HATCH ROAD STUDY / PRELIMINARY DESIGN

Corridor Study Report

February 24, 2009

Prepared for:

City of Spokane

Prepared by:



Hatch Road Study / Preliminary Design

Corridor Study Report

February 24, 2009

Prepared for:

City of Spokane

808 W. Spokane Falls Boulevard Spokane, WA 99201

Prepared by:



12100 NE 195th St, Suite 300 Bothell, WA 98011 (425) 951-4800

Table of Contents

| 1 – | BASELINE CONDITIONS | | 1-1 | | | |
|-----|--|-----------------|-------|--|--|--|
| | INTRODUCTION | | 1-1 | | | |
| | EXISTING CONDITIONS | | 1-1 | | | |
| | Physical Context | | 1-4 | | | |
| | TERRAIN | | 1-4 | | | |
| | Traffic Volumes and Circulation | | 1-6 | | | |
| | Non-Motorized Transportation Facilities | | 1-12 | | | |
| | TRANSIT OPERATIONS | | 1-15 | | | |
| | FREIGHT OPERATIONS | | 1-15 | | | |
| | COLLISION HISTORY | | 1-19 | | | |
| | Relevant Regional Transportat Projects | TION | 1-21 | | | |
| 2 – | IMPROVEMENT OPTIONS | | 2-1 | | | |
| | IDENTIFICATION OF VISION & OPPC | RTUNITIES | 2-1 | | | |
| | IMPROVEMENT OPTIONS | | 2-1 | | | |
| | SAFETY IMPROVEMENTS | | 2-2 | | | |
| | BICYCLE AND PEDESTRIAN FAC | CILITIES | 2-2 | | | |
| | Hatch and 57 th Intersectic Improvements |)N | 2-5 | | | |
| 3 – | ANALYSIS OF IMPROVEME | NT OPTIONS | 3-1 | | | |
| | CONCEPTUAL LAYOUTS | | 3-1 | | | |
| | BICYCLE/PEDESTRIAN FACILITIES OF | PTIONS | 3-1 | | | |
| | OPTION 1B – SHARED USE PA | ATHWAY, CLASS I | 3-2 | | | |
| | Option 2 – Bike Lanes/Side | WALKS, CLASS II | 3-2 | | | |
| | Option 4 – Widened Uphili Shoulder/Sidewalk, Class | - III or IV | 3-2 | | | |
| | Hatch & 57 th Intersection Improvement Options | | | | | |
| | NO BUILD OPTION | | 3-7 | | | |
| | Option 1 – 'T' Intersection | ······ | 3-7 | | | |
| | Option 2 – Urban Single Lane Roundabout Option 3 – Four-Way Intersection at Hatch & Perry | | | | | |
| | | | | | | |
| | TRAFFIC OPERATIONS ANALYSIS | | 3-14 | | | |
| | CONCEPT-LEVEL COSTS | | 3-17 | | | |
| 4 – | CONCLUSIONS | | 4-1 | | | |
| Hat | ch Road Study; 57 th to Hangma | an Bridge i WHP | acıfi | | | |

Corridor Study Report Revised: February 24, 2009



List of Tables

| 1-1: LEVEL OF SERVICE DEFINITIONS | 1-9 |
|--|----------|
| 1-2: INTERSECTION PM PEAK HOUR DELAY AND LOS BY APPROACH | 1-9 |
| 1-3: A.M. BICYCLE COUNTS | 1-14 |
| 1-4: P.M. BICYCLE COUNTS | 1-14 |
| 1-5: COLLISION TYPES HATCH ROAD | 1-19 |
| 1-6: CONTRIBUTING REASONS TO COLLISIONS | 1-19 |
| 3-1: PM PEAK-HOUR INTERSECTION LEVEL OF SERVICE | 3-16 |
| 3-2: SUMMARY OF CONCEPT-LEVEL COST ESTIMATES | 3-16 |

List of Figures

| 1-1: VICINITY MAP | 1-2 |
|--|----------|
| 1-2: EXISTING ROADWAY SECTIONS | 1-3 |
| 1-3: TOPOGRAPHIC MAP | 1-5 |
| 1-4: HATCH ROAD HOURLY DIRECTIONAL VOLUMES | 1-6 |
| 1-5: TURNING MOVEMENTS | 1-8 |
| 1-6: 2030 PM PEAK-HOUR QUEUE LENGTHS | 1-11 |
| 1-7: Pedestrian Context | 1-13 |
| 1-8: SPOKANE REGIONAL BIKE MAP | 1-16 |
| 1-9: STA ROUTES | 1-17 |
| 1-10: TRUCK ROUTES | 1-18 |
| 1-11: COLLISION LOCATION HISTORY | 1-20 |
| 1-12: HATCH ROAD – SR 195 INTERCHANGE | 1-22 |
| 2-1: INITIAL BICYCLE/PEDESTRIAN FACILITIES OPTIONS | 2-4 |
| 3-1: OPTION 1-B – SHARED USE PATHWAY | 3-4 |
| 3-2: OPTION 2 – BIKE LANES/SIDEWALKS | 3-5 |
| 3-3: OPTION 4 – WIDENED SHOULDER/SIDEWALK | 3-6 |
| 3-4: Option 1 – 'T' Intersection | 3-11 |
| 3-5: Option 2 – Single Lane Urban Roundabout | 3-12 |
| 3-6: Option 3 – Four-Way Intersection at Hatch & Perry | 3-13 |
| 3-7: INTERSECTION CONTROL TREATMENT OPTIONS | 3-15 |

Hatch Road Study; 57th to Hangman Bridge Corridor Study Report *Revised: February 24, 2009*



Appendices

- Appendix A: Documentation of Public Involvement Process
- Appendix B: Concept-Level Cost Estimates
- Appendix C: Hatch Road Vertical Alignment Exhibits
- Appendix D: Conceptual Drainage Design Basis

SECTION 1 – BASELINE CONDITIONS

Introduction

In order to address the deficiencies and safety issues on the Hatch Corridor, it is necessary to fully comprehend the baseline conditions as they currently exist along the roadway and to look ahead into the future planning horizon. Baseline conditions were developed by obtaining and reviewing:

- Relevant transportation and development impact studies, and other regional and local transportation plans and economic data
- Available traffic volume data for the study area based on development traffic studies and regional transportation plans
- City of Spokane Traffic Counts, SRTC Traffic Counts
- Accident Reports
- Local and regional access and circulation
- Spokane Transit Authority (STA) service and operations
- Non-motorized mobility conditions
- Business, community and regional access, including freight
- Site reconnaissance to ascertain and inventory the physical roadway, deficiencies and opportunities

This section summarizes the existing baseline conditions for the Hatch Road Corridor from 57th Avenue to the Hangman Bridge in Spokane, Washington.

Existing Conditions

Physical Context

Hatch Road is a minor arterial located in the southern part of the City of Spokane (see Figure 1-1). Hatch Road currently is the City/County boundary. It is an approximately 1.5 mile stretch of road that connects 57th Ave. and US 195. Hatch Road consists of two travel lanes with little to no shoulder throughout much of the project area (see Figure 1-2). Lane and shoulder widths along the road are inconsistent and variable. There are, however, improved shoulders and left turn lanes in the central portion of the project area, associated with recent subdivision development. The interior portion of Hatch Road contains acceleration and deceleration lanes that are also associated with the developments. There are residential development access points and one significant intersection at Hangman Valley Road along Hatch between the northern and southern limits of the project. At the northern limit, Hatch and 57th intersect in a three-way stop intersection configuration. At the southern limit there is a stop sign where Hatch intersects US 195, after crossing Hangman Bridge.









OCTOBER 2008



Page 1-3

2-LANE SECTION

OCTOBER 2008

NHPacific

Terrain

Hatch Road ascends the side of the South Hill from Latah Valley. Along much of the corridor, Hatch Road has been benched into the hillside (**see Figure 1-3**). The Northern portion, 57th Ave. to Tomaker Lane, consists of either well vegetated slopes with grades ranging from 25 to 85 percent or poorly vegetated slopes with grades ranging from 25 to 60 percent. The well vegetated areas consist of short grasses and Ponderosa pine trees. The Central portion, Tomaker Lane to Highland Park Drive, consists of grasses, landscaping and Ponderosa pine trees with grades ranging from 5 to 15 percent. The Southern portion, Highland Park Drive to Hangman Bridge, consists of either well vegetated slopes that range from 25 to 60 percent in grade or poorly vegetated slopes that range from 25 to 70 percent in grade. The well vegetated areas of the southern portion are similar to the northern portion. Excluding the bridge and extreme southern end of the corridor, which are nearly flat, the existing roadway averages about a six and a half percent grade. The grade reaches a maximum between Hangman Valley Road and the Highland Park Drive at just over 8 percent.

Adjacent Land Use

In general, Hatch Road is flanked by housing developments, large lot homes and natural terrain. Easterly of the roadway is relatively undeveloped with the exception of the Aaker's Additions housing development. Westerly of Hatch is lined with housing developments including Blackwood, Highland Park, and Casa Bella (see Figure 1-3).





Traffic Volumes and Circulation

Hatch Road is the only available direct route between Spokane's South Hill and US 195. New subdivisions south along Hangman Valley Road and US 195 make Hatch Road a feasible commuter route to South Hill and Downtown employment centers. There are limited commercial, recreational and educational opportunities in the emerging Hangman Valley communities. As such, Hatch is used as a primary access route to the South Hill.

<u>Hourly Volumes.</u> Traffic volume data used in this analysis was collected in June and July 2008 by the City of Spokane. Volumes were collected on Hatch Road south of 57th Ave. for two days and at Hangman Valley Road for three days. Volumes and percentages at these two locations were averaged to obtain the data presented. The results show that traffic on Hatch Road is moderate in both directions. Overall daily traffic is over 8,000 vehicles per day with a fairly even split between northbound and southbound volumes. There is, however, a higher southbound volume during the AM peak hours. The peak hours occur between 7 AM and 8 AM with predominately a southbound traffic flow, and between 5 PM and 6 PM in the evenings with a slightly higher northbound volume. At the height of the evening commute, more than 700 vehicles travel through the corridor during a single hour. **Figure 1-4** shows the traffic volumes by hour for Hatch Road. Throughout the corridor, the total volume included 4.8 percent trucks and 0.1 percent buses, with the largest truck having more than six axles. The count data also showed 1.3 percent of the volume was bicycle traffic.





Hatch Road Study; 57th to Hangman Bridge Corridor Study Report *Revised: February 24, 2008*



<u>Circulation Patterns</u>. Review of turning volumes at corridor intersections provides information of activity and circulation patterns. Turning volume counts were provided by Spokane Regional Transportation Council (SRTC) and were done during PM peak hours only. Turning movement counts were done at three locations; Hatch and SR 195 in March 2008, Hatch and 57th Ave. in March 2008, and Perry Street and 57th Ave. in April 2008. A review of the turning movement data showed the following patterns:

- During the PM peak hour, approximately 70 percent of the corridor's southbound volume travels the entire length of Hatch from 57th Ave. to SR 195, while between 95 and 100 percent of the corridor's northbound volume travels the entire length, indicating the significance of the corridor as a regional route.
- Approximately 75 percent of southbound traffic is comprised of westbound vehicles on 57th Ave. making a left-hand turn onto Hatch.
- Approximately 80 percent of northbound traffic is comprised of southbound vehicles on SR 195 making a left-hand turn onto Hatch.

The high percentages of traffic using the entire corridor might suggest that there is a lack of eastwest connectivity between southwest Spokane and SR 195 and that Hatch Road to SR 195 is a more attractive option than surface streets to travel from southwest Spokane to the north. Northbound PM traffic overwhelmingly uses Hatch to access eastbound 57th Avenue.

<u>PM Peak Hour</u>. During the PM peak hour, major turning movements occur at the intersection of Hatch Road and 57th Avenue.

- From south to east: 57th Ave. (310 trips)
- From west to south: 57th Ave. (95 trips)
- From east to south: 57th Ave. (319 trips)
- From south to west: 57th Ave. (47 trips)

Figure 1-5 shows the major circulation patterns for the intersection of Hatch Road and 57th Avenue, as well as for the intersection of 57th Avenue and Perry Street during the PM peak hour.





0.

642 34

317

- Ce

66 134

2008 PM PEAK TRAFFIC

95

47

225 455

95

<u>Intersection Operations</u>. Level of Service (LOS) is a measure of the quality of traffic operations at an intersection. LOS uses an A to F scale, with LOS A representing minimal traffic delays and LOS F representing severe congestion and long delays. The LOS is the measured average control delay per vehicle and is reported for the worst movement for unsignalized intersections and for the overall average of all approaches for signalized intersections. The consultant used the traffic counts collected for this study to calculate the LOS for the intersection of Hatch Road and 57th Avenue. **Table 1-1** indicates the LOS definitions for signalized and unsignalized intersections.

| LOS | Signalized Delay per Vehicle (seconds/vehicle) | Unsignalized Delay per Vehicle (seconds/vehicle) |
|-----|---|---|
| А | 0-10 | 0-10 |
| В | >10-20 | >10-15 |
| С | >20-35 | >15-25 |
| D | >35-55 | >25-35 |
| E | >55-80 | >35-50 |
| F | >80 | >50 |

Table 1-1. Level of Service Definitions

The LOS range for signalized intersections allows for greater delay because signals are usually in areas with higher traffic volumes where drivers tend to tolerate more delay. The Hatch Road corridor between 57th Avenue and Hangman Bridge does not have many side street intersections. Since a large number of vehicles use Hatch as a through route, the intersection at Hatch and 57th is a primary traffic control point for vehicles entering or exiting the corridor. Hatch and 57th form a "Y-intersection" with three stop-controlled movements. The LOS for the intersection at Hatch and 57th was calculated by averaging the delay for each corner of the "Y". This was done to create a baseline measurement against future alternatives that measure LOS based on average intersection delay, including signals and roundabouts. **Table 1-2** shows the PM peak hour delay and LOS for the intersections of Hatch and Perry with 57th Avenue. Delay and LOS were also calculated using projected traffic for the year 2030.

| | Street Name | Control Type | 2008 Delay | 2030 Delay | 2008 LOS | 2030 LOS |
|------------|--|-----------------|------------|------------|-------------|-------------|
| | 57 th Ave./Hatch Road | А | 13.7 | 30.0 | В | D |
| PM Peak | 57 th Ave./Perry Street (N) | S | 14.5 | 18.7 | В | С |
| | 57 th Ave./Perry Street (S) | S | 15.5 | 29.0 | С | D |

Table1-2. Intersection PM Peak Hour Delay and Level of Service by Approach

A = Average intersection delay.

S = *Stop Sign* (*one direction*).



<u>Vehicle Queuing</u>. The length of vehicle queues that occur during peak periods can provide additional understanding about the operation of a corridor. Queues form naturally when a roadway is controlled by either a signal or a stop sign. The length of a queue is a factor of the conflicting volume of vehicles, signal timing, turn lane lengths and the number of available gaps in traffic. **Figure 1-6** shows the predicted 2030 PM peak hour vehicle queue lengths at 57th Avenue for both Hatch Road and Perry Street. Only the 2030 predicted queues were shown, as current queues for the intersections average close to one car length. The queues show that there isn't sufficient storage area for northbound right turns onto 57th Ave. without blocking northbound left turns onto 57th. There is also insufficient storage area for westbound left turns onto Hatch Road from 57th Ave. because of the stop sign at the southern portion of the "Y". Queues will build up in the southbound direction on Hatch Road that will likely spill over onto 57th causing queues there as well. Problems associated with excess queuing are generally an increase in rear-end collisions and an increase in driver impatience, which is associated with intersection collisions.





2030 PM PEAK HOUR PROJECTED TRAFFIC QUEUE LENGTHS





Non-Motorized Transportation Facilities

The identification of bicycle and pedestrian facilities is important to encouraging non-motorized travel and improving safety along Hatch Road.

<u>Pedestrian facilities.</u> There are currently very few pedestrian facilities along Hatch Road (**see Figure 1-7**). The road is narrow, only about 25 feet, and has limited vehicle recovery area due to the steep side slopes. Most of the roadway has no sidewalks, though there are a couple of small stretches of sidewalk associated with the Blackwood and Highland Park housing developments. These stretches are limited and are not connected with any other pedestrian facilities along the roadway. The existing facilities near the northern project



limits include sidewalks along 57th Avenue from Palouse Highway to Perry Street. The existing facilities at the southern project limits include a sidewalk on the north side of the Hangman Bridge. There are also a number of trails located west of Hatch Road in Hangman Park. Possible local destinations for non-motorized traffic along Hatch Road at the southern end of the project limits might include Campion and Hangman Park along Latah Creek. Destinations at the northern end of the project limits might include the South Side Sports Complex, Comstock and Hamblen Parks, St. Stephens Episcopal Church and neighborhood commercial amenities such as Luna Restaurant, Egger's Meats, and Dance Center of Spokane. On Tuesday July 1, 2008 bicycle and pedestrian counts were done for three hours in the morning and three hours in the afternoon on Hatch Road south of 57th Avenue. There was only 1 pedestrian during the six hours of counting, perhaps due to the lack of adequate pedestrian facilities within the corridor.





<u>Bicycle Facilities</u>. Within Spokane County, the Spokane Regional Transportation Council (SRTC) designates all arterial roadways as Class IV "Shared Roadways" if they are not equipped with dedicated bike facilities. Hatch Road is designated as a Class IV facility (see **Figure 1-8**). Hatch Road serves as a significant portion of a popular bicycle route that loops via Hangman Valley Road, to the Palouse Highway, to 57th Avenue and back to Hatch Road. As a Class IV roadway, bicycles share the travel lanes with cars along Hatch. The Spokane County Regional Trails Plan Draft 2008 has identified Hatch Road as an area for improvement. One of the planning goals in the document is to "Provide a safe bicycle/pedestrian route in the area of Hatch Road between Highway 195 and 57th Avenue." The City of Spokane Master Bike Plan 2008 specifies that Hatch Road would remain a Class IV "shared roadway".

On Tuesday July 1, 2008 bicycle and pedestrian counts were performed on Hatch Road south of 57th Ave. Counts were done during peak periods, from 6:00-9:00 in the morning and 4:00-7:00 in the afternoon. **Table 1-3** and **Table 1-4** show the AM and PM bicycle counts. These counts are consistent with the documentation of this corridor as a regionally significant bicycle route.

| AM Bicycles | | | | | | | | |
|-------------|--------|------|---------------|------|--------|-----|-------|-----|
| | | Dire | Direction Sex | | x Age | | | |
| Hour | Number | SB | NB | Male | Female | <18 | 19-64 | 65+ |
| 6:00-6:15 | 5 | 4 | 1 | 4 | 1 | 0 | 5 | 0 |
| 6:15-6:30 | 26 | 2 | 24 | 26 | 0 | 0 | 22 | 4 |
| 6:30-6:45 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 6:45-7:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00-7:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15-7:30 | 2 | 2 | 0 | 2 | 0 | 0 | 1 | 1 |
| 7:30-7:45 | 3 | 3 | 0 | 1 | 2 | 0 | 3 | 0 |
| 7:45-8:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00-8:15 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 0 |
| 8:15-8:30 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 8:30-8:45 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 |
| 8:45-9:00 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| Total | 43 | 15 | 28 | 37 | 6 | 0 | 37 | 6 |

| 1 UDIE 1-3 | Та | ble | 1-3 |
|------------|----|-----|-----|
|------------|----|-----|-----|

Table 1-4

| PM Bicycles | | | | | | | | |
|-------------|--------|------|---------------|------|--------|-----|-------|-----|
| | | Dire | ction Sex Age | | | | | |
| Hour | Number | SB | NB | Male | Female | <18 | 19-64 | 65+ |
| 4:00-4:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15-4:30 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 4:30-4:45 | 2 | 2 | 0 | 0 | 2 | 0 | 2 | 0 |
| 4:45-5:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00-5:15 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 5:15-5:30 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 5:30-5:45 | 4 | 3 | 1 | 4 | 0 | 0 | 4 | 0 |
| 5:45-6:00 | 4 | 3 | 1 | 3 | 1 | 0 | 4 | 0 |
| 6:00-6:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15-6:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30-6:45 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 6:45-7:00 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| Total | 15 | 11 | 4 | 11 | 4 | 0 | 15 | 0 |

Hatch Road Study; 57th to Hangman Bridge Corridor Study Report *Revised: February 24, 2008*



While there are no significant accident reports pertaining to bicycles, Hatch Road does present a variety of hazards. Hatch is a steep, winding road with narrow lanes, inconsistent shoulders, and gravel on the roadway. These hazards present many opportunities for improving Hatch Road, in order to make it safer for bicycles, as well as pedestrians.

Transit Operations

<u>Spokane Transit Authority (STA)</u>. Currently, STA Route 45 (**see Figure 1-9**) connects downtown Spokane to the south hill along Southeast Blvd. to Regal St. to 57th Ave. and then a loop along Perry St., 49th Ave. and Crestline St. to 57th Ave. and back toward downtown. After Reviewing STA's 2008-2014 Transit Development Plan, it was concluded that there are no immediate future routes anticipated in the project area.

Freight Operations

U.S. Highway 195, Hatch Road and 57th Avenue are all designated truck routes for semi-tractor trailers and truck and trailers (**see Figure 1-10**). Hatch Bridge currently has a weight restriction posted, limiting loads to 25 Tons for a single unit, 36 Tons for a Semi-Tractor Trailer and 40 Tons for a Truck and Trailer. City of Spokane traffic count data from June and July 2008 showed that 4.8 percent of the road's total daily volume can be attributed to truck traffic. This data shows that Hatch Road is a significant truck route.









Collision History

1998-2007 collision data along the Hatch Road corridor from 57th Ave. to US 195 was reviewed. The data, provided by the City of Spokane and the Washington State Department of Transportation, includes details about the location, time of day, collision type, severity, and contributing reasons. Along the corridor there were 37 collisions during the ten-year data period. **Figure 1-11** identifies the number and types of collisions by location. The highest number of collisions occurred at the intersection of Hatch Road and 57th Avenue, where there are high traffic and turning movement volumes.

<u>Collision Types</u>. Most collisions along Hatch Road are rear end or object/parked vehicle collisions. They each make up 32 percent of Hatch Road collisions reflecting the steep grade of road, narrow lanes and vehicles stopping to make left turns at intersections. **Table 1-5** summarizes the types of collisions observed throughout the Hatch Road corridor.

| Туре | Collisions (2000-06) | Percent (%) Of Total |
|---------------------------------|----------------------|-------------------------|
| Rear End | 12 | 32% |
| Object/Parked Vehicle Collision | 12 | 32% |
| Entering at an Angle | 5 | 14% |
| Head On | 4 | 11% |
| Approach Turn | 2 | 5.5% |
| Sideswipe | 2 | 5.5% |
| Total | 37 | 100% |

Table 1-5. Collision Types Hatch Road

<u>Contributing Reasons</u>. Other reasons can contribute to a collision event. **Table 1-6** identifies the contributing factors associated with the reported collisions.

Table 1-6. Contributing Reasons to Collisions

| Contributing Reasons | Collisions (2000-06) |
|----------------------------------|----------------------|
| None Listed | 10 |
| Not Granting Right of Way | 7 |
| Following too Closely | 5 |
| Under the Influence of Alcohol | 4 |
| Other | 4 |
| Exceeding Reasonably Safe Speeds | 1 |
| Inattention | 1 |
| Over the Centerline | 1 |





Relevant Regional Transportation Improvement Projects

US 195 – Hatch Road to Interstate 90

WSDOT is improving the corridor along US 195 between I-90 and Hatch Road by constructing interchanges at Cheney-Spokane Road, Meadow Lane Road and Hatch Road. The project also includes construction of grade-separated crossings for Thorpe Road and 16th Avenue, as well as a new city street network system. The new city street network system will allow motorists alternative routes other than US 195 and provides separation of local and regional traffic. The Hatch Road interchange project includes the realignment of the southern portion of Hatch Road, including the Hangman Bridge, from Hangman Valley Road to US 195 and the relocation of the intersection of Hatch Road and Hangman Valley Road. **Figure 1-12** shows a preliminary concept of the proposed interchange at Hatch Road on US 195. The limited access plans for the project were approved in December 2002. The preliminary designs are currently underway; however, it is still unfunded by about 94 million dollars. Once funding is complete, acquisition of right of way and construction can begin and will be phased in three parts.

Hatch Road Bypass

This project was envisioned during the SRTC Southside Transportation Study (2004) and would provide a new principal arterial route from Hatch Road to the Palouse Highway with connections to Regal and Freya Streets. This project is assumed to be built by 2030 according to the SRTC Metropolitan Transportation Plan (MTP), Update 2007.

57th Avenue – Perry Street to Hatch Road

This is a project listed in the 2007 MTP Update and includes upgrading the road to current standards by building sidewalks, curb and bike lanes with a center two-way left turn lane. These upgrades would match the existing 57th Avenue road section between Perry Street and Palouse Highway. It is anticipated that these improvements may be included with the Hatch Road Project.





SECTION 2 – IMPROVEMENT OPTIONS

Identification of Vision & Opportunities

Upon completion of the research and understanding of the baseline conditions for the Hatch Road corridor, it was clear that the corridor is rich with deficiencies, and as such is also rich with opportunities for improvement. With this information in-hand, the Stakeholder Advisory Committee (SAC) and Public Meetings were held on June 11th, and June 12th, 2008, respectively to communicate and validate the baseline conditions, and to solicit input from the stakeholders and residents in the form of vision elements and improvement opportunities.

Detailed notes and format discussion from the SAC and Public meetings is presented in **Appendix A**. A summary of the more prevalent vision elements communicated by the stakeholders and public is provided as follows:

• Bicycle and Pedestrian Facilities:

- o Improved Bicycle and Pedestrian Facilities are Needed
- o Safety is the Primary Concern
- Consider Near-Term Solution for Bicycles for Safety Reasons
- Uphill/Downhill Bicycle Facilities Desirable
- Consider Splitting Bicycle/Pedestrian Facilities to Connect at 57th & Perry
- Upgrade Bicycle Facilities to Include Signage/Markings (Class III)
- o Maximize Opportunities for Pedestrian Connections
- Hatch Road Corridor Safety Issues:
 - Roadway Surfacing and Shoulders are Deficient and Unsafe
 - o Soil Stability is an Issue During Intense Rain Events
 - o Roadway Superelevation is too Great During Icy Conditions
- Hatch & 57th Intersection Improvements
 - o Consider left-turn lane on 57th
 - o Consider Merge Lane for East-Bound Turning off Hatch Road
 - Need Signal for Left Hand Turns (safety and operations)

Improvement Options

Ideas for improvements to the Hatch Road corridor were collected from the SAC and Public meetings. Feasible options were combined with ideas from City staff and the consultant team and are presented



below. The improvement options are categorized as safety improvements, bike and pedestrian facilities improvements, and Hatch Road and 57th Ave Intersection improvements.

Safety Improvements

The City of Spokane has indicated that any rebuild of Hatch Road pavements should consider the following roadway safety improvements:

- Provide Minimum Standard Lane Width: 12'
- Provide Minimum Standard Shoulders: 3'
- Provide Standard Superelevation: 2% Maximum.
- Rebuild Hatch Road Pavement Section
- Improve Hatch Road and 57th Ave Intersection (see options below)

Bicycle and Pedestrian Facilities

Figure 2-1 illustrates the initial improvement options considered for the Hatch Road corridor. A summary of each option is provided as follows:

<u>Option 1A – Buffered Shared Use Pathway (Class I)</u>. This option would improve facilities on Hatch Road to include a 12' wide, paved, Class I shared use pathway, located on the uphill side of the road. In addition, a standard 5-foot bike lane would be provided for downhill bike traffic, due to the steep grade and associated high travel speeds. Option 1A provides for a 7-foot (min.) separation between vehicular traffic and the shared use pathway. One variation of Option 1A would be to separate the shared use pathway from the Hatch Road alignment and connect it to the Perry Street & 57th Avenue intersection.

In this option, the bike lane would be delineated with 6" wide white pavement markings, as well as standard bicycle lane symbols.

<u>Option 1B – Adjacent Shared Use Pathway (Class I)</u>. This option would improve facilities on Hatch Road to include a 12' wide, paved, Class I shared use pathway, located on the uphill side of the road. In addition, a standard 5-foot bike lane would be provided for downhill bike traffic, due to the steep grade and associated high travel speeds. Option 1B does not include the multi-use pathway buffer area, instead locating the shared use path immediately adjacent to the roadway curb.

In this option, the bike lane would be delineated with 6" wide white pavement markings, as well as standard bicycle lane symbols.

<u>Option 2 – Bike Lanes/Sidewalks (Class II).</u> This option would improve facilities on Hatch Road to include bicycle lanes and sidewalks as shown. The uphill bike lane would be 6-feet wide to provide for additional passing width for slow moving cyclists.

In this option, the bike lanes would be delineated with 6" wide white pavement markings, as well as standard bicycle lane symbols.

<u>Option 3 – Shared Use Lanes/Sidewalks (Class III or IV)</u>. This option would improve facilities on Hatch Road to include 15-foot minimum standard width shared use lanes, and sidewalks as shown. Bicyclists would be required to share the lanes with vehicular traffic, but additional lane width is provided for safety.



Bicycle signage and markings may be included to highlight the presence of significant bicycle traffic. Signage and pavement markings will be in accordance with the City's Comprehensive Plan and may include shared use designation signage and symbols.

<u>Option 4 – Widened Uphill Shoulder/Sidewalk (Class III or IV)</u>. This option would improve facilities on Hatch Road to include a widened 6-foot shoulder, and uphill sidewalk as shown. This option represents the vision as presented in the 2004 Southside Transportation Study, as developed by the Spokane Regional Traffic Council (SRTC), City of Spokane, Spokane County and neighborhood stakeholders. The shoulder pavement markings would consist of a standard 4-inch white line.

With the same roadway and bike facility lane widths as shown, the City could designate the uphill shoulder as a true bike lane, and include signage and markings for both the bike lane and shared use lanes. This variation is consistent with the current City of Spokane Master Bicycle Plan draft, and is intended to be the standard for terrain-constrained corridors, such as Hatch Road in the next Comprehensive Plan update.

<u>Option 5 – Widened Shoulders/Sidewalk (Class IV)</u>. This option would improve facilities on Hatch Road to include widened 6-foot shoulders, and uphill sidewalk as shown. This option represents a City Council-approved roadway section for Hatch Road as envisioned in the early 1990's when housing development approvals began along the corridor. Shoulder pavement markings would consist of a standard 4-inch white line.





Upgrading of the existing bicycle facilities for Hatch Road is a local and regional priority, as consistently identified in the following planning documents:

- <u>Spokane County Regional Trails Plan, January, 2008 DRAFT</u> Identifies urban connection strategy to "Provide a safe bicycle/pedestrian route in the area of Hatch Road between Highway 195 and 57th Avenue."
- <u>SRTC Southside Transportation Study, 2004</u> Identifies a widened shoulder "for bicyclists and pedestrian use on the uphill side of the roadway."
- <u>City of Spokane Master Bike Plan, August 2008 DRAFT</u> Identifies Hatch Road to an uphill bike lane, and a marked downhill shared-use lane.
- <u>City of Spokane Comprehensive Plan, December, 2006 Update</u> Identifies Hatch Road to include Class IV, shared-use bicycle facilities.

Due to the wide range of initial bike/pedestrian improvements options identified, an initial screening was performed to pare them down to three feasible options for which design concepts and conceptlevel analysis would be performed. The three options were selected primarily to envelope the range of costs/impacts anticipated with implementation of the feasible facilities options. The options selected for analysis are:

- Option 1B Adjacent Shared Use Pathway (Class I)
- Option 2 Bike Lanes/Sidewalks (Class II)
- Option 4 Widened Uphill Shoulder/Sidewalk (Class III or IV).

Hatch and 57th Intersection Improvements

Three feasible options are presented for consideration for improving the safety and operations of the Hatch and 57th Intersection. Figures depicting the conceptual layouts for these options are provided in Section 3 of this document.

<u>Option 1 – 'T' Intersection</u>. This option would improve the intersection configuration to a standard 'T'. Left-turn pockets would be provided on Hatch and 57th, and all movements would either be controlled via traffic signal or stop sign(s). Additionally, a right-turn lane would be provided on east-bound 57th Ave to improve operations for these movements.

<u>Option 2 – Single-Lane Urban Roundabout</u>. This option would improve the intersection configuration to a modern single-lane urban roundabout. The roundabout would be located slightly southerly of the existing intersection location, to accommodate a northern leg that would provide safe access to a number of residents adjacent to the intersection. The inscribed circle is anticipated to be 110' and would accommodate the WB-50 design vehicle, and emergency vehicles via use of the mountable concrete truck apron adjacent to the center island.

<u>Option 3 – Four-Way Intersection at Hatch & Perry</u>. This option would replace the existing intersection at Hatch & 57th with a four-leg intersection, located at the existing 57th Ave & Perry St

Page 2-5



intersection. Hatch Road would need to be extended north to Perry to accommodate this option. The current Hatch and 57th intersection would be obliterated and portions of the roadways would be utilized for local access to adjacent homes and St. Stephens Church.

Page 2-6



SECTION 3 - ANALYSIS OF IMPROVEMENT OPTIONS

Conceptual Layouts

In order to analyze the Hatch Road improvement options, conceptual layouts of the improvement options were prepared. Preparation of the concept-level engineering layouts serves to illustrate each option, identify key elements, potential issues and impacts. Options for the Hatch Road bicycle and pedestrian facilities, as well as for the 57th & Perry Intersection improvements are depicted and discussed in detail herein.

Bicycle/Pedestrian Facilities Options

Elements common to each Bicycle/Pedestrian Facility Option are summarized as follows:

Horizontal Alignment. In order to accommodate the additional width required for the bike/pedestrian facilities, the Hatch Road horizontal alignment has been modified. In general, the roadway centerline has been adjusted towards the uphill side of the existing terrain, in an effort to minimize difficult to construct, costly, fill-related impacts downhill of the existing roadway and best-fit the widest pedestrian/bike facility option (Option 2).

Vertical Alignment. In general, the Hatch Road vertical alignment was adjusted minimally, to closely match the existing roadway grades. However, between Hangman Valley Road and Highland Park Drive, the existing grades on Hatch Road exceed the maximum City standard grade of 8 percent, in places (see **Appendix C, Sheet 1**). As such, the vertical alignment was adjusted to accommodate the 8 percent maximum grade and as a result, there are centerline cut depths in this region of up to 8 feet. Alternatively, the City may choose to obtain a design deviation in this area and simply match the existing grades, in order to save substantial cost.

Roadway Safety Elements. As previously discussed, the following roadway elements are intended to be modified as part of the roadway pavement reconstruction and bike/pedestrian improvements and are included in each option:

- Provide Minimum Standard Lane Width: 12'
- Provide Minimum Standard Shoulders: 3'
- Provide Standard Superelevation: 2% Maximum.
- Rebuild Hatch Road Pavement Section
- Improve Hatch Road and 57th Ave Intersection (see options below)
- Reconstruct Roadway Pavements Recommended to replace existing pavement section on Hatch Road with 5 ½ inches of Hot Mix Asphalt on 7 inches Crushed Rock Base Course (CRBC).



Option 1B – Shared Use Pathway, Class I

See **Figure 3-1** for a plan view and typical sections for this option.

This option includes a 12-foot wide shared use pathway that would accommodate uphill/downhill pedestrian movements on Hatch Road, as well as uphill bicycle traffic. Due to the steep grades, and associated downhill bicycle speeds, a 5-foot bike lane will be included to safely accommodate downhill bicycle traffic. The shared use pathway would be asphalt-surfaced, and would be located adjacent to the roadway curb as shown.

Where existing sidewalks are currently located on Hatch Road, formal (marked and signed) or informal crossings would be implemented to provide safe locations for pedestrians/bicyclists to access the pathway.

In order to minimize cut-slope and right-of-way acquisition, cut-slope retaining walls are required on the uphill sides of the roadway. The estimated extents and wall height ranges for the retaining walls are shown in **Figure 3-1**. Per the geotechnical engineering recommendations, it is anticipated that cut-slope retaining walls will be fairly straightforward to construct, and would likely be soldier pile walls with an aesthetic facing.

Option 2 – Bike Lanes/Sidewalks, Class II

See **Figure 3-2** for a plan view and typical sections for this option.

This option includes bike lanes adjacent to the vehicle travel lanes, and 5-foot sidewalks adjacent to the roadway as shown. The downhill bike lane would be 5-feet wide, and the uphill bike lane would be 6-feet wide. The bike lanes would include a 6-inch wide, white painted line to separate the bike lane from the vehicle lane, and would also include standard bike-lane symbols and signage to clearly identify the intended use.

The proposed sidewalks would be designed to match in to existing sidewalks to provide a continuous and safe route along Hatch, from Hangman Valley road to 57th Ave.

In order to minimize cut-slope and right-of-way acquisition, cut-slope retaining walls are required on the uphill sides of the roadway. The estimated extents and wall height ranges for the retaining walls are shown in **Figure 3-2**. Per the geotechnical engineering recommendations, it is anticipated that cut-slope retaining walls will be fairly straightforward to construct, and would likely be soldier pile walls with an aesthetic facing.

There are locations where roadway fill slopes do not catch within the existing Hatch Road right-of-way, and permanent slope easements would be required. In all cases, these incursions on private property occur where there are no direct impacts to private parcels, and if desired, the City may limit these impacts by constructing Mechanically Stabilized Earth (MSE) retaining walls.

Option 4 – Widened Uphill Shoulder / Sidewalk, Class III or IV

See Figure 3-3 for a plan view and typical sections for this option.

This option includes a 6-foot uphill shoulder, adjacent to the vehicle travel lane. While the purpose of the widened shoulder would be for bicyclists, a standard 4-inch white line would delineate the shoulder



Hatch Road Study; 57th to Hangman Bridge Corridor Study Report *Revised: February 24, 2009* Page 3-2

area, and no bike-lane signs or markings are required. Alternatively, the City may designate the shoulder as a bike lane, with a 6" stripe and bike lane markings. The shared use lane may be designated with signage and "sharrow" pavement markings as well if Class III facilities are desired.

A 5-foot sidewalk would be provided on the uphill side of the roadway only. Where existing sidewalks are currently located on Hatch Road, formal (marked and signed) or informal crossings would be implemented to provide safe locations for pedestrians/bicyclists to access the uphill sidewalk.

Due to the limited bike/pedestrian facilities presented in this option, it is anticipated that the associated impacts and cost would be minimized.

In order to minimize cut-slope and right-of-way acquisition, cut-slope retaining walls are required on the uphill sides of the roadway. The estimated extents and wall height ranges for the retaining walls are shown in **Figure 3-3**. Per the geotechnical engineering recommendations, it is anticipated that cut-slope retaining walls will be fairly straightforward to construct, and would likely be would likely be soldier pile walls with an aesthetic facing.

WHPacific






Hatch & 57th Intersection Improvement Options

No-Build Option

This option would only serve to reconstruct the existing pavements at the current Hatch/57th Intersection location, and no safety or bike/pedestrian facility improvements are considered.

Option 1 – 'T' Intersection

This option would include the reconstruction of the existing Hatch & 57th intersection to a standard 'T' configuration as depicted in **Figure 3-4**.

<u>Safety Improvements</u>. Modifying the intersection to a 'T' configuration provides the following safety improvements over the existing configuration:

- Improved sight distance due to improved landing distance, and elimination of landscaped triangle.
- Improved sight angles due to elimination of triangular geometry.
- Improved pedestrian crossings due to more formalized crosswalks and potential signal control.

<u>Horizontal and Vertical Alignments</u>. In order to obtain standard vertical grades (3 percent maximum grade, 100 feet from the intersection curb returns) at the proposed intersection location, the grade of Hatch Road will need to increase to a maximum of 8 percent. As shown in **Appendix C, sheet C-2**, the roadway will need to be re-graded 650 feet back along Hatch to safely attain the required grades. Retaining walls may be required to contain the fill slopes from the elevated roadway.

<u>Impacts to Private Property</u>. St. Stephens Episcopal Church, located on the SE quadrant of the proposed 'T' Intersection would be impacted by this option. Raising the profile grade to accommodate the required intersection landing along Hatch Road would preclude access to the lower church parking lot from Hatch road. As such, it is assumed that access to the lower lot would need to be provided from the upper lot and that these improvements would be accommodated by the City as part of this project.

<u>Impacts to Utilities</u>. The 'T' intersection configuration will have the following impacts to existing utilities:

• Existing natural gas, fiber optic, water and buried telephone facilities located at the Hatch & 57th Intersection and running along 57th Ave would require relocation to the new 57th Ave and Hatch roadway alignments.

<u>Landscaping/Gateway Opportunities</u>. This reconfiguration of the intersection will provide for several pocket areas, suitable for landscaping, as shown. Additionally, the City may wish to include provisions to include gateway features, such as welcome signs, public artwork, and/or informational boards within certain landscaped areas.



Option 2 – Urban Single Lane Roundabout

This option would include the reconstruction of the existing Hatch & 57th intersection to an urban single lane roundabout with an inscribed circle of 110 feet, as depicted in **Figure 3-5**.

<u>Safety Improvements</u>. Modifying the intersection to a roundabout provides the following safety improvements over the existing configuration:

- Improved sight distance due to improved landing distance, and elimination of landscaped triangle.
- Improved sight angles due to elimination of triangular geometry.
- Minimized accident severity by reduction of turning movement conflict points, elimination of left turns, and improved speed control throughout the intersection for all intersection legs.
- Improved pedestrian crossings due to more formalized crosswalks.

<u>Horizontal and Vertical Alignments</u>. In order to obtain standard vertical grades (3 percent maximum grade, 100 feet from the intersection curb returns) at the proposed intersection location, the grade of Hatch Road will need to increase to a maximum of 6.9 percent. As shown in **Appendix C, sheet C-3**, the roadway will need to be re-graded approximately 1,200 feet back along Hatch to safely attain the required grades. Retaining walls may be required to contain the fill slopes from the elevated roadway.

<u>Impacts to Private Property</u>. St. Stephens Episcopal Church, located on the SE quadrant of the proposed roundabout would be impacted by this option. Raising the profile grade to accommodate the required intersection landing along Hatch Road would preclude access to the lower church parking lot from Hatch road. As such, it is assumed that access to the lower lot would need to be provided from the upper lot and that these improvements would be accommodated by the City as part of this project. The roundabout will require additional right-of-way from the church, due to the geometry of the intersection.

This option would also include limited impact to three residences immediately adjacent to the intersection location, along the northern side of 57th Ave. In order to safely provide access from these properties to the intersection, a separate frontage-type access road is proposed. This access road would connect to the roundabout directly, allowing access to each of the other three primary intersection legs. Minor grading of the driveways for the properties is anticipated to accommodate vertical grade changes required to accommodate the roundabout.

<u>Impacts to Utilities</u>. The roundabout intersection configuration will have the following impacts to existing utilities:

• Existing natural gas, fiber optic, water and buried telephone facilities located at the Hatch & 57th Intersection and running along 57th Ave would require relocation to the new 57th Ave and Hatch roadway alignments.

<u>Landscaping/Gateway Opportunities</u>. The roundabout reconfiguration allows for several pocket areas, suitable for landscaping, as shown. Additionally, the City may wish to include provisions to include gateway features, such as welcome signs, public artwork, and/or informational boards within the central island of the roundabout.



Option 3 – Four-Way Intersection at Hatch & Perry

This option would include the realignment of Hatch Road from approximately Blackwood Lane up to the existing Perry Street / 57th Avenue intersection location, as depicted in **Figure 3-6**.

<u>Safety Improvements</u>. Relocating the intersection to Perry provides the following safety improvements over the existing configuration:

- Improved sight distance due to improved landing distance.
- Improved sight angles due to elimination of triangular geometry.
- Improved pedestrian crossings due to more formalized crosswalks.

<u>Horizontal and Vertical Alignments</u>. In order to obtain standard vertical landing grades (3 percent maximum grade, 100 feet from the intersection curb returns) at the proposed intersection location, the grade of Hatch Road will need to increase to a maximum of 7.8 percent. As shown in **Appendix C, sheet C-4**, the roadway will need to be re-graded 1,100 feet back along Hatch to safely attain the required grades. Retaining walls will be required to minimize cut slope impacts along uphill side of the re-aligned Hatch roadway.

<u>Impacts to Private Property</u>. The realignment of Hatch Road to Perry Street will have the following impacts to private property:

- Closure of 58th access to Perry Street: In order to minimize additional traffic impacts to the single-family neighborhoods on 58th, it is recommended to eliminate the direct access to Perry Street and provide a turn-around (hammerhead or cul-de-sac). 58th Street residents would have access to 57th Ave via Helena Street, one block to the east.
- Acquisition of property at SE Corner of 58th & Perry: Due to the proximity of the realigned Hatch Roadway, as well as the recommended turn-around on 58th Street, it is likely that the impacts to this property will lead to acquisition of the entire parcel. Acquisition of this parcel would allow for access to the property directly to the South via extension of a private driveway off of the proposed turn-around.
- Right-of-Way for curb radii: Right-of-Way will be required from the parcels immediately adjacent to the Perry/57th intersection in order to encompass the 35-foot turning radii required at the new Hatch leg.
- Noise Impacts: Significant realignment of Hatch in this manner would likely necessitate a noise impact analysis, and result in possible mitigation efforts to address impacts.
- Existing Hatch/57th Intersection: The existing intersection would no longer be necessary for connection of 57th to Hatch. As such, the City might consider the following opportunities for the existing intersection location and segment of Hatch along the southerly side of the Episcopal church:
 - Remove existing roadway pavements and re-establish to natural conditions (provided fiber optic, gas, and telephone facilities are relocated to the realigned Hatch/Perry Street alignment).
 - Modify the intersection to allow local access for the Episcopal Church lower parking lot, and utilities remaining on Hatch Road.

Page 3-9



<u>Impacts to Utilities</u>. The realignment of Hatch Road to Perry Street will have the following impacts to utilities:

- Existing natural gas, fiber optic, and buried telephone facilities located at the Hatch & 57th Intersection and running along Hatch Road between the intersection and the new alignment with Perry would require relocation to the new Perry Street alignment.
- Sanitary sewer, water, natural gas, and telephone facilities on Perry Street, between 57th and 58th would require adjustment to the new roadway grades. Aerial power and cable facilities along the Perry Street right-of-way would require relocation to the new roadway alignment.

<u>Landscaping/Gateway Opportunities</u>. The new Perry Street alignment and intersection provides for limited pocket areas, suitable for landscaping, as shown. Additionally, the City may wish to include provisions to include gateway features, such as welcome signs, public artwork, and/or informational boards within the curb return right-of-way, or on the acquired property at 58th and Perry.







Page 3-13

Traffic Operations Analysis

Operations Analysis of Intersection Control Treatment Options

This narrative summarizes the preliminary operation analysis of intersection control treatment options for the Hatch Road and 57th Avenue Intersection. These options will require further geometric and feasibility evaluation but provides a menu of options to choose from to narrow down the range of alternatives that should be further considered by the City of Spokane.

Description of Alternatives

Below are a description and summary of the improvement concepts developed for 57th Avenue and Hatch Road. **Figure 3-7** illustrates the intersection control treatment options considered.

- **No-Build**: No geometric Changes to the intersection.
- **Option 1a:** Build a three legged 'T' intersection that is three-way stop controlled. Eastbound 57th Avenue will have a through and right turn lane. Westbound 57th Avenue will have a through and a left turn lane. Northbound Hatch Road will have a left turn and a right turn lane. The intersection will be controlled by a 3-way stop.
- **Option 1b**: Build a three legged 'T' intersection that is stop controlled on Hatch Road only. This alternative is geometrically the same as Option 1 but is controlled by a stop on Hatch Road.
- **Option 1c**: Build a 'Flying T'-Intersection. This option is similar to Option 1 and 2 but westbound through on 57th Avenue is a free movement. There will be a receiving lane for northbound left from Hatch Road that will allow merging onto 57th Avenue.
- **Option 1d**: Build a three legged 'T' intersection that is signalized. This option is similar to Option 1 and 2 but is signalized.
- **Option 2**: Build a Single lane roundabout. This option will construct a single lane roundabout with four legs. The residential traffic on the north side of 57th Avenue will use a frontage road that connects to the north leg of the intersection.
- **Option 3a**: Realign Hatch Road with Perry Street. This option realigns Hatch Road and constructs a traffic signal for intersection control. Eastbound and westbound 57th Avenue will have a left-turn lane and a through-right lane. Northbound Hatch Road and southbound Perry Street will have a single approach.
- Option 3b: Realign Hatch Road with Perry and add northbound right turn lane.
- No roundabout option was analyzed for the Hatch & Perry intersection location due to significant physical constraints and property impacts that would be unavoidable.



Page 3-15

Traffic Operations

Traffic volumes collected by WSDOT at 57th Avenue and Hatch Road and 57th Avenue and Perry Street were used to develop 2008 PM peak hour volumes. The volumes were projected to 2030 using a 1.4% growth rate provided by Spokane Regional Transportation Council. The 2030 PM peak hour volumes are used to predict how the intersection treatment will operate in the future. Highway Capacity Software was used to analysis stop controlled intersection options; SYNCHRO was used to analyze traffic signal options, and SYDRA was used to analysis the roundabout option.

The table below summarizes the resulting intersection Level of Service and control delay for each option.

| Table 3-1. PM Peak Hour Intersection Level of Service | | | | | | |
|---|---------|--------------|---|---------|--------------|--|
| | 2008 PN | A Peak Hour | | 2030 PN | /I Peak Hour | |
| Option Evaluated | LOS* | LOS* Delay** | | | Delay** | |
| No Build | В | 13.7 | - | D | 30 | |
| Option 1a | D | 27.6 | - | F | 114.7 | |
| Option 1b | D | 27.2 | | F | 232.2 | |
| Option 1c | C | 23 | | F | 154.3 | |
| Option 1d | В | 17 | | C | 27.9 | |
| Option 2 | А | 6 | | В | 13.6 | |
| Option 3a | D | 37.4 | | F 122.6 | | |
| Option 3b | C | 30.9 | | E | 79 | |

*LOS = Level of Service

**Delay = Average delay in seconds per vehicle. For all-way stop controlled, signalized, and roundabout intersections LOS and delay is based on a weighted average of all approaches. For two-way stop controlled intersection LOS and delay is based on the worst performing movement.

Operationally, the intersection treatments considered for a new Hatch intersection at 57th And Perry (Option 3a, 3b) do not provide a 2030 PM Peak-Hour LOS sufficient to match even the No-Build intersection at its current location. As such, no further analysis or cost computations have been considered for these Options.

Option 2 (Roundabout) is the best performing treatment for the Hatch & 57th Intersection with a 2030 PM Peak-Hour LOS B. Options 1D (Signalized 'T' Intersection) and the No-Build Option are the next best options operationally, with LOS C and LOS D, respectively.

WHPacific

Concept-Level Costs

Concept-level cost estimates were prepared for each of the Bicycle/Pedestrian Improvement Options and the Hatch & 57th Intersection Improvement Options, including estimates of enhancements, right-of-way costs, and engineering & construction management costs. Unit prices were derived from a combination of recent construction cost unit bid prices, recent historical averages, and discussions with appropriate vendors and/or purveyors.

The detailed cost estimates are provided in **Appendix B**. A summary of the concept-level cost estimates is provided below in **Table 3-2**.

| Cost C | Component | Bike/Ped/Safety Option 1b | Bike/Ped/Safety Option 2 | Bike/Ped/Safety Option 4 | |
|--|--|------------------------------|-----------------------------|-----------------------------|--|
| CONSTRUCTION COSTS (incl. 20% Design & Construction | Option 1 - 'T' Intersection | \$9,000,000 | \$9,800,000 | \$8,600,000 | |
| | Option 2 - Roundabout Intersection | \$8,800,000 | \$9,600,000 | \$8,400,000 | |
| Contingencies) | Option 3 – Hatch & Perry Intersection | N/A** | N/A** | N/A** | |
| | | | | | |
| TOTAL PROJECT | Option 1 - 'T' Intersection | \$11,000,000 | \$12,000,000 | \$10,500,000 | |
| COSTS (incl. 12% Design Engineering & 10% | Option 2 - Roundabout Intersection | \$10,700,000 | \$11,700,000 | \$10,200,000 | |
| Management) | Option 3 – Hatch & Perry Intersection | N/A** | N/A** | N/A** | |
| | | | | | |

Table 3-2: Summary of Concept-Level Cost Estimates

** Option 3 – Upon review of the operational deficiencies as compared to the potential improvements at the existing intersection location of Hatch and 57th, it was concluded Option 3 did not justify relocating the intersection. Therefore the financial analysis of this option was not completed.



^{*}All costs are shown in rounded 2008 dollars.

SECTION 4 - CONCLUSIONS

The purpose of the Hatch Road Study is to identify and evaluate feasible engineering solutions in order to achieve the following objectives:

- Improve safety at the intersection of Hatch Road & 57th;
- Include designated facilities for bicycle/pedestrian use along Hatch Road, per the 2004 SRTC Southside Transportation Study, and
- Reconstruct deficient roadway pavements.

Following successful completion of this study, the City of Spokane plans on using the design solutions and cost estimates to pursue further project funding for final design and construction. This study has produced a number of feasible options that meet the aforementioned objectives. The range in anticipated costs/impacts identified during the study process are such that the City is able to confidently pursue sufficient funds to accommodate any combination of the bicycle and pedestrian, intersection safety, and roadway safety options identified.

The final design phase of this project is anticipated to include a public involvement component that will seek input on the preferred solutions that evolve. The final design phase is also anticipated to include environmental study and documentation, as well as right-of-way analysis, appraisal, and purchase, if required.

APPENDIX A

DOCUMENTATION OF PUBLIC INVOLVEMENT PROCESS

APPENDIX A

DOCUMENTATION OF PUBLIC INVOLVEMENT PROCESS

The public involvement process is a key component of the Hatch Road Study/Preliminary Design Project. In order to create a plan that truly reflects the City's and Stakeholders vision, it was critical to maintain two-way communication with stakeholders and community members and to be sure that their concerns were reflected in the decision-making process.

One of the first steps in the public involvement process was to identify the Stakeholder Advisory Committee (SAC). The purpose of the SAC was to provide guidance and feedback to the consultant team throughout the process. Stakeholders were selected by the City and include neighborhood group representatives, Spokane County planning and engineering, City of Spokane planning and engineering, WSDOT, SRTC, Health District, and Bicycle Advisory Board representatives. The list of SAC members is attached.

The public involvement process occurred in several ways – primarily in meetings, but also via public comment forms which were distributed at the Public Meetings, and e-mail and phone correspondence. Two SAC meetings and two public meetings were held at selected key points during the planning study. The purpose of each meeting is described below.

SAC Meeting #1 – At SAC meeting #1, held on June 11, 2008, project goals and existing and future baseline conditions of the Corridor were outlined by the consultant team. The majority of this meeting was used for roundtable discussion to identify the specific bicycle/pedestrian and safety issues and opportunities which exist in the Corridor. The consultant team recorded SAC member ideas on a flip chart.

Public Meeting #1 – This meeting was held the night after the first SAC meeting at St. Stephens Episcopal Church, and provided much of the same data (project goals, baseline conditions, etc.) to the public. As a method to gather the public's input on what the specific transportation issues of the Corridor are, the consultant team used graphic display boards depicting the entire Corridor and had members of the public circulate around the graphics using post-it notes to write down suggested enhancements. The enhancement written on the post-it was then adhered to the corresponding location on the graphic.

All of the data and information obtained during the first set of meetings was compiled, categorized, and used to develop a list of potential improvement options.

SAC Meeting #2 – At SAC meeting #2, held on November 20, 2008, conceptual safety improvements, bicycle/pedestrian facilities and intersection improvement options and subsequent analyses were presented. Feedback on the options and analyses were solicited from the stakeholders and changes were incorporated in to the draft final Corridor Report for presentation at Public Meeting #2.

Public Meeting #2 – This meeting was held on January 21, 2009 at Beautiful Savior Lutheran Church. The draft conceptual improvement options, as modified by SAC meeting #2 and subsequent analyses were presented to the group. Comments were solicited and are documented herein.

Hatch Road Study; 57th to Hangman Bridge Corridor Study Report Revised: February 24, 2009 Appendix A-1



All comments received on the project to date are included in the following pages.

Hatch Road Study; 57th to Hangman Bridge Corridor Study Report Revised: February 24, 2009 Appendix A-2



City of Spokane Hatch Road Study/Preliminary Design

Stakeholder Advisory Committee (SAC)

| Stakeholder Representative | Representation |
|-------------------------------|-------------------------------|
| | |
| Linda Cunningham | Comstock |
| Fred Knostman | Eagle Valley/LatahValley |
| Patrick Moore | Southgate |
| Paul Kropp | Moran Prairie |
| John Speare | Bicycle Advisory Board |
| Bill Bender | Bicycle Advisory Board |
| Heleen Dewey | Pedestrian - Health District |
| Louis Meuler | City Planning- Transportation |
| Eve Nelson | SRTC |
| Steve Davenport | County Planning |
| Chad Simonson | WSDOT Eastern Region |
| | |

HATCH ROAD STUDY / PRELIMINARY DESIGN

Stakeholders Advisory Committee (SAC) DRAFT Meeting Notes

June 11, 2008, 6:30 PM

Spokane City Hall, Conference Room 5a

| In Attendance: | Katherine Miller (City CIP) | John Speare (Bicycle Advisory Board) | | |
|----------------|------------------------------|--------------------------------------|--|--|
| | Richard McDermott (City CIP) | Bill Bender (Bicycle Advisory Board) | | |
| | Mark Brower (WHPacific) | Heleen Dewey (Health District) | | |
| | Fred Knostman (Latah Valley) | Eve Nelson (SRTC) | | |
| | Paul Kropp (Moran Prairie) | | | |
| Not in | Linda Cunningham (Comstock) | Steve Davenport (County Planning) | | |
| Attendance: | Patrick Moore (Southgate) | Louis Meuler (City Planning) | | |

SAC general comments:

- WSDOT should be included on the Stakeholder Advisory Committee.
- Southgate neighborhood's focus is on Regal projects. Consider contacting new Chair, Teresa Kafentzis, individually to update and garner input.

SAC comments on Baseline Conditions for Hatch Road:

- Need to add more pedestrian/bicycle destinations. Include north Hatch Road to High Drive area. Include Hangman Park hiking/biking trails.
- Recall cyclist fatality on Hatch/Hangman Valley Road, perhaps in 2006/07.
- Reference Bicycle Master Plan and ensure we are coordinated with planning.
- Update ADT data for the current year.
- Add development data from City/County planning.
- AM traffic counts would be beneficial. Consider including bike/pedestrian counts.

- Note that the Hatch roadway itself is inconsistent, in terms of lane widths, shoulders.
- Verify the Hatch corridor priority with Bicycle Master Plan. Should be highest priority.

SAC Roundtable comments on Hatch Road deficiencies/issues, as well as vision for the improved Hatch corridor:

- Hatch/Hangman Valley is one of the most popular bike routes in City
- Uphill/downhill bike facility is desirable.
- Left onto Hangman Valley Road from Hatch, consider safety mitigation for this turning movement.
- Ensure that we're coordinated with planned DOT project at 195 and Hatch
- Additional commercial possible in Regal/Palouse area impacts to Hatch need to be considered.
- Hatch serves as primary access for Valley residents to schools, team sports, water parks, commercial, medical/dental, Post Office, churches, etc on South Hill.
- Is there a way to fund the improvements in our lifetime? Would like to find a way!
- At a minimum bike lane on east, sidewalk on west side.
- Politics of solving only bike/pedestrian and not traffic? Does this make this project a difficult sell to City/funding agencies?
- There is currently congestion at US 195 and at 57^{th}
- Vehicular traffic will benefit with separated bike traffic. Flow and safety are primary benefits.
- City is seeking feasible/fundable implementation not "Taj Mahal."
- Hatch should remain Minor Arterial, if bike route.
- If US 195 project occurs, would likely negative impact to bike/pedestrians on Hatch. Commit to keeping Hatch a minor arterial?
- Safety should be the number one criteria for evaluation Hatch improvement options.
- Hatch road needs signage that highlights the corridor as a bicycle route, such as the "Share the Roadway" signage.
- Bicycle Master Plan to call for improving class of the Hatch corridor to include bicycle signage.
- Ensure project plan is coordinated with City/County/Bike/WSDOT corridor and regional planning.
- Signage for bike/pedestrians, as well as speed limit needs more emphasis
- Make sure Hatch Road stays 2-lane, minor arterial.
- A buffer between pedestrian facilities is desirable.
- Plan for long term; include coordination with transit planning (pullouts, crosswalks, etc.).
 - Consider separated bike/pedestrian pathway. Separate with planting strip.
- Emphasize recreational trails in the area/park lands and private. Maximize connection opportunities for pedestrians in Hatch corridor.

Public Meeting Sign in Sheet

June 12, 2008

Name

Preferred Contact Information

MCAPILEARE CLARKA DAVIS ionas S LUSTOF ĺ Pra 28 Ŋ 1 Mar ンへ CURRIER 4ber my PO NK Ž PReda DaRothy N-K J MIAR 60 Ş at the arce し、め Seb Nelson 5 لم لا PAN V 6184 Where 7



Public Meeting Sign in Sheet

June 12, 2008

Preferred Contact Information LCNCORN Nob - Warlson Brad Rateliff STELLARKO chsor Name 96 NANCY E VANS ZAROWING Jeal Webster AVX91 てなし 13:2 としいひょう tour per G 064 9 N.S. t d







Public Meeting Sign in Sheet

Hatch Road Study; 57th to Hangman Bridge Summary of Public Comments from 6-12-08 Meeting

| Comment | Category |
|---|--|
| Signal at 57th intersection. Consider que length along Hatch: flatten grade, widen lanes, traffic cycle times, multiple lanes. Speed limit 30 mph. | 57th/Hatch Intersection |
| Left turn lane for westbound traffic on 57th turning onto Hatch and a merge lane for cars coming up Hatch and going east on 57th. (4 lanes). | 57th/Hatch Intersection |
| Need signal at 57th and Hatch to alleviate long waits for left turns. | 57th/Hatch Intersection |
| 57th and Hatch intersection is very dangerous. | 57th/Hatch Intersection |
| Lots of unused land near church and 57th intersection | 57th/Hatch Intersection |
| Fix Hatch and 57th 1st ; Pave Hatch 2nd; promote bypass from Pullman to Palouse Hwy's | 57th/Hatch Intersection |
| The expansion of Hatch for bikes and turn lanes is very much needed. | Dike /Ded Secilities |
| Bike lanes min. width of 6', prefer 8'. Uphill bike velocity as low as 5mph. No downhill bike lane is ok if lane | Bike/Ped Facilities |
| width is at least 12'. In the meantime, before project implementation, repair shoulder, add 3' pavement beyond fog line. Problems with poor shoulder like drainage and erosion. Will add significant safety with little impact. | Bike/Ped Facilities Bike/Ped Facilities |
| Two vehicle lanes uphill, one down. Allows slow traffic to get out of way. Second lane will give bikes a safe lane to climb the hill. Bike lanes not often used because of gravel accumulation. | Bike/Ped Facilities |
| Combination bike/ped walkway downhill (bikes in traffic lane anyway). | Bike/Ped Facilities |
| Temporary bike lane until project implemented so nobody is killed. Just uphill lane. | Bike/Ped Facilities |
| No need to ever put in downhill bike lane. Sidewalk on one side only. | Bike/Ped Facilities |
| Yes improve road safety for bikes, don't improve road for trucks or more car traffic. | Bike/Ped Facilities |
| Bike/Ped need both up and downhill access and safety. Top Priority. | Bike/Ped Facilities |
| Use Perry for the uphill bikelanes, keeping traffic on Hatch | Bike/Ped Facilities |
| School district boundaries include all developments on Hatch and north on 195 are in the Mullan Road Elementary District. This increases traffic and need for ped/bike facilities to get to school. | Bike/Ped Facilities |
| Bike/Ped facilities are badly needed. Very dangerous right now. Safety of bike/ped should be the primary concern. | Bike/Ped Facilities |
| I would rather have a passable uphill bike lane (at least 3') in 2 yrs than a great one in 15 yrs | Bike/Ped Facilities |
| Send only bikes up Perry | Bike/Ped Facilities |
| Must have bike lanes on downhill side as well as the uphill side. Going downhill bicyclists have limited ability to signal. Cars like to pass bikes going downhill posing a potential fatality. | Bike/Ped Facilities |
| Support bike lanes as well as rebuilding the roadway surface. | Bike/Ped Facilities |
| Bike lanes should be on both sides of the road, road should be resurfaced. | Bike/Ped Facilities |
| Negative impact on church and children's activities. | Church Impact |



Hatch Road Study; 57th to Hangman Bridge Summary of Public Comments from 6-12-08 Meeting

| Comment | Category |
|--|--------------------|
| Curb and gutter/drain stormwater to 208 swale at bottom. | Drainage |
| Stormwater drainage to minimize erosion. | Drainage |
| Need more traffic information in addition to tube counts. Other methods are available. Both summer and winter counting etc. | Funding |
| Load Restrictions on Hangman Bridge should be enforced to limit trucks and buses on Hatch. | Hangman Bridge |
| Replace bridge with full roadway section and right turn lanes. | Hangman Bridge |
| Put timeline on lower 1/2 or 1/3 near bridgepossibly get BR or State funds | Hangman Bridge |
| Alternate truck route. | Hatch Road Bypass |
| Take trucks off HatchBuild bypass. Bypass seems like the best solution. Amen! | Hatch Road Bypass |
| Too many problems with Hatch. Need Hatch road bypass | Hatch Road Bypass |
| Push for Hatch Road Bypass | Hatch Road Bypass |
| Work to get the bypass built | Hatch Road Bypass |
| Concerned about ruining neighborhood at 58th and Perry. Understands safety issue at 57th and Hatch. Use creativity to solve the problem without disrupting neighborhood. (See Diagram) | No Perry Extension |
| Concerned about Perry connection. Traffic would use 58th instead of 57th. Could 58th become a cul-de-sac on the west side? Safety of children in the neighborhood with increased traffic. | No Perry Extension |
| Maintain neighborhood environment/quality at 57th/58th between Perry and Helena. Benefit of keeping traffic on Hatch versus changing to Perry- Create T or roundabout. | No Perry Extension |
| Violently opposed to connecting to Perry. Destroy a neighborhood and make it unsafe for kids. Property values would plummet. Take part of church parking lot to make decent intersection at 57th | No Perry Extension |
| Use lower church parking lot to make 57th intersection. Seldom used by the church. Don't destroy neighborhood on 58th. Kids play in the streets. No highway along Perry | No Perry Extension |
| Don't Destroy 58th/Perry neighborhood | No Perry Extension |
| opposed to connecting Hatch and Perry. If so, make 58th a cul-de-sac, add rock wall, or use church parking lot | No Perry Extension |
| Option1: Make Hatch and 57th a "T". How is "+" safer than a "T"? Option2: Use some church land to create a roundabout. Option3: Remove entire church to improve intersection. | No Perry Extension |
| Block Perry to traffic between 57th and 58th. | No Perry Extension |
| Concerned about noise level as a result of increased traffic. | Noise |
| Noise abatement for Helena residents | Noise |
| Concerned about noise abatement for all residents on Hatch | Noise |
| Contact owners about surveying. Get permission to access private property. | Notification |



Hatch Road Study; 57th to Hangman Bridge Summary of Public Comments from 6-12-08 Meeting

| Comment | Category |
|--|---------------------|
| Add Manito/Cannon Hill Notification | Notification |
| Sight distance on corners for both cars and bikes. Especially Hatch and Hangman Valley intersection | Roadway Problems |
| Retaining walls will be needed to stabilize slopes. | Roadway Problems |
| Concerned about soil stability on uphill side if road is widened for bike/ped. | Roadway Problems |
| Consider wider shoulders for safety, car break downs, accidents, etc. | Roadway Problems |
| Reduce Speed limit on Hatch | Roadway Problems |
| Superelevation of corners is too great in the winter. | Roadway Problems |
| Very dangerous turning in and out of the church parking lot onto 57th | Roadway Problems |
| Just put in 6' shoulders, 10' lanes with proper drainage. | Roadway Problems |
| Future commercial developments are continuing with no regard to bottlenecks on Hatch. That will increase both regular traffic and freight. | Roadway Problems |
| What is the process to join the Stakeholder Committee. | Stakeholders |
| Concerned about Tuscan Ridge Condos. Factors: 5yrs building infrastructure, utilities, sewers, retaining walls, construction noise/pollution. 100 condos = 200 cars then increased traffic on Hatch. | Tuscan Ridge Condos |
| Was this used for the Tuscan Ridge Condos? | Tuscan Ridge Condos |
| 100 New Condos planned | Tuscan Ridge Condos |
| Do not ignore the proposed Tuscany Condos as they pose more problems and no solutions. | Tuscan Ridge Condos |
| 58th and Perry extended to Hatch. Traffic light at Perry and 57th | Yes Perry Extension |
| Address safety at 57th and Hatch. Perry extension would greatly improve safety. | Yes Perry Extension |
| To meet grade standards it is important to look at the Perry extension as a viable alternative. | Yes Perry Extension |



HATCH ROAD STUDY / PRELIMINARY DESIGN

Stakeholders Advisory Committee (SAC) Meeting Notes

November 20, 2008, 6:30 PM

Spokane City Hall, Conference Room 2b

| In Attendance: | Katherine Miller (City CIP) | Bob Lutz (Bicycle Advisory Board) |
|----------------|-----------------------------------|--------------------------------------|
| | Richard McDermott (City CIP) | Bill Bender (Bicycle Advisory Board) |
| | Mark Brower (Womer & Assoc.) | David Lill (Southgate) |
| | Fred Knostman (Latah Valley) | Eve Nelson (SRTC) |
| | Paul Kropp (Moran Prairie) | Linda Cunningham (Comstock) |
| | Steve Davenport (County Planning) | Louis Meuler (City Planning) |
| | Barry Greene (County Traffic) | Joel Soden (City Bicycle Planning) |
| Not in | Chad Simonson WSDOT | John Speare (Bicycle Advisory Board) |
| Attendance: | Teresa Kafentzis (Southgate) | Heleen Dewey (Health District) |
| | Patrick Davidson (Eagle Valley) | |

SAC comments on Pedestrian/Bicycle Concepts:

- Some SAC members felt that downhill bike lanes should be wider than the uphill bike lanes to allow flexibility for higher speeds.
- Bicycle Advisory Board representatives recommended no downhill bike lane. They
 would rather be in a shared use lane with vehicles. Drivers will pay more attention
 to bicyclist's signals and maneuvering in a shared lane situation. Also, the frequent
 presence of debris poses a threat when the bicyclist is limited to a bike lane
 traveling at downhill speeds. This is the direction that the Master Bike Plan is
 heading as well.

- Some questioned whether it would be beneficial to have a downhill bike lane for relatively inexperienced users. In general, the steep Hatch Road grade precludes most inexperienced users from using the corridor with any regularity. Sidewalks, if available, could also be used for inexperienced riders.
- 8-foot sidewalks are desirable for Hatch Road, due to area requirements for plowing.
- Many would like to see a sidewalk along the downhill side of Hatch Road, due to the number of developments on that side of the road. Also the views to the west are more enticing. In general sidewalks on both sides of the road are preferred, such that crossings are minimized within the corridor.
- SAC members questioned if short-term improvements to the dangerous bicycle facilities are possible? More immediate bicycle improvements would need to be discussions with City Streets Dept. and would take the form of minor improvements to the shoulders, etc.

SAC comments on the Intersection Improvement Concepts:

- Members discussed how roundabouts accommodate bicyclists. There are options for bicyclists to utilize the circulatory roadway, or the widened combined-use sidewalks as shown in the figure.
- Has the City considered purchasing right-of-way of the three parcels on 57th that require their own access roadway? Would the cost balance out? The City responded that the state/federal funding programs tend to favor, and pay for, solutions that minimize impacts to private property.
- County mentioned that signalizing the Flying T intersection is also an option.
- County planning has no immediate plans for the Hatch Road bypass. In fact, construction of a bypass roadway is not a best practice outside the Urban Growth Area (UGA).
- County indicated that the SRTC model includes the Hatch Road Bypass in the build scenario, as well as the new interchange at SR 195 and Hatch Road. If these projects are not built, the traffic numbers may be significantly higher on Hatch Road, thereby creating a traffic bottleneck.
- SAC neighborhood representatives favored including gateway opportunities in the intersection options shown.
- The Consultant advised that the single-lane urban roundabout provides for the best operations, based on 2030 pm peak-hour traffic growth estimates.

General Comments:

- City staff indicated that the next public meeting would likely be in the beginning of January, 2009. After that point, the Corridor Study report would be finalized.
- City staff is happy to come to neighborhood meetings to discuss the project.

HATCH ROAD STUDY / PRELIMINARY DESIGN

Public Meeting Agenda

January 21, 2009, 6:30 pm

Beautiful Savior Lutheran Church 4320 S. Conklin Street

| Introductions and Welcome | 6:30 – 6:40 pm |
|---|----------------|
| Welcome and Introductions (K. Miller) | |
| • Study Process Overview (K. Miller) | |
| DRAFT Conceptual Improvement Options (M. Brower) | 6:40 – 7:00 pm |
| Safety Improvements | |
| Bicycle/Pedestrian Facilities | |
| Hatch and 57th Intersection Improvements | |
| Analysis of DRAFT Improvement Options (M. Brower) | 7:00 – 7:30 pm |
| Bicycle/Pedestrian Facilities | |
| Common Elements, Impacts, Issues | |
| Hatch and 57th Intersection Improvements | |
| Common Elements, Impacts, Issues, Traffic Operations | |
| Concept-Level Cost Estimates | |
| Summary & Next Steps (K. Miller, M. Brower) | 7:30 – 7:40 pm |
| Questions & Comments | 7:40 – 8:00 pm |

Thank you for your support and input on this project!

Public Meeting Sign in Sheet January 21, 2009

| Preferred Contact Information | | | | | | | | | | | | | | |
|-------------------------------|-----------------------|-----------------|----------------------|--------------------|-------------|-----------------------|--------------------|------------|--------------|---------------|--------------|---------------|------------------|--|
| Name | Tarke & Jam Sargrave) | Duida Cumunghan | CyNDE + John Chatham | Margaret Megilvrau | Cean Greene | 17 relet Dordly Davie | Christ Marci Houts | Dave Hower | They Swapper | Office Kreeps | Ruch Landers | Bobbic Salina | Kellee Daugherty | |





Public Meeting Sign in Sheet January 21, 2009 **Preferred Contact Information**

-VVatso-AT TH MLdeny Jarke Jarres I allman Tom 2 trank ()herst 1-Y Name 2944 Nav90 audavet Bob Nelson STEREN Revecu RIVIN 0





Name: Address: **Contact In** You currently have both School + STA buses using the 57th Perry Chend No. across the church parking lot by coming (Sealing off 58th AV) you could put a 57th & Perry STOP light Best wishes, CITY OF SPOKANE Please return comments via mail or email to: SPOKANE Katherine Miller at Spokane City Hall; kemiller@SpokaneCity.org 808 W. Spokane Falls Blvd., Spokane, WA 99201 HATCH ROAD STUDY;

57TH TO HANGMAN BRIDGE

JANUARY 2009

1

Name:

Address:

Contact Ir

LOVE the Roundabout!! Go for it.

| | Po | undab | outit | | | |
|---------|--------------------------------------|-------|--------------------------------|-----------|--|--|
| ŠPOKANE | Please re Katherine 808 W. Spc | | _ <i>spokan</i> , .vA 99201 | eCity.org | CITY OF SPOKANE ATCH ROAD STUDY; TO HANGMAN BRIDGE ACILIC | |

| Nam | e: |
|----------------|---|
| Addr | ess: |
| Conta | act Informa |
| | ~ Aque that Round Bout |
| | 15 BASST NOTUTION FOR SPEETY |
| | J TRAFFIC CALMINET. |
| | |
| | ~ BIKE LANGS GHOULD BUS |
| | LONSERVATION WOR ROW. |
| | |
| | |
| 2. | |
| 0 | |
| 11 <u></u> | |
| ŠPOKANE | Please return comments via mail or email to: Katherine Miller at Spokane City Hall; kemiller@SpokaneCity.org 808 W. Spokane Falls Blvd., Spokane, WA 99201 HATCH ROAD STUD 57TH TO HANGMAN BR |

WHPacific

JANUARY 2009

DGE

| Name: |
|----------------------|
| Address: |
| Contact Information: |
| |
| |
| I agree with y |
| the Bikers' Advice |
| That there should be |
| downhill on Hatch |
| - That would be more |
| a clean lane with |
| traffic. |
| |
| traffic. |



Please return comments via mail or email to: SPOKANE Katherine Miller at Spokane City Hall; kemiller@SpokaneCity.org 808 W. Spokane Falls Blvd., Spokane, WA 99201


PUBLIC COMMENT FORM

| Name: | |
|-----------------------------|-------------|
| Address: | |
| Contact Information: | |
| Would like to see crassi | WAIK |
| at Lower Tomaker -> Highia | and Park. |
| This is a school bus stop ; | Pines |
| children need to cross Ho | atch |
| Road when dropped off | + bus going |
| downhill. This makes for | a dangerous |
| situation ; a cross wa | IK would |
| be comforting. | |
| Need wider road most | 411 |
| Blind spot fixed below | tomaker. |

SPOKANE

Please return comments via mail or email to: Katherine Miller at Spokane City Hall; kemiller@SpokaneCity.org 808 W. Spokane Falls Blvd., Spokane, WA 99201

CITY OF SPOKANE HATCH ROAD STUDY; There are many walking paths on both sides of WHPacific JANUARY 2009 WHPacific JANUARY 2009 Think sidewalk costs not necessary.

APPENDIX B

CONCEPT-LEVEL COST ESTIMATES

| CITY | OF S | SPOKANE | | | | | | | | | | |
|--|------|--|------|----------------|---------------------------------------|--------------------------|----------------|----------------------|---------------------------|--|--|---------------------------------|
| Hatch Road Study: 57th to Hangman Bridge | | 2 | | | | | | | | OPTION #4 | | |
| ΔΡΡΕ | | X B. CONCEPT-LEVEL COST ESTIMA | \TF | | OPTION #1B | | | OPTION #2 | | WIDE | NED UPHILL | . FOR |
| | | | | UPHILLS | SHARED USE P | PATHWAY | DUAL BI | KELANES & SI | DEWALKS | SHOUL | DER & SIDE | WALK |
| | NO. | ITEMS OF WORK AND MATERIALS | UNIT | TOTAL QUANTITY | UNIT PRICE | TOTAL AMOUNT | TOTAL QUANTITY | UNIT PRICE | TOTAL AMOUNT | TOTAL QUANTITY | UNIT PRICE | TOTAL AMOUNT |
| | | GENERAL ITEMS | | | | | | | | | | |
| | 1 | General Conditions & Mobilization (8%) | LS | 1 | \$ 289,000 | \$ 289,000 | 1 | \$ 326,000 | \$ 326,000 | 1 \$ | 274,000 | \$ 274,000 |
| | 2 | Temporary Traffic Control (5%) | LS | 1 | \$ 181,000 | \$ 181,000 | 1 | \$ 204,000 | \$ 204,000 | 1 \$ | 171,000 | \$ 171,000 |
| | 3 | Erosion Control (1.5%) | LS | 1 | \$ 54,000 | \$ 54,000 | 1 | \$ 61,000 | \$ 61,000 | 1 \$ | 51,000 | \$ 51,000 |
| | 4 | CLEARING, GRUBBING & DEMO ITEMS | | | ¢ 72.000 | * 72.000 | | ¢ 01.000 | ć 01.000 | | <u> </u> | ć <u> </u> |
| | 4 | Removal of Structures & Obstructions (2%) | LS | 1 | \$ 72,000 : \$ 2.00 ! | \$ 72,000 e | 1 | \$ 81,000 \$ 2.00 | \$ 81,000 ¢ | | 68,000 | \$ 68,000 ¢ |
| | 6 | Removal of Walks and Driveways | SOFT | 0 | <u>\$ 2.00</u> | | 0 | \$ 2.00 \$ 2.00 | | 0 \$ | 2.00 | <u>-</u> \$ |
| | 7 | Asphalt Pavement Cutting | FOOT | 300 | \$ 1.50 | \$ 450 | 300 | \$ 1.50 | \$ 450 | 300 \$ | 1.50 | \$ 450 |
| | 8 | Clearing and Grubbing (incl. trees) | LS | 1 | \$ 10,000 | \$ 10,000 | 1 | \$ 10,000 | \$ 10,000 | 1 \$ | 10,000 | \$ 10,000 |
| | | ROAD CONSTRUCTION ITEMS | | | | | | | | | | |
| | 9 | Roadway Excavation/Embankment | CUYD | 34300 | \$ 12 | \$ 411,600 | 62000 | \$ 12 | \$ 744,000 | 32000 \$ | 12 | \$ 384,000 |
| | 10 | Cold Plane Pavement Removal, 7 Inch Deep | SQFT | 151400 | \$ 0.75 | \$ 113,550 | 151400 | \$ 0.75 | \$ 113,550 | 151400 \$ | 0.75 | \$ 113,550 |
| | 11 | Aggregate Base, 7" thick | SQFT | 161900 | \$ 1.25 \$ 2.25 | <u>\$ 202,375</u> | 155800 | \$ 1.25 ¢ 2.25 | \$ <u>194,750</u> | 161300 \$ | 1.25 | <u>\$ 201,625</u> |
| | 12 | Level 3, HMAC Mixture, 3.5 (filck | SOFT | 161900 | <u>\$ 2.25</u> \$ 1.50 | \$ 304,275 \$ 242,850 | 155800 | \$ 2.25 \$ 1.50 | \$ 350,550 \$ 233,700 | 161300 \$ | 2.25 | <u>\$ 362,925</u> \$ 2/1 950 |
| | 14 | Plain Concrete Pymt., 8" Thick | SOFT | 0 | \$ 6.50 | \$ <u>242,850</u> \$- | 155800 | \$ 1.50 \$ 6.50 | <u>\$ 233,700</u> \$ - | 0 \$ | 6.50 | <u>\$</u> |
| | 15 | Concrete Curb and Gutter | FOOT | 8850 | \$ 15 | \$ 132,750 | 8850 | \$ 15 | \$ 132,750 | 8850 \$ | 15 | \$ 132,750 |
| TS | 16 | Concrete Standard Curb | FOOT | 0 | \$ 9.00 | \$ - | 0 | \$ 9.00 | \$ - | 0 \$ | 9.00 | \$ - |
| Ż | 17 | Pavement Markings | FOOT | 11646 | \$ 0.50 | \$ 5,823 | 17469 | \$ 0.50 | \$ 8,735 | 11646 \$ | 0.50 | \$ 5,823 |
| Ξ | 18 | Roadway Signing | LS | 1 | \$ 10,000 | \$ 10,000 | 1 | \$ 10,000 | \$ 10,000 | 1 \$ | 10,000 | \$ 10,000 |
| E E | 19 | Pigmented & Patterned Crosswalk | SQFT | 0 | \$ 15 5 | \$ | 0 | \$ 15 | \$ - | 0 \$ | 15 | \$ - |
| Ó | 20 | Faced Soldier Pile Retaining Wall, Cut Slope | SQFT | 19004 | \$ 55 S | \$ 1,045,220 | 20454 | \$ 55 ¢ 25 | \$ 1,124,970 c | 1/104 \$ | 55 | \$ 940,720 |
| ЪВ | 21 | | SUFT | 0 | \$ <u></u> 55 | - | 0 | \$ 35 | \$ - | 0 3 | 35 | ş - |
| Σ | 22 | Concrete Driveways- 6" thick, Residential | SOFT | 0 | \$ 5.00 | \$ - | 0 | \$ 5.00 | Ś - | 0 \$ | 5.00 | <u>\$</u> |
| | 23 | Concrete Driveways, Reinf, 6" thk, Comm. | SQFT | 0 | \$ 5.50 | <u>-</u> \$ - | 0 | \$ 5.50 | \$ - | 0 \$ | 5.50 | \$ - |
| AC | 24 | Concrete Walks, 4" thick on 2" aggregate | SQFT | 0 | \$ 4.00 | \$ - | 44230 | \$ 4.00 | \$ 176,920 | 24115 \$ | 4.00 | \$ 96,460 |
| M | 25 | Concrete Sidewalk Ramps | EACH | 12 | \$ 1,250 | \$ 15,000 | 12 | \$ 1,250 | \$ 15,000 | 12 \$ | 1,250 | \$ 15,000 |
| 동 | 26 | Shared Use Path Asphalt, 2" thick | SQFT | 57900 | \$ 1.50 | \$ 86,850 | | | | | | |
| Ĕ | 27 | Shared Use Path Base Rock, 4" thick | SQFT | 57900 | <u>\$ 0.75</u> | \$ 43,425 | | | | | | |
| Ť | 20 | 12 Jack dia Storm Drain Bing | FOOT | <u> </u> | ¢ 25 | ¢ 220.000 | | ¢ 25 | \$ <u>220.000</u> | 0000 ć | 25 | ¢ 220.000 |
| | 20 | Concrete Inlets | FACH | 116 | <u>\$ 23</u> \$ 1500 | \$ 220,000 \$ 174,000 | 116 | \$ <u>1500</u> | \$ 220,000 \$ 174,000 | 116 \$ | 1 500 | <u>\$ 220,000</u> \$ 174,000 |
| | 30 | Storm Drainage Treatment/Control Facilities | EST | 110 | \$ 225.000 | \$ 225.000 | 110 | \$ 250.000 | \$ 250.000 | 110 \$ | 200.000 | \$ 200.000 |
| | | UTILITIES | | l | · · · · · · · · · · · · · · · · · · · | | | | | ······································ | | |
| | 31 | Water & Sewer Main Relocation | LF | 4000 | \$ 75 | \$ 300,000 | 4000 | \$ 75 | \$ 300,000 | 4000 \$ | 75 | \$ 300,000 |
| | 32 | Gas Main Relocation | LF | 2000 | \$ - ! | \$- | 2000 | \$ - | \$ - | 2000 \$ | - | \$ - |
| | 33 | OH Utility Relocations | LF | 2000 | \$ - ! | \$ | 2000 | \$ - | <u>\$</u> - | 2000 \$ | - | \$ - |
| | 34 | Buried Communication Relocations | LF | 2000 | <u>Ş - S</u> | <u>-</u> | 2000 | Ş - | Ş - | 2000 \$ | - | Ş - |
| | 25 | Removal of Existing Illumination | 15 | 0 | \$ 3,000 | ć _ | | \$ 3,000 | ¢ _ | o | 3 000 | ¢ |
| | 36 | Street & Pedestrian Lighting | LS | 0 | \$ 25.000 | , Ś - | 0 | \$ 5,000 | <u>\$</u> | 0 \$ | 25.000 | <u>,</u> Ś - |
| | 37 | Traffic Signal Installation | LS | 0 | \$ 220,000 | \$- | 0 | \$ 220,000 | \$ - | 0 \$ | 220,000 | \$ - |
| | | LANDSCAPE & RESTORATION | | I | · · · · · · · · · · · · · · · · · · · | | | | | | ······································ | |
| | 38 | Landscape Restoration | SQFT | 0 | \$ 1.50 | \$ - | 0 | \$ 1.50 | \$ - | 0 \$ | 1.50 | \$ - |
| | 39 | Center Island Landscaping | LS | 0 | \$ 10,000 | \$ | 0 | \$ 10,000 | \$ - | 0 \$ | 10,000 | \$ - |
| | 40 | Slope Stabilization | LS | 1 | \$ 15,000 S | 5 15,000 | 1 | \$ 15,000 | \$ 15,000 | 1 \$ | 15,000 | \$ 15,000 |
| | 41 | | LS | 0 | > 15,000 | > - | 0 | Ş 15,000 | \$ - | 0 \$ | 15,000 | \$ - |
| | 42 | Right of Way Monumentation | 15 | 1 | \$ 10,000 | <u>ς</u> 10 000 | 1 | \$ 10.000 | \$ 10.000 | 1 خ | 10 000 | \$ 10.000 |
| | 43 | Permanent Slope Easement | SQFT | 7550 | \$ 3.00 | \$ 22.650 | 27900 | \$ 3.00 | \$ 83.700 | 4900 \$ | 3.00 | \$ 14.700 |
| | 44 | Right of Way | SQFT | 8800 | \$ 10 | \$ 88,000 | 15500 | \$ 10 | \$ 155,000 | 8100 \$ | 10 | \$ 81,000 |
| | SUBT | OTAL | | | : | \$ 4,334,818 | | | \$ 4,995,075 | | | \$ 4,093,953 |

| CITY Hatch APPE | OF S n Ro NDI | SPOKANE ad Study; 57th to Hangman Bridge X B: CONCEPT-LEVEL COST ESTIMA | TE | UPHILL | OPTION #11 SHARED USE | B PATHWAY | DUAL BI | OPTION #2 (ELANES & SII | DEWALKS | WIDE SHOUI | OPTION #4 NED UPHILI DER & SIDE | L FOR WALK |
|-----------------------|---------------------|---|------|----------------|---|------------------------------|----------------|----------------------------|--|------------------|---------------------------------------|--------------------------------|
| | NO. | ITEMS OF WORK AND MATERIALS | UNIT | TOTAL QUANTITY | UNIT PRICE | TOTAL AMOUNT | TOTAL QUANTITY | UNIT PRICE | TOTAL AMOUNT | TOTAL QUANTITY | UNIT PRICE | TOTAL AMOUNT |
| | | | | | | | | | | | | |
| | 1 | GENERAL ITEMS | 15 | 1 | ć 100.100 | ć 100.100 | 1 | ¢ 100 E00 | <u>د اور اور اور اور اور اور اور اور اور اور</u> | 1 6 | 102 500 | ć 102 E00 |
| | <u>1</u> 2 | Temporary Traffic Control (5%) | 15 | 1 | \$ 124 500 | \$ 199,100 \$ 124,500 | 1 | \$ 124 700 | \$ 199,300 \$ 124,700 | 1 \$ | 192,300 | \$ 192,300 \$ 120,300 |
| | 2 | Frosion Control (1.5%) | 15 | 1 | \$ 124,300 \$ 37,300 | \$ 124,300 \$ 37,300 | 1 | \$ 37.400 | \$ 124,700 \$ 37,400 | 1 \$ | 36 100 | \$ <u>120,300</u> \$ 36,100 |
| | | CLEARING, GRUBBING & DEMO ITEMS | | | <i>\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ </i> | <i>y 37,300</i> | ¥ | , 57,400 | ý <u>57,400</u> | | 50,100 | <i>y 30,100</i> |
| | 4 | Removal of Structures & Obstructions (2%) | LS | 1 | \$ 49,800 | \$ 49,800 | 1 | \$ 49,900 | \$ 49,900 | 1 \$ | 48,100 | \$ 48,100 |
| | 5 | Removal of Curbs | FOOT | 0 | \$ 2.00 | \$ - | 0 | \$ 2.00 | \$ - | 0 \$ | 2.00 | \$ - |
| | 6 | Removal of Walks and Driveways | SQFT | 0 | \$ 2.00 | \$ - | 0 | \$ 2.00 | \$ - | 0 \$ | 2.00 | \$ - |
| | 7 | Asphalt Pavement Cutting | FOOT | 300 | \$ 1.50 | \$ 450 | 300 | \$ 1.50 | \$ 450 | 300 \$ | 1.50 | \$ 450 |
| | 8 | Clearing and Grubbing (incl. trees) | LS | 1 | \$ 10,000 | \$ 10,000 | 1 | \$ 10,000 | \$ 10,000 | 1 \$ | 10,000 | \$ 10,000 |
| | | ROAD CONSTRUCTION ITEMS | | | | | | | | | | - <u>.</u> |
| | 9 | Roadway Excavation/Embankment | CUYD | 19783 | <u>\$ 12</u> | <u>\$ 237,396</u> | 19429 | <u>\$ 12</u> | <u>\$ 233,148</u> | 18268 \$ | 12 | <u>\$ 219,216</u> |
| | 10 | Cold Plane Pavement Removal, 7 Inch Deep | SQFT | 73042 | \$ 0.75 | \$ 54,782 | 73042 | \$ 0.75 | \$ 54,782 | 73042 \$ | 0.75 | \$ 54,782 |
| (0 | 11 | Aggregate Base, /" thick | SQFT | 97510 | \$ 1.25 \$ 2.25 | \$ 121,888 \$ 210,209 | 105010 | <u>\$ 1.25</u> | \$ 131,263 \$ 226,272 | 100510 \$ | 1.25 | \$ 125,638 \$ 226,149 |
| Ë | 12 | Level 3, HMAC Mixture, 5.5 thick | SOFT | 97510 | \$ 2.23 \$ 1.50 | \$ 219,396 \$ 1/6.265 | 105010 | \$ 2.23 \$ 1.50 | \$ 250,275 \$ 157,515 | 100510 \$ | 1 50 | \$ 220,140 \$ 150,765 |
| <u> </u> | 14 | Plain Concrete Pymt 8" Thick | SOFT | 0 | \$ 6.50 | \$ <u>1</u> +0,205 | 105010 | \$ 6.50 | \$ <u>1</u> 57,515 | , 100510 0 \$ | 6 50 | \$ <u>1</u> 50,705 |
| Σ | 15 | Concrete Curb and Gutter | FOOT | 5200 | \$ 15 | \$ 78.000 | 5200 | \$ 15 | \$ 78.000 | 5200 \$ | 15 | \$ 78.000 |
| N N | 16 | Concrete Standard Curb | FOOT | 0 | \$ 9.00 | \$ - | 0 | \$ 9.00 | \$ - | 0 \$ | 9.00 | \$ - |
| õ | 17 | Pavement Markings | FOOT | 8100 | \$ 0.50 | \$ 4,050 | 8100 | \$ 0.50 | \$ 4,050 | 8100 \$ | 0.50 | \$ 4,050 |
| E E | 18 | Roadway Signing | EACH | 1 | \$ 5,000 | \$ 5,000 | 1 | \$ 5,000 | \$ 5,000 | 1 \$ | 5,000 | \$ 5,000 |
| Σ | 19 | Pigmented & Patterned Crosswalk | SQFT | 720 | \$ 15 | \$ 10,800 | 720 | \$ 15 | \$ 10,800 | 720 \$ | 15 | \$ 10,800 |
| z | 20 | Faced Soldier Pile Retaining Wall, Cut Slope | SQFT | 17725 | \$ 55 | \$ 974,875 | 16775 | \$ 55 | \$ 922,625 | 16475 \$ | 55 | \$ 906,125 |
| 2 | 21 | MSE Retaining Wall, Fill Slope | SQFT | 3550 | \$ 35 | \$ 124,250 | 3675 | \$ 35 | \$ 128,625 | 3550 \$ | 35 | \$ 124,250 |
| 5 | | SIDEWALKS & DRIVEWAYS | COFT | 670 | ć 5.00 | ¢ 2.250 | 670 | ¢ 5.00 | ¢ 2.250 | c70 6 | 5.00 | ¢ 2.250 |
| SE | 22 | Concrete Driveways- 6" thick, Residential | SQFT | 670 | \$ 5.00 \$ 5.00 | \$ 3,350 ¢ | 670 | \$ 5.00 \$ 5.00 | \$ 3,350 ¢ | 6/0 \$ | 5.00 | \$ 3,350 ¢ |
| ER | 23 | Concrete Walks 4" thick on 2" aggregate | SOFT | 10950 | \$ 5.50 \$ 4.00 | > - \$ 13,800 | 25950 | \$ 5.50 \$ 4.00 | > - \$ 103 800 | 0 \$ 18450 \$ | 5.50 | <u> </u> |
| Ę | 24 | Concrete Sidewalk Ramps | FACH | 10950 | \$ 4.00 \$ 1.250 | \$ <u>43,800</u> \$ 5,000 | 23330 4 | \$ 1 250 | \$ <u>5,000</u> | 18450 Ş 4 ¢ | 4.00 | \$ 75,800 \$ 5,000 |
| <u> </u> | 26 | Shared Use Path Asphalt, 2" thick | SQFT | 18000 | \$ 1,250 \$ 1.50 | \$ 27.000 | | <u> </u> | \$ 3,000 | | 1,230 | ç <u>5,000</u> |
| Ē | 27 | Shared Use Path Base Rock, 4" thick | SQFT | 18000 | \$ 0.75 | \$ 13,500 | | | | | | |
| <u> </u> | | STORM DRAINAGE | | | | | | | | | | |
| z | 28 | 12 Inch dia. Storm Drain Pipe | FOOT | 2250 | \$ 25 | \$ 56,250 | 2250 | \$ 25 | \$ 56,250 | 2250 \$ | 25 | \$ 56,250 |
| ō | 29 | Concrete Inlets | EACH | 30 | \$ 1,500 | \$ 45,000 | 30 | \$ 1,500 | \$ 45,000 | 30 \$ | 1,500 | \$ 45,000 |
| ILd | 30 | Storm Drainage Treatment/Control Facilities | LS | 1 | \$ - | \$ - | 1 | \$ - | \$- | 1 \$ | - | \$ - |
| 0 | 31 | Water & Sewer Main Relocation | LF | 300 | \$ 75 | \$ 22,500 | 300 | \$ 75 | \$ 22,500 | 300 Ś | 75 | \$ 22,500 |
| | 32 | Gas Main Relocation | LF | 600 | \$ - | \$ - | 600 | \$ - | \$ - | 600 \$ | - | \$ - |
| | 33 | OH Utility Relocations | LF | 0 | \$ - | \$- | 0 | \$ - | \$- | 0 \$ | - | \$ - |
| | 34 | Buried Communication Relocations | LF | 900 | \$ - | \$- | 900 | \$ - | \$- | 900 \$ | - | \$ - |
| | | SIGNALS & LIGHTING | | | | | | | | | | |
| | 35 | Removal of Existing Illumination | LS | 1 | \$ 3,000 | \$ 3,000 | 1 | \$ 3,000 | \$ 3,000 | 1 \$ | 3,000 | \$ 3,000 |
| | 36 | Street & Pedestrian Lighting | LS | 1 | \$ 25,000 | \$ 25,000 | 1 | \$ 25,000 | \$ 25,000 | 1 \$ | 25,000 | \$ 25,000 |
| | 37 | Traffic Signal Installation | LS | 1 | \$ 220,000 | \$ 220,000 | 1 | \$ 220,000 | ş 220,000 | 1 \$ | 220,000 | \$ 220,000 |
| | 20 | LANDSCAPE & KESTUKATION | SOFT | 25050 | ¢ 1 E O | ć <u>ว</u> ק בקר | 25050 | ć 1 EO | ć <u>ว</u> ק בקר | 25050 6 | 1 50 | ć <u> </u> |
| | 20 | Center Island Landscaping | | 25050 | \$ 10,000 | \$ 57,575 \$ | 25050 | \$ 10,000 | \$ 37,575 ¢ - | 25050 \$ | 10,000 | \$ 57,575 \$ |
| | | Slope Stabilization | 15 | 1 | \$ 2500 | <u>-</u> \$ 2 500 | 1 | <u>\$ 10,000</u> | <u>-</u> \$ 2 500 | 1 ¢ | 2 500 | <u>-</u> \$ 2500 |
| | 41 | Gateway Feature | LS | 1 | \$ 15.000 | \$ 15.000 | 1 | \$ 15.000 | \$ 15.000 | 1 5 | 15.000 | \$ 15.000 |
| | | RIGHT-OF-WAY AND EASEMENTS | | | | | | | | | | |
| | 42 | Right of Way Monumentation | LS | 1 | \$ 2,500 | \$ 2,500 | 1 | \$ 2,500 | \$ 2,500 | 1 \$ | 2,500 | \$ 2,500 |
| | 43 | Permanent Slope Easement | SQFT | 0 | \$ 3.00 | \$ - | 0 | \$ 3.00 | \$ - | 740 \$ | 3.00 | \$ 2,220 |
| | 44 | Right of Way | SQFT | 23284 | \$ 10 | \$ 232,840 | 24784 | \$ 10 | \$ 247,840 | 26284 \$ | 10 | \$ 262,840 |
| | SUBT | OTAL | _ | | | \$ 3,152,668 | | | \$ 3,173,345 | | | \$ 3,088,758 |

| CITY | OF SPOKANE | | | | | | | | | | |
|------------|---|-----------|----------------|------------------------------|-----------------------------------|----------------|--|--|--|---------------------|---------------------------------|
| Hatch | h Road Study; 57th to Hangman Bridg | е | | | _ | | | | | | 500 |
| ΔΡΡΕ | NDIX B. CONCEPT-LEVEL COST ESTIM | ΔTF | | OPTION #1 | В | | OPTION #2 | | WIDI | | LFOR |
| | | | UPHILL S | SHARED USE | PATHWAY | DUAL BI | KELANES & SI | DEWALKS | SHOU | LDER & SIDE | WALK |
| | NO. ITEMS OF WORK AND MATERIALS | UNIT | TOTAL QUANTITY | UNIT PRICE | TOTAL AMOUNT | TOTAL QUANTITY | UNIT PRICE | TOTAL AMOUNT | TOTAL QUANTITY | UNIT PRICE | TOTAL AMOUNT |
| | GENERAL ITEMS | | | | | | | | | | |
| | 1 General Conditions & Mobilization (8%) | LS | 1 | \$ 183,000 | \$ 183,000 | 1 | \$ 180,000 | \$ 180,000 | 1 | \$ 176,000 | \$ 176,000 |
| | 2 Temporary Traffic Control (5%) | LS | 1 | \$ 114,000 | \$ 114,000 | 1 | \$ 112,000 | \$ 112,000 | 1 | \$ 110,000 | \$ 110,000 |
| | 3 Erosion Control (1.5%) | LS | 1 | \$ 54,000 | \$ 54,000 | 1 | \$ 61,000 | \$ 61,000 | 1 | 51,000 | \$ 51,000 |
| | CLEARING, GRUBBING & DEMO ITEMS | | | | | | ГГ | | ······································ | | |
| | 4 Removal of Structures & Obstructions (2%) | LS | 1 | \$ 46,000 | \$ 46,000 | 1 | \$ 45,000 | \$ 45,000 | 1 | 44,000 | \$ 44,000 |
| | 5 Removal of Curbs | FOOT | 0 | \$ 2.00 | <u>\$</u> - | 0 | \$ 2.00 | <u>\$</u> - | 0 | 5 2.00 | <u>\$</u> - |
| | 6 Removal of Walks and Driveways | SQFT | 0 | \$ 2.00 \$ 1.50 | <u>\$</u> - | 0 | \$ 2.00 | <u>\$</u> - | 0 | 5 2.00 | <u>\$</u> - |
| | Asphalt Pavement Cutting | FUUT | 300 | \$ 1.50 \$ 10.000 | \$ 450 \$ 10,000 | 300 | \$ 1.50 \$ 10.000 | <u>\$ 450</u> | 300 | 5 1.50 5 10.000 | \$ 450 \$ 10,000 |
| | | LS | L | \$ 10,000 | \$ 10,000 | L | \$ 10,000 | \$ 10,000 | I | 5 10,000 | \$ 10,000 |
| 6 | 9 Roadway Excavation/Embankment | | 19433 | \$ 12 | \$ 233.196 | 19079 | \$ 12 | <u>۲۲۵ ۲۲۵ ۲۲۵ ۲۲۵ ۲۲۵ ۲۲۵ ۲۲۵ ۲۲۵ ۲۲۵ ۲۲۵</u> | 17918 | 5 12 | \$ 215.016 |
| Ë | 10 Cold Plane Pavement Removal, 7 Inch Deep | SOFT | 73042 | \$ 0.75 | \$ 54,782 | 73042 | \$ 0.75 | \$ 54,782 | 73042 | 5 0.75 | \$ 54,782 |
| Ē | 11 Aggregate Base, 7" thick | SQFT | 87917 | \$ 1.25 | \$ 109,896 | 95417 | \$ 1.25 | \$ 119,271 | 90917 | 5 1.25 | \$ 113,646 |
| Σ | 12 Level 3, HMAC Mixture, 3.5" thick | SQFT | 87917 | \$ 2.25 | \$ 197,813 | 95417 | \$ 2.25 | \$ 214,688 | 90917 | \$ 2.25 | \$ 204,563 |
| Ž | 13 Level 3, HMAC Mixture, Overlay, 2" thick | SQFT | 87917 | \$ 1.50 | \$ 131,876 | 65417 | \$ 1.50 | \$ 98,126 | 90917 | 5 1.50 | \$ 136,376 |
| S | 14 Plain Concrete Pvmt., 8" Thick | SQFT | 2720 | \$ 6.50 | \$ 17,680 | 2720 | \$ 6.50 | \$ 17,680 | 2720 | 6.50 | \$ 17,680 |
| E E | 15 Concrete Curb and Gutter | FOOT | 6743 | \$ 15 | \$ 101,145 | 6743 | \$ 15 | \$ 101,145 | 6743 | \$ 15 | \$ 101,145 |
| ≥ | 16 Concrete Standard Curb | FOOT | 0 | \$ 9.00 | \$- | 0 | \$ 9.00 | \$ - | 0 | \$ 9.00 | \$ - |
| Z | 17 Pavement Markings | FOOT | 7400 | \$ 0.50 | \$ 3,700 | 7400 | \$ 0.50 | \$ 3,700 | 7400 | 5 0.50 | \$ 3,700 |
| <u> </u> | 18 Roadway Signing | LS | 1 | \$ 5,000 | \$ 5,000 | 1 | \$ 5,000 | \$ 5,000 | 1 3 | 5,000 | \$ 5,000 |
| 5 | 19 Pigmented & Patterned Crosswalk | SQFT | 550 | \$ <u>15</u> | \$ 8,250 | 550 | \$ 15 | <u>\$ 8,250</u> | 550 | 5 15 | \$ 8,250 |
| SE | 20 Faced Soldier Pile Retaining Wall, Cut Slope | SQFT | 1//25 | \$ 55 ¢ 25 | <u>\$ 974,875</u> | 16//5 | \$ 55 ¢ 25 | <u>\$ 922,625</u> | 164/5 | > 55 | <u>\$ 906,125</u> |
| ER | | SUFT | 3550 | ş 35 | \$ 124,250 | 30/5 | \$ 35 | \$ 128,025 | 3550 | > 35 | \$ 124,250 |
| Ļ | 22 Concrete Driveways- 6" thick Residential | SOFT | 0 | \$ 5.00 | <u>ج</u> - | 0 | \$ 5.00 | <u>ج</u> | 0 | 5 00 | <u>ج</u> - |
| 2 | 23 Concrete Driveways, Reinf, 6" thk, Comm. | SOFT | 0 | \$ 5.50 | \$ - | 0 | \$ 5.50 | <u>\$</u> - | 0 | 5 5.50 | \$ - |
| 5 | 24 Concrete Walks, 4" thick on 2" aggregate | SQFT | 18500 | \$ 4.00 | \$ 74,000 | 33500 | \$ 4.00 | \$ 134,000 | 26000 | 5 4.00 | \$ 104,000 |
| õ | 25 Concrete Sidewalk Ramps | EACH | 6 | \$ 1,250 | \$ 7,500 | 6 | \$ 1,250 | \$ 7,500 | 6 | 5 1,250 | \$ 7,500 |
| Ā | 26 Shared Use Path Asphalt, 2" thick | SQFT | 18000 | \$ 1.50 | \$ 27,000 | | | | | | |
| | 27 Shared Use Path Base Rock, 4" thick | SQFT | 18000 | \$ 0.75 | \$ 13,500 | | | | | | |
| 5 | STORM DRAINAGE | | | | | | | | | | |
| S | 28 12 Inch dia. Storm Drain Pipe | FOOT | 2250 | \$ 25 | \$ 56,250 | 2250 | \$ 25 | \$ 56,250 | 2250 | 5 25 | \$ 56,250 |
| - - | 29 Concrete Inlets | EACH | 30 | \$ 1,500 | <u>\$</u> 45,000 | 30 | \$ 1,500 | <u>\$</u> 45,000 | 30 | 5 1,500 | <u>\$</u> 45,000 |
| 7 | | LS | 1 | Ş - | Ş - | 1 | Ş - | <u>ې -</u> | 1 3 | - | <u>ې</u> - |
| ő | 31 Removal of Existing Illumination | 15 | 1 | \$ 3,000 | \$ 3,000 | 1 | \$ 3,000 | \$ 3,000 | 1 | 3 000 | \$ 3,000 |
| Ē | 32 Street & Pedestrian Lighting | LS | 1 | \$ <u>5,000</u> \$ 25.000 | \$ 3,000 \$ 25.000 | 1 | \$ 5,000 | \$ <u>5,000</u> \$ 25,000 | 1 | 5 25.000 | \$ 5,000 \$ 25.000 |
| PO | 33 Traffic Signal Installation | LS | 0 | \$ 220,000 | \$ - | 0 | \$ 220,000 | \$ - | 0 | 5 220,000 | \$ - |
| | UTILITIES | | | · | | | | | | | ······ |
| | 34 Water & Sewer Main Relocation | LF | 300 | \$75 | \$ 22,500 | 300 | \$ 75 | \$ 22,500 | 300 | 5 75 | \$ 22,500 |
| | 35 Gas Main Relocation | LF | 1000 | \$- | \$- | 1000 | \$- | \$ - | 1000 | - | \$- |
| | 36 OH Utility Relocations | LF | 0 | \$- | \$ - | 0 | \$ - | \$ - | 0 | - | \$ |
| | 37 Buried Communication Relocations | LF | 1300 | \$ - | \$ - | 1300 | \$ - | \$ - | 1300 | - | \$ - |
| | LANDSCAPE & RESTORATION | | 10000 | <u> </u> | ¢ | 10000 | ¢ | ć <u></u> | 10000 | | ¢ |
| | 38 Landscape Restoration | SQFT | 19900 | \$ 1.50 \$ 10.000 | > 29,850 | 19900 | > 1.50 | > 29,850 | 19900 | | > 29,850 |
| | | LS 1 C | 1 | γ 10,000 \$ 2 500 | γ <u>10,000</u> ς γ <u>200</u> | 1 | <i>μ</i> = 10,000 <i>μ</i> = 00 <i>μ</i> = 0 <i>μ</i> = 0 | > 10,000 \$ > 500 | | | γ <u>10,000</u> ς <u>200</u> |
| | 41 Gateway Feature | 15 | 1 | <u>, 2,500</u> Ś 15 000 | \$ 2,500 | 1 | \$ 2,500 \$ 15,000 | <u>, 2,500</u> Ś 15 000 | | , 2,500 5 15,000 | \$ 2,500 \$ 15 000 |
| | RIGHT-OF-WAY AND EASEMENTS | | - | - 10,000 | - 10,000 | ± | - 10,000 | - 10,000 | L | 10,000 | - 13,000 |
| | 42 Right of Way Monumentation | LS | 1 | \$ 2,500 | \$ 2,500 | 1 | \$ 2,500 | \$ 2,500 | 1 | \$ 2,500 | \$ 2,500 |
| | 43 Permanent Slope Easement | SQFT | 0 | \$ 3.00 | \$ - | 0 | \$ 3.00 | \$ - | 740 | \$ 3.00 | \$ 2,220 |
| | 44 Right of Way | SQFT | 30726 | \$ 10 | \$ 307,260 | 32226 | \$ 10 | \$ 322,260 | 33726 | 5 10 | \$ 337,260 |
| | SUBTOTAL | | | | \$ 3,010,773 | | | \$ 2,986,650 | | | \$ 2,944,563 |

| CITY OF SPOKANE Hatch Road Study; 57th to Hangman Bridge APPENDIX B: CONCEPT-LEVEL COST ESTIMATE | OPTION #1B UPHILL SHARED USE PATHWAY | OPTION #2 DUAL BIKELANES & SIDEWALKS |
|---|--|---|
| SCHEDULE SUMMARY | | |
| HATCH ROAD IMPROVEMENTS | \$ 4,334,818 | \$ 4,995,075 |
| OPTION 1 - 'T' INTERSECTION OPTION 2 - ROUNDABOUT OPTION 3 - HATCH & PERRY INTERSECTION | \$ 3,152,668 \$ 3,010,773 N/A | \$ 3,173,345 \$ 2,986,650 N/A |
| SUBTOTALS HATCH + OPTION 1 HATCH + OPTION 2 HATCH + OPTION 3 | \$ 7,487,486 \$ 7,345,591 | \$ 8,168,419 \$ 7,981,724 |
| DESIGN & CONSTRUCTION CONTINGENCIES (20) HATCH + OPTION 1 HATCH + OPTION 2 HATCH + OPTION 3 |)%) \$1,497,497 \$1,469,118 <u>\$</u> - | \$ 1,633,684 \$ 1,596,345 <u>\$ -</u> |
| TOTAL CONSTRUCTION ESTIMATE (Rounded) HATCH + OPTION 1 HATCH + OPTION 2 HATCH + OPTION 3 | \$ 9,000,000 \$ 8,800,000 \$ - | \$ 9,800,000 \$ 9,600,000 \$ - |
| DESIGN ENGINEERING (12%) and CONSTRUCTION MANAGEMENT (10%) HATCH + OPTION 1 HATCH + OPTION 2 HATCH + OPTION 3 | \$ 1,980,000 \$ 1,936,000 \$ - | \$ 2,156,000 \$ 2,112,000 <u>\$ -</u> |
| TOTAL PROJECT ESTIMATE (Rounded) HATCH + OPTION 1 HATCH + OPTION 2 HATCH + OPTION 3 | \$ 11,000,000 \$ 10,700,000 \$ - | \$ 12,000,000 \$ 11,700,000 \$ - |

OPTION #4 WIDENED UPHILL FOR SHOULDER & SIDEWALK

| \$ | 4,093,953 |
|----------------|-------------------------------|
| \$ \$ | 3,088,758 |
| , N/А | 2,944,303 |
| \$ \$ | 7,182,711 7,038,516 |
| \$ \$ \$ | 1,436,542 1,407,703 - |
| \$ \$ \$ | 8,600,000 8,400,000 - |
| \$ \$ \$ | 1,892,000 1,848,000 - |
| \$ \$ \$ | 10,500,000 10,200,000 - |

APPENDIX C

HATCH ROAD VERTICAL ALIGNMENT EXHIBITS



HATCH VERTICAL ALIGNMENT OPTION 1: "T" INTERSECTION AT HATCH ROAD AND 57TH AVE

HATCH VERTICAL ALIGNMENT OPTION 2: ROUNDABOUT INTERSECTION AT HATCH ROAD AND 57TH AVE

HATCH VERTICAL ALIGNMENT OPTION 3: 4-WAY INTERSECTION AT HATCH ROAD AND 57TH AVE

APPENDIX D

CONCEPTUAL DRAINAGE DESIGN BASIS

APPENDIX D

CONCEPTUAL DRAINAGE DESIGN BASIS

BACKGROUND AND PURPOSE

This appendix serves to summarize the technical requirements relating to a conceptual stormwater management system for the Hatch Road corridor, from 57th Ave to the Hangman Creek Bridge. Further this appendix identifies the types of conveyance, water quality, and flow control facilities that have been considered in this concept-level study.

TECHNICAL REQUIREMENTS SUMMARY

The following summarize documents were reviewed:

- 1. Spokane City Code Stormwater Facilities;
- 2. Spokane Regional Stormwater Manual.

The following are a summary of integral requirements pertaining to stormwater facilities:

Spokane City Code – Stormwater Facilities: This document specifies that "the director of wastewater management may recommend that the City assume responsibility for the further design, construction, operation, and/or maintenance of the drainage facilities, or any increment of the responsibility for the facilities, on a specific development property." The site does not appear to be in a Special Drainage District as designated by the City of Spokane.

Spokane Regional Stormwater Manual: This manual gives guidelines and regulations adopted by Spokane County, the City of Spokane, and City of Spokane Valley relating to stormwater management.

Chapter 6 describes water quality treatment design. The following are key requirements relating to treatment facilities:

| Moderate Use Site: | Hatch Road is an urban road with expected ATD between 7,500 and 30,000. |
|---------------------------|--|
| Oil Control: | Not Applicable |
| Metals Treatment: | Required. Hatch Road is moderate use, and drains to fish- bearing stream (Hangman Creek). |
| Phosphorous Treatment: | May be required, depending on listing of Spokane River tributaries sensitivity to Phosphorous. |

Hatch Road Study; 57th to Hangman Bridge Corridor Study Report Revised: February 24, 2009

Design Storm: 6-month SES Type II storm event is the design storm to be used for both volume based and flow rate based water quality BMPs.

Chapter 7 describes flow control facilities. The following are key requirements relating to detention facilities:

| Design Storm: | NRCS Type 1A 24 hour storm event is the design storm to be used for all flow control facilities that use a surface discharge. |
|---------------------------------|---|
| Sizing Requirements: | Flow Control Facilities (surface discharge): Retain 2- year and 25-year with applicable release rates. Provide 100-year overflow route. Conveyance Systems: 10-year (25-yr for regional systems) |
| Release Rate: | Flow Control Facilities: < 2-year pre-developed, < 25-year pre-developed. |
| Setbacks: | Pond Overflow Structures shall be located a minimum of 10' from any structure or property line. The toe of the berm or top of bank shall be a minimum of 5' from any structure or property line. Setbacks for any pond shall be at least 30' when located up-gradient for 10' when located down-gradient from septic tanks or drain fields. |
| Emergency Overflow Spillway: | Emergency overflow spillways shall be provided for detention ponds with constructed berms of 2 feet or more in height. Spillway requirements located in Spokane Regional Stormwater Manual Section 7.8.5. |
| Embankments: | The height of an embankment is measured from the top of the berm to the catch point of the native soil at the lowest elevation. Embankments shall meet the following minimum requirements (SRSM Section 7.8.6): 1. Embankments 4 feet or more in height shall be constructed as recommended by a geotechnical engineer. 2. The berm top width shall be a minimum of 4'. |

3. Etc.

| Fencing: • | Drainage facilities with the first overflow at 2 or more feet above the pond bottom; Drainage facilities with retaining walls 2.5 feet high or taller. Drainage facilities located at, or adjacent to, schools, nursing homes, daycares, or similar facilities. At the discretion of the local jurisdiction, if a pond is proposed as an amenity (i.e. enhancements to the disposal facility are proposed, such as rocks, boulders, waterfalls, fountains, creative landscaping, or plant materials), the design will be reviewed on a case-by- case basis, such that the fencing may be reduced or waived. | | | | |
|---------------|---|--|--|--|--|
| Ponds: • | Pond bottoms shall be located a minimum of 0.5 feet below the outlet to provide sediment storage In general, all pond bottoms shall be flat. | | | | |
| • | Pond side slopes shall meet one of the following requirements: 1. Interior side slopes shall not be steeper than 3:1 (horizontal to vertical); 2. Interior side slopes may be increased to a maximum of 2:1 if the surrounding grade creates a cut or fill with no greater depth than 1.0 foot; 3. Exterior side slopes shall not be steeper than 2:1 unless analyzed for stability by a geotechnical engineer. 4. Pond walls may be vertical retaining walls, provided that: A fence is provided along the top of the wall for walls 2.5 feet or taller and a 4-foot wide access ramp to the pond bottom is provided, with slopes less than 4:1 and the design is stamped by an engineer with structural expertise if the wall is surcharged or if it is 4 feet or more in height. A separate building permit may be required by the local jurisdiction if the wall height exceeds 4 feet. | | | | |

Chapter 8 describes storm water system conveyance design. The following are key requirements relating to conveyance systems:

Channels:

- Min grade: 0.5%
- Max. Side Slope: 2:1 (sandy earth)
- Max. Velocity: 3 fps

Hatch Road Study; 57th to Hangman Bridge Corridor Study Report Revised: February 24, 2009

| Storm Drain Pipe: | SCS Method Used for Flow Control Facility Applies Provide overflow path for 100-year storm when | | | | | | | | |
|-------------------|--|--|--|--|--|--|--|--|--|
| | closed system is overtopped. | | | | | | | | |
| | Min 0.5' freeboard between HGL and surface grates | | | | | | | | |
| | Min. velocity of 3 fps, Max 10 fpsMin diameter: 12-inches | | | | | | | | |
| | | | | | | | | | |
| | Gutters: | 24-feet non-flooded width required in roadways for design storm. | | | | | | | |

CONCEPTUAL HATCH ROAD STORMWATER MANAGEMENT SYSTEM

Conveyance Systems. Due to the limited roadway width available for ditching, highly erodible sandy soils, as well as the steepness of the terrain longitudinally, a closed drainage system (catch basins, pipes, etc.) is envisioned for Hatch Road. A standard urban minor-arterial cross-section is applicable for Hatch Road, and includes concrete curb and gutter for conveyance of roadway runoff.

Treatment Facilities: Due to the steep roadway grades and limited width along much of Hatch, Road, there are limited opportunities for biofiltration swales. Opportunities for biofiltration swales exist along the central portion of the roadway (between Highland Park Drive and S. Tomaker Lane) where the roadway corridor is wider, and less steep. Surface water runoff may be conveyed from the northern portion of Hatch to this area for treatment. Alternatively, the City may wish to utilize proprietary underground filtration systems for treatment that will easily fit within the existing right-of-way. For the purposes of this study, construction of biofiltration swales is the central and southern portions of the corridor.

Control/Disposal Facilities: Again, due to limited physical space along the roadway, and steep roadway grades there are limited areas available for control disposal facilities. Geotechnical investigations were conducted along the project to investigate feasibility of on-site disposal via drywells. The results of the investigations were generally favorable (See Geotechnical Report, by GeoEngineers, dated June, 2008, with good hydraulic conductivity and resulting drywell outflow rates. As such, drywells (in conjunction with biofiltration swales) are recommended for on-site disposal of stormwater for this project.

For the purposes of this study, we assumed (conservatively) that right-of-way would need to be acquired for storm drainage swales and drywells along Hatch Road in the central portion (between Highland Park Drive and S. Tomaker Lane), as well as in the southern portion of the corridor (near the private roadways on the North side of Hatch Road, between Hangman Creek Bridge and Hangman Valley Road. Treatment and disposal facilities are envisioned at the following locations:

• Private property across Hatch Road from Highland Park Drive, utilizing existing depressed area (location of Geotechnical Boring B-102).

• Private property located on northerly side of Hatch Road adjacent to private road located 300 feet easterly of the Hangman Creek Bridge.

Estimated quantities and costs for the Stormwater Management System, including right-of-way are provided in Appendix B.

