

4.9. Transportation

4.9.1. Introduction

This section includes the transportation information presented in the January 2006 EA (Jones & Stokes 2006), as well as the results of additional traffic analysis conducted by Spokane County for the Sullivan Road area. Additional clarification of impacts and mitigation measures is presented below to address public comments received on the proposed action as presented in the January 2006 EA. The County received over 150 public comments regarding transportation, traffic, and safety.

Analysis for existing conditions is based upon traffic counts, which were collected between 2000 and 2004. Updated transportation analysis for projected future conditions was completed by utilizing the Interim Regional Travel Demand Model developed by the Spokane Regional Transportation Council (SRTC) and reflects 2025 land use projections provided by Spokane County.

4.9.2. What are the existing transportation conditions along the existing alignment?

General Roadway Characteristics

The East Bigelow Gulch Road/North Forker Road corridor extends between Havana Street in the City of Spokane and the intersection of North Sullivan Road and East Wellesley Avenue in the City of Spokane Valley (Figure 2-1). Traveling eastbound, the roadway rises through a series of horizontal curves to Weile Avenue where it straightens, rising and falling through a series of vertical curves to North Forker Road. Along North Forker Road, the roadway falls to North Progress Road through a series of horizontal curves and continues along North Progress to East Wellesley Avenue.

Bigelow Gulch Road (called Francis Avenue in the City of Spokane) is an east-west, two-lane roadway with 1- to 3-foot paved shoulders. The road is classified as a Rural Minor Arterial and has a posted speed limit of 45 miles per hour (mph). The arterial is approximately 6.5 miles in length between Havana Street in the City of Spokane and North Forker Road.

North Forker Road is a north-south, two-lane road that is classified as a Rural Major Arterial that is approximately 1.8 miles in length between East Bigelow Gulch Road and North Progress Road. Land use adjacent to the proposed alignment predominantly consists of farms and large residential lots. North Progress Road and East Wellesley Avenue are two-lane roadways that are classified as Urban Minor

Arterials. North Sullivan Road south of East Wellesley Avenue is classified as Urban Principal Arterial (Spokane County 2003).

Vertical grades of up to 10% are present on East Bigelow Gulch Road between Havana Street and North Argonne Road, and on North Forker Road between Progress Road and East Bigelow Gulch Road. Based on weekday traffic counts collected in February 2004, traffic composition includes 9 to 10% trucks on a typical day.

The area is predominantly rural along most of the length of the proposed alignment, so pedestrian trip generation is limited. Pedestrian trips are more likely to regularly occur toward the east end of the project corridor where existing development becomes more urban in nature. In particular, residential development is located along both Progress Road and Sullivan Road as they approach Wellesley Avenue. In addition, East Valley High School is located east of Sullivan Road and northeast of Wellesley Avenue; and East Valley Middle School is located west of Sullivan Road and Wellesley Avenue. Sullivan Road is currently a two-lane gravel paved local roadway between the schools and recreational play fields.

Pedestrian and bicycle travel along Bigelow Gulch Road must occur on the roadway itself, or on the existing shoulder, which varies in width but is generally very narrow, offering minimal separation from vehicular traffic.

Existing Traffic Volumes

Daily Traffic Volumes

Historical Average Annual Daily Traffic (AADT) volumes for years 1994 through 2005 were obtained from Spokane County. Table 4.9-1 shows the historical AADT volumes of different segments along the corridor.

Table 4.9-1. Historical Average Annual Daily Traffic

| Year | E Bigelow Gulch Road | | N Forker Road |
|------|---------------------------------|---------------------------------|-------------------------------|
| | Havana Street to N Argonne Road | N Argonne Road to N Forker Road | South of E Bigelow Gulch Road |
| 2005 | 11,906 | 6,901 | 9,667 |
| 2004 | 12,335 | 7,871 | 10,750 |
| 2003 | 10,048 | 7,563 | 10,308 |
| 2002 | 11,255 | 6,709 | 8,848 |
| 2001 | 10,718 | 5,384 | 7,623 |
| 2000 | 12,158 | 6,124 | 7,985 |
| 1999 | 13,598 | 6,864 | 8,347 |
| 1998 | 12,850 | 7,352 | 7,922 |

| Year | E Bigelow Gulch Road | | N Forker Road |
|-----------------------------------|---------------------------------|---------------------------------|-------------------------------|
| | Havana Street to N Argonne Road | N Argonne Road to N Forker Road | South of E Bigelow Gulch Road |
| 1997 | 12,102 | 7,839 | 7,497 |
| 1996 | 11,896 | 7,283 | 7,072 |
| 1995 | No Record | No Record | No Record |
| 1994 | 12,326 | 8,499 | 6,194 |
| Average per Segment | 11,927 | 7,126 | 8,383 |
| Average for Corridor 9,145 | | | |

Source: Spokane County 2007b

Intersection Turning Volumes

Most of the intersections along the East Bigelow Gulch Road/North Forker Road corridor occur with driveways and minor streets.

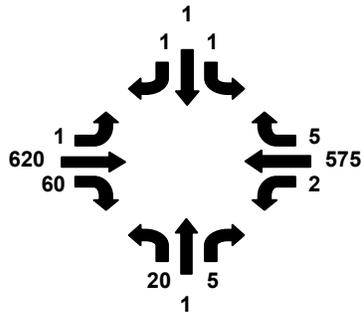
The following seven intersections located along the project corridor were selected for operational analysis:

1. East Bigelow Gulch Road and North Jensen Road: stop control on northbound and southbound approaches;
2. East Bigelow Gulch Road and North Argonne Road: signalized intersection;
3. East Bigelow Gulch Road and North Forker Road: stop control on eastbound approach;
4. North Forker Road and North Progress Road: stop control on westbound approach;
5. East Wellesley Avenue and North Evergreen Road: all-way stop control;
6. East Wellesley Avenue and North Progress Road: all-way stop control; and
7. East Wellesley Avenue and North Sullivan Road: all-way stop control.

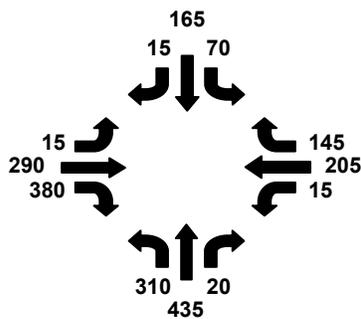
PM peak-hour intersection traffic counts were collected between the years 2000 and 2004. Figure 4.9-1 includes a summary of the turning movements at the seven analysis intersections under existing conditions.



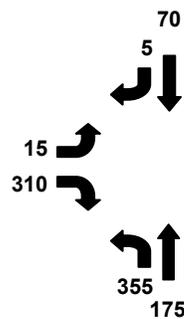
Bigelow Gulch Road and Jensen Road (2004)



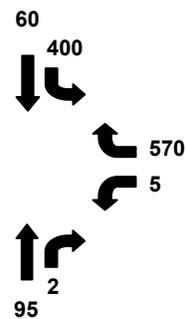
Bigelow Gulch Road and Argonne Road (2001)



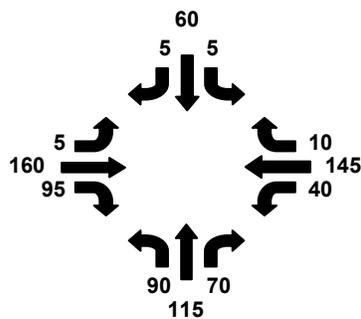
Bigelow Gulch Road and Forker Road (2002)



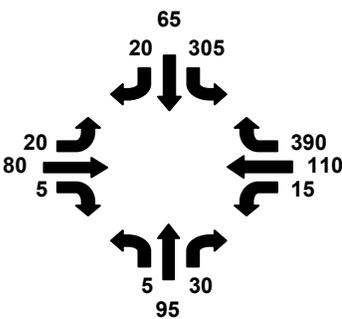
Forker Road and Progress Road (2000)



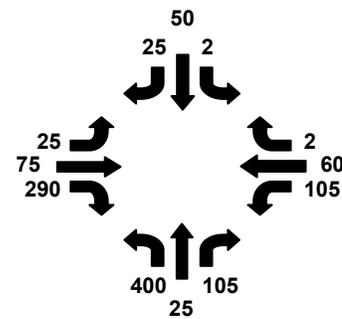
Wellesley Avenue Evergreen Road (2001)



Wellesley Avenue and Progress Road (2002)



Wellesley Avenue and Sullivan Road (2002)



**Figure 4.9-1
Existing PM Peak Hour Intersection Traffic Volumes**

Level of Service Analysis

Approach

Level of Service (LOS) is a quantitative measure, and is the primary measurement used to determine the operating condition of a roadway segment or intersection. LOS is calculated by comparing the actual number of vehicles using a roadway (volume of traffic) to its carrying capacity. The *Highway Capacity Manual* (Transportation Research Board 2000a) is the recognized source for the LOS techniques used to measure transportation facility performance. Using the Highway Capacity Manual procedures, the quality of traffic operation is graded into one of six LOS designations: A, B, C, D, E, or F. LOS A and B represent the best traffic operation, and LOS C and D represent intermediate operation. LOS E indicates that traffic conditions are at or approaching congested levels, and LOS F represents a high level of congestion and unstable traffic flow. LOS analysis was completed for both intersections and roadway segments along the project corridor. Discussion of LOS analysis methods is included in the Transportation Technical Report, included as Appendix B of the January 2006 EA.

LOS Standard

LOS standards are used to evaluate the transportation impacts of long-term growth. The Washington State Growth Management Act (RCW 36.70A, 1990) requires that jurisdictions adopt standards by which the minimum acceptable roadway operating conditions are determined and deficiencies may be identified.

For arterial intersections located within Urban Growth Areas, Spokane County has adopted a standard of LOS D for signalized intersections and LOS E for unsignalized intersections (Spokane County 2001a). The Urban Connector Alignment is located outside the urban growth boundaries for the cities of Spokane and Spokane Valley. However, for the purpose of evaluation presented in this report, the adopted County LOS standards were applied.

The County has not adopted LOS standards for roadway segments. LOS standards are adopted in accordance with the regional minimum LOS standards set by the Growth Management Steering Committee of Elected Officials. The Steering Committee has approved the use of corridor travel time to determine LOS standards. SRTC conducted a travel time study to determine the annual average corridor travel time (Spokane County 2001a). For purposes of this analysis, a standard of LOS C was defined for roadway segments, based upon guidelines set forth by American Association of State Highway Transportation Officials 2001) and WSDOT (2007a).

Intersection LOS

Table 4.9-2 summarizes the existing PM peak hour LOS calculated for the analysis intersections. The table shows that all analysis intersections meet LOS standards under existing conditions.

Table 4.9-2. Intersection PM Peak Hour LOS – Existing Conditions

| Intersection | Traffic Control ¹ | Average Delay ¹ (sec/veh) | LOS | LOS Standard |
|---|------------------------------|---|-----|--------------|
| 1 E Bigelow Gulch Road and N Jensen Road | NB/SB stop control | 37/27 | E/D | E |
| 2 E Bigelow Gulch Road and N Argonne Road | Signal | 27 | C | D |
| 3 E Bigelow Gulch Road and N Forker Road | EB stop control | 13 | B | E |
| 4 N Progress Road and N Forker Road | NB stop control | 17 | C | E |
| 5 E Wellesley Avenue and N Evergreen Road | All-way stop control | 12 | B | E |
| 6 E Wellesley Avenue and N Progress Road | All-way stop control | 23 | C | E |
| 7 E Wellesley Avenue and N Sullivan Road | All-way stop control | 26 | D | E |

¹ For two-way or one-way stop-controlled intersections, LOS and average delay are shown for minor leg (stop-controlled) movements.

Roadway Segment LOS

Roadway segment LOS analysis on East Bigelow Gulch Road was based upon PM peak hour volumes.

- On East Bigelow Gulch Road between Havana Avenue and North Argonne Road, the terrain is rolling with grades ranging from 3% to 10%. Analysis of the existing conditions on this segment of East Bigelow Gulch Road indicates that it operates at LOS E in both directions, which exceeds the standard of LOS C.
- On East Bigelow Gulch Road between North Argonne Road and North Forker Road, the terrain is rolling with grades ranging from 3% to 10%. Analysis of the existing conditions on this segment of East Bigelow Gulch Road indicates that it operates at LOS E in both directions, which exceeds the standard of LOS C.
- On North Forker Road south of East Bigelow Gulch Road, the terrain is also rolling with grades ranging from 3% to 10%. Analysis of the existing conditions on Forker Road indicates that it operates at LOS E in both directions, which exceeds the standard of LOS C.

For a detailed discussion of segment LOS analysis, see the Roadway Geometry and Safety Discipline (Appendix B of the January 2006 EA).

Freight Movement

The East Bigelow Gulch Road /North Forker Road Corridor is a heavily used truck route that carries between 4 and 10 million tons of freight annually (based on the years 2000 and 2004 vehicle counts). It has been identified as a high priority in the Activities and Recommendations Report of the Washington State Freight Mobility Strategic Investment Board (2003). Two food distribution centers, large petroleum distribution centers, numerous industrial and commercial complexes are located at the west end of the corridor. The Spokane Industrial Area and SR 290 (and its extension into North Idaho as Idaho State Route 53) are located at the east end of the East Bigelow Gulch Road/North Forker Road Corridor. The roadway serves as the extension of Sullivan Road, which provides connection between the project corridor and I-90.

The East Bigelow Gulch Road/North Forker Road Corridor is the shortest route and provides the least travel time between the industrial and wholesale distribution facilities at each end of the corridor. Table 4.9-3 summarizes the results of a travel-time and delay study that was completed for different routes between the intersections of Freya Street/Francis Avenue and Sullivan Road/SR 290.

Table 4.9-3. Corridor Travel Time Comparison

| Route | Distance (miles) | Number of Signalized Intersections | Travel Time (minutes) |
|--|------------------|------------------------------------|-----------------------|
| Bigelow Gulch / Forker | 9.6 | 3 | 14.5 |
| SR 290 / Mission / Green / Market | 11.8 | 15 | 24 |
| Sullivan / I-90 / Freya / Green / Market | 15.8 | 18 | 29 |

The table shows that the shorter distance and travel time along the East Bigelow Gulch Road/North Forker Road route results in substantial savings in transporting the goods and commodities of the businesses within close proximity to this corridor.

Historical Vehicle Collisions

Historical collision data for the project corridor was obtained for years 1994 through 2006 on East Bigelow Gulch Road (between Havana Street and North Forker Road) and North Forker Road (between North Progress Road and East Bigelow Gulch Road). Data is summarized by for a 13-year period from January 1, 1994 through October 31, 2006.

For the purpose of the accident analysis, the project corridor was divided into the following three segments, based upon the typical traffic volumes they carry:

- East Bigelow Gulch Road: Havana Street to North Argonne Road (milepost [MP] 0.00–MP 3.37);
- East Bigelow Gulch Road: North Argonne Road to North Forker Road (MP 3.37–MP 6.63); and
- North Forker Road: North Progress Road to East Bigelow Gulch Road (MP 0.58–MP 1.53).

The collision rates per million vehicle miles and fatal collision rates per hundred million vehicle miles were calculated based on the historical AADT on these segments, summarized in Table 4.9-1.

Table 4.9-4 summarizes the collision analysis in terms of annual average occurrence and collision rates. The table shows that 546 collisions were reported on East Bigelow Gulch Road and North Forker Road from 1994 through October 2006, averaging 43 collisions per year. This translates to a rate of 1.68 collisions per million vehicle miles traveled. This exceeds the average collision rate of 1.34 per million vehicle miles for state highways, calculated by WSDOT for state highways in its Eastern Region (WSDOT 2005).

Table 4.9-5 summarizes traffic accident data by the severity of accident. The table shows an average rate of 2.16 fatal collisions per hundred million vehicle miles. This exceeds the average rate of 0.59 fatal collision per hundred million vehicle miles on state highways, calculated by WSDOT for highways in its Eastern Region (WSDOT 2005). The table also shows that approximately 39% of the reported collisions involved injuries and 1.3% involved fatalities. The percentage of total accidents that have resulted in fatalities exceeds the rate of 1%, calculated by WSDOT for state highways in its Eastern Region (WSDOT 2005).

Within the project area, the highest number of collisions occurred on East Bigelow Gulch Road between Havana Street and North Argonne Road. Four fatality collisions also occurred on the segment with the fatal accident rate of 2.13 per hundred million vehicle miles.

Table 4.9-4. Historical Vehicle Collisions in Project Corridor (1994-2006)

| Segment | Distance (Miles) | AADT ¹ | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 ² | Total | Avg per Year | Collisions per million vehicle miles |
|---------------------------|------------------|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------------|------------|--------------|--------------------------------------|
| Bigelow Gulch Road | | | | | | | | | | | | | | | | | | |
| Havana to Argonne | 3.37 | 11,927 | 28 | 30 | 21 | 21 | 14 | 17 | 15 | 22 | 38 | 23 | 27 | 21 | 19 | 296 | 23.07 | 1.57 |
| Argonne to Forker | 3.26 | 7,126 | 24 | 28 | 14 | 11 | 15 | 16 | 9 | 17 | 4 | 13 | 11 | 8 | 6 | 176 | 13.72 | 1.62 |
| Forker Road | | | | | | | | | | | | | | | | | | |
| Progress to Bigelow | 0.95 | 8,383 | 7 | 6 | 6 | 0 | 3 | 4 | 7 | 7 | 2 | 11 | 4 | 4 | 11 | 74 | 5.77 | 1.98 |
| Total | 7.58 | 9,145 | 59 | 64 | 41 | 32 | 32 | 37 | 31 | 46 | 46 | 47 | 42 | 33 | 36 | 546 | 42.56 | 1.68 |

¹ AADT is the average of AADT from 1994 to 2005.

² Accident data collected through October 2006.

Source: Spokane County 2007c

Table 4.9-5. Historical Traffic Collisions by Severity (1994–2006)

| Segment | Property Damage Only | Injury | Fatality | Fatal Collisions per hundred million vehicle miles |
|-----------------------------|----------------------|------------|----------|--|
| E Bigelow Gulch Road | | | | |
| Havana to Argonne | 169 | 123 | 4 | 2.13 |
| Argonne to Forker | 108 | 66 | 2 | 1.84 |
| N Forker Road | | | | |
| Progress to Bigelow | 49 | 24 | 1 | 2.68 |
| Total | 326 | 213 | 7 | 2.16 |
| Percentage of Total | 59.7% | 39.0% | 1.3% | – |
| Eastern Region (2005) | 59.0% | 40.0% | 1.0% | 0.59 |

Source of Eastern Region average data: WSDOT 2005.
Source for corridor collision data: Spokane County 2007c

Table 4.9-6 summarizes the accident analysis by type of accident. The table shows that 43.6% of the collisions on the East Bigelow Gulch Road and North Forker Road involve vehicles leaving the road, which is higher than the rate of 31% in the eastern Washington (WSDOT 2005).

Table 4.9-6. Historical Traffic Collisions by Type

| Segment | Entering at Angle | Sideswipe/ Same Direction | Rear End/ Same Direction | Head on/ Opposite Direction | Vehicle Left Rear End/ Roll Over | Other/ Deer |
|-----------------------------|-------------------|---------------------------|--------------------------|-----------------------------|----------------------------------|-------------|
| E Bigelow Gulch Road | | | | | | |
| Havana to Argonne | 9 | 8 | 75 | 41 | 148 | 15 |
| Argonne to Forker | 43 | 7 | 42 | 15 | 64 | 5 |
| N Forker Road | | | | | | |
| Progress to Bigelow | 16 | 0 | 18 | 11 | 26 | 3 |
| Total | 68 | 15 | 135 | 67 | 238 | 23 |
| Percentage | 12.5% | 2.7% | 24.7% | 12.3% | 43.6% | 4.2% |
| Eastern Region | 11% | 7% | 29% | <5% | 31% | 2% |

Source of Eastern Region average data: WSDOT 2005.
Source for corridor collision data: Spokane County 2007c

4.9.3. What regulations apply to transportation?

American Association of State Highway Transportation Officials, Federal Highway Administration (FHWA), WSDOT, and Spokane County set roadway design and

analysis standards. The Urban Connector Alignment would meet all applicable standards set forth by these agencies.

The FHWA directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (23 CFR 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

4.9.4. How were potential effects evaluated?

The following traffic characteristics were examined to determine the effects that could be generated by the proposed action.

Forecast of Future Traffic Volumes

Future traffic volumes were developed based upon the SRTC Interim Regional Travel Demand Model (VISSUM Model). Traffic volumes were developed for 2025 with and without the proposed improvements to the Urban Connector.

The SRTC model assumes completion of the following two planned regional transportation improvements by 2025:

- North Spokane Corridor lane configuration would vary by segment. The assumption is for four-lanes each direction from I-90 to the Freya Interchange, three-lanes each direction from the Freya Interchange to U.S. 2 Interchange, and two-lanes each direction from U.S. 2 Interchange to U.S. 395.
- Widening of I-90 to the Idaho State Line to six lanes for that increment between North Sullivan Road and East Sprague Avenue.

If either of these projects is not completed by 2025, it is expected that the traffic volumes on the East Bigelow Gulch Road/North Forker Road Corridor would be higher than the projected volumes presented in this report.

Roadway Traffic Volumes and LOS

Traffic increases that result from the project are considered significant if they result in violation of adopted LOS standards, as described earlier in this chapter.

Safety

Safety impacts are considered significant if design elements of the project, or project construction, would result in conditions that would increase the risk of accidents, either for vehicular or non-motorized traffic. Elements that could result in safety impacts include poor sight distance, sharp curves, substantial differences in speed

between construction-related and general-purpose traffic, or increases in vehicular or train traffic at railroad crossings that would require an upgrade to the crossing in order to meet operational and safety standards.

Safety improvements were identified based on research provided by the Transportation Research Board (2000b).

4.9.5. What are the potential transportation effects of the Urban Connector Alignment?

Future Roadway Characteristics

Proposed Action

The Urban Connector Alignment would straighten and expand East Bigelow Gulch Road and North Forker Road to a four-lane rural arterial with a gravel median and left-turn pockets at selected locations. The posted speed limit would remain at 45 mph, except where the speed limit would be lowered to 35 mph for a 0.75-mile segment from west of Jensen Road to east of Argonne Road. Additionally, access points to the facility would be consolidated where possible and existing vertical and horizontal curves would be minimized. The arterial would be improved and realigned at the North Forker Road intersection and improved at the North Argonne Road intersection.

The project also includes the widening and extension of North Sullivan Road from East Wellesley Avenue to North Forker Road. The proposed East Bigelow Gulch Road/North Forker Road corridors would use North Sullivan Road instead of North Progress Road. North Progress Road would turn into a cul-de-sac with no access to North Forker Road. A traffic signal would be installed at the intersection of Wellesley Avenue and Sullivan Road. The new intersection of Forker Road and Sullivan Road would be a T-intersection with stop-control on eastbound approach.

The proposed maximum design grade would be 6% on Bigelow Gulch Road from Havana Street to Argonne Road; and Forker Road from Progress Road to Bigelow Gulch Road.

The following intersection improvements have been defined as part of the proposed action:

- Bigelow Gulch Road and North Forker Road: add dedicated southbound and westbound right turn lanes;
- North Forker Road and North Sullivan Road: add dedicated eastbound right turn lane; and
- East Wellesley Avenue and North Sullivan Road: would have left turn lane on all approaches.

The proposed Urban Connector Alignment includes construction of an undercrossing from Forker Road, which would merge with the East Bigelow Gulch Road eastbound traffic about 500 feet east of the proposed East Bigelow Gulch Road/North Forker Road intersection. The undercrossing would provide traffic from Forker Road an easier and safer access to East Bigelow Gulch Road. The configuration of East Bigelow Gulch Road/North Forker Road intersection would be two lanes on North Forker Road (one southbound left-right share lane and one northbound lane) and five lanes on East Bigelow Gulch Road (two through lanes each direction and one center two-way left-turn lane). The Forker Road undercrossing would be one lane with yield control while merging with East Bigelow Gulch Road eastbound traffic. Figure 2-4 presents a conceptual drawing of the interchange.

No Action

- The roadway geometry under 2025 No Action conditions is expected to be the same as it is under existing conditions.

Traffic Volumes

Table 4.9-7 summarizes projected 2025 PM peak hour volumes under the No Action and proposed action scenarios. K-factors presented in the table were calculated by dividing the existing PM peak hour volumes by the existing AADT. The K-factors were then applied to the projected 2025 PM peak hour volumes to convert them to AADT. The table shows that AADT on Bigelow Gulch Road is projected to reach 14,000 vehicles per day west of Argonne Road and 12,500 vehicles per day east of Argonne Road with the Urban Connector project in place.

The 2025 intersection traffic volumes that were projected by the SRTC model under the proposed action and No Action alternatives are shown in Figures 4.9-2 and 4.9-3, respectively.

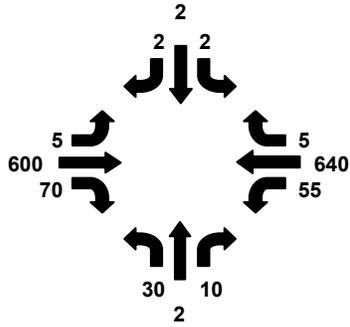
Table 4.9-7. 2025 PM Peak Hour Model Volume and AADT Comparison

| Segment | Direction | Existing | | | 2025 No Action | | 2025 Proposed Action | |
|--------------------------------------|------------|----------------------|--------|------------------------|----------------------|--------|----------------------|--------|
| | | PM Peak Hour Volumes | AADT | K- factor ¹ | PM Peak Hour Volumes | AADT | PM Peak Hour Volumes | AADT |
| E Bigelow Gulch Road | | | | | | | | |
| West of N Argonne Road | Westbound | 527 | 10,718 | 0.11 | 640 | 12,000 | 720 | 14,000 |
| | Eastbound | 684 | | | 600 | | 660 | |
| East of N Argonne Road | Westbound | 365 | 5,384 | 0.14 | 240 | 7,500 | 640 | 12,500 |
| | Eastbound | 381 | | | 300 | | 610 | |
| N Forker Road/N Sullivan Road | | | | | | | | |
| Bigelow Gulch to Wellesley | Northbound | 670 | 11,000 | 0.10 | 600 | 10,600 | 1,100 | 19,000 |
| | Southbound | 410 | | | 460 | | 800 | |

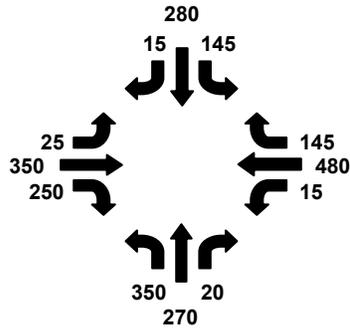
¹ K-factors are calculated by dividing the existing PM peak hour volumes by the existing AADT.



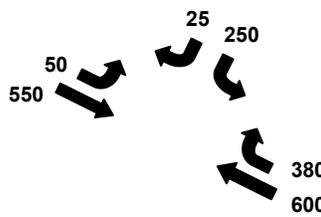
Bigelow Gulch Road and Jensen Road



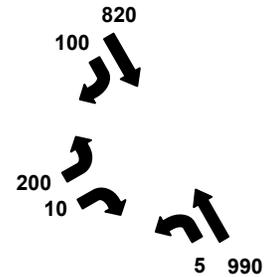
Bigelow Gulch Road and Argonne Road



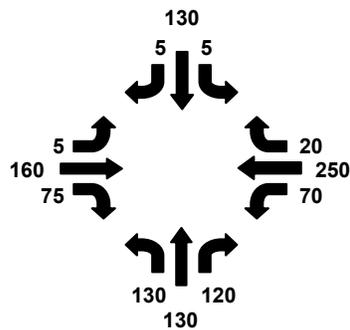
Bigelow Gulch Road and Forker Road



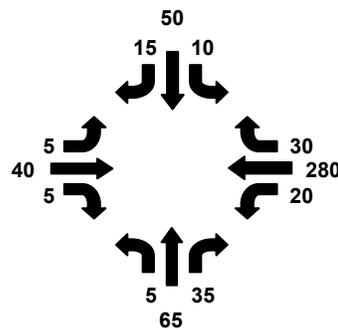
Forker Road and Sullivan Road



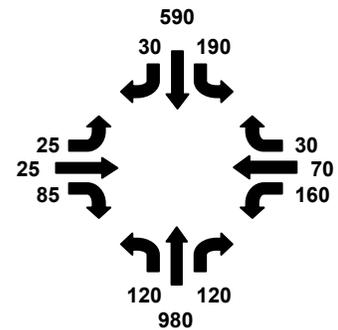
Wellesley Avenue Evergreen Road



Wellesley Avenue and Progress Road



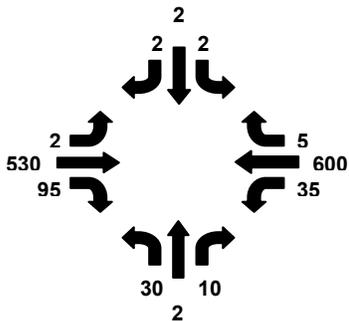
Wellesley Avenue and Sullivan Road



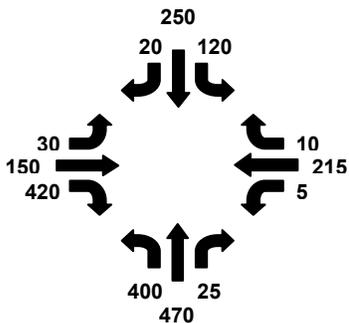
**Figure 4.9-2
2025 Urban Connector
PM Peak Hour Traffic Volumes**



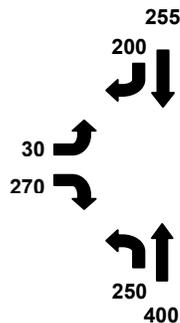
Bigelow Gulch Road and Jensen Road



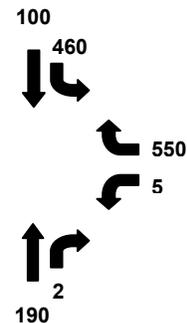
Bigelow Gulch Road and Argonne Road



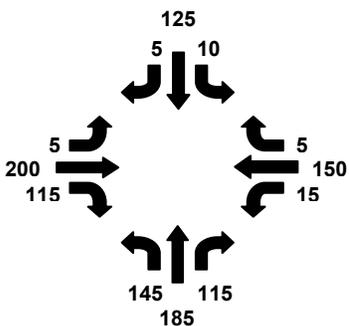
Bigelow Gulch Road and Forker Road



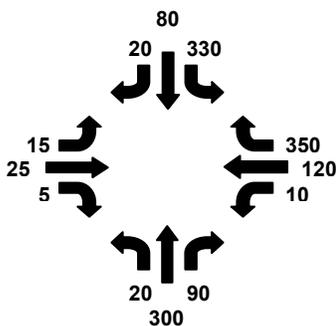
Forker Road and Progress Road



Wellesley Avenue Evergreen Road



Wellesley Avenue and Progress Road



Wellesley Avenue and Sullivan Road

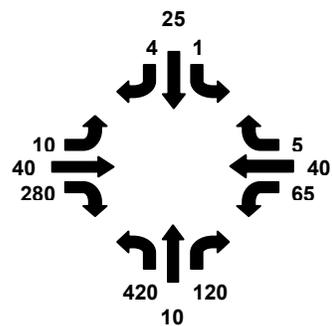


Figure 4.9-3
2025 No Action Alternative
PM Peak Hour Traffic Volumes

Intersection LOS

Proposed Action

Widening and straightening the Bigelow Gulch/Forker Road Corridor would accommodate a greater volume of traffic and decrease travel time for travelers using the route. This would improve traffic flow, ultimately decreasing traffic congestion and delays a beneficial impact for commuters in the region. The corridor would also accommodate existing and future freight and commuter travel. The proposed action would provide a link between the industrial areas of north Spokane and the Spokane Valley.

The 2025 intersection traffic volumes that were projected by the SRTC model under the proposed action and No Action alternatives are shown in Figures 4.9-2 and 4.9-3, respectively.

Intersection LOS

Proposed Action

Widening and straightening the Bigelow Gulch/Forker Road Corridor would accommodate a greater volume of traffic and decrease travel time for travelers using the route. This would improve traffic flow, ultimately decreasing traffic congestion and delays a beneficial impact for commuters in the region. The corridor would also accommodate existing and future freight and commuter travel. The proposed action would provide a link between the industrial areas of the north Spokane and the Spokane Valley.

2025 LOS under the proposed action was calculated based on the projected PM peak hour traffic volumes shown in Figure 4.9-2.

Table 4.9-8 summarizes the 2025 PM peak hour LOS calculated for the analysis intersections under the proposed action. The table shows that all analysis intersections are expected to meet LOS standards under these conditions.

Table 4.9-8. 2025 Intersection PM Peak Hour LOS – Proposed Action

| Intersection | Traffic Control | Average Delay ¹ (sec/veh) | LOS ¹ | LOS Standard |
|---|----------------------|---|------------------|--------------|
| E Bigelow Gulch Road and N Jensen Road | NB/SB stop control | 16/16 | C/C | E |
| E Bigelow Gulch Road and N Argonne Road | Signal | 17 | B | D |
| N Forker Road and N Sullivan Road | EB stop control | 35 | D | E |
| E Wellesley Avenue and N Evergreen Road | All-way stop control | 20 | C | E |
| E Wellesley Avenue and N Progress Road | All-way stop control | 10 | B | E |

| Intersection | Traffic Control | Average Delay ¹ (sec/veh) | LOS ¹ | LOS Standard |
|---|------------------|---|------------------|--------------|
| E Wellesley Avenue and N Sullivan Road | Signal | 23 | C | D |
| E Bigelow Gulch Road and N Forker Road Undercrossing | | | | |
| Southbound | SB Stop Control | 16 | C | E |
| Northbound | NB Yield Control | 13 | B | E |

¹For two- or one-way stop-controlled intersections, LOS and average delay are shown for minor leg movements.

Analysis indicates that the reduced speed limit for the 0.75-mile portion of roadway from Jensen Road to Argonne Road would not result in a change in LOS at either the Jensen Road or Argonne Road intersections.

No Action

Based on the traffic volumes shown in Figure 4.9-3, the LOS for the No Action Alternative was calculated for the PM peak hour and summarized in Table 4.9-9. The table shows that one analysis intersection, East Wellesley Avenue and North Sullivan Road, is projected to operate at LOS F, which exceeds the standard of LOS E. The other six intersections are expected to meet LOS standards under these conditions.

Table 4.9-9. 2025 Intersection PM Peak Hour LOS – No Action

| Intersection | Traffic Control | Average Delay ¹ (sec/veh) | LOS ¹ | LOS Standard |
|---|----------------------|---|------------------|--------------|
| E Bigelow Gulch Road and N Jensen Road | NB/EB stop control | 44/29 | E/D | E |
| E Bigelow Gulch Road and N Argonne Road | Signal | 16 | B | D |
| E Bigelow Gulch Road and N Forker Road | EB stop control | 29 | D | E |
| N Progress Road and N Forker Road | WB stop control | 23 | C | E |
| E Wellesley Avenue and N Evergreen Road | All-way stop control | 21 | C | E |
| E Wellesley Avenue and N Progress Road | All-way stop control | 44 | E | E |
| E Wellesley Avenue and N Sullivan Road | All-way stop control | 241 | F | E |

¹For two- or one-way stop-controlled intersections, LOS and average delay are shown for minor leg (stop controlled) movements.

Segment LOS

Segment LOS analysis was completed according to procedures provided in the Transportation Background Report, included as Appendix B to the January 2006 EA.

Proposed Action

Multi-lane highway LOS analysis was conducted for the proposed action using the traffic volumes projected for 2025, assuming that the vehicle percentages and other

geometric assumptions would remain the same as current conditions. Analysis shows that in 2025 all segments would operate at LOS A, B, or C in both directions, which meets the standard of LOS C.

No Action

Two-way, two-lane LOS analysis was completed for the No Action alternative, using the traffic volumes projected for 2025. Analysis shows that all segments are expected to operate at LOS E or F under these conditions, which exceeds the standard of LOS C.

Traffic Safety

As noted previously, the rate of injuries on the Bigelow Gulch and Forker Road arterials is greater than the WSDOT Eastern Region average. In addition, 50% of the collisions on East Bigelow Gulch Road and North Forker Road involve vehicles leaving the road, which is also greater than the Eastern Region average.

Proposed Action

Research conducted by Transportation Research Board (TRB) (2000b) shows that the following types of collisions on rural two-lane highways could be reduced directly by lane and shoulder width improvements:

- head-on,
- runoff-road/fixed object,
- runoff-road/rollover,
- same direction sideswipes, and
- opposite direction sideswipes.

Widening a lane by 3 feet (e.g., from 10 to 13 feet) could result in a 32% reduction in related accident types. Widening shoulders from 2 to 8 feet could result in a 40% reduction of related collisions if the shoulders are paved and a 35% reduction of related accidents if the shoulders are unpaved (TRB 2000b).

Passing lanes, short four-lane sections, and turnouts lanes also can reduce the accident frequencies by 25, 35, and 30%, respectively, for the sites that carry higher traffic volumes than average two-lane sections (TRB 2000b).

For collisions involving left-turns, two-way left-turn lanes or left-turn pockets can effectively reduce the related accidents on two-lane rural highways by 85% and the related accidents on multi-lane highways by 35% (TRB 2000b).

There would be a change in traffic accident patterns and there should be a reduction in accidents compared to the No Action Alternative based on the traffic safety analysis. The construction of a gravel median should eliminate all head on accidents

and the installation of left-turn pockets would reduce rear end and left turning type accidents. Runoff roadway accidents would be reduced with paved shoulders, clear zone, and sight distance improvements.

The reduced speed limit for the 0.75-mile portion of roadway and narrower clear zone from Jensen Road to Argonne Road would not reduce traffic safety in that section since the speed limit would be reduced to 35 mph, consistent with engineering safety requirements.

No Action

With the exception of the recently completed improvement at the intersection of East Bigelow Gulch Road and North Argonne Road, this alternative does not include physical improvements that would be expected to address the safety issues identified through analysis of the historical collisions within the project corridor.

Freight Movement

Proposed Action

The Bigelow Gulch/Forker Road corridor currently has major roadway grades extending for approximately 8,000 and 5,000 feet respectively and numerous vertical curves. The planned improvements would moderate the geometric alignments and provide additional travel lanes to mitigate the impedance to passenger vehicles by the larger freight haulers and improve safety for the motoring public. Until the North Spokane Corridor is connected to I-90 as a high speed, limited access facility, alternate routes such as Bigelow Gulch Road that avoid congested areas would become increasingly important to accommodate the increase of freight shipments between areas of north Spokane and destinations east of Spokane.

Upon completion, the East Bigelow Gulch Road/North Forker Road Corridor would become a more attractive route for freight traffic that travels between north Spokane and communities to the east. Widening, straightening, and reducing roadway grades of the East Bigelow Gulch Road/North Forker Road Corridor would mitigate the current safety concerns along this route, accommodate a greater volume of traffic, and decrease travel time for trucks.

No Action

Discussions provided in Appendix B to the January 2006 EA document indicates that auxiliary truck climbing and crawl lanes are warranted on numerous segments of the project corridor. These auxiliary lanes would not be constructed under the No Action alternative. This alternative does not include physical improvements that would be expected to improve conditions for freight movement throughout the project corridor.

Non-Motorized Travel

Proposed Action

Along the rural section of the roadway (west of Forker Road), bicycle, and pedestrian traffic would be accommodated on the 8-foot shoulder that is proposed on each side of the roadway as part of the project. Along the urban portion of the roadway (between Forker Road and Wellesley Avenue) bicycle traffic would be accommodated on a separate 4-foot bicycle lane that is proposed on each side of the roadway. Pedestrian travel would be accommodated on an 8-foot-wide sidewalk, which would be separated from roadway traffic by a 12-foot swale. In addition, a pedestrian underpass is proposed across the roadway between East Valley Middle School and the adjacent play fields.

No Action

Pedestrian and bicycle travel along East Bigelow Gulch Road/North Forker Road Corridor would remain the same as under existing conditions. Travel must occur on the roadway itself or on the existing shoulder. The shoulder varies in width but is generally very narrow, offering minimal separation from vehicular traffic.

Sullivan Road between Wellesley Avenue and I-90

This section presents additional operational analysis completed for Sullivan Road south of Wellesley Avenue under both the proposed action and No Action alternatives.

Planned Projects

There are three future planned projects on Sullivan Road between Wellesley Avenue and I-90.

- Under the “Bridging the Valley” (BTV) project, addition of a railroad line is planned on the existing Burlington Northern Santa Fe Railway corridor paralleling Trent Avenue. To add the railroad line, the bridges over the railroad and Trent Avenue would be reconstructed; the preliminary plans show additional lanes being added on Sullivan Road.
- The City of Spokane Valley is currently evaluating the possibility of widening of Sullivan Road to seven lanes, due to the adjacent industrial development. Preliminary engineering work is planned to begin on this project in 2007.
- Reconstruction and widening of the Sullivan Bridge over the Spokane River is also a planned.

Completion of these projects was not assumed in the analysis presented in this section, but each includes improvements that would address traffic issues that are identified in the following section.

Roadway Segment Capacity

Forecasted traffic volumes were reviewed on Sullivan Road between Wellesley Avenue and the I-90/Sullivan Interchange, and compared to the roadway capacity. Review was completed for the proposed action and No Action scenarios.

Table 4.9-10 summarizes Sullivan Road traffic volumes and percent increases expected to result from the proposed action. Under the proposed action, the segment between Wellesley Avenue and SR 290 (Trent Avenue) showed a substantial increase in traffic volumes, as compared to the No Action alternative. The segments between SR 290 and Euclid Avenue, and Euclid Avenue and Spokane River Bridge show a much lower increase in traffic volume.

Table 4.9-10. Sullivan Road Traffic Volumes and Percent Increase

| Segment | No Action | | | Proposed Action | | | Percent increase |
|---------------------|-----------------|----------|------|-----------------|----------|------|------------------|
| | Two way Volumes | Capacity | V/C | Two way Volumes | Capacity | V/C | |
| Wellesley to SR 290 | 830 | 6,000 | 0.14 | 1,640 | 6,000 | 0.27 | 98 |
| SR 290 to Euclid | 2,350 | 6,600 | 0.36 | 2,710 | 6,600 | 0.41 | 15 |
| Euclid to Sp. River | 2,690 | 6,600 | 0.41 | 2,980 | 6,600 | 0.45 | 11 |

V/C = Volume to Capacity Ratio

Analysis indicates that the segment capacities are still within acceptable levels for the proposed action for traffic volumes on Sullivan Road. Volume to Capacity ratios (V/C) are used to measure levels of congestion, and the SRTC has identified a V/C ratio of 0.70 as the threshold for identifying corridors with potential capacity deficiencies. (Spokane Regional Transportation Council 2003) V/C ratios shown in the table are less than the 0.70 threshold.

Intersections

LOS of five intersections on Sullivan Road, south of Wellesley Avenue, was analyzed under the No Action and proposed action alternatives. All five of the intersections are signalized, so are subject to the adopted standard of LOS D. Spokane County, the City of Spokane Valley, and WSDOT have adopted similar intersection LOS standards of “D” for signalized intersections. The analysis of each intersection is described below:

- **Sullivan and Kiernan.** Under the No Action scenario, 2025 operations are projected to be LOS E, which exceeds the LOS standard. LOS D is projected under the proposed action, which would be an improvement over No Action, and within the standard.
- **Sullivan and Euclid.** 2025 operations at this intersection are projected to be LOS C under the No Action alternative. Under the proposed action, operations are

projected to be LOS E, which exceeds the standard of LOS D. Therefore, an intersection improvement project is recommended at this location that would mitigate conditions to LOS C. A westbound left-turn lane is recommended to accommodate the large volume of traffic that makes this turn. The suggested westbound lane configuration would be as follows: one dedicated left-turn lane, one left-turn/through lane, and one dedicated right-turn lane. This configuration is feasible because the intersection is already split-phased in the east-west directions. LOS C is projected at this intersection under future conditions with the proposed improvement in place.

- **Sullivan and Marietta.** Projections under both the No Action and proposed action alternatives indicate acceptable LOS at this intersection through 2025. Operations under the No Action are projected at LOS B, and under the proposed action are projected at LOS C.
- **Sullivan and Trent (north and south ramps).** Projections under both the No Action and proposed action alternatives indicate acceptable LOS at this location through 2025. Under No Action, the north ramp is projected at LOS B and south ramp at LOS A. Both ramps are projected to operate at LOS B under the proposed action. Even though the LOS is within adopted standards, under current conditions the northbound and southbound left turns at the ramps do experience long queues during peak periods. Specifically, vehicles waiting for gaps to make left turns sometimes back up past the ramp signals. The BTV project was reviewed for adequacy for handling the left turn queue issues, and proposes to add left-turn lanes in each direction. The proposed left-turn storage length is approximately 230 feet for both the northbound and southbound directions. The 95% queue lengths calculated under the proposed action would require less than these proposed storage lengths. Thus, analysis indicates that the proposed BTV configuration should be adequate to address existing and future queuing problems at this location.
- **I-90/Sullivan interchange/Indiana.** The I-90/Sullivan interchange traffic volumes were analyzed under the proposed action and No Action alternatives. Analysis indicates that 2025 LOS would be the same for the three signalized intersections at this interchange under both the No Action and proposed action scenarios. Specifically, operations at Indiana/Sullivan are projected at LOS E, Sullivan/westbound I-90 ramp is projected at LOS D, and Sullivan/eastbound I-90 ramp is projected at LOS B. As described earlier, the City of Spokane Valley is planning to reconstruct the west bridge (southbound lanes) over the Spokane River, widening Sullivan Road to three lanes. Work is planned to begin in 2007 (2007–2012 6-year transportation improvement program, City of Spokane Valley). Analysis indicates that with this project completed, operations at Indiana/Sullivan would improve from LOS E to LOS D under both the No Action and proposed action alternatives.

Old Bigelow Gulch Road between Weile Avenue and Thierman/Bigelow Gulch Roads

This section provides analysis of traffic volumes on Old Bigelow Gulch Road between Weile Avenue and Thierman/Bigelow Gulch roads under the proposed action. This is the section of roadway that would be bypassed under the proposed action.

AADT for this roadway in the year of project completion was estimated by adding traffic counts on Orchard Prairie and Espe, which are the two roads to which access is provided exclusively by Old Bigelow Gulch Road, to traffic generated by additional residential development currently located along the roadway. Under existing conditions, Orchard Prairie had an AADT of 222 and Espe had an AADT count of 374. Additionally, nine residences front this segment of roadway. Using typical Institute of Transportation Engineers (ITE) trip generation rates for single-family homes, this equates to approximately 100 AADT generated by these homes (ITE 2003b). Thus, existing AADT along this segment of roadway is calculated by adding these three numbers, which results in an estimate of approximately 700 vehicles per day. Currently, this segment of roadway has a capacity of approximately 12,000 AADT.

To project future traffic on this segment under the proposed action alternative, vacant buildable lots accessed by the roadway were counted and population projections for 2025 and ITE trip generation rate were applied. This results in a future AADT projection of 833 vehicles per day under future build-out conditions.

Construction Impacts

Proposed Action

Construction would generate additional traffic related to construction employees, delivery of construction material and movement of construction equipment. Current traffic would experience delays for construction detours, rough roadways, and short roadway closures. These impacts would generally occur along the entire corridor though the Palmer Road to Weile Avenue and Progress Road segments would have slightly less impacts. Within these segments new roadway alignments are being constructed which are located well away from existing roadways.

The slowing of traffic may temporarily increase noise and air emissions in the project area. Detouring vehicles around construction activities would temporarily increase traffic volumes and pressure on nearby roads, such as Wellesley Avenue.

Traffic using the corridor during construction would generally use the existing current roadway while construction occurs on the shoulder or adjacent areas. When grade changes are made, vehicles would be required to use the regraded area. The temporary lane width reductions and rough roadway would reduce travel speeds.

Access to adjacent properties would be temporarily disrupted during construction. Some temporary closures may occur while grading activities occur.

Staging of construction equipment and material would be located along the corridor most likely on private properties.

No Action

No construction would occur under the No Action Alternative, thus there would be no construction impacts.

4.9.6. What are the indirect effects?

Indirect effects are those caused by the proposed action that are later in time or farther removed in distance, but still reasonably foreseeable. No indirect transportation effects are identified as a result of this project.

4.9.7. What transportation mitigation measures are recommended under the proposed action?

Construction

- Spokane County will prepare and implement a Traffic Management Plan that will include traffic control signing consistent with the Manual on Uniform Traffic Control Devices (DOT 2000) and State standards for road construction.
- Spokane County will inform the public, school districts, emergency service providers, and transit agencies of changes in traffic flow or lane closures ahead of time through a public information process. A wide spectrum of techniques and media should be used to convey planned construction activities, such as a website with the planned construction schedule regularly updated.

Operations

- Spokane County will coordinate an intersection improvement project at the intersection of Sullivan and Euclid Avenue to mitigate LOS E operations projected for 2025 with the proposed action in place, which exceeds the adopted County standard of LOS D. The intersection improvement project would consist of a reconfiguring of the westbound approach with a dedicated left-turn lane, a left-through lane, and a dedicated right-turn lane to mitigate conditions to LOS C.

Analysis of the effects of the proposed action on transportation indicates that they will not rise to a level of significance. Improvements in safety and capacity will be beneficial effects. Construction and operations measures listed in this section were considered in combination with proposed mitigation listed in Section 4.9.3, Bigelow Gulch Road EA dated January 2006 in reaching this conclusion.