VALLEYRIDE

Rail Corridor Evaluation Study

Volume I

Study Report

April 2003

Committee Acknowledgement

Acknowledgements

This is to recognize the hard work and devoted effort of the many individuals and organizations involved in the completion of this project. They are deserving of our thanks and gratitude. Our community has benefited due to their time and energy.

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EXECUTIVE SUMMARY

This Rail Corridor Evaluation Study was undertaken for ValleyRide in cooperation with Ada and Canyon Counties, the Ada County Highway District, the cities of Boise, Meridian, Nampa and Caldwell, the Community Planning Association of Southwest Idaho, and the Idaho Transportation Department. The primary purpose of the study was to provide the information and background necessary for the sponsoring agencies to make an informed decision regarding a public acquisition of certain rail corridors within Ada and Canyon Counties. Factors addressed during the course of the study included:

- The current status of the ownership and operating rights of the subject corridor.
- A recommended strategy for exploring the potential of public acquisition of all or portions of the subject rail corridors.
- An opinion of value for the segment of the Boise Cut-Off not currently in public ownership.
- The current extent of railroad property holdings along the Boise Cut-Off.
- The current condition of the railroad facilities (track, ties, ballast, crossings, crossing protection and structures) in the corridor.
- The improvements and capital costs required to place a starter commuter rail operation in service in the corridor.
- An environmental scan of the corridor.
- Operating plans for 45-minute and 30-minute service frequencies were developed including the location of potential stations and a maintenance/storage facility. An estimate of annual operating costs was prepared for each of the service plans.
- The potential impacts on traffic and utilities of introducing a commuter operation in the corridor were also addressed.

Figure 1 (page 1-2) identifies the railroad lines in the Boise area and also highlights the segment of the Boise Cut-Off that is the primary subject of the study.

Commuter Rail Defined

While acknowledging the primary purpose of the study is the exploration of public acquisition of the Boise Cut-Off, the underlying intent would be to utilize the corridor for public transportation service in the form of a commuter rail service. Commuter rail refers to passenger rail service that operates on rail lines that currently or in the past have served as freight

railroad lines. Although commuter rail operations have existed for decades in some metropolitan areas, only recently has this transportation technology seen a substantial resurgence as metropolitan areas heavily impacted by traffic congestion look for lower cost solutions. Dallas, San Diego, Los Angeles, Seattle, Sacramento, Vancouver BC, Salt Lake City and Portland are a few of the communities where commuter rail has recently been introduced into service or is in the process of being implemented. In many cases, the service focuses on the peak period commute, although a number of the systems do offer service at a reduced level during off-peak periods. Commuter rail cost advantages compared to typical light rail systems are the result of the use of existing rail corridors, although in most cases they must be upgraded to accommodate the passenger operations. Vehicles used in commuter rail systems vary substantially, from double decked locomotive-pulled units to lightweight single diesel units resembling light rail cars.

Corridor History

Rail passenger service from Boise to the communities to the west, including Meridian, Nampa and Caldwell, is not a new concept. Elements of such service were introduced to the Valley as early as 1887, with an interurban line from Boise to Caldwell via Eagle, Star and Middleton placed in service in 1907. A line from Boise to Meridian to the south of the Boise River was initiated in 1906, was extended to Nampa in 1909, and on to Caldwell in 1912. The portion of this latter line between Boise and Meridian was also rebuilt in 1912 along the current Boise Cut-Off alignment. The interurban passenger service flourished for a number of years but began to feel the effects of the increased use of the automobile in the mid-1920s, resulting in the abandonment of the interurban passenger service in 1928. Amtrak and its predecessors did provide long-haul passenger service utilizing the Boise Cut-Off until the service was terminated in 1997. After numerous ownership changes in the early years of the corridor, the Union Pacific Railroad (UPRR) currently owns the line with freight service being provided by the Idaho Northern & Pacific Railroad (INPR).

Corridor Condition Assessment

A detailed assessment of the current physical condition of the Boise Cut-Off and the railroad facilities within the corridor was conducted. The right-of-way width is generous for its current use, with the minimum width being 100 feet. Fifty-seven (57) percent of the 24.8 miles of the Boise Cut-Off not currently in public ownership has a width of 200 feet.

In general the track, structures and grade crossings are in good condition. The INPR generally maintains the line to approximately FRA Class 2 conditions that allow freight trains to operate at 25 MPH. The rail is jointed 133RE section in generally good condition. Most of the ballast is

clean and free draining with a few isolated areas of fouled ballast. The condition of the ties is a limiting factor in upgrading to passenger-level operations with between 15% and 50% of the ties on a per mile basis requiring replacement. The 13 structures that are the responsibility of the railroad are in fair to very good condition. There are a total of 45 grade crossings along the portion of the Boise Cut-Off under consideration. The level of crossing protection varies substantially with some crossings having flashing lights and gates and others protected by crossbucks and stop signs. The condition of the crossing surfaces also varies substantially from timber headers with gravel to full concrete surfaces.

Improvements Required For a Commuter Rail Operation

The study identifies a detailed set of recommended upgrades necessary in order to achieve FRA Class 3 conditions that would allow passenger operations at speeds up to 60 MPH. The detailed recommendations are included in a set of spreadsheets contained in Appendix A to the study report. Recommendations include:

- The replacement of all existing rail with continuous welded rail (CWR) using either 133RE or 136RE rail. This approach would decrease signal and rail maintenance costs, provide a smoother ride, and increase the initial service life after startup of the commuter operation.
- The replacement of approximately 20,000 ties, including nearly all switch ties.
- Following the tie replacement and rail relay, the entire line is recommended to be surfaced and lined at tolerances exceeding FRA Class 3.
- Cleaning of track ditches and proper drainage reestablished at all locations.
- A few minor upgrades to structures in the portion of the Cut-Off recommended for use in a starter operation are identified, including some replacement of ties.
- Installation of new flashing lights and gates at 21 crossings. Another 20 crossings are recommended to have crossing gates added to the existing flashing light systems now in place.
- New CWR and ties for all existing public crossings and replacement of all non-concrete crossings with concrete panels.
- The closure of one public and one private crossing.
- Installation of a fully centralized train control (CTC) signal and communications system for the entire corridor.

Environmental Scan

An environmental scan was conducted on the subject portion of the Boise Cut-Off. The scan addressed hazardous wastes, wetlands, and sensitive species. No sites were identified that would appear to impact either the ability to implement or the cost of implementing a commuter rail operation in the corridor.

Utility and Traffic Impacts

Given that the commuter operation would occur on the existing track alignment, the impacts on utilities either within or crossing the rail corridor are anticipated to be very minimal. Some minor impacts could occur in the station areas.

An assessment of the impacts of a commuter rail operation on existing traffic in the corridor was undertaken on five representative crossings. For purposes of the investigation, the more frequent 30-minute service was utilized, representing the maximum anticipated impact for a starter line. With a maximum of four crossings in a one hour period, the relatively short period of time that the gates are down (approximately 45 seconds), and the ability to coordinate the signals to compensate for the gate times at the nearby intersections, the overall impact on traffic was found to be negligible.

Operations Plans

Two operating plans were developed to help illustrate the range of service and costs that might be appropriate for an initial commuter operation on the Boise Cut-Off. The two plans are identified as a 45-Minute Service and a 30-Minute Service. Both services would have a western terminus at 11th Avenue in Nampa and the eastern terminus (East Terminal Station) near the intersection of Federal Way and Yamhill. Five intermediate stations are assumed:

Idaho Center
Meridian
Eagle Road
Boise Towne Square Mall
Boise Depot

The total length of the service would be 22.9 miles with a small limited-function maintenance facility located near the Nampa end of the project. A number of vehicle options are discussed in the report. For purposes of developing the operating plan and cost estimates, a Federal Railroad Administration (FRA) fully compliant Diesel Multiple Unit (DMU) vehicle was utilized. This vehicle option would allow for an operation that is mixed with the existing freight traffic.

A detailed schedule is provided for both the 45 and 30-Minute services, with both providing a 15 and one-half hour service day. Less frequent service is anticipated during the mid-day and late evening. The 45-Minute service would require two three-car trains with a third train set as a spare. The 30-Minute service would require three three-car trains with a fourth train set as a spare. The travel time from terminal to terminal is estimated at 34 minutes. The following are the operating statistics for the 45 and 30-Minute services:

Category	45-Minute Schedule	30-Minute Schedule
Daily One-Way Trips	26	38
Daily Revenue Train Miles	596	871
Daily Revenue Car Miles	1,789	2,614
Daily Train Hours	20	36
Daily Peak AM Eastbound Seats	1,500	2,100
Annual Revenue Train Miles	152,026	222,192
Annual Revenue Car Miles	456,078	666,575
Annual Train Hours	5,100	9,690

Operations Costs

Operating costs were estimated for both the 45 and 30-Minute plans utilizing the experiences of similar operations. Operating costs for small to moderate commuter rail operations where the passenger service, rather than the freight service, is the dominant factor in the corridor would not vary significantly based on the level of service. This is the case because fixed costs would typically make up a significant portion of the overall operating costs. The following are the estimated annual operating costs associated with the two operating plans:

Cost Category	45-Minute Schedule	30-Minute Schedule
Track and Signal Maintenance	1,000,000	1,040,000
Dispatch	600,000	600,000
Station and Revenue Collection	350,000	300,000
Direct Management	525,000	525,000
General Administrative	1,000,000	1,000,000
Fuel	159,000	232,000
Transportation	500,000	600,000
Equipment Maintenance	500,000	650,000
Maintenance Facility	200,000	200,000
Total	**$ 4,834,000**	**$ 5,147,000**

Because of the unknown factors influencing both the level and cost of insurance, no assumed level of coverage or premiums are estimated.

Capital Costs

Capital cost estimates were developed for both the 45-Minute and 30-Minute operating plans. The costs are based on the costs experienced on similar projects and include what are considered appropriate levels of contingency, engineering, administration and construction support allowances given the conceptual nature of the current definition of the projects. The estimates do not include an estimate of a public purchase of the Boise Cut-Off right-of-way. The following table provides a brief summary of the estimates:

Cost Category	45-Minute Schedule	30-Minute Schedule
Track and Structures	11,898,000	13,998,000
Grade Crossings/Signals	4,624,000	4,896,000
CTC, Communications, Dispatch	25,000,000	25,000,000
Vehicles	24,000,000	36,000,000
Stations	3,500,000	3,500,000
Park and Ride	7,450,000	7,450,000
Maintenance	3,050,000	3,050,000
Contingency	15,904,000	18,779,000
Engineering and Administration	7,952,000	9,389,000
Construction Support Services	4,771,000	5,634,000
Total	**$ 108,149,000**	**$ 127,696,000**

For comparison purposes, the costs for commuter rail operations of a similar nature with moderate levels of ridership have ranged from $4 to $8 million per mile. The 45-Minute service, with an estimated capital cost of $108.1 million for a 22.93 mile project, results in a $4.72 million per mile estimate. The 30-Minute service, with an estimated capital cost of $127.7 million, results in a $5.57 million per mile estimate.

Corridor Ownership and Operating Rights

The Boise Cut-Off corridor extends from MP 467.8 in Nampa to MP 423.5 in Orchard, a total of 44.3 miles. The 16.94 mile section of the corridor from Nampa to the Boise Branch near Hartman Road (MP 467.8 to MP 450.86) is currently owned by the UPRR. The second section of the corridor extends from the Boise Branch (MP 450.86 east to Orchard (MP423.5) where the line intersects with the UP mainline. The UPRR owns the corridor from the Boise Branch (MP450.86) to near Hillcrest, southeast of Boise (MP443.0). From MP 443.0 to Orchard (MP423.5) the City of Boise owns the corridor, having acquired the corridor from the UPRR in a sale (MP 443.0 to MP 439.5) and donation (MP 439.5 to 423.5) in 2000.

The underlying title for both of the above-mentioned sections of the corridor was examined by a review of the Schedule of Property contained in the UPRR maintained Valuation Maps. Sample deeds and agreements were randomly researched through County records to verify the accuracy of the original transfer. In summary, the Boise Cut-Off from Nampa to Boise is owned by the UPRR and is secured by generally good title.

The most significant property owned by the UPRR outside the rail corridor is in Meridian. The UPRR owns approximately 18 acres north of the rail line to Broadway, and extending six blocks east of 1st Street. Some of the area is under lease, mostly to rail using businesses.

Freight service in the corridor is currently provided between Nampa and Hillcrest (MP 443). The service is provided by the Idaho & Northern Pacific Railroad (INPR), a subsidiary of the Rio Grande Pacific, under a lease agreement between the UPRR and INPR. The UPRR interchanges rail traffic with the INPR at Nampa. Under the terms of the agreement, the UPRR retained all passenger rights on the corridor as well as management responsibility and income generated from other property leases, licenses and agreements such as billboards, pipelines and fiber optics. UPRR has the right to sell the corridor, provided that the INPR lease agreement also transfers to the new owner.

Establishing an Opinion of Value

Acquisition of railroad corridors, or rights to use the corridor or track capacity, is almost always a critical element in the implementation of a commuter rail passenger operation. Unlike other real estate acquisitions, local or state governments do not typically have condemnation authority to acquire existing, active railroad corridors. With no real alternative, public authorities must therefore bargain with the railroads to acquire all or part of a corridor for passenger rail development. The railroads, of course, realize the importance and uniqueness of their corridor assets to any publicly funded passenger rail project and are well equipped to bargain effectively for the maximum value.

In these situations, where there is but one buyer and one seller, traditional appraisal techniques have not proven to be particularly useful or accurate in establishing a corridor value. Establishing a value for corridors such as the Boise Cut-Off has become more art than science. Because the 2000 Boise sale/donation is the only recent area sale of a rail corridor, it will play an important role in framing the negotiations for the acquisition of the remaining 24.8 miles of the Boise Cut-Off. Negotiations between ValleyRide and the UPRR will determine the final agreed upon value. Early public disclosure of a value likely to result from the negotiations will only serve to set a threshold of value, and therefore have been provided separately from this report.

Transit System Integration

The study includes a discussion of the importance of integrating the commuter operation with the remainder of the public transportation system. This is not only important for the outlying stations in order to provide enhanced access to the system, but in the case of this corridor is particularly important at the Boise Depot Station. This station is not within pedestrian range of the numerous major trip generators such as the Central Business District, Boise State University, and the State Capital complex. Therefore, the success of a commuter line on the Boise Cut-Off will be dependent upon the quality of a connecting transit service that would efficiently distribute the passengers to their final destinations. An added consideration is the selection of a vehicle type that would be compatible with a future extension of the service to directly serve the above mentioned areas or to connect into one of the planned downtown intermodal centers.

Getting to Caldwell

The study identifies alternatives for extension of the commuter rail operation beyond the initial west terminus in Nampa to Caldwell. Three conceptual alternatives were explored and are described. One option would run parallel to the existing UPRR mainline between Nampa and Caldwell, utilizing a portion of the existing rail right-of-way. Two other alternatives would make use of the Madden Spur between Nampa and Highway 20/26 with one alternative terminating at that point with a park and ride lot. The second Madden Spur option would extend the rail service to the east edge of Caldwell by running within the Highway 20/26 right-of-way. Although each alternative is considered technically feasible, each would introduce a number of design, regulatory and acquisition issues that would make implementation difficult. The costs of any of these alternatives on a per mile basis would be substantially more than the estimates for the initial starter line on the Boise Cut-Off alignment.

Next Steps

ValleyRide, with participation from partner jurisdictions, has initiated discussions focused on negotiating an acquisition of the remaining portions of the Boise Cut-Off. This is an appropriate next step in the process of introducing passenger rail service in the Boise area.

With the assumption that ValleyRide would pursue Federal Transit Administration (FTA) New Starts funding to implement a project, the project would have to proceed according to the processes outlined for all projects competing for funding under this program. The initial steps would include the following:

- Alternatives Analysis - Evaluation of a range of alternatives that could result in improved transit service in the corridor. This would involve an added level of conceptual design, development of ridership projections, project justification and an initial identification of local funding commitments.
- Selection of a Locally Preferred Alternative.
- Request to FTA to enter Preliminary Engineering.
- Preparation of environmental documentation (Environmental Assessment or Environmental Impact Statement).
- Preliminary Engineering.

Each step includes a number of specific requirements be met as the project moves forward. Successfully moving a project forward requires frequent consultation with FTA as the project advances.

1.0 PROJECT BACKGROUND

1.1 Purpose and Scope

The purpose of the Rail Corridor Evaluation Study was to provide the basis for an informed decision regarding the potential for public acquisition of certain rail corridors within Ada and Canyon Counties, Idaho. Factors investigated include the status of the ownership and operating rights of the subject rail corridors, the extent of the railroad property holdings, the costs associated with upgrading the rail facilities for passenger operations, and a recommended strategy for exploring the potential of public acquisition of all or portions of the rail corridors.

Specific tasks undertaken during the course of the study include the following:

- Development of project mapping, including railroad property lines, environmental data, existing rail facilities and adjacent land use.
- A detailed evaluation of the existing rail facilities, including the track, structures, grade crossings and crossing protection.
- Identification of utilities located within the rail right-of-way that could conflict with upgrading of the corridor for passenger operations.
- Evaluation of the potential traffic impacts associated with the introduction of a commuter passenger operation in the corridor.
- Environmental scan of the Boise Cut-Off.
- Identification of potential station locations for a future commuter operation.
- Identification of potential locations for a maintenance and storage facility.
- Development of initial starter system operations plans.
- Development of capital cost estimates for an initial starter commuter rail operation.
- Review of the ownership and operating rights of the rail corridors under consideration.
- Development of an opinion of value and acquisition plan for the subject rail corridors.
- Identification of alternative alignments for a passenger rail service that extends from Nampa to Caldwell.

Figure 1
Vicinity Map

Figure 1 is a Vicinity Map illustrating the various rail corridors located in the Boise Area. The primary focus of the Rail Corridor Evaluation Study has been on the portion of the Boise Cut-Off from Nampa to a location just south of Gowen Road near I-84 in Boise. This rail corridor segment is illustrated as the red alignment in Figure 1. The Vicinity Map also identifies other existing rail alignments in the area that could be considered for acquisition in order to retain the option for future passenger operations.

1.2 Work Products

The work products produced as a result of this study are summarized and presented in the following documents:

Rail Corridor Evaluation Study - Volume I, Study Report
Rail Corridor Evaluation Study - Volume II, Corridor Mapping
Technical Memorandum; Corridor Value
Environmental Data Resources, Inc., Environmental Scan

In addition, the Consultant Team provided display graphics and made presentations to the project Technical Advisory Committee, Policy Committee and the ValleyRide Board of Directors.

1.3 Corridor History

The concept of passenger rail service is not new to the Treasure Valley. Much of the early history and economic development of the Valley was tied to the development of a series of interurban lines that connected communities within the Valley. As an early forerunner to the interurban lines, the Idaho Central Railroad Company built a line in 1887 from Nampa to what is now Bishop Kelley High School. The line was extended to downtown Boise in 1889. The City of Boise saw the introduction of streetcar service in 1891. By the year 1905, plans were being made to introduce interurban rail service down the Valley to the west of Boise. With the incorporation of the Boise & Interurban Railway Company, construction began in 1906 on a line from Boise to Caldwell via Eagle, Star and Middleton. The line was placed into service on August 8, 1907. The line was well received in terms of both passengers and freight usage, although a planned extension to Nampa did not materialize as originally planned.

A second line located south of the Boise River was built by the Boise Valley Railway Company, with service initiated between Boise and Meridian in 1906. This line also included plans for service directly to Nampa, but delays resulted in the service not occurring until October of

1909. The connection between Nampa and Caldwell was completed in May of 1912, thus completing what became known as the Interurban Loop. A popular Sunday and holiday activity became $1.00 excursion trips known locally as “Loop the Loop”.

Figure 2 Interurban at Meridian

In 1912, the south line from Boise to Nampa via Meridian was rebuilt to make it more direct and to eliminate a number of curves. Major portions of this new alignment remain today as the Boise Cut-Off, the subject of the current study.

The Boise & Interurban Railway Company and the Boise Valley Railway Company were operated by the Idaho Traction Company until 1913 when they became part of the Idaho Light and Power Company. In 1915, operations were transferred to the Boise Valley Traction Company, which was owned by the Idaho Power Company. The interurban system, successful through 1920, began feeling the effects of the increased use of automobiles and trucks and began to suffer financial losses in 1924. Unable to successfully compete, the passenger service was abandoned in May of 1928. In 1923 and 1924 the Oregon Shortline built the section of the Boise Cut-Off from Boise Junction (Curtis Road) to Orchard, providing Boise mainline freight rail service rather than being at the end of a branch line.

The Boise Cut-Off is currently owned by the Union Pacific Railroad (UPRR) and continues as a freight-only operation. Currently the Idaho Northern & Pacific Railroad provides the freight service on the line under agreement with the UPRR. Until 1997, Amtrak provided service on the Boise Cut-Off as part of its Pioneer Route, utilizing the Boise Depot.

Figure 3 Boise Depot

2.0 RAILROAD INVENTORY

2.1 Right-of-Way

The portion of the Boise Cut-Off that is the subject of this study is located between Mile Post 467.80 in Nampa and Mile Post 443.00 just south of Gowen Road in Boise, a total distance of 24.80 miles. The right-of-way currently houses a single track with numerous industrial sidings and spurs. The right-of-way also accommodates a number of utilities, including high voltage overhead lines and fiber optic lines.

The right-of-way is generous for its current use, with the majority of the corridor having a width of either 100 feet or 200 feet (57 percent of the alignment has a width of 200 feet). Volume II of this report, titled Corridor Mapping, provides illustrations of the entire corridor with the UPRR right-of-way superimposed on Year 2000 aerial photos.

Table 1 provides a general description of the width of the corridor right-of-way from its beginning in the Nampa rail yards to the point that the City of Boise ownership begins, at Mile Post 443.00 just south of Gowen Road in Boise.

Table 1

Boise Cut-Off, Right-of-Way Width

Corridor Location		
From (mile post)	**To (mile post)**	**Width (feet)**
467.8 @ UPRR Nampa Yard	467.52 @ 1st Street Nampa	150
467.52	464.96 @ 1/3 mile west of 11th Ave. NO	100
464.96	450.90 @ mid-point between Liberty and Hartman Roads	200
450.90	446.18 @ north of Broadway	100
446.18	445.74 @ approx. 2000’ west of Gekeler Road	150
445.74	445.55 @ approx. 1000’ west of Gekeler Road	100
445.55	444.94 @ approx. 1000’ west of Apple Road	150
444.94	443.00 @ approx. 600’ south of Gowen Road	100

2.2 Rail Facilities

A review of the existing UPRR Boise Cut-Off corridor was performed in order to determine the existing general condition of the track, grade crossings, crossing protection, and major structures. The existing conditions were used as a baseline for the development of recommended upgrades that would be required in order to accommodate commuter rail operations between Nampa and the vicinity of Micron, east of Boise. The review consisted of the following tasks:

1) Review of available records and maps from the UPRR and their lessee, Idaho Northern & Pacific Railroad (INPR). UPRR owns the right-of-way and improvements. INPR operates and maintains the line under an agreement with the UPRR. Available documentation included track inspection reports, grade crossing inventory, bridge inspection notes, and right-of-way maps.

2) Track and structure inspections to determine the general condition of the existing improvements. The inspections included a hi-rail trip of the entire line with the INPR roadmaster. Walking inspections were also performed for several hundred feet each direction from nearly every grade crossing. The major structures were inspected during the hi-rail trip. No attempt was made to inspect culverts along the corridor. There are currently no train control signals on the Cut-Off.

3) Review of available grade crossing records from the Idaho Transportation Department (ITD). The State has an extensive inventory of all of the grade crossings on the line. Meetings were held with representatives of the ITD to discuss issues regarding the crossings and their impressions of upgrades that might be needed to accommodate commuter rail operations.

4) Inspection of the grade crossings on the corridor to determine the general condition of the crossing protection systems, grade crossing surfaces, and issues affecting grade crossing operations such as adjacent traffic signals, heavy traffic locations and sight distance impairments.

Information gathered from the reviews and on-site inspections has been organized and documented in a series of spreadsheets. The spreadsheets document the existing conditions listed by location and railroad milepost and recommended upgrades to the existing system to accommodate commuter rail operations. The recommendations are based on bringing the track and structures to conditions meeting Federal Railroad Administration (FRA) minimum requirements for Class 3 operations.

Class 3 allows maximum train speeds of 40 MPH for freight trains and 60 mph for passenger trains. Recommended upgrades to the grade crossings are based on providing active protection including flashing lights and gates at all public grade crossings. In addition, all public grade crossings would have precast concrete crossing panels installed to replace existing non-concrete surfaces.

2.2.1 Inspection Summary

In general, the track, structures, and grade crossings are in good condition. INPR generally maintains the line to approximately FRA Class 2 conditions that allow freight trains to operate at up to 25 MPH. This line carried Amtrak passenger operations until May 1997 and was kept at Class 3 by the UPRR. Since that time the track has received a decreased level of maintenance. The inspections revealed the following described general conditions. Details of the inspections and the recommended upgrades can be found in the spreadsheets in Appendix A.

Track

The main limiting conditions within the corridor are track geometry and condition of the ties. The rail is jointed 133RE section in generally good condition with some locations showing more wear than others. The track ballast is a mix of crushed basalt, granite, and limestone. Most of the ballast is clean and free draining with a few isolated areas of fouled ballast located mostly in areas where there is heavy switching done by the railroad. Turnouts along the line are all constructed of 133RE rail. The switches and frogs are in fair to good condition with some wear that needs repair. The switch ties are in fair to poor condition and should all be replaced. Some segments of the corridor have brush growing very near the track. This condition restricts site distances at grade crossings, makes track maintenance more difficult, and presents a fire hazard.

Figure 4 Typical Boise Cut-Off Track Section

Structures

There are 18 major structures along the line. Of these, five are highway overcrossings that are not the responsibility of the railroad. The remaining 13 are in fair to very good condition. No major upgrades or repairs are recommended, except for the replacement of one timber frame trestle in Nampa. This structure carries the track over the 1st Street Extension near the junction of the Cut-Off with the UPRR mainline. The balance of the recommendations mostly relate to the replacement of bridge ties and handrails.

2.2.2 Recommended Upgrades

Track

Recommended track upgrades are detailed on the Track Inventory and Recommended Upgrades spreadsheet (Appendix A). They are broken down by milepost and category. The upgrades are intended to bring the track up to a minimum of FRA Class 3 conditions to accommodate commuter rail operations at train speeds of up to 60 MPH.

Figure 5 Typical Track with Siding

1) Rail - The existing rail is 133RE jointed rail in fair to good condition. The rail is in good condition to continue servicing the freight operation, but may present several problems for commuter rail operations. If left in the track, the bolted joints in the rail would make it more difficult to install and maintain train control signal systems since all of the joints would need to be electrically bonded and must be maintained to keep signals operating properly. The joints would also make it more difficult to maintain the track surface. Finally, if left in place, the remaining service life of the existing rail is probably only a few years if placed under increased train traffic from the commuter operation. It is recommended to replace all of the existing rail with continuous welded rail (CWR) using 133RE or 136RE rail. This would decrease both signal and track maintenance, provide a smoother ride, and increase the initial service life of the rail after the start of commuter rail operations.

2) Ties - Tie condition is one of the major limiting factors keeping the existing track from being FRA Class 3. In order to meet Class 3 criteria, approximately 20,000 crossties must be replaced. The inspection indicated that the number of replacement ties per mile varies from 450 to 1500. This represents from 15% to nearly 50% of the ties, depending upon location. The existing ties are timber and the recommendation is to replace them with timber, since alternatives such as concrete or steel would require complete replacement of all ties and the unit price of the ties would also increase.

   Inspection of the switch ties indicates that nearly all of them should be replaced. This would meet the requirements for FRA Class 3 and also provide extended service life for the switches and frogs. Again, the existing ties are timber and the recommendation is to continue with timber ties.

3) Surface and Line Track - Following the tie replacements and rail relay, all of the track should be surfaced and lined to reestablish proper track geometry for operation of the commuter rail trains. The tolerances for this work should exceed those for FRA Class 3 to provide a smooth ride for passengers and to reduce track

maintenance. In addition to surfacing and lining of the track, minimum 12-inch wide ballast shoulders should be established to provide track stability. Track ditches should be cleaned and proper drainage along the track reestablished at all locations. Proper track drainage is one of the most important items to maintaining good track. Finally, all vegetation within 25 feet of the track should be cut or mowed to a height of no more than one foot. This would provide good visibility for train crews, track maintenance personnel, and the driving public and would reduce the fire danger. INPR is currently doing a good job of maintaining the track ballast and shoulders, providing a good base for the upgrade work for commuter rail.

Structures

Only a few structure upgrades are recommended. All of the bridge ties on Bridge No. 446.07 should be replaced. Approximately 10 bridge ties and the handrail on Bridge No. 448.22 should be replaced. The entire structure, including abutments, at Bridge No. 467.54 needs to be replaced due to damage from being hit by road vehicles. The existing timber posts and stringers and the concrete abutments are all damaged. The structure is not in danger, but should be replaced if the commuter rail is extended beyond the currently recommended terminus at 11th Avenue.

2.3 Grade Crossings

2.3.1 Inspection Summary

There are a total of 45 grade crossings along the alignment. Of these, 38 are public and seven are private, including one pedestrian-only crossing. Eighteen of the grade crossings along the corridor are already protected by active protection systems, including flashing lights and some with gates. The other public crossings are protected by crossbucks and stop signs. The private crossings have private crossing and stop signs. Some of the public grade crossings present special challenges for installation of crossing signals related to very wide crossings, close proximity to signalized street intersections, right turn moves with restricted sight distance, and high traffic counts. These types of crossing situations take special measures. INPR and ITD are already working together to solve some of these situations.

Figure 6 Crossing with Flashing Light and Crossbucks

There are a variety of crossing surfaces throughout the alignment ranging from timber headers with gravel to rubber and concrete surfaces. INPR has upgraded a number of crossings using precast concrete panels. Many of the remaining crossings need upgrading due to deterioration of the existing surfaces.

2.3.2 Recommended Upgrades

Grade crossing upgrades are divided into two categories: the crossing surface and the grade crossing protection systems. INPR has a program of replacing existing asphalt, timber, and rubber crossing surfaces with precast concrete panel crossings. The work at each crossing includes rebuilding the track through the crossing with new ties and welded rail. It is recommended to continue their work and replace all non-concrete public crossings with concrete panels. The UPRR has a standard panel design that can be used. The road approaches on each side of the crossings should also be repaved. All private crossings should continue to be maintained using the same type of crossing materials as are currently in place.

Active grade crossing protection systems should be installed at all public crossings without such protection. Twenty-one crossings should have new flashing lights and gates installed. Another 20 crossings should have crossing gates added to the existing flashing light systems now in place. INPR and ITD have an ongoing program of upgrading crossing protections along the corridor. This established working relationship and their familiarity with the corridor should be utilized to help plan the upgrade program for commuter rail.

In addition to improving crossing protection systems, it is also recommended that one public and one private crossing be permanently closed. The existing crossing at Karcher Road at Milepost 465.28 is not associated with an improved street or road. The crossing does not provide access to any public facilities and does not appear to serve any useful purpose. The private crossing located at Milepost 449.77 in Boise provides access to a single residence from Alpine Street. Alternative access could be provided from an adjacent street without crossing the track. Some railroad right-of-way parallel to the track may be required to provide the alternative access. Elimination of grade crossings improves safety and reduces maintenance.

Figure 7 Unimproved Public Crossing with Crossbucks at Karcher Road

2.4 CTC, Communications and Dispatch Systems

At this very early stage of study and design, it is difficult to identify these improvements in detail. The recommendation is to install a centralized train control (CTC) system for the commuter rail operation. The existing corridor has no train control signals. The scope and cost of the recommended improvements are based on similar operations on similar transit systems. The recommendations include a full CTC signal system, communication and train control for the entire corridor, and a dispatch center.

2.5 Utilities

The implementation of a commuter passenger operation in an existing freight rail corridor requires careful consideration of the impacts on utilities located either within or crossing the railroad right-of-way. The costs of relocating utilities to implement a passenger service are also a consideration. Passenger operations are generally more sensitive to the existence of utilities located within a right-of-way, particularly if either maintenance or repair of the utilities would result in a potential interruption of service.

The Boise Cut-Off houses a number of utilities within the railroad right of way, which is typical of most rail lines, particularly those located within urban areas. The utilities located within the right of way are there with permission of the railroad and in most cases can be required to move if in conflict with rail operations.

For the starter commuter operation identified for the Boise Cut-Off, the majority of the length of the operation would occur on the existing track, upgraded to accommodate higher speed passenger operations. A review of the corridor indicates that there are no current utilities located in a manner that would interfere with operations on the existing trackage. With the 45-minute schedule, both terminal stations and the station at Eagle Road would have a short section of new track built. A review of these locations does not indicate a conflict would exist with an existing major utility. None of the new track locations are anticipated to require the second track be extended across an existing roadway, therefore avoiding any added conflict with utilities located in road rights-of-way. With the 30-minute schedule, approximately two miles of added double tracking would be required. Again, no substantial utility impacts are anticipated, although two road crossings would be impacted.

Portions of the Boise Cut-Off house a major Idaho Power transmission line. The line is a double circuit 230 KV line located in the right of way between Apple Street and Overland Road and from Phillippi Street to Eagle Road. The line generally is located to the side of the rail right of way and in all cases appears to preserve sufficient right of way to construct a second track if freight and/or passenger operations required the added capacity in the future.

2.6 Land Use

The 24.8 mile Boise Cut-Off rail corridor traverses a wide variety of existing land uses ranging from the mature urban residential neighborhoods of the City of Boise to open farm land. The line serves the urbanized areas of Nampa, Meridian and Boise characterized by a mix of residential, commercial, institutional and industrial uses. The areas between Nampa and Meridian and Meridian and Boise, although still dominated by agricultural uses, have experienced very rapid growth that is projected to continue into the future. East of the Boise Depot the alignment serves established residential neighborhoods that give way to industrial development near the Boise Airport and I-84. The rail alignment directly serves or is in close proximity to a significant number of major regional trip generators, making the corridor attractive as a transit operation. Included are:

- Idaho Center
- Boise State University Extension Campus (Proposed)
- St. Luke's Meridian Medical Center
- Boise Towne Square Mall
- Boise State University/Downtown Boise/State Capital Complex
- Boise Airport
- Micron

Appendix B provides an index and four maps that illustrate the zoning of the land area adjacent to the rail alignment. The land use categories are generalized in order to account for the differing categories of land use zoning used by the various jurisdictions. In general, the maps reflect the current trend of the entire corridor becoming more urbanized over time. The station locations initially recommended are all situated in locations that are planned for urban type uses.

The maps contained in Volume II of this report illustrate the current land uses directly adjacent to the existing rail corridor.

3.0 ENVIRONMENTAL SCAN

The Boise Cut-Off serves a large number of industrial uses that are located adjacent to the rail line, many of which are provided rail service by the INPR. In addition, numerous businesses situated adjacent to the rail service generate, store, treat or dispose of hazardous waste materials as a function of their business activities.

URS conducted an Environmental Scan of the corridor from Mile Post 467.80 in Nampa to Mile Post 443.00 in east Boise. The purpose of the scan was to evaluate the potential for environmental impacts either within the rail corridor right-of-way or within the rail corridor study area.

URS reviewed information gathered from several environmental databases through the assistance of Environmental Data Resources, Inc. (EDR) to assess whether activities on or near the rail corridor have the potential to impact environmental conditions within the study area. EDR maintains collective databases compiled by federal, state, and local governmental agencies. The complete list of reviewed databases is provided in the EDR report, forwarded to ValleyRide separately. It should be noted that this information is reported as received from EDR, which in turn reports information as it is provided in various government databases. It is not possible for either URS or EDR to verify the accuracy or completeness of information contained in these databases. However, the use of and reliance on this information is a generally accepted practice in the conduct of environmental assessments.

The EDR study area was defined as one mile on either side of the rail line from Mile Post 467.80 to Mile Post 443.00. A summary of the environmental database review is provided as follows:

- The environmental database identified two Comprehensive Environmental Response, Compensation and Liability (CERCLIS) sites located within the EDR radius search. Neither of the identified sites are located within the corridor study area or the rail corridor right-of-way. In addition, information provided on the database indicates neither site is listed on the National Priority List site. The CERCLIS site status is low in one case (EDR Map ID #21) and clean-up is complete on the second site (EDR Map ID #66).

- The environmental database identified four Corrective Action (CORRACTS) sites within the EDR radius search where corrective remedial measure has been approved (EDR Map ID #40, 41, 67 and 71). None of the identified sites are located within the corridor study area or the rail corridor right-of-way.

- The environmental database identified 73 Leaking Underground Storage Tank (LUST) sites within the EDR radius search. Of those listed, 14 are designated as "open" status, the remainder of the listed sites are noted as "clean-up complete". Four of the open LUST sites are located within the corridor study area (EDR Map ID #13, 15, 40 and 67). None of the identified sites are located within the rail corridor right-of-way.

Two potential wetlands were identified and mapped adjacent to the east side of rail line right-of-way within Nampa. The two wetland areas are outside the rail line right-of-way but in relatively close proximity to the line near Mile Post 467.35. The identified wetlands are not in locations tentatively identified for the construction of a station, park and ride lot, or maintenance facility. The rail corridor does cross a number of minor waterways and canals; however, the identified waterways and canals are not in locations that are suggested for construction in excess of upgrades to existing track under the 45-minute schedule. With the 30-minute schedule, seven culverts would likely require extensions to accommodate the added passing tracks.

A single sensitive plant species occurrence was identified north of Nampa. The location is outside the rail line right-of-way. No endangered plant species sites were identified within or directly adjacent the rail corridor.

The presence of historic structures associated with the ValleyRide Rail Corridor was not evaluated as part of this study.

4.0 COMMUTER OPERATIONS PLAN

4.1 Stations

In order to develop an operating plan for an initial starter line, it is necessary to identify the location of stations within the corridor. For commuter rail operations, stations are typically spaced in the range of three to five miles apart. A review was conducted of the existing and projected land use along the corridor as well as existing and planned major activity centers. Based on the review of the above information, locations were selected as tentative station locations for purposes of developing a starter operations plan. Table 2 identifies the stations, the approximate Mile Post and distance between stations.

Table 2

Station Location and Spacing

Station	Railroad Mile Post	Distance from Previous Station
Nampa @ 11th Ave. No	466.16	
Idaho Center	463.46	2.70
Meridian	457.53	5.93
Eagle Road	455.69	1.84
Boise Towne Square Mall	451.90	3.79
Boise Depot	448.59	3.31
East Terminal	443.23	5.36
Total Miles	22.93	
Average Station Spacing		3.82

The western terminus of the starter line is suggested to be a station located at 11th Avenue in the northeast quadrant of Nampa. The station would be in the vicinity of the City recreation complex and would be well situated to intercept trips originating in the Nampa area headed to the various destinations to the east. A second potential site at or near the terminus of the Boise Cut-Off at the north end of the UPRR Nampa yards was not recommended based on a much more difficult access for the majority of the Nampa population. The second station, located at Can Ada Road, would be well situated to serve Idaho Center, the proposed Boise State University extension campus, and the surrounding development. The Meridian Station would serve the commercial and industrial activities in the downtown area of Meridian as well as the surrounding area. The Eagle Road Station would serve the rapidly developing areas accessed by Eagle Road in addition to major employment centers such as the St. Luke's Meridian Medical Center. The Boise Towne Square Mall, located near Milwaukee Road, would serve the mall and the substantial adjacent development. The Boise Depot Station would make use of the historic train station and serve as the

major destination point for individuals headed to downtown Boise, Boise State University and the State Capital complex. The East Terminal Station, located near the intersection of Federal Way and Yamhill, is well situated to service Micron and other industrial uses in the area. The seven stations result in an average spacing of 3.82 miles, toward the lower end of typical commuter rail operations.

The stations would be relatively simple in design, including an approximate 200 to 250 foot platform to handle either two or three-car operations. The platform would be between 15 and 18 feet wide, and include a sheltered area to provide weather protection along with lighting for security purposes. Disabled access would be provided, the nature of the design depending on the type of vehicle selected to operate in the corridor. Other features included at the station platform would be an information kiosk, ticket vending and pedestrian/bicycle access.

Figure 8 Commuter Rail Typical Station

An important element of accessing most commuter rail operations, particularly given the nature of the service that operates outside the most built up portion of urban areas, is the provision of park and ride lots. For planning purposes, it was assumed that park and ride lots would be provided at the Nampa, Idaho Center, Meridian, Eagle Road and East Terminal stations. Parking was not assumed at the Boise Towne Square Mall and Boise Depot stations given that they are primarily destination stations with the surrounding area already being developed.

4.2 Maintenance Facility

Implementation of a commuter rail operation would require the development of an operations and maintenance facility. Based on the relatively small fleet of vehicles required, it is recommended that the

facility be planned to handle vehicle storage, inspection and minor repair. Major vehicle maintenance, including diesel engine repair, major component repair and any required body repair, could be contracted to a qualified vendor.

The operations and maintenance facility would be sized to accommodate the starter operation with allowance for future expansion of the fleet. The functions to be accommodated at the facility would include a secured area for storage of the vehicles, vehicle cleaning, vehicle inspection, light maintenance, operator report and administration. Improvements to the site would include the provision of perimeter fencing, storage tracks laid out to allow movement of the fleet within the yard, employee parking and a maintenance building. The building would provide a weather-protected inspection area and a minor maintenance area with an inspection pit. The maintenance structure would also house parts and cleaning equipment, a small office area for the operator-report function and administrative space. The yard would provide for outdoor storage of materials required for maintenance of the commuter line. The facility would require access to water, sewer and electricity.

The operations and maintenance facility should be located directly adjacent to the rail line in order to avoid added operating costs. A location near either end of the line also offers advantages in terms of operating costs. It appears that potential sites may be available adjacent to the line in the Nampa area. Two locations have been identified as potential sites for planning purposes.

Figure 9 provides a typical layout for an operations and maintenance facility that would accommodate the needs of a starter operation in the Boise to Nampa corridor. The final layout for a facility would be modified to fit the configuration of the specific site selected.

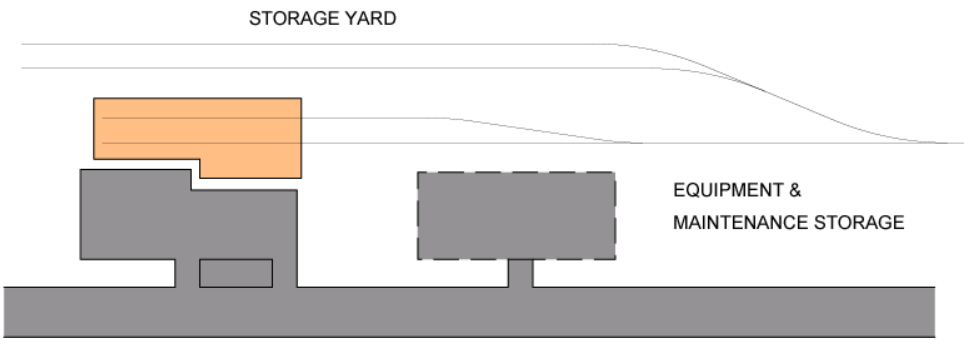

Figure 9 Schematic Maintenance Facility Site Layout

4.3 Operating Plan

Two operating plan schedules have been developed for the service, with both plans focused on balancing three critical factors: initial capital cost requirements; ongoing operations costs; and service delivery. The 45-minute operating plan, or schedule, provides for a 45-minute peak hour headway between an 11th Avenue station in Nampa as the western terminus and the East Terminal Station near the Micron facility as the eastern terminus. The 30-minute operating plan provides a 30-minute schedule between the same stations as the 45-minute plan.

Vehicles

Three vehicle options may be available for this commuter rail service. The first option is the classic commuter rail push/pull service utilizing locomotives and passenger coaches. In this configuration, each train set would have a locomotive on one end of the train (e.g., the east end) followed by one or more passenger coaches with a cab car (a passenger coach equipped with controls to operate the train) at the other end of the train. Operating eastbound, the locomotive "pulls" the train, with the engineer operating the train from the locomotive at the head end of the train. Operating westbound, the locomotive "pushes" the train, with the engineer operating the train from the cab car at the leading (west end) of the train. Push-pull equipment is usually less expensive to purchase, and is best suited for high density, high ridership service. With the single locomotive, the train set can easily operate a 10-12 car train with either bi-level coaches (seating approximately 150 passengers per coach) or single level coaches (seating approximately 100 per coach).

Figure 10 Typical Push/Pull Commuter Rail Train

Figure 11 Trinity Railway Express DMU

The second option is operation of self-propelled diesel vehicles, the newer version of the older Budd Rail Diesel Car (RDC) now operating between Dallas-Fort Worth by Trinity Railway Express. These vehicles, generally called Diesel multiple-units (DMU), incorporate motive power within the car body design itself. Colorado Rail Car has developed a new prototype of this vehicle that has received much recent publicity. DMUs would likely have a higher capital cost, but offer greater operational flexibility because each vehicle, or two car married pair, can operate independently. Normally DMUs would be used in light or moderate density service, much as is expected with the Boise to Nampa service. DMUs are currently planned for the Raleigh/Durham service by the Triangle Transit Authority in North Carolina and in Oregon for the proposed Washington County service near Portland.

Figure 12 Modern DMU, Colorado Rail Car

The third vehicle option is a lighter weight DMU that does not meet the Federal Railway Association (FRA) standards for operation in mixed traffic with rail freight service. Because the Boise-Nampa rail line handles only a moderate to light level of local freight traffic, it may be possible to shift rail freight service to nighttime hours only. With a clear time separation between the freight service and passenger service, a lighter weight DMU could operate. These vehicles are lighter weight because they do not comply with the FRA strength requirements and the lighter weight provides for better performance, including a tighter turning radius and better acceleration and deceleration. These DMUs have even greater operational flexibility than the heavier FRA compliant vehicles. Light DMUs are expected to have a lower capital cost than compliant DMUs, and have lower operating costs.

Figure 13 Lightweight DMU, Ottawa

For purposes of the operating plan and cost estimates, fully compliant DMUs are used as the baseline, but further study and analysis of light DMUs is recommended.

4.3.1 Forty-Five Minute Operations Plan

Stations

The forty five minute operations plan assumes a Western Terminal Station at 11th Street in Nampa (MP 466.16) and an Eastern Terminal Station at the Boise East Terminal (MP 443.23). Five intermediate stations are located at:

Idaho Center (MP 463.46)
Meridian (MP 457.53)
Eagle Road (MP 455.69)
Boise Towne Square Mall (MP 451.99)
Boise Depot (MP 448.59)

Schedule

Table 3 is a draft schedule reflecting service with 45-minute headways for both the morning and afternoon peak periods. Off peak service (mid-day and evenings) would have 90-minute headways. To provide this level of service, two three-car train sets would be required for daily service (listed as "A" and "B" in Table 3). A third train set would be necessary for routine maintenance and to protect the daily service levels.

Table 3
45-Minute Schedule

EASTBOUND: NAMPA-BOISE

	A-101	B-103	A-105	B-107	A-109	A-111	A-113	A-115	A-117	A-119	B-121	B-123	B-125
Nampa 11th Ave No	6:00	6:45	7:30	8:15	9:00	10:30	12:00	13:30	15:00	16:30	17:15	18:45	20:15
Idaho Center	6:05	6:50	7:35	8:20	9:05	10:35	12:05	13:35	15:05	16:35	17:20	18:50	20:20
Meridian	6:13	6:58	7:43	8:28	9:13	10:43	12:13	13:43	15:13	16:43	17:28	18:58	20:28
Eagle Road	6:17	7:02	7:47	8:32	9:17	10:47	12:17	13:47	15:17	16:47	17:32	19:02	20:32
Boise Towne Square Mall	6:32	7:08	7:53	8:38	9:23	10:53	12:23	13:53	15:23	16:53	17:38	19:08	20:38
Boise Depot	6:28	7:13	7:58	8:43	9:28	10:58	12:28	13:58	15:28	16:58	17:43	19:13	20:43
East Terminal	6:34	7:19	8:04	8:49	9:34	11:04	12:34	14:04	15:34	17:04	17:49	19:19	20:49

WESTBOUND: BOISE-NAMPA

	A-100	B-102	A-104	A-106	A-108	A-110	A-112	A-114	B-116	A-118	B-120	B-122	B-124
East Terminal	6:45	7:30	8:15	9:45	11:15	12:45	14:15	15:45	16:30	17:15	18:00	19:30	21:00
Boise Depot	6:51	7:36	8:21	9:51	11:21	12:51	14:21	15:51	16:36	17:21	18:06	19:36	21:06
Boise Towne Square Mall	6:56	7:41	8:26	9:56	11:26	12:56	14:26	15:56	16:41	17:26	18:11	19:41	21:11
Eagle Road	7:02	7:47	8:32	10:02	11:32	13:02	14:32	16:02	16:47	17:32	18:17	19:47	21:17
Meridian	7:06	7:51	8:36	10:06	11:36	13:06	14:36	16:06	16:51	17:36	18:21	19:51	21:21
Idaho Center	7:14	7:59	8:44	10:14	11:44	13:14	14:44	16:14	16:59	17:44	18:29	19:59	21:29
Nampa Ave No	7:19	8:04	8:49	10:19	11:49	13:19	14:49	16:19	17:04	17:49	18:34	20:04	21:34

Each train set would begin each day in Nampa. The "B" train would make two eastbound moves and one westbound move in the morning, laying over mid-day at the East Terminal before re-entering service for the evening peak period and providing the evening off peak service. The "A" train set would operate from the first eastbound movement at 6:00 a.m. through mid-day service, until the completion of the afternoon peak service. The Eagle Road Station siding would be the only passenger train siding necessary, as all train meets would occur at the Eagle Road Station.

Contract Services

To provide commuter passenger service, an agreement is necessary with the freight service operator, the Idaho and Northern Pacific Railroad (INPR). Coordination of the freight and passenger service is crucial to the success of the service. Ideally, freight service would be provided during evening and night hours, allowing passenger service to have full access to the corridor during peak-period and mid-day hours. The capital costs and operations plan assumes night freight services. All new start commuter rail services have contracted for the provision of the actual train operations and vehicle maintenance. Having a public agency qualify crews and employ the expertise to operate a small system is not usually cost efficient. Depending on the outcome of negotiations with INPR, train crews can be supplied by either the INPR or an independent contractor (such as AMTRAK, Herzog or Connex, three entities that currently have commuter service contracts). Regardless of who provides the train and engine crews, each train would operate with a two person, FRA qualified crew consisting of an engineer and a conductor.

Vehicle maintenance is also typically contracted out, usually combined with the operations contract. Vehicle maintenance would be accomplished at a ValleyRide supplied maintenance facility that would also serve as the commuter rail operations and administration headquarters. Vehicle maintenance would primarily consist of daily cleaning and periodic inspections, with major work limited to component change out. Significant bodywork or major mechanical work (e.g., engine or transmission overhaul) would be done off site.

Track and signal maintenance currently done by INPR would likely still be provided by the INPR, again depending on the outcome of negotiations with INPR. Dispatch of the corridor would also be under contract with the INPR, as an expansion of the existing INPR dispatch responsibilities on the corridor.

Revenue Collection

New start commuter rail services follow the example set by North

American Light Rail Systems, implementing a "barrier free" fare collection system. The barrier free systems provide ticket vending machines (TVMS) on all platforms and do not provide for on-board ticket sales. Even though commuter systems, because of FRA and railroad operating practices, have an on-board conductor, freeing the conductor from fare collection duties allows the conductor to focus on train handling and safety responsibilities. No on-board ticket sales also eliminates the need for cash handling procedures and on-board security for cash fare collection.

4.3.2 Thirty Minute Operations Plan

To increase the service level from Nampa to Boise, a more frequent peak hour headway schedule was examined. A 30-minute peak hour headway schedule was developed, requiring two passing sidings. Off peak service continues the 90-minute headways of the 45-minute schedule, with an occasional 60-minute headway. The operation changes from the 45-minute schedule are highlighted below.

Stations

The 30-minute schedule retains the same stations as the 45-minute schedule.

Schedule

The 30-minute schedule is presented in Table 4. Three train sets are utilized in this schedule, noted by A, B, and C. The train sets in the 30-minute schedule are also three car sets as in the 45-minute schedule. Two passing sidings would be required for the 30-minute schedule, rather than the single siding at Eagle Road required in the 45-minute schedule. The western siding would be located between the Idaho Center and Meridian Stations, and the eastern siding would be located between the Boise Towne Square Mall and Boise Depot stations. Each siding should be approximately one mile long.

The "A" train set would operate two round trips from the Nampa 11th Avenue Station from 5:30 a.m. to 8:19 a.m., and would go out of morning revenue service at 9:04 a.m. after a one-way trip to Nampa. It would return to revenue service for the afternoon peak, operating three afternoon/evening one-way trips. The "C" train set would operate two morning round trips, and return to service for the afternoon peak and the evening off peak service. The "B" train set would operate during both peaks and stay in service for the mid-day service as well as evening trips. All train sets would be rotated day to day through the schedule to balance utilization of the equipment.

Table 4
30-Minute Schedule

EASTBOUND: NAMPA-BOISE

	A-101	B-103	C-105	A-107	B-109	C-111	A-113	B-115	B-117	B-119	B-121	B-123	C-125	B-127	C-129	A-131	B-133	C-135	B-137
Nampa 11th Ave No	5:30	6:00	6:30	7:00	7:30	8:00	8:30	9:00	10:30	12:00	13:30	15:00	15:30	16:30	17:00	17:30	18:00	18:30	19:30
Idaho Center	5:35	6:05	6:35	7:05	7:35	8:05	8:35	9:05	10:35	12:05	13:35	15:05	15:35	16:35	17:05	17:35	18:05	18:35	19:35
Meridian	5:43	6:13	6:43	7:13	7:43	8:13	8:43	9:13	10:43	12:13	13:43	15:13	15:43	16:43	17:13	17:43	18:13	18:43	19:43
Eagle Road	5:47	6:17	6:47	7:17	7:47	8:17	8:47	9:17	10:47	12:17	13:47	15:17	15:47	16:47	17:17	17:47	18:17	18:47	19:47
Boise Towne Square Mall	5:53	6:23	6:53	7:23	7:53	8:23	8:53	9:23	10:53	12:23	13:53	15:23	15:53	16:53	17:23	17:53	18:23	18:53	19:53
Boise Depot	5:58	6:28	6:58	7:28	7:58	8:28	8:58	9:28	10:58	12:28	13:58	15:28	15:58	16:58	17:28	17:58	18:28	18:58	19:58
East Terminal	6:04	6:34	7:04	7:34	8:04	8:34	9:04	9:34	11:04	12:34	14:04	15:34	16:04	17:04	17:34	18:04	18:34	19:04	20:04

WESTBOUND: BOISE-NAMPA

	A-100	B-102	C-104	A-106	B-108	C-110	B-112	B-114	B-116	B-118	B-120	C-122	A-124	B-126	C-128	A-130	B-132	C-134	B-136
East Terminal	6:15	6:45	7:15	7:45	8:15	8:45	9:45	11:15	12:45	14:15	15:45	16:15	16:45	17:15	17:45	18:15	18:45	19:15	20:15
Boise Depot	6:21	6:51	7:21	7:51	8:21	8:51	9:51	11:21	12:51	14:21	15:51	16:21	16:51	17:21	17:51	18:21	18:51	19:21	20:21
Boise Towne Square Mall	6:26	6:56	7:26	7:56	8:26	8:56	9:56	11:26	12:56	14:26	15:56	16:26	16:56	17:26	17:56	18:26	18:56	19:26	20:26
Eagle Road	6:32	7:02	7:32	8:02	8:32	9:02	10:02	11:32	13:02	14:32	16:02	16:32	17:02	17:32	18:02	18:32	19:02	19:32	20:32
Meridian	6:36	7:06	7:36	8:06	8:36	9:06	10:06	11:36	13:06	14:3	16:06	16:36	17:06	17:36	18:06	18:36	19:06	19:36	20:36
Idaho Center	6:44	7:14	7:44	8:14	8:44	9:14	10:14	11:44	13:14	14:44	16:14	16:44	17:14	17:44	18:14	18:44	19:14	19:44	20:44
11th Ave No	6:49	7:19	7:49	8:19	8:49	9:19	10:19	11:49	13:19	14:49	16:19	16:49	17:19	17:49	18:19	18:49	19:19	19:49	20:49

4.3.3 Operating Statistics

For costing and comparison purposes, operating statistics for the two operating plans were developed. Revenue train miles are the miles that the train sets would operate each day in revenue service. Non-revenue movements are not calculated, as they should be limited with this service, assuming the maintenance facility is located near the Nampa 11th Avenue Station. The operating plans do not require morning or mid-day positioning movements. Revenue car miles are computed based on a proposed three car trainset for both the 45 and 30-minute schedules. Additional cars would of course increase the revenue car mile total, but would not affect the revenue train mile total. Train hours are calculated to determine crew time and assignments. Total train hours are included, allowing time before and after each trainset enters and leaves revenue service. These times are necessary to calculate, as this time is included in the FRA hours of service regulations. Revenue seats for the eastbound morning peak service are calculated to demonstrate the effect of the 45-minute vs. the 30-minute service.

Annual calculations are based on 255 week days per year. No weekend service is assumed.

45-Minute Headway **Route Miles: 22.93**

Daily One Way Trips: 26
Daily Revenue Train Miles: 596.18
Daily Revenue Car Miles: 1,788.54
Daily Train Hours: 20
Daily Revenue Peak Service AM Eastbound Seats: 1,500
Annual Revenue Train Miles: 152,025.9
Annual Revenue Car Miles: 456,077.7
Annual Train Hours: 5,100

30-Minute Headway **Route Miles: 22.93**

Daily One Way Trips: 38
Daily Revenue Train Miles: 871.34
Daily Revenue Car Miles: 2,614.02
Daily Train Hours: 36
Daily Revenue Peak Service AM Eastbound Seats: 2,100
Annual Revenue Train Miles: 222,191.70
Annual Revenue Car Miles: 666,575.10
Annual Train Hours: 9,690

4.4 Operating Costs

4.4.1 45-Minute Schedule

Operating costs for small to moderate commuter rail operations where the passenger service, rather than the freight service, is the dominant factor on the corridor would not vary significantly based on the level of service. This is because costs such as track and signal maintenance, insurance, dispatch, and even vehicle maintenance do not appreciably increase with more service. These more or less fixed costs typically make up more than 2/3 of the operating costs of the service. The costs that are truly variable relate to car miles (for fuel and to a lesser extent vehicle maintenance) and train hours (for train and engine crew costs). Services must expand dramatically to significantly increase the administrative and overhead costs of the passenger operations.

Fixed Costs

Track and Signal Maintenance

The corridor would require a much more vigorous track and signal maintenance program to keep the system operating at a safe and reliable FRA Class 3 60 mph standard. The high number of grade crossings, plus the relatively small system, would drive the unit costs to the mid to high level of the standard commuter rail norm. Track maintenance costs are usually estimated on the track miles (not route miles) to be maintained. Including sidings and yard tracks, the Nampa to Boise East system contains approximately 25 miles of passenger track. Using an industry moderate to high norm of $40,000 per track mile, the track and signal maintenance cost estimate is $1,000,000/year.

Dispatch

With the addition of a CTC signal system on the corridor, a more advanced dispatch center would be required for the passenger system. INPR currently dispatches the system using a simpler time and track warrant system. If the corridor is active seven days a week, both days and nights, the center would be staffed 24/7. The annual cost includes seven dispatchers, allowing for relief, vacation and back-up staffing. Utilities and redundant communication facilities are also necessary. The annual cost is estimated at $600,000. This cost can be reduced if the corridor is operational less than 24/7. This cost can also be shared with the rail freight operator. As with track and signal maintenance, no assumptions are made concerning any cost sharing arrangements with INPR.

Insurance

Insurance costs were escalating prior to 9/11, and in the past year insurance premiums have been extremely volatile. All mainline railroads are now requiring insurance coverage from $200,000,000 and up. Acquiring the corridor from the UP should remove UP as a factor in determining the necessary coverage limits, however. Time separation from INPR should also reduce coverage limits requested by the INPR. No independent commuter operator, or the INPR, would operate, maintain, or dispatch the corridor without either publicly provided or at least publicly funded coverage. Coverage levels would also be somewhat dependent on Idaho governmental immunity statutes and interpretations. Because of the unknown factors in insurance, no assumed level of coverage or premiums are estimated.

Station Maintenance Costs and Revenue Collection

These costs vary with the number of stations and ticket vending machines in the system. For the seven station system, with an average station cost, including TVMs, of $50,000, the station and revenue collection is estimated at $350,000.

Management

The minimum commuter rail management staff includes a General Manager, Chief Transportation Officer, Chief Mechanical Officer (Vehicles), Chief Engineer/Roadmaster (Track and Signals) and two assistants/clerks. FRA mandated record keeping is more extensive than other transportation modes. The cost estimate is $525,000 per year.

General and Administrative

Many functions of operating the commuter system would likely not be handled by the operations and maintenance contractor. Such items as public information, lost and found, security, schedule printing, advertising and promotions would be handled directly by ValleyRide, or in conjunction with other ValleyRide services. An allowance of $1,000,000 is included for these costs.

Costs That Vary With Car Miles

Fuel

Fuel consumption would vary with the car miles operated and the type of equipment utilized. FRA compliant DMUs are estimated to operate at 3.0 mpg per car. The 45-minute schedule includes 456,077.7 car miles per year, adding 10% to this for yard moves and idling yields 501,685.47 miles per year or 167,228.49 gallons per year (at 3.0 mpg). At $.95 per gallon, the annual fuel cost is $158,867.

Costs That Vary With Train Hours

Train and Engine Crews

Transportation costs for train operations vary directly with the service hours of the train and engine crews (T&E). The FRA regulates crew time and crew rest periods. Service design for a limited operation as proposed is important to control T&E costs, with a goal of maximizing individual crew time actually operating the equipment and minimizing the number of crews needed. If the INPR operates the service, T&E costs could be further controlled, as integration of INPR and commuter operations could optimize T&E utilization. Four T&E crews would be necessary for the service, allowing for prudent staffing levels, at an annual cost of $400,000 per year.

Costs That Vary With Equipment Type And Number

Equipment Maintenance

Equipment maintenance costs vary by the type of equipment (DMUs or push-pull) and the number of train sets. Because each DMU is its own motive power, each vehicle is treated as a locomotive, and must undergo the FRA required maintenance and intervention schedule for locomotives. Vehicles (except locomotives) used in push-pull service are maintained as coaches, with a far less active maintenance and intervention schedule. For the levels of service here, maintenance costs are only marginally affected by usage. More miles do not directly translate into higher costs, unless more equipment is required. Scheduled servicing is dictated by the calendar day FRA requirements, rather than usage. A nine car DMU fleet (three, three car train sets) can be maintained for $500,000 per year. A three locomotive, three cab car, three trailer bi-level fleet can be maintained for $350,000 per year.

Equipment Maintenance Facility

The cost to open and run the equipment maintenance facility is based on the size of the facility, which in turn is based on the number and type of vehicles maintained. It is assumed that most major overhaul work would be done off site, so the facility would not be sized for that activity. Even if such work were done on site, the cost of the work itself would likely be a capital cost and the only operating cost element is the operation of the facility. For the scope of services, here, an estimated $200,000 cost for a DMU facility is appropriate.

Table 5 provides a summary of the anticipated annual operating costs for a 45-minute schedule.

Table 5

Annual Operating Cost Summary
45-Minute Schedule

Element	Cost
Track and Signal Maintenance	$1,000,000
Dispatch	600,000
Insurance	n/a
Station and Revenue Collection	350,000
Direct Management	525,000
General Administrative	1,000,000
Fuel	159,000
Transportation	500,000
Equipment Maintenance	500,000
Maintenance Facility	200,000
Total	**$4,834,000**

4.4.2 30-Minute Schedule

As stated above, many costs of operating a small commuter system would not vary significantly based on the level of service. Highlighted below are changes that would occur with operating a 30-minute schedule, compared with operating the 45-minute schedule.

Fixed Costs

Track and Signal Maintenance

The track miles would be increased slightly because two passing sidings would be necessary for the 30-minute schedule, compared to the one passing siding at Eagle Road needed for the 45-minute schedule. Assuming one mile passing sidings, the track miles would increase from approximately 25 miles to 26 miles, resulting in a $40,000 increase in annual track and signal maintenance costs.

Dispatch

No change.

Insurance

Even with increased service, the insurance costs would not appreciably increase.

Station Maintenance Costs and Revenue Collection

No change.

Management

No change.

General and Administrative

No change.

Station Costs and Revenue Collection

No change.

Fuel

The 30-minute schedule includes 666,575.1 car miles, adding 10% to this for yard moves and idling yields 733,236.61 miles per year, or 244,412.2 gallons per year (at 3.0 mpg). At $.95 per gallon, the annual fuel cost would be $232,191.59.

Train and Engine Crews

Although the 30-minute schedule would only add one train set, two additional train crews, for a total of six would be required because of the total increased train hours. The annual cost would be increased to $600,000.

Equipment Maintenance

The 45-minute schedule would require three, three-car train sets for a total of nine DMUs. The 30-minute schedule would require four, three-car train sets, for a total of twelve DMUs. The maintenance cost for this size fleet would increase $150,000 for a total of $650,000.

Equipment Maintenance Facility

No change.

Table 6 provides a summary of the anticipated annual operating costs for a 30-minute schedule.

Table 6

Annual Operating Cost Summary
30-Minute Schedule

Element	Cost
Track and Signal Maintenance	$1,040,000
Dispatch	600,000
Insurance	n/a
Station and Revenue Collection	300,000
Direct Management	525,000
General and Administrative	1,000,000
Fuel	232,000
Transportation	600,000
Equipment Maintenance	650,000
Maintenance Facility	200,000
Total	**$5,147,000**

4.5 Traffic Analysis

A level of service (LOS) analysis was performed at representative intersections along the corridor using the methodologies found in the latest version of the Highway Capacity Manual (HCM). The following intersections were analyzed:

- Franklin Road and Eagle Road
- Franklin Road and Maple Grove Road
- Franklin Road and Milwaukee Street
- Franklin Road and Cole Road
- Federal Way and Overland Road

Intersection operations were analyzed using the methodologies outlined in the latest version of the *2000 Highway Capacity Manual* (HCM). According to the HCM, the operating performance of an intersection is related to one of six levels of service (LOS). The LOS is identified by a letter grade, and ranges from LOS A, which indicates a free-flow traffic condition, to LOS F, which indicates an operational breakdown. LOS D is usually considered to be a minimum acceptable condition. Table 7 presents the relationship between the level of service and average delay per vehicle (seconds/vehicle).

Table 7

Intersection Level-of-Service Criteria

Level-of-Service (LOS)	Average Delay per Vehicle (Sec/Veh) Signalized Intersection
A	0-10
B	>10-20
C	>20-35
D	>35-55
E	>55-80
F	>80

Source: 2000 Highway Capacity Manual (HCM), Chapter 16

Appendix C contains a series of tables referenced in the following paragraphs. The tables describe current traffic conditions at the selected intersections and the conditions with commuter rail using the more frequent 30-minute schedule.

4.5.1 Existing Conditions Analysis

An intersection operation analysis was conducted for the PM peak hour. Table 8 summarizes the existing conditions at each of the intersections.

Table 8

Existing PM Peak Hour Traffic Operations

Intersection	LOS	Delay (seconds/vehicle)
Franklin Road and Eagle Road	F	91.4
Franklin Road and Maple Grove Road	D	47.2
Franklin Road and Milwaukee Street	F	153.3
Franklin Road and Cole Road	D	44.9
Federal Way and Overland Road	A	7.5

As shown, the intersections of Franklin Road and Eagle Road, and Franklin Road and Milwaukee Street are both currently operating at unacceptable levels of service. Both intersections are currently operating at LOS F, with calculated average delays of 91.4 and 153.3 seconds per vehicle, respectively.

4.5.2 Conditions with Commuter Rail Analysis

The intersections were evaluated to determine the impacts that the addition of a commuter rail operation would have. The intersections of Franklin Road and Eagle Road, and Federal Way and Overland Road were not impacted due to the distance between the corridor and these intersections. However, the remaining three intersections were analyzed to determine the impacts that commuter rail would have from their close proximity to the corridor. It was assumed that trains would travel on 30-minute headways each way, with a 45-second total gate time. Therefore, the analysis assumed a 45-second interruption of traffic from the trains every 15 minutes.

Table 9

PM Peak Hour Traffic Operations with Commuter Rail

Intersection	Existing Conditions		With Commuter Rail	
	LOS	Delay (seconds/ vehicle)	LOS	Delay (seconds/ vehicle)
Franklin Road and Eagle Road	F	91.4	--	--
Franklin Road and Maple Grove Road	D	47.2	D	47.6
Franklin Road and Milwaukee Street	F	153.3	F	169.7
Franklin Road and Cole Road	D	44.9	D	43.8
Federal Way and Overland Road	A	7.5	--	--

As the table indicates, there would be a minor increase in overall delay at the intersection of Franklin Road and Milwaukee Street, an intersection that currently experiences LOS F operations during the PM peak period. The Franklin Road and Milwaukee Street intersection would experience a very slight increase in delay, the Franklin Road and Cole Road a slight decrease, each reflecting the minor increase in green-time allocated to the heavier north-south traffic volumes on Franklin Road.

4.5.3 Conclusion

The overall impact to the nearby intersections would be negligible due to the infrequency of trains (on average one every 15 minutes), the relatively short time the gates would be down (45 seconds), and the ability to coordinate the traffic signals to compensate for the gate times.

4.6 Transit System Integration

By definition, the vast majority of commuter rail operations serve corridors characterized by service from outlying communities to a larger central city. The Boise Cut-Off corridor fits this definition by providing a connection between Nampa, Meridian and other outlying communities to Boise, the largest employment and trip destination in the region. However, unlike some other communities, the station serving Boise is not in the midst of the downtown area nor within walking distance of major trip generators such as Boise State University, the Capital Mall and the Downtown Boise Core. Therefore, the success of a commuter rail service would be heavily influenced by the quality of the connecting service that would distribute riders from the Boise Depot Station to various destinations. To be most effective, from a rider's perspective, such service would need to be viewed as seamless, with vans or buses waiting when the trains arrived in order to provide a direct and quick transfer. Given the multiple destinations in the central Boise area, multiple vehicles and routes would provide the best and most time sensitive service to the riders.

Another potential longer term solution would be to extend the rail service to the downtown area into one of the planned intermodal centers. It is likely that such an option would require the use of non-FRA compliant DMU technology, as described in Section 4.3. These vehicles have characteristics more appropriate for operating in an urban environment outside of an existing freight rail corridor. The advantage of such an extension is that the downtown station would be within walking distance for more trips, would be more easily supported by short circulator trips, and could potentially introduce more than one station to serve the numerous destinations.

5.0 CAPITAL COST ESTIMATES

Capital cost estimates were prepared for each of the two operating alternatives; 45-minute service and 30-minute service. The estimates were prepared at an appropriate level of detail based on the very conceptual planning phase of the project. The estimates do not include the cost of a public purchase of the Boise Cut-Off right-of-way.

The estimates for track, special track work, track upgrades, bridge repairs, signals and crossing protection were based on a detailed inspection of the rail corridor and an assessment of the level of work required to upgrade the rail alignment to passenger service requirements. The costs are based on experience in upgrading facilities of a similar nature and condition. The costs for the CTC, communications, dispatch, vehicles, stations, park-and-ride lots and maintenance facility are based on recent experience with other commuter rail projects. A 20 percent contingency was applied to the estimates, which reflects the current level of definition of the alternatives. Allowances are also included for project engineering and administration as well as support services during the construction phase.

A summary of the capital cost estimates for the 45-minute service alternative is shown in Table 10. Table 11 shows the estimates for the 30-minute service alternative. All estimates are in Year 2003 dollars.

The estimates represent the capital costs required to implement the service based on the assumptions regarding station locations, operating plans, equipment types and level of track facilities upgrades. Some cost categories could either increase or decrease during subsequent and more detailed investigation of implementation of passenger rail service in the corridor.

Capital costs for commuter rail operations of a similar nature with moderate levels of ridership have ranged from $4 to $8 million per mile. As an example, the Wilsonville to Beaverton Commuter Rail project planned for the Portland, Oregon region recently completed the preliminary engineering design phase (30%) for the 15.4 mile facility with an estimate of $6.8 million per mile. This project required substantially more upgrades to the existing track facilities, as well as a significant amount of double tracking and structure repairs.

The 45-minute service option capital cost estimate of $108.1 million results in a $4.72 million estimate per mile over the 22.93 mile length of the project. For the 30-minute service option, the estimate of $127.7 million results in a cost of $5.57 million per mile.

Table 10

Capital Cost Estimate
45-Minute Service

Item	Description	Quantity	Unit	Unit Cost	Extension
38	Lake Rd Industrial Spur Modifications (HDR)		LS	$476,000.00	
39	TPS Building, Foundation & Ground Mat. LTK110		EA	$60,000.00	
40	OCS Pole Foundations LTK120		RF	$15.06	
41	Signal Communication Building LTK130		EA	$60,000.00	
42	Ductbank/ Conduit -PAVED TRACK- LTK140		RF	$200.00	
43	Ductbank/ Conduit -OPEN TRACK- LTK140		RF	$110.00	
44					
45	Corrosion Mitigation LTK150		RF	$10.73	
46	Civil				
47	Civil				
48	Civil				
49	Civil				
50					
51	Ins				
52					
53					
54					
55					
56					
1	Track & Structures				
	track upgrade	130,944	TF	$ 77	$ 10,082,688
	new track	4,400	TF	$ 200	$ 880,000
	special trackwork		LS	$ 625,000	$ 625,000
	bridge repair		LS	$ 310,000	$ 310,000
2	Grade Crossing Upgrades/Signals	34	EA	$ 136,000	$ 4,624,000
3	CTC, Communications, Dispatch	1	LS	$ 25,000,000	$ 25,000,000

4	**Vehicles**	9	VEH	$	3,000,000	$	24,000,000
5	**Stations**	7	EA	$	500,000	$	3,500,000
6	**Park & Ride property**	1,100	SPACE	$	4,000	$	4,400,000
			LS	$	3,050,000	$	3,050,000
7	**Maintenance Facility property**	1	LS	$	2,600,000	$	2,600,000
			LS	$	450,000	$	450,000
	Subtotal					$	79,522,000
	Contingency				20.00%	$	15,904,000
	Engineering & Administration				10.00%	$	7,952,000
	Construction Support Services				6.00%	$	4,771,000
	Total					$	108,149,000

Note: Costs in 2003 dollars.

Table 11

Capital Cost Estimate
30-Minute Service

Item	Description	Quantity	Unit	Unit Cost	Extension
38	Lake Rd Industrial Spur Modifications (HDR)		LS	$476,000.00	
39	TPS Building, Foundation & Ground Mat. LTK110		EA	$60,000.00	
40	OCS Pole Foundations LTK120		RF	$15.06	
41	Signal Communication Building LTK130		EA	$60,000.00	
42	Ductbank/ Conduit -PAVED TRACK- LTK140		RF	$200.00	
43	Ductbank/ Conduit -OPEN TRACK- LTK140		RF	$110.00	
44					
45	Corrosion Mitigation LTK150		RF	$10.73	
46	Civil				
47	Civil				
48	Civil				
49	Civil				
50					
51	Ins				
52					
53					
54					
55					
56					
1	Track & Structures				
	track upgrade	130,944	TF	$ 77	$ 10,083,000
	new track	13,400	TF	$ 200	$ 2,680,000
	special trackwork		LS	$ 925,000	$ 925,000
	bridge repair		LS	$ 310,000	$ 310,000
2	Grade Crossing Upgrades/Signals	36	EA	$ 136,000	$ 4,896,000

3	**CTC, Communications, Dispatch**	1	LS	$	25,000,000	$	25,000,000
4	**Vehicles**	12	VEH	$	3,000,000	$	36,000,000
5	**Stations**	7	EA	$	500,000	$	3,500,000
6	**Park & Ride property**	1,100	SPACE	$	4,000	$	4,400,000
			LS	$	3,050,000	$	3,050,000
7	**Maintenance Facility property**	1	LS	$	2,600,000	$	2,600,000
			LS	$	450,000	$	450,000
	Subtotal					$	93,894,000
	Contingency				20.00%	$	18,779,000
	Engineering & Administration				10.00%	$	9,389,000
	Construction Support Services				6.00%	$	5,634,000
	Total					$	127,696,000

Note: Costs in 2003 dollars.

6.0 CORRIDOR OWNERSHIP/OPERATING RIGHTS

6.1 Background

The corridor generally known as the Boise Cut-Off extends from MP 467.8 in Nampa, Canyon County to MP 423.5 in Orchard, Ada County, a total of 44.3 miles. The corridor was assembled by predecessors of the Union Pacific Railroad in two distinct sections. The first to be acquired, beginning in the 1870s and concluding in the 1880s, was portions of the section from Nampa to Boise, opening for service prior to any acquisition or operation from Boise east.

The downtown element of the corridor (the Boise Branch) now operates as a spur off the mainline of the Nampa to Boise line, with the switch located at MP 450.86. The branch currently extends approximately 1.5 miles northeast from the mainline to near the intersection of Orchard and Irving Streets in Boise. The bridge spanning the Boise River is approximately ¾ of a mile east of the current end of the line and is intact but functions as a hike and bike bridge for the Boise recreational trail system.

The 16.94 mile section of the corridor from Nampa to the Boise Branch (MP 467.8 to MP 450.86) is currently owned by the Union Pacific Railroad (UPRR). The freight service is provided by the Idaho & Northern Pacific Railroad (INPR), a subsidiary of the Rio Grande Pacific, under a lease agreement between UPRR and INPR.

The second section of the corridor was acquired in the 1920s and extends from the Boise Branch (MP 450.86) east to Orchard (MP 423.5) where the line intersects with the UP mainline. UP owns the corridor from the Boise Branch (MP 450.86) to near Hillcrest, southeast of Boise (MP 443.0). From MP 443 to Orchard (MP 423.5), the City of Boise owns the corridor, having acquired the corridor from the UP in a sale (MP 443 to MP 439.5) and donation (MP 439.5 to 423.5) in 2000. The INPR operates on this section from the Boise Branch (MP 450.9) to Hillcrest (MP 443) under the same UP lease agreement. No rail freight activities occur between Hillcrest (MP 443) and Orchard (MP 423.5), except some rail car storage on the far east end of the line near Orchard.

For both the east and west sections of the corridor, the underlying title to the corridor was examined by a review of the Schedule of Property contained in the UP maintained Valuation Maps. This documentation traces the assembly of the corridor by detailing how each parcel that makes up the corridor was acquired.

Boise West

The bulk of the corridor between Nampa and Boise Junction was acquired by the Idaho Central Railway Company (long ago merged into the UPRR) by an 1875 Act of Congress. Congressional grants were of course a common manner of railroad acquisition and funding in the second half of the 19th century. Congressional grants have not been successfully challenged in Idaho for active rail lines and are considered excellent title. Some smaller portions of the corridor were acquired by the Oregon Short Line Railway (OSLR) in the 1880s. Several sample deeds of the OSLR were randomly searched to verify the accuracy of the original transfer. All deeds searched for were located at the County Courthouse and revealed good title.

Boise Branch

The Boise Branch, extending from MP 450.86 for approximately 1.5 miles and ending before crossing the Boise River, was not part of the original Nampa to Boise acquisition. The Boise Branch was generally acquired by warranty deeds dating from the 1890s. The corridor is nominally 70-80 feet wide, with numerous encroachments by adjoining businesses. The corridor northeast of Irving and Orchard Streets is not intact, with considerable private and public developments in the former corridor.

Boise East

The line from Boise Junction east was the last acquired. From Boise Junction to Hillcrest (MP 450.86 to MP 443) the line is still owned by UP. Although the line was apparently assembled by prior, bankrupt railroads, it was acquired by the OSLR in 1923. Most parcels were acquired through a series of "Bargain and Sale" Agreements between OSLR and the state of Idaho, acting as trustee. Again, several of these agreements were selected at random to review through courthouse records and all were identified and verified. This segment of the mainline is generally 100 feet wide, with fewer encroachments than the Boise Branch.

INPR Lease Agreement

The line from Nampa (MP 467.8) to Boise East (MP 443), including the 1.5 mile Boise Branch, is under lease from UPRR to the INPR. For business confidentiality reasons, neither UPRR nor INPR allows the release of the lease agreement. The lease is not filed of record in either Canyon or Ada Counties. INPR did allow a private review of the lease in the Rio Grande Pacific Corporate offices in Fort Worth, Texas. The

original lease agreement is dated November 1993 and covers property not at issue here. In a supplemental agreement dated February 1999, the Boise Cut-Off was added. These types of lease agreements are common in the railroad industry. The mainline railroad (here UPRR) "leases" the freight rights to a short line railroad (here INPR), enabling the short line to service the local rail freight customers while the mainline carrier handles the long haul freight movement. UPRR interchanges rail traffic with INPR at Nampa. Under the terms of the lease, UPRR retained all passenger rights on the corridor, as well as management responsibility and income generated from other property leases, licenses and agreements such as billboards, pipelines and fiber optics. UPRR also has the right to sell the corridor, provided that the INPR lease agreement also transfers to the new owner. INPR and Rio Grande Pacific officials are aware of the local interest in rail passenger service and are supportive of the effort.

Meridian

The most significant property owned by UPRR outside the 100 to 200 foot wide corridor is in Meridian. In Meridian UPRR owns approximately 18 acres north of the rail line, which extends north of the tracks to Broadway and runs 6 blocks east from Main Street. Some of these parcels are currently under lease to mostly rail using business concerns.

6.2 Summary

In summary, the Boise Cut-Off from Nampa to Boise is owned by UPRR and is secured by generally good title. The corridor is most significantly encumbered by a lease arrangement between UPRR and INPR whereby INPR has exclusive freight rail rights, with UPRR retaining exclusive passenger rights and income generated from other, non-rail property agreements such as the downtown Meridian property.

6.3 Corridor Valuation

The number of publicly funded passenger rail transportation projects has grown from only a handful in the early 1980s to more than 100 already built, under construction, or planned in 2003. Most of these rail projects use, in whole or in part, existing railroad corridors. Acquisition of railroad corridors, or rights to use the corridor or track capacity is almost always a critical element in the implementation of a rail passenger system. Unlike other real estate acquisitions, local or state governments do not typically have condemnation authority to acquire existing, active railroad corridors. Railroads, operating under authority granted by the Surface Transportation Board (formerly the Interstate Commerce

Commission), are not subject to a state's (or city or county) rights to condemn. The US Congress, in granting jurisdiction of railroads to the Surface Transportation Board, has pre-empted any state or local condemnation authority. Assembling a new rail corridor in an urban, or even suburban environment, is extremely difficult, and even if possible, cost prohibitive. With no real alternative, public authorities must therefore bargain with the railroads to acquire all or part of a corridor for passenger rail development. Owners of railroad corridors, usually one of the now only four Class I Railroads, of course realize the importance and uniqueness of their corridor assets to these publicly funded passenger rail projects and are well equipped to bargain effectively for the maximum value.

In these situations where there is but one buyer and one seller, traditional appraisal techniques have not proven to be particularly useful or accurate in establishing a corridor value. Establishing a value for railroad corridors for purchase by public agencies has become more art than science over the past fifteen years.

For the Boise Cut-Off, 18.20 miles of the 44.3 miles is currently in public ownership. In June 2000, the City of Boise purchased 3.5 miles (MP 443 to MP 439.5) from the UPRR for $2,000,000. In October 2000, UPRR donated an additional 14.70 miles (MP 439.5 to MP 424.8) to Boise. At least four valuation or appraisal efforts were conducted for all or portions of these segments. Arthur Anderson provided two appraisals for UPRR, one dated June 1999 for MP 443 to MP 433 and the second in October 2000 for the donated section from MP 424.8 to MP 439.5. Both appraisals determined relatively low land value ($130,000 for the 10 miles in the 1999 report and $105,000 for the 14.7 miles in the 2000 report) and higher value for the track and structures ($4,845,216 for the 1999 report and $6,280,000 for the 2000 report). Two reports were prepared to assist Ada County and the City of Boise in evaluating the Boise Cut-Off. Both were prepared in the fall of 1999 and addressed the value and replacement value of the track and other rail structures. The MKJ Group reported a track value from MP 443 to 424.8 of $2,598,900 and a replacement value of $4,845,216. TRAX Engineering's report for the same track segment estimates the salvage value at $2,276,000 and the replacement value at $19,576,000. The depreciated value of the line was estimated at $19,336,000.

Two factors are important to note in the Boise Purchase/Donation: (1) UPRR desired to abandon the line as an active railroad; and (2) the corridor had little or no use as an urban or suburban transit corridor.

Because the 2000 Boise sale/donation is the only area sale of rail corridors, it will play an important role in framing the negotiations for the

acquisition of the remaining 24.8 miles of the Boise Cut-Off. ValleyRide's goal is to cast the sale/donation as a single transaction of $2,600,000 for a total of 18.20 miles, an average of $109,890 per mile. UPRR would portray the transaction as $2,000,000 for 3.5 miles ($571,428 per mile) of vacant land with virtually no real estate value. UPRR would further maintain that the Nampa to Boise corridor, in contrast, is very developed, with a high real estate value. Other rail corridors in urban environments sell for more than $1,000,000 per mile. Negotiation between ValleyRide and UPRR would determine the value between these extremes. Early public disclosure of a value likely to result from the negotiations will only serve to set the threshold of value and therefore has been provided separately from this report.

7.0 NAMPA TO CALDWELL

This chapter identifies alignment alternatives for extending the initial starter commuter rail operations from the City of Nampa to the City of Caldwell. For each alignment alternative, possible connections to the starter line, impacts to the existing conditions and possible terminus locations are evaluated. Three potential alignment options were explored, as illustrated in Figure 14. Each alignment is considered technically feasible based on an initial reconnaissance. Each would introduce regulatory and acquisition issues that would make the projects more difficult to implement than is anticipated with the introduction of service on the Boise Cut-Off. The costs on a per-mile basis would undoubtedly be more than estimated for the initial starter line on the Boise Cut-Off.

UPRR Mainline Alignment

This alignment would be located on the eastern edge of the existing 200-foot UPRR right-of-way. The alignment assumes 40-foot strip of right-of-way could be acquired from the UPRR to install a new single track, parallel to the UPRR tracks, for approximately 2 to 2.5 miles, depending on the location of the terminus in Caldwell. The new track would be exclusive for commuter rail operations.

The challenge with this alignment is establishing a connection with the initial starter line, currently proposed to terminate at 11th Avenue in the City of Nampa. Three connection options were evaluated:

- From the existing Boise Cut-Off terminus at the UPRR Nampa Yards to the City of Caldwell.
- Madden Spur tracks and the Boise Loop.
- New tracks from the Boise Cut-Off utilizing Karcher Road right-of-way.

Starting from the proposed Boise Cut-Off terminus, the first 800 feet of the new track may have significant impacts running along the UPRR yard. Bents for the 11th Avenue bridge and Highway 55 bridge appear to be located very close to the existing tracks making it difficult to construct a new track with adequate clearances. Siding tracks serving the Madden Spur, located in this vicinity, are also a challenge and would require special track crossings and new signals. Large power poles located on the north side of the yard could potentially conflict with the new track at this location.

Figure 14
Caldwell Connection Alternatives

Using Madden Spur as a means to access the UPRR north of 11th Avenue undercrossing would eliminate some of the conflicts mentioned in the previous option. To provide this connection, the old Boise Loop tracks would have to be reestablished by constructing new tracks, improving existing tracks, and providing new signalized at-grade crossings at Franklin Boulevard and 6th Avenue. This option, once in the UPRR right-of-way, could have potential conflicts with the Highway 55 bridge piers, as mentioned above.

Figure 15 UPRR Mainline and Yard in Nampa (looking North)

Using Karcher Road right-of-way to access the UPRR right-of-way north of the yard would minimize the conflicts with the existing tracks and bridges. Approximately 2.5 miles of new track connection from the Boise Cut-Off to the UPRR right-of-way and a new overcrossing of I-84 would need to be constructed. This alignment would not enter Nampa, but would remain on the north side of I-84 and serve Nampa by utilizing a park-and-ride near the Franklin Road and Karcher Road intersection. This alignment would have conflicts with existing property access and some existing utilities along Karcher Road. Crossing Madden Spur would be at-grade and would require coordination with the freight operations. This option would require moving the starter line terminal station from the 11th Avenue location.

The UPRR mainline from Nampa to Caldwell has a large amount of utilities along the alignment. There are power poles along the length of the corridor, located predominantly on the north side of the tracks. Four companies have either buried fiber optic cable or telephone lines along the mainline. There is a high-pressure natural gas pipeline located in the vicinity of the rail line. Irrigation and sewer utilities exist close to the railroad, but should not be impacted by adding a new track.

Karcher Road has power poles on the north side of the road from I-84 to the Boise Cut-Off. The poles are very close to the edge of pavement and are spaced close together. Large metal poles, which signal a possible transmission line, continue east. There are also irrigation ditches, a gas line, and a water line with hydrants continuing down the north side of Karcher Road. A telephone line exists on the south side of the road. Two companies also have fiber optic lines located along Karcher Road.

At Caldwell, two potential termini are identified, at 10th Street and at Chicago Street adjacent to Highway 20/26. The criteria used in determining terminus locations are ease of access from I-84 and availability of land for use as a park-and-ride lot.

The terminus at 10th Street could be located south of the 10th Street undercrossing to avoid any conflict with the bridge piers. To access this location, two new bridges would be required to cross Indian Creek.

This option has direct access to I-84 via 10th Street.

The Chicago Street option is located south of Highway 20/26 and Franklin Boulevard. This location would avoid crossing Indian Creek and would not require new bridge construction.

Madden Spur to Highway 20/26 Alignment

This alignment would utilize the existing Madden Spur to a park-and-ride located approximately four miles east of Caldwell on Highway 20/26. This alignment would not enter Caldwell, but would rely on a park-and-ride in the vicinity of the Madden Spur and Highway 20/26 as the rail access point for residents of the Caldwell area.

Four possible connections from the proposed commuter start line to the Madden Spur are identified:

- Connection through the UPRR yard.
- Reestablishing Boise Loop tracks and improving connections at the Boise Cut-Off and Madden Spur.
- New track in Karcher Road right-of-way, between the Boise Cut-Off and Madden Spur.
- New track options mostly in the I-84 right-of-way, between the Boise Cut-Off and Madden Spur.

The first two options have the same issues and complications as the access to the UPRR right-of-way.

The Karcher Road right-of-way could provide access to the Madden Spur by constructing approximately 1.5 miles of new track from the Boise Cut-Off. Making the turn from Karcher Road to the Madden Spur could impact the existing siding tracks and the storage building located at that corner. This alignment would require a new station and park-and-ride to serve Nampa.

Using the north side of I-84 could provide access to the Madden Spur by constructing approximately 1.2 miles of new track. This option could impact buildings located along Franklin Road and the highway ramps. Options of crossing Franklin Boulevard would be to either cross at-grade or to construct an undercrossing utilizing the grades. Property along I-84 and the Boise Cut-Off could be utilized for a park-and-ride.

Utility impacts along the UPRR yards and Karcher Road are described in the UPRR Mainline Alignment. The alignment following I-84 would be located on the north side of the off-ramp at Franklin and would encounter

a telephone and water line. In addition to telephone lines, utilities in the vicinity of Franklin Road and along I-84 include gas, power, and fiber optic. This option would have a relatively large amount of utility conflicts.

Madden Spur to Highway 20/26 and New Alignment to Caldwell

This alternative would be the same as the previously described alternative except that a new alignment would be established from the Madden Spur into Caldwell. The new alignment would run in the 100 foot Highway 20/26 right-of-way and terminate at a park-and-ride approximately one half mile east of Highway 84.

Figure 16 Highway 20/26 Looking West

Construction of new tracks in the right-of-way would impact access to adjacent property. Controlling this access could possibly require additional traffic signals and gated crossings. One option would be to construct a frontage road to minimize the number of crossings.

Highway 20/26 has a power line along the entire study area alignment. Between I-84 and Middleton Road the poles are on the south side of the road, and from Middleton Road east they are on the north side of the road. Telephone and fiber optic lines are evident along Highway 20/26 at various locations. The fiber optic line appears to be on the north side of the road, while telephone lines are on both sides of the road. There is gas located on the north side of the road close to I-84, which could also be encountered elsewhere along the highway.

8.0 NEXT STEPS

ValleyRide, with participation from partner jurisdictions, has initiated discussions focused on negotiating an acquisition of the remaining portions of the Boise Cut-Off. This is an important next step in the process of introducing passenger rail service in the Treasure Valley area. Securing public control of the proposed rail passenger corridor is the preferred long-term solution.

The assumption is that ValleyRide would pursue Federal Transit Administration (FTA) Section 5309 New Starts funding to implement a project. To utilize this source of funding, the project would have to proceed according to the processes outlined for all projects competing for funding under this program. Appendix D contains a copy of the current FTA process for advancing a project from early planning to construction under the Section 5309 program. The process does recognize that each project and project circumstances are unique, resulting in different levels of detail and issues to be addressed as the project advances. However, any project will need to eventually receive a favorable ranking from the FTA to be eligible to receive federal funds.

The initial steps in the process would include the following:

- Alternatives Analysis - Evaluation of a range of alternatives that could result in improved transit service in the corridor. This stage would involve an added level of conceptual design, development of ridership projections, project justification and an initial identification of local funding commitments.

- Selection of a Locally Preferred Alternative.

- Request to FTA to enter Preliminary Engineering.

- Preparation of environmental documentation (Environmental Assessment or Environmental Impact Statement).

- Preliminary Engineering.

Each step includes a number of specific requirements to be met as the project moves forward. Successfully moving a project forward will require frequent consultation with FTA.

APPENDIX

A - CORRIDOR INVENTORY AND RECOMMENDED UPGRADES

B - CORRIDOR ZONING MAPS

C - TRAFFIC ANALYSIS TABLES

D - FTA NEW STARTS PLANNING AND PROJECT DEVELOPMENT PROCESS

APPENDIX A

Corridor Inventory and Recommended Upgrades

- Track Inventory and Recommended Upgrades
- Crossing Inventory and Upgrade Recommendations
- Bridge Inventory and Proposed Improvements

APPENDIX B

Corridor Zoning Maps

- Zoning Index Map
- Zoning Maps 1-4

APPENDIX C

Traffic Analysis Tables

- Existing Conditions
  - Franklin Road and Eagle Road
  - Franklin Road and Maple Grove Road
  - Franklin Road and Milwaukee Street
  - Franklin Road and Cole Road
  - Federal Way and Overland Road

- Conditions with a 30-Minute Commuter Rail Service
  - Franklin Road and Maple Grove Road
  - Franklin Road and Milwaukee Street
  - Franklin Road and Cole Road

- Side-by-Side Comparison of Existing Conditions and Condition with Commuter Rail
  - Franklin Road and Maple Grove Road
  - Franklin Road and Milwaukee Street
  - Franklin Road and Cole Road

Franklin Road and Eagle Road
(Existing Conditions)

MOVEMENT	Delay (sec./veh.)	LOS
EB Left	324.7	F
EB Through	253.2	F
EB Right	41.5	D
EB Approach	**198.9**	**F**
WB Left	95.4	F
WB Through	90.4	F
WB Right	53.5	D
WB Approach	**82.1**	**F**
NB Left	190.2	F
NB Through/Right	54.3	D
NB Approach	**70.9**	**E**
SB Left	214.7	F
SB Through/Right	60.5	E
SB Approach	**74.3**	**E**
INTERSECTION	**91.4**	**F**

Franklin Road and Maple Grove Road
(Existing Conditions)

MOVEMENT	Delay (sec./veh.)	LOS
EB Left	112.8	F
EB Through/Right	42.2	D
EB Approach	**49.7**	**D**
WB Left	50.9	D
WB Through	46.9	D
WB Right	29.2	C
WB Approach	**44.1**	**D**
NB Left	100.5	F
NB Through	48.1	D
NB Right	36.6	D
NB Approach	**52.4**	**D**
SB Left	63.0	E
SB Through	42.6	D
SB Right	17.5	B
SB Approach	**45.9**	**D**
INTERSECTION	**47.2**	**D**

Franklin Road and Milwaukee Street
(Existing Conditions)

MOVEMENT	Delay (sec./veh.)	LOS
EB Left	147.5	F
EB Through	120.7	F
EB Right	321.9	F
EB Approach	**188.6**	**F**
WB Left	136.2	F
WB Through	84.4	F
WB Right	366.9	F
WB Approach	**188.0**	**F**
NB Left	140.2	F
NB Through	31.6	C
NB Right	29.0	C
NB Approach	**109.1**	**F**
SB Left	66.2	E
SB Through	120.0	F
SB Right	40.8	D
SB Approach	**88.1**	**F**
INTERSECTION	**153.3**	**F**

Franklin Road and Cole Road
(Existing Conditions)

MOVEMENT	Delay (sec./veh.)	LOS
EB Left	52.1	D
EB Through/Right	24.2	C
EB Approach	**31.6**	**C**
WB Left	62.7	E
WB Through	33.1	C
WB Right	24.6	C
WB Approach	**37.8**	**D**
NB Left	86.6	F
NB Through/Right	22.3	C
NB Approach	**36.9**	**D**
SB Left	40.7	D
SB Through/Right	72.8	E
SB Approach	**68.0**	**E**
INTERSECTION	**44.9**	**D**

Federal Way and Overland Road
(Existing Conditions)

MOVEMENT	Delay (sec./veh.)	LOS
EB Left	25.7	C
EB Right	18.9	B
EB Approach	**21.2**	**C**
NB Left	2.4	A
NB Through	2.0	A
NB Approach	**2.2**	**A**
SB Approach	**5.5**	**A**
INTERSECTION	**7.5**	**A**

Franklin Road and Maple Grove Road
(with Commuter Rail)

MOVEMENT	Delay (sec./veh.)	LOS
EB Left	126.8	F
EB Through/Right	47.1	D
EB Approach	**55.7**	**E**
WB Left	58.8	E
WB Through	49.2	D
WB Right	34.5	C
WB Approach	**48.3**	**D**
NB Left	55.7	E
NB Through	44.7	D
NB Right	38.1	D
NB Approach	**44.1**	**D**
SB Left	51.8	D
SB Through	41.9	D
SB Right	21.3	C
SB Approach	**42.6**	**D**
INTERSECTION	**47.6**	**D**

Franklin Road and Milwaukee Street
(with Commuter Rail)

MOVEMENT	Delay (sec./veh.)	LOS
EB Left	166.5	F
EB Through	140.4	F
EB Right	359.5	F
EB Approach	**213.8**	**F**
WB Left	169.1	F
WB Through	111.1	F
WB Right	401.0	F
WB Approach	**218.2**	**F**
NB Left	170.0	F
NB Through	28.7	C
NB Right	26.7	C
NB Approach	**129.6**	**F**
SB Left	64.1	E
SB Through	94.4	F
SB Right	33.9	C
SB Approach	**72.7**	**E**
INTERSECTION	**169.7**	**F**

Franklin Road and Cole Road
(with Commuter Rail)

MOVEMENT	Delay (sec./veh.)	LOS
EB Left	62.2	E
EB Through/Right	43.7	D
EB Approach	**48.6**	**D**
WB Left	56.6	E
WB Through	44.7	D
WB Right	31.5	C
WB Approach	**45.0**	**D**
NB Left	65.9	E
NB Through/Right	33.6	C
NB Approach	**41.0**	**D**
SB Left	30.3	C
SB Through/Right	42.9	D
SB Approach	**41.0**	**D**
INTERSECTION	**43.8**	**D**

The following tables show a side-by-side comparison of the results.

Franklin Road and Maple Grove Road (Comparison)

MOVEMENT	Existing Conditions		With Commuter Rail		Difference in Delay (sec./veh.)
	Delay (sec./veh.)	LOS	Delay (sec./veh.)	LOS	
EB Left	112.8	F	126.8	F	14.0
EB Through/Right	42.2	D	47.1	D	4.9
EB Approach	**49.7**	**D**	**55.7**	**E**	**6.0**
WB Left	50.9	D	58.8	E	7.9
WB Through	46.9	D	49.2	D	2.3
WB Right	29.2	C	34.5	C	5.3
WB Approach	**44.1**	**D**	**48.3**	**D**	**4.2**
NB Left	100.5	F	55.7	E	-44.8
NB Through	48.1	D	44.7	D	-3.4
NB Right	36.6	D	38.1	D	1.5
NB Approach	**52.4**	**D**	**44.1**	**D**	**-8.3**
SB Left	63.0	E	51.8	D	-11.2
SB Through	42.6	D	41.9	D	-0.7
SB Right	17.5	B	21.3	C	3.8
SB Approach	**45.9**	**D**	**42.6**	**D**	**-3.3**
INTERSECTION	**47.2**	**D**	**47.6**	**D**	**0.4**

Franklin Road and Milwaukee Street (Comparison)

MOVEMENT	Existing Conditions		With Commuter Rail		Difference in Delay (sec./veh.)
	Delay (sec./veh.)	LOS	Delay (sec./veh.)	LOS	
EB Left	147.5	F	166.5	F	19.0
EB Through	120.7	F	140.4	F	19.7
EB Right	321.9	F	359.5	F	37.6
EB Approach	**188.6**	**F**	**213.8**	**F**	**25.2**
WB Left	136.2	F	169.1	F	32.9
WB Through	84.4	F	111.1	F	26.7
WB Right	366.9	F	401.0	F	34.1
WB Approach	**188.0**	**F**	**218.2**	**F**	**30.2**
NB Left	140.2	F	170.0	F	29.8
NB Through	31.6	C	28.7	C	-2.9
NB Right	29.0	C	26.7	C	-2.3
NB Approach	**109.1**	**F**	**129.6**	**F**	**20.5**
SB Left	66.2	E	64.1	E	-2.1
SB Through	120.0	F	94.4	F	-25.6
SB Right	40.8	D	33.9	C	-6.9
SB Approach	**88.1**	**F**	**72.7**	**E**	**-15.4**
INTERSECTION	**153.3**	**F**	**169.7**	**F**	**16.4**

Franklin Road and Cole Road (Comparison)

MOVEMENT	Existing Conditions		With Commuter Rail		Difference in Delay (sec./veh.)
	Delay (sec./veh.)	LOS	Delay (sec./veh.)	LOS	
EB Left	52.1	D	62.2	E	10.1
EB Through/Right	24.2	C	43.7	D	19.5
EB Approach	**31.6**	**C**	**48.6**	**D**	**17.0**
WB Left	62.7	E	56.6	E	-6.1
WB Through	33.1	C	44.7	D	11.6
WB Right	24.6	C	31.5	C	6.9
WB Approach	**37.8**	**D**	**45.0**	**D**	**7.2**
NB Left	86.6	F	65.9	E	-20.7
NB Through/Right	22.3	C	33.6	C	11.3
NB Approach	**36.9**	**D**	**41.0**	**D**	**4.1**
SB Left	40.7	D	30.3	C	-10.4
SB Through/Right	72.8	E	42.9	D	-29.9
SB Approach	**68.0**	**E**	**41.0**	**D**	**-27.0**
INTERSECTION	**44.9**	**D**	**43.8**	**D**	**-1.1**

APPENDIX D

FTA New Starts Planning and Project Development Process