# West Olympia Access Study

## Alternative Screening

### US 101 West Olympia Access Study

February 18, 2010

George Kovich
Olympic Region Planning Office

# Screening (Comparison) Criteria Categories and Elements

| Safety | Built Environment Impacts | Natural Environment Impacts | Constructability | Transportation Benefit |
|---|---|---|---|---|
| Compatibility with Freeway Safety | Displacements | Wetlands and Shorelines | Probable Construction Cost | Vehicle Miles Traveled (VMT)<br>Vehicle Hours Traveled (VHT) |
| Compatibility with Local Street Safety | Right-of-way | Water Resources | Constructability | Compatibility with Local System Operations |
| Ability to meet Design Standards | | | | Compatibility with Freeway Operations |

# Screening (Comparison) Criteria Descriptions

| Built Environment Impacts | |
|---|---|
| **Element** | **Evaluation Measurement** |
| Disruptions and Displacement<br>*How many commercial and residential properties will be displaced?* | Quantitative estimate of the net number of properties adversely affected. An initial assessment will be made for full or partial takes. |
| Right of Way<br>*How much additional ROW is required?* | Quantitative estimate of the additional right-of-way required. |
| **Natural Environment Impacts** | |
| **Element** | **Evaluation Measurement** |
| Wetland/Shorelines<br>*How will implementation of an option impact known wetland resources?* | Planning-level estimate of impact and quality of impacted wetlands &/or buffers. |
| Water Resources (Stormwater)<br>*What are the impacts on surface and groundwater?* | Quantitative estimate of additional impervious surface. Planning-level estimate of impact and quality of impacted water basins. |
| **Constructability** | |
| **Element** | **Evaluation Measurement** |
| Constructability<br>*How easy and lengthy would it be to implement the option during construction?* | Subjective qualitative judgments based on the potential overall construction schedule, impacts to traffic operations, ability to sequence and phase project delivery, etc. |
| Probable Construction Cost<br>*How much to build the full project?* | Probable estimated construction cost estimate based on InRoads footprint cut/fill volumes and typical markups for similar projects |

# Screening (Comparison) Criteria Descriptions

| Safety | |
|---|---|
| **Element** | **Evaluation Measurement** |
| Compatibility with Freeway Safety<br>*How does the option impact safety on the freeway?* | The projected number of congested conflict zones (ramp merge and diverge segments) as a function of Level of Service (HCS). |
| Compatibility with Local Street Safety<br>*How does the option impact safety on the freeway?* | Impact on at key intersections based on number of collisions per year as a function of traffic volumes. |
| Ability to meet Design Standards<br>*How well does the option adhere to WSDOT design standards?* | Nominal Safety is examined in reference to compliance with standards, warrants, guidelines and sanctioned design procedures. |
| **Transportation Benefit** | |
| **Element** | **Evaluation Measurement** |
| Vehicle Miles Traveled (VMT)<br>Vehicle Hours Traveled (VHT)<br>*How is the option affect distribution of vehicle trips within the local transportation system?* | This will show the daily amount of vehicle travel and the total daily hours of travel for vehicles on the study area road system. VMT and VHT are an output of the travel forecasting model. |
| Compatibility with Freeway Operations<br>*How does the option impact the freeway mainline?* | The projected number of poorly operating mainline segments. For this evaluation “poorly operating is broken down by Level of Service “LOS= D, E, or F”. |
| Compatibility with Local System Operations<br>*How does the option impact key local intersections?* | Based on the potential for increases or decreases in LOS at key intersections (“Triangle+ Black Lake SPUI intersections”). |

# Scoring

| WORST | | | | BEST |
|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** |
| Most Impact or No Benefit | High Impact or Low Benefit | Moderate Impact or Benefit | Slight Impact or High Benefit | No Impact or Highest Benefit |

- Consensus based

# Safety

- Ability to meet Design Standards
  *How well does the option adhere to WSDOT design standards?*

- Compatibility with Local Street Safety
  *How does the option impact safety on the freeway?*

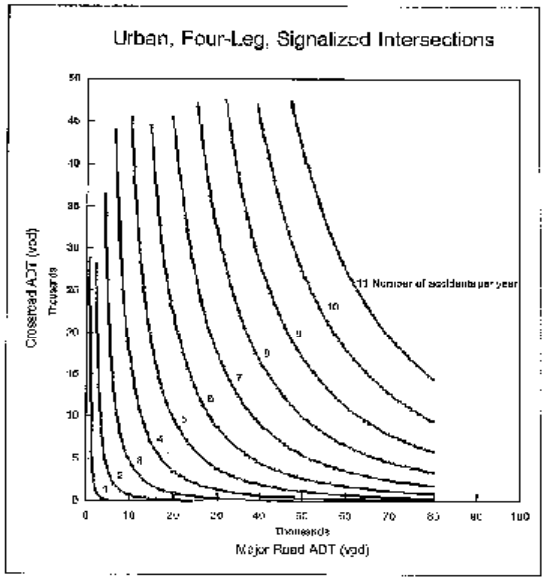
- Compatibility with Freeway Safety
  *How does the option impact safety on the freeway?*

# Safety
# Ability to Meet Design Standards

| | Black Lake/Yauger | Evergreen | Hybrid Interchange |
|---|---|---|---|
| **No. of Deviations** | **1** | **0** | **1** |
| | Superelevation runoff distance may be needed on new WB bridge crossing over BL Blvd | NA | Superelevation runoff distance may be needed on new WB bridge crossing over BL Blvd |
| **No. of Potential Design issues** | **3** | **2** | **4** |
| | - Weaving distance WB between BL I/C and Crosby I/C.<br><br>- Advance signing of WB off-ramp to BL Blvd and new C/D to Yauger<br><br>- WB CD transition from ramp into local roadway and new intersection at 9th | - Weaving distance both directions of SR 101 between Kaiser I/C and Black Lake I/C<br><br>- Westbound off-ramp to Kaiser. If tight diamond configuration, the off ramp may be tying into a steep cross-grade on Kaiser Road. This is not ideal for large trucks turning against the steep cross-grade. | - Weaving distance WB between BL I/C and Crosby I/C.<br><br>- Advance signing of WB off-ramp to BL Blvd and new C/D to Yauger<br><br>- WB CD transition from ramp into Yauger Way and new intersection at 9th<br><br>- Westbound off-ramp to Kaiser. If tight diamond configuration, the off ramp may be tying into a steep cross-grade on Kaiser Road. This is not ideal for large trucks turning against the steep cross-grade. |

# Safety
## Compatibility with Local Street Safety

- An analysis of intersections was based on statistical models as identified in FHWA PUBLICATION NO. FHWA-RD-99-094, *Statistical Models of At-Grade Intersection Accidents—Addendum*, (MARCH 2000).
- Methodology helps us compare the **potential** safety of the two alternatives.
- Provides an idea of the level of intersection crashes that might be expect based on volumes,
- Intersection types considered:
  - urban, four-leg, stop-controlled intersections; urban, three-leg,
  - stop-controlled intersections;
  - urban, four-leg, signalized intersections



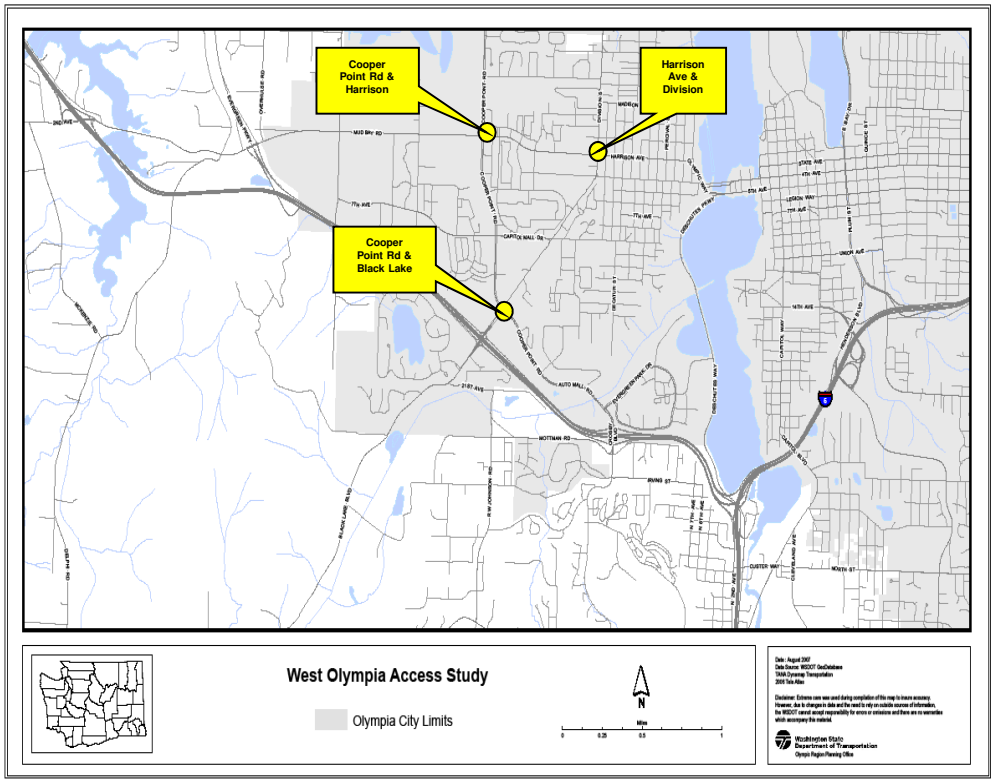

| Major road characteristics: | Crossroad characteristics: | Other: |
|---|---|---|
| • No access control<br>• Average lane width of 3.6 m (12 ft)<br>• No free right turns<br>• 4 or 5 lanes | • 5 lanes or less | • Fully-actuated signal timing<br>• Multiphase signalization |

**Figure 10. Number of Accidents per Year as a Function of Traffic Volumes for Typical Urban, Four-Leg, Signalized Intersections**

# Safety
## Compatibility with Local Street Safety

| Intersection | Black Lake/Yauger | | | Evergreen | | | Hybrid Interchange | | |
|---|---|---|---|---|---|---|---|---|---|
| | Accidents | ADT | LOS* (Delay) | Accidents | ADT | LOS* (Delay) | Accidents | ADT | LOS *(Delay) |
| Harrison Avenue/Division Street | 7.9 | 55675 | E (76.2) | 7.9 | 56313 | E (79.4) | 8 | 55750 | E (78.6) |
| Harrison Avenue/Cooper Point Road | 8 | 58075 | E (74.9) | 7.9 | 57513 | E (71.3) | 8.4 | 59188 | E (73.3) |
| Black Lake Boulevard/Cooper Point Road | 10.2 | 79613 | E (67.7)* | 10.3 | 82388 | E (65.1) | 10.3 | 79438 | E (63.9) |
| Total | 26.1 | | | 26.1 | | | 26.7 | | |
| Total at all 10 study intersections | 65.2 | | | 63.8 | | | 65.4 | | |

** 1- hour LOS*




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 any jurisdictions involved in the data

# Safety
## Compatibility with Freeway Safety

| Segment | Black Lake/Yauger | | Evergreen | | Hybrid Interchange | |
|---|---|---|---|---|---|---|
| | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS |
| ***Westbound US 101*** | | | | | | |
| WB Crosby Off-Ramp | 57 | F | 54 | F | 56 | F |
| WB Crosby /BL Weave | 30 | C | 24 | C | 24 | C |
| WB BL On-Ramp | 26 | C | 31 | D | 23 | C |
| WB Evergreen Off-Ramp/ BL-Evergreen Weave** | 32 | D | 40 | F | 32 | D |
| WB Evergreen On-Ramp | NA | NA | 21 | C | NA | NA |
| ***Eastbound US 101*** | | | | | | |
| EB Evergreen Off-Ramp | NA | NA | 27 | C | NA | NA |
| EB Evergreen On-Ramp | 26 | C | 49 | F | 20 | C |
| EB Kaiser On-Ramp | NA | NA | NA | NA | 15 | B |
| EB BL Off-Ramp/ Kaiser On-BL Off Weave* | 37 | E | 37 | E | 26 | C |
| EB BL On-Ramp | 24 | C | 21 | C | 21 | C |
| EB Crosby Off-Ramp | 31 | D | 29 | D | 29 | D |
| EB Crosby On-Ramp | 39 | E | 48 | F | 58 | F |
| **# Weaves** | 1 | | 3 | | 2 | |
| **# Merges** | 5 | | 5 | | 5 | |
| **# Diverges** | 4 | | 3 | | 4 | |
| **LOS D or better** | 6 | | 6 | | 8 | |
| **LOS E** | 2 | | 1 | | 0 | |
| **LOS F** | 1 | | 3 | | 2 | |

*Diverge segment for Scenario 5. Weave Segment for scenarios 7 and 9

** Diverge segment for Scenarios 5 and 9. Weave segment for Scenario 7

# Natural Environment Impacts

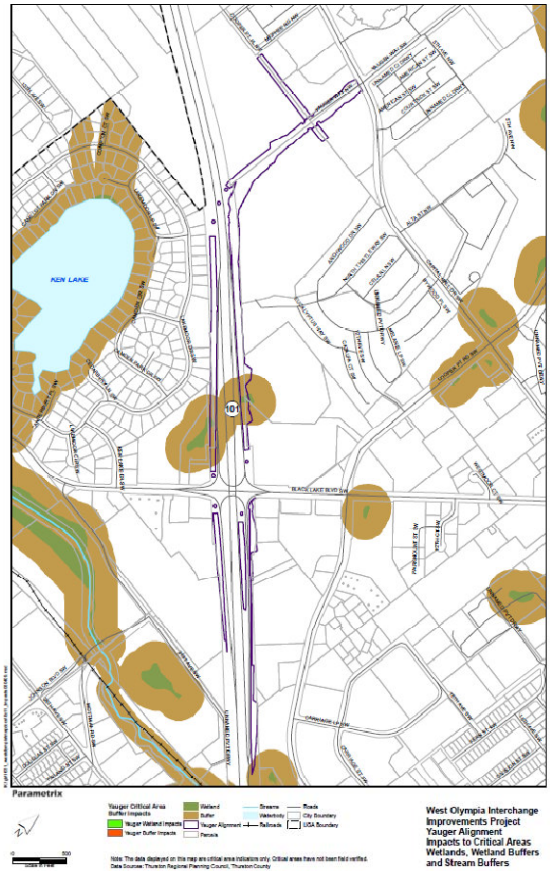
- Wetland/Shorelines
  *How will implementation of an option impact known wetland resources?*

- Water Resources (Stormwater)
  *What are the impacts on surface and groundwater?*

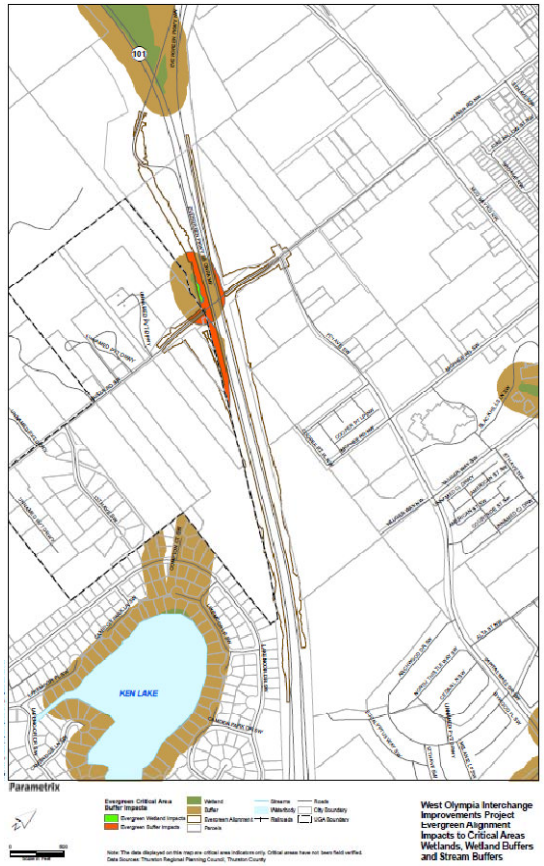
# Natural Environment Impacts
## Wetlands and Shorelines

| Black Lake/Yauger | Evergreen | Hybrid Interchange |
|---|---|---|
| 1.5 buffer acres | 2.4 buffer acres | 2.0 buffer acres |
| 0.2 wetland acres | 0.1 wetland acres | 0.1 wetland acres |
| **1.7 acres** | **2.5 acres** | **2.1 acres** |

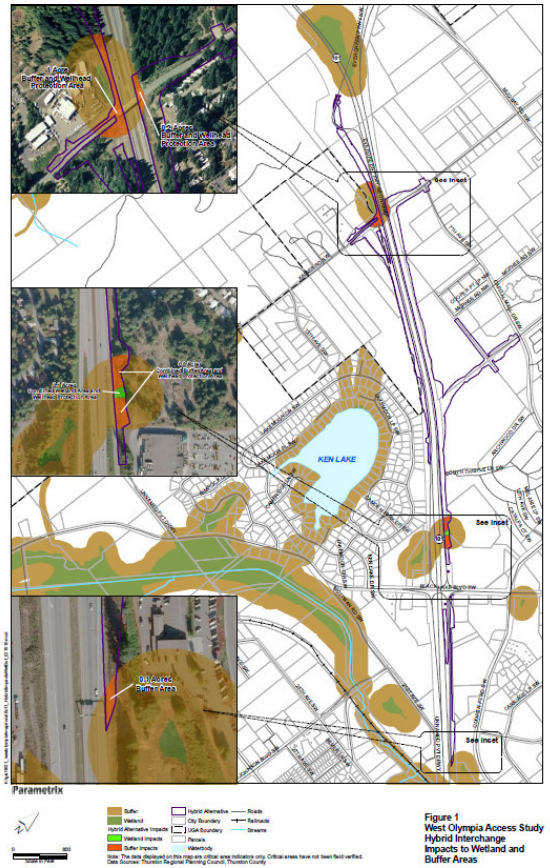
**Black Lake/Yauger**




**Evergreen**

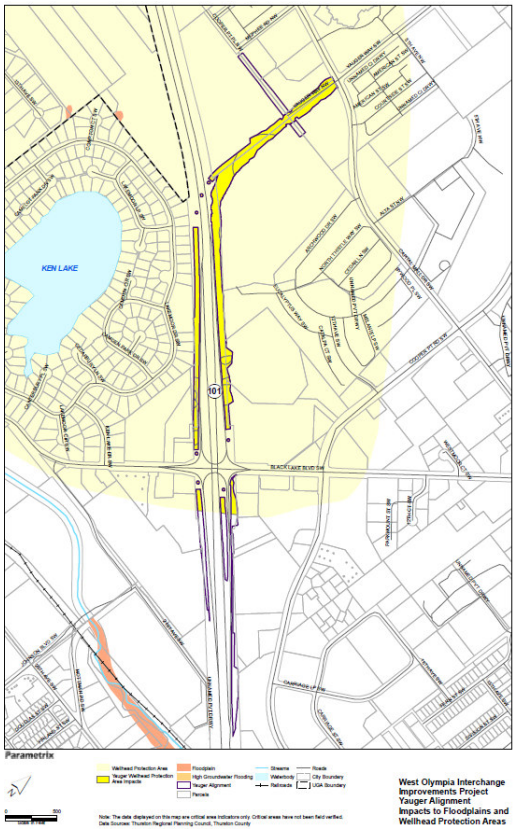


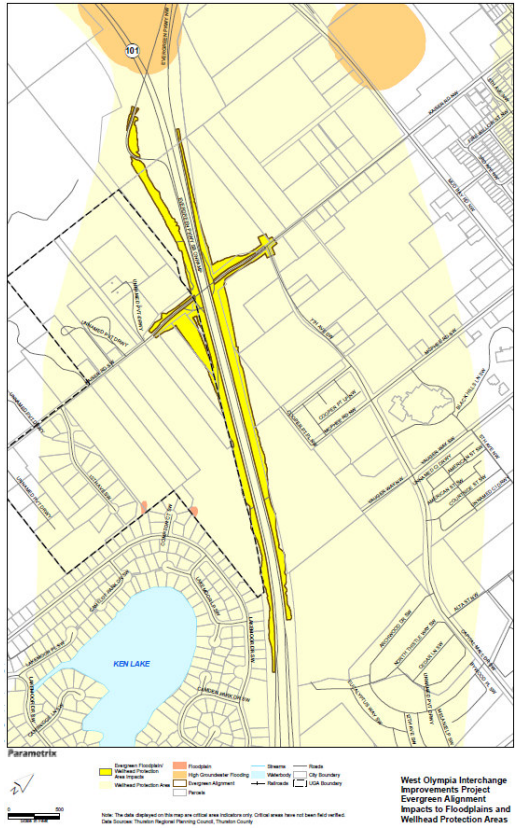

**Hybrid Interchange**

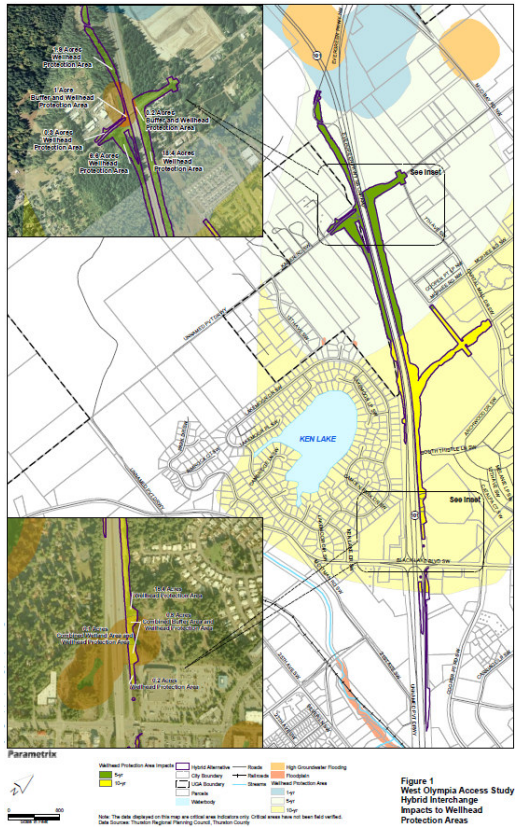


# Natural Environment Impacts
## Water Resources

| Black lake/Yauger | Evergreen | Hybrid Interchange |
|---|---|---|
| 11.7 acres Wellhead Protection Areas | 21.4 acres Wellhead Protection Areas | 30.8 acres Wellhead Protection Areas |
| | *0.1 acres - 1-yr (Allison Springs)* | |
| | *18.2 acres - 5-yr (Allison Springs)* | *16.8 acres - 5-yr (Allison Springs)* |
| *11.7 acres - 10-yr (Allison Springs)* | *3.1 acres - 10-yr (Allison Springs)* | *14.1 acres - 10-yr (Allison Springs)* |
| 345,000 sq ft (8 acres) of Additional Impervious Surface | 303,000 sq ft (7 acres) of Additional Impervious Surface | 645,600 sq ft (14.2 acres) of Additional Impervious Surface |



# Built Environment Impacts
## Displacements/Right-of-way

| | Black Lake/Yauger | Evergreen | Hybrid Interchange |
|---|---|---|---|
| **Potential Displacements** | 0 | 3 mobile homes | 3 mobile homes |
| **Estimated Right-of-way Needs (sq ft)** | 147,000 | 240,000 | 310,000 |
| *Vacant (Undeveloped)* | 129,000 | 199,000 | 269,000 |
| *Commercial* | 15,700 | 0 | 0 |
| *Residential* | 2,300 | 41,000 | 41,000 |

# Constructability

- Constructability

  *How easy and lengthy would it be to implement the option during construction?*

- Probable Construction Cost

  *How much to build the full project?*

# Constructability

## Constructability

**Black Lake/Yauger:**

- Traffic disruptions to Black Lake Blvd, WB off-ramp, and EB on-ramp during construction of bridge overcrossings, C/D ramps, and revised ramp connections to mainline.
- Most work can be staged to minimize roadway or lane closures.
- Yauger Way extension and C/D ramps west of Black Lake can be constructed with minimal disruption to existing roadways.

**Evergreen:**

- Traffic disruption to Kaiser Road during bridge reconstruction
- Occasional shoulder and outside lane closure on SR 101 during construction of auxiliary lanes between Kaiser I/C and Black Lake I/C.
- C/D ramps can be constructed without disruption to SR 101

**Hybrid Interchange:**

- Traffic disruptions to Black Lake Blvd and WB off-ramp during construction of bridge overcrossing, C/D roadway, and revised off-ramp connection to mainline.
- Yauger Way extension and C/D roadway west of Black Lake can be constructed with minimal disruption to existing roadways.
- Traffic disruption to Kaiser Road during bridge reconstruction.
- Occasional shoulder and outside lane closure on EB SR 101 during construction of auxiliary lanes between Evergreen I/C and Black Lake I/C.

# Constructability
## Estimated Construction Cost

This is a planning level cost estimate only accounts for the construction costs and excludes the following items:

- Right-of-way
- Wetland mitigation and environmental permitting
- Preliminary engineering costs
- Risk and inflation factors

| | Black Lake/ Yauger | Evergreen (Original Estimate)* | Evergreen (Revised Estimate)** | Hybrid Interchange |
|---|---|---|---|---|
| ***Construction*** | | | | |
| **Preparation And Grading** | $3,595,500 | $3,559,072 | $2,355,932 | $4,811,172 |
| **Structures** | $29,385,000 | $7,459,000 | $5,528,000 | $14,297,800 |
| **Surfacing And Paving** | $2,518,500 | $2,887,880 | $1,851,280 | $4,712,880 |
| **Roadside Development And Drainage** | $6,692,500 | ***$7,483,600*** | $5,146,600 | $12,868,600 |
| **Traffic Services And Safety** | $6,142,000 | $6,295,300 | $4,313,300 | $10,799,300 |
| ***Subtotal*** | ***$48,333,500*** | **$27,684,852** | ***$19,195,112*** | ***$47,489,752*** |
| ***Other Items**** | $37,934,050 | $19,100,498 | $15,223,888 | $37,272,248 |
| **Total** | **$86,268,000** | **$49,368,000** | **$34,419,000** | **$84,762,000** |

** Includes allowance for misc. bid items, mobilization, sales tax (8.5%), contingencies during construction, construction engineering*

** Original estimate assumes both eastbound and westbound Kaiser/Evergreen ramps are combined into a single merge/diverge location for both directions*

*** Original estimate assumes only the westbound Kaiser/Evergreen ramps are combined into a single diverge location. Eastbound Kaiser/Evergreen is assumed to be separate merge locations*

# Constructability
## Project Phasing Plan

Hybrid Alternative phasing and estimated cost:

Phase 1: Yauger Off-Ramp - $42,000,000

Phase 2: Kaiser On-Ramp - $27,000,000

Phase 3: Kaiser Off-Ramp - $16,000,000

# Transportation Benefits

- Vehicle Miles Traveled (VMT)/Vehicle Hours Traveled (VHT)

  *How is the option affect distribution of vehicle trips within the local transportation system?*

- Compatibility with Local System Operations

  *How does the option impact key local intersections?*

- Compatibility with Freeway Operations

  *How does the option impact the freeway mainline?*

# Transportation Benefits
## VMT/VHT

**US 101 Corridor VMT and VHT**

| Scenario | VMT | Change | % Change | VHT | Change | % Change | Avg. Spd | Change | % Change |
|---|---|---|---|---|---|---|---|---|---|
| **2030 Baseline** | 36,190 | | | 880 | | | 41.1 | | |
| **2030 Black Lake/Yauger** | 35,750 | -440 | -1.20% | 850 | -30 | -3.40% | 42.1 | 0.93 | 2.30% |
| **2030 Evergreen** | 35,920 | -270 | -0.70% | 860 | -20 | -2.30% | 41.8 | 0.64 | 1.60% |
| **2030 Hybrid Interchange** | 35,000 | -1,190 | -3.30% | 860 | -20 | -2.30% | 41.8 | 0.67 | 1.60% |

**US 101 Corridor, Black Lake Corridor and Cooper Point Corridor combined VMT and VHT**

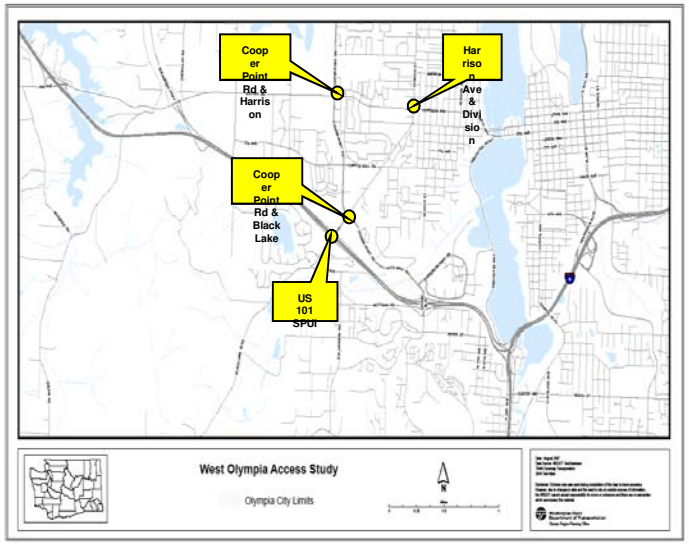
| | VMT | Change | % Change | VHT | Change | % Change | Avg. Spd | Change | % Change |
|---|---|---|---|---|---|---|---|---|---|
| **2030 Baseline** | 44,870 | | | 1,330 | | | 33.7 | | |
| **2030 Black Lake/Yauger** | 42,910 | -1,960 | -4.40% | 1,160 | -170 | -12.80% | 37 | 3.3 | 24.40% |
| **2030 Evergreen** | 43,260 | -1,610 | -3.60% | 1,200 | -130 | -9.80% | 36.1 | 2.3 | 14.30% |
| **2030 Hybrid Interchange** | 42,330 | -2,540 | -5.66% | 1,190 | -140 | -10.53% | 35.6 | 1.8 | 5.40% |

# Transportation Benefits

## Compatibility with Local System Operations - PM Peak Hour LOS*

| Intersection | Nobuild | Black Lake/Yauger | Evergreen | Hybrid Interchange |
|---|---|---|---|---|
| Harrison Avenue/Division Street | F (187.1) | E (76.2) | E (79.4) | E (78.6) |
| Harrison Avenue/Cooper Point Road | F (110.3) | E (74.9) | E (71.3) | E (73.3) |
| Black Lake Boulevard/Cooper Point Road | F (199.9) | E (67.7)* | E (65.1) | E (63.9) |
| Cooper Point Rd/Top Foods Entrance | F (85.1) | D (41.5) | E (67.4) | D (48.5) |
| Black Lake Boulevard SPUI | F (187.0) | E (72.5) | F (82.4) | E (79.0) |
| Total Delay (sec/veh) | 769.4 | 332.8 | 365.6 | 343.3 |
| LOS A, B, C | 0 | 0 | 0 | 0 |
| LOS D | 0 | 1 | 0 | 1 |
| LOS E | 0 | 4 | 4 | 4 |
| LOS F | 5 | 0 | 1 | 0 |

** 1- hour LOS*



# Transportation Benefits

## Compatibility with Freeway Operations - Freeway LOS and Densities without Ramp Metering

| Segment | No-Build | | Black Lake/Yauger** | | Evergreen | | Hybrid Interchange | |
|---|---|---|---|---|---|---|---|---|
| | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS |
| ***Westbound US 101*** | | | | | | | | |
| Crosby/Black Lake Weave | 24 | C | 28 | C | 24 | C | 24 | C |
| Mainline | 30 | D | 29 | D | 31 | D | 27 | D |
| Black Lake On-Ramp | 26 | C | 25 | C | 31 | D | 24 | C |
| ***Eastbound US 101*** | | | | | | | | |
| Evergreen On-Ramp | 133 | **F** | 31 | D | 49 | **F** | 20 | C |
| Mainline | 137 | **F** | 41 | **E** | NA | NA | 20 | C |
| Kaiser On-Ramp | NA | NA | NA | NA | NA | NA | 15 | B |
| Black Lake Off-Ramp/ Kaiser On-Black Lake Off Weave* | 131 | **F** | 43 | E | 37 | E | 27 | C |
| Mainline W/o Crosby Blvd On-Ramp | 19 | C | 26 | D | 36 | E | 39 | E |
| Crosby Blvd On-Ramp | 19 | B | 39 | E | 63 | **F** | 68 | **F** |
| Mainline | 32 | D | 56 | **F** | 68 | **F** | 69 | **F** |
| ***Southbound I-5*** | | | | | | | | |
| SB I-5 US 101 On-Ramp | 43 | **E** | 47 | **F** | 45 | **F** | 50 | **F** |

*Diverge segment for Scenario 5. Weave segment for scenarios 7 and 9

**EB Yauger on-ramp is metered

# Transportation Benefits

## Compatibility with Freeway Operations - Freeway LOS and Densities with Ramp Metering

| Segment | No-Build | | Black Lake/Yauger** | | Evergreen*** | | Hybrid Interchange*** | |
|---|---|---|---|---|---|---|---|---|
| | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS | Density (pc/mi/ln) | LOS |
| ***Westbound US 101*** | | | | | | | | |
| Crosby/Black Lake Weave | 24 | C | 30 | C | 24 | C | 24 | C |
| Mainline | 30 | D | 29 | D | 31 | D | 27 | D |
| Black Lake On-Ramp | 26 | C | 26 | C | 31 | D | 23 | C |
| ***Eastbound US 101*** | | | | | | | | |
| Evergreen On-Ramp | 133 | **F** | 26 | C | 49 | **F** | 20 | C |
| Mainline | 137 | **F** | 38 | **E** | NA | NA | 20 | C |
| Kaiser On-Ramp | NA | NA | NA | NA | NA | NA | 15 | B |
| Black Lake Off-Ramp/ Kaiser On-Black Lake Off Weave* | 131 | **F** | 37 | E | 37 | E | 26 | C |
| Mainline W/o Crosby Blvd On-Ramp | 19 | C | 27 | D | 29 | D | 32 | D |
| Crosby Blvd On-Ramp | 19 | B | 39 | E | 48 | **F** | 58 | **F** |
| Mainline | 32 | D | 58 | **F** | 62 | **F** | 65 | **F** |
| ***Southbound I-5*** | | | | | | | | |
| SB I-5 US 101 On-Ramp | 43 | **E** | 48 | **F** | 46 | **F** | 49 | **F** |

*Diverge segment for Scenario 5. Weave segment for scenarios 7 and 9

**EB Yauger on-ramp and Crosby on-ramp are metered

*** EB Black Lake and Crosby on-ramps are metered

# Transportation Benefits
## Compatibility with Freeway Operations - LOS Summary

| All Scenarios | No Build | Black Lake/Yauger | Evergreen | Hybrid Interchange |
|---|---|---|---|---|
| Total # of Segments Operating at LOS A | 0 | 0 | 0 | 0 |
| Total # of Segments Operating at LOS B | 4 | 1 | 1 | 2 |
| Total # of Segments Operating at LOS C | 12 | 11 | 13 | 12 |
| Total # of Segments Operating at LOS D | 12 | 16 | 16 | 17 |
| **Total # of Segments Operating at LOS D or better** | **28** | **28** | **30** | **31** |
| **Total # of Segments Operating at LOS E** | **6** | **8** | **4** | **5** |
| **Total # of Segments Operating at LOS F** | **8** | **6** | **10** | **7** |
| **Average of All Densities** | **42** | **36** | **36** | **35** |
| **Sum of All Densities** | **1710** | **1459** | **1458** | **1454** |

# Transportation Benefits

## Compatibility with Freeway Operations - Travel Times (sec)

| Segment | No Build | Black Lake/Yauger | Evergreen | Hybrid Interchange |
|---|---|---|---|---|
| **Eastbound 101** | | | | |
| Start of model to Mud Bay On Ramp | 44 | 43 | 43 | 43 |
| Mud Bay On Ramp to Black Lake On Ramp | 470 | 211 | 211 | 201 |
| Black Lake On Ramp to Crosby On Ramp | 71 | 61 | 58 | 61 |
| Crosby On Ramp to I-5 Off Ramp | 67 | 57 | 65 | 71 |
| ***Eastbound 101 Total Travel Time*** | **652** | **372** | **378** | **376** |
| **Westbound 101** | | | | |
| I-5 On Ramp to Crosby On Ramp | 76 | 81 | 76 | 76 |
| Crosby On Ramp to Black Lake On Ramp | 76 | 77 | 74 | 73 |
| Black Lake On Ramp to Mud Bay Off Ramp | 138 | 138 | 138 | 137 |
| Mud Bay Off Ramp to Model End | 61 | 61 | 61 | 61 |
| ***Westbound 101 Total Travel Time*** | **350** | **357** | **350** | **347** |
| **Northbound I-5** | | | | |
| Start of model to US 101 Off Ramp | 34 | 34 | 35 | 34 |
| US 101 Off Ramp to US 101 On Ramp | 33 | 33 | 34 | 33 |
| US 101 On Ramp to 14th St Off Ramp | 66 | 73 | 71 | 73 |
| 14th St Off Ramp to Model End | 23 | 23 | 23 | 23 |
| ***Northbound I-5 Total Travel Time*** | **155** | **163** | **163** | **164** |
| **Southbound I-5** | | | | |
| Start of model to 14th St On Ramp | 205 | 201 | 200 | 201 |
| 14th St On Ramp to US 101 Off Ramp | 35 | 34 | 34 | 34 |
| US 101 Off Ramp to US 101 On Ramp | 43 | 43 | 43 | 43 |
| ***Southbound I-5 Total Travel Time*** | **282** | **278** | **278** | **278** |



Average travel times from 4:30 PM to 5:30 PM

# Transportation Benefits
## Compatibility with Freeway Operations - US 101 Speeds

| | No Build | Black lake/ Yauger | Evergreen | Hybrid Interchange |
|---|---|---|---|---|
| **Westbound US 101** | | | | |
| Mud Bay Interchange | 59 | 59 | 58 | 59 |
| Evergreen Pkwy On Ramp | NA | NA | 59 | NA |
| Evergreen Pkwy Off Ramp | 59 | 59 | 58 | 59 |
| Black Lake On Ramp | 55 | 56 | 55 | 57 |
| Black Lake Off Ramp | 57 | 57 | 57 | 58 |
| Crosby Blvd/Cooper Point Off Ramp | 43 | 42 | 43 | 43 |
| US 101/I-5 | 48 | 47 | 46 | 47 |
| ***Average Westbound US 101*** | **56** | **56** | **56** | **56** |
| **Eastbound US 101** | | | | |
| Mud Bay Interchange | 57 | 59 | 59 | 59 |
| Evergreen Pkwy Off Ramp | NA | NA | 57 | NA |
| Evergreen Pkwy On Ramp | 47 | 57 | 50 | 59 |
| Kaiser On Ramp | NA | NA | NA | 59 |
| Black Lake Off Ramp | 59 | 59 | 59 | 59 |
| Black Lake On Ramp | 58 | 58 | 59 | 59 |
| Crosby Blvd/Cooper Point On Ramp | 50 | 50 | 51 | 49 |
| US 101/I-5 | 45 | 45 | 43 | 44 |
| ***Average Eastbound US 101*** | **54** | **57** | **56** | **56** |

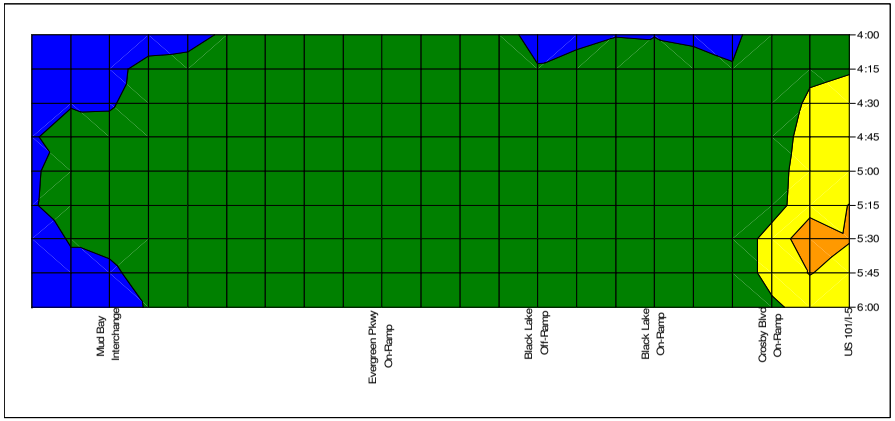
# Transportation Benefits
## Compatibility with Freeway Operations - I-5 Speeds

| | No Build | Black lake/ Yauger | Evergreen | Hybrid Interchange |
|---|---|---|---|---|
| **Southbound I-5** | (4:30-5:30) | (4:30-5:30) | (4:30-5:30) | (4:30-5:30) |
| City Center Off Ramp | 29 | 29 | 29 | 29 |
| City Center On Ramp | 32 | 33 | 33 | 33 |
| I-5/US 101 Weave | 46 | 47 | 46 | 46 |
| US 101 Off Ramp | 58 | 59 | 59 | 58 |
| US 101 On Ramp | 49 | 48 | 48 | 48 |
| ***Average Southbound I-5*** | **43** | **43** | **42** | **42** |
| **Northbound I-5** | | | | |
| City Center Off Ramp | 58 | 58 | 58 | 58 |
| US 101 On Ramp | 51 | 50 | 50 | 50 |
| US 101 Off Ramp | 57 | 57 | 56 | 57 |
| ***Average Northbound I-5*** | **56** | **55** | **56** | **56** |

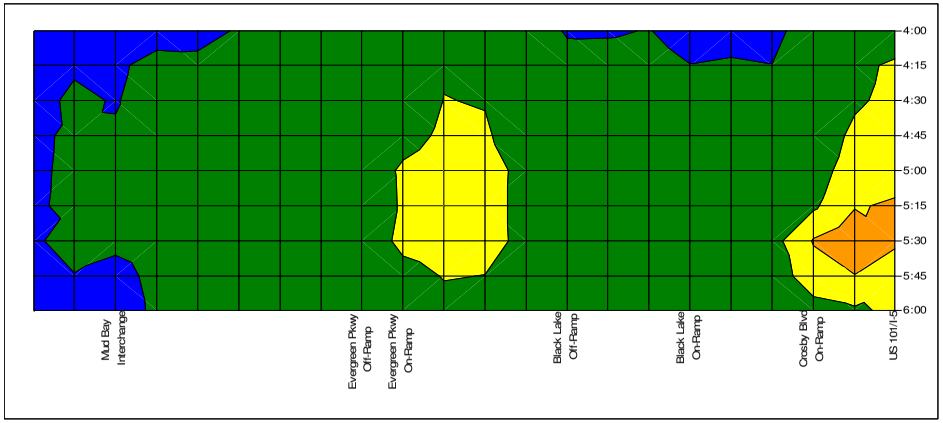
# Transportation Benefits

## Compatibility with Freeway Operations - Eastbound US 101 Speeds

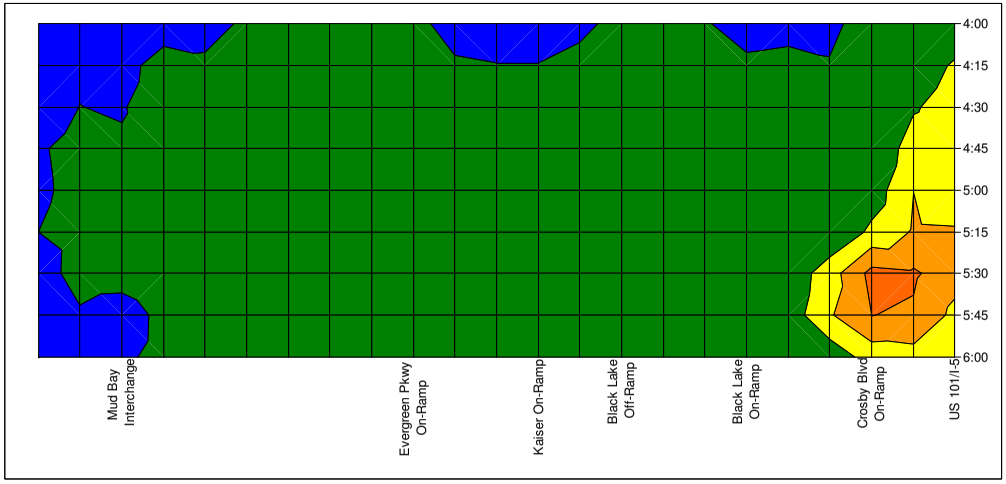
Eastbound US 101 – 2030 Black Lake I/C Scenario 5




Eastbound US 101 – 2030 Evergreen I/C Scenario 7




Eastbound US 101 – 2030 Hybrid I/C Scenario 9



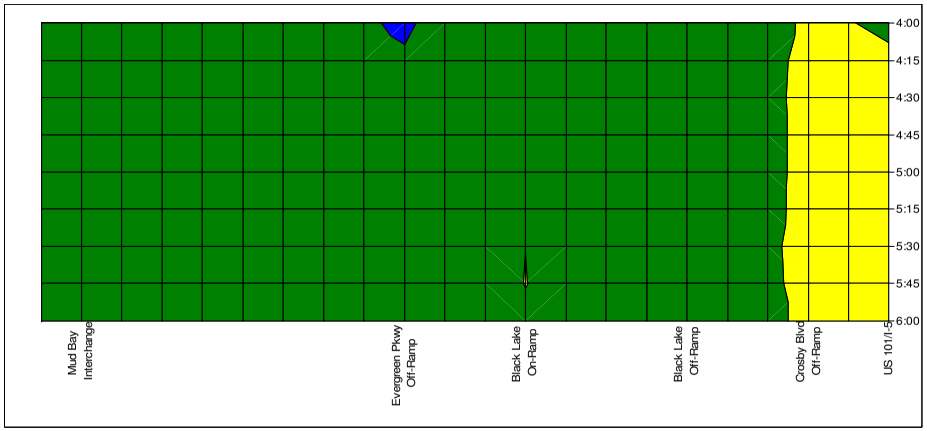

**Speeds (mph)**

0-10 10-20 20-30 30-40 40-50 50-60 60-70

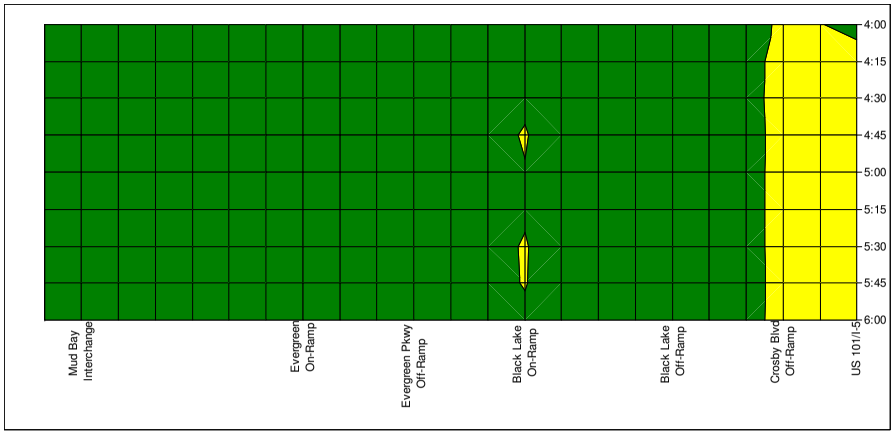
# Transportation Benefits

## Compatibility with Freeway Operations - Westbound US 101 Speeds

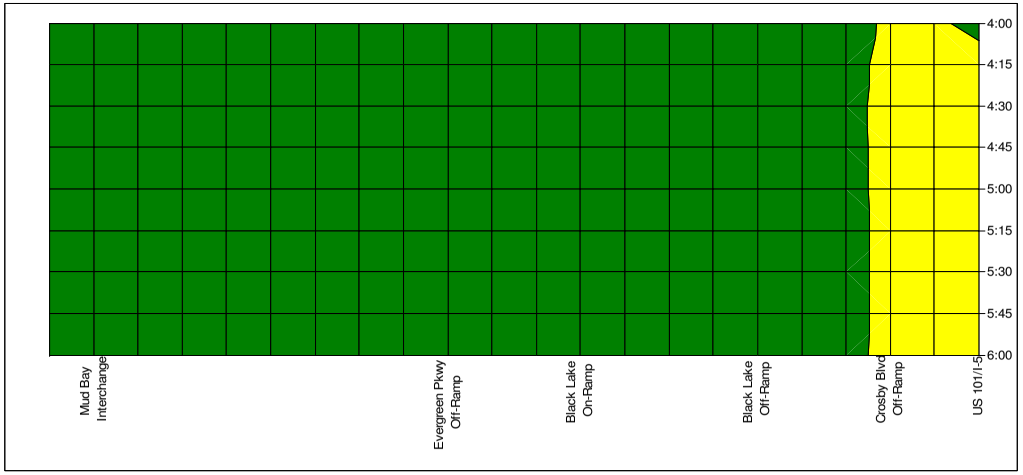
Westbound US 101 – 2030 Black Lake I/C Scenario 5




Westbound US 101 – 2030 Evergreen Scenario 7




Westbound US 101 – 2030 Hybrid I/C Scenario 9




**Speeds (mph)**

0-10 10-20 20-30 30-40 40-50 50-60 60-70

# Next Steps

- Present Hybrid, Black Lake, and Evergreen alternatives to Olympia City Council on March 9th (tentative date)
- Meet with Technical Committee on March 18th to discuss and decide what alternative(s) to recommend for the next phase of work—IJR/Environmental Documentation/Preliminary Engineering
  - Hybrid Alternative Only
  - Evergreen Alternative Only
  - Black Lake Alternative Only
  - More than one alternative
- Final Technical Committee meeting for this phase of work in April if needed