Policy Point 1: Need for the Access Point Revision

What are the current and projected needs? Why are the existing access points and the existing or improved local system unable to meet the proposal needs? Is the anticipated demand short or long trip?

Introduction

The Spokane Transit Authority (STA), in cooperation with the Federal Transit Administration (FTA), the Federal Highway Administration (FHWA), and the Washington State Department of Transportation (WSDOT), is proposing a new West Plains Transit Center with freeway flyer stops for local and express bus connections, near the SR 902/Medical Lake Interchange with Interstate 90 (I-90) at Exit 272.

STA’s goal is to provide fast and convenient service connecting the West Plains and Medical Lake area with downtown Spokane, Cheney, Washington, the Eastern Washington University and Spokane International Airport by providing competitive transit travel times, as compared to Single Occupant Vehicles (SOVs). To provide this service, STA’s buses should minimize time on local roads and in the transit center. By routing buses through the proposed West Plain Transit Center, buses will be off I-90 for 8 to 11 minutes for each stop at the transit center, as compared to less than two minutes to access the transit station with flyer stops along I-90.

Spokane Transit Authority West Plains Transit Center Project

The STA West Plains Transit Center project is located near Exit 272 along I-90 in the West Plains area of Spokane County. The transit center will be an important element of the future High Performance Transit Network (HPTN) providing service throughout the West Plains. In early 2012, conceptual studies for the West Plains Transit Center were started. As a result of these studies, preliminary concepts and construction cost opinions were developed. After meeting with local agencies, these concepts and cost opinions were updated in March, 2013. Under the current conceptual design, the West Plains Transit Center will feature three passenger loading platforms and park and ride lot with at least 100 parking stalls. The main loading platform will feature at least three bus bays to accommodate current and future service growth. Another loading platform will be adjacent to the eastbound off-ramp and accommodate mainline transit service along I-90. The remaining loading platform will serve westbound buses along I-90 and be connected to the rest of the transit center by a pedestrian bridge. Other features will include landscaping, lighting, bicycle parking, passenger shelters, and intelligent transportation systems (ITS). Architectural treatments and design features will also be incorporated into the project.

The West Plains Transit Center project will include the construction of:

- 100 parking stalls for commuters plus room for future expansion;
- Freeway bus lane (median or adjacent to westbound through lanes on north side) to create an efficient connection with frequent service to Cheney (4,000+ riders each day during Eastern Washington University school days, approximately 10% of I-90 rider throughput on the West Plains);
- Pedestrian bridge from the bus only freeway flyer stop to the transit center (possible extension to north side of freeway in the future for non-motorized access should the median station be the preferred option); and
- Three bus loading platforms to allow for additional capacity to connect to Medical Lake, Airway Heights, Fairchild Air Force Base, Spokane International Airport, and surrounding residential neighborhoods and businesses from one central location.
Purpose of this Interchange Justification Report

This Interchange Justification Report (IJR) report will address several specific problems to help retain and increase ridership on the current network and improve STA’s competitiveness with other modes of transportation – expressed by travel time. This is especially true as related to serving the increasing demand for competitive travel alternatives between Spokane and Cheney/Eastern Washington University (nearly 20 percent of travelers on SR 904 between I-90 and Cheney are on an STA bus). For example, currently, travel time for transit users between Spokane and Eastern Washington University is 52% more than automobile travel and yet nearly 20% percent of travelers on SR 904 (the main State Highway connecting the University to I-90 and on into Spokane) use the existing bus transit route. And transit users from Medical Lake currently have to travel east to Downtown Spokane and then west on express buses to Cheney. There is an increasing demand for more frequent and reliable transit services between Medical Lake and Cheney, and between Spokane and Cheney. The proposed West Plains Transit Center with flyer stations should improve connectivity for travel between major employers and cities in the West Plain’s area, while providing reliable access to Spokane and Cheney.

The additional transit access points along the interstate and the off-ramp for the flyer stops is the focus of this IJR. To accommodate eastbound transit express buses along I-90, a flyer stop with a loading platform adjacent to the transit center will be located on the eastbound off-ramp to the Medical Lake Interchange. A median or westbound on-ramp transit flyer stop is proposed for westbound buses traveling along I-90 with new access and egress points along I-90. The median flyer stop will be connected to the transit center by a pedestrian bridge.

Project Study Area

This project will only affect transit bus routings at the SR 902/Medical Lake Interchange with no impacts to the upstream or downstream interchanges. As a result, the project area for this IJR will focus on the SR 902/Medical Lake Road Interchange (Exit 272, MP 272.81) and extend along I-90 to the SR 904/Four Lakes Interchange (Exit 270, MP 270.55) to analyze weave and merge/diverge operations associated with the bus-only access changes. The Geiger Boulevard/Grove Road Interchange (Exit 276, MP 276.32) will not be analyzed.

The study area of the local street system will include the following major street intersections:

- Eastbound ramps at SR 902/Medical Lake Road and I-90 ramp;
- Westbound ramps at SR 902/Medical Lake Road and I-90 ramp;
- W. Aero Road and W. Westbow Boulevard;
- W. Westbow Boulevard and S. Hayford Road; and
- S. Hayford Road and W. Medical Lake Road.

The overall study area for traffic forecasting purposes will include all of Spokane County, as defined by the Spokane Regional Transportation Council (SRTC) travel demand model.

Further information about the model and assumptions for this project is summarized in the I-90/SR 902/Medical Lake Interchange Justification Report – Methods & Assumptions Documents.
Figure 1.1 Study Area Map
Existing and Future Needs

For this IJR analysis, the SRTC travel demand models were used to provide a basis for the above analysis years and periods. The SRTC model includes both the existing plus committed projects for the region from the 4-year Transportation Improvement Programs (TIPs) for the County and member Cities, and the future unfunded improvements for the County and member Cities. The lists of the Horizon 2040 Regional Significant Projects are contained in Appendix PP1-A. It is anticipated that model “post-processing” will be utilized to account for localized discrepancies between existing “ground counts” and model-generated volumes. The recommended method will be the Factoring Procedure – Difference Method per NCHRP 765 Chapter 6, which add the “model growth increment” (the difference between the 2010 and the future year model volumes) to the existing ground count traffic volumes. The following 3 model runs are assumed:

- 2014 Base Year
- 2020 with current four year TIP and 2020 land use
- 2040 with TIP and unfunded regional improvements and 2040 land use

Operational analysis methods and assumptions are based on the Highway Capacity Manual (HCM) 2010 methodology. Both AM and PM peak periods were analyzed to determine operational conditions for the following three scenarios: existing (2014), opening year (2020), and design year (2040). The existing conditions analysis was based on 2014 counts. To provide a better understanding of existing and future baseline traffic operations at the study area, Synchro models were constructed for a detailed analysis of the intersections.

Existing and Future Base Conditions Transit Travel Times

Currently, there is no direct bus service from Airway Heights, Spokane International Airport, and the Medical Lake area to Cheney without having to travel to downtown Spokane and transferring to the Cheney/Eastern Washington University express bus. Based on published transit schedules, transit service from Airway Heights, Spokane International Airport, and the Medical Lake area takes about 20 to 25 minutes to downtown Spokane and then about 23 to 25 minutes to Cheney/Eastern Washington University via the express bus; for a total travel time of about 43 to 50 minutes, plus transfer time in downtown Spokane.

By 2020, the West Plains Transit Center will be open for operations. Bus service from Airway Heights, Spokane International Airport, and the Medical Lake area will be re-routed to serve the new transit center and riders will be able to transfer to the Cheney/Eastern Washington University express bus.

By 2040, WSDOT may complete their I-90/Medical Lake Improvement project (3 roundabouts and revised diamond interchange), the travel times for the bus service through the ramp intersections and adjacent local intersections may be improved. Further information about the WSDOT I-90/Medical Lake Improvement Project is contained in the I-90 SR 902 Interchange Improvements Value Engineering Study dated February 2013.

For comparison purposes the following travel time analysis is based on the travel demand model, for travel through the study area from the Geiger Boulevard/Grove Road Interchange to the SR 904/Four Lakes Interchange.

1. Existing Transit Travel Times

Today through the study area, transit buses operate at current interstate speeds on I-90 mainline. No express bus stops at the Medical lake area. The peak hour transit travel time between the Geiger Boulevard/Grove Road Interchange and the SR 904/Four Lakes Interchange is approximately 5 minutes.
2. 2020 Base Conditions Transit Travel Times

In 2020, the West Plains Transit Center will be in operation. Without the flyer stop, these express buses must exit I-90 and travel on surface streets to access the transit center. This re-routing will increase the express bus travel time by approximately 13 to 17 minutes, assuming the ramp intersections remain stop controlled.

3. 2040 Base Conditions Transit Travel Times

By 2040, the West Plains Transit Center will have been in operations for several years. Without the flyer stop, these express buses must exit I-90 and travel on surface streets to access the transit center. This re-routing will increase the express bus travel time by approximately 18 to 38 minutes, assuming the ramp intersections remain stop controlled.

If the WSDOT I-90/Medical Lake Improvement project which is not currently completely funded would be constructed before 2040, the LOS on the ramp intersections and adjacent local intersections may be improved, as well as the travel times for the bus service. Without the fly stop, the express buses exit I-90 and travel on surface streets to access the transit center, the re-routing will increase the express bus travel time by approximately 8 to 11 minutes.

Existing and Future Base Conditions I-90 Freeway Operation

The existing and future base conditions analysis reviewed the traffic operations of the current I-90 mainline and ramps for existing 2014, opening year 2020 and design year 2040, in the study area. Table 1.2 summarizes the AM and PM peak hour results of the freeway LOS analysis for I-90. Freeway LOS operations are measured by the density of traffic in passenger cars per mile per lane during the AM and PM peak hours.

Table 1.2 Baseline Freeway Level of Service Summary

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Existing 2020</td>
<td>2040 Existing</td>
</tr>
<tr>
<td>I-90, Westbound</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-90 WB, off-ramp to SR 904</td>
<td>Diverge</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>I-90 WB, between SR 902 and SR 904</td>
<td>Basic</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>I-90 WB, on-ramp from SR 902</td>
<td>Merge</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>I-90 WB, under SR 902</td>
<td>Basic</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>I-90 WB, off-ramp to SR 902</td>
<td>Diverge</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>I-90 WB, East of SR 902</td>
<td>Basic</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>I-90, Eastbound</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-90 EB, between SR 902 and SR 904</td>
<td>Basic</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>I-90 EB, off-ramp to SR 902</td>
<td>Diverge</td>
<td>A</td>
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<td>I-90 EB, under SR 902</td>
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<td>Basic</td>
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</tbody>
</table>

The existing conditions analysis indicated that all freeway segments operate at LOS B or better during the AM and PM peak hour. The 2020 (opening Year) conditions analysis indicates that all freeway segments operate at LOS C or better during the AM and PM peak hour.

For design year 2040, the WSDOT I-90/Medical Lake Improvement project may be constructed; it is expected the LOS on the ramp intersections and adjacent local intersections will be improved significantly. However, the WSDOT improvement project
would have insignificant impact to the freeway operations. The Level of Service for the freeway operations would maintain the same with or without the ramp terminal improvements. During the AM and PM peak hour, all freeway segments operate at LOS C or better.

**Existing and Future Base Condition Intersection Traffic Operation**

The intersection traffic operation evaluation examined five intersections in the study area, including ramp termini and adjacent intersections at the Medical Lake interchange. The LOS at each intersection is determined by average control and queue delays per vehicle in seconds. Table 1.3 summarizes the intersection LOS conditions for the AM and PM peak hours for existing 2014, opening year 2020 and design year 2040.

**Table 1.3 Baseline Intersection Level of Service Summary**

<table>
<thead>
<tr>
<th>No.</th>
<th>Intersection</th>
<th>Traffic Control</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Existing</td>
<td>2020</td>
</tr>
<tr>
<td>1</td>
<td>EB Ramp @ SR 902 / I-90</td>
<td>TW²</td>
<td>E/36.4</td>
<td>F/481</td>
</tr>
<tr>
<td>2</td>
<td>WB Ramp @ SR 902 / I-90</td>
<td>TW²</td>
<td>D/33</td>
<td>F/177</td>
</tr>
<tr>
<td>3</td>
<td>Aero Rd @ Westbow Blvd</td>
<td>AW</td>
<td>A/9.9</td>
<td>B/10.9</td>
</tr>
<tr>
<td>5</td>
<td>Hayford Rd @ Medical Lake Rd</td>
<td>TW²</td>
<td>D/29.7</td>
<td>F/864</td>
</tr>
</tbody>
</table>

1. S: Signalized intersection, TW: two way stop controlled intersection, AW: all way controlled intersection
2. Two Way stop intersection becomes roundabout under “2040 with Roundabout” option
3. Delay is in minutes

1. **Existing Intersection Traffic Operation**

Currently, four of the study intersections have minor street stop-controls and one intersection is all-way stop-controlled. In the AM peak hour, all intersections operate overall at LOS D or better except EB Ramp intersection which operates at LOS E. In the PM peak hour, the Hayford Road/Medical Lake Road Intersection operates at LOS F with westbound failing approach.

2. **2020 Base Conditions Intersection Traffic Operation**

Under 2020 base conditions, the I-90 ramp intersections and the Hayford Road/Medical Lake Road intersection would operate at LOS F in both AM and PM peak hour. The other 2 intersections would operate at LOS B or better.

3. **2040 Base Conditions Intersection Traffic Operation**

Year 2040 was identified as the design year based on available land use and traffic forecasts. If the WSDOT I-90/Medical Lake Improvement project is constructed; it is expected the LOS on the ramp intersections and adjacent local intersections will be improved significantly. To better understand the traffic operations of the current facility at the design year, two different base conditions intersection analysis are conducted:

- without the ramp terminal improvements (roundabouts)
- with the ramp terminal improvements (roundabouts) proposed by WSDOT
Under 2040 base conditions without the WSDOT I-90/Medical Lake Improvement project, the I-90 ramp intersections and the Hayford Road/Medical Lake Road intersection would operate at LOS F in both AM and PM peak hour. The other 2 intersections would operate at LOS C or better.

Under 2040 base conditions with the WSDOT I-90/Medical Lake Improvement project, the I-90 ramp intersections and the Hayford Road/Medical Lake Road intersection would operate at LOS A in both AM and PM peak hour. The other 2 intersections would operate at LOS C or better.

Further information about the existing and future base conditions traffic analysis for this project is contained in Policy Point 3.

Summary

Project Purpose: The purpose of the West Plains Transit Center is to expand connectivity to the West Plains communities and improve travel times to and from Cheney and Eastern Washington University by providing improved high quality, higher performance and cost effective transit service that will address mobility needs for an expanding population and employment base west of Downtown Spokane. Multi-modal transportation services will be improved through:

- Improving connectivity between cities and to the West Plains area;
- Providing easy and fast connections to high performance transit service along the I-90 corridor;
- Improving transit access to residential and employment areas adjacent to Exit 272 by providing convenient transfers between local and express bus services; and
- Reducing congestion by providing an attractive alternative for single occupant vehicle (SOV) users.

Project Need: Between 1990 and 2012, STA’s total annual ridership increased 65 percent. Changes in land use and lifestyle choices have influenced the demand for competitive travel options, possibly no more so than in the West Plains Area and to Eastern Washington University in Cheney. In response to regional growth and the need for competitive travel options, STA has developed a plan for a High Performance Transit Network (HPTN) which is a series of corridors anticipated to provide all-day, two-way, reliable, and frequent service that will be competitive in travel speed to private automobiles.

By not providing freeway flier stops, it will be harder for STA to provide competitive transit service to maintain existing riders, attract new riders and meet all the goals associated with the West Plains Transit Center project. By incorporating flier stops along I-90 in the West Plain area, there is no need for express buses to exit I-90 and travel on surface streets to access the transit center. This will save the express bus travel time by approximately 8 to 11 minutes. STA will be more equipped to provide fast and convenient service and meet their goals and objectives.

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