis

ARRC continues to invest in their comprehensive program of capital improvements within the study area, as well as throughout the rail system. $43.1 million were programmed for capital improvements in 2010. According to the railroad's annual reports, in 2008, the company earned a profit of $12.5 million (down 23% from the previous year) on revenues of $158.7 million (up 6.9%), $121.7 million of which was operating revenue (up 5.2%).

6.5.2 Rail Conditions

Much of the rail system in the study area was upgraded around 1985 when the State bought the railroad from the US government for $22.3 million. Improvements were needed and maintenance that had been deferred was undertaken. As with any transportation system, additional investment must continually be made in order to keep the system in good repair and operating up to current design and safety standards.

6.5.1.1 Existing Deficiencies

Curves and grades can be impediments to safe and efficient rail operations. There are curves in the Fort Wainwright area that need to be reduced. Siding improvements are also needed to improve efficiency. Sidings should be spaced every 30 minutes based on travel time and be able to hold a 6,000-foot long freight train. Several siding projects have been completed and other areas with planned siding improvement projects include Cantwell, Canyon, Cascade, Caswell, Colorado, Garner, North Nenana, and Saulich. Power switch installations are needed at Susitna, and Sunshine. Additional traffic control needs are at Ester, and Summit.

6.5.2 Safety (Statewide Programs of the ARRC)

6.5.2.1 Track Rehabilitation

Track rehabilitation includes a Tie Program, Ballast Surfacing and Shoulder Maintenance. These are ongoing programs. The Tie Program installs new wood and concrete ties. Ballast Surfacing regenerates or rehabilitates the surface course of the track bed. Shoulder Maintenance will supply the embankment to support the rail and the heavier and faster moving trains. The program includes culverts where necessary.

6.5.2.2 Collision Avoidance System

The Collision Avoidance System (CAS) integrates on-board equipment, wayside devices and a communication network to electronically deliver instructions, stop trains, monitor switches for proper alignment and detect broken rail.

6.5.2.3 Crossbuck Illumination

At-grade railroad crossings are considered unsafe. There are low-technology and high technology solutions to the problem. Low technology solutions include the standard crossbuck railroad crossing signs with or without crossing arms. The ARRC conducted a test of improved illumination materials at the standard crossbuck style signs. The material was found not suitable for Alaska conditions. The ARRC has requested permission to test deployment of an advanced traffic warning reader board system for at-grade crossings with crossbuck signage.

6.5.2.4 Locomotive and Car Upgrades

Upgraded locomotives and cars serve a variety purposes, one of which is to keep the ARRC current for safety and passenger comfort. The ARRC budgets for new equipment and to

rehabilitate equipment each year. This type of fleet maintenance and improvement is critical to maintaining a safe and efficient system.

6.5.2.5 Bridge Program

Bridges need to be replaced or repaired regularly to insure safety. Table 6-31 lists bridge-related projects planned for the study area.

Table 6-31 2010 Alaska Railroad Bridge Projects in the Interior Area

Milepost	Project
MP 352.7	Rehab bridge components
MP 432.1	Replace Little Goldstream Creek Bridge – New bridge on new alignment

Source: http://www.alaskarailroad.com/Portals/6/pdf/projects/2010%20System%20Summary.pdf

In addition to these projects will be the Tanana River Crossing north of Delta Junction, if the Northern Rail Extension proceeds on schedule.

6.5.3 Summary of ARRC Rail Recommendations

6.5.3.1 Highway/Railroad Grade Separations

There are several projects that the ARRC is working on that would eliminate at-grade crossings along the Parks Highway. The Road-Rail Transportation Corridor project proposes to re-align the road and railroad outside of downtown Wasilla, eliminating any at-grade crossings. The South Wasilla Rail Line Relocation would eliminate five at-grade crossings off the Parks Highway between RR MP 154 and 158.

The ARRC Fairbanks Freight Intermodal Improvements project includes several grade separations. The ARRC Nenana Rail Line Relocation also includes eliminating several at-grade intersections – one on the Parks Highway, at Airport Access and at 9th Street. The Fairbanks Area Rail Line Relocation project also includes grade separations. The Fort Wainwright Rail Realignment project has grade separations as well

A grade separation project for Broad Pass (MP 194) on the Parks Highway was included in a STIP prior to May 2008. That STIP Amendment re-established priorities for spending FHWA funding in Alaska. The proposed separation is still on the Needs List. Other locations noted in the STIP Needs List include the Parks Highway at Summit (MP 204) Parks Highway at Rex (MP 276) and Parks Highway at Hurricane (MP 169). The Needs List has a grade separation at

International Airport Road and Jewel Lake Road, a grade separation at University Ave. in Fairbanks, and on the Steese Highway at MP 1.

6.5.3.2 Double Tracks

The ARRC has studied double tracks through Anchorage for some time. There do not appear to be any plans on the part of the ARRC to double track in the planning area.

6.5.3.3 Line Relocations/Realignments

The Healy Canyon line realignments are almost complete. Safety aspects of this proposed project include stabilizing the track bed as well as rock slide problems with the steep slopes and unstable soil. Track realignment will reduce the risk of derailment in this curving section of track. The Nenana Rail Line Relocation proposal realigns the track around downtown Nenana. The Fairbanks Area Rail Line Relocation project is still in an analysis phase. It includes three phases: Richardson Highway MP 9 to southeast side of North Pole near Moose Creek; Richardson Highway MP 9 north to 3-Mile Gate; and 3-Mile Gate to the west. The Fort Wainwright Rail Realignment will enhance safety by relocating tracks away from Ladd Field and reduce travel times through Fort Wainwright.

6.5.3.4 New Rail Line

New rail lines are included in the Access to Joint Tanana Military Training Complex and the Denali Park Passenger Train Turnaround Track. The Northern Rail Extension project would construct a new line between North Pole and Big Delta.

Not included in ARRC planning at this time, but acknowledged by them is the Alaska Canada Rail Line Phase I Feasibility Study. Also, not on the ARRC planning list is a concept to bypass Nenana by construction of a line east –west between the Parks Highway and the Richardson Highway, north of the Alaska Range.

6.6 River Transportation System Analysis

6.6.3 Barge Landings

6.6.1.1 Nenana Harbor

The Nenana Harbor hosts a 1,000,000 gallon petroleum product tank farm owned and operated by Crowley. The Harbor receives bulk petroleum products, packaged petroleum products and

general cargo via truck, barge and rail for distribution downriver. It has an improved barge landing.

The City of Nenana is currently in preliminary design for a sheet pile shore protection project on the Nenana River side of the harbor. There is a section of bank north of the proposed sheet pile area that needs to be stabilized. There is also a need for a new marine dock area to get boats out of the water.

Aerial view of Nenana River harbor

6.6.1.2 Community Landings

Fort Yukon was the only community with an improved landing in the study area; however, erosion has rendered it inoperable. Fort Yukon receives a substantial amount of goods via barge. As explained in section **Error! Reference source not found.**, the barge landing can occur in two places, depending on water depth. A dedicated barge landing with public access to town is needed.

The other villages in the study area are visited more rarely than Fort Yukon but would benefit from an improved landing area.

6.6.1.3 Special Interest Areas

Interviews with barge freight providers indicated that some improved landing capability would be beneficial. One provider in particular suggested that "deadman" style anchors for tying up the barge would significantly improve on and off loading. A deadman is a log or logs, heavy timber or timbers, a large block of concrete, a large boulder, or combination of the above that is partially or completely buried. Eyebolts placed in deadmen are used to anchor cables.[13]

There are two landing areas in Tanana: at the airport and in town. Both are problematic. The airport landing is too small and requires freight to be trucked. The downtown landing is congested with other traffic and sometimes log jams.

[13] FHWA online glossary, accessed at fhwa.dot.gov.

6.6.2 Operations

6.6.2.1 Planning Level Assessment (Barge and Ferry)

Barge service to the villages in the Upper Yukon is still important. Most villages can be served at least once or twice a year, if not three times. Service, however, can be influenced by cash flow problems. Goods to be delivered by barge need to be ordered well in advance and paid for in advance. Financial assistance to local governments (Revenue Sharing) was halted for several years and only recently re-instated. Villages have not had the cash in hand to pre-order and pay for bulk fuel in some time. Some villages are purchasing fuel as they can afford to have it delivered by air. Air delivery of fuel appears to be cost effective within a certain radius of Fairbanks which most of the study area villages meet.

When the 1981 Louis Berger and Associates *Yukon River Ferry Economic Analysis Report* looked at ferry service, they determined ferry service would displace some regular barge and air service to the detriment of both industry bottom lines. They further concluded that ferry service would not be economically viable unless heavily subsidized.

6.6.3 Summary of Landing Recommendations

6.6.3.1 Expanded Barge Landings

No barge landings need expansion; however, there are some erosion control projects needed in Nenana.

6.6.3.2 New Barge Landings

A new private landing is desired in Tanana.

6.6.3.3 Rehabilitated/Reconstructed Barge Landings

As discussed above, Fort Yukon would benefit from a new landing that provides public street access into the community. Barge operators discussed the "deadman" bolts at Tanana. These should be looked at for maintenance. The other study area village landings should be analyzed to see if the landing areas should be rehabilitated.