

SR 510: MARVIN ROAD TO YELM WEST CORPORATE LIMIT

CHARACTERISTICS

Segment Description:

This SR 510 Corridor begins at the Marvin/Pacific Road Intersection in the City of Lacey Urban Area Boundary and ends at the City of Yelm West Corporate Limit, MP 4.28 to MP 14.41, ARM 1.69 to 11.81.

County/Counties: Thurston

Cities/Towns Included: The beginning of SR 510 is in the City of Lacey and the ending for SR 510 is in the City of Yelm. It does not pass through any cities in between, but does pass through the Nisqually Tribal Reservation (MP 9.99 to MP 10.93 Vicinity) and Fort Lewis.

Number of lanes in the corridor: 2 to 4

Lane width: 11 to 12 feet.

Speed limit: 35 to 50 mph.

Median width: 0 to 0 feet.

Shoulder width: 4 to 8 feet.

Highway Characteristics:

SR 510 is a Highway of Regional Significance (Non-HSS) and is not part of the National Highway System. The freight classification is T-3 with approximately 3.3 million tons per year estimated in 2005. There is a short location at the start of SR 510 where the classification is T-2 (MP 0.01 to MP 0.19) with approximately 6 million average gross annual tonnage in 2003.

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

Special use lanes on this SR 510 corridor include 0.09 mile of two-way left turn lane mile, 0.40 turn lane miles, and 0.28 acceleration lane mile.

Access Control Type(s):

MP 2.85 to MP 6.35, Class 3 (Lacey UAB)

MP 6.35 to MP 9.99, Class 2

MP 9.99 to MP 10.93, Class 3 (Nisqually Reservation)

MP 10.93 to MP 14.41, Class 2.

The City of Lacey is Class 4 with full control at the I-5/SR 510 Interchange at the beginning of SR 510 and the City of Yelm is Class 4 and Class 5 at the end of SR 510.

Terrain Characteristics:

The middle segment of SR 510 (5.16 miles) is primarily rolling terrain with the City of Lacey and the City of Yelm at each end of SR 510 being in level terrain (First 1.69 miles and last 6.22 miles).

Natural Features:

SR 510 provides access to the Nisqually Tribal Reservation. The Cowlitz Indian Tribe Historical Area of Importance may touch a portion of SR 510 at the beginning of the route.

Adjacent Land Description:

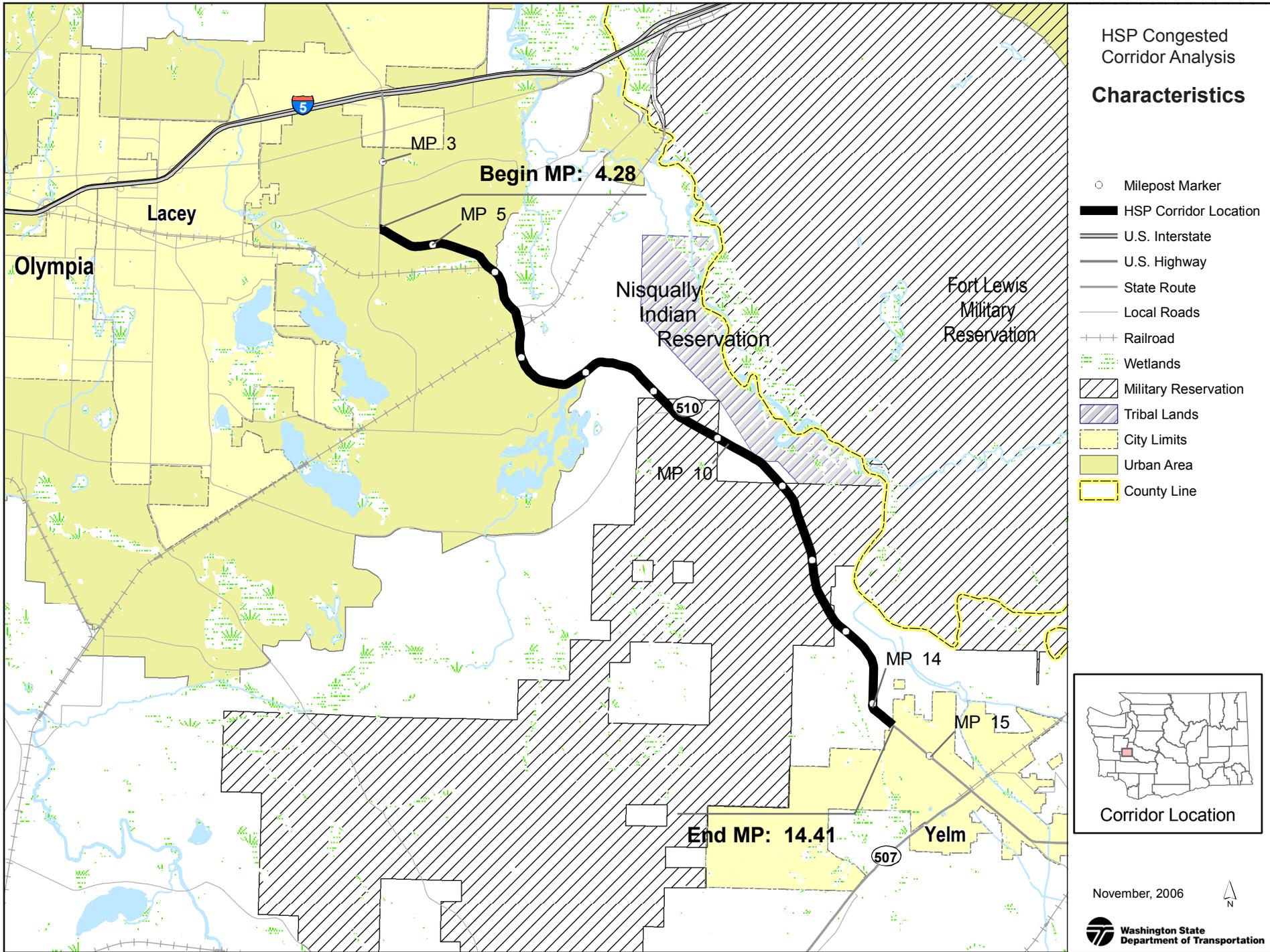
SR 510 travels through the traditional area of interest (usual and accustomed area) for the Nisqually Tribe. It also passes through a portion of Fort Lewis. There are existing large residential subdivisions with even larger residential subdivisions proposed that will impact the SR 510 Corridor near Yelm.

Environmental Issues:

McAllister Springs, located off SR 510 at Old Pacific Hwy., is a water recharge source. There are approximately 3 fish barriers of which approximately 2 require work and 8 storm water outfalls.

Major Economic Issues:

The Red Wind Casino and Nisqually Tribal Community within the Reservation are significant traffic generators (MP 9.99 to MP 10.93).



SR 510: MARVIN ROAD TO YELM WEST CORPORATE LIMIT

ASSETS

Pavement:

There are approximately 20.42 lane miles of Hot Mix Asphalt on this segment of SR 510.

Signal:

There is a new signal system at MP 10.40 within the Nisqually Tribe Reservation at Muk-Set-Wei Drive for the Red Wind Casino, LOS not available. A signal system at the SR 510/SR 507 intersection, MP 15.67, in the City of Yelm also experiences long traffic queues with LOS F .

Structures:

There are two structures in this corridor that consist of two Pre-Tensioned Concrete Beam.
(Ramps, and locally owned structures (if any exist) are not identified in this section and may not be reflected on maps.)

Features Crossed:

There are no features crossed.

ITS Facilities:

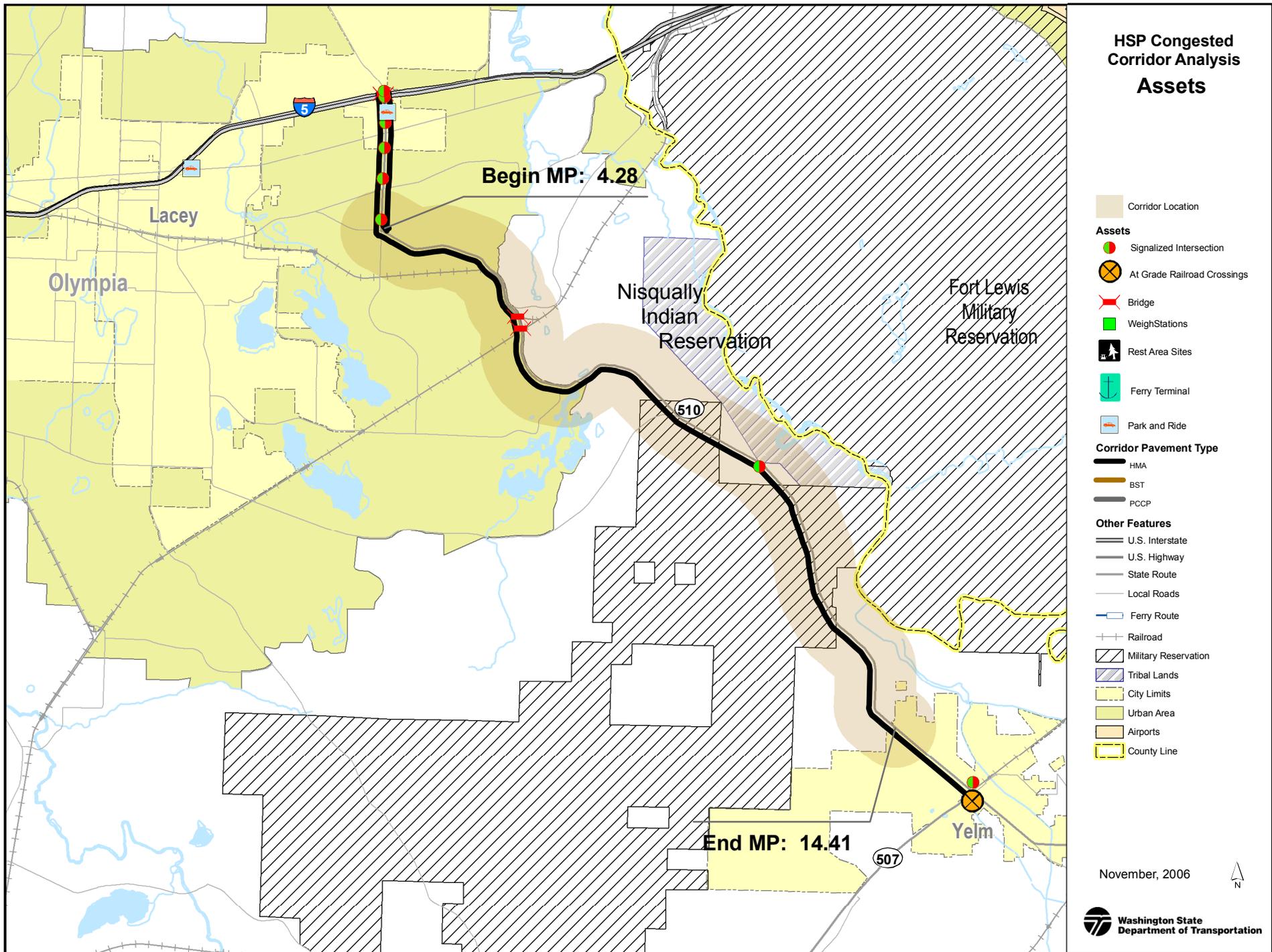
There are no intelligent Transportation systems on this corridor.

Railroad Crossings:

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

Asset Other:

There is a military tank crossing between the Nisqually Reservation and Southworth Elementary School (MP 11.79) consisting of a concrete pad. High power transmission lines cross over SR 510 at/near the Nisqually Reservation Boundaries (recently relocated).



SR 510: MARVIN ROAD TO YELM WEST CORPORATE LIMIT

USAGE

General Origin and Destination Travel Characteristics:

The Red Wind Casino in the Nisqually Reservation is a major traffic generator and attraction. A recent license plat survey indicates the City of Yelm is a major origin of destination with approximately 60% of SR 510 traffic being Yelm based with more than 30% passing through Yelm. A SR 510 travel survey from July 1997 showed typical destinations to be 54% Olympia/Lacey, 26% Yelm, 6% Tacoma, 3% Fort Lewis, 2% Tumwater, and 5% other.

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 7,100 to 15,000.

Significant Seasonal Average Annual Daily Traffic Changes:

January traffic volume is approximately 13% lower than annual average with June, July, and August traffic volumes approximately 9% higher than annual average.

General Description of Major Average Annual Daily Traffic Locations:

Marvin Road Roundabout at Pacific Avenue, to Old Pacific Highway (within City of Lacey UAB) with 9,600 to 10,000 annual average daily traffic (AADT) in 2004. Reservation Road (West of Nisqually Reservation) to SR 507 with 11,000 to 16,000 AADT in 2004.

Freight:

Freight Classification: T3

Yearly Tonnage: 0.3M to 4M

Truck Percentage of Annual Average Daily Traffic: 7.37% to 8.13%

Additional Usage Comments:

The alternative new alignments in nearby Yelm (Y-3, Y-2, and Y-1) are not funded for construction and are likely to be high cost solutions. Only the Y-3 northern loop has preliminary engineering and right-of-way funding allocated. A new Yelm Wal-Mart will construct a short segment of the Y-3 alternative new alignment loop on the east side of the City (800 feet). Quadrant corporation has purchased 1,100 lots from Tahoma Terra in Yelm to build homes and they produce one home every 53 to 54 days.

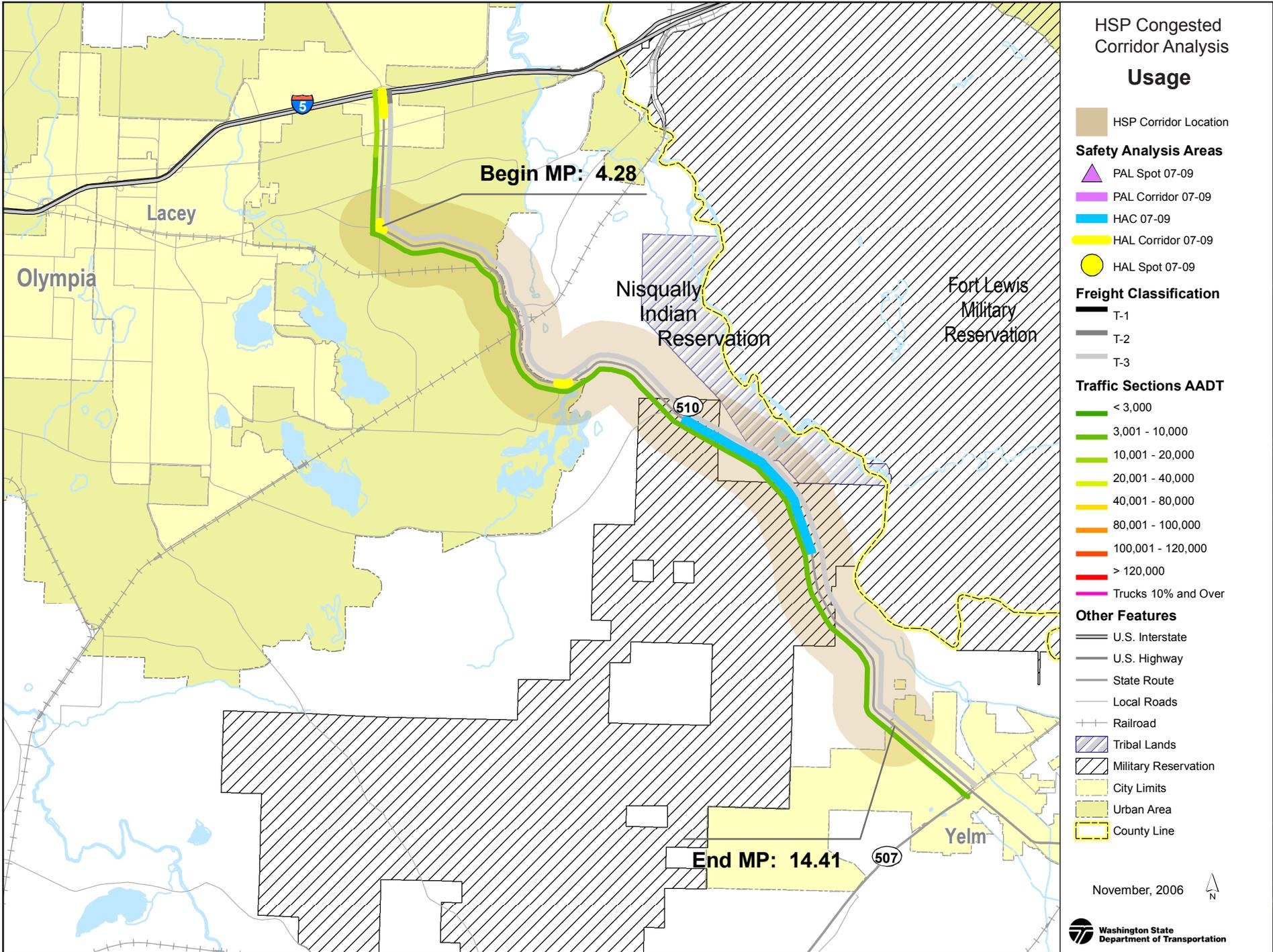
Average Annual Societal Cost of All Collisions: Approximately \$3.53M

Collisions:

Severe No of Collisions: 5

Less Severe No of Collisions: 223

List Data Years: 2003 to 2005



NEEDS AND STRATEGIES

Preservation

Pavement Condition and Needs:

Preserve transportation infrastructure to achieve the lowest life cycle cost and prevent failure. Pavements should be programmed targeting the lowest life cycle cost per the Washington State Pavement Management System "due" date. This is the point in a pavement's life cycle where optimum pavement life has been achieved and the least cost to resurface is obtained. Pavements that have past this point typically incur more costs to rehabilitate. Existing safety features shall be restored to provide basic design level standards.

Pavement Management Strategies:

Reduce the backlog of pavement preservation needs that have gone beyond the point of economical resurfacing (lowest life cycle cost). Existing hot mix asphalt (ACP) has an average life of 16.5 years in Western Washington. When the last pavement cycle approaches the due date or exceeds the average life cycle, paving with bituminous surface treatment (BST) to extend the life or surfacing with HMA will be necessary.

Structures Condition and Needs:

Preserve transportation infrastructure to achieve the lowest life cycle cost and prevent failure. (This may include ramps and locally owned structures if any exist.)

Structures Management Strategies:

There are seismic retrofits proposed at two railroad overcrossings in Bridge's 20-year plan. They are for BN RR OC (NP) at bridges 510/009 (MP 6.48 to MP 6.51) and 510/010 (MP 6.63 to MP 6.67). Not funded at this time with work planned in year 2057.

Additional Condition and Needs:

Preserve transportation infrastructure such as electronic/mechanical systems, major drainage, safety rest area refurbishment, traffic control systems, unstable slopes, weight facilities.

Additional Management Strategies:

Constructing bottleneck and chokepoint solutions and highway system plan conceptual solutions address unstable slopes by assuming retaining wall costs in the vicinity of the unstable slope (10 ft high for the length of the deficiency).

Improvement

Mobility Condition and Needs:

The 2-lane facility between Reservation Road and SR 507 in the City of Yelm is experiencing tremendous traffic growth. Congestion in the City of Yelm begins when the local schools let out after 2 p.m. and traffic queues don't dissipate until after 6 p.m.

Mobility Management Strategies:

A near term strategy is providing a two-way left turn lane within the City of Yelm in front of the high school and junior high that will alleviate some mainline traffic queues. Alternative new alignments are needed (Y-3, Y-2, and Y-1) along with widening SR 510. SR 510 between Yelm Highway (with a relocated Reservation Road) and the Y-3 northern loop alternative would have the most congestion and need to be a 4-lane divided facility first, except in the Nisqually Reservation. A master plan is being done by the Nisqually Tribe to examine future needs within the reservation. Long term strategy may be a 4 lane facility between Lacey and Yelm Y-3 loop.

Safety Condition and Needs:

Reduce and prevent deaths and the frequency and severity of disabling injuries, and reduce the societal costs of accidents (Focus on the rate of severity and frequency). This SR 510 corridor experiences 32% rear ends, 37% single vehicle run off the road, 18% T-Bone, 5% mainline opposite direction, and 8% other. Under 23 United States 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:

Constructing bottleneck and chokepoint solutions and highway system plan conceptual solutions should reduce these kinds of accidents. A 30% reduction in all accidents was assumed as a placeholder in the bottleneck and chokepoint solutions. The SR

SR 510: MARVIN ROAD TO YELM WEST CORPORATE LIMIT

510/Sitka Street to 93rd Ave. SE - Paving project in 2006 will include rumble strips along the centerline to alert motorists and reduce mainline opposite direction accidents.

Environmental Condition and Needs:

Reduce impacts by addressing noise reduction, air quality, stormwater, wetland mitigation, chronic environmental deficiencies, and fish barriers. This SR 510 corridor has fish barriers, stormwater outfalls, and may cover an area with threatened and endangered species.

Environmental Management Strategies:

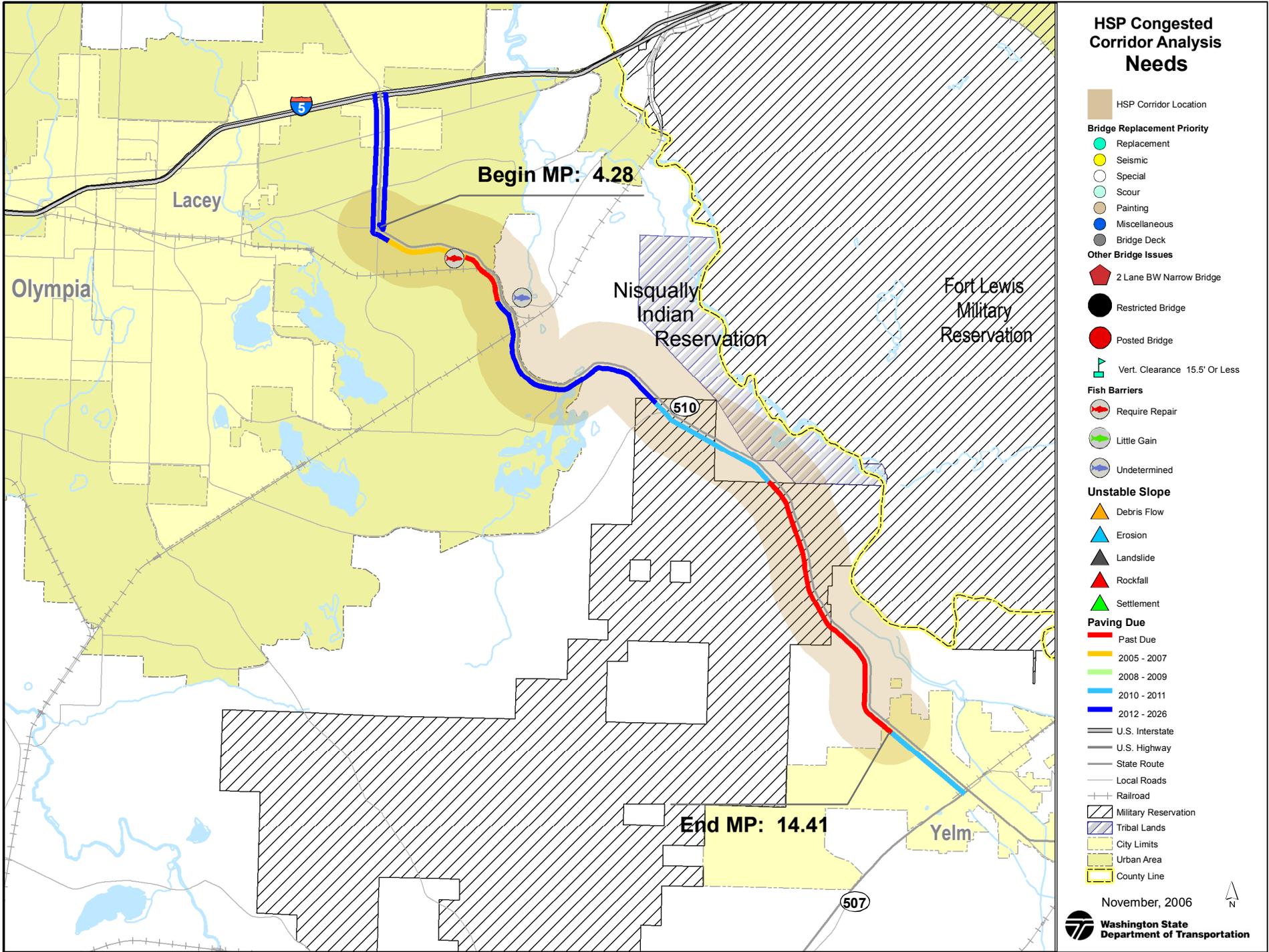
Fish passage barriers: Culverts that have been identified as fish passage barriers that will be impacted by the construction of highway projects within this corridor will be corrected. Stormwater: All projects in this corridor will provide adequate stormwater treatment as outlined in WSDOT's Highway Runoff Manual to achieve compliance with federal and state water quality regulations. Threatened and Endangered Species: Biological assessments will be performed on projects in this corridor to determine the effects on plants and wildlife. Mitigating measures will be suggested where appropriate.

Restrictions:

There are none identified.

50-Year Configuration:

SR 510 will be a 4 lane divided facility between the City of Lacey and the City of Yelm, except in the Nisqually Tribe Reservation. SR 510 within the reservation boundaries may be a 4 or 5 lane facility (4 lanes with left turn channelization or 5 lanes with a two way center left turn lane), or SR 510 may remain a 2 lane facility with left turn channelization and a separate 2-lane IRR providing congestion relieve via a loop frontage road. The City of Lacey will remain a 5 lane facility, center two way left turn lane (two way left turn lane (TWLTL)), and the City of Yelm will have 3 alternative loops (Y1, Y2, and Y3).



HSP Congested Corridor Analysis Needs

- HSP Corridor Location
- Bridge Replacement Priority**
- Replacement
- Seismic
- Special
- Scour
- Painting
- Miscellaneous
- Bridge Deck
- Other Bridge Issues**
- 2 Lane BW Narrow Bridge
- Restricted 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
- U.S. Interstate
- U.S. Highway
- State Route
- Local Roads
- Railroad
- Military Reservation
- Tribal Lands
- City Limits
- Urban Area
- County Line

November, 2006



SR 510: MARVIN ROAD TO YELM WEST CORPORATE LIMIT

TIERED PROPOSED SOLUTIONS

Minimum Fix

Description:

There is only one nearby 2003 Bottleneck and Chokepoint Solution:

A two-way left turn lane (two way left turn lane (TWLTL)) between Burnett Road (Yelm West Corporate Limit) to SR 507. It is assumed the City of Yelm will be lead agency because they are establishing a local improvement district from 93rd Avenue SE to NW Killion Road. The proposed bottleneck and chokepoint solution expands the limits of the City's two way left turn lane (TWLTL) (Also known as a Y-5 alternative in the City of Yelm Comprehensive Plan).

A new northern loop alignment (Y-3) is proposed in Yelm and is funded for design and right-of-way acquisition only. New southern loop alignments were also proposed (Y-2, and Y-1), but are not funded. The cost of these loop alternatives are not shown.

Delay Reduction: 73% daily

Collision Reduction: 30%

Deficient Concrete Lane Miles: None

Total Estimate Cost: \$10.3 million with benefits of \$12.7 million and a B/C ratio of 1.81 with present value cost.

Cost Estimate Explanation:

There was only one bottleneck/chokepoint solution near the SR 510 corridor (partnership opportunity). Cost estimate based upon Access cost estimating tool developed and maintained by Delwar Murshed, WSDOT. Benefits based upon WSDOT Mobility Project Prioritization Process, Benefit/Cost Software User's Guide, May 2000, prepared by Dowling Associates, Inc. in conjunction with Kittleson & Associates.

Minimum Fix Benefits:

This project will increase peak hour speeds above 70% of the posted speed based upon year 2003 traffic volumes. However, the proposed two way left turn lane (TWLTL) is currently outside the corridor limits which match to a SR 510/Yelm Loop (Y-3) - New Alignment project that is only funded for design and right-of-way acquisition at this time.

Moderate Fix

Description:

Unconstrained 20-Year Washington State Highway System Plan (HSP) Conceptual Solutions:

Widen from 2 lanes to 4 lanes with median barrier between Marvin Road and the SR 510/Yelm Loop project.

Park and ride lots in Tri-Lakes Vicinity (MP 6.95) and within the Nisqually Reservation.

Consider realignment of Reservation Road to line up with Yelm Highway and a non-motorized grade separated crossing within the Nisqually Community.

Full access intersections are recommended at Sitka Street (MP 4.51), Chatham Drive (MP 4.98), Rockress Drive (MP 5.38), Old Pacific Highway (MP 6.35), Meridian realignment to improve sight distance (MP 6.93), full access at Mullen Road (MP 7.64), Yelm Highway with a realignment of Reservation Road (MP 9.27), Muk-Sut-Wei SE (MP 10.40), She-Nah-Num Drive (MP 10.21), Fort Lewis tank crossing (MP 11.79), and Southworth Elementary. New signal systems may be warranted at Old Pacific Hwy. (MP 6.35), Meridian Rd SE (MP 6.93), and Yelm Hwy. SE (MP 9.27).

Delay Reduction: None identified.

Collisions Reduction: None identified.

Deficient Concrete Lane Miles: None identified.

Total Estimate Cost: None identified.

Cost Estimate Explanation:

The highway system plan conceptual solutions have not yet been through our benefit/cost process. The conceptual solutions in the HSP are based upon a State Route 510 Route Development Plan, SR 510 Interstate 5 to Junction SR 507, dated November 1997.

Moderate Fix Benefits:

These projects reduce congestion delay and accidents in areas that have a Congestion Index (CI) ratio exceeding 10 urban and 6 rural over a 20-year period in the HSP. CI is annual average daily traffic volumes divided by one hour peak capacity volumes. A

SR 510: MARVIN ROAD TO YELM WEST CORPORATE LIMIT

CI of 10 is roughly LOS D/E and CI of 6 is roughly LOS C/D. This corridor segment of SR 510 is designated rural.

Maximum Fix

Description:

A new alignment bypassing the Yelm Core Business District in a Southeast direction (Y-1) was previously identified as well as a bypass in a Northeast direction for SR 507 (Y-2). It should be noted that the Nisqually Tribe is developing a Master Plan for their community over the next year which will identify additional improvements.

Delays Reduction: None identified.

Collisions Reduction: None identified.

Deficient Concrete Lane Miles: None identified.

Total Estimate Cost: None identified.

Cost Estimate Explanation:

The maximum fix conceptual solutions have not yet been through our benefit/cost process. The Nisqually Tribe is in the process of developing a Master Plan.

Maximum Fix Benefits:

None identified.

SR 510: MARVIN ROAD TO YELM WEST CORPORATE LIMIT

Off-System Solutions:

City of Yelm, Pride of the Prairie Comprehensive Plan, proposed several roadway connections that would be off-system. The most important off system solutions to SR 510 and SR 507 are alternative corridors Y-1 (Southwest of City CBD), Y-2 (Southeast of City CBD), and Y-3 (North of City CBD). The City of Yelm will be forming a local improvement district (LID) to provide realignment of two skewed public road intersections into SR 510. This LID will collect developer traffic impact mitigation's and Yelm High School traffic mitigation's to fund the realignments. The LID may also be used to fund a two-way left turn lane along SR 510 (Y-5) that is not off-system.

Special Studies/Reports:

State Route 510 Route Development Plan, November 1997.

Required Studies

Nisqually Tribe Master Plan for the Nisqually Reservation.

Start/Completion Date of Study:

Underway and expect completion in 2007.

ExpectedResults

The Nisqually Master plan will probably recommend a vision for how the reservation will be developed (commercially and recreationally). It may recommend alternatives for SR 510 (e.g. Rather than widening SR 510 to 4/5 lanes maybe a couplet or alternate 2-lane business route to better serve tribal government may be proposed).

Funded Projects within Corridor Limits

Project No	Title
351015A	SR 510/ Sitka Street to 93rd Ave. SE - Paving
351025A	SR 510/Yelm Loop - New Alignment

Additional Comments:

The City of Yelm local improvement district (LID) for realignment work and possibly constructing a two way left turn lane on SR 510 is anticipated to be funded 50% with developer funding at an estimated total cost of \$8 million.

Data Sources and Contacts used:

Washington State Highway System Plan: 2003-2022, dated February 2002

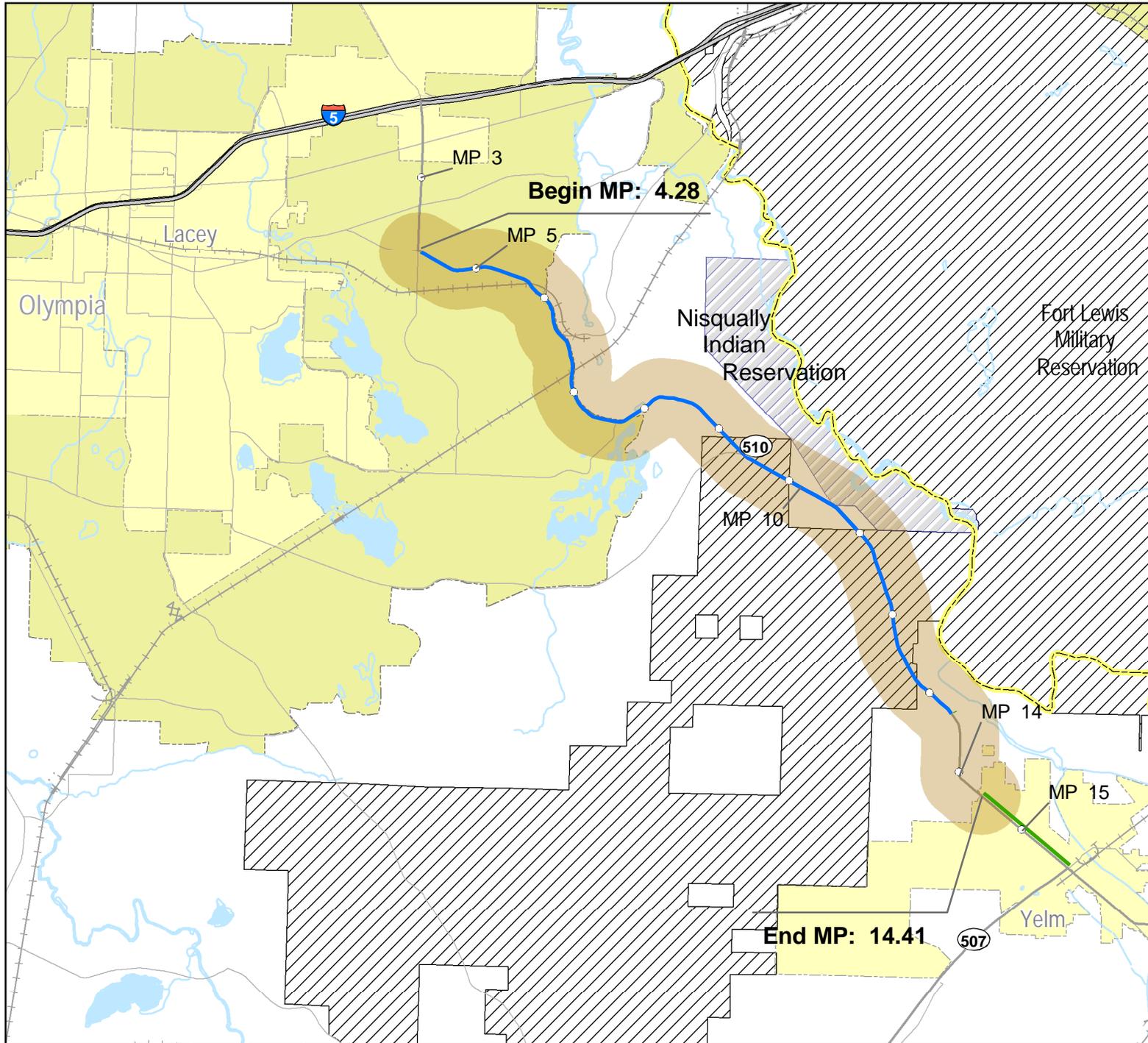
GIS Environmental and Transportation Workbench

Capital Improvement and Preservation Program

Summary of South Thurston County License Plate Survey, January 2006

Measures, Markers and Mileposts, Basic Pavement Types and Ratings Summary (The Gray Notebook)

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