SECTION 4(f) EVALUATION

ALASKA RAILROAD MOODY TUNNEL REMOVAL

FEDERAL TRANSIT ADMINISTRATION
U.S. Department of Transportation

INTRODUCTION

This Section 4(f) Evaluation has been prepared in compliance with the requirements of Section 4(f) of the Department of Transportation Act of 1966, as amended, 49 U.S.C. 303(c). The purpose of a Section 4(f) evaluation is to document the basis for a determination that there are no feasible and prudent alternatives to the use of land from a publicly owned park, recreation area, or wildlife refuge, or land from an historic site of national, state, or local significance, and that the proposed action includes all possible planning to minimize harm to the protected resources. This evaluation documents the necessity for removing an Alaska Railroad Corporation (ARRC) tunnel, known as Moody Tunnel, which is eligible for listing on the National Register of Historic Places (NRHP). The project is a federally assisted undertaking with funding through the Federal Transit Administration (FTA).

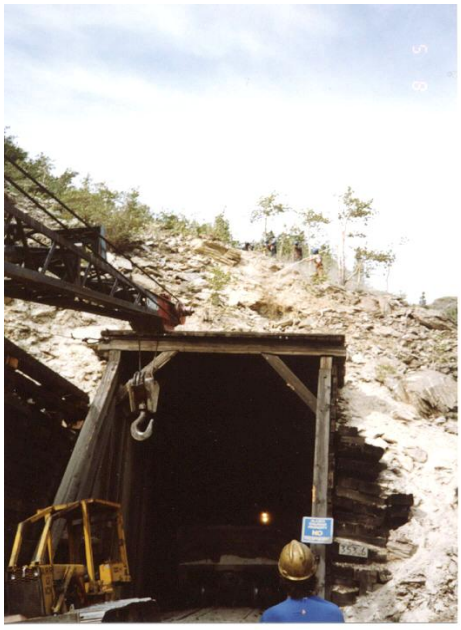
PROPOSED ACTION

ARRC proposed to "daylight" or remove Moody Tunnel with systematic rock excavation during planned track closures when train traffic is light. The back slope would be cut to a stable configuration to minimize rock fall that could impact rail operations. The purpose is to enhance system reliability and maintain a safe, active railroad track. The north portal area of the Moody Tunnel collapsed in June 2005, and the south portal had collapsed in 1992. Its long term stability is questionable due to the susceptibility of the bedrock to weathering, the potential for rock falls, and deterioration of the timber lining from seepage. Therefore, the likelihood of future passenger service interruptions is high. The tunnel also provides a very tight clearance (approximately 6 inches) for ARRC's new bi-level dome passenger cars.

DESCRIPTION OF THE SECTION 4(f) RESOURCE

Moody Tunnel is a 262-foot long tunnel built in the early 1920s during construction of the Alaska Railroad. It is located approximately 600 feet north of the Nenana River Bridge on the George Parks Highway in Section 9, Township 13 South, Range 7 West, Fairbanks Meridian (USGS Quadrangle Healy D-4). This tunnel is located at ARRC Mile 353.6 in an area known as Healy Canyon, which has a long history of landslides, sinkholes, and tunnel cave-ins. It was built with drill and blast methods through schist bedrock. Additional information about the tunnel is provided in the Determination of Eligibility in Attachment A.

In the 1940s, the tunnel was lined with 12- by 12-inch untreated vertical timbers as structural members to increase the tunnel and portal strength and stability using a standard style of construction. All of the timbers used at the portals were creosote treated, whereas most of the interior timbers were untreated. The tunnel portals are approximately 19 feet wide by 25 to 30 feet tall. There is very little written record of additional repairs on this tunnel up to 1992. In 1992, there was a partial collapse of the tunnel at the south portal. Polyurethane foam was used to repair a hole cut into the schist bedrock at that time.



Photograph shows repairs being made after the 1992 collapse at the south end. Passenger service was disrupted for 3 days.

The north portal area of the Moody Tunnel collapsed in June 2005, and repairs were made with reinforcing vertical steel sets and polyurethane foam. Refer to the photograph below. The track was out of service for 3 days during the peak season while repairs were made.

ARRC and its passengers and freight customers are the only users of this tunnel. The south portal of Moody tunnel is visible to the public from the George Parks Highway.

EVALUATION OF IMPACTS

According to 36 CFR Part 800.5(1), an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register of Historic Places in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. The proposed action will remove Moody Tunnel, which has been determined to be eligible for the NRHP. The Alaska State Historic Preservation Officer (SHPO) has determined that this undertaking constitutes an adverse effect. Several alternatives were considered, including minimization and avoidance alternatives:

1. Proposed Action
2. Improve the existing tunnel by increasing its height and width clearances (Minimization)
3. Remove a portion of the tunnel (Minimization)
4. Do nothing at the tunnel (Avoidance)

Proposed Action. Under the proposed action, the tunnel would be removed by systematic rock excavation during planned track closures when train traffic is light, and the back slope would be cut to a stable configuration. The proposed action would meet project goals and the future needs of the railroad and its clientele. Removing the tunnel would improve safety, remove rock stability hazards, and eliminated costs associated with the tunnel maintenance including unplanned track closures and emergency repairs. This alternative would also remove the existing vertical and horizontal restrictions. However, the proposed action would remove a tunnel identified as historic.

Improve the existing tunnel. Under this alternative, the tunnel would be improved by increasing its height and width clearances to increase the clearance for bi-level dome passenger cars and double-stacked freight loads. Increasing the tunnel size would require systematic removal of the timber sets, one or two at a time, mechanical excavation of the rock, selective rock reinforcement with rock bolts, and installation of replacement steel sets. The new lining in the north portion of the tunnel, where seepage is evident in the crown, should include an impermeable cap to keep the seepage off the track. The portal structures would need to be rebuilt if the lining is replaced as the rock above the portals is relatively loose from past damage. The cost of this effort would be substantial and unplanned closures and associated costs could occur if stability problems are encountered during reconstruction. These improvements would also destroy the historic characteristics of the tunnel, since the design would be substantially modified, and timber portals and sets would need to be replaced with steel and concrete, as described below.

The purpose of tunnel portals, sets, and lining is to insure an appropriate level of structural integrity for safe operational use. These structures reinforce, and in some locations actually support, the bedrock located directly above and adjacent to the tunnel crown. These reinforcing structures are especially critical at Moody Tunnel due to the condition of the local bedrock. The bedrock consists of Birch Creek Schist, a highly fractured, faulted and weathered metamorphic rock subject to on-going and frequent alterations associated with the Denali Fault System. Under these prevailing site conditions, the function and importance of the reinforcing structures to the integrity of Moody Tunnel can not be overstated.

Steel and concrete are man-made engineered materials that have highly reliable structural and durability properties. These characteristics are critical for the fundamental assurance of on-going tunnel integrity. The tunnel reinforcing structures are located in an exposed environment. Portals are directly exposed to precipitation, sunlight, freeze-thaw cycles and temperature extremes. Water seepage through the tunnel crown exposes timber reinforcing sets and lining to seasonally continuous damp, dark, stagnant air conditions that are ideal for wood decay. These "against earth" structural applications make steel and concrete a much more appropriate material choice, more durable, more reliable and much stronger, and essentially render timber functionally obsolete for tunnel reinforcing and maintenance purposes.

Moody Tunnel was constructed in the early 1920s, when timber was a locally available resource and was easy to work with using equipment and tools in service at that time. Man-made materials, particularly steel, were expensive relative to labor, required long lead times to acquire, could only be effectively worked in large fabrication shops, and were more difficult to transport and handle at remote construction sites. Timber was naturally chosen for tunnel reinforcement during original construction. Currently, steel and concrete are generally inexpensive relative to labor, are readily available, are easily modified in both shop and field locations, have uniform, reliable properties and better meet societal requirements for transportation infrastructure safety, reliability and reduction of workplace hazards.

This alternative is less desirable that the proposed action, since it would not eliminate future tunnel maintenance costs. In addition, it is not possible to enlarge the tunnel without affecting its historic characteristics. Therefore, this alternative is not feasible and prudent.

Remove a portion of the tunnel. Visual observations and recent tunnel performance indicate the timber lining in the northern third of the tunnel is approaching the end of its service life and would require replacement with higher capacity steel sets in the near future (see "Do Nothing" alternative described below) or removal. Removing a portion of the tunnel would involve leaving the majority of the tunnel in place (approximately 200 feet), by removing approximately 60 feet at the north end and not increasing the tunnel's height and width clearances. This alternative retains the historic features of the tunnel to the extent possible, although it is not clear if the remaining portion of the tunnel would retain sufficient integrity to remain eligibility for listing on the NRHP. This alternative would require substantial rock excavation (but less than the proposed action), construction of a new portal, and possibly rock reinforcement for long-term stability. It would not be a substantial improvement over the "Do Nothing" alternative, because the railroad would still be vulnerable to potential rock falls and tunnel damage and the resultant track closures and passenger service interruptions. The remaining tunnel would continue to have safety concerns, tight clearances for bi-level dome passenger cars, continued load restrictions, and future maintenance and repair costs. Therefore, this alternative is not feasible and prudent.

Do nothing at the tunnel. The "Do Nothing" alternative involves leaving the tunnel in its current condition, but maintaining it as needed. This alternative would leave the railroad vulnerable to the types of tunnel problems that have plagued it in the past. Portions of the aging wooden tunnel lining are in a deteriorated condition that would continue to degrade with time, and would require frequent maintenance, possibly on an emergency basis, to correct structural deficiencies. Maintenance would involve replacement of the structurally-deficient timber sets. As described above with regard to improving the tunnel, steel sets would have a much longer service life than new timber sets, but would affect the historic characteristics of the tunnel. Continued use of timber sets would likely be considered in-kind

replacement, and would not change the historic resource. Either way, safety concerns, tight clearances for bi-level dome passenger cars, continued load restrictions, and future maintenance and repair costs would continue. In addition to the continuing safety considerations, the cost of doing nothing can be substantial. The minor lining damage in a single event caused by an out-of-compliance load in June 2005 resulted in over $500,000 in direct repair costs; disruption of service for several days; lost revenue; an injured ARRC employee; adverse economic impacts; and inconvenience to passengers and commercial customers.

The "Do Nothing" alternative would not address the existing safety concerns, and there would be continued risk of future unplanned track closures with the costs and impacts noted above, plus a higher level of maintenance than for track with no tunnels. Therefore, this alternative is not a feasible or prudent choice.

MEASURES TO MINIMIZE HARM TO 4(F) PROPERTIES

A Memorandum of Agreement (MOA) specifying mitigation measures for the proposed tunnel removal project is being developed. ARRC would ensure Moody Tunnel is architecturally recorded (drawings, photographs and history) to Historic American Building Survey (HABS)/Historic American Engineering Record (HAER) Level II Standards, except as provided in the MOA. Photographs for the Architectural Recordation were obtained in 2005. ARRC would provide the final recordation to the National Archives and Records Administration (654 West 3rd Ave., Anchorage, Alaska), where the permanent archive would be retained. In addition, ARRC would prepare an Alaska Heritage Resource Survey (AHRS) card for Moody Tunnel.

COORDINATION

Project planning has been funded through a grant from FRA. ARRC and FRA have consulted with SHPO pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f) and Section 110(f) of this Act, 16 U.S.C. 470h-2(f). On July 24, 2003, on behalf of FRA, ARRC submitted a determination that that the Moody Tunnel was eligible for the NRHP. On August 7, 2003, SHPO concurred that Moody Tunnel was eligible for listing in the NRHP. In subsequent correspondence, ARRC and SHPO agreed on the mitigation described above. Project correspondence with SHPO is provided in Attachment B. Because funding for tunnel removal will be through FTA, ARRC and FTA are continuing to work with the SHPO to develop a MOA documenting the required mitigation for the tunnel, as described above.

ARRC consults with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) annually, and as changes occur to the state threatened and endangered species list, to determine if threatened or endangered species or critical habitat are known to occur on railroad property (ARRC's 200-foot right-of-way and land reserves). The USFWS has indicated that there are no federally listed or proposed species and/or designated or proposed critical habitat under its jurisdiction along ARRC's right-of-way and reserves. The NMFS indicated that there are no threatened or endangered trust resources outside the marine environment, and it does not expect any threatened or endangered species under its jurisdiction to occur inland along the ARRC corridor. Therefore, the proposed project would have no effect on populations or habitat of species listed as threatened or endangered under the Endangered Species Act. Correspondence is provided in Attachment C.

Opportunities are provided for the agencies and the public to review and comment on ARRC proposed projects on an annual basis at open houses in Seward, Anchorage, Wasilla, and Fairbanks. A copy of ARRC's Fact Sheet for Healy Canyon Projects, which includes the replacement of Moody Tunnel, is provided on ARRC's web site (www.akrr.com). Public controversy associated with removal of the tunnel is not anticipated because of its generally remote location and because it is only used by ARRC.

SECTION 4(f) DETERMINATION

The FTA has concluded that no feasible and prudent alternative exists to the proposed action, which entails removing Moody Tunnel. The proposed action would meet project goals and the future needs of the railroad and its clientele, remove rock stability and safety hazards, eliminate costs associated with tunnel maintenance (including potential future unplanned track closures and emergency repairs), remove tight clearances for passenger cars, and remove freight load restrictions. It is not feasible and prudent to improve the existing tunnel by increasing its height and width clearances, as this alternative would also impact the tunnel's historic characteristics. Similarly, it is not feasible and prudent to remove only a portion of the tunnel or preserve the existing tunnel, as it would remain vulnerable to the types of problems that have plagued it in the past, including safety concerns, tight clearances for passenger cars, load restrictions, and high maintenance and repair costs.

FTA concludes that there will be an adverse affect to this tunnel, but there is no feasible and prudent alternative to the proposed action. There are unique problems or unusual factors involved in the use of alternatives that avoid the Section 4(f) properties, and the cost, social, economic, and environmental impacts resulting from such alternatives reach extraordinary magnitudes. Project development has included all possible planning to minimize harm to the tunnel.