

SR 500 FROM I-5 TO FOURTH PLAIN IN CLARK COUNTY

CHARACTERISTICS

Segment Description:

SR 500 is located within the City of Vancouver and abuts the Vancouver and unincorporated Clark County boundary. This section of SR 500 is a west to east route originating at Interstate 5 and terminating at the 4th Plain Road /SR 503 Intersection.

County/Counties: Clark

Cities/Towns Included: The corridor passes through Vancouver.

Number of lanes in the corridor: 4 to 8

Lane width: 12 to 12 feet.

Speed limit: 55 to 55 mph.

Median width: 2 to 3 feet.

Shoulder width: 8 to 10 feet.

Highway Characteristics:

This corridor is in the National Highway System (NHS). State functional Class is Urban Major Arterial. Based on 2004 data, the freight classifications and annual tonnage on this corridor are T1 and T2 and the tons vary from 4,390,000 to 13,900,000.

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

This corridor has approximately one mile of weaving lanes at the end of the segment.

Access Control Type(s):

This corridor alternates between full control, partial control limited access, and full control limited access.

Terrain Characteristics:

From ARM 0.00 to 3.89, the terrain condition is rolling; From ARM 3.89 to 5.96, the terrain condition is flat (level).

Natural Features:

This segment of SR 500 parallels the Burnt Creek Greenbelt from ARM 0.00 to approximately ARM 1.85. The highway crosses Burnt Creek at ARM 1.23. Wetlands and ponds are located near the Andresen Road interchange ARM 3.10 and the Thurston Way interchange ARM 3.88.

Adjacent Land Description:

The highway is located adjacent to high density urban lands. The urban mix includes high and low density residential, commercial, retail and greenspace. Two significant retail areas are located near this section of SR 500 at Andresen Road and Thurston Way.

Environmental Issues:

The primary environmental issues are related to water quality for the Burnt Creek Greenbelt. Localized air and noise quality issues may arise near proposed interchange and intersection improvement areas. Wetlands occur in limited areas in the SR 500 corridor, primarily associated with Burnt Bridge Creek and two small basins between NE 54th Av and Thurston Way. Proposed improvements at St. Johns Rd and 54th Av will likely have wetland and riparian impacts. A northbound connection between SR 500 and I-5 may effect a short length of Burnt Bridge Creek and small associated wetlands and riparian corridor. A small wetland may occur on the SW corner of the SR 500/4th Plain intersection that could be effected by proposed modifications in this area. Any proposed projects in the vicinity of Andresen Road and the north side of SR 500 between Andresen and Thurston Way have the potential to effect an existing WSDOT wetland mitigation site. Impacts to wetland mitigation sites carry much higher replacement ratios than natural wetlands. Using a linear measurement of wetlands immediately adjacent to the highway, approximately 7,743 linear feet (1.47 miles) of wetlands occur to the north of SR 500, and approximately 2,460 linear feet (0.47 miles) occur to the south of SR 500. Additional wetlands may be present 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.

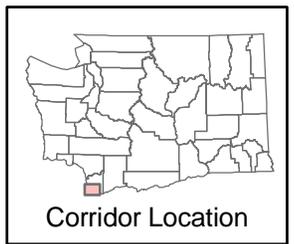
Major Economic Issues:

The region's goal is to maximize economic competitiveness by improving traffic movement through this and other corridors to the County's industrial and business areas. SR 500 provides some freight movement between the east and west areas of Clark County but the route is primarily used by single occupancy vehicles that are a mix of commute and local trips. Commercial and light industrial infix development will occur within the influence area of this segment of SR 500 during the 20 year horizon of the 2006 Highway System Plan update.

HSP Congested Corridor Analysis

Characteristics

- Milepost Marker
- █ 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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ASSETS

Pavement:

There are 25.82 lane miles of Hot Mix Asphalt on this segment of SR 500.

Signal:

There are signalized intersections at the following four locations: St. Johns, 42nd, 54th and SR 503.

Structures:

There are nine structures in this corridor that consist of: three Concrete Box Girder, two Pre-Tensioned Concrete Beam, two Post-Tensioned Box Girder, one Post-Tensioned Box Girder Pre-Tensioned Concrete Beam and one Post-Tensioned Box Girder. (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 SR 500 crosses Burnt Creek at ARM 1.25 (bridge number 500/004).

ITS Facilities:

Closed circuit television cameras (CCTV) at 15th Ave, St. Johns, Andresen, I-205, 112th, and Fourth Plain

Fiber-Optic cable runs from I-5 to State Route 503.

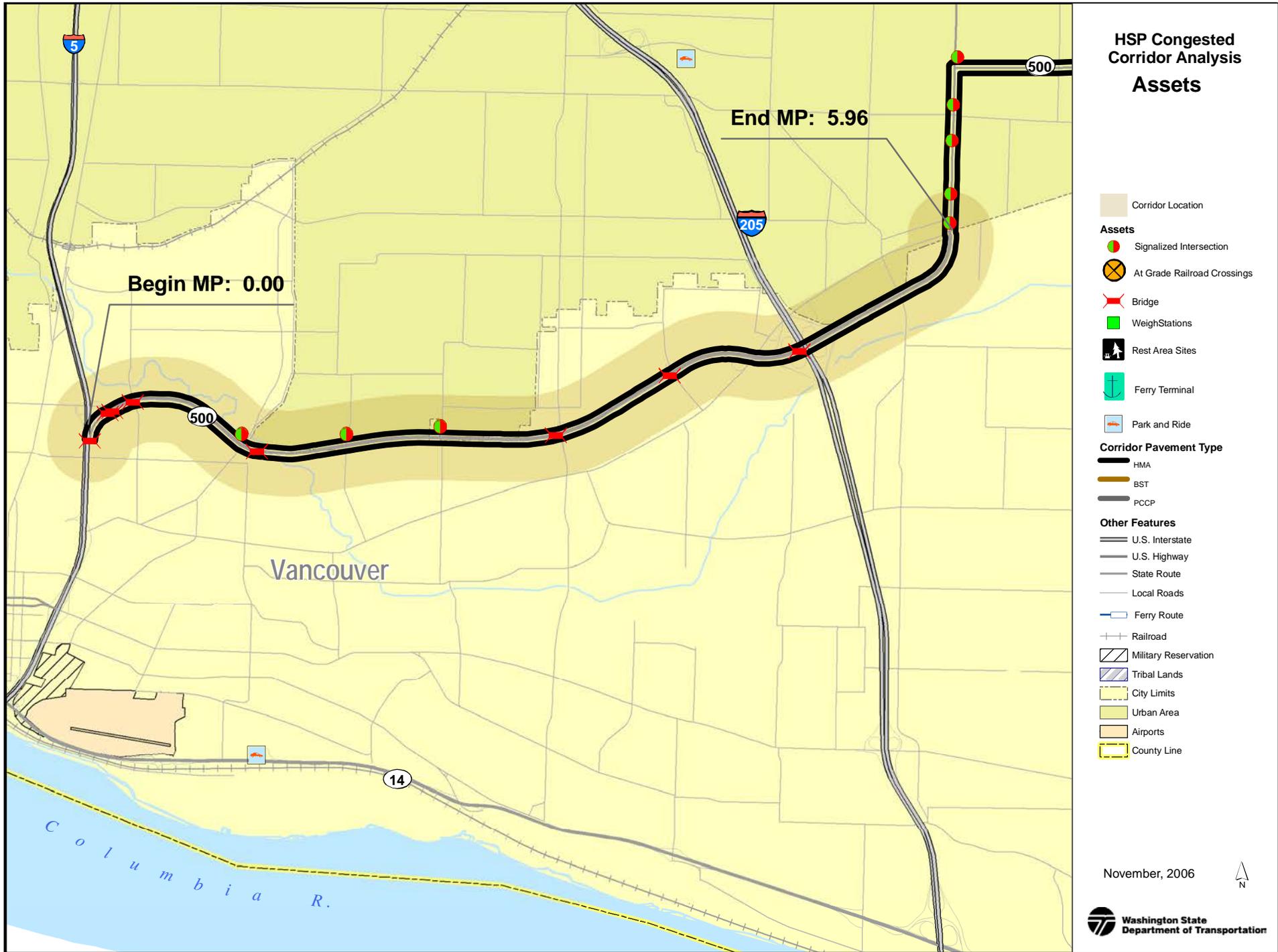
There is a Variable Message Sign (VMS) at 60th eastbound.

Railroad Crossings:

There are no at-grade rail crossings within this route segment.

Asset Other:

NONE IDENTIFIED.



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USAGE

General Origin and Destination Travel Characteristics:

This segment of SR 500 serves commuter and local trip traffic for the central Vancouver and east Clark County communities. SR 500 provides connection to both the Interstate 5 and Interstate 205 corridors, the major commuter and freight corridors in the region. Portland and Vancouver are the major employment destinations for AM peak commuter traffic. A major retail area between the Andresen Rd and Interstate 205 interchanges captures significant volumes of local traffic.

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 28,000 to 71,000.

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, but congestion is due to commuter traffic.

General Description of Major Average Annual Daily Traffic Locations:

I-5 Interchange to NE 15th Ave the annual average daily traffic (AADT) is 28,000. I-205 to NE Gher Road the AADT is 71,000. AADT is above 39,000 from 0.89 to 5.96, covering the following intersections: NE 15th, St. Johns, NE 42nd, NE 54th, NE Andersen, NE Thurston Way, NE, 112th, NE Gher Rd, NE 4th Plain Blvd.

Freight:

Freight Classification: T2

Yearly Tonnage: 8.8M

Truck Percentage of Annual Average Daily Traffic: 6%

Additional Usage Comments:

There are no additional comments.

Average Annual Societal Cost of All Collisions: Approximately \$9.32M

Collisions:

Severe No of Collisions: 10

Less Severe No of Collisions: 757

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
- HAC 07-09
- HAL Corridor 07-09
- HAL Spot 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
- County Line

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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 corridor is in good condition.

Pavement Management Strategies:

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

66% percent of corridor lane miles were either reconstructed or paved in 2000-2004. Estimated pavement life is 15 years. These lane miles will be due for a hot mix asphalt overlay in 2017.

The remaining 34% of corridor lane miles consist of sections that are small in length, and are located between the Southwest Region interchange construction projects completed on SR 500 in 2002 and 2004. Southwest Region maintenance will maintain these areas until the adjacent pavement sections are due for overlay.

Structures Condition and Needs:

There are nine structures in this corridor that consist of: three Concrete Box Girder, two Pre-Tensioned Concrete Beam, two Post-Tensioned Box Girder, one Post-Tensioned Box Girder Pre-Tensioned Concrete Beam and one Post-Tensioned Box Girder. (This may include ramps and locally owned structures if any exist.)

Structures Management Strategies:

MP 1.21 500/4 Burnt Bridge Creek

Two new structures will be constructed adjacent to this bridge for on/off ramps of the new St. Johns Interchange. There will be no change to the existing structure.

Additional Condition and Needs:

There are none identified.

Additional Management Strategies:

There are none identified.

Improvement

Mobility Condition and Needs:

This section of SR 500 is one of the main east-west corridors in Vancouver. It links I-5 and I-205 and provides connection to SR 503. The corridor currently experiences traffic back-ups during peak hours. Without mobility improvements, it is estimated in 2030, that peak hour speeds on most segments of this corridor will be lower than 50% of the posted speed. Southwest Region has identified three bottlenecks and chokepoints on this corridor: (1) intersection with St. John's Blvd., (2) ramp from SR 500 westbound to I-205 southbound, and (3) intersection of SR 500 and Fourth Plain Rd. Additional congestion is caused by three at-grade intersections along the corridor: St. Johns Boulevard, 42nd Ave and 54th Ave.

Mobility Management Strategies:

A programmed interchange at Street John's Boulevard should solve the problem at that chokepoint. Another programmed project should help to improve the performance of ramp from SR 500 Westbound to I-205 southbound by lengthening the Westbound merge lane, but this chokepoint needs further investment to solve the weaving problem. Among the proposed projects, two of them should directly relieve the congestion at the chokepoints. For SR 500/I-205, it is proposed to build a fly over from SR 500 Westbound to I-205 southbound (high cost solution).

For the SR 500/Fourth Plain, it is proposed to construct dual right turns from Northbound to Eastbound. A \$100,000 study for this intersection is funded in 2005 - 2007 Biennium (PIN 450099B). Other locations with high traffic demands have. Build 42nd Ave bridge and 54th Ave interchange. This project will remove two signalized intersections, making this corridor a full control limited access highway, thus significantly reducing delay. Add an additional on-ramp lane from SR 500 Westbound to I-205 NB. and Construct direct connection between I-5 and SR 500 - 2 flyovers (high cost).

To improve the overall mobility performance on this corridor, it is proposed to establish Intelligent Transportation Systems (ITS) facilities along the whole corridor.

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Safety Condition and Needs:

Reduce frequency and severity of accidents within the SR 500 corridor. Rear-end collisions account for 63% of all accidents. 68% of all accidents in this corridor are related to intersections. Highest accident intersections along this corridor are: I-5 transition; 112th and Gher; 4th Plain; 54th Street; 42nd Street; and St. Johns Blvd. 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:

Build new or improve existing intersections, including direct connection to I-5 and flyovers at other key locations, to mitigate high intersection related accident levels. Throughout corridor, adjust transition lanes and ramps and 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:

There are no fish barriers. There is one stream crossing (Burnt Bridge Cr.) in this corridor with associated riparian and wetland areas that provide habitat for vegetation, fish and wildlife. There are some additional wetland areas located along the eastern half of the corridor. There are approximately 25 known stormwater outfalls located along this corridor.

Environmental Management Strategies:

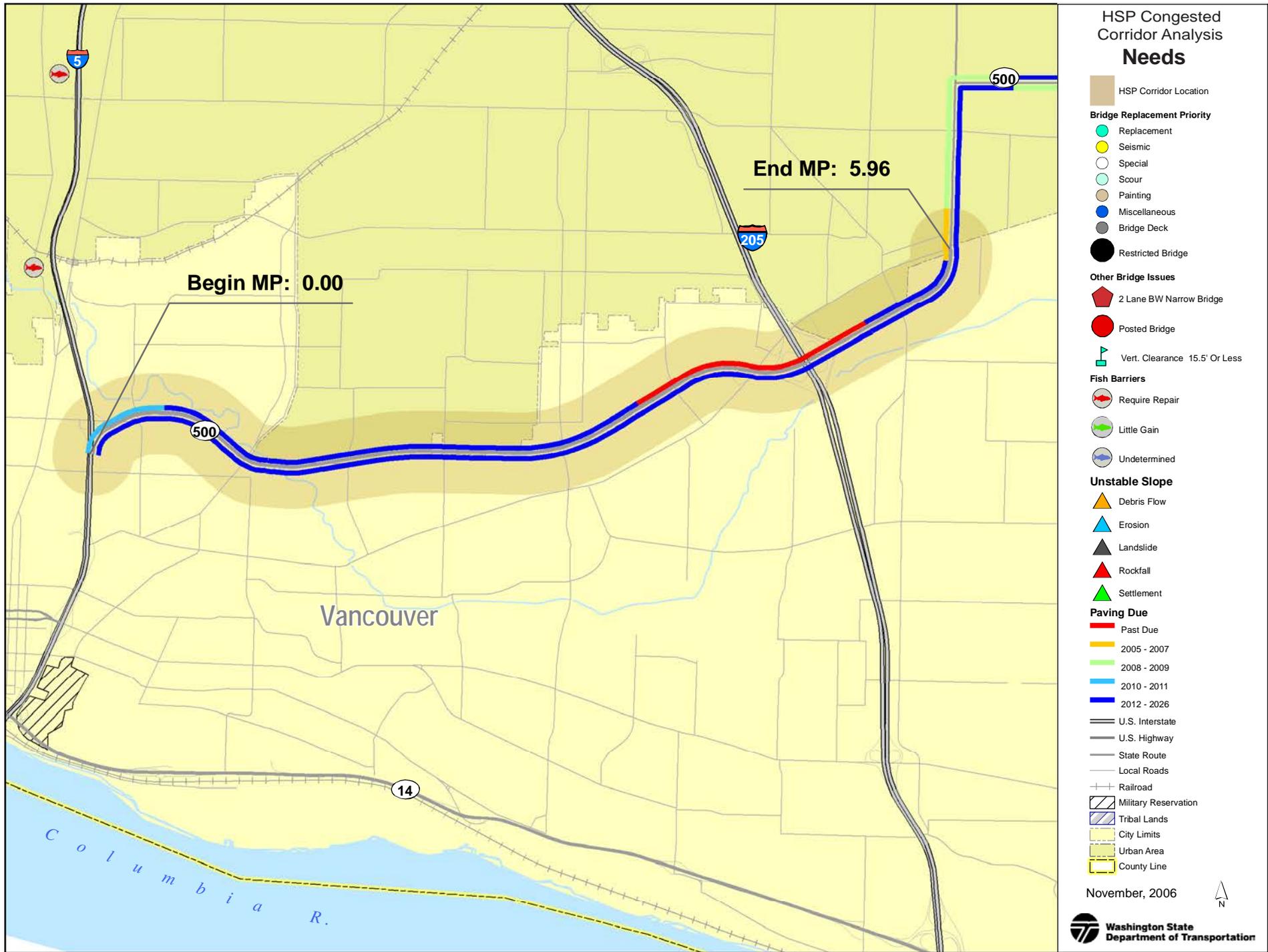
Proposed improvement solutions will take into consideration the existing environmental conditions of the corridor and make every effort to minimize any potential adverse impacts.

Restrictions:

There are none identified.

50-Year Configuration:

The entire route connects the major origin and destinations within Vancouver. During the next 50 years, the redevelopment and influx opportunities within immediate locations around the congested state route 500 corridor will likely be built out. Additionally as growth continues east, away from established County employment nodes and the two bridges crossing to Portland, this corridor will continue to be a major commuter route. The additional traffic volume from this growth will likely cause delay that may not be economically feasible to address along this corridor. The corridor will likely have all possible improvements in place as well as HOV and high capacity mobility systems, by year 2056. At build out, options to improve mobility within the corridor shift to alternative local routes and the establishment of parallel corridors. Presently RTC, the Regional Transportation Council, is beginning a study to identify a 50-year corridor configuration for Clark County.



HSP Congested Corridor Analysis Needs

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

Minimum Fix

Description:

ARM 0.38 to 0.42, add 2 signals at SR 500/15th Avenue intersection (Cost: \$1.23 million; B/C: 2.95). ARM 5.09 to 5.26, add one additional on-ramp lane from westbound 500 to NB 205 (Costs: \$2 million). ARM 5.94 to 5.96, NB to eastbound dual right turns at Fourth Plain Rd. (Costs: \$1 million, this intersection improvement is under a funded study; also see proposed solutions for SR 503). CCTV at intersections, interchanges and blind spots (Costs: \$568,000). Data stations every 1/2 mile and at interchanges/intersections (Costs: \$679,000). Ramp metering at interchanges (Costs: \$970,000)

Delay Reduction: 30 to 68%

Collision Reduction: 30 to 50%

Deficient Concrete Lane Miles: None identified.

Total Estimate Cost: \$6.5 M

Cost Estimate Explanation:

Project (1): Assume signal construction costs are \$350,000/each.

Project (2): Assume we extend the two lanes from SR 500/112th Ave Westbound off-ramp to SR 500 / I-205 Westbound on ramp.

Project (3): A \$100,000 study for this intersection is funded in 2005 - 2007 Biennium (PIN 450099B).

All Intelligent Transportation Systems (ITS) facility costs estimates are based on information from SW Region Traffic Office.

Minimum Fix Benefits:

Project (1): The average intersection delay and v/c ratios were determined using Synchro (software) software (for both build and no-build scenario). Accidents occurring on related ramps (type LX, Q1 and R1) are included in the Safety benefits.

Project (2): This project will reduce the merging problem between the two interchanges.

Project (3): In-depth benefit analysis is expected in the funded \$100,000 study.

Moderate Fix

Description:

Build 42nd Ave bridge and 54th Ave interchange (Costs: \$51 million)

A. ARM 1.80, 42nd Ave (Falk Road) bridge (Costs: \$14 million; B/C: 2.61)

B. ARM 2.38, 54th Ave Interchange (Costs: \$37 million; B/C: 2.32)

Delay Reduction: 64%

Collisions Reduction: 30%

Deficient Concrete Lane Miles: None identified.

Total Estimate Cost: \$51.0 M

Cost Estimate Explanation:

The \$51 million project costs are based on the estimates from Vancouver Engineer Office in August 2006 and the inflation factor in 2006.

Moderate Fix Benefits:

This project will improve mobility by removing two signalized intersections on a high-volume corridor. Upon the completion of the project, the whole corridor will become a full control limited access highway.

Maximum Fix

Description:

(1) Direct connection between I-5 and SR 500 - 2 flyovers (this project is part of the ongoing Columbia River Crossing study; costs and benefits are to be determined)

(2) ARM 5.21, SR 500 Westbound to I-205 southbound fly over (Costs: \$33 million; delay reduction: 26%)

(3) Parallel Route (50 year vision)

Delays Reduction: None identified.

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Collisions Reduction: None identified.

Deficient Concrete Lane Miles: None identified.

Total Estimate Cost: The costs for fly over are \$33 M, other costs are to be determined.

Cost Estimate Explanation:

Project (1): This project is part of the ongoing Columbia River Crossing study; costs are to be determined.

Project (2): New Bridge 36 feet wide 1200 feet long at \$400 per square feet. Eight new luminaires are assumed. Wetlands are currently within the existing cloverleafs. It is assumed that four acres are impacted and need to be replaced at a 2:1 ratio.

Project (3): No cost estimate for parallel route.

Maximum Fix Benefits:

For the fly over project from SR 500 Westbound to I-205 southbound, Highway Capacity Software (HCS+) was used to estimate delay reduction. Analysis of the no build scenario involved modeling two freeway weave segments - Gher Rd on ramp to I-205 N on ramp, and I-205 N off ramp to I-205 on ramp. The build scenario includes one weave - Gher Rd to I-205 on ramps, and a merge at I-205 N off ramp. The build and no build scenarios were run for the AM and PM peak hours for 2006 and 2026. Based on the HCS+ output, this project will reduce delay by 26%.

Off-System Solutions:

None identified.

Special Studies/Reports:

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

SWRTC Clark County High Capacity Transit Study

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

Project No	Title
450000A	SR 500/St. Johns Blvd. - Interchange
450000G	SR 500/Thurston Way - Interchange
450099A	SR 500/NE 112th Ave. - Interchange
450008A	SR 500/I-205 Interchange Improvements
450000E	SR 500/NE 42nd Ave. and 54th Ave.
450099B	SR 500/SR 503/Fourth Intersection Study

Additional Comments:

None identified.

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

Washington State Pavement Management System, 2005



HSP Congested Corridor Analysis Solutions

- HSP Corridor Location
- Solutions**
- Tier 1
- Tier 2
- Tier 3
- Other Features**
- U.S. Interstate
- U.S. Highway
- State Route
- Milepost Marker
- Local Roads
- Railroad
- Tribal Lands
- Military Reservation
- City Limits
- Urban Area
- COUNTY

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