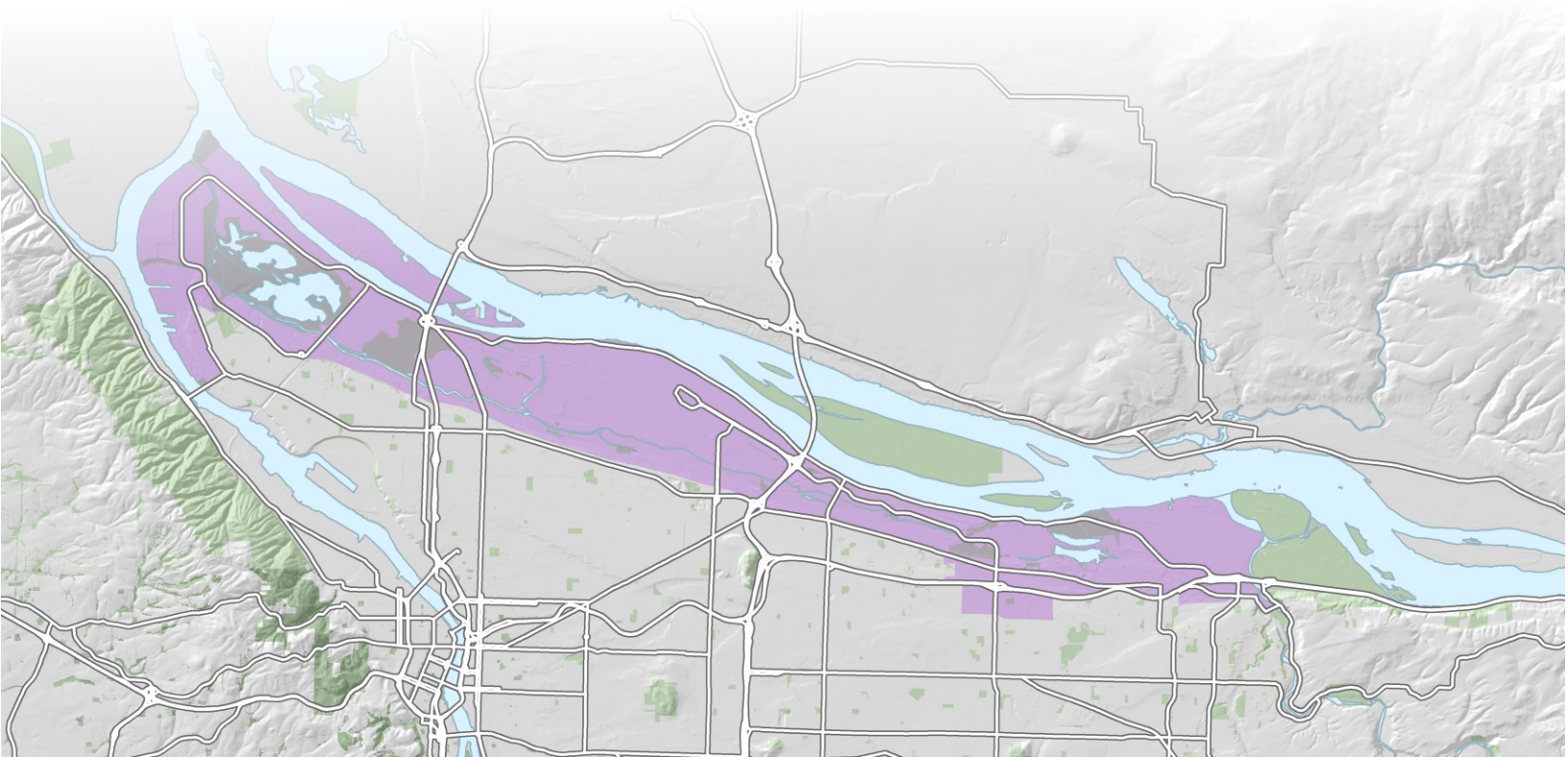
# Columbia Multimodal Corridor Study

## Technical Appendix

December 2012



# INRIX Data

2008 - 2010 Average Travel Time
2008 - 2010 Average Speed

# Figure 1a: Speed Map- 2008 to 2010 Weekday Morning Peak Hour (7-8 A.M.)
## Average Roadway Link Travel Speed compared to Free-Flow Speed

**Port of Portland**

Columbia Corridor

- Uncongested (travel speeds of at least 90% of free-flow speed)
- Slowing (travel speeds between 75% and 90% of free-flow speed)
- Slow (travel speeds between 60% and 75% of free-flow speed)
- Congested (travel speeds of less than 60% of free-flow speed)

- RTP Intersection Project
- RTP Link Project
- Parks and Open Spaces
- Railroad
- Study Area

Data Source: INRIX

N

Columbia Corridor Vicinity

Miles 0.5 0.25 0

WASHINGTON

OREGON

Portland International Airport

I-5

99E HWY

LOMBARD

ROSA PARKS WAY

KILLINGSWORTH ST

PRESCOTT

ST

33RD DR

COLUMBIA BLVD

AVE

BLVD

AIRPORT WAY

EVERGREEN HWY

I-205

ELLSW

GOING ST

0 0.25 0.5 Miles

# Figure 1b: Speed Map- 2008 to 2010 Weekday Morning Peak Hour (7-8 A.M.)
## Average Roadway Link Travel Speed compared to Free-Flow Speed

**Port of Portland**

Columbia Corridor

- Uncongested (travel speeds of at least 90% of free-flow speed)
- Slowing (travel speeds between 75% and 90% of free-flow speed)
- Slow (travel speeds between 60% and 75% of free-flow speed)
- Congested (travel speeds of less than 60% of free-flow speed)

N

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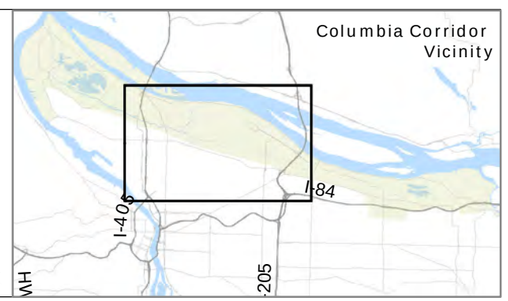
- RTP Link Project
- Parks and Open Spaces
- Railroad
- Study Area

Data Source: INRIX



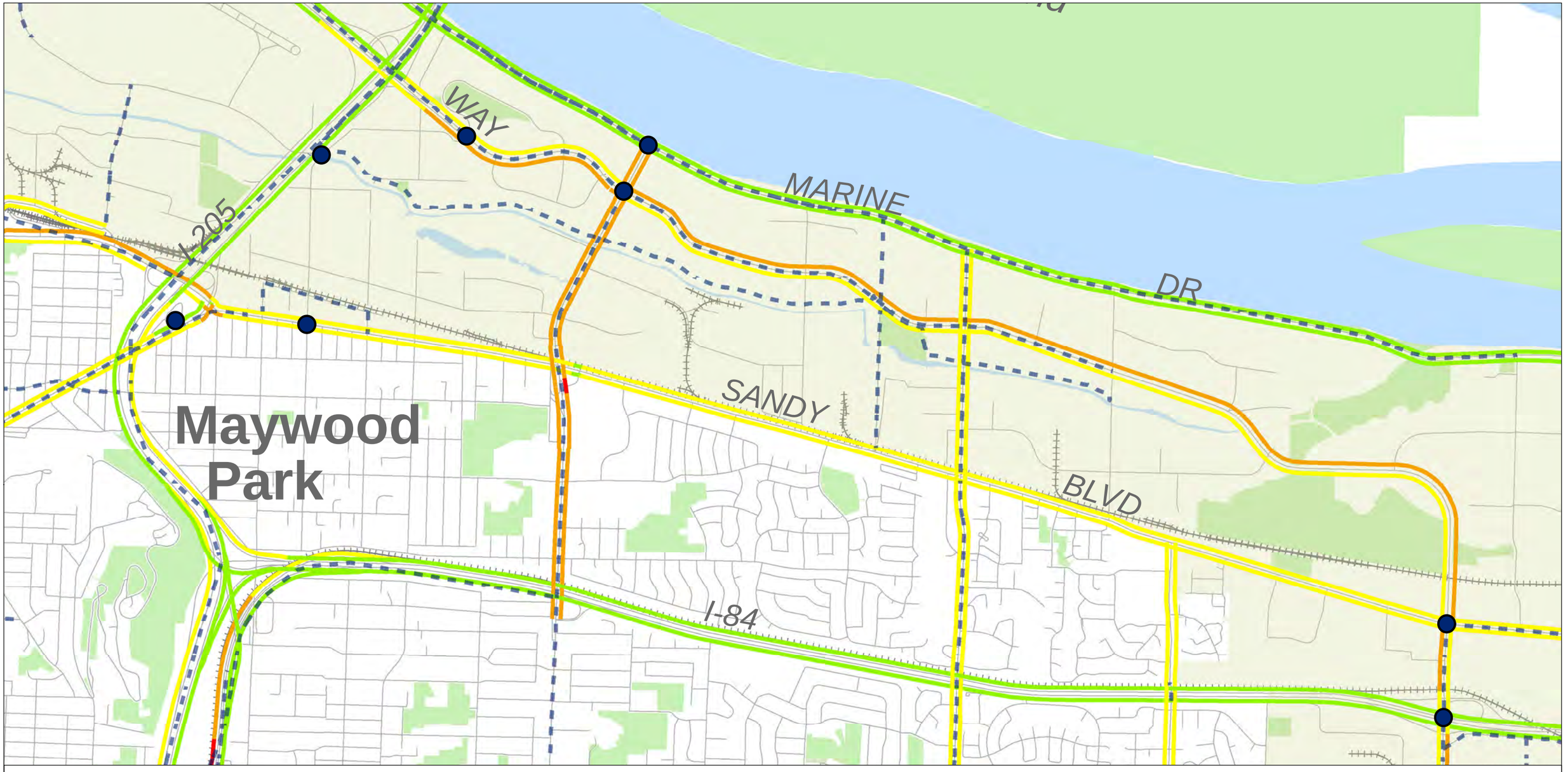



Figure 1c: Speed Map- 2008 to 2010 Weekday Morning Peak Hour (7-8 A.M.)
Average Roadway Link Travel Speed compared to Free-Flow Speed

Port of Portland
Columbia Corridor

- Uncongested (travel speeds of at least 90% of free-flow speed)
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- Slow (travel speeds between 60% and 75% of free-flow speed)
- Congested (travel speeds of less than 60% of free-flow speed)

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- RTP Link Project
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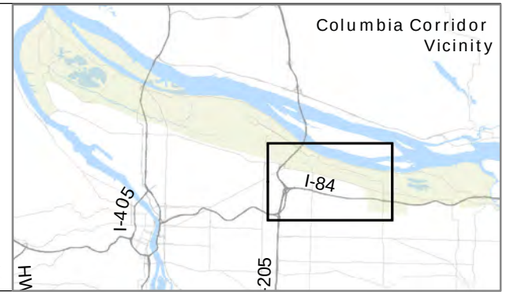
- Railroad
- Study Area

Data Source: INRIX



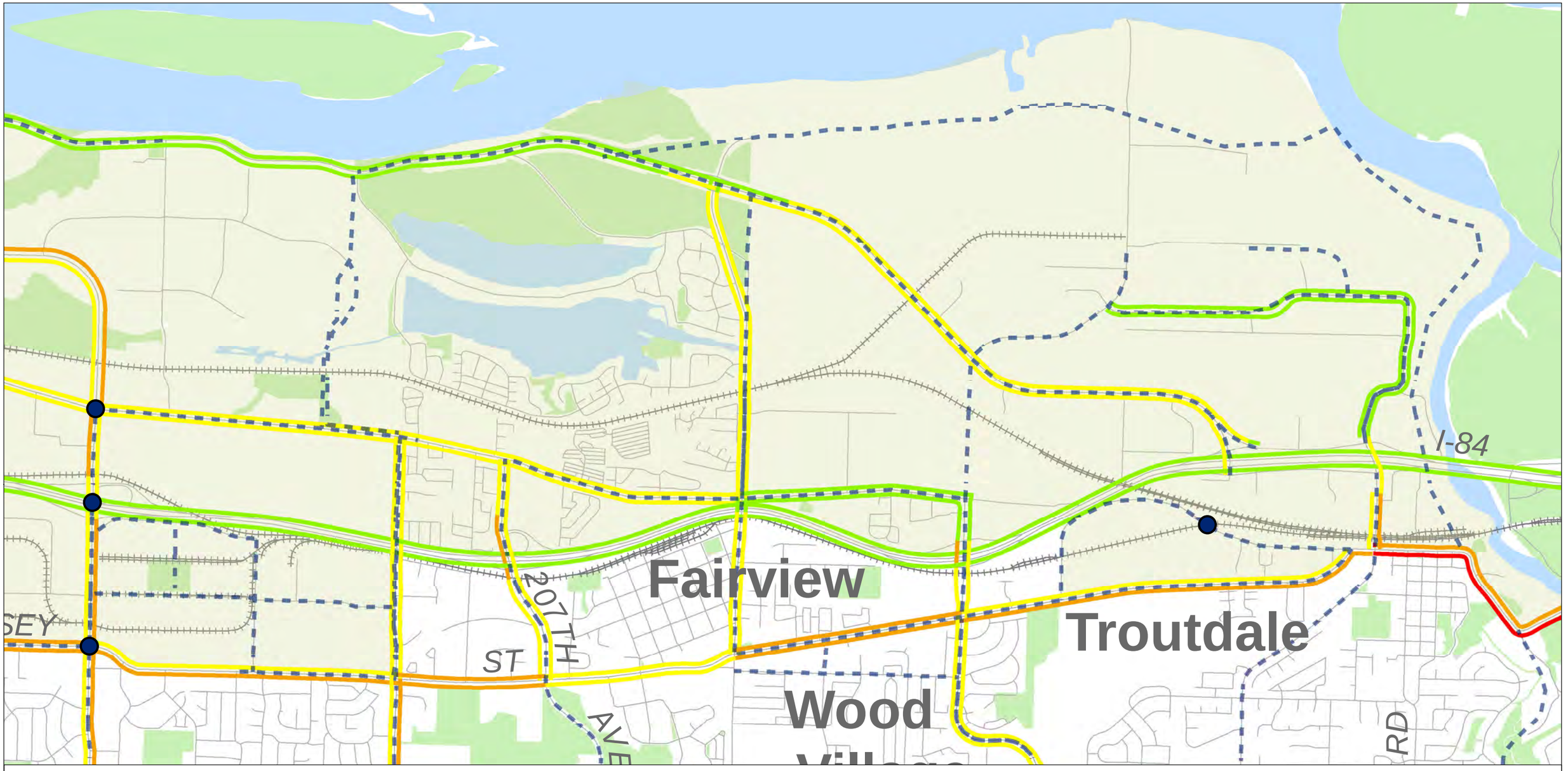



Figure 1d: Speed Map- 2008 to 2010 Weekday Morning Peak Hour (7-8 A.M.)
Average Roadway Link Travel Speed compared to Free-Flow Speed

Port of Portland
Columbia Corridor

- Uncongested (travel speeds of at least 90% of free-flow speed)
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- Congested (travel speeds of less than 60% of free-flow speed)

N

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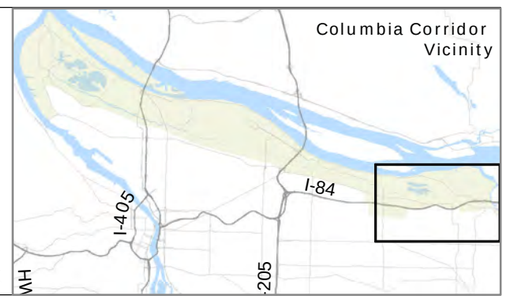
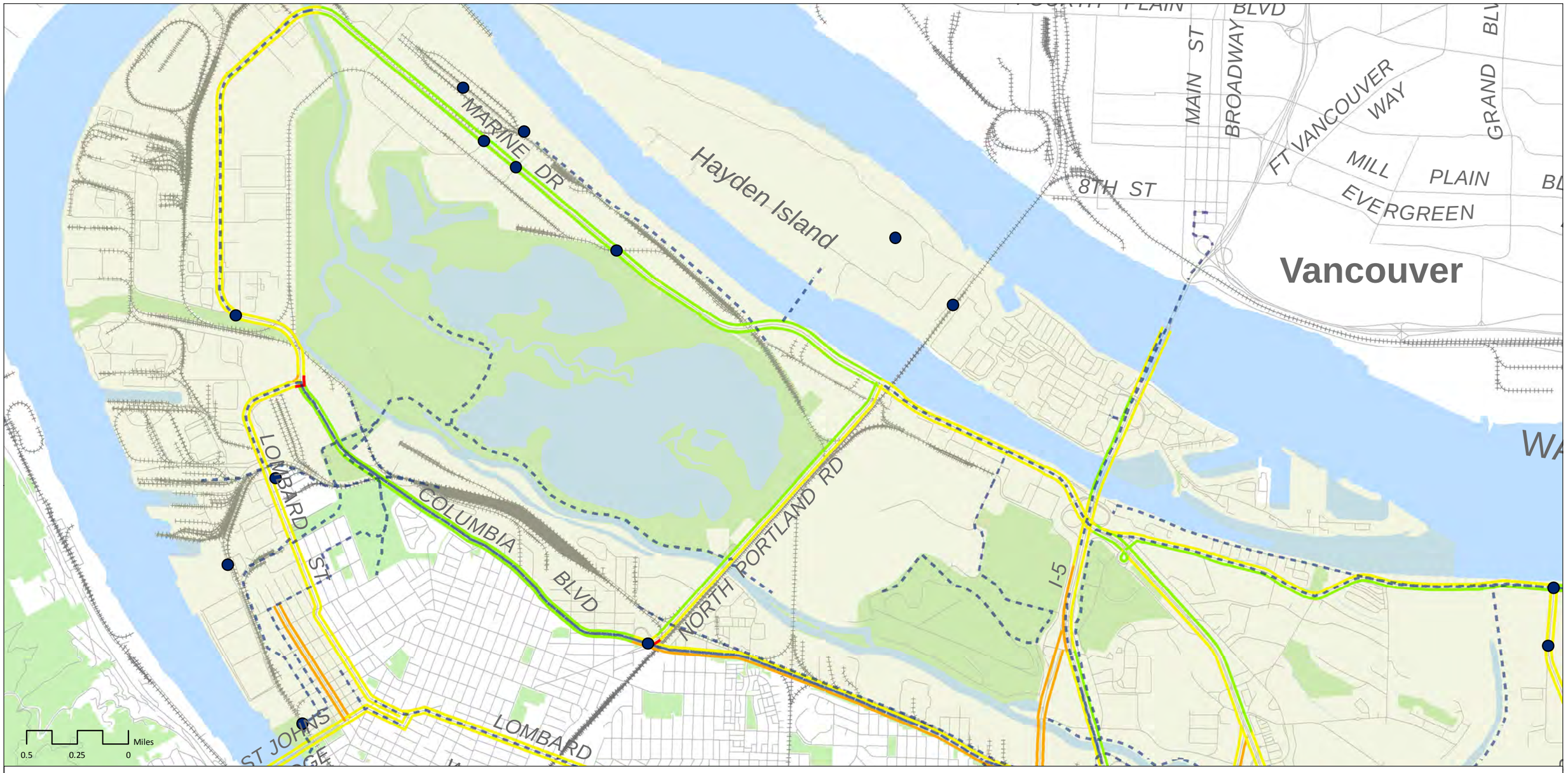
- RTP Link Project
- Parks and Open Spaces
- Railroad
- Study Area

Data Source: INRIX






# Figure 2a: Speed Map- 2008 to 2010 Weekday Midday (12-1 P.M.)
# Average Roadway Link Travel Speed compared to Free-Flow Speed

## Port of Portland
Columbia Corridor

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- Slow (travel speeds between 60% and 75% of free-flow speed)
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Data Source: INRIX

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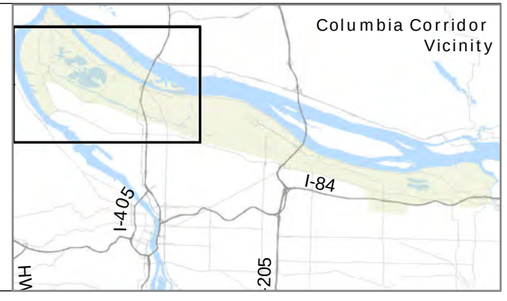

WASHINGTON

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LOMBARD

ROSA PARKS WAY

KILLINGSWORTH

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BLVD

PRESCOTT

GOING ST

0 0.25 0.5 Miles

DR

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COLUMBIA BLVD

AIRPORT WAY

EVERGREEN HWY

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I-205

# Figure 2b: Speed Map- 2008 to 2010 Weekday Midday (12-1 P.M.)
## Average Roadway Link Travel Speed compared to Free-Flow Speed

**Port of Portland**

Columbia Corridor

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- Slow (travel speeds between 60% and 75% of free-flow speed)
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- RTP Link Project
- Parks and Open Spaces
- Railroad
- Study Area

Data Source: INRIX

Columbia Corridor Vicinity

I-84

I-405

I-205

HWY

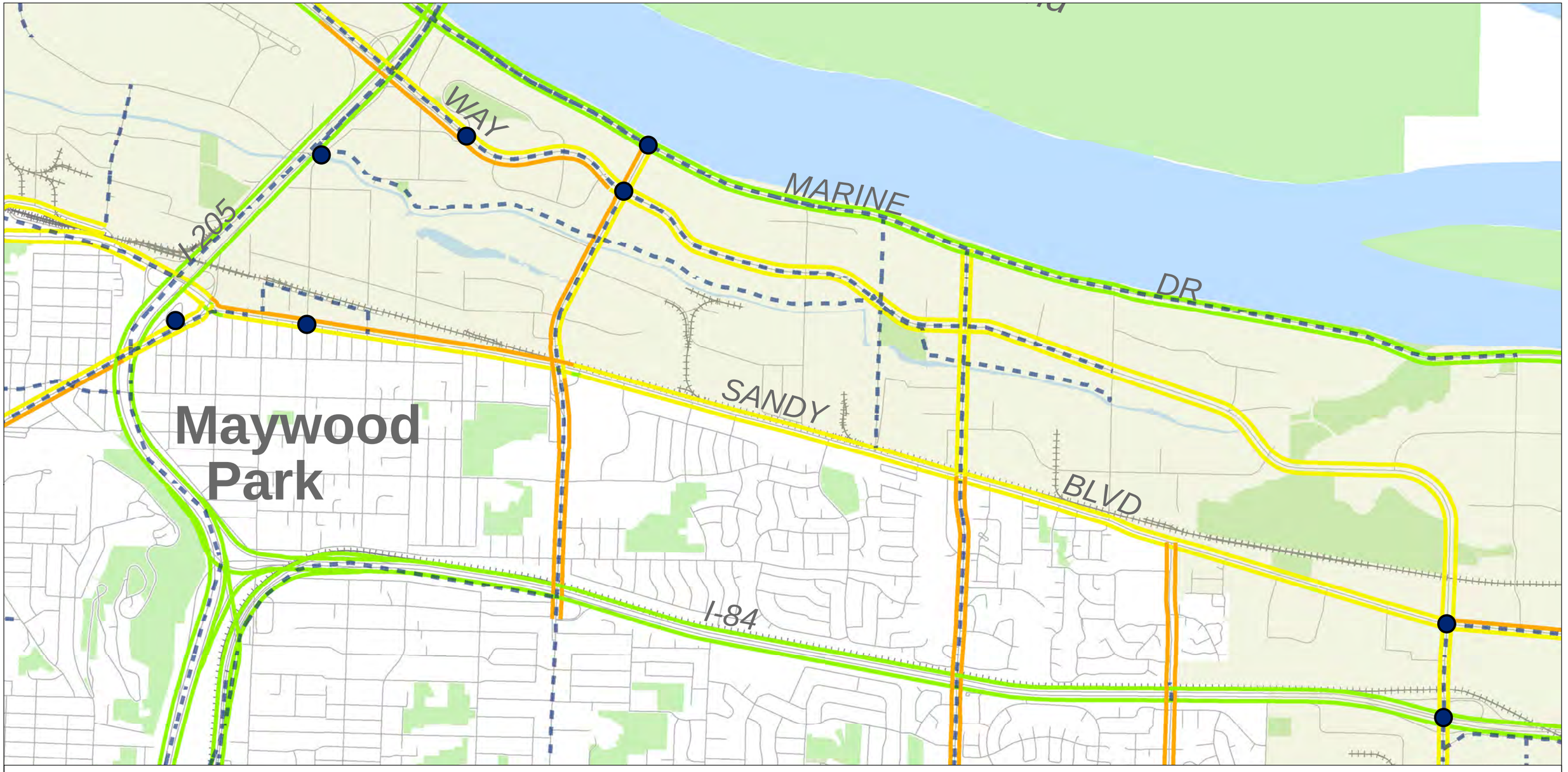


Figure 2c: Speed Map- 2008 to 2010 Weekday Midday (12-1 P.M.)
Average Roadway Link Travel Speed compared to Free-Flow Speed

Port of Portland
Columbia Corridor

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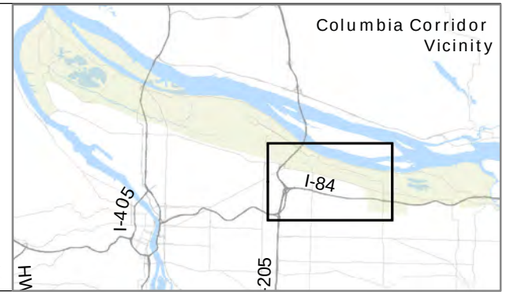
Data Source: INRIX



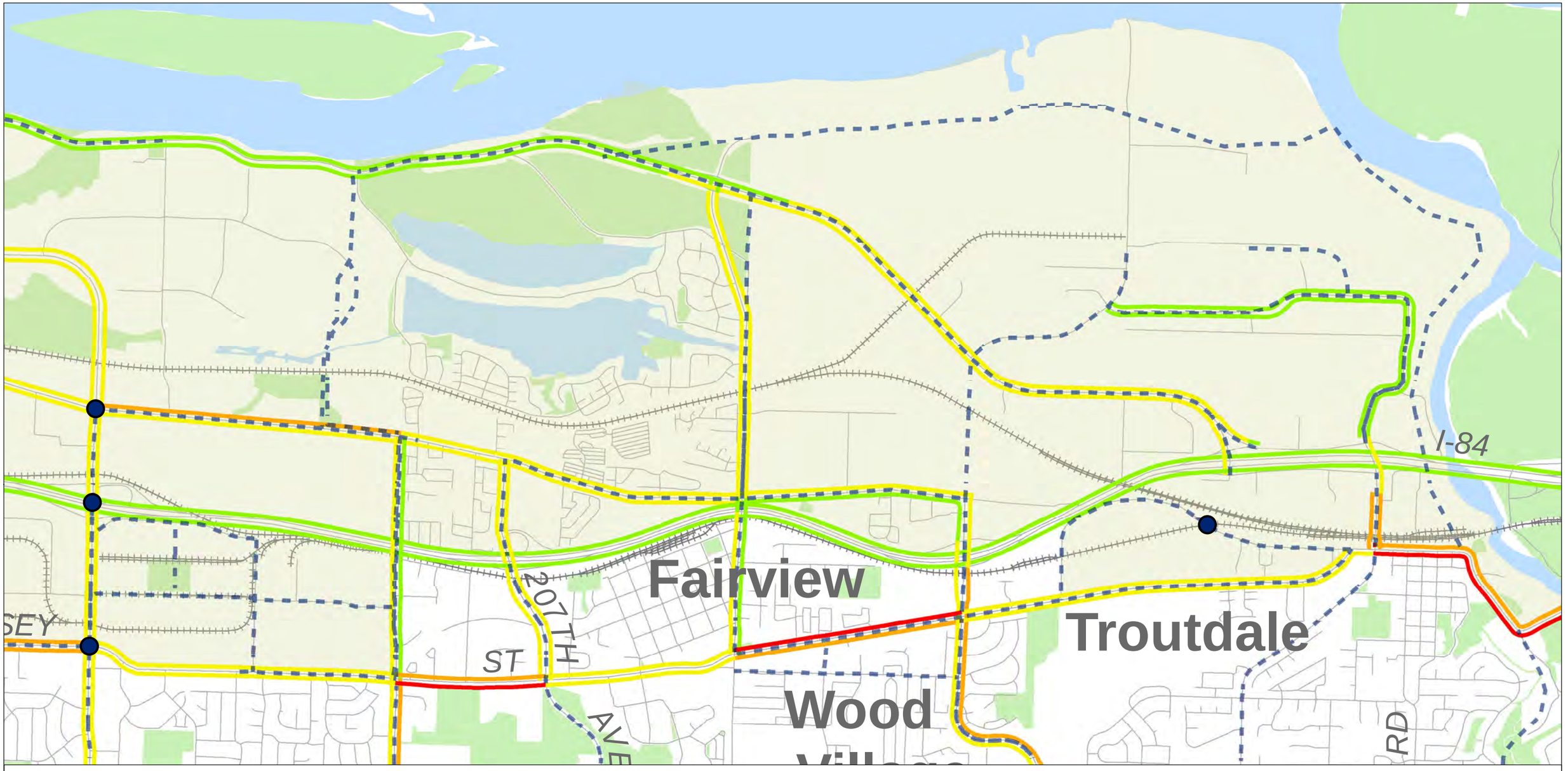



Figure 2d: Speed Map- 2008 to 2010 Weekday Midday (12-1 P.M.)
Average Roadway Link Travel Speed compared to Free-Flow Speed

Port of Portland
Columbia Corridor

- Uncongested (travel speeds of at least 90% of free-flow speed)
- Slowing (travel speeds between 75% and 90% of free-flow speed)
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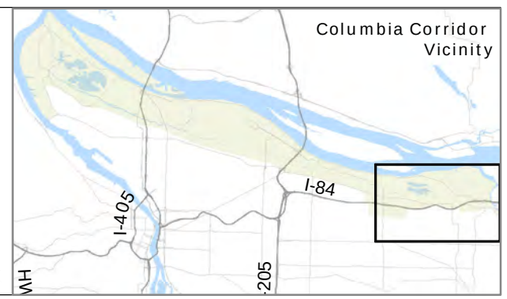
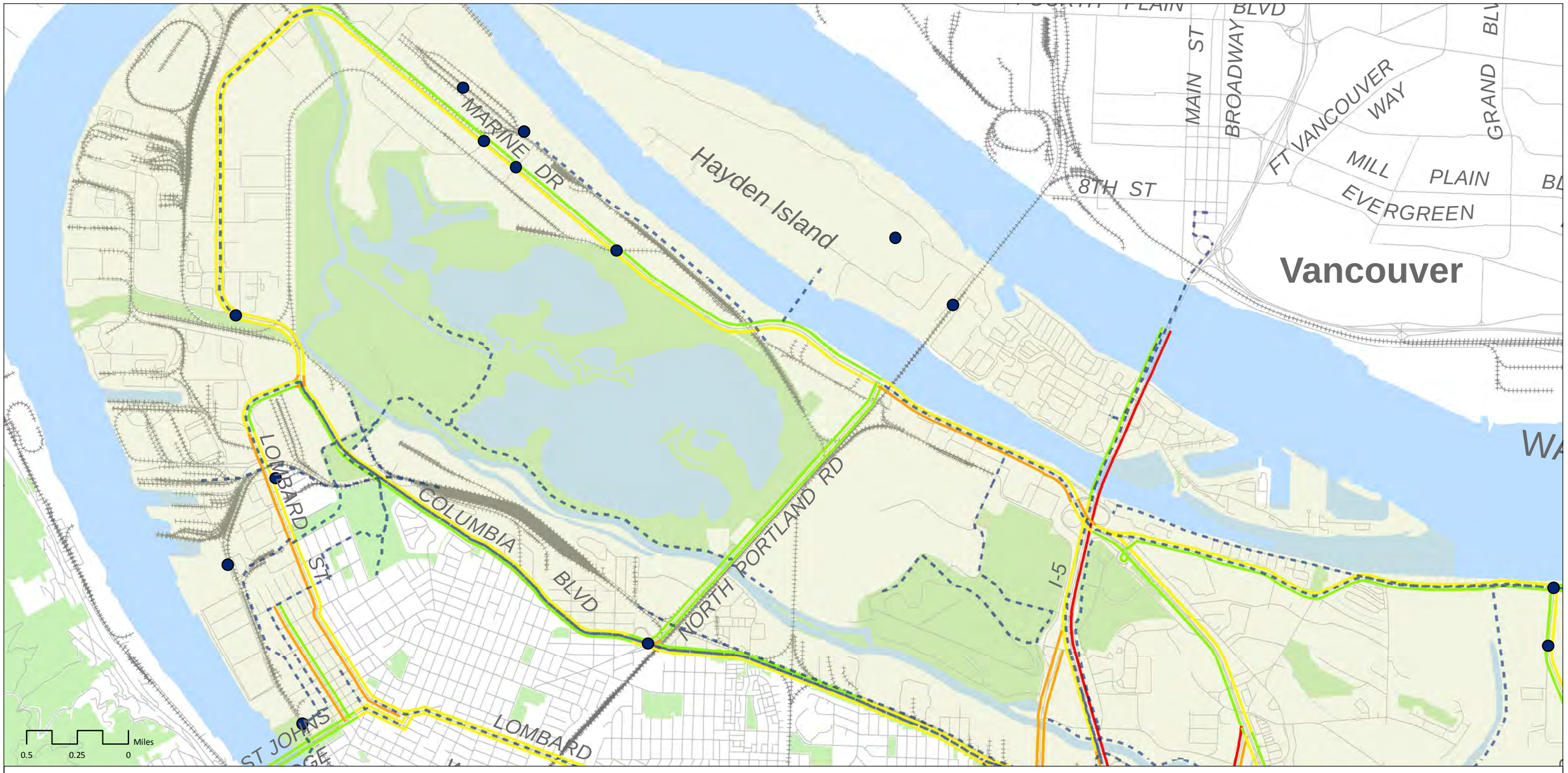
- RTP Link Project
- Parks and Open Spaces
- Railroad
- Study Area

Data Source: INRIX






# Figure 3a: Speed Map- 2008 to 2010 Weekday Evening Peak Hour (5-6 P.M.)
## Average Roadway Link Travel Speed compared to Free-Flow Speed

**Port of Portland**

Columbia Corridor

- Uncongested (travel speeds of at least 90% of free-flow speed)
- Slowing (travel speeds between 75% and 90% of free-flow speed)
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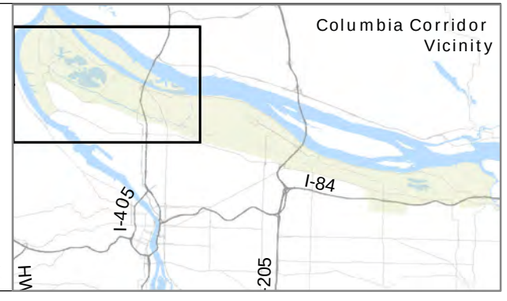
- Study Area

Data Source: INRIX



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COLUMBIA BLVD

AIRPORT WAY

EVERGREEN HWY

I-205

0 0.25 0.5 Miles

# Figure 3b: Speed Map- 2008 to 2010 Weekday Evening Peak Hour (5-6 P.M.)
## Average Roadway Link Travel Speed compared to Free-Flow Speed

**Port of Portland**

Columbia Corridor

- Uncongested (travel speeds of at least 90% of free-flow speed)
- Slowing (travel speeds between 75% and 90% of free-flow speed)
- Slow (travel speeds between 60% and 75% of free-flow speed)
- Congested (travel speeds of less than 60% of free-flow speed)

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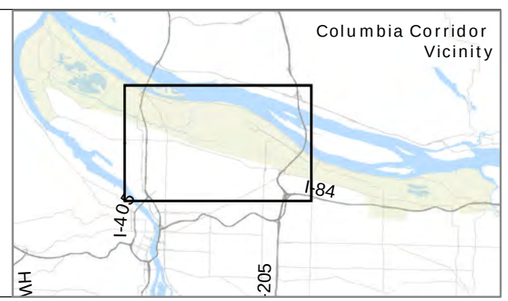

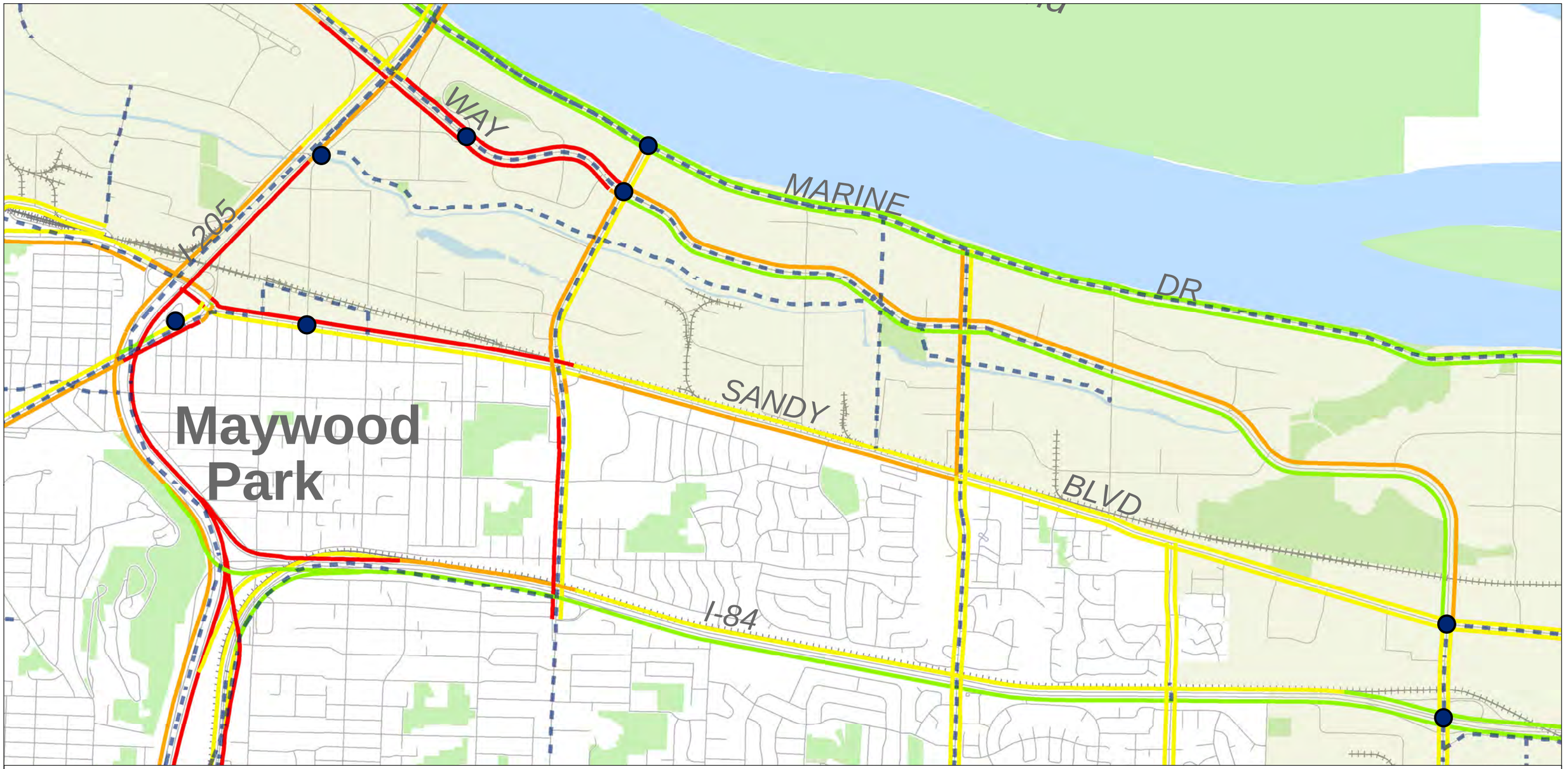


Figure 3c: Speed Map- 2008 to 2010 Weekday Evening Peak Hour (5-6 P.M.)
Average Roadway Link Travel Speed compared to Free-Flow Speed

Port of Portland
Columbia Corridor

- Uncongested (travel speeds of at least 90% of free-flow speed)
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- Slow (travel speeds between 60% and 75% of free-flow speed)
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N

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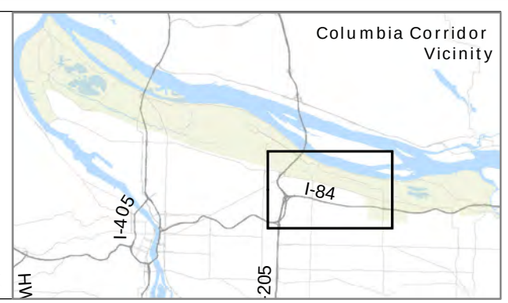

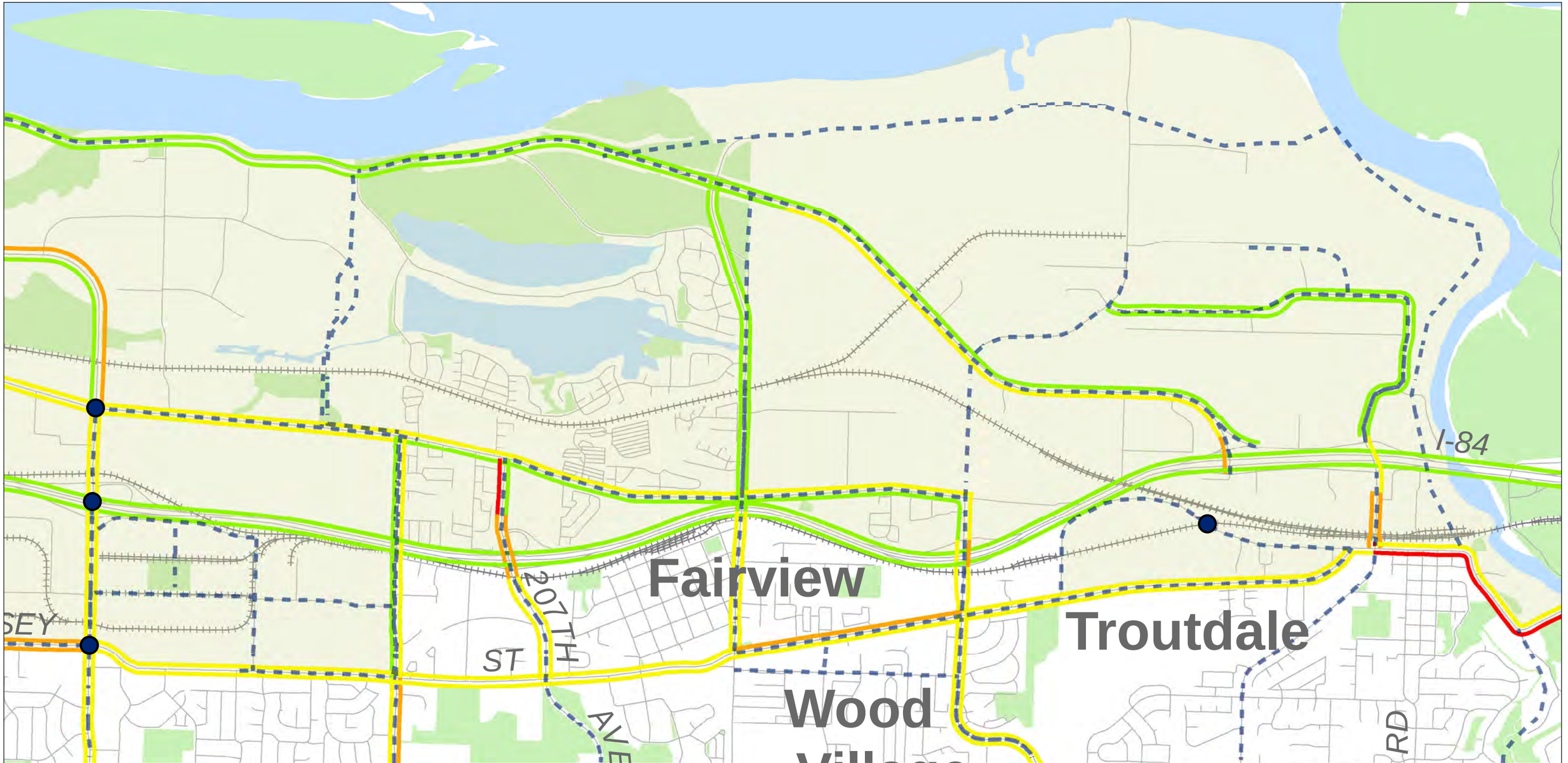


Figure 3d: Speed Map- 2008 to 2010 Weekday Evening Peak Hour (5-6 P.M.)
Average Roadway Link Travel Speed compared to Free-Flow Speed

Port of Portland
Columbia Corridor

- Uncongested (travel speeds of at least 90% of free-flow speed)
- Slowing (travel speeds between 75% and 90% of free-flow speed)
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N

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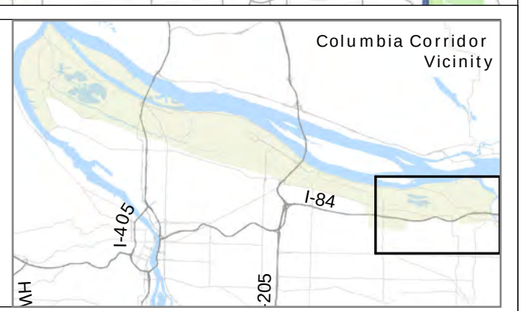
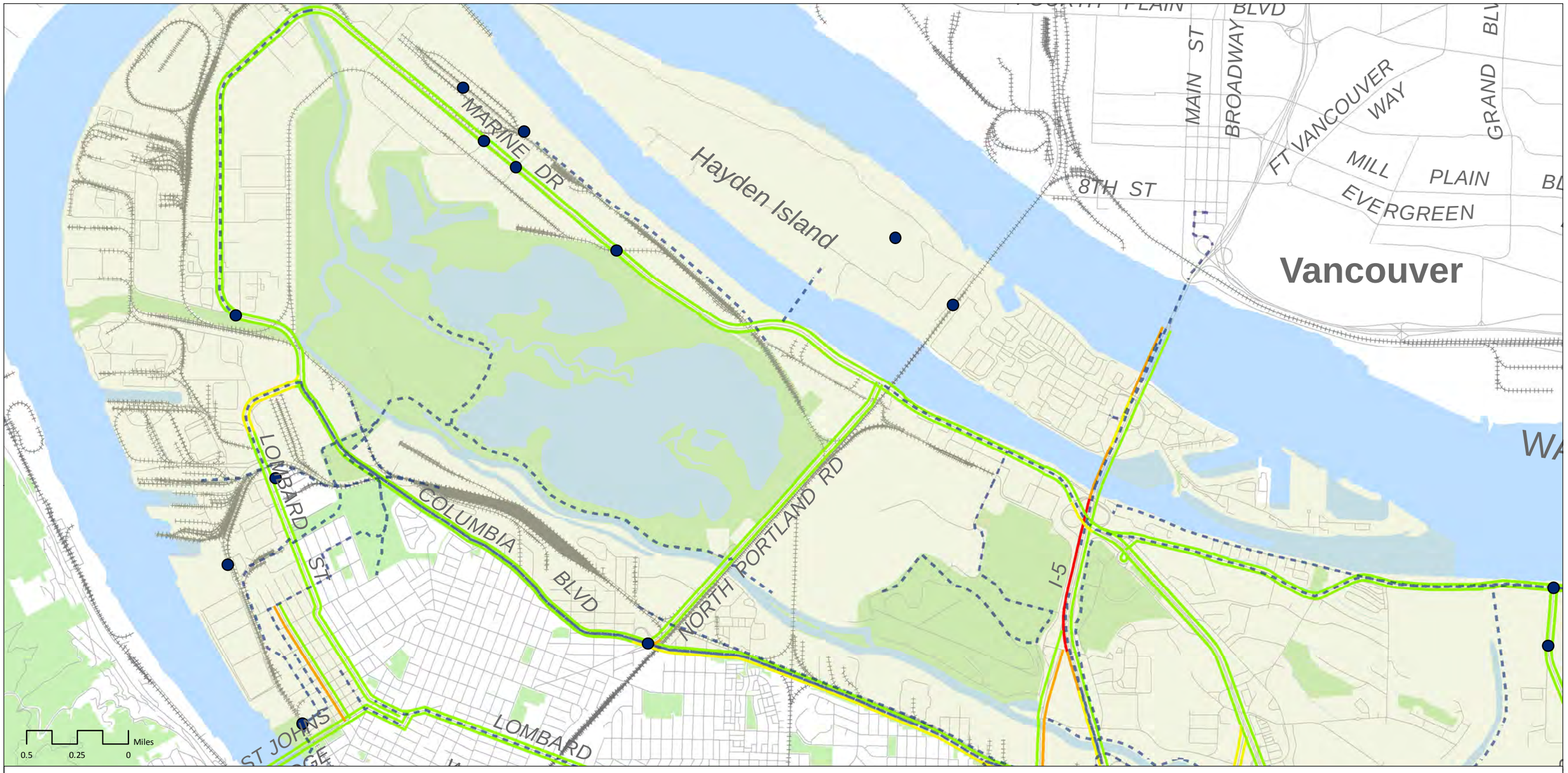
- Railroad
- Study Area

Data Source: INRIX






# Figure 4a: Travel Time- 2008 to 2010 Weekday Morning Peak Hour (7-8 A.M.)
## Average Roadway Link Travel Time compared to Free-Flow Travel

**Port of Portland**

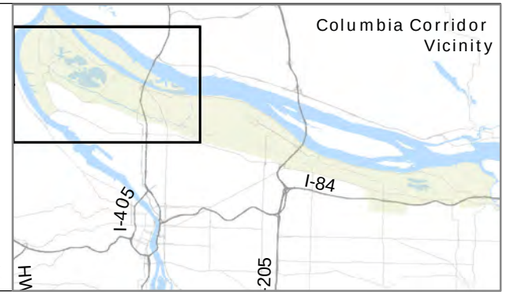
Columbia Corridor

- Travel time is less than 30 seconds higher per mile
- Travel time is between 30 seconds and one minute higher per mile
- Travel time is between one and two minutes higher per mile
- Travel time is more than two minutes higher per mile

N

- RTP Intersection Project
- RTP Link Project
- Parks and Open Spaces
- Railroad
- Study Area

Data Source: INRIX



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EVERGREEN HWY

ELLSW

I-205

BLVD

GOING

0 0.25 0.5 Miles

# Figure 4b: Travel Time- 2008 to 2010 Weekday Morning Peak Hour (7-8 A.M.)
## Average Roadway Link Travel Time compared to Free-Flow Travel

Port of Portland

Columbia Corridor

- Travel time is less than 30 seconds higher per mile
- Travel time is between 30 seconds and one minute higher per mile
- Travel time is between one and two minutes higher per mile
- Travel time is more than two minutes higher per mile

N

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- RTP Link Project
- Parks and Open Spaces
- Railroad
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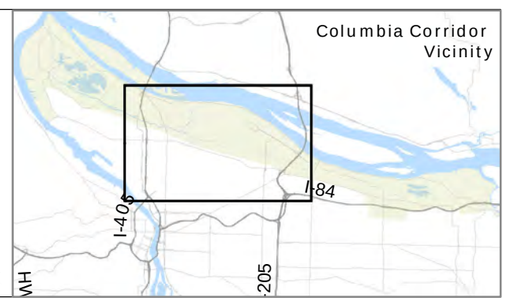
Data Source: INRIX



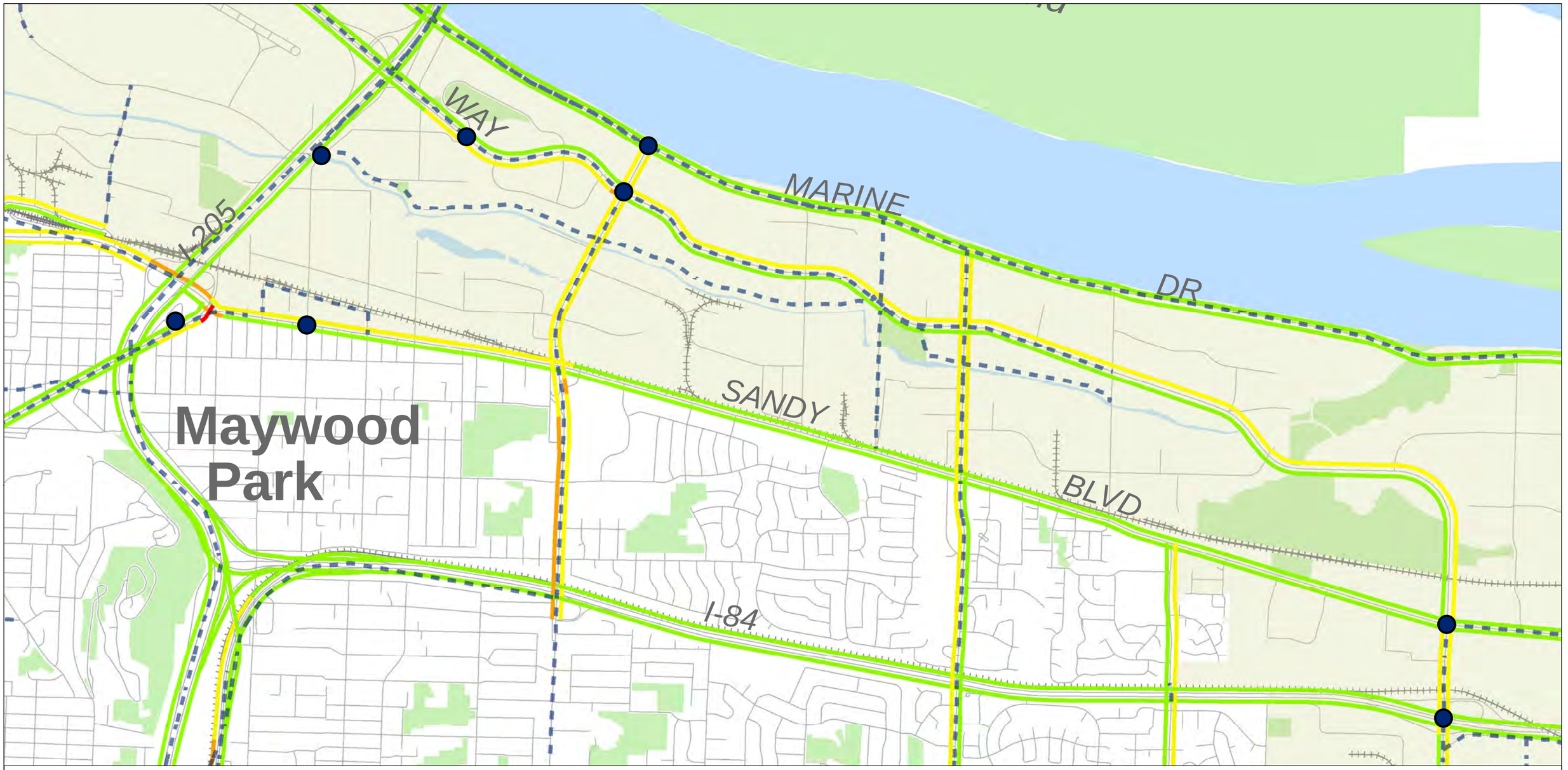



Figure 4c: Travel Time- 2008 to 2010 Weekday Morning Peak Hour (7-8 A.M.)
Average Roadway Link Travel Time compared to Free-Flow Travel

Port of Portland

Columbia Corridor

- Travel time is less than 30 seconds higher per mile
- Travel time is between 30 seconds and one minute higher per mile
- Travel time is between one and two minutes higher per mile
- Travel time is more than two minutes higher per mile

N

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- Study Area

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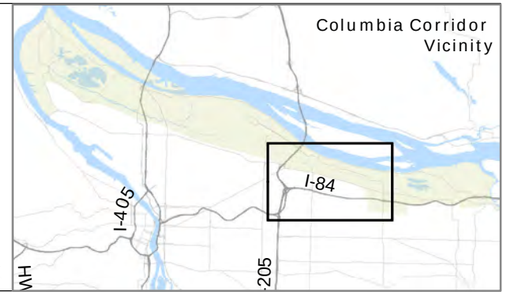

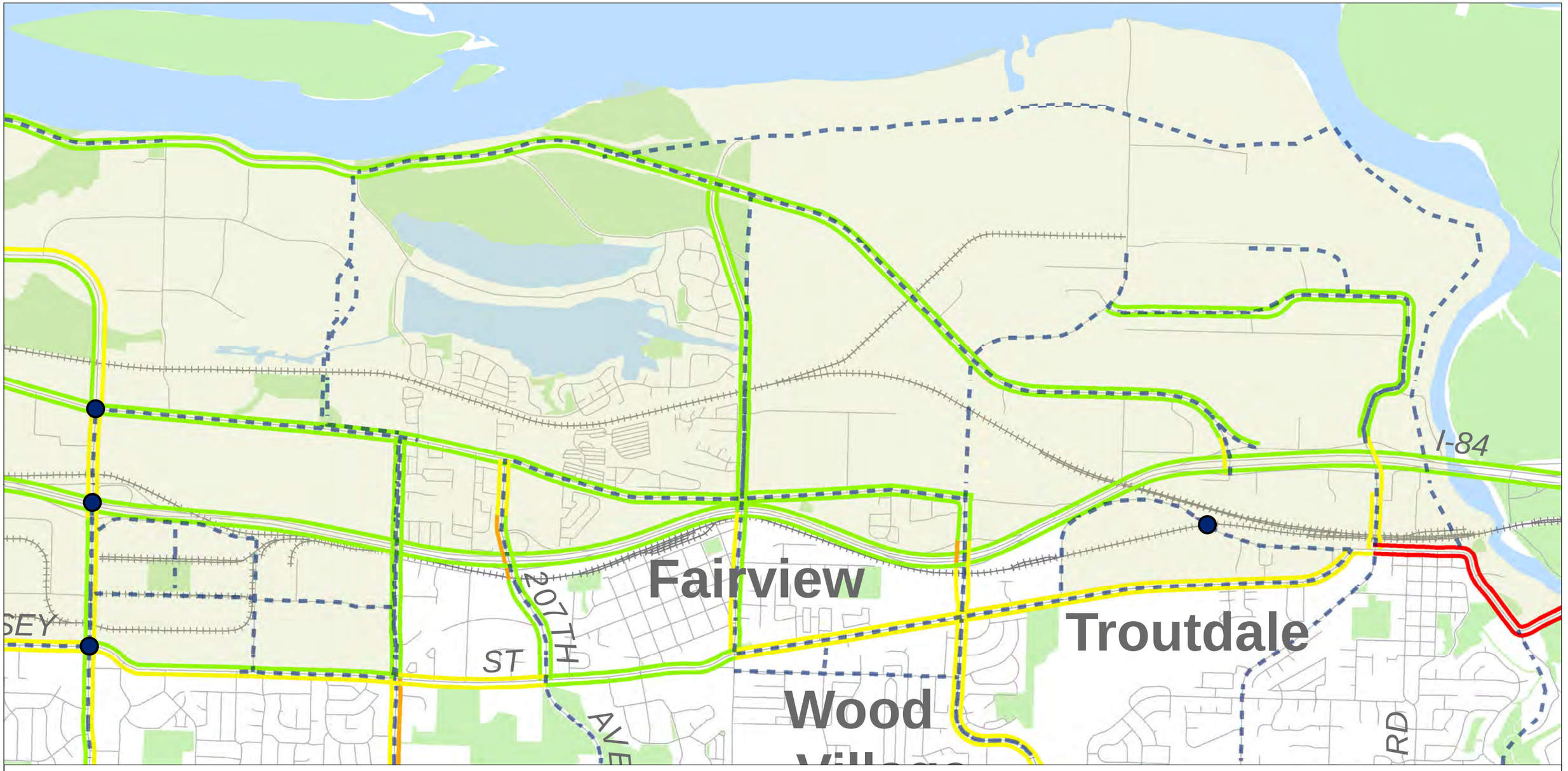


Figure 4d: Travel Time- 2008 to 2010 Weekday Morning Peak Hour (7-8 A.M.)
Average Roadway Link Travel Time compared to Free-Flow Travel

Port of Portland
Columbia Corridor

- Travel time is less than 30 seconds higher per mile
- Travel time is between 30 seconds and one minute higher per mile
- Travel time is between one and two minutes higher per mile
- Travel time is more than two minutes higher per mile

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- RTP Link Project
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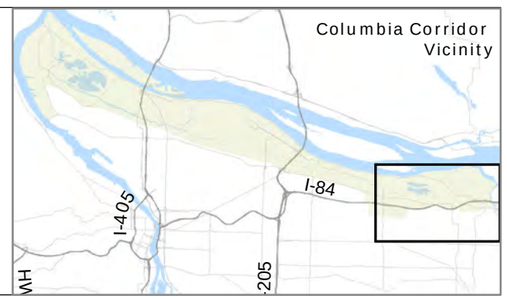
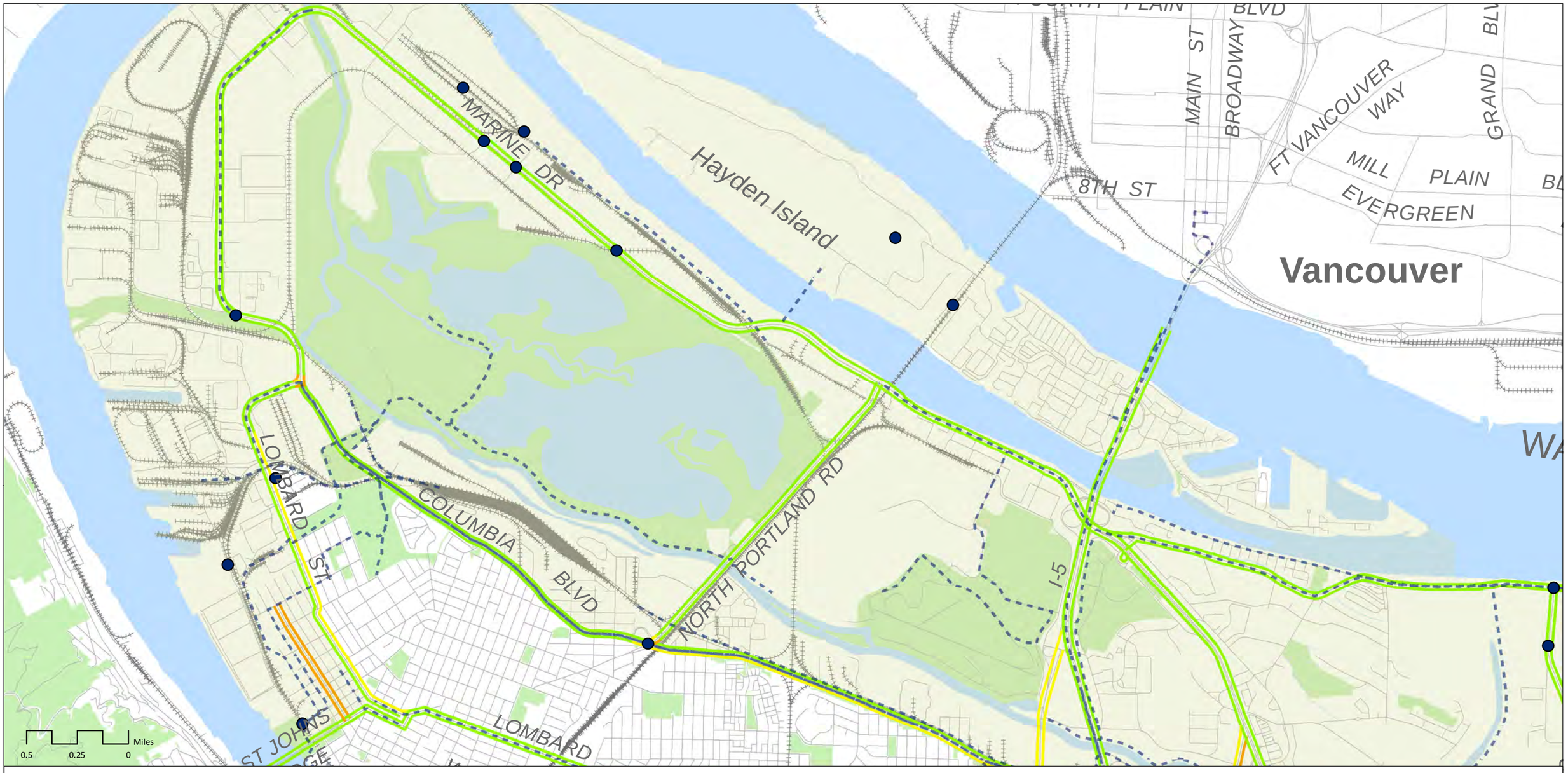
Data Source: INRIX






# Figure 5a: Travel Time- 2008 to 2010 Weekday Midday (12-1 P.M.) Average Roadway Link Travel Time compared to Free-Flow Travel

## Port of Portland

Columbia Corridor

- Travel time is less than 30 seconds higher per mile
- Travel time is between 30 seconds and one minute higher per mile
- Travel time is between one and two minutes higher per mile
- Travel time is more than two minutes higher per mile

N

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- RTP Link Project
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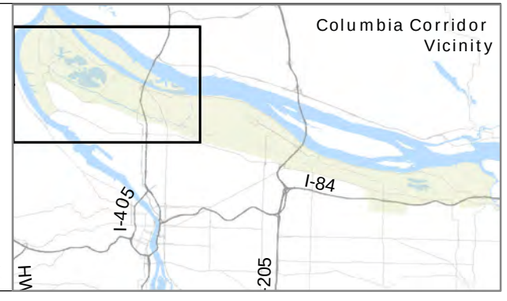
- Study Area

Data Source: INRIX



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AIRPORT WAY

EVERGREEN HWY

I-205

Miles 0 0.25 0.5

# Figure 5b: Travel Time- 2008 to 2010 Weekday Midday (12-1 P.M.)
## Average Roadway Link Travel Time compared to Free-Flow Travel

Port of Portland

Columbia Corridor

- Travel time is less than 30 seconds higher per mile
- Travel time is between 30 seconds and one minute higher per mile
- Travel time is between one and two minutes higher per mile
- Travel time is more than two minutes higher per mile

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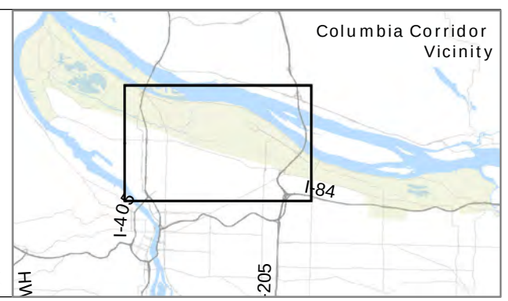
Data Source: INRIX



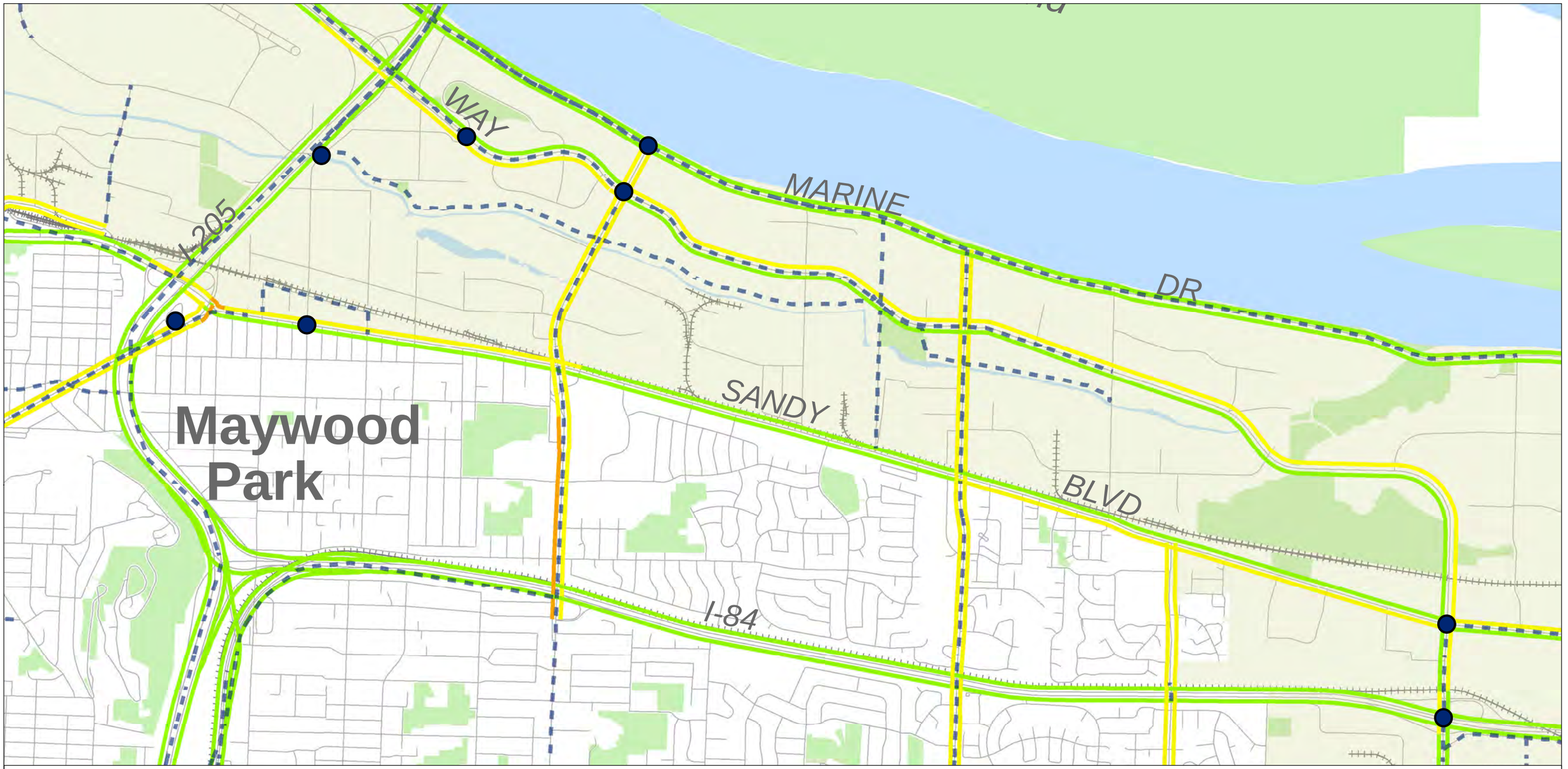



Figure 5c: Travel Time- 2008 to 2010 Weekday Midday (12-1 P.M.)
Average Roadway Link Travel Time compared to Free-Flow Travel

Port of Portland

Columbia Corridor

- Travel time is less than 30 seconds higher per mile
- Travel time is between 30 seconds and one minute higher per mile
- Travel time is between one and two minutes higher per mile
- Travel time is more than two minutes higher per mile

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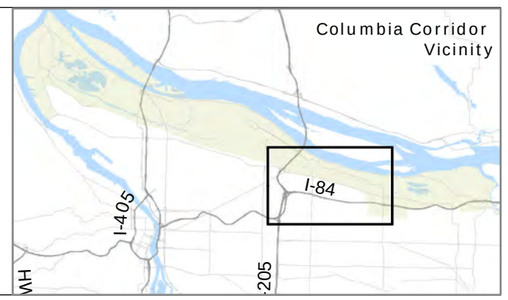
Data Source: INRIX



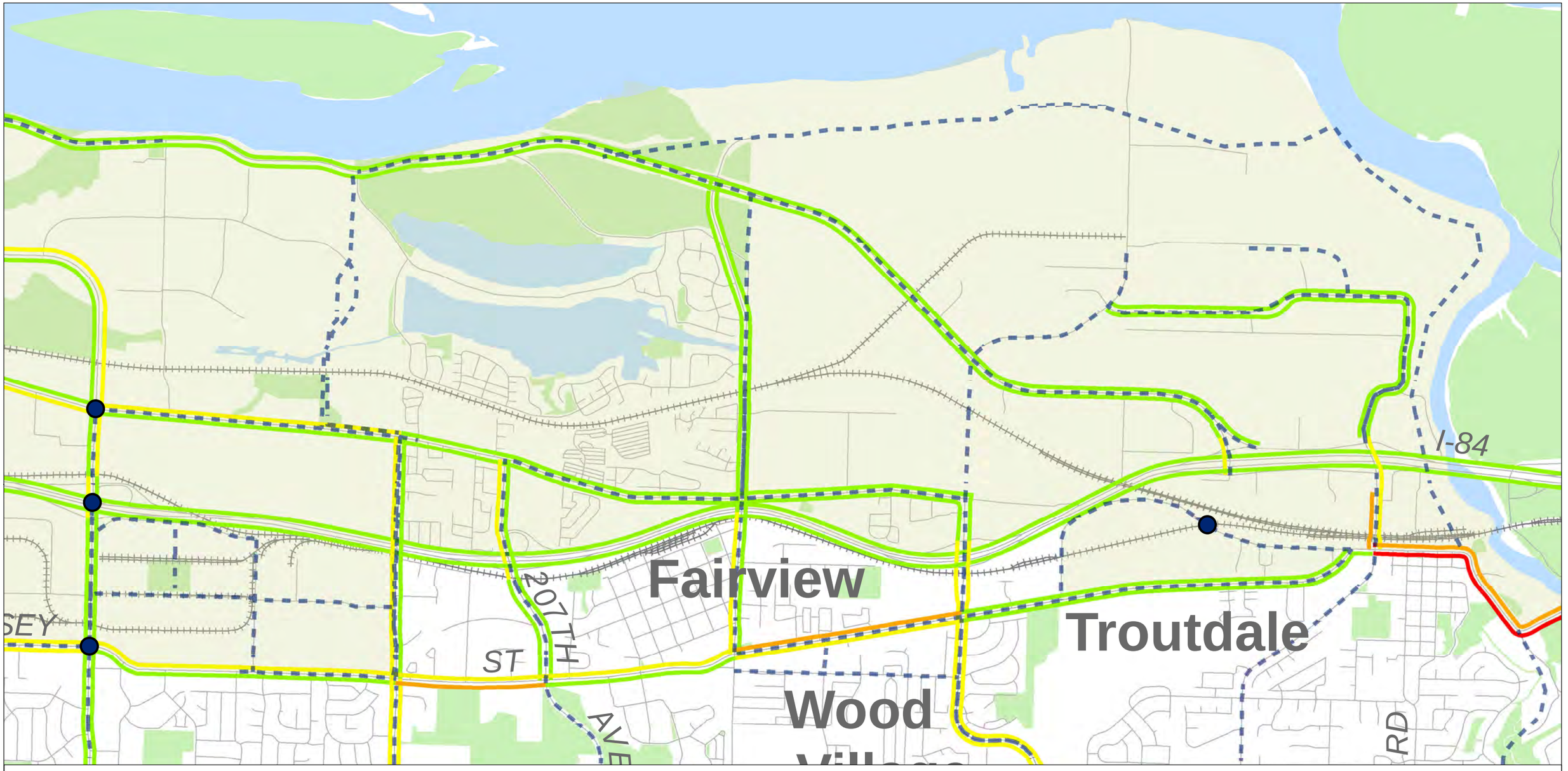



Figure 5d: Travel Time- 2008 to 2010 Weekday Midday (12-1 P.M.)
Average Roadway Link Travel Time compared to Free-Flow Travel

Port of Portland
Columbia Corridor

- Travel time is less than 30 seconds higher per mile
- Travel time is between 30 seconds and one minute higher per mile
- Travel time is between one and two minutes higher per mile
- Travel time is more than two minutes higher per mile

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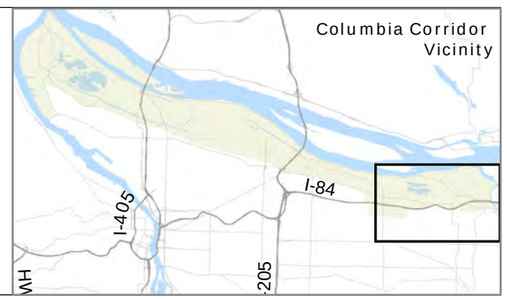
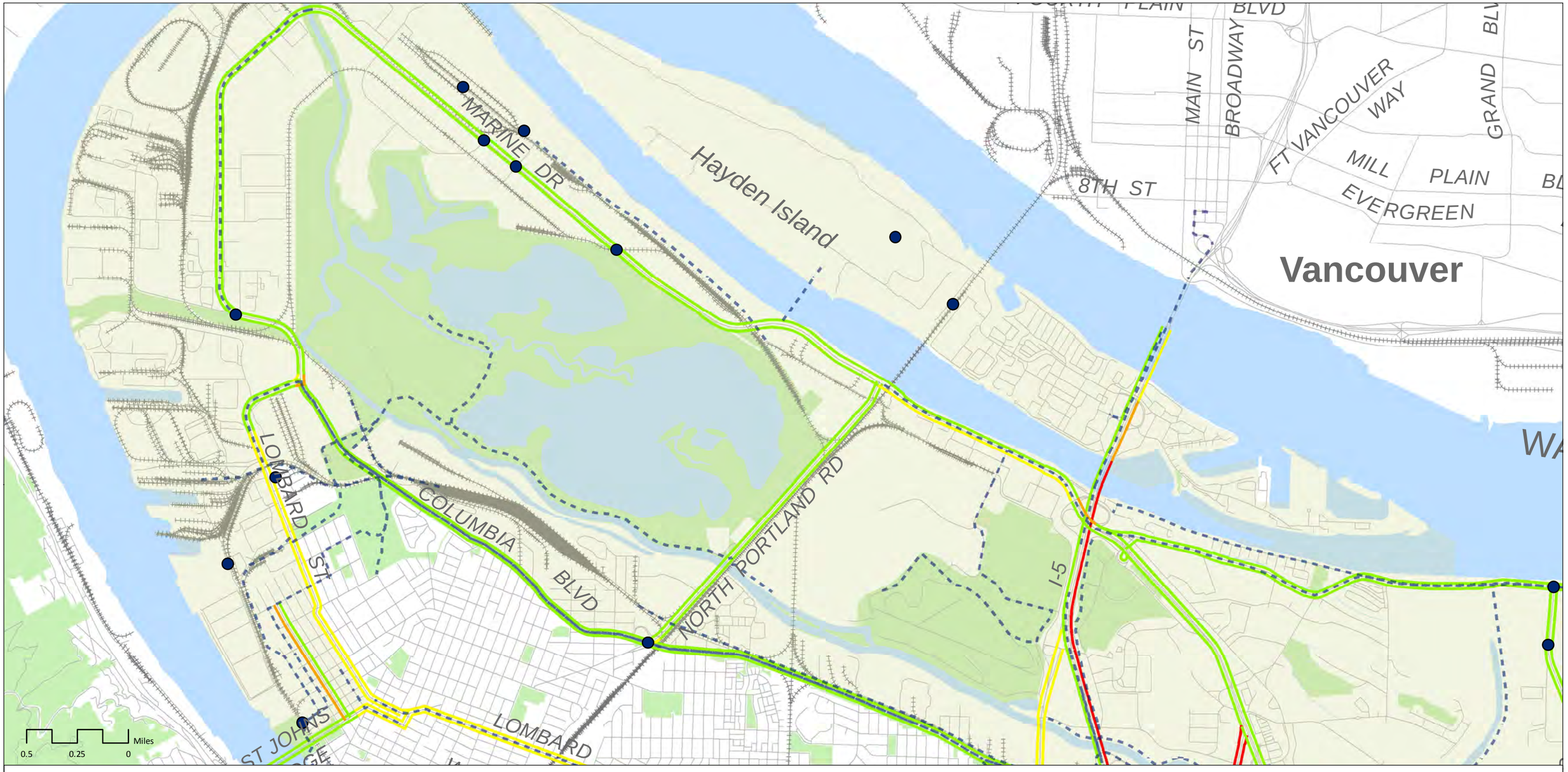
- Railroad
- Study Area

Data Source: INRIX






# Figure 6a: Travel Time- 2008 to 2010 Weekday Evening Peak Hour (5-6 P.M.)
## Average Roadway Link Travel Time compared to Free-Flow Travel

**Port of Portland**

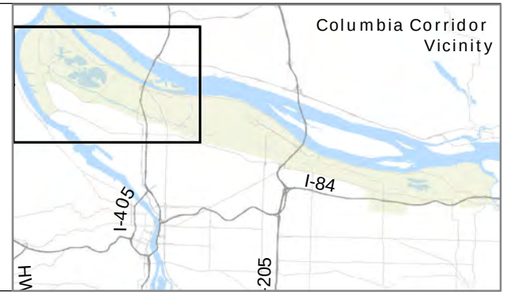
Columbia Corridor

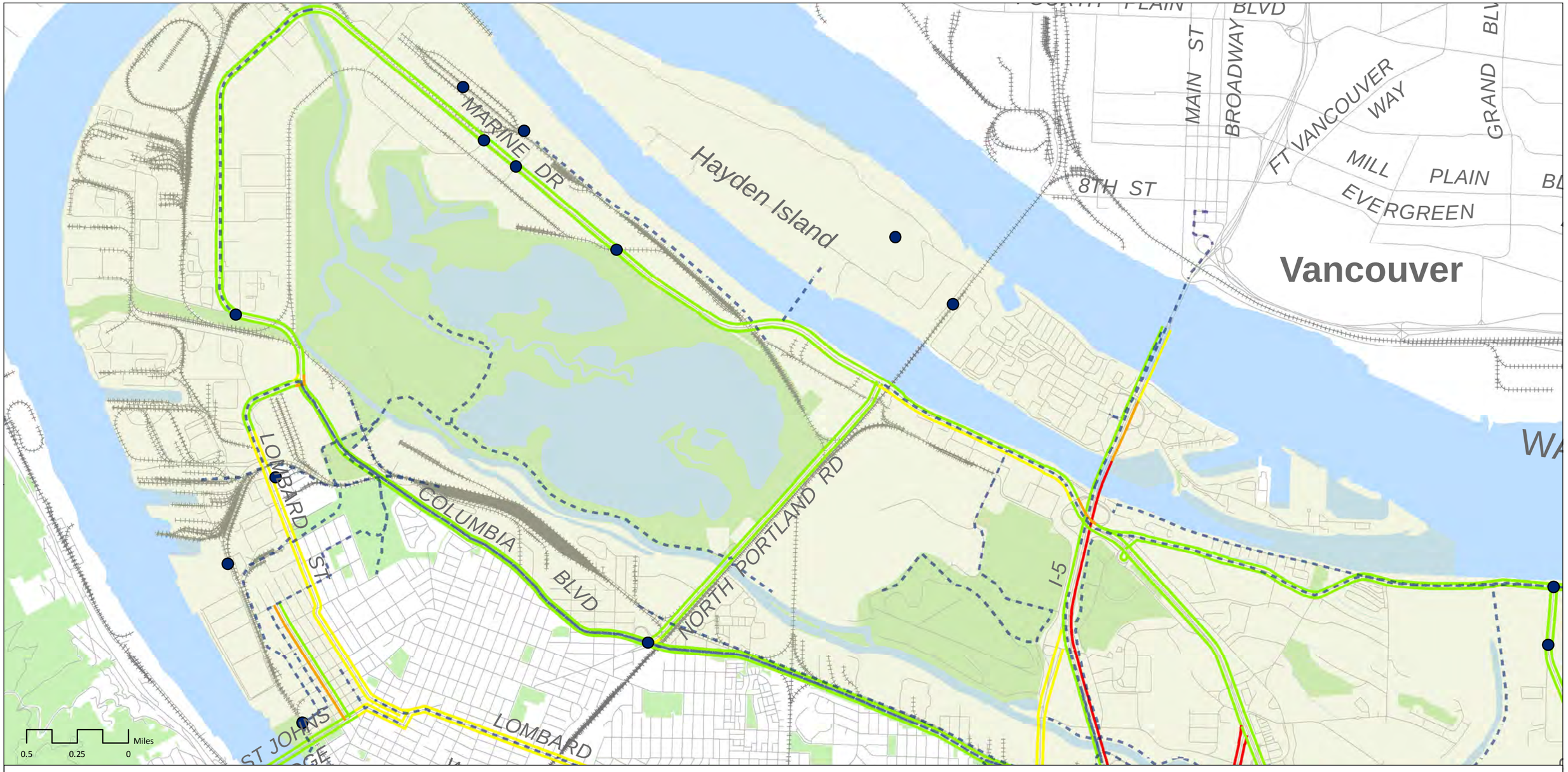
- Travel time is less than 30 seconds higher per mile
- Travel time is between 30 seconds and one minute higher per mile
- Travel time is between one and two minutes higher per mile
- Travel time is more than two minutes higher per mile

- RTP Intersection Project
- RTP Link Project
- Parks and Open Spaces
- Railroad
- Study Area

Data Source: INRIX

N






# Figure 6b: Travel Time- 2008 to 2010 Weekday Evening Peak Hour (5-6 P.M.)
## Average Roadway Link Travel Time compared to Free-Flow Travel

Port of Portland

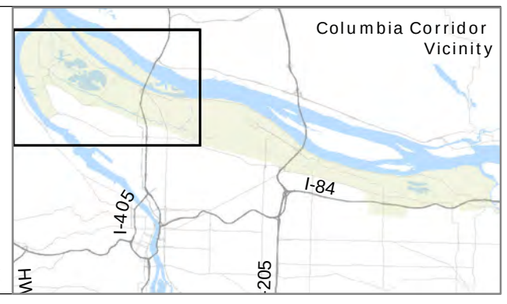
Columbia Corridor

- Travel time is less than 30 seconds higher per mile
- Travel time is between 30 seconds and one minute higher per mile
- Travel time is between one and two minutes higher per mile
- Travel time is more than two minutes higher per mile

N

- RTP Intersection Project
- RTP Link Project
- Parks and Open Spaces
- Railroad
- Study Area

Data Source: INRIX



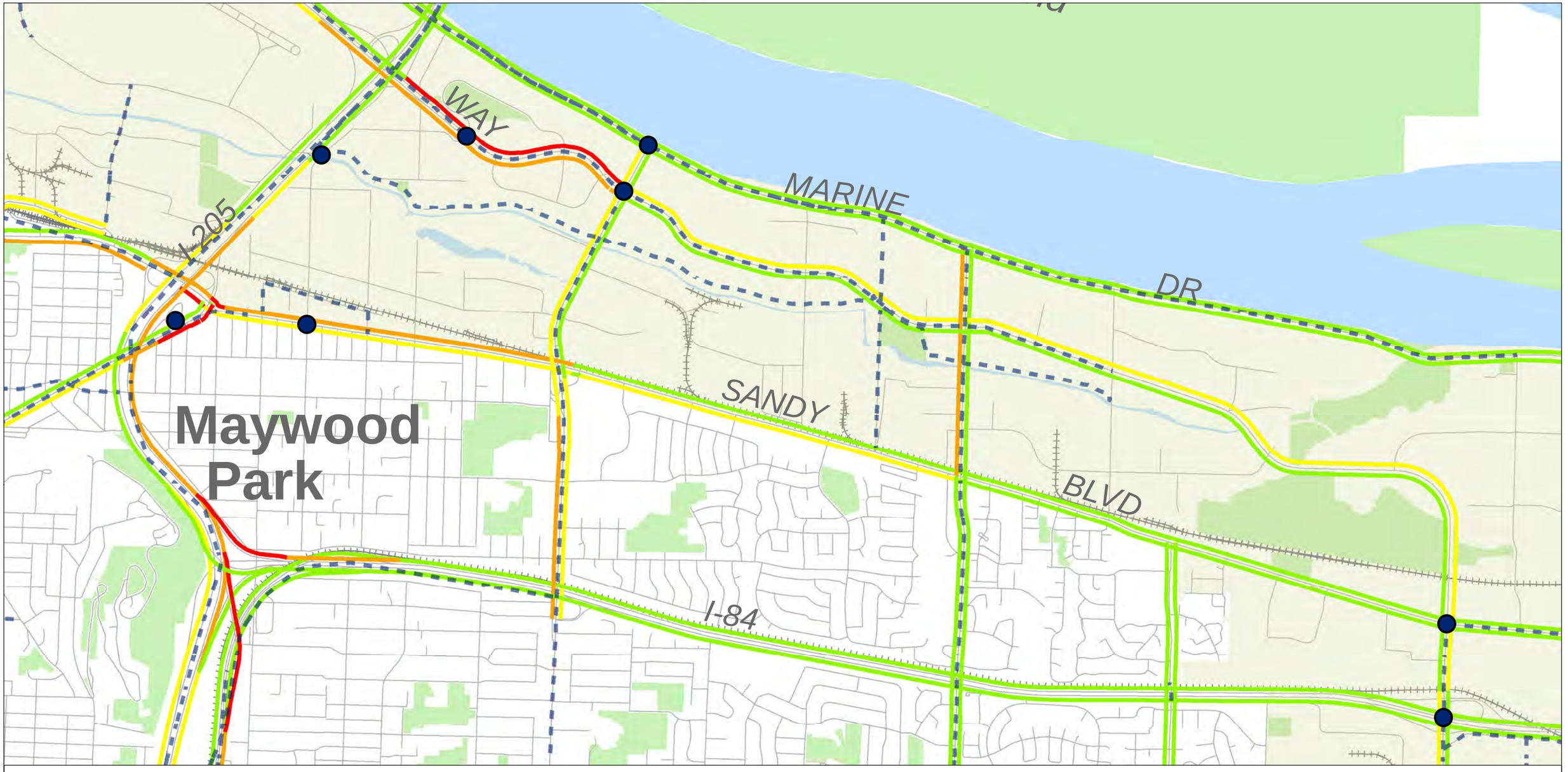



Figure 6c: Travel Time- 2008 to 2010 Weekday Evening Peak Hour (5-6 P.M.)
Average Roadway Link Travel Time compared to Free-Flow Travel

Port of Portland
Columbia Corridor

- Travel time is less than 30 seconds higher per mile
- Travel time is between 30 seconds and one minute higher per mile
- Travel time is between one and two minutes higher per mile
- Travel time is more than two minutes higher per mile

N

- RTP Intersection Project
- RTP Link Project
- Parks and Open Spaces
- Railroad
- Study Area

Data Source: INRIX

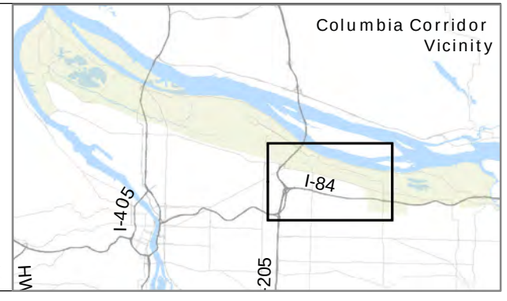



Figure 6d: Travel Time- 2008 to 2010 Weekday Evening Peak Hour (5-6 P.M.)
Average Roadway Link Travel Time compared to Free-Flow Travel

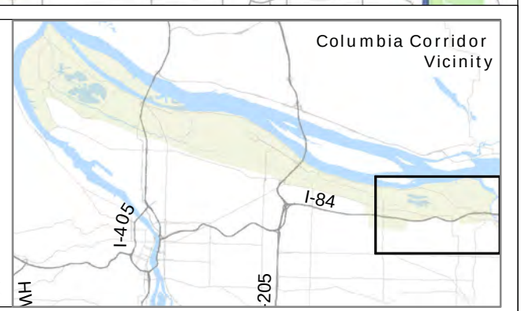
Port of Portland
Columbia Corridor

- Travel time is less than 30 seconds higher per mile
- Travel time is between 30 seconds and one minute higher per mile
- Travel time is between one and two minutes higher per mile
- Travel time is more than two minutes higher per mile

N

- RTP Intersection Project
- RTP Link Project
- Parks and Open Spaces
- Railroad
- Study Area

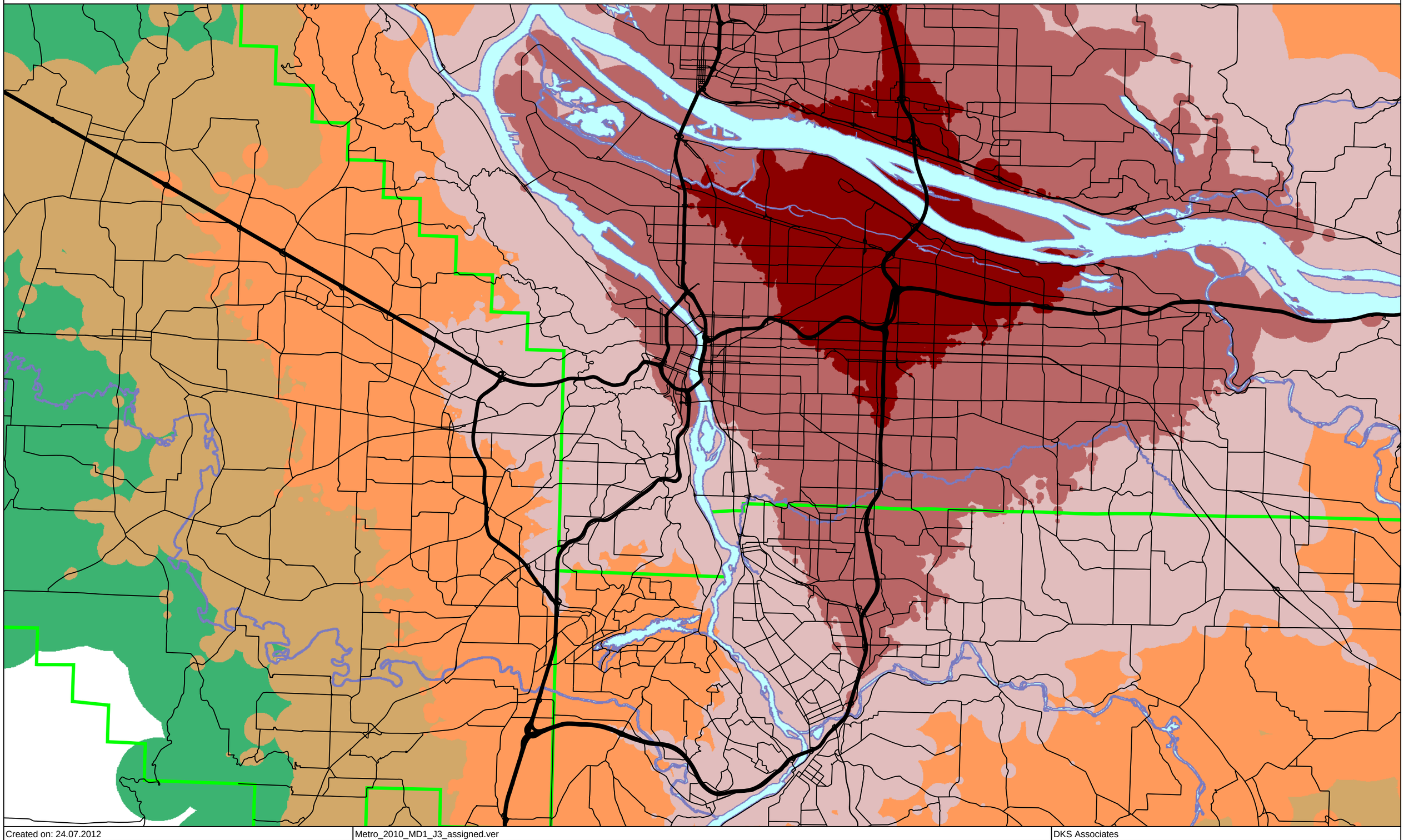
Data Source: INRIX



# 10 Minute Isochron Data

2010 Metro Regional Travel Demand Model (Rivergate, PDX, Troutdale)
2035 Metro Regional Travel Demand Model (Rivergate, PDX, Troutdale)

# Motor Vehicle - 10 Minute Isochrones



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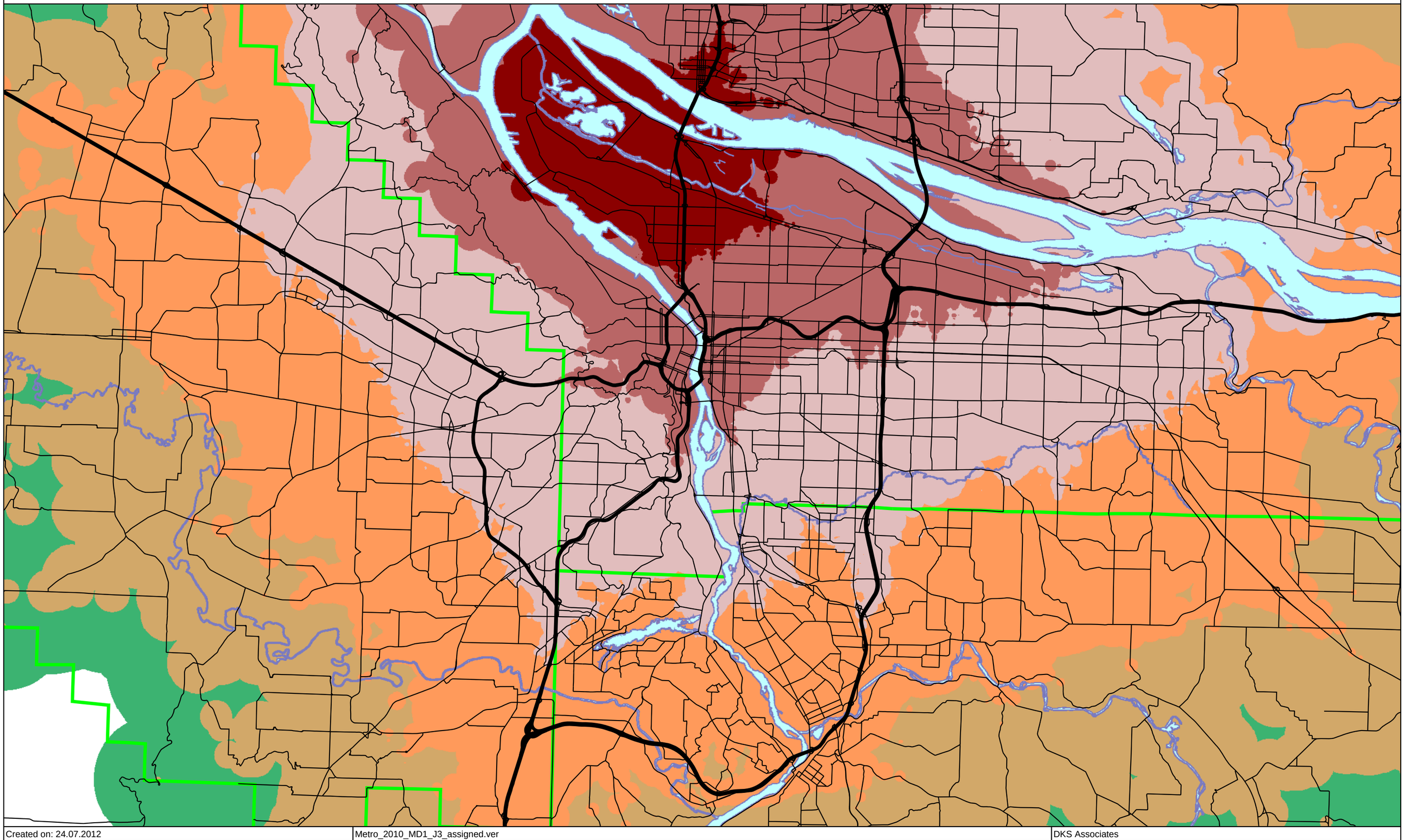
# Motor Vehicle - 10 Minute Isochrones



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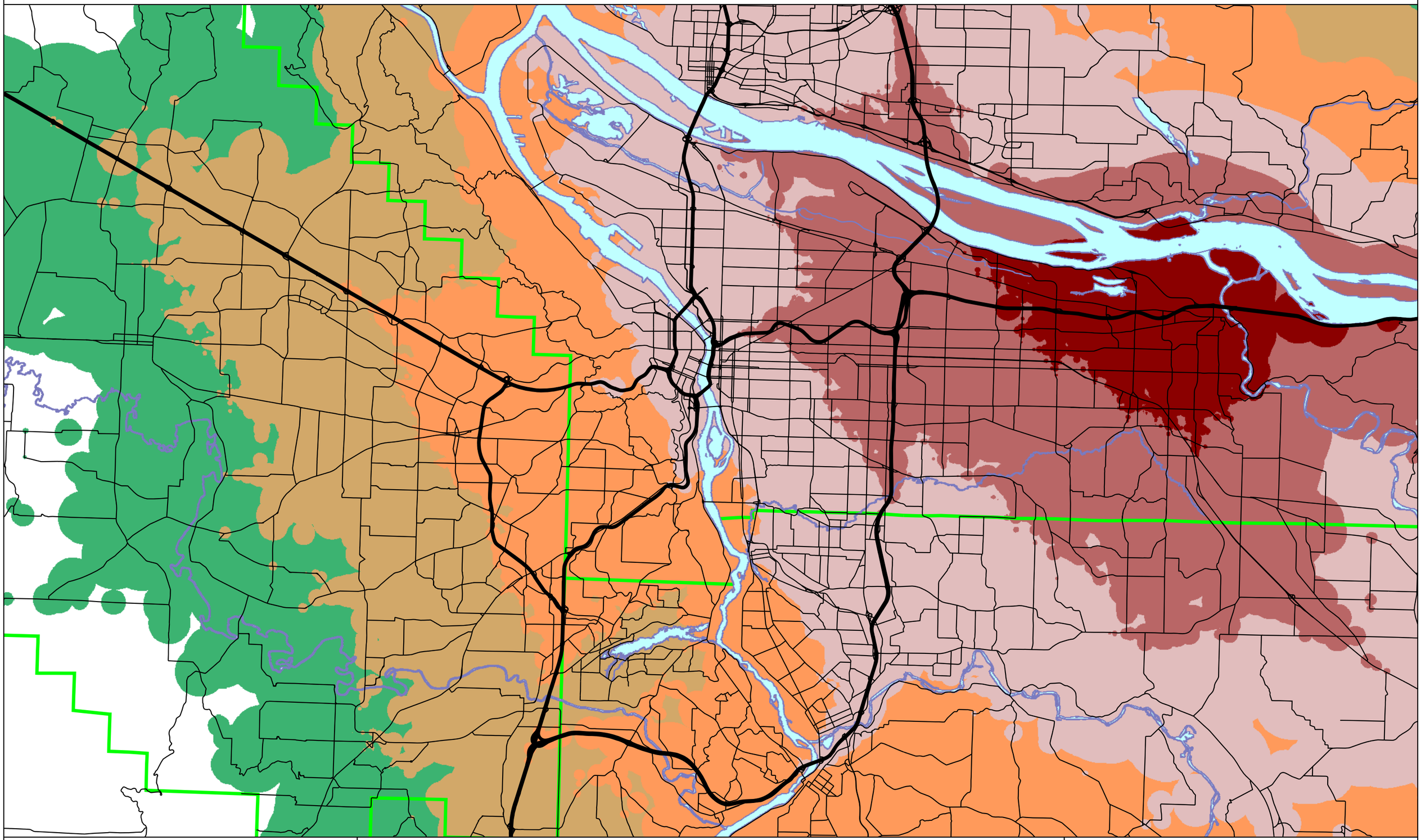
# Motor Vehicle - 10 Minute Isochrones



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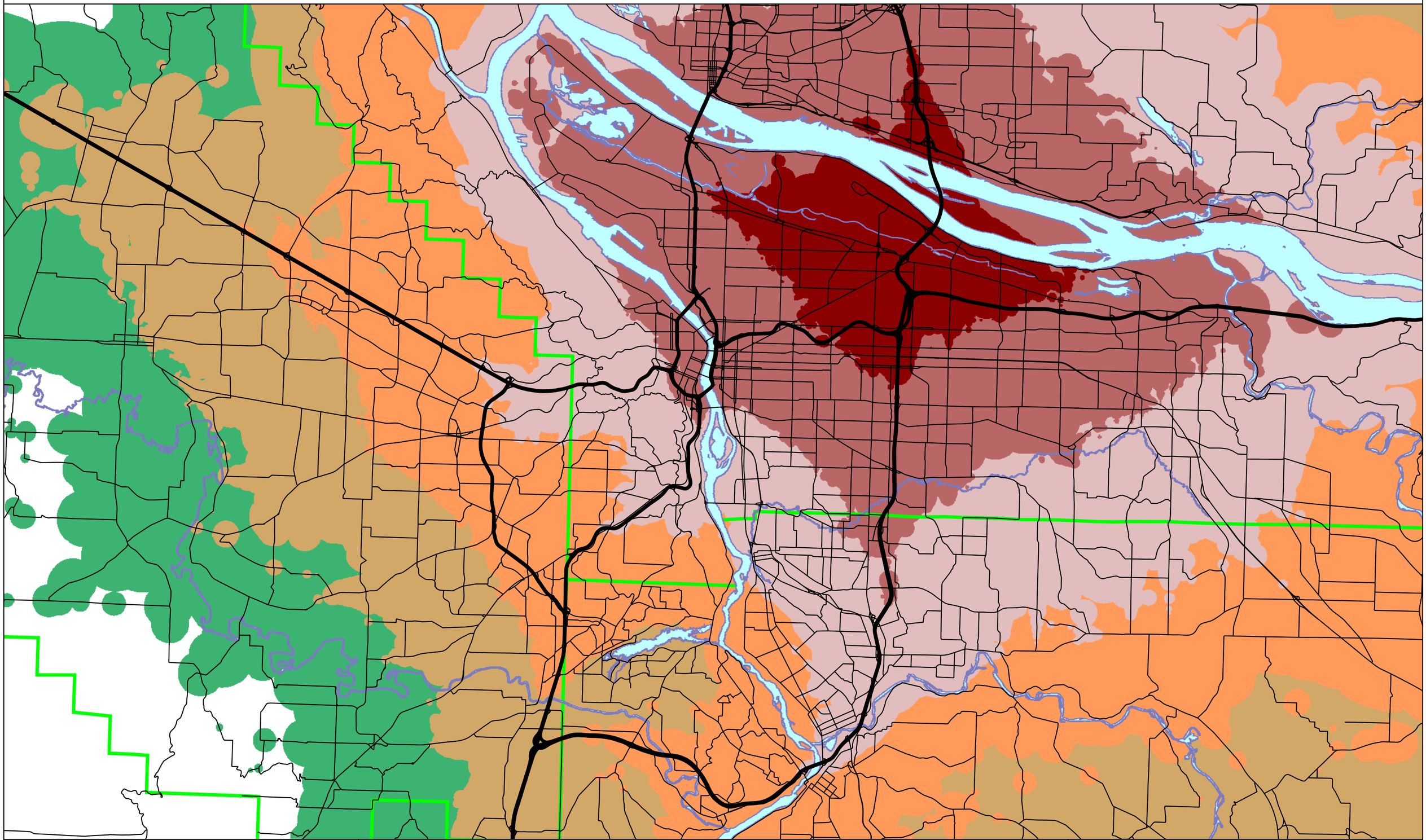
# Motor Vehicle - 10 Minute Isochrones



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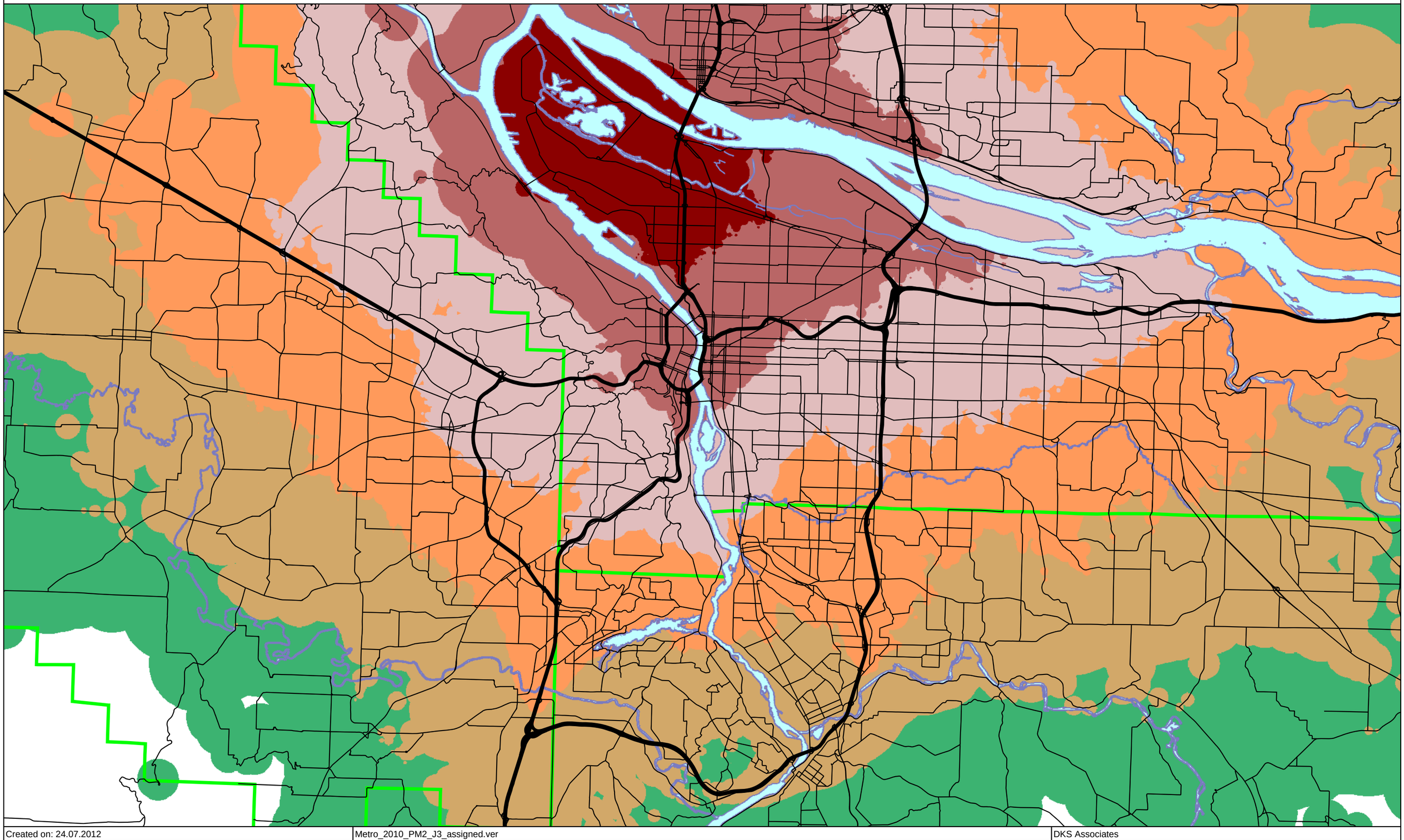
# Motor Vehicle - 10 Minute Isochrones



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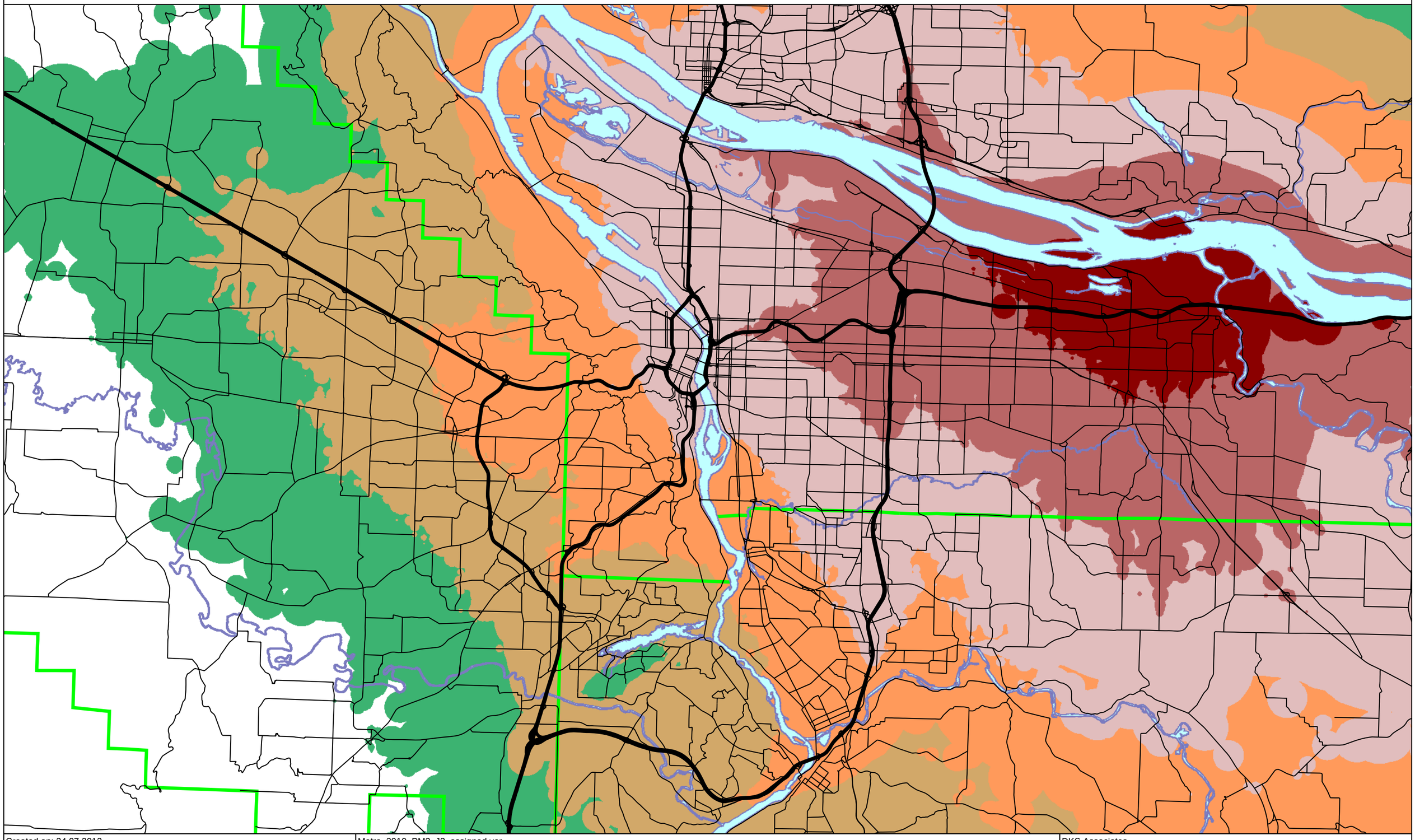
# Motor Vehicle - 10 Minute Isochrones



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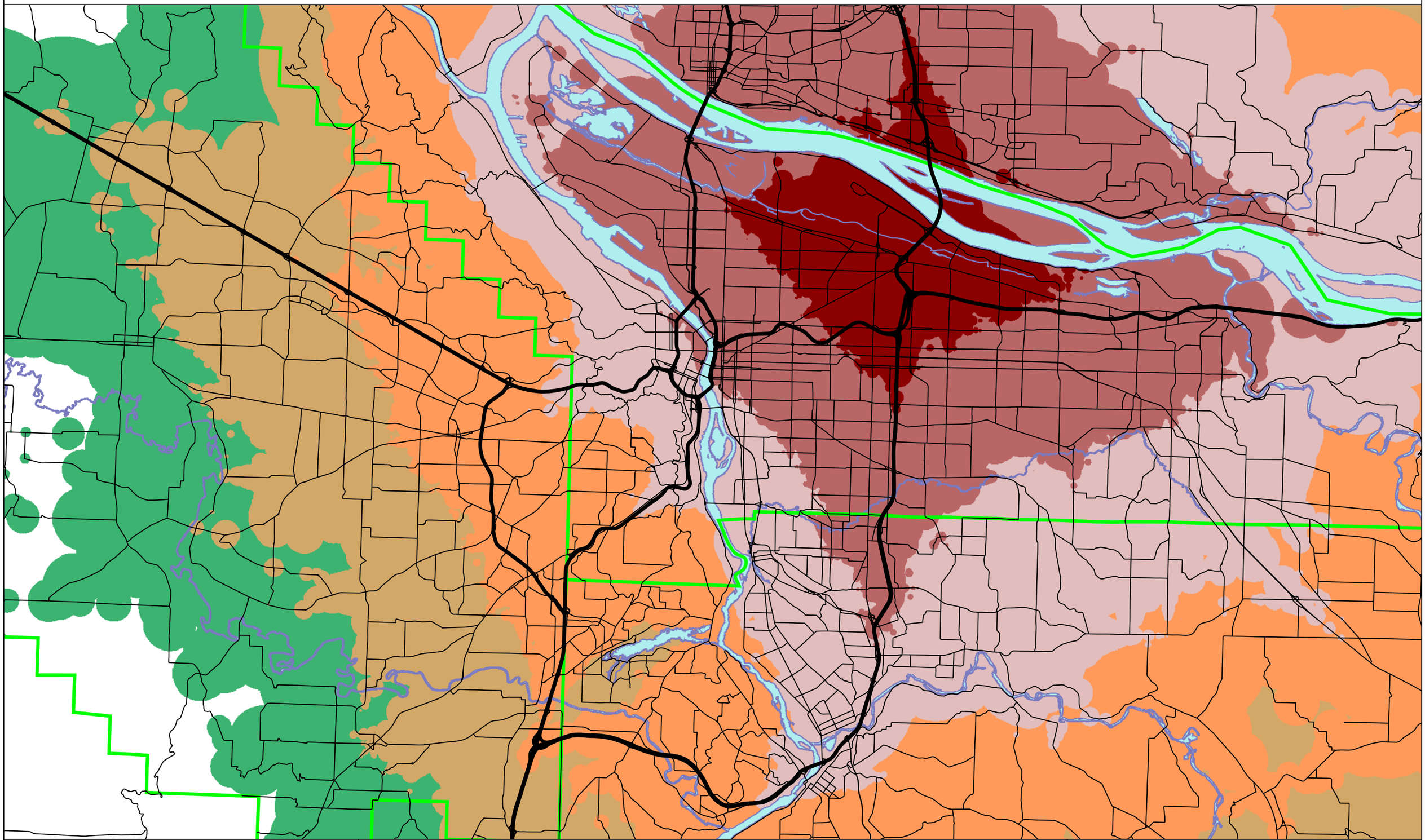
# Motor Vehicle - 10 Minute Isochrones



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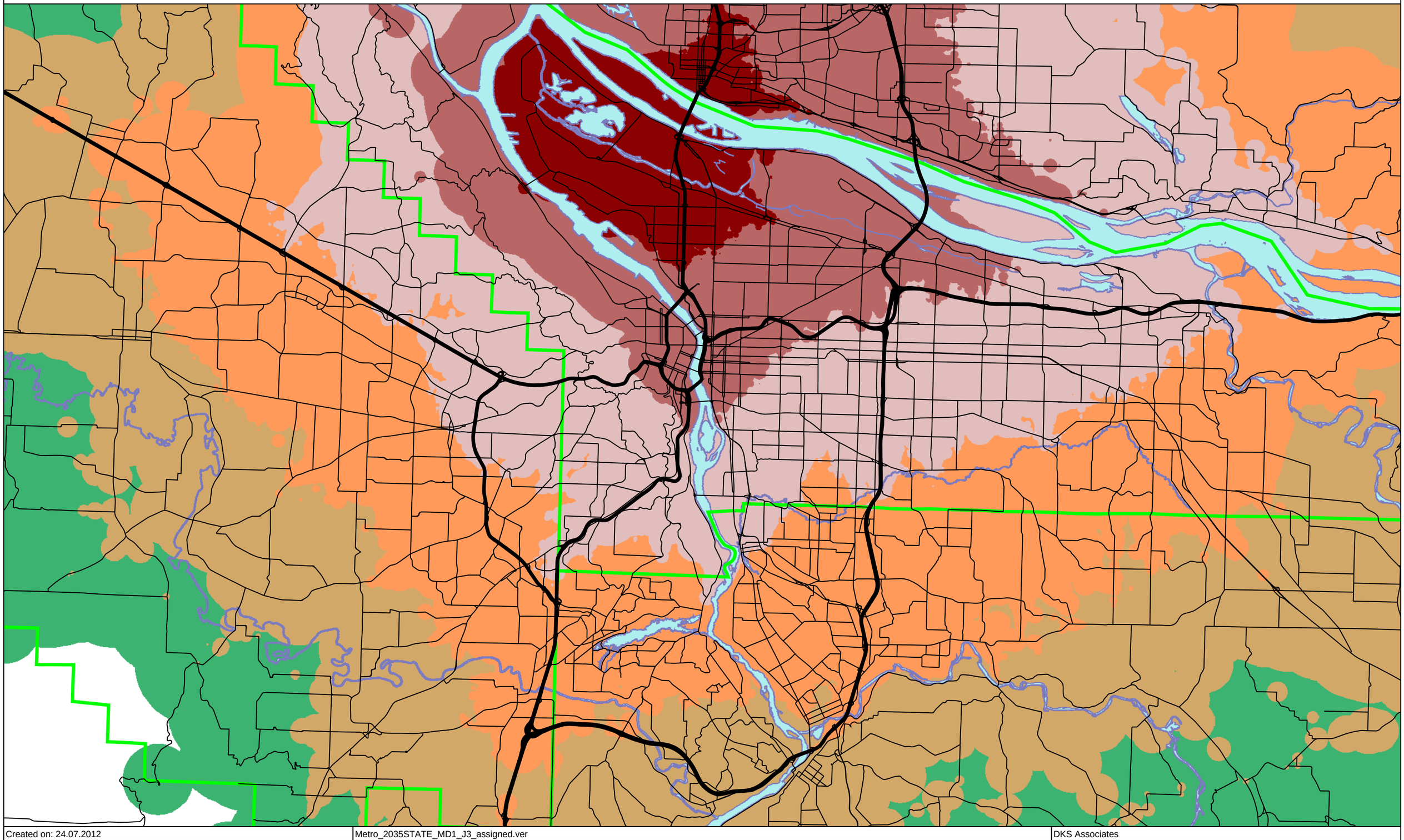
# Motor Vehicle - 10 Minute Isochrones



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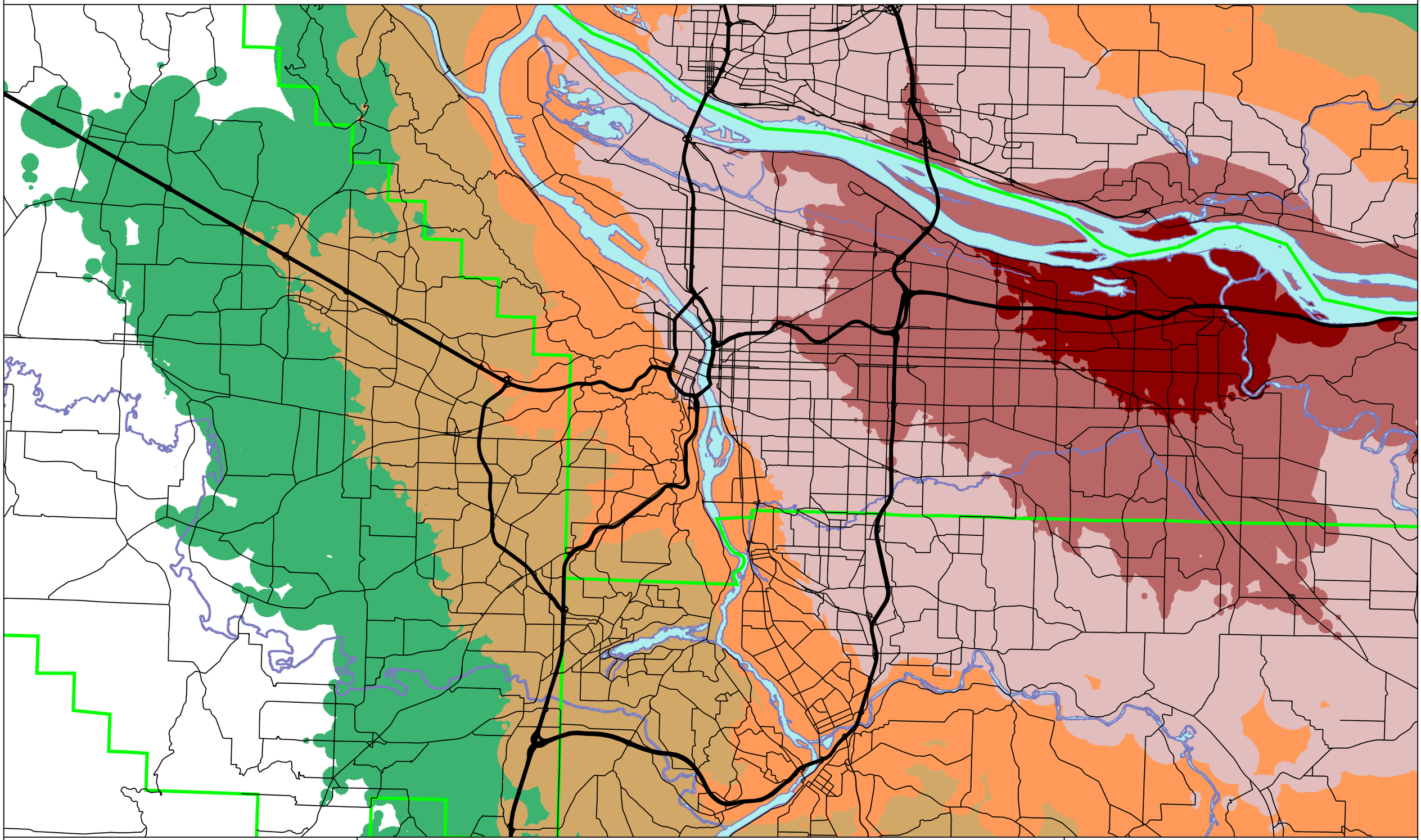
# Motor Vehicle - 10 Minute Isochrones



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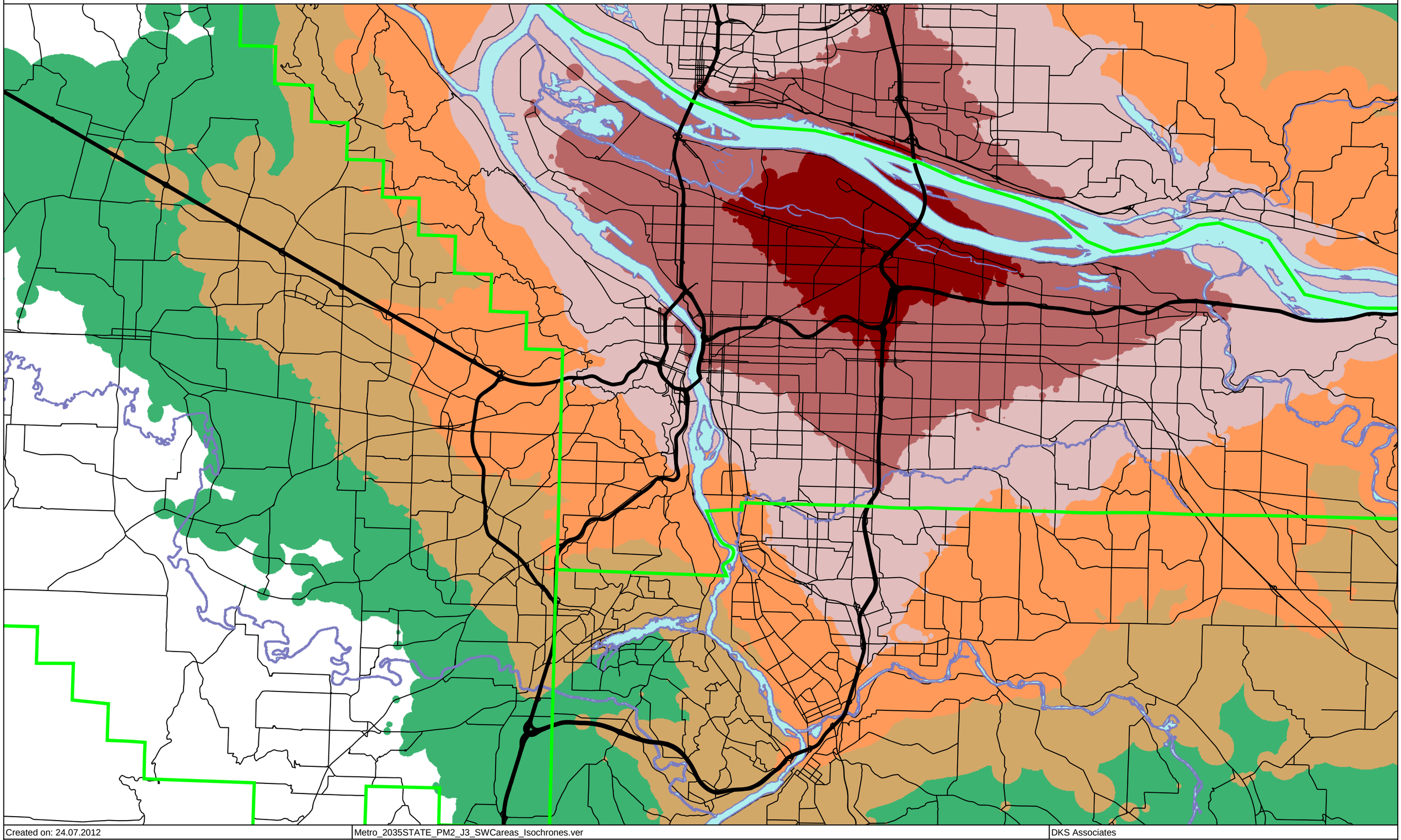
# Motor Vehicle - 10 Minute Isochrones



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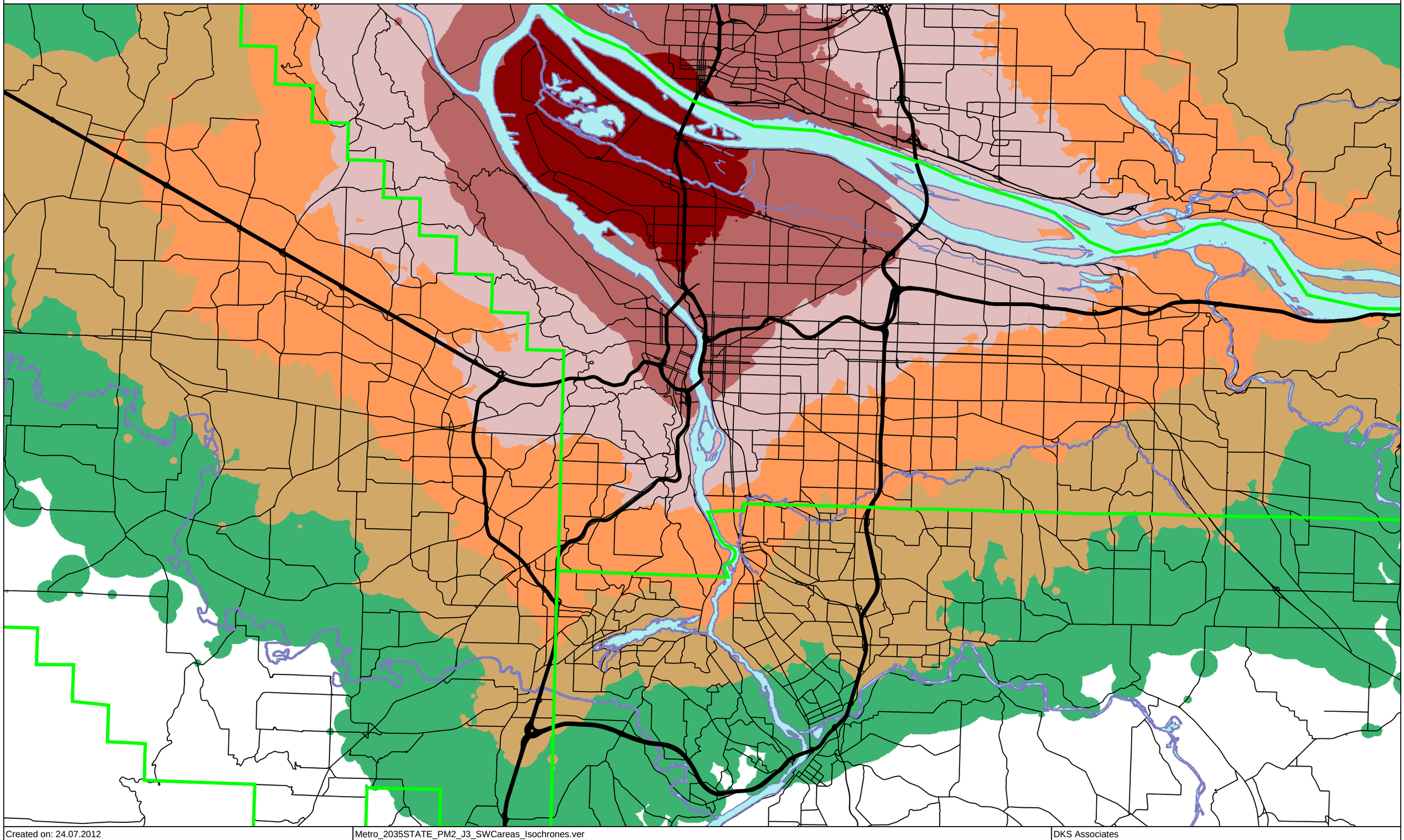
# Motor Vehicle - 10 Minute Isochrones



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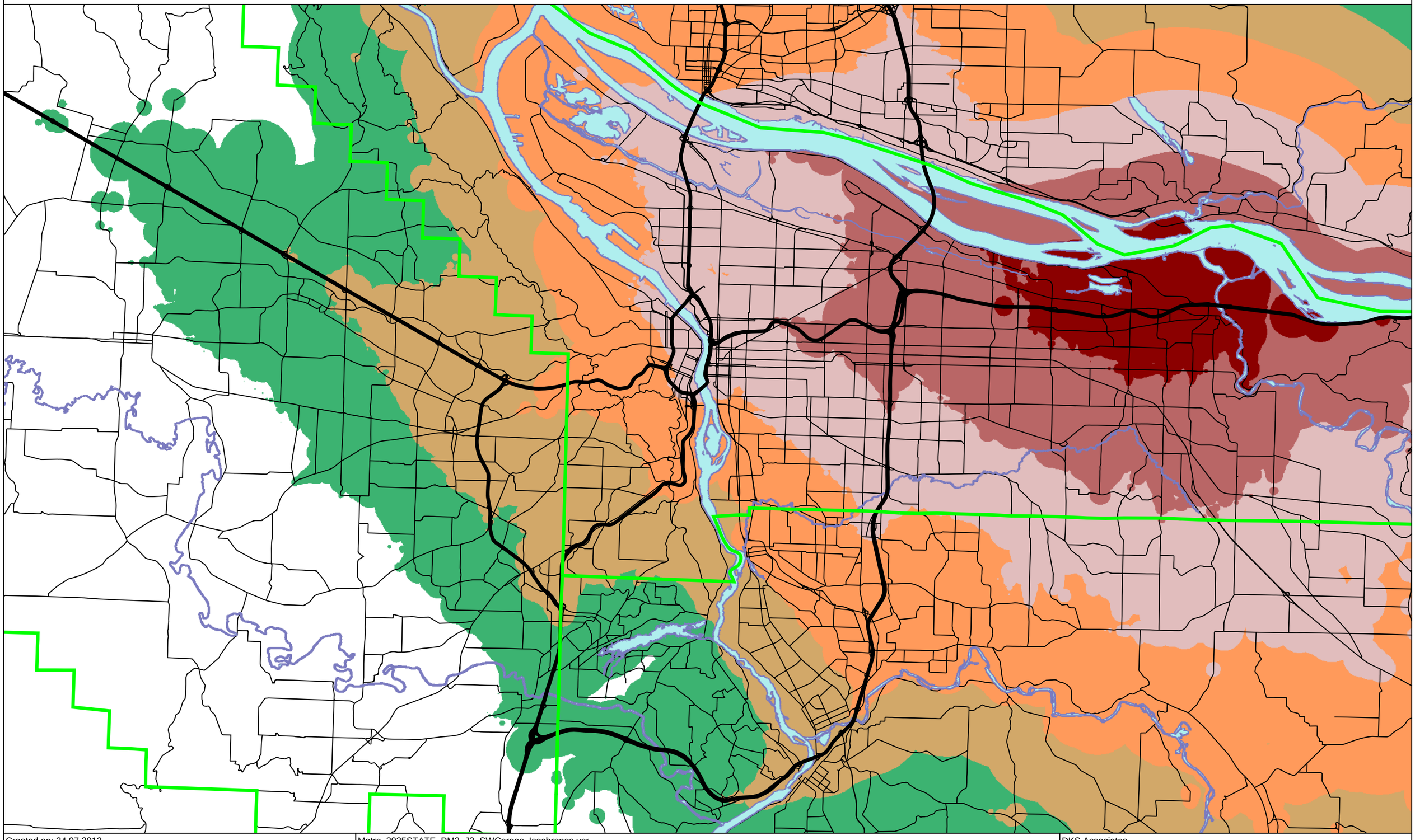
# Motor Vehicle - 10 Minute Isochrones



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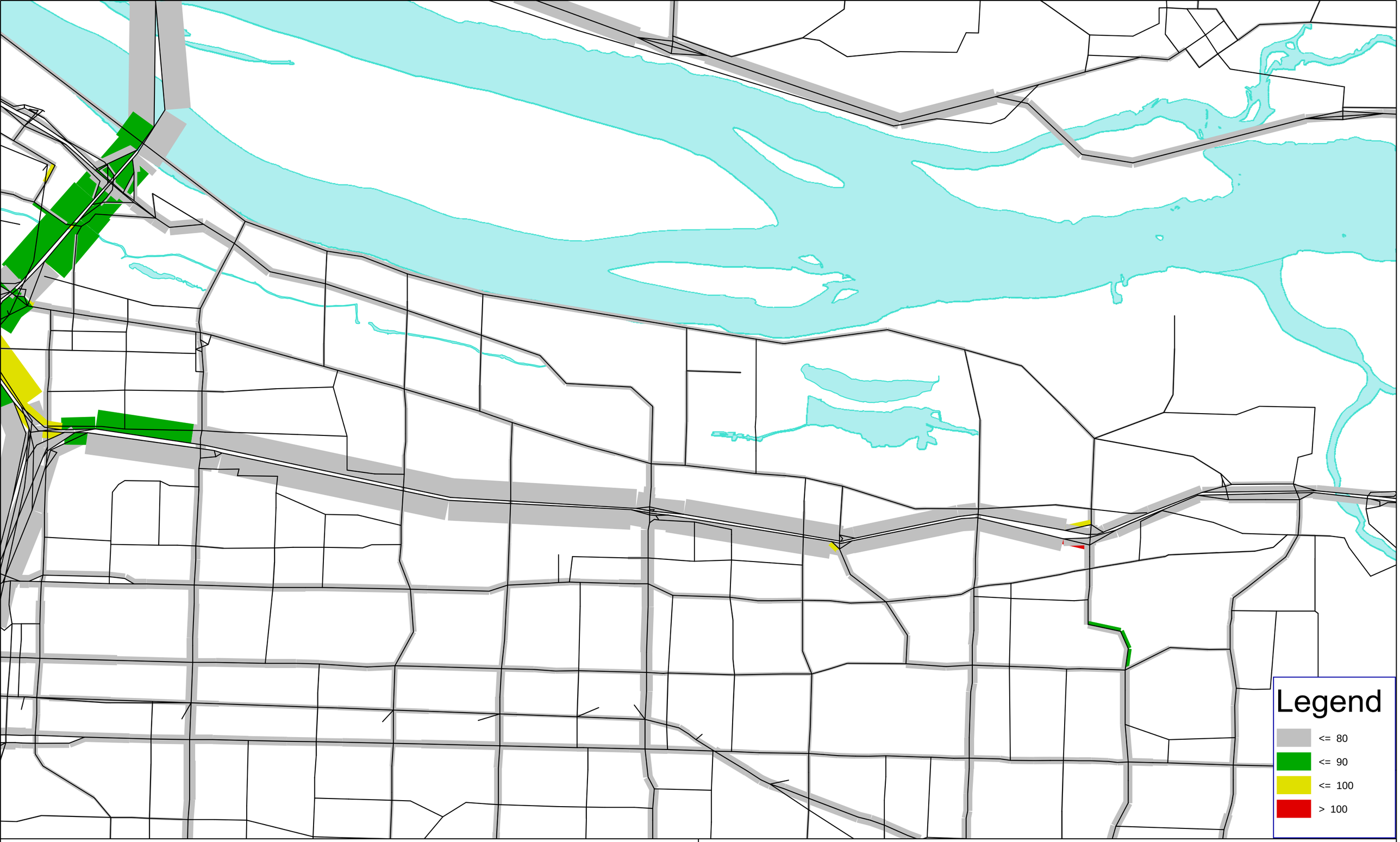
# 2035 VISUM Travel Demand Model

1 hour and 2 hour Midday Volume-to-Capacity Ratio
1 hour and 2 hour PM Peak Volume-to-Capacity Ratio

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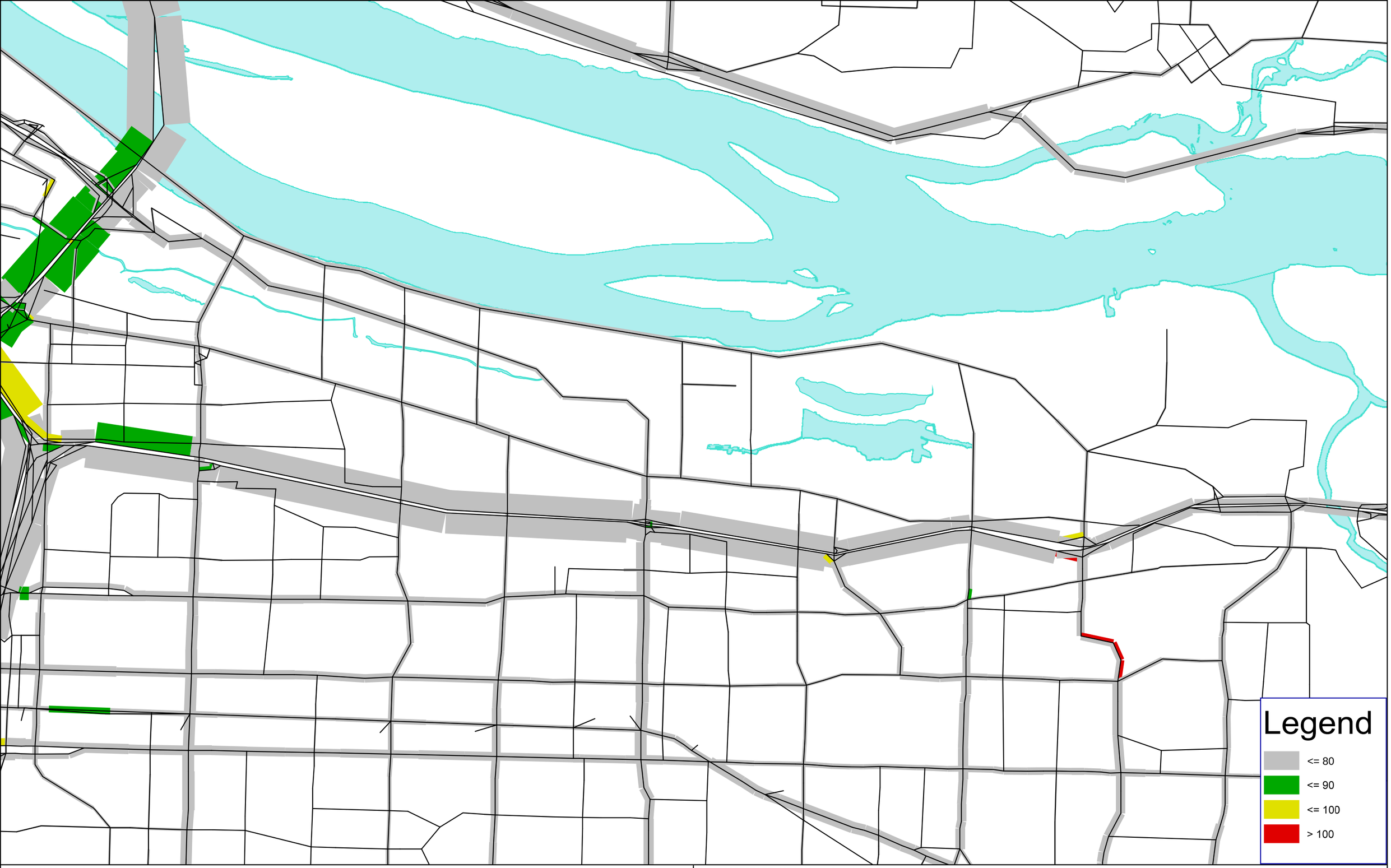
| DKS Associates | PM Peak 2-hr V/C Ratio |

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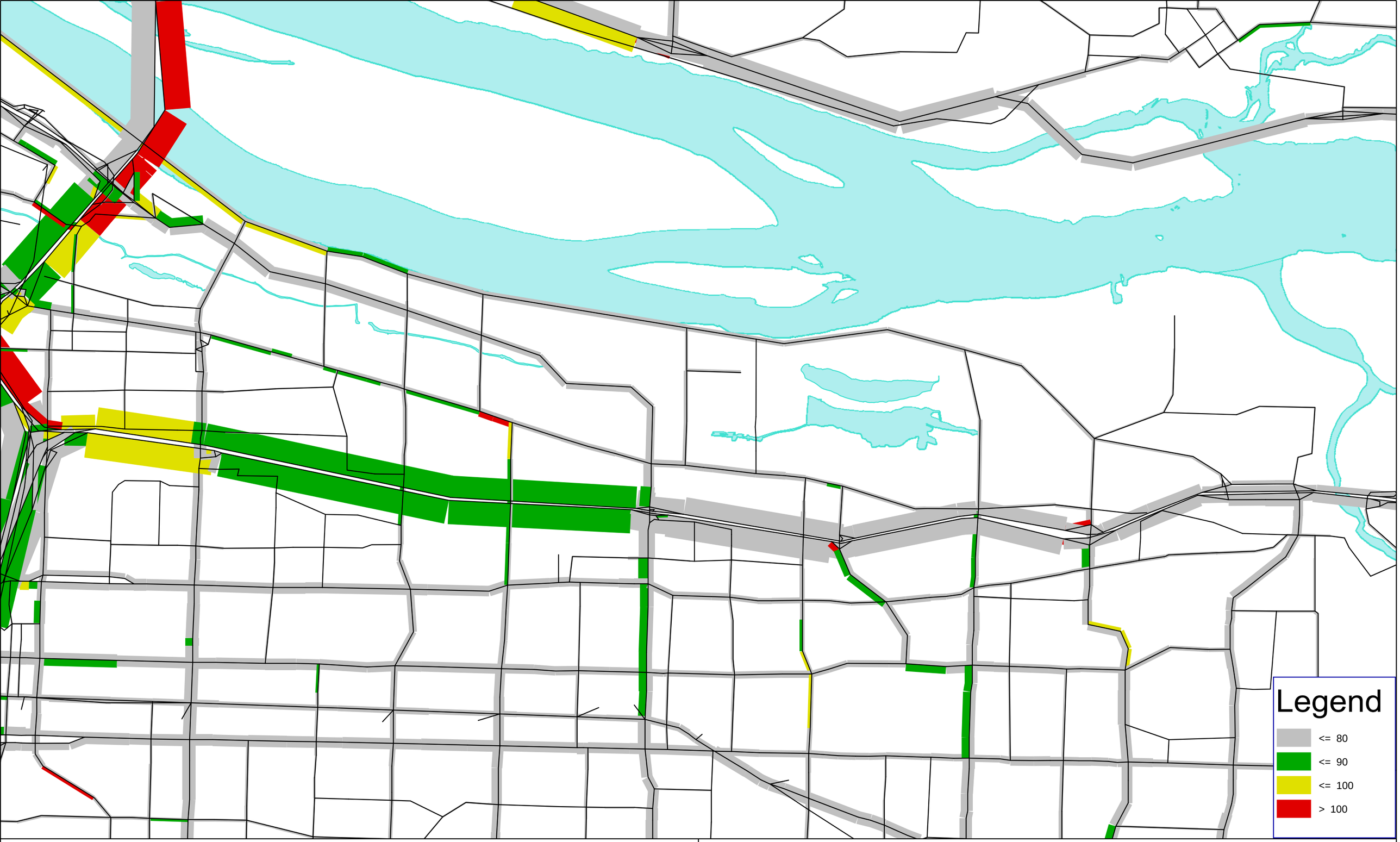


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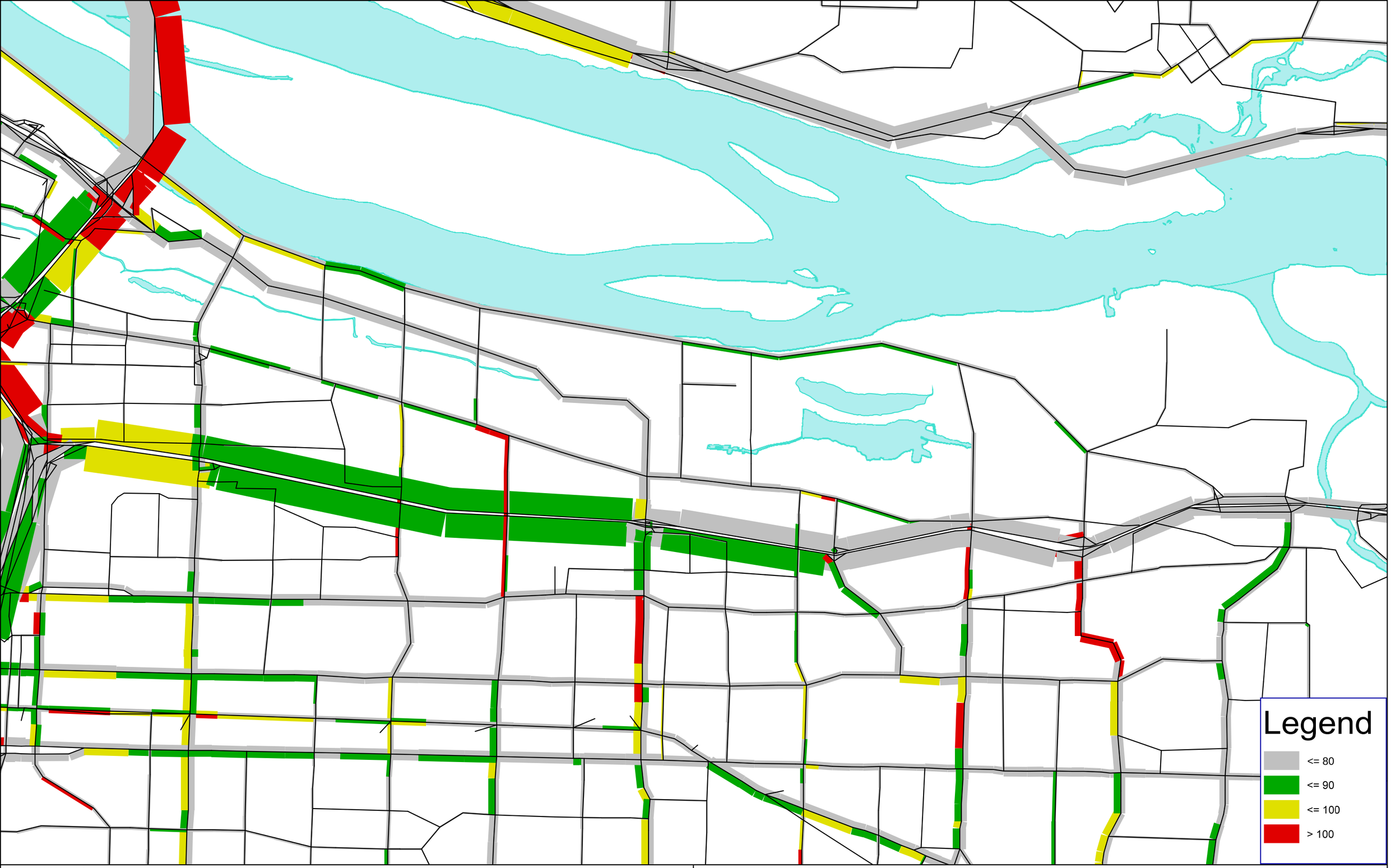


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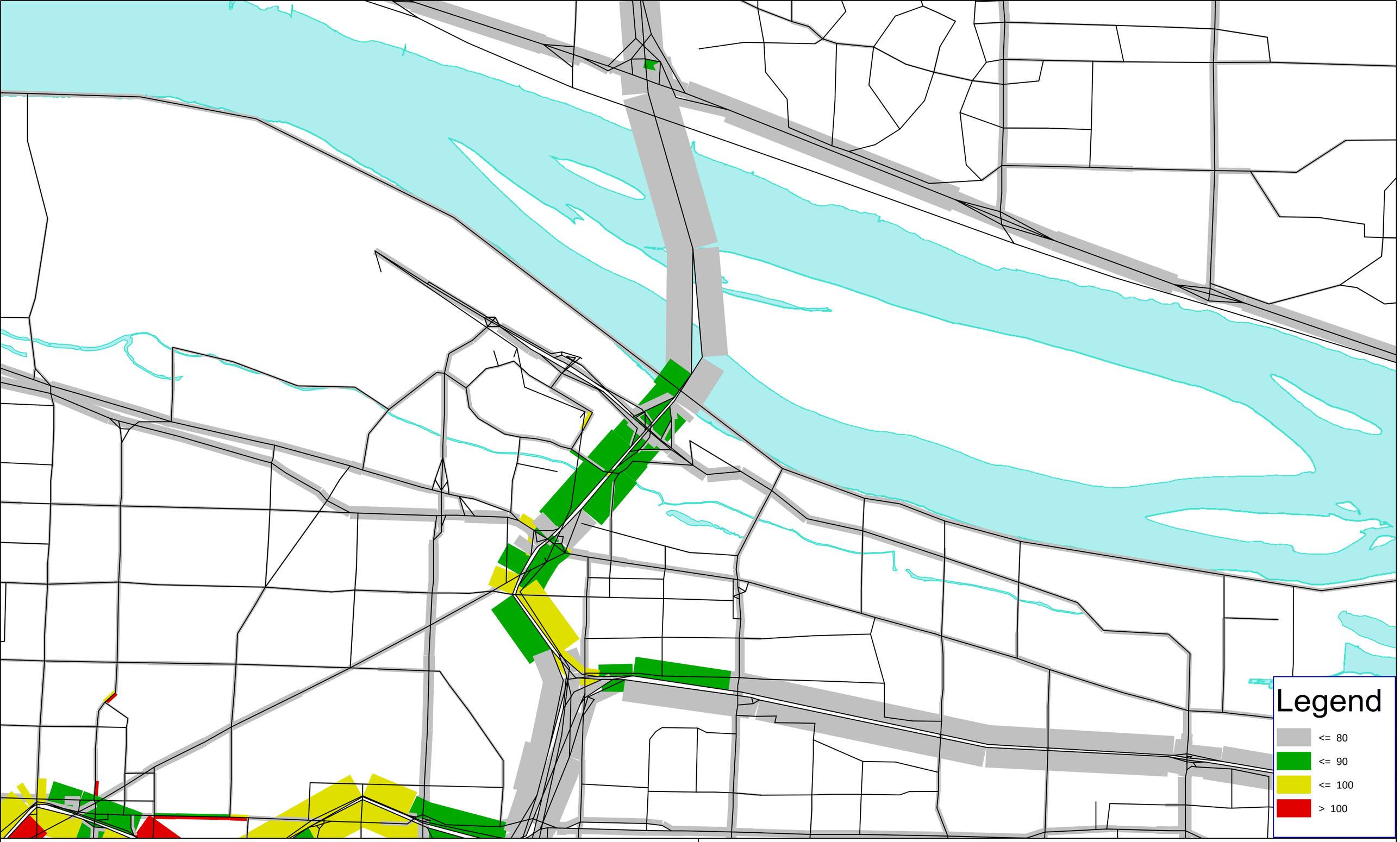


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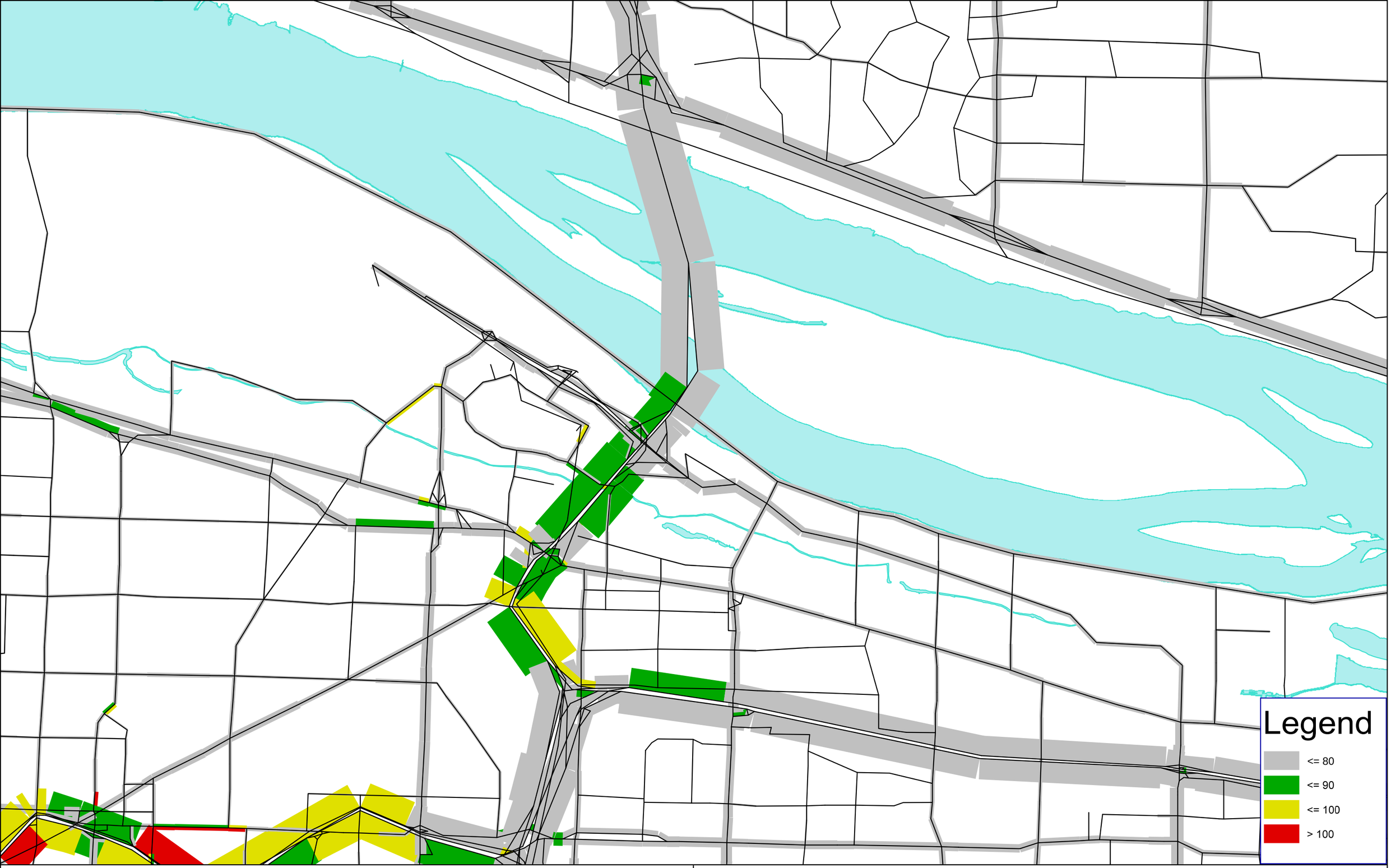


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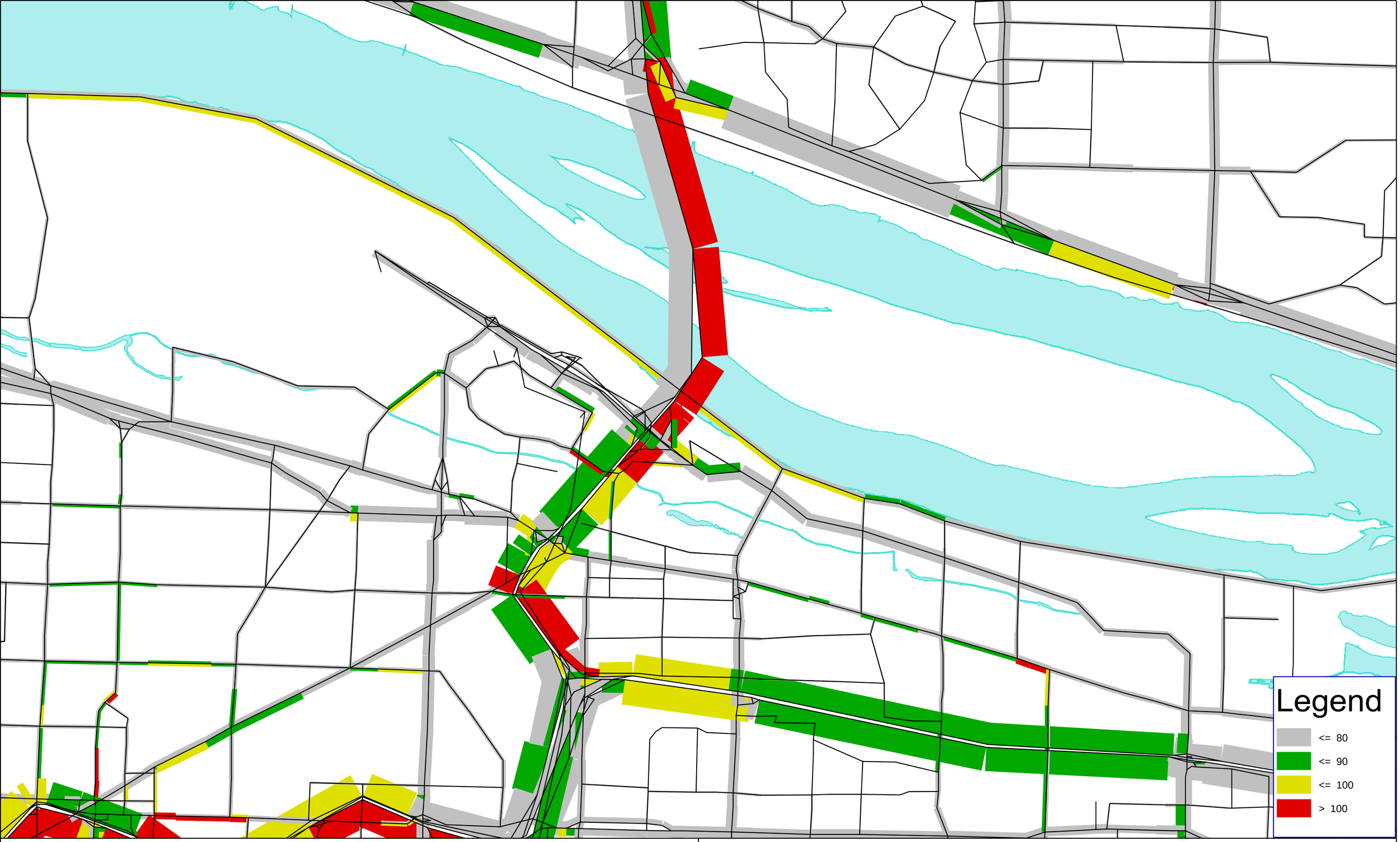
| Metro VISUM Model | Metro_2035STATE_MD1_J3_assigned_VC.ver |
| DKS Associates | PM Peak 2-hr V/C Ratio |

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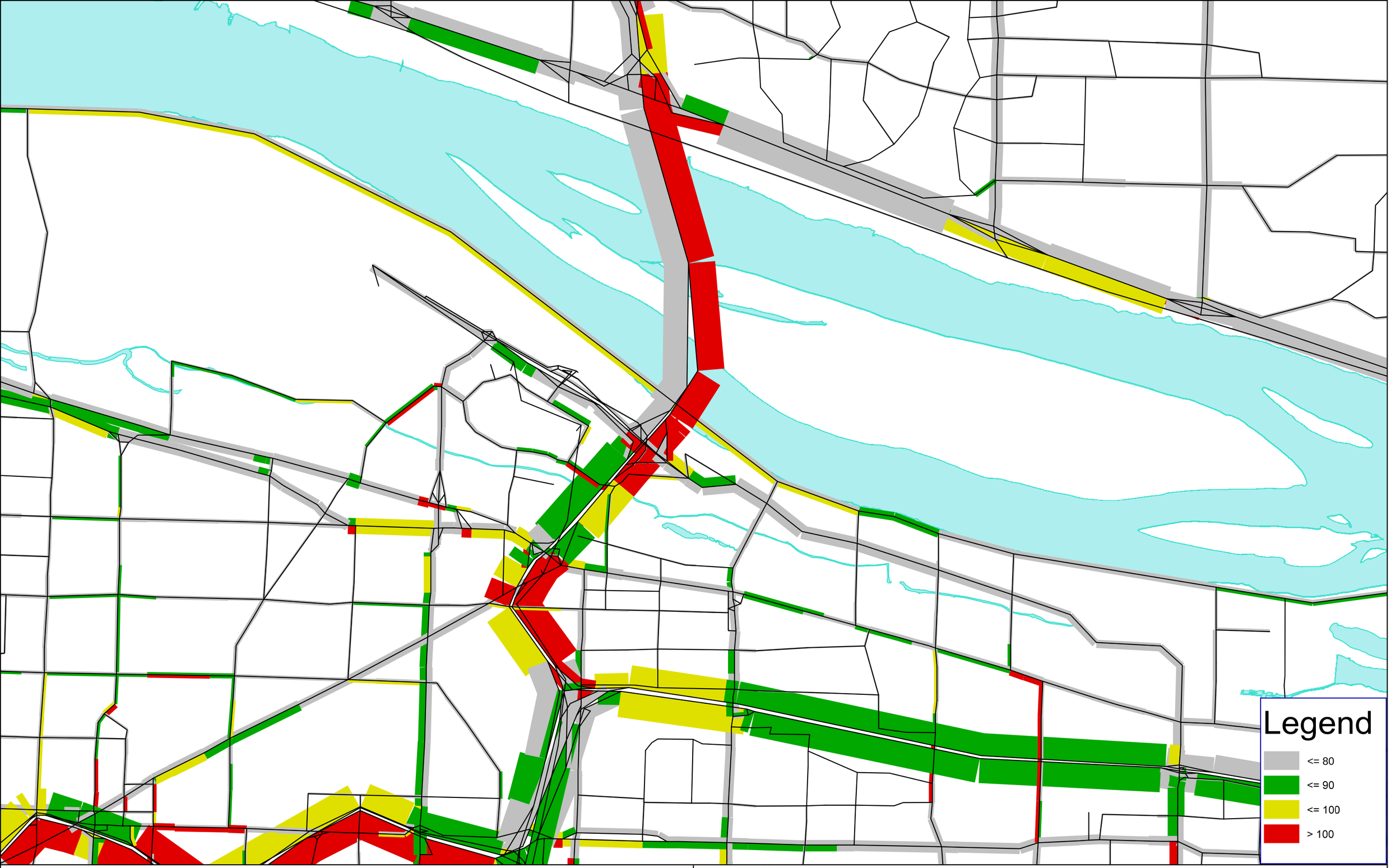


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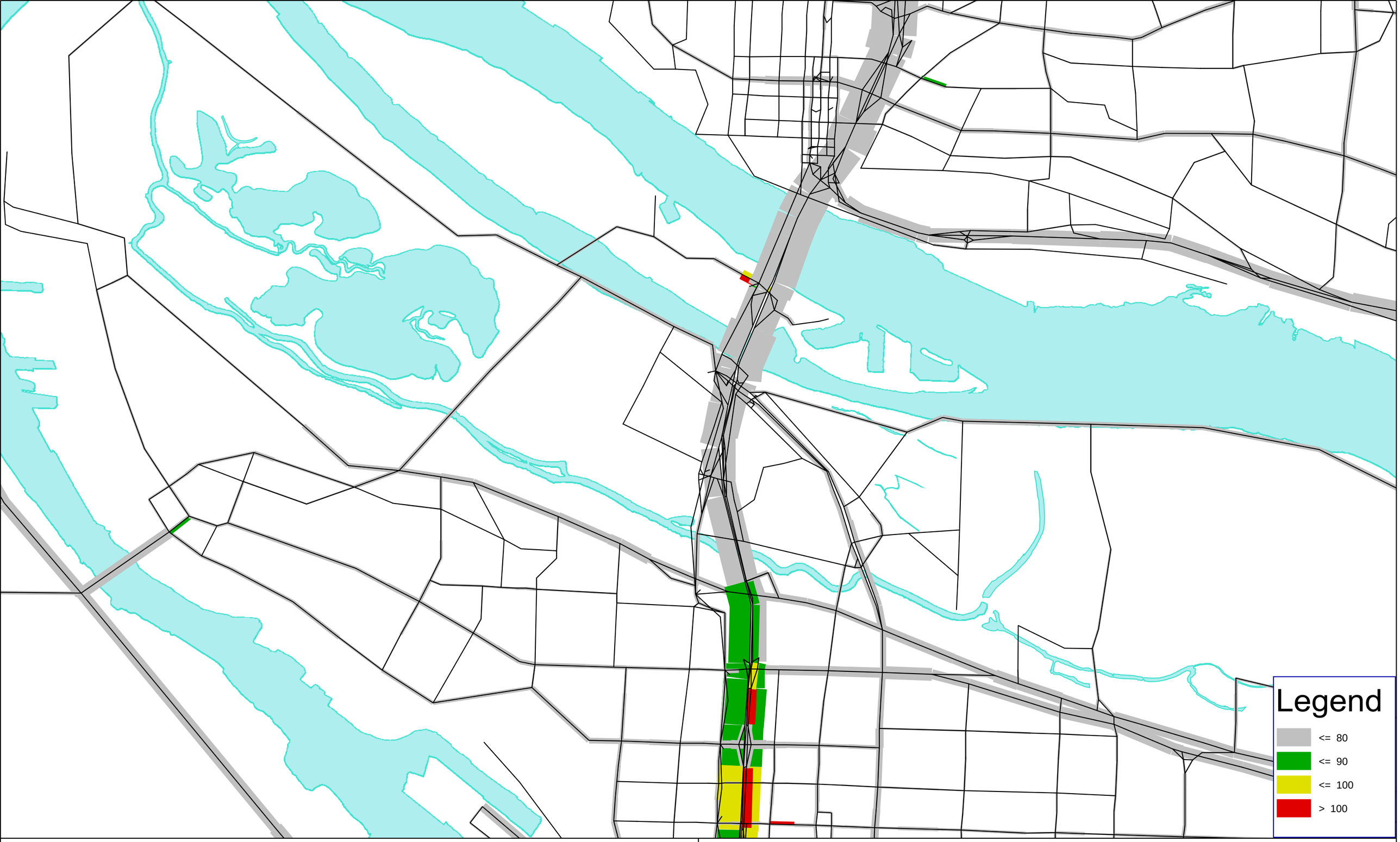
| DKS Associates | PM Peak 2-hr V/C Ratio |

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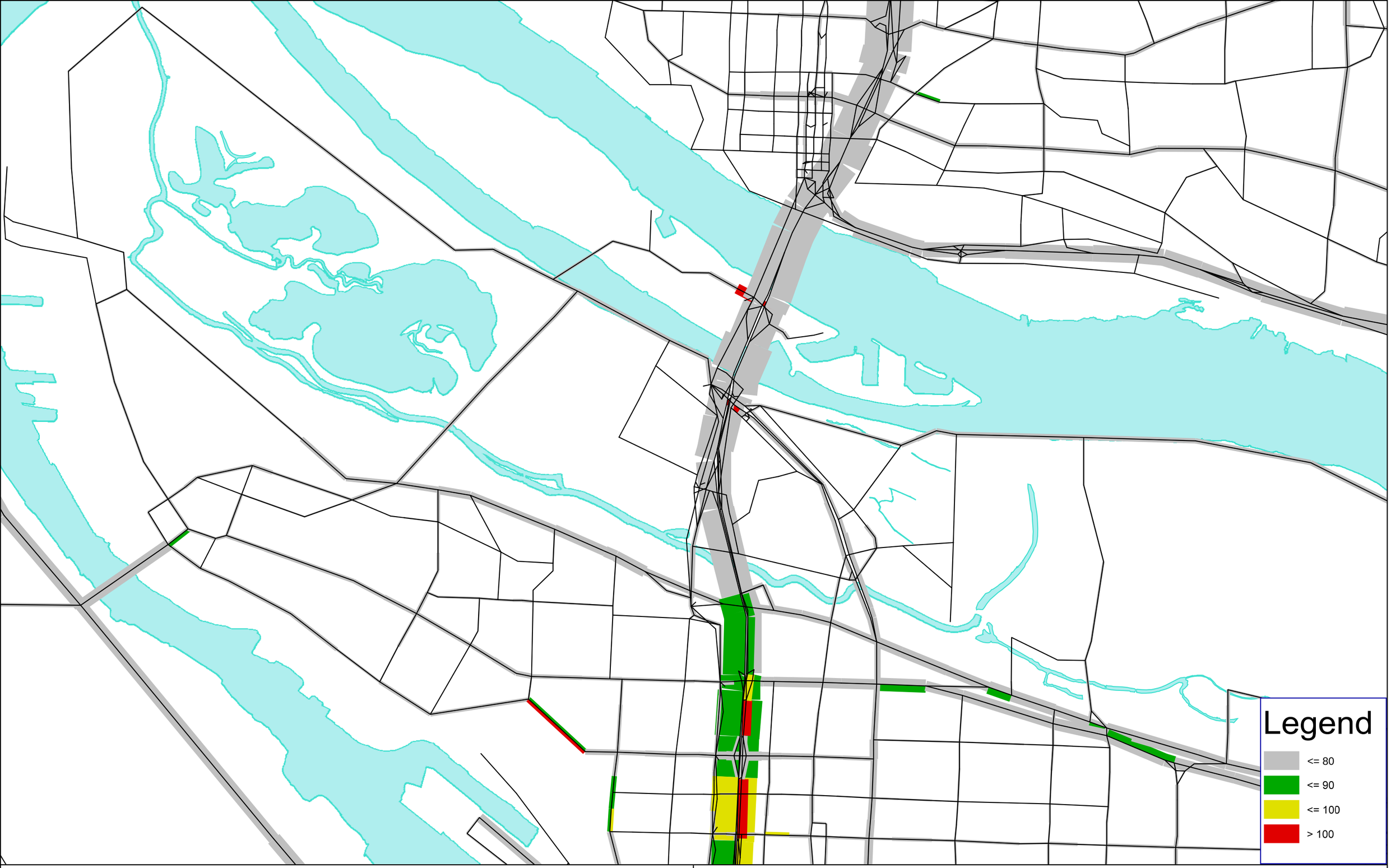
| DKS Associates | PM Peak 2-hr V/C Ratio |

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|---|---|
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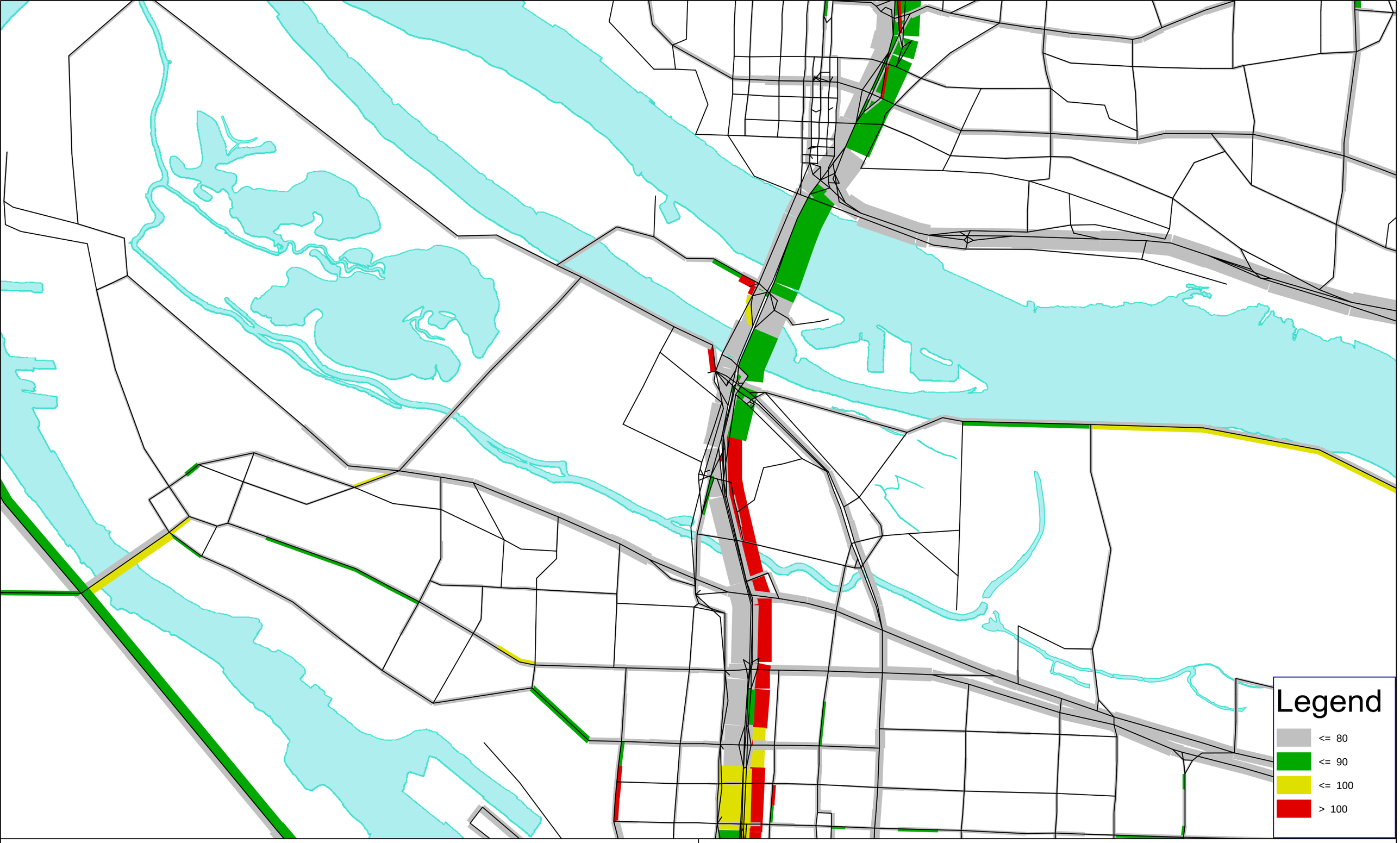
| DKS Associates | PM Peak 2-hr V/C Ratio |

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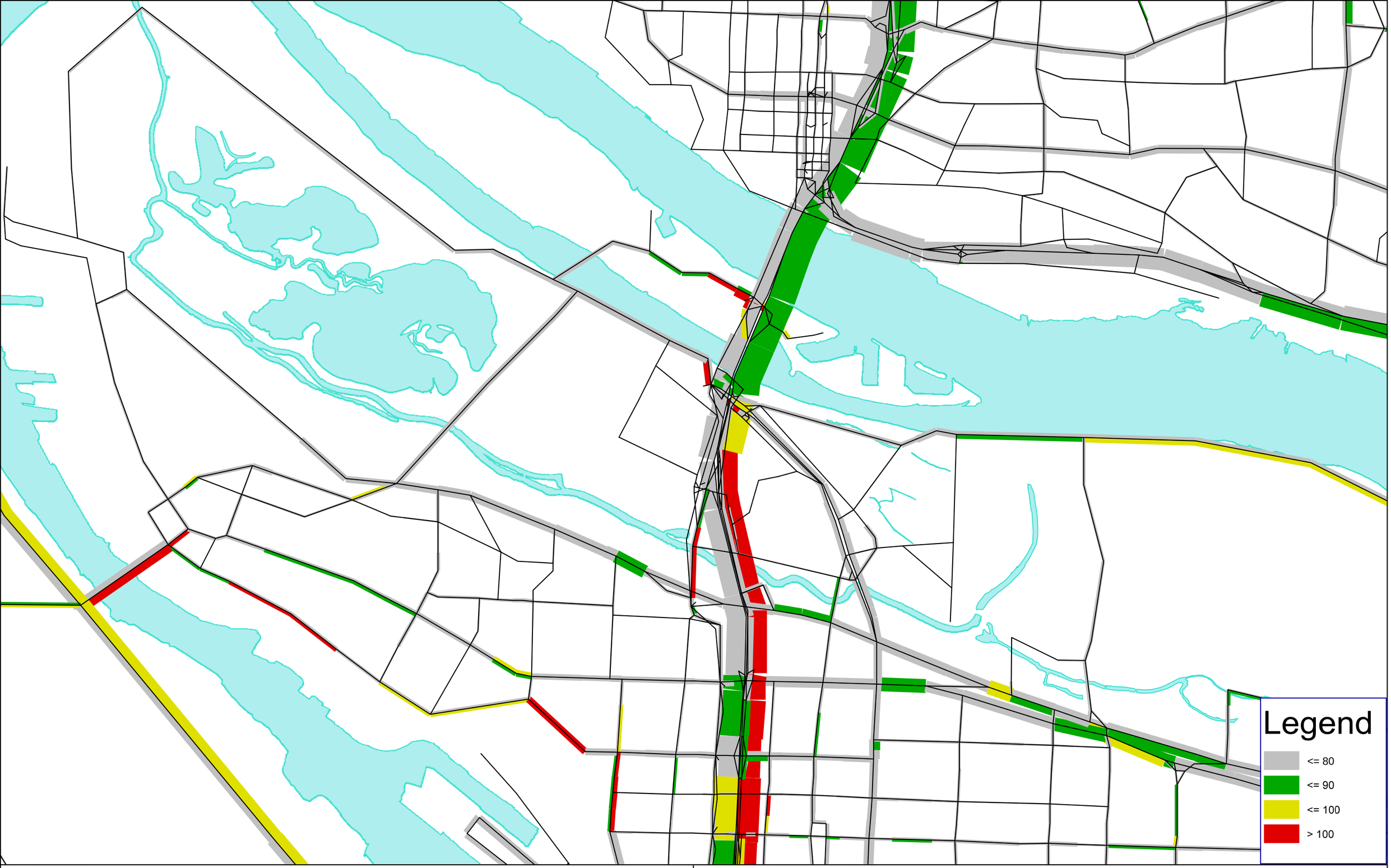
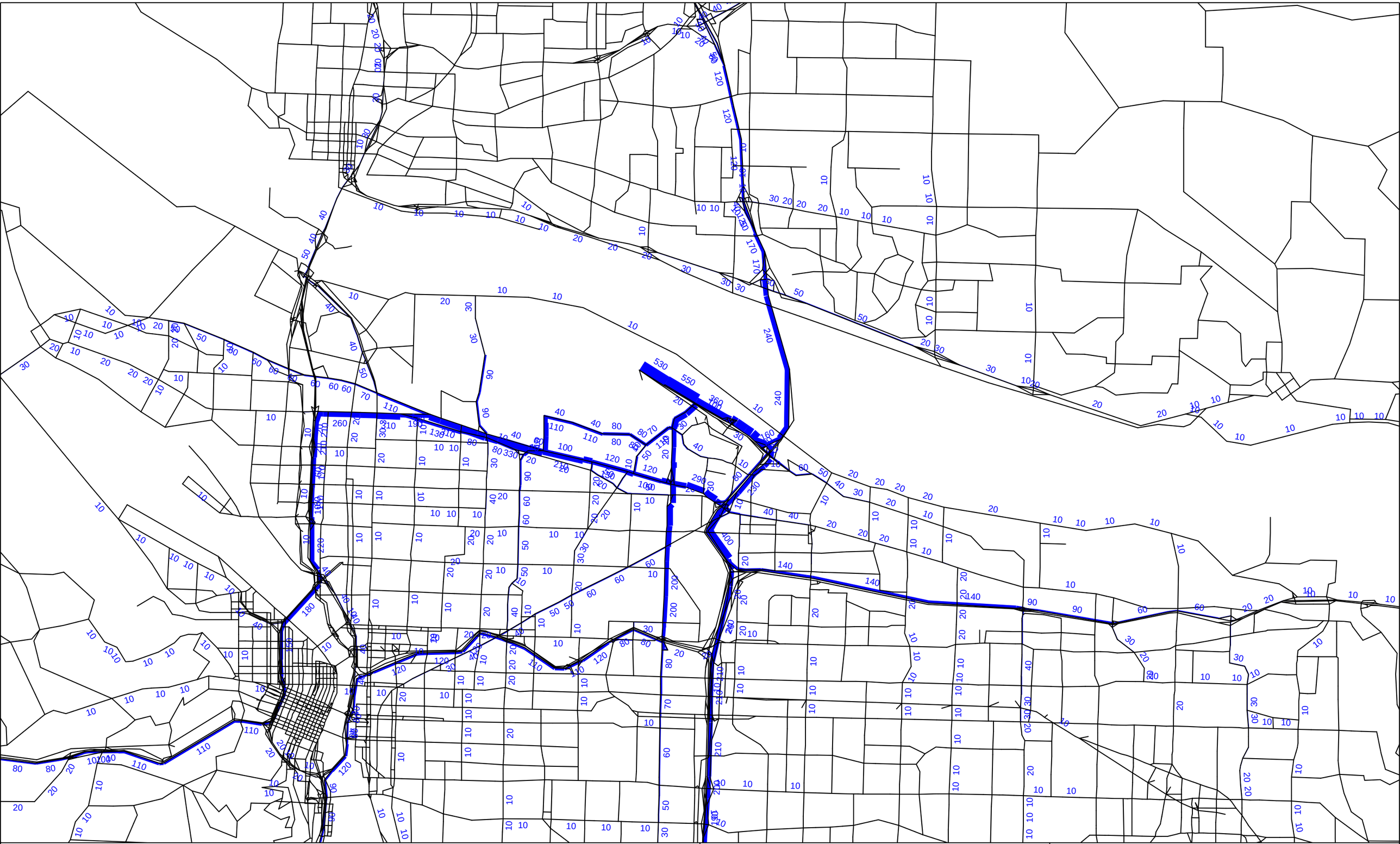
| DKS Associates | PM Peak 2-hr V/C Ratio |




| | |
|---|---|
| Metro VISUM Model | Metro_2035STATE_PM2_J3_assigned_VC.ver |
| DKS Associates | PM Peak 2-hr V/C Ratio |

# Select Zone Travel Demand Model Data

2010 Midday Peak Hour (Rivergate, PDX, Troutdale)
2010 PM Peak Hour (Rivergate, PDX, Troutdale)
2035 Midday Peak Hour (Rivergate, PDX, Troutdale)
2035 PM Peak Hour (Rivergate, PDX, Troutdale)



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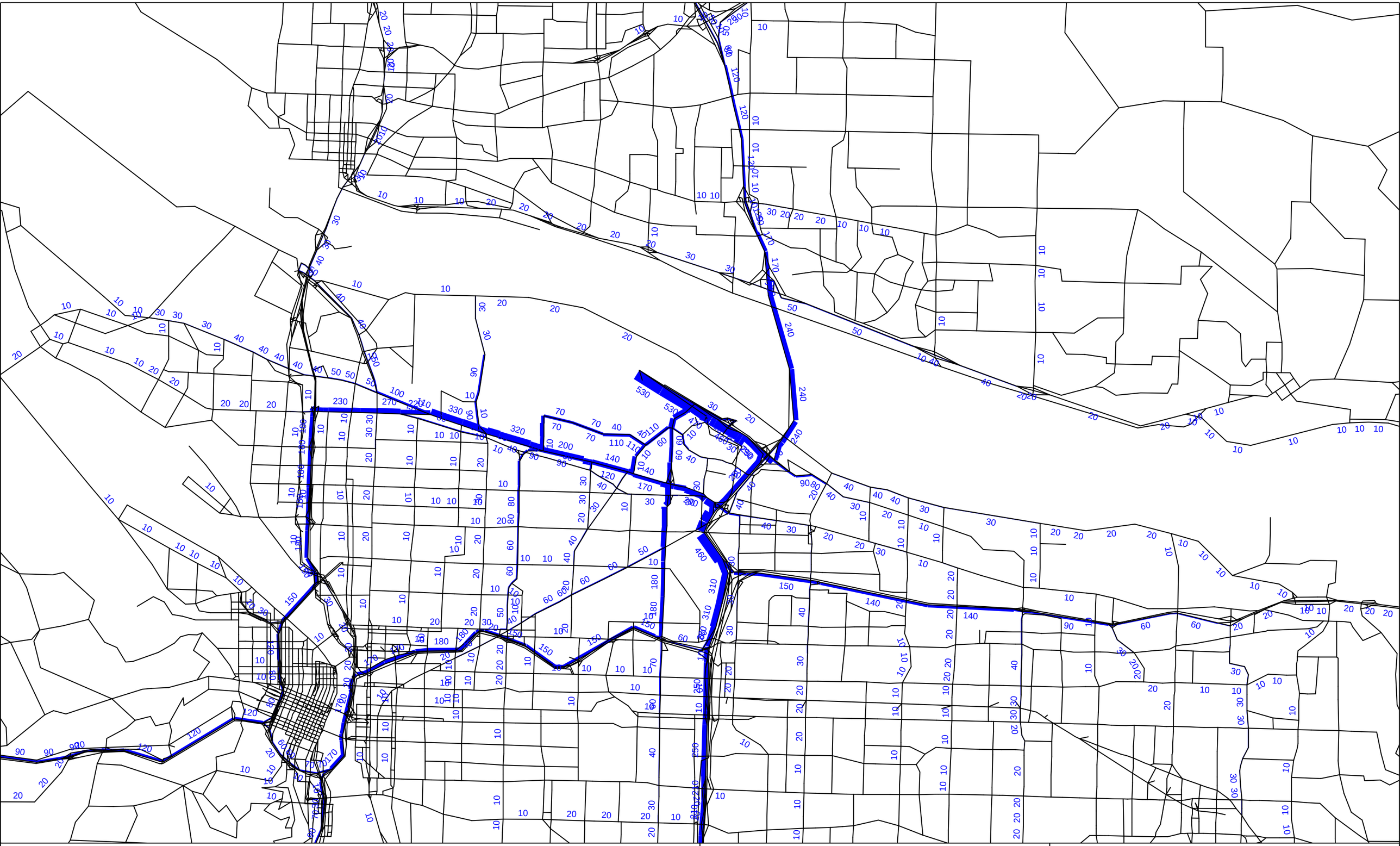
| Metro_2010_MD1_J3_assigned.ver | 1:71612 | Created on: 29.03.2012 |
| DKS Associates | Select Zone | MJD |



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|---|---|---|
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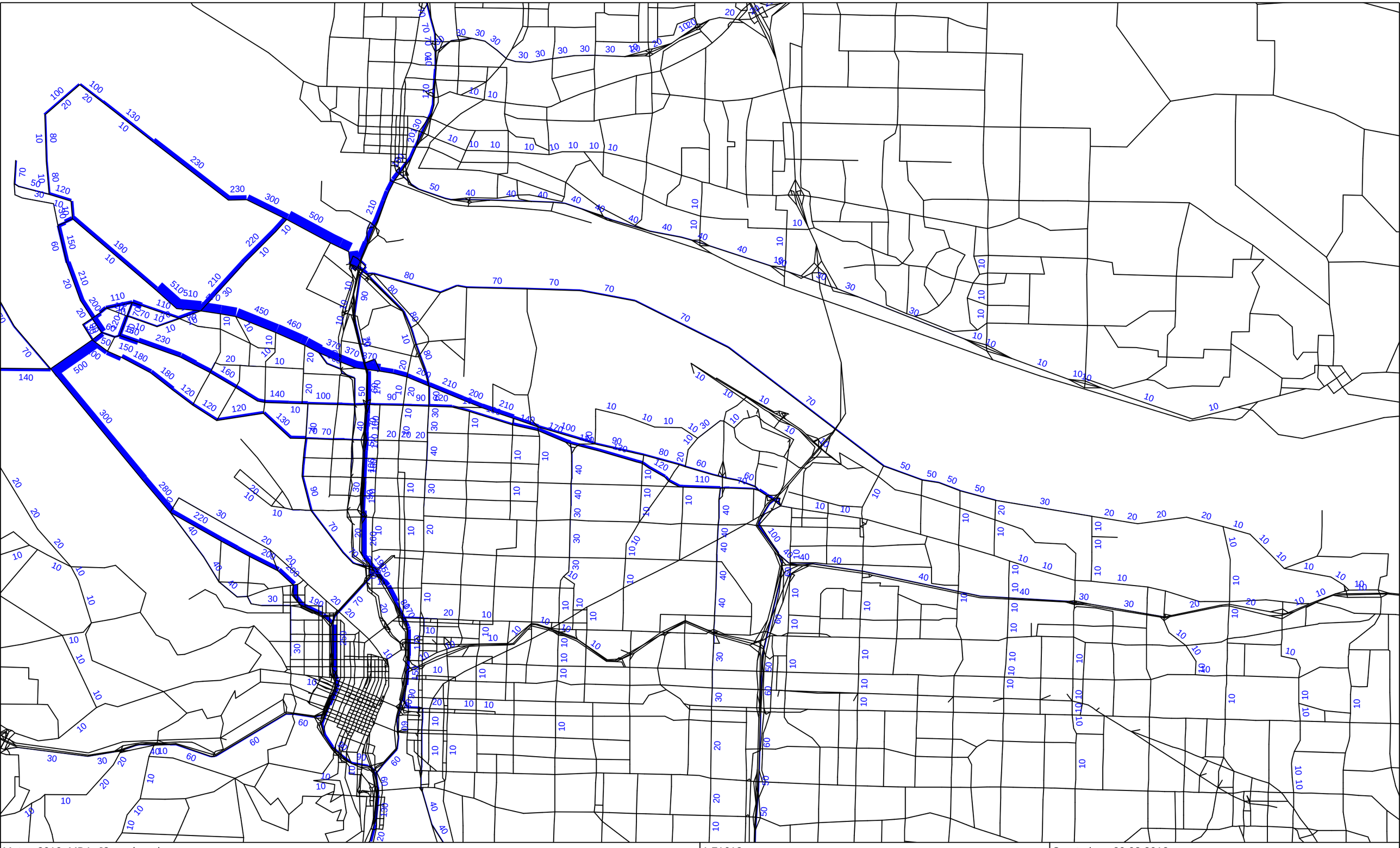
| DKS Associates | Select Zone | MJD |



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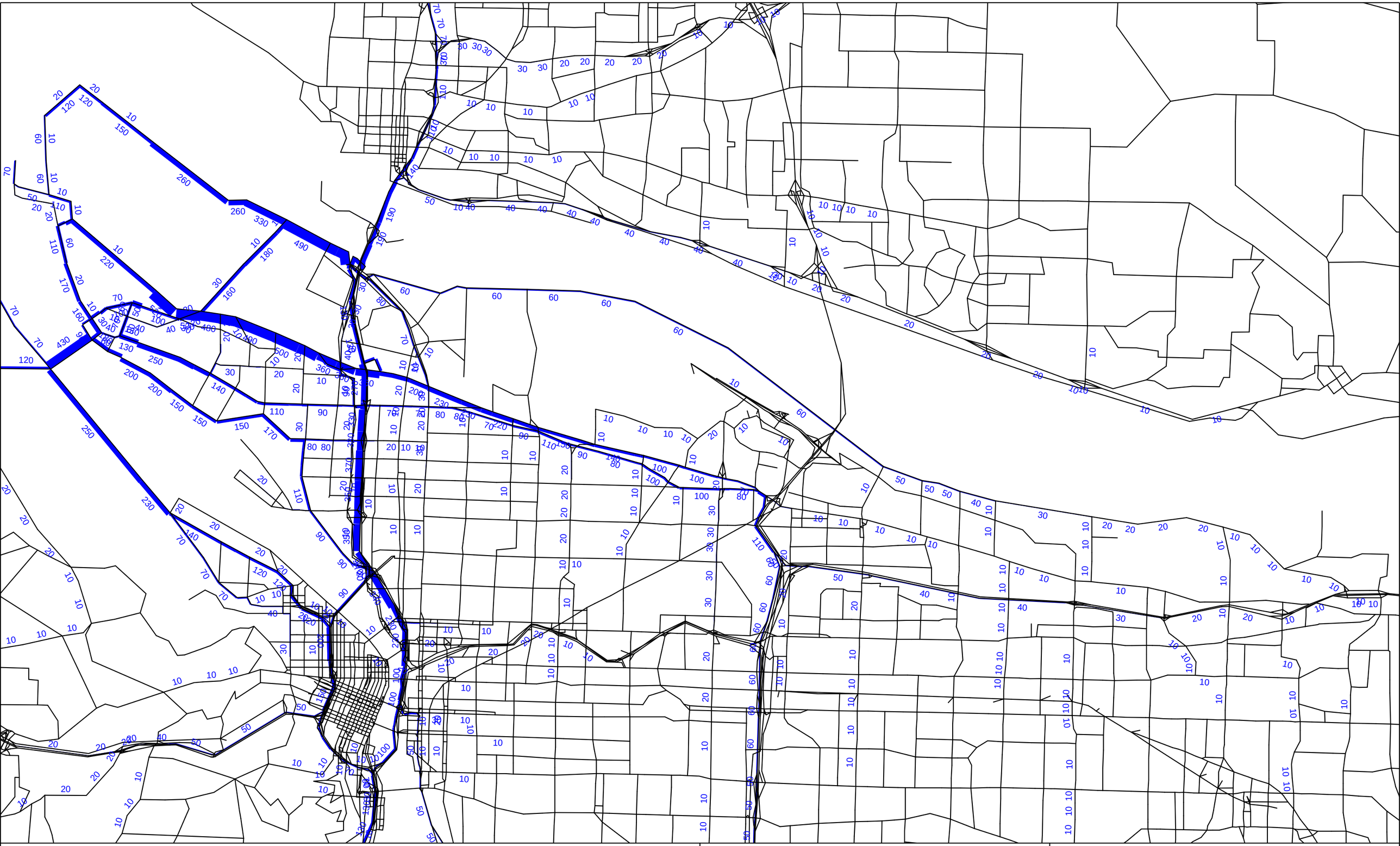

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|---|---|---|
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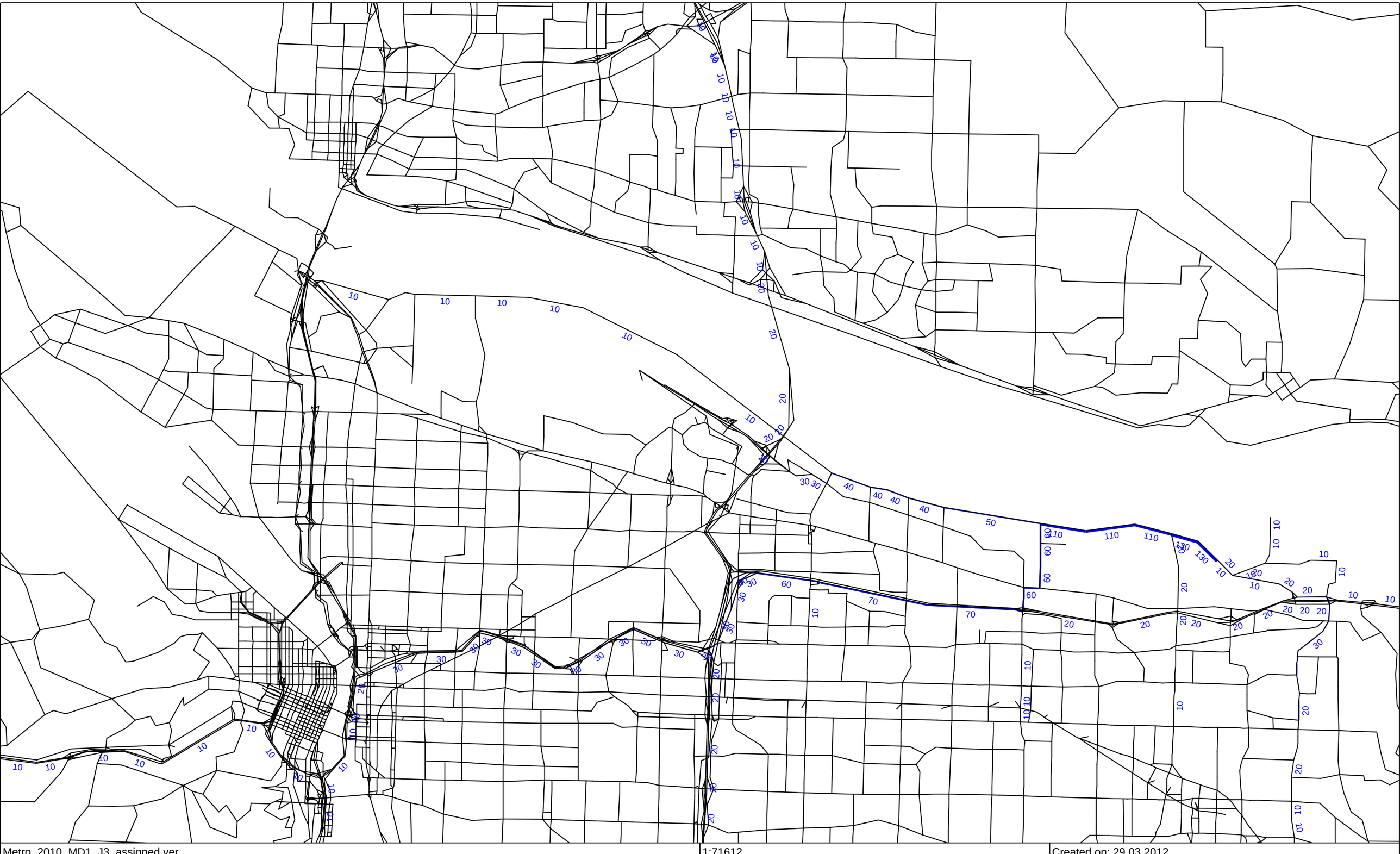
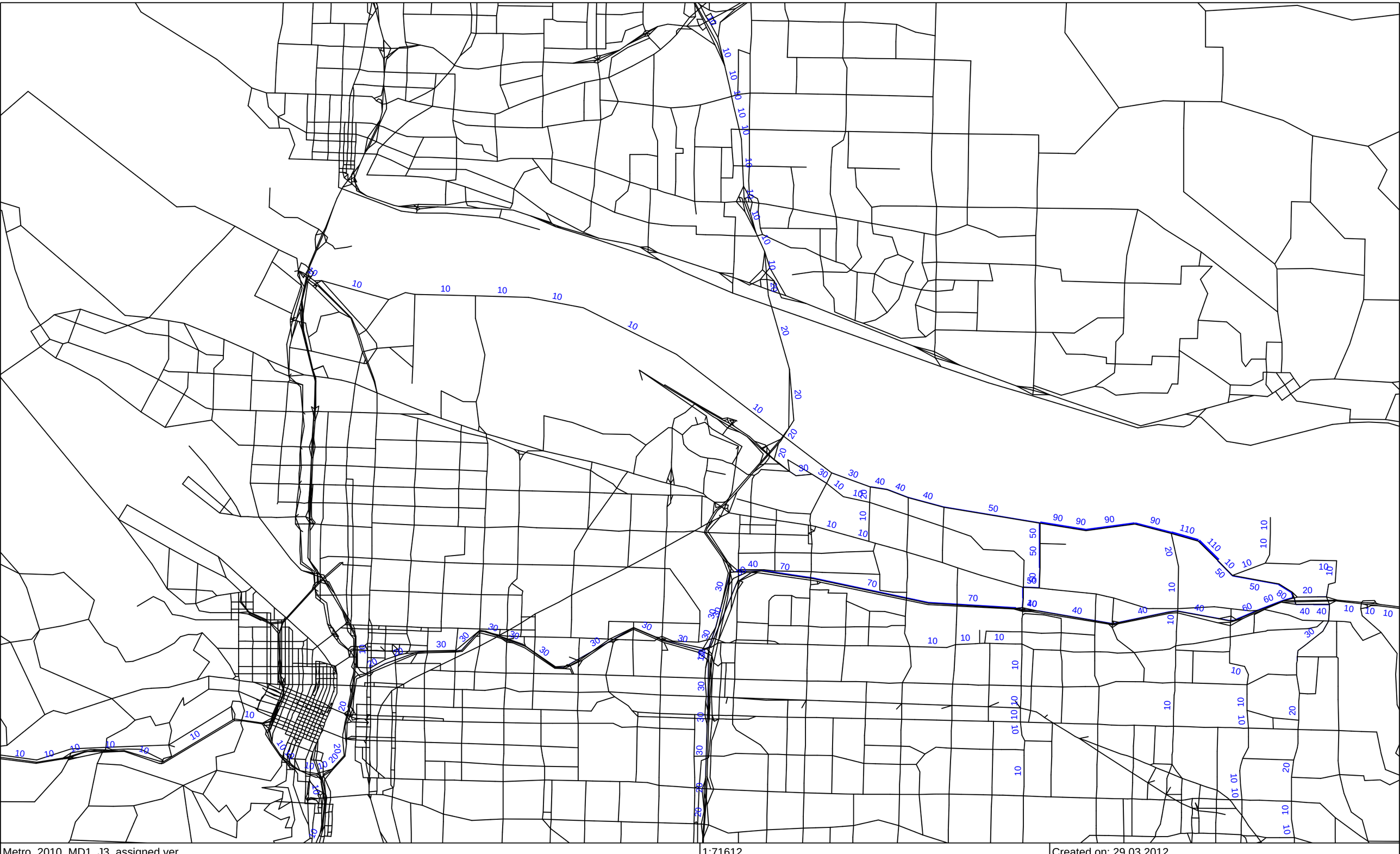
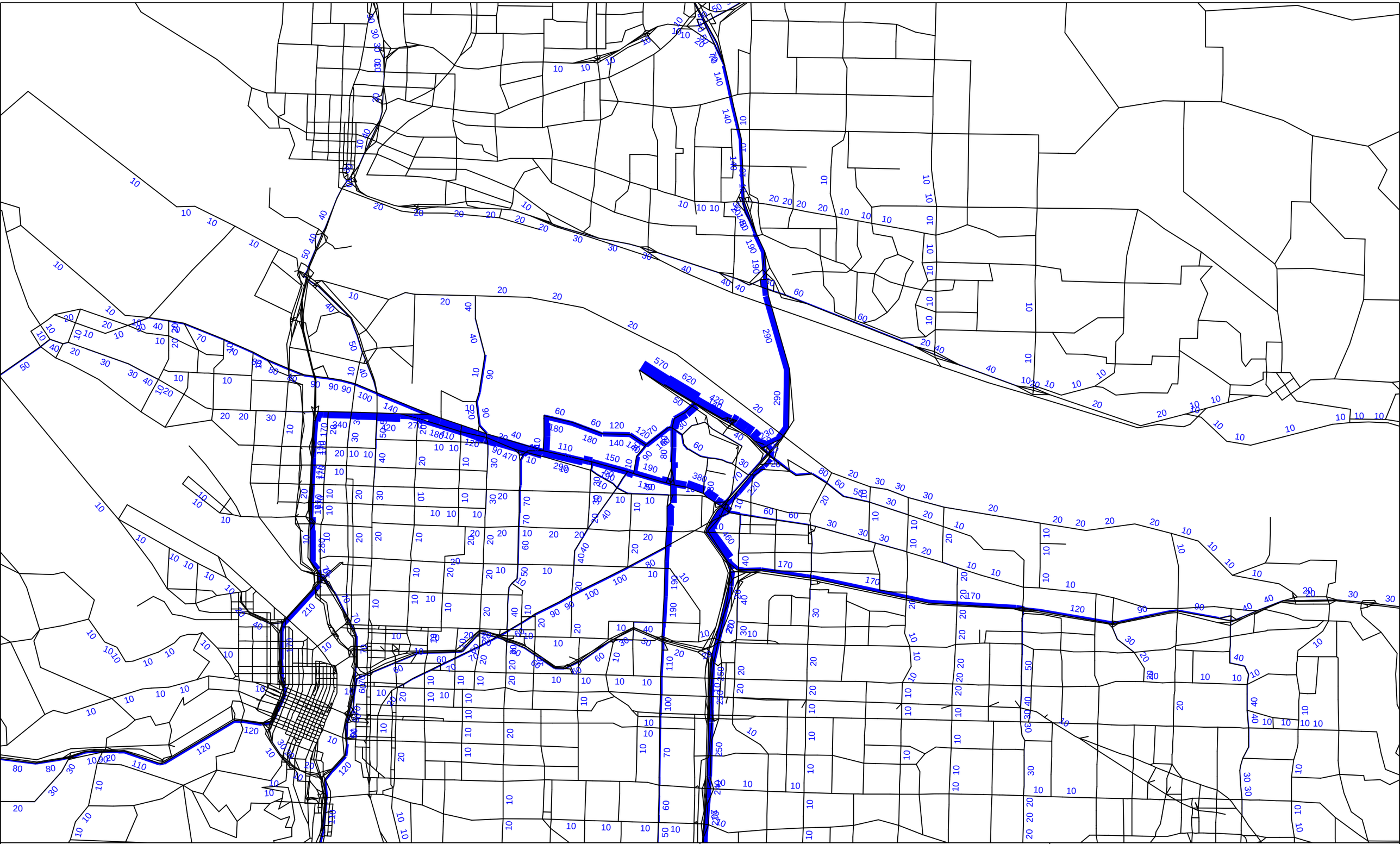


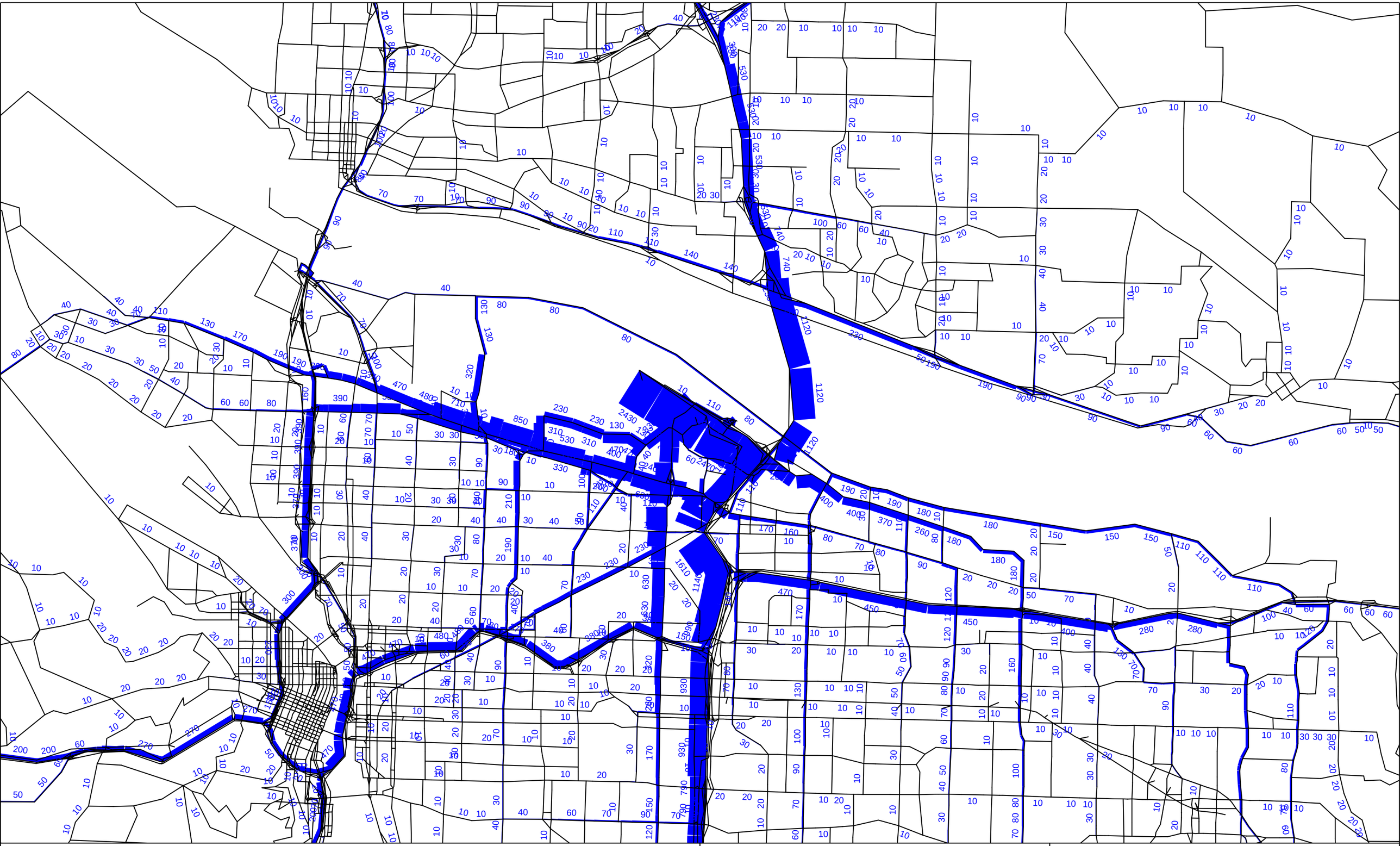
| | | |
|---|---|---|
| Metro_2010_MD1_J3_assigned.ver | 1:71612 | Created on: 29.03.2012 |
| DKS Associates | Select Zone | MJD |



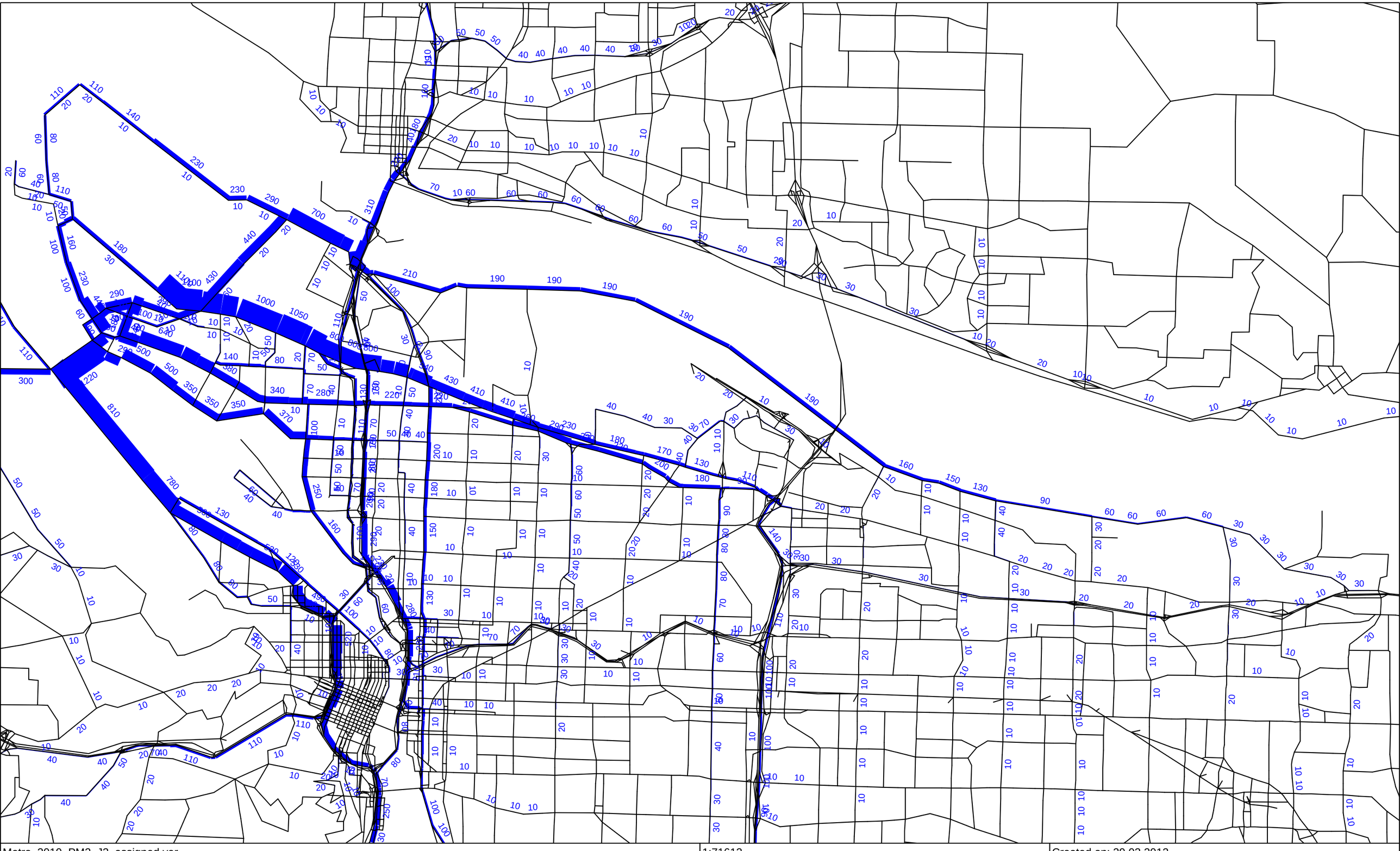
| | | |
|---|---|---|
| Metro_2010_MD1_J3_assigned.ver | 1:71612 | Created on: 29.03.2012 |
| DKS Associates | Select Zone | MJD |



| | | |
|---|---|---|
| Metro_2010_PM2_J3_assigned.ver | 1:71612 | Created on: 29.03.2012 |
| DKS Associates | Select Zone | MJD |



| | | |
|---|---|---|
| Metro_2010_PM2_J3_assigned.ver | 1:71612 | Created on: 29.03.2012 |
| DKS Associates | Select Zone | MJD |



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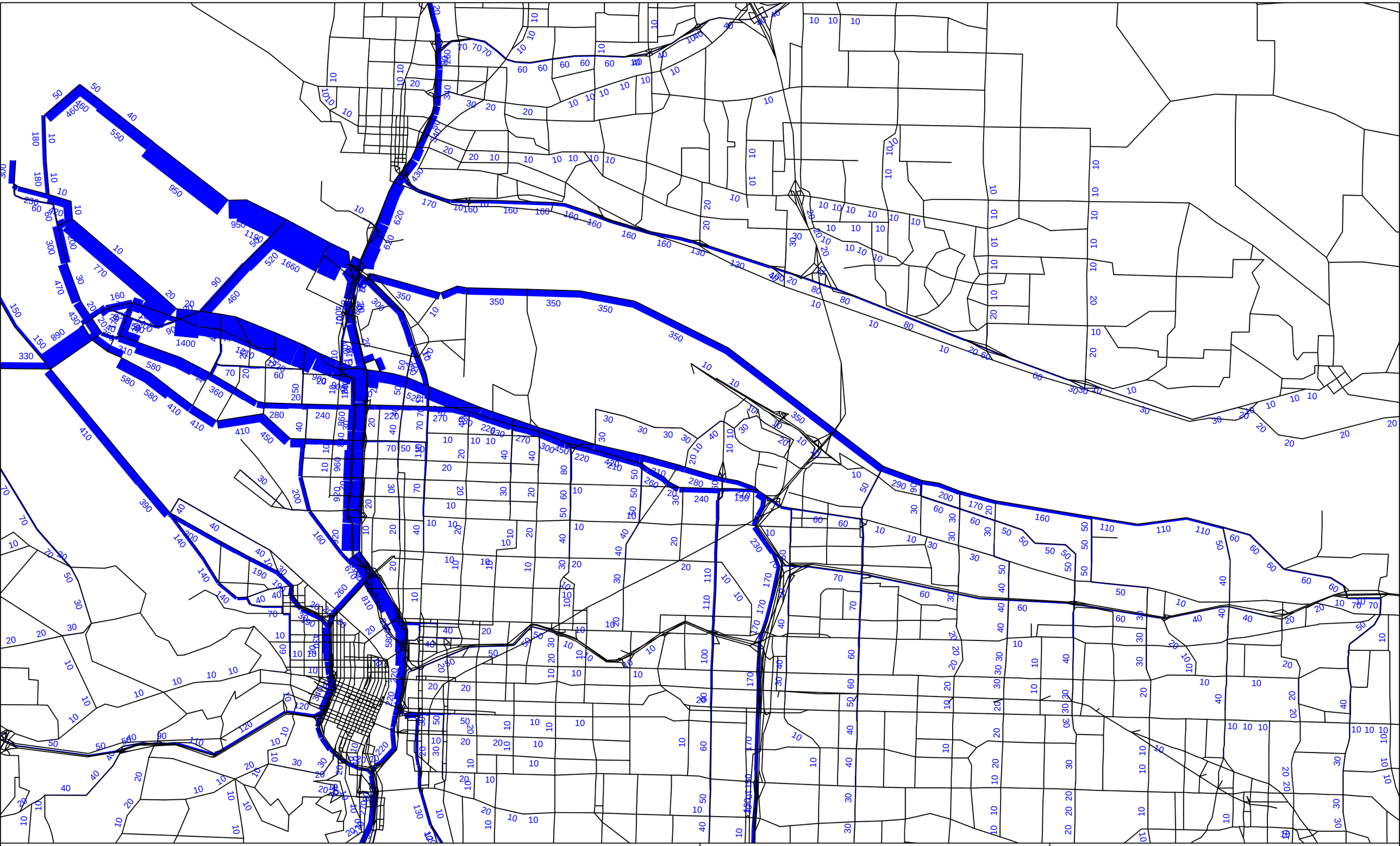

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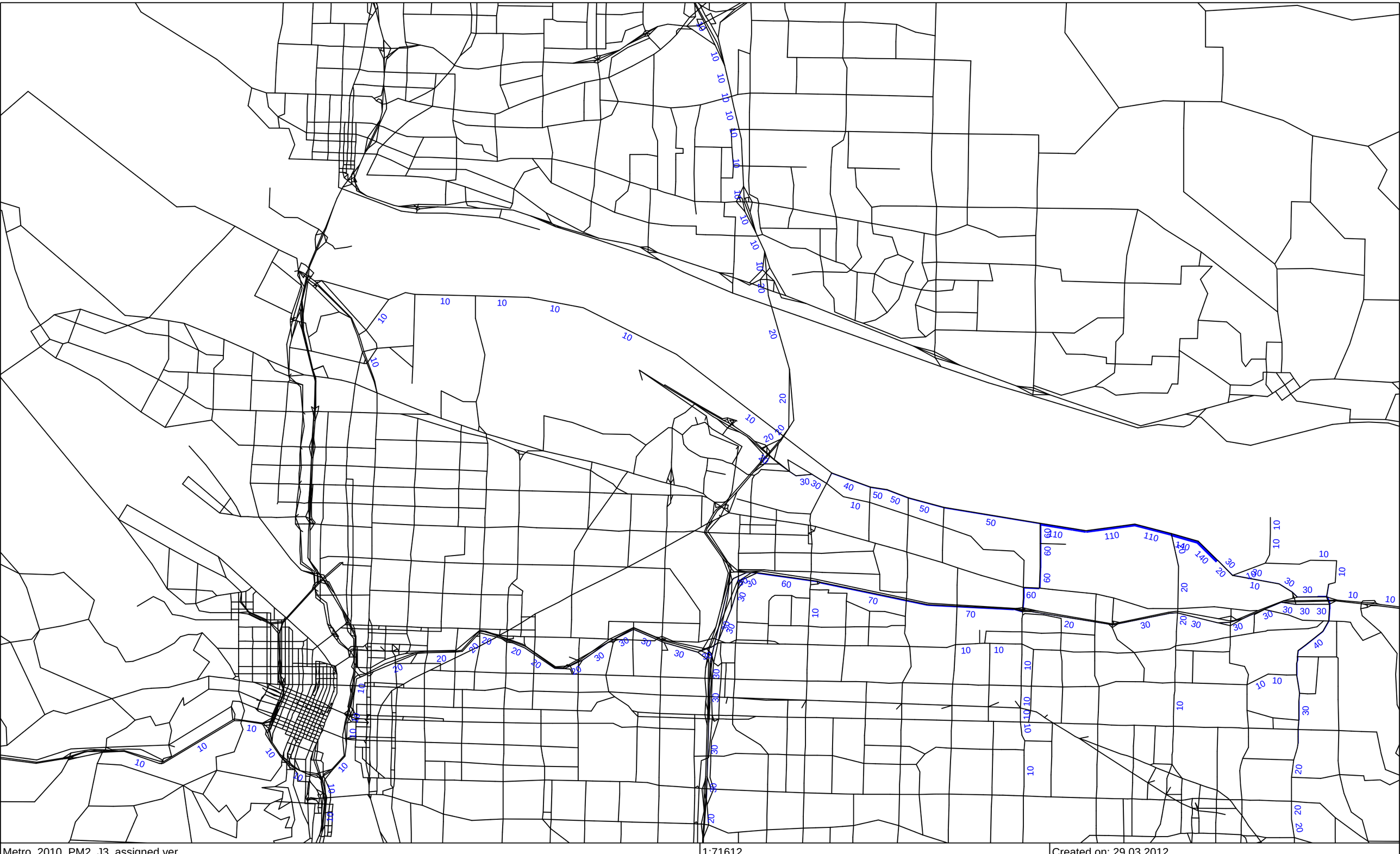

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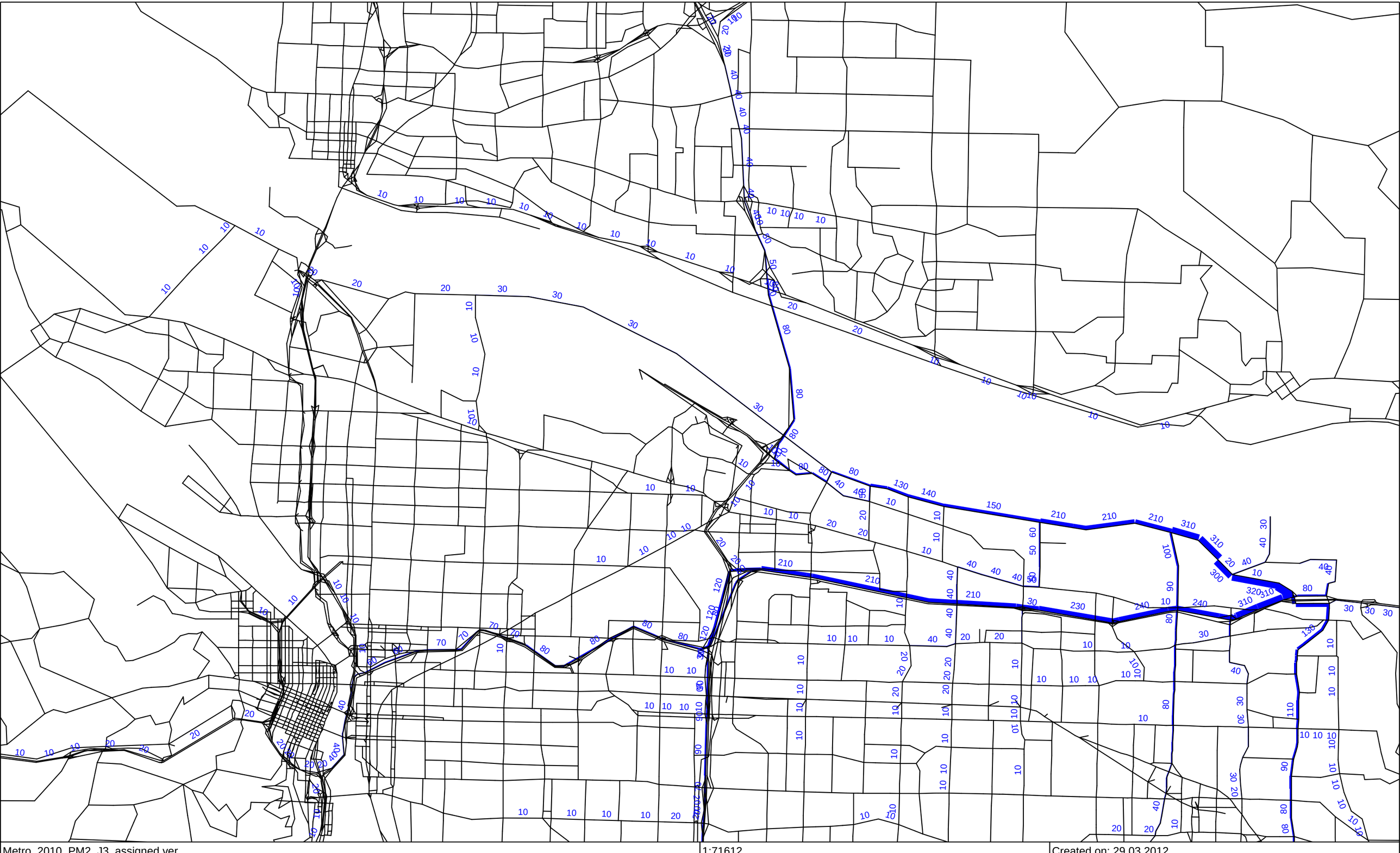

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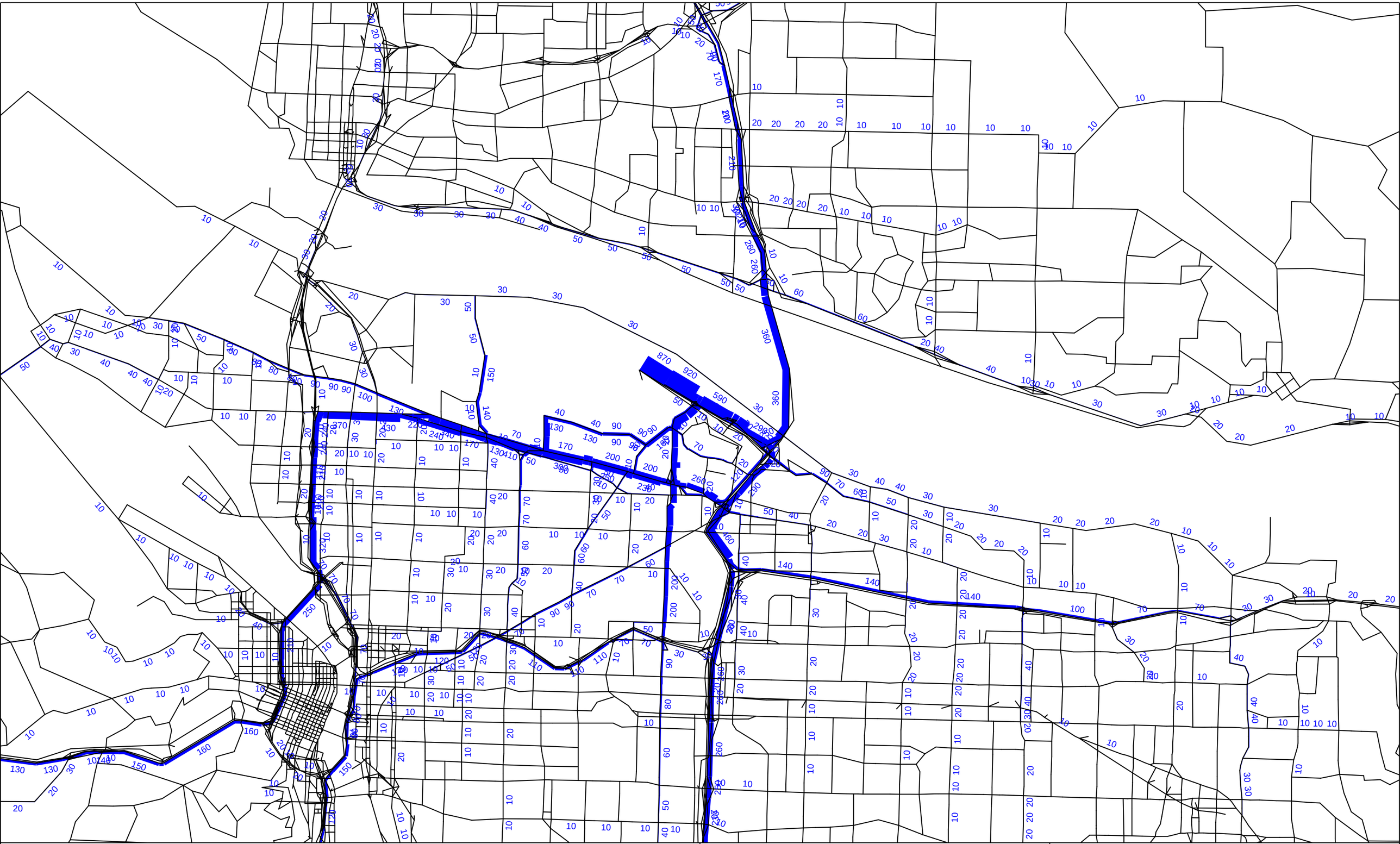

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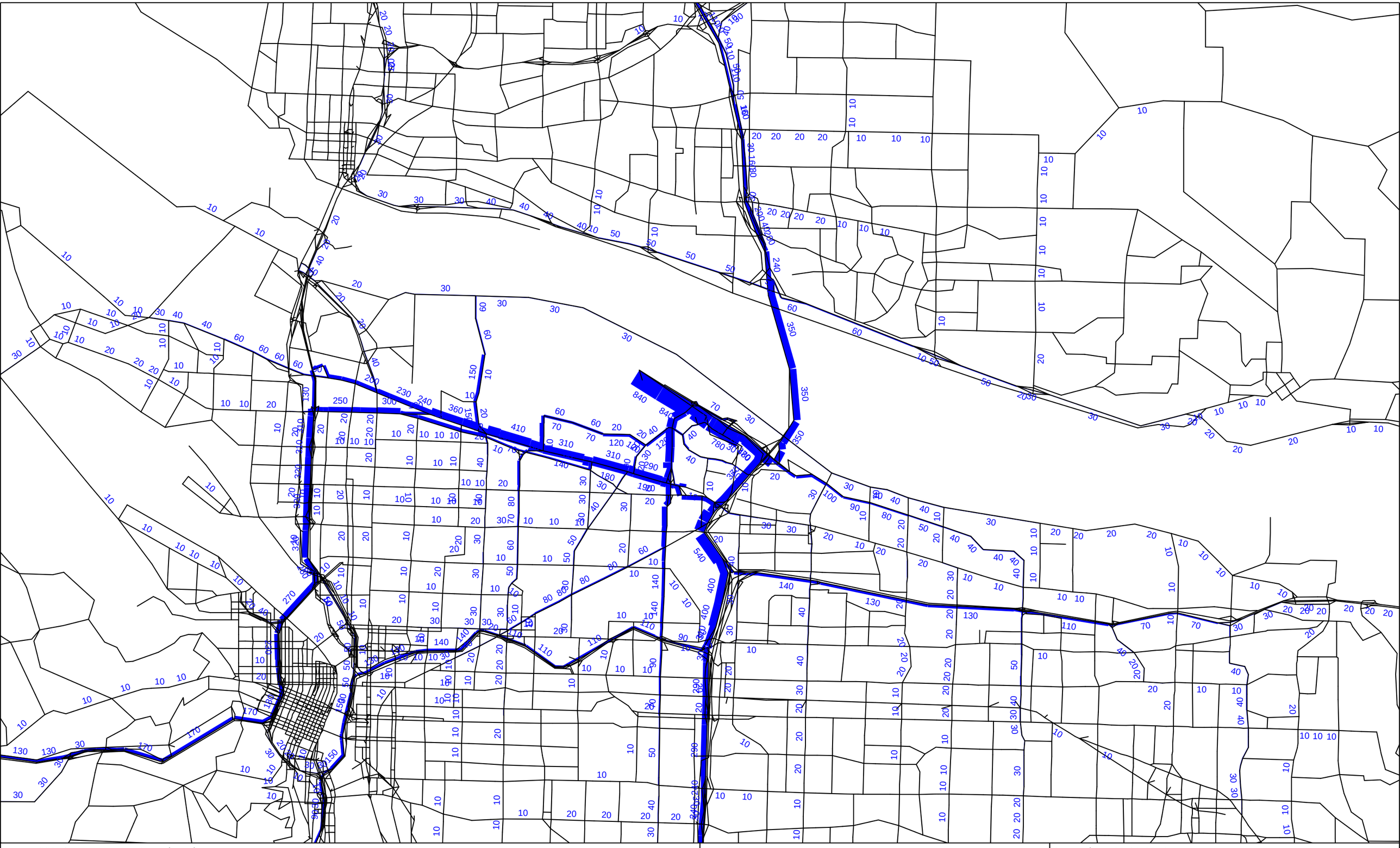

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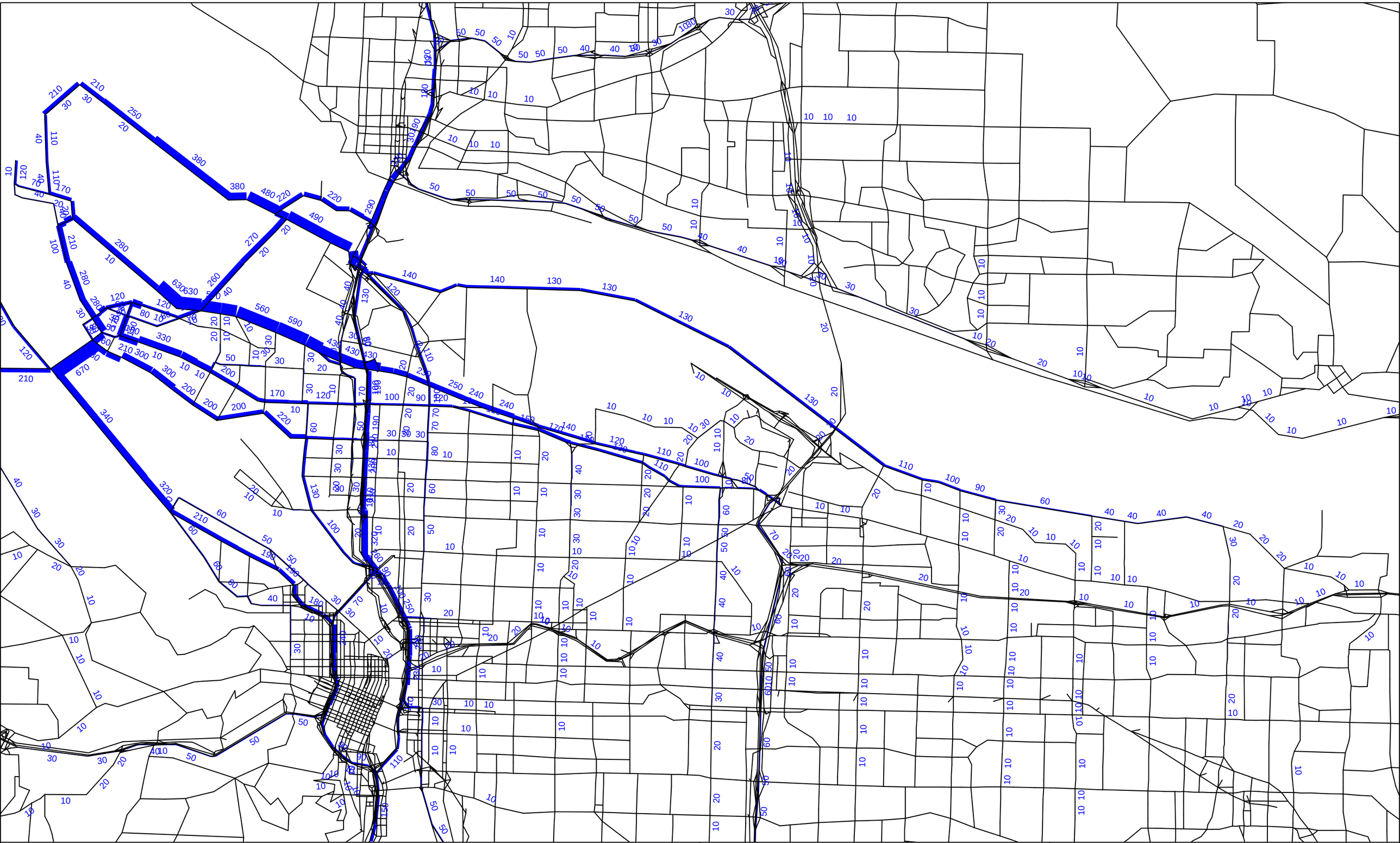

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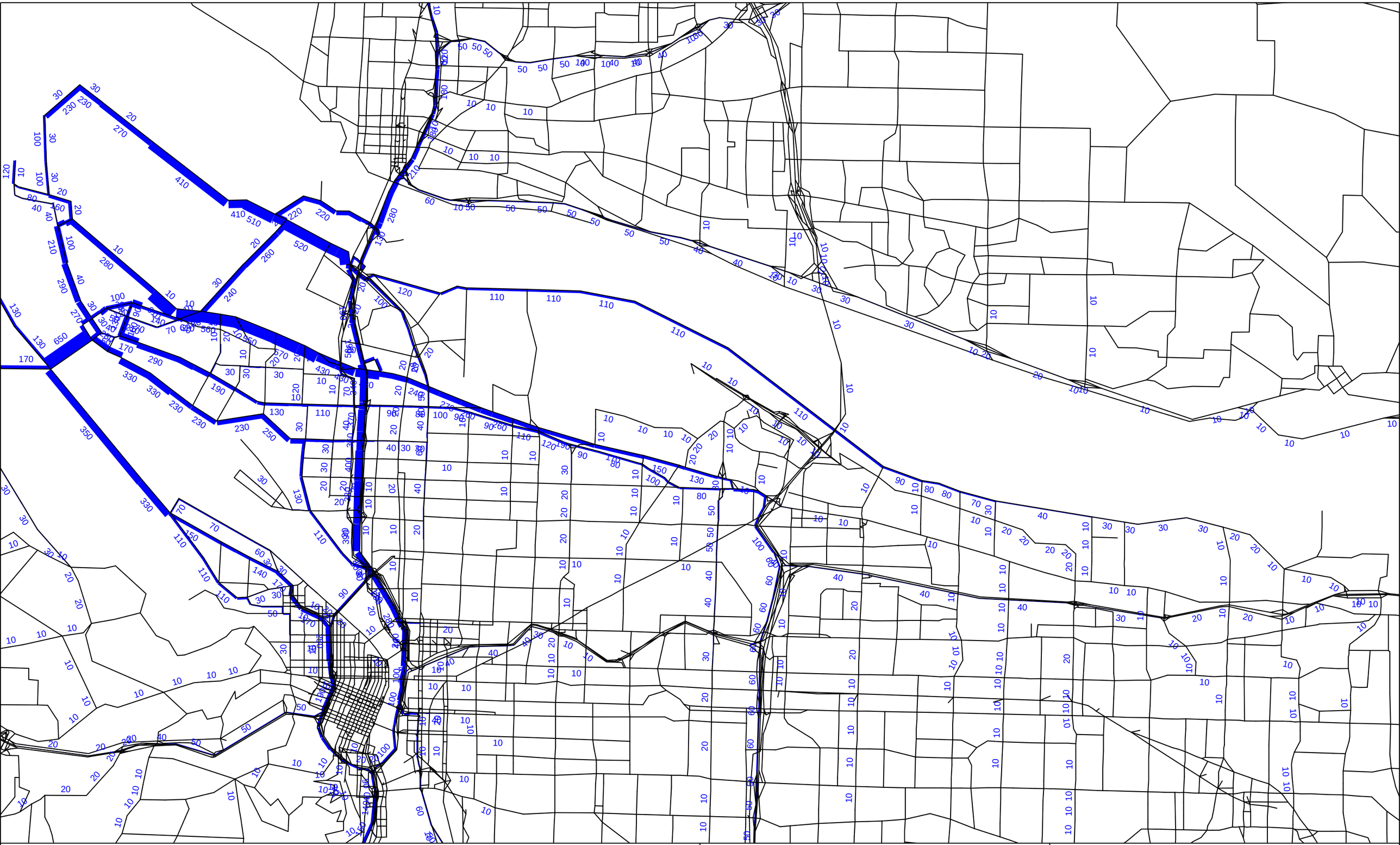

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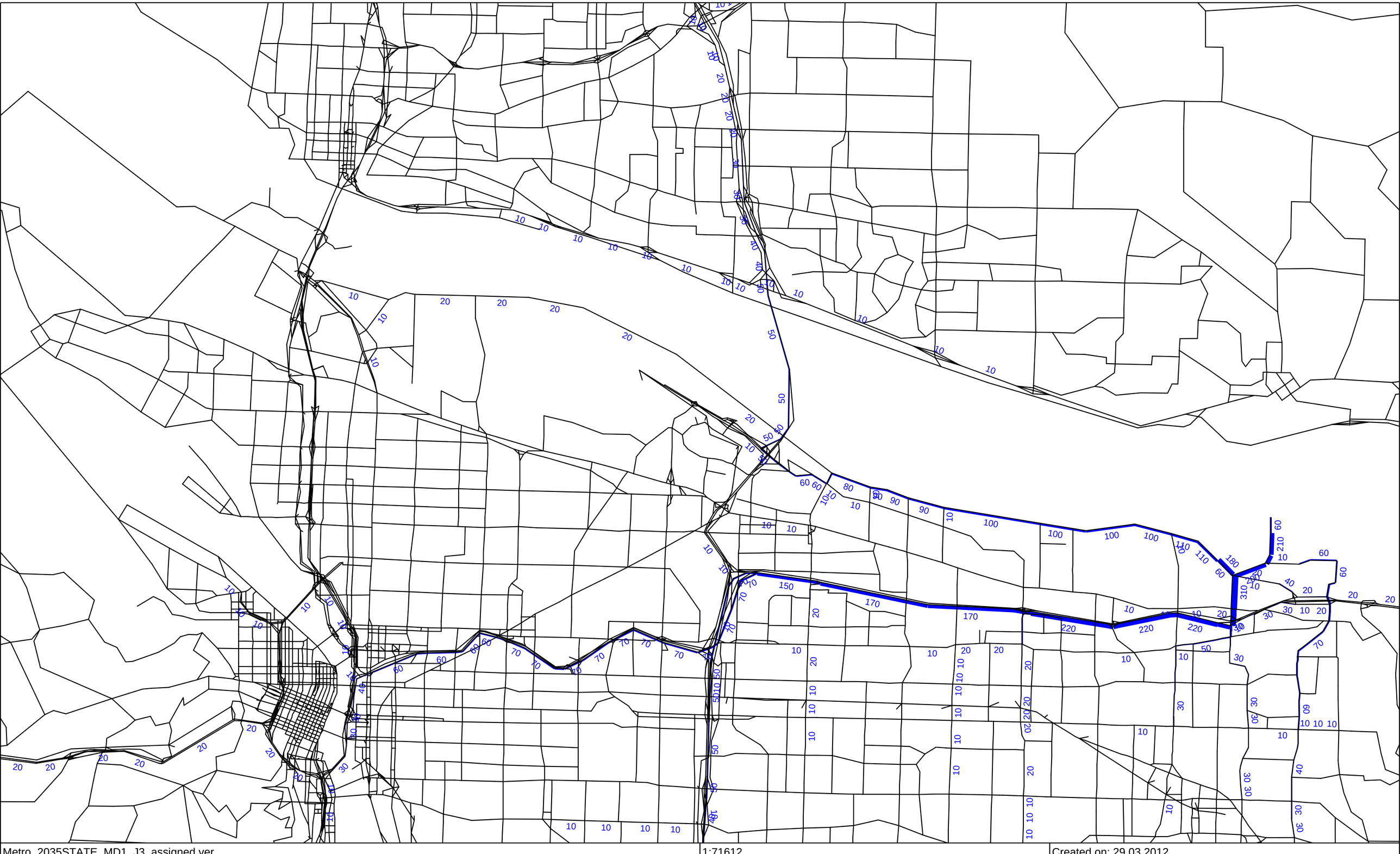

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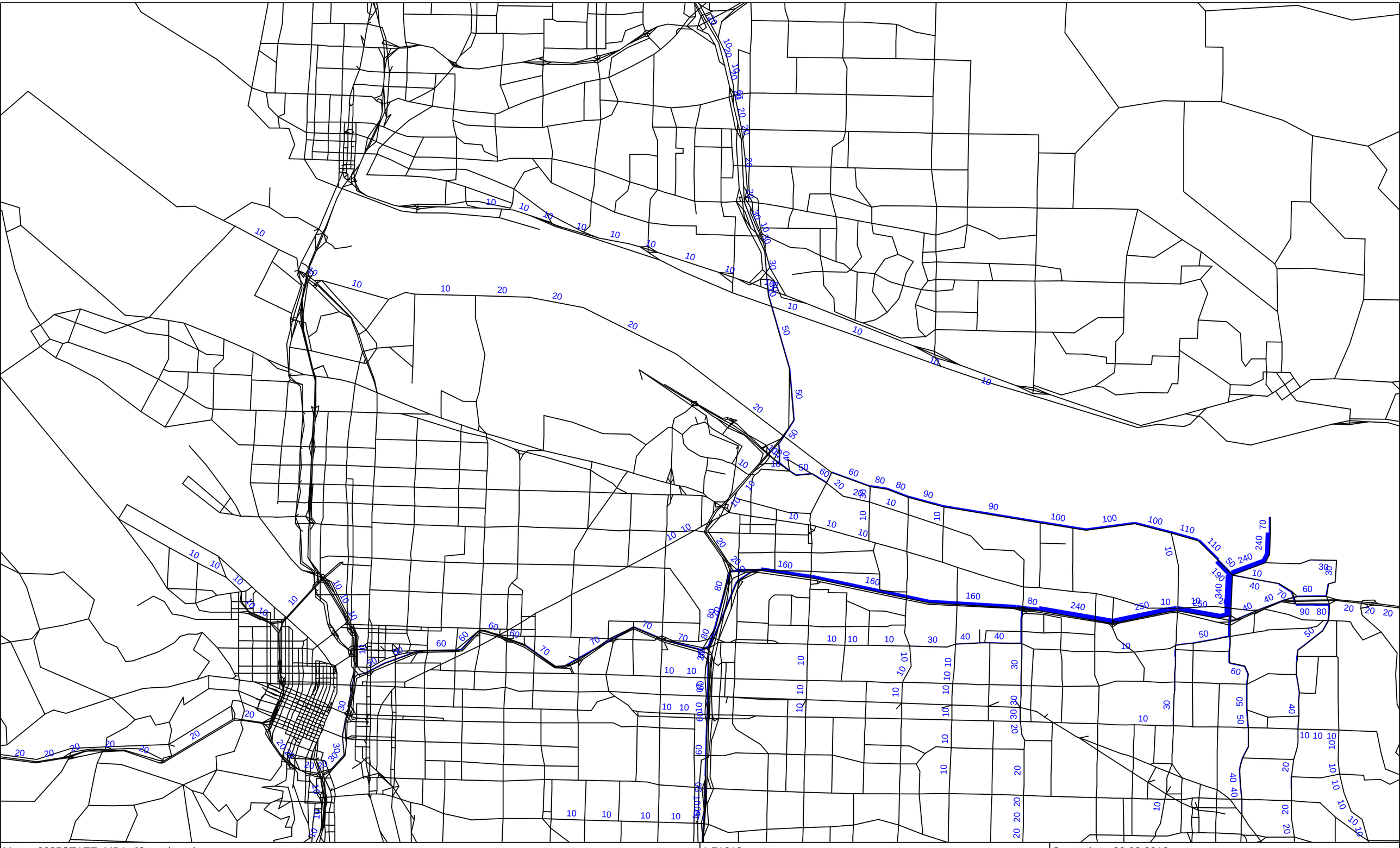

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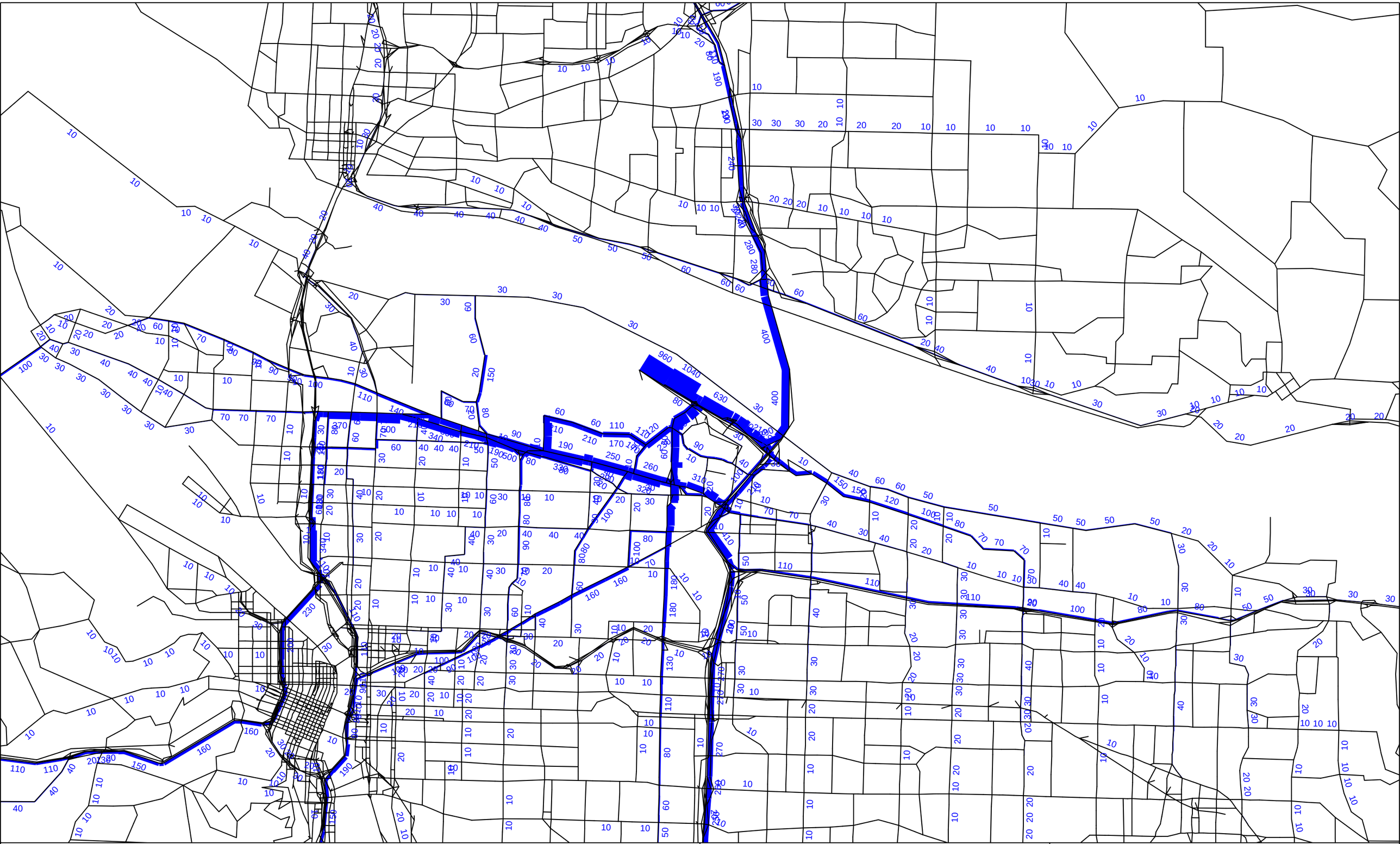

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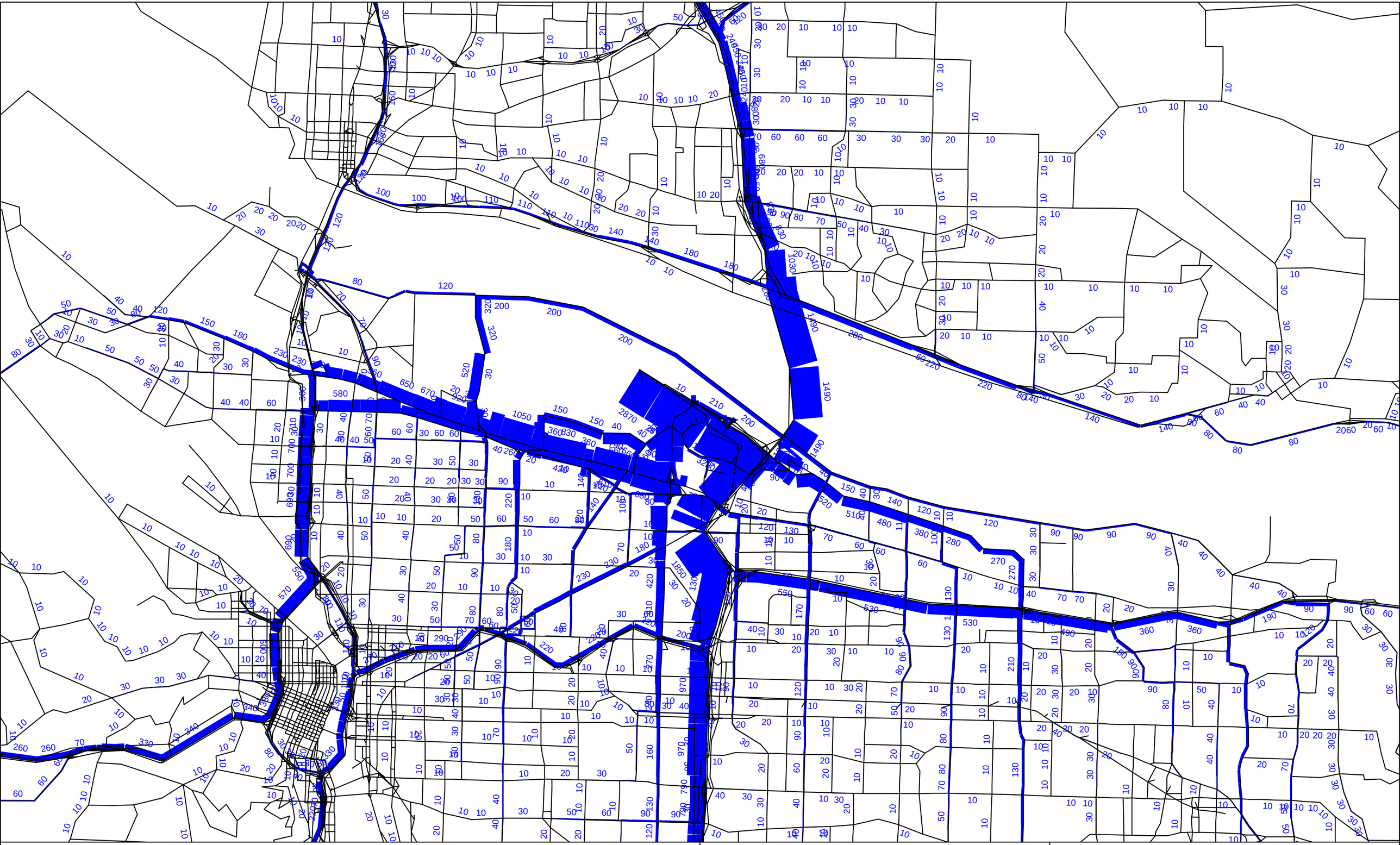

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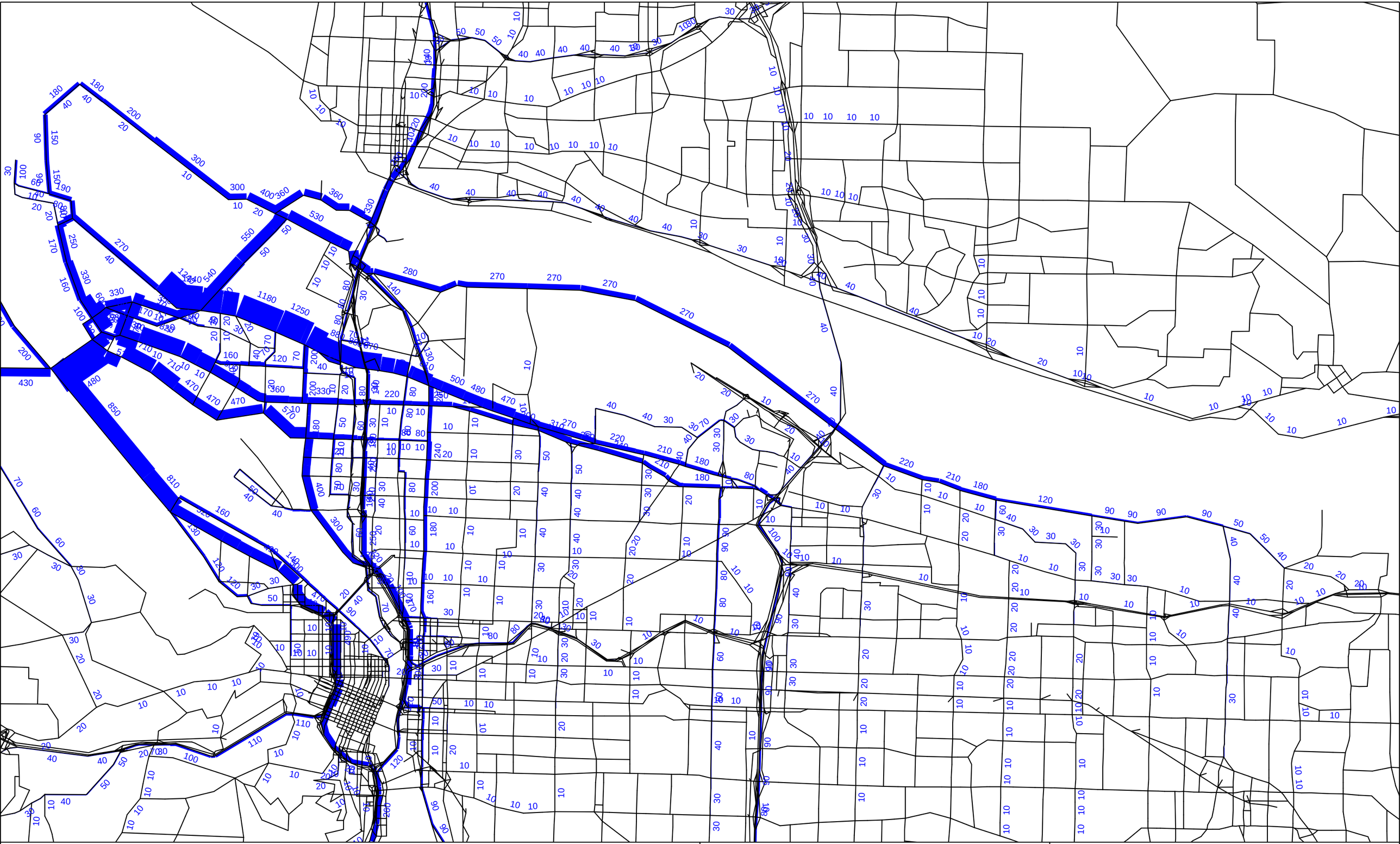

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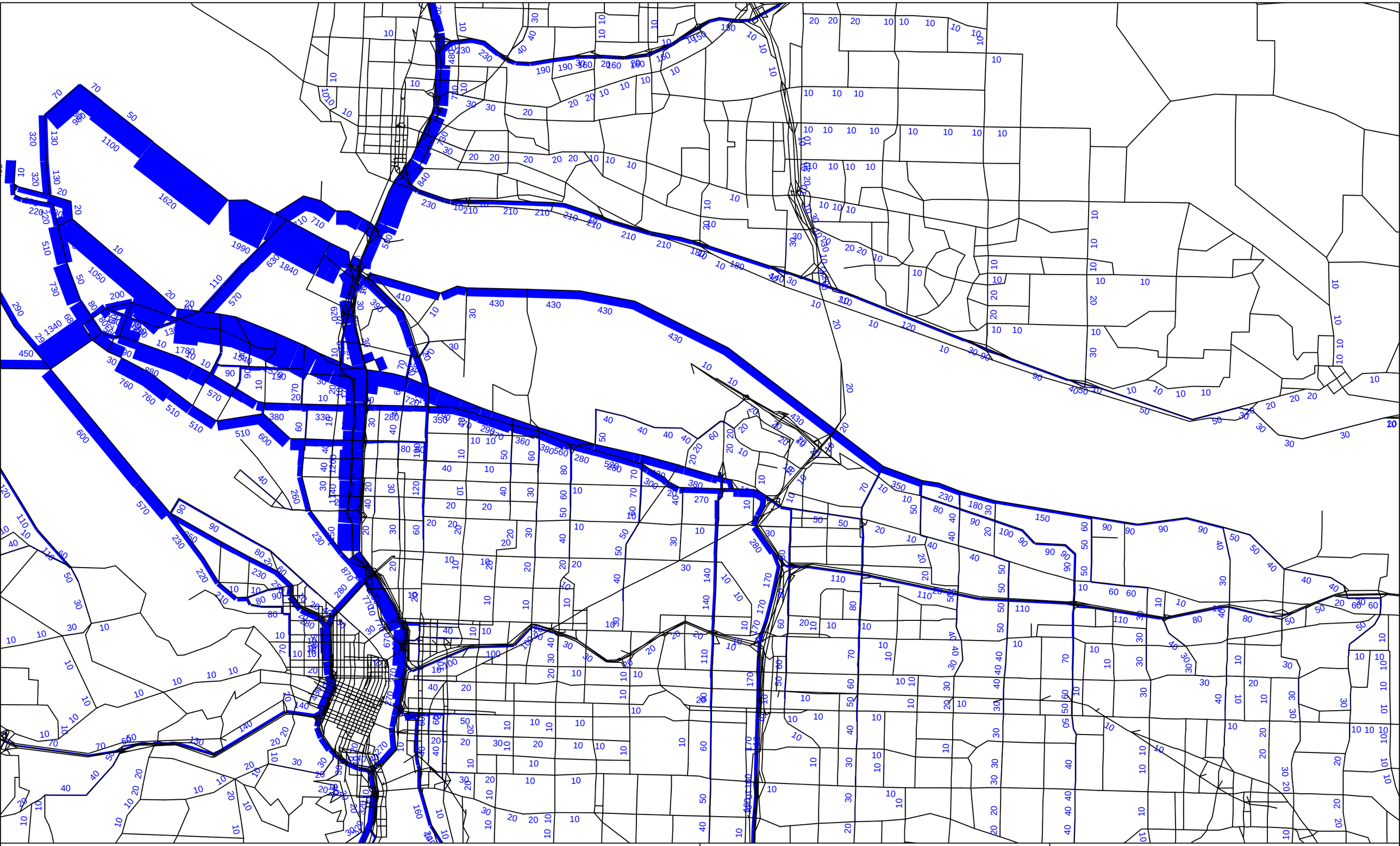

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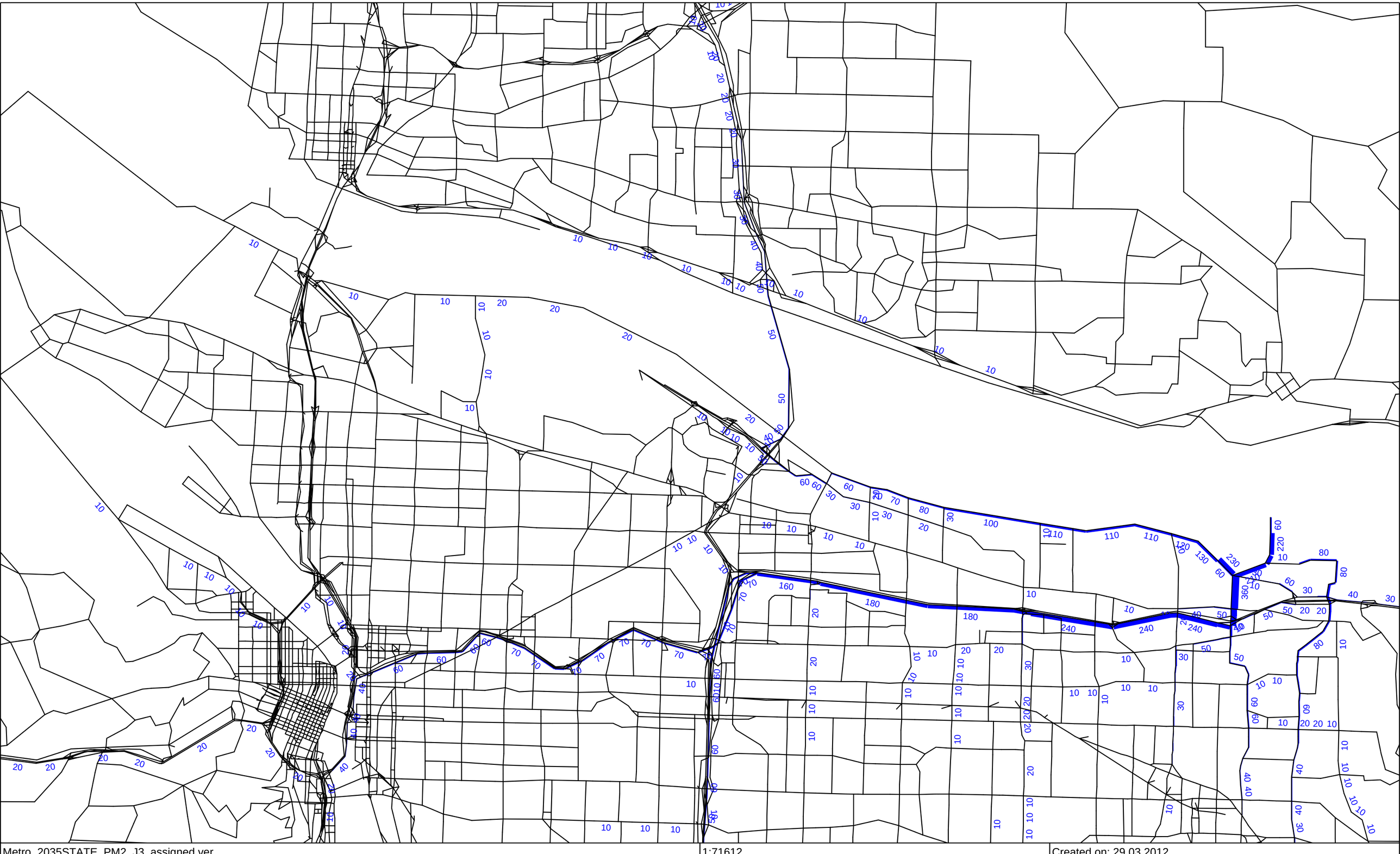

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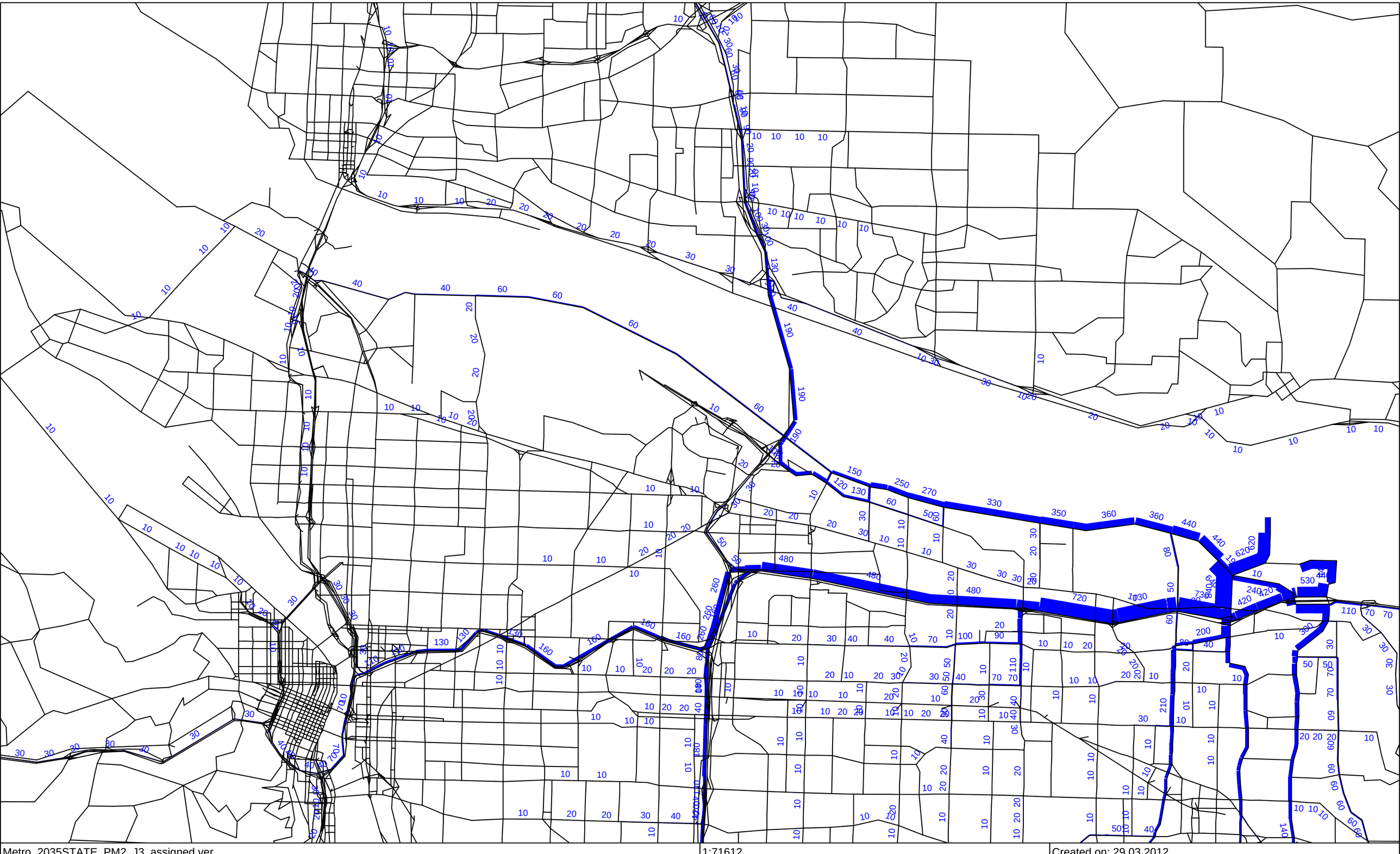

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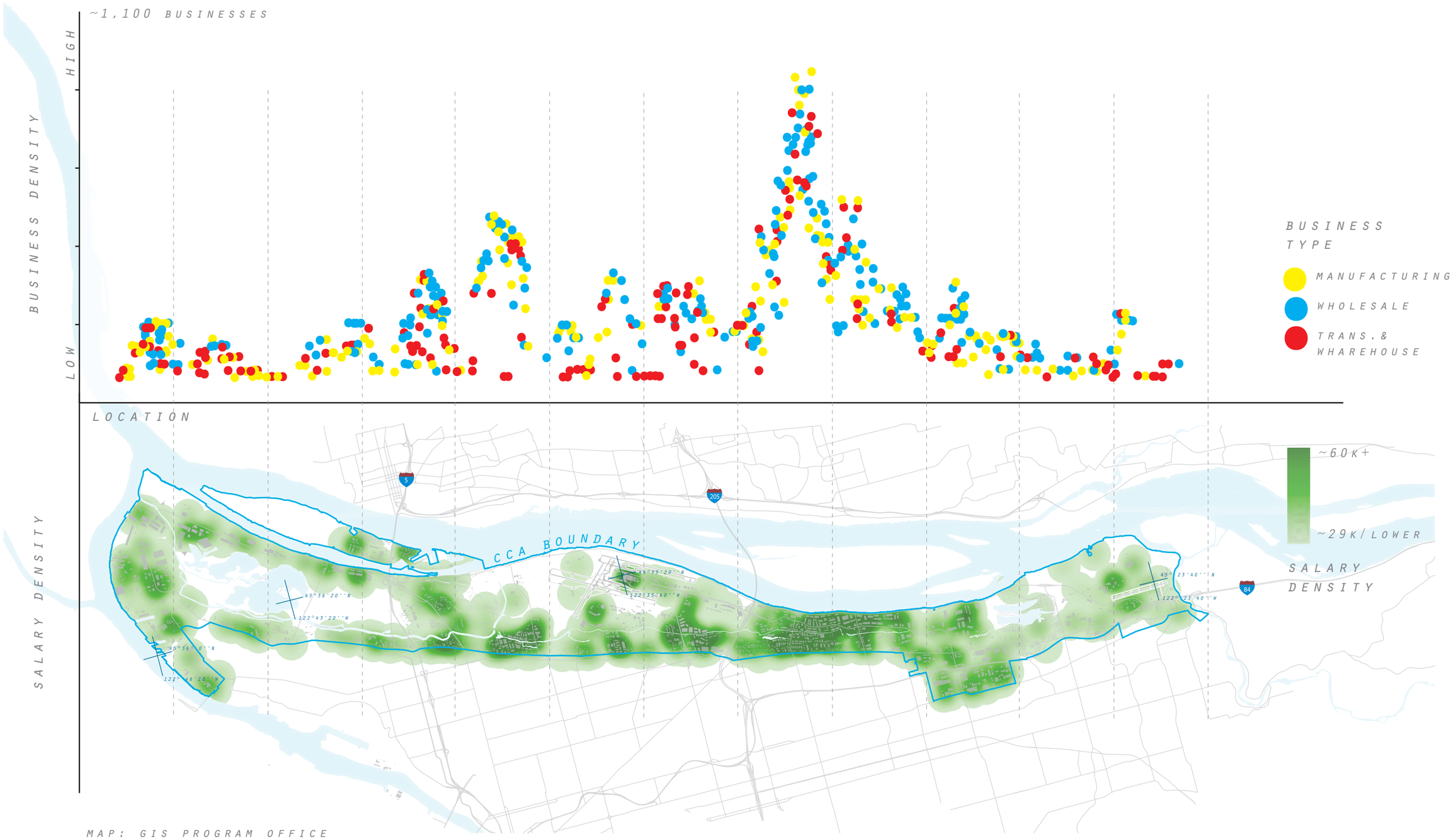
# Business Type and Density

All businesses
Manufacturing
Wholesale
Transportation

# BUSINESSES




MAP: GIS PROGRAM OFFICE

DATA SOURCE: OREGON EMPLOYMENT DEPARTMENT - 2011 QCEW

# MANUFACTURING

ESTABLISHMENTS PRIMARILY ENGAGED IN THE PHYSICAL OR CHEMICAL TRANSFORMATION OF MATERIALS OR SUBSTANCES INTO NEW PRODUCTS

~300 BUSINESSES

BUSINESS DENSITY

HIGH

LOW

LOCATION

SALARY DENSITY

EMPLOYEE SIZE

- 500-1000+
- 100-500
- 50-100
- 0-50

~60K+

~29K/LOWER

SALARY DENSITY

CCA BOUNDARY

45°36'20''N
122°43'20''W

45°35'20''N
122°35'40''W

45°23'40''N
122°33'40''W

45°34'40''N
122°46'20''W

5 205 84

MAP: GIS PROGRAM OFFICE

DATA SOURCE: OREGON EMPLOYMENT DEPARTMENT - 2011 QCEW

# WHOLESALE

ESTABLISHMENTS PRIMARILY ENGAGED IN WHOLESALING MERCHANDISE AND PROVIDING RELATED LOGISTICS, MARKETING AND SUPPORT SERVICES

~460 BUSINESSES

BUSINESS DENSITY

HIGH

LOW

LOCATION

EMPLOYEE SIZE

- 500-1000+
- 100-500
- 50-100
- 0-50

SALARY DENSITY

~60K+

~29K/LOWER

SALARY DENSITY

CCA BOUNDARY

45°36'20''N
122°43'20''W

45°35'20''N
122°35'40''W

45°36'0''N
122°46'20''W

45°23'40''N
122°33'40''W

5
205
84

MAP: GIS PROGRAM OFFICE

DATA SOURCE: OREGON EMPLOYMENT DEPARTMENT - 2011 QCEW

# TRANSPORTATION\WAREHOUSING

~330 BUSINESSES

ESTABLISHMENTS PRIMARILY ENGAGED IN TRANSPORTING PASSENGERS AND GOODS, WAREHOUSING AND STORING GOODS, AND PROVIDING SERVICES TO THESE ESTABLISHMENTS

BUSINESS DENSITY

HIGH

LOW

20 + BUSINESSES - CLASSIFICATION VARIES

EMPLOYEE SIZE

- 500-1000+
- 100-500
- 50-100
- 0-50

LOCATION

SALARY DENSITY

~60K+

~29K/ LOWER

SALARY DENSITY

CCA BOUNDARY

45°36'20''N
122°43'20''W

45°35'20''N
122°35'40''W

45°23'40''N
122°33'40''W

45°36'20''N
122°46'20''W

5 205 84

MAP: GIS PROGRAM OFFICE

DATA SOURCE: OREGON EMPLOYMENT DEPARTMENT - 2011 QCEW

# Business Surveys Summary

# Columbia Multi-Modal Corridor Study Firm Interviews

## Introduction

The Columbia Multi-Modal Corridor Study is a detailed analysis of traffic patterns, congestion points and known freight needs. To verify suspected problems and search for all potential solutions, we interviewed businesses in the Columbia Corridor. Ten firms were selected to complete a questionnaire and were subsequently interviewed regarding the content of their responses. The firms selected varied significantly in size from 20 local employees to over 1700 local employees, and represented diverse lines of business activities. Firms surveyed utilize the transportation system for similar reasons such as freight transportation, labor force mobility, and provision of services as they engage in commerce. The volumes and intensity of use vary greatly across the sample as does the timing of use over a 24-hour business cycle, due to the different natures of use, production schedules and shifts. Some firms have balanced inbound to outbound freight flows (by weight or truckload volume) while others do not have this option. The primary interviewer is adjunct faculty for the Portland State University School of Business Management and former freight logistics manager for Schnitzer Steel Industries.

All of the firms surveyed were located within the Columbia Corridor as defined by the industrial employment area along the north of Greater Portland: bordered by the Columbia River on the North, Columbia Blvd/Lombard/Sandy on the South, the Willamette Harbor on the west, and the Sandy River on the east. One of the firms surveyed included information for a plant site in the Rivergate Industrial area and a plant site adjacent to the Union Pacific Albina railroad yard, with the Albina site considered to be outside of the Columbia Corridor area of interest. The information provided is nonetheless insightful and useful for the survey.

For each business, we evalutated the company profile, recent trends in their transportation activity and their opinions on transportation and land use policy. Firms were asked questions concerning very specific aspects of transportation system functional efficiency and bottlenecks, as well as high-level questions regarding strengths, weaknesses, and overall policy direction with respect to transportation and land use in the region.

## Product & Services Classification of Firms

The firms surveyed classify their products and services using the following NAICS codes and descriptions:

212312 – Limestone

212399 – Fly Ash

311412 – Frozen Foods
327310 – Portland Cement
327320 – Ready-Mix Concrete Manufacturing
327331 – Concrete Block and Brick Manufacturing
327332 – Concrete Pipe Manufacturing
327390 – Other Concrete Product Manufacturing
327992 – Slag
332212 – Multi-Purpose Tools Manufacturing
336411 – Aircraft Manufacturing
336413 – Other Aircraft Parts and Auxiliary Equipment Manufacturing
484110 – General Freight Trucking, Local
484121 – General Freight Trucking, Long Distance, Truckload
484122 – General Freight Trucking, Long-Distance, Less Than Truckload
488510 – Freight Transportation Arrangement
492110 – Couriers and Express Delivery Services
493110 – General Warehousing and Storage
541380 – Design and Testing Laboratory
562111 - Local Solid Waste Collection Services
624310 – Vocational Rehabilitation Services

## Employment

The total number of full-time equivalent (FTE), locally-based employees represented by the ten firms surveyed is 3,722. This figure does not include the approximately 100 temporary associates employed by one firm on an ongoing basis, nor does it include the 360 long-distance truck driving employees who work for a company based in the study area. In the latter case, the aggregate FTE figure only includes those employees who report to the headquarters office/terminal on a regular/daily basis.

## Mass Transit

Firms surveyed reported a wide range of experiences with mass transit, ranging from no access in two cases to all employees having access in other cases, with various degrees of service and access adequacy in between. Of those that have access to transit, low rates of utilization are reported due primarily to proximity between employment site and nearest transit access point (and related issues of convenience and safety), as well as limited and infrequent service which is incompatible with production shifts and schedules. One survey respondent indicated that, in addition to transit access, they also have a carpool program.

One respondent noted a successful effort working with Tri-Met leadership to establish improved levels of service to their facility as well as to areas where their workforce resides:

> "PHC's commitment to transportation issues began because employees needed a way to get to work. Many people with disabilities do not drive, and even fewer own cars, making most employment situations problematic. Because the goal of PHCNW is to help people with disabilities to achieve independent living situations, the issue of transportation became a top priority. PHCNW leadership immediately identified TriMet as a valuable partner in helping to find a convenient, environmentally friendly way to get employees to work. PHC began collaborating with TriMet's leaders to seek out a way to include PHCNW's headquarters at 148th and Airport Way as a stop along an existing route. Now served on the 87 line via the Parkrose/Sumner Transit Center, PHC's lobbying efforts turned into a cost-effective, reliable method of transportation that ensured employees a way to get to work. PHC also managed to negotiate bulk purchasing rates on bus passes, giving employees stationed at Portland International Airport the opportunity to purchase passes directly from PHC at low cost. Additionally, the housing projects PHC developed are all transit-friendly to preserve the affordable nature within the transit network."

## Commodities and Transport Modes

The Columbia Multi-modal Corridor is home to extremely diverse firms using a wide variety of local and foreign suppliers and customers. The regional transportation system and infrastructure at the Port of Portland facilitates the economic linkages and global connectivity which allows producers and consumers in this region to participate in such a broad and varied market. Some examples of commodity movements discovered during the firm interviews include:

- A frozen foods producer sources produce and packaging locally, throughout the domestic US, and globally. Finished goods are distributed throughout the US by temperature-controlled truck and intermodal (truck to rail to truck) shipments.
- A building materials producer sources limestone rock from British Columbia, Canada by barge and ships ground limestone finished goods products to customers in Oregon, Washington, and California by truck and rail.
- An aircraft manufacturer/assembler sources aluminum, titanium, stainless steel, and electronic components as raw materials and produces finished aircraft assemblies. Both the raw materials and finished products are transported to/from throughout the US and globally using air freight, FTL (full truckload), LTL (less-than truckload), small

package/parcel, ocean vessel both FCL (full container load) and LCL (less-than full container load).

- A manufacturer of precast concrete products sources cement, sand, and gravel from local quarries and steel products from local suppliers in Oregon and Washington, although they occasionally receive some specialty steel wire from a supplier in Arizona. Outbound finished products are shipped throughout Oregon and Washington, frequently to remote locations in these states, and occasionally (although infrequently) to Idaho and Utah. This company uses truck transportation for all of their inbound raw materials and outbound finished goods.
- A trucking company specializes in transporting high-value raw materials and finished goods supporting "just-in-time" (JIT) and "lean" supply chains characteristic of the high tech manufacturing cluster. These commodities demand specialized equipment such as air-ride trailers, and a high level of service due to low levels of buffer inventory stocks in the supply chain and a tendency to not utilize warehousing. The company provides overnight service and real-time shipment tracking technology solutions to support customer requirements in this sector. Commodities transported are primarily imported from Asia into the four primary Western US metropolitan airports: Seattle, Portland, San Francisco, and Los Angeles, though most of their shipping volume derives from cargo delivered to San Francisco (SFO), where they can pick up cargo and deliver to Portland-area customers via their 12-hour overnight service.
- A manufacturer of multi-purpose tools and flashlights receives as raw materials steel coils, fasteners, metal cast parts, nylon & leather sheaths from Taiwan, Hong Kong, China, India, Portugal, and Mexico. Finished goods are exported worldwide through distributors who control the transportation arrangements. Thus, the finished goods pass through many export gateways. This manufacturer utilizes many modes of transportation for both raw materials and finished goods: air freight, truck of varying size, rail intermodal, and ocean container.
- A trucking company transports general merchandise, foodstuffs, paper, consumer commodities, using their substantial fleet of dry van equipment. Their largest customer is a major retailer accounting for approximately 40% of their business volumes. They operate mostly in Washington, Oregon, California and Arizona along the I-5 corridor using their own assets, although approximately one-half of their total business volumes is in truck brokerage or logistics. TWIC regulations and border crossing issues with respect to truck drivers make it difficult to engage in international business (Canada, Mexico, and operations at port terminal facilities), so they do not engage in import/export-related business directly. They are involved in some domestic intermodal shipping, primarily truck to rail, although they are engaged in some truck to marine domestic intermodal shipments to Alaska. Their business growth and expansion to new

traffic lanes, including intermodal business, has been primarily driven by their large retail customer account – they go where their customer needs them to go and have grown their business this way.

- A testing laboratory and proving ground receives prototype materials handling products and related components for assembly, comparative testing, research and development, and design work. These arrive from throughout the US and globally/internationally, depending on specific projects, including from: Illinois, Kentucky, Alabama, India, Germany, Japan, and Canada. Transportation is primarily by truck and small package carrier with some use of air freight although a particularly large machine may occasionally arrive by rail to the local railhead where it is reloaded to heavy haul truck for delivery to the proving ground. Project timing and lead times tend to drive required service levels when procuring transportation: service is a greater consideration than cost.
- A provider of vocational rehabilitation services – in addition to the transportation issues surrounding the mobility of a large, complex, and diverse workforce – transports paper, aluminum (extrusions), electronic components, apparel components, and a variety of other products through clearinghouse activities. These are transported to and from the Portland area to a wide range of domestic locations, most notably New Jersey and California, in addition to shipments supporting local activities, using common (truckload) carriers.
- A local solid waste collection service collects waste and recycling products from households and businesses by truck such as: municipal solid waste, yard debris, plastics, metals, pulp and paper products. A third party engages in the disposition and trade of recyclable commodities collected.

## Shipping Volumes

This small sampling of firms represents annual shipping volumes exceeding 6.6 billion lb of cargo. While most firms report no current initiatives underway or future plans to shift transportation modes, three respondents indicated modal changes are underway: a frozen foods producer has shifted some truck volumes to rail intermodal over the last year; an aircraft manufacturer/assembler is in the process of moving some freight volumes from air cargo to ocean cargo; and a multi-purpose tool manufacturer is in the process of shifting modes in shipment of inbound raw materials from less-than truckload mode to rail intermodal using a local third party reload/intermodal terminal company.

## Corridor Gateways

Survey respondents were asked which corridor gateways their firms use as primary access points into and out of the region: interstate freeways I-5/I-205 and I-84, intercontinental railroads Union Pacific and Burlington Northern Sante Fe, Portland International Airport (PDX), and the marine transportation system. Four firms used only the interstate freeway system as corridor gateways they directly accessed (though they acknowledged a hand-off from other modes and gateways in the supply chain before or after their chain of possession) while three firms used the freeway system and PDX for air cargo. For the remaining three respondents, one shipper uses freeways, railroads, and the marine system; another uses PDX for air cargo, ships some volume via rail intermodal, and makes heavy use of the freeway system; another respondent uses the freeway system, rail to truck intermodal, PDX for air freight, and ships some containerized ocean freight.

Other comments shippers made included issues of congestion and labor disputes at the ports in Los Angeles, and how strategic supply chain decisions are made specifically to avoid use of the LA/Long Beach ports for this reason, thus routing freight through other gateways such as Portland, Seattle, and Oakland. One respondent indicated that they transport a significant amount of expedited air cargo freight volumes from San Francisco's airport (SFO) to the Portland area due to the number, variety, and frequency of flights calling on that airport. In many cases respondents indicated that Portland is limited by the number of carriers calling on its international air cargo terminals/airport and marine terminals: much freight enters and exits the United States as import/export gateways in places other than Portland – though the value-added manufacturing occurred here – for this reason.

## Port of Portland

Firms responding to the survey were asked to describe and estimate the frequency of use (if any) of the Port of Portland's marine and/or airport, to include passenger business travel and cargo facilities, and how their business would be affected absent these amenities. Generally, firms responded very strongly that the airport is an important business amenity, adding to the value of the business environment by providing a convenient and efficient service, even when they noted their own low rates of utilization. Firms used terms to describe the airport like, "provides for added administrative efficiency," and "improves employee productivity." Frozen food producer Ajinomoto, a heavy user of PDX for business passenger travel both for employees traveling to see customers and for frequent out of town guests flying in to tour Ajinomoto's Portland facility, commented that the Port's facilities help them to be effective in their current business, but also serve as a capacity and capability basis upon which to plan future business.

Respondents considered business conditions absent the Port of Portland's facilities, noting the necessity to alter gateways, increased lead times, and transit delays related to freight shipments, and less convenient, inefficient passenger service and other hardships related to reduced access to markets, suppliers, materials, and components. Leatherman Tools, a producer of multi-purpose tools, addressed in particular how not having access to local facilities such as PDX and the Port's Marine Terminal 6 would affect their business operations: the Port of Portland's facilities reduces Leatherman's lead times. In lieu of these facilities they would be required to carry additional inventory to compensate for longer lead times and avoid manufacturing delays and downtime. This additional inventory would negatively impact Leatherman's financial performance and competitive position.

## Columbia River Crossing

Firms were asked how they have responded to congestion at the Interstate 5 Columbia River Crossing. Where feasible, both shippers and transportation companies have adjusted operating practices to avoid the predictable peak congestion times and most congested areas of the system in order to maintain higher levels of productivity. Transportation companies make use of dynamic routing technology and real-time information to avoid congested areas, and shippers adjust shipping hours where practicable, although most shippers simply maintain traditional shipping and receiving hours and allow for exceptions by prior arrangement, incurring overtime as necessary to load and unload late-arriving trucks. Some shippers have realigned warehousing and distribution functions, consolidating them to conserve fuel, reduce handling, and create more favorable traffic routing patterns to avoid peak congestion areas and times. Some have shifted towards off-peak shipping and receiving hours, although this requires changes in operational practices, and is becoming increasingly more difficult to do as regulatory changes to truck driver hours of service rules cause a driver's day to become less flexible and more structured/proscribed.

The general sentiment towards the Columbia River Crossing project is that respondents would appreciate the reduced congestion, productivity and efficiency gains that are expected to result from the project. Trucks can't get in as many turns or loads per day as they once could due to the effects of congestion – consider the productivity level of a fleet of ready-mix trucks – thus requiring a larger number of trucks and drivers to accomplish the same amount of work (as measured by volume of freight moved in a single business day, for example). A growing shortage of qualified truck drivers will likely exacerbate this problem into a full-blown crisis, creating significant inflationary pressures. The effect of congestion is not just on the movement of freight, goods, and material inputs to production, but also on the labor force: employees are frequently late to work and it takes them longer to get to and from work as a result of the congestion, negatively impacting their quality of life and productivity.

A large trucking operation located near the I-5 Columbia River Crossing noted that congestion is a problem that is a drag on productivity, wastes fuel and energy, and generates unnecessary pollutants, but their business model does not provide for an obvious way of working around peak time congestion at the Columbia River Crossing as they cannot precisely time the arrival of their long-haul truck drivers into the area around peak congestion times: the trucks arrive when they arrive. Due to their location they are constrained to approach their facility via the I-5 Columbia River Crossing influence area regardless of congestion conditions. The same is true for a solid waste collection service due to the hours within which they must operate: they are constrained to operate in congested areas during peak congestion times and it is simply infeasible to do otherwise.

Many respondents also indicated congestion at the other Columbia River Crossing: I-205 and Airport Way. For firms located in this area or who use it heavily as a shipping corridor the frequent congestion and delays are just as frustrating and productivity-killing as are those found in the influence area of the I-5 Columbia River Crossing.

## Regional Transportation System

In this next section, respondents were asked about perceived strengths and weaknesses of the region's transportation system, in particular identifying key system bottlenecks (if any). Without exception, firms noted the Portland region's geographical endowments: deep water connecting the region to the ocean and marine transportation, including inland waterways; the significant presence of two transcontinental railroads; the confluence of two major interstate freeways, a north-south freeway connecting Canada and Mexico, and an east-west freeway connecting Portland to the eastern seaboard; a major international airport and air cargo facilities; and a petroleum pipeline terminus and storage hub. Respondents acknowledged that relative to other major metropolitan areas Portland's traffic congestion seems to be less severe. Additionally, respondents who were shippers appreciated the region's robust modal representation and equipment availability, while those who were transportation companies appreciated the region's location with respect to other major metropolitan areas (the ability to get to Seattle and back within one working day, San Francisco and back within two working days, and so forth). One respondent expressed the viewpoint that Portland's approach to mass transit (light rail systems) is very forward-thinking, and that the region's urban growth boundary, though a controversial approach to land use management, functions to keep the region compact and efficient, noting that sprawl creates congestion, and further that economic activity results in traffic (i.e. economic activity and levels of traffic are positively related).

Respondents were very forthcoming in expressing what they viewed as shortcomings of the regional transportation system and areas where potential bottlenecks exist. These were:

- Infrastructure disrepair and lack of investment, particularly in the I-5 corridor, where much renovation and investment is needed. Truck operating costs are increasing due to

road conditions and congestion/low productivity. The resulting longer lead times compounded with regulatory changes like driver hours of service are impacting business costs and productivity.

- Within the Columbia Corridor access points to the interstate system require improvement.
- Truck congestion within the Portland metro area and limited potential for expanding freeway capacity. Key bottlenecks seem to be along the I-5 system at Hwy 99, I-84, and the Columbia River Crossing. These are impacting trucking operation productivity levels as they cannot make as many turns/get in as many trips within a driver's workday as congestion worsens.
- The location of the Portland container port is difficult to access.
- There are an insufficient number of bridges over the Columbia River and not enough expressways connecting I-5 and I-205 (East-West corridors/connectors): I-84 and SR-14 in Washington State are too congested to serve as effective East-West connections between I-5 and I-205.
- The bottleneck between 60th & I-205 on Columbia Blvd, in particular where the road width narrows from 2 lanes each direction to 1 each direction and at the signal at 82nd Avenue.
- Congestion and operational inefficiency at the I-205/I-84 interchange as well as increasing congestion along I-205 between the airport and Tualatin as Clackamas County continues to experience growth.
- Too many ill-timed traffic lights and the region would benefit from more ITS. For example, 122nd: a large street, but anytime a cross street is added a signal is added that is not in synch with the others.
- Tualatin-Sherwood Road should be 4 lanes all the way (between I-5 and Highway 99).
- A bypass from Wilsonville to 185th is needed.
- The Boone Bridge is a significant regional bottleneck: there aren't enough river crossings and anytime there is a problem or accident around this bridge it shuts the region down (due to lack of redundancy).
- I-84 and I-5 interchange is a significant bottleneck.
- The Vista Ridge Tunnel (US 26): poor design makes this a bottleneck because it is sight-limited…people cannot see around the corners and so slow down naturally whether there is traffic or not. I-84/I-5 has a similar problem at the intersection due to the sharp corners.
- Bottleneck related to light rail at Airport Way and 82nd: as MAX passes traffic for 82nd queues. After MAX passes, signals give priority to Airport Way traffic instead of clearing the 82nd Avenue queue immediately.
- Issues with I-84 weather closures.

- I-205 and Airport Way congestion issues.
- The congestion through downtown Portland and the Columbia River Crossing are problems.
- In the Columbia Corridor, East-West access is inadequate: Marine Drive is unsafe with the number of accidents.
- Trucking industry is continually getting pushed out farther and farther due to land use decisions, transportation system access, and congestion issues (and unwanted): but where do you go from here? Notes that FedEx opened large terminal in Troutdale, but that adds a lot of additional miles to routes, more fuel consumed, more emissions, etc.
- Commented on the CRC Marine Drive Plan, noting that the planned loop adds one-half mile to access Jubitz to preserve a dog park and asking if it was computed how much additional fuel would be consumed/how many additional emissions to facilitate the preservation of the dog park.
- Columbia River Crossing bottleneck and related congestion.
- Marine Drive, particularly under winter driving conditions of ice/fog, is dangerous.
- I-84/I-205 interchange is congested/inefficient.
- Congestion through Damascus/Rock Creek business district.
- US26 through Gresham.
- 238th & Halsey – McMenamins concerts generate significant traffic bottlenecks.
- Any additional traffic burden that may be diverted or added onto 223rd, a facility which is already insufficiently designed to safely support its present operational burden.
- The region lacks access to rail and rail connections.
- Concerned most with the impact of traffic congestion as their operation is primarily characterized by the mobility of the labor force, although congestion also increases transport times for components and materials.
- The system bottlenecks are the weaknesses: the Columbia River Crossing doesn't solve all of the problems though it needs to happen – it is an economic necessity because of the bottleneck it creates.
- US 26 Vista Ridge Tunnel is a significant East/West bottleneck.
- I-205/Lombard/Sandy and I-205/Airport Way are severely congested at times.
- The Columbia Corridor seems to works pretty well…there are far worse areas.
- I-84 creates a large bottleneck backing up onto I-5 and has only one through lane in the center of downtown Portland – is referring to the area between the Rose Garden and the Marquam Bridge.

## Policy Environment

Finally, we asked respondents what improvements could be made from a physical, policy, or regulatory standpoint. Responses varied greatly across the ten firms surveyed:

- Shouldn't just look at bottlenecks, should look at corridors. For example, looking at the functionality of the I-5 system from OR/WA (Columbia River Crossing) to south of Portland.
- Increase the capacity of I-5 within the Portland metro area.
- Limit regulation of waterfront industries to reasonable and meaningful items. There are trivial shoreline tree planting landscaping requirements stipulating species and density without respect to whether or not the trees will actually survive.
- A Westside by-pass would help with congestion.
- If a business fails on river-dependent lands there is pressure to redevelop the land in some other use such as hotels, condos, etc.
- Railroad anti-competitive behavior: railroads are cutting service days, burdening industries with track capacity and storage issues, and shifting the capital burden associated with ownership of railroad cars to customers (customers must buy or lease their own railroad cars) – and railroads assess storage charges on privately-owned or leased cars on their lines.
- The Port of Portland container port only has a limited number of major steamship lines calling requiring importers/exporters to use other West Coast port facilities.
- Restore direct flights from Portland International Airport to Western Europe with a major airline.
- Tolling: a respondent's corporate office is in another state where there are many toll roads. They can't understand why there is so much consternation over tolling in the Northwest.
- Deployment of more ITS in key corridors such as Columbia Blvd.
- New signal at Cornfoot and Alderwood that is not working efficiently.
- Columbia and MLK frequently back up sufficiently such that access to businesses along Columbia is obstructed.
- Illegal camping on Grand Avenue near the Econolodge and activities of transients in the area including trespassing, property damage, metal theft, and breaking and entering. What is the City doing to help the homeless so they're not impacting business operations negatively?
- Cornfoot Road access is inefficient for trucks to get to air cargo terminal.
- Portland airport policy favors passengers over air cargo.
- Zoning at certain properties near the airport severely restrict land use and possibilities for business expansion, growth, and revenue opportunities.

- Columbia River Crossing project needs to be resolved and started.
- Oregon is the only state with a weight-mile tax and it seems like this is inefficient with Oregon having to send its auditors to trucking companies throughout the US to assure they are correctly reporting and paying weight-mile taxes to Oregon. Do receipts exceed administrative expenses? What do other states do?
- Significant disconnect between local municipal leadership as Fairview, Wood Village, Troutdale, and Gresham each work within their respective silos on various major economic development initiatives that would have major land use and transportation impacts on industry in the region. As examples, the USS Ranger project and site selection of a casino in the area would impose substantial system costs/externalities on industrial facilities.
- The City does not do well at managing roadway improvements and maintenance such as paving. There are policy constraints, particularly with respect to funding: there are no funds to widen roadways, and this is unpopular. Transit is encouraged in policy (even though many industries' employees don't have access to it). Does transit function efficiently to get people to work on time?

## Conclusion

Industries in the Columbia Corridor are diverse: firms range from very small in terms of both number of employees and freight volumes to very large by these same measures. Some are very capital intensive manufacturing industries, while others classify as labor-intensive service sector businesses. The variance in viewpoints with respect to the regional transportation system should not be surprising. Each firm's perspective is driven by the ways in which they interact with the system: the gateways and corridors used, predominant transportation modes, and so forth.

It is clear that congestion affects firm performance and generates compensating practices and behaviors and that there is a cost involved in this. It also seems clear that, regardless of the predominant transportation mode a firm employs, there are strong linkages to the freeway and roadway systems, as these are typically the "last mile" connections for freight to connect to other modes and the principal conveyance for the labor force to access their worksite. Respondents also made it evident that the Port of Portland's facilities are a valuable regional economic amenity, providing infrastructure and a capabilities basis upon which firms in the region can count upon to base their own growth.

One of the factors increasing freight congestion on the highways is the reliance of import/export gateways in California and Washington. Increased economic activity in Oregon should lead to improved gateways in Oregon. However, that same increase in economic activity will also lead to more highway traffic, if only for the last mile of delivery.

# Miscellaneous Maps and Data

## 2010 Columbia Corridor Industry Demographic

| Industry | Sum of TOTPAY | Sum of AVGEMP | AVG PAY | % of total |
|---|---|---|---|---|
| Manufacturing | $696,982,800 | 13,544 | $51,461 | 21% |
| Transportation and Warehousing | $524,533,505 | 11,671 | $44,943 | 18% |
| Wholesale Trade | $389,121,903 | 7,541 | $51,601 | 12% |
| Retail Trade | $187,630,509 | 6,211 | $30,209 | 10% |
| Accommodation and Food Services | $79,655,057 | 4,268 | $18,663 | 7% |
| Administrative and Support | $102,594,272 | 3,509 | $29,237 | 5% |
| Construction | $182,452,648 | 3,173 | $57,502 | 5% |
| Other Services | $96,933,875 | 2,451 | $39,549 | 4% |
| Finance | $149,412,189 | 2,447 | $61,059 | 4% |
| Public Administration | $123,258,479 | 2,416 | $51,018 | 4% |
| Professional Services | $111,490,077 | 1,750 | $63,709 | 3% |
| Health Care | $61,192,842 | 1,598 | $38,293 | 2% |
| Real Estate | $53,363,581 | 1,340 | $39,824 | 2% |
| Management | $71,883,482 | 945 | $76,067 | 1% |
| Agriculture | $24,668,636 | 792 | $31,147 | 1% |
| Recreation | $13,328,577 | 557 | $23,929 | 1% |
| Educational | $17,886,269 | 479 | $37,341 | 1% |
| Information | $26,094,199 | 422 | $61,835 | 1% |
| Utilities | $17,920,888 | 224 | $80,004 | 0% |
| Other Misc. | $246,179 | 6 | $41,030 | 0% |
| Mining | $10,940 | 1 | $10,940 | 0% |
| **Grand Total** | **$2,930,660,907** | **65,344** | **$44,850** | 100% |

**% CCA Jobs to MSA**
8%

## CCA compared to Portland Metro

***MTWWT = Manufacturing, Transportation, Warehousing, and Wholesale Trade***

| | Payroll | # jobs | Avg Pay | % jobs to Corridor | % jobs to total MSA | % jobs to Portland MTWWT |
|---|---|---|---|---|---|---|
| **CCA - MTWWT** | $1,610,638,208 | 32,756 | $49,171 | 50% | 4% | 19% |
| **CCA - All Jobs** | $2,930,660,907 | $65,344 | $44,850 | 100% | 8% | |
| **Portland Metro** | $39,693,881,261 | 832,891 | $47,658 | | | |
| **Portland MTWWT** | $10,982,256,647 | 168,930 | $65,011 | | | |

**Porland MTWWT**

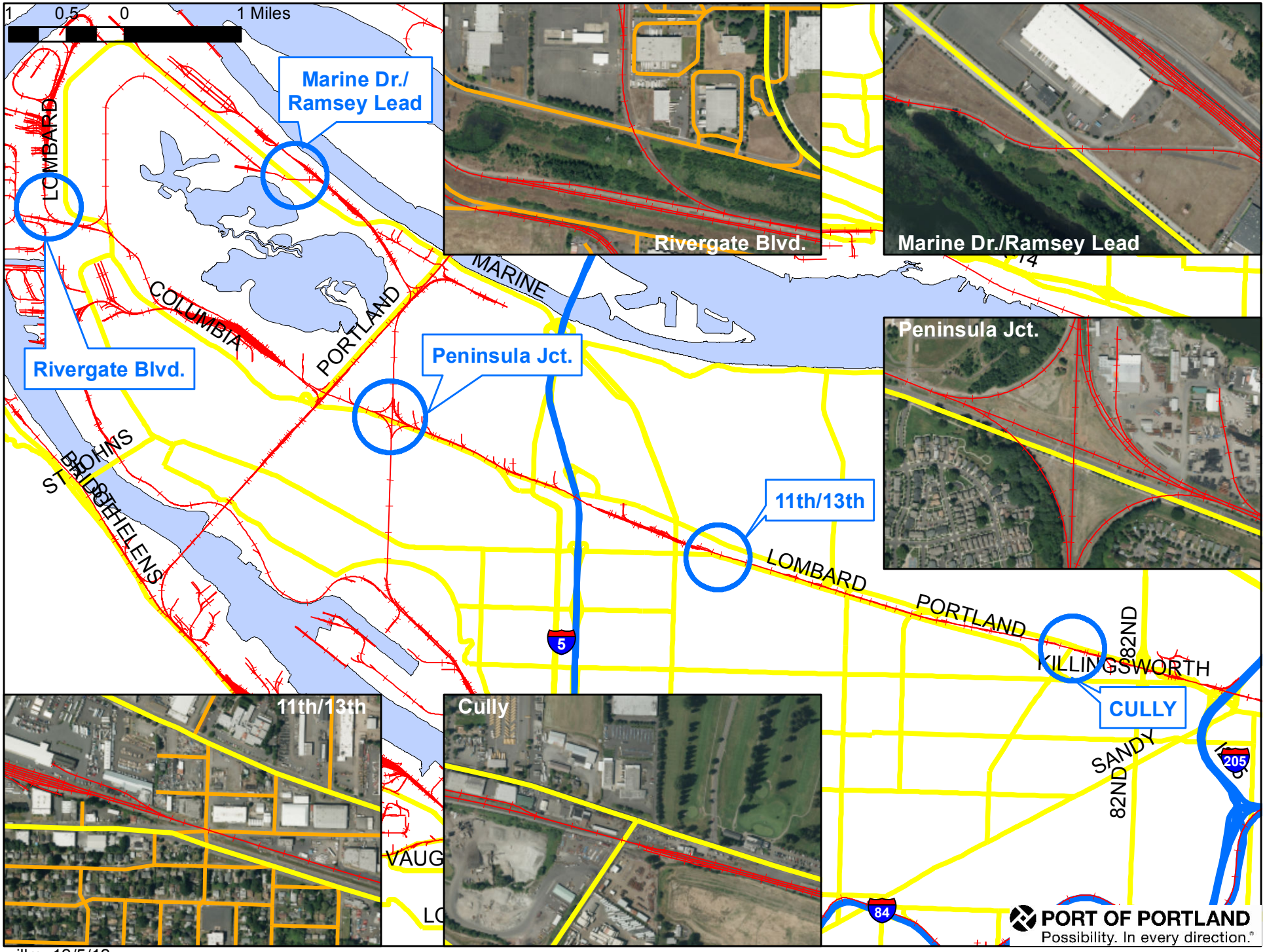
| | Payroll | # jobs | Avg Pay |
|---|---|---|---|
| Manufacturing | $6,432,083,492 | 94,918 | $67,765 |
| Wholesale Trade | $3,422,122,923 | 47,455 | $72,113 |
| Trans Warehousing | $1,128,050,232 | 26,557 | $42,477 |
| **subtotal** | **$10,982,256,647** | **168,930** | **$65,011** |

Portland MTWWT to Total METRO
20%

**NOTE: Manufacturing, Transportation, Warehousing, and Wholesale Trade*

**Summary Bullets**

There are more than 2,600 business in the CC employing over 65,000 people with an average wage of $45k a year; This is roughly 8% of the entire metro employmen
50% of the jobs in the CC fall within the Manufacturing, Transportation, Warehousing, and Wholesale Trade industries (MTWWT)
MTWWT wages in the CC average $49K / year; This is higher than the average wage for all jobs in the Portland MSA of $47.5k / yea


1 0.5 0 1 Miles
Marine Dr./
Ramsey Lead
Rivergate Blvd.
Peninsula Jct.
11th/13th
CULLY
LOMBARD
PORTLAND
MARINE
COLUMBIA
PORTLAND
ST HELENS
KILLINGSWORTH
82ND
SANDY
VAUG
5
84
205
Rivergate Blvd.
Marine Dr./Ramsey Lead
Peninsula Jct.
11th/13th
Cully
PORT OF PORTLAND
Possibility. In every direction.

willm, 12/5/12

## 2014-15 REGIONAL FLEXIBLE FUND ALLOCATION

## PROJECT SUMMARY

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# CATHEDRAL PARK WHISTLE FREE ZONE

# -BRADFORD STREET RAIL REALIGNMENT-

1. Project sponsor agency:

   Port of Portland and City of Portland

2. Project extent or area description and how you identified the location as a priority:

   The total project area is the co-mingled right-of-way of the City of Portland's N. Bradford Street and the Union Pacific Railroad's St. Johns Lead rail line within the Cathedral Park neighborhood of North Portland. The total length of the full whistle free zone project area is approximately 3,340 feet in length. This funding request will complete the first phase of the project which encompasses approximately 1,900 feet in length. The rail realignment would begin under the St. Johns Bridge and end approximately 200 feet north of St. Louis Avenue.

   The Port and City have been working with the Cathedral Park Neighborhood Association since at least 2004 to refine the project area and scope. This first phase of the project was chosen as it significantly impacts freight mobility and is the linchpin of a future whistle free zone. Other roadway alternatives to separating the train traffic from other modes impact the North Portland Greenway trail alignment and the Baltimore Woods area.

3. Purpose and need statement (highlight most relevant criteria):

   North Bradford Street is a City of Portland Freight District Street that provides access to multiple industrial businesses. The St. Johns rail line connects Union Pacific Railroad's (UPRR) Barnes and Albina Yards. The St. Johns Lead provides train access to the Port's Terminal 4 and other rail served businesses in the Portland Harbor.

   Currently the St. Johns Lead rail line runs down the center of N. Bradford Street. Freight trains occupy the same street space with trucks, cars, bikes, and pedestrians. This situation creates safety concerns, degrades freight mobility, and increases train horn noise. Train horn noise, particularly at night time, is a constant problem for the community and complaints are ongoing.

   The project is within an area that has a medium density of elderly and disabled residents, a medium density of low income, minority, and Hispanic residents, a significant Black population, and a significant American Indian/Alaska Native population. The median household income is 82% of Multnomah County as a whole and the median per capita income is only 70% of Multnomah County as a whole.

Upon project completion the St. Johns Lead will operate within its own track ballast area. North Bradford Street will be physically separated from the railroad tracks by a barrier and will function as a two way truck street. The project focus is to construct improvements necessary to improve mobility for freight and other modes and also to improve livability for the surrounding community by creation of a railroad whistle free zone. The project will mitigate an adverse EJ impact (for noise), with respect to lower income and minority populations.

This project is an effort by the City and the Port to implement freight mobility and community livability strategies for the Cathedral Park neighborhood. To create a truly sustainable working waterfront city, it is imperative to find ways to maintain jobs, move freight, and improve the livability of neighborhoods. This project accomplishes all three of those goals.

4. Description of project design elements:

The project will relocate the UPRR's St. Johns Lead out of the travel way of North Bradford Street. The original concept plan [Cathedral Park Rail Realignment Study, HDR Inc., 2006] proposed relocating the track 10 feet to the west. The concept plan was updated in 2009 through consultation with UPRR and now calls for relocating the railway approximately 19 feet to the west of its current location within North Bradford Street. This will place a new track in the location of an existing disconnected track. In order to achieve this amount of lateral relocation within North Bradford Street approximately 1900 feet of track relocation will need to occur, beginning just south of the St. Johns Bridge (to the south) and ending at the Toyota yard (to the north) at Terminal 4.

The new alignment for the track will require removing pavement and replacing it with ballast. The areas of the roadway where track is removed will be repaved. A concrete barrier will be installed to separate the roadway from the train tracks so that it will not be physically possible for motor vehicles to enter into the track bed. This is a critical piece to improve safety. Upon project completion, the St Johns Lead will operate within its own track ballast area. North Bradford Street will be physically separated from the track by a barrier and will function as a two-way roadway.

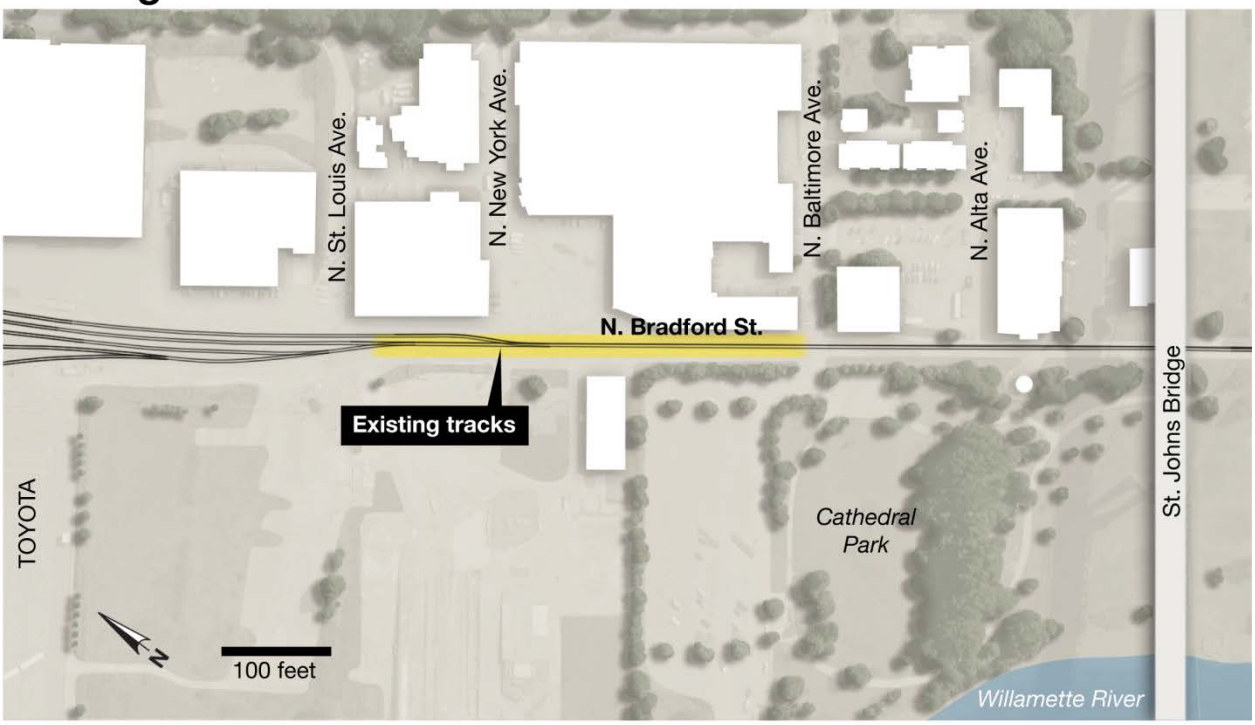
5. Please attach a map of project area.

Project (and location) map attached.

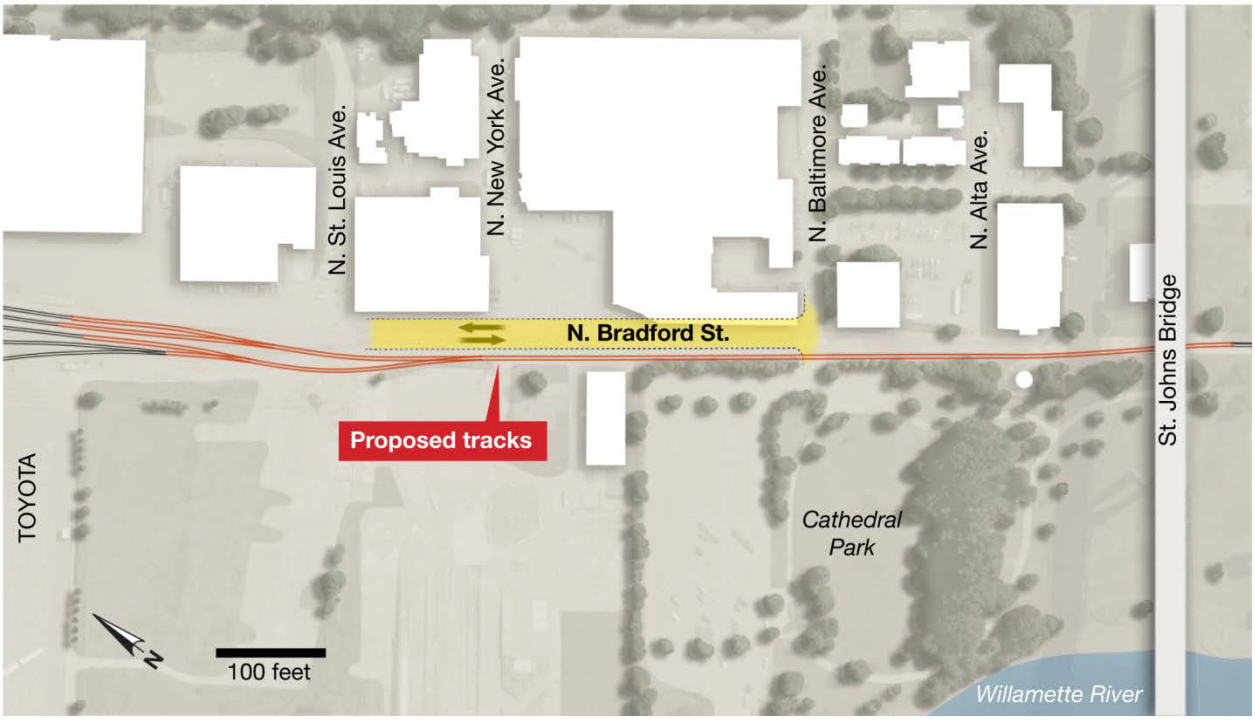
6. Please provide an estimate of total project cost and the funds you are requesting for the project.

The estimated project cost is $2.5 million. The requested funds are $2.363 million.

## Existing

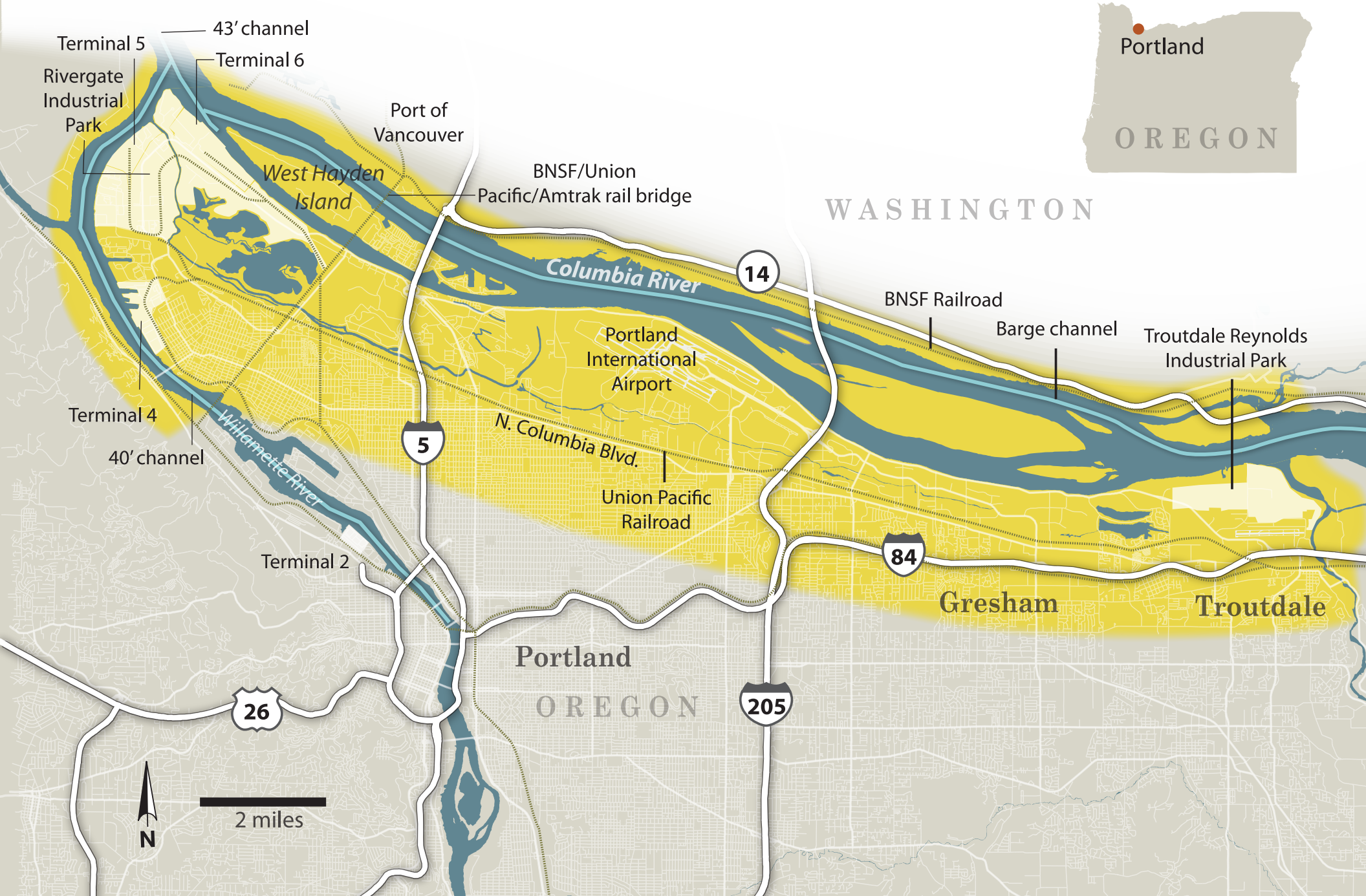


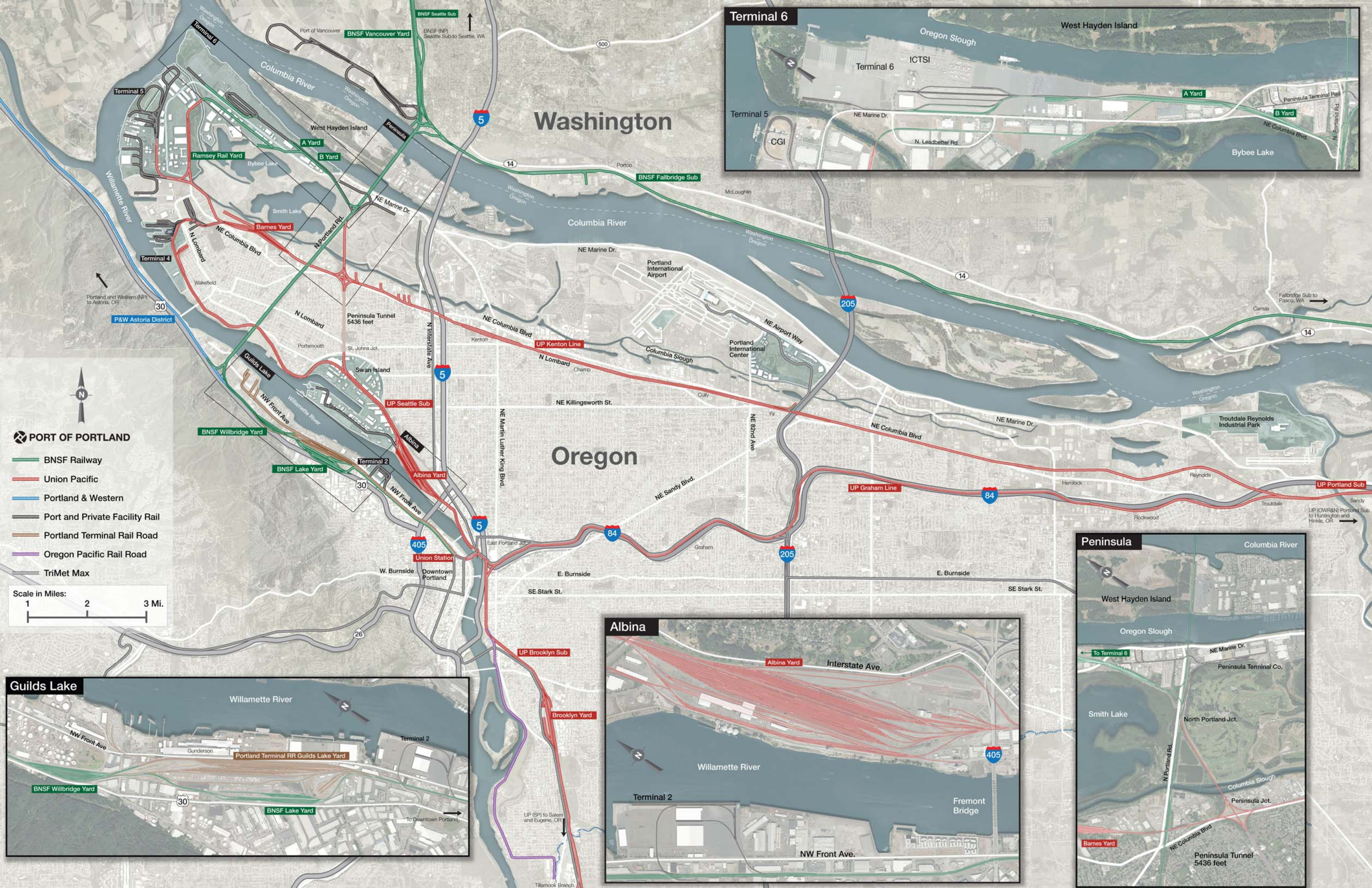

## Proposed



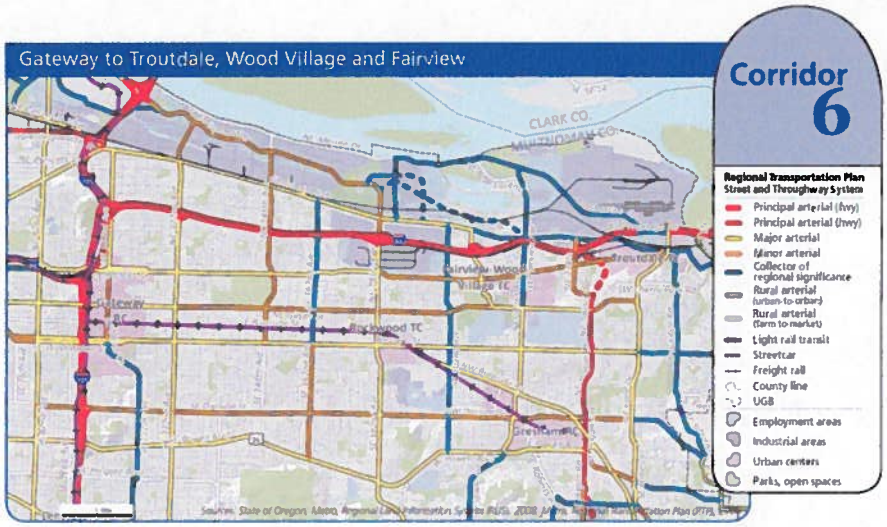

T6
T5
T4
T2
WASHINGTON
OREGON
Columbia River
Willamette River
Portland
Project site
14
205
5
84
— Union Pacific
— Burlington Northern Santa Fe
N
1 mile

# Columbia Multimodal Corridor




Terminal 6
West Hayden Island
Oregon Slough
ICTSI
Terminal 6
A Yard
Peninsula Terminal Rail
Terminal 5
NE Marine Dr.
B Yard
N. Portland Rd.
CGI
N. Leadbetter Rd.
NE Columbia Blvd.
Bybee Lake
Washington
Oregon
Terminal 6
Terminal 5
Terminal 4
Terminal 2
Columbia River
Willamette River
BNSF Seattle Sub
BNSF (NP) Seattle Sub to Seattle, WA
Port of Vancouver
BNSF Vancouver Yard
West Hayden Island
Peninsula
A Yard
B Yard
Ramsey Rail Yard
Bybee Lake
Smith Lake
Barnes Yard
NE Marine Dr.
N Portland Rd.
N Lombard
NE Columbia Blvd
Wakefield
Portland and Western (NP) to Astoria, OR
P&W Astoria District
Portsmouth
St. Johns Jct.
Peninsula Tunnel 5436 feet
N Interstate Ave
Guilds Lake
NW Front Ave
Willamette River
BNSF Willbridge Yard
BNSF Lake Yard
UP Seattle Sub
Albina
Albina Yard
Terminal 2
Union Station
W. Burnside
Downtown Portland
East Portland Jct.
Portco
McLoughlin
BNSF Fallbridge Sub
Kenton
Swan Island
Champ
Cully
Fir
UP Kenton Line
Columbia Slough
Portland International Airport
Portland International Center
NE Airport Way
NE Killingsworth St.
NE Martin Luther King Blvd.
NE 82nd Ave
NE Sandy Blvd.
Graham
UP Graham Line
UP Brooklyn Sub
Brooklyn Yard
UP (SP) to Salem and Eugene, OR
Tillamook Branch
E. Burnside
SE Stark St.
Fallbridge Sub to Pasco, WA
Camas
Troutdale Reynolds Industrial Park
Hemlock
Reynolds
Rockwood
Troutdale
Sandy
UP Portland Sub
UP (OWR&N) Portland Sub to Huntington and Hinkle, OR
Washington
Oregon
500
14
30
26
5
205
84
405
PORT OF PORTLAND
BNSF Railway
Union Pacific
Portland & Western
Port and Private Facility Rail
Portland Terminal Rail Road
Oregon Pacific Rail Road
TriMet Max
Scale in Miles:
1
2
3 Mi.
Guilds Lake
Willamette River
NW Front Ave
Gunderson
Terminal 2
Portland Terminal RR Guilds Lake Yard
BNSF Willbridge Yard
BNSF Lake Yard
To Downtown Portland
Albina
Albina Yard
Interstate Ave.
Willamette River
Terminal 2
Fremont Bridge
NW Front Ave.
Peninsula
Columbia River
West Hayden Island
Oregon Slough
To Terminal 6
NE Marine Dr.
Peninsula Terminal Co.
Smith Lake
North Portland Jct.
N Portland Rd.
Columbia Slough
Peninsula Jct.
Barnes Yard
NE Columbia Blvd
Peninsula Tunnel 5436 feet

## Mobility Corridor 6: Gateway to Troutdale, Wood Village and Fairview




### *Corridor Summary*

The Gateway to Troutdale mobility corridor includes sections of **I-84** and MAX light rail. I-84 provides interstate travel and interregional access to the Portland International Airport, the Columbia Gorge, and points beyond. The MAX blue line connects Gateway regional center and Portland central city to Gresham regional center. The key parallel arterials include **Marine Dr, Sandy Blvd, Halsey St, Glisan St, Division St,** and **Powell Blvd.** The local street network is generally discontinuous, with many dead end streets.

### *Where Are We Now?*

Currently three regional facilities in this corridor have coordinated signal timings updated within the last five years: SE Division St, SE Powell Blvd and NE Sandy Blvd. Transit signal priority is located at select traffic signals along SE Division St and SE Powell Blvd. Communications infrastructure exists along segments of SE Division St, SE Powell Blvd, NE Airport Way, and E Burnside St. The segment of I-84 through this corridor is generally equipped with cameras, ramp meters, detection, and communication equipment.

The Gresham Regional Center TMA works with employers, employees, and residents to reduce drive-alone trips. Additionally, the TMA runs a Bike Program which conducts safety outreach, gives away helmets and installs bike racks. The City of Gresham has begun to implement a city-wide bicycle way-finding program.

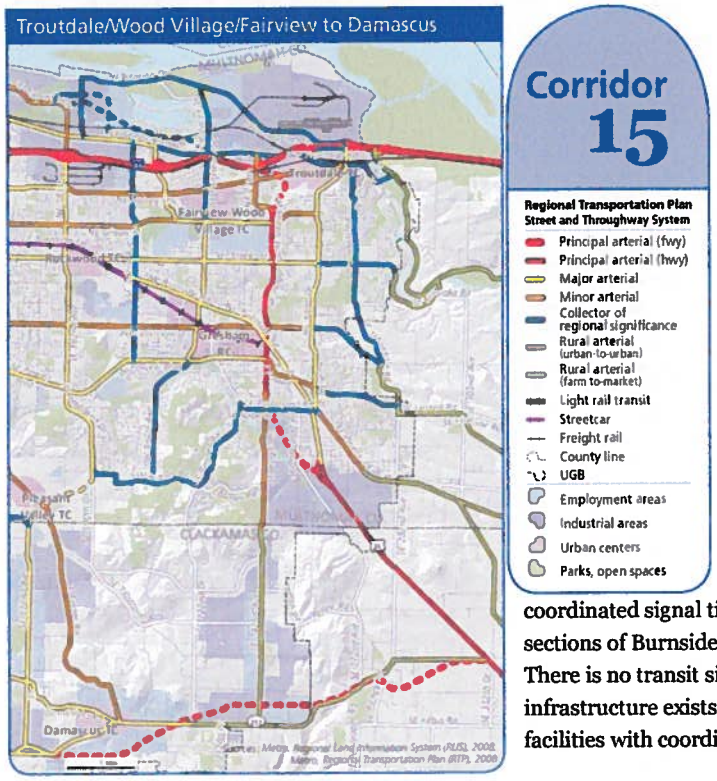
| Project Name | Description | Facility | Goal/ Objective | Time-frame | Cost | |
|---|---|---|---|---|---|---|
| | | | | | Capital | Annual O&M |
| **Regional Multimodal Traffic Management** | | | | | | |
| Arterial Corridor Management (ACM) | Improve arterial corridor operations by expanding traveler information and upgrading traffic signal equipment and timings. Install upgraded traffic signal controllers, establish communications to the central traffic signal system, provide arterial detection (including bicycle detection where appropriate) and routinely update signal timings. Provide real-time and forecasted traveler information on arterial roadways including current roadway conditions, congestion information, travel times, incident information, construction work zones, current weather conditions and other events that may affect traffic conditions. Upgrade and/or add traffic signage. Also includes on-going maintenance and parts replacement. | NE Halsey St | Reliability & Traveler Information | 11+ yrs | $4,900,000 | $100,000 |
| | | SE Stark St | | 1-5 yrs | $3,600,000 | $70,000 |
| | | NE Glisan St | | 6-10 yrs | $4,500,000 | $90,000 |
| | | SE Division St (160th to 190th) | | 1-5 yrs | $700,000 | $14,000 |
| | | Airport Way (I-205 to 158th) | | 6-10 yrs | $1,500,000 | $30,000 |
| ACM with Adaptive Signal Timing | Includes the ACM project with signal systems that automatically adapt to current arterial roadway conditions. | SE Division St (I-205 to 160th) | Reliability & Traveler Information | 6-10 yrs | $1,000,000 | $20,000 |
| | | SE Powell Blvd (Birdsdale to US 26) | | 6-10 yrs | $1,900,000 | $40,000 |

| Project Name | Description | Facility | Goal/ Objective | Time-frame | Cost | |
|---|---|---|---|---|---|---|
| | | | | | Capital | Annual O&M |
| ACM with Transit Priority Treatment | Includes the ACM project with transit signal priority added to traffic signals along a facility. | NE Sandy Blvd (east of 122nd) | Reliability, Traveler Information, & Quality of Life | 6-10 yrs | $3,200,000 | $60,000 |
| | | SE Powell Blvd (I-205 to 160th) | | 1-5 yrs | $1,500,000 | $30,000 |
| ACM with Adaptive Signal Timing and Transit Priority Treatment | Includes the ACM with both adaptive signal timing and transit priority treatment. | Division (Birdsdale to Burnside) | Reliability, Traveler Information, & Quality of Life | 6-10 yrs | $1,400,000 | $30,000 |
| Freeway Management | Expand freeway vehicle detection to provide comprehensive freeway traveler information including travel speed, travel times, volumes, forecasted information, incident conditions, and weather conditions. | I-84 | Reliability, Traveler Information, & Safety | 6-10 yrs | $700,000 | $14,000 |
| **Traveler Information** | | | | | | |
| Traveler Information Only | Provide real-time and forecasted traveler information on arterial roadways including current roadway conditions, congestion information, travel times, incident information, construction work zones, current weather conditions and other events that may affect traffic conditions. | SE Powell Blvd (190th to Birdsdale) | Traveler Information | 6-10 yrs | $200,000 | $40,000 |
| | | SE Division (182nd to Birdsdale) | | 6-10 yrs | $250,000 | $5,000 |
| | | Airport Way (158th to Sandy) | | 11+ yrs | $1,100,000 | $20,000 |

| Project Name | Description | Facility | Goal/ Objective | Time-frame | Cost | |
|---|---|---|---|---|---|---|
| | | | | | Capital | Annual O&M |
| **Transportation Demand Management** | | | | | | |
| Individualized Marketing | Implement and/or support intensive outreach to targeted neighborhoods that encourages use of travel options through delivery of local travel options information and services to interested residents. | Gresham Civic Station neighborhood (RTO Subcommittee funded this project) | Quality of life | 1-5 years | $0 | $130,000 |
| Individualized Marketing | (same as above) | East Portland | | 1-5 years | $0 | $500,000 |
| Individualized Marketing | (same as above) | Fairview / Gresham | | 6-10 years | $0 | $500,000 |
| Rideshare incentives | Leverage regional rideshare services to encourage greater levels of carpooling and vanpooling by providing financial incentives to commuters. | I-84 | Quality of life | 1-5 years | $0 | $50,000 |
| Rideshare incentives | (same as above) | I-84 | Quality of life | 6-10 years | $0 | $50,000 |
| Rideshare Park & Ride | Negotiate shared parking agreements with public and private parking lots, provide signage and, if needed, coordinate registration. | I-84 | Quality of life | 1-5 years | $0 | $4,800 |
| Rideshare Park & Ride | (same as above) | I-84 | Quality of life | 6-10 years | $0 | $4,800 |
| Transportation Management Associations | Support public-private partnerships in regional or town centers that assist employees and/or residents increase use of travel options. | Gresham Regional Center | | through 10 years | | $75,000 |

| Project Name | Description | Facility | Goal/ Objective | Time-frame | Cost | |
|---|---|---|---|---|---|---|
| | | | | | Capital | Annual O&M |
| Parking management | Convene stakeholders to plan and implement parking management strategies. Ideally this action raises revenue to expand TDM solutions. | Gresham Regional Center | Quality of life | 1-5 years | $0 | $100,000 |
| Parking management | (same as above) | Gresham Regional Center | Quality of life | 6-10 years | $0 | $100,000 |
| Location-efficient living | Support programs and strategies that promote and advance location-efficient living strategies. | Match industrial/employment area north if I-84 with housing opportunities to the south. | Quality of life | through 10 years | $0 | $50,000 |
| Bike Sharing | Provide funding to implement bikes for loan or rent. | Transit oriented developments, large employers, colleges, hotels and significant transit stops. | Quality of life | 6-10 years | $100,000 | $50,000 |
| Park & Ride Management | Implement parking management elements such as time limits, fees or changing spaces to carpool-only. | Gateway Transit Center | Quality of life | 1-5 years | $100,000 | $10,000 |
| Car-share operations | Support 3 or more car-sharing vehicles in developing centers. | Gresham Regional Center | Quality of life | 1-5 years | $0 | $200,000 |

## Mobility Corridor 15: Troutdale/Wood Village/Fairview to Damascus




### *Corridor Summary*

The Troutdale/Wood Village/Fairview to Damascus mobility corridor encompasses the arterials and collector streets that provide access between I-84 and US 26, as well as transit and bicycle routes that support movement in and through the corridor. There are no freeways included within this corridor. The key arterials in this corridor include **SE 181st Ave, SE 202nd Ave, SE 238th/242nd/Hogan Dr** and **SE 257th/Kane Dr.** Although the corridor has a well-connected arterial and collector street grid, the local street network is generally discontinuous with many cul-de-sac and dead end streets. The majority of land use in this area is considered rural. The urbanized area has a mix of commercial and industrial uses.

### *Where Are We Now?*

Currently one regional facility in this corridor has coordinated signal timings updated within the last five years, NE 242nd; and sections of Burnside Rd and 181st are equipped with adaptive signal timing. There is no transit signal priority located in this corridor. Communications infrastructure exists along 257th Ave, Glisan St, and 223rd as well as along the facilities with coordinated and adaptive signal timing.

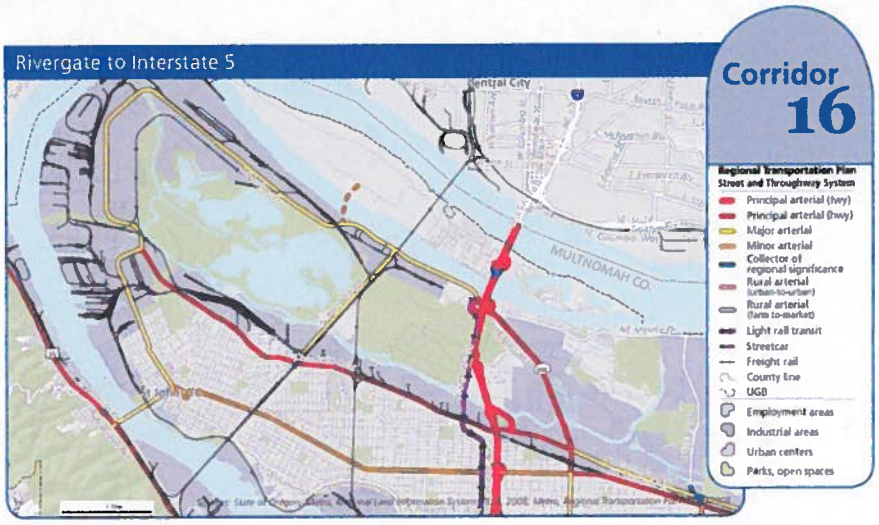
The Gresham Regional Center TMA works with employers, employees, and residents to reduce drive-alone trips. Additionally, the TMA runs a Bike Program which conducts safety outreach, gives away helmets, and installs bike racks. The City of Gresham has begun to implement a city-wide bicycle way-finding program.

| Project Name | Description | Facility | Goal/ Objective | Time-frame | Cost | |
|---|---|---|---|---|---|---|
| | | | | | Capital | Annual O&M |
| **Regional Multimodal Traffic Management** | | | | | | |
| Arterial Corridor Management (ACM) | Improve arterial corridor operations by expanding traveler information and upgrading traffic signal equipment and timings. Install upgraded traffic signal controllers, establish communications to the central traffic signal system, provide arterial detection (including bicycle detection where appropriate) and routinely update signal timings. Provide real-time and forecasted traveler information on arterial roadways including current roadway conditions, congestion information, travel times, incident information, construction work zones, current weather conditions and other events that may affect traffic conditions. Upgrade and/or add traffic signage. Also includes on-going maintenance and parts replacement. | 160th/162nd Ave | Reliability & Traveler Information | 6-10 yrs | $2,100,000 | $40,000 |
| | | Burnside (122nd to 223rd) | | 6-10 yrs | $1,200,000 | $25,000 |
| | | NE 207th Ave (Sandy to Glisan) | | 6-10 yrs | $850,000 | $17,000 |
| | | 223rd Ave | | 6-10 yrs | $1,200,000 | $25,000 |
| | | 257th/Kane Dr | | 6-10 yrs | $2,800,000 | $60,000 |
| ACM with Adaptive Signal Timing | Includes the ACM project with signal systems that automatically adapt to current arterial roadway conditions. | 238th/242nd Ave/Hogan Dr (Sandy to Palmquist) | Reliability & Traveler Information | 1-5 yrs | $3,600,000 | $70,000 |

| Project Name | Description | Facility | Goal/ Objective | Time-frame | Cost | |
|---|---|---|---|---|---|---|
| | | | | | Capital | Annual O&M |
| ACM with Transit Priority Treatment | Includes the ACM project with transit signal priority added to traffic signals along a facility. | NE 181st/182nd Ave (Glisan to Powell) | Reliability, Traveler Information, & Quality of Life | 6-10 yrs | $2,000,000 | $40,000 |
| ACM with Adaptive Signal Timing and Transit Priority Treatment | Includes the ACM with both adaptive signal timing and transit priority treatment. | NE 181st Ave(I-84 to Glisan) | Reliability, Traveler Information, & Quality of Life | 6-10 yrs | $600,000 | $12,000 |
| **Traveler Information** | | | | | | |
| Traveler Information Only | Provide real-time and forecasted traveler information on arterial roadways including current roadway conditions, congestion information, travel times, incident information, construction work zones, current weather conditions and other events that may affect traffic conditions. | Burnside (223rd to Powell) - Adaptive signal timing is in place along this segment, traveler information will be added. | Traveler Information | 1-5 yrs | $950,000 | $19,000 |
| Roadside Travel Time Information | Provide real-time traveler information on westbound US 26 for different routes (arterial and freeway) between Portland and Gresham. | US 26 | Traveler Information | 6-10 yrs | $100,000 | $15,000 |

| Project Name | Description | Facility | Goal/ Objective | Time-frame | Cost | |
|---|---|---|---|---|---|---|
| | | | | | Capital | Annual O&M |
| **Transportation Demand Management** | | | | | | |
| Transportation Management Associations | Support public-private partnerships in regional or town centers that assist employees and/or residents increase use of travel options. | Gresham Regional Center | Quality of Life | through 10 years | $0 | (annual cost recorded under corridor 6) |

## Mobility Corridor 16: Rivergate to Interstate 5




### *Corridor Summary*

The Rivergate to I-5 corridor encompasses **N Columbia Blvd**, parallel arterials as well as bus service and bicycle routes the support movement in and through the corridor. The key parallel arterials are **N Lombard/St John's Bridge** and **N Marine Dr.** The corridor includes a combination of marine-dependant industrial activities, nature reserves, mixed used commercial and residential uses. Due to the industrial and marine port uses, this corridor carries high volumes of heavy vehicle traffic. In the residential and commercial areas the local network is dense and well-connected. The local street network in the industrial and open space areas provides accessibility to large lots and tends to be discontinuous.

### *Where Are We Now?*

Currently no regional facilities in this corridor have coordinated signal timings updated within the last five years. Transit signal priority is located at select traffic signals along N Lombard St. Communications infrastructure exists along the St John's Bridge, N Oswego Ave/N Smith St/N Columbia Way/N Portland Rd, and N Marine Dr.

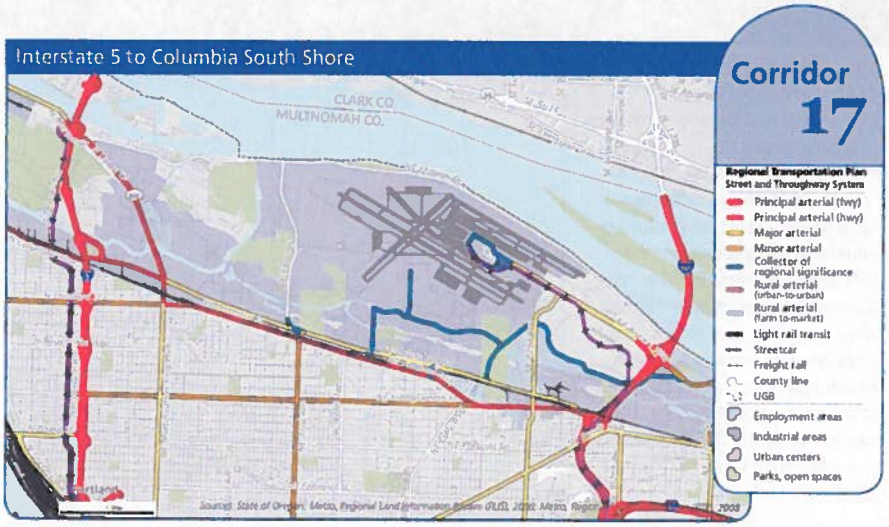
The City of Portland SmartTrips program began an individualized marketing program for residents of the N/NW Portland area. Also, the City of Portland sponsors Sunday Parkways events in North Portland to encourage use of biking and walking for all trips.

| Project Name | Description | Facility | Goal/ Objective | Time-frame | Cost | |
|---|---|---|---|---|---|---|
| | | | | | Capital | Annual O&M |
| **Regional Multimodal Traffic Management** | | | | | | |
| Arterial Corridor Management (ACM) | Improve arterial corridor operations by expanding traveler information and upgrading traffic signal equipment and timings. Install upgraded traffic signal controllers, establish communications to the central traffic signal system, provide arterial detection (including bicycle detection where appropriate) and routinely update signal timings. Provide real-time and forecasted traveler information on arterial roadways including current roadway conditions, congestion information, travel times, incident information, construction work zones, current weather conditions and other events that may affect traffic conditions. Upgrade and/or add traffic signage. Also includes on-going maintenance and parts replacement. | N Columbia Blvd | Reliability & Traveler Information | 6-10 yrs | $2,300,000 | $45,000 |
| ACM with Adaptive Signal Timing | Includes the ACM project with signal systems that automatically adapt to current arterial roadway conditions. | N Lombard St (Greeley to I-5) | Reliability & Traveler Information | 11+ yrs | $750,000 | $15,000 |

| Project Name | Description | Facility | Goal/ Objective | Time-frame | Cost | |
|---|---|---|---|---|---|---|
| | | | | | Capital | Annual O&M |
| ACM with Adaptive Signal Timing and Transit Priority Treatment | Includes the ACM with both adaptive signal timing and transit priority treatment. | N Lombard St (Richmond to Greeley) | Reliability, Traveler Information, & Quality of Life | 6-10 yrs | $3,200,000 | $60,000 |
| **Traveler Information** | | | | | | |
| Traveler Information Only | Provide real-time and forecasted traveler information on arterial roadways including current roadway conditions, congestion information, travel times, incident information, construction work zones, current weather conditions and other events that may affect traffic conditions. | N Lombard St (north of St Johns Bridge) | Traveler Information | 6-10 yrs | $2,200,000 | $45,000 |
| | | Marine Dr | | 6-10 yrs | $2,200,000 | $45,000 |
| Railroad Crossing Information System | Implement communications between the at-grade railroad crossing and the traffic operations center and emergency management centers to inform emergency responders and general travelers when service will be interrupted. | Marine Dr | Reliabilty, Traveler Information, & Safety | 6-10 yrs | $75,000 | $2,000 |
| **Transportation Demand Management** | | | | | | |
| Employee incentives | Targeted investment to add to employer services to incentivize non-SOV commutes. | to be determined | Quality of life | 1-5 years | $0 | $50,000 |
| Employee incentives | (same as above) | to be determined | Quality of life | 6-10 years | $0 | $50,000 |

| Project Name | Description | Facility | Goal/ Objective | Time-frame | Cost | |
|---|---|---|---|---|---|---|
| | | | | | Capital | Annual O&M |
| Location-efficient living | Support programs and strategies that promote and advance location-efficient living strategies. | Rivergate industrial/employment area with nearby housing opportunities. | Quality of life | through 10 years | $0 | $50,000 |
| Last-mile services | Provide shuttles or demand-responsive transit to connect transit stops with significant destinations one to two miles away, especially at hours not served by current transit service. | Rivergate | Quality of life | 6-10 years | $500,000 | $500,000 |

## Mobility Corridor 17: Interstate 5 to Columbia South Shore




### *Corridor Summary*

The I-5 to Columbia South Shore corridor encompasses **N/NE Columbia Blvd** and **N/NE Lombard St,** parallel arterials as well as bus service and bicycle routes the support movement in and through the corridor. The key parallel arterials through this corridor are **NE Marine Dr** and **NE Killingsworth St**. Land use is primarily industrial with the Portland International Airport (PDX) occupying a substantial portion of acreage. The MAX Red line connects between PDX and Beaverton town center. South of N/NE Lombard St is primarily residential. In the residential area, the local street network is dense and well-connected. The local street network in the industrial area provides accessibility to large lots and is discontinuous.

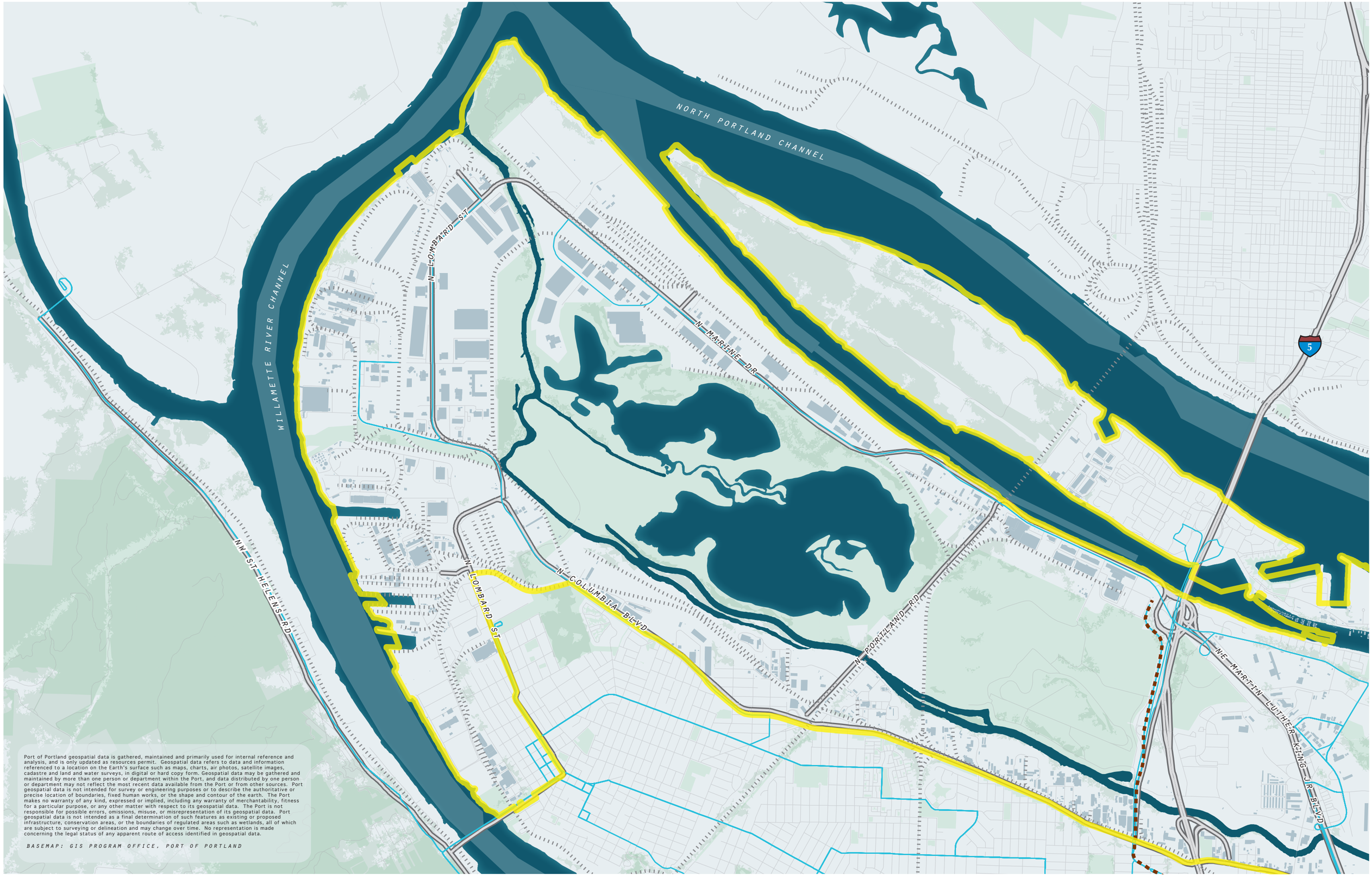
### *Where Are We Now?*

Currently two regional facilities in this corridor have coordinated signal timings updated within the last five years: NE Lombard St/NE Portland Hwy and NE Columbia Blvd. Transit signal priority is located at select traffic signals along NE Killingsworth St. Communications infrastructure exists along a segment of NE Killingsworth St.

The City of Portland sponsors Sunday Parkways events in Northeast Portland to encourage use of biking and walking for all trips. Additionally, the Community Cycling Center has been awarded a grant to reduce barriers for bicycling for historically under-represented populations.

| Project Name | Description | Facility | Goal/ Objective | Time-frame | Cost | |
|---|---|---|---|---|---|---|
| | | | | | Capital | Annual O&M |
| **Regional Multimodal Traffic Management** | | | | | | |
| Arterial Corridor Management (ACM) | Improve arterial corridor operations by expanding traveler information and upgrading traffic signal equipment and timings. Install upgraded traffic signal controllers, establish communications to the central traffic signal system, provide arterial detection (including bicycle detection where appropriate) and routinely update signal timings. Provide real-time and forecasted traveler information on arterial roadways including current roadway conditions, congestion information, travel times, incident information, construction work zones, current weather conditions and other events that may affect traffic conditions. Upgrade and/or add traffic signage. Also includes on-going maintenance and parts replacement. | N/NE Columbia Blvd | Reliability & Traveler Information | 1-5 yrs | $3,100,000 | $60,000 |
| ACM with Transit Priority Treatment | Includes the ACM project with transit signal priority added to traffic signals along a facility. | N/NE Lombard St/NE Portland Hwy | Reliability, Traveler Information, & Quality of Life | 6-10 yrs | $2,600,000 | $50,000 |
| | | N/NE Killingsworth St | | 6-10 yrs | $2,600,000 | $50,000 |

| Project Name | Description | Facility | Goal/ Objective | Time-frame | Cost | |
|---|---|---|---|---|---|---|
| | | | | | Capital | Annual O&M |
| **Traveler Information** | | | | | | |
| No projects in this corridor | | | | | | |
| **Transportation Demand Management** | | | | | | |
| Individualized Marketing | City of Portland SmartTrips will reach N/NE Portland residents between Chautauqua and NE 82nd Ave. Consider 1/3rd of the project will impact Corridor 5. The action is to implement and/or support intensive outreach to targeted neighborhoods or demographics that encourages travel options through delivery of local travel options information and services to interested residents. | NE Portland along North side of I-84 | Quality of life | 1-5 years | $0 | $333,333 |
| Employee incentives | Targeted investment to add to employer services to incentivize non-SOV commutes. | to be determined | Quality of life | 1-5 years | $0 | $50,000 |
| Employee incentives | (same as above) | to be determined | Quality of life | 6-10 years | $0 | $50,000 |

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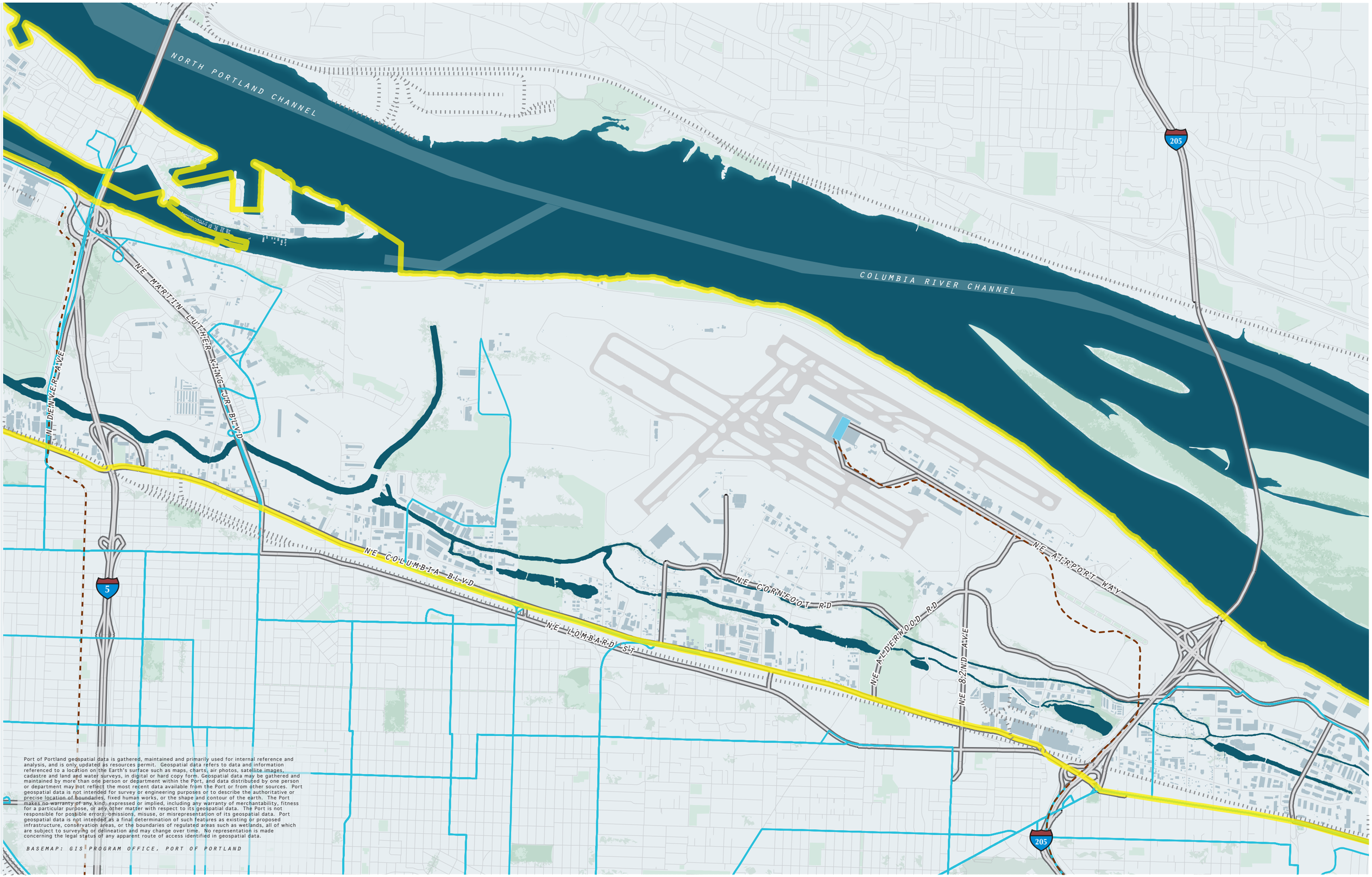


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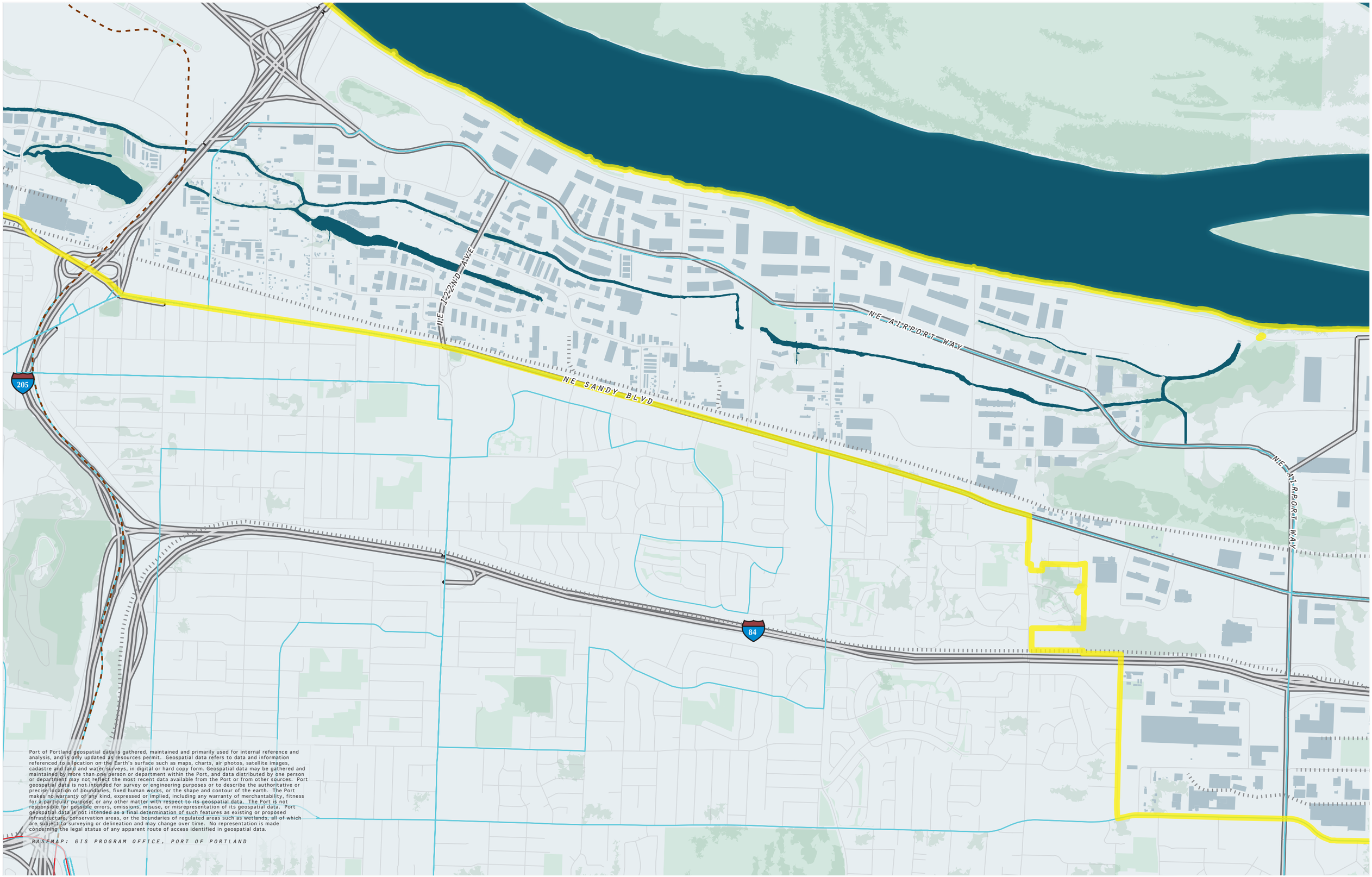


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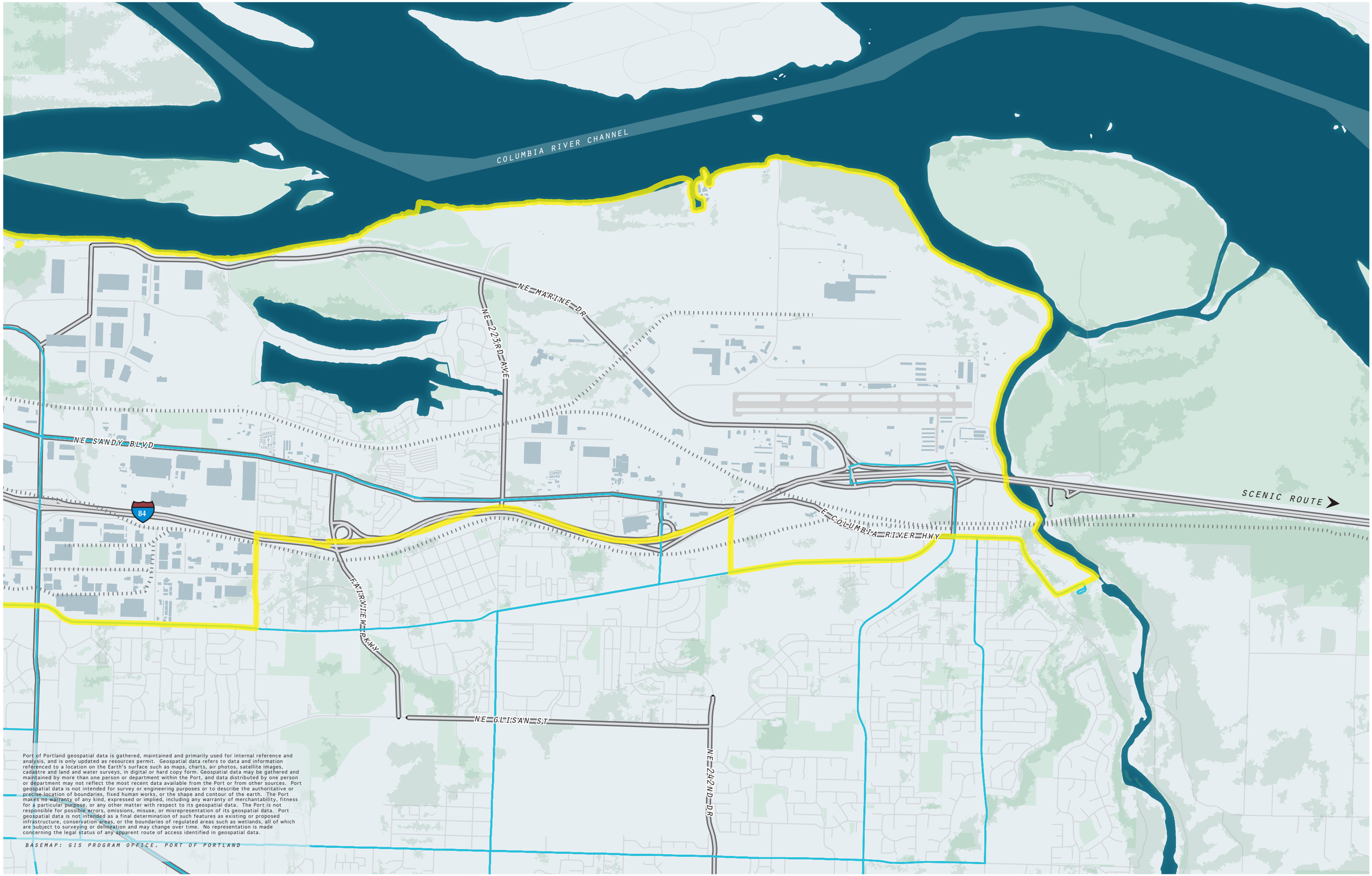


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