Columbia River CROSSING

A long-term, comprehensive solution

Washington State Transportation Commission

November 15, 2011




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CRC project area

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CRC project area

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Critical I-5 problems

- **Crashes**: 400 per year increasing to 750 by 2030
- **Congestion**: 4 to 6 hrs. per day increasing to 15 hrs. by 2030
- **Freight immobility**: 1 in 5 Oregon jobs are trade dependent
- **Limited transit options**: Subject to I-5 congestion
- **Poor bike and ped access**: 4 ft. wide shared path
- **Earthquake risk**: Wooden pilings don't reach solid footing

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Freight impaired by congestion

- $40 billion in freight crosses bridge; $71 billion by 2030
- 8% of traffic was freight in 2005 (11,000 trucks); 11% by 2030
- 75% of freight trucks crossing bridge uses an interchange in project area
- Trucks traveling in project area are more likely to be involved in a crash

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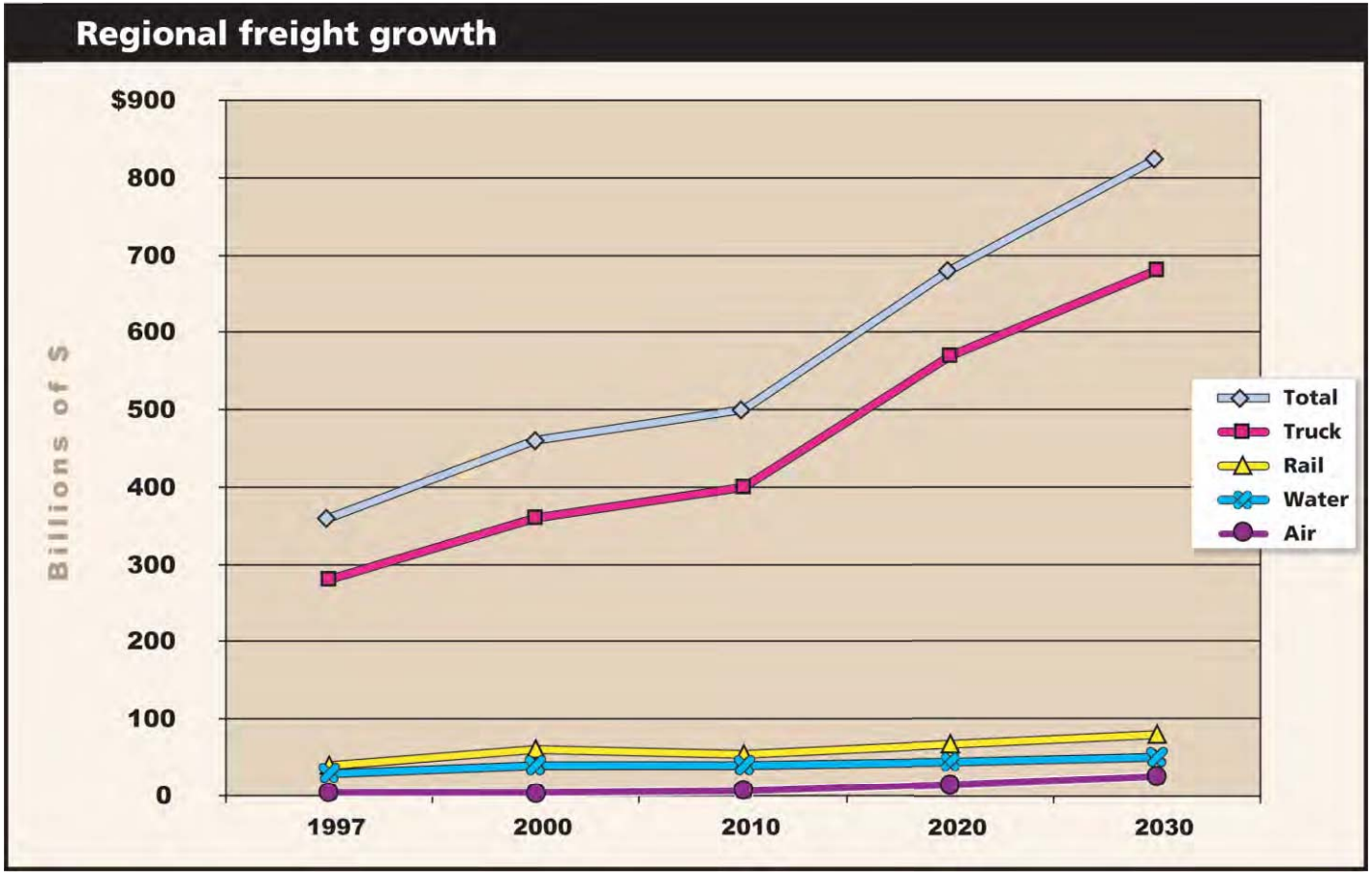
Portland-Vancouver freight tonnage to double by 2030



Source: Economic Development Research Group, Inc.

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Public process to develop solutions

- **2001 – 2002**
  I-5 Transportation and Trade Partnership
- **2005 – 2008**
  39-member CRC Task Force
- **2008 – today**
  Project Sponsors Council and citizen advisory groups
- **More than 29,000 people engaged at over 1000 events**

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Long-term, comprehensive solution to improve safety and reduce congestion

- Replacement I-5 **bridge**
- Improvements to closely-spaced highway **interchanges**
- **Light rail** extension to Vancouver
- **Pedestrian and bicycle** facility improvements
- Tolling

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Project benefits

- **Improves safety**
  - Reduces average number of crashes per year by 70%
- **Reduces congestion**
- **Increases travel reliability for freight and businesses**
- **Supports economic growth and access to ports**
- **Provides travel options**
- **Environmental benefits**

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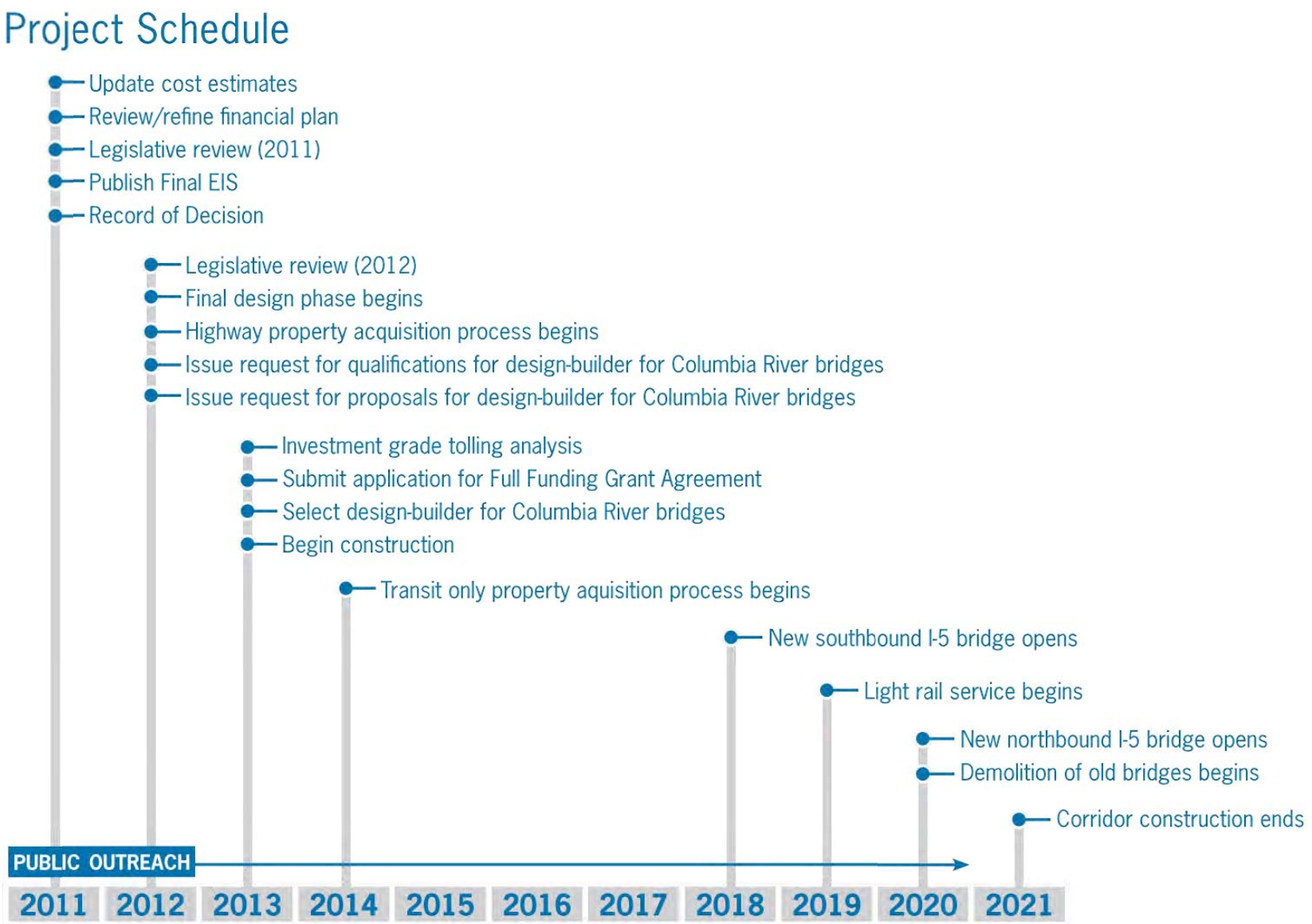
Project development schedule



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CRC Traffic Report

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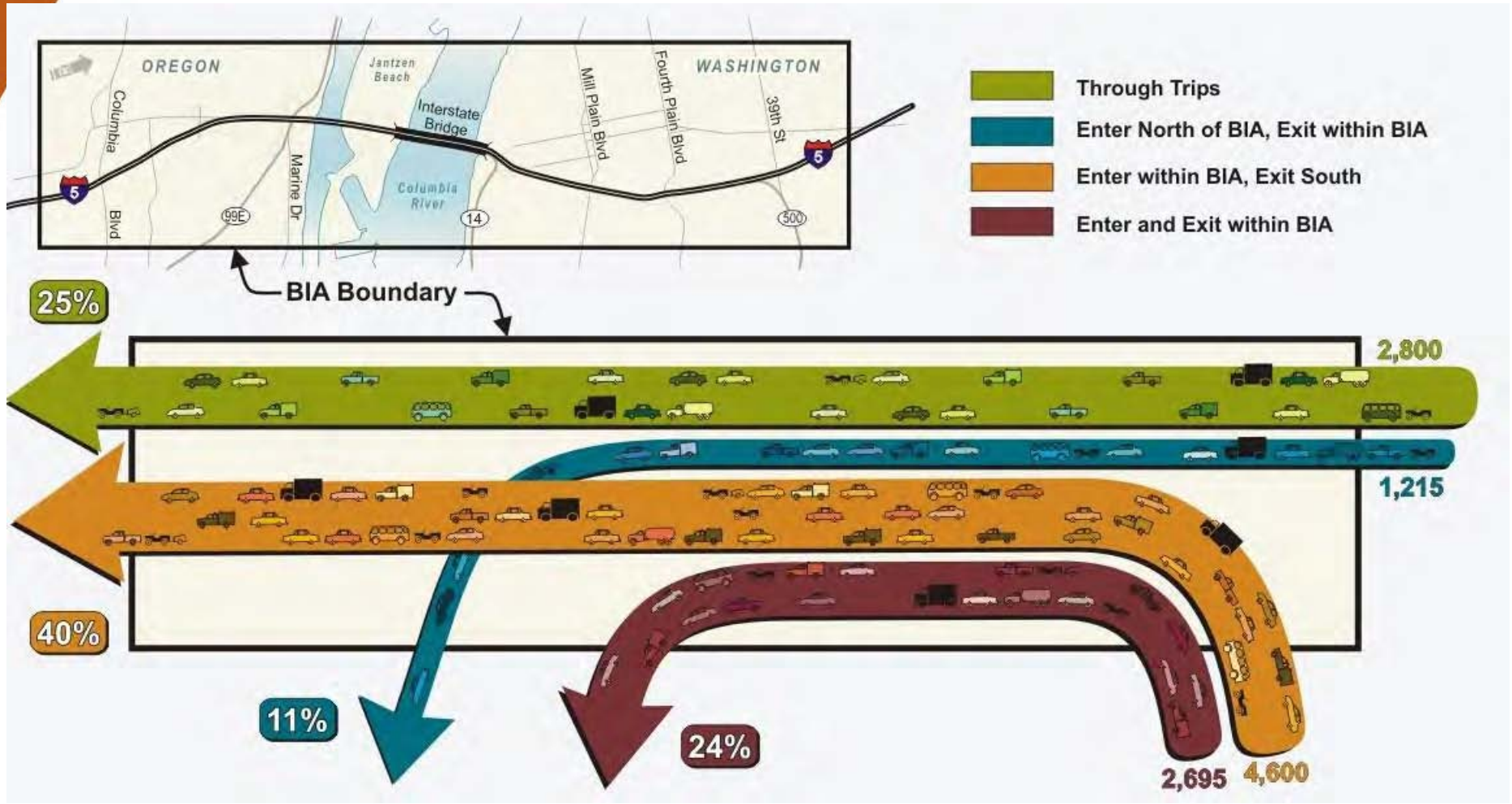
Seven closely spaced interchanges

Standard Spacing: Desirable = 2 Miles
Minimum = 1 Mile

75% of southbound traffic to/from 7 interchanges



Source: CRC Traffic Technical Report, 2011

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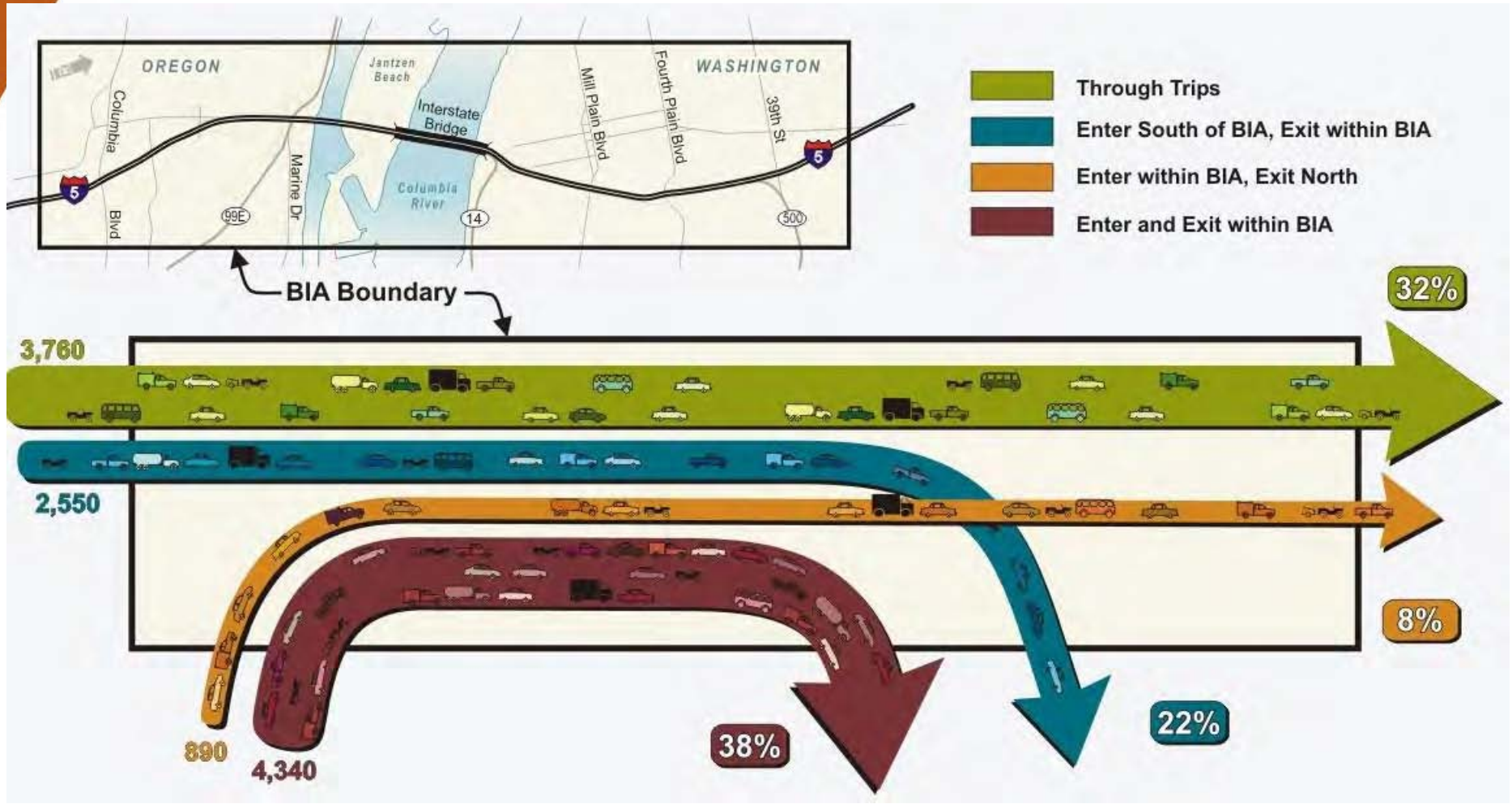
68% of northbound traffic to/from 7 interchanges



Source: CRC Traffic Technical Report, 2011

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The I-5 bridge influence area functions as one complex interchange

- Up to 75% of peak traffic traveling on the Interstate Bridge enters and/or exits I-5 within 2 miles of the bridge

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Vehicular Collision Analysis




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Vehicle collisions by type on I-5 in Vancouver

2002-2006

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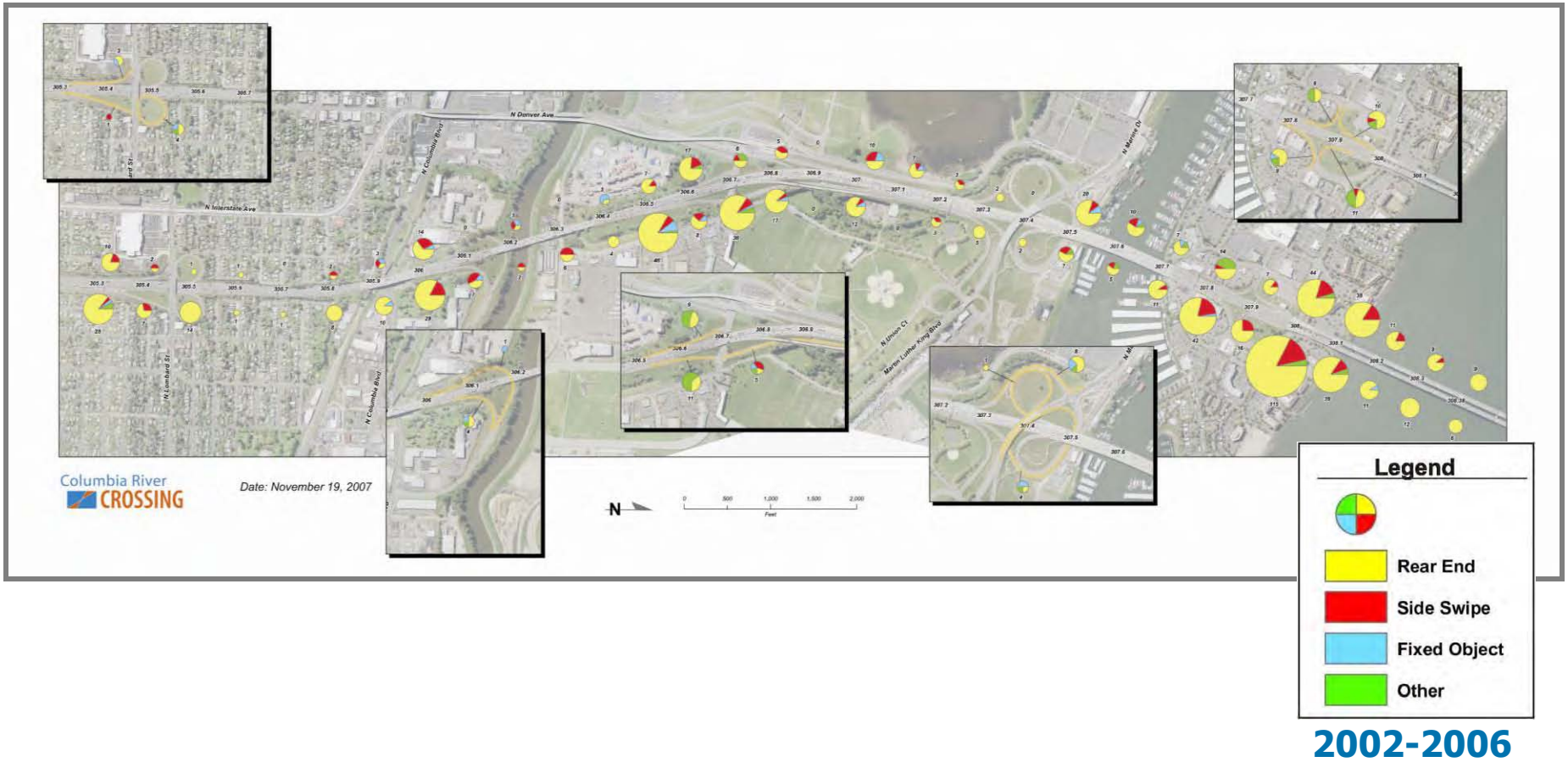
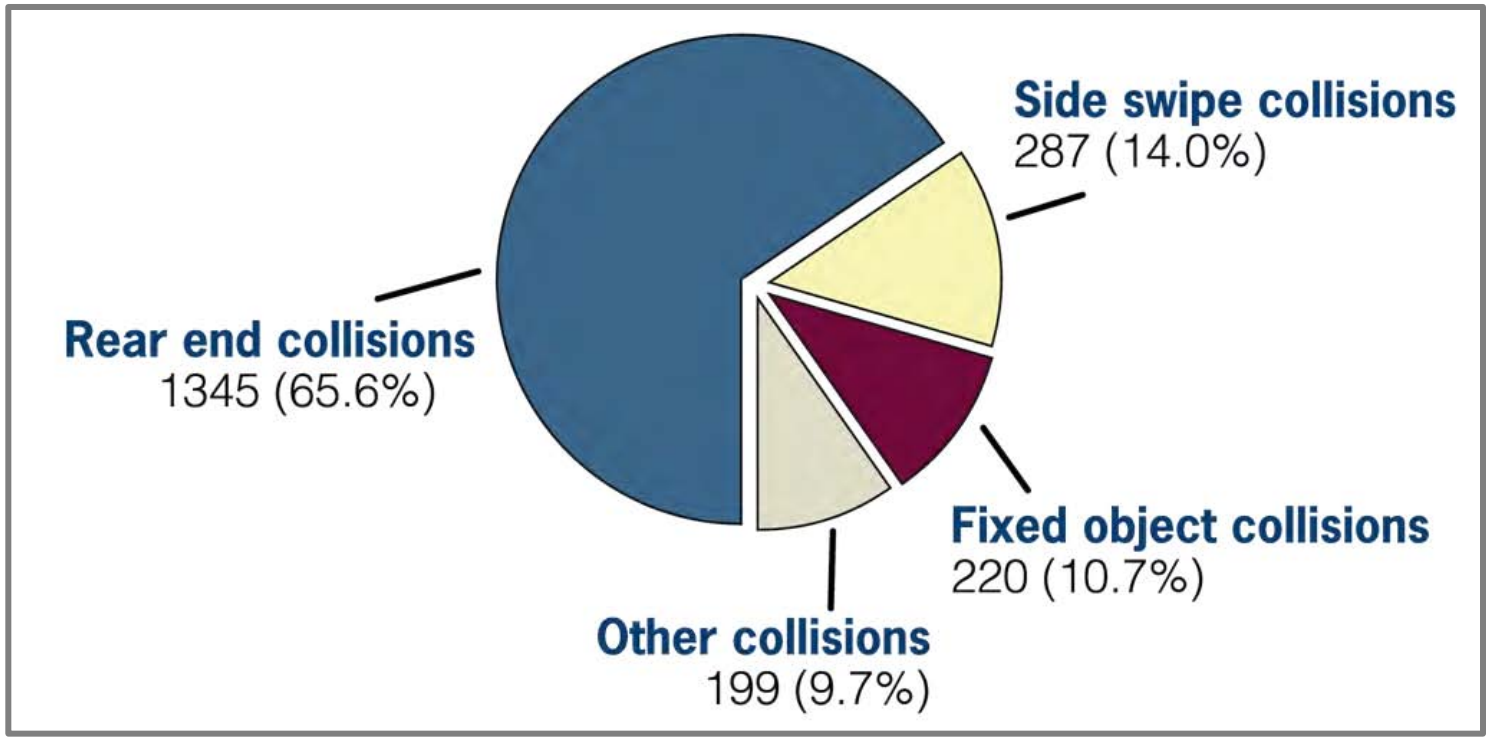
Vehicle collisions by type on I-5 in Portland



2002-2006

Most collisions are rear end crashes



2002-2006

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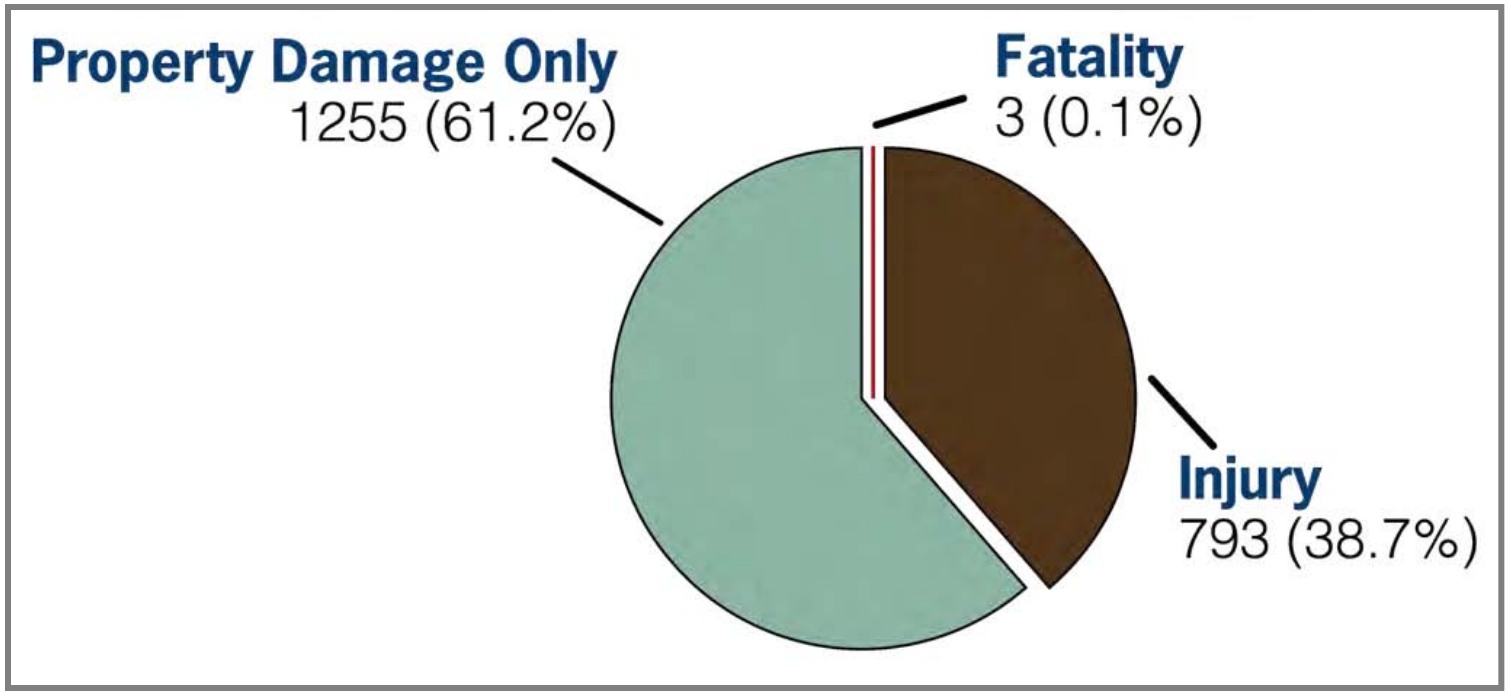
39% of collisions result in injuries



2002-2006

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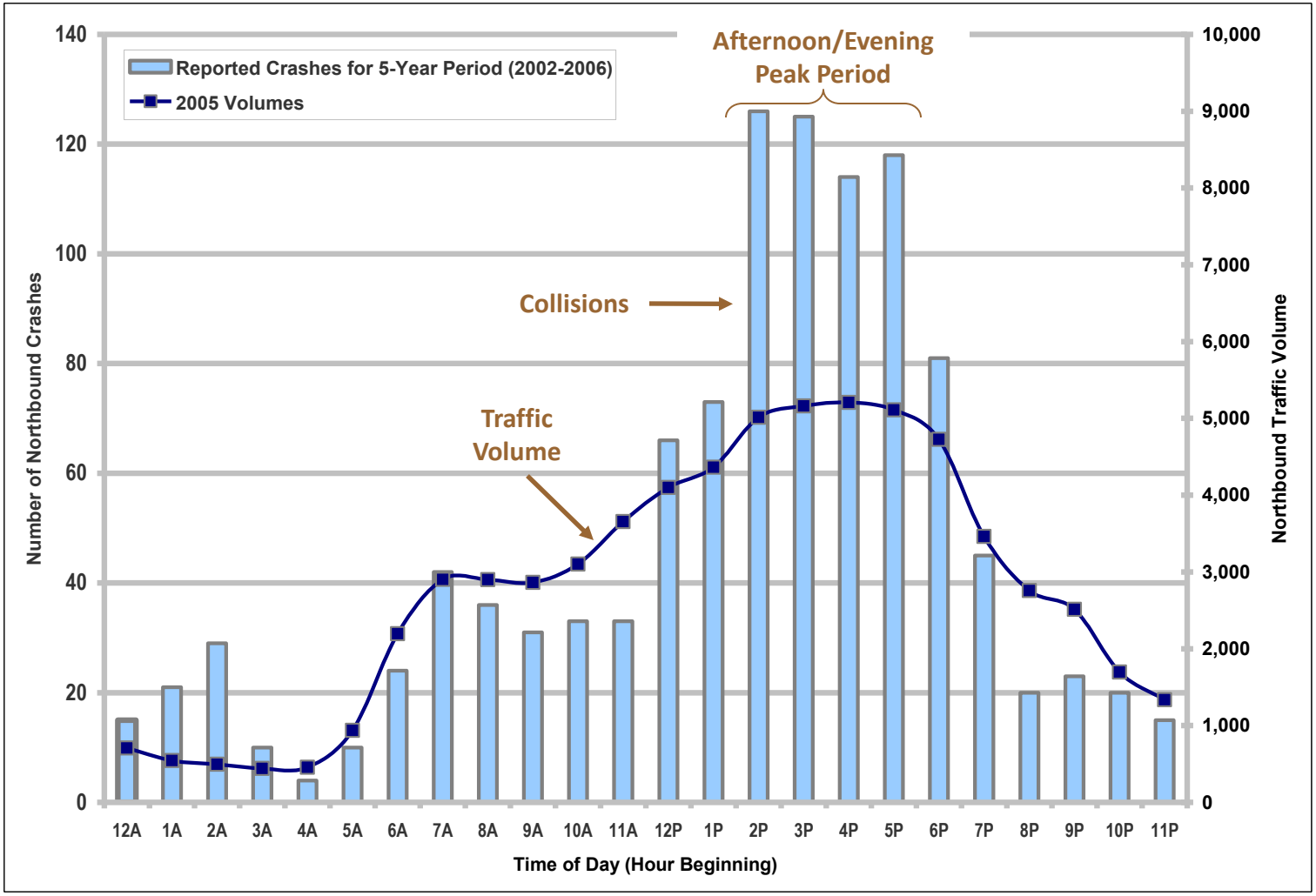
Collisions increase during congestion



2002-2006

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Non-standard, outdated geometric design elements in Washington

- Ramp-to-highway acceleration lane length
  Highway-to-ramp deceleration lane length
  Ramp-to-ramp separation lengths
- Highway weaving area lane length
- Highway horizontal alignment
  Highway vertical alignment
- Highway shoulder width

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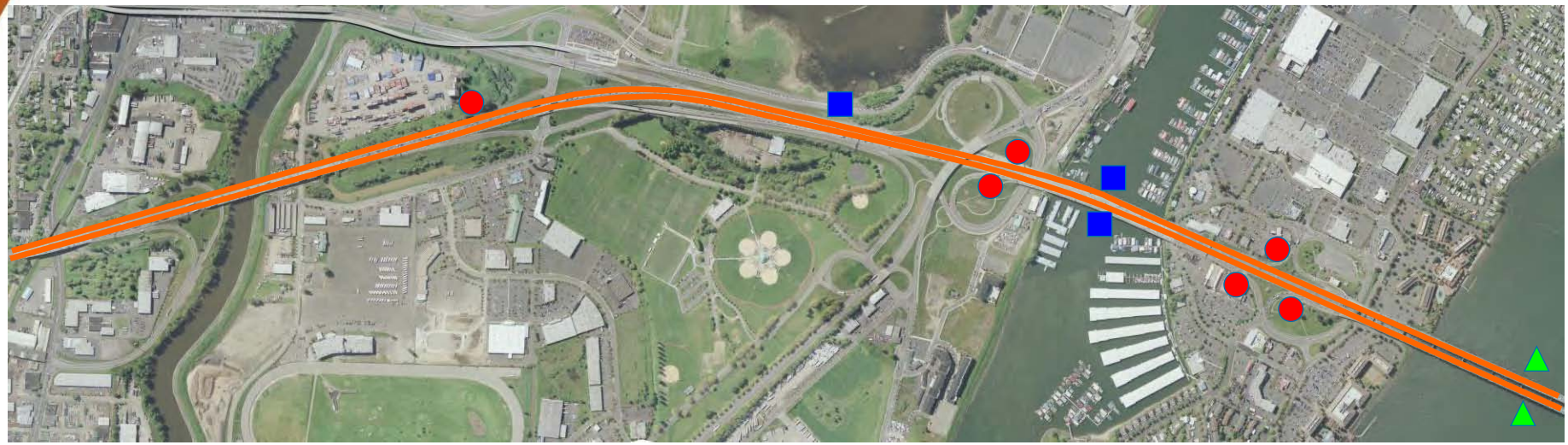
Non-standard, outdated geometric design elements in Oregon



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- Highway shoulder width

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Truck-related crashes

- In 5-year period, 255 crashes involving trucks on I-5 mainline and ramps
- On a per vehicle basis, trucks are involved in 50% more crashes compared to autos
- 39% of truck crashes involved sideswipes, compared to 14% for all vehicles
- 30% of truck crashes involved injuries, compared to 39% for all vehicles

Crashes during bridge lifts and traffic stops

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Crashes during bridge lifts and traffic stops

- Bridge lifts and traffic stops only allowed on weekdays between 9:00 a.m. and 2:30 p.m. and between 6:00 p.m. and 6:30 a.m.
- There is at least a 3 times higher likelihood of a northbound collision when a bridge lift/traffic stop occurs than when it does not
- There is over a 4 times higher likelihood of a southbound collision when a bridge lift/traffic stop occurs than when it does not

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Travel Demand Forecasting: Regional Model




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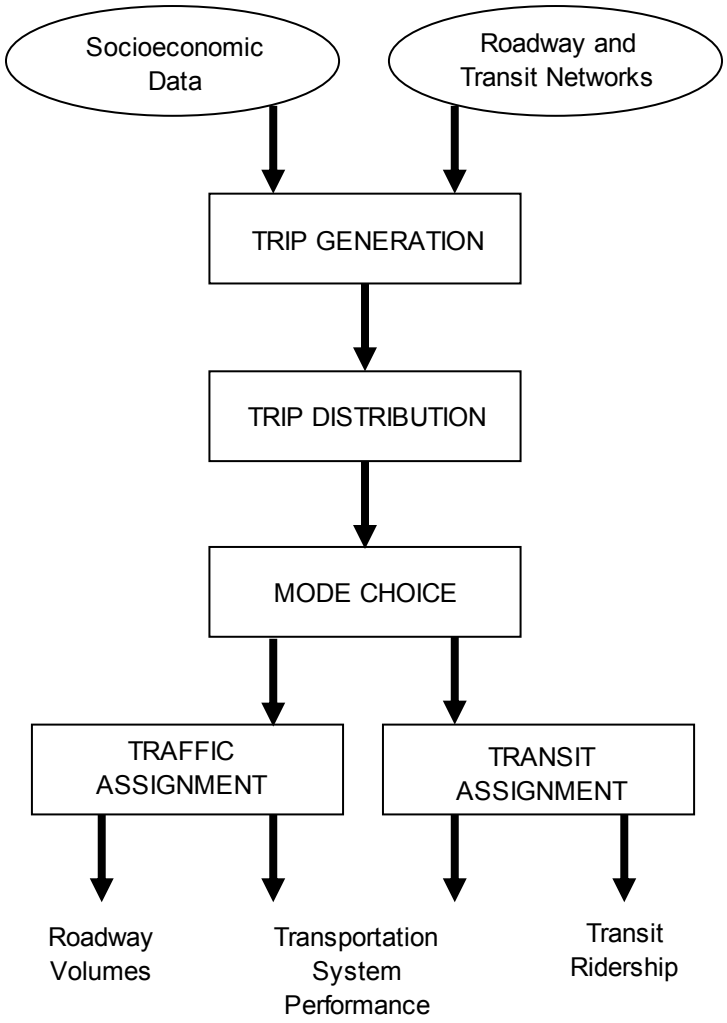
Portland-Vancouver travel demand model

- **Metro/RTC's Travel Demand Model Consists of:**
  - 7 counties
  - 2,029 transportation analysis zones
  - Multi-modal (auto, transit, pedestrian, bike)
  - 4-step process

Portland-Vancouver travel demand model



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Forecasting travel demands

- Traffic projections based upon adopted regional land use forecasts for appropriate year
- Forecasts developed using Metro/RTC's travel demand model based on regional travel behavior surveys
- Model considers numerous elements, including transportation network and travel costs
- FHWA and FTA require use of comprehensive and proven regional model

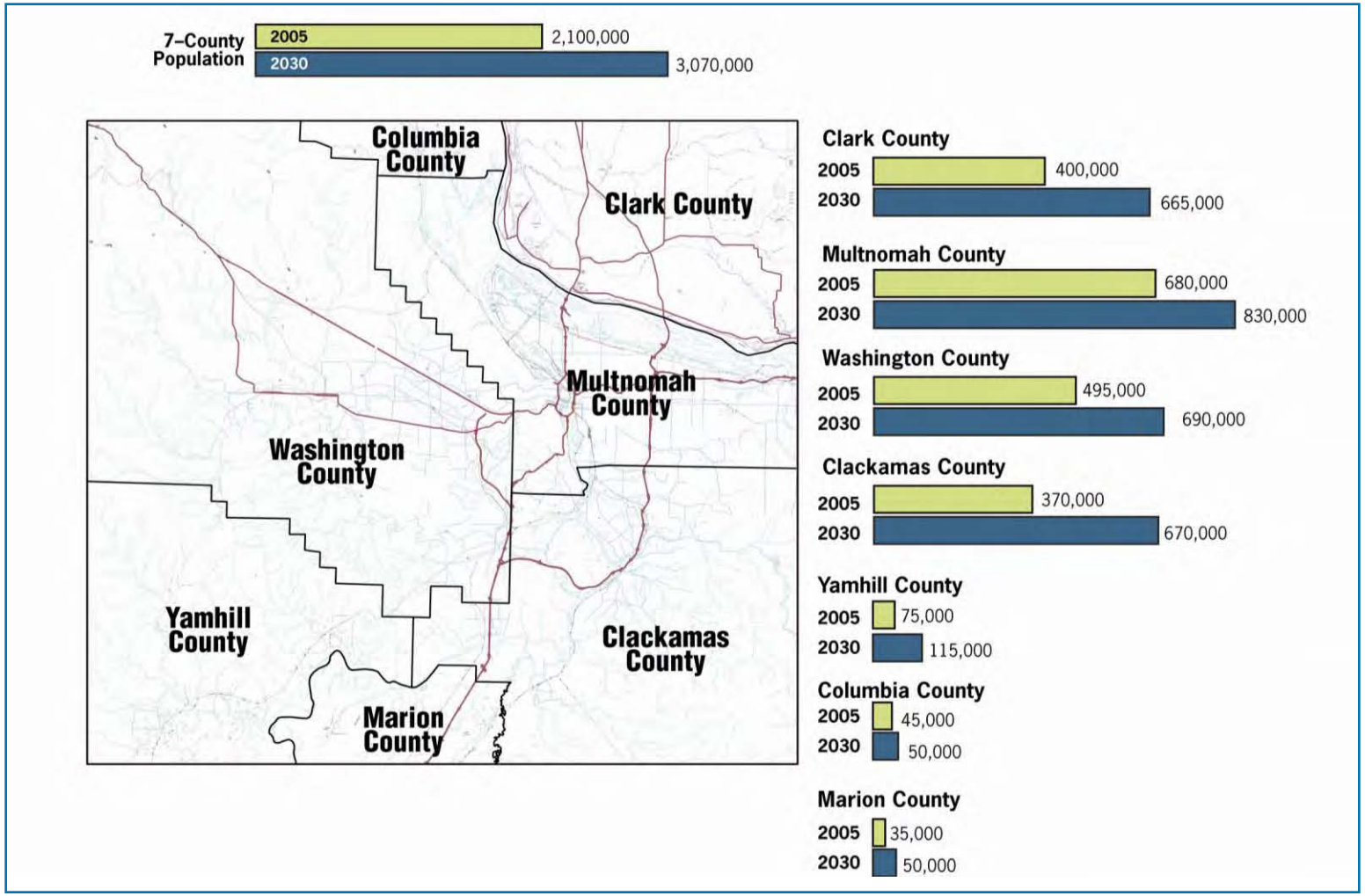
Land use allocation

- **2005 Base Year**
  - Highway and transit networks based on completed Metro and RTC 2005 network definitions
  - Extensive traffic and transit data collection used to validate regional travel demand models
- **2030 Forecast Year**
  - Highway and transit network based on financially constrained MTP and RTP
  - No-Build includes roadway improvements outside the CRC study area

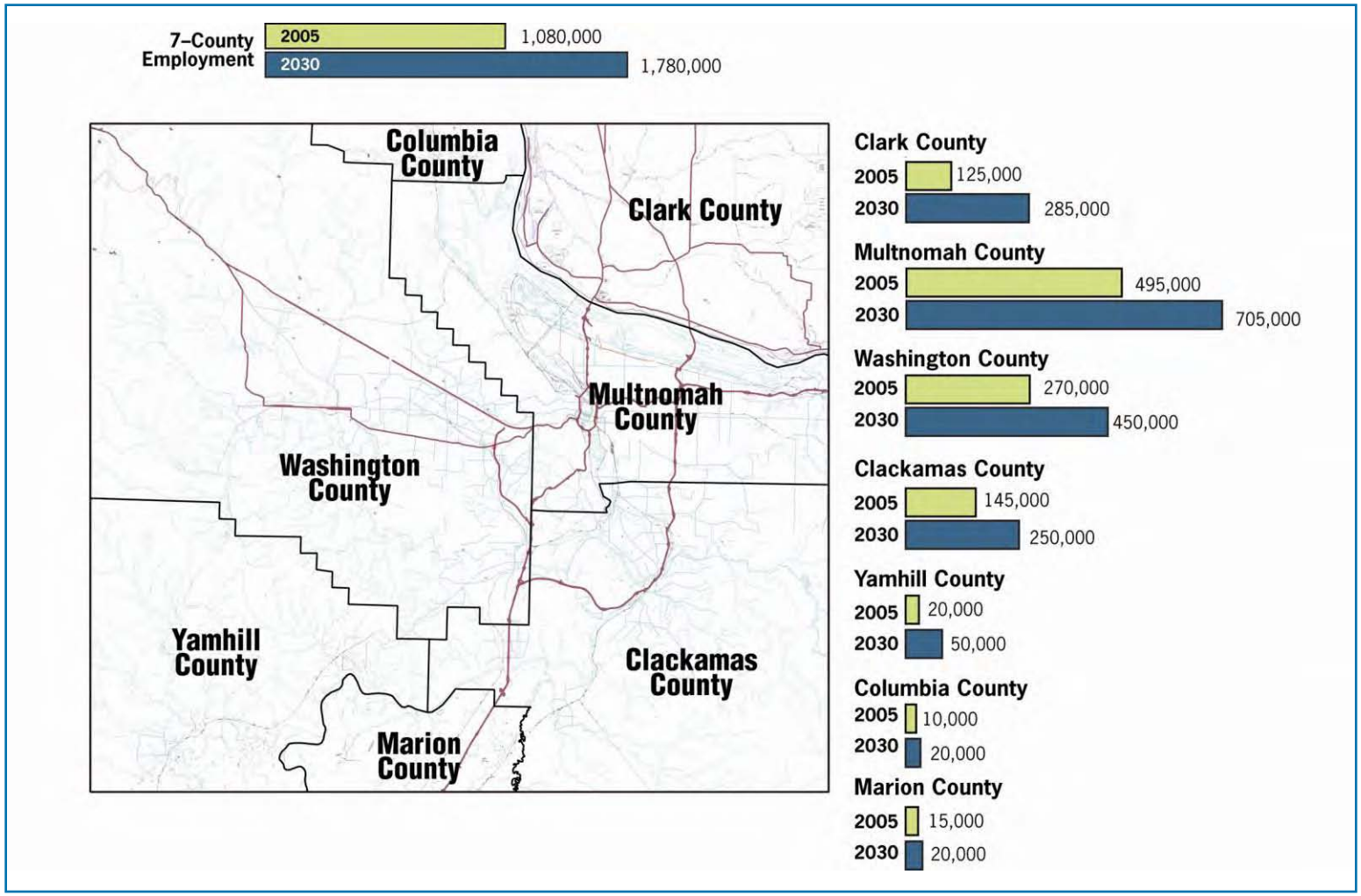
Land use allocation

- **2030 forecast year assumptions reflect**
  - Adopted land use in Oregon
  - GMA policy direction in Clark County's FEIS
  - City of Vancouver's adopted comprehensive plan
- **Bi-State Coordination Committee**
  - Reviews, discusses and makes recommendations about transportation and land use
  - Met in February 2007 to agree on the common 2030 land use forecasts

Population expected to increase 46%



Employment estimated to increase 65%



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Land use, population, employment analysis (2010)

- **Metroscope model integrates economic, demographic, land use and transportation data**
  - Economic model (market analysis of supply/demand)
  - Travel model (input from Metro TDM)
  - Two real estate location models
  - GIS database and tools
- **Can test a range of policy scenarios**
  - Most relevant to CRC: test how distribution of population and employment vary with different transportation infrastructure
- **Model outputs relevant to CRC indirect impact analysis**
  - Employment location
  - Housing prices (proxy for housing demand)

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Metroscope results (2010)

- **Conditions that create significant induced demand are not present for the CRC project**
- **Regional job growth shifts slightly to I-5 corridor**
  - 1% regional redistribution of jobs to corridor
  - North and Northeast Portland (4000 more jobs)
  - Clark County (1000 more jobs)
- **Up to 3% greater increase in home values (by 2020) in Clark County and North Portland (about 0.12%/yr)**

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Modeling Tools




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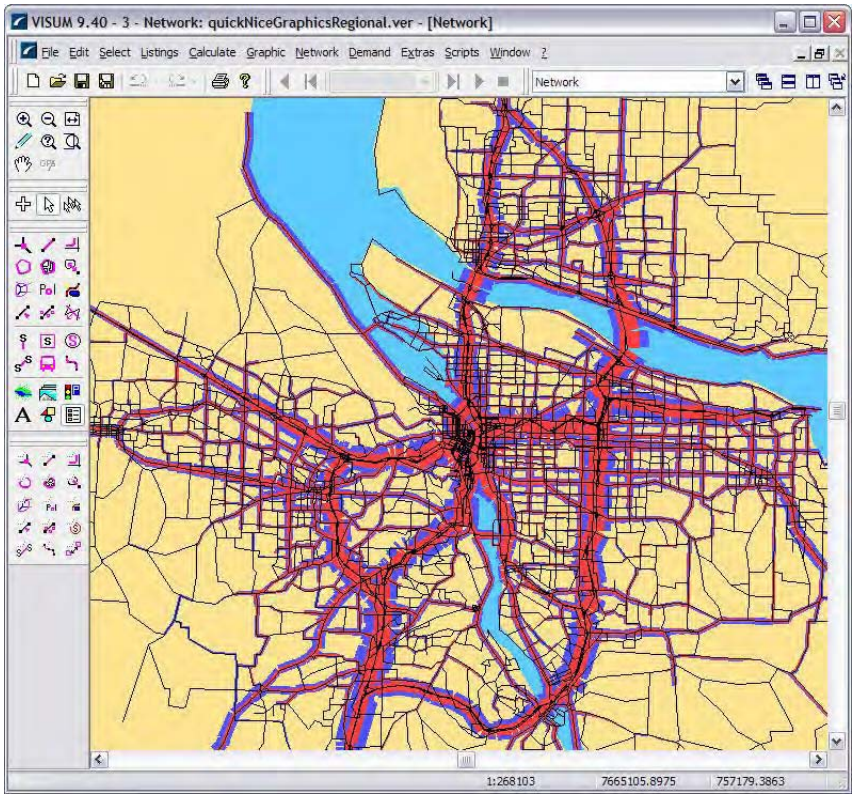
EMME/2 model

- **Tool for planning transportation of people on multi-modal networks**
  - Offers tools for demand modeling, network analysis
- **Assignment results in roadway link volumes**
- **Used to edit highway networks, analyze data, display and plot results, and import and export data**
- **Highway and transit assignments done w/ EMME/2**

VISUM model

- Data management and customization/scripting
- Visualization capabilities (GIS imports, aerial images)
- Assignment analysis
- Easy user interface
- VISUM to VISSIM interface
- Highway assignments completed using VISUM



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VISSIM model

- **Powerful multi-model modeling capabilities**
- **Can simulate unique operational conditions**
  - HOV lanes
  - Toll lanes
  - Exclusive lanes
  - Merging/diverging segments
  - Weaving segments
  - Interacting bottlenecks
  - Ramp meters
- **3D animation features**

Synchro/SimTraffic model

- **Synchro**
  - Based on general geometric and operational parameters
  - Optimizes traffic signals for individual intersections, arterials, and overall networks
  - Best for isolated locations with no congestion
- **SimTraffic**
  - Based on general geometric and operational parameters
  - Can account for variations in driver behavior
  - Can account for upstream and downstream signal effects on nearby intersections
  - Best for system of intersections
  - Visual presentations

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Existing Travel Conditions

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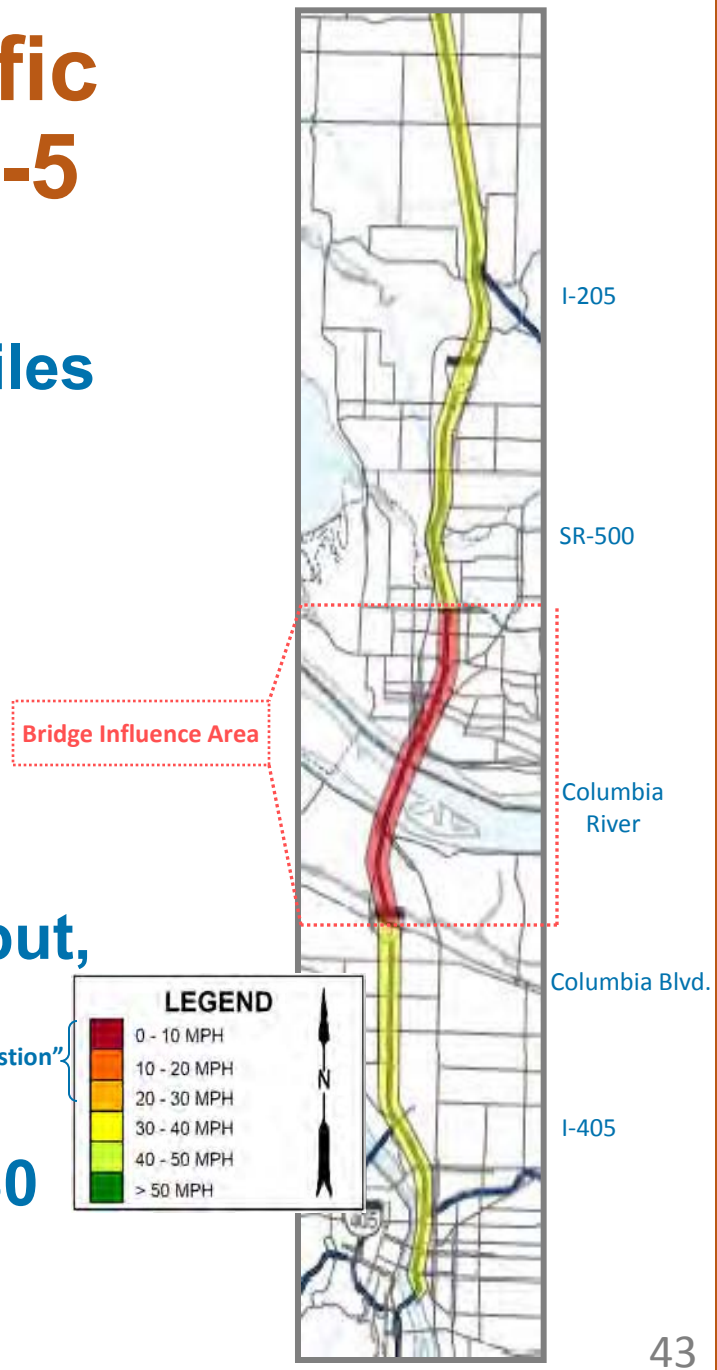
Travel speeds and traffic congestion along the I-5 corridor

- Traffic analysis includes 23 miles of I-5 from Pioneer Street to Marquam Bridge
- Expanded study area enables analysis of upstream and downstream considerations
- Operational outputs include speeds, travel times, throughput, and density
- “Congestion” defined when freeway travel speeds below 30 mph



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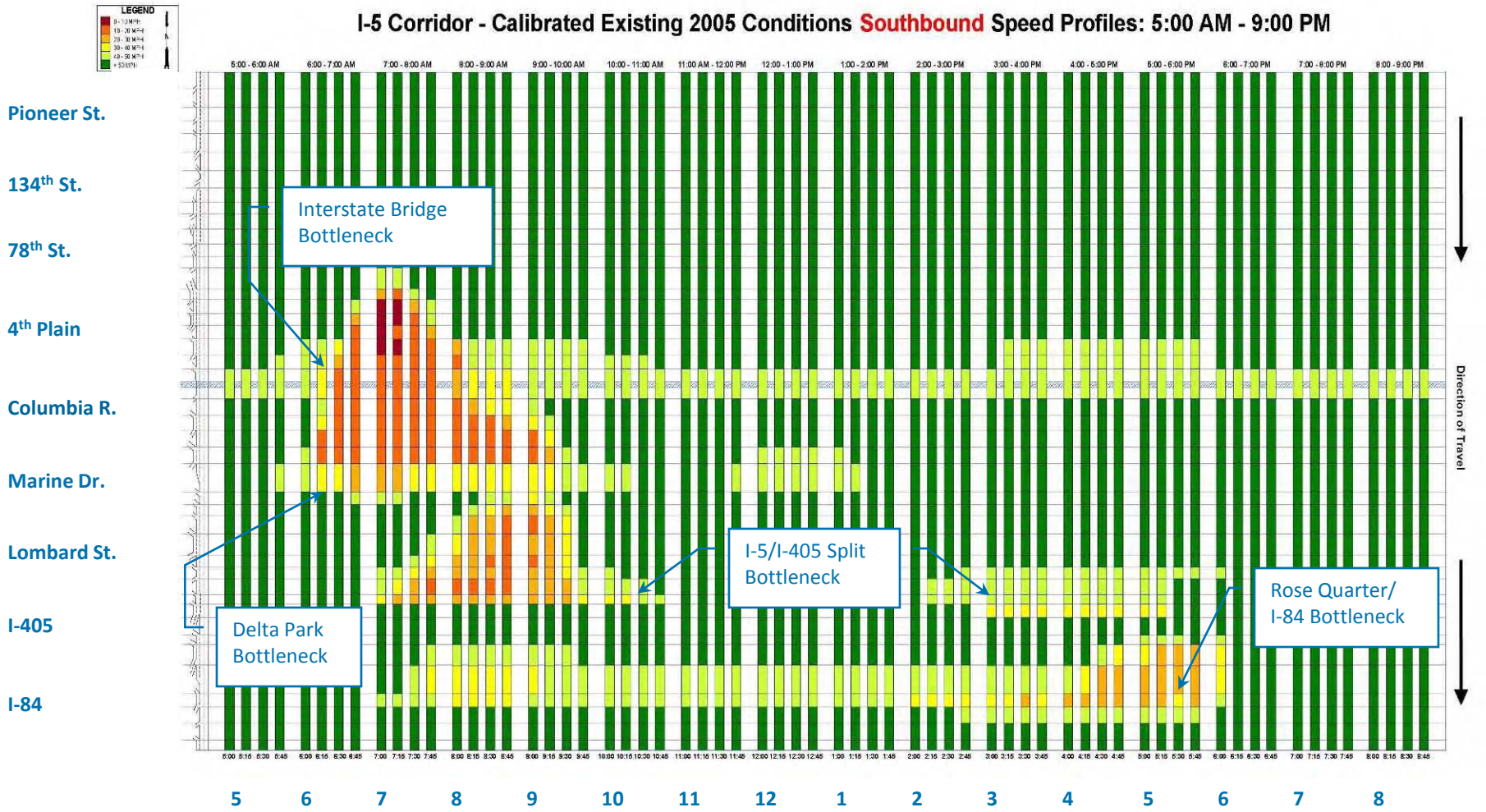
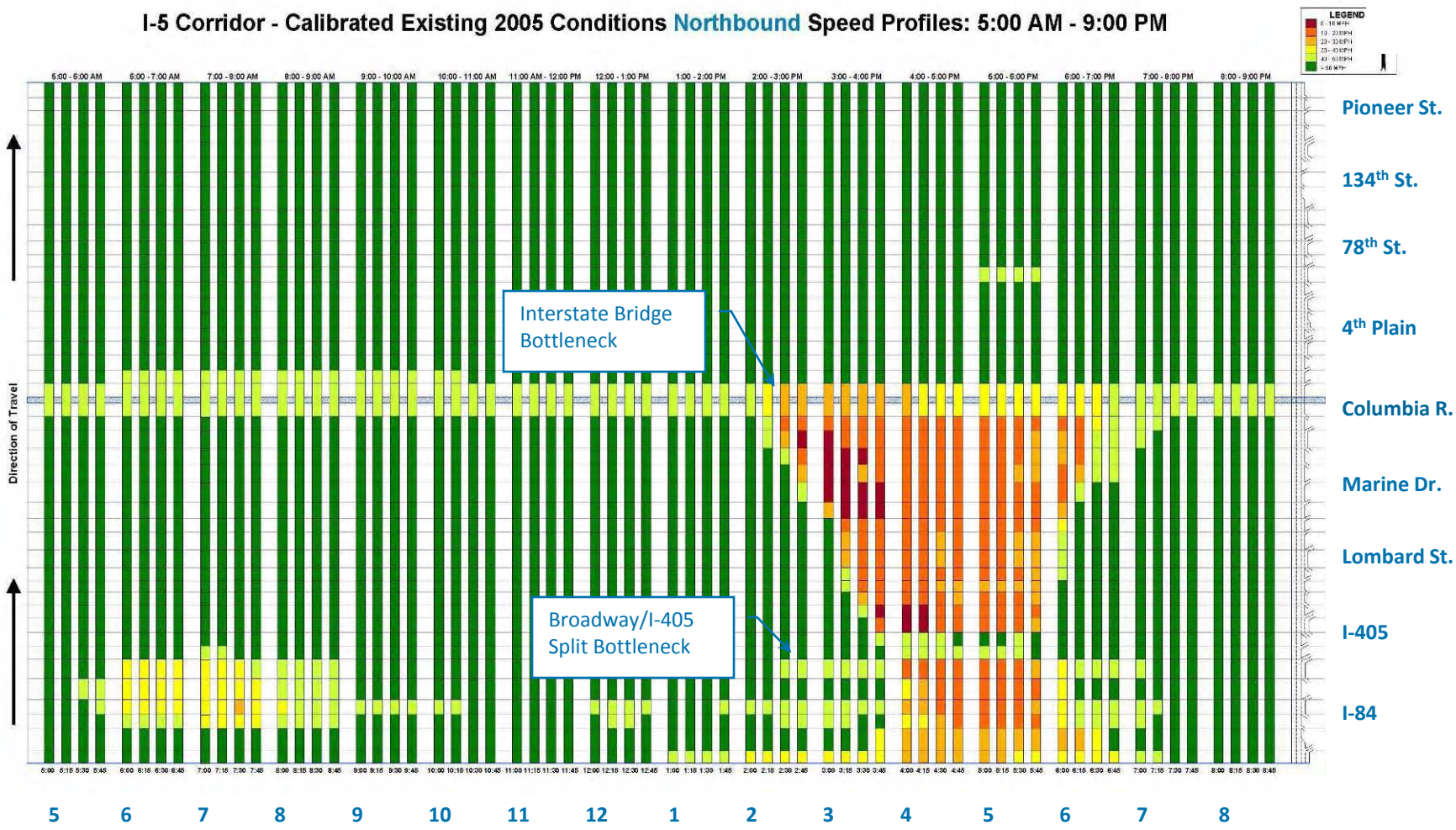

I-5 Corridor - Calibrated Existing 2005 Conditions Southbound Speed Profiles: 5:00 AM - 9:00 PM
LEGEND
5:00 - 6:00 AM
6:00 - 7:00 AM
7:00 - 8:00 AM
8:00 - 9:00 AM
9:00 - 10:00 AM
10:00 - 11:00 AM
11:00 AM - 12:00 PM
12:00 - 1:00 PM
1:00 - 2:00 PM
2:00 - 3:00 PM
3:00 - 4:00 PM
4:00 - 5:00 PM
5:00 - 6:00 PM
6:00 - 7:00 PM
7:00 - 8:00 PM
8:00 - 9:00 PM
Pioneer St.
134th St.
78th St.
4th Plain
Columbia R.
Marine Dr.
Lombard St.
I-405
I-84
Interstate Bridge Bottleneck
Delta Park Bottleneck
I-5/I-405 Split Bottleneck
Rose Quarter/ I-84 Bottleneck
Direction of Travel
5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8

I-5 Corridor - Calibrated Existing 2005 Conditions Northbound Speed Profiles: 5:00 AM - 9:00 PM



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Daily traffic and congestion levels

Options	Hours of Congestion	Average daily traffic
2005 Existing	6	 134,000

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No-Build Alternative

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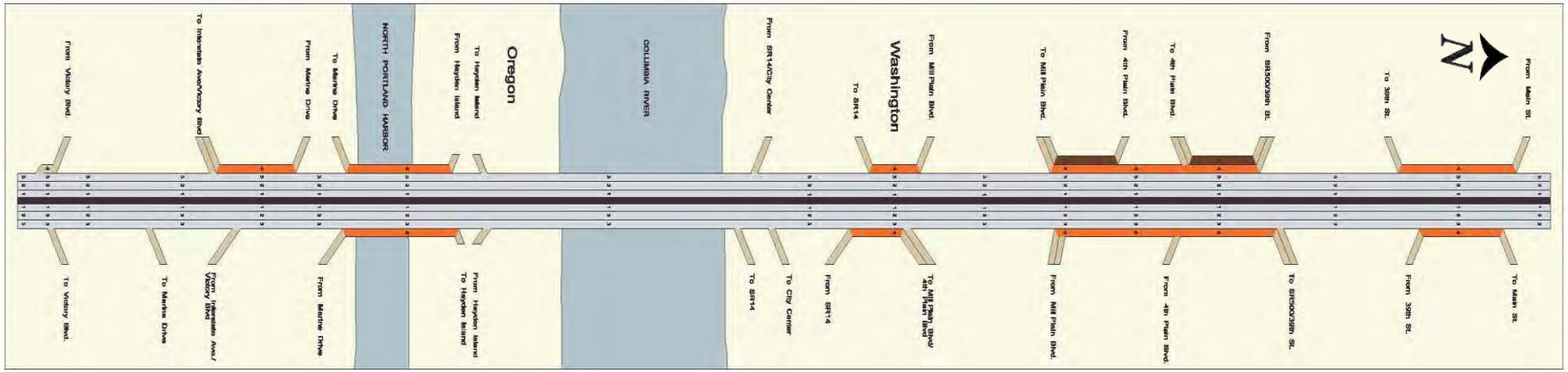
2030 No-Build add/drop lanes



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I-5 Corridor - 2030 No Build Southbound Speed Profiles: 5:00 AM - 9:00 PM

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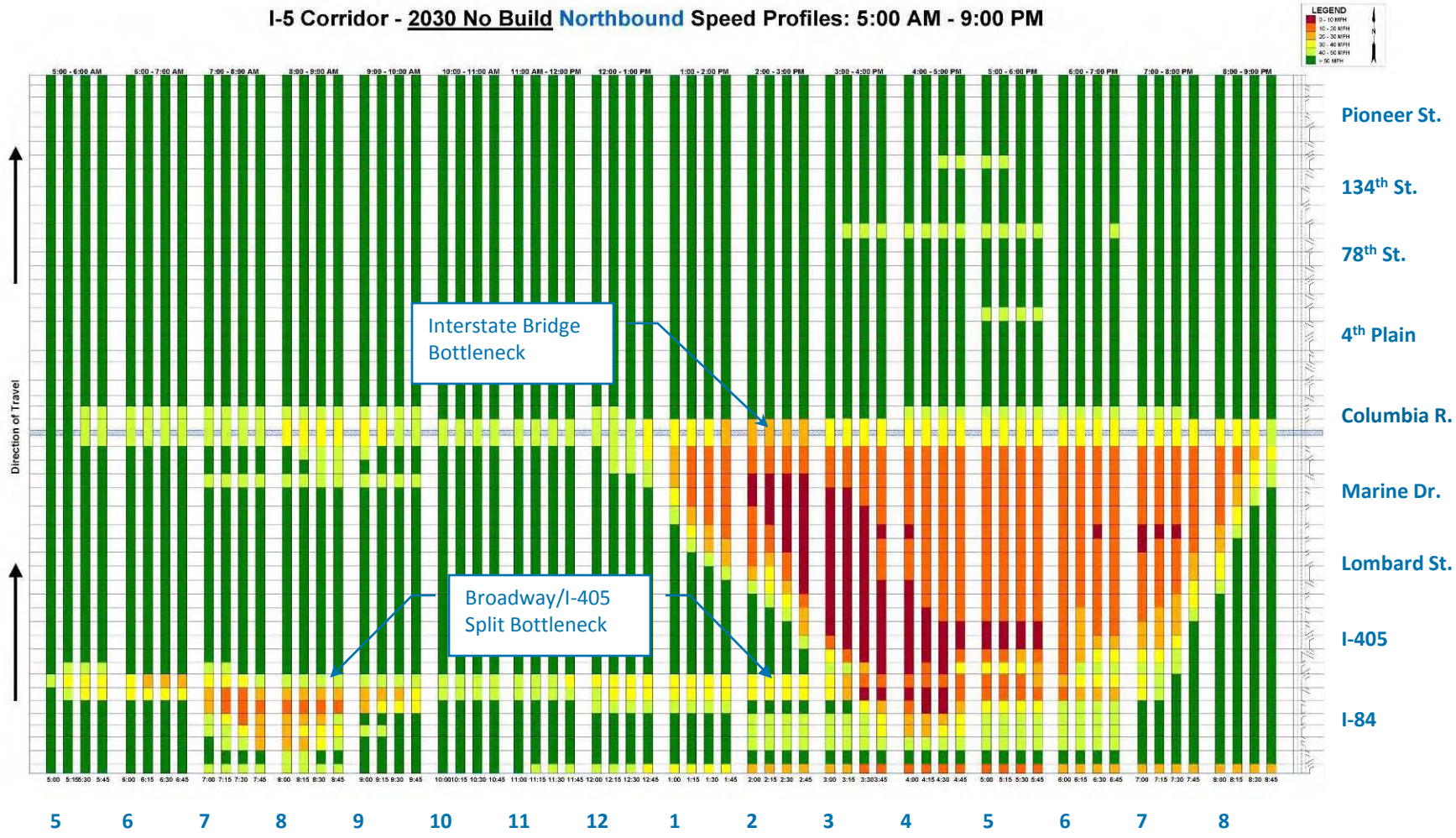
I-5 Corridor - 2030 No Build Northbound Speed Profiles: 5:00 AM - 9:00 PM



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Daily traffic and congestion levels

Options	Hours of Congestion	Average daily traffic
2005 Existing	6	134,000
2030 No-Build	15	184,000

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Locally Preferred Alternative

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What are add/drop lanes?

Non-through lanes that connect ramps to facilitate acceleration and deceleration, weaving, merging, and diverging for automobiles and trucks between two or more interchanges

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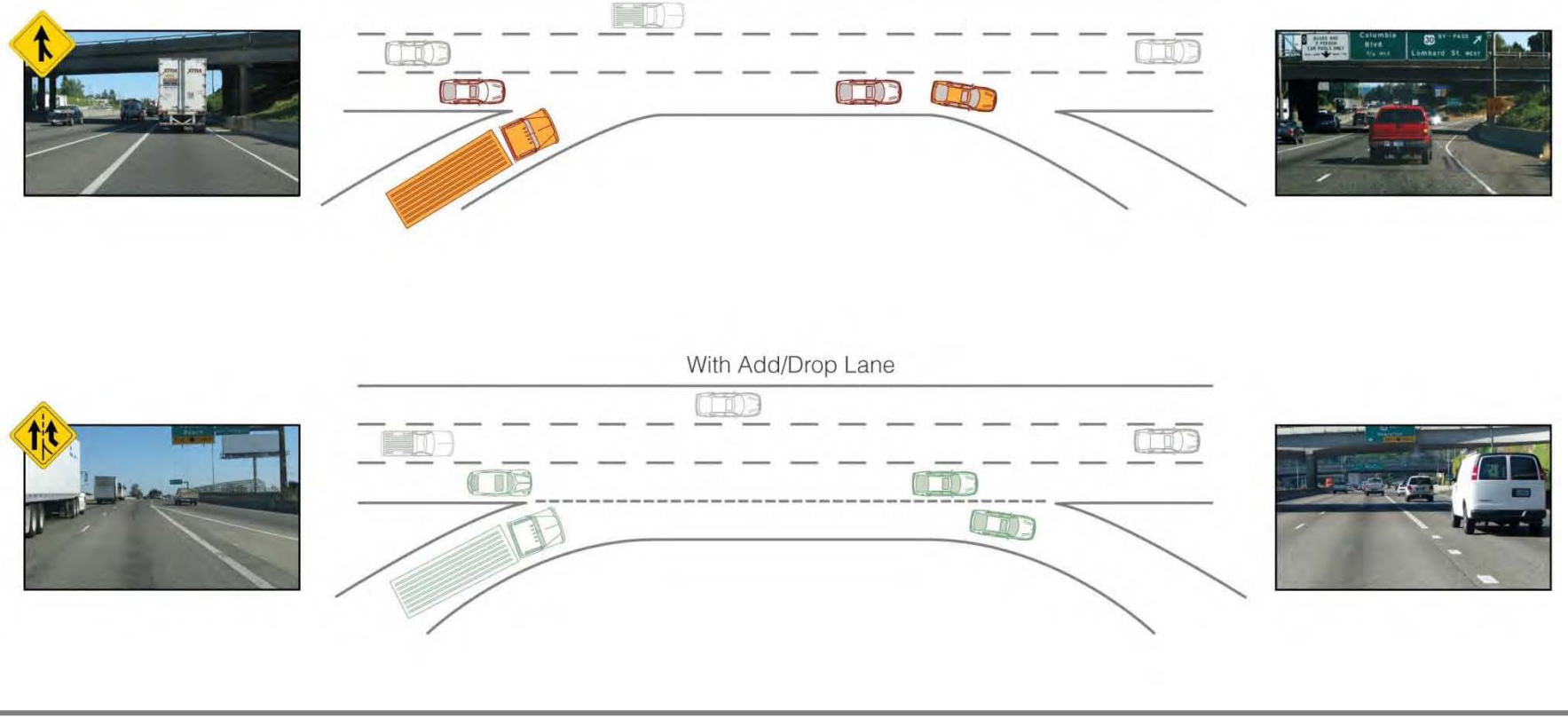
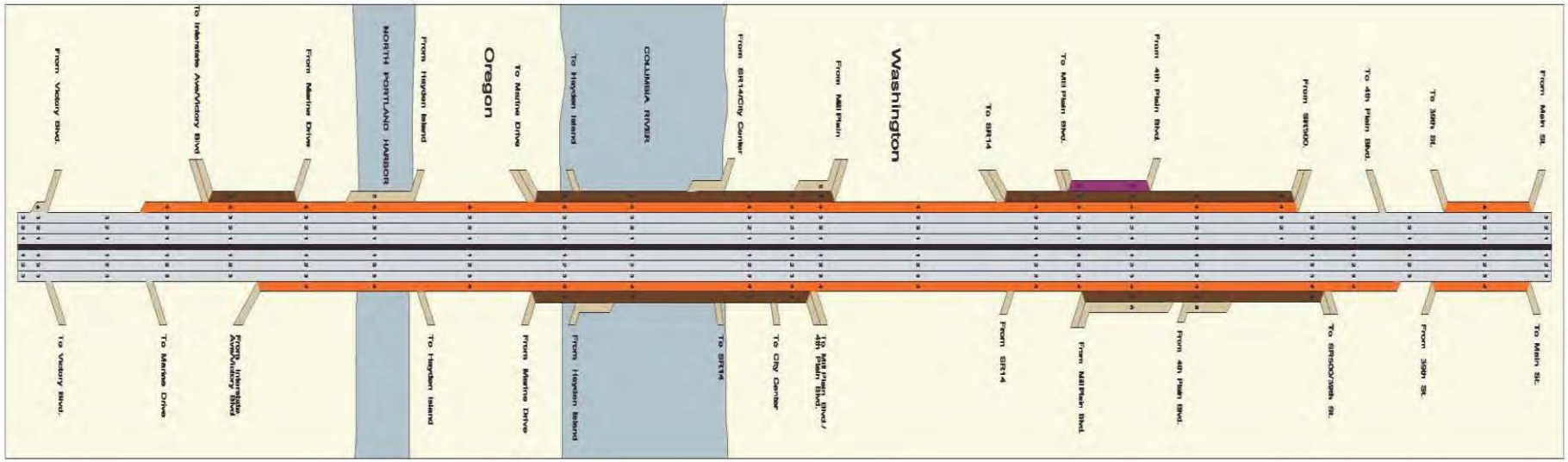
Highway merge and diverge conditions



Extent of proposed add/drop lanes



LEGEND

- Through Lane
- Lane 4 — Auxiliary Lane 1
- Lane 5 — Auxiliary Lane 2
- Lane 6 — Auxiliary Lane 3
- Ramp Lane

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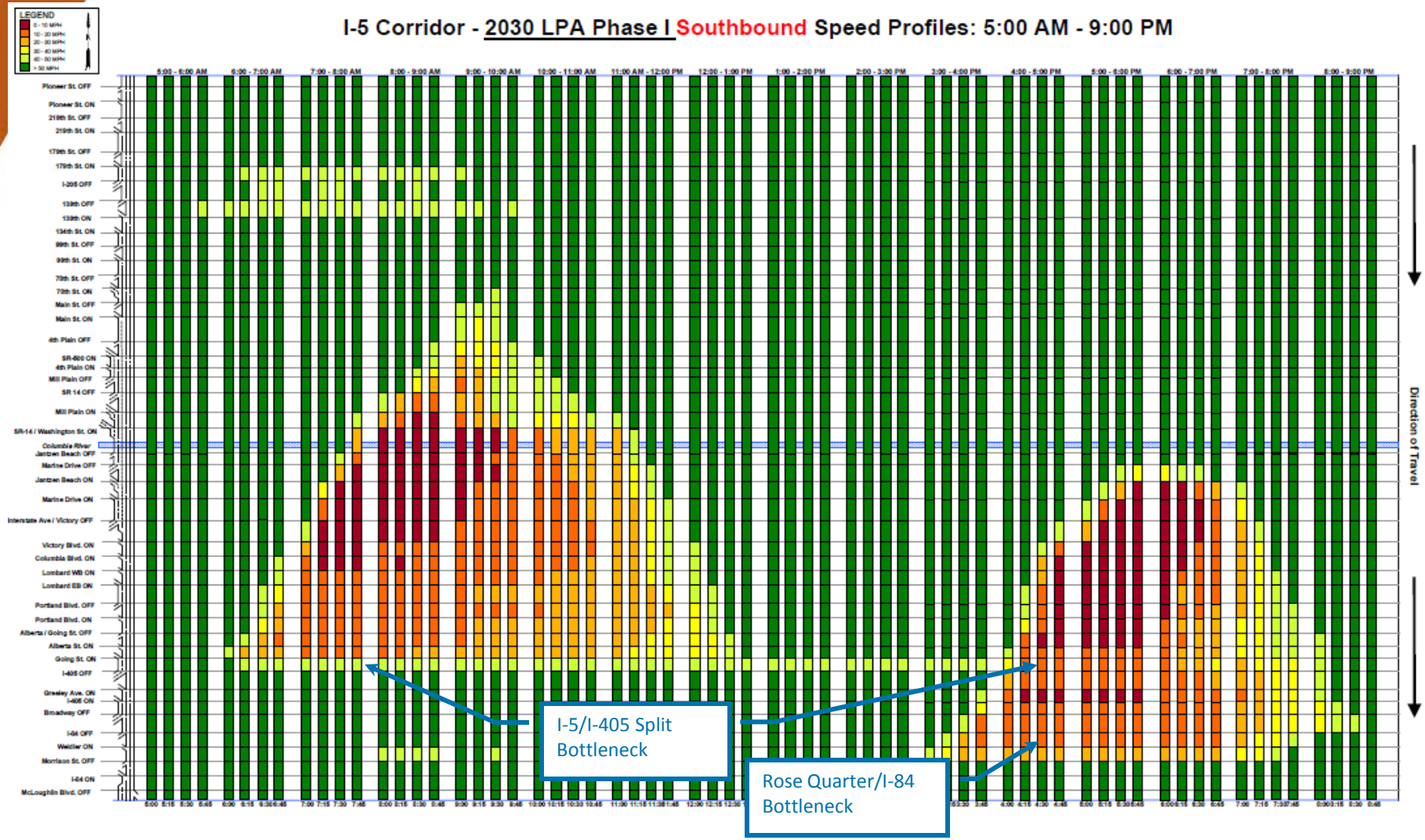
I-5 Corridor - 2030 LPA Phase I Southbound Speed Profiles: 5:00 AM - 9:00 PM



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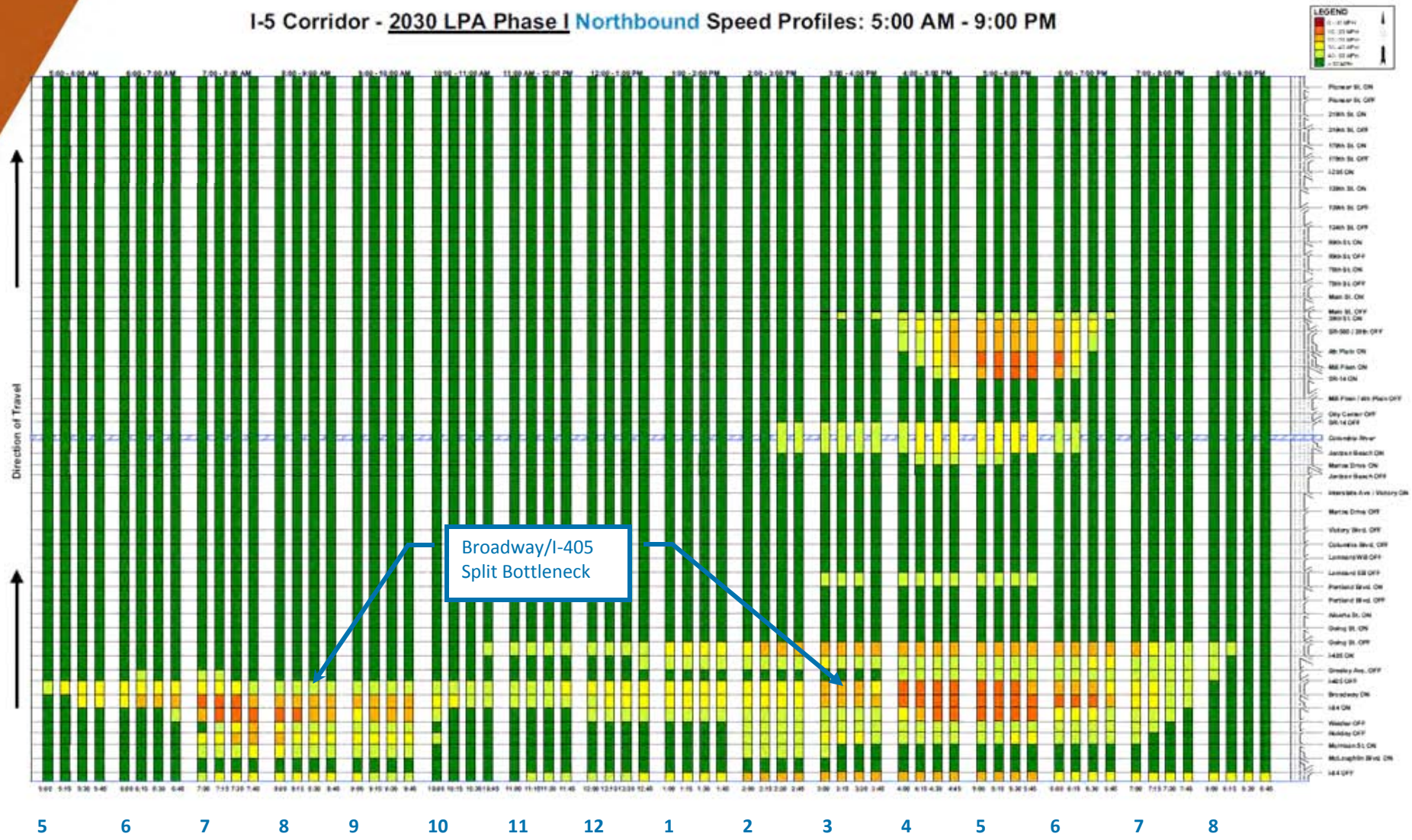
I-5 Corridor - 2030 LPA Phase I Northbound Speed Profiles: 5:00 AM - 9:00 PM



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Daily traffic and congestion levels

Options	Hours of Congestion	Average daily traffic
2005 Existing	6	134,000
2030 No-Build	15	184,000
2030 LPA Phase I	4.5	178,000

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Project area tour




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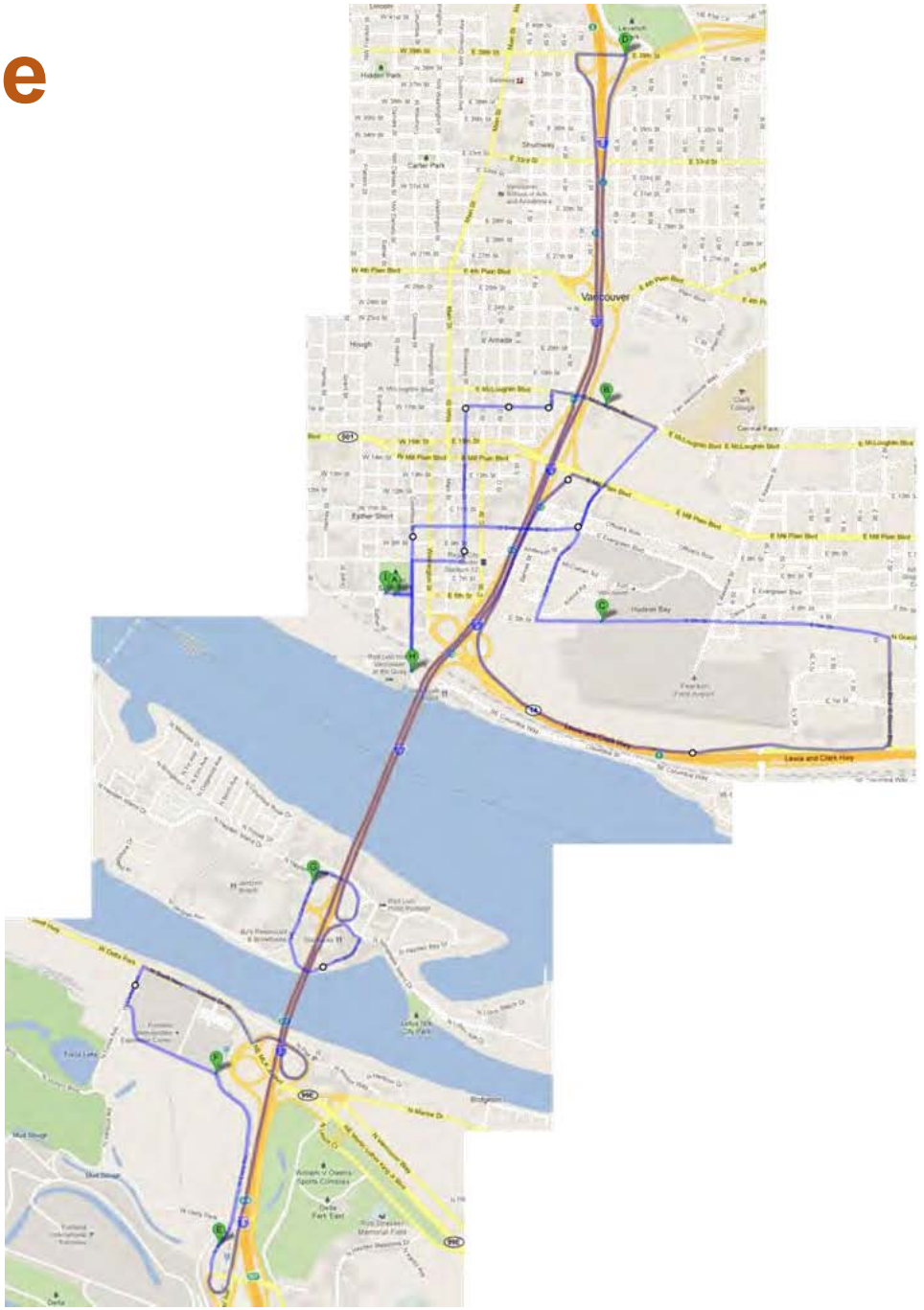
Tour logistics

- **Two hour tour**
- **Tour guides:**
  - Kris Strickler, CRC Deputy Project Director
  - Casey Liles, CRC Highway Engineering Manager
  - Wesley King, CRC Deputy Transit Manager
  - Thayer Rorabaugh, City of Vancouver
- **Topics will include:**
  - Highway improvements
  - Light rail extension / park and rides
  - Replacement bridge
  - Other

Tour route



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