APPENDIX E

DRAFT DIAGNOSTIC TEAM REPORT

DRAFT/March 9, 2008

Diagnostic Team Report
Trunk Road Extension South and Nelson Road Project

This diagnostic team (DT) was composed of:

Tom Brooks, Alaska Railroad Corporation
Ron Martindale, Alaska Department of Transportation
_____, Matanuska Susitna Borough

Many others participated in the DT meetings. Attached is a list of participants (Exhibit 1 and 2).

Diagnostic Team Meetings were held on:

November 20, 2007
December 13, 2007

Background:

This project covers a section of the Alaska Railroad from MP 151.0 (Matanuska) to MP 156.2 (Fairview Loop). The important highway intersections are at the Trunk Road/Parks to the east, and the Fairview Loop/Matanuska Road to the west. All roads of concern are to the south of the Parks Highway.

The area has the following existing crossings:

Crossing MP	Road Name	DOT Crossing ID #	Crossing Owner	Crossing Protection
151.5	Glenn Highway	868 311 B	ADOT	Grade Separation
151.6	Glenn Frontage	868 311 B	ADOT	Lights and Gates
155.1	Driveway	868 313 P	Orphan	Stop Signs
155.3	Abby Road	910 224 K	MSB	Lights and Gates
155.6	Valley Block	868 314 W	Private VBC	Stop Signs
156.2	Fairview Loop	868 315 D	ADOT	Lights and Gates

The area south or the railroad and served by these crossings is developing rapidly. The Matanuska Susitna Borough (MSB) has undertaken a project to extend Trunk Road south from the Parks/Trunk intersection, and west to the Fairview/Matanuska Road area. The road would serve several existing, new and proposed subdivisions with up to 2000 lots, and a new school with a capacity of 450 students. Figure 1 shows the area.

The MSB and their consultant, Lounsbury and Associates, has issued a report: "Trunk Road Extension South, Preliminary Reconnaissance Report, October 2007". Much of the background, data and detailed description of the alternatives can be found in this report. It is attached to this report as Appendix A. Lounsbury also prepared a Traffic Analysis of the proposed road. It is included as Appendix B.

The MSB plans to open a school in the area in Fall 2009 (see map). This will place school related traffic on the crossing, including private vehicles and school buses. Private vehicles are included in the traffic analysis generated ADTs.

School bus officials estimate 4-6 school buses will cross the tracks to access Fairview Loop Road 4 times daily traveling to and from the new elementary school. The buses will move students to the school in the morning, about 0900. Buses will then leave and return for the afternoon pick up, about 1530 hrs. All school bus movements will require the buses to stop at the crossing, display red flashing lights, open and close the doors and then proceed. School bus movements are not likely to be together, but will occur in groups of one or two buses.

07016-G2

Discussion Fairview Loop Area:

Options:

Retain/Upgrade Existing Abby Boulevard Crossing:

This option would leave the traffic on Abby Boulevard. This is the most feasible, lowest cost option, requiring the shortest time to implement prior to the 2009 opening of the new elementary school. Abby Boulevard will be the only access for the school traffic until another alternative is developed. The increasing traffic on Abby will result in queuing issues at the crossing. There is approximately 120' of storage between the crossing and the Abby/Fairview Loop intersection. As ADT grows, and with the introduction of school buses to serve the new school, traffic waiting for a break in Fairview Loop traffic will queue across tracks. As ADT counts build to those projected in the Lounsbury reports, this will occur more frequently.

There are three potential solutions for queue issues. The first is to rely on drivers to stop clear of the tracks as the law requires. "Do Not Stop on Tracks" signs can be added to assist in this effort. In addition, the crossing shoulders area should be constructed and maintained to enable drivers who do stop on the tracks to pull around a vehicle stopped in front of them.

The second strategy would widen the Abby approach to Fairview Loop to provide a left turn, right turn and shoulder space on the right for potentially "trapped" vehicles to clear the crossing. Capacity analysis at the proposed Nelson/Fairview intersection shows that a configuration consisting of left and right turn lanes along with an 8' shoulder on the right will work without traffic backing up onto the crossing. There may be an exception in later years as traffic builds towards the projected 2030 ADT for periods immediately following the end of the school day for the new Elementary School. During those 15 minutes, it may be possible that traffic will queue up beyond the crossing approaching Fairview Loop Road. The presence of the left turn lane and the 8' shoulder will allow vehicles who may become trapped to get into another lane and clear the crossing. If Abby were reconstructed to be similar to the proposed Fairview Loop, this analysis would apply.

The third solution is preemption. This would require a traffic signal at the Abby/Fairview Loop intersection. The crossing signal would notify the traffic signal of an approaching train. The traffic signal would then shift to a green for Abby, allowing the queue to clear before the arrival of a train. If Abby Road remains the only connection to Fairview Loop, this may require signalization of the Abby Road/Fairview Loop Road intersection in the future to accommodate the traffic volumes and enable the railroad signal to preempt the traffic signal to clear the Nelson Road approach of standing traffic prior to the train's arrival. Since this signal would be warranted based on railroad preemption rather than a traditional volume or accident warrant and because a traffic signal is expensive to install and maintain, this solution should only be implemented if traffic volumes and/or queuing problems necessitate it.

The APV for this crossing under existing active devices, traffic volumes and train movements is 0.0132. The APV for this crossing (using 18 daily train movements and a predicted 2030 average daily traffic volume of 3200) is calculated to be 0.0241.

The eventual construction of the railroad realignment will remove most rail traffic from this crossing. The APV would then drop to a low level with reduced numbers of trains and reduced train speeds.

Nelson Road Grade Separation Alternatives:

The Lounsbury report considered two alternatives for grade separation in the Fairview Loop area. In addition, a local landowner proposed a third alternative. All three options are expensive and require property acquisition. While grade separated crossings are desirable to eliminate train-vehicle conflicts, the APV, economic feasibility and property impacts must also be considered. These options are expensive and have significant private property impacts.

The APVs for the existing crossing and for any future option (such as Nelson Road) are not high enough to mandate a grade separation. However, a grade separation in this area will eliminate the crossing hazard, as well as eliminate crossing related traffic congestion. The westerly options will bridge both the existing and planned rail alignment. In addition, it may be possible to consolidate the Fairveiw Loop crossing into a grade separation in this area.

If problems develop with local landowners over other options, the existing crossing at Abby Boulevard may be the access for some time. If this continuing Abby Boulevard access is not acceptable, a grade separation may become a more universally accepted solution.

Upgrade Private Crossing at Valley Block and Concrete (VBC):to a Signalized At-Grade Public Crossing

This option would relocate the Abby Boulevard crossing to an existing private crossing serving VBC. The Abby crossing would be closed under this option, as dictated by the Alaska Policy on Highway/Railroad Crossings.

The existing private crossing at VBC has no storage between the tracks and the roadway. School buses cannot use this crossing without storage between the roadway intersection and the tracks, so this option will require realigning Fairview Loop Road away from the tracks to create vehicle storage similar to the existing Abby crossing. This will require property acquisition and relocation of utilities.

This option would create the same queuing issues as discussed above for the Abby option.

In order to mitigate the potential queuing problem, the proposed configuration of the Nelson Crossing and adjacent intersection with Fairview Loop Road will include relocating Fairview Loop to the north to create storage between the crossing and Fairview Loop Road for a school bus and two vehicles. (approximately 100 feet.). The Nelson Road approach will provide a left turn lane, right turn lane, and an 8 foot shoulder on the right for potentially "trapped" vehicles to clear the crossing. Capacity analysis at the proposed Nelson/Fairview intersection shows that a configuration consisting of left and right turn lanes along with an 8 foot shoulder on the right will work without traffic backing up onto the crossing. There may be an exception in later years as traffic builds towards the projected 2030 ADT for periods immediately following the end of the school day for the new Elementary School. During those 15 minutes, it may be possible that traffic will queue up beyond the crossing approaching Fairview Loop Road. The presence of the left turn lane and the 8' shoulder will allow vehicles who may become trapped to get into another lane and clear the crossing.

If the Nelson Road connection is the only connection constructed, all traffic from the subdivisions south of the tracks and the school will have to access Fairview Loop via this crossing. This may require signalization of the Nelson Road/Fairview Loop Road intersection in the future to accommodate the traffic volumes and enable the railroad signal to preempt the traffic signal to clear the Nelson Road approach of standing traffic prior to the train's arrival.

Traffic flows in the subdivisions would also change under this option. The Abby crossing would be closed. Garden Terrace residents would utilize Timothy for access to the new Nelson Road

crossing, and almost all traffic volumes would disappear from Abby. Nelson Road would become the primary access for homeowners and the school. .

The APV for this crossing (using 18 daily train movements and a predicted 2030 average daily traffic volume of 3200) with passive controls (no signal) would be near 0.08, the threshold for consideration of active crossing devices. The APV with railroad/highway grade crossing signals and gates is calculated to be 0.0241. For new crossings with APV's at the threshold, active controls are recommended as a single crossing incident would trigger the requirement anyway. For this crossing, a single incident would cause the APV to rise to 0.16 (passive) and 0.06 (active).

The eventual construction of the railroad realignment will remove most rail traffic from this crossing. The APV would then drop to a low level with reduced numbers of trains and reduced train speeds.

Brome Road Extension:

The Brome Road extension concept was not explored in the Lounsbury reports. The option would extend Brome Road to the east, tying it into Gershmel Loop (see Figure 2). Similar to the VBC option, this would require the closing of the Abby Road crossing. It would also:

Not have a queuing problem because of the increased distance between the crossing and the roadway intersections.

Require a crossing of Wasilla Creek, with associated environmental issues and costs.

Change the traffic flows for the area more significantly than the Abby or VBC options.

It does not appear property acquisition would be required for this option.

The APV for this crossing would be similar to the proposed Nelson Road crossing, 0.08 with passive controls (no signal) and 0.0241 with railroad/highway grade crossing signals and gates.

Lounsbury did a separate analysis of the road geometry (see attached Appendix C). This option would require an 8% descending grade into the crossing from the east. In addition, the road would be approximately 20' over Wasilla Creek, creating a more expensive bridge and causing further impacts to wetlands.

The DT agreed this was not a feasible solution.

Private Driveway MP 155.1:

This crossing is redundant with any selected alternative. Moving this private traffic to a public crossing with a higher level of crossing protection would improve safety for both roadway and rail users. Alternative platted access appears to exist.

East Linlu Lane Connection:

This option consists of a westerly extension of Nelson Road to Fairview Loop Road in the 90 degree curve near the intersection of Linlu Lane. See Figure 3. This option would preclude the need for a new crossing at the Valley Block and Concrete (VBC) location. It provides an opportunity to close the existing Abby Boulevard crossing and reduce potential vehicle-train conflicts by reducing the number of at-grade crossings.

Even if the existing Abby or the proposed VBC crossing is in service, access to the west (to Fairview Loop south of the existing Fairview Loop crossing) would improve crossing safety by allowing westbound traffic to avoid two crossings (the first to access Fairview Loop, and the second at the Fairview Loop crossing. School buses would have the potential to avoid all at grade crossings. Currently, there is only a partial public egress along E. Linlu Lane. Creating this access would require expanding and extending the easement by acquiring private parcels.

Discussion Trunk/Parks Connection Area:

Existing condition: The existing eastern connection between Nelson Road and the Parks/Trunk Road intersection is via the Glenn Frontage Road and the associated at grade crossing (ARRC MP 151.6). This road has very light traffic volumes, but development of the Nelson Road subdivisions will change that.

Options:

Grade Separation Alternatives: (South Trunk Road)

A grade separated crossing has been proposed in the MP 153.5 area. See the Lounsbury report. This would divert traffic from existing at grade crossings, improving crossing safety.

Retain/Upgrade Existing Crossing:

If a grade separation at ARRC MP 153.5 is constructed, elimination of the crossing at MP 151.6 is possible. This could eliminate 100% of the at grade crossing hazard and related maintenance expenses. Equivalent access to the Trunk Road/Parks Highway interchange would be provided by the grade separation, as both routes deliver traffic directly to this location.

Recommendations Fairview Loop Area:

The situation in this area is complex. This section of the DT Report presents a short summary of the recommendations, followed by recommendations at each existing or proposed crossing location.

Summary:

1. The existing Abby Boulevard crossing will be the primary access for some time. Recommendations should be implemented in the near future.
2. Extending westward to Fairview Loop via E. Linlu eliminates the crossing hazards and crossing related expenses of other options, it should be thoroughly investigated and implemented if feasible.
3. If an E, Linlu Lane extension is not feasible, then the construction of the Nelson Road crossing at VBC is recommended. This will close the existing Abby Boulevard crossing.
4. Grade separated alternatives have merit, but rail and traffic volumes do not require them. They should be encouraged as potential solutions to land and traffic congestion issues, as well as for the safety benefit.

Recommendations for specific locations:

1) For the existing Abby Boulevard crossing:

As stated earlier, this is the most feasible, lowest cost option, requiring the shortest time to implement prior to the 2009 opening of the new elementary school.

This crossing should be closed when the Matanuska-Susitna Borough has solidified plans for a new Nelson Road connection; at-grade, grade separated, or westerly extension and the selected alternative constructed. The westerly extension of Nelson Road is the most desirable long-term option as it eliminates the vehicle/train conflict and has the potential to reduce the number of railroad/highway grade crossing in this area.

~~Until it is closed, queuing should be periodically monitored to determine if vehicles are stopping on the tracks.~~

~~If vehicles are queuing onto the tracks, t~~ Until it is closed, the Abby Boulevard/Fairview Loop intersection should be modified to provide separate left and right turn lanes and a right shoulder on the Abby Boulevard approach to provide additional queuing space. These Abby approach improvements should be done regardless of other options that may be identified in this area due to the uncertainty of funding for other options and the limited time window before the new elementary school opens.

If vehicle queuing continues to be a problem after additional queuing is provided, then a traffic signal at Abby/Fairview Loop with preemption should be installed It should be noted that a traffic signal here would be a less desirable location as it is not located on a future ½ mile grid.

2) For the proposed Nelson Road crossing options:

A grade separated crossing in this area is preferred. The MSB should work with local landowners, developers, the platting board and potential funding sources to explore a grade separation in this area. This has the most potential to eliminate grade crossing hazards. If a grade separated solution is not feasible, an at-grade crossing in the VBC area is recommended.

A new railroad/highway at grade crossing in the VBC area shall only be created if the Abby Boulevard crossing is closed.

Queuing should be provided for one school bus and two vehicles between the tracks and the Nelson/Fairview Loop intersection. (A minimum of 100 feet between the tracks and the edge of traveled way on Fairview Loop Road.)

Automatic crossing signal and gates shall be provided at the crossing.;

If vehicles are queuing regularly onto the tracks, then a traffic signal at Nelson/Fairview Loop with preemption should be evaluated and installed if traffic volumes at the intersection and queuing conditions at the railroad/highway grade crossing warrant it.

3) For the private crossing at MP 155.3:

This crossing should be closed and existing access to the signalized crossing at Abby (or future Nelson crossing) should be used.

4) For E. Linlu Lane:

The MSB should work to develop a public easement westward to Fairview Loop along E. Linlu Lane. Roadway access should be developed from this point and the three existing crossings at VBC, Abby, and MP 155.3 be closed.

Subdivision plans should recognize this as a potential future access.

Recommendations Trunk/Parks Connection Area:

1) For the proposed grade separated crossing at MP 153.5 (approximate):

   The crossing should be grade separated.

2) For the existing at grade crossing at MP 151.6:

   When a new crossing opens in the MP 153.5 area, this crossing should be closed.

Signed:

_____ _____

Tom Brooks, Alaska Railroad Corporation Date

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Ron Martindale, Alaska Department of Transportation Date

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John Duffy, Matanuska Susitna Borough Date

Figure 1: Map of area similar or same as in Lounsbury report.
Figure 2: Map of Brome Road extension to Gershmal Loop.
Figure 3: Map showing South Palmer Elementary School – Access Plan

Exhibit 1: List of DT Participants

Appendices:

Appendix A: Trunk Road Extension South, Preliminary Reconnaissance Report, Final, October 2007, Lounsbury and Associates, MSB Project # 35007

Appendix B: Traffic Analysis, Truck Road Extension South, October 2007, Lounsbury and Associates, MSB Project # 35007

Appendix C: Lounsbury and Associates, Brome Extension Exhibit 7, 3 drawings.