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A Quantitative Assessment of Driver Detention Times in Commercial Motor Vehicle Operations

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Problem:

Detention time refers to excessive delays associated with loading/unloading that commercial motor vehicle (CMV) drivers may experience at shipping and receiving facilities. Although there is currently no standard definition, the industry commonly defines detention time as "any time drivers have to wait beyond two hours, which is the average time it takes to load or unload their cargo." Since the CMV industry enforces hours of service (HOS) regulations limiting driving and working hours, time spent waiting is a costly inefficiency. In addition, the primary goal of HOS regulations is to reduce driver fatigue, thereby reducing fatigue-associated crashes. If detention time impacts drivers' abilities to remain within these Federal requirements, then this may also impact driver safety.

Method:

Third-party providers of safety and compliance technology and data services, such as those used to manage drivers' HOS, provided the necessary data. Identifying detention time proved challenging; thus, the vendors only provided information about "known delivery" locations and excluded stops at other locations, such as rest stops, terminals, etc.

Two third-party vendors provided their most recent six months of data. The initial data set contained stop time data from 31 carriers comprising approximately 30,000 trucks in total. For the purposes of analysis, additional stratification variables were also requested, including

operation size (e.g., small, medium, large), operation type (e.g., for-hire or private; TL or LTL), and freight type (e.g., general freight, bulk, refrigerated, etc.).

Initial examination of the data revealed the stop time variable contained a large number of unrealistic values that required filtering (e.g., zero hours or less and 24 hours or more). Thus, a lower boundary of 30 minutes and an upper boundary of 10 hours were placed on the data and all other values outside of these boundaries were excluded from the analysis. To investigate the issue of detention time, a second lower bound was set at two hours, meaning any value over two hours was considered detention time. This allowed for a comparison of instances where drivers were detained (i.e., stops > 2 hours and ≤ 10 hours) versus instances where they were not detained (i.e., stops ≥ 30 minutes and ≤ 2 hours).

Results & Discussion

Stop time refers to the total amount of time at a delivery/pick up location (i.e., loading/unloading and any waiting time). As illustrated in Figure 1, the data were positively skewed with the bulk of the data falling in the lower stop time bins. Around 89% of the total number of stops were between 30 minutes and 2 hours, and would be classified as typical loading/unloading with no detention time. However, approximately 11% of the stops (approx. 1 of every 10 stops) were over 2 hours long, which would be considered detention time. The average detention time overall was 1.4 hours (*SD* = 1.57). This represents the length of time a driver was detained beyond 2 hours—that is, in addition to the 2 hours viewed by the industry as standard loading/unloading time. Accordingly, a driver detained for 1.4 hours was loading/unloading at the location for a total of 3.4 hours.

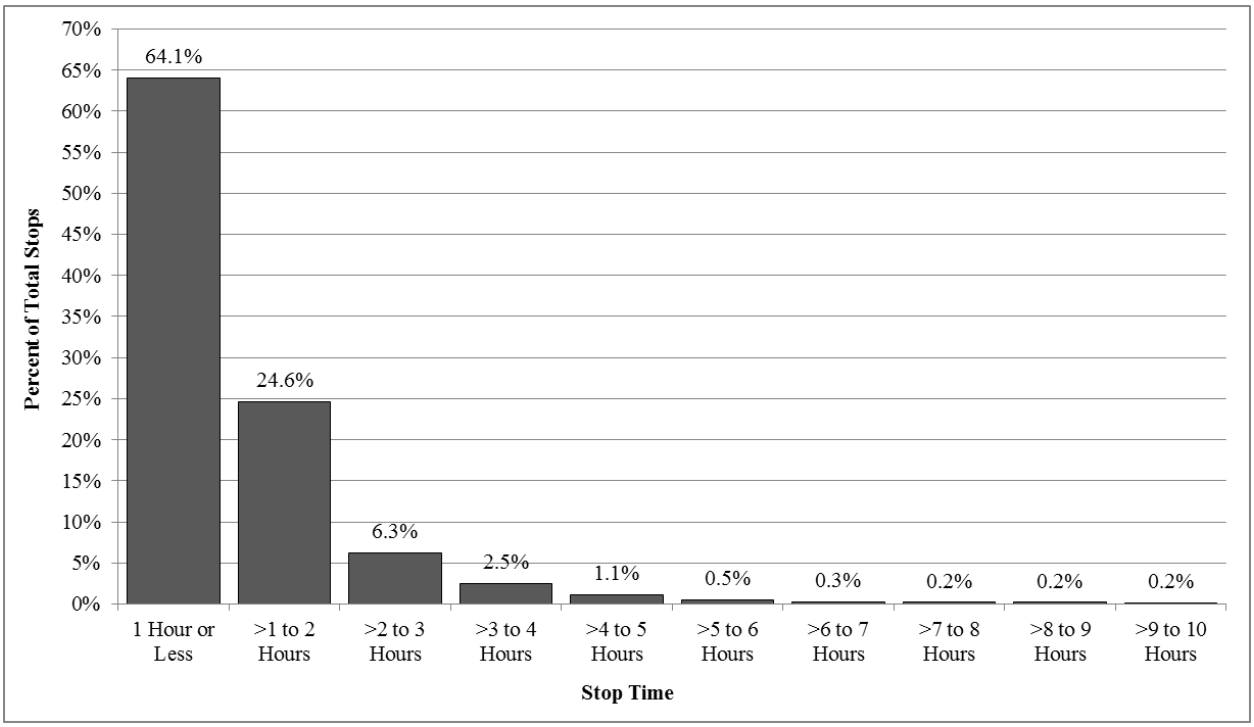

Figure 1: Distribution of stop times between 30 minutes and 10 hours

In regard to operation size, the odds ratio (OR) analysis revealed the odds of a driver being detained were 2.17 times greater for medium carriers than for large carriers [OR = 2.17* with CI = (2.15, 2.20)]. This is in line with suggestions in the literature that large carriers may experience less frequent detention time as they have more leverage to include detention time fees in their contracts with shippers and to collect on those fees when detention time occurs. It is suspected that small carriers and owner-operators would fair even worse than medium carriers; however, the data lacked sufficient information to complete this analysis.

For-hire truckload (TL) carriers were worse off than less-than-truckload (LTL) or private carriers in terms of how frequently they were detained, although the average length of detention time was similar across all 3 operation types. The ORs confirmed for-hire TL drivers were nearly five times more likely to experience detention time than private carriers [OR = 4.89* with CI = (4.83, 4.95)] and two and a half times more likely to be detained than LTL drivers [OR = 2.60* with CI = (2.52, 2.68)].

Freight type was the factor that had the greatest impact on the duration of detention time. Refrigerated trailer drivers and van freight carriers (i.e., dry goods, not temperature controlled) had the longest average detention times (1.7 hours and 1.6 hours, respectively), as well as the

highest frequency and greatest odds of being detained compared to all other freight types. For refrigerated freight, this may be due to the temperature controlled trailers being able to maintain their cargo at the required temperature; thus, they can wait for cargo from non-refrigerated trailers to be unloaded (GAO, 2011). Van freight is also typically not perishable so it may not be viewed as high priority.

While results from previous self-report studies highlighted that detention time is a regular, problematic occurrence in the CMV industry, the results of the current study used objective measures to provide further evidence and more detail regarding the nature of the problem. Clearly, there are factors largely beyond the driver's control that contribute to detention time and the problem is worse for certain segments of the CMV industry.

Summary:

Time spent waiting is unproductive, inefficient, and costly, especially in an industry that regulates the hours a driver can work and drive. Because of this, drivers who experience detention time may be more inclined to drive faster to reach their destinations within the HOS limits, or to operate beyond the limits and improperly log their driving and duty time to make deliveries on time. If detention time impacts a driver's ability to remain within these Federal requirements, then this may also impact driver fatigue and subsequently, driver safety. Unfortunately, the quantitative contribution of detention time to HOS violations and crashes has not been studied, but it is clearly an issue the CMV industry needs to address in the near future.