

NW Seaport Alliance Puget Sound
Zero-Emission Truck Collaborative

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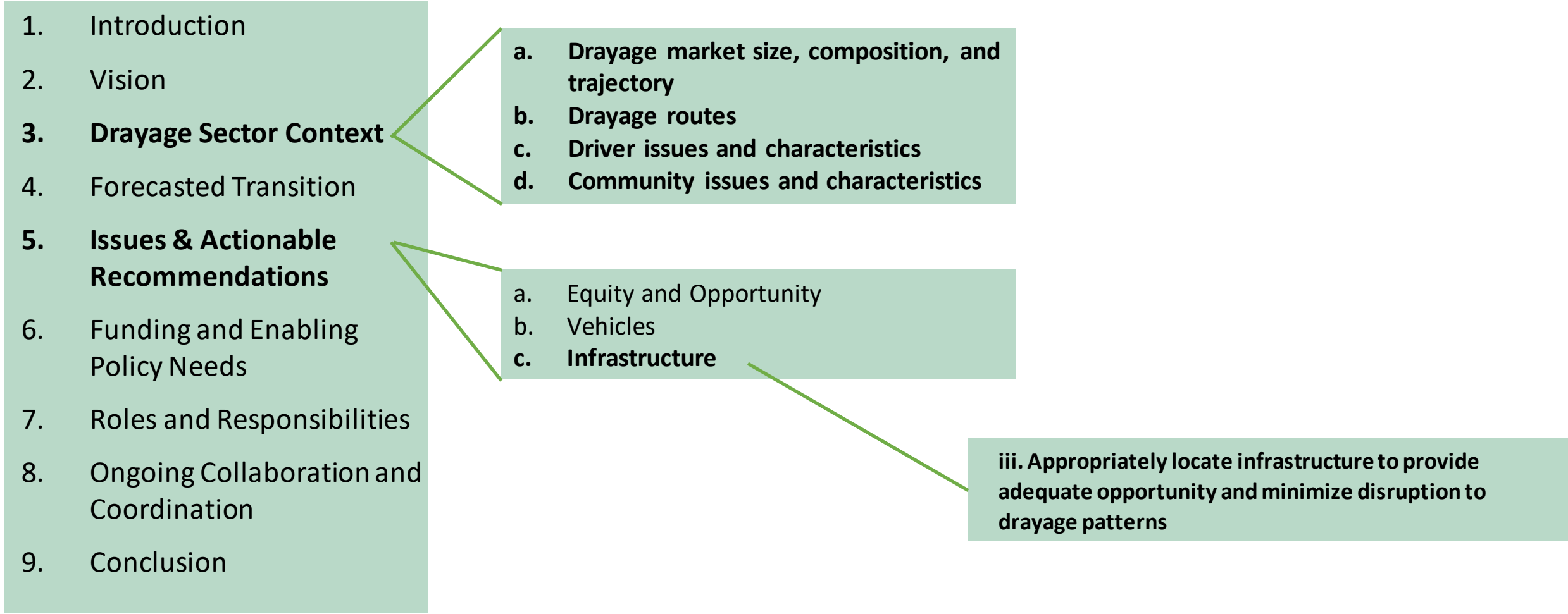
March 27, 2024



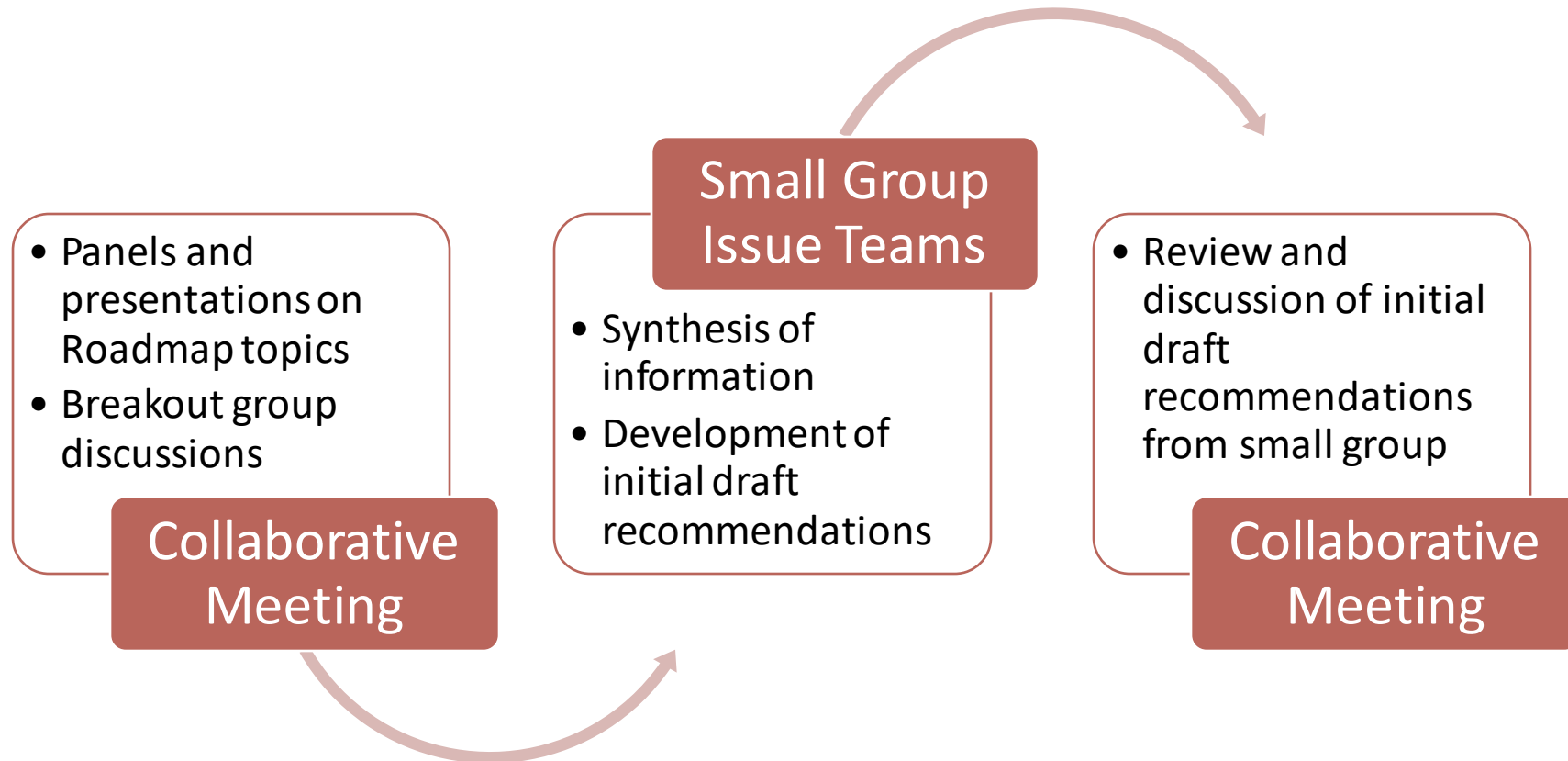
Meeting Objectives

- Share information about recent legislative session, grant proposals, and federal initiatives
- Review and affirm initial draft recommendations on utility planning and infrastructure (from January meeting)
- Understand and discuss key takeaways from recent driver and community outreach activities
- Hear about Tetra Tech drayage characterization study and discuss implications for Roadmap

Roadmap Outline: Today's Focus on Driver/Community Insights and Drayage Characterization Study



Development of Draft Recommendations



Small group session with Infrastructure and Equity groups:
Thursday, April 4: 1:00-2:30 PM

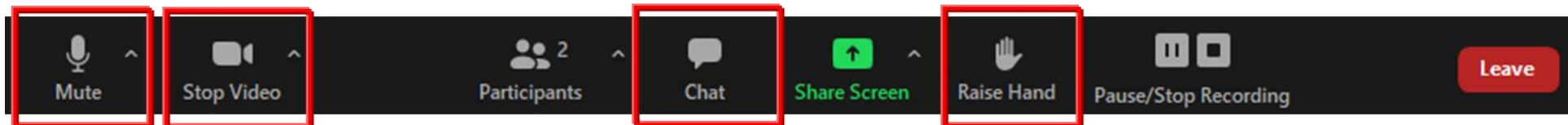
Meeting Agenda



- 1:00 – 1:10 PM **Welcome and Meeting Overview**
- 1:10 – 1:30 PM **Quick Funding and Policy Updates**
- 1:30 – 1:45 PM **Draft Recommendation Review: Utility Planning & Infrastructure**
- 1:45 – 2:30 PM **Driver and Community Outreach: Activities and Key Insights**
- 2:30 – 2:45 PM *Break*
- 2:45 – 4:00 PM **Drayage Characterization Study**
- 4:00 – 4:45 PM **Breakout Sessions on Drayage Characterization Study**
- 4:45 – 4:55 PM **Public Comment**
- 4:55 – 5:00 PM **Wrap up and Adjourn**

Participating Effectively via Zoom

- Collaborative members please show your video
- If you're using your telephone for audio, remember to enter your participant ID
- If needed, update your name and affiliation
- To reduce background noise, please mute yourself when you are not speaking
- During discussions, please let us know you'd like to jump in by "raising your hand"



Public Participation

- Those observing the meeting will be muted, off video, and off chat until the public comment time
- There will be an opportunity for 2-minute public comments at the end of the meeting. At that time, members of the public who would like to comment should raise their hands if they would like time to speak

Project Website

URL:

<https://www.rossstrategic.net/Zero-Emission-Truck-Collaborative/>

PUGET SOUND

Zero-Emission Truck Collaborative

[Meeting Schedule & Materials](#)

About the Collaborative

The transition to zero-emission drayage vehicles serving ports in the Pacific Northwest is a key step to meet zero emission trucking targets adopted in the Northwest Ports Clean Air Strategy while also contributing to city and state decarbonization goals. The multi-stakeholder Puget Sound Zero-Emission Truck Collaborative to develop a roadmap for transitioning to zero-emission drayage services at the Puget Sound region marine cargo terminals no later than 2050. The Collaborative will meet approximately every other month for half-day meetings between June 2023 and December 2024. Most of these meetings will be virtual but some may be in-person meetings that will include site visits and/or listening sessions. This website will be updated with relevant materials for each of these meetings.

Meeting Schedule and Materials

Meeting 1: June 30, 2023

The purpose of this first meeting is to introduce members of the Collaborative and create a shared understanding of project context, background, and objectives and proposed process for the Collaborative. Members will discuss and affirm Roadmap principles and Collaborative purpose, as well as the Collaborative charter and operating guidelines.

[Meeting Agenda](#) [Draft Charter](#) [Collaborative Members](#) [Collaborative and Roadmap Scoping Document](#)

Meeting dates and materials will be posted for future meetings as available.

Quick Ice Breaker



What is your favorite early spring activity?

- Please chat in

Quick Funding and Policy Updates



Phase 1: Establish Hubs

2024-2027



ZEF Network

- Selected Corridors
- ▲ Selected Principal Ports
- Selected Intermodal Freight Facilities
- × Selected Truck Parking
- Selected Hubs
- National Highway Freight Network

Draft Recommendations Review: Utility Planning and Infrastructure



Near-Term: Recommended Best Practices



For customers interested in charging facilities:

- Engage utilities early about proposed charging projects to inform site location and design
- Proactively engage communities to understand benefits/needs (e.g., parking, security) and reduce likelihood of project-related conflicts during permitting, etc.
- Provide utilities with information about medium and longer-term plans to inform longer-term system planning
- Comprehensively plan project components and schedules to help avoid project delays

For other project proponents:

- Add a requirement to charging infrastructure RFPs that applicants communicate early with utilities
- Support community-based planning for charging sites and local benefits

Near-Term: Recommended Best Practices



For utilities:

- Offer pre-application process for charging infrastructure projects to encourage early communications and collaboration
- Offer customer-facing programs (e.g., comprehensive fleet assessments) that allow the collection of data on potential charging infrastructure projects, which can provide information on future loads and locations to inform system planning
- Collaborate with other providers of infrastructure programs and incentives; help direct customers to utility/local/state/federal vehicle and infrastructure incentive programs and assist with stacking of incentives for customers
- Understand and pursue all incentive funds available for utilities; figure out how they can be stacked
- Collaborate with charging partners on pilot/demonstration projects
- Partner with research organizations (e.g., EPRI, LBNL, PSCAA) to research planning and infrastructure needs

Longer-term: Challenge and Potential Solutions



Key Challenge: Traditional utility planning and investment practices (governed by rules and regulatory oversight) are unlikely to allow utilities to proactively make infrastructure investments at the scale needed to fully transition drayage vehicles to ZEVs in the Puget Sound gateways.

Specific barriers include:

- Prudency rules requiring customer application to proceed (where applicable)
- Equity concerns of passing utility infrastructure costs onto low-income ratepayers
- Other demand for electricity, contributing to overall load growth (e.g., building electrification, other transportation electrification, ports electrification, data centers, AI, etc.)

Longer-term: Challenge and Potential Solutions



Recommendations:

- Utilities explore strategies that can create grid capacity and management benefits from electrification--e.g., vehicle-to-grid, use of residual capacity of batteries for grid-services, etc.
- Proactive engagement with regulators (e.g., on prudence requirements)
- Proactive engagement with state policymakers on infrastructure funding and program design
- Advocate for CFS and CCA funds for utility charging investments (i.e., non rate-based funds)
- Partner with charging providers, customers, or others on joint projects
- Consider utility role in owning and operating charging infrastructure for drayage (e.g., where there are barriers to privately-funded charging)
- Consider relative strengths and roles of battery-electric vs. hydrogen when planning infrastructure

Driver and Community Outreach: Activities and Key Insights



Driver & Near-Port Community Engagement

Puget Sound Zero-Emission Truck Collaborative meeting

March 27, 2024

Stepherson & Associates Communications



Agenda

- **2024 Engagement Summaries**
 - Briefings with near-port communities
 - Driver listening sessions
 - Driver online survey
- **Next Steps**
- **Q&A**



Engagement Goals



- Understand barriers and challenges for drayage truck communities to make the switch to zero emissions
 - Work to build understanding and trust/credibility/confidence of both the zero emission technologies and the Decarbonizing Drayage Roadmap
 - Generate excitement around the positive project outcomes, both with truckers and near-port communities
- Provide easy-to-access, in-language outreach and communications
 - Provide a feedback loop so that the Collaborative hears the needs and priorities from community and drivers, its incorporated into the Roadmap, and outcomes are reported back to community and drivers

Engagement Tools



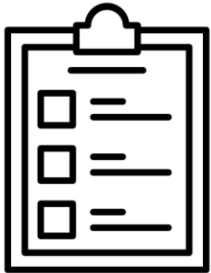
Postcard



Small group listening session(s)



Community meetings



Online driver survey



Email listservs

2024 Engagement Summary – Near-Port Community Briefings



South Harbor Community Outreach List

1. 350 Tacoma
2. Climate Alliance of the South Sound
3. Advocates for a Cleaner Tacoma
4. Earthjustice
5. Puyallup/Sumner Chamber of Commerce
6. Fife/Milton/Edgewood Chamber of Commerce

2024 Engagement Summary – Near-Port Community Briefings



Climate Alliance of the South Sound (CASS)

Key Feedback

- Interested in more efficient (zero-emission) trucks to improve air quality and help reduce asthma rates
- Implement with the big companies, not the small business owners and operators
- Ensure it is economically beneficial to small business owners and operators. Build alliances with them
- Be mindful of the battery lifecycle – from mining of lithium to disposing of dead batteries

2024 Engagement Summary – Near-Port Community Briefings



North Harbor Community Outreach List

1. South Park Neighborhood Association
2. Georgetown Community Council
3. SODO BIA Transportation Committee
4. District 1 Community Network

2024 Engagement Summary – Near-Port Community Briefings



South Park Neighborhood Association

Key Feedback

- Incorporate alternative fuels that are already available – natural gas and biofuel
- Expand project funding to include revenues from the Port of Seattle
- Implement strategies for emission reductions sooner than 2050
- Consider identifying new truck routes that don't go through South Park
- Recommend including environmentally-safe truck tire disposal methods in the Decarbonizing Drayage Roadmap

2024 Engagement Summary – Near-Port Community Briefings



Georgetown Community Council

Key Feedback

- Independent truck drivers express they do not make enough money to purchase zero-emission trucks
- Have bigger companies invest in the transition of zero-emission trucks, not just independent truck drivers

2024 Engagement Summary – Driver Listening Sessions



Saturday, Feb. 3, 2024 Fabulich Center, Port of Tacoma	Monday, Feb. 12, 2024 Terminal 46, Port of Seattle
9 participants	11 participants
7 owner/operators	10 owner/operators
2 trucking company employees	1 trucking company rep.
17 average years in trucking industry	17.5 average years in trucking industry
Majority of drivers visit NWSA marine terminals 2-3 times a day	
Several drivers do long-haul trips to nearby states	

2024 Engagement Summary – Driver Listening Sessions, Continued



Key Feedback

- Maintenance is a big concern
- Affordability and cost are a deal breaker
- Infrastructure and parking are paramount to making the system work
- Leasing, funding mechanisms, and legislative changes could help make the transition feasible
- Trucking as a service is too expensive for independent owners and operators
- Start with the large trucking companies
- Offer a pilot program to expose other truck drivers to zero-emission trucks

Listening Session Questions



- What have you heard about zero-emissions trucks so far and from where?
- What benefits do you see in making this switch?
- What hardships do you see in the transition? What is your biggest concern?
- What would you need to transition to a zero-emission truck?
- What ideas do you have that would make the transition to zero emission trucks work for drivers?
- With the information and discussion today, how do you feel?
- Do you feel optimistic about the path forward or unhappy about moving in the zero-emissions direction, are you somewhere in between?
- Do you have any suggestions for how best to connect with you and other drayage truck drivers?

2024 Engagement Summary – Driver Survey Results



- Trucker Appreciation Week – December 2023
- NWSA online survey open for 3 months – 129 responses

4. Do you own and operate your own truck or are you an employee of a trucking company?

[More Details](#)

● Employee driver	41
● Owner-operator	78
● Other	6

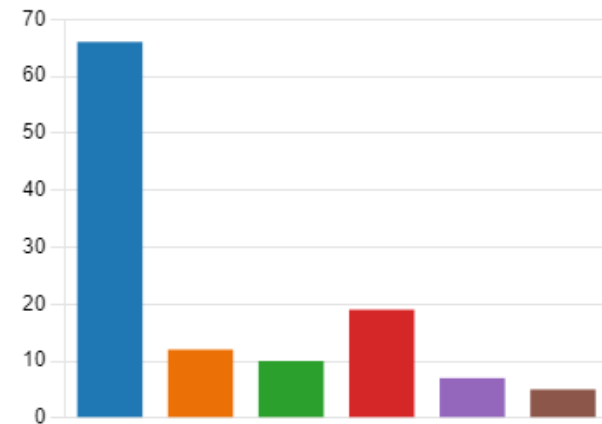


7. What size fleet do you operate at NWSA terminals?

[More Details](#)

[Insights](#)

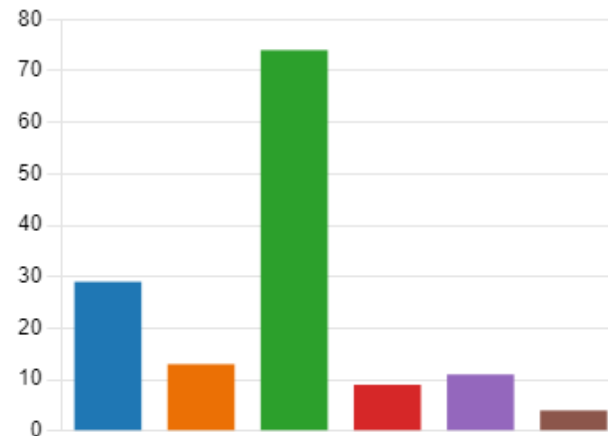
● 1 truck	66
● Less than 5	12
● 5-10 trucks	10
● 10-25 trucks	19
● 25-50 trucks	7
● More than 50	5



8. Where do you typically park your truck overnight? (you can choose more than one)

[More Details](#)

● On-street	29
● At home	13
● Trucking company yard	74
● Warehouse yard	9
● Secure Overnight Parking Facility	11
● Other	4



Listening

Driver Survey

Community Briefings

Next Steps



Fall 2024

- Present draft Roadmap to drivers and near-port communities for feedback
- Report back to Collaborative the feedback for integration into final Roadmap

Break



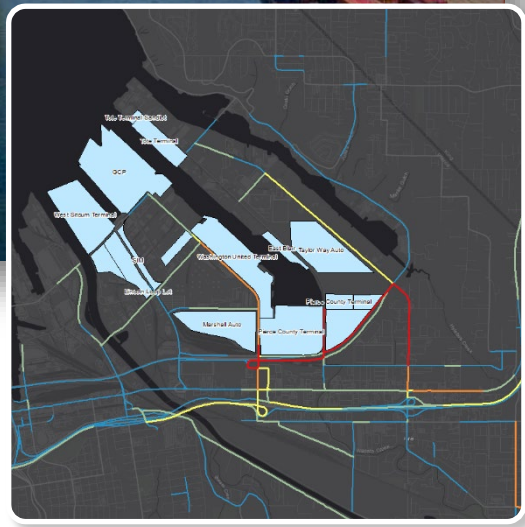
Drayage Characterization Study





Drayage Truck Operational Analysis BRIEF overview

**Rodrigo Gonzalez-
Abraham, Brian Murphy and
Monica Wright**



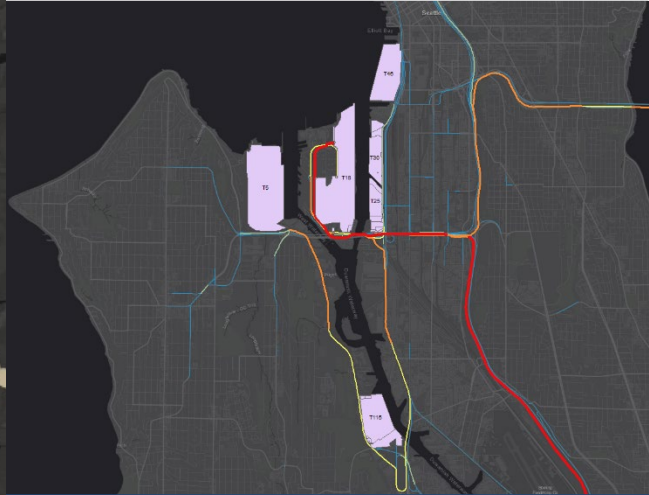
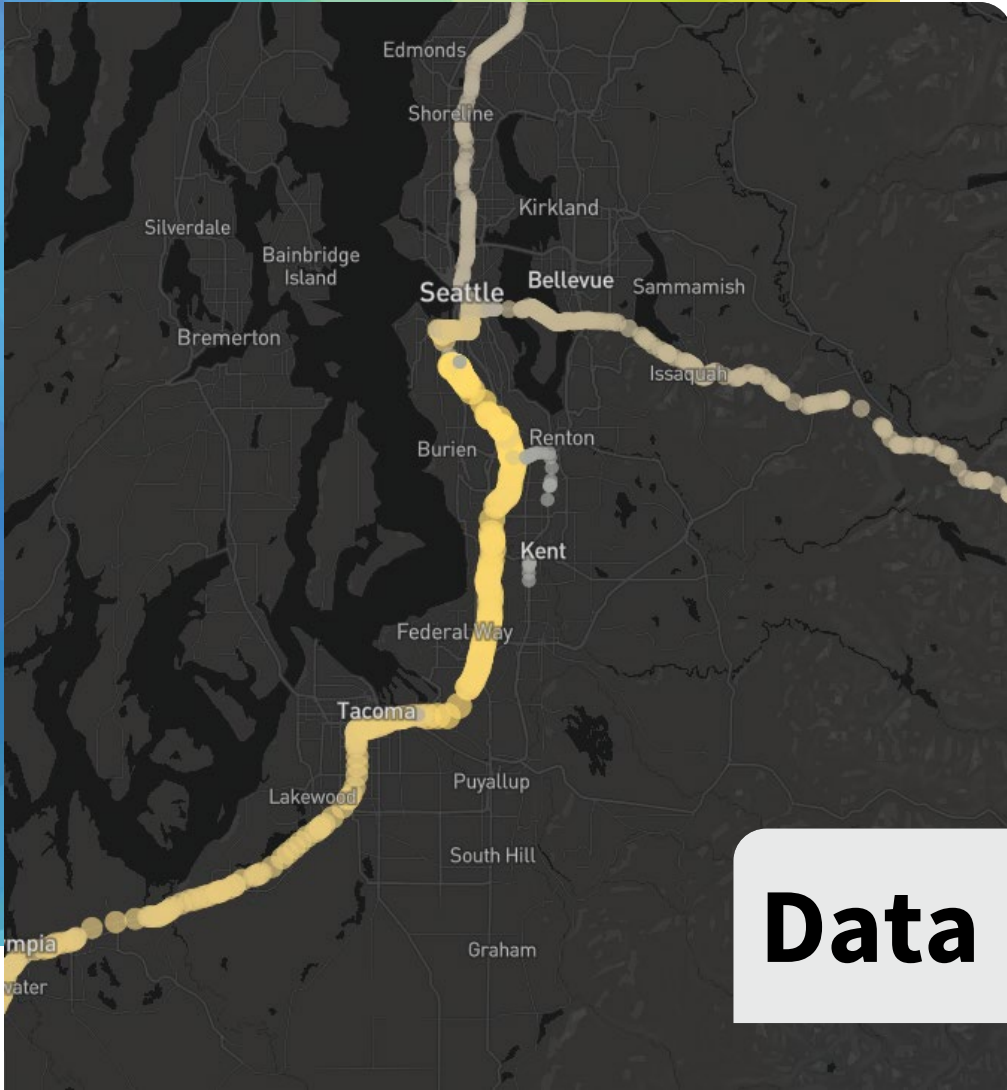
Agenda

- Project Goals
- Streetlight Data Processing
- Analysis
 - Route Trends and Characteristics
 - Identification of Dwelling Areas
 - Drayage Counts
- Takeaway and Opportunities



Project Goals

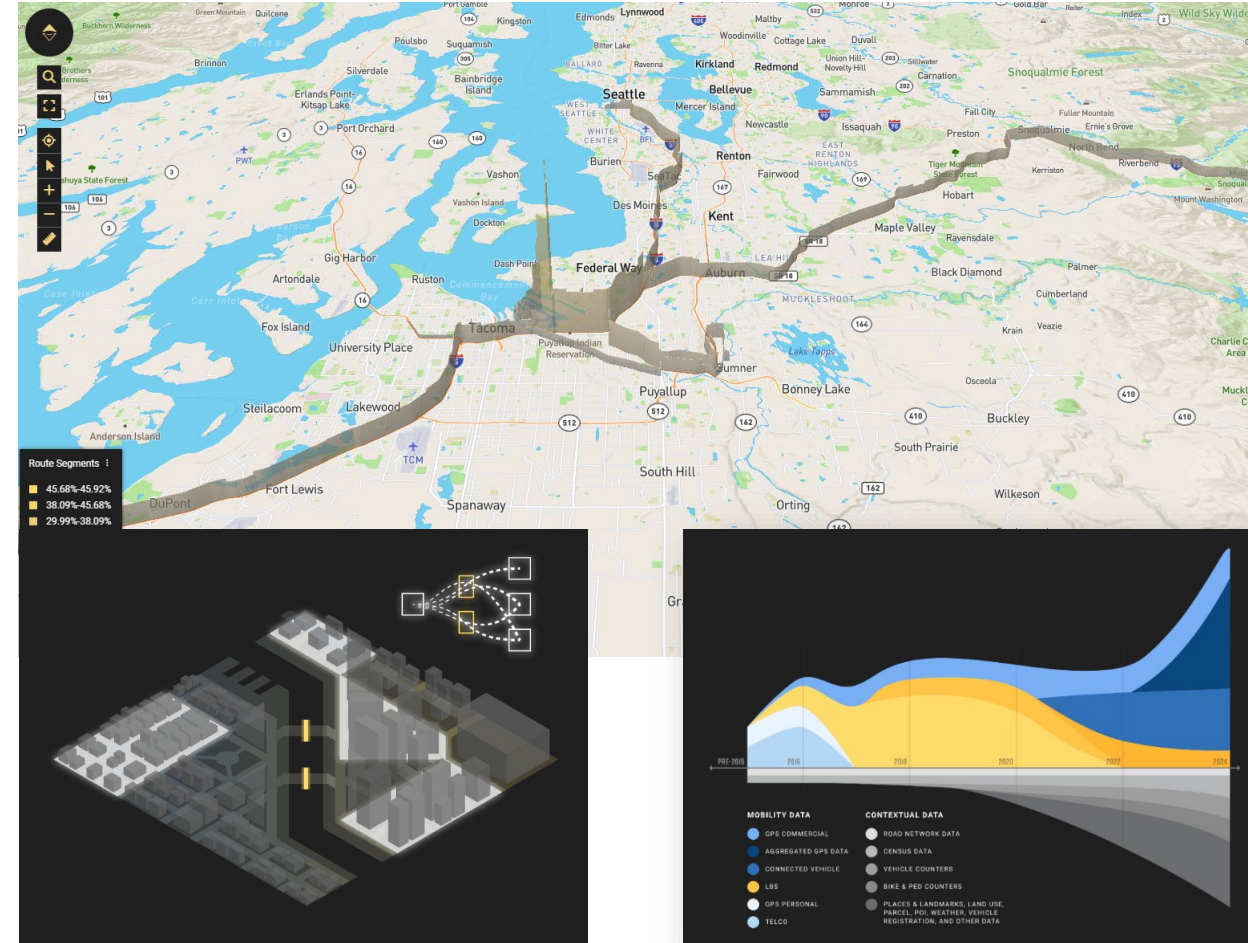
- Support the implementation of the Northwest Ports Clean Air Strategy (NWPCAS)
 - Eliminating emissions of Diesel Particulate Matter, Green House Gases and Short-Lived Climate Forcers
 - Accelerating the transition to zero-emission fuels and technologies
 - Developing a roadmap with the Puget Sound Zero-Emission Truck Collaborative for transitioning to zero-emission drayage
- Improve understanding of traffic trends and dwelling behavior from drayage trucks operating within the NWSA airshed and region



Data Processing

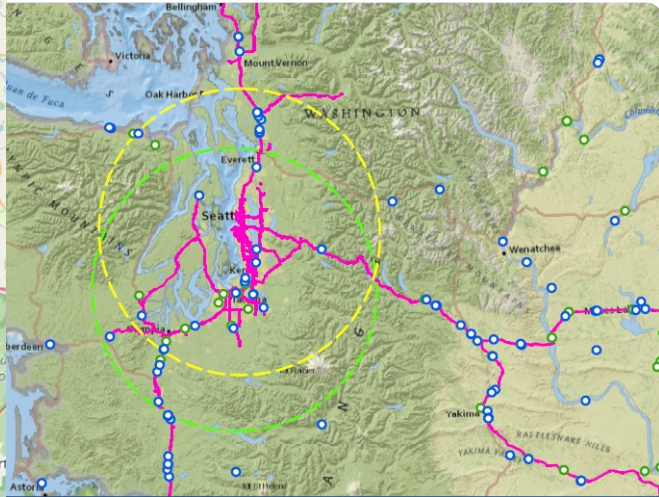
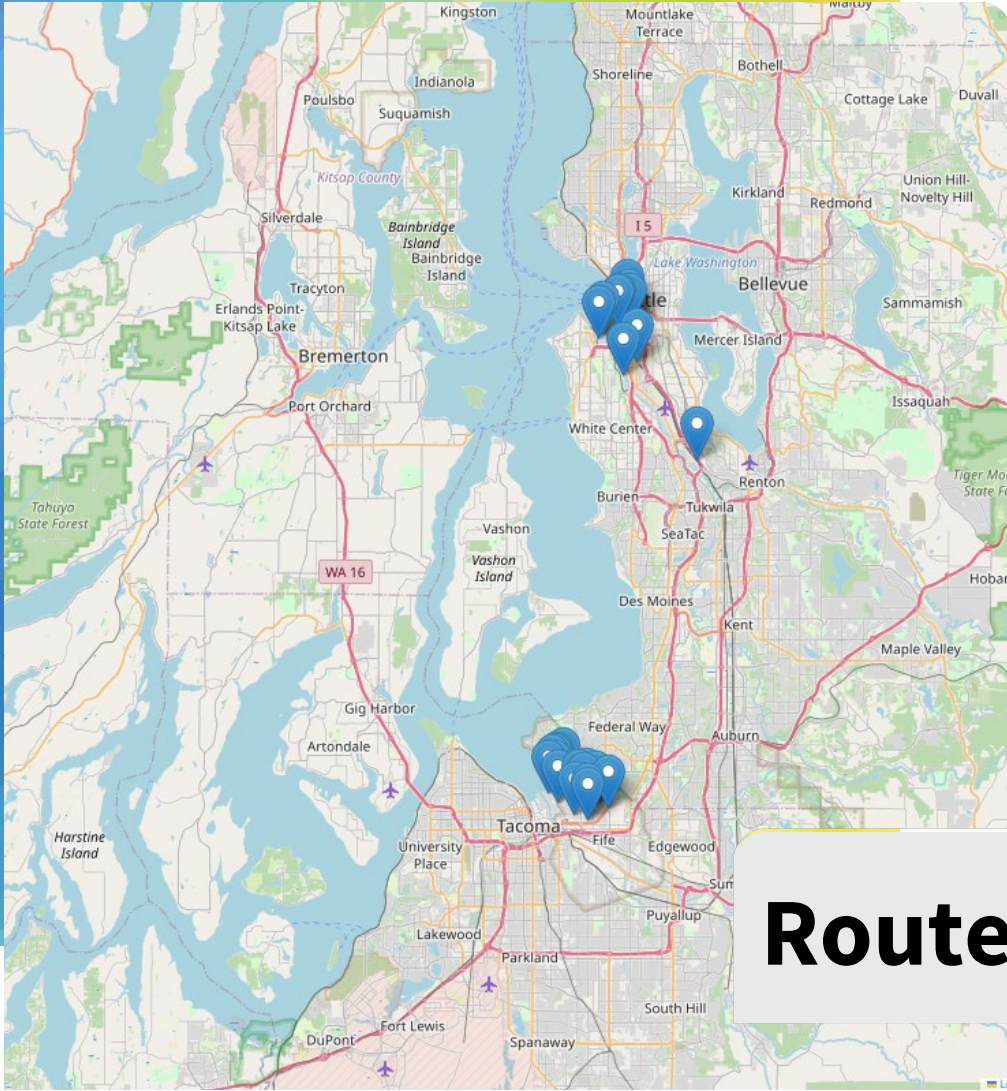
Route and Dwell Identification Analysis Approach

- Obtain vehicle data from Streetlights for regional traffic analysis zones (TAZ) of interest to the Port.
- Filter data to focus on Drayage trucks.
- Select vehicle traffic distribution data to focus on the inbound and outbound routes of trucks from all ports.
- Perform spatial and data evaluation using GIS tools to evaluate regional and port to port route patterns.
- Evaluate origin and end point locations to identify dwell areas.



Data Processing – Route Trends

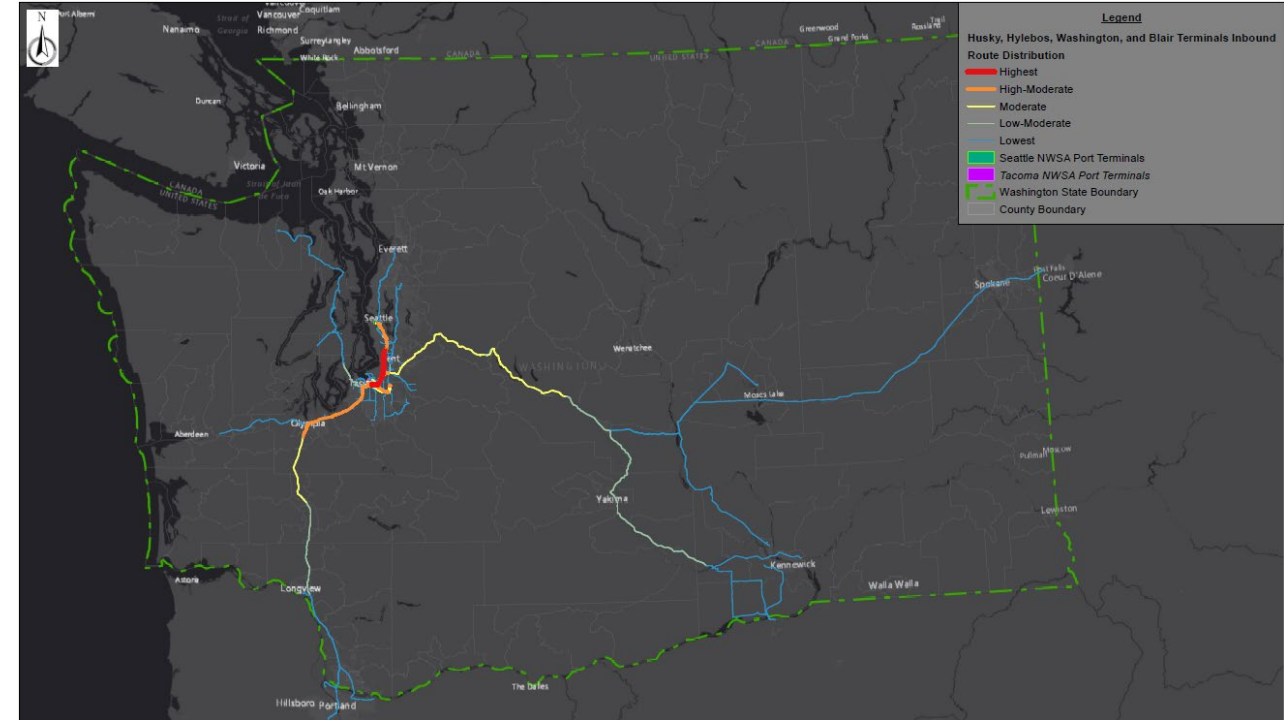
- Analysis focused on four types of behavior:
 - 1)Regional traffic patterns
 - 2)Port to Port traffic patterns
 - 3)Terminal to Terminal*
 - 4)Dwelling (Warehouses, Distribution Centers)
- Route Trends were evaluated for 2021 and 2022 data.
- For Dwell location evaluation Port provided RFID data for 2021 and route distribution for 2021 data were used to develop counts.
- *Terminal to Terminal analysis was beyond the scope of this project and is not included in the presentation

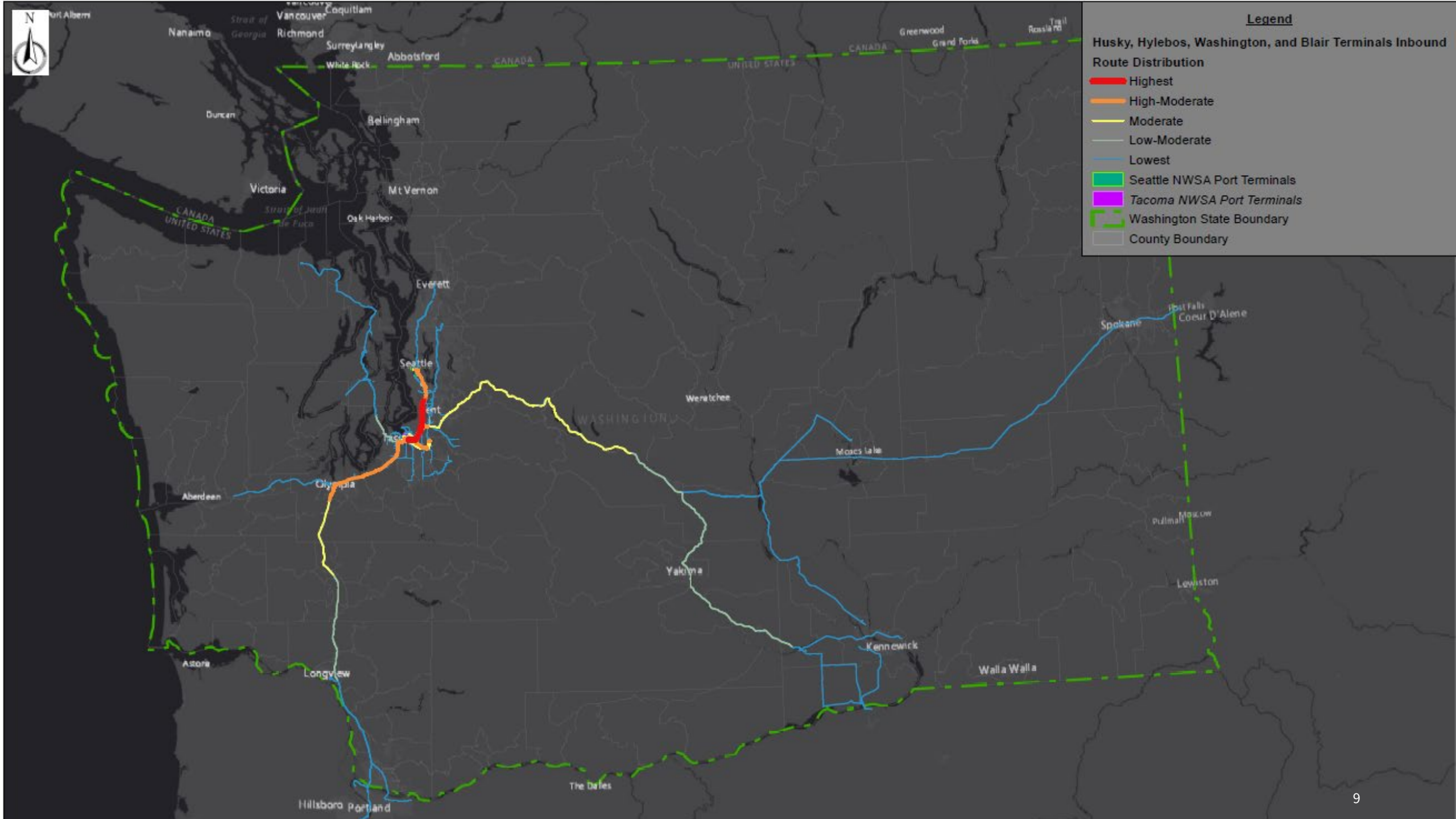


Route Trends: Regional Traffic Patterns

Regional Traffic Patterns

- Necessary to ID strategic locations and routes for ZEV transition.
- ID charging needs beyond single charge range.
- Extend to the WA state borders and beyond N, S and E.
- Isolated data from each port to understand overall and individual port trends at a regional level.
- Looking for routes with highest traffic volumes both inbound to the ports and outbound from the ports.
- Helps ID regional areas for alternative charging which gives flexibility when working with utility power availability
- Allows removal of long-range regional trends for local dwell location evaluation

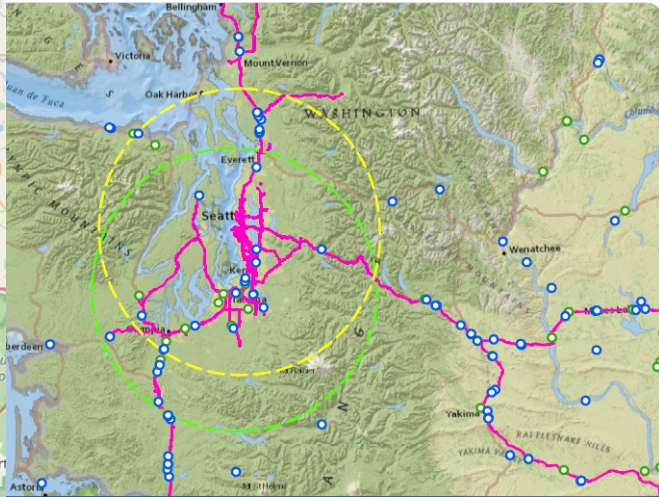
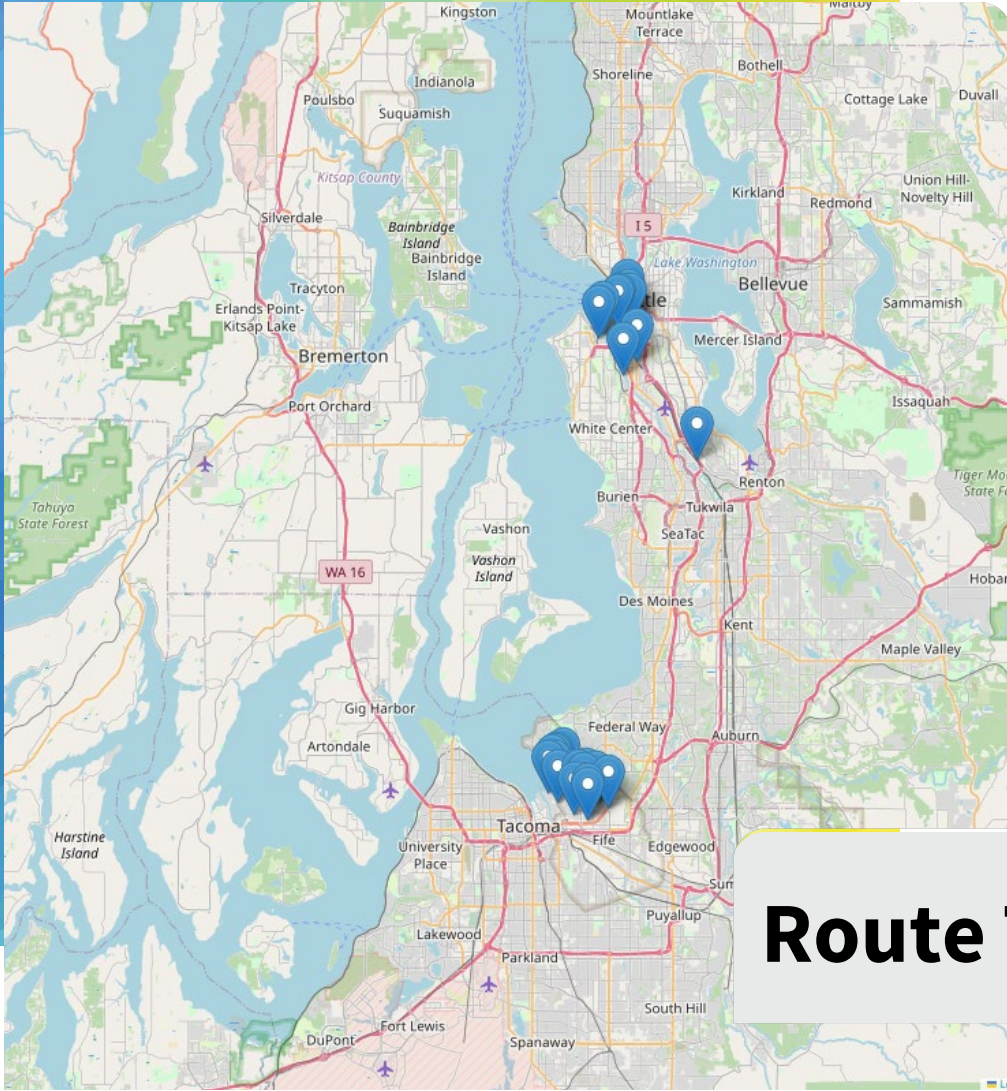




Regional Behavior: Summary

The table below shows the three main routes with the higher volumes of drayage trucks inbound or outbound from the Port of Seattle and Port of Tacoma - 1st being the route with the highest volume of trucks.

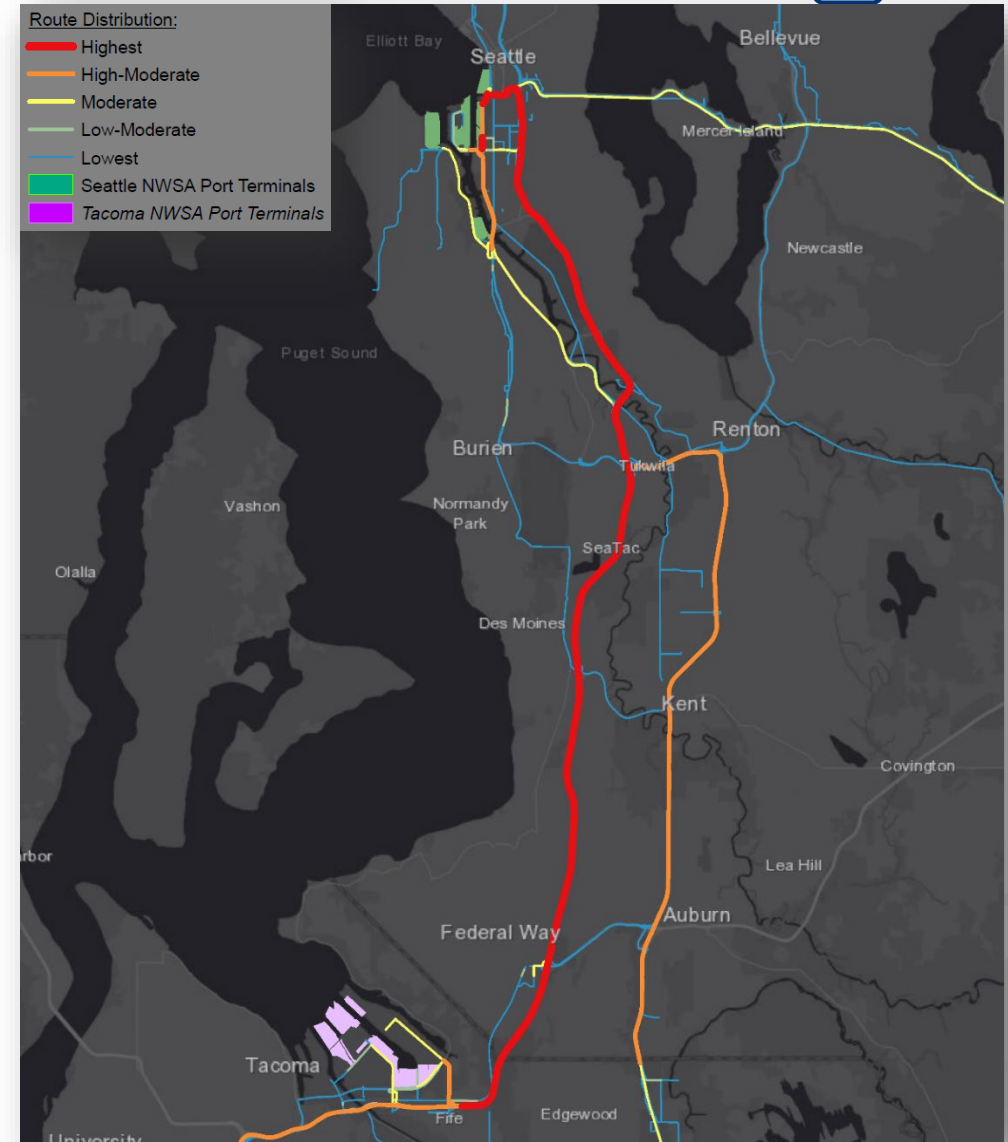
	Inbound		Outbound	
	Seattle	Tacoma	Seattle	Tacoma
1st	East I-90	East WA-18	South I-5	South I-5
2nd	South I-5	North I-5	East I-90	East WA-18
3rd	North I-5	South I-5	South WA-167	North I-5



Route Trends: Port-to-Port Traffic Patterns

Port to Port Patterns

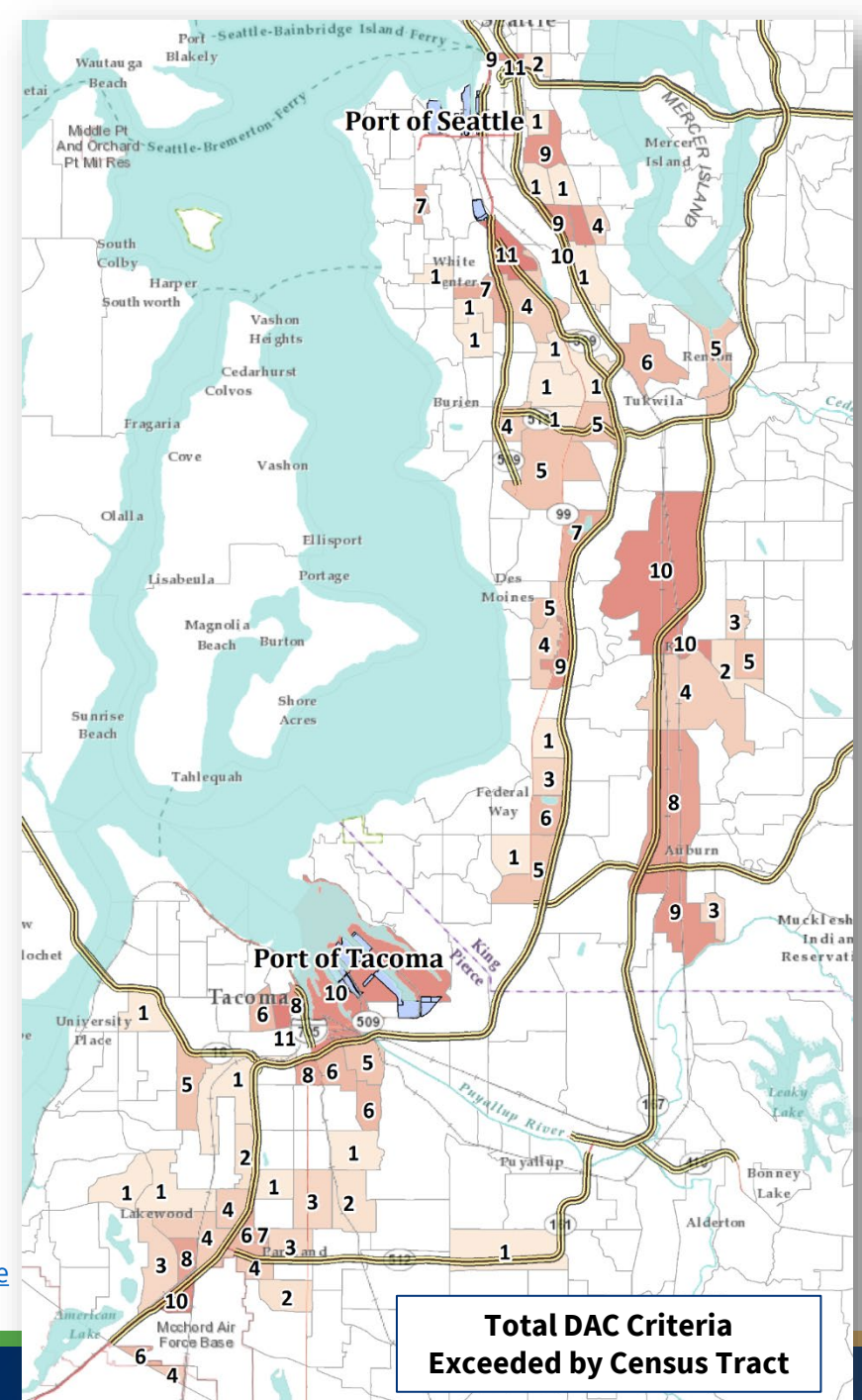
- Necessary to ID patterns for between port dwell evaluation.
- Supports the understanding and alignment with the truck pattern data and allows for comparison with on the ground observations and known drayage truck behavior/logistics
- Supports identification of multiple potential locations for alternative near port fueling infrastructure which may be needed to align with utility power availability or collaborations with fleet managers.
- Supports the removal of port-to-port trends from local dwell location evaluation.

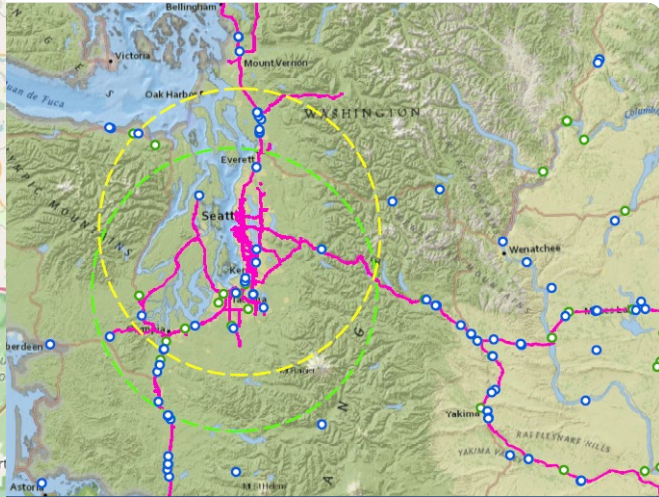


Port to Port Traffic Patterns

- Strongest trends occurred along the stretch of I5 between the two ports.
- Shorter trips and constrained in distance between the two ports.
- Distance can be covered with battery trucks with the shortest charging time inside of the terminals or close to the ports within the I5 corridor between the two ports
- Seattle terminals show a strong port to port behavior
 - Majority of route distribution is between ports along I5 and WA 167
- Tacoma terminals also show a strong port to port behavior
 - Distribution is not as dominated by I5 compared to the Seattle terminals
 - All terminals have a connection to Port of Seattle, but much greater variability
- [Port-to-Port Behavior: Seattle](#)
- [Port-to-Port Behavior: Tacoma](#)

[Climate and Economic Justice Screening Tool](#)

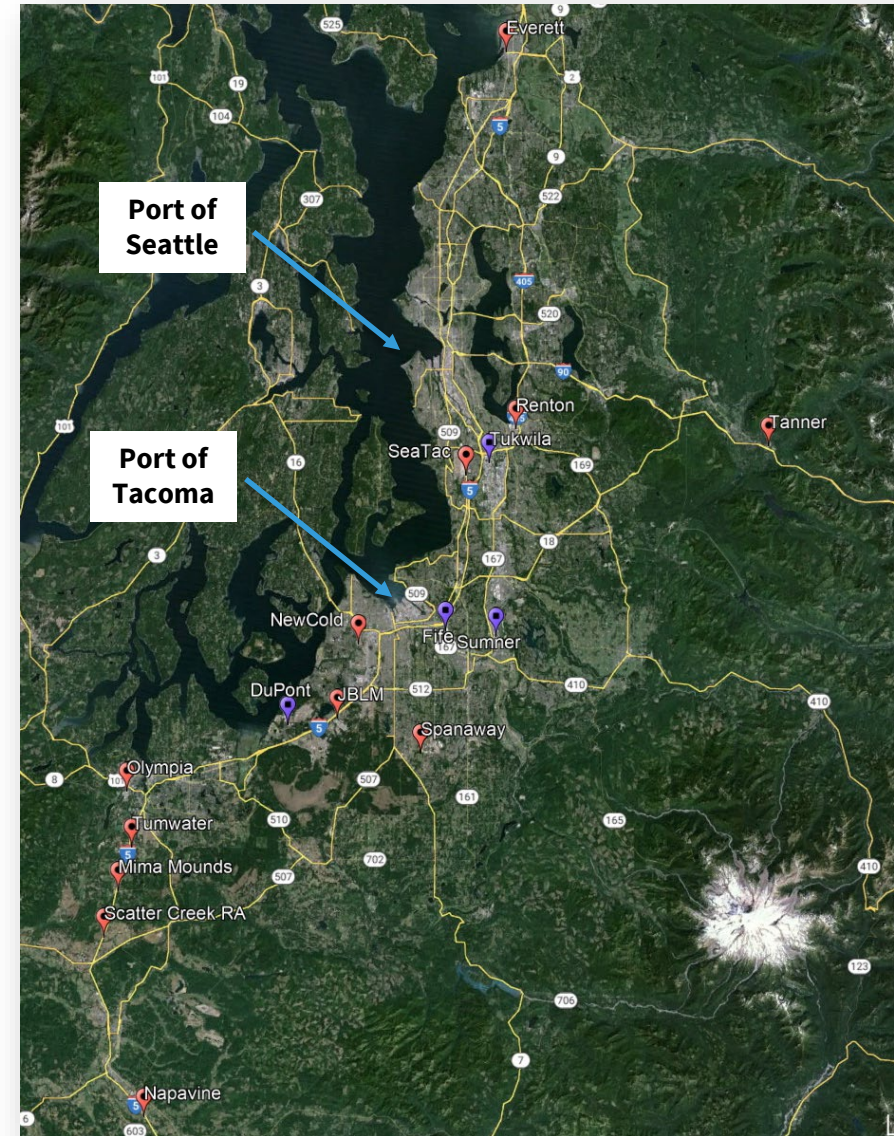




Dwelling Area Identification

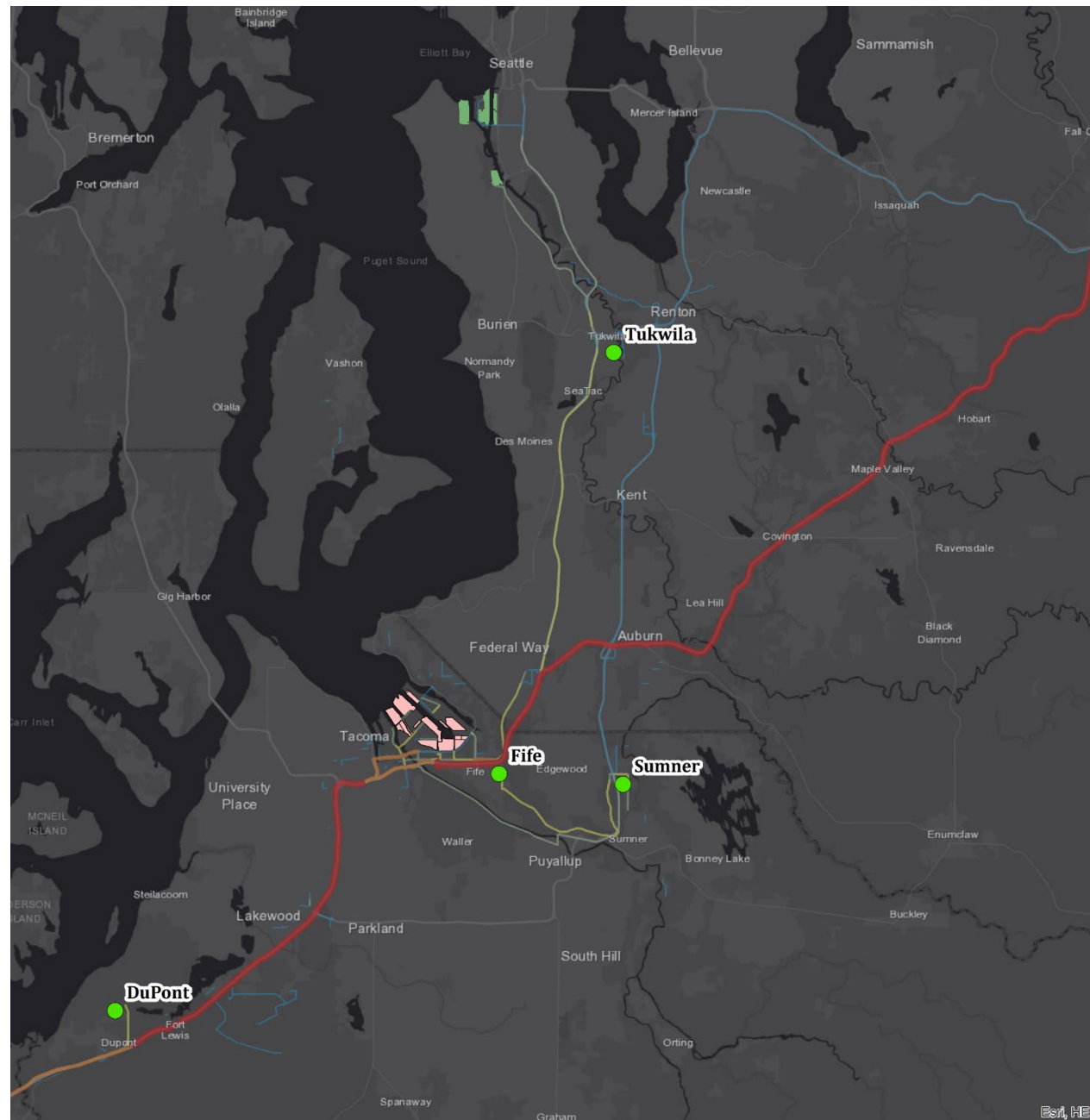
Dwelling Area Identification

- Reviewed route trends and distribution plots
 - Dead ends, overlaps, consistencies
- Identified of points of interest
 - Dwelling areas
 - Warehouses
 - Distribution Centers
 - Common travel stops, fueling stations, and rest areas
- 4-main areas of focus along I-5
- 10+ additional areas along common routes
- Dwell time **default** used is the Streetlights trip origin and endpoint. (~15 minutes with movements less than 5 m = end of trip)



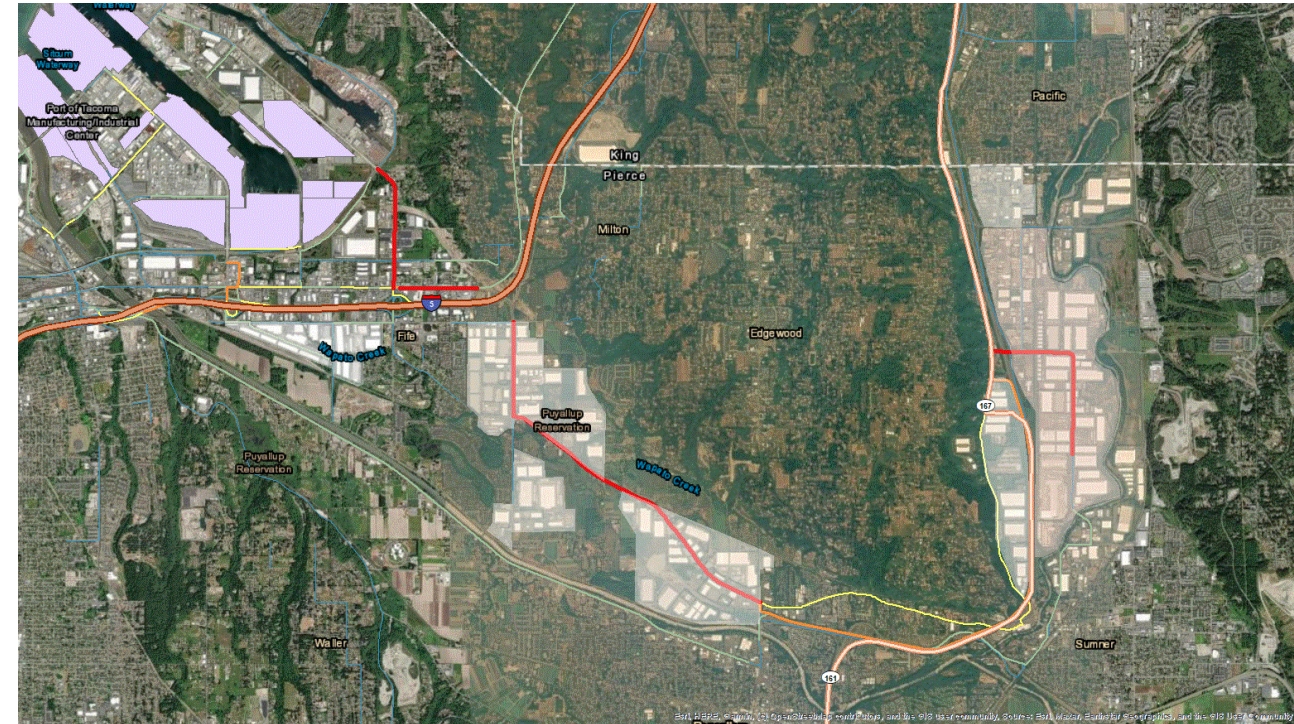
Areas of Interest

- Sumner
- Tukwila
- Fife
- DuPont



Sumner Warehouse and Distribution Center

- Predominate connection with Port of Tacoma
 - Main Tacoma Terminals
 - Husky, Washington, East Sitcum, Marshall Ave, Pierce County, T7, TOTE, West Sitcum
 - Main Seattle Terminals
 - T5, T18

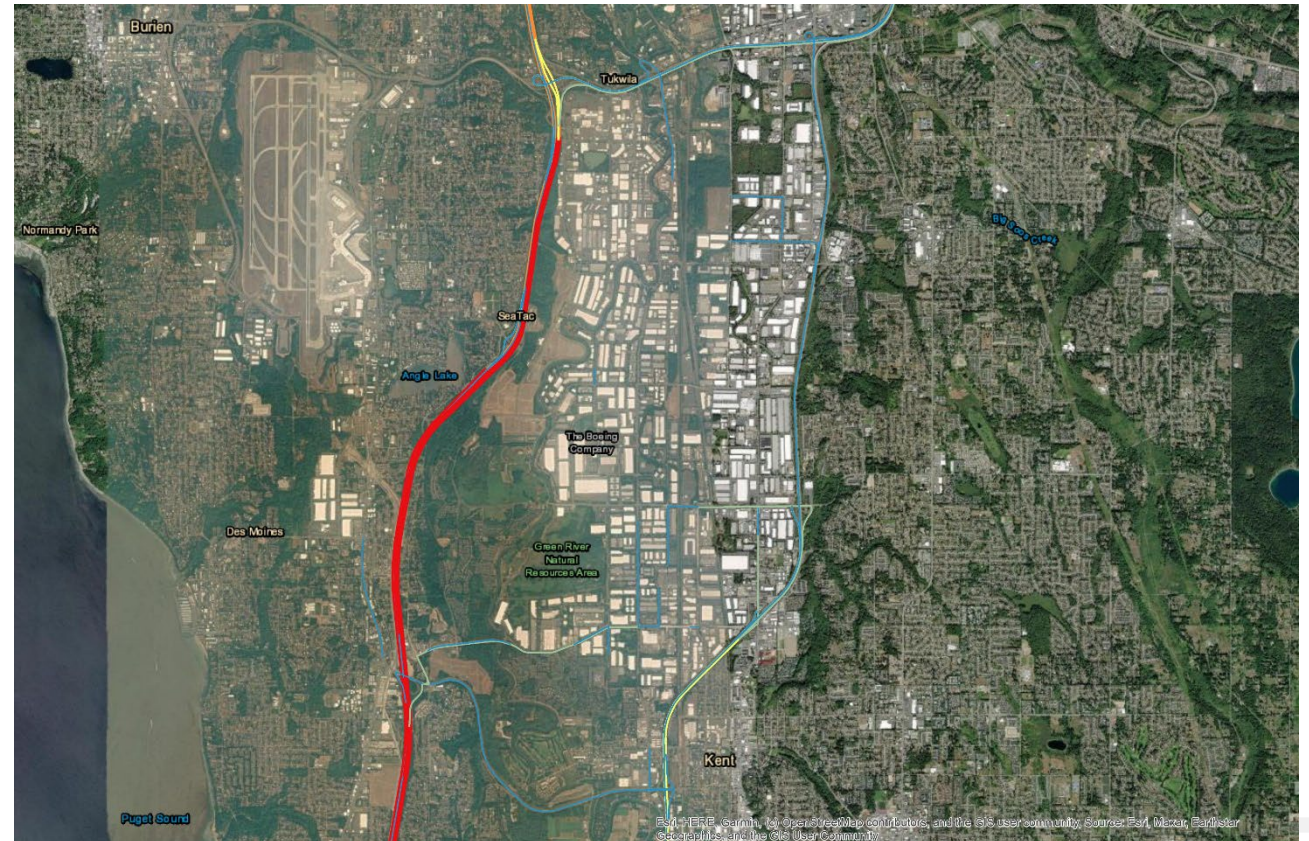


Origin	Destination	HDV Count
Tacoma	Sumner	18,071
Sumner	Tacoma	15,491
Seattle	Sumner	4,778

Tukwila Warehouse and Distribution Center

- Connection with both Ports
 - Main Tacoma Terminals
 - East Sitcum, TOTE
 - Main Seattle Terminals
 - T5, T18

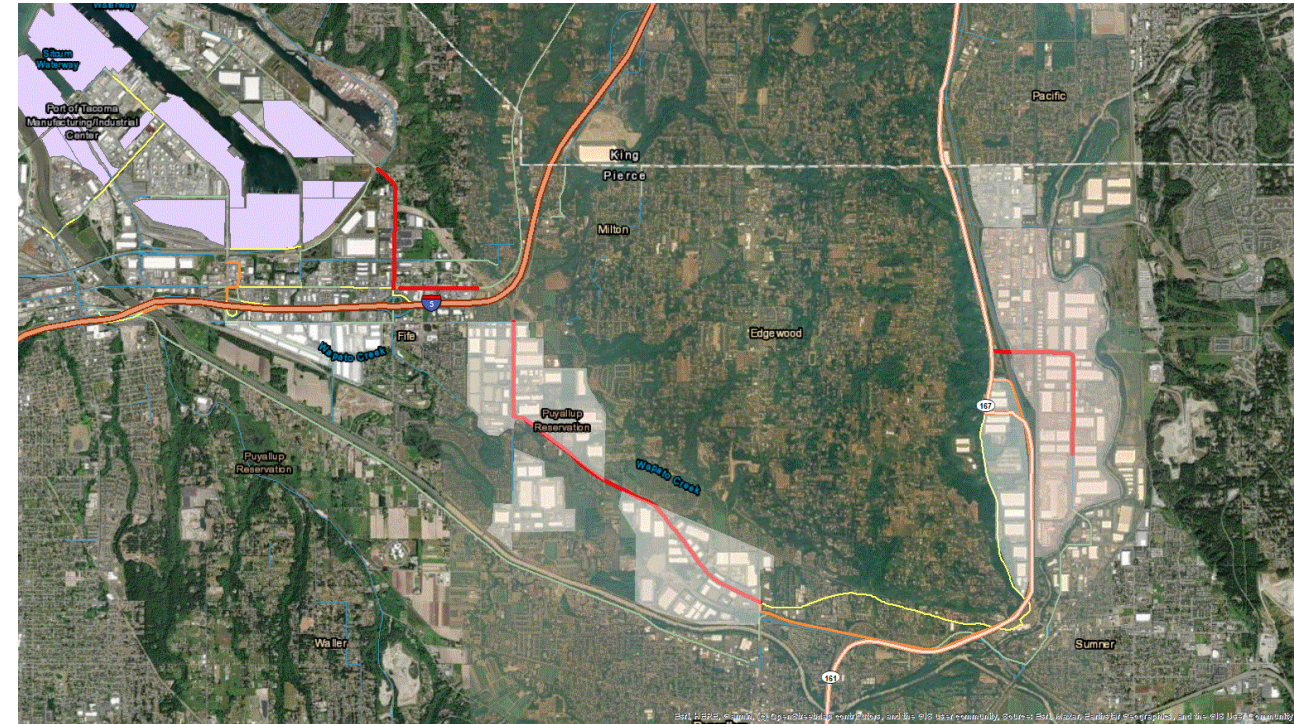
Origin	Destination	HDV Count
Seattle	Tukwila	5,559
Tukwila	Seattle	3,852
Tacoma	Tukwila	2,687
Tukwila	Tacoma	3,075



Fife Warehouse and Distribution Center

- Predominate connection with Port of Tacoma
 - Main Tacoma Terminals
 - Husky, Washington, East Sitcum, Marshall Ave, Pierce County, T7, TOTE, West Sitcum

Origin	Destination	HDV Count
Tacoma	Fife	3,800
Fife	Tacoma	3,286



DuPont Warehouse and Distribution Center

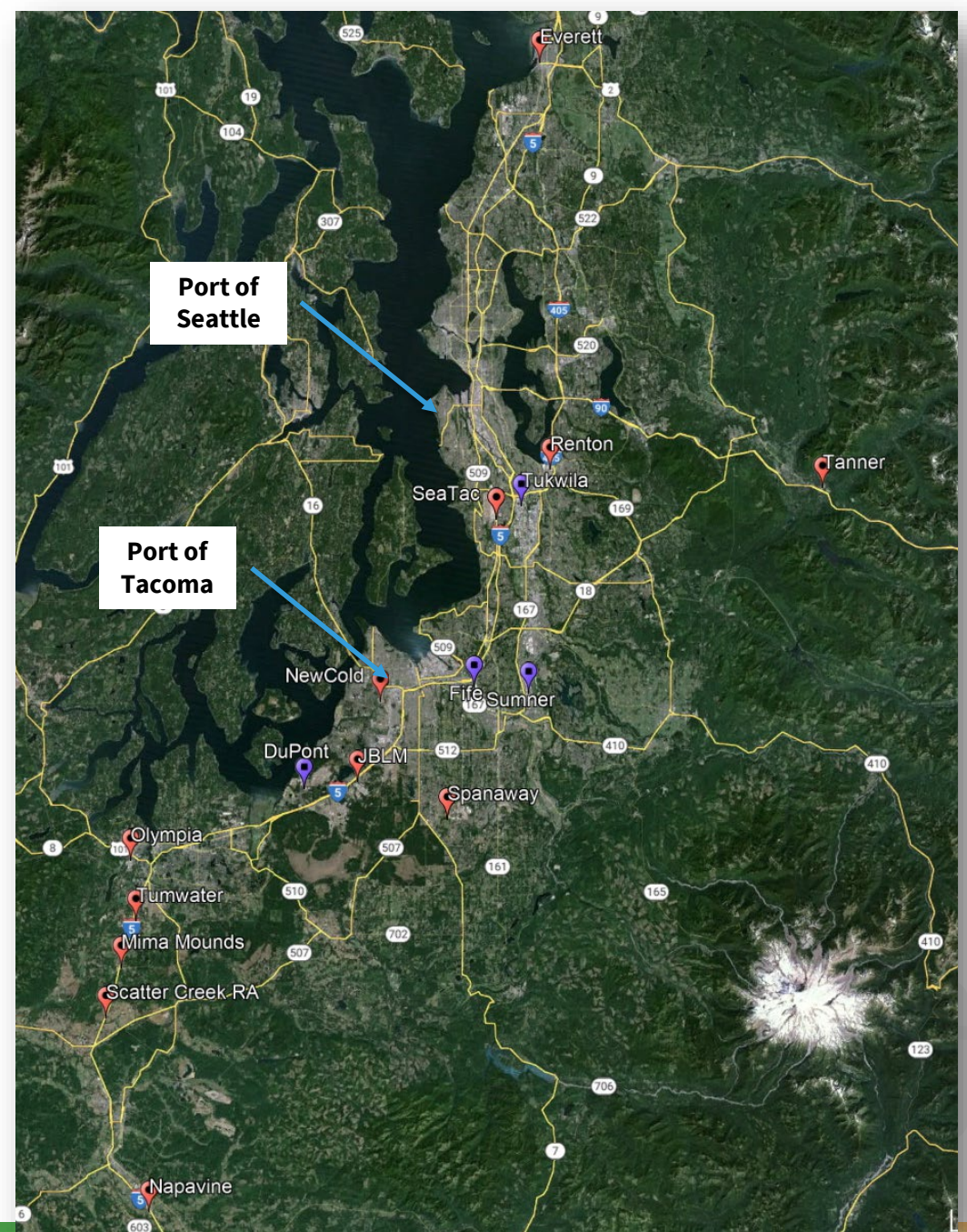
- Predominate connection with Port of Tacoma
 - Main Tacoma Terminals
 - East Sitcum, Pierce County, T7, Taylor Way

Origin	Destination	HDV Count
Tacoma	DuPont	198
DuPont	Tacoma	103
Seattle	DuPont	47

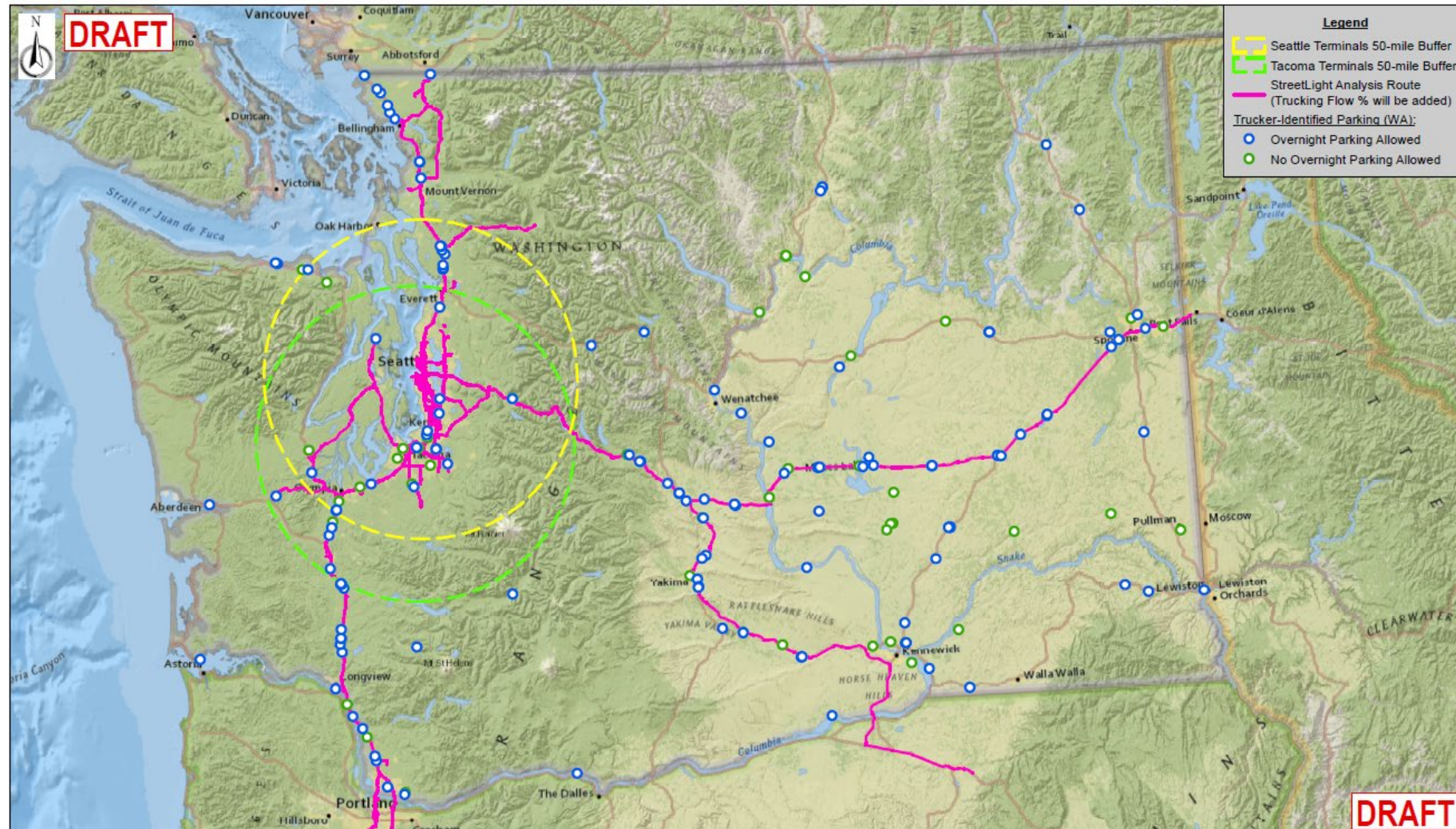


Additional Areas of Interest

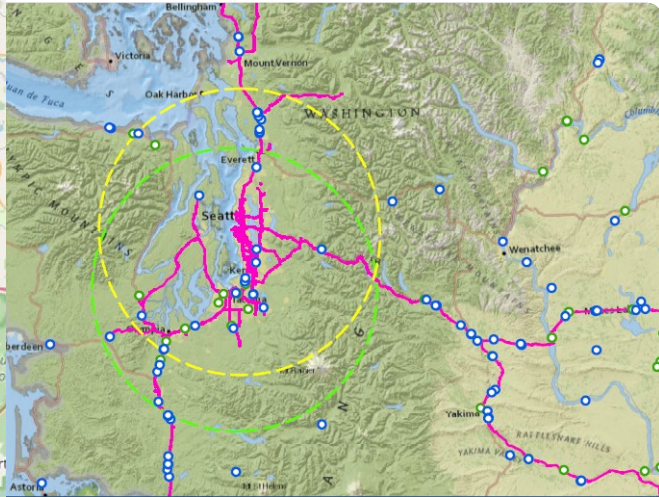
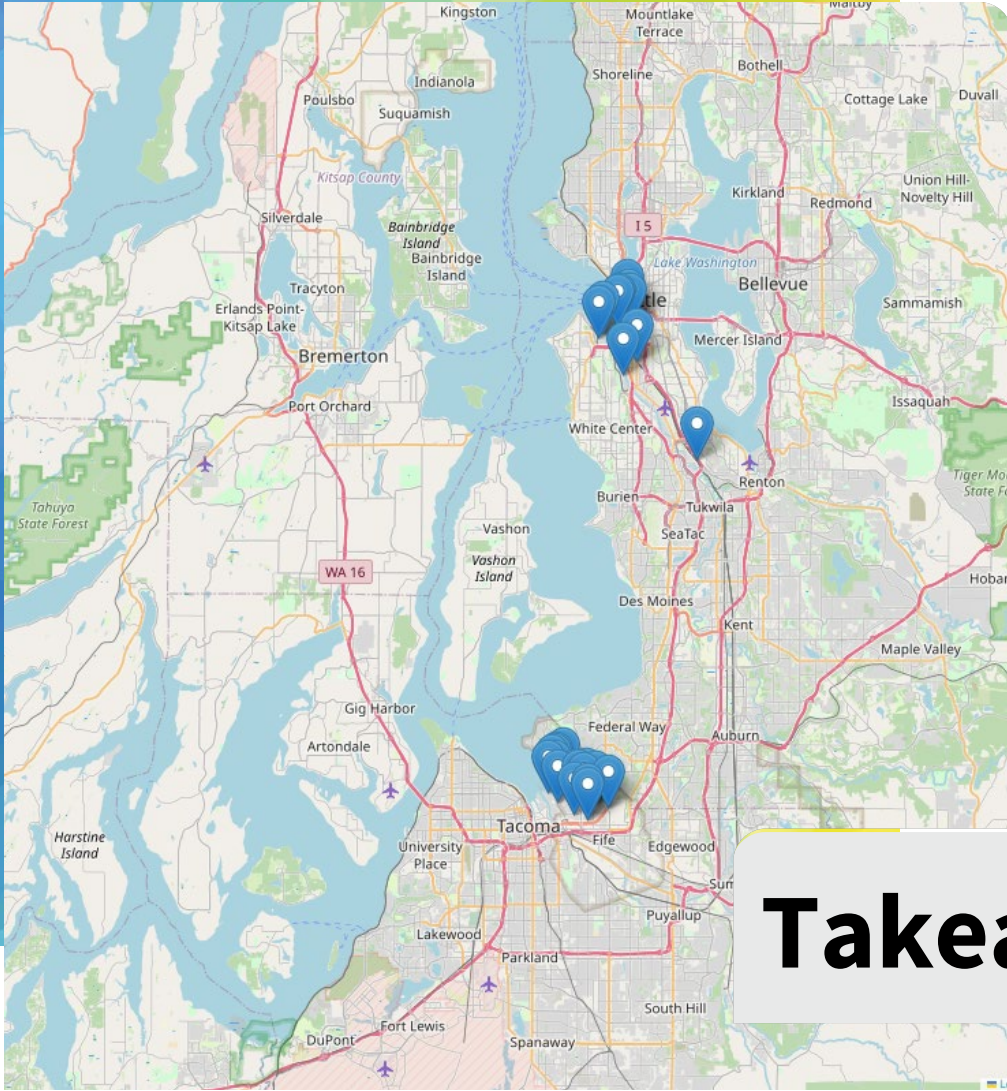
- Warehouses/Distribution Centers
 - Tukwila
 - Spanaway
 - Tumwater
 - SeaTac
 - Joint Base Lewis-McCord
 - Woodinville
 - Olympia
 - NewCold
- Trucking Centers, Travel Support
 - Napavine Travel Stop
 - Scatter Creek Rest Area
 - Tanner (also warehouse center)



Parking and Overnighting Cross Reference



There was alignment between locations identified via desktop study and self reported dwell locations from truckers.



Takeaways and Opportunities

The Takeaway

- **Regional trends** do exist and opportunities for alternative fueling along these routes would align with the West Coast Collaborative in the N-S and could support regional collaborations with partners to the east and southeast of the state.
- **Port to port** behavior is common and signals the need to identification of power availability and close collaboration with local fleets, utility, and other entities looking to increase electrification in the transportation sectors.
- **Local dwell location** trends tend to align with locations of transportation logistic hubs (warehouses, fleet lots, and existing travel centers.) Near port parking is mentioned, but these spaces may not be ideal or official parking areas.

Next Steps and Opportunities

- Repeat local evaluation with a custom dwell-time metric (\$) to evaluate elapsed time between the end of a trip, and the start of the next trip, and/or diurnal patterns. These additional analyses will help to determine the various time spent at points of interest and which locations could be used for other logistic coordination.
- More detailed trucker surveys to uncover preferences and behaviors related to mid shift breaks and interest in split shifts.
- Clean Port and other Funding opportunities
- Coordination with utilities on power availability and needs for various locations.
- Coordination with local fleet owners and managers to understand existing infrastructure plans.
- Coordination with DAC and community benefits organizations to evaluate existing impacts of highway traffic (focused on Drayage Routes)
- Evaluate truck corridor air quality data and monitor as transition occurs to determine AQ benefits.
- Collective regional planning, DOT, and emergency response to develop planning and training for BEV and H2 vehicles.
- Community awareness events to support transition readiness.

Tetra Tech clean truck (CTP) and climate pollution reduction (CPRG) programs



Greenhouse Gas and Low Carbon Fuel Standard Verifications

- Certified verifiers for several state programs
- Verification for stationary combustion, process, transactions, power sector.
- Low carbon fuel validation, verification and reporting.



Air Monitoring

- Air pollutant and meteorological monitoring programs for risk reduction, regulatory compliance, program evaluation, and community benefits.
- Multiple criteria and toxic pollutant monitoring options including expertise in low cost sensors
- Use of cloud-based systems to review real-time and post processed data, custom dashboards



EV and H2 HSE Readiness and Gap Analysis

- Dwell time and Alternative fueling location identification.
- Data gap analysis and opportunity identification.
- Utility coordination on alternative fueling feasibility analysis.



Workforce Development and Training

- Technical content development and delivery to technical and public audiences
- Coordination and collaboration on EV and H2 specific safety and environmental training



Community Engagement

- Coordination and facilitation of impacted and interested community meetings and events.
- Developments of community benefit plans to meet Justice 40 and EJ initiatives.
- Implementation and management of on-going community benefit programs including KPI monitoring, modeling and reporting.



CTP Development and Management

- Program development and implementation: truck replacements, retrofits, scrappages, and vehicle upgrades to alternative fuel propulsion according to all regulatory guidelines. Support for drayage truck registry.
- Analysis including; cost benefit for clean vehicle strategies; price point analysis; developing and implementing application processing; scrappage programs, etc.
- For longest running program, emissions have been reduced by 90% for diesel particulate matter, 63% for nitrogen oxides and 97% for sulfur oxides.



Clean Off Road Equipment Projects

- Developed and managing heavy duty off road and landscape equipment programs in multiple states.
- Over \$150M for ZE equipment distributed to date.

Breakout Sessions



Discussion

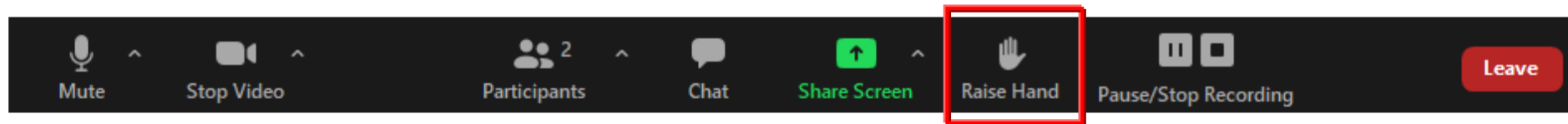
- What are key takeaways from the study for you?
- What does the drayage study suggest about the type and location of infrastructure needed to start supporting the ZEV transition in the near term (3-5 years)?
- What further questions do you have? Where should we do more analysis?

Public Comment



Instructions for Public Comment

- Members of the public that are interested in making 2-minute statements are invited to do so
- Please introduce yourself
- To the extent possible, please frame remarks as comments rather than questions
- For virtual participants, please use Zoom to raise your hand if you would like to make a statement, and you will be unmuted



Next Steps



Next Steps

- Meeting summary, slides and materials will be posted on website— along with driver session summaries
- Small group session with Infrastructure and Equity groups: Thursday, April 4: 1:00-2:30 PM
- Next full Collaborative meeting: April 29, 8:30 AM – Noon
 - Vehicle incentive program design
 - Hydrogen vehicles and fueling infrastructure