Oregon Commercial Truck Parking Study

November 12th, 2019 TAC Meeting
Today’s Agenda

• Welcome and Introductions
• Study Status
• Survey and Interview Summary
• Current Truck Parking Demand
• Future Truck Parking Demand
• Committee Discussion: Strategies to Address Truck Parking Needs
• Wrap-up & Next Steps
Study Status

• Revised inventory
• Conducted interviews and surveys
• Estimated current/future truck parking demand
Inventory Update
Survey and Interviews

• **Online Survey:** Designed to reach a wide audience of industry, agency and community stakeholders.

• **Interviews:** Team conducted 26 in-person or phone interviews with key stakeholders familiar with truck parking in Oregon or nationally. Probed issues more deeply and helped disseminate survey.

• **Tabling/In-Person Survey:** Conducted at:
  - *Jubitz Travel Center* (Portland, I-5)
  - *Pilot Travel Center* and *Grand Central Travel Center* (Biggs Junction, I-84)
  - *Truck ‘N’ Travel* (Coburg, I-5)
  - *2019 Oregon Truck Driver Championships* (Portland)
Survey

Overview

• Included questions of: how, why, when, and where parking locations are chosen

• Allowed corridor-based input to be provided
  • Same corridors as demand analysis

• Online survey was live from June 7 through August 26, 2019

• Survey link was provided to
  • Interviewees, 4 tabling events and truck stops
  • TAC committee members
  • Oregon Trucking Association
  • Oregon Industry mailing list
Survey

Respondents

• Obtained 729 responses
  • 662 online and 67 in-person

• 26 longer interviews also conducted

• Profile of respondents
  • 80% were truck drivers
  • 68% indicated they look for parking in Oregon 2-3 times per month
  • 75% had been driving for more than 10 years
  • 48% operate regionally and 40% operate nationally
Survey

Findings – Availability

• Parking availability was single most important issue

• Most respondents identified availability of truck parking as “Poor” (40%) or “Very Poor” (19%).
  • Only 14% held a positive view of parking availability

• Weekday nights hardest to find parking

• The most popular reason for stopping was the required breaks in HOS
Survey

Findings – Availability

- Segments in the Portland Metro area (H,I,J) were ranked as having the least availability
- Weekday nights hardest to find parking
Survey

Findings – Time Spent Looking for Parking

- Significant variability
- 25% or more of respondents routinely take more than 1 hour to find parking at segments:
  - A, H, J, M, Q
Survey
Findings – Safety or Security of Spaces

• Over 40% indicated that parking is not safe or secure at
  • D, H, I, J, K, P, Q, T
• Safest or most secure parking found at
  • G, L, O
Survey
Findings – Adequacy of Services

• 60% of respondents indicated there are inadequate services in segments:
  • D, N, O, and T
Survey

Findings – Behavior

• Finding spots
  • 65% have favorite locations
  • 39% use smartphone apps

• Reason for stopping
  • 60% said HOS
  • “Personal safety or cargo safety” was identified by just under half of respondents
  • “Proximity to route/destination” also ranked highly
  • The least common reason was “Established stops provided by my company.”
Survey

*Findings – Behavior*

- Choosing parking facilities based on amenities
  - restrooms (80%)
  - expected parking availability (66%)
  - Food, ease of vehicle access, and showers were also important factors.

- Types of parking facilities
  - Private truck stops were the most popular with 51% stopping three or more times per week.
  - Terminals were least popular (8% stopping three or more times per week),
Survey

Findings – Issues

What do you think are the main problems and issues with truck parking in Oregon?

- A general lack of available parking: 331
- Current hours of service rules and regulations: 215
- Delays associated with congestion and traffic: 197
- Parking limitations at rest areas: 188
- Difficulty knowing if and where spaces are available: 185
- Public perception of truck parking: 149
- Delays associated with loading/unloading: 145
- Distance between parking areas: 119
- Crowding due to weather or weather-delays: 111
- Other (please specify): 94
- Lack of oversize truck parking spots: 92
- Out-of-direction travel required: 36
Survey

Findings – Strategies

Which of the following strategies to alleviate truck parking issues make sense to you?

- Larger truck rest areas and truck parking lots: 329
- Build more public truck stops: 260
- Convert weigh stations to provide additional...: 254
- Smart signs that show available parking: 236
- Encourage private investment and expansion: 233
- Incentivize local businesses to allow truck parking: 209
- Real-time parking availability information: 197
- Incentivize businesses to accept deliveries 24/7: 161
- More/better maps of truck parking areas: 145
- Cell phone notification system: 113
- Reduced delivery curfews: 66
- Paid parking reservation systems: 66
- Other (please specify): 59

Which of the following strategies to alleviate truck parking issues make sense to you?
Interviews

Overview

• Most interviewees were truck stop employees, motor carriers, port of entry staff, and advocacy groups

• Interviewees tended to be unsure (9) or feel negatively about the general availability of truck parking (9)

• As with survey respondents, interviewees also perceived a general lack of availability as the most common issue with truck parking in Oregon. Likewise, HOS rules were also an important issue.
Interviews

*Segment Specific Findings*

- All segments have a lack of parking during peak hours
- Less safe parking everywhere
- Portland Metro area (G, H, I, J) have limited parking availability and traffic congestion.
  - Drivers want to park close to morning destination, however urban growth has constrained parking availability
- Rural areas were perceived as less problematic
- US 97 is remote and subject to winter advisories. Parking is scarce, particularly to make Bend deliveries.
Interviews

**Findings – Impacts of parking issues**

- Decreases truck utilization and increases costs
- New parking rules (6 respondents)
  - Hurt drivers through towing, fines, and new fees (often not covered by fleet)
- Trucks parking multiple days
- Problematic parking safety and security (5 respondents)
- Higher truck loads increase truck stop maintenance (3 respondents)
- Trucks often park illegally or in unsafe locations (6)
- Stop short or adjust their schedule (5)
- Adjust trip planning (4) to change routes and travel times
- Reservation systems (3)
- Avoid locations (2)
Interviews

*Findings – Other Strategies*

- Incentivize local jurisdictions to allow truck parking and reduce costs
- Make HOS rules more flexible
- Provide portable restrooms
- Use surplus underdeveloped property for truck parking
- Leverage private investors instead of building more rest areas
- Leverage technologies such as satellite radio
- Increase patrols of rest areas
- Review designs of rest areas to better accommodate trucks
- Add several smaller areas as opposed to few large ones
Current Truck Parking Demand

Methodology Recap

1. Identification of Parking Locations
   - Designated parking: facility inventory
   - Undesignated parking: cluster analysis of ATRI GPS data & input from interviews
   - Geocode boundaries

2. Estimation of Expansion Factors
   - Compare ATRI GPS data to video counts
   - Explore regression approach

3. Calculation of Parking Demand
   - Convert GPS counts to total demand using expansion factors
   - Explore demand variability
   - Calculate system performance metrics
ATRI GPS Data

- Raw data
  - 16 weeks from 09/09/18 to 07/06/19
  - 30 miles beyond Oregon borders
  - ½ mile from study corridors
  - Hundreds of millions of lat-long records
- Developed algorithm to estimate GPS occupancy at rest areas and truck stops
- Developed algorithm to identify clusters of undesignated truck parking
GPS Expansion Model

**Objective**
- Limited GPS Data
- GPS Expansion Model
- Estimate Demand for All Rest Areas and Truck Stops

**Observations**
- Video Observations
  - 9 rest areas and 2 truck stops
  - Observed parking occupancy for 24 to 48 hrs.
- Application Observations
  - 11 truck stops
  - Recorded parking occupancy every 4 hours for first week of July
GPS Expansion Model

**Estimation**

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<td>GPS Occupancy – Portland Area</td>
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<td>GPS Occupancy – US 97</td>
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<td>GPS Occupancy – I 5</td>
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<td>Adjusted R^2</td>
<td>0.920</td>
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<td>Number of Observations</td>
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</table>

* Statistically Significant
Designated Parking

Statewide Overview

Weekday Midnight Occupancy in Oregon

- Rest Areas: 2,875
- Truck Stops: 412

Measure Parking Demand at Midnight

- Type: Rest Areas (Blue), Truck Stops (Orange)

Data points:
- Avg. O
- 62.16
- 10.44

Chart showing occupancy trends from 0 to 24 hours with peak demand at midnight.
Designated Parking

**Statewide Overview**

- Highest demand on Wednesday
- Highest demand at truck stops
- Greater variability throughout the week at rest areas
- Considered influence of weather, but no conclusions could be made

<table>
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<th>Thu</th>
<th>Fri</th>
<th>Sat/Sun</th>
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<tr>
<td>Average</td>
<td>57.67</td>
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<td>66.64</td>
<td>62.80</td>
<td>61.88</td>
<td>42.06</td>
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<tr>
<td>Percent</td>
<td>7.47%</td>
<td>11.18%</td>
<td>11.92%</td>
<td>10.63%</td>
<td>10.04%</td>
<td>5.34%</td>
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</table>

- Highest demand on Wednesday
- Highest demand at truck stops
- Greater variability throughout the week at rest areas
- Considered influence of weather, but no conclusions could be made
- Segment A (I-5 between California border and Grants Pass)
- Segment B (I-5 between Grants Pass and Roseburg)
- Segment C (I-5 between Roseburg and Eugene)
- Segment E (I-5 between Eugene and Albany)
- Segment F (I-5 between Albany and Salem)
- Segment G (I-5 between Salem and Portland/I-205)
- Segment H (I-5 between Portland/I-205 and Vancouver)
- Segment I (I-205 between Portland/I-5 and Washington border)
- Segment J (I-84 between Portland/I-5 and Troutdale)
- Segment K (I-84 between Troutdale and US97)
- Segment L (I-84 between US97 and Pendleton)
- Segment S (I-84 between Pendleton and Idaho border)
- Segment M (OR-22/US20 between Salem and Bend)
- Segment P (US20 between US97 and US395)
- Segment Q (US20 between US395 and Idaho border)
- Segment D (OR58 between Eugene and US97)
- Segment N (US97 between I-84 and Madras)
- Segment O (US97 between Madras and Bend)
- Segment T (US97 between Bend and OR58)
- Segment R (US97 between OR58 and California border)
Demand defined as average occupancy during midnight on weekdays.

Availability = Supply - Demand

Supply estimated from facility inventory.

- 57 truck stops and 39 rest areas.
Designated Parking

Supply-Demand Balance

- Most limited at high volume segments near Portland:
  - J on I-84 (19 spaces)
  - G on I-5 (5 spaces)
  - H on I-5 (40 spaces)
- Also limited at
  - K on I-84 (30 spaces)
  - C on I-5 (21 spaces)
Designated Parking

*Supply-Demand Balance*

- Limited space also present in low volume segments:
  - P on US 20 (1 rest area)
  - O on US 97 (1 truck stop)
  - M on OR 22 (1 truck stop)
- No spaces on segments:
  - D on OR 58
  - I on I-205 in Portland
Designated Parking

*Supply-Demand Balance*

- Ample space on segments:
  - L on I-84 (243 spaces)
  - S on I-84 (190 spaces)
  - T on US 97 (174 spaces)
  - R on US 97 (128 spaces)
- Most of these spaces are unstriped at truck stops
Undesignated Parking

**Locations**

- Highway shoulders
- Interchange on/off ramps
- Pullouts
- Weigh stations (some don’t allow overnight parking)
- Chain-up areas
- Vista points
- Shoulders of access roads to rest areas
Undesignated Parking

Processing

1. Converted lat-long records to truck stops along Cartesian grid
2. Exclude stops lasting less than 5 minutes
3. Performed cluster analysis to identify areas along the corridor with a high frequency of undesignated truck parking
4. Added areas identified by ODOT and other stakeholders where undesignated truck parking is common
5. Drew polygons around the areas identified in (3) and (4)
6. Totaled parking demand in undesignated parking clusters.
Undesignated Parking

*Results Overview*

- 49 areas were identified along study corridors with more than 5 hours of parking per day
- On an average weekday, 594 trucks park in these areas
- Average parking duration: ~2 hours
Undesignated Parking

Results

• Segments with highest undesignated parking
  • S on I-84 (229 hr)
  • K on I-84 (220 hr)
  • L on I-84 (158 hr)
  • B on I-5 (149 hr)
  • A on I-5 (110 hr)

• Most of I-84
• I-5 border with CA
Undesignated Parking

1st Ranked location

- Ashland Hill Park on I-5
- 100.6 hours per day
- 1.3 hours per parked truck
Undesignated Parking

2\textsuperscript{nd} \textit{Ranked location}

- 2\textsuperscript{nd} Ranked Location: I-5 Manzanita Rest Area Ramps
- 86.6 hours per day
- 2.0 hours per parked truck
Undesignated Parking

3rd Ranked location

• I-5 Frontage Road to Santiam River Rest Area
• 58.7 hours per day
• 1.7 hours per parked truck
15 Minute Break
Future Truck Parking Demand

**Forecast Assumptions**

- Oregon’s Statewide Integrated Model (SWIM) growth rates
- 2040 horizon, proportional to volumes
- Fastest growth in Q and O
- Slow percentage growth in I-5, but significant absolute growth
Future Truck Parking Demand

*Increase 2019 to 2040*

- Measured at midnight on weekdays
- Most growth in parking demand on S and L on I-84
- Significant increase in demand on R in US97 and several segments of I-5
Future Truck Parking Demand

*2040 Supply-Demand Balance*

- Shortfall of spaces on segments:
  - G on I-5 (44 spaces)
  - J on I-84 (21 spaces)
  - C I-5 (9 spaces)
- Segment H is expected to reach capacity
Future Truck Parking Demand

2040 Supply-Demand Balance

- Sufficient availability projected on:
  - T on US 97 (166 spaces)
  - L on I-84 (156 spaces)
  - Q on US 20 (85 spaces)
  - R on US 97 (84 spaces)
  - N on US 97 (76 spaces)
  - E on I-5 (60 spaces)
Future Truck Parking Demand

**Uncertainty**

• Model Accuracy
  • All models are simplifications. Accuracy could be improved with more observations

• Truck Activity
  • Changes in economic production/consumption patterns
  • Changes in shipment sizes/truck sizes

• Regulation and Policy
  • Hours of Service, compliance requirements

• Connected and Autonomous Tech
  • Unlikely to have significant effect by 2040
Committee Discussion

Suggested Strategies by Drivers

- Larger truck rest areas and truck parking lots: 329
- Build more public truck stops: 260
- Convert weigh stations to provide additional...: 254
- Smart signs that show available parking: 236
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- Other (please specify): 59

Other Strategies to Expand Availability:

- Opening up more spaces in commercial, stadium lots, etc.
- Forcing municipalities to allow more parking in city limits
- Prohibit parking by non-truck vehicles, such as RVs
- Local drivers leave trucks at nearby stops when they are at home (3 respondents)
### Committee Discussion

#### Suggested Strategies by Interviewees

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<td>Convert weigh stations to provide</td>
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<td>Paid parking reservation systems</td>
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*Not Sure* | *Disagree* | *Agree*
Committee Discussion

Suggested Strategies by Interviewees

- Incentivize local jurisdictions to allow truck parking and reduce costs
- Make HOS rules more flexible
- Provide portable restrooms
- Use surplus underdeveloped public or private property for truck parking
- Leverage private investors, instead of building more rest areas
- Leverage technologies such as satellite radio
- Increase patrols of rest areas
- Review designs of rest areas to better accommodate trucks
- Add several smaller areas as opposed to few large ones
- Truck parking at weigh stations make operations more difficult
Committee Discussion

*Other Strategies from interviews*

- Use technologies for monitoring space availability
- Track of technological advancements: CAV Tech, platooning, Uber Freight
- Cross-docking could be offered at truck stops
- Look at other states for solutions
- Lower costs of increasing capacity and address NIMBYism
- Explore public-private partnerships: Oasis program in Utah
- Parking on public lands: who pays maintenance or is liable
- Track parking time limits to prevent long-term parking.
Wrap-up & Next Steps

• OFAC Meeting – January
• Finalize Current and Future Parking
• Develop Strategies and Recommendations
• Next TAC meeting – February
  • Strategy and Recommendations
  • Final Report
Appendix Slides
Undesignated Parking Locations

North Central Oregon

1045: MP 49 EB
Category: Mainline Shoulder
Hours of Parking: 21.4 /day
Trucks Parked: 10.7 /day

1046: MP 54.3 WB WS
Category: Weigh Station
Hours of Parking: 22.5 /day
Trucks Parked: 9.9 /day

1049: MP 60.8
Category: Mainline Shoulder
Hours of Parking: 11.2 /day
Trucks Parked: 4.8 /day

1052: Memaloose RA EB
Category: Ramp Shoulder
Hours of Parking: 18.2 /day
Trucks Parked: 6.6 /day

1054: MP 76.9 ramp
Category: Ramp Shoulder
Hours of Parking: 11.4 /day
Trucks Parked: 10 /day

1055: MP 77 WB
Category: Mainline Shoulder
Hours of Parking: 7.4 /day
Trucks Parked: 4.9 /day

1056: MP 92.4 EB
Category: Mainline Shoulder
Hours of Parking: 19.7 /day
Trucks Parked: 11.7 /day

1061: Arlington Viewpoint
Category: Viewpoint
Hours of Parking: 40.5 /day
Trucks Parked: 16.2 /day

1062: MP 161.3 ramps
Category: Ramp Shoulder
Hours of Parking: 13 /day
Trucks Parked: 9 /day

1065: Boardman RA ramps
Category: Ramp Shoulder
Hours of Parking: 11.1 /day
Trucks Parked: 9.6 /day

1066: MP 109.9 ramp
Category: Ramp Shoulder
Hours of Parking: 11.1 /day
Trucks Parked: 7.5 /day

1067: Stanfield RA ramps
Category: Mainline Shoulder
Hours of Parking: 40.1 /day
Trucks Parked: 9.6 /day

Acronyms:
MP: Mile Post
RA: Rest Area
EB: Eastbound
WB: Westbound
Undesignated Parking Locations

Northeast Oregon

Oregon Commercial Truck Parking Study
Undesignated Parking Locations

Northwest Oregon

Oregon Commercial Truck Parking Study
Undesignated Parking Locations

Southeast Oregon

108E: MP 356.4 EB
Category: Mainline Shoulder
Hours of Parking: 19.5 /day
Trucks Parked: 14.2 /day

1106: Vale unpaved area
Category: Unpaved Area
Hours of Parking: 6.7 /day
Trucks Parked: 1.7 /day

110S: Jurupa
Category: Mainline Shoulder
Hours of Parking: 5.7 /day
Trucks Parked: 2.1 /day

Acronyms:
M.P.: Mile Post
E.B.: Eastbound

Oregon Commercial Truck Parking Study
Undesignated Parking Locations

Southwest Oregon

Oregon Commercial Truck Parking Study

1026: MP 142 ramps
Category: Ramp Shoulder
Hours of Parking: 6.3/day
Trucks Parked: 5.1/day

1027: Cabin Creek RA SB ramps
Category: Ramp Shoulder
Hours of Parking: 2.0/day
Trucks Parked: 1.1/day

1028: Gettings Creek RA ramps
Category: Ramp Shoulder
Hours of Parking: 9.2/day
Trucks Parked: 9.4/day

1019: MP 102.6 SB
Category: Mainline Shoulder
Hours of Parking: 6.7/day
Trucks Parked: 4.6/day

1012: Manzanita RA ramps
Category: Ramp Shoulder
Hours of Parking: 8.6/day
Trucks Parked: 4.2/day

1014: Exit 86 Cravel Area
Category: Unpaved Area
Hours of Parking: 32.9/day
Trucks Parked: 11/day

1007: Ashland POE ramps
Category: Weigh Station
Hours of Parking: 7.1/day
Trucks Parked: 3.5/day

1004: Ashland Hill Park
Category: Mainline Shoulder
Hours of Parking: 100.6/day
Trucks Parked: 77.3/day