**SPOKANE REGIONAL LIGHT RAIL PROJECT**
**South Valley Corridor**
***Railroad Interfaces***
*January 2004*

## INTRODUCTION

The Spokane Transit Authority (STA) is proposing to develop a high capacity transit corridor from downtown Spokane to Liberty Lake, Washington. This project is also called the Spokane South Valley Corridor project. The Spokane metropolitan region has been experiencing rapid population and employment growth and has been developing plans to manage change. The region has been examining options in this corridor over the past two decades of transportation system planning. In the early 1980s, the Spokane region began to pursue a transportation system that offers choices to the public, rather than emphasizing one mode of transportation over others. The high capacity corridor under study offers the region's best opportunity, however, most of the current high capacity options under consideration impact a portion of the existing railroad system that serves the city. Two Class 1 railroads, the Union Pacific Railroad (UPRR) and the Burlington Northern Santa Fe Railroad (BNSF) serve the Spokane Region. This report describes the interfaces with the railroads for each of the high capacity transit alternatives currently under consideration.

## ALTERNATIVES

The alternatives currently under consideration in the South Valley Corridor include the technologies of light rail transit (LRT) or bus rapid transit (BRT) or a combination of both. The rail options could either be powered by electricity in a conventional overhead-catenary configuration or by diesel fuel using Diesel Multiple Units (DMUs). The alternatives and their descriptions are listed below:

### Bus Rapid Transit (BRT) Alternative

This alternative includes a strategy of bus system improvements focused on the corridor. It provides premium bus service with limited stops in the corridor from downtown Spokane to Liberty Lake primarily on Sprague Avenue. In downtown Spokane, the service would begin and end at the Plaza Transit Center, with buses sharing lanes with normal traffic. Eastbound service would be on Riverside Avenue and westbound service would be on Sprague Avenue. The routes would separate near the Intermodal Transportation Center on Sprague Avenue at Bernard Street. Westbound buses would continue on Sprague Avenue turning to the north on Lincoln Street. Eastbound buses would turn right on Riverside Avenue, then south on Bernard Street and then to the east on Sprague Avenue. Different options have been developed to serve the Riverpoint Campus area. Once out of the downtown area, BRT buses would run in mixed traffic using outside lanes, with priority treatment at major intersections. There would be limited BRT stops with LRT-like stations that allow prepayment of fare. Between U-City and Liberty Lake, this alternative is the same as the U-City LRT/BRT Option.

### Light Rail Transit (LRT) Alternative (3 Options)

- **Separate Track Option.** This option consists of a double track system that would run 16.4 miles from downtown Spokane to the City of Liberty Lake. As mentioned above, the trains would be powered either by electricity from overhead wires or would be DMUs. From its western terminus at the Plaza Transit Center on Riverside Avenue, the alignment would run on the street through the heart of the business and financial district on Riverside Avenue, to the east. East of downtown Spokane, the alignment follows approximately 6.3 miles of existing railroad right-of-way to Dishman-Mica Road in the City of Spokane Valley. The LRT vehicles would travel on track separated from freight track and service. Continuing eastward, first along

Appleway Boulevard and then along an abandoned railroad right-of-way now owned by Spokane County, the alignment continues through the eastern Spokane Valley to the City of Liberty Lake. The LRT/street intersections would generally be at grade with crossing protection provided by gates and incorporated into the existing traffic signal system.

- **Shared Track Option.** This option is a similar, but scaled back version of the Separate Track Option. This option consists of a 15.5-mile single-track line running from downtown Spokane to the City of Liberty Lake. The principal difference with this option is that the line would share trackage with the existing UPRR Wallace Branch freight line, between approximately Fancher Road and Dishman-Mica Road. LRT passenger service and freight railroad service would be time separated. This line would be shorter, and much of it would be a single track with double track passing segments. Vehicles would be powered either by electricity from overhead wires or be DMUs. The operation systems and station finishes would be simpler than those for the Separate Track Option.
- **MOS LRT/BRT Option.** This option is similar to the Shared Track Option from downtown Spokane to U-City. The rail portion of the project would follow an alignment similar to that of the Shared Track Option, with the following differences:
    - Shorter passing tracks in the vicinity of Trent Station, Fairgrounds Station and University Station
    - Extended limits of track shared with the UPRR so that they are shared from Playfair to Argonne except in Spokane Yard
    - From Playfair to Havana Street reconstruct existing track and include the turnouts for freight spurs
    - Eliminate Freya Street and Park Street Stations
    - Use less expensive options for systems, stations and maintenance facilities
    - End the rail at University Station and continue to Liberty Lake using Bus Rapid Transit (BRT) technology

  Rail vehicles would be powered either by electricity from overhead wires or be diesel-fueled units. From U-City to Liberty Lake, transit service would be provided on buses utilizing BRT strategies. The initial terminus at U-City would enhance the transfer of passengers from bus to rail and would be located on Appleway Boulevard at University Road. The BRT buses would leave the transfer station and head north on University Road to Sprague Avenue where they would turn to the east. They would follow Sprague to Country Vista Drive and continue into Liberty Lake with a terminus at the existing Liberty Lake Transit Center on Mission Avenue. BRT buses would run in mixed traffic using outside lanes with priority treatment at major intersections. There would be limited BRT stops with LRT-like stations to allow prepayment of fare.

## SUMMARY OF RAILROAD INTERFACES WITH THE SOUTH VALLEY CORRIDOR

As mentioned above, two Class 1 railroads, the UPRR and the BNSF, serve the Spokane Region. Both railroads cross the region on an east/west alignment, entering Spokane's Central Business District (CBD) from the west on a consolidated rail corridor operated by BNSF. Just east of the CBD, two UPRR tracks diverge from the BNSF mainline at the Napa Street Interlocker. One UPRR track splits to the northeast enroute to Eastport, Idaho. Text in this memo may refer to this as the "UPRR mainline". Another UPRR track cuts to the southeast to an alignment just to the north of Sprague Avenue. This memo refers to this track as the "UPRR yard lead". At Havana Street this track enters UPRR's Spokane Yard. The UPRR "Wallace Branch" begins at the east end of the Spokane Yard proceeding east until reaching Argonne Avenue where it then swings to the south enroute to Plummer, Idaho. Approximately eight to ten trains are operated daily by UPRR through Spokane, six to eight of which may operate between Napa and the UPRR's Spokane Yard. Only two trains per day use the Wallace Branch east of the Spokane Yard.

Approximately 60 to 70 trains operate daily operate daily on the BNSF mainline. BNSF grants trackage rights to Amtrak, which operates two trains per day into Spokane from the west: one from Portland and a second from Seattle. These two trains are combined into one train to head east enroute to Chicago. The operation of combining these passenger trains occurs between the hours of midnight and 2:00 AM.

## ENVIRONMENTAL CLEARANCE AND DECISION PROCESS

The Spokane South Valley Corridor Project is currently following the National Environmental Policy Act (NEPA) process, which documents the environmental consequences of alternatives being considered for federally funded projects. STA is developing a draft environmental impact statement (DEIS) to document each alternative's impact on the environment, and will make this information available to the public for comment. The DEIS is supported by sufficient conceptual engineering information to accurately evaluate the anticipated impacts of each alternative. The public process for the DEIS started with public scoping meetings, the most recent of which were held on September 4, 2003. The DEIS is anticipated to be published in late-2004. Public input will be encouraged at that time.

During the public input process access to the DEIS will be available for all who want to review and comment. The public comment period will be open for a period of 45 days, during which time public open houses and/or public hearings will be held to receive public and agency comments. The public and agency comments on the DEIS will become part of an official record. Following the public comment period, a decision will be made by STA on whether or not to proceed with the project. If a decision is made to proceed, it will include designation of a locally preferred alternative (LPA). Following the selection of an LPA, STA can seek permission from the Federal Transportation Administration (FTA) to enter into the preliminary engineering phase of design and to prepare a final environmental impact statement (FEIS). The FEIS further documents the impacts of the selected alternative.

The current project schedule indicates that the project could enter preliminary engineering in 2005. Following preliminary engineering and completion of the FEIS, additional federal approvals will be necessary. Meanwhile, local funding mechanisms must be secured. If all required approvals are achieved, the project could begin final design during 2006, construction could begin in 2007, and the system could be operational in year 2009 or 2010.

## UPRR OPERATIONS IN THE PROPOSED LIGHT RAIL CORRIDOR

As will be discussed later in this memo, the UPRR interfaces with the proposed LRT options are far more extensive than the BNSF interfaces. Therefore, a discussion of the relevant UPRR operations follows:

- **Mainline Operations.** As discussed above, the UPRR operates eight to ten trains daily in and around the Spokane area. Between four and six trains "run through" Spokane stopping only to change crews on their way between Hinkle, Oregon (a major classification yard near Pendleton, Oregon) and the Canadian border at Eastport, Idaho. In addition to these "run through" trains, each day one mainline train enters and one mainline train departs Spokane Yard on the yard lead that connects the yard with BNSF's Napa Street interlocker. This train, known as the HKSK (code: Hinkle = HK, Spokane = SK), delivers cars for the Spokane area, transporting automobiles, fertilizer, propane, and general merchandise. During 2001, trains averaged 50 to 70 cars in length, or about 5,000 feet. Generally, this train is scheduled to arrive in Spokane at 7:00 AM each day. The outbound train transports empty automobile and propane cars, lumber and wood chips from Spokane. Generally this train, which is of similar size and length as the inbound train, is on duty at 4:00 PM departing the yard for Hinkle sometime between 4:00 PM and 5:30 PM.

- **Yard Operations.** The local switch (yard) crew switches the inbound mainline train (HKSK) upon its arrival. This crew is on duty at 7:00 AM each day and generally follows a prescribed switching pattern in order to distribute the cars brought into Spokane Yard by the HKSK. The switch crew's first assignment is to spot and pull the auto racks for the TS&D auto unloading facility. The TS&D facility is located north of the Spokane Yard and just west of Fancher Avenue. Once this is accomplished, the yard crew builds the Plummer Local on duty at Spokane Yard each day at 10:00 AM. Then the yard crew gathers cars for the Eastside Syndicate Industrial Park and proceeds to this industrial area which is located between Sprague Avenue and the BNSF mainlines and west of Freya Avenue.

  During 2001, up to five industries received and released freight cars each day from this industrial park. These include:
  - LaFarge (numerous cars of cement each day from both BNSF as well as UPRR)
  - Thunderbird (A&I) Lubricants (1-2 cars/week)
  - A&I Distributing (1-2 cars/week)
  - Joey August Beverage Distributing (3 cars/week)
  - Northern Energy (1-2 cars propane/week)

  Spokane Recyclers previously received rail cars on an occasional basis but was not receiving rail cars as of Summer, 2001. The spur serving Empire Cold Storage is currently out-of-service and no rail cars have been solicited by this industry.

  Generally, the yard crew is at the Eastside Syndicate Industrial area for a couple of hours each day starting around 10:00 AM. In order for BNSF to efficiently handle rail cars to and from LaFarge, BNSF switch crew's use a "runaround" track located adjacent to and south of the yard lead in the vicinity of the switch serving the Eastside Industrial area.

  Two active industry spurs are situated just north of the UPRR yard lead, between Havana Street and the Eastside Industrial area: Trumark and WTB Reload. According to a UPRR representative, Trumark's track has been taken out of service and they are using the WTB spur to handle the products (lumber) brought in by rail. In addition, there is a spur track that appears to receive cars located next to the Trumark facility. However, UPRR indicated that recently no cars had been spotted into this spur track.

  Once the Eastside Industrial switching assignments have been completed, the yard engine returns to Spokane Yard for lunch then proceeds to its third assignment of the day: spotting and pulling cars from the Lake Street Industrial area. This area is located just east of the east end of Spokane Yard (and east of Fancher Avenue). Only two industries are currently served by UPRR at Lake Street. These include Spokane Seed (1-2 cars/day when in season), and Northern Pea & Bean (3-4 cars/day in season).

  In addition to the above listed assignments, the switch engine must also assemble the outbound SKHK, which is called on duty at Spokane approximately 3:00 PM each day. The switch engine also spots and pulls propane cars from the V-1 propane spur located near the TS&D auto unloading facility.

- **Other Switching Movements.** The Plummer Local, on duty Spokane Yard at 10:00 AM daily, generally departs for Plummer sometime between 11:00 and 11:30 AM with approximately 10-20 cars. This train runs east on the Wallace Branch, returning to Spokane Yard in the late afternoon.

The Trentwood Local occasionally has its locomotives serviced at the locomotive servicing tracks that are located along the northern edge of Spokane Yard. This means that the local crew must be transported via auto to Spokane Yard to the locomotive servicing tracks to pick up their locomotive. The crew then takes their train out the west end of the yard, over Havana Street enroute to Napa Street, then back east to Trentwood on the Spokane International. This move occurs daily at approximately 9:00 AM to 10:00 AM and the reverse of this move repeated that evening.

The switch crew is also obligated to "rescue" freight trains that have exceeded their hours-of-service. This means that once the switch crew is on duty, if one of UPRR's mainline trains fails to reach the location where train crews are customarily changed, then the switch crew must be transported by auto (or in some cases, use their locomotive) to the train that requires rescuing. Then the switch crew moves the mainline train to the crew change location. Once this move is completed, the switch crew resumes their regularly scheduled assignments. Because a train that has exceeded its hours-of-service blocks the mainline, this movement is usually of the highest urgency; especially if BNSF's mainline is blocked. Consequently, the first priority of the switching assignments listed above, the spotting of the TS&D auto facility will not occur until the mainline trains have been rescued.

Occasionally the UPRR will spot a Hinkle to Eastport mainline train in Spokane Yard. This is done simply because there is either no place to meet this train with opposing mainline trains and/or the outbound crew is not available to take the mainline train through to its destination.

## BRIDGING THE VALLEY

The Bridging the Valley (BTV) Project, which is currently in the preliminary engineering stages, proposes to combine the operation of the UPRR and the BNSF mainlines in this area into one railroad corridor and would eliminate at-grade railroad crossings. In the 42-mile long corridor between Spokane, Washington and Athol, Idaho, the UPRR mainline has 52 at-grade crossings, or crossings that intersect roadways, and 2 grade separated crossings. The BNSF line has 20 at-grade crossings, 6 grade separations. As a result of this project this entire rail corridor would become fully grade separated. Combining rail tracks into a single corridor could have a positive effect on future economic growth, traffic mobility, traffic safety, and train whistle noise abatement.

BTV calls for abandoning the UPRR tracks (except for sidings), and moving train traffic onto or adjacent to the present BNSF mainline tracks. The BNSF tracks are those that are just to the south of and parallel to Trent Avenue. This project would also move UPRR's Spokane Yard from its present site (between Sprague and the Fairgrounds, Havana and Fancher), to a location within the BNSF's mainline corridor. BTV is not proposing to eliminate the UPRR Wallace Branchline and its two trains per day which operate in the corridor proposed to be shared by the light rail project east of Fancher. The BTV project, estimated to cost $252 million, includes the construction of a third set of tracks in the BNSF right-of-way and a new bridge over the Spokane River, parallel to the existing bridge.

The LRT options of the South Corridor Valley project would benefit from Bridging the Valley since most of the conflicts between freight operations and light rail operations would be eliminated. In addition, the project may be able to obtain the UPRR abandoned right-of-way at a low cost to the project. Also, if the UPRR abandons the corridor, the 25-foot separation requirement between LRT and freight rail would be eliminated and this would help reduce other right-of-way impacts. The reuse of the existing UPRR trackage in the abandoned corridor is also a possibility. However, these benefits will only occur when the UPRR's Spokane Yard is eliminated and the UPRR tracks between the Napa Street Interlocker and Lake Road are abandoned. The project currently in

preliminary design anticipates the closure of the Spokane Yard but may not include the abandonment of the tracks.

For the LRT Project's "Separate Track Option", the alignment bridges over the BNSF main line and continues adjacent to the existing UPRR "yard lead" east. In this option, the UPRR yard lead would be relocated to the south in the right-of-way to provide 25 feet of separation from LRT operation. The LRT alignment passes to the north of the UPRR yard and continues east across Fancher Road and under Interstate 90. Just west of I-90, the UPRR's Lake Street industrial spur connects to the UPRR Wallace Branch line. Based on information that is available, it is assumed that BTV would leave the UPRR track from Lake Street to Argonne Road in place to provide the connection to the Wallace Branch line. The UPRR tracks west of this location would be abandoned, and the LRT tracks could be centered in the right-of-way. However a final determination by BTV of exactly which tracks stay and which are abandoned has not been made. If the UPRR track is not abandoned in this segment then the LRT tracks would have to be located in the south part of the ROW with a 25-foot separation between LRT and the freight railroad tracks. From Lake Street east to Argonne Road, the UPRR tracks are proposed to be located on the south side of the alignment with the LRT tracks on the north side. The LRT alignment would require a new bridge across Sprague. South of Sprague, the LRT alignment diverges from the UPRR at Argonne Road where the UPRR heads southeast toward Plummer, and the LRT alignment continues east along Appleway Boulevard.

In the railroad corridor portion of the LRT Project's "Shared Track" and "U-City MOS LRT/BRT" Options, the LRT alignment crosses under the BNSF mainline tracks at Madelia Street, and then turns east on Riverside Avenue, connecting back into the UPRR right-of-way at Playfair. At this point the LRT alignment shares the UPRR yard lead right-of-way. For the Shared Track Option the UPRR industrial spurs and the yard lead would be relocated to the north as needed along the alignment. East of Havana Street, the Shared Track alignment is south of the existing UPRR yard and connects back onto the UPRR Wallace branch line, sharing track east of Fancher Road.

For the U-City MOS LRT/BRT option, the LRT alignment would run on the UPRR track from Playfair to the Spokane Yard. New track would be constructed along the northern boundary of the yard to serve a station adjacent to the Spokane County Fair and Exposition Center (Fairgrounds Station). After leaving the Fairgrounds Station the new track would continue in the northern portion of the yard meeting existing UPRR track at a point about 200 feet west of Fancher Road.

The UPRR Lake Street industrial spur connects in just east of this point, and both the Shared Track and U-City LRT/BRT Options operate on the UPRR track and cross under Interstate 90 and continue to share track east to Argonne Road, crossing Sprague on an existing UPRR bridge. At Argonne, LRT diverges from the UPRR Wallace Branch freight line that continues to the south.

If the BTV project were to occur and if it included the removal of UPRR track, then any impacts to the LRT project from the UPRR between Playfair Racetrack and Lake Street would be eliminated. However, as long as the Wallace Branch remains in operation, then operations of the LRT trains and freight trains from Lake Street to Argonne Road would have to be time separated.

Currently, the BTV Project is in preliminary engineering, and completion of this phase of design is scheduled for November of 2004. Final design is scheduled for 2005, with initial construction scheduled for 2007 through 2009

or 2010. Phase I includes the bridge over the Spokane River, a new UPRR yard and adding the trackage to move the UPRR. This phase must be complete before the move can take place.

## UPRR TRACK CONDITION ASSESSMENT

On March 24 and 25, 2003, an inspection was made of the existing UPRR track from approximately Napa Street to Argonne/Appleway Boulevard. The purpose of the inspection was to develop a better understanding of the conditions of existing track, structures and signal systems. The existing conditions are suitable for the current use as a freight railroad with speeds for freight operations ranging from 10 MPH to 25 MPH depending upon the location in the corridor. Additionally, some of the corridor is within yard limits with appropriately restricted speeds.

Train speeds are restricted by track conditions in accordance with Federal Railroad Administration (FRA) Track Safety Standards as defined within Title 49 Part 213 of the Code of Federal Regulations. The following are the FRA maximum allowable operating speeds for passenger trains over track that meets all of the requirements prescribed under Part 213 for:

- Class 1 track 15 mph
- Class 2 track 30 mph
- Class 3 track 60 mph

For purposes of this study, it was assumed that the desired operating speed for light rail (passenger) vehicles in the corridor would be a minimum of 45 MPH. In order to attain this throughout the corridor, all of the track would need to meet FRA requirements for Class 3 track.

The portion of the track between Havana Street and Fancher Road was not inspected as this is in the main UPRR yard. Inspection in that area would have been difficult due to rail cars stored on yard tracks and switching activity throughout the yard area.

### UPRR Track Condition Assessment Findings

For the purposes of this discussion, the corridor can be broken into three segments based on conditions of existing track, structures, and signal systems:

- Napa Street to Havana Street
- Havana Street to Fancher Road (UPRR Yard)
- Fancher Road to Argonne/Appleway Boulevard

- **Napa Street to Havana Street.** Generally in the line segment from Napa Street to Havana Street, the track is in poor condition. Poor rail and tie conditions, mud and water in the track, and poor track geometry contribute to the poor condition. Over 50 percent of the ties are defective. The rail is heavily worn with engine burns, battered and chipped rail ends, and bent rails. The ballast is heavily fouled with standing water in the track in some places. Track drainage is poor. The overall condition of the segment meets the minimums of FRA Class 1 track. The maximum allowable operating speed for passenger trains would be 15 MPH.

  Either signals or crossbucks protect grade crossings along the segment. None of the crossings are protected by gates. Altamont Street near Playfair Racetrack is grade-separated.

- **Havana Street to Fancher Road (UPRR Yard).** In the area of the UPRR yard, a cursory inspection of the turntable just west of the Costco building indicated that the turntable structure appears to be in good condition, but not functioning. The amount of work required to make it operational is unknown. An operational turntable may be an added benefit if this location were selected for a light rail maintenance facility.

  As mentioned previously, no detailed inspection was performed in the existing yard, storage tracks, or of the mainline through the yard.

- **Fancher Road to Argonne/Appleway Boulevard.** The line segment from Fancher Road to Appleway Boulevard is in generally good condition and appears to meet the requirements for FRA Class 2 track. The grade crossing signal systems in this segment are in good condition with active warning devices at all major grade crossings. Park Road and Sprague Avenue are grade separated with the track on bridges at both locations.

### UPRR Condition Assessment Conclusions

As stated above, it is assumed that LRT operating speeds may be as high as 45 MPH along the corridor. In order to accommodate LRT in a shared track application, it is recommended that the following improvements to the existing corridor in order to meet FRA Class 3 requirements and to provide appropriate levels of public safety at grade crossings.

- **Track.** From Napa Street to Fancher Road, it is recommended to remove and rebuild the entire UPRR track section using all new rail, ties, turnouts, ballast, and hardware. It is recommended that a minimum of 115RE continuously welded rail (CWR) and either 7”x 9”x 8’-6” timber ties or concrete ties be used.

  From Fancher Road to Argonne, it is recommended that the existing rail with 133RE CWR be relayed, replacing cross ties as required, surfacing, lining and dressing the track. The heavier rail is recommended in order to support shared use of the segment by UPRR freight operations.

- **Structures.** The UPRR Altamont Street grade separation structure is a timber pile trestle with a steel deck girder center span over the road. It appears to be in good condition. If the separate track alternative were to be selected, a new bridge for LRT is conceptually planned to be built alongside of the existing bridge. Assessment of the interface between these two structures should be considered during the preliminary engineering phase.

  The UPRR Park Road grade separation structure is a single-span steel deck girder structure with concrete abutments and headwalls. The substructure appears to be in good condition. No improvements are required for use by LRT.

  Just east of Park Road is a 7-span timber pile trestle. The structure appears to be in fair to good condition, but does not appear to serve any purpose. It is recommended that this bridge be removed and the area beneath it filled in order to reduce long-term maintenance costs.

  The UPRR Sprague Avenue grade separation structure is a 2-span steel structure with concrete abutments, pier and headwalls. The structure appears to be in good condition. No improvements are recommended.

- **Grade Crossings.** The Havana Street grade crossing has a prefabricated timber panel surface with shoulder mount signals. It is recommended to replace the existing signals with cantilever signals and gates. The crossing surface may be replaced with concrete panels.

  At this time the UPRR is proposing to close the Fiske, Greene, Ralph, and Sycamore Streets' grade crossings. The Freya Street grade crossing has a precast concrete panel surface on timber ties with cantilever signals. It is recommended that gates be added to the existing crossing protection system.

  The Fancher Street grade crossing has a precast concrete panel surface on timber ties on the mainline and prefabricated timber panels on the lead track. It has cantilever signals. It is recommended that gates be added to the existing crossing protection system and that the timber crossing be rebuilt in the lead track with precast concrete panels.

  Vista Road is an asphalt grade crossing with cantilever signals and gates. It is recommended to replace the crossing surface with precast concrete panels and rebuild the track.

- **Train Control Systems.** There are no train control systems in the corridor except at the junction with the BNSF in the vicinity of Napa Street. Train control signals and communication systems would need to be added to the alignment in order to accommodate passenger operations. Recommendations for these improvements are included in other project documentation.

## BNSF INTERFACES

Interfaces of the light rail alternatives with the BNSF Railroad primarily involve proximity and encroachment onto railroad owned right of way, and do not involve direct interfaces with any of the BNSF's tracks.

### Separate Track Option

The Separate Track Option borders the BNSF mainline to the north just east of Spokane's CBD in the vicinity of the Trent Avenue crossing of the Spokane River. The BNSF mainline at this location is elevated on a high (30'+) embankment. The LRT alignment is located either at the bottom of the embankment or "benched" into the embankment. As such, the geotechnical issues concerning the stability of the embankment will be critical to the railroad. It will be expected that railroad operations will not be interrupted due to construction in this area. This option is proposed to cross Erie Street on a ballasted track structure.

The LRT alignment would then proceed east, crossing the BNSF mainline near Napa Street on a proposed flyover structure. The flyover would be long enough to cross the two BNSF mainlines, a yard lead, an industry spur and a future mainline as proposed by the Bridging the Valley Project. The LRT alignment would touch down on the east side of the UPRR Spokane yard lead, eliminating the need for a crossing of this track. The recommended BNSF vertical clearance is a minimum of 23 feet and the preferred minimum horizontal clearance is 25 feet from centerline of track. BNSF would likely allow the bridge to be constructed, but the construction window might be limited to no more that 3 to 4 hours each work window. Also, the time of day that this window is allowed might vary considerably from day to day.

### Shared Track and MOS LRT/BRT Options

Both the Shared Track and MOS LRT/BRT Options have similar interfaces with the BNSF railroad. Similar to the Separate Track Option, the Shared Track and alignment MOS LRT/BRT Options border the BNSF mainline

to the north, just east of Spokane's CBD in the vicinity of the Trent Avenue crossing of the Spokane River. However the shared track alignments include a single track with some double track areas for passing. In addition the shared track alignments are proposed to be further from the BNSF track embankment and cross Erie Street at grade, further reducing the extent of the interface to the BNSF railroad. The alignment for both the Shared Track and MOS LRT/BRT Options is proposed to pass under the BNSF through an existing structure on Madelia Street and then to continue east on Riverside Avenue from Madelia Street. The BNSF will likely be concerned with the stability of the embankment and the underpass. The railroad will not allow their operations to be interrupted during construction activities. They will want to review all anticipated activities and engineering documents.

## UPRR INTERFACES

The UPRR has several operations that would be impacted by the LRT options of the South Valley Corridor. They are described by area below:

### Separate Track Option

Impacts to the railroad due to this option are best described by separating them into the following areas:

- **Playfair to Havana Street.** The Separate Track Option is located in the UPRR right of way on the north side of the UPRR tracks just east of Playfair. The two LRT tracks are parallel to the UPRR tracks (yard lead) from Playfair to the entrance of the Spokane Yard at Havana Street. This corridor is lined by light to moderately heavy industrial buildings on either side of a corridor that ranges from 52 to 100 feet in width. Several freight rail tracks occupy this corridor. These tracks serve a variety of functions such as storage tracks, yard leads, and access to local industry. An access road is located south of these tracks on the alignment of a former track. All spur tracks in this portion of the alignment would be severed by this LRT option and service to the local businesses would either have to be from the BNSF or by truck.

  According to FRA's 49 CFR 209 & 211, the nearest LRT track must be horizontally offset a minimum of 25 feet (centerline to centerline) from the nearest freight rail track. Assuming that the UPRR would like to maintain an access road, this road could be situated within the FRA-specified offset. Union Pacific would prefer to see even greater separation, but this distance should be verified during preliminary design. In order to get the UPRR track, two LRT tracks and the separation in place, it would be necessary to relocate UPRR's yard lead as follows: from the south property line to the nearest UPRR track (yard lead), a minimum of 15 feet would be required; then 25 feet north of the yard lead to the nearest LRT track; leaving 60 feet for LRT use in areas of 100-foot right-of-way. The minimum width of right-of-way needed to accommodate a single UPRR track, an access road for the UPRR, and two STA tracks is 62 feet-6 inches. This is based on:

  - 15 feet of clearance from the south R/W line to the centerline of the UPRR track;
  - 25 feet of clearance between the UPRR and the first STA track;
  - 14 feet of clearance between the STA tracks; and
  - 8 feet-6 inches from the centerline of the northerly STA track to the north R/W line.

  There appear to be some areas in the existing UPRR right-of-way with less than the required width. These areas may require special design characteristics such as crash walls or acquisition of additional right-of-way.

  This figure could shrink if UPRR wishes to maintain an offset from the south right-of-way line greater than the 15 feet estimated above. If an offset between the UPRR and LRT tracks of less than 25 feet is desired,

STA may be required to construct a crash wall plus a vertical separation of track alignment profiles between the freight and LRT alignments. These treatments may not be achievable given the numerous at-grade road crossings along this portion of the corridor. The portion of the corridor required by STA would be subject to the stipulations outlined in a sales/lease agreement between UPRR and STA.

- **Spokane Yard.** After crossing Havana Street the LRT tracks would diverge to the north, bypassing Spokane Yard to the north, on property previously acquired by STA from UPRR. Near the east end of the yard, the LRT alignment crosses the lead track for the TS&D auto unloading and distribution facility. Due to the high priority UPRR places on rail shipments to the TS&D auto unloading facility, it is highly unlikely that UPRR would agree to a temporal separation for rail access to this facility. As a result, the Separate Track Option assumes that an overcrossing would be constructed to eliminate conflicts between LRT and UPRR operations at this location.
- **Lake Road Industrial Spur.** As the LRT alignment leaves the yard it crosses the Lake Road Spur. Due to the relatively small number of shippers on this lead, it may be possible to construct an at-grade RR/LRT crossing diamond and provide rail service to the Lake Road customers between 1:00 AM and 5:00 AM. However, this could require UPRR to add an additional switch engine crew for this night assignment and the approval of the FRA. Therefore, the Separate Track option for LRT has assumed that a grade separation would also be constructed to avoid a direct interface of the freight and LRT tracks at this location.
- **I-90 Overcrossing.** As the alignment continues east, LRT and the Wallace Branch cross under I-90. According to WSDOT plans, the distance between abutment walls supporting the overcrossing is approximately 53 feet 4 inches. In order to accommodate both the UPRR and LRT at this location, it is assumed that UPRR will reserve 15 feet from the centerline their Wallace Branch to the south abutment wall, 25 feet from centerline of Wallace Branch to centerline of nearest LRT track, leaving just over 13 feet remaining. This is not sufficient horizontal distance to allow a double-track LRT system (that requires 14 feet between LRT tracks plus 7 feet from nearest LRT to abutment wall). This suggests that 61 feet is the minimum horizontal distance that is needed.

  Potential actions could be targeted to reduce clearance requirements to allow the three tracks to be constructed beneath I-90 including: reduce UPRR's required clearance to 10 feet between the south abutment wall and the Wallace Branch; and avoid the location of center poles for their overhead catenary system in this location allowing the LRT track centerlines to be reduced to 12 feet. In such a case the double track LRT alignment might be constructed so as to maintain the FRA minimum 25 foot offset from the UPRR. Additional considerations regarding track alignment curvature prior to reaching the viaduct should also be incorporated into a successful design. If these mandated offsets cannot be reasonably achieved, then it might be possible to reduce the LRT trackage to a single main track for approximately 1,000 feet through and under the I-90 Viaduct. The double track would be reduced to one track or expanded to two tracks by a power-operated turnout at either end of the single-track section.

- **Wallace Branch.** East of I-90, the two LRT tracks continue along the north side and parallel to the Wallace Branch. At the west end of this segment it is anticipated that the Branch would be relocated to the south as necessary in the existing right-of-way. It is believed that no active spurs exist in this segment. It has been noted that numerous encroachments, most of which appeared to be legal, impinge upon the UPRR right-of-way. The terms and agreements of these encroachments should be investigated. The LRT tracks for the Separate Track option would cross Sprague on a new bridge and divert from the Wallace Branch onto the north side of Appleway Boulevard.

## Shared Track Option

Impacts to the railroad due to this option are best described by separating them into the following areas:

- **Playfair to Havana Street.** The Shared Track Option would be located in the UPRR right of way on the existing UPRR yard lead just east of Playfair Racetrack. The existing track would be upgraded to handle LRT operations. A new track for the UPRR yard lead would be newly constructed on the northside of the LRT track. The required minimum horizontal offset of 25'from centerline of the LRT track to the nearest freight rail track would be provided. The existing UPRR access road wouldn't necessarily be maintained. Since only one LRT track would be located in this area most of the right-of-way issues are eliminated or significantly reduced.
- **Spokane Yard.** After crossing Havana Street, the LRT tracks pass through the south portion of the Spokane Yard. A LRT operations and maintenance facility could be located in vicinity. The LRT alignment continues south of the main yard tracks and crosses Fancher Road. The UPRR uses some of the land to the south for various support purposes and has an existing spur to this area providing access. These uses south of the main yard are assumed to be discontinued with this option.
- **Lake Road Industrial Spur to Argonne Road.** The industrial spur would be realigned and the UPRR Branchline track and LRT operations would share a track through this segment. A turnout connecting the Lake Road industrial spur with the LRT/UPRR track would occur under I-90. From this point east to Argonne Road, the rail operations would be shared and time separated on one track. At Argonne, just prior to crossing Appleway, the LRT alignment diverges to the east and onto the south side of Appleway. Heavy rail operations continue to the south on the Wallace Branch to Plummer, Idaho.

## MOS LRT/BRT Option

This option is viable if the Bridging the Valley Project (BTV) is completed, but faces many challenges if BTV does not occur. Interfaces with the railroad with this option are best described by separating them into the following areas:

- **Playfair to Havana Street.** The MOS LRT/BRT Option would be located in the UPRR right of way on the existing UPRR yard lead beginning just east of Playfair Racetrack. The existing track would be reconstructed as discussed earlier to accommodate passenger rail operations. If UPRR operations were to remain, then separation of light rail and freight services would be temporal as no relocation of the UPRR tracks is proposed in this option.
- **Spokane Yard.** After crossing Havana Street, a new track would be constructed near the northern boundary of the yard to serve a station near the Fairgrounds. Passing tracks would be added near the Fairgrounds Station. A LRT operations and maintenance facility could be located either on Parcel B owned by the Spokane Transit Authority or in the southern portion on the yard. The LRT tracks tie back into the existing UPRR tracks about 200 feet west of Francher Road. The new LRT track is proposed to be at grade throughout this segment. As such, it would conflict with UPRR's TS&D auto loading spur. It is again noted that the BTV project proposes to relocate the TS&D operation outside of this corridor, thereby eliminating that interface if BTV is implemented. As noted above, the Spokane Yard would also be eliminated with BTV.
- **Lake Road Industrial Spur to Argonne Road.** The industrial spur would be realigned with a turnout connecting the Lake Road industrial spur with the LRT/UPRR track located beneath I-90. From this point

east to Argonne Road, the rail operations would be shared and time separated on one track. The UPRR Wallace Branch track would be upgraded to Class 3 as discussed elsewhere. At Argonne, just prior to crossing Appleway, the LRT alignment diverges to the east and onto the south side of Appleway. Heavy rail operations continue to the south to Plummer, Idaho.

## RAILROAD INTERFACES WITH LRT MAINTENANCE FACILITY SITE OPTIONS

A study of possible sites for the maintenance facility for LRT operations was conducted. Several sites were initially reviewed and three locations remain for consideration in the DEIS:

- Playfair Racktrack
- UPRR Spokane Yard Vicinity
- STA Fleck Center

The Fleck Center site is located along the abandoned railroad right-of-way east of Bowdish Road in the City of Spokane Valley and doesn't impact current railroad operations so it will not be discussed here.

### Playfair Racetrack

Several possible site configurations were considered at this former horse racing facility. The site was considered quite favorably from the standpoint of its expandability to accommodate future system growth, and it's central proximity to this project as well as a potential future northern extension for light rail. Conceptual plans for this option was developed in 2001 as part of the Separate Track Option. In that option the UPRR yard lead would be to the south of the proposed LRT alignment and therefore no interference between LRT and railroad operations at this location occurs.

However, the UPRR yard lead would be to the north and between the Playfair Racetrack location and the LRT alignment for the Shared Track option. In order to utilize the Playfair site for a maintenance facility, the Shared Track option would need to have a maintenance yard lead that would cross the UPRR yard lead. This likely eliminates this location for that option unless the BTV Project occurs and removes the conflict.

The U-City MOS LRT/BRT Option shares trackage with the UPRR yard lead in this vicinity, thus a LRT yard lead would be required to turn out from the track alignment to serve the Playfair site.

### UPRR Spokane Yard Vicinity

Several sites in the UPRR Spokane Yard vicinity have been considered for a LRT operations and maintenance facility, including a site just south of the Spokane County Fair and Expo Center. STA previously purchased a portion of UPRR land, referred to as "Parcel B", just north of the existing UPRR yard and south of Fairgrounds parking, near the purple gate. This site would allow access for the maintenance facility to be shared with the access to the Fairgrounds Station and the park and ride facility. Another possible site that could be used for a small start-up LRT operation is south of the UPRR yard north of the Sprague Avenue Costco store. The area south of the main UPRR yard has several possibilities for location of a LRT maintenance facility. All LRT Options in this vicinity would interface with existing UPRR yard operations. It is again noted that implementation of the BTV project would eliminate all railroad interfaces with respect to these maintenance facility site options.

## FRA, FTA AND DOT REGULATORY ISSUES

The interface between freight railroads and LRT systems has been regulated in a recent (July 2000) rulemaking effort by the Federal Railroad Administration (FRA). This regulation (49 CFR 209 & 211) was enacted to minimize the likelihood that lightly constructed LRT equipment might interface with the more staunchly built freight rail equipment. This regulation could potentially affect STA's LRT system. As a requirement of 49 CFR 209 & 211, a distance of 25' must separate the freight rail track(s) from those of the LRT system. Thirty feet is required if the freight trackage is considered "excepted track," a classification reserved for trackage not meeting the minimum standards required for Class 1 designation; in other words, relatively poor track. In addition, wherever these two systems cross, the FRA requires temporal separation of the respective operations to safeguard against inadvertent collisions. Given that STA's preferred alignment either crosses or borders two railroads, FRA rules may dictate what is acceptable in terms of design and operations in order for the project to proceed.

## SUMMARY

No matter which alternative for high capacity transit service is selected, all have implications with respect to interfaces with the railroads. Even if the full BRT option is selected, it is intended to be designed to convert to LRT in the future. The interfaces with the railroads can have a major impact on the cost and schedule on the South Valley Corridor project. In addition the Bridging the Valley project has considerable potential to mitigate many of the interface issues created by the various LRT options. Over the course of early stages of conceptual design for light rail, initial meetings were conducted with both railroads to inform them of the LRT options under consideration and to seek their advice regarding ways to deal with the interfaces. It is recommended that meetings continue to be held with each railroad as the conceptual design process is completed and as local decisions are made regarding the LRT project. Once a locally preferred alternative decision is made, continued discussions with the railroads will necessarily focus on development of agreements that defines the project scope, responsibilities and schedule, maintenance responsibilities and of course financial considerations. Resolving these issues early in the design process will result in a better project with a reliable schedule and budget.

Principal Information Sources:

HDR, Technical Memo supporting conceptual design of the Separate Track Option (Summer 2001)
HDR Technical Memo supporting conceptual design of the Shared Track Option (June 25, 2002)
Working Draft of the Spokane South Valley Corridor Project DEIS (April 7, 2003)
DEA Technical Memo documenting UPRR Condition Assessment (2003)
Various meetings between DEA and HDR regarding Bridging the Valley
FRA, FTA, DOT Guidelines and Standards of Practice