Chapter 2. Project Description

2.1. Introduction

This chapter addresses the project purpose and need, and presents a detailed description and illustrations of the proposed action, the Bigelow Gulch/Forker Road Urban Connector–Havana Street to Sullivan Road (Urban Connector Alignment), including modifications since preparation of the January 2006 Environmental Assessment (EA) (Jones & Stokes 2006).

As described in Chapter 1, Spokane County proposes to widen and improve Bigelow Gulch Road and a portion of Forker Road to make the roadways safer, to accommodate more traffic, and to allow freight to move through the area more efficiently. The Urban Connector Alignment would include a rural design for Bigelow Gulch Road from Havana Street to Forker Road, and an urban design for the remaining eastern section.

Prompted by the update of the Spokane County Comprehensive Plan in May 1997, citizens and community leaders began exploring the concept of an urban connector road system to accommodate expected increases in traffic volumes in Spokane County. The report, *Connecting our Community—A Regional Study of Urban Connectors* (Spokane County 1998a), referred to herein as the Connector Study, identified a number of high-volume traffic corridors, one of which was the Bigelow Gulch Road/Forker Road corridor, defined as Bigelow Gulch Road between Old Argonne Road and Forker Road, and Forker Road from Bigelow Gulch Road to Wellesley Road (Bigelow Gulch/Forker corridor).

Bigelow Gulch Road and Forker Road both consist of two lanes with 1- to 3-foot paved shoulders. This roadway configuration limits passing opportunities and

increases the chance of head-on collisions. Several sharp curves in the western portion of the Bigelow Gulch/Forker corridor pose a risk to vehicles during icy conditions. These roads are classified as rural minor arterial and have a posted speed limit of 35 to 45 miles per hour (mph). The properties bordering the arterial are predominantly farms and large residential lots.

2.2. Purpose and Need

2.2.1. What is the project purpose?

The project purpose is to improve safety and operational conditions along the Bigelow Gulch/Forker corridor by:

- increasing roadway capacity,
- improving transportation system linkage, and
- accommodating existing and future freight linkages between areas north of Spokane (City and County) to the industrial and retail areas east of Spokane and Interstate (I)-90.

Additionally, the project objectives are:

- improved connections between major freight handlers and their primary destinations;
- subregional connections for businesses and employers; and
- support for the Spokane County and Cities of Spokane and Spokane Valley comprehensive plans through provision of transportation infrastructure between Spokane County, the City of Spokane, and the City of Spokane Valley warehouse and industrial zones. The industrial-zoned areas are located on the western and eastern ends of the Bigelow Gulch/Forker corridor.

2.2.2. Why is the project needed?

The Connector Study identified the Bigelow Gulch/Forker corridor as having declining vehicle capacity and high collision rates. The Bigelow Gulch/Forker corridor is one of several corridors identified in the study as requiring increased capacity and improved freight mobility.

The Connector Study also recommended transportation improvements that would provide sufficient vehicle capacity, improve traveler safety, improve freight mobility, ease current traffic congestion, improve the general air quality, and meet the objective of improved infrastructure under the Washington State Growth Management Act.

The specific need components are described in the following sections.

Transportation Demand

Transportation demand is expected to exceed the current capacity of the Bigelow Gulch/Forker corridor. This increase will trigger the need for a direct, more efficient route between Francis Avenue on the west and Sullivan Road to the east.

Transportation Capacity and Roadway Deficiencies

Average Annual Daily Traffic (AADT) represents the average number of vehicles that travel a roadway on a typical day. The 2003 AADT on Bigelow Gulch Road west of Argonne Road was 10,048 trips; that number is projected to increase to 12,000 trips by 2025 if no changes are made to the current infrastructure (No Action). The 2003 AADT on Bigelow Gulch Road (east of Argonne Road) was 7,563 trips; that number is projected to remain approximately level through 2025 under No Action.

Level of Service (LOS) measures the operating quality of a roadway segment or intersection. The quality of traffic conditions is graded into one of six LOS designations, ranging from A through F. LOS A and B represent the fewest traffic slow-downs, and LOS C and D represent intermediate traffic congestion. LOS E indicates that traffic conditions are at or approaching urban congestion conditions and LOS F indicates that traffic volumes are at a high level of congestion and unstable traffic flow. Traffic analysis indicated that Bigelow Gulch Road currently operates at LOS E in both directions. Under No Action, all segments along the corridor are projected to operate at LOS E or F by 2025, which fails to meet the County's adopted standard of LOS C for this corridor.

The Spokane Regional Transportation Council (SRTC) *Metropolitan Transportation Plan* (SRTC MTP 2003) identifies sections of the Bigelow Gulch/Forker corridor as having existing deficiencies within the regional network. In analysis conducted for the MTP, SRTC calculated an existing volume to capacity ratio of 0.79 for the section east of Argonne Road. Since this exceeds the threshold of 0.7 defined by SRTC as the standard for acceptable operating conditions, a need was indicated to further analyze existing and future capacity of the Bigelow Gulch/Forker corridor.

Safety

From January 1, 1994, to October 31, 2006, 546 collisions were reported on Bigelow Gulch Road and Forker Road in the project area, an average of 43 collisions per year. This represents a collision rate of approximately 1.68 per million vehicle miles, higher than the average 1.34 per million vehicle miles rate for state highways in eastern Washington.

The fatal collisions rate for these road segments during this period was calculated at 2.16 per hundred million vehicle miles, over 3.6 times higher than the average eastern Washington rate of 0.59 per hundred million vehicle miles. Approximately 39% of the reported collisions involved injuries and 1.3% involved fatalities. The fatality rate in eastern Washington is 1.0% (Washington State Department of Transportation [WSDOT 2005]).

Research provided by the Transportation Research Board (2002) has shown that the following types of collisions on rural two-lane highways can be reduced directly by lane and shoulder width improvements:

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

Area Road Connections

The Connector Study identified the Bigelow Gulch/Forker corridor as an important regional transportation link between the arterial network in the northern part of Spokane County and the cities of Spokane and Spokane Valley. The corridor links two roadways classified as rural major, two classified as major principal, and one state highway.

Phase I of the North Spokane Corridor, which is currently under construction, is expected to result in increased traffic and demand along arterial links to Interstate (I)-90, including the Bigelow Gulch/Forker corridor. The expansion of Bigelow Gulch Road will provide some measure of relief to the capacity constraints along those north-south arterials within the City of Spokane until the North Spokane Corridor is linked directly to I-90.

Goals and Policies of the Spokane County Comprehensive Plan

The Spokane County Comprehensive Plan includes goals that focus on improving transportation infrastructure to support existing and planned growth as required by GMA. The area west of the Bigelow Gulch/Forker corridor is one of the larger industrial and commercial subareas in Spokane County, so it is essential that these areas have access to regional routes and interstate freeways. Key goals and policies from the Spokane County Comprehensive Plan are discussed below.

The Transportation Element of the Spokane County Comprehensive Plan includes goals and policies for the design of rural and urban roads. The Urban Connector Alignment would be consistent with the following goals.

Urban Road Design

Goal

T.4a. Ensure that urban roadway systems are designed to preserve and be consistent with community character.

Policies

T.4a.1. Use best engineering practices for a safe and efficient roadway.

T.4a.5. Transportation facilities shall support the creation and preservation of communities and neighborhoods while providing safe and efficient movement of people and goods.

T.4a.7. Transportation facilities should incorporate adequate consideration of cultural, historical, and aesthetic issues.

Rural Road Design

Goals

T.5a. Provide a safe and efficient system of rural roads.

T.5b. Provide all-weather roads to serve the rural environment.

T.5c. Provide major rural arterials that connect urban areas (urban connectors) while maintaining rural character and protecting the environment.

Environment

Goals

T.12a. Develop transportation systems that avoid environmental impacts where possible and mitigate impacts where avoidance is not possible.

Freight Transport

The Bigelow Gulch/Forker corridor is a heavily used truck route that carries between 4 and 10 million tons of freight annually (based on vehicle counts for the years 2000 and 2004). It was identified as a high priority in the 2003 Activities and Recommendations Report of the Washington State Freight Mobility Strategic Investment Board. Facilities located at the west end of the corridor include two food distribution centers, large petroleum distribution centers, and numerous industrial and commercial complexes.

Located at the east end of the Bigelow Gulch/Forker corridor are the Spokane industrial area and State Route (SR) 290 (and its extension into North Idaho as Idaho SR 53)—the extension of Sullivan Road serving Spokane Valley, Spokane Valley Mall, Spokane Industrial Park, and providing a connection to I-90.

The Bigelow Gulch/Forker corridor provides the shortest, most direct route between the industrial and wholesale distribution facilities at either end. A travel time and delay study was performed to compare this route with the alternate routes available to serve the area. Under existing conditions, each route was measured from the intersections of Freya Street and Francis Avenue to Sullivan Road and SR 290 (Table 2-1).

Table 2-1. Travel Time and Distance Comparison of Freight Travel Routes

Route	Distance (miles)	Signalized Intersections	Travel Time (minutes)
Bigelow Gulch/Forker	9.6	3	14.5
SR 290/Mission/Green/Market	11.8	15	24.0
Sullivan/I-90/Freya/Green/Market	15.8	18	29.0

The shorter distance and travel time along the Bigelow Gulch/Forker route results in substantial savings in fuel and in the time it takes to transport goods and commodities to and from businesses in the area.

The Bigelow Gulch/Forker corridor has major roadway grades extending for approximately 13,000 feet and numerous vertical curves. It is difficult and unsafe for passenger vehicles to pass trucks on the current alignment. Until the North Spokane Corridor is connected to I-90 as a high-speed, limited-access facility, the Bigelow Gulch/Forker corridor will become increasingly important to accommodate the increase of freight shipments between areas of north Spokane and points east of Spokane.

2.3. What is the Urban Connector Alignment?

The Urban Connector Alignment, the action proposed by Spokane County to meet the project purpose and needs identified above, would involve the modification of an 8.26-mile section of Bigelow Gulch Road and Forker Road in Spokane County, Washington. Chapter 3, *Alternatives*, describes the process by which the County came to select the Urban Connector Alignment as its preferred alternative. As previously stated, the Urban Connector Alignment analyzed herein differs from proposed action analyzed in the January 2006 EA. The modified Urban Connector Alignment is described below in Section 2.3.2.

2.3.1. Project Area and Proposed Alignment

The project area for the Urban Connector Alignment includes the specific path that the proposed roadway would follow (the proposed alignment) and the surrounding area. The proposed alignment would:

- begin on Bigelow Gulch Road at its intersection with Havana Street;
- continue east on along Bigelow Gulch Road to Forker Road;
- turn southeast along Forker Road;
- depart southeast from Forker Road, cross Progress Road and a portion of the East Valley School District property joining Sullivan Road between East Valley middle and high schools; and
- continue on Sullivan Road south to its intersection with Wellesley Avenue (Figure 1-1).

2.3.2. Project Description

The Urban Connector Alignment would widen approximately 5.80 miles of the existing Bigelow Gulch and Forker roadways, and construct 2.46 miles of new roadway at the west and east ends of the project area (Figure 2-1, Sheets 1–5). The following bullets summarize the key segments of the Urban Connector Alignment.

- The section of roadway from the Bigelow Gulch Road/Havana Street intersection to the Forker Road/Progress Road intersection would be designed as a rural roadway with four lanes, alternated with gravel medians with two-way left-turn pockets, and paved shoulders (Figure 2-2).
- The section of roadway from the Forker Road/Progress Road intersection to the Sullivan Road/Wellesley Avenue intersection would be designed as an urban roadway with four lanes and two-way left-turn pockets, bike lanes, sidewalks, and landscaping (Figure 2-3).
- A Forker Road interchange would be designed to merge with Bigelow Gulch Road eastbound traffic about 500 feet east of the proposed intersection of Bigelow Gulch Road with Forker Road.
- A 0.14-mile section of the right-of-way from west of Jensen Road to just east of Old Argonne Road would be reduced in width from 120 to 80 feet and shifted slightly south to avoid the historic Karl Paulson Farmstead on Bigelow Gulch Road. The width reduction would be accompanied by a speed limit reduction from 45 to 35 mph.

2.3.3. What changes to the Urban Connector Alignment have occurred since the January 2006 Environmental Assessment?

Since preparation of the January 2006 EA, Spokane County has made several changes to the Urban Connector Alignment to further improve safety and stormwater management, reduce impacts, and partially mitigate for loss of wildlife habitat. These changes are briefly described below.

Forker Road Interchange

As originally planned and presented in the January 2006 EA, the Forker Road interchange at Bigelow Gulch Road would include stop-sign-controlled right and left turns from Forker Road onto Bigelow Gulch Road. The revised Forker Road interchange would include construction of an underpass that would extend from Forker Road (at its existing intersection with Bigelow Gulch Road), travel beneath Bigelow Gulch Road, and merge with eastbound Bigelow Gulch Road traffic about 500 feet from the proposed Bigelow Gulch/Forker intersection. The underpass would provide easier, safer access to Bigelow Gulch Road from Forker Road. Right turns onto Bigelow Gulch Road from Forker Road would still be stop sign controlled.

The intersection would be configured with two lanes on Forker Road (one southbound left-right share lane and one northbound lane) and five lanes on Bigelow Gulch Road (two through lanes each direction and one center two-way, left-turn lane). The Forker Road underpass would consist of one lane with yield control for traffic merging with eastbound Bigelow Gulch Road traffic. Figure 2-4 presents a preliminary concept of the interchange. Section 4.9, *Transportation*, presents an analysis of LOS with the proposed interchange.

In addition to the LOS improvement, the addition of the underpass on-ramp would improve safety for eastbound vehicles that would otherwise have turned left from Forker Road onto Bigelow Gulch Road.

Forker Road Alignment

The Urban Connector Alignment would include the modification of approximately 2,300 linear feet of roadway along Forker Road from just south of its intersection with Jacobs Road south to its intersection with Progress Road. Spokane County conducted an engineering and environmental analysis of the modified Forker Road alignment to compare with the original Forker Road alignment (Figure 2-5). The modified Forker Road alignment would differ from the original approximately as follows:

- 1,877 linear feet less stream realignment,
- 0.37 acre less wetland impact, and
- 6.5 acres less fill of 100-year floodplain.

The modified Forker Road alignment would require more earthwork, more impervious surface, and more forest/grass vegetation removal than the original alignment. The impacts of the original alignment and the proposed alignment are compared in Table 2-2.

Restoration of the Existing Roadway

At various locations, the proposed alignment would depart from the existing roadway, particularly at its west and east ends. (For example, the proposed alignment would bypass approximately 2,800 feet of existing Bigelow Gulch Road in the vicinity of Palmer Road, and would require a section of new roadway.) The Urban Connector Alignment has been modified to include restoration of a portion of the existing roadway for stormwater detention ponds, wetland mitigation, and wildlife habitat (Figure 2-6).

In total, approximately 7.8 acres (339,975 square feet) of existing roadway (impervious surface) would be removed, regraded, and revegetated to partially compensate for the loss of wildlife habitat from construction of the proposed alignment. Depending on location, the restored area would be planted with mixed-forest cover (Douglas-fir, Ponderosa pine), grasses, and patches of shrubs.

Table 2-2. Summary of Impacts—Original Alignment and Proposed Alignment

Environmental Element	Original Alignment	Proposed Alignment
Geology and Soils	Cross approximately 1,500 linear feet of erodible soil.	Cross approximately 1,400 linear feet of erodible soils—100 feet less than original.
Earthwork	Excavate 876,241 cubic yards. Fill 862,293 cubic yards.	Excavate 1,225,740 cubic yards—349,499 cubic yards more than original. Fill 787,060 cubic yards—75,233 cubic yards less than original.
Groundwater	Potential for roadway pollutant infiltration into groundwater.	Same
Floodplains	Fill 511,564 square feet (11.7 acres) of 100-year floodplain.	Fill 224,636 square feet (5.2 acres) of 100-year floodplain—286,928 square feet (6.5 acres) less than original.
Wetlands	Impact 1.08 acres.[1]	Impact 0.71 acre—0.37 acres less than original.
Streams	Realign and reconstruct 5,699 linear feet of stream.	Realign and reconstruct 3,822 linear feet—1,877 linear feet less than original.
Impervious Surface	Construct 742,940 square feet of new impervious surface.	Construct 793,252 square feet of new impervious surface. Remove and restore as habitat 339,975 square feet of existing roadway—395,287 square feet less net impervious surface.
Vegetation and Wildlife	Remove 31.5 acres of forest and grass/trees.	Remove 37.8 acres of forest and grass/trees—6.3 acres more than original.
Land Use and Displacement	No Impact	Same
Environmental Justice	No Impact	Same
Transportation	Meets purpose and need	Same
Air Quality	No Impact	Same
Noise	Impact 20 residences by either a 10 dBA or greater increase in noise or from traffic levels exceeding 66 dBA.	No additional impact; alignment slightly closer to church (C-2); slightly farther from church residence (H-77); slightly closer to residence H-78 and farther from H-76.
Visual Quality	Slightly degrade current visual quality, but stays within range of moderate visual quality.	Same
Parks and Recreation	No Impact	Same
Cultural and Historic Resources	No Impact	Same
Section 4(f)	No use for this revised portion of roadway.	Same

[1]Wetland impacts adjusted based on additional wetlands identified during 2007 field surveys.

2.3.4. Design and Construction

Design

The design phase of the Urban Connector Alignment, which will begin following National Environmental Policy Act approval by the Federal Highway Administration, would include the following:

- a detailed topographic survey and geotechnical investigation,
- development of an earthwork balance of excavation and embankment requirements to achieve the minimum amount of soil transport,
- design of stormwater conveyance and water quality treatment, and
- final placement of the proposed alignment to achieve roadway design standards and to minimize impacts on environmental resources such as streams and wetlands.

The design would follow the standards and requirements established in the WSDOT *Local Agency Guidelines Manual* (WSDOT 2007b) and the WSDOT *Standard Specifications for Road, Bridge, and Municipal Construction* (WSDOT 2006c) *(M41-10)*.

Construction Phases

Construction of the Urban Connector Alignment would occur in six phases:

Phase 1. Bigelow Gulch Road from its intersection with Havana Street continuing east—0.7 mile (2009 completion).

Phase 2. Bigelow Gulch Road from the endpoint of Phase 1 east along the adjoining segment of Weile Avenue, then connecting with the eastern segment of Weile Avenue to its intersection with Bradley Road—1.24 mile (2009 completion).

Phase 3. Weile Avenue at its intersection with Bradley Road, converging with Bigelow Gulch Road and continuing to just west of its intersection with Old Argonne Road—1.1 mile (2009 completion[1]).

Phase 4. Bigelow Gulch Road from its intersection with Old Argonne Road east to its intersection with Evergreen Road—2.8 mile (2012 completion).

[1] The 0.55–mile portion of Bigelow Gulch Road between Phase 3 and 4 segments (Phase 3A) was constructed by the Spokane County as the Bigelow Gulch Road/Argonne Road Intersection Safety Improvements Project in 2005, and is consistent with the Urban Connector Alignment.

Phase 5. Bigelow Gulch Road from its intersection with Evergreen Road southeast along Forker Road—1.15 mile (2011 completion).

Phase 6. Continuing southeast on Forker Road, crossing Progress Road and a portion of the East Valley School District property and joining Sullivan Road between the East Valley middle and high schools, and continuing south to its intersection with Wellesley Avenue—0.75 mile (2010).

Construction Methods

The construction sequencing for the Urban Connector Alignment would be as follows:

- develop and implement a Temporary Erosion and Sediment Control Plan using best management practices (BMPs) and a Spill Prevention and Control Countermeasures Plan;
- install erosion control material consisting of silt fences along the outside limits of construction on both sides of the roadway;
- clear the construction area of brush and vegetation;
- strip any topsoil and unsuitable base subsoil and transport it to a stockpile;
- excavate rock outcroppings (i.e., ripping);
- excavate material as required to achieve slopes, add fill and extend any culverts using good quality fill material, and transport poor quality material to a spoils disposal area;
- cut and bench slopes or install fill in lifts on slopes;
- place and compact fill material to establish the subgrade;
- realign stream channels and install culverts;
- place and compact sub-base of crushed rock; and
- install pavement and stormwater drainage.

Stormwater Program

The collection, conveyance, and treatment of stormwater on the Urban Connector Alignment would comply with all applicable federal, state, and county laws. These rules generally require the controlled release and treatment of stormwater. The stormwater program as currently proposed would involve two general methods to handle stormwater runoff, both of which would meet applicable standards of Chapter 14.706 (Aquifer Sensitive Area Overlay) of the Spokane County Zoning Code and will comply with the updated *Spokane County Guidelines for Stormwater Management* (Spokane County 1998b). Additional guidelines are provided in the

2005 draft of the *Spokane Regional Stormwater Manual* (Spokane County et al. 2005).

These methods are dictated, in part, by topographic conditions. Steep slopes and grades occur on each end of the Urban Connector Alignment. For approximately 2.1 miles at each end of the Urban Connector Alignment (from Havana Street to Weile Avenue and from west of Evergreen Road to the east end of the Urban Connector Alignment) stormwater would be collected in roadside ditches and pipe systems and conveyed to treatment ponds. The treated water would then be metered into drywells for infiltration.

For approximately 4 miles in the center of the Urban Connector Alignment (from Weile Avenue to just east of Evergreen Road), roadside slopes, and swales would be used to capture, treat, and infiltrate stormwater into the ground.

Currently, only the paved portion of the Argonne Road intersection (constructed in 2005) meets the current Spokane County stormwater collection and treatment requirements. The Urban Connector Alignment would improve this condition by collecting and treating the stormwater for all new paved surfaces. The proposed stormwater drainage would use open roadside ditches along the edge of the roadway shoulders as the preferred method of conveyance where possible. Adjacent property development and protected natural areas tightly confine the project area. Conveyance would primarily consist of roadside ditches and swales. These features would transport runoff to treatment and flow control facilities within the right-of-way. Six stormwater ponds (detention ponds combined with stormwater treatment wetlands) would be constructed as part of the project.

Avoidance Measures

Spokane County would use BMPs, WSDOT Standard Specifications, and design elements to avoid or minimize potential effects on the environment from the Urban Connector Alignment. Collectively, these measures are known as avoidance and minimization measures. They are identified for each environmental element analyzed in Chapter 4, and listed in Appendix 2, *Mitigation Commitment List*. Any unavoidable adverse effects of the Urban Connector Alignment not addressed through avoidance and minimization measures would be addressed through mitigation.

Access

Roadway access during construction would be along temporary construction access roads and on existing roadway. Construction and public vehicular traffic would be controlled and managed following a construction management plan. Existing local access to side roads and driveways would be maintained when possible, or modified as necessary to provide temporary alternate routes.

Construction Activities

Staging Areas and Construction Equipment

Staging areas would be planned and identified along the roadway. Staging areas would be secured, located in close proximity to construction, and would avoid impacting sensitive environmental resources (e.g., wetlands, streams). Construction equipment such as scrapers, dozers, backhoes, drill rigs, haul trucks, and rollers would be stored in the construction staging areas when the equipment is not in use. The contractor would place stockpiles of construction supplies and imported material in the construction staging areas for later use. All required spill control and countermeasure plans would be employed.

Topsoil

Topsoil removed during construction would be stockpiled for regrading of areas to be revegetated, and for realignment of the stream channels.

Stream Realignment and Wetland Mitigation

Stream realignment would be required for approximately 1,123 linear feet of Bigelow Gulch Creek on the west side of the Urban Connector Alignment, and 2,699 linear of the creek along Forker Road (Forker Creek) and two tributaries.

During construction, any stream flow would be bypassed in a temporary channel or pipe, and the location of the new stream alignment would be constructed following the Washington State Department of Fish and Wildlife *Aquatic Habitat Guidelines: An Integrated Approach to Marine, Freshwater, and Riparian Habitat Protection and Restoration* (Washington State Department of Fish and Wildlife 2004). This would include the construction of stream channels to sufficiently carry the natural stream flows and additional stormwater flows from the roadway.

Sub-Base Material for Roadbed

Sub-base material includes manufactured (crushed) rock products that would be imported to the Urban Connector Alignment from quarries or aggregate plants. This material would be transported to the project area by haul trucks and deposited onto the completed subgrade. The volume of sub-base materials would be determined following geotechnical studies and during final design.

Crews

The duration of construction would vary with each phase of the Urban Connector Alignment and weather conditions. The size of the construction crew would vary with the construction schedule.

Dust Control

BMPs would be implemented for dust control during construction.