



Oregon State University

Measures of Freight Network Resiliency During the
Covid-19 Pandemic:
Drivers and Driver Support Services

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Measures of Freight Network Resiliency During the Covid-19 Pandemic: *Drivers and Driver Support Services*

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Current ODOT Projects



Current ODOT Projects

RESEARCH

- Expanding the Oregon Motor Carrier Safety Action Plan: Best Return on Investment
- Trends and Challenges Posed by Medium Duty Trucks to the Operation and Safety of Oregon Highways
- Support for Crash Data Analysis at Signalized Intersections and Roundabouts in Oregon
- Preliminary Investigation of Heavy Vehicle Parking Design in Oregon Rest Areas

Truck Simulator



Example Drone Footage



Home Government Business Technology Equipment Safety Fuel Logistics Auto

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Business Fuel Transport Topics June 8, 2020 10:00 AM, EDT

How Truck Stops Are Serving Truckers While Keeping Them Safe

[Stay on top of transportation news: Get TTF News in your inbox.]

The nation's truck stop chains and travel centers are working hard to remain open and serve drivers during the coronavirus crisis, while also taking steps to ensure safety. However, services are reduced in many cases.

In addition, the Customized Logistics and Delivery Association has advice from its members on how to protect the supply chain and the health of the workers involved. For drivers it includes spraying the interior passenger space of their vehicle with a disinfectant at the beginning and end of the day. [Here are more of their tips.](#) Natso also has a [handy reference page](#) with quick links to resources.

RELATED: [Thanking truckers](#) | [Chains offer meals, parking](#) | [Fuel trucks OK'd](#)

Here's a rundown of what Pilot Flying J, TA and Petro Stopping Centers, and Love's are doing, with links to more information:

Pilot Flying J

HDT Truckinginfo

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DRIVERS

The Pandemic Highway: Drivers Report in as COVID-19 Rages On

March 23, 2020 by Jack Roberts



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BUSINESS INSIDER

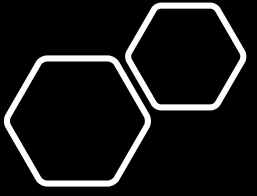
TRANSPORTATION

In an unprecedented move, the Trump administration suspended an 82-year-old road safety law for some truck drivers, showing how much coronavirus is pressuring retailers and hospitals to maintain cleaning and medical supplies

Richard Plonick May 14, 2020, 2:04 PM

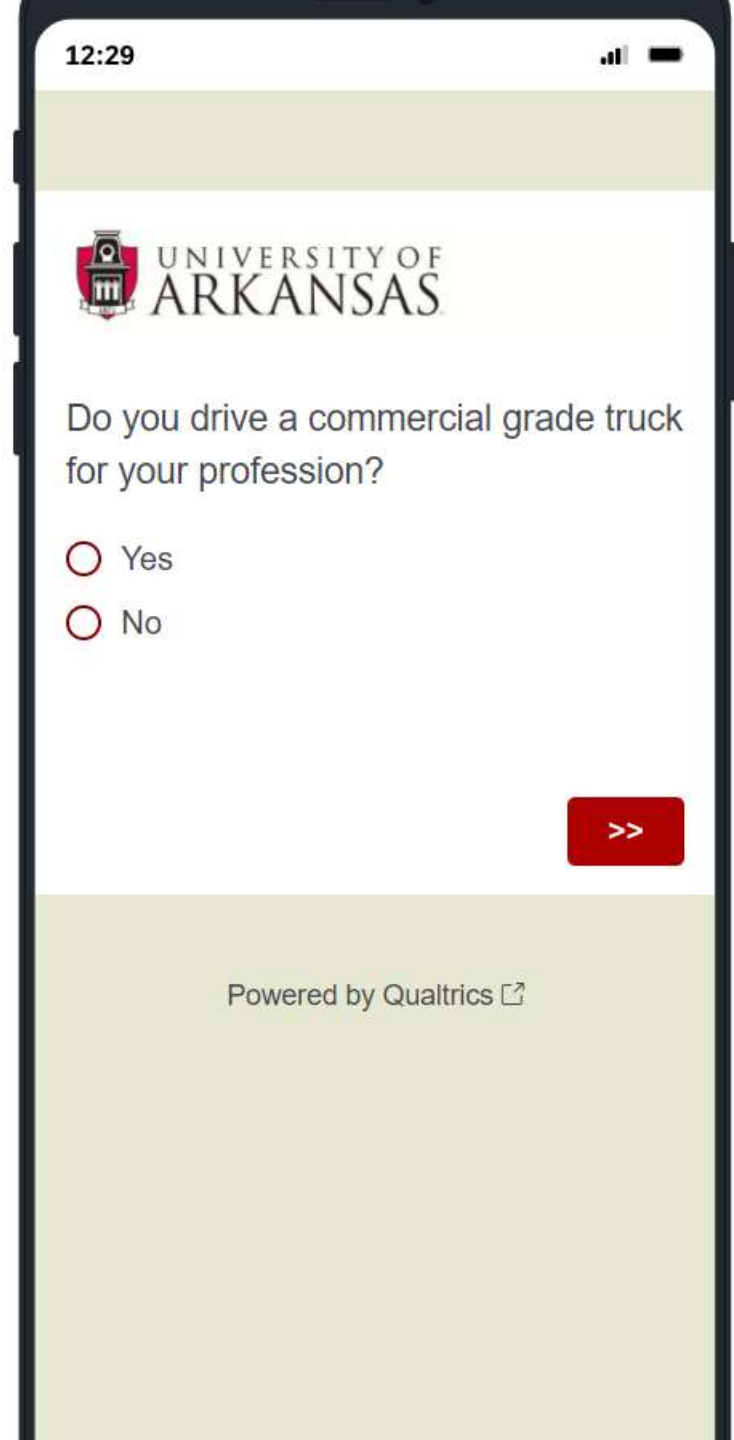


Drivers and Driver Support Services As Essential Freight Infrastructure



Survey Overview

- Qualtrics survey platform
- May 25th to June 1st when the HOS regulations were partially lifted and near the height of social distancing and stay at home orders across the U.S.
- 500 responses
- Non-probability internet opt-in panel of commercial truck drivers (18 years and older) who had used a public or private truck stop and who were driving the pandemic.
- Participants were provided an incentive for completing the survey.
- Questions compare operational and behavioral patterns before and during the pandemic.



Basic Demographics

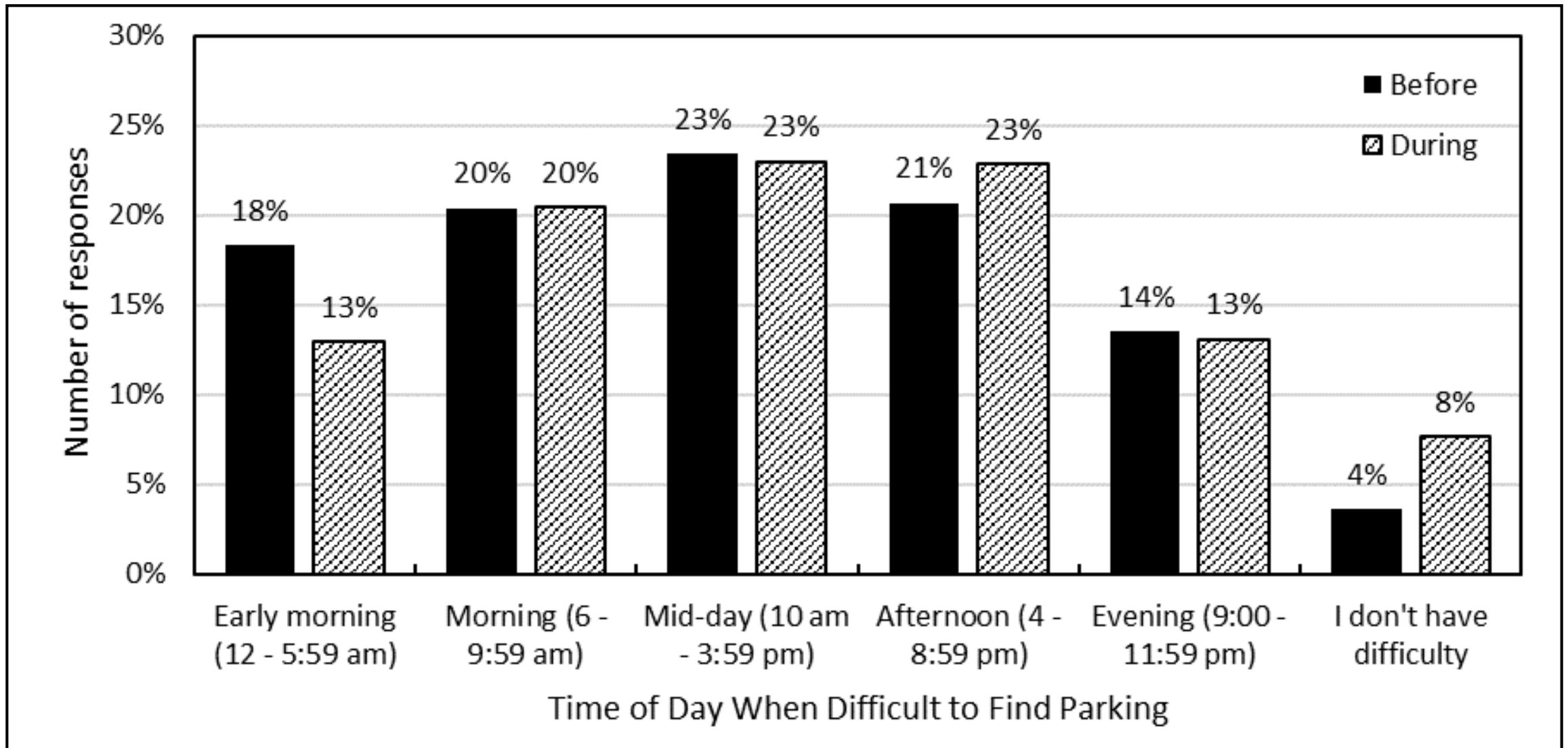
66% Male

40% 2-3 years driving experience, 40% 6-10 years experience

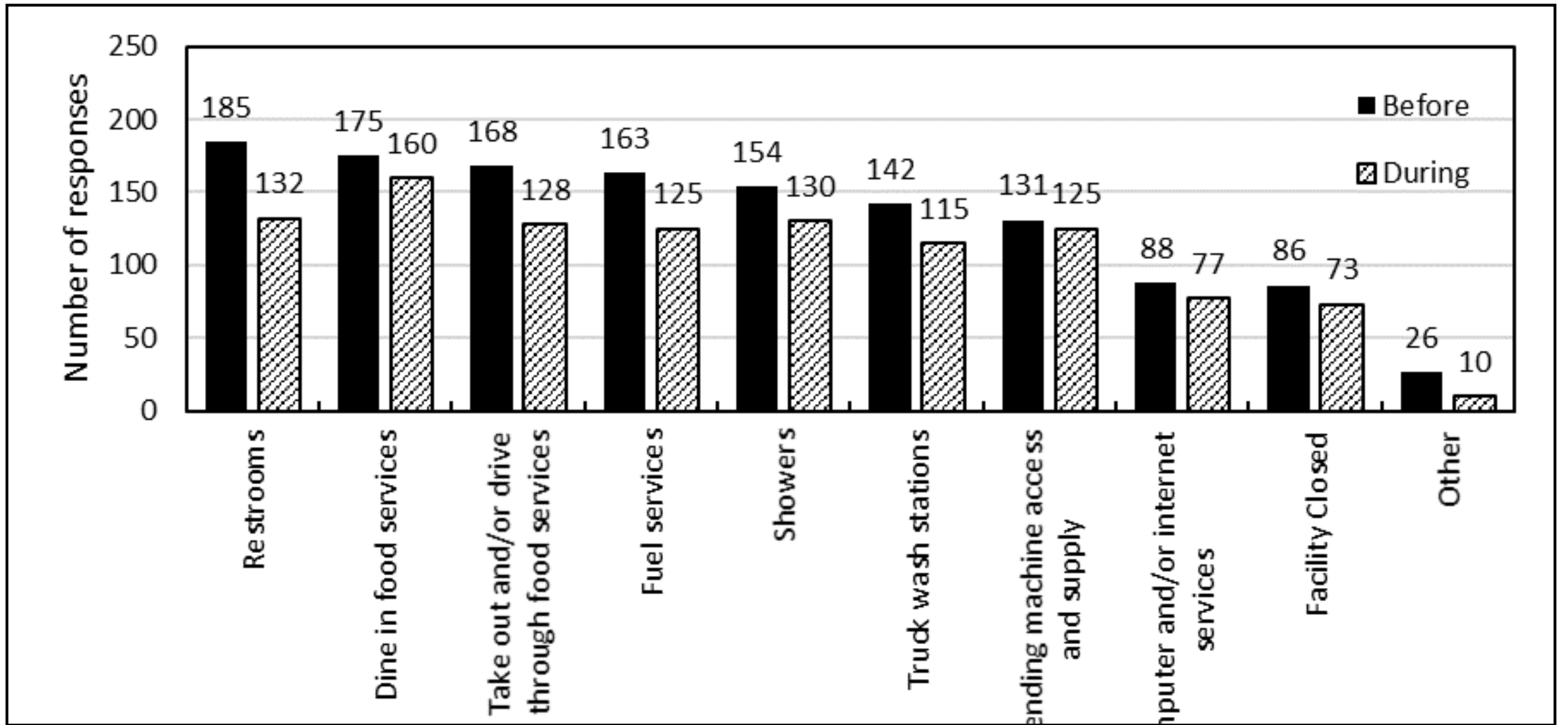
Income \$60-80k, hourly pay

40% for-hire and private carriers

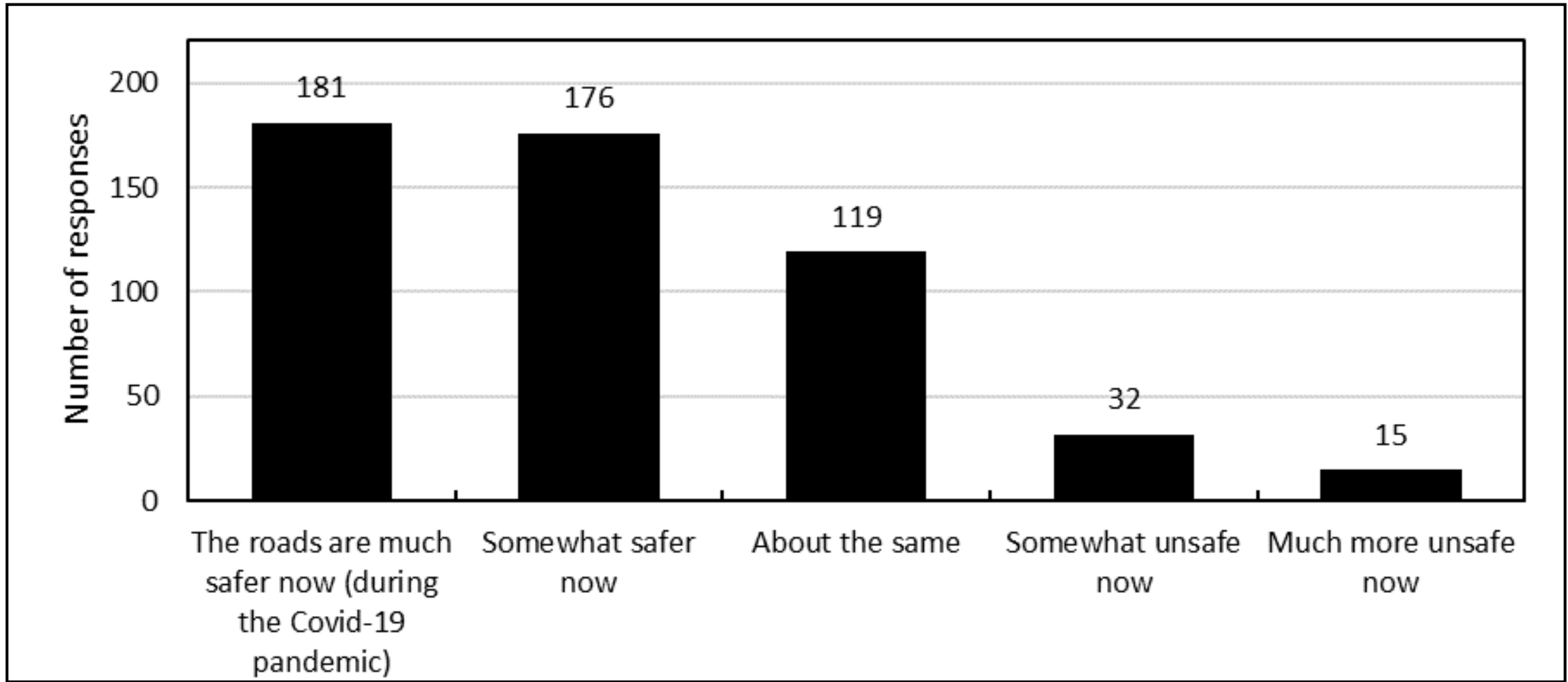
30% working for company with 11 to 25 drivers



Time of Day Reported for Parking Difficulties



Service Disruptions

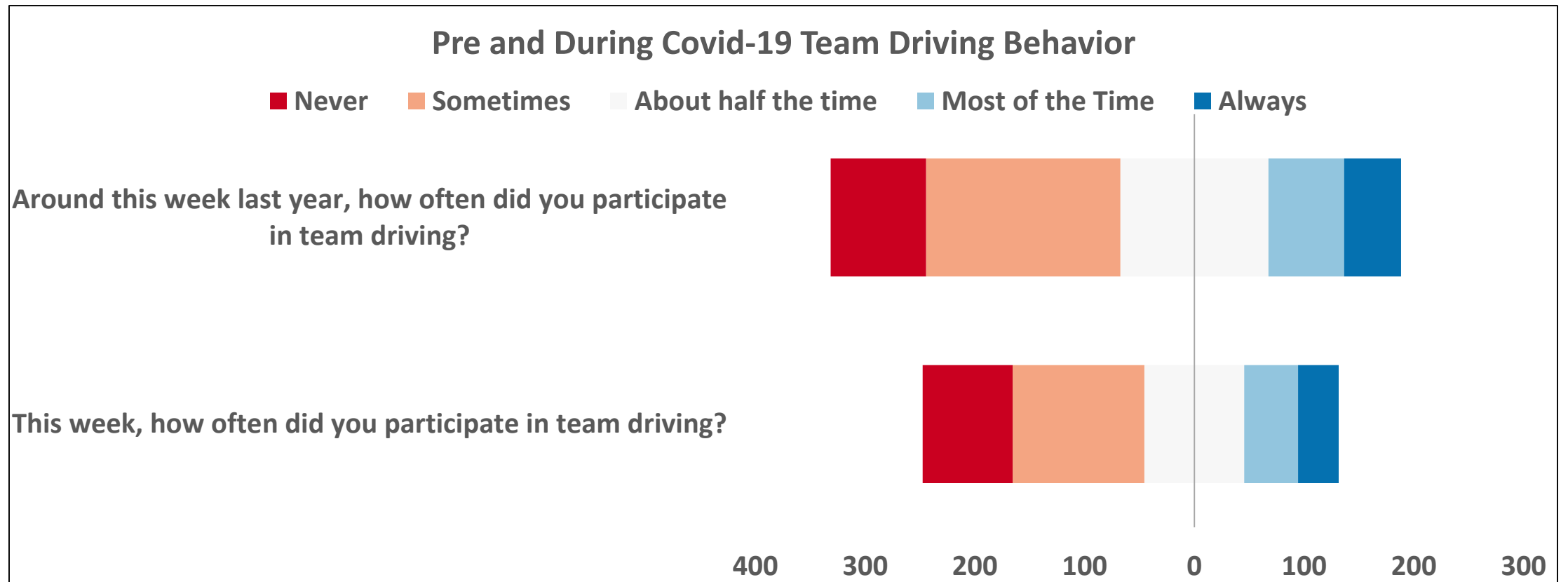


Perceptions of Road Safety

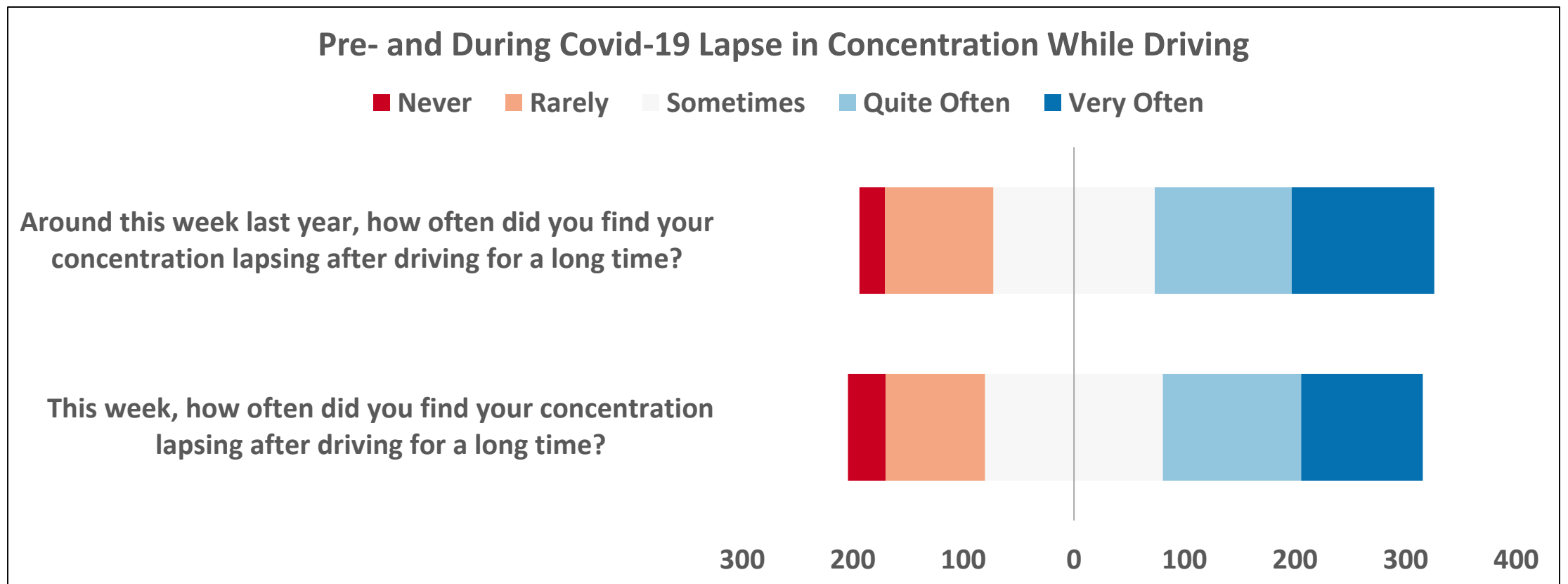
Pre- and During Covid- 19 Truck Driver Fatigue Management

- Discuss a subset of **Fatigue Management** questions from survey
- **Visualization** of survey questions (Current vs Same Week Last Year)
- On going **Econometric Analyses** to uncover factors influencing the differences between Current & Same Week Last Year response variables.

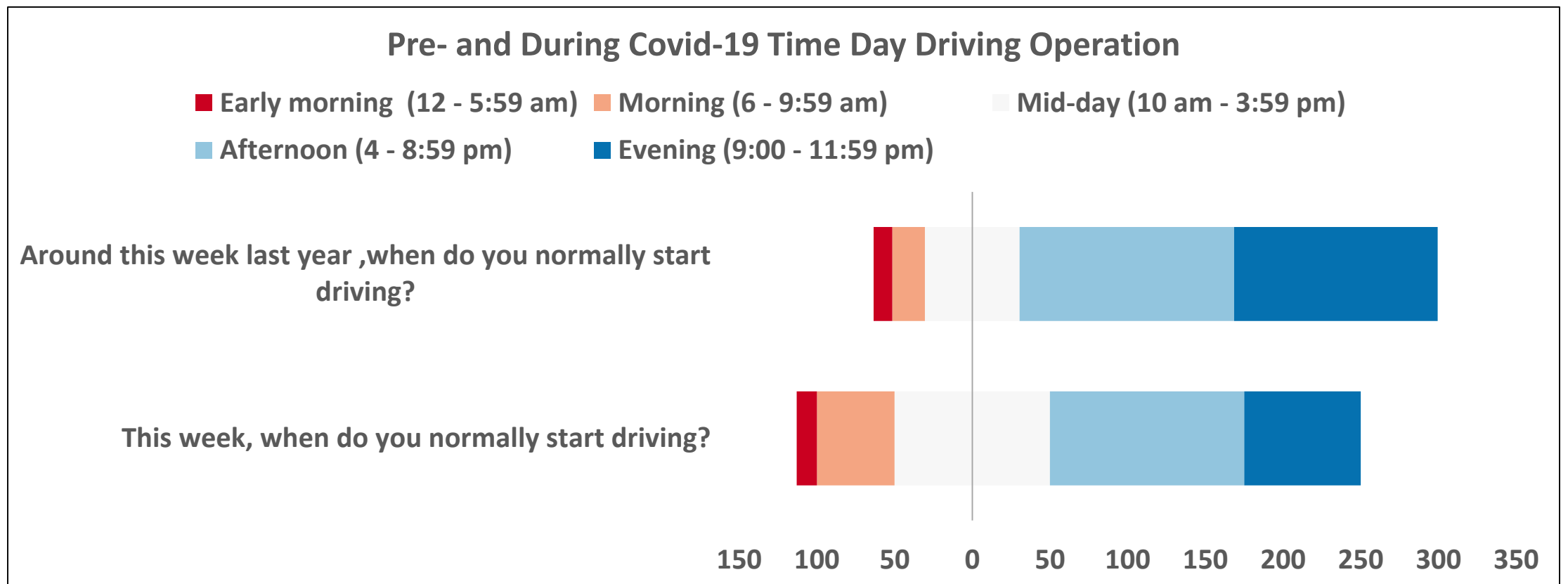
Pre- and During Covid-19 Team Driving Behavior



Pre- and During Covid-19 Lapse in Concentration While Driving



Pre- and During Covid-19 Time-of-Day Driving Operation



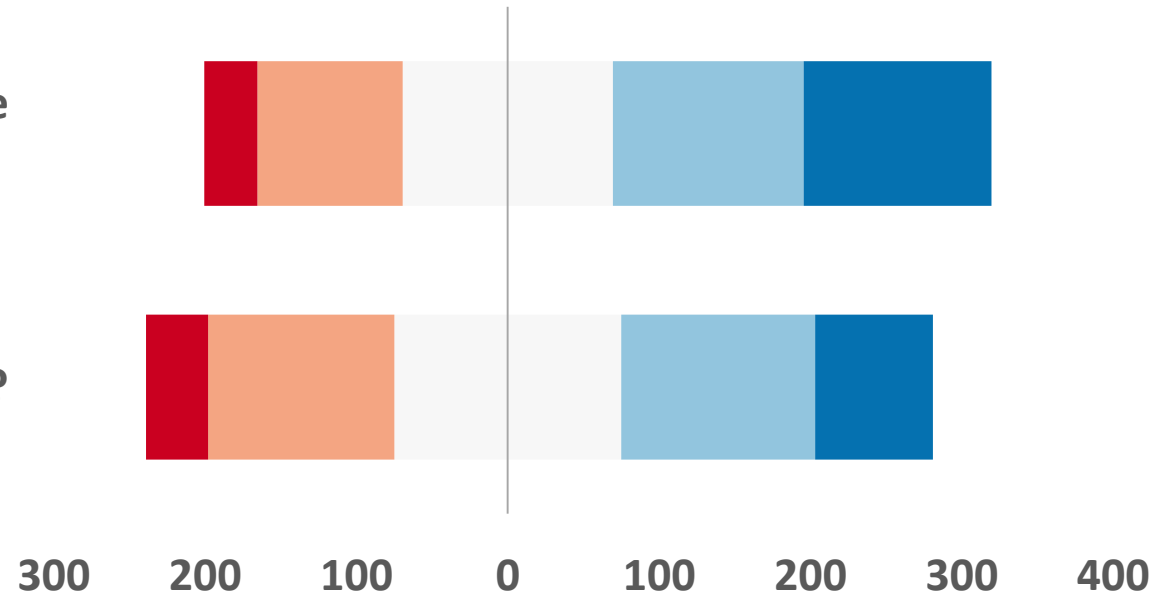
Pre- and During Covid-19 Driving While Tired

Pre- and During Covid-19 Driving While Tired

■ Never ■ Rarely ■ Sometimes ■ Quite Often ■ Very often

Around this week last year, how often do you drive when tired?

This week, how often do you drive when tired?



Ongoing Econometric Analyses

- Conducting Bivariate Binary and Ordered Probability Models
- For the Bivariate case we have **two binary**:

$$\begin{aligned}z_{i1} &= \beta_1 X_{i1} + \varepsilon_{i1} \\z_{i2} &= \beta_2 X_{i2} + \varepsilon_{i2}\end{aligned}$$

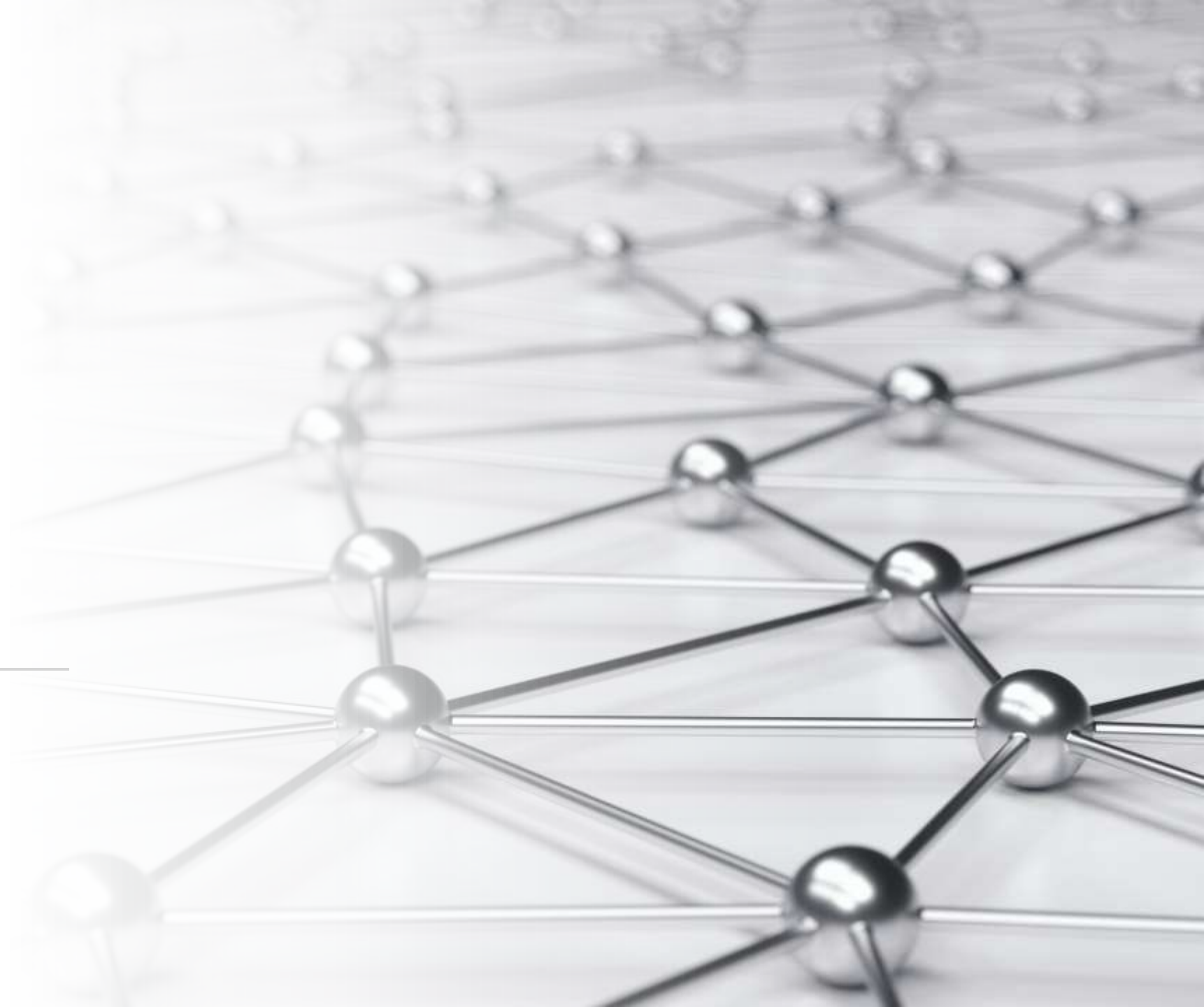
- And we now consider the fact that these equations are linked by:

$$\rho = \text{Cor}(\varepsilon_{i1}, \varepsilon_{i2})$$

- This is equivalent to a SURE model for non-continuous data



Collaboration with Industry Partners



Collaboration with Industry Partners

- EROAD

is a company that develops and implements technology to modernize traditional paper-based systems within the trucking industry. As part of this modernization, EROAD collects the data used for generating reliable truck driver safety performance measures

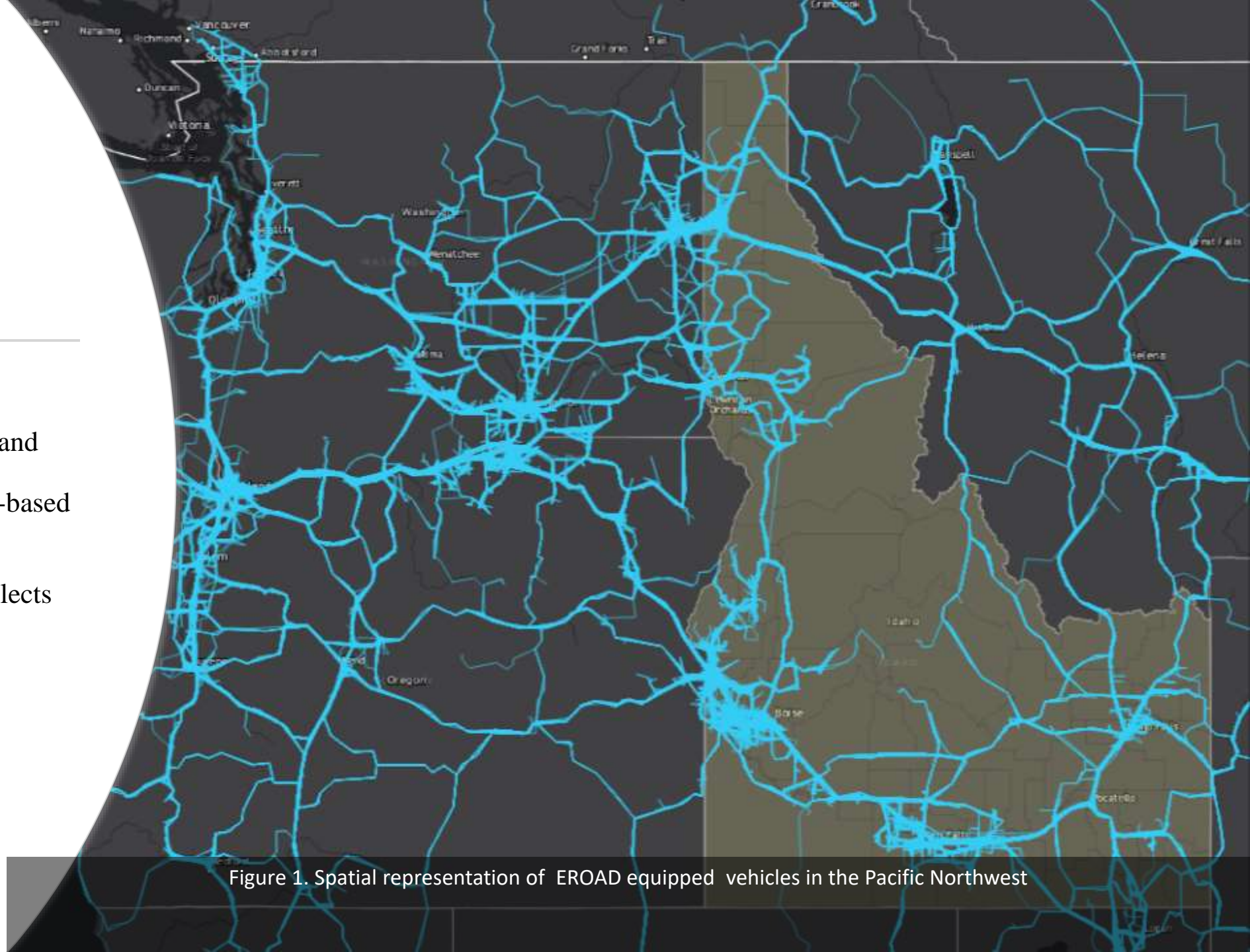
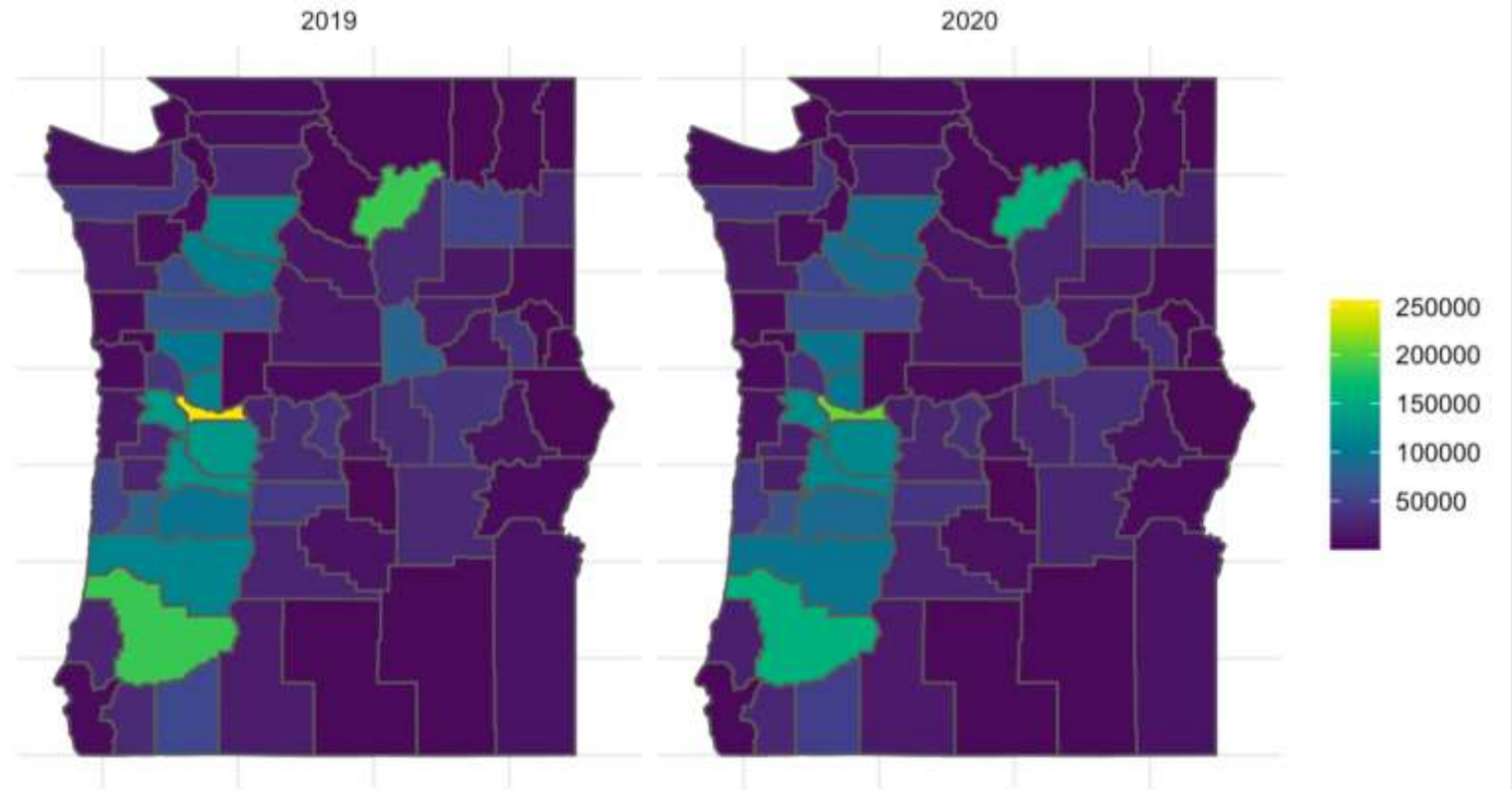


Figure 1. Spatial representation of EROAD equipped vehicles in the Pacific Northwest

Freight Telematic Data

Trip count by Oregon & Washington Counties

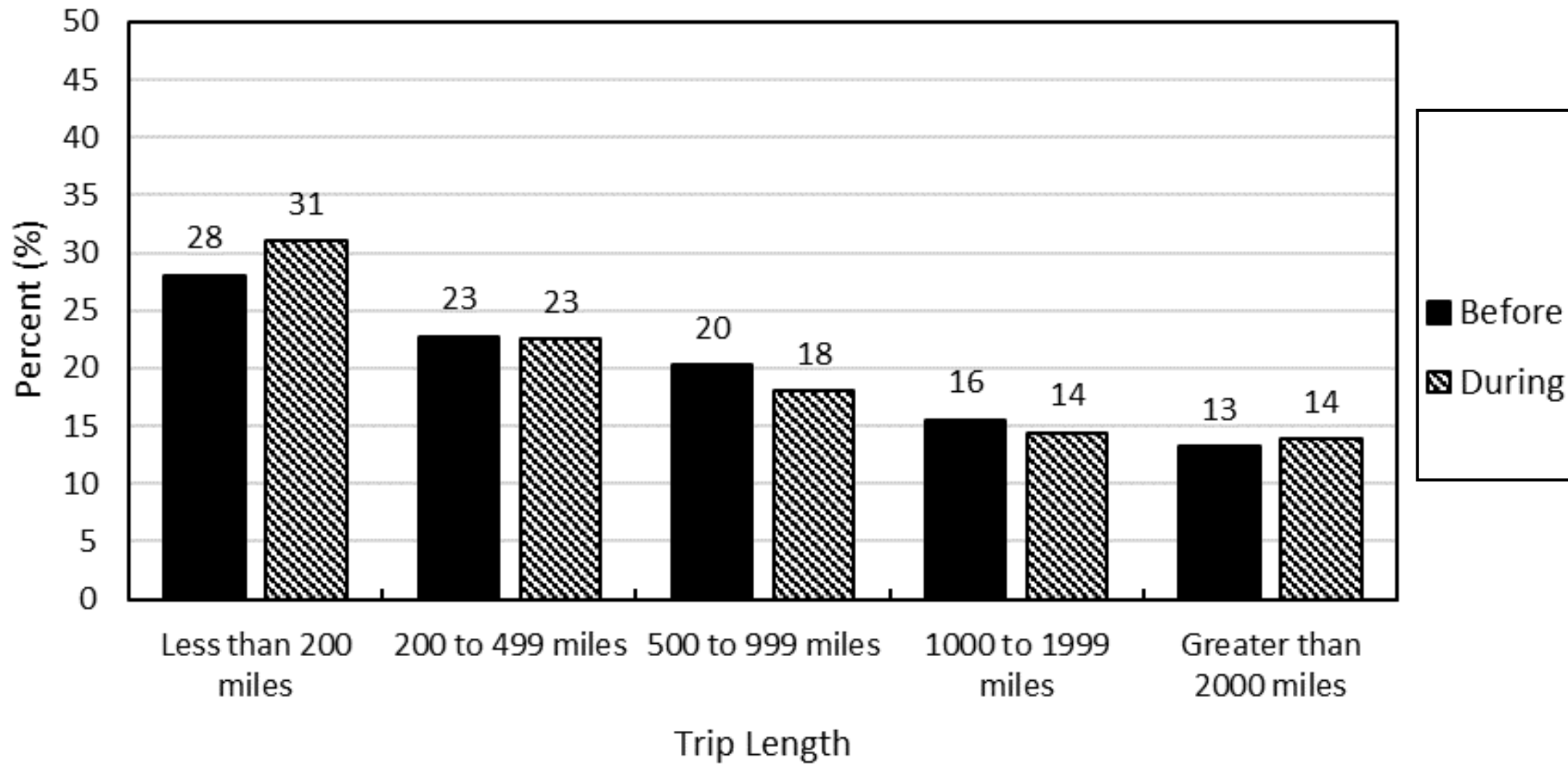




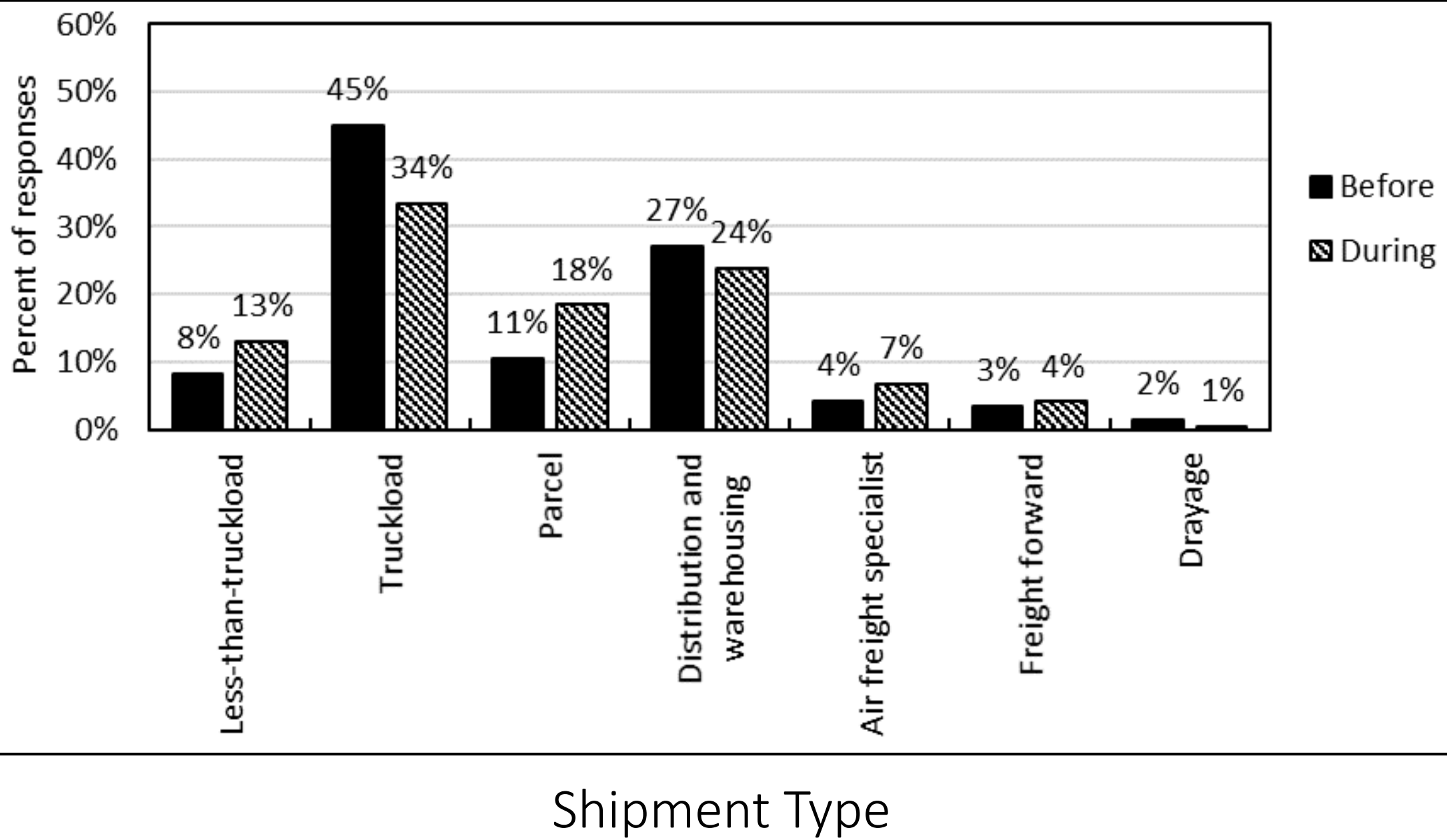
EROAD

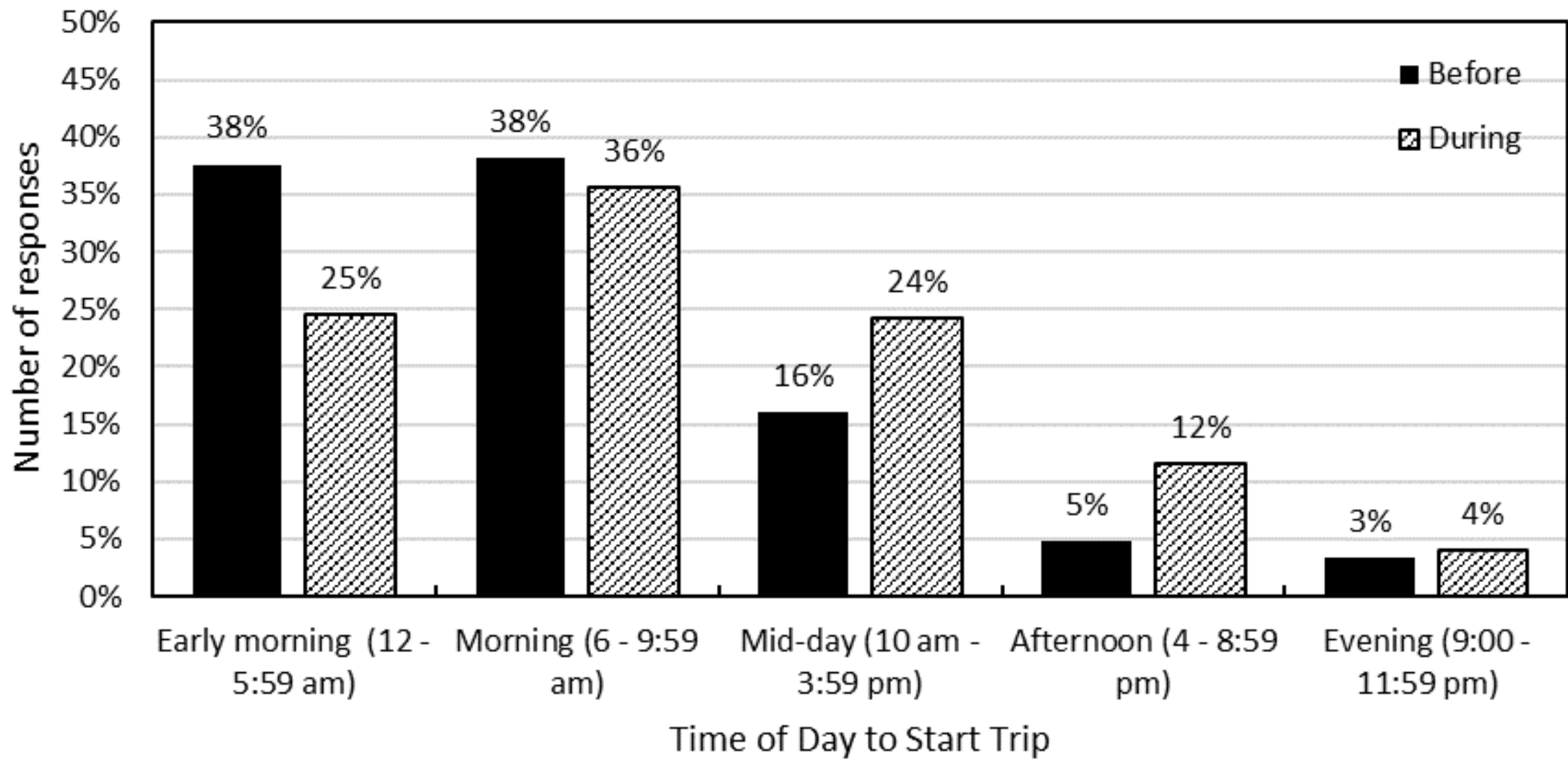


Thanks!



Percent of Trips by Length





Trip Start Time