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Perceived safe and adequate truck parking: A random parameters binary logit analysis of truck driver opinions in the Pacific Northwest

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ABSTRACT

This paper focuses on the availability of parking for freight vehicles, with a specific focus on being able to find safe and adequate parking (i.e., a designated parking location for large trucks) along a primary freight corridor in Oregon. This is achieved through the use of a truck driver survey regarding their experiences related to the availability of safe and adequate parking. The survey is geographically focused on drivers and freight activity throughout the Pacific Northwest, as to better infer on truck parking along the study corridor. The data and information collected are then utilized to estimate a binary outcome (logit) model to evaluate how different factors, obtained from the driver survey, impact the likelihood of finding safe and adequate parking from the perspective of the driver. Of 134 indicator variables, 11 factors are found to be statistically significant and provide insights into what impacts or affects the probability that a driver will encounter problems finding safe and adequate parking. Results show that drivers of less-than-truckload (LTL) shipments, weekend shipments, and older drivers have significantly fewer challenges finding safe and adequate parking. Findings from the current study can be used to better guide efforts in Oregon, and across the country, in regard to safe and adequate truck parking.

1. Introduction

The limited availability of adequate parking is an ongoing issue for drivers of large trucks throughout the United States. A 2012 study by the Federal Highway Administration (FHWA) reported that national truck parking shortages are severe and widespread, and 75% of the surveyed drivers reported having problems finding secure parking during the night (Federal Highway Administration, 2012). As a result of such shortages and the issues associated with finding adequate parking, there are intrinsic safety impacts to all highway users due to large trucks parking in unsafe locations (this is often due to drivers pushing their hours-of-service (HOS) limits to find safe and adequate parking). National HOS regulations limit drivers' time

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on the road, in an attempt to increase safety by limiting fatigue, thereby creating a need for adequate parking (Federal Motor Carrier Safety Administration, 2011). Further, a lack of available parking leads to increased congestion at parking spots, drivers breaking regulations by continuing to drive past their allotted hours, and illegal parking. Congestion and lack of safe parking ultimately leads to safety concerns for transportation agencies and trucking industries throughout the country. In an attempt to better understand this issue, the current study utilizes the results of a recent truck driver survey administered in the Pacific Northwest. Understanding how truck drivers make these parking decisions can provide insights on current parking problems and offer potential solutions for transportation agencies and trucking firms.

With that in mind, there have been recent efforts to address parking shortages throughout the transportation network. Funding programs to improve truck parking have been introduced, such as The Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and Jason's Law. During the pilot program of SAFETEA-LU, 2008 to 2012, $231 million was requested from FHWA for parking related projects. Of the $231 million requested, just $34 million was released to support 20 projects (Office of Freight Management and Operations, 2015)—Jason's Law allocated $1 billion from 2010 to 2015 for safe parking projects. Despite increased spending on projects, a recent FHWA survey indicated 37 states still suffer from severe parking shortages (Federal Highway Administration, 2012).

Given the safety concerns associated with parking shortages, the projected increase in freight volumes, the current parking shortages reported, and funding programs initiated, it is vital to determine those factors which lead to difficulty finding safe and adequate parking (from a driver's perspective) and to adequately address them. Previous works have shown the importance of understanding user perception in regards to mode choice and its impact on adopting measures to properly increase ridership among a given mode (Paulley et al., 2006; Commins and Nolan, 2011; Hernández and Witter, 2015). Therefore, in the current study, understanding how drivers perceive safe and adequate parking can assist state and federal agencies in planning and adopting the appropriate solutions for truck parking shortages.[1] It is hypothesized that varying geographic regions of the United States have different factors that influence truck parking shortages. For this reason, determining unique regional factors is an important planning variable for project funding requests. Accordingly, this work utilizes a survey directed to drivers of large trucks to uncover factors that lead to drivers encountering problems finding safe and adequate parking (i.e., designated parking location for large trucks) in the Pacific Northwest region of the United States.

2. Background

Recent studies have addressed truck parking availability and its related problems for various regions across the United States. The Pennsylvania State Transportation Advisory Committee conducted a survey to document the location of trucks parked on highway shoulders and ramps. The factors found to contribute to drivers parking along shoulders, rather than parking facilities, included personal safety, driver access, perceived capacity of parking facility, local driver knowledge, and lack of capacity at parking facilities (Pennsylvania State Transportation Advisory Committee, 2007).

In South Dakota, there was a study that focused on seven rest areas located along I-29 and I-90, where a common problem facing rest stops was determined. Specifically, rest area systems as a whole are nearing the end of their design life, and many do not comply with the Americans with Disabilities Act (ADA) or building code requirements. These inadequacies lead to instances where truck drivers must park at the point of entry (e.g., freeway ramps and shoulders) and walk to the visitor center to utilize the facilities (Felsburg Holt and Ullevig, 2014). In addition, many of these locations possess poor heating, ventilating, and lighting systems (Felsburg Holt and Ullevig, 2014).

A recent New Jersey study identified common factors that affect large truck parking. A key finding was that the demand, likely associated with HOS regulations, is skewed toward overnight periods when most drivers sleep and parking facilities are filled beyond capacity (Freight Initiative Committee, 2008). Similarly, a study conducted in Wisconsin concluded that fatigued truck drivers are unable to find parking due to HOS regulations; therefore, increasing parking demand at night and exacerbating congested parking facilities (Adams et al., 2009). In some locations throughout New Jersey, rising real estate prices impede parking capacity expansion due to alternative, higher-valued land-uses near highways. As a result, truck-oriented operations are often unable to compete with lucrative land-uses near highways (Freight Initiative Committee, 2008). Parking capacity issues were also evident from a study in Minnesota revealing that interstate segments with high volumes of large trucks are closely correlated to congestion issues at rest areas (Maze et al., 2010); this was also the case for Adams et al. (2009).

The American Transportation Research Institute (ATRI) recently released a study with results from a Kansas Department of Transportation survey of more than 1300 drivers of large trucks in Kansas. Based on the survey, it was determined that a majority of drivers spend, on average, more than 30 min searching for a location to park; it was also noted that finding available parking is more difficult on weekdays than on weekends (Boris and Brewster, 2016).

As seen from the literature, there is a need to better understand truck parking issues from a driver's point of view. This is also seen in peer-reviewed research, in which studies that focus on truck parking are quite sparse and focus primarily on demand (Chatterjee and Wegmann, 2000; Gaber et al., 2005; Abdelgawad et al., 2011; Nourinejad et al., 2014; Bayraktar et al., 2015; Haque et al., 2016; Rosenfield et al., 2016). As such, this study focuses on what factors directly lead to drivers

[1] It is important to note that the factors identified in this work are based on driver perceptions (i.e., not factors directly leading to troubles finding safe and adequate parking).