

Knik-Goose Bay Road Grade Separation Alternatives Analysis

Prepared for:

Alaska Railroad Corporation
Alaska Department of Transportation & Public Facilities
City of Wasilla
Matanuska-Susitna Borough
Matanuska-Susitna Community Transit

Prepared by:

HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, AK 99503

January 2005



Grade-separated "Rail over Trail" near downtown Anchorage, Alaska



Aerial view of the Main Street/Knik-Goose Bay Road/Parks Highway Intersection



Bus at Knik-Goose Bay Rail Crossing



Existing Wasilla Depot near the at-grade Knik-Goose Bay Road Crossing



Knik-Goose Bay Road Existing At-grade Crossing in Wasilla, Alaska



Table of Contents

1.0 Introduction 1
 1.1 Purpose of this Document..... 1
 1.2 Document Overview 1
 1.3 History of the project 1
2.0 Description of the Study Area 2
 2.1 Community Description..... 2
 2.2 Corridor History..... 2
3.0 Transportation Problems and Needs 3
 3.1 Overview 3
 3.2 Intersection Configuration—Part of the Problem 3
 3.3 Congestion & Travel Delays Caused at the Crossing..... 4
 Summer and Winter Rail Traffic through the at-grade KGB Road Crossing 5
4.0 Preliminary Purpose and Need 6
5.0 Conceptual Alternatives 7
Conceptual Alignment Alternatives Comparison 8
Conceptual Alignment Alternatives 9
 Alternative 1: Present Main Street At-Grade configuration 9
 Alternative 2: Three-lane Main Street Grade-Separation 10
 Alternative 3: Five-lane Main Street Grade-Separation 10
 Alternative 4: Main Street and Yenlo/Talkeetna Streets One-Way Couplet..... 10
 Alternative 5: Main Street and Knik Street Couplet..... 11
 Alternative 6: Crusey Street Grade-Separation..... 11
 Alternative 7: Knik Street Grade-Separation 11
 Alternative 8: Main Street Grade Separation (“Rail over Road”) 12
6.0 Pre-NEPA Alternatives Analysis: Human & Environmental Considerations ... 13
7.0 Long-term Planning: The Project in Context 14
8.0 Summary & Recommendations 15

- Appendix A. Preliminary Engineering Alternatives**
Appendix B. Preliminary Right-of-Way Analysis
Appendix C. Preliminary Cost Estimates

List of Tables

	<i>On page</i>
Table 1. Approximate Time Trains Occupy the KGB Crossing	5
Table 2. Approximate Daily Train Delay at the KGB Crossing	5
Table 3. Peak Daily Rail Traffic At the KGB Road Crossing.....	5
Table 4. Conceptual Alignment Alternatives Comparison.	8



Large traffic generators, such as the Carrs Mall, City Hall, the Post Office, and schools, such as the Iditarod Elementary School, Wasilla Middle School and Ice Arena, and Wasilla High School and Swimming Pool are within a mile and a half of the Main Street/KGB Road/Parks Highway intersection. The Wasilla Public Library and the Dorothy Page Museum & Historic Town Site are a few blocks away from the intersection as well. Improving north-south flow across the ARRC tracks is a critical need.



Knik-Goose Bay Road at-grade crossing in Wasilla, Alaska

1.0 Introduction

The population and subsequent traffic growth that has occurred in the Wasilla area coupled with ever growing train traffic on the ARRC mainline through town, led the Alaska Railroad (ARRC) to commission this alternatives analysis to examine a grade-separated intersection of the Alaska Railroad to replace the at-grade crossing at Knik-Goose Bay Road (KGB). The KGB-ARRC intersection is the busiest north-south street crossing the tracks in Wasilla, and the growing rail and vehicle traffic necessitate an improvement. The intent of the analysis is to identify and evaluate at a conceptual engineering-level, reasonable and feasible project alternatives for a grade separation of the KGB Road and the Parks Highway in Wasilla.

1.1 Purpose of this Document

This document presents an alternatives analysis of the options for closing the KGB-ARRC intersection and replacing it with a grade-separated crossing in downtown Wasilla. According to the Federal Transit Administration (FTA), “alternatives analysis” has been a part of established transportation planning practice for several decades. An effective alternatives analysis answers the questions:

- What are the problems?
- What are their underlying causes?
- What are viable options for addressing these problems?
- What are their costs?
- What are their benefits?

The alternatives analysis process is a locally managed study that develops information on travel patterns, problems, and needs as part of a planning process. The FTA allows local agencies participating in an alternatives analysis to have broad latitude in how the study is performed, including the

choice of whether to conduct the analysis under the review process established by the National Environmental Policy Act of 1969 (NEPA).¹ Completing an alternatives analysis is an important process for requesting FTA funding and is required when seeking funds under the Section 5309 New Starts program. The FTA likes to see the following information presented in an alternatives analysis:

- Description of Study Area, Transportation Problems, and Needs.
- Study Goals, Objectives, and Preliminary Evaluation Measures.
- Description of Conceptual Alternatives.

1.2 Document Overview

The ARRC organized this report to closely match the FTA’s guidance on preparing an alternatives analysis.

Because the analysis must respond to the unique conditions of the problem under review, the analysis first presents information that provides a basic understanding of the local study area and the specific problems and needs to be addressed in the study. In section 2.0, a summary of relevant transportation, socioeconomic, land use, and other data is presented to give an overview of the study area and the context for the problem experienced at the KGB-ARRC intersection. This information also provides supporting information for the purpose and need for the project, which is presented in Section 4.

Section 5 presents an overview of the alternatives considered and evaluated in the analysis. The alternatives address the identified problems and meet the study goals and objectives. Information presented will help decision makers in choosing a course for remedying the problems at the KGB-ARRC intersection. The alternatives have been structured to isolate the differences among potential solutions and to highlight the trade-offs inherent in the selection of a proposed alternative. The alternatives include alignment and grade options for meeting the project purpose and need. Conceptual engineering drawings of those alternatives have been prepared and could be used to initiate environmental analysis at a later date.

1.3 History of the project

The intersection at ARRC Milepost [MP] 159.9 is adjacent to the Parks Highway (MP 42.2). Heavy vehicle traffic on the Parks Highway and KGB Road coupled with the layout of the intersection relative to the ARRC mainline (which intersects the KGB Road about two car-lengths south of the intersection of the Parks Highway and KGB Road) causes safety concerns as traffic has grown. The ARRC and the Parks Highway are major east-west facilities that tend to inhibit the north-south movements in and



Aerial view of the ARRC/Knik-Goose Bay Road/Parks Highway Intersection

around the City of Wasilla. The layout of the intersection, growing traffic, roadway capacity, and safety concerns at the intersection of KGB Road with the ARRC line and Parks Highway have been a concern for some time. In fact, the DOT&PF has performed a number of studies examining the transportation system through Wasilla, looking at ways to reduce congestion and improve safety. Almost a decade ago, an environmental assessment was conducted for Parks Highway improvements through Wasilla. DOT&PF recently conducted a Parks Highway Corridor Management plan which looked at long-term transportation needs along the highway corridor, including the Wasilla area.

In 2002, a joint committee (“Wasilla Intermodal Steering Committee”) consisting of representatives from state and local Wasilla-area transportation providers (including representatives from DOT&PF, City of Wasilla, Matanuska-Susitna (Ma-Su) Borough, ARRC, and Mat-Su Community Transit [MASCOT]) was formed to provide oversight on the development and coordination of a number of transportation and transit-oriented projects in the greater Wasilla area. FTA requested a joint planning effort be initiated among the several agencies to ensure that federal funds are being wisely and are cooperatively invested in the Wasilla area. A joint planning document was developed (The Wasilla Area Intermodal Plan) in spring of 2003. One of the projects identified by the Steering Committee to move forward for conceptual engineering and alternatives analysis was the potential for a grade separation to resolve the problems. The ARRC initiated a study which culminated in this document.

¹ This analysis is being performed as part of a Pre-NEPA process. If the ARRC decides to move forward with the project, environmental analysis would be initiated at that time.



2.0 Description of the Study Area

2.1 Community Description

Wasilla is located in the Matanuska-Susitna (Mat-Su) Borough in south-central Alaska on the (Anchorage to Fairbanks) Parks Highway, 43 miles north of Anchorage. The community lies south of the Talkeetna Mountains, about 12 miles north of Knik Arm. The Alaska Railroad mainline, which stretches from Fairbanks to Seward, passes through the middle of the community.

Wasilla (and the Mat-Su Valley in general) is among the fastest growing regions in Alaska. The Mat-Su Borough gained more than 20,000 new residents between 1990 and 2000. The 2000 census indicates that the Mat-Su Borough's population was 59,322, up from 39,683 in 1990, and 17,816 in 1980. The majority of people live in the southern part of the Mat-Su Borough within about an hour drive time of the Anchorage metropolitan area. The two largest towns in the Mat-Su Borough are Palmer and Wasilla, each with a current population of roughly 5,000 residents. The "Core-Area" of the Mat-Su Valley (the area between Wasilla and Palmer) is largely residential. Approximately 35% of the employed labor force commutes south to Anchorage on a daily basis.

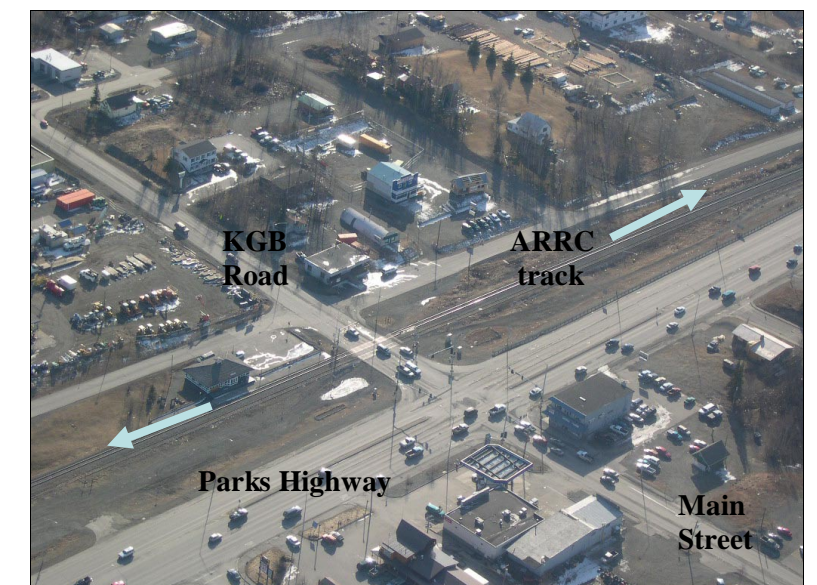
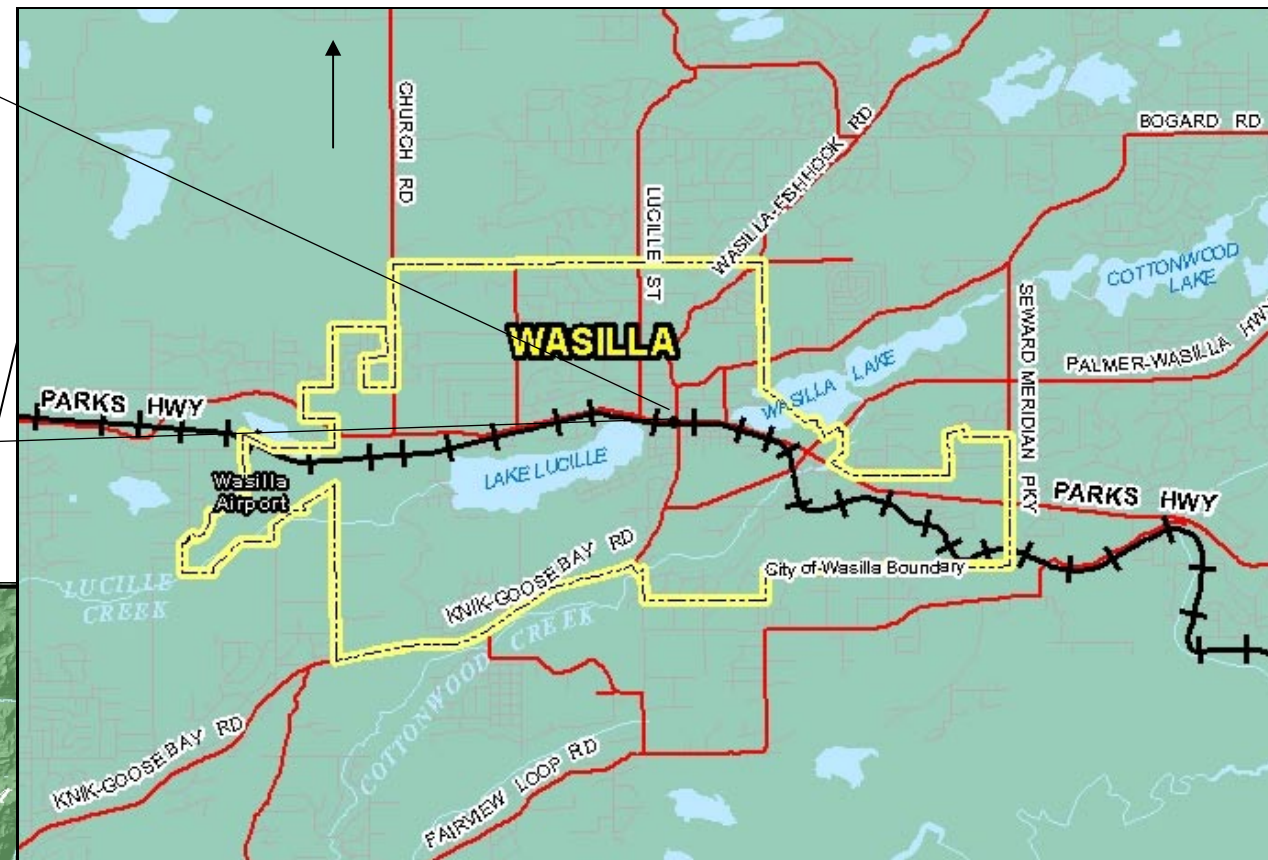
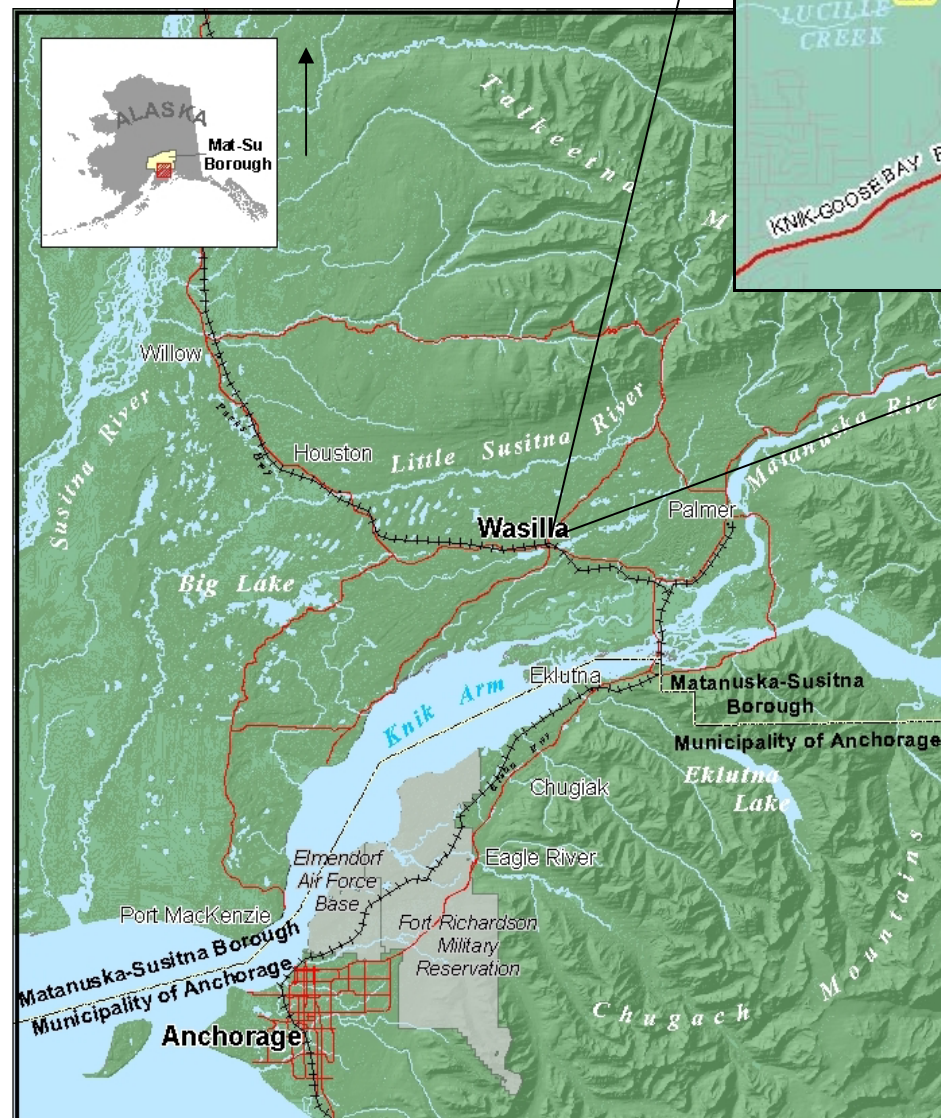
2.2 Corridor History

Construction of the Alaska Railroad (ARRC) and subsequent road connections to Anchorage fueled population growth in the Wasilla area. Wasilla's history as a community dates back to 1917 when the federal government sold town lots prior to constructing the ARRC. The Railroad officially opened service through the community from Anchorage to Fairbanks before 1923 and provided the only direct link between the Mat-Su Valley and Anchorage until improved road access was developed in the 1970s.

Direct road access to and from Anchorage through Wasilla came with the construction of the Parks Highway in the early 1970s. This highway enabled Anchorage workers and their families to live in the Wasilla area, and commute each day to the city for employment. Support and service industries began to expand to meet the needs of new residents. The City of Wasilla incorporated in 1974, and has developed as a retail and commercial hub.

Knik Goose Bay Road Crossing

Vehicle traffic through KGB Road-ARRC intersection has grown significantly and causes safety and capacity concerns.



The Alaska Railroad crosses Knik-Goose Bay Road just south of the Parks Highway intersection of Knik-Goose Bay Road and Main Street in downtown Wasilla.



3.0 Transportation Problems and Needs

3.1 Overview

Land use patterns have been largely shaped by the early development of the rail and highway corridor. As Wasilla grew, it grew linearly along the rail/highway corridor. With increasing population, demand for north-south crossings of the rail/highway corridor also increased. Wasilla is the hub for several regional roads, including the Palmer-Wasilla Highway, Wasilla-Fishhook, and Knik-Goose Bay (KGB) Road. (Main Street turns into KGB Road when it crosses south of the Parks Highway). Main Street/KGB Road is the critical north-south link in downtown traffic circulation in the City of Wasilla. Main Street is one of only three north-south crossings in the City of Wasilla; Church/Mack Road and Palmer-Wasilla Highway are the other two. Main Street is the only crossing serving the downtown business grid.

When the population was small, these crossings were not a problem but with the community's rapid expansion over the past 15 years, the growing population and traffic has overburdened the road network and increased the demand for travel crossing the highway and railroad as well as the demand running along the major through-town corridors. Traffic congestion is evident at the Parks Highway, with the ARRC and other large traffic generators in the nearby vicinity, such as the post office, city hall, Carrs Mall, public library, and schools, such as the Iditarod Elementary School, Wasilla Middle School and ice arena, and Wasilla High School and swimming pool. Recreational and tourist-oriented development north of Wasilla has contributed to the increased through traffic and now presents its own problems; burdening the road network. The growth and inefficient layout of the road network aggravates conditions.

To deal with the worsening traffic problems, the state has embarked on an aggressive road construction program in the area. The state's emphasis on the Parks Highway corridor reflects the highway's importance as one of the state's main commercial corridors and the critical nature of the corridor for intercity travel. Completion of the Palmer-Wasilla Highway extension to the KGB Road at Glenwood Avenue provides a convenient routing to the Parks Highway from south of Wasilla to help relieve some of the demand for the KGB Road in downtown. Much of the travel remaining on the KGB Road crossing the ARRC/Parks Highway is local in nature; bound for Wasilla or points west (north). While these improvements have helped move traffic, over time the road network improvements are likely to foster additional growth and demand for crossings of the rail line.

The increasing cross traffic (vehicle and pedestrian) coupled with increasing through traffic (vehicle and rail) exacerbates safety concerns for at-grade crossings of the rail line in Wasilla, particularly at the intersection of KGB Road and the ARRC mainline.

3.2 Intersection Configuration—Part of the Problem

This section describes the existing conditions and layout of the current intersection configuration. The location and configuration of the rail crossing relative to the KGB-Parks Highway intersection contributes to the concerns.

An Intersection of Key Arterial Roadways. Though the Parks Highway is experiencing on-going construction, it is generally a 6-lane, signalized, major arterial that runs east-west through Wasilla. It is the primary commuter corridor to Anchorage.

The facility is also the main highway connecting Anchorage to points north. KGB Road runs north-south through Wasilla and is the primary route moving traffic from the south side of Wasilla and the Mat-Su Borough along the west side of Knik Arm. Near the intersection with the Parks Highway, the KGB Road is a 2-lane arterial. KGB Road becomes Main Street on the north side of the KGB-Parks Highway intersection. Due to severe north-south congestion on the KGB Road, the DOT&PF is studying adding capacity to the roadway.

Configuration Exacerbates Congestion and Causes Safety Concerns. The Alaska Railroad mainline and a siding cross the KGB Road approximately two car-lengths south of the intersection of the two roads. When trains block the crossing, the already congested roadway situation is exacerbated. The crossing is so close to the roadway intersection that many vehicles back up onto the railroad tracks when stopped at the intersection.

Overuse on a road not designed for a high number of vehicles decreases safety of the facility. The increasing stop and go traffic not only adds more travel time, but stop and go traffic can result in more accidents. With the increase in congestion, vehicles wait lengthy periods to turn across traffic, or vehicles maneuver where they would not under normal conditions (such as cutting through parking lots, passing on the shoulders around stopped cars, or trying to beat the railroad warning gate before it comes down).

Traffic is often backed up at the KGB Road-Parks Highway intersection. As the busiest intersection in Wasilla, and with an at-grade railroad crossing, people are generally aware of stopping at or driving through the intersection with caution. However, heavy traffic sometimes has vehicles stopped on or too close to the tracks. This can be problematic when the gate is trying to come down. Sometimes drivers try to drive through to miss waiting at the gate. School buses are required to stop at railroad tracks, which slow down traffic even more at the intersection.

Annual Average Daily Traffic (AADT)

The Annual Average Daily Traffic (AADT) is the estimated number of vehicles traveling over a given road segment during one 24 hour day. In practice, AADT is usually obtained from a sample (coverage count) adjusted for seasonality. Traffic data, such as AADT, is used to provide information for road planning, design, construction, and maintenance.

Annual Average Daily Traffic in Downtown Wasilla

Wasilla Roads	2001	2002	2003
KGB Road junction with Parks Highway	9,661	10,060	9,068
Parks Highway junction with KGB Road/ Main Street	15,850	25,953	26,990
Parks Highway junction with Palmer-Wasilla Highway	31,947	33,270	29,753
Parks Highway junction with Seward Meridian Road	19,487	20,292	21,113
Parks Highway junction with Crusey Street	33,000	30,575	31,800
Wasilla Fishhook Road junction with Parks Highway	8,880	9,751	9,798

Source: DOT&PF Annual Traffic Volume Report, as accessed 1/05
www.dot.state.ak.us/stwdplng/mapping/trafficmaps/trafficdata_reportscen/2003VRPT.pdf

As can be seen in the table above, traffic on the KGB Road at the Parks Highway junction has averaged around 10,000 trips per day over the last several years, while traffic on the Parks Highway junction with KGB Road and Main Street has ranged between nearly 30,000 and 33,000 trips per day.

The reduction in traffic between 2001 and the 2003 is likely a result of the Palmer-Wasilla Highway extension. The Palmer-Wasilla Highway was extended south of the Parks Highway and connected with KGB Road at Glenwood Avenue in 2002. The project included a grade-separated railroad crossing south of the Parks Highway and construction of a paved separated path. The extension was built to relieve pressure caused by congestion in the city core at the KGB Road-Parks Highway intersection, thereby reducing volumes of traffic through Wasilla's busiest intersection.

In the long-term, a road/highway bypass of downtown Wasilla may be the required solution. For many years, long-term transportation plans in Wasilla have included either a rail or highway bypass. In the near term, a grade separation of the KGB-ARRC intersection and increased capacity on the existing roadways are needed. The DOT&PF is pursuing highway improvement projects to address the roadway needs and the ARRC is pursuing the grade-separated crossing.



Train Depot Location Exacerbates Congestion. The existing railroad depot is located on the existing mainline, in downtown Wasilla, near the intersection of the KGB Road and Parks Highway. The depot has a siding, the mainline track running adjacent to the facility, a small parking lot, and a rail platform. The ARRC owns the property that the existing depot sits on, but no longer owns the depot building itself because the ARRC donated the depot to the City. The historic train depot houses the Greater Wasilla Chamber of Commerce. The ARRC only uses the platform occasionally, as a flag stop, to allow local residents to load and unload. The primary problem is when the train stops to pick up passengers; it blocks the KGB Road and southbound turns off of the Parks Highway.

In a separate report, the ARRC is examining several potential commuter rail station locations in the Wasilla vicinity. Given the interference with the KGB Road, the existing location is not satisfactory. See Section 7 for more details on future intermodal and commuter facility plans for Wasilla.

3.3 Congestion & Travel Delays Caused at the Crossing

Typical train speed at the KGB Road crossing is 49 miles per hour (mph). As a train approaches the KGB Road crossing, lights start flashing and bells will ring for three seconds, and then the gates start down. The gates will reach the horizontal position in about 12 seconds, and the train will be crossing about five seconds later. This is an average time sequence of 20 seconds of warning before the train arrives. Trains block the crossing for varying periods, depending on the length and speed. The average total time the crossing is blocked is 1 minute, 42 seconds. A shorter train (approximately 2,000 feet), such as the daily summer northbound (230N) or southbound passenger trains (230S), would block the crossing for 1 minute, 15 seconds. A larger train, such as an 80-car northbound empty coal train (183N) would take more than 2 minutes. Southbound trains experience a speed change just south of the KGB Road crossing, which generally increases the amount of time through the crossing.

Using the time schedule from Tables 1 and 2, the amount of time the KGB Road is blocked varies daily between nearly 9 minutes total on a winter Friday to nearly 16 minutes total on a summer Sunday. The crossing is blocked longer in the summer because more trains are operating. These times do not reflect a new gravel service beginning in the summer of 2004. The gravel trains traveled through Wasilla this past summer to accommodate the opening of Quality Asphalt Paving's new gravel pit located on the northwest outskirts of the City of Wasilla. The gravel service addition adds up to 15 extra minutes of trains daily crossing the KGB Road during the summer. These are also optimum train times, which do not reflect differences in train operators and engineers and other considerations, such as weather. The time the trains are actually blocking the KGB Road crossing is likely higher than the listed optimum crossing times. Table 2 depicts the daily train delay caused at the KGB Road crossing during the summer and winter, not including the new gravel service.

3.4 Growing Highway and Rail Demand Will Worsen the Problems

Rail demand for use of the crossing is anticipated to grow and further exacerbate roadway congestion, travel delay, and safety. The types of trains traveling through the KGB Road crossing are a mix of northbound and southbound; empty and loaded; freight, coal, oil, gravel, and passenger trains. Table 1 lists the types of trains and their corresponding lengths and approximate time it takes to cross through the KGB Road. Throughout the year, there are occasional passenger charter trains, company work trains, and other extra trains that cannot be accurately predicted. A new gravel train service for Quality Asphalt began early summer 2004. A more detailed time schedule of rail traffic at the KGB Road crossing is depicted in Figures 1 and 2.

Most of the transportation issues facing the Wasilla area stem from the rapid population growth and subsequent increase in roadway traffic and congestion. The Parks Highway is heavily used throughout the year by tourists and Alaskans traveling between Fairbanks and Anchorage and to Denali National Park. As one of the fastest growing regions in Alaska, the Parks Highway will continue to see an increase in the average daily traffic count.

If feasible, the ARRC foresees commuter rail as a large portion of their future daily train traffic at the KGB Road crossing. Over the past two decades, studies have been conducted analyzing the potential for commuter ridership between Anchorage and surrounding communities. Table 3 depicts peak existing and forecasted daily rail traffic through the KGB Road crossing.

ARRC in Wasilla
Approximately 6 miles (ARRC MP 156.6 to 162.7) of Alaska Railroad tracks pass through the city limits of Wasilla, all on the south side of the Parks Highway. There are six at-grade road/rail intersections within the city limits.



The Historic Wasilla Train Depot near the Knik-Goose Bay Road Rail Crossing

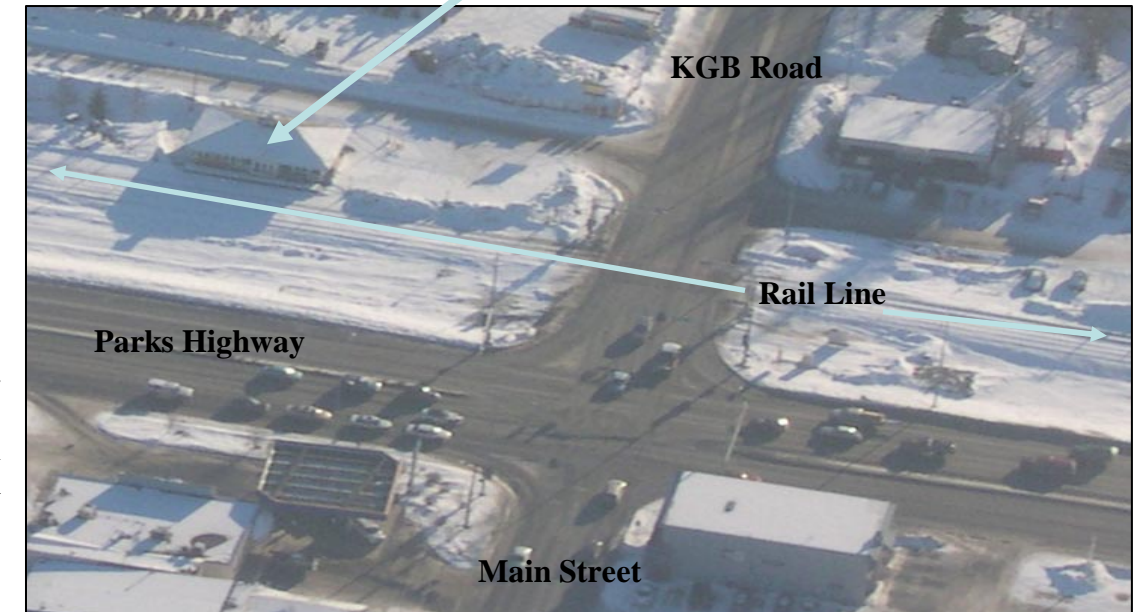




Table 1. Approximate Time Trains Occupy the KGB Crossing

Train Type	Approximate Time through Crossing**	Approximate Number of Train Cars
130N (Northbound empty oil train)	2 minutes 25 seconds	70
183N (Northbound empty coal train)	2 minutes 25 seconds	80
130S (Southbound loaded oil train)	2 minutes	70
183S (Southbound loaded coal train)	2 minutes 25 seconds	80
135S (Southbound empty trailer train)	2 minutes	40
135N (Northbound loaded trailer train)	2 minutes	40
235N (Northbound passenger train)	40 seconds	4
235S (Southbound passenger train)	40 seconds	4
230N (Northbound Daily Summer passenger train)	1 minute 15 seconds*	24
230S (Daily Summer Southbound passenger train)	1 minute 15 seconds*	24
150N (Northbound empty gravel train)	2 minutes 25 seconds	80
150S (Southbound loaded gravel train)	2 minutes 25 seconds	80

Source: ARRC Signals Director, 2004.

* Times are variable due to tourist companies and how many cars they attach to the train, particularly during the peak or shoulder season.

** All times are optimum times. Actual time will vary and will probably be higher due to variations in the way different engineers operate the train and any special instructions that may affect the train operations. Northbound passenger trains stopping at the depot may block the crossing while passengers are loading and unloading. If the train doesn't block the crossing, the time it blocks the crossing once moving would be longer than 75 seconds due to acceleration time.

Table 2. Approximate Daily Delay at the KGB Crossing Due to Trains

Daily Delay at the KGB Road Crossing	Winter	Summer
Sunday	13 min. 55 sec.	15 min. 45 sec.
Monday	10 min. 50 sec.	15 min. 20 sec.
Tuesday	10 min. 50 sec.	15 min. 20 sec.
Wednesday	10 min. 50 sec.	15 min. 20 sec.
Thursday	11 min. 15 sec.	15 min. 45 sec.
Friday	8 min. 50 sec.	11 min. 20 sec.
Saturday	9 min. 30 sec.	11 min. 20 sec.
Weekly Total	76 min. 50 sec.	100 min. 10 sec.

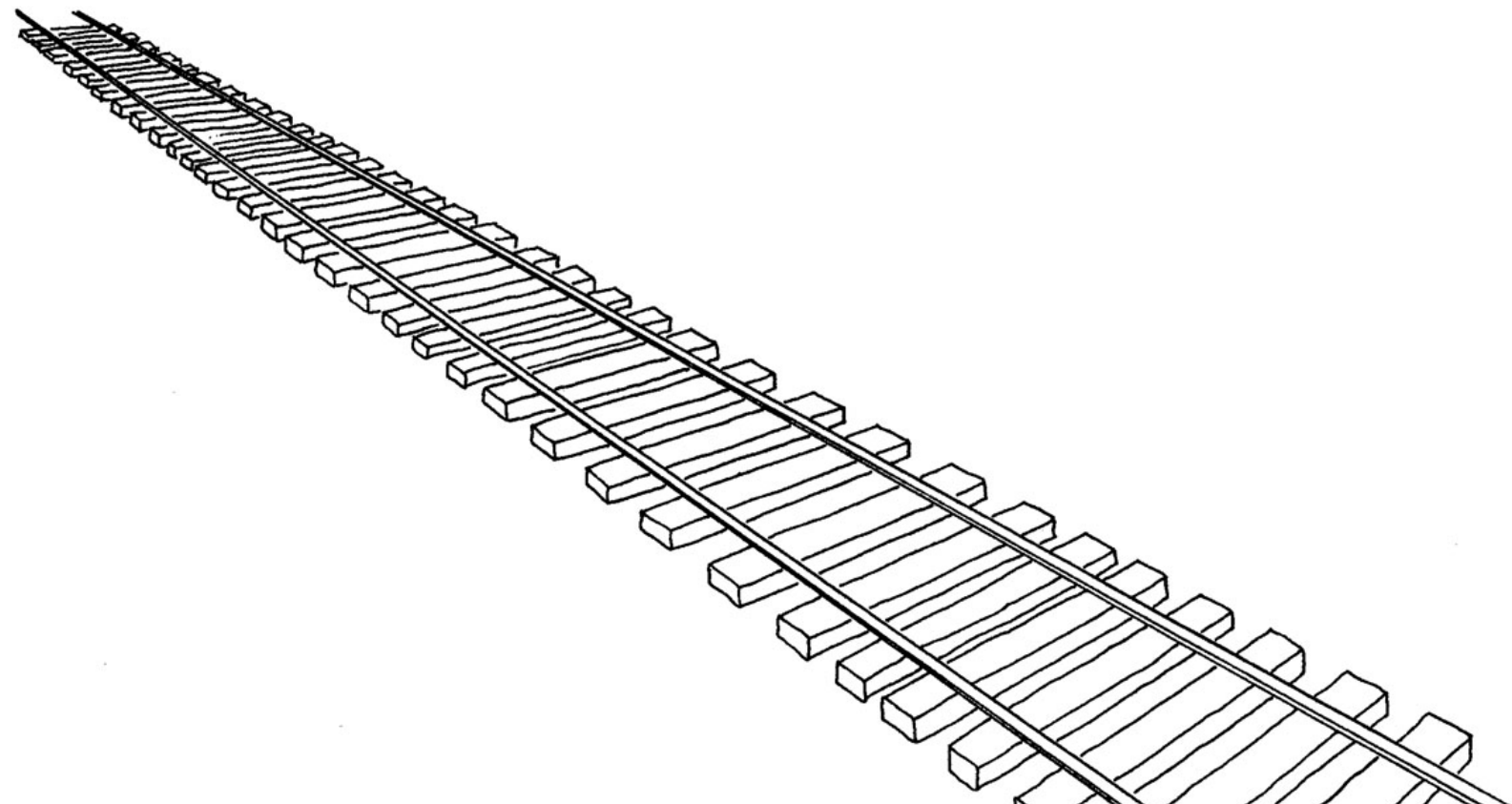
Summer and Winter Rail Traffic through the at-grade KGB Road Crossing

During the winter, on average, seven trains go through the KGB Road crossing on Sundays; five on Mondays; five on Tuesdays; five on Wednesdays; five on Thursdays; four on Fridays; and five on Saturdays. In the summer, the 235 southbound and northbound passenger train is replaced with a daily northbound passenger train crossing the KGB Road at 9:45 a.m. and a daily southbound passenger train running through the KGB Road crossing at 6:30 p.m. During the summer, on average, 12 to 13 trains are traversing through the crossing daily. A new gravel train service began in the summer of 2004. For purposes of this report and the time schedule described here, the expected summer gravel train schedule adds four trains daily on Monday through Saturday, with an occasional train on Sunday.

Southbound trains are flexibly scheduled to fit around the northbound train traffic, which is more rigidly scheduled. Most trains run on a tighter schedule and cross the KGB Road at specific times during the day. Other trains cross the KGB Road within a time range rather than at a specific scheduled time. These trains are typically the southbound loaded oil train, southbound loaded coal train, southbound empty trailer train, and northbound empty coal train.

Table 3. Peak Daily Rail Traffic at the KGB Road Crossing

Train Type	2004 Peak Daily Train Traffic			2025 Future Peak Daily Train Traffic		
	Day	Night	Total	Day	Night	Total
Base						
Passenger (through Wasilla)	2	0	2	6	0	6
Passenger (Commuter)	-	-	-	16	0	16
Freight	2	4	6	4	6	10
Gravel	2	2	4	4	4	8
Coal	1	1	2	1	1	2
Total Base	7	7	14	31	11	42
Occasional						
Passenger Charter	2	0	2	4	0	4
Company Work	4	0	4	4	0	4
Total Base + Occasional (Peak)	13	7	20	39	11	50





4.0 Preliminary Purpose and Need

A well-specified statement of the problem for which alternative solutions are being analyzed is a key early step of the alternatives analysis planning process. Later, as part of the NEPA process, the "purpose and need" establishes the problems that must be addressed in the analysis; serves as the basis for the development of project goals, objectives, and evaluation measures; and provides a framework for determining which alternatives should be considered as reasonable options to a given problem. More fundamentally, the statement of purpose and need serves to articulate – and justify - why an agency is proposing to spend potentially large amounts of taxpayer's money to study and implement a project that may cause significant environmental impacts, and why these impacts are acceptable.

For studies performed outside of NEPA, the same type of information should be generated. Like the purpose and need statement, this information provides the context for performing the analysis and for identifying the measures against which alternatives strategies are to be evaluated. It also serves as an introduction for decision makers (like FTA, but also local and state agencies), stakeholders, and the general public to the study area and its transportation problems and needs.

The Alaska Railroad has identified a need to construct a grade-separated crossing of the Alaska Railroad in the vicinity of downtown Wasilla to allow the closure of the current at-grade crossing on Knik-Goose Bay (KGB) Road. The intent of the proposed project is to address a number of safety concerns and operational inefficiencies caused by the at-grade crossing of KGB Road with the ARRC rail tracks and the resultant vehicle congestion, travel delay, capacity problems and safety concerns. The purposes of the project are to:

- **Improve safety by eliminating the potential for train-vehicle collisions** caused by:
 - Growing vehicle and train traffic through the crossing, and
 - Driver failure to comply with traffic regulations at this complex intersection.
- **Maintain roadway and access circulation with sufficient north-south capacity.** In other words, simply closing KGB Road would not be reasonable. The solution must account for the anticipated growth in north-south roadway traffic and circulation needs in downtown Wasilla.
- **Eliminate congestion caused by trains closing the intersection** during traverses of the crossing and while stopped at the depot.

As the traffic of both vehicles and trains grows the inherent safety risk also increases. Improving the safety of the crossing is the overriding goal of the project. The intent of the proposed improvements would be to improve the safety of the transportation network by removing the possibility of a train-vehicle collision. A bridge would be built to carry either the rail over the road or visa versa. Putting the two systems on different levels would eliminate the potential conflicts.

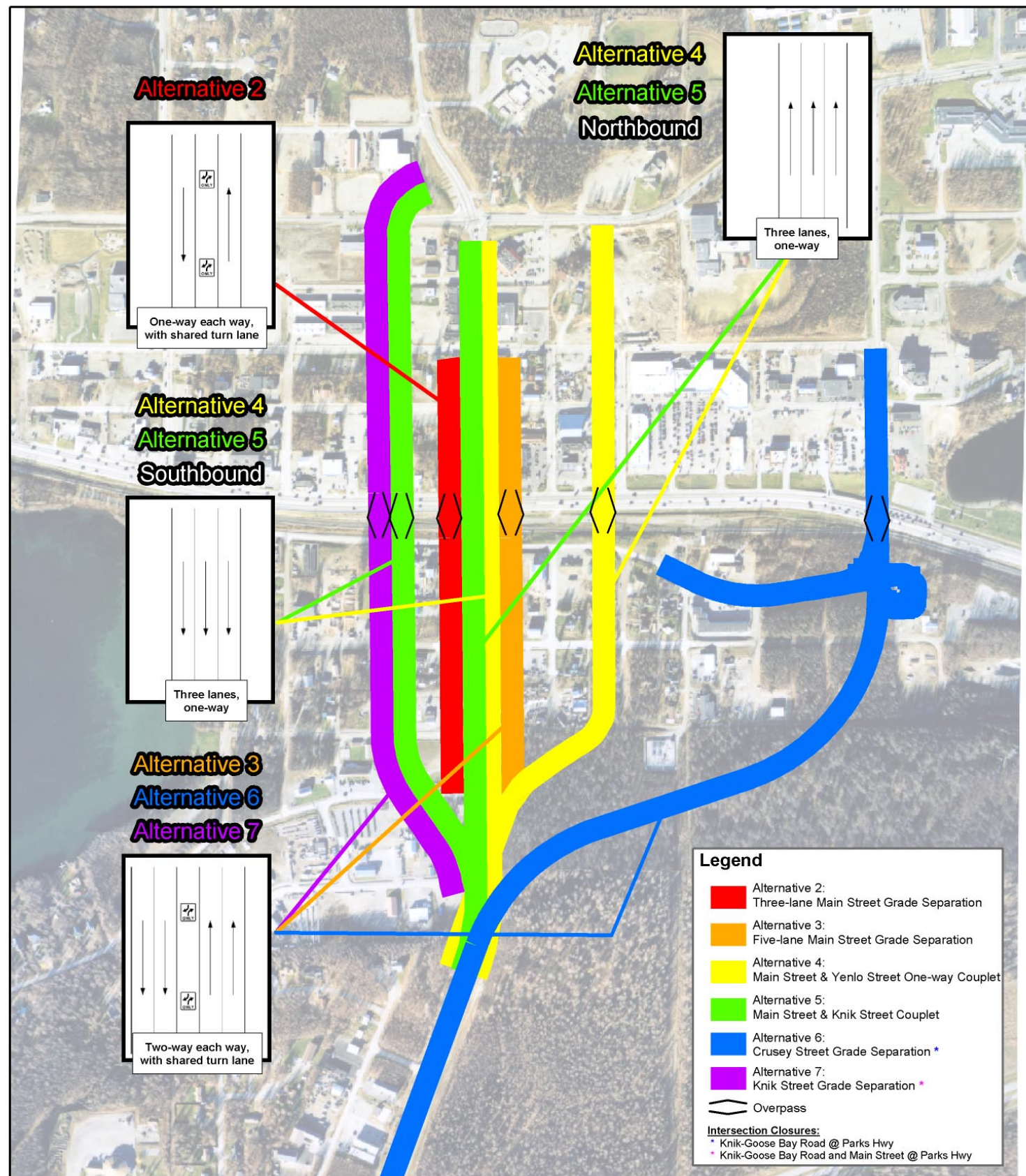
The growing roadway traffic not only causes concerns for the ARRC, but the DOT&PF has been building improvements on the Parks Highway and is studying capacity improvements for KGB Road-Main Street. By eliminating the additional delay interjected into the roadway network by the ever increasing train traffic, traffic circulation and capacity for vehicles would be improved. Moreover, it is critical that any improvements that are made be sized sufficiently to take into account the projected growth in roadway traffic.

Goals of Improving the Knik-Goose Bay Road at the Railroad and Parks Highway Intersection

- To improve vehicle-train safety.
- To improve travel times.
- To improve vehicle capacity & circulation.
- To maintain local access and through traffic.
- To satisfy existing and future traffic demand.



The Wasilla Historic Depot & existing railroad platform and tracks are located immediately south of the Parks Highway and east of the Knik-Goose Bay Road



“Road over Rail” Alternatives

5.0 Conceptual Alternatives

In this analysis, two types of grade separations are considered – “Road over Rail” concepts, in which the road alignments go over the rail alignment, and the “Rail over Road” concept, in which the railroad goes over KGB Road. Eight alternatives have been conceptually engineered. The adjacent figure shows the six “Road over Rail” alignments. Note that all of the road over rail options also go over the Parks Highway (due to the roadway’s grade requirements, there is insufficient distance to get back to grade in the short distance between the tracks and the Parks Highway). Sub-options vary between mixing certain road configurations that are grade-separated with at-grade roads intersecting the Parks Highway, to one-way southbound or northbound travel lanes configured as couplets. Many of these alternatives have been considered in the past by DOT&PF. None have been pursued due to the impacts on right-of-way, businesses, and downtown ambiance.

Alternative 1 presents the **No Action** Alternative. In this alternative no improvements would be made. The existing crossing between the KGB Road and the ARRC rail line would remain at-grade.

Alternative 2 explores an alternative that develops a bridge over the rail line that would have one travel lane each direction plus a center turn lane. The **three lane cross-section would add capacity to the KGB-Main Street** road network. A three-lane road cross-section with an at-grade crossing is currently being examined by the DOT&PF to determine if it would have enough capacity.

Alternative 3 explores developing a 5-lane bridge over the rail line that would have two travel lanes each direction plus a center turn lane. A **five lane cross-section would greatly add capacity to the KGB-Main Street** road network. A five-lane road cross-section with an at-grade crossing is currently being examined by the DOT&PF to determine if it would have enough capacity.

Alternative 4 presents a couplet that pairs **Yenlo Street** as a 3-lane northbound facility with **KGB-Main Street** as a 3-lane southbound facility. Northbound Yenlo is depicted as an overpass. Such a concept could be combined with Alternative 2 (i.e. grade separating both legs of the couplet). A similar couplet, with at-grade intersections, is currently being examined by DOT&PF.

Alternative 5 presents a couplet that uses **KGB-Main Street** as a 3-lane northbound facility with **Knik Street** as a 3-lane southbound facility. Southbound Knik Street is depicted as an overpass. Such a concept could be combined with Alternative 2 (i.e. grade separating both legs of the couplet). A similar couplet with at-grade intersections is currently being examined by DOT&PF.

Alternative 6 consists of connecting KGB Road with **Crusey Street** as a **five-lane roadway** with an overpass over the Parks Highway/ARRC tracks. Ramps would connect to Railroad Avenue to facilitate a connection between the north and south sides of downtown.

Alternative 7 proposes connecting KGB Road with **Knik Street** as a **five-lane roadway** with an overpass of over the Parks Highway/ARRC tracks.

Alternative 8 would take the **ARRC tracks over the KGB roadway**. The track would be raised on an embankment with a bridge structure over the roadway. The bridge could be sized to accommodate either 3 or 5 lanes.



Alternative 8 – “Rail over Road”



Conceptual Alignment Alternatives Comparison

Table 4 summarizes key characteristics relating to the alternatives, including which roads are impacted; whether roads are grade-separated or at-grade; how many lanes the roads will have; in certain cases, direction of traffic; road access closures where applicable; number of on and off ramps to access the Parks Highway; number of parcels impacted; estimated right-of-way costs; and total estimated cost of each alternative. The next section describes each alternative in further detail.

Table 4. Conceptual Alignment Alternative Comparison

Characteristics		Alternative 1 Present Main Street configuration	Alternative 2 Three-lane Main Street Grade Separation	Alternative 3 Five-lane Main Street Grade Separation	Alternative 4 Main Street & Yenlo/ Talkeetna Streets One-way Couplet	Alternative 5 Main Street & Knik Street Couplet	Alternative 6 Crusey Street Grade Separation	Alternative 7 Knik Street Grade Separation	Alternative 8 KGB Road Grade Separation
“Road over Rail”									
Total Number of Lanes		3 lanes	3 lanes	5 lanes	6 lanes	6 lanes	5 lanes	5 lanes	3 or 5 lanes
Main Street/KGB Road at Parks Highway Intersection		At-grade	Grade-separated	Grade-separated	At-grade	At-grade	Intersection closed at KGB Road; Main Street open at Parks Highway intersection (Main Street “T” to highway)	Intersection closed at KGB & Main Street.	Grade-separated
Main Street/KGB Road		3-lane	One-way each way, with a shared turn lane	Two-way each way, with a shared turn lane	<u>Southbound:</u> Three lanes, one-way	<u>Northbound:</u> Three lanes, one-way			3-lane
Couplet	Yenlo Street & Talkeetna Street at Parks Highway Intersection				Grade-separated overpass				Three lanes in one direction on each street Grade separation of the ARRC with either: (1) Main Street, (2) Main Street and Boundary/Yenlo, or (3) Main Street and Knik Street
	Yenlo Street/Talkeetna Street				<u>Northbound:</u> Three lanes, one-way traffic				
Couplet	Knik Street at Parks Highway Intersection					Grade-Separated overpass			
	Knik Street					<u>Southbound:</u> Three lanes, one-way traffic			
Crusey Street at Parks Highway Intersection							Grade-separated		
Crusey Street							Two-way each way with center turn lane		
Knik Street at Parks Highway Intersection								Grade-separated	
Knik Street								5-lane (2 lanes each way with center turn lane)	
Intersection road closures to the Parks Highway		None	Total: 6 Knik Street, Boundary Street, Yenlo Street, and 3 access driveways	Total: 6 (Same as Alternative 2)	Total: 3 3 access driveways	Total: 1 Willow Street	Total: 4 KGB Road, 3 access driveways	Total: 6 Willow Street, Main Street, Boundary Street, KGB Road, and 2 access driveways	None to the Parks Highway*
On-Off ramps to Parks Highway**		None	Total: 4 One each: Eastbound and Westbound, on & off ramps	Total: 4 (Same as Alternative 2)	Total: 2 One Westbound off ramp, One Eastbound on ramp	Total: 1 One Westbound on ramp.	Total: 4 One each: Eastbound and Westbound, on & off ramps	Total: 4 One each: Eastbound and Westbound, on & off ramps	Not Applicable
Number of Parcels Impacted by the Alignment		0	23	35	24	42	15	46	2
Estimated Right-of-Way (ROW) Costs***		0	\$2.0 million	\$5.2 million	\$9.0 million	\$5.5 million	\$850,000	\$5.4 million	\$50,000****
Total cost (including design, ROW & construction)		\$3.5 million	\$15.4 million	\$23.9 million	\$39.2 million	\$33.8 million	\$47.3 million	\$35.9 million	\$32.5 million

* The Frontage Road, which runs south and parallel along the Parks Highway would be closed off west of the KGB Road. The Frontage Road east of KGB Road would have to be relocated slightly to the south.

** The Parks Highway is an urban arterial serving as a strip commercial business roadway through Wasilla. Ramps would necessitate approximately 1/2-mile (1/4-mile ramp and 1/4-mile merge/weave) controlled-access before the next open driveway.

*** Right-of-way cost is according to a “total take” of the parcel (total appraised value of the land and buildings) regardless of the percentage of impact to the parcel.

**** Value is low because the alignment assumes most of the existing ARRC right-of-way; therefore only 2 parcels are impacted.



Conceptual Alignment Alternatives

In this analysis, eight alternatives have been conceptualized to alleviate traffic congestion at the KGB-Parks Highway intersection. The following section presents a no action alternative (Alternative 1). A no action alternative is often presented to depict baseline conditions with which to compare the other alternatives and to identify conditions that are anticipated if nothing is done to remedy the problems.

Alternative 1:

Alternative 1 (No Action Alternative) Present Main Street configuration

- **At-grade** intersection remains at the Main Street/KGB Road/Parks Highway Intersection
- **3-lane** Main Street/KGB Road
- 20-year traffic capacity demands **not met** for road system
- Does not disrupt existing businesses

Present Main Street At-Grade configuration

The current three-lane at-grade intersection of the Parks Highway at Main Street-KGB Road would remain at-grade and the tracks would not be relocated. There is not much that can be accomplished to significantly improve the capacity or safety of the intersection, as it exists now.

Trains and vehicles would continue to stop on the ARRC tracks. Northbound traffic on the KGB Road stopped at the Parks Highway intersection will continue to back up across the railroad tracks. Southbound KGB Road traffic that is required to stop at all crossings (buses, fuel trucks, hazmat vehicles, etc) would continue to slow down and back up traffic on the Parks Highway.

Keeping traffic moving at the intersection

Northbound traffic on KGB Road causes traffic to back up over the ARRC tracks, causing safety concerns. Allowing traffic to travel southbound only from Main Street onto KGB Road would alleviate traffic that would otherwise be backing up over the railroad tracks.

Alternatives 2, 3, 4, and 8 either grade separates the KGB Road-Parks Highway intersection or has southbound-only traffic traveling through the rail crossing.



Main Street/ KGB Road: Existing Conditions (Road & Rail At-grade)



**Alternative 2
Three-lane Main Street Grade Separation**

- **Grade-separated** intersection at the Main Street/KGB Road/Parks Highway Intersection
- **One-way** each way with a divided turn lane
- 20-year traffic capacity **not met** for road system
- ROW/Business impacts

**Alternative 2:
Three-lane Main Street Grade-Separation**

Under Alternative 2, the Main Street/KGB Road and Parks Highway intersection would be grade-separated. From the north, the 3-lane alignment would begin at Swanson Avenue, near the City library. Main Street would rise over the Parks Highway and become KGB Road. Main Street/KGB Road would be one-lane, each way, with a divided turn lane. The overpass would begin to rise south of Herning Avenue, continuing over the Parks Highway and leveling off before touching back on the ground near Lakeview Avenue.

Under this alternative, a large fill contained by retaining walls would have to be constructed in order to cross the Parks Highway and the railroad tracks. The walls would be close to many Main Street businesses. Additional fill for retaining walls would be placed south of the Parks Highway intersection for eastbound on- and off-ramps and north of the Parks Highway intersection for westbound on- and off-ramps.

A westbound off-ramp and a westbound on-ramp of the Parks Highway would close six intersections/ access driveways north of the Parks Highway between Yenlo Street and Knik Street. Traffic normally accessing these businesses from the Parks Highway would have to find a different access route. Direct access on and off the Parks Highway from the north would be restricted to the on- and off-ramps at Main Street. Direct access on and off the Parks Highway from the south would be restricted to KGB Road, as it currently is now, except access would be via on- and off-ramps. Additional fill for retaining walls would be placed south of the Parks Highway for eastbound on- and off-ramps.

**Alternative 3
Five-lane Main Street Grade Separation**

- **Grade-separated** intersection at the Main Street/KGB Road/Parks Highway Intersection
- **Two-way** each way with a shared turn lane
- 20-year traffic capacity **met** for road system
- Extensive ROW/Business impacts
- Potential Section 4(f) impact to Wasilla Community Hall/Museum (ANC-135)
- Past public involvement shows a five-lane alternative in front of the museum and along Main Street is not acceptable to the public or local government (Public Hearing 3/3/92 for Wasilla Fishhook Road, DOT&PF Project No. 53150)

Alternative 3: Five-lane Main Street Grade-Separation

This alternative is similar to Alternative 2, although the amount of lanes is increased by one in each direction, making KGB Road a total of five lanes instead of three. From the north, this five-lane grade-separated alignment begins at Swanson Avenue, raises and crosses over the Parks Highway, and continues on to Lakeview Avenue. Main Street/KGB Road would be two lanes in each direction, with a shared center turn lane.

This one-way couplet alternative was developed with the primary idea of keeping Main Street in its current location, but converting it to three lanes. With this concept, however, there would still be an at-grade crossing of the Parks Highway and the railroad. Both Boundary Street and Yenlo/Talkeetna Streets were looked at for the pair; however, with an embankment fill, it would not be possible to provide driveway access to the abutting properties if Boundary Street were chosen as an option.

This alternative is designed to meet future suggested traffic needs. Under this alternative, as with Alternative 2, large fill or walls would be necessary on Main Street to provide the grade-separated crossing of the Parks Highway and the railroad. Businesses would be significantly impacted, with one side of development being inaccessible. The walls would be close to many Main Street businesses, many of which would have to be relocated or acquired. Additional fill for retaining walls would be placed south of the Parks Highway for eastbound on and off ramps.

A westbound off-ramp and a westbound on-ramp of the Parks Highway would close six intersections/ access driveways north of the Parks Highway between Yenlo Street and Knik Street. Direct access on and off the Parks Highway from the north would be restricted to Main Street, and from the south, Parks Highway access would be restricted to the KGB Road, as it is now.

**Alternative 4
Main Street & Yenlo /Talkeetna Streets One-Way Couplet**

- **At-grade** crossing at the Main Street/KGB Road/Parks Highway Intersection
- Main Street/KGB Road becomes **three lanes, one-way** traffic travels southbound (this avoids northbound traffic from stopping over the ARRC tracks which currently happens)
- **Grade-separated** Yenlo/Talkeetna Streets overpass
- Yenlo/Talkeetna Streets become **three lanes, one-way** traffic travels northbound
- 20-year capacity **met** for road system
- Does not disrupt existing businesses on Main Street
- No access to businesses along Boundary Street or Yenlo Street
- Difficult transitions at each end

**Alternative 4:
Main Street and Yenlo/Talkeetna Streets One-Way Couplet**

Under Alternative 4, Main Street/KGB Road would be converted to three lanes and one-way traffic would travel southbound. There would still be an at-grade crossing of the Parks Highway and the railroad tracks. Yenlo/Talkeetna Streets would be converted to three lanes and accommodate one-way travel northbound via a grade-separated overpass.

The intent of this alternative, is if the couplet is paired with a street to the east (Yenlo/Talkeetna), then the one-way southbound Main Street traffic would not back up across the railroad tracks while waiting at a red light. Traffic would be required to make right/left turns to return to the Main Street/KGB Road, or new intersections would have to be constructed at the turnaround close to Centaur Avenue to the south, and the tie-in to Bogard Road to the north. A turnaround near Centaur Avenue would be available for cars heading southbound on KGB Road to turnaround and head north on Talkeetna Street. There would be an off-ramp at Yenlo Street for westbound traffic, and an eastbound traffic on-ramp at Talkeetna Street.



**Alternative 5
Main Street & Knik Street Couplet**

- **At-grade** crossing at the Main Street/KGB Road/Parks Highway Intersection
- Main Street/KGB Road becomes **three lanes, one-way** traffic travels northbound (traffic still backs up across ARRC tracks)
- **Grade-separated** Knik Street overpass
- **Knik Street** becomes three lanes, one-way traffic travels southbound
- 20-year capacity **met** for road system
- Does not disrupt existing Main Street businesses
- Buys out entire Knik Street Business district
- Difficult transitions at each end

Alternative 5: Main Street and Knik Street Couplet

With this alternative, Main Street/KGB Road would be converted to three lanes and one-way traffic would travel northbound. There would still be an at-grade crossing of the Parks Highway and the railroad tracks. Knik Street would be converted to three lanes and accommodate one-way travel southbound. The three-lane Knik Street would tie in to Wasilla Fishhook Road to the north and tie in to KGB Road near Centaur Avenue to the south. A turnaround near Centaur Avenue would be available for vehicles heading southbound on Knik Street to turnaround and head north on KGB Road. The three-lane Main Street/KGB Road would begin at Bogard Road to the north and become two lanes at the tie-in near Lakeview Avenue, as does Knik Street.

This Alternative was designed to retain the couplet concept and to minimize impact on development that has occurred along Boundary Street and Yenlo Street. Development in recent years has almost precluded a grade-separated Boundary Street and Yenlo Street. This alternative would provide the necessary traffic capacity. However, the drawback of this alternative is having Main Street as the northbound leg and traffic again backing up across the railroad tracks at the Main Street/KGB Road and Parks Highway signal.

**Alternative 6
Crusey Street Grade Separation**

- **Grade-separated** intersection at the Crusey Street/Parks Highway Intersection
- Two-way each way with center turn lane
- Can connect to either Railroad Avenue or extend to Glenwood Avenue/KGB Road
- 20-year traffic capacity **met** for road system

Alternative 6: Crusey Street Grade-Separation

Under this alternative, Crusey Street would be grade-separated. Crusey Street would begin to the north as a two-way each way, rising up sharply from Swanson Avenue, crossing over the Parks Highway and the railroad, and continuing south to connect to the KGB Road at either Railroad Avenue and/or before Glenwood Avenue. Once over the Parks Highway, southbound traffic would be able to take an off-ramp from Crusey Street onto Railroad Avenue. Alignment 2 would be less curvilinear for through trips. The KGB Road at-grade crossing of the railroad would be closed between the Parks Highway and Railroad Avenue. Traffic traveling eastbound on Railroad Avenue wanting to go north of the Parks Highway would access Crusey Street by going underneath Crusey Street, and then on a circular ramp that brings traffic onto Crusey Street. Access to and from the Parks Highway from Crusey Street would be via on-off ramps – a westbound off-ramp, a westbound on-ramp, an eastbound on-ramp, and an eastbound off-ramp.

The main disadvantage to this idea is the grade between Swanson Avenue and the crossing over the Parks Highway is close to 8 percent. Also, the access between the KGB Road and Wasilla-Fishhook Road is inconvenient unless a better connection is constructed between Crusey Street/Bogard Road and Wasilla-Fishhook Road.

Traffic wanting to move from one side of the Parks Highway to the other will have to use the grade-separated Crusey Street. Motorists used to using the Main Street/ KGB Road and Parks Highway intersection may find the new route via Crusey Street a bit circuitous.

**Alternative 7
Knik Street Grade Separation**

- **Grade-separated** intersection at the Knik Street/Parks Highway Intersection
- **5-lane** Knik Street (2 lanes each way with center turn lane)
- Railroad crossing by KGB Road is closed; Main Street becomes a “T” with the Parks Highway
- 20-year traffic capacity **met** for road system
- Does not disrupt existing businesses on Main Street
- Buys entire business district on Knik Street

Alternative 7: Knik Street Grade-Separation

This alternative realigns most of the northbound and southbound through traffic into a five-lane Knik Street grade-separated crossing of the Parks Highway. In an effort to remove the through trips from the Main Street business center, this alternative aligns the KGB Road and the Wasilla-Fishhook Road with Knik Street to provide a continuous corridor. Knik Street would become a five-lane urban arterial. The railroad crossing would be closed, in effect, keeping KGB Road local in character, with a “T” intersection to the Parks Highway. The Knik Street transition into the KGB Road would be a smooth realignment on the south end; on the north end, Knik Street would run into Wasilla-Fishhook Road just north of the Bogard Road and Main Street intersection.

Like Alternatives 2 and 3, a fill contained by retaining walls would have to be constructed in order to cross the Parks Highway and the railroad tracks. A westbound off-ramp and a westbound on-ramp of the Parks Highway would close six intersections/access driveways. Additional fill for retaining walls will be placed south of the Parks Highway for eastbound on- and off-ramps.

Most likely, an entire row of lots will have to be acquired on the east side of Knik Street. Under this alternative, the drawbacks are the circuitry of access for KGB Road traffic bound for the westbound Parks Highway – probably the majority of the trips will use the Tommy Moe Drive. An option would be an eastbound on-ramp that could be provided between the Parks Highway and the railroad.



Alternative 8

KGB Road Grade Separation (“Rail over Road”)

- **Grade-separated** intersection at the Knik Street/Parks Highway Intersection with the Railroad elevated over KGB Road
- Alignment assumes most of the existing ARRC right-of-way
- Creates a major embankment running west to east along downtown Wasilla

Alternative 8: Main Street Grade Separation (“Rail over Road”)

This is the only alternative that elevates the railroad over KGB Road. The alignment would begin climbing on an embankment near Lake Lucille on the west (railroad north) end of the project, climbing to a height of about 25 feet at the crossing of KGB Road. East (railroad south) of KGB Road the embankment would run out to near South Wasilla Street before touching back down. The crossing of KGB Road would accommodate up to six travel lanes and sidewalks under the bridge. The crossing and embankment would look much like the railroad’s crossing of Dimond Boulevard in Anchorage (see adjacent photo).

To maintain rail service during construction, a shoofly track would be constructed on an alignment that runs approximately along Railroad Avenue. The alignment elevates the tracks over the cross streets running south of the Parks Highway, including KGB Road. Traffic patterns would remain the same, except for the elimination of a railroad crossing. Railroad Avenue, a frontage road that runs south and parallel along the Parks Highway, would be closed west of the KGB Road. The Frontage Road east of KGB Road would have to be relocated slightly to the south.

The existing historic depot at the KGB Road-ARRC intersection, which houses the Wasilla Chamber of Commerce, would need to be relocated because of the embankment created by this alternative. The depot’s platform, which is still used occasionally by the ARRC as a flag stop would be eliminated. An interim flag stop location may need to be constructed until a new depot/station/intermodal facility is constructed. The Wasilla Chamber of Commerce has no immediate intentions of moving the depot to another location. If needed to do so because of this alternative or some other track realignment, the Chamber of Commerce has considered moving near the City’s new multi-use sports complex.



Example of a grade-separated rail crossing (“Rail over Road”) over Dimond Boulevard in south Anchorage



6.0 Pre-NEPA Alternatives Analysis:

Human & Environmental Considerations

As mentioned earlier in Section 1, FTA does not require an Alternatives Analysis to be performed as part of the National Environmental Policy Act (NEPA) process. NEPA requires projects that use federal funds to evaluate design alternatives and locations, as well as potential impacts to the human and natural environment.

The purpose of this section is to identify the potential physical and environmental issues of potentially realigning the KGB-Main Street-Parks Highway intersection. The discussion of issues here is limited to those categories that may be impacted by any of the alternatives and that would need to be eventually addressed in further environmental analysis. Key issues that might require special study include Right-of-Way impact, Archeological and historic site impact, Section 4(f) impact, and contaminated sites impact.

Land Use

Land use within the project corridor consists primarily of residential and commercial. The project area is within the City of Wasilla and is subject to its zoning regulations. Because of the various permitted uses in the area, there are numerous locations with private residences or developed residential subdivisions next to commercial buildings.

Socioeconomics

Minor tax base reduction could occur due to ROW acquisition of private parcels. Relocations of displaced businesses and residences, and ROW acquisition would result in a slight decrease in the local tax revenues. Improved access to and through the area would increase the development potential of the area.

A modification to existing access due to raised medians has been a past concern of local business owners. Owners feel that circuitous travel caused by raised medians could adversely affect their business. Changes in access patterns could substantially affect business or commercial property values. Temporary road closures due to construction activities could cause delays and inconvenience to highway users and business owners.

Essential Fish Habitat/ Threatened & Endangered Species

There are no known streams that support anadromous or resident fish within the project area. The project corridor does not fall within the known range or habitat of any listed, proposed, threatened, or endangered species.

Coastal Zone

The project area falls within the boundaries of the Coastal Zone Management Plan for the Mat-Su Borough and is therefore governed by the regulations of the Alaska Coastal Management Program (ACMP).

Noise

Noise impacts would be a sensitive environmental issue associated in the project area. A noise analysis would be required during the environmental phase. Mitigation measures could include constructing noise barriers. There may be a possible decrease in horn sound if the at-grade crossing were eliminated because trains would not need to sound their horn at the crossing.

Archeological and Historic Sites

The following historical sites are documented Alaska Heritage Resources Survey (AHRs) sites.

- **ANC-456 Woodward Cabins**

The location of this site is on western side of Main Street, between Parks Highway & Herning Avenue. The site has historical significance; however, it was determined ineligible for listing on the National Register of Historic Places (NRHP).

Within the project corridor, the following three sites are identified as historically significant:

- **ANC-765 Tom Maurine/ Dodson Cabin**

This cabin is located on the western side of Knik Street, between Parks Highway & Herning Avenue, adjacent to the Oscar Tryck Cabin (ANC-764). The Maurine/Dodson Cabin was built in the early 1920s as a storefront and a residence for Mr. Maurine. The cabin operated as a commercial outlet for baked goods from the North Pole Bakery in Anchorage from the early 1920s until the early to mid-1930s when the structure was sold to Mr. and Mrs. Dodson. This cabin is considered eligible for the NRHP.

- **ANC-764 Oscar Tryck Cabin**

This cabin is located on western side of Knik Street, between Parks Highway & Herning Avenue, adjacent to ANC-765. The Oscar Tryck Cabin was originally constructed in the City of Knik. It was moved to Wasilla in 1917 after Oscar Tryck bought a townsite lot during the June 20, 1917 sale. This cabin is considered eligible for the NRHP.

- **ANC-135 Wasilla Community Hall/Museum**

This historical site is located on the eastern side of Main Street, between Herning Avenue and Swanson Avenue. The Wasilla/Community Hall/Museum is currently on the NRHP. This was built in 1930-1931 for use as the first community hall in Wasilla. It was built on land willed to the community of Wasilla by an early Wasilla homesteader. Threatened with demolition in the 1960s, the building's interior was fully refurbished. Renovations were made with centennial funds so the building could be used as the headquarters for the Wasilla-Knik-Willow Creek Historical Society.

The following sites found in the Wasilla vicinity are listed on the NRHP, according to the National Park Service website listing, as accessed 1/5/05:

- **Teeland's Country Store**, listed 1978-11-14, and located at mile 42 of the Parks Highway and Knik Road.
- **Wasilla Community Hall**, listed 1982-09-08. This is the same historical site as listed previously as AHRs ANC-135.
- **Wasilla Depot**, listed 1977-12-16, and located at the Parks Highway and Knik Road, as discussed in Section 3 of this report.
- **Wasilla Elementary School**, listed 1980-02-05, and off of the Parks Highway.



The Wasilla Community Hall/Museum, located on Main Street, is listed on the National Register of Historic Places and the Alaska Heritage Resources Survey.



Section 4(f) Properties

Section 4(f) of the U.S. DOT&PF Act of 1966 (80 Stat. 931, Public Law 89-670), as amended by 23 U.S.C. 138, states that no administrative action will use land from any significant publicly owned public park, recreation area, or wildlife and waterfowl refuge, or any historical site of national, state, or local significance unless there is no feasible and prudent alternative to the use of such land, and such action includes all possible planning to minimize harm to the land from such use. Leo M. Nunley Park (Townsite Park) is a 1.14 acre urban park located along Swanson Avenue between Willow and Knik Streets. A long safety fence separates the park from Swanson Avenue. The Townsite Park and ANC-135 (Wasilla Community Hall/Museum) may require a Section 4(f) evaluation.

Contaminated Sites

An Initial Site Assessment (ISA) was conducted in 1993 for the Wasilla-Fishhook Road Rehabilitation (DOT&PF Project No. 53150) to determine the potential of encountering hazardous substances. The Rehabilitation is proposed in a similar footprint of the KGB Road grade separation alternatives analysis project corridor footprint. An environmental re-evaluation (STP-0525[12]/54302) for the Alaska Department of Transportation & Public Facilities was conducted in August 2003. The re-evaluation found eight medium or high-risk sites in the project vicinity along KGB Road, from Glenwood Avenue to the Parks Highway, and along Main Street, from the Parks Highway to Bogard Road. Further coordination with Alaska Department of Environmental Conservation would be necessary to determine the project's potential to encountering impacted soils and contaminated sites within the project area.

Zoning

The majority of the land within the project corridor is commercially zoned. Several segments of land north of the Parks Highway, along Main Street, Herning Avenue, and Swanson Avenue are zoned public land. These areas house Wasilla City Hall, the public library, the museum historic block, and the public safety building. Land southeast of Crusey Street (Wasilla Lake Park) is also zoned public land. The most recent City of Wasilla Comprehensive Plan (October 1992) calls for improving the City's downtown historic block and improving recreational opportunities along Wasilla Lake.

7.0 Long-term Planning: The Project in Context

Two evolving transportation concepts would impact the Wasilla core area in a significant way. These are the Knik Arm Crossing and the Alternative Parks Highway corridor. For many years, long-term transportation plans in Wasilla have included either a rail or a highway bypass. These concepts are not included as part of an adopted long-term plan or schedule. For the purposes of the KGB Road grade separation, we assume neither projects are likely to be constructed in the next 20 years. While these major projects are on a longer study timeframe, the KGB Road and the Parks Highway intersection is already operating unacceptably and in critical need of improvements. Even if the ARRC rail line eventually moves out of the central business district of the City of Wasilla, potential future commuter rail may still use the existing rail line in the downtown area. It is reasonable to proceed with a study upon these assumptions and will not preclude future options.

The 2002 Parks Highway Corridor Management Plan produced by DOT&PF calls for a possible second or even a third corridor to address the traffic volume anticipated by 2030. The Plan says that if all the roadway(s) have direct access, as many as 12 lanes could be needed to carry the expected east-west traffic in downtown Wasilla. A 1982 Parks Highway location study investigated alternative alignments for the Parks Highway through and around Wasilla to accommodate the project traffic growth. Eventually, additional travel lanes will be needed on any section not bypassed.

Future Intermodal Facility Plans for Wasilla

Commuter rail has long been on the minds of Southcentral Alaska residents. For the past 10 years, reports have studied the potential for ridership between Anchorage and surrounding communities. Commuter rail has been in the long-term development plans of the Alaska Railroad as well. The Alaska Railroad is proposing to construct one or more intermodal facilities in the greater Wasilla area. Key features of the facility would include an enclosed waiting room, platform and station siding, parking area, transit drop-off area, and some pedestrian amenities. The facility would serve commuters traveling to and from their homes in Willow, Houston, Big Lake, and Wasilla and their places of work in Anchorage on a commuter rail line.

The Wasilla Area Intermodal Steering Committee meeting, as described earlier, identified four potential locations for an intermodal facility, one of which is the current Alaska Railroad platform (Historic Depot) located at the KGB Road-ARRC intersection. The other three locations are: the Wasilla Airport area, Kenai Supply Company Building Area, and the Fairview Loop Area. Placement of an intermodal facility and/or retaining the existing ARRC platform for commuter rail purposes would be influential factors in choosing what alternative is best suited for the KGB Road grade separation.

Wasilla: An Intermodal Community

As mentioned in Section 1, a joint committee, known as the Wasilla Intermodal Steering Committee, was formed to provide oversight on the development and coordination of a number of transportation projects in the greater Wasilla area. Along with the KGB Road grade separation analysis, the steering committee identified three other projects to be moved forward into further analysis:

- **Wasilla Realignment Alternatives Analysis**
This analysis is examining future long-term potential realignment options for relocating the ARRC outside of downtown Wasilla
- **Wasilla Intermodal Facilities Alternatives Analysis**
This analysis is examining several potential commuter rail station locations in the Wasilla vicinity
- **South Wasilla Track Realignment project**
This project would entail track straightening and eliminating five at-grade crossings to improve safety and operations in South Wasilla



8.0 Summary & Recommendations

The population and subsequent traffic growth that is continuing to occur in the Wasilla area combined with the growing train traffic on the ARRC mainline through town has resulted in the need for improvements at the busy KGB Road-ARRC-Parks Highway intersection. The intersection configuration is a key part of the problem, which exacerbates vehicle congestion, causes safety concerns, and delays travel.

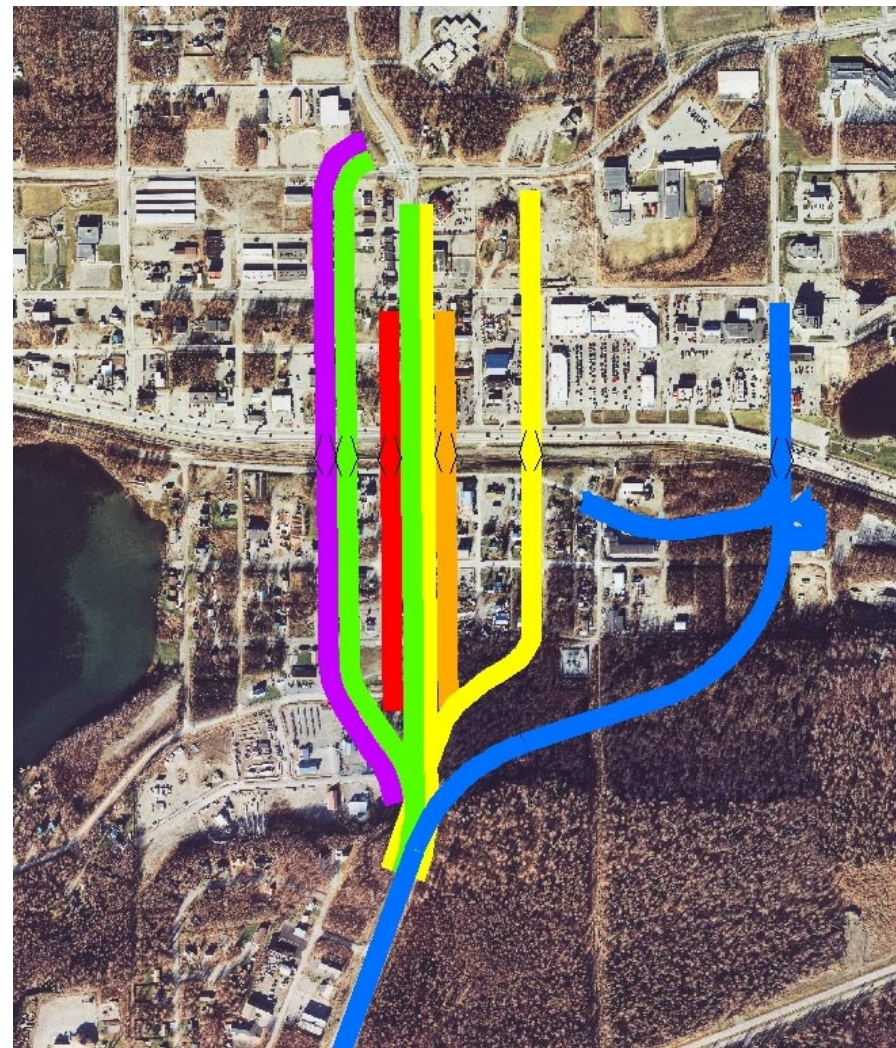
To help alleviate the growing travel demand through the corridor into Anchorage, the ARRC has been pursuing rail improvements that, when complete, will provide commuter rail and enhanced passenger services through the corridor. The KGB Road grade-separation is one such improvement.

By grade-separating the intersection, a number of safety concerns and operational inefficiencies would be addressed. The project would: improve safety by eliminating the potential for train-vehicle conflicts; maintain roadway and access circulation with sufficient north-south capacity; and eliminate congestion caused by trains closing the intersection.

The road over rail alternatives necessitate also taking the Knik Goose Bay Road over the Parks Highway because of the limited space in which to get back down to grade. To keep a direct connection to the Parks Highway, on and off ramps were explored. In either case, with or without ramps, the “road over rail” solutions require extensive right-of-way from the core area of downtown Wasilla. These business impacts would be substantial. Further exploration of the road over rail options makes sense only if the DOT&PF were to have intentions of grade separating the entire highway through Wasilla, which they do not. As a solution to the ARRC’s concerns to the Knik Goose Bay Road rail crossing, the road over rail options are not recommended due to the business and social impacts and substantial right-of-way requirements.

The recommended solution is for the rail to go over the Knik Goose Bay Road. Most of the project could be accomplished with the right-of way that the ARRC already owns. The project can be constructed with minimal direct affect on the downtown business community.

The primary impacts would be changes to noise levels of the elevated railroad (approximately 17 feet high over the KGB road), although horn noise at the crossing would be eliminated, and the visual effects of the embankment needed to raise the tracks. No road crossings or driveways would be eliminated and circulation would improve as traffic and pedestrians would no longer be required to stop for trains at the crossing.



“Road over Rail” Alternatives (Alternatives 2-7)

The “Road over Rail” Alternatives (Alternatives 2-7) are not reasonable and are not recommended due to:

- Substantial business impacts in downtown core area.
- Social impacts associated with loss of downtown.
- ROW acquisition cost is substantial, and potential for relocation limited.
- Impacts to traffic circulation create circuitous routing to get to remaining business due to long embankment run-outs and closed driveways.
- Have more difficult pedestrian accessibility of climbing up over the overpass to get from one side of downtown to the other.
- It is anticipated that a high degree of controversy would be generated by these alternatives.

The “Rail over Road” Alternative (Alternative 8) is the recommended solution because it:

- Has least impact on downtown business district.
- Maintains downtown traffic circulation the best.
- Provides the best flexibility for DOT&PF to increase future capacity of KGB road under the rail crossing.
- Provides better pedestrian linkages in downtown.
- Has the least ROW requirements

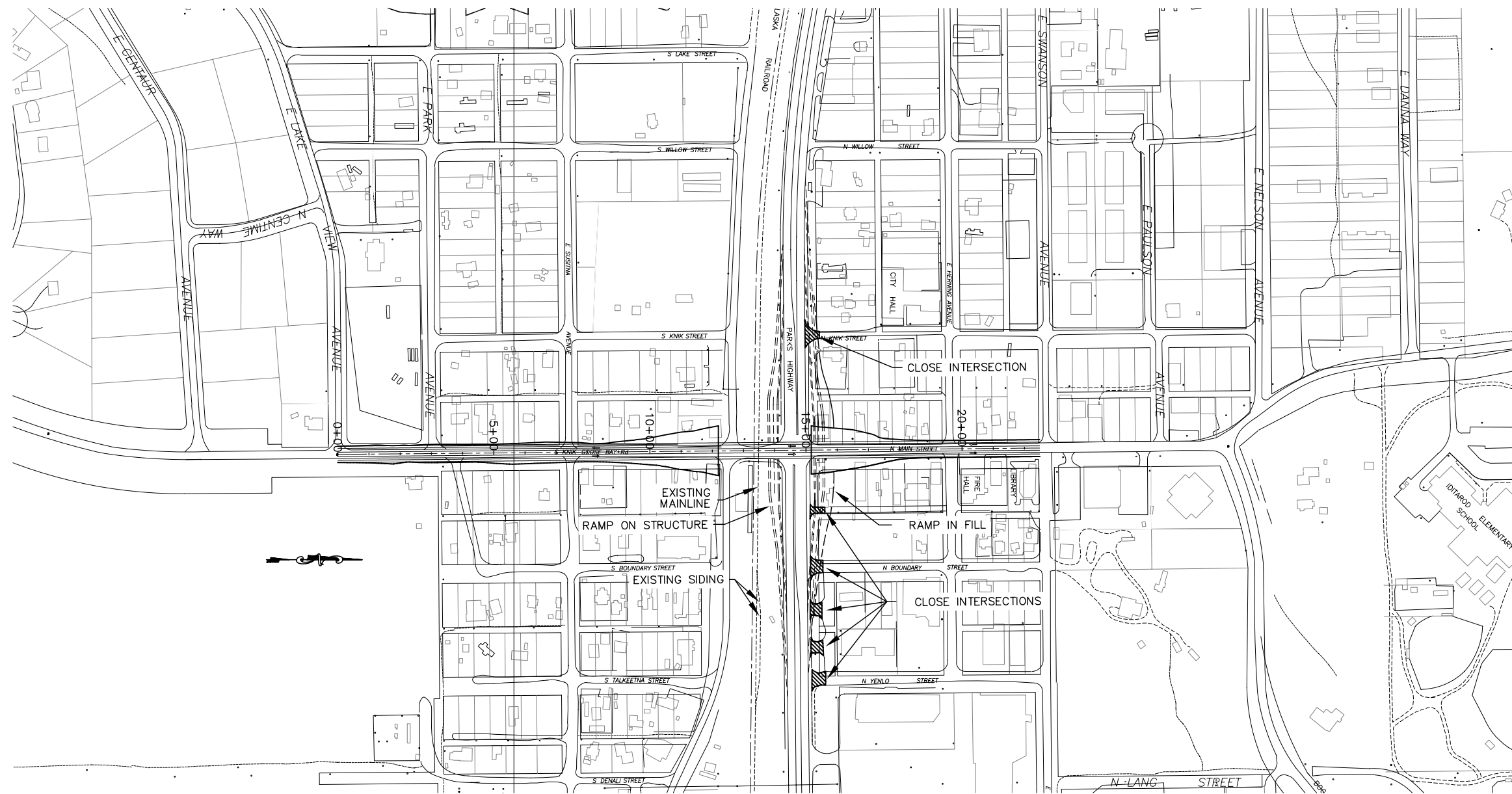
Concerns of this alternative, which would have to be explored during the environmental phase, are primarily due to the embankment running through downtown on which the rail would traverse, and include visual impacts and potential changes in noise levels. It is unknown whether these impacts would be significant; an Environmental Assessment is the recommended documentation to proceed with during the next phase of work.



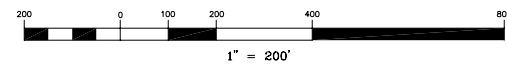
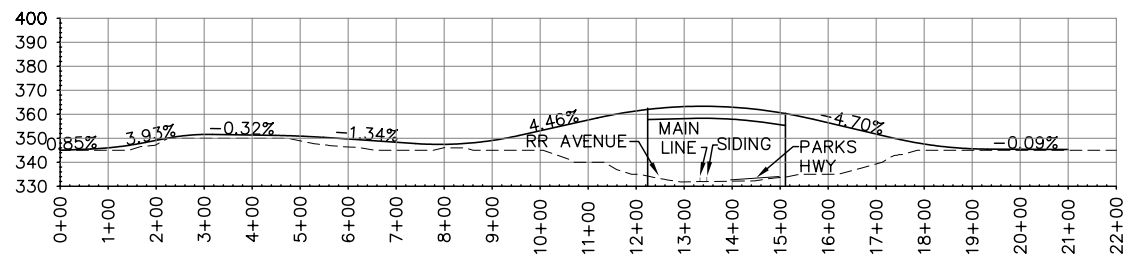
“Rail over Road” Alternative (Alternative 8)



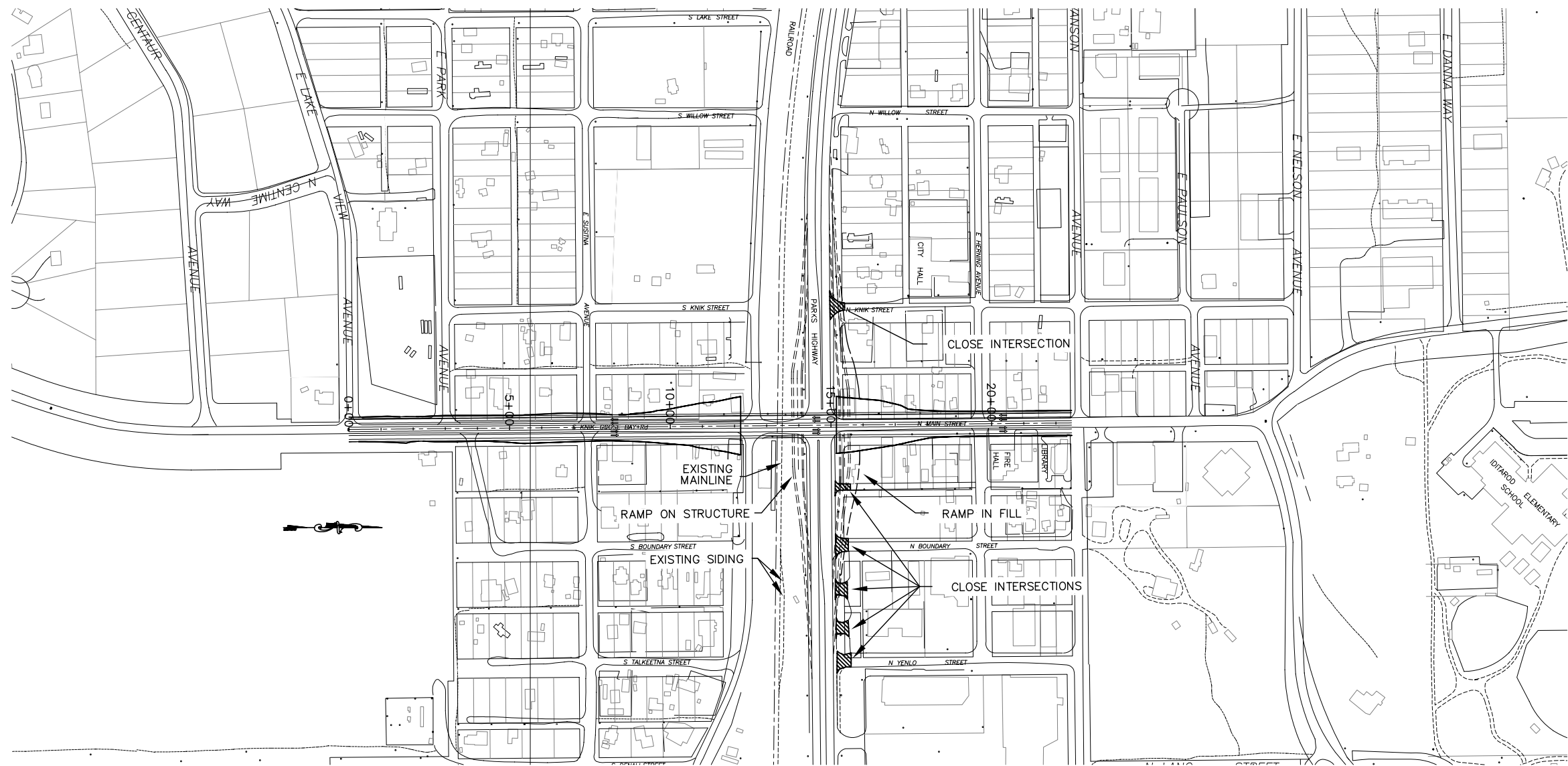
Appendix A. Preliminary Engineered Alternatives



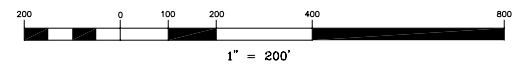
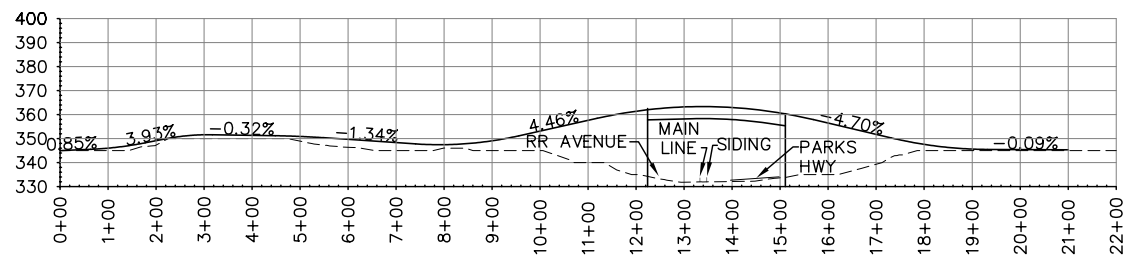
KGB NORTH-SOUTH



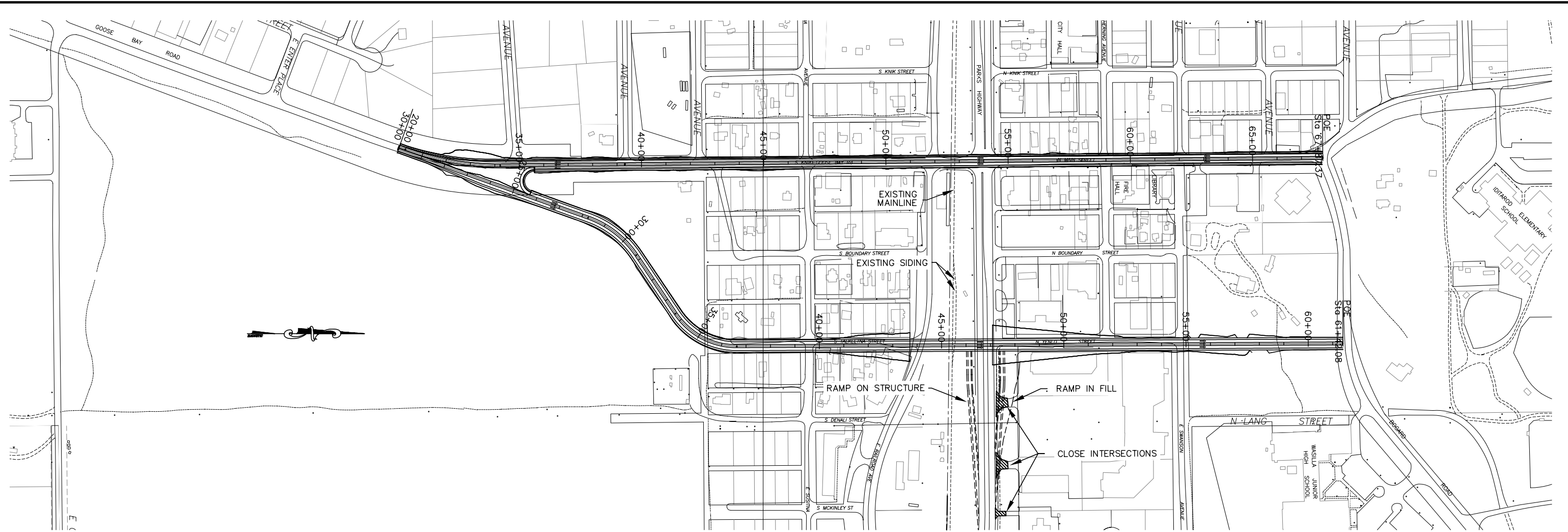
ALASKA RAILROAD CORPORATION OFFICE OF THE CHIEF ENGINEER P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500 (907) 265-2456			
PROJECT: KNIK GOOSE BAY GRADE-SEPARATION ALTERNATIVE ANALYSIS			
TITLE: ALTERNATIVE 2: THREE-LANE MAIN STREET GRADE SEPARATION			
DESIGNED BY: _____	REVIEWED BY: _____	SCALE: 1"=100'	FILE: _____
DRAWN BY: _____	APPROVED BY: _____	DATE: 12-31-03	DWG. NO. _____ OF _____



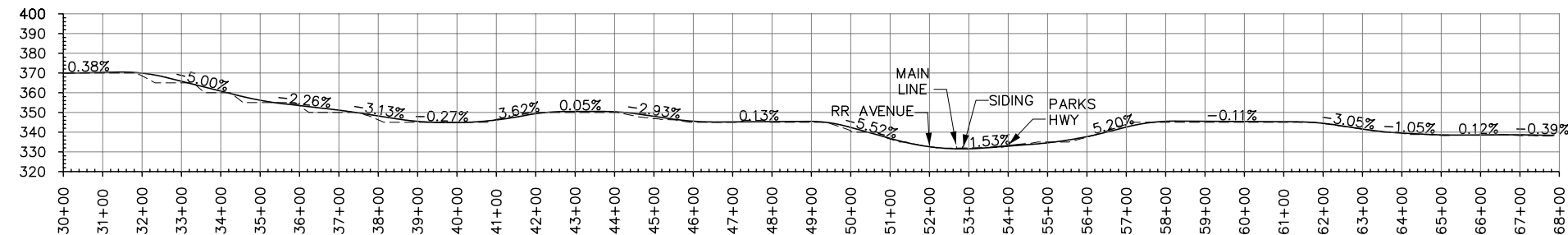
KGB NORTH-SOUTH



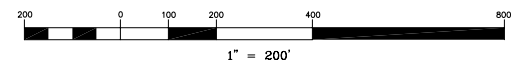
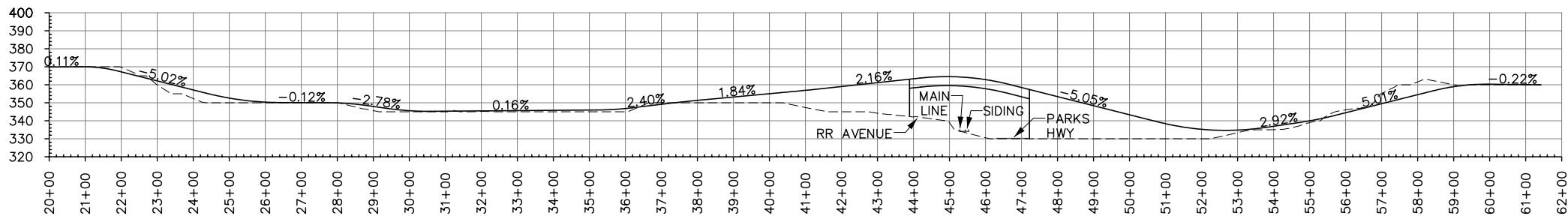
		ALASKA RAILROAD CORPORATION OFFICE OF THE CHIEF ENGINEER P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500 (907) 265-2456		
		PROJECT: KNIK GOOSE BAY GRADE-SEPERATION ALTERNATIVE ANALYSIS		
		TITLE: ALTERNATIVE 3: FIVE-LANE MAIN STREET GRADE SEPARATION		
DESIGNED BY: _____	REVIEWED BY: _____	SCALE: 1"=100'	FILE FILE	
DRAWN BY: _____	APPROVED BY: _____	DATE: 12-31-03	DWG NO. _____ OF _____	





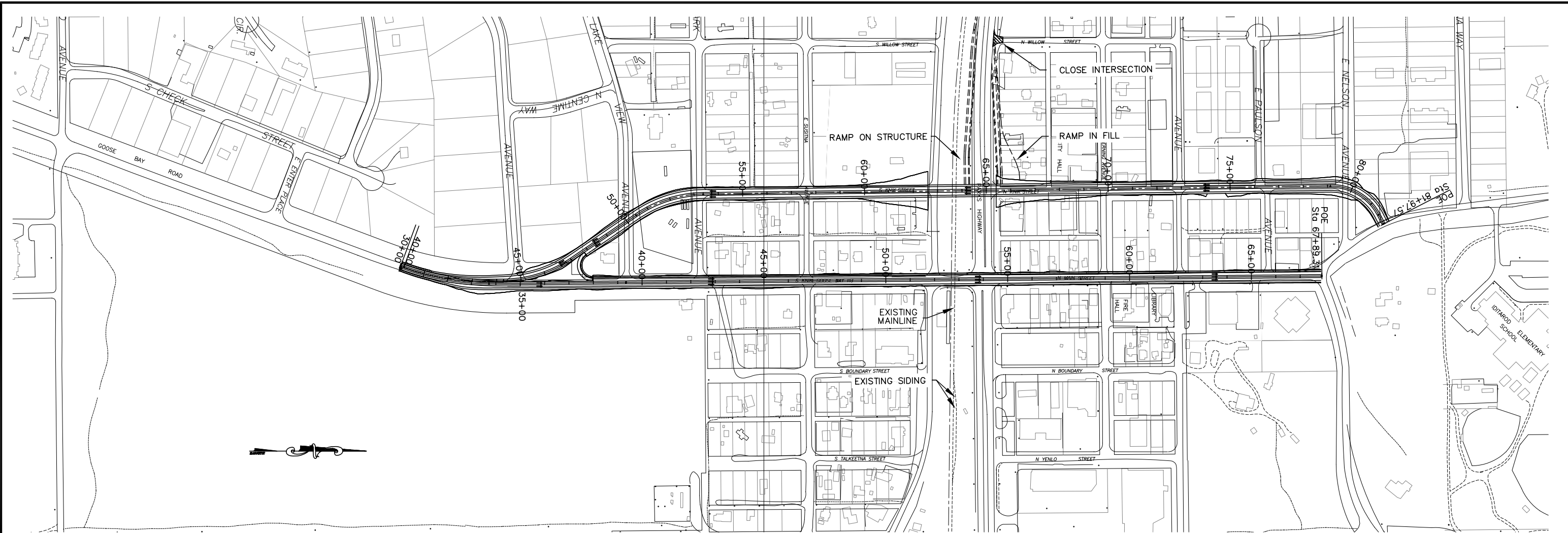
Main Street



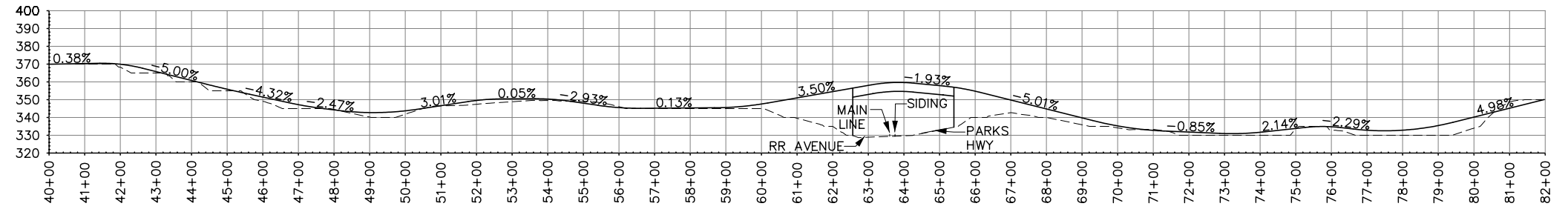
Yenlo Street



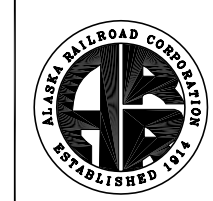
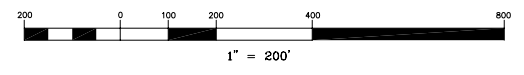
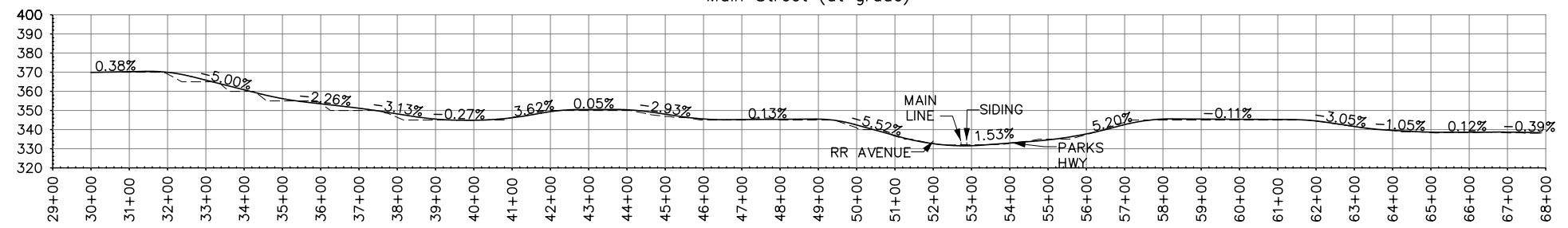
		ALASKA RAILROAD CORPORATION OFFICE OF THE CHIEF ENGINEER P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500 (907) 265-2456	
		PROJECT: KNIK GOOSE BAY GRADE-SEPARATION ALTERNATIVE ANALYSIS	
TITLE: ALTERNATIVE 4: MAIN STREET & YENLO/TALKEETNA STREETS ONE-WAY COUPLET		DESIGNED BY: _____ DRAWN BY: _____	REVIEWED BY: _____ APPROVED BY: _____
SCALE: 1" = 200' DATE: 12-31-03		FILE NO. _____ DWG NO. _____ OF _____	



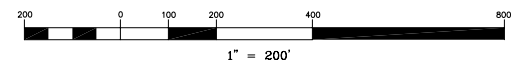
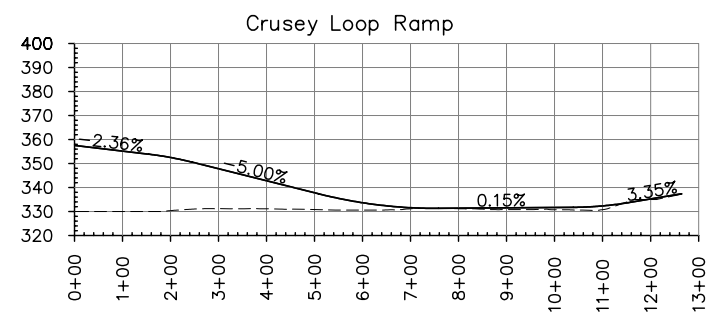
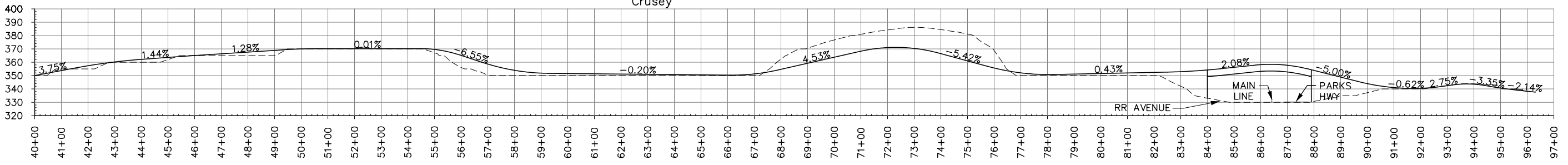
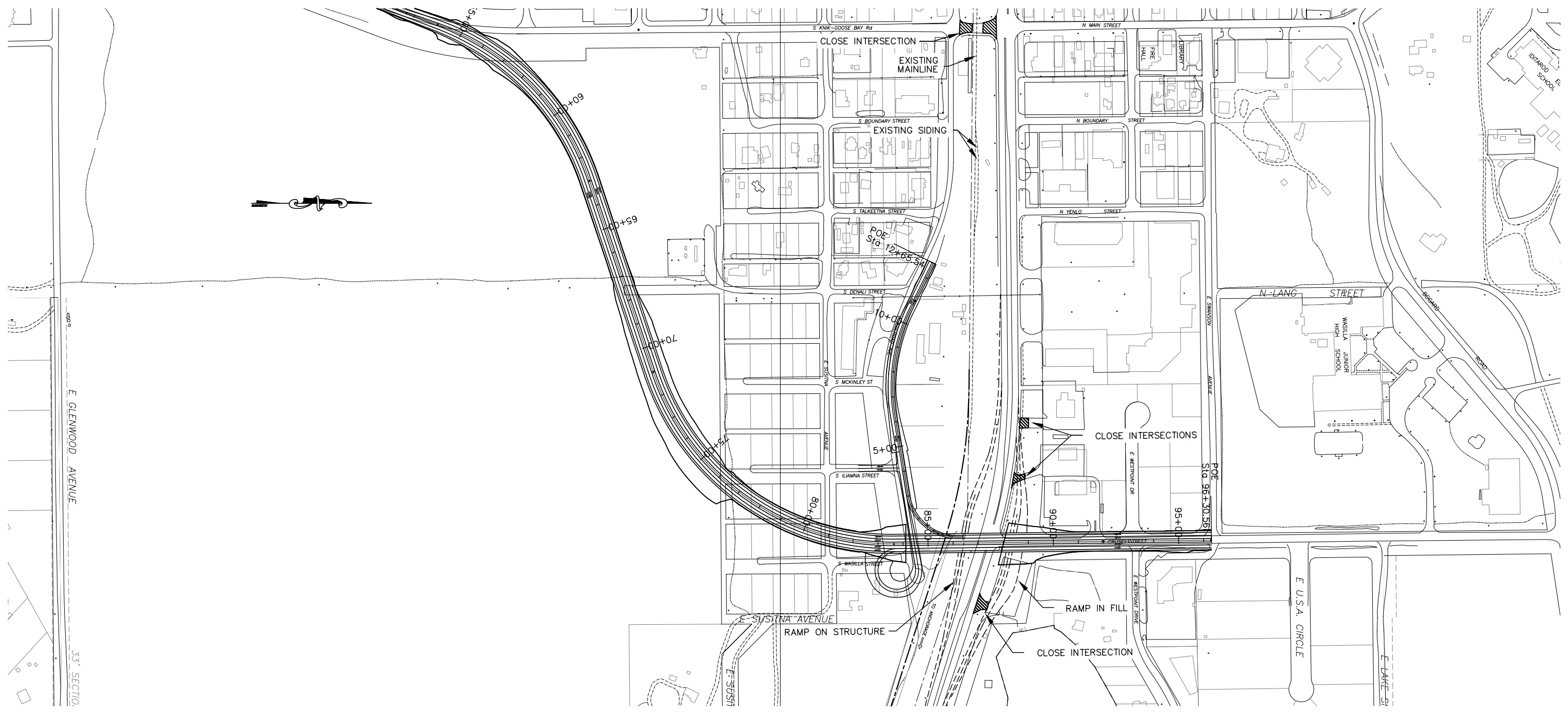
Knik Overpass




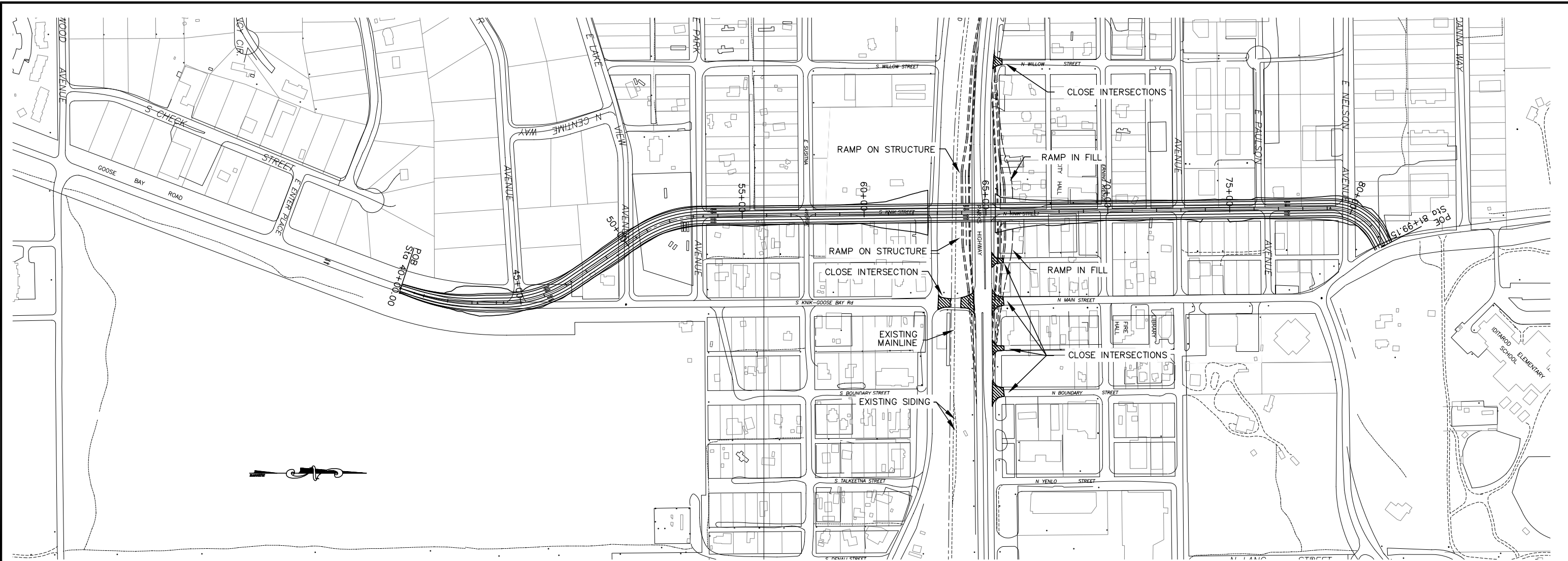
Main Street (at grade)



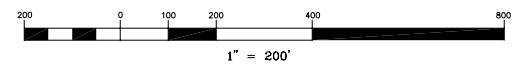
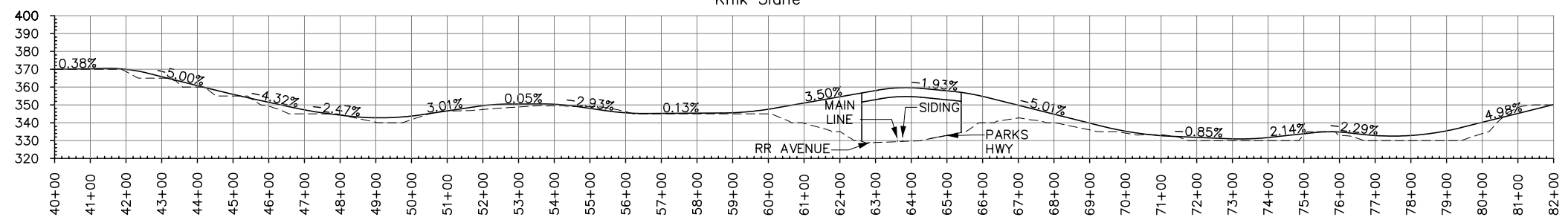
ALASKA RAILROAD CORPORATION OFFICE OF THE CHIEF ENGINEER P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500 (907) 265-2456			
PROJECT: KNIK GOOSE BAY GRADE-SEPARATION ALTERNATIVE ANALYSIS			
TITLE: ALTERNATIVE 5: MAIN STREET AND KNIK STREET COUPLET			
DESIGNED BY: _____	REVIEWED BY: _____	SCALE: 1"=200'	FILE NO. _____
DRAWN BY: _____	APPROVED BY: _____	DATE: 12-31-03	DWG NO. _____





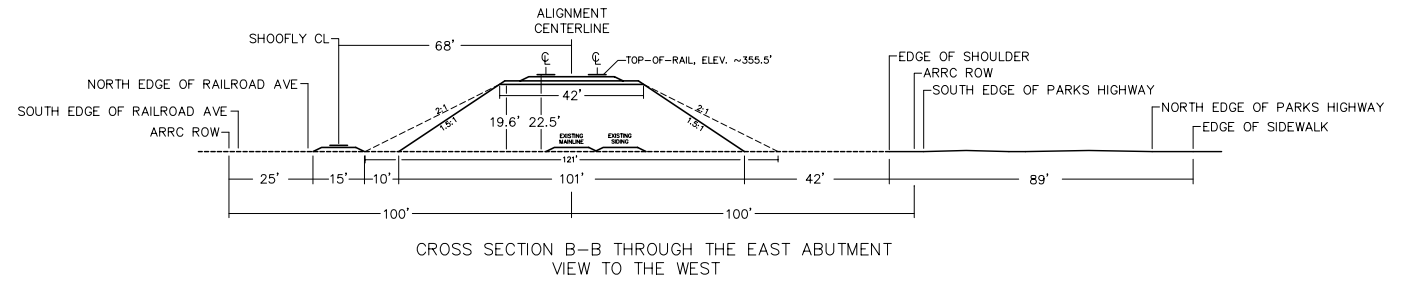
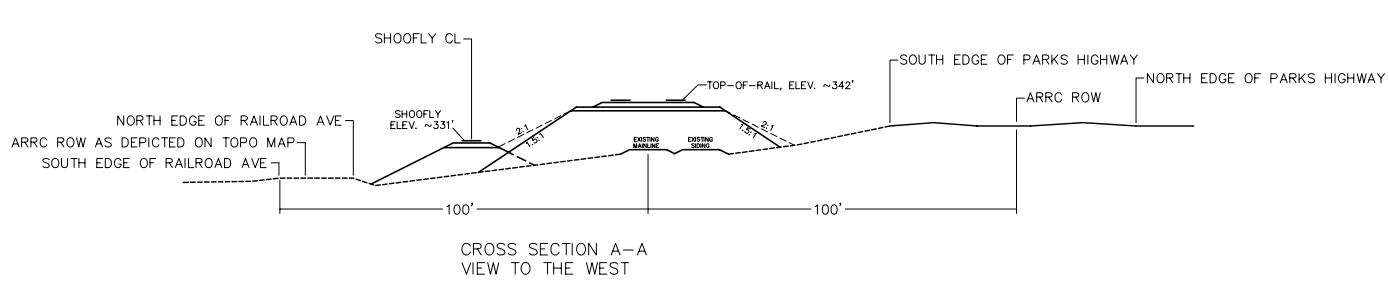
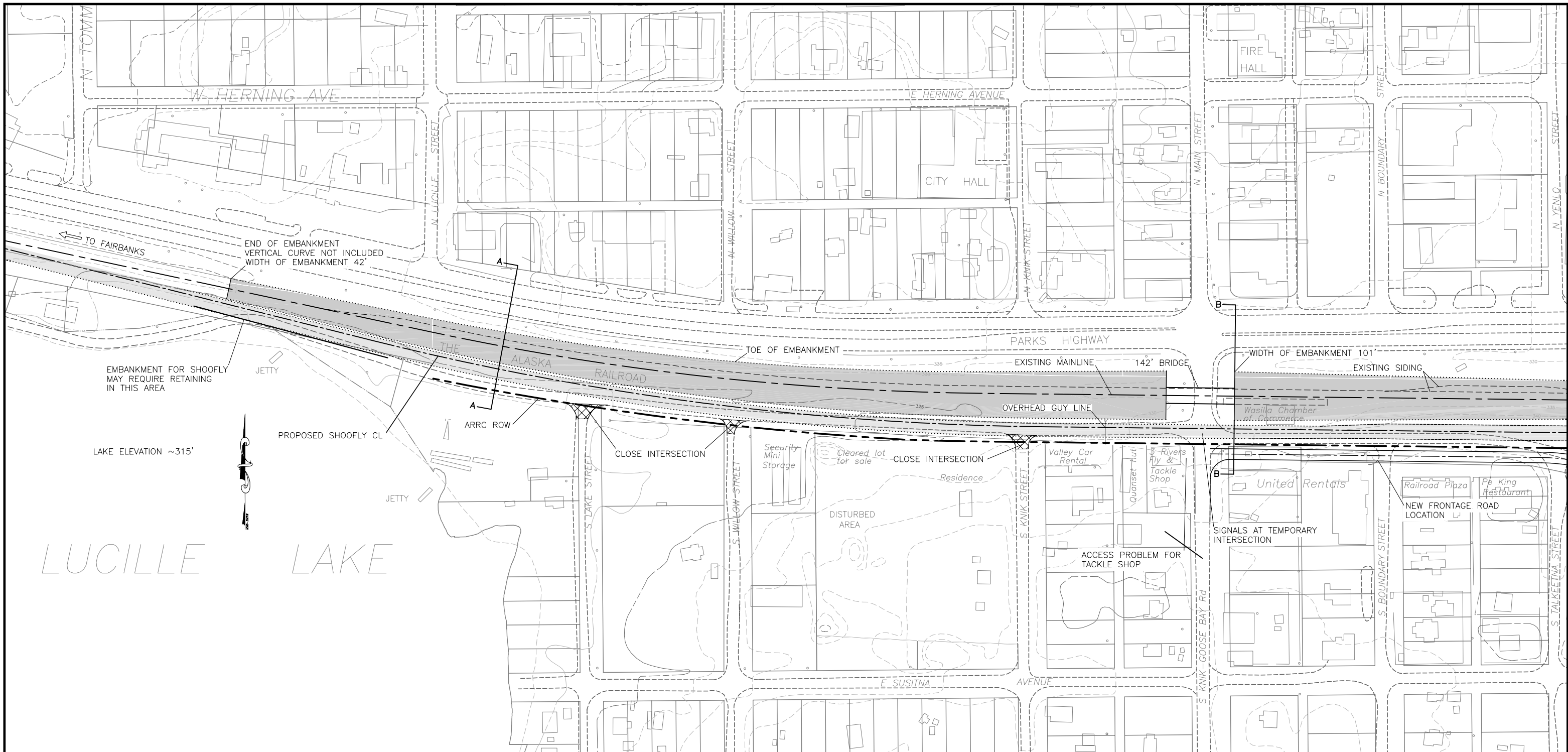
	ALASKA RAILROAD CORPORATION OFFICE OF THE CHIEF ENGINEER P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500 (907) 265-2456		
	PROJECT: KNIK GOOSE BAY GRADE-SEPARATION ALTERNATIVE ANALYSIS TITLE: ALTERNATIVE 6: CRUSEY STREET GRADE SEPARATION		
DESIGNED BY: _____ DRAWN BY: _____	REVIEWED BY: _____ APPROVED BY: _____	SCALE: 1"=200' DATE: 12-31-03	FILE NO.: _____ DWG NO.: _____ OF _____



Knik 5 lane



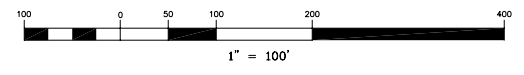
		ALASKA RAILROAD CORPORATION OFFICE OF THE CHIEF ENGINEER P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500 (907) 265-2456	
		PROJECT: KNIK GOOSE BAY GRADE-SEPARATION ALTERNATIVE ANALYSIS	
TITLE: ALTERNATIVE 7: KNIK STREET GRADE SEPARATION		DESIGNED BY: _____ DRAWN BY: _____	REVIEWED BY: _____ APPROVED BY: _____
		SCALE: 1"=200' DATE: 12-31-03	FILE NO. _____ DWG NO. _____ OF _____



Top-of-rail 22.5 feet above top-of-asphalt, 19' between the street and bottom of bridge structure, 3' for bridge structure depth and 0.5' to top of rail
 Track grade is 1.00%, total embankment length is 3,920 feet
 Width of embankment top is 42 feet, enough for double track.
 Width of embankment toe at highest point is 100.5'.
 Bridge length is 142'; this places the abutments 10' outside the 122' modular crossing.
 Shoofly length is 5,600 feet.
 3 or 4 businesses and one residence will be affected by moving or removing the frontage road. Frontage road could be rebuilt after overpass construction.

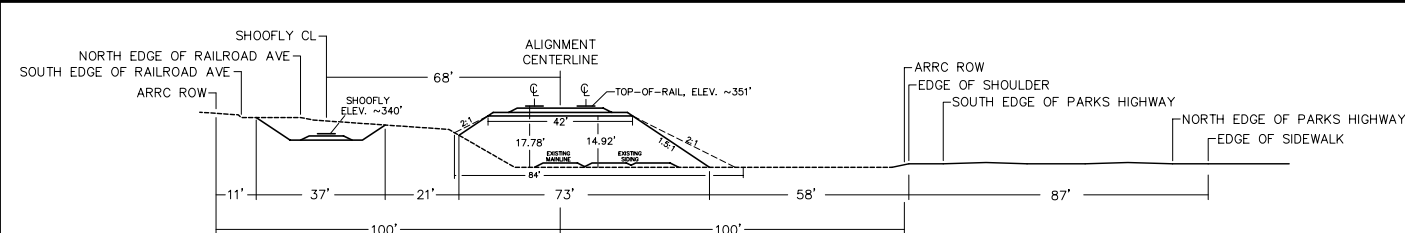
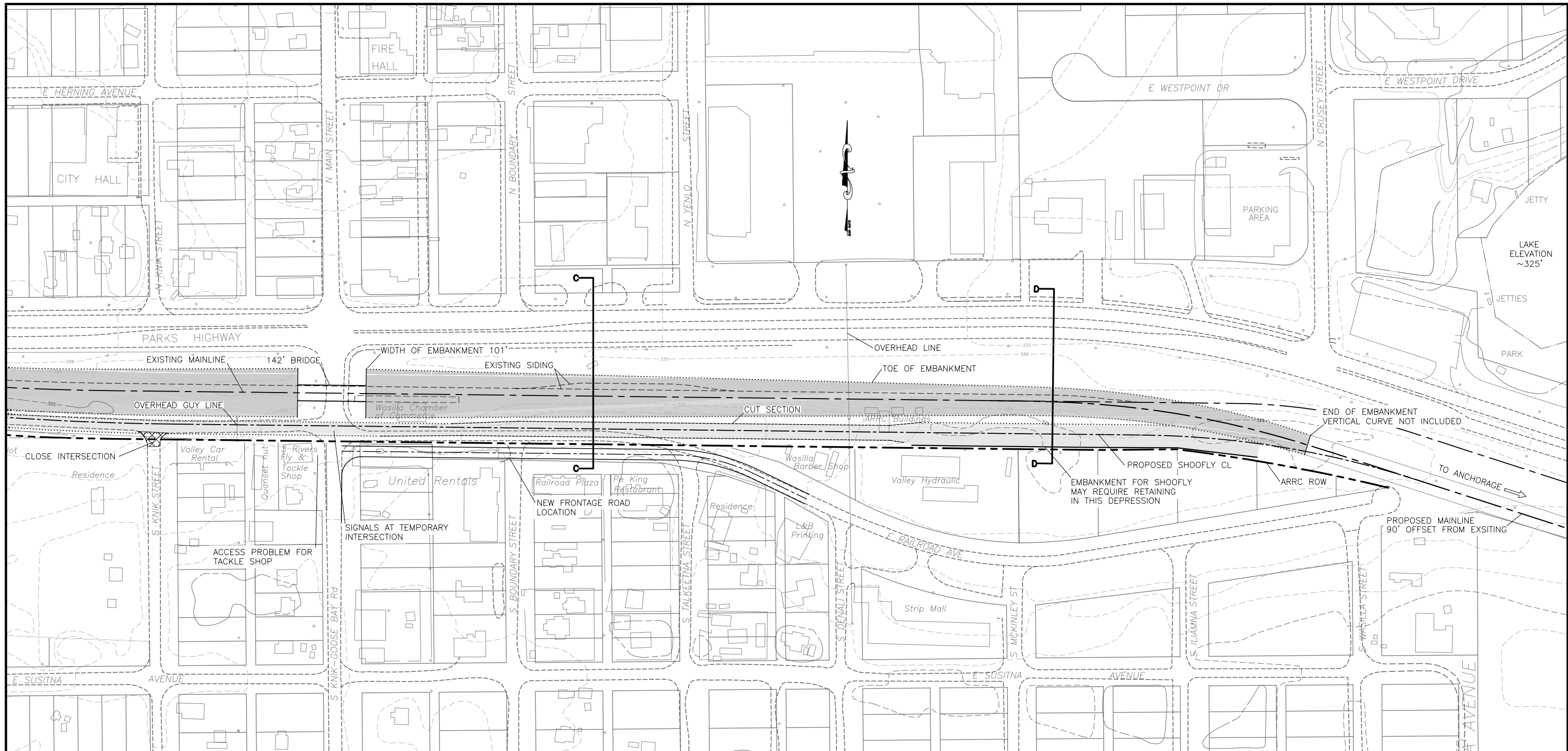
East of Knik-Goose Bay Road, along the proposed shoofly location, the terrain raises about 12' higher than the existing tracks. This raise extends from the road crossing to a point just east of the existing ARRC buildings, about 1,200'. Depending on the grade allowed for the shoofly, this raise will require lowering.
 Wasilla lake elevation is ~325', Lake Lucille elevation is ~315' and track elevation at crossing is ~333'. Water table elevation at crossing ~319'. If track went under the road, track elevation will be ~304'. This assumes 23.5' train clearance and 5' road bridge depth.

THIS SHEET DEPICTS THE CROSSING DURING CONSTRUCTION.
 AFTER CONSTRUCTION THE SHOOFLY IS REMOVED.

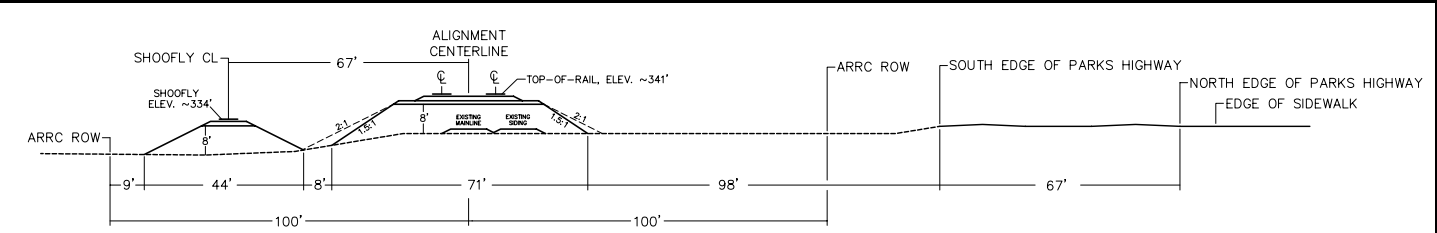


DESIGNED BY: _____
 DRAWN BY: _____

ALASKA RAILROAD CORPORATION OFFICE OF THE CHIEF ENGINEER P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500 (907) 265-2456	
PROJECT: KNIK GOOSE BAY GRADE-SEPARATION ALTERNATIVES ANALYSIS	
TITLE: ALTERNATIVE 8: KGB ROAD GRADE SEPARATION	
REVIEWED BY: _____	SCALE: 1"=100'
APPROVED BY: _____	DATE: 3-14-03
FILE NO. _____	DWG NO. 1 OF 2



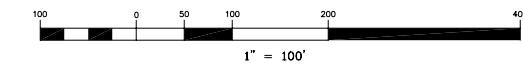
CROSS SECTION C-C
VIEW TO THE WEST



CROSS SECTION D-D
VIEW TO THE WEST

The cross sections are approximate, being derived from a combination of the topo map and photographs. Therefore, all dimensions and elevations are approximate. Maximum shoofly grade assumed to be 1.25%. Elevations shown in cross sections based on road crossing elevation of 333', per spot elevations on the topo map. Embankment slopes of 2H:1V provide better purchase for plants.

First 1,000' of the shoofly traverses a depression 5 to 8 feet below the mainline elevation. In the area west of the Knik-Goose Bay crossing the terrain slopes down from the Parks Highway to Railroad Ave, in some places the elevation difference is 15' or more.



ALASKA RAILROAD CORPORATION OFFICE OF THE CHIEF ENGINEER P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500 (907) 265-2456			
KNIK GOOSE BAY GRADE-SEPARATION ALTERNATIVES ANALYSIS			
ALTERNATIVE 8: KGB ROAD GRADE SEPARATION			
DESIGNED BY: _____	REVIEWED BY: _____	SCALE: 1"=100'	FILE NO. _____
DRAWN BY: _____	APPROVED BY: _____	DATE: 3-14-03	DWG NO. 2 OF 2



Appendix B. Preliminary Right-of-Way Analysis

The purpose of this section is to identify impacted properties based on each alignment, and to determine the impacts and costs associated with the acquisition of that land, whether it is a “partial take” of the property or a “total take” of the property.

The right-of-way footprint was created by electronically superimposing the engineered alignments upon the Mat-Su Borough parcel layout using ArcGIS 8.3. The right-of-way footprint relative to the parcel lines is depicted on the figures adjacent to the alternatives described earlier in this document. In determining right-of-way cost, the appraised values from tax year 2002 were used. Appraised values rather than tax assessor’s value was used because sometimes businesses or other types of parcel owners get tax breaks, and the value of the parcel would not reflect the cost of impacting that property. Likewise, appraisal value sometimes isn’t reflective of what the parcel and associated buildings are really worth.

Right-of-way impact includes impacting parcels with no buildings, parcels with buildings though the alignment does not affect the building, parcels with buildings in which the alignment directly impacts the buildings on the property, and parcels where the alignments restrict vehicular access to the property. In Table 1, the ‘number of parcels with buildings directly impacted’ column represents those alternatives in which the alignment directly impacts the building, and in which the buildings would have to be acquired or relocated. Further right-of-way impact analysis is still needed for traffic circulation, particularly whether or not the alignments impact business accessibility. Even if the superimposed alignment does not impact a property, the fill used to create a ramp or raise the road alignment may significantly impact how easy or difficult it is to access parcels with businesses.

Many of the alternatives impact a significant number of parcels. The “Road over Rail” alternatives (Alternatives 2-7) range from impacting 15 to 45 parcels. The City core along Main Street is well developed, which includes the Post Office, the Library, the Wasilla/Community Hall/Museum, and many businesses. One block to the west, along Knik Street, is City Hall, Nunley Townsite Park, and many other businesses. The Main Street, and other neighboring streets, corridor is fairly well developed. Alternative 8, the only “Rail over Road” alternative, impacts only two parcels, as this alignment assumes most of the existing ARRC right-of-way.

While many of the alternatives impact a significant number of parcels, most of the impacts are by a small percentage. Only two alternatives impact any parcel by greater than 50%. Of the 15 parcels impacted by Alternative 6, only three parcels are impacted by greater than 50%. These three parcels require roughly 58%, 67%, and 46% take of these properties. Of the 45 parcels impacted by Alternative 7, only two parcels are impacted by greater than 50%. These two parcels require roughly 63% and 53% take of the properties. No buildings are on these five parcels.

Table 1. Right-of-Way Impacts: Affected Parcels

Alternative	Number of Parcels impacted	Number of parcels with Buildings	Number of parcels with Buildings Directly Impacted	Total Appraised value of all impacted parcels (“total take” ~ worst case scenario”)	Total Appraised value of affected buildings (“total take of building”)	Total Appraised value of affected land (“partial take”)
Alternative 1: Present Main Street At-Grade configuration	0	-	0	0	0	0
Alternative 2: Three-lane Main Street Grade-Separation	23	9	4	\$2.0 million	\$550,000	\$136,000
Alternative 3: Five-lane Main Street Grade-Separation	33	14	5	\$5.2 million	\$570,000	\$211,000
Alternative 4: Main Street and Yenlo/Talkeetna Streets One-Way Couplet	23	11	1	\$9.0 million	\$410,000	\$200,000
Alternative 5: Main Street and Knik Street Couplet	41	15	3	\$5.5 million	\$2,690,000	\$114,000
Alternative 6: Crusey Street Grade-Separation	15	1	1	\$850,000	\$33,000	\$106,000
Alternative 7: Knik Street Grade-Separation	45	15	5	\$5.4 million	\$2,690,000	\$150,000
Alternative 8: Main Street Grade Separation (“Rail over Road”)**	2	0	0	\$50,000	\$0	\$1,900***

*Appraised values from Tax Year 2002

**All “Road over Rail” alternatives (Alternatives 2-7) require take of ARRC right-of-way.

*** Value is low because the alignment assumes most of the existing ARRC right-of-way; therefore only 2 parcels are impacted.



Appendix C. Preliminary Cost Estimates

Knik Goose Bay Road Grade-Separation

Main, Knik, Yenlo and Crusey Streets

COST ESTIMATE


SECTION	Subtotal	Contingency	Construction Subtotal	Construction Administration	Design	Utilities	Right-of-Way	SUBTOTAL
Alt. 1: Present Main Street Configuration	\$1.9	\$0.6	\$2.5	\$0.4	\$0.3	\$0.3	\$0.0	\$3.5
Alt. 2: 3-Lane Main Street Grade-Separation	\$7.5	\$2.3	\$9.8	\$1.5	\$1.0	\$1.0	\$2.1	\$15.4
Alt. 3: 5-Lane Main Street Grade-Separation	\$10.6	\$3.2	\$13.8	\$2.1	\$1.4	\$1.4	\$5.2	\$23.9
Alt. 4: Main Street & Yenlo/Talkeetna Streets One-way Couplet	\$16.9	\$5.1	\$22.1	\$3.4	\$2.3	\$2.3	\$9.1	\$39.2
Alt. 5: Main Street & Knik Street Couplet	\$16.0	\$4.8	\$20.9	\$3.2	\$2.1	\$2.1	\$5.5	\$33.8
Alt. 6: Crusey Street Grade-Separation	\$26.3	\$7.9	\$34.3	\$5.2	\$3.5	\$3.5	\$0.8	\$47.3
Alt. 7: Knik Street Grade-Separation	\$17.3	\$5.2	\$22.5	\$3.4	\$2.3	\$2.3	\$5.4	\$35.9
Alt. 8: KGB Road Grade-Separation	\$18.5	\$5.5	\$24.0	\$3.6	\$2.4	\$2.4	\$0.1	\$32.5

Knik Goose Bay Road Grade-Separation

Alternative 1: Present Main Street Configuration
COST ESTIMATE

TYPICAL SECTION	3-Lane Main Street/KGB Road: 6' (sidewalk) - 2' - 12' - 14' - 12' - 2' - 6' (sidewalk) =	54
STRUCTURAL SECTION (inches)	SMA Pavement =	4
	CAB =	6
	Borrow "A" =	42
SEGMENTS (feet)	Main Street, Parks Hiway to Swanson:	750
	KGB Road, Lakeview Avenue to Parks Hiway	1430
RAMPS (feet)	n/a	
STRUCTURES (feet)	n/a	

DESCRIPTION: Main Street At-Grade. The current 3-lane at-grade intersection of the Parks Highway at Main Street/KGB Road will remain at-grade and the tracks would not be relocated. Surfacing to be rehabilitated.



ALTERNATIVE 1

ASSUMPTIONS: Clear Zone: 30-feet
Slopes: 6:1 (20'), 2:1

DESCRIPTION	ITEM No	Pay Unit			
		Pay Unit	Unit Price	Quantity	Amount
DEMOLITION and CLEARING	202()	ACRE	\$150,000.00	0	\$0
UNCLASSIFIED EXCAVATION	203(3)	CY	\$5.00	22,121	\$110,607
EMBANKMENT	203(5B)	TON	\$8.00	0	\$0
- BORROW B	203(5A)	TON	\$8.00	33,881	\$271,046
- BORROW A					
STRUCTURAL SECTION					
-AGGREGATE BASE COURSE (6")	301(1)	TON	\$11.00	4,356	\$47,912
-HAP, SMA (4")	407(1)	TON	\$45.00	2,320	\$104,378
-AC, GRADE PG 58-28	407(2)	TON	\$275.00	128	\$35,083
-CURB and GUTTER, Expressway	609(2B)	LF	\$12.00	0	\$0
-CURB and GUTTER, Mountable	609(2C)	LF	\$12.00	4,360	\$52,320
-SIDEWALK, 4" Thick	608(1)	SY	\$35.00	323	\$11,304
-ASPHALT PATHWAY and MEDIAN	608(8)	TON	\$55.00	0	\$0
STRUCTURES					
-BRIDGES		SF	\$200.00	0	\$0
-PEDESTRIAN BRIDGE RAILING	507(2)	FT	\$150.00	0	\$0
-RETAINING WALLS	501()	SY	\$500.00	0	\$0
-MSE RETAINING WALLS	511(1)	SF	\$65.00	0	\$0
-RAILROAD CROSSING MAT	617(1)	LF	\$500.00	0	\$0
-NOISE BARRIER	607(7)	SF	\$25.00	0	\$0
GUARDRAIL	606(1)	FT	\$30.00	0	\$0
CONCRETE MEDIAN BARRIER	606(18b)	FT	\$250.00	0	\$0
END-SECTIONS (ET-2000)	606(11)	EACH	\$3,000.00	0	\$0
TOPSOIL	620(1)	SY	\$3.00	3,511	\$10,533
SEEDING	618(1)	ACRE	\$4,000.00	0.73	\$2,920
PLANTINGS		LUMP SUM	\$10,000.00	All Req'd	\$10,000
WATERING	618(3)	M-Gallon	\$20.00	50	\$1,000
PEDESTRIAN HARDSCAPE		LUMP SUM	\$10,000.00	All Req'd	\$10,000
IRRIGATION SYSTEM	627(24)	LF	\$8.00	4,360	\$34,880
RAILROAD CROSSING SIGNALS	660(20)	EACH	\$50,000.00	1	\$50,000
SIGNALIZED INTERSECTIONS	660(1)	EACH	\$150,000.00	1	\$150,000
CONTINUOUS ILLUMINATION	660(3)	EACH	\$5,000.00	22	\$109,000
SIGNING and STRIPING		LANE-MILE	\$100,000.00	1.43	\$142,803
DRAINAGE MEASURES (10%)		LUMP SUM	\$200,000.00	All Req'd	\$200,000
EROSION and POLLUTION (3%)		LUMP SUM	\$100,000.00	All Req'd	\$100,000
SURVEYING (3%)		LUMP SUM	\$100,000.00	All Req'd	\$100,000
CONSTRUCTION TRAFFIC CONTROL (5%)		LUMP SUM	\$100,000.00	All Req'd	\$100,000
MOBILIZATION (10%)		LUMP SUM	\$200,000.00	All Req'd	\$200,000
SUBTOTAL					\$1,853,768
CONTINGENCY (30%)					\$556,130
CONSTRUCTION SUBTOTAL					\$2,500,000
CONSTRUCTION ADMINISTRATION (15%)					\$400,000
DESIGN (10%)					\$300,000
PROJECT SUBTOTAL					\$3,200,000
UTILITIES (10%)		LUMP SUM	\$300,000.00	All Req'd	\$300,000
RIGHT-of-WAY		LUMP SUM		All Req'd	\$0
GRAND TOTAL					\$3,500,000

SEGMENT	TYPICAL SECTION WIDTH	SIDE SLOPE WIDTH	SEGMENT LENGTH	CAB DEPTH	BORROW A DEPTH	EXC DEPTH	MUCK EXC	TOTAL EXC (cy)	TOTAL CAB (ft3)	TOTAL BORROW A (ft3)	TOTAL BORROW B (ft3)
Main Street	54	2	750	0.5	3.5	4.0	0.0	6,444	20,250	147,000	
KGB Road	54	10	1,430	0.5	3.5	4.0	0.0	15,677	38,610	320,320	
TOTAL:			2,180					22,121	58,860	467,320	0

ITEM	FACTOR	QUANTITY
Select Material Type B (tons)	145 lb/ft ³	0
Select Material Type A (tons)	145 lb/ft ³	33,881
Crushed Aggregate Base Course (tons)	148 lb/ft ³	4,356
HAP SMA (tons)	152 lb/ft ³	2,320
AC Oil (tons)	5.5 % of HAP	128
Asphalt Pathway (tons)	153 lb/ft ³	0
Asphalt Median (tons)	153 lb/ft ³	0

HAP SMA (ft3):	30,520
Jersey Barrier (LF):	0
C&G Expressway (LF):	0
C&G Mountable (LF):	4,360
Pathway (ft3):	0
Median (ft3):	0
Sidewalk (CY):	323

Spacing	Length
x2	2,180
200	4,360
TOTAL:	22

Parks Hiway and Main Street	1
TOTAL:	1

Segment	Length	Lanes
Main Street	750	3
KGB Road	1,430	3
Parks Hiway	200	5
TOTAL:	1,430	

Main Street	3,000
KGB Road	28,600
TOTAL:	31,600

Project Length:	2,180
x2 runs	4,360
TOTAL:	4,360

Residential Length:	0
Average Height:	8
TOTAL:	0

Location	Length	Height	Face
			0
			0
			0
TOTAL:			0

Location	Length	Height	Face
			0
			0
			0
TOTAL:			0

Railing:	0
TOTAL:	0

Structures:	0
x4	0
x250 LF	0
TOTAL:	0

Structures:	0
x4	0
TOTAL:	0

Knik Goose Bay Road Grade-Separation
Alternative 2: Three-Lane Main Street Grade-Separation
 COST ESTIMATE

TYPICAL SECTION	3-Lane Main Street/KGB Road: 6' (sidewalk) - 2' - 12' - 14' - 12' - 2' - 6' (sidewalk) =	54
STRUCTURAL SECTION (inches)	SMA Pavement =	4
	CAB =	6
	Borrow "A" =	42
SEGMENTS (feet)	Main Street, Parks Hiway to Swanson:	750
	KGB Road, Lakeview Avenue to Parks Hiway	1430
RAMPS (feet)	n/a	
STRUCTURES (feet)	Bridge over Parks Hiway and ARRC:	300

DESCRIPTION: Main Street Grade-Separation. The current 3-lane at-grade intersection of the Parks Highway at Main Street/KGB Road will grade-separated over the tracks. There will be no access ramps; access will be through adjacent side streets (Knik, Boundary, Yenlo and Crusey Streets) to the north, and via the Palmer-Wasilla Highway at Glenwood Avenue to the south.



ALTERNATIVE 2

ASSUMPTIONS: Bridge embankments to bottom of Borrow A.
 Length for 4% approach grade = 600-feet
 Height of embankment to bottom of Borrow A (need Borrow, CAB, HAP) = 20-feet

DESCRIPTION	ITEM No	Pay Unit			
		Pay Unit	Unit Price	Quantity	Amount
DEMOLITION and CLEARING	202()	ACRE	\$150,000.00	1.10	\$165,289
UNCLASSIFIED EXCAVATION	203(3)	CY	\$5.00	22,121	\$110,607
EMBANKMENT	203(5B)	TON	\$8.00	81,780	\$654,240
- BORROW B	203(5A)	TON	\$8.00	33,881	\$271,046
STRUCTURAL SECTION					
-AGGREGATE BASE COURSE (6")	301(1)	TON	\$11.00	4,356	\$47,912
-HAP, SMA (4")	407(1)	TON	\$45.00	2,320	\$104,378
-AC, GRADE PG 58-28	407(2)	TON	\$275.00	128	\$35,083
-CURB and GUTTER, Expressway	609(2B)	LF	\$12.00	0	\$0
-CURB and GUTTER, Mountable	609(2C)	LF	\$12.00	4,360	\$52,320
-SIDEWALK, 4" Thick	608(1)	SY	\$35.00	323	\$11,304
-ASPHALT PATHWAY and MEDIAN	608(8)	TON	\$55.00	0	\$0
STRUCTURES					
-BRIDGES		SF	\$200.00	16,200	\$3,240,000
-PEDESTRIAN BRIDGE RAILING	507(2)	FT	\$150.00	600	\$90,000
-RETAINING WALLS	501()	SY	\$500.00	0	\$0
-MSE RETAINING WALLS	511(1)	SF	\$65.00	3,760	\$244,400
-DEMO EXISTING BRIDGES		SF	\$20.00	0	\$0
-NOISE BARRIER	607(7)	SF	\$25.00	0	\$0
GUARDRAIL	606(1)	FT	\$30.00	1,000	\$30,000
CONCRETE MEDIAN BARRIER	606(18b)	FT	\$250.00	0	\$0
END-SECTIONS (ET-2000)	606(11)	EACH	\$3,000.00	4	\$12,000
TOPSOIL	620(1)	SY	\$3.00	8,844	\$26,533
SEEDING	618(1)	ACRE	\$4,000.00	1.83	\$7,309
PLANTINGS		LUMP SUM	\$10,000.00	All Req'd	\$10,000
WATERING	618(3)	M-Gallon	\$20.00	50	\$1,000
PEDESTRIAN HARDSCAPE		LUMP SUM	\$10,000.00	All Req'd	\$10,000
IRRIGATION SYSTEM	627(24)	LF	\$8.00	4,360	\$34,880
SIGNALIZED INTERSECTIONS		EACH	\$150,000.00	0	\$0
CONTINUOUS ILLUMINATION		EACH	\$5,000.00	22	\$109,000
SIGNING and STRIPING		LANE-MILE	\$100,000.00	1.43	\$142,803
DRAINAGE MEASURES (10%)		LUMP SUM	\$600,000.00	All Req'd	\$600,000
EROSION and POLLUTION (3%)		LUMP SUM	\$200,000.00	All Req'd	\$200,000
SURVEYING (3%)		LUMP SUM	\$200,000.00	All Req'd	\$200,000
CONSTRUCTION TRAFFIC CONTROL (5%)		LUMP SUM	\$400,000.00	All Req'd	\$400,000
MOBILIZATION (10%)		LUMP SUM	\$700,000.00	All Req'd	\$700,000
SUBTOTAL					\$7,510,105
CONTINGENCY (30%)					\$2,253,031
CONSTRUCTION SUBTOTAL					\$9,800,000
CONSTRUCTION ADMINISTRATION (15%)					\$1,500,000
DESIGN (10%)					\$1,000,000
PROJECT SUBTOTAL					\$12,300,000
UTILITIES (10%)		LUMP SUM	\$1,000,000.00	All Req'd	\$1,000,000
RIGHT-of-WAY		LUMP SUM	\$2,055,000.00	All Req'd	\$2,055,000
GRAND TOTAL					\$15,400,000

SEGMENT	TYPICAL SECTION WIDTH	SIDE SLOPE WIDTH	SEGMENT LENGTH	CAB DEPTH	BORROW A DEPTH	EXC DEPTH	MUCK EXC	TOTAL EXC (cy)	TOTAL CAB (ft3)	TOTAL BORROW A (ft3)	TOTAL BORROW B (ft3)
Main Street	54	2	750	0.5	3.5	4.0	0.0	6,444	20,250	147,000	564,000
KGB Road	54	10	1,430	0.5	3.5	4.0	0.0	15,677	38,610	320,320	564,000
TOTAL:			2,180					22,121	58,860	467,320	1,128,000

TABLE of ESTIMATING FACTORS		
ITEM	FACTOR	QUANTITY
Select Material Type B (tons)	145 lb/ft ³	81,780
Select Material Type A (tons)	145 lb/ft ³	33,881
Crushed Aggregate Base Course (tons)	148 lb/ft ³	4,356
HAP SMA (tons)	152 lb/ft ³	2,320
AC Oil (tons)	5.5 % of HAP	128
Asphalt Pathway (tons)	153 lb/ft ³	0
Asphalt Median (tons)	153 lb/ft ³	0

SUMMARY	
HAP SMA (ft3):	30,520
Jersey Barrier (LF):	0
C&G Expressway (LF):	0
C&G Mountable (LF):	4,360
Pathway (ft3):	0
Median (ft3):	0
Sidewalk (CY):	323
TOTAL:	0

ILLUMINATION	
Spacing	Length
x2	2,180
200	4,360
TOTAL:	22

SIGNALS		
TOTAL:		0

STRIPING		
Segment	Length	Lanes
Main Street	750	3
KGB Road	1,430	3
Parks Hiway	200	5
TOTAL:		1.43

TOPSOIL and SEEDING (SF)	
Main Street	27,000
KGB Road	52,600
Ramps	0
TOTAL:	79,600

IRRIGATION (LF)	
Project Length:	2,180
x2 runs	4,360
TOTAL:	4,360

NOISE BARRIER (SF)	
Residential Length:	0
Average Height:	8
TOTAL:	0

RETAINING WALLS (SF)			
Location	Length	Height	Face
			0
			0
			0
			0
TOTAL:			0

MSE RETAINING WALLS (SF)			
Location	Length	Height	Face
Main Street Bridge Abutments	94	20	1,880
			0
			0
TOTAL:			3,760

STRUCTURES (SF)	
Main Street	16,200
Railing:	600
TOTAL:	16,200

GUARDRAIL (LF)	
Structures:	1
x4	4
x250 LF	1,000
TOTAL:	1,000

END-SECTIONS	
Structures:	1
x4	4
TOTAL:	4

Knik Goose Bay Road Grade-Separation
Alternative 3: Five-Lane Main Street Grade-Separation
 COST ESTIMATE

TYPICAL SECTION	5-Lane Main Street/KGB Road: 10' (pathway) - 2' - 12' - 12' - <u>16'</u> - 12' - 2' - 6' (sidewalk) = 84
STRUCTURAL SECTION (inches)	SMA Pavement = 4 CAB = 6 Borrow "A" = 42
SEGMENTS (feet)	Main Street, Parks Hiway to Swanson: 750 KGB Road, Lakeview Avenue to Parks Hiway: 1430
RAMPS (feet)	n/a
STRUCTURES (feet)	Bridge over Parks Hiway and ARRC: 300

DESCRIPTION: 5-lane Main Street Grade-Separation. Future traffic needs suggested a 5-lane roadway. There will be no access ramps; access will be through adjacent side streets (Knik, Boundary, Yenlo and Crusey Streets) to the north, and via the Palmer-Wasilla Highway at Glenwood Avenue to the south.



ALTERNATIVE 3

ASSUMPTIONS: Bridge embankments to bottom of Borrow A.
Length for 4% approach grade = 600-feet
Height of embankment to bottom of Borrow A (need Borrow, CAB, HAP) = 20-feet

DESCRIPTION	ITEM No	Pay Unit			
		Pay Unit	Unit Price	Quantity	Amount
DEMOLITION and CLEARING	202()	ACRE	\$150,000.00	2.60	\$390,496
UNCLASSIFIED EXCAVATION	203(3)	CY	\$5.00	31,810	\$159,052
EMBANKMENT					
- BORROW B	203(5B)	TON	\$8.00	53,940	\$431,520
- BORROW A	203(5A)	TON	\$8.00	50,476	\$403,808
STRUCTURAL SECTION					
-AGGREGATE BASE COURSE (6")	301(1)	TON	\$11.00	6,775	\$74,530
-HAP, SMA (4")	407(1)	TON	\$45.00	3,755	\$168,994
-AC, GRADE PG 58-28	407(2)	TON	\$275.00	207	\$56,801
-CURB and GUTTER, Expressway	609(2B)	LF	\$12.00	0	\$0
-CURB and GUTTER, Mountable	609(2C)	LF	\$12.00	4,360	\$52,320
-SIDEWALK, 4" Thick	608(1)	SY	\$35.00	161	\$5,652
-ASPHALT PATHWAY and MEDIAN	608(8)	TON	\$55.00	278	\$15,287
STRUCTURES					
-BRIDGES		SF	\$200.00	25,200	\$5,040,000
-PEDESTRIAN BRIDGE RAILING	507(2)	FT	\$150.00	600	\$90,000
-RETAINING WALLS	501()	SY	\$500.00	0	\$0
-MSE RETAINING WALLS	511(1)	SF	\$65.00	4,960	\$322,400
-DEMO EXISTING BRIDGES		SF	\$20.00	0	\$0
-NOISE BARRIER	607(7)	SF	\$25.00	0	\$0
GUARDRAIL	606(1)	FT	\$30.00	1,000	\$30,000
CONCRETE MEDIAN BARRIER	606(18b)	FT	\$250.00	0	\$0
END-SECTIONS (ET-2000)	606(11)	EACH	\$3,000.00	4	\$12,000
TOPSOIL	620(1)	SY	\$3.00	8,844	\$26,533
SEEDING	618(1)	ACRE	\$4,000.00	1.83	\$7,309
PLANTINGS		LUMP SUM	\$10,000.00	All Req'd	\$10,000
WATERING	618(3)	M-Gallon	\$20.00	50	\$1,000
PEDESTRIAN HARDSCAPE		LUMP SUM	\$10,000.00	All Req'd	\$10,000
IRRIGATION SYSTEM	627(24)	LF	\$8.00	4,360	\$34,880
SIGNALIZED INTERSECTIONS		EACH	\$150,000.00	0	\$0
CONTINUOUS ILLUMINATION		EACH	\$5,000.00	22	\$109,000
SIGNING and STRIPING		LANE-MILE	\$100,000.00	2.25	\$225,379
DRAINAGE MEASURES (10%)		LUMP SUM	\$800,000.00	All Req'd	\$800,000
EROSION and POLLUTION (3%)		LUMP SUM	\$300,000.00	All Req'd	\$300,000
SURVEYING (3%)		LUMP SUM	\$300,000.00	All Req'd	\$300,000
CONSTRUCTION TRAFFIC CONTROL (5%)		LUMP SUM	\$500,000.00	All Req'd	\$500,000
MOBILIZATION (10%)		LUMP SUM	\$1,000,000.00	All Req'd	\$1,000,000
SUBTOTAL					\$10,576,960
CONTINGENCY (30%)					\$3,173,088
CONSTRUCTION SUBTOTAL					\$13,800,000
CONSTRUCTION ADMINISTRATION (15%)					\$2,100,000
DESIGN (10%)					\$1,400,000
PROJECT SUBTOTAL					\$17,300,000
UTILITIES (10%)		LUMP SUM	\$1,400,000.00	All Req'd	\$1,400,000
RIGHT-of-WAY		LUMP SUM	\$5,209,300.00	All Req'd	\$5,209,300
GRAND TOTAL					\$24,000,000

SEGMENT	TYPICAL SECTION WIDTH	SIDE SLOPE WIDTH	SEGMENT LENGTH	CAB DEPTH	BORROW A DEPTH	EXC DEPTH	MUCK EXC	TOTAL EXC (cy)	TOTAL CAB (ft3)	TOTAL BORROW A (ft3)	TOTAL BORROW B (ft3)
Main Street	84	2	750	0.5	3.5	4.0	0.0	9,778	31,500	225,750	744,000
KGB Road	84	10	1,430	0.5	3.5	4.0	0.0	22,033	60,060	470,470	744,000
TOTAL:			2,180					31,810	91,560	696,220	744,000

TABLE of ESTIMATING FACTORS		
ITEM	FACTOR	QUANTITY
Select Material Type B (tons)	145 lb/ft ³	53,940
Select Material Type A (tons)	145 lb/ft ³	50,476
Crushed Aggregate Base Course (tons)	148 lb/ft ³	6,775
HAP SMA (tons)	152 lb/ft ³	3,755
AC Oil (tons)	5.5 % of HAP	207
Asphalt Pathway (tons)	153 lb/ft ³	278
Asphalt Median (tons)	153 lb/ft ³	0

SUMMARY	
HAP SMA (ft3):	49,413
Jersey Barrier (LF):	0
C&G Expressway (LF):	0
C&G Mountable (LF):	4,360
Pathway (ft3):	3,633
Median (ft3):	0
Sidewalk (CY):	161

ILLUMINATION	
Spacing	Length
x2	2,180
200	4,360
TOTAL:	22

SIGNALS		
TOTAL:	0	

STRIPING		
Segment	Length	Lanes
Main Street	750	5
KGB Road	1,430	5
Parks Hiway	200	5
TOTAL:	2.25	

TOPSOIL and SEEDING (SF)	
Main Street	27,000
KGB Road	52,600
Ramps	0
TOTAL:	79,600

IRRIGATION (LF)	
Project Length:	2,180
x2 runs	4,360
TOTAL:	4,360

NOISE BARRIER (SF)	
Residential Length:	0
Average Height:	8
TOTAL:	0

RETAINING WALLS (SF)			
Location	Length	Height	Face
			0
			0
			0
			0
TOTAL:			0

MSE RETAINING WALLS (SF)			
Location	Length	Height	Face
Main Street Bridge Abutments	124	20	2,480
			0
			0
TOTAL:			4,960

STRUCTURES (SF)	
Main Street	25,200
Railing:	600
TOTAL:	25,200

GUARDRAIL (LF)	
Structures:	1
x4	4
x250 LF	1,000
TOTAL:	1,000

END-SECTIONS	
Structures:	1
x4	4
TOTAL:	4

Knik Goose Bay Road Grade-Separation
 Alternative 4: Main Street and Yenlo/ Talkeetna Streets One-Way Couplet
 COST ESTIMATE

TYPICAL SECTION	3-Lane Main Street: 6' (sidewalk) - 2' - 12' - <u>14'</u> - 12' - 2' - 6' (sidewalk) = 54	
	3-Lane Yenlo Street: 10' (pathway) - 2' - 12' - <u>14'</u> - 12' - 2' - 6' (sidewalk) = 58	
STRUCTURAL SECTION (inches)	SMA Pavement = 4	
	CAB = 6	
	Borrow "A" = 42	
SEGMENTS (feet)	Main Street, Parks Hiway to Bogard Road: 1400	
	KGB Road, Centaur Avenue to Parks Hiway: 2400	
	Yenlo Street, Centaur Avenue to Bogard Road: 3800	
RAMPS (feet)	2 (4' - 12' - 8')	800
STRUCTURES (feet)	Yenlo Street:	350

DESCRIPTION: Main Street and Yenlo Street One-Way Couplet. To keep Main Street in its current location, there would still have to be an at-grade crossing of the Parks Highway and Alaska Railroad. Pairing the couplet with Yenlo Street grade-separated to the east, the one-way southbound Main Street traffic would not back up across the tracks while waiting at a red light.



ALTERNATIVE 4

ASSUMPTIONS: Bridge embankments to bottom of Borrow A.
 Length for 4% approach grade = 600-feet
 Height of embankment to bottom of Borrow A (need Borrow, CAB, HAP) = 20-feet

DESCRIPTION	ITEM No	Pay Unit	Unit Price	Quantity	Amount
DEMOLITION and CLEARING	202()	ACRE	\$150,000.00	12.86	\$1,928,375
UNCLASSIFIED EXCAVATION	203(3)	CY	\$5.00	82,252	\$411,259
EMBANKMENT					
- BORROW B	203(5B)	TON	\$8.00	196,620	\$1,572,960
- BORROW A	203(5A)	TON	\$8.00	160,167	\$1,281,336
STRUCTURAL SECTION					
-AGGREGATE BASE COURSE (6")	301(1)	TON	\$11.00	18,589	\$204,477
-HAP, SMA (4")	407(1)	TON	\$45.00	10,032	\$451,440
-AC, GRADE PG 58-28	407(2)	TON	\$275.00	552	\$151,734
-CURB and GUTTER, Expressway	609(2B)	LF	\$12.00	0	\$0
-CURB and GUTTER, Mountable	609(2C)	LF	\$12.00	15,200	\$182,400
-SIDEWALK, 4" Thick	608(1)	SY	\$35.00	844	\$29,556
-ASPHALT PATHWAY and MEDIAN	608(8)	TON	\$55.00	485	\$26,648
STRUCTURES					
-BRIDGES		SF	\$200.00	18,900	\$3,780,000
-PEDESTRIAN BRIDGE RAILING	507(2)	FT	\$150.00	700	\$105,000
-RETAINING WALLS	501()	SY	\$500.00	0	\$0
-MSE RETAINING WALLS	511(1)	SF	\$65.00	3,760	\$244,400
-DEMO EXISTING BRIDGES		SF	\$20.00	0	\$0
-NOISE BARRIER	607(7)	SF	\$25.00	0	\$0
GUARDRAIL	606(1)	FT	\$30.00	1,000	\$30,000
CONCRETE MEDIAN BARRIER	606(18b)	FT	\$250.00	0	\$0
END-SECTIONS (ET-2000)	606(11)	EACH	\$3,000.00	4	\$12,000
TOPSOIL	620(1)	SY	\$3.00	76,622	\$229,867
SEEDING	618(1)	ACRE	\$4,000.00	15.83	\$63,324
PLANTINGS		LUMP SUM	\$10,000.00	All Req'd	\$10,000
WATERING	618(3)	M-Gallon	\$20.00	50	\$1,000
PEDESTRIAN HARDSCAPE		LUMP SUM	\$10,000.00	All Req'd	\$10,000
IRRIGATION SYSTEM	627(24)	LF	\$8.00	21,600	\$172,800
RAILROAD CROSSING SIGNAL	660(20)	EACH	\$50,000.00	1	\$50,000
SIGNALIZED INTERSECTIONS		EACH	\$150,000.00	3	\$450,000
CONTINUOUS ILLUMINATION		EACH	\$5,000.00	108	\$540,000
SIGNING and STRIPING		LANE-MILE	\$100,000.00	5.11	\$511,364
DRAINAGE MEASURES (10%)		LUMP SUM	\$1,300,000.00	All Req'd	\$1,300,000
EROSION and POLLUTION (3%)		LUMP SUM	\$400,000.00	All Req'd	\$400,000
SURVEYING (3%)		LUMP SUM	\$400,000.00	All Req'd	\$400,000
CONSTRUCTION TRAFFIC CONTROL (5%)		LUMP SUM	\$800,000.00	All Req'd	\$800,000
MOBILIZATION (10%)		LUMP SUM	\$1,600,000.00	All Req'd	\$1,600,000
SUBTOTAL					\$16,949,938
CONTINGENCY (30%)					\$5,084,981
CONSTRUCTION SUBTOTAL					\$22,100,000
CONSTRUCTION ADMINISTRATION (15%)					\$3,400,000
DESIGN (10%)					\$2,300,000
PROJECT SUBTOTAL					\$27,800,000
UTILITIES (10%)		LUMP SUM	\$2,300,000.00	All Req'd	\$2,300,000
RIGHT-of-WAY		LUMP SUM	\$9,099,300.00	All Req'd	\$9,099,300
GRAND TOTAL					\$39,200,000

SEGMENT	TYPICAL SECTION WIDTH	SIDE SLOPE WIDTH	SEGMENT LENGTH	CAB DEPTH	BORROW A DEPTH	EXC DEPTH	MUCK EXC	TOTAL EXC (cy)	TOTAL CAB (ft3)	TOTAL BORROW A (ft3)	TOTAL BORROW B (ft3)
Knik Street	54	2	1,400	0.5	3.5	4.0	0.0	12,030	37,800	274,400	0
KGB Road	54	10	2,400	0.5	3.5	4.0	0.0	26,311	64,800	537,600	0
Yenlo Street	58	10	3,800	0.5	3.5	4.0	0.0	43,911	110,200	904,400	1,176,000
Ramps	24	20	3,200	0.5	3.5	0.0	0.0	0	38,400	492,800	1,536,000
TOTAL:			10,800					82,252	251,200	2,209,200	2,712,000

TABLE of ESTIMATING FACTORS		
ITEM	FACTOR	QUANTITY
Select Material Type B (tons)	145 lb/ft ³	196,620
Select Material Type A (tons)	145 lb/ft ³	160,167
Crushed Aggregate Base Course (tons)	148 lb/ft ³	18,589
HAP SMA (tons)	152 lb/ft ³	10,032
AC Oil (tons)	5.5 % of HAP	552
Asphalt Pathway (tons)	153 lb/ft ³	485
Asphalt Median (tons)	153 lb/ft ³	0

SUMMARY	
HAP SMA (ft3):	132,000
Jersey Barrier (LF):	0
C&G Expressway (LF):	0
C&G Mountable (LF):	15,200
Pathway (ft3):	6,333
Median (ft3):	0
Sidewalk (CY):	844

ILLUMINATION	
Spacing	Length
x2	21,600
200	108
TOTAL:	108

SIGNALS	
Ramp Terminals	2
Parks Hiway	1
TOTAL:	3

STRIPING		
Segment	Length	Lanes
Knik Street	1,400	3
KGB Road	2,400	3
Yenlo Street	3,800	3
Ramps	3,200	1
Parks Hiway	200	5
TOTAL:	5.11	

TOPSOIL and SEEDING (SF)	
Knik Street	5,600
KGB Road	48,000
Yenlo Street	124,000
Ramps	512,000
TOTAL:	689,600

IRRIGATION (LF)	
Project Length:	10,800
x2 runs	21,600
TOTAL:	21,600

NOISE BARRIER (SF)	
Residential Length:	0
Average Height:	8
TOTAL:	0

RETAINING WALLS (SF)			
Location	Length	Height	Face
			0
			0
			0
TOTAL:			0

MSE RETAINING WALLS (SF)			
Location	Length	Height	Face
Yenlo Street Bridge Abutments	94	20	1,880
			0
			0
TOTAL:			3,760

STRUCTURES (SF)	
Yenlo Street	18,900
Railing:	700
TOTAL:	18,900

GUARDRAIL (LF)	
Structures:	1
x4	4
x250 LF	1,000
TOTAL:	1,000

END-SECTIONS	
Structures:	1
x4	4
TOTAL:	4

Knik Goose Bay Road Grade-Separation

Alternative 5: Main Street & Knik Street Couplet

COST ESTIMATE

TYPICAL SECTION	3-Lane Main Street: 6' (sidewalk) - 2' - 12' - 14' - 12' - 2' - 6' (sidewalk) =	54
	3-Lane Knik Street: 10' (pathway) - 2' - 12' - 14' - 12' - 2' - 6' (sidewalk) =	58
STRUCTURAL SECTION (inches)	SMA Pavement =	4
	CAB =	6
	Borrow "A" =	42
SEGMENTS (feet)	Main Street, Parks Hiway to Bogard Road:	1400
	KGB Road, Centaur Avenue to Parks Hiway:	2400
	Knik Street, Centaur Avenue to Nelson Road:	3700
RAMPS (feet)	2 (4' - 12' - 8')	800
STRUCTURES (feet)	Knik Street:	300

DESCRIPTION: Main Street and Knik Street Couplet. A Main Street and Knik Street 3-lane one-way couplet, with Knik Street grade-separated over the Parks Highway and railroad would provide the necessary traffic capacity, but this has the drawback of having Main Street as the northbound at-grade leg and traffic again backing up across the tracks at the signal.



ALTERNATIVE 5

ASSUMPTIONS: Bridge embankments to bottom of Borrow A.
Length for 4% approach grade = 600-feet
Height of embankment to bottom of Borrow A (need Borrow, CAB, HAP) = 20-feet

DESCRIPTION	ITEM No	Pay Unit	Unit Price	Quantity	Amount
UNCLASSIFIED EXCAVATION	203(3)	CY	\$5.00	81,096	\$405,481
EMBANKMENT					
- BORROW B	203(5B)	TON	\$8.00	196,620	\$1,572,960
- BORROW A	203(5A)	TON	\$8.00	158,442	\$1,267,532
STRUCTURAL SECTION					
-AGGREGATE BASE COURSE (6")	301(1)	TON	\$11.00	18,374	\$202,116
-HAP, SMA (4")	407(1)	TON	\$45.00	9,926	\$446,652
-AC, GRADE PG 58-28	407(2)	TON	\$275.00	546	\$150,125
-CURB and GUTTER, Expressway	609(2B)	LF	\$12.00	0	\$0
-CURB and GUTTER, Mountable	609(2C)	LF	\$12.00	15,000	\$180,000
-SIDEWALK, 4" Thick	608(1)	SY	\$35.00	837	\$29,296
-ASPHALT PATHWAY and MEDIAN	608(8)	TON	\$55.00	472	\$25,946
STRUCTURES					
-BRIDGES		SF	\$200.00	16,200	\$3,240,000
-PEDESTRIAN BRIDGE RAILING	507(2)	FT	\$150.00	600	\$90,000
-RETAINING WALLS	501()	SY	\$500.00	0	\$0
-MSE RETAINING WALLS	511(1)	SF	\$65.00	3,760	\$244,400
-DEMO EXISTING BRIDGES		SF	\$20.00	0	\$0
-NOISE BARRIER	607(7)	SF	\$25.00	0	\$0
GUARDRAIL	606(1)	FT	\$30.00	1,000	\$30,000
CONCRETE MEDIAN BARRIER	606(18b)	FT	\$250.00	0	\$0
END-SECTIONS (ET-2000)	606(11)	EACH	\$3,000.00	4	\$12,000
TOPSOIL	620(1)	SY	\$3.00	76,400	\$229,200
SEEDING	618(1)	ACRE	\$4,000.00	15.79	\$63,140
PLANTINGS		LUMP SUM	\$10,000.00	All Req'd	\$10,000
WATERING	618(3)	M-Gallon	\$20.00	50	\$1,000
PEDESTRIAN HARDSCAPE		LUMP SUM	\$10,000.00	All Req'd	\$10,000
IRRIGATION SYSTEM	627(24)	LF	\$8.00	21,400	\$171,200
RAILROAD CROSSING SIGNAL	660(20)	EACH	\$50,000.00	1	\$50,000
SIGNALIZED INTERSECTIONS		EACH	\$150,000.00	3	\$450,000
CONTINUOUS ILLUMINATION		EACH	\$5,000.00	107	\$535,000
SIGNING and STRIPING		LANE-MILE	\$100,000.00	4.91	\$490,625
DRAINAGE MEASURES (10%)		LUMP SUM	\$1,200,000.00	All Req'd	\$1,200,000
EROSION and POLLUTION (3%)		LUMP SUM	\$400,000.00	All Req'd	\$400,000
SURVEYING (3%)		LUMP SUM	\$400,000.00	All Req'd	\$400,000
CONSTRUCTION TRAFFIC CONTROL (5%)		LUMP SUM	\$700,000.00	All Req'd	\$700,000
MOBILIZATION (10%)		LUMP SUM	\$1,500,000.00	All Req'd	\$1,500,000
SUBTOTAL					\$16,035,049
CONTINGENCY (30%)					\$4,810,515
CONSTRUCTION SUBTOTAL					\$20,900,000
CONSTRUCTION ADMINISTRATION (15%)					\$3,200,000
DESIGN (10%)					\$2,100,000
PROJECT SUBTOTAL					\$26,200,000
UTILITIES (10%)		LUMP SUM	\$2,100,000.00	All Req'd	\$2,100,000
RIGHT-of-WAY		LUMP SUM	\$5,472,000.00	All Req'd	\$5,472,000
GRAND TOTAL					\$33,800,000

SEGMENT	TYPICAL SECTION WIDTH	SIDE SLOPE WIDTH	SEGMENT LENGTH	CAB DEPTH	BORROW A DEPTH	EXC DEPTH	MUCK EXC	TOTAL EXC (cy)	TOTAL CAB (ft3)	TOTAL BORROW A (ft3)	TOTAL BORROW B (ft3)
Main Street	54	2	1,400	0.5	3.5	4.0	0.0	12,030	37,800	274,400	0
KGB Road	54	10	2,400	0.5	3.5	4.0	0.0	26,311	64,800	537,600	0
Knik Street	58	10	3,700	0.5	3.5	4.0	0.0	42,756	107,300	880,600	1,176,000
Ramps	24	20	3,200	0.5	3.5	0.0	0.0	0	38,400	492,800	1,536,000
TOTAL:			10,700					81,096	248,300	2,185,400	2,712,000

TABLE of ESTIMATING FACTORS		
ITEM	FACTOR	QUANTITY
Select Material Type B (tons)	145 lb/ft ³	196,620
Select Material Type A (tons)	145 lb/ft ³	158,442
Crushed Aggregate Base Course (tons)	148 lb/ft ³	18,374
HAP SMA (tons)	152 lb/ft ³	9,926
AC Oil (tons)	5.5 % of HAP	546
Asphalt Pathway (tons)	153 lb/ft ³	472
Asphalt Median (tons)	153 lb/ft ³	0

SUMMARY	
HAP SMA (ft3):	130,600
Jersey Barrier (LF):	0
C&G Expressway (LF):	0
C&G Mountable (LF):	15,000
Pathway (ft3):	6,167
Median (ft3):	0
Sidewalk (CY):	837

ILLUMINATION	
Spacing	Length
x2	21,400
200	107
TOTAL:	107

SIGNALS	
Ramp Terminals	2
Parks Hiway	1
TOTAL:	3

STRIPING		
Segment	Length	Lanes
Main Street	1,400	3
KGB Road	2,400	3
Knik Street	3,700	3
Ramps	3,200	1
Parks Hiway	200	5
TOTAL:	4.91	

TOPSOIL and SEEDING (SF)	
Main Street	5,600
KGB Road	48,000
Knik Street	122,000
Ramps	512,000
TOTAL:	687,600

IRRIGATION (LF)	
Project Length:	10,700
x2 runs	21,400
TOTAL:	21,400

NOISE BARRIER (SF)	
Residential Length:	0
Average Height:	8
SF	0

RETAINING WALLS (SF)			
Location	Length	Height	Face
			0
			0
			0
			0
TOTAL:			0

MSE RETAINING WALLS (SF)			
Location	Length	Height	Face
Knik Street Bridge Abutments	94	20	1,880
			0
			0
TOTAL:			3,760

STRUCTURES (SF)	
Knik Street	16,200
Railing:	600
TOTAL:	16,200

GUARDRAIL (LF)	
Structures:	1
x4	4
x250 LF	1,000
TOTAL:	1,000

END-SECTIONS	
Structures:	1
x4	4
TOTAL:	4

Knik Goose Bay Road Grade-Separation

Alternative 6: Crusey Street Grade Separation
COST ESTIMATE

TYPICAL SECTION	5-Lane Crusey Street: 10' (pathway) - 2' - 12' - 12' - 16' - 12' - 12' - 2' - 6' (sidewalk) =	84
	Railroad Avenue: 8' - 12' - 12' - 8' =	40
STRUCTURAL SECTION (inches)	SMA Pavement =	4
	CAB =	6
	Borrow "A" =	42
SEGMENTS (feet)	Crusey Street, Glenwood to Swanson:	5700
	Railroad Avenue, Denali to Crusey:	1260
RAMPS (feet)	2 (4' - 12' - 8')	800
STRUCTURES (feet)	Crusey Street:	400
RAILROAD	Railroad Embankment:	5100
	Shoofly/Siding:	500

DESCRIPTION: Crusey Street Interchange. This interchange will have Crusey Street rising up sharply from Swanson Avenue, cross the Parks Highway and the railroad, and continue south to connect to the KGB before Glenwood Avenue. The KGB at-grade crossing of the railroad would be closed between the Parks Highway and Railroad Avenue. This Alternative is excellent if Crusey Street is connected to Fishhook Road at Peck Street. Access will be via a tight diamond interchange ramps. Includes ARRC realignment for ramps.



ALTERNATIVE 6

ASSUMPTIONS: Bridge embankments to bottom of Borrow A.
Length for 4% approach grade = 600-feet
Height of embankment to bottom of Borrow A (need Borrow, CAB, HAP) = 20-feet

DESCRIPTION	ITEM No	Pay Unit	Unit Price	Quantity	Amount
DEMOLITION and CLEARING	202()	ACRE	\$150,000.00	20.15	\$3,022,039
UNCLASSIFIED EXCAVATION	203(3)	CY	\$5.00	148,459	\$742,296
EMBANKMENT					
- BORROW B	203(5B)	TON	\$8.00	90,480	\$723,840
- BORROW A	203(5A)	TON	\$8.00	260,087	\$2,080,692
STRUCTURAL SECTION					
-AGGREGATE BASE COURSE (6")	301(1)	TON	\$11.00	22,422	\$246,642
-HAP, SMA (4")	407(1)	TON	\$45.00	13,042	\$586,872
-AC, GRADE PG 58-28	407(2)	TON	\$275.00	717	\$197,254
-CURB and GUTTER, Expressway	609(2B)	LF	\$12.00	0	\$0
-CURB and GUTTER, Mountable	609(2C)	LF	\$12.00	13,920	\$167,040
-SIDEWALK, 4" Thick	608(1)	SY	\$35.00	516	\$18,044
-ASPHALT PATHWAY and MEDIAN	608(8)	TON	\$55.00	887	\$48,807
STRUCTURES					
-BRIDGES		SF	\$200.00	33,600	\$6,720,000
-PEDESTRIAN BRIDGE RAILING	507(2)	FT	\$150.00	800	\$120,000
-RETAINING WALLS	501()	SY	\$500.00	0	\$0
-MSE RETAINING WALLS	511(1)	SF	\$65.00	2,480	\$161,200
-DEMO EXISTING BRIDGES		SF	\$20.00	0	\$0
-TRACK and BALLAST		LF	\$500.00	5,600	\$2,800,000
GUARDRAIL	606(1)	FT	\$30.00	1,000	\$30,000
CONCRETE MEDIAN BARRIER	606(18b)	FT	\$250.00	0	\$0
END-SECTIONS (ET-2000)	606(11)	EACH	\$3,000.00	4	\$12,000
TOPSOIL	620(1)	SY	\$3.00	51,911	\$155,733
SEEDING	618(1)	ACRE	\$4,000.00	10.73	\$42,900
PLANTINGS		LUMP SUM	\$10,000.00	All Req'd	\$10,000
WATERING	618(3)	M-Gallon	\$20.00	50	\$1,000
PEDESTRIAN HARDSCAPE		LUMP SUM	\$10,000.00	All Req'd	\$10,000
IRRIGATION SYSTEM	627(24)	LF	\$8.00	20,320	\$162,560
SIGNALIZED INTERSECTIONS		EACH	\$150,000.00	2	\$300,000
CONTINUOUS ILLUMINATION		EACH	\$5,000.00	102	\$508,000
SIGNING and STRIPING		LANE-MILE	\$100,000.00	6.48	\$648,106
DRAINAGE MEASURES (10%)		LUMP SUM	\$2,000,000.00	All Req'd	\$2,000,000
EROSION and POLLUTION (3%)		LUMP SUM	\$600,000.00	All Req'd	\$600,000
SURVEYING (3%)		LUMP SUM	\$600,000.00	All Req'd	\$600,000
CONSTRUCTION TRAFFIC CONTROL (5%)		LUMP SUM	\$1,200,000.00	All Req'd	\$1,200,000
MOBILIZATION (10%)		LUMP SUM	\$2,400,000.00	All Req'd	\$2,400,000
SUBTOTAL					\$26,315,028
CONTINGENCY (30%)					\$7,894,508
CONSTRUCTION SUBTOTAL					\$34,300,000
CONSTRUCTION ADMINISTRATION (15%)					\$5,200,000
DESIGN (10%)					\$3,500,000
PROJECT SUBTOTAL					\$43,000,000
UTILITIES (10%)		LUMP SUM	\$3,500,000.00	All Req'd	\$3,500,000
RIGHT-of-WAY		LUMP SUM	\$849,200.00	All Req'd	\$849,200
GRAND TOTAL					\$47,400,000

SEGMENT	TYPICAL SECTION WIDTH	SIDE SLOPE WIDTH	SEGMENT LENGTH	CAB DEPTH	BORROW A DEPTH	EXC DEPTH	MUCK EXC	TOTAL EXC (cy)	TOTAL CAB (ft3)	TOTAL BORROW A (ft3)	TOTAL BORROW B (ft3)
Crusey Street	84	10	5,700	0.5	3.5	4.0	0.0	87,822	239,400	1,875,300	1,488,000
Railroad Avenue	40	10	1,260	0.5	3.5	4.0	0.0	11,200	25,200	220,500	480,000
Ramps	24	10	3,200	0.5	3.5	0.0	0.0	0	38,400	380,800	768,000
Railroad Embankment	42	10	5,100	0.0	4.0	4.0	0.0	46,844	0	1,060,800	0
Railroad Shoofly/Siding	15	10	500	0.0	4.0	4.0	0.0	2,593	0	50,000	0
TOTAL:			15,760					148,459	303,000	3,587,400	1,248,000

TABLE of ESTIMATING FACTORS		
ITEM	FACTOR	QUANTITY
Select Material Type B (tons)	145 lb/ft ³	90,480
Select Material Type A (tons)	145 lb/ft ³	260,087
Crushed Aggregate Base Course (tons)	148 lb/ft ³	22,422
HAP SMA (tons)	152 lb/ft ³	13,042
AC Oil (tons)	5.5 % of HAP	717
Asphalt Pathway (tons)	153 lb/ft ³	887
Asphalt Median (tons)	153 lb/ft ³	0

SUMMARY	
HAP SMA (ft3):	171,600
Jersey Barrier (LF):	0
C&G Expressway (LF):	0
C&G Mountable (LF):	13,920
Pathway (ft3):	11,600
Median (ft3):	0
Sidewalk (CY):	516

ILLUMINATION	
Spacing	Length
x2	20,320
200	102
TOTAL:	102

SIGNALS	
Ramp Terminals	2
TOTAL:	2

TRACK and BALLAST	
Length Mainline	5,100
Length Shoofly	500
TOTAL:	5,600

STRIPING		
Segment	Length	Lanes
Crusey Street	5,700	5
Railroad Avenue	1,260	2
Ramps	3,200	1
TOTAL:	6.48	

TOPSOIL and SEEDING (SF)	
Crusey Street	162,000
Railroad Avenue	49,200
Ramps	256,000
TOTAL:	467,200

IRRIGATION (LF)	
Project Length:	10,160
x2 runs	20,320
TOTAL:	20,320

NOISE BARRIER (SF)	
Residential Length:	0
Average Height:	8
SF	0

RETAINING WALLS (SF)			
Location	Length	Height	Face
			0
			0
			0
			0
TOTAL:			0

MSE RETAINING WALLS (SF)			
Location	Length	Height	Face
Crusey Street Abutments	124	20	2,480
			0
			0
TOTAL:			2,480

STRUCTURES (SF)	
Crusey Street	33,600
Railing:	800
TOTAL:	33,600

GUARDRAIL (LF)	
Structures:	1
x4	4
x250 LF	1,000
TOTAL:	1,000

END-SECTIONS	
Structures:	1
x4	4
TOTAL:	4

Knik Goose Bay Road Grade-Separation

Alternative 7: Knik Street Grade Separation
COST ESTIMATE

TYPICAL SECTION	5-Lane Knik Street: 10' (pathway) - 2' - 12' - 12' - <u>16'</u> - 12' - 12' - 2' - 6' (sidewalk) =	84
STRUCTURAL SECTION (inches)	SMA Pavement =	4
	CAB =	6
	Borrow "A" =	42
SEGMENTS (feet)	Knik Street N, Parks Hiway to Fishhook Road	1700
	Knik Street S, Lakeview Avenue to Parks Hiw	2250
RAMPS (feet)	4 (4' - 12' - 8')	800
STRUCTURES (feet)	Bridge over Parks Hiway and ARRC:	300

DESCRIPTION: 5-lane Knik Street Interchange. Future traffic needs suggested a 5-lane roadway across the Parks Hiway. The current 3-lane intersection of the Parks Highway at Main Street/KGB will be closed, and Knik Street will be widened and grade-separated over the Parks Hiway and the ARRC, with tight ramps accessing the Parks Hiway.



ALTERNATIVE 7

ASSUMPTIONS: Bridge embankments to bottom of Borrow A.
Length for 4% approach grade = 600-feet
Height of embankment to bottom of Borrow A (need Borrow, CAB, HAP) = 20-feet

DESCRIPTION	ITEM No	Pay Unit			
		Pay Unit	Unit Price	Quantity	Amount
DEMOLITION and CLEARING	202()	ACRE	\$150,000.00	15.58	\$2,336,433
UNCLASSIFIED EXCAVATION	203(3)	CY	\$5.00	56,830	\$284,148
EMBANKMENT	203(5B)	TON	\$8.00	165,300	\$1,322,400
- BORROW B	203(5A)	TON	\$8.00	126,494	\$1,011,955
STRUCTURAL SECTION					
-AGGREGATE BASE COURSE (6")	301(1)	TON	\$11.00	15,118	\$166,300
-HAP, SMA (4")	407(1)	TON	\$45.00	8,750	\$393,756
-AC, GRADE PG 58-28	407(2)	TON	\$275.00	481	\$132,346
-CURB and GUTTER, Expressway	609(2B)	LF	\$12.00	0	\$0
-CURB and GUTTER, Mountable	609(2C)	LF	\$12.00	7,900	\$94,800
-SIDEWALK, 4" Thick	608(1)	SY	\$35.00	293	\$10,241
-ASPHALT PATHWAY and MEDIAN	608(8)	TON	\$55.00	504	\$27,699
STRUCTURES					
-BRIDGES		SF	\$200.00	25,200	\$5,040,000
-PEDESTRIAN BRIDGE RAILING	507(2)	FT	\$150.00	600	\$90,000
-RETAINING WALLS	501()	SY	\$500.00	0	\$0
-MSE RETAINING WALLS	511(1)	SF	\$65.00	4,960	\$322,400
-DEMO EXISTING BRIDGES		SF	\$20.00	0	\$0
-NOISE BARRIER	607(7)	SF	\$25.00	0	\$0
GUARDRAIL	606(1)	FT	\$30.00	1,000	\$30,000
CONCRETE MEDIAN BARRIER	606(18b)	FT	\$250.00	0	\$0
END-SECTIONS (ET-2000)	606(11)	EACH	\$3,000.00	4	\$12,000
TOPSOIL	620(1)	SY	\$3.00	73,311	\$219,933
SEEDING	618(1)	ACRE	\$4,000.00	15.15	\$60,588
PLANTINGS		LUMP SUM	\$10,000.00	All Req'd	\$10,000
WATERING	618(3)	M-Gallon	\$20.00	50	\$1,000
PEDESTRIAN HARDSCAPE		LUMP SUM	\$10,000.00	All Req'd	\$10,000
IRRIGATION SYSTEM	627(24)	LF	\$8.00	14,300	\$114,400
SIGNALIZED INTERSECTIONS		EACH	\$150,000.00	2	\$300,000
CONTINUOUS ILLUMINATION		EACH	\$5,000.00	72	\$357,500
SIGNING and STRIPING		LANE-MILE	\$100,000.00	4.54	\$453,598
DRAINAGE MEASURES (10%)		LUMP SUM	\$1,300,000.00	All Req'd	\$1,300,000
EROSION and POLLUTION (3%)		LUMP SUM	\$400,000.00	All Req'd	\$400,000
SURVEYING (3%)		LUMP SUM	\$400,000.00	All Req'd	\$400,000
CONSTRUCTION TRAFFIC CONTROL (5%)		LUMP SUM	\$800,000.00	All Req'd	\$800,000
MOBILIZATION (10%)		LUMP SUM	\$1,600,000.00	All Req'd	\$1,600,000
SUBTOTAL					\$17,301,497
CONTINGENCY (30%)					\$5,190,449
CONSTRUCTION SUBTOTAL					\$22,500,000
CONSTRUCTION ADMINISTRATION (15%)					\$3,400,000
DESIGN (10%)					\$2,300,000
PROJECT SUBTOTAL					\$28,200,000
UTILITIES (10%)		LUMP SUM	\$2,300,000.00	All Req'd	\$2,300,000
RIGHT-of-WAY		LUMP SUM	\$5,423,800.00	All Req'd	\$5,423,800
GRAND TOTAL					\$36,000,000

SEGMENT	TYPICAL SECTION WIDTH	SIDE SLOPE WIDTH	SEGMENT LENGTH	CAB DEPTH	BORROW A DEPTH	EXC DEPTH	MUCK EXC	TOTAL EXC (cy)	TOTAL CAB (ft3)	TOTAL BORROW A (ft3)	TOTAL BORROW B (ft3)
Knik Street North	84	2	1,700	0.5	3.5	4.0	0.0	22,163	71,400	511,700	744,000
Knik Street South	84	10	2,250	0.5	3.5	4.0	0.0	34,667	94,500	740,250	744,000
Ramps	24	20	3,200	0.5	3.5	0.0	0.0	0	38,400	492,800	1,536,000
TOTAL:			7,150					56,830	204,300	1,744,750	2,280,000

TABLE of ESTIMATING FACTORS		
ITEM	FACTOR	QUANTITY
Select Material Type B (tons)	145 lb/ft ³	165,300
Select Material Type A (tons)	145 lb/ft ³	126,494
Crushed Aggregate Base Course (tons)	148 lb/ft ³	15,118
HAP SMA (tons)	152 lb/ft ³	8,750
AC Oil (tons)	5.5 % of HAP	481
Asphalt Pathway (tons)	153 lb/ft ³	504
Asphalt Median (tons)	153 lb/ft ³	0

SUMMARY	
HAP SMA (ft3):	115,133
Jersey Barrier (LF):	0
C&G Expressway (LF):	0
C&G Mountable (LF):	7,900
Pathway (ft3):	6,583
Median (ft3):	0
Sidewalk (CY):	293

ILLUMINATION	
Spacing	Length
x2	14,300
200	72
TOTAL:	72

SIGNALS	
Ramp Terminals	2
TOTAL:	2

STRIPING		
Segment	Length	Lanes
Knik Street North	1,700	5
Knik Street South	2,250	5
Parks Hiway	200	5
Ramps	3,200	1
TOTAL:	4.54	

TOPSOIL and SEEDING (SF)	
Knik Street	54,800
KGB Road	93,000
Ramps	512,000
TOTAL:	659,800

IRRIGATION (LF)	
Project Length:	7,150
x2 runs	14,300
TOTAL:	14,300

NOISE BARRIER (SF)	
Residential Length:	0
Average Height:	8
SF	0

RETAINING WALLS (SF)			
Location	Length	Height	Face
			0
			0
			0
TOTAL:			0

MSE RETAINING WALLS (SF)			
Location	Length	Height	Face
Knik Street Bridge Abutments	124	20	2,480
			0
			0
TOTAL:			4,960

STRUCTURES (SF)	
Knik Street	25,200
Railing:	600
TOTAL:	25,200

GUARDRAIL (LF)	
Structures:	1
x4	4
x250 LF	1,000
TOTAL:	1,000

END-SECTIONS	
Structures:	1
x4	4
TOTAL:	4

Knik Goose Bay Road Grade-Separation
Alternative 8: KGB Road Grade Separation ("Rail over Road")
COST ESTIMATE

TYPICAL SECTION	3-Lane Main Street: 6' (sidewalk) - 2' - 12' - <u>14'</u> - 12' - 2' - 6' (sidewalk) =	54
	Railroad Double Track Mainline:	42
	Shoofly/Siding:	15
STRUCTURAL SECTION (inches)	SMA Pavement = 4	
	CAB = 6	
	Borrow "A" = 42	
SEGMENTS (feet)	Main Street, Parks Hiway to Swanson: 750	
	KGB Road, Lakeview Avenue to Parks Hiway: 1430	
RAILROAD	Railroad Mainline Embankment: 3900	
	Shoofly/Siding: 5600	
STRUCTURES (feet)	Main Street: 140	

DESCRIPTION: Railroad Grade-Separation. The Alaska Railroad Corporation (ARRC) would be elevated over Main Street. It will require a large amount of material for the required flat grades (on the order of 1 percent) in each direction between Crusey Street to Tommy Moe Drive.



ALTERNATIVE 8

ASSUMPTIONS: Bridge embankments to bottom of Borrow A.
 Length for 1% approach grade = -feet
 Height of embankment to bottom of Borrow A (need Borrow, CAB, HAP) = 20-feet

DESCRIPTION	ITEM No	Pay Unit	Unit Price	Quantity	Amount
DEMOLITION and CLEARING	202()	ACRE	\$150,000.00	12.86	\$1,928,375
UNCLASSIFIED EXCAVATION	203(3)	CY	\$5.00	51,159	\$255,793
EMBANKMENT					
- BORROW B	203(5B)	TON	\$8.00	175,305	\$1,402,440
- BORROW A	203(5A)	TON	\$8.00	144,603	\$1,156,822
STRUCTURAL SECTION					
-AGGREGATE BASE COURSE (6")	301(1)	TON	\$11.00	4,356	\$47,912
-HAP, SMA (4")	407(1)	TON	\$45.00	2,320	\$104,378
-AC, GRADE PG 58-28	407(2)	TON	\$275.00	128	\$35,083
-CURB and GUTTER, Expressway	609(2B)	LF	\$12.00	0	\$0
-CURB and GUTTER, Mountable	609(2C)	LF	\$12.00	4,360	\$52,320
-SIDEWALK, 4" Thick	608(1)	SY	\$35.00	323	\$11,304
-ASPHALT PATHWAY and MEDIAN	608(8)	TON	\$55.00	0	\$0
STRUCTURES					
-RAILROAD BRIDGES		LF	\$11,000.00	280	\$3,080,000
-PEDESTRIAN BRIDGE RAILING	507(2)	FT	\$150.00	280	\$42,000
-RETAINING WALLS	501()	SY	\$500.00	0	\$0
-MSE RETAINING WALLS	511(1)	SF	\$65.00	1,640	\$106,600
-DEMO EXISTING BRIDGES		SF	\$20.00	0	\$0
-TRACK and BALLAST		LF	\$500.00	9,500	\$4,750,000
GUARDRAIL	606(1)	FT	\$30.00	0	\$0
CONCRETE MEDIAN BARRIER	606(18b)	FT	\$250.00	0	\$0
END-SECTIONS (ET-2000)	606(11)	EACH	\$3,000.00	0	\$0
TOPSOIL	620(1)	SY	\$3.00	33,289	\$99,867
SEEDING	618(1)	ACRE	\$4,000.00	6.88	\$27,511
PLANTINGS		LUMP SUM	\$10,000.00	All Req'd	\$10,000
WATERING	618(3)	M-Gallon	\$20.00	50	\$1,000
PEDESTRIAN HARDSCAPE		LUMP SUM	\$10,000.00	All Req'd	\$10,000
IRRIGATION SYSTEM	627(24)	LF	\$8.00	4,360	\$34,880
SIGNALIZED INTERSECTIONS		EACH	\$150,000.00	1	\$150,000
CONTINUOUS ILLUMINATION		EACH	\$5,000.00	22	\$109,000
SIGNING and STRIPING		LANE-MILE	\$100,000.00	1.43	\$142,803
DRAINAGE MEASURES (10%)		LUMP SUM	\$1,400,000.00	All Req'd	\$1,400,000
EROSION and POLLUTION (3%)		LUMP SUM	\$500,000.00	All Req'd	\$500,000
SURVEYING (3%)		LUMP SUM	\$500,000.00	All Req'd	\$500,000
CONSTRUCTION TRAFFIC CONTROL (5%)		LUMP SUM	\$800,000.00	All Req'd	\$800,000
MOBILIZATION (10%)		LUMP SUM	\$1,700,000.00	All Req'd	\$1,700,000
SUBTOTAL					\$18,458,087
CONTINGENCY (30%)					\$5,537,426
CONSTRUCTION SUBTOTAL					\$24,000,000
CONSTRUCTION ADMINISTRATION (15%)					\$3,600,000
DESIGN (10%)					\$2,400,000
PROJECT SUBTOTAL					\$30,000,000
UTILITIES (10%)		LUMP SUM	\$2,400,000.00	All Req'd	\$2,400,000
RIGHT-of-WAY		LUMP SUM	\$50,000.00	All Req'd	\$50,000
GRAND TOTAL					\$32,500,000

SEGMENT	TYPICAL SECTION WIDTH	SIDE SLOPE WIDTH	SEGMENT LENGTH	CAB DEPTH	BORROW A DEPTH	EXC DEPTH	MUCK EXC	TOTAL EXC (cy)	TOTAL CAB (ft3)	TOTAL BORROW A (ft3)	TOTAL BORROW B (ft3)
Main Street	54	2	750	0.5	3.5	4.0	0.0	6,444	20,250	147,000	0
KGB Road	54	10	1,430	0.5	3.5	4.0	0.0	15,677	38,610	320,320	0
Mainline Embankment	42	20	3,900	0.0	4.0	0.0	0.0	0	0	967,200	2,418,000
Shoofly Embankment	15	10	5,600	0.0	4.0	4.0	0.0	29,037	0	560,000	
TOTAL:			11,680					51,159	58,860	1,994,520	2,418,000

TABLE of ESTIMATING FACTORS		
ITEM	FACTOR	QUANTITY
Select Material Type B (tons)	145 lb/ft ³	175,305
Select Material Type A (tons)	145 lb/ft ³	144,603
Crushed Aggregate Base Course (tons)	148 lb/ft ³	4,356
HAP SMA (tons)	152 lb/ft ³	2,320
AC Oil (tons)	5.5 % of HAP	128
Asphalt Pathway (tons)	153 lb/ft ³	0
Asphalt Median (tons)	153 lb/ft ³	0

SUMMARY	
HAP SMA (ft3):	30,520
Jersey Barrier (LF):	0
C&G Expressway (LF):	0
C&G Mountable (LF):	4,360
Pathway (ft3):	0
Median (ft3):	0
Sidewalk (CY):	323

ILLUMINATION	
Spacing	Length
x2	2,180
200	4,360
TOTAL:	22

TRACK and BALLAST	
Length Mainline	3,900
Length Shoofly	5600
TOTAL:	9,500

TOPSOIL and SEEDING (SF)	
Main Street	3,000
KGB Road	28,600
ARRC Embankments	268,000
TOTAL:	299,600

IRRIGATION (LF)	
Project Length:	2,180
x2 runs	4,360
TOTAL:	4,360

NOISE BARRIER (SF)	
Residential Length:	0
Average Height:	8
TOTAL:	0

RETAINING WALLS (SF)			
Location	Length	Height	Face
			0
			0
			0
TOTAL:			0

MSE RETAINING WALLS (SF)			
Location	Length	Height	Face
Main Street Bridge Abutments	82	20	1,640
			0
			0
TOTAL:			1,640

RAILROAD STRUCTURES (LF)	
Main Street (Double)	280
Railing:	0
TOTAL:	280

GUARDRAIL (LF)	
Structures:	0
x4	0
x250 LF	0
TOTAL:	0

END-SECTIONS	
Structures:	0
x4	0
TOTAL:	0

SIGNALS		
Parks Hiway	1	
TOTAL:	1	

STRIPING		
Segment	Length	Lanes
Main Street	750	3
KGB Road	1,430	3
Parks Hiway	200	5
TOTAL:	1.43	