

## SR 503 FOURTH PLAIN TO GABRIEL ROAD IN CLARK COUNTY

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### **CHARACTERISTICS**

#### **Segment Description:**

This highway segment begins at the intersection of SR 500 and Fourth Plain Blvd., and generally extends north through unincorporated Clark County, through the City of Battle Ground, and back into rural Clark County terminating at ARM 14.13.

**County/Counties:** Clark

**Cities/Towns Included:** This corridor passes through Battleground and Vancouver.

**Number of lanes in the corridor:** 2 to 4

**Lane width:** 11 to 12 feet.

**Speed limit:** 40 to 55 mph.

**Median width:** 3 to 4 feet.

**Shoulder width:** 0 to 8 feet.

#### **Highway Characteristics:**

From Fourth Plain to SR 502, this segment of the corridor is in the National Highway System (NHS). The State Functional Class for this corridor are Urban Principle Arterial and Rural Minor Arterial. Based on 2004 data, the freight classifications and annual tonnage on this corridor are T2, and T3 ranging from 1,060,000 to 4,320,000 tons.

#### **Special Use Lane Information (HOV, Bicycle, Climbing):**

There are approximately 3.5 miles of Two Way Turn Lane, 2.48 miles of general turn Lane and 0.15 miles of acceleration Lane within this corridor.

#### **Access Control Type(s):**

Access control varies along the corridor from Partial Limited to Managed Access.

#### **Terrain Characteristics:**

Most of this corridor has level terrain. There is a significant grade at Lewisville County Park and several other grades between SR 502 and Gabriel Rd.

#### **Natural Features:**

The corridor originates (ARM 0.00) in a high density urban area and terminates in a low density rural area within Clark County at ARM 14.13. The corridor is located within two drainage basins and crosses Salmon Creek at ARM 5.04 and the East Fork Lewis River at ARM 10.04. The corridor for this section of SR 503 provides access to several recreational areas in northeast Clark County, south Cowlitz County (Merwin and Yale lakes) and the Mount Saint Helen's National Monument. In Clark County, the Lewisville Park entrance is on SR 502 at ARM 10.04. At ARM 13.41, NE Lucia Falls Road provides access to Moulten Falls and Lucia Falls parks from SR 503.

#### **Adjacent Land Description:**

Densely urbanized land that include residential, commercial and industrial uses are in the beginning of the corridor then the land use transitions into rural residential / commercial uses and farm lands. As the route enters the City of Battle Ground it is densely urbanized and as the highway leaves the city it transitions to low density rural and farm lands.

#### **Environmental Issues:**

The primary environmental issue is stormwater retention/detention and release into the Salmon Creek and East Fork Lewis River watersheds.

Wetlands occur throughout this corridor, primarily concentrated to the north of NE 144th Street. In several cases, wetlands run continuously along the SR 503 alignment for several thousand feet, greatly increasing the possibility of wetland impact for any proposed improvement project with work beyond the paved shoulder. Several stream and river crossings occur as well, one of which (Salmon Creek) is, in part, a large WSDOT wetland mitigation site. This site, built for the SR 503 144th to Battle Ground project, is located on both sides of SR 503 immediately north of Salmon Creek. Impacts to existing mitigation sites carry much higher replacement ratios than natural wetlands.

Using a linear measurement of wetlands immediately adjacent to the highway, approximately 23,910 linear feet (4.5 miles) of wetlands occur to the west of SR 503, and approximately 16,360 linear feet (3.1 miles) occur to the east of SR 503. Many other wetlands occur a short distance from the highway, but were not included in this measurement. These figures are preliminary and subject to change with further analysis and formal wetland delineation.

#### **Major Economic Issues:**

The corridor provides access for commuter traffic during peak hours for employment destinations throughout the Portland/Vancouver

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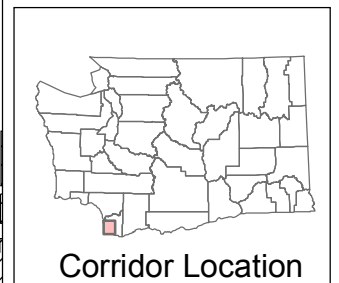
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region. Specifically on the corridor the economic mix is retail/commercial and mixed-use office park. Clark County has recently rezoned 1500 acres of land between ARM 3.4 and 4.5 to urban uses, including industrial and manufacturing zones. It is anticipated that a new employment cluster will develop around ARM 4.48.

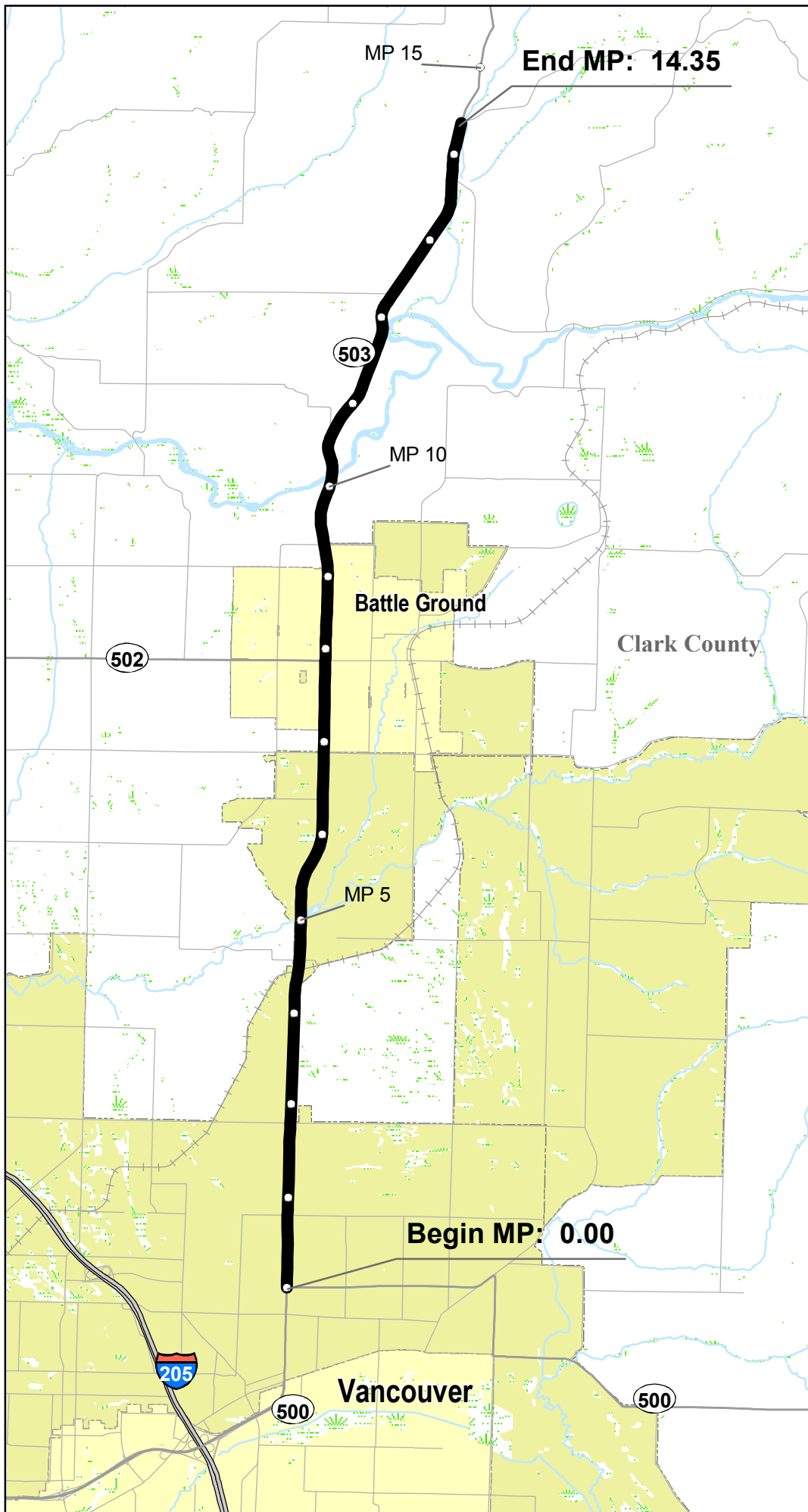
# HSP Congested Corridor Analysis

## Characteristics

- Milepost Marks
- ▬ HSP Corridor Location
- ▬ U.S. Interstate
- ▬ U.S. Highway
- ▬ State Route
- ▬ Local Roads
- ▬ Railroad
- ▬ Wetlands
- ▬ Military Reservation
- ▬ Tribal Lands
- ▬ City Limits
- ▬ Urban Area
- ▬ County Line



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## SR 503 FOURTH PLAIN TO GABRIEL ROAD IN CLARK COUNTY

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### **ASSETS**

#### **Pavement:**

There are 43.85 lane miles of Hot Mix Asphalt on this segment of SR 503.

#### **Signal:**

There are 14 signalized intersections in this corridor.

#### **Structures:**

There are two structures along this segment Salmon Creek bridge, and East Fork Lewis River Bridge. (Ramps, and locally owned structures (if any exist) are not identified in this section and may not be reflected on maps.)

#### **Features Crossed:**

This segment of State Route 503 crosses Salmon Creek (ARM 5.04) and the East Fork Lewis River (ARM 10.04).

#### **ITS Facilities:**

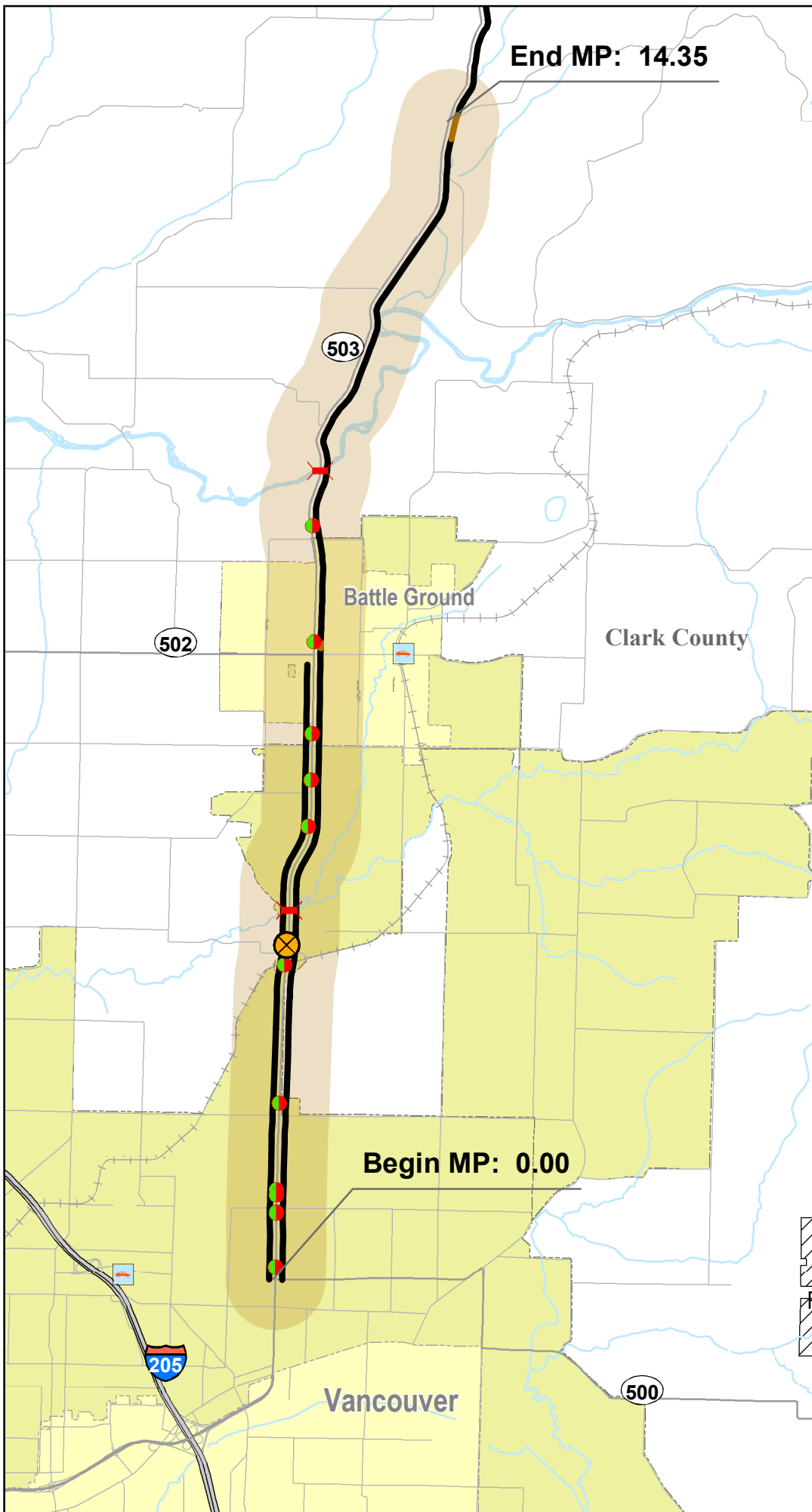
There are no Intelligent Transportation Facilities on this corridor.

#### **Railroad Crossings:**

The Columbia Basin Railroad crosses SR 503 at-grade (ARM 4.48). The crossing is a single track at a 75 degree angle to the road with intersection control via drop-arm barriers. At the present time only one train a week passes through the crossing. This will possibly change in the near future when industrial lands are developed by the rail alignment in the immediate area of the crossing. The track is rated as class 1 with speeds at 10 miles per hour.

#### **Asset Other:**

**NONE IDENTIFIED.**



HSP Congested  
Corridor Analysis  
**Assets**

HSP Corridor Location

**Assets**

- Signalized Intersection
- At Grade Railroad Crossings
- Bridge
- Ferry Terminals
- Ferry Route
- Park and Ride
- Weigh Stations
- Rest Area Sites

**Corridor Pavement Type**

- HMA
- BST
- PCCP

**Other Features**

- U.S. Interstate
- U.S. Highway
- State Route
- Local Roads
- Railroad
- Military Reservation
- Tribal Lands
- City Limits
- Urban Area
- Airport
- County Line

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### *USAGE*

#### **General Origin and Destination Travel Characteristics:**

This corridor provides arterial access for Clark County commuters residing in central and north central Clark County. Primarily during the summer months leisure traffic utilizes the corridor to access recreation locations north of the congested corridor. At the south end of the corridor and within the City of Battle Ground are retail, service and commercial uses accessed by SR 503. These businesses are generally serviced by local trips utilizing the corridor.

#### **Snow/ice Issues:**

There are no sections within this corridor which present a problem for normal snow/ice control.

#### **Annual Average Daily Traffic:**

Ranges from 9,500 to 34,400.

#### **Significant Seasonal Average Annual Daily Traffic Changes:**

There is a minor increase in annual average daily traffic in the summer months due to recreational traffic.

#### **General Description of Major Average Annual Daily Traffic Locations:**

There are major annual average daily traffic (AADT) numbers at the following locations: Rosewood Rd intersection, NE 65th St. intersection, NE 66th St. intersection, NE 71st St. intersection, Shopping Mall, and NE 76th St. intersection.

#### **Freight:**

**Freight Classification:** T2 and T3

**Yearly Tonnage:** 1.1M to 4.3M

**Truck Percentage of Annual Average Daily Traffic:** 6.8%

#### **Additional Usage Comments:**

There are no additional comments.

**Average Annual Societal Cost of All Collisions:** Approximately \$8.03M

#### **Collisions:**

**Severe No of Collisions:** 12

**Less Severe No of Collisions:** 500

**List Data Years:** 2003 to 2005

HSP Congested Corridor Analysis

Usage

HSP Corridor Location

Safety Analysis Areas

PAL Spot 07-09

PAL Corridor 07-09

HAL Spot 07-09

HAL Corridor 07-09

HAC 07-09

Freight Classification

T-1

T-2

T-3

Traffic Sections AADT

< 3,000

3,001 - 10,000

10,001 - 20,000

20,001 - 40,000

40,001 - 80,000

80,001 - 100,000

100,001 - 120,000

> 120,000

Trucks 10% and Over

Other Features

U.S. Interstate

U.S. Highway

State Route

Local Roads

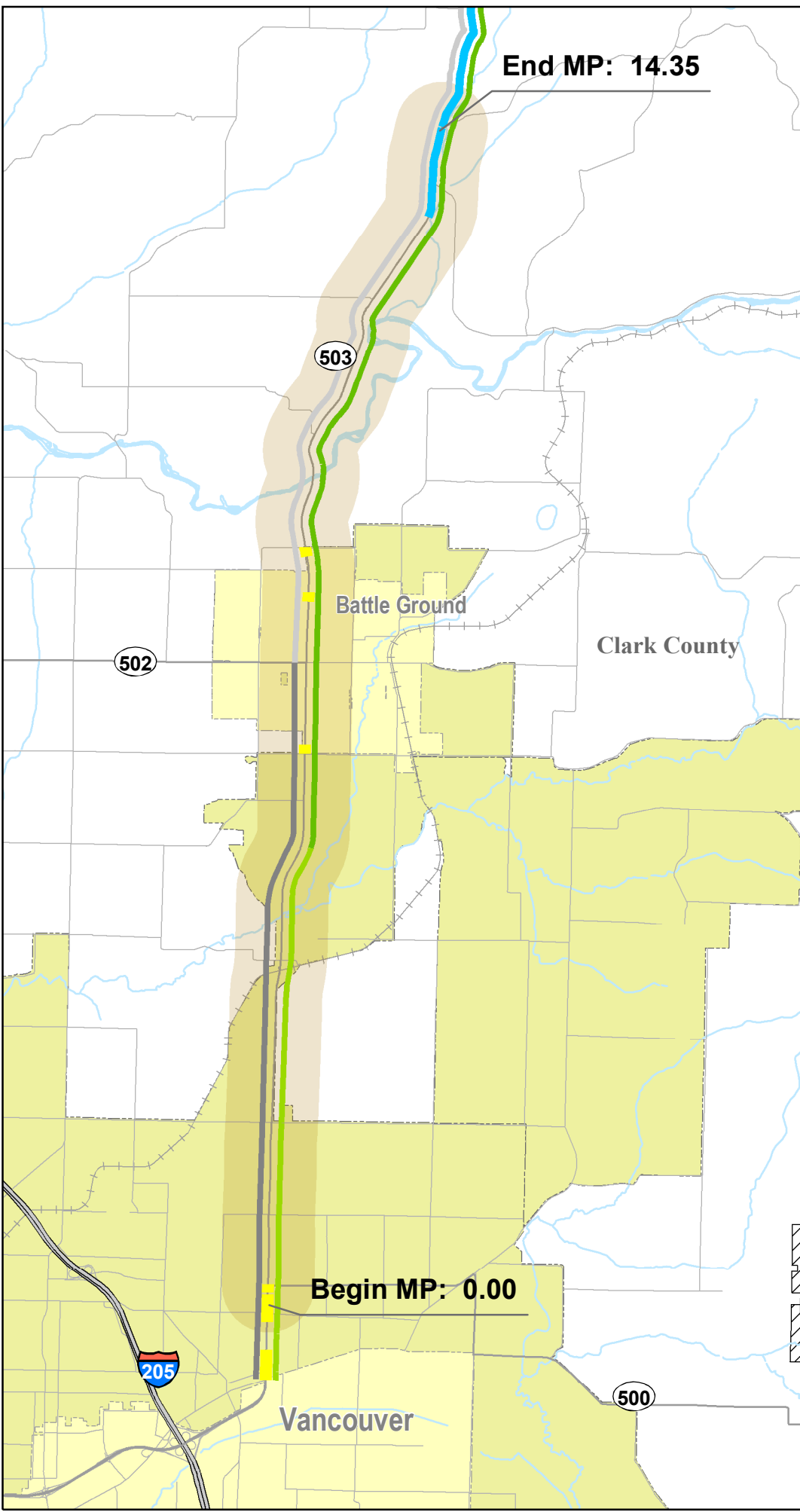
Railroad

Tribal Lands

Military Reservation

City Limits

Urban Area



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### **NEEDS AND STRATEGIES**

#### **Preservation**

##### **Pavement Condition and Needs:**

The existing pavement in this corridor is hot mix asphalt.

The pavement in the southern eight miles of the corridor is in satisfactory condition.

The pavement in the northern six miles of the corridor is in need of an overlay because of rutting, structural deterioration or lack of smoothness.

##### **Pavement Management Strategies:**

The pavement type for this corridor will remain hot mix asphalt.

43% of corridor lane miles were paved in 1996-1997; 27% percent of corridor lane miles were paved in 2002. Estimated pavement life is 15 years. These two areas of the corridor, which are the southern and middle sections, will be due for hot mix asphalt overlays in 2012 and 2017. The remaining 30% of corridor lane miles will have a hot mix asphalt overlay in 2006, 2007, or 2009 as part of either a paving project, a safety improvement project, or a rural mobility project programmed for these respective years. Estimated pavement life is 15 years. After the above projects are completed, the northern section of the corridor will be due for a hot mix asphalt overlay in 2021 and 2024. A truck climbing lane will be constructed from MP 8.80 to MP 11.20 on the SR 503/Lewisville Park Climbing Lane project to be advertised in 2009.

##### **Structures Condition and Needs:**

There is 1 pre-tensioned concrete beam structure on drilled shafts and 1 concrete box girder structure in this corridor. (This may include ramps and locally owned structures if any exist.)

##### **Structures Management Strategies:**

This bridge is programmed for a seismic retrofit to be advertised in 2008.

This bridge will be widened on the SR 503/Lewisville Park Climbing Lane project to be advertised in 2009.

##### **Additional Condition and Needs:**

There are none defined

##### **Additional Management Strategies:**

There are none identified.

#### **Improvement**

##### **Mobility Condition and Needs:**

This corridor provides arterial access for Clark County residents in central and north areas. Currently, the corridor experiences traffic back-ups during peak hours, especially at the south end. Without mobility improvements, it is estimated by 2030 the peak hour speeds on the corridor from Fourth Plain to Battle Ground will be lower than 50% of the posted speed; the congestion on the north of Battle Ground will also fall under "deficiency" category based on state congestion standard. SW Region has identified two bottlenecks or chokepoints on this corridor: (1) intersection with Padden Parkway, and (2) intersection with Fourth Plain Rd. The right-of-way costs at the south section of the corridor are high. Wetland mitigation is needed for widening projects on this corridor.

##### **Mobility Management Strategies:**

For the bottleneck/chokepoint at Padden Parkway, it is proposed to build an urban interchange. For the bottleneck/chokepoint at Fourth Plain, there is a funded \$100,000 study underway (PIN 450099B). We propose to construct dual right turns from NB SR 503 to eastbound Fourth Plain to reduce the congestion; other alternatives are under discussion. A more detailed benefits/costs analysis is expected upon the completion of the study (this project is also listed under SR 500 proposed solutions). Other locations/segments with high traffic demand have been addressed as well, such as the intersection improvement at SR 503/SR 502 (this project will reduce delay by 50%), or the median curb from Fourth Plain to 149th St. (this project has B/C ratio of 7.88). To improve the overall mobility performance on this corridor, it is proposed to widen the section from Padden Parkway to SR 502 to six lanes, and the section from SR 502 to Gabriel Rd to four lanes. Intelligent Transportation Systems (ITS) facilities will be established from Fourth Plain to SR 502.

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### **Safety Condition and Needs:**

Reduce frequency and severity of accidents within this SR 503 corridor. Intersection and driveway related accidents account for 67% of all collisions in this corridor up to ARM 4.31 and for 52% of all collisions from ARM 4.31 to 14.13. Rear end collisions occur in 56% of all accidents. 2% of all accidents resulted in a disability or fatality. Under 23 United State Code-Section 409, this data cannot be used in discovery or as evidence at trial in any action for damages against the WSDOT or the State of Washington. This disclaimer is for all accident data mentioned in this report.

### **Safety Management Strategies:**

Increase roadway capacity for existing demand and expected growth from Padden Parkway to SR 502. Increase access management by building new or improving existing intersections throughout the corridor and completing median curb separation (ARM 0.0-4.31) to mitigate high intersection related accident levels. Ensure clear and consistent direction of traffic through technology (ITS). Beyond fixes in this plan, monitor corridor for future high accident locations and high accident corridors. Review accidents as they occur and develop solutions commensurate to the severity and causes.

### **Environmental Condition and Needs:**

MP 13.21 Unnamed creek to Rock Creek Culvert is a fish barrier due to outfall and slope. There are several stream crossings in this corridor with associated riparian and wetland areas that provide habitat for vegetation, fish and wildlife. An endangered species has been identified near the corridor north of Battle Ground. There are approximately 40 known stormwater outfalls located along this corridor.

### **Environmental Management Strategies:**

This culvert is listed on WSDOT Six Year Plan. It is a potential future project, but has not been scoped. WSDOT will work with Washington Department of Fish and Wildlife and other interested parties to identify a solution to remove the fish passage barrier. Proposed improvements will take into consideration the existing environmental conditions of the corridor and make every effort to minimize any potential adverse impacts.

### **Restrictions:**

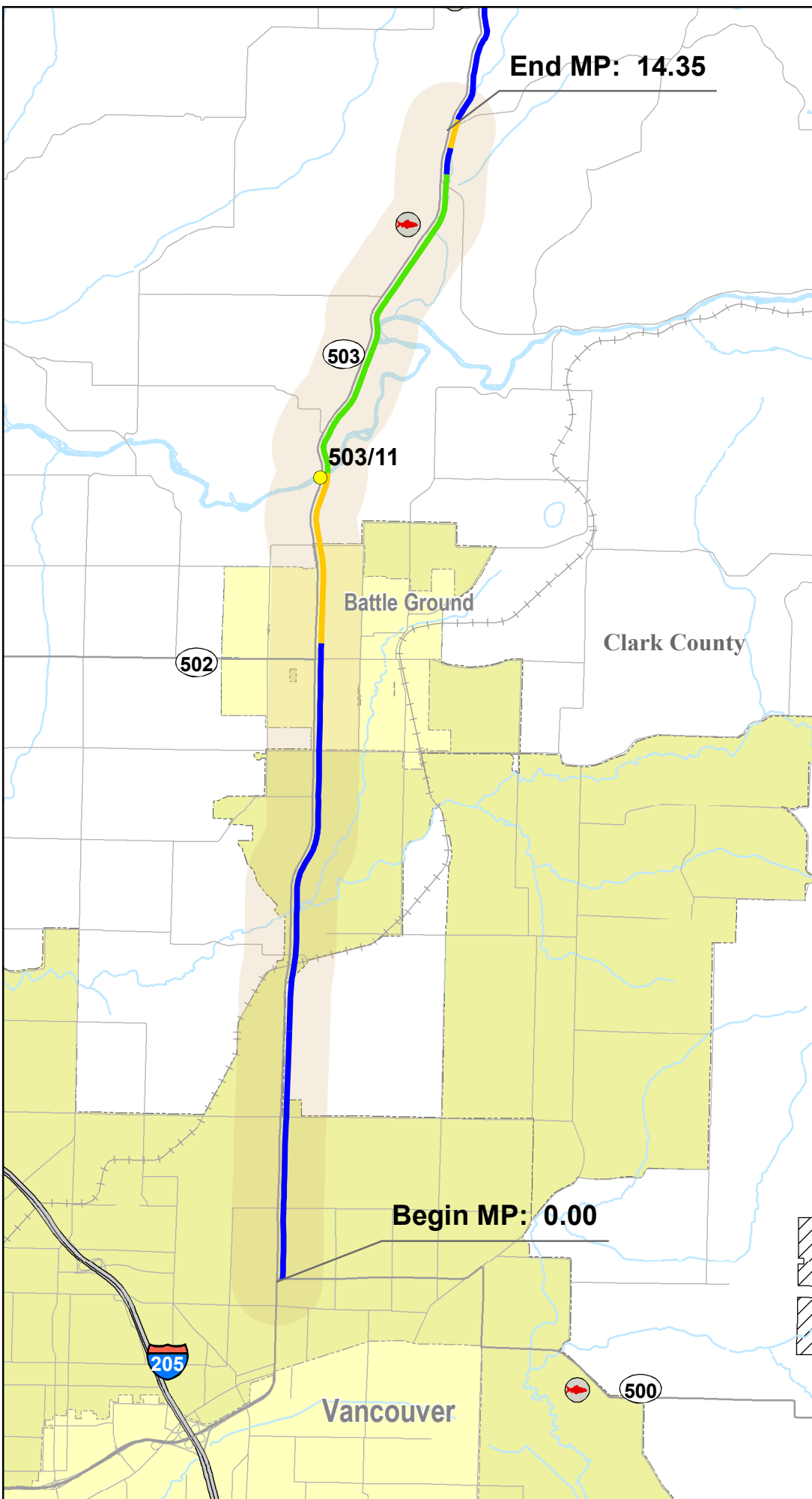
There are none identified.

### **50-Year Configuration:**

It is anticipated that the area of influence for this segment of SR 503 will have significant growth over the next 30 years such that the semi-rural/suburban land use pattern will become densely urbanized. The expansion of the existing highway is constrained by existing development, most notably commercial, in the confluence areas around the Padden Parkway, SR 500 and SR 502. The 50 year configuration would likely include a completed major and minor arterial grid and an additional north/south arterial located east of the existing highway. In addition to road capacity solutions, it is likely that multimode options and high capacity transit would be established within the corridor over the next 50 years. For SR 503 north of Battle Ground, the corridor would be widened to at least 4 travel lanes with access control. Growth will occur along the corridor but the densities are expected to remain semi-rural.

# HSP Congested Corridor Analysis

## Needs



-  HSP Corridor Location
- Bridge Priorities**
  -  Replacement
  -  Special
  -  Seismic
  -  Scour
  -  Painting
  -  Miscellaneous
  -  Bridge Deck
- Other Bridge Issues**
  -  2 Lane BW Narrow Bridge
  -  Restricted Bridge
  -  Posted Bridge
  -  Vert. Clearance < 15.5'
- Unstable Slope**
  -  Debris Flow
  -  Erosion
  -  Landslide
  -  Rockfall
  -  Settlement
- Fish Passage Barriers**
  -  Require Repair
  -  Little Gain
  -  Undetermined
- Paving Due**
  -  Past Due
  -  2005 - 2007
  -  2008 - 2009
  -  2010 - 2011
  -  2012 - 2026
- Other Features**
  -  U.S. Interstate
  -  U.S. Highway
  -  State Route
  -  Local Roads
  -  Railroad
  -  Military Reservation
  -  Tribal Lands
  -  City Limits
  -  Urban Area
  -  County Line

## SR 503 FOURTH PLAIN TO GABRIEL ROAD IN CLARK COUNTY

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### ***TIERED PROPOSED SOLUTIONS***

#### **Minimum Fix**

##### **Description:**

CCTV at intersections, interchanges and blind spots from SR 500 to SR 502 (Costs: \$1,486,000). Data stations every ½ mile and at intersections and interchanges SR 500 to SR 502 (Costs: \$1,583,000). ARM 0.00, Intersection at SR 503 / SR 500 / 4th Plain, NB to eastbound dual right turns (Costs: \$1 million, this intersection improvement is under a funded study; also see proposed solutions for SR 500). ARM 0.00 to 4.31: Median curb, where feasible, from Fourth Plain to 149th (Costs: \$1,291,000 for 2.8 mile median curb - there is 1.5 mile existing/funded curb in this section; B/C: 7.88; Collision Reduction: 70% on driveway/median related accidents). ARM 1.80 to 9.13: Fiber cable 99th to 244th Streets and interconnect (Costs: \$1,876,000). ARM 2.18: southbound VMS at 107th to direct traffic to the Padden Parkway when SR 500 is congested (Costs: \$323,000). Directional signs (overhead signs) to direct traffic to I-205 via the Padden Parkway (Costs: \$140,000). ARM 7.85 to 7.89: Intersection improvements at SR 503 / SR 502 - add right turn channelization on east leg, west leg, and south leg (Costs: \$2.1 million; Delay reduction: 50%; Collision reduction: 10% to 40%)

**Delay Reduction:** None identified.

**Collision Reduction:** 10% to 70%

**Deficient Concrete Lane Miles:** None identified.

**Total Estimate Cost:** \$10.0 M

##### **Cost Estimate Explanation:**

All costs include both construction costs and overhead; unit price is updated to 2006 standard. The median curb project (from SR 500 to 149th St.) is already in process; developers will pay part of the cost. The existing/funded median curb runs about 1.5 miles. To complete the proposed median curb, funding is needed for an additional 2.8 miles. The construction costs for median curb are estimated as \$50 per linear foot based on past projects and inflation factor. The cost estimations for Intelligent Transportation System (ITS) facilities and traffic signs are based on the information provided by SWR Traffic Office.

##### **Minimum Fix Benefits:**

Depending on the location, benefits for ITS facilities vary. Overall it is acknowledged that ITS has positive impacts on mobility and safety.

The Benefit Cost ratio (B/C) for the median curb project is estimated to be 7.88 based on the assumption that median curb can reduce driveway/median related accidents by 70%.

#### **Moderate Fix**

##### **Description:**

ARM 1.00, build an interchange at Padden Parkway (Costs: \$32 million; Benefit Cost Ratio: 1.33)

**Delay Reduction:** 71%

**Collisions Reduction:** 30%

**Deficient Concrete Lane Miles:** None identified.

**Total Estimate Cost:** \$32 M

##### **Cost Estimate Explanation:**

All costs are using 2006 dollar value. WSDOT Southwest Vancouver Area Engineer Office helped to update the construction cost estimation; the bridge cost is estimated as \$400 per square feet. WSDOT Southwest Real Estate Office estimates the right of way cost will be \$1,650,000. WSDOT Southwest Environmental Service Office does not find a need for wetland mitigation at this location.

##### **Moderate Fix Benefits:**

The benefit estimations are calculated through WSDOT Mobility Projects Prioritization Process (MPPP) program.

For Padden Parkway Interchange project, the truck volume (4.6%) and growth rate (3.77%) are from the Highway Segment Analysis Program. The PM Peak hour delay and V/C ratios are calculated through Synchro (software). The 24-hour delay reduction is calculated through MPPP software.

## SR 503 FOURTH PLAIN TO GABRIEL ROAD IN CLARK COUNTY

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### **Maximum Fix**

#### **Description:**

ARM 1.04 to 7.89, widen to 6 lanes from Padden Pkwy to SR 502 (Cost estimation: \$132 million; Delay reduction: 46%). ARM 1.04 to 2.82, widen to six lanes from Padden Pkwy to NE 119 St. (Urban) (Cost estimation: \$32 million). ARM 2.82 to 7.89, widen to six lanes from Northeast 119 St. to SR 502 (Suburban) (Cost estimation: \$100 million). Arm 7.89 to 14.13, widen to four lanes from State Route 502 to Gabriel Rd. (Cost estimation: \$34 million; B/C: 1.35; Delay reduction: 76%; Collision reduction: 30% to 40%).

**Delays Reduction:** 46% to 76%

**Collisions Reduction:** 30% to 40%

**Deficient Concrete Lane Miles:** None identified.

**Total Estimate Cost:** \$166 M

#### **Cost Estimate Explanation:**

Cost estimations are based on discussions with Vancouver Area Engineer Office, SWR Environmental Service Office, SWR Real Estate Office, SWR Utility Office, and SWR Engineering Design/Service staff. All construction costs are updated to today's standard, 2006 dollar value.

For the widening project from Padden Pkwy to SR 502, the project cost estimation includes \$25 million noise wall, \$21 million right-of-way, \$8 million bridge widening, and \$4 million utility relocation. For the widening project from SR 502 to Gabriel Rd., the costs for earthwork are estimated to be \$60 per linear foot due to several slopes along the corridor.

#### **Maximum Fix Benefits:**

The benefits estimations are calculated through MPPP software. The delay reduction is estimated through Benefit Collision Delay Program. SR 503 is the main north-south arterial in Clark County; both traffic volumes and accidents are high on this corridor. The widening and interchange project from Padden Pkwy to SR 502 will reduce the delay on the corridor by 46%. The widening project from SR 502 to Gabriel Road is a response to both the congestion and safety concerns. It is estimated the project can bring \$29 million mobility benefits and \$11 million safety benefits in 20 years. The B/C ratio is 1.35. The delay reduction is estimated to be 76%; and the collision reduction is estimated to be 30% to 40% (MPPP software).

#### **Off-System Solutions:**

Parallel route at the east of SR 503 connects Battle Ground and Washougal/Camas.

#### **Special Studies/Reports:**

Southwest Washington Regional Transportation Council (SWRTC): Transportation Corridors Visioning (50-year vision for Clark County, in process).

#### **Required Studies**

There are no identified required studies.

#### **Start/Completion Date of Study:**

There are no planned start/completion dates.

#### **Expected Results**

None identified.

#### **Funded Projects within Corridor Limits**

<b>Project No</b>	<b>Title</b>
450393A	SR 503/Lewisville Park - Climbing Lane
450387B	SR 503/NE 144th Street to Battle Ground (completed)
450305B	SR 503/4th Plain/ SR 500 Intersection
450305D	SR 503/SR 502 to Rock Creek Rd. - Paving (complete in 06)
450306A	SR 503/Gabriel Rd. Intersection

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### **Data Sources and Contacts used:**

Washington State Highway System Plan: 2003-2022, dated February 2002  
GIS Environmental and Transportation Workbench  
Capital Improvement and Preservation Program  
Transportation Data Office  
Washington State Highway Log 2005B  
WSDOT Vancouver Area Engineering Office  
WSDOT SWR Environmental Service Office  
WSDOT SWR Real Estate Office  
WSDOT SWR Traffic Office  
Southwest Regional Transportation Council Travel Demand Model  
WSDOT BidTabs Professional Database