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# Commercial Truck Parking and Other Safety Issues

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**Research Report**
**KTC-15-04/SPR14-478-1F**

# Commercial Truck Parking and Other Safety Issues

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**16. Abstract**

Commercial truck parking is a safety issue, since trucks are involved in approximately 10% of all fatal accidents on interstates and parkways in Kentucky. Drivers experience schedule demands and long hours on the road, yet they cannot easily determine available parking locations. The objective of this study was to identify information related to parking demand, locations with documented or potential safety issues, and potential countermeasures. The literature review indicated substantial research has been done on commercial vehicle parking, and works have outlined the necessary facilities to accommodate trucks before drivers exceed their allowable hours of driving. Attention to commercial truck parking became a priority with SAFETEA-LU, and this focus continued with the inclusion of Jason's Law as part of MAP-21.

Surveys were conducted to determine how frequently commercial vehicles used parking facilities on interstates in Kentucky. The surveys focused on the state's two primary north-south interstates (I-65 and I-75). Data samples were also obtained from the other interstates in Kentucky (I-24, I-64, and I-71). Of the 4715 parking spaces surveyed during daytime observations, 2143 were in use, or 45 percent. Of 7,844 parking spaces surveyed during nighttime observations, 6803 were in use, or 87 percent. Crash data were analyzed for the period 2010-2013. Of 848 crashes that were either shoulder-related or fatigue-related, collision reports were reviewed. 239 crashes were related to commercial truck parking. Two-thirds of all crashes included in the analysis occurred on I-75, I-65, I-64, and I-71. Crash cluster locations appeared to be directly related to proximity and usage rate of parking facilities.
To address truck parking demand and to improve safety, the following general recommendations were identified in the review of literature: 1) use public and private parking areas to increase capacity, 2) use ITS to improve use of parking facilities, 3) provide real-time information that informs truck drivers of parking facility locations with available spaces, 4) combine GPS tracking with electronic communication to notify truckers of nearest parking, and 5) monitor parking usage rates to determine future needs. Part of the literature review included recommendations from truck drivers. Based on observations at sites on interstates in Kentucky, several locations would benefit from increasing the number of parking spaces, including a number of locations on I-64, I-65, I-71 and I-75. Any site that had 90 percent or more of its spaces used during the surveys could be a candidate for an expansion of existing parking spaces or for development of a new facility to accommodate more parking.

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# 1.0 EXECUTIVE SUMMARY

Commercial truck parking is a safety issue, since trucks are involved in approximately 10% of all fatal accidents on interstates and parkways in Kentucky. A driver's schedule demands long hours on the road, yet they cannot easily determine available parking locations for times that they are required to take breaks. The objective of this study was to identify information related to parking demand, locations with documented or potential safety issues, and potential countermeasures. The literature review indicated research has been done on the topic of commercial vehicle parking, and works have outlined the necessary facilities needed to accommodate trucks before drivers exceed their allowable hours of driving. Attention to commercial truck parking became a priority with SAFETEA-LU, and this focus continued with the inclusion of Jason's Law as part of MAP-21.

This study uncovered a number of important facts. The volume of trucks on the road is expected to grow, so the demand for parking will grow. As distances between rest areas increased, the incidence of crashes involving trucks increased, and those crashes were more severe. Those drivers involved in critical incidents tended to get less sleep.

Analysis included extraction data from the CRASH database for commercial vehicles (gross vehicle weight rating and/or gross combination weight rating of 10,001 pounds or more). Data entry codes were used to distinguish those crashes relevant to driver fatigue and to parking in unsafe locations. From a total of 848 crashes matching these criteria, collision reports were reviewed to determine which of those crashes (239) were specifically related to the safety issue of commercial truck parking. Analysis of 2010 through 2013 data showed two-thirds of the total crashes occurred on I-64, I-65, I-75 and I-71. Other highways with more than 5 percent of the total crashes were I-24, Edward Breathitt (Pennyrile Parkway), and Western Kentucky Parkway.

Surveys were conducted to determine how frequently commercial vehicles used parking facilities on interstates in Kentucky. The surveys focused on the state's two primary north-south interstates (I-64 and I-75). Data samples were also obtained from the other interstates in Kentucky (I-24, I-64 and I-71). Of the 4,715 parking spaces surveyed during daytime observations, 2,143 were in use, or 45 percent. Of 7,844 parking spaces surveyed during nighttime observations, 6,803 were in use, or 87 percent. Usage ranged from a low of 32 percent on I-24 during daytime observations to a high of 93 percent on I-71 during nighttime observations. Daytime observations included hours of daylight and nighttime surveys were conducted during hours of limited light (dusk, dark, and dawn).

Crash analysis of the period from 2010 to 2013 found that 848 crashes matched criteria of being either shoulder-related or fatigue-related. Further review of the actual collision reports indicated that 239 crashes were related to commercial truck parking. Two-thirds of all crashes included in the analysis occurred on I-64, I-65, I-71 and I-75.

Based on observations at sites on interstates in Kentucky, several locations would benefit from increasing the number of parking spaces, including a number of locations on I-64, I-65, I-71 and I-75. Any site that had 90 percent or more of its spaces used during the surveys could be a candidate for an expansion of existing parking spaces or for development of a new facility to accommodate more parking.

To address truck parking demand and improve safety, the following are general recommendations: 1) use public and private parking areas to increase capacity, 2) use Intelligent Transportation Systems (ITS) to improve use of parking facilities, 3) provide real-time information that informs truck drivers of parking facility locations with available spaces, 4) combine GPS tracking with electronic communication to notify truckers of nearest parking, and 5) monitor parking usage rates to determine future needs.

# 2.0 INTRODUCTION

Commercial truck parking is a safety issue that continues to be a concern, given the increase in truck travel throughout Kentucky and the United States. Trucks represent approximately 35 percent of the total volume of vehicles on I-65. That percentage is typical on other interstates in Kentucky. Results from previous research at the Kentucky Transportation Center (KTC) indicated that vehicles stopped at, entering, or exiting roadway shoulders were involved in approximately 10 percent of all fatal accidents on interstates and parkways in Kentucky. Other types of crashes are related to extended hours of driving by commercial truck operators, especially when hours of service are exceeded and convenient parking is unavailable. Although Kentucky has opened truck weigh/inspection stations and rest areas for commercial vehicles to park, overall usage has not been documented. Most drivers are unable to determine the next location with available parking spots, so they sometimes park illegally, which compromises highway safety when these lots are full.

The need for truck parking countermeasures was recognized as part of SAFETEA-LU legislation and again as part of MAP-21. A Truck Parking Facilities Pilot Program was started as part of SAFETEA-LU, but was discontinued in MAP-21; however, the Truck Parking Program was included as an eligible activity under the Discretionary Program that could be funded with HSIP, STP, and NHPP funds under MAP-21.

Commercial vehicles are classified by having a gross vehicle weight rating or gross combination weight rating, or actual gross vehicle weight or gross combination weight, of 10,001 pounds or more, whichever is greater. Using this definition and the "commercial vehicle" code as criteria to search the Kentucky CRASH database, there were 4,975 crashes recorded in 2012 and 5,183 in 2013. This is approximately 2,000 fewer crashes than were recorded in 2005. However, fatalities involving commercial vehicles continue to represent approximately 10 percent of total fatalities, with 69 in 2012 and 70 in 2013.

Drivers of commercial vehicles face the high demands of handling and dynamics related to the overall size and weight of their trucks. In addition, fatigue and distraction resulting from long driving hours continue to increase demands on truck drivers. There are Federal Motor Carrier Safety Regulations in place that limit drivers to 11 hours of driving after 10 consecutive hours off duty, with restrictions that prohibit driving beyond the 14$^{th}$ consecutive hour after coming on duty, followed by 10 consecutive hours off duty. Even with these limitations, truck drivers remain vulnerable to crashes and the subsequent outcome from these large vehicles is typically more serious than crashes involving other vehicle types.

The objective of this study was to identify information related to parking demand, locations with documented or potential commercial truck parking safety issues, and potential countermeasures.

# 3.0 LITERATURE REVIEW

This chapter summarizes relevant literature related to commercial truck parking safety and demand for parking facilities.

*Commercial Motor Vehicle Parking Shortage* (2012) (2)

This report, which updated the 2002 Federal Highway Administration (FHWA) report, was largely anecdotal, yet used current evidence to demonstrate that the lack of adequate commercial truck parking was still a significant and dangerous problem. The report substantiated the 2002 prediction with models and supportive figures from the FHWA. These models provided the Freight Analysis Framework (FAF) Flow in the U.S. in 2007 and forecasted the Flow for 2040. This forecast predicted a large growth in vehicle miles traveled by trucks, which intensifies the urgency to act now in order to prevent a larger parking issue in the future. The report also put forward ideas to ameliorate the parking problem. One of these ideas was to combine public and private parking areas to provide more space. A successful version of this strategy was executed in Florida after the Secretary of Transportation awarded funds to build public spaces adjacent to privately owned spaces. The report also analyzed several other national studies, which are summarized below:

*Study of Adequacy of Commercial Truck Parking Facilities-Technical Report* (2008) (5)

This report included a wide array of truck parking issues and an assessment of adequate truck parking spaces based on a national inventory of truck parking spaces and parking demand models. This study concluded that the current demand for parking space has surpassed the current supply, and that the forecasted increase in vehicle miles traveled would exponentially aggravate the problem. It cited that expansion plans for parking capacity were set in 15 states and were still under review in another 22 states. Using ITS technology, 16 states planned to improve the availability and use of truck parking areas.

*Commercial Vehicle Parking in California: Exploratory Evaluation of the Problem and Possible Technology Based Solutions* (2007) (11)

This report stated that there is dramatic growth occurring in commercial vehicle truck travel in the U.S., leading to critical shortages in truck parking. The research was based on data gathered in California, which is ranked first in the nation for public and private parking shortage according to Fledger et al. (2006). The report indicated that while California was the leader, there were severe shortages in all states, specifically in public parking capacity. With this information in mind, the consequences of commercial parking shortages included but were not limited to: roadway safety, public health, environmental issues, and economic productivity. The report also provided recommendations and possible solutions from truck

drivers, highway maintenance engineers, and the National Transportation Safety Board, as summarized below.

Truck Driver Recommendations:
Improving truck parking information and methods of communicating this information were explored in the FHWA survey (3). Seventy-three percent of respondents indicated that they would like to receive information by the radio in their vehicle; 40 percent preferred to use their vehicle's electronic visual display; and 12 percent preferred the internet (3). Respondents also indicated a desire for the following real-time information: (1) location of truck parking facilities along the road being traveled (84 percent); (2) features (e.g., showers, hot meals) that are available at upcoming parking facilities (77 percent); (3) number of truck parking spaces available at upcoming parking facilities (6 percent); and (4) length of time limits on upcoming truck parking spaces (46 percent). From the over 200 written comments, respondents also expressed interest in obtaining information about: "(1) the layout and size of parking spaces at upcoming facilities and (2) whether a parking facility can accommodate trucks that are oversized, hauling hazardous materials, or (3) multiple–trailer loads".

Highway Maintenance Engineers:
The National Cooperative Highway Research Program (NCHRP) surveyed highway maintenance engineers from 49 states to identify effective and feasible solutions to truck parking problems (Trombly, 2003). Using "ITS to expand the amount of information available to truckers" ranked first (among a list of improvements including building new rest areas and truck stops) when evaluated against effectiveness and feasibility criteria (7, p. 17). Moreover, it was reported that "…the responses reflect a belief among agencies that the most effective and feasible way to reduce shortages is to make better use of existing resources, combined with a prudent expansion of existing public spaces. Because all the respondents work in the public sector, it can be speculated that their responses reflect recognition that a public role is appropriate—but the resources to meet all needs are not available, and that the private sector is in a better position to provide these resources" (7, p. 17). Two specific recommendations made by the states were: (1) developing ITS deployments that provide drivers with real-time information on the location and availability of parking spaces (for example, investigating the use of mobile phones and radio frequencies to broadcast parking locations and availability to drivers); and (2) distributing a "truckers' map" that pinpoints parking facilities for drivers (7, p. 19).

National Transportation Safety Board:
The National Transportation Safety Board published a special report on truck parking-related problems in May 2000. The following are the major conclusions:
While guides and mapping programs listed the private truck stops and public rest areas, they were not all-inclusive of available truck parking, such as alternative locations like park-and-ride lots and weigh stations. Also, the Safety Board

concluded that some truck drivers do not have enough information on parking locations and need access to all available parking in advance and during trips. In many large trucking companies, trucks are equipped with global positioning systems (GPS) that enable dispatchers to tell drivers where to pick up a load, drop off, and get fuel, based on the truck's precise location. GPS, combined with electronic guidance, could enable dispatchers to notify truck drivers of the nearest parking facility (5, p. 23).

*Examining Large Truck Crash Risk Attributed to Driver Fatigue and Hours of Sleep* (2010) (7)

This study used the Large Truck Crash Causation Study (LTCCS) to examine the correlation of different fatigue-related driver factors with different crash types. These data were collected at 24 sites in 17 states by researchers between 2001 and 2003. For each crash, the data were collected by a trained researcher and a State truck inspector. Data analysis was performed on two distinct groups: crashes that involved a single large truck and crashes that involved multiple vehicles, at least one of which was a large truck.

The study concluded that driver fatigue was more prominent in single-truck crashes than in multiple-vehicle crashes involving trucks. Falling asleep and speeding were two of the most frequent catalysts of single truck crashes. This implied that fatigue and aggressive driving were two significant driver factors causing single-truck crashes. But after examining LTCCS variables related to fatigue, such as inattention and distraction, they did not appear to have a significant influence in most cases. The report stated that drivers at fault may not admit that they were fatigued and that the fatigue did not make the driver fall asleep, but nonetheless reduced their ability to respond to situations on the road.

The reliability of fatigue-related variables based on interviews and other subjective sources was difficult to assess. However, the hours of sleep at the last sleep interval were found to be a critical factor that increased crash risk.

*Highway Safety Study: Analysis of Vehicle Crashes Related to Safety Rest Area Spacing* (2007) (12)

The Minnesota DOT replicated a study undertaken by Michigan State University (2000), which was titled "A Study of Highway Rest Areas and Fatigue-Related Truck Crashes." The study by Taylor and Sung analyzed the relationship between safety rest area spacing and vehicle crashes on Michigan interstate highways. It identified a positive relationship between safety rest area spacing and fatigue-related single-vehicle truck crashes. More specifically, the study determined that highway segments with 30 miles or more between safety rest areas experienced a disproportionately higher rate of single-vehicle truck crashes than the segments less than 30 miles from a safety rest area. The Minnesota DOT study design largely

mirrored the Michigan study, but used Minnesota data and conditions to observe the relationship between rest areas and single-vehicle crashes. In addition, the Minnesota study analyzed whether a relationship existed between Commercial Motor Vehicle (CMV) nighttime parking demand and interstate highway accidents.

Some of the key findings in the Minnesota study included:
1) As the spacing between safety rest areas increased, single-vehicle truck crashes increased during all times of the day.
2) As the percentage of spaces filled at safety rest areas increased, the frequency of downstream nighttime single-vehicle truck crashes increased.
3) Statistical tests indicated that the percentage of parking spaces filled at night in safety rest areas had strong predictive capabilities for nighttime single-vehicle truck crashes.

One key difference between the two studies was that the Minnesota DOT was not able to replicate the relationship between safety rest area spacing and the incidence of nighttime single-vehicle truck crashes, as was found in the Michigan study. This was because Minnesota's safety rest area spacing seldom exceeded 50 miles, and only 6 rest areas out of 34 were located more than 50 miles from the nearest rest area. Only one rest area was more than 60 miles away from the next rest area.

*SAFETEA-LU Section 1305 – Truck Parking Facilities Pilot Program* (2009) (3)

The purpose of the Truck Parking Facilities Pilot Program was to address the shortage of long-term parking for commercial motor vehicles (CMV) on the National Highway System (NHS). The program was authorized $25 million, which was then divided between several states to develop selected interstates or segments of the interstates.

The Fact Sheet on Highway Provisions provides information on how individual states attain eligibility for award money, and on how the FHWA prioritizes the states for distribution of the funding. "Funds shall be available for projects on the NHS that may include the following activities:

- Constructing safety rest areas that include commercial vehicle parking
- Constructing commercial vehicle parking facilities adjacent to commercial truck stops and travel plazas
- Opening existing facilities to commercial vehicles
- Promoting the availability of publicly or privately provided commercial vehicle parking on the NHS, by using ITS systems and other means
- Constructing turnouts for commercial vehicles
- Making capital improvements to public commercial vehicle parking facilities to allow for year-round use

- Improve the geometric design of interchanges to improve access to parking facilities"

*Moving Ahead for Progress in the 21st Century: Jason's Law Section* (2012) (4)

Jason's Law authorizes the construction of safety rest areas and CMV parking facilities that are eligible for Federal funding. It requires the U.S. DOT to survey states regarding their CMV traffic and CMV parking. The survey must be updated periodically on the U.S. DOT's website. Jason's Law was included in MAP-21 after Jason Rivenburg, a truck driver, was murdered while taking his mandatory rest break at an abandoned gas station in South Carolina. Rivenburg had been told the location was safe and had to wait there to prevent an early arrival at his drop-off location. Jason's Law requires the following of states: construction of safe parking facilities next to commercial truck stops; use of existing facilities for truck parking, including inspection stations, weigh stations, and park-and-ride facilities; construction of turnouts along the NHS; promotion of the availability of publicly and privately owned parking; and making capital improvements to public truck parking facilities during the season they are closed.

*SmartPark Technology Demonstration Project* (2013) (8)

The SmartPark project was created by the Federal Motor Carrier Safety Administration to assess the feasibility of a technology that would provide truck parking space availability in real time. Phase I involved a field operational test to determine the accuracy and reliability of a technology for counting available truck parking spaces. Phase II focused on broadcasting parking availability information and evaluating whether the technology could be used to alleviate truck parking problems in the U.S.

After Phase I was implemented, several drawbacks associated with equipment use were identified. First, there was a large amount of equipment required, and all physical conditions had to be met for the system to work properly. Second, the system was accessible to pedestrians and thus vulnerable to damage or alteration. Lastly, ice buildup on the equipment caused the system to stop working. However, one positive outcome that emerged from system use was increased site usage. This was because of improved perceptions of safety, combined with a decrease in negative or criminal activity. Also, the system proved very accurate, which is a positive indicator for the future of the program. The results of Phase II were not included in this report.

*The Sleep of Commercial Vehicle Drivers under the 2003 Hours-of-Service Regulations* (2007) (6)

Previous research found that commercial drivers averaged 5.18 hours of sleep per night. Revised hours-of-service (HOS) regulations were put in place in 2003 to allow drivers more opportunities to rest. This study raised the question of whether

drivers actually get more sleep under these revised regulations. It also examined the relationship between the amount of time a driver sleeps and critical incidents (crashes, near-crashes, or crash-relevant conflicts).

Data were collected from 73 truck drivers during a naturalistic driving study (after implementation of the 2003 HOS regulations). This information was analyzed to determine: 1) overall time of sleep (using actigraphy), and 2) the amount of sleep a driver had prior to a critical incident. 62 of the drivers had logged at least seven days of data (Monday-Sunday). The average amount of sleep per 24-hour period (midnight centered using the Cole–Kripke algorithm) for these drivers was 6.28 hours with a standard deviation of 1.42 hours. 58 critical incidents were recorded during the 10th or 11th driving hours. Analysis indicated that drivers received significantly less sleep compared to their average in the period just before a critical incident.

This study indicated that drivers may be sleeping more under the revised 2003 HOS regulations than they did under the prior regulations. In addition, it found that for drivers involved in a critical incident, they received significantly less sleep in the 24-hour period leading up to their involvement in a critical incident. This suggested that driver fatigue may have been a contributing factor in these critical incidents.

*Truckers' Park/Rest Facility Study* (2008) (1)

This study examined the state of truck parking and rest area facilities in the Northern Illinois/Chicago metropolitan area to determine if and how truck parking problems affected the region's freight transportation infrastructure, safety, economy, and environment. Researchers interviewed truck drivers and government authorities to understand truck traffic volume and truck parking availability at publicly and privately owned sites. One critical problem was when local company drivers parked in rest areas designed for over-the-road drivers. Because of the lack of parking spaces, local company drivers were forced to park in residential or retail areas. This created safety hazards, harmful emissions, and a less efficient transportation system, all of which can have negative impacts on the economy. This study recommended the creation of additional parking at existing truck parking areas, and suggested the use of underutilized retail, manufacturing, and seasonally affected sites for additional truck parking. Another suggestion was that truck parking availability should be communicated via radio or other means.

*The Minnesota Interstate Truck Parking Study* (2009) (9)

The purpose of this study was to help the Minnesota DOT produce the information needed to support decisions on truck parking issues. The goals of the study were to: determine what the state's role should be in the provision of truck parking, identify strategies for long-term truck parking that provide the greatest economic support, and recommend what actions will provide the greatest benefit

to traffic safety. The study drew from an inventory of Minnesota's Interstate Truck Parking Supply, Truck Parking Demand Analysis (data compiled on parking facilities), and a survey on trucking company practices and attitudes related to truck parking. Although there were no specific recommendations, this research identified potential statewide solutions that will form the basis of future studies. The next step would be to evaluate the effectiveness of public private partnerships, parking capacity additions, parking policy revisions, and information technology systems.

# 4.0 PROCEDURE

## 4.1 Commercial Truck Crash Analysis

Analysis included extraction of 2010-2013 data from the commercial vehicles CRASH database. The following codes were used to distinguish those crashes that involved driver fatigue and parking in unsafe locations:

- Commercial Vehicle Indicator equal to YES, and
- Route is Interstate or Parkway, and
- Directional Analysis Code equal to 50 (Rear end on shoulder), or
- Directional Analysis Code equal to 51 (Other collisions on shoulder), or
- Location of First Event equal to 4 (Outside shoulder – left), or
- Location of First Event equal to 5 (Outside shoulder – right), or
- Location of First Event equal to 6 (Shoulder), or
- Pre-collision Vehicle Action equal to 4 (Entering parked position), or
- Pre-collision Vehicle Action equal to 12 (Parked), or
- Pre-collision Vehicle Action equal to 14 (Starting from parked position),
- Human Factor equal to 9 (Fatigue), or
- Human Factor equal to 10 (Fell Asleep)

848 crashes matched the above criteria. Collision reports were then reviewed to determine how many of those crashes (239) were specifically related to the safety issue of commercial truck parking. The most frequently occurring crash types removed from analysis included the following:

- Passenger car driver fatigue
- Inattention
- Road condition/weather
- Equipment failure

## 4.2 Commercial Truck Parking Inventory

Between 2008 and 2009, the Kentucky Transportation Cabinet performed a Truck Parking Inventory of truck parking facilities available at exits on interstates and parkways (Truck Parking Inventory, 13). This inventory showed there were 6,746 parking spaces, the majority of which were marked locations at private truck stops. The inventory was updated in 2014, and it indicated there were a total of 5,980 spaces at interstate exits, rest areas, welcome centers, and weigh stations (Truck Parking Inventory, 14). For all major roadways, in addition to interstates and parkways, the total number of available spaces was 6,604 – a small decrease from the number in 2008-2009. Overall truck parking demand for the state has not been calculated. However, national estimates predict an increase in truck traffic in the coming years. Demand is expected to be especially high for Kentucky because of two major north–south freight corridors (I-65 and I-75) passing through the state.

### 4.3 Commercial Truck Parking Usage Survey

Observational surveys were conducted on parking facilities to determine frequency of use by commercial vehicles on interstates in Kentucky. The surveys were focused on the two primary north–south interstates (I-65 and I-75), where historical data have shown a high volume of truck traffic (Pigman, 10). In addition, samples were obtained from the other Kentucky interstates (I-24, I-64, and I-71). Data were collected during the summer of 2014. Surveys were conducted during the day and at night. Daytime surveys were conducted at various times with the aim of identifying temporal patterns of commercial truck parking. Daytime data were also used to determine the location and layout of facilities in advance of the nighttime surveys. Nighttime surveys were conducted at varying times, with an emphasis placed on the after-midnight period; this was to capture a maximum number of drivers seeking overnight parking. There were 8 daytime observation dates and 16 nighttime observation dates. All data were collected during dry weather conditions.

# 5.0 RESULTS

## 5.1 Commercial Vehicle Crash Data

Between 2010 and 2013, there were 239 crashes in Kentucky involving driver fatigue and/or improper use of a shoulder or ramp by a commercial vehicle. For this four-year period, crash data were analyzed for 10 interstates and 7 parkways. Table 1 presents, in decending order of crash frequency, the number of crashes by route. As expected, the majority of crashes occurred on interstates with the highest annual average daily traffic (AADTs) and truck volumes. Two-thirds of all crashes included in the analysis occurred on I-64, I-65, I-71 and I-75. Other highways with more than five percent of the total crashes were I-24, Edward Breathitt (Pennyrile Parkway), and Western Kentucky Parkway.

**Table 1**. Frequency of Commercial Vehicle Crashes Resulting From Fatigue or Shoulder Parking on Interstates and Parkways (2010-2013)

| Counties | Route | Number of Crashes | Percent of Total | Crashes per Mile |
|---|---|---|---|---|
| Boone, Fayette, Grant, Kenton, Laurel, Madison, Rockcastle, Scott, Whitley | I-75 | 53 | 22.2% | .28 |
| Barren, Bullitt, Hardin, Hart, Jefferson, Larue, Simpson, Warren, Edmonson | I-65 | 50 | 20.9% | .36 |
| Bath, Boyd, Carter, Christian, Clark, Franklin, Jefferson, Montgomery, Rowan, Scott, Shelby, Woodford | I-64 | 30 | 12.6% | .16 |
| Boone, Carroll, Gallatin, Henry, Jefferson, Oldham | I-71 | 27 | 11.3% | .28 |
| Lyon, McCracken, Christian | I-24 | 18 | 7.5% | .19 |
| Henderson, Hopkins, Simpson | E. Breathitt-Parkway | 14 | 5.9% | .20 |
| Caldwell, Grayson, Hardin, Hopkins, Muhlenberg, Ohio | W. Ford Parkway | 13 | 5.4% | .36 |
| Boone, Campbell, Kenton | I-275 | 11 | 4.6% | .13 |
| Anderson, Hardin, Nelson, Woodford | M. Collins Parkway | 7 | 2.9% | .10 |
| Butler, Daviess, Ohio, Warren | W. Natcher Parkway | 6 | 2.5% | .08 |
| Powell, Wolfe | B.T. Combs Parkway | 2 | 0.8% | .03 |
| Jefferson | I-264 | 2 | 0.8% | .09 |
| Marshall | J. Carroll Parkway | 2 | 0.8% | .04 |
| Barren | L. Nunn Parkway | 1 | 0.4% | .01 |
| Jefferson | I-265 | 1 | 0.4% | .04 |
| Campbell | I-471 | 1 | 0.4% | .17 |

| | | | | |
|---|---|---|---|---|
| Caldwell | I-69 | 1 | 0.4% | .02 |

Table 2 lists one-mile road sections with the highest crash numbers over the four year analysis period. I-75 produced two of the largest crash clusters, both on sections located in Boone County. There were four notable clusters of crashes on I-65 – two in Jefferson County with one cluster in Hardin County and Simpson County, respectively. The Simpson County location is situated at the Kentucky-Tennessee border and has an interchange in its immediate vicinity. Not surprisingly, the majority of clusters were located on the primary, north–south interstates, however, the E. Breathitt Parkway contained a cluster in Henderson County that recorded three crashes over the four-year period, while the W. Natcher Parkway had a cluster in Ohio County with four crashes. Figure 1 presents a map of these crash clusters, with major routes labeled.

**Table 2**. Frequency of Commercial Vehicle Crashes Resulting From Fatigue or Shoulder Parking on Interstates and Parkways (2010-2013) – One Mile Sections

| County | Route | Milepoint Crash Cluster (1-mile sections) | Count |
|---|---|---|---|
| *Boone | I-75 | 176.00-176.99 | 5 |
| *Boone | I-75 | 177.00-177.99 | 4 |
| *Ohio | WK-9001 | 75.00-75.99 | 4 |
| *Simpson | I-65 | 0.00-0.99 | 4 |
| Montgomery | I-64 | 112.00-112.99 | 4 |
| Hardin | I-65 | 89.00-89.99 | 3 |
| Gallatin | I-71 | 69.00-69.99 | 3 |
| Gallatin | I-71 | 54.00-54.99 | 3 |
| Henderson | EB-9004 | 68.00-68.99 | 3 |
| *Jefferson | I-65 | 125.00-125.99 | 3 |
| *Jefferson | I-65 | 130.00-130.99 | 3 |

*Denotes crashes at an interchange

**Figure 1.** Map showing Commercial Vehicle Crash Clusters

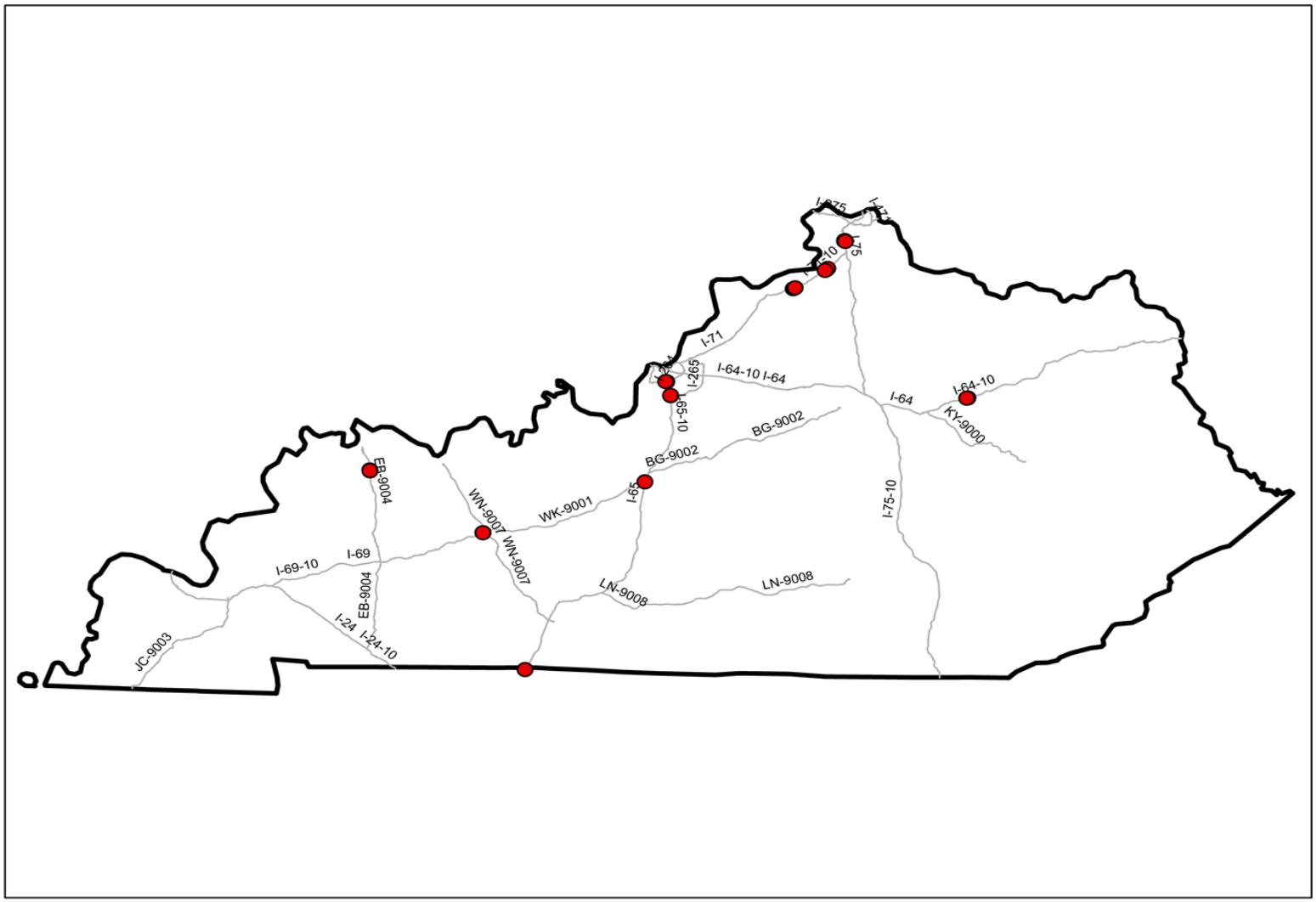


Table 3 summarizes the number of commercial vehicle crashes by time of occurrence. The 24-hour period was broken into four-hour intervals beginning at midnight, and the number of crashes was recorded for each period. The time intervals with the highest number of crashes occurred between midnight and 4:00 A.M., followed by the period of 4:00 am to 8:00 am. These, along with 8 P.M. to midnight, may be times when a driver is most likely to be fatigued and/or parked on a shoulder. The pattern by time of day/night for this subset of truck crashes (59.4 percent between 8:00 P.M. and 8:00 A.M.) was quite different from all crashes; nighttime crashes represented approximately 30 percent. Further analysis was performed to determine if truck crash time periods were consistent with truck volumes during those periods. Based on data from nine permanent truck weigh stations which included continuous truck volume data, only 20.8 percent of the total commercial vehicle data occurred between midnight and 8 A.M. Therefore, truck crashes were overrepresented between midnight and 8:00 A.M., relative to their travel during that same time period.

**Table 3**. Commercial Vehicle Crashes Resulting From Fatigue or Shoulder Parking on Interstates and Parkways (2010-2013) by Time of Day/Night

| Time of Day/Night | Number of Crashes | Percent of Total |
|---|---|---|
| 12:01 A.M. – 4:00 A.M. | 60 | 25.1% |
| 4:01 A.M. – 8:00 A.M. | 56 | 23.4% |
| 8:01 A.M. – 12:00 noon | 44 | 18.4% |
| 12:01 P.M. – 4:00 P.M. | 33 | 13.8% |
| 4:01 P.M. – 8:00 P.M. | 20 | 8.4% |
| 8:01 P.M. – 12:00 midnight | 26 | 10.9% |

Table 4 summarizes the relationship between weather and crash frequency. The vast majority of crashes occurred on clear or cloudy days, however, approximately 10 percent of crashes took place during rainy or wintry conditions. This indicated that crashes occurring during wet or wintry conditions were underrepresented for commercial vehicles. When compared to all crashes in Kentucky, approximately 25 percent of crashes happened during poor weather conditions.

**Table 4**. Frequency of Commercial Vehicle Crashes Resulting From Fatigue or Shoulder Parking on Interstates and Parkways (2010-2013) by Weather Conditions

| Type of Weather | Number of Crashes | Percent of Total |
|---|---|---|
| Clear or Cloudy | 214 | 89.5% |
| Raining | 20 | 8.4% |
| Sleet or Snow | 3 | 1.3% |
| Other | 2 | 0.8% |

Crashes were split into categories based on the nature of the collisions. Table 5 presents the number of crashes based on these categories: commercial vehicle driver fatigue; commercial vehicle parked on shoulder, within a parking facility, on or near a ramp, in a construction zone; avoiding passenger cars on shoulder; and merging onto a shoulder. Approximately 38 percent of all crashes had driver fatigue as a contributing factor. This included commercial vehicle drivers falling asleep at the wheel, passing out from

exhaustion, or being inattentive due to fatigue. The second largest category was commercial vehicles parked on a shoulder, which represented 24 percent of all crashes. Crashes within parking facilities accounted for 11.7 percent of the total, with many drivers citing overcrowded lots and tight corners as the reason for the crash.

Analyses were performed for the 58 crashes involving commercial vehicles parked on shoulders, sorted by the locations of available parking and the parking usage rate. Locations of 35 (interstate crashes only) of those crashes and the nearest parking facility are presented in Appendix A. Data for crashes and proximity to parking facilities indicated that 71 percent of those crashes were near a facility with usage rates of 90 percent or more. Additional analysis focused on those one-mile sections with the highest number of crashes during the four-year period of analysis (previously presented in Table 2 and Figure 1). Results are presented in Appendix B, with crash clusters shown relative to the proximity and usage of parking facilities. Those clusters of crashes had a direct relationship to parking facility usage rate, with 7 of the 9 sites having a nearest parking facility usage rate of 90 percent or more.

**Table 5**. Commercial Vehicle Crashes Resulting From Fatigue or Shoulder Parking on Interstates and Parkways (2010-2013) by Type of Collision

| Type of Collision | Number of Crashes | Percent of Total |
|---|---|---|
| Fatigue/ Driver fell asleep | 92 | 38.5% |
| Parked on Shoulder | 58 | 24.3% |
| Within Parking Facility | 28 | 11.7% |
| Ramp Related | 18 | 7.5% |
| Merging from Shoulder | 15 | 6.3% |
| Construction Zone | 12 | 5.0% |
| Avoiding wreck/ passenger car on shoulder | 12 | 5.0% |
| Merging onto Shoulder | 4 | 1.7% |

Table 6 lists the number of crashes according to the state of vehicle truck or tractor unit license. Not surprisingly, Kentucky ranked highest in number of crashes —17.6 percent of the total. Other bordering states such as Indiana and Tennessee were frequently represented, with 13.4 percent and 10.4 percent, respectively. Given it is not located near Kentucky, the high number of crashes (13 over a four-year period) involving Oklahoma-plated vehicles was somewhat surprising. This may be related to the location of trucking companies in Oklahoma and therefore, licensing in that state.

**Table 6**. Commercial Vehicle Crashes Resulting From Fatigue or Shoulder Parking on Interstates and Parkways (2010-2013) by State of Vehicle License

| State | Number of Crashes | Percent of Total |
|---|---|---|
| KY | 41 | 17.20% |
| IN | 31 | 13.00% |
| TN | 25 | 10.50% |
| OH | 15 | 6.30% |
| IL | 15 | 6.30% |
| OK | 13 | 5.40% |
| MI | 11 | 4.60% |
| MO | 10 | 4.20% |
| FL | 9 | 3.80% |
| AL | 8 | 3.30% |
| TX | 7 | 2.90% |
| GA | 6 | 2.50% |
| ON | 5 | 2.10% |
| NE | 5 | 2.10% |
| MS | 5 | 2.10% |
| SC | 3 | 1.30% |
| IA | 3 | 1.30% |
| NC | 3 | 1.30% |
| WI | 3 | 1.30% |
| Other | 21 | 8.80% |

Table 7 indicates the distribution of crash severity level for all vehicles and drivers involved in commercial vehicle crashes. It is noteworthy that fatal collisions from this subset of crashes were represented at a frequency more than three times that of all commercial vehicle crashes. Commercial vehicle crashes that were shoulder- or ramp-related, or fatigue-related, were much more severe than other commercial vehicle crashes.

**Table 7**. Number of Crashes by Severity Level

| Crash Severity | Total | Percent of Total |
|---|---|---|
| Fatal (K) | 7 | 1.6% |
| Severe Injury (A) | 17 | 4.0% |
| Moderate Injury (B) | 29 | 6.7% |
| Minor Injury (C) | 39 | 9.1% |
| Property Damage Only (O) | 338 | 78.6% |

Figures 2 and 3 map the commercial vehicle crashes included in the analysis, with major routes labeled. This spatial distribution of trucks showed a pattern of crashes following interstate routes in expected locations. Figure 3 shows the apparent clusters in the Louisville and northern Kentucky areas. The area with the highest volume of crashes is in northern Kentucky on I-71/I-75.

**Figure 2**. Commercial Vehicle Crashes Plotted on Kentucky Interstates and Parkways

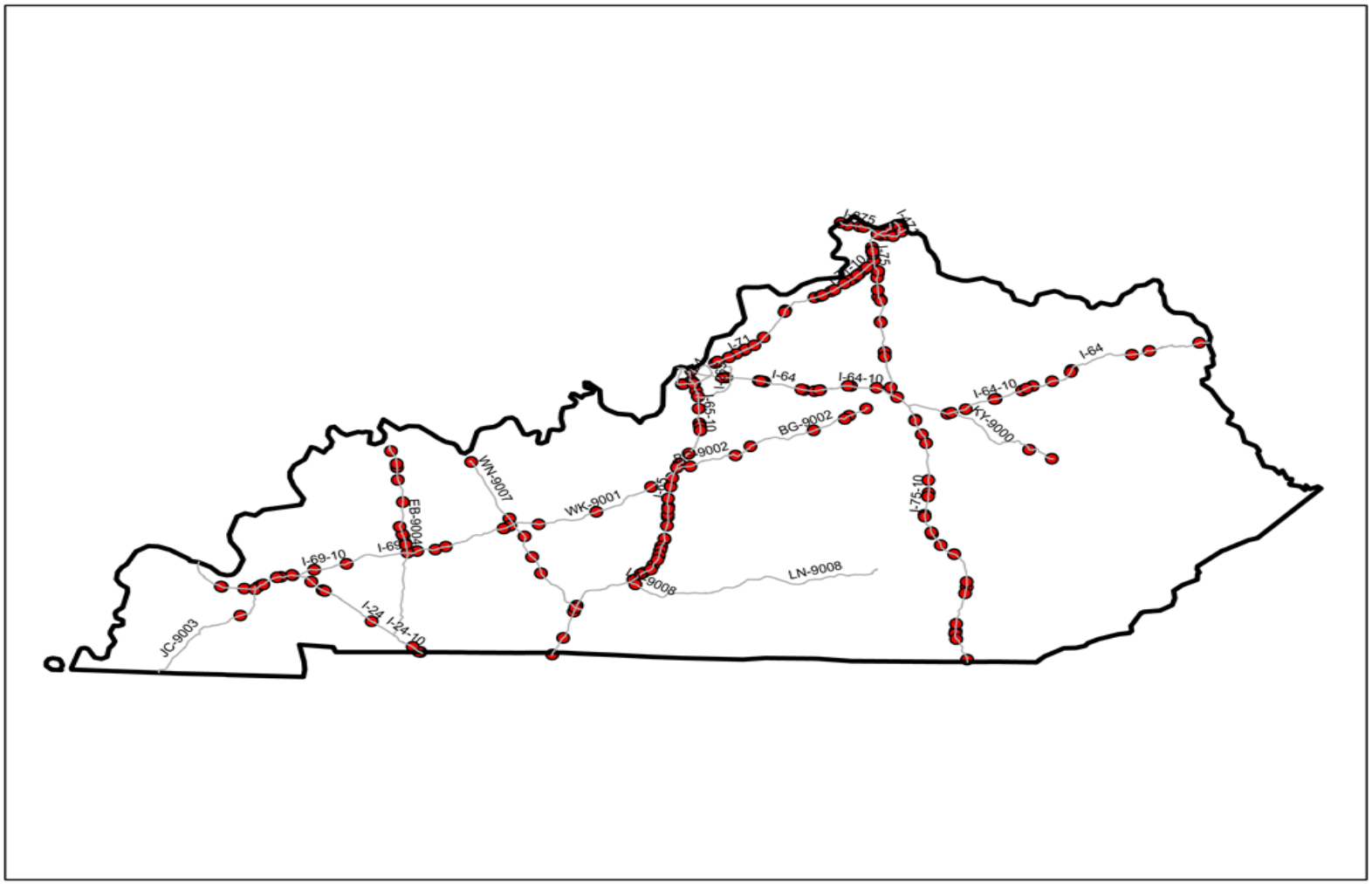


**Figure 3.** Commercial Vehicle Crashes in Louisville and Northern KY

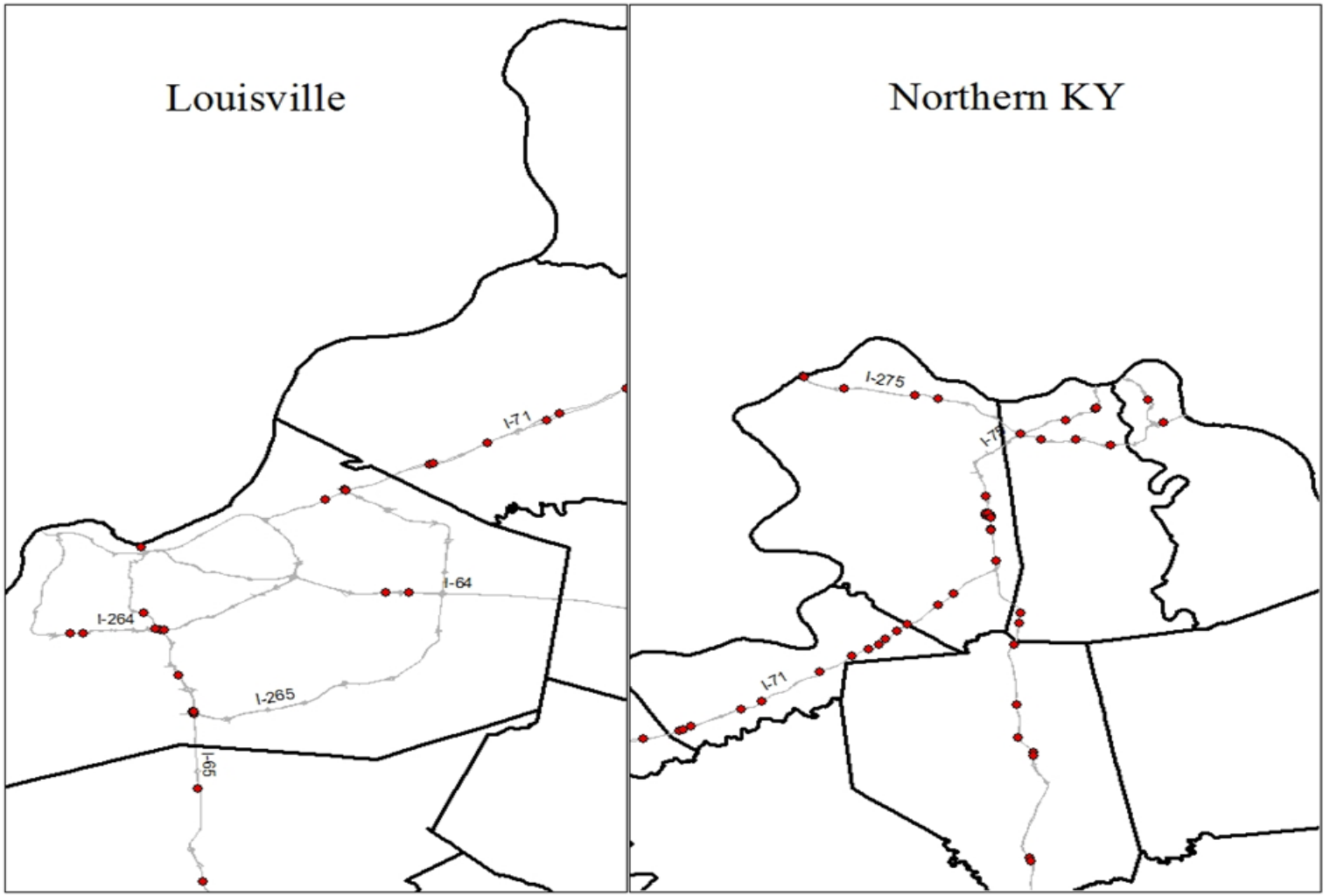
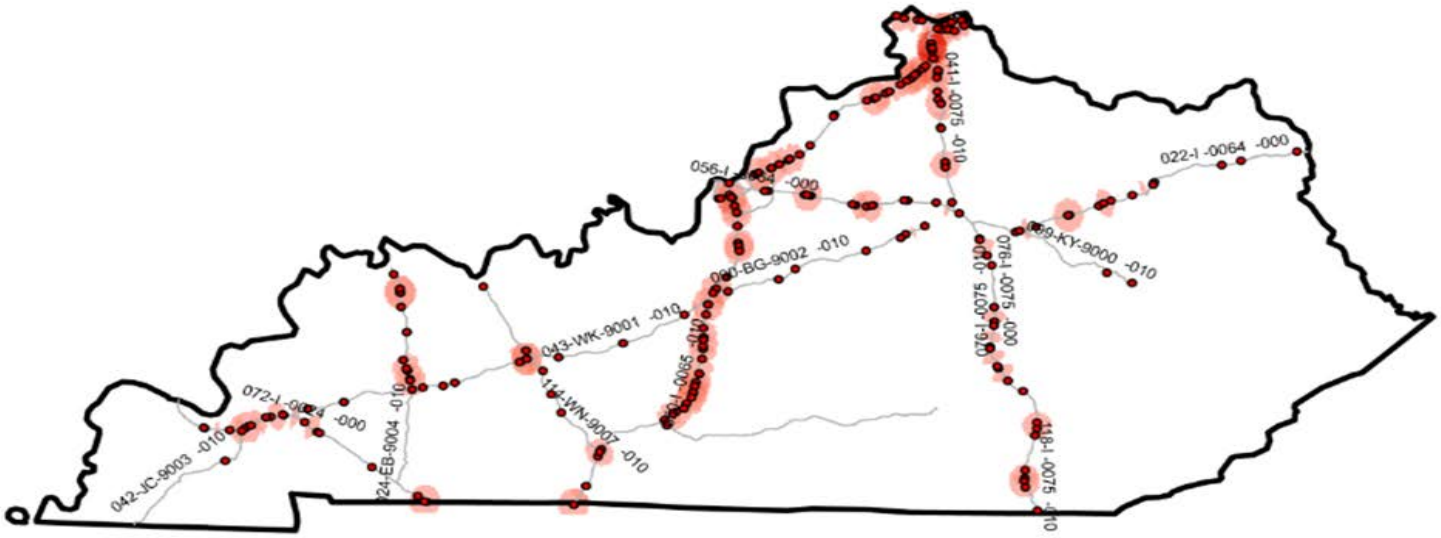


Figure 4 maps the crash density (higher densities are indicated by more intense shades of red) of commercial vehicle crashes in Kentucky between 2010 and 2013. The sections with the highest density are I-71/I-75 in northern Kentucky and the I-64 interchange with I-65 in Louisville. There are also sections along the I-65 corridor from Louisville to just before Bowling Green with high crash frequencies.

**Figure 4**. Map of Commercial Vehicle Crash Density on State-Owned Interstates and Parkways (more intense red shading equals higher density).



## 5.2 Commercial Truck Parking Usage Survey

Surveys were conducted to determine how frequently parking spaces are used by commercial vehicles at parking facilities on interstates in Kentucky. The surveys focused on the two primary north–south interstates (I-65 and I-75) where historical data have shown a high volume of truck traffic (Pigman, 10). In addition, data were obtained from three other interstates in Kentucky (I-24, I-64 and I-71). Data were collected during the summer of 2014, over both day and nighttime periods. Daytime observations included hours of daylight and nighttime surveys were conducted during hours of limited light (dusk, dark, and dawn). Instructions were provided to the data collectors to include only those facilities with approximately 20 or more parking spaces. Included in this report are tables summarizing the parking surveys on I-64, I-65, I-71, and I-75. Table 8 summarizes when routes were surveyed, whether the survey took place at day or night, the number of spaces surveyed, and usage rate. A total of 4,715 parking spaces were surveyed or counted during daytime observations, and 7,844 spaces were counted during nighttime observations. There were 8 daytime observation dates and 16 nighttime observation dates. Of the 4,715 parking spaces surveyed during the day, 2,143 were in use (45 percent). Of the 7,844 parking spaces surveyed during nighttime observations, 6,803 were in use (87 percent). Usage ranged from a low of 32 percent on I-24 during daytime observations to a high of 93 percent on I-71 during nighttime observations. It should be noted that several sites were surveyed more than once. During these repeat surveys, there were occasional discrepancies in total number of spaces due to low visibility, poorly delineated lines, and variability in estimation of unmarked spaces.

**Table 8**. Summary of Parking Surveys by Route, Date, Day/Night, and Usage

| Route | Dates | Day/Night | Spaces Surveyed | Spaces in Use | Percent Used |
|---|---|---|---|---|---|
| I-24 | 6/27/14 F | Day | 423 | 129 | 32% |
| I-64 | 6/25/14 W<br>6/30/14 M<br>7/07/14 M | Day | 702 | 370 | 53% |
| I-65 | 6/26/14 Th<br>7/02/14 W<br>7/10/14 Th | Day | 2041 | 901 | 44% |
| I-71 | 6/25/14 W | Day | 413 | 156 | 38% |
| I-75 | 6/25/14 W<br>7/08/14 T | Day | 1136 | 587 | 52% |
| I-64 | 7/07/14 M<br>7/15/14 T | Night | 526 | 416 | 79% |
| I-65 | 7/10/14 Th<br>7/24/14 Th<br>7/25/14 F<br>8/12/14 T<br>8/13/14 W<br>8/21/14 Th | Night | 4107 | 3420 | 83% |

**Table 8**. (Continued)

| Route | Dates | Day/Night | Total Spaces Surveyed | Spaces in Use | Percent Used |
|---|---|---|---|---|---|
| I-71 | 7/23/14 W | Night | 488 | 454 | 93% |
| I-75 | 7/08/14 T<br>7/17/14 Th<br>7/18/14 F<br>8/04/14 M<br>8/05/14 T<br>8/8/14 F<br>8/13/14 W<br>8/14/14 Th | Night | 2723 | 2422 | 89% |

The surveyors noted whether facilities were maintained by the state or privately owned. Table 9 shows the level of commercial vehicle usage for state and private facilities during daytime conditions. Similarly, Table 10 presents a summary of nighttime commercial vehicle parking usage, according to facility ownership. Table 11 displays a summary of commercial vehicle parking based on delineation of spaces. For those surveys conducted during the daytime, it was found that 354 of 4,292 spaces were unmarked (8.2 percent). For nighttime surveys, there were 1,771 parking spaces unmarked from the total of 7,844 total spaces surveyed (87.6 percent). Additional analysis of parking space delineation for the four primary interstate routes (I-64, I-65, I-71, and I-75) revealed that the proportion of unmarked parking spaces ranged from 13 percent on I-71 to 20 percent on I-64 and I-75, and 21 percent on I-65. It should be noted that the number of unmarked spaces was estimated by the surveyors for each location. Darkness affected the estimation of the number of trucks that could fit into an area of open space. Table 12 is a usage analysis by size of commercial vehicle parking facilities. The usage rate was lower at facilities that had 50 or fewer parking spaces. This confirmed a decision to focus on larger facilities, due to limitations of surveyors' time and availability.

**Table 9**. Summary of Commercial Vehicle Parking Data (Day)

| | Total Spaces Surveyed | | |
|---|---|---|---|
| | **All** | **Used** | **% Used** |
| **State Facilities** | 600 | 116 | 19% |
| **Private Facilities** | 4115 | 2027 | 49% |

**Table 10**. Summary of Commercial Vehicle Parking Data (Night)

| | Total Spaces Surveyed | | |
|---|---|---|---|
| | **All** | **Used** | **% Used** |
| **State Facilities** | 1465 | 1121 | 77% |
| **Private Facilities** | 6379 | 5591 | 87.6% |

**Table 11.** Unmarked Parking Spaces Surveyed Compared to Total Spaces

| | **Unmarked Spaces Surveyed** | **Total Spaces Surveyed** | **Percent of Total** |
|---|---|---|---|
| **Day** | 354 | 4292 | 8.2% |
| **Night** | 1771 | 7844 | 22.6% |

**Table 12.** Summary of Commercial Vehicle Parking Data by Parking Facility Size

| | **50 or fewer** | **>50** |
|---|---|---|
| **Day** | 36% | 47% |
| **Night** | 68% | 88% |

Tables 13 and 14 present a summary of the commercial truck parking data on I-64 during the day. Of the 702 parking spaces surveyed, all were from privately owned facilities. Over 50 percent of the parking spaces were in use at four of the 11 locations surveyed. In total, 53 percent of the spaces were in use. It should be noted that the number of unmarked spaces was estimated by the data collectors.

**Table 13**. Summary of Commercial Vehicle Parking Data on I-64 by Site (Day)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | % Used |
| I 64 @ Exit 28 Pilot | Wed Jun 25 2014 19:36:19 | 52 | 5 | 1 | 0 | 58 | 53 | 91% |
| I 64 @ Exit 29 Rest Area | Wed Jun 25 2014 19:42:53 | 11 | 12 | 0 | 0 | 23 | 11 | 48% |
| I 64 @ Exit 43 Love's | Wed Jun 25 2014 20:00:00 | 51 | 21 | 1 | 0 | 73 | 52 | 71% |
| I 64 @ Exit 43 Flying J | Wed Jun 25 2014 20:04:20 | 89 | 10 | 6 | 0 | 105 | 95 | 90% |
| I 64 Exit 113 Pilot | Mon Jun 30 2014 11:48:49 | 33 | 41 | 2 | 0 | 76 | 35 | 46% |
| I 64 Exit 113 Super Express Stop | Mon Jun 30 2014 15:00:19 | 7 | 23 | 0 | 4 | 34 | 7 | 21% |
| I 64 Exit 133 Eagle Travel Plaza | Mon Jul 07 2014 20:40:51 | 0 | 0 | 31 | 15 | 46 | 31 | 67% |
| I 64 Exit 133 Eagle Travel Center | Mon Jun 30 2014 14:28:50 | 14 | 16 | 4 | 12 | 46 | 18 | 39% |

**Table 13.** (Continued)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | % Used |
| I 64 Exit 172 Super Quick | Mon Jun 30 2014 12:50:16 | 0 | 0 | 24 | 24 | 48 | 24 | 50% |
| I 64 Exit 172 Pilot | Mon Jun 30 2014 13:11:43 | 8 | 30 | 2 | 0 | 40 | 10 | 25% |
| I 64 Exit 185 Flying J | Mon Jun 30 2014 13:29:40 | 24 | 119 | 0 | 0 | 153 | 34 | 22% |

**Table 14**. Summary of Commercial Vehicle Parking Data on I-64 (Day)

| | Total Spaces Surveyed | | |
|---|---|---|---|
| | All | Used | %Used |
| State Facilities | 23 | 11 | 48% |
| Private Facilities | 679 | 359 | 53% |

Tables 15 and 16 present a summary of the commercial truck parking survey data on I-65 during the day. There were 2,041 available parking spaces at 21 locations. Usage ranged from 8 percent at the Exit 3 weigh station to 91 percent at the Exit 121 Pilot. Of the 21 locations surveyed, 10 had at least 50 percent of the parking spaces in use. Table 16 breaks down usage rate according to facility type. Only 20 percent of the state-owned spaces were in use, while 51 percent of the privately owned spaces were used.

**Table 15**. Summary of Commercial Vehicle Parking Data on I-65 by Site (Day)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | %Used |
| I-65 Exit 0 Welcome Center | Thu Jun 26 2014 18:27:52 | 13 | 8 | 0 | 0 | 21 | 13 | 62% |
| I-65 Exit 0 Welcome Station | Thu Jul 10 2014 20:51:58 | 15 | 8 | 0 | 0 | 23 | 15 | 65% |
| I-65 Exit 2 Flying J | Thu Jun 26 2014 17:59:29 | 87 | 70 | 3 | 0 | 160 | 90 | 56% |
| I-65 Exit 2 Flying J | Thu Jul 10 2014 20:59:55 | 134 | 35 | 6 | 0 | 175 | 140 | 80% |
| I-65 Exit 2 Key Stop | Thu Jun 26 2014 17:52:28 | 30 | 31 | 5 | 0 | 66 | 35 | 53% |
| I-65 Exit 2 Marathon | Thu Jul 10 2014 20:56:06 | 36 | 10 | 16 | 1 | 63 | 52 | 83% |
| I-65 Exit 3 Weigh Station | Thu Jun 26 2014 18:34:06 | 3 | 36 | 0 | 0 | 39 | 3 | 8% |
| I-65 Exit 6 Pilot | Thu Jun 26 2014 17:25:21 | 70 | 70 | 3 | 0 | 143 | 73 | 51% |
| I-65 Exit 6 Bluegrass Plaza | Thu Jun 26 2014 18:41:55 | 40 | 48 | 3 | 0 | 91 | 43 | 47% |
| I-65 Exit 38 BP | Wed Jul 02 2014 18:09:17 | 1 | 20 | 22 | 22 | 65 | 23 | 35% |
| I-65 Exit 58 Love's 360 | Wed Jul 02 2014 17:43:12 | 50 | 51 | 3 | 0 | 104 | 53 | 51% |

**Table 15.** (Continued)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | %Used |
| I-65 Exit 60 Welcome Center | Wed Jul 02 2014 17:35:46 | 9 | 101 | 0 | 0 | 110 | 9 | 8% |
| I-65 Exit 60 NB Welcome center | Wed Jul 02 2014 18:42:50 | 22 | 92 | 0 | 0 | 114 | 22 | 19% |
| I-65 Exit 60 NB Rest Area | Thu Jul 10 2014 19:54:54 | 12 | 98 | 0 | 0 | 110 | 12 | 11% |
| I-65 Exit 81 Pilot | Wed Jul 02 2014 17:10:50 | 18 | 81 | 15 | 0 | 114 | 33 | 29% |
| I-65 Exit 86 Extra Lot | Wed Jul 02 2014 16:42:00 | 77 | 166 | 0 | 0 | 243 | 77 | 32% |
| I-65 Exit 86 Pilot | Wed Jul 02 2014 16:58:00 | 37 | 46 | 0 | 0 | 83 | 37 | 45% |
| I-65 Exit 105 Pilot 399 | Wed Jul 02 2014 16:03:01 | 34 | 48 | 19 | 34 | 135 | 53 | 39% |
| I-65 Exit 113 Welcome Center | Wed Jul 02 2014 15:50:21 | 14 | 8 | 2 | 0 | 24 | 16 | 67% |
| I-65 Exit 116 Love's | Wed Jul 02 2014 15:34:07 | 40 | 50 | 2 | 0 | 92 | 42 | 46% |
| I-65 Exit 121 Pilot | Wed Jul 02 2014 15:18:32 | 56 | 5 | 4 | 1 | 66 | 60 | 91% |

**Table 16**. Summary of Commercial Vehicle Parking Data on I-65 (Day)

| | Total Spaces Surveyed | | |
|---|---|---|---|
| | All | Used | %Used |
| State Facilities | 441 | 90 | 20% |
| Private Facilities | 1600 | 811 | 51% |

Tables 17 and 18 detail commercial vehicle parking results for I-71 during the day. Out of the 413 parking spaces available, 11 percent were at state-owned facilities, while 89 percent were at privately owned facilities. Once again, the privately owned spaces were more frequently used, with 41 percent as opposed to 11 percent. Of the 5 facilities surveyed, there were 2 facilities (Exits 55 and 62) where over 50 percent of the parking spaces were in use.

**Table 17**. Summary of Commercial Vehicle Parking Data on I-71 by Site (Day)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | % Used |
| I-71 Exit 28 Pilot (1) | Wed Jun 25 2014 17:21:50 | 18 | 60 | 1 | 0 | 79 | 19 | 24% |
| I-71 Exit 28 Pilot (2) | Wed Jun 25 2014 17:29:56 | 36 | 118 | 1 | 0 | 155 | 37 | 24% |
| I-71 Exit 55 Love's | Wed Jun 25 2014 16:40:35 | 72 | 19 | 0 | 0 | 91 | 72 | 79% |
| I-71 Exit 62 Truck Stop | Wed Jun 25 2014 16:26:41 | 0 | 0 | 22 | 1 | 43 | 23 | 53% |
| I-71 Exit 75 Weigh Station | Wed Jun 25 2014 16:00:20 | 5 | 40 | 0 | 0 | 45 | 5 | 11% |

**Table 18**. Summary of Commercial Vehicle Parking Data on I-71 (Day)

| | Total Spaces Surveyed | | |
|---|---|---|---|
| | All | Used | %Used |
| State Facilities | 45 | 5 | 11% |
| Private Facilities | 368 | 151 | 41% |

Tables 19 and 20 present a summary of the commercial vehicle parking data collected for I-75 during the day. Of the 1,136 parking spots available, 8 percent were at state-owned facilities and 92 percent were at privately owned facilities. 11 percent of the state-owned spaces were used during daytime, while 55 percent of the privately owned spaces were in use. Over 50 percent of the parking spaces were in use at six of the 15 locations surveyed.

**Table 19.** Summary of Commercial Vehicle Parking Data on I-75 by Site (Day)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | % Used |
| I-75 Exit 11 Pilot | Tue Jul 08 2014 20:07:49 | 49 | 3 | 2 | 0 | 54 | 51 | 94% |
| I-75 Exit 29 Pilot | Tue Jul 08 2014 20:34:36 | 70 | 11 | 4 | 0 | 85 | 74 | 87% |
| I-75 Exit 29 Love's | Tue Jul 08 2014 20:46:22 | 79 | 7 | 2 | 0 | 88 | 81 | 92% |
| I-75 Exit 33 NB weigh station | Tue Jul 08 2014 20:56:28 | 7 | 43 | 0 | 0 | 50 | 7 | 14% |
| I-75 Exit 127 NB Service Area | Wed Jun 25 2014 12:11:11 | 16 | 29 | 0 | 0 | 45 | 16 | 36% |
| I-75 Exit 127 SB Service Area | Wed Jun 25 2014 12:44:13 | 18 | 29 | 0 | 0 | 47 | 18 | 38% |
| I-75 Exit 129 Pilot (1) | Wed Jun 25 2014 12:23:18 | 42 | 29 | 0 | 0 | 71 | 42 | 59% |
| I-75 Exit 129 Pilot (2) | Wed Jun 25 2014 12:38:25 | 22 | 48 | 0 | 0 | 70 | 22 | 31% |
| I-75 Exit 144 Noble's | Wed Jun 25 2014 13:06:57 | 0 | 0 | 10 | 15 | 25 | 10 | 40% |
| I-75 Exit 168 SB Weigh Station | Wed Jun 25 2014 14:17:19 | 3 | 38 | 0 | 0 | 41 | 3 | 7% |
| I-75 Exit 171 Flying J | Wed Jun 25 2014 13:56:35 | 54 | 146 | 2 | 0 | 212 | 66 | 31% |
| I-75 Exit 175 TA Travel | Wed Jun 25 2014 14:39:29 | 56 | 40 | 7 | 0 | 103 | 63 | 61% |

**Table 19.** (Continued)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | % Used |
| I-75 Exit 177 NB Rest Area | Wed Jun 25 2014 14:51:53 | 20 | 35 | 0 | 0 | 55 | 20 | 36% |
| I-75 Exit 177 SB Rest Area | Wed Jun 25 2014 15:31:21 | 25 | 34 | 0 | 0 | 59 | 25 | 42% |
| I-75 Exit 181 TA Travel | Wed Jun 25 2014 15:04:00 | 89 | 42 | 0 | 0 | 131 | 89 | 68% |

**Table 20**. Summary of Commercial Vehicle Parking Data on I-75 (Day)

| | Total Spaces Surveyed | | |
|---|---|---|---|
| | All | Used | %Used |
| State Facilities | 91 | 10 | 11% |
| Private Facilities | 1045 | 577 | 55% |

Tables 21 and 22 summarize the data collected for commercial vehicle parking on I-64 exits at night. All locations surveyed were private facilities. Over 50 percent of the spaces were in use at six of the eight facilities. Of the eight sites surveyed at night, three had usage rates of 85 percent or more. All told, 79 percent of the 526 spaces were in use.

**Table 21**. Summary of Commercial Vehicle Parking Data on I-64 by Site (Night)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | %Used |
| I-64 Exit 113 Pilot | Mon Jul 07 2014 21:14:59 | 52 | 19 | 3 | 0 | 74 | 55 | 74% |
| I-64 Exit 113 Pilot | Tue Jul 15 2014 23:09:39 | 76 | 0 | 8 | 0 | 84 | 84 | 100% |
| I-64 Exit 113 Super Express | Mon Jul 07 2014 21:22:48 | 8 | 22 | 2 | 3 | 35 | 10 | 29% |

**Table 21.** (Continued)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | %Used |
| I-64 Exit 113 Super Express | Tue Jul 15 2014 23:15:55 | 14 | 22 | 0 | 0 | 36 | 14 | 39% |
| I-64 Exit 133 Eagle Travel | Tue Jul 15 2014 22:44:10 | 0 | 0 | 43 | 3 | 46 | 43 | 93% |
| I-64 Exit 172 Super Quick | Tue Jul 15 2014 21:58:01 | 0 | 0 | 34 | 15 | 49 | 34 | 69% |
| I-64 Exit 172 Love's | Tue Jul 15 2014 22:03:47 | 29 | 8 | 3 | 0 | 40 | 32 | 80% |
| I-64 Exit 185 Flying J | Tue Jul 15 2014 21:37:28 | 139 | 18 | 5 | 0 | 162 | 144 | 89% |

**Table 22**. Summary of Commercial Vehicle Parking Data on I-64 (Night)

| | Total Spaces Surveyed | | |
|---|---|---|---|
| | All | Used | %Used |
| State Facilities | 0 | 0 | |
| Private Facilities | 526 | 416 | 79% |

*Rest Areas were not surveyed because of the subjective criteria of including only those locations with number of parking spaces 20 or more.

Tables 23 and 24 summarize the commercial vehicle data collected on I-65 at night. Of the 38 locations surveyed, 32 were over 50 percent capacity with 20 of the locations over 85 percent capacity. Once again, the private facilities had higher use than those owned by the state, with 87 percent and 67 percent of the spaces in use at their respective facilities. There were 4,107 spaces in total.

**Table 23.** Summary of Commercial Vehicle Parking Data on I-65 by Site (Night)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | %Used |
| I-65 Exit 0 Welcome Station | Fri Jul 25 2014 00:02:12 | 20 | 2 | 4 | 0 | 26 | 24 | 92% |
| I-65 Exit 2 Marathon | Fri Jul 25 2014 00:15:38 | 51 | 6 | 7 | 0 | 64 | 58 | 91% |
| I-65 Exit 3 NB Weigh Station | Thu Jul 10 2014 21:11:55 | 3 | 36 | 0 | 0 | 39 | 3 | 8% |
| I-65 Exit 3 Weigh Station | Fri Jul 25 2014 00:26:14 | 10 | 32 | 0 | 0 | 42 | 10 | 24% |
| I-65 Exit 6 Shell | Thu Jul 10 2014 21:15:59 | 43 | 11 | 9 | 26 | 89 | 52 | 58% |
| I-65 Exit 6 Pilot (1) | Thu Jul 10 2014 21:22:24 | 87 | 15 | 1 | 0 | 103 | 88 | 85% |
| I-65 Exit 6 Pilot (2) | Thu Jul 10 2014 21:25:49 | 20 | 14 | 3 | 0 | 37 | 23 | 62% |
| I-65 Exit 6 Pilot (2) | Fri Jul 25 2014 00:39:10 | 34 | 0 | 4 | 0 | 38 | 38 | 100% |
| I-65 Exit 6 Sudden Service | Fri Jul 25 2014 00:31:27 | 1 | 0 | 98 | 19 | 118 | 99 | 84% |
| I-65 Exit 38 BP | Thu Jul 10 2014 21:54:27 | 44 | 23 | 8 | 3 | 78 | 52 | 67% |
| I-65 Exit 38 BP | Fri Jul 25 2014 01:08:40 | 0 | 0 | 79 | 7 | 86 | 79 | 92% |
| I-65 Exit 38 BP | Wed Aug 13 2014 00:03:25 | 80 | 5 | 0 | 0 | 85 | 80 | 94% |
| I-65 Exit 38 Exxon | Thu Aug 21 2014 00:33:01 | 66 | 6 | 23 | 0 | 95 | 89 | 94% |

**Table 23.** (Continued)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | %Used |
| I-65 Exit 58 Love's | Thu Jul 10 2014 22:15:45 | 107 | 0 | 9 | 2 | 118 | 116 | 98% |
| I-65 Exit 58 Love's | Thu Aug 21 2014 01:05:59 | 110 | 5 | 28 | 2 | 145 | 138 | 95% |
| I-65 Exit 60 NB Rest Area | Thu Jul 10 2014 22:25:29 | 42 | 72 | 2 | 0 | 116 | 44 | 38% |
| I-65 Exit 60 NB Rest Area | Tue Aug 12 2014 23:33:53 | 78 | 33 | 6 | 0 | 117 | 84 | 72% |
| I-65 Exit 60 NB Rest Area | Wed Aug 13 2014 00:32:55 | 90 | 23 | 25 | 0 | 138 | 115 | 83% |
| I-65 Exit 60 NB Rest Area | Thu Aug 21 2014 01:13:28 | 94 | 10 | 24 | 0 | 127 | 117 | 92% |
| I-65 Exit 60 NB Rest Area | Thu Aug 21 2014 00:10:47 | 86 | 27 | 8 | 0 | 121 | 94 | 78% |
| I-65 Exit 81 Pilot | Thu Jul 10 2014 22:46:32 | 95 | 32 | 10 | 0 | 137 | 105 | 77% |
| I-65 Exit 81 Pilot | Wed Aug 13 2014 00:50:50 | 102 | 27 | 16 | 0 | 145 | 118 | 81% |
| I-65 Exit 81 Pilot | Thu Aug 21 2014 01:32:11 | 76 | 48 | 14 | 0 | 138 | 90 | 65% |
| I-65 Exit 86 Pilot | Thu Jul 10 2014 22:59:38 | 77 | 12 | 0 | 0 | 89 | 77 | 87% |
| I-65 Exit 86 Pilot | Wed Aug 13 2014 01:01:03 | 77 | 19 | 0 | 0 | 96 | 77 | 80% |
| I-65 Exit 86 Petro | Thu Jul 10 2014 23:04:33 | 218 | 30 | 0 | 0 | 248 | 218 | 88% |
| I-65 Exit 86 Petro | Wed Aug 13 2014 01:04:31 | 244 | 8 | 5 | 0 | 257 | 249 | 97% |

**Table 23.** (Continued)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | %Used |
| I-65 Exit 86 Extra lot | Wed Aug 13 2014 01:12:19 | 0 | 0 | 52 | 31 | 83 | 52 | 63% |
| I-65 Exit 86 Pilot | Thu Aug 21 2014 01:42:25 | 98 | 3 | 6 | 6 | 113 | 104 | 92% |
| I-65 Exit 86 Petro | Thu Aug 21 2014 01:47:23 | 210 | 10 | 5 | 0 | 225 | 215 | 96% |
| I-65 Exit 86 Extra Lot | Thu Aug 21 2014 01:53:57 | 0 | 0 | 34 | 53 | 87 | 34 | 39% |
| I-65 Exit 91 SB Weigh Station | Thu Jul 10 2014 23:38:31 | 2 | 6 | 0 | 0 | 8 | 2 | 25% |
| I-65 Exit 91 SB Weigh Station | Thu Jul 24 2014 21:32:04 | 3 | 5 | 0 | 0 | 8 | 3 | 38% |
| I-65 Exit 105 Pilot | Wed Aug 13 2014 01:31:31 | 90 | 3 | 74 | 5 | 172 | 164 | 95% |
| I-65 Exit 105 Pilot | Thu Aug 21 2014 02:12:01 | 87 | 4 | 93 | 1 | 185 | 180 | 97% |
| I-65 Exit 116 Love's | Wed Aug 13 2014 01:46:12 | 106 | 1 | 17 | 0 | 124 | 123 | 99% |
| I-65 Exit 116 Love's | Thu Aug 21 2014 02:28:34 | 91 | 2 | 23 | 0 | 116 | 114 | 98% |
| I-65 Exit 121 Pilot | Thu Aug 21 2014 02:40:33 | 85 | 2 | 7 | 0 | 94 | 92 | 98% |

**Table 24**. Summary of Commercial Vehicle Parking Data on I-65 (Night)

| | Total Spaces Surveyed | | |
|---|---|---|---|
| | All | Used | %Used |
| State Facilities | 742 | 496 | 67% |
| Private Facilities | 3365 | 2924 | 87% |

Tables 25 and 26 present a summary of the commercial vehicle data collected at six locations on I-71 at night. Of the 488 parking spaces surveyed, 9 percent were at state-owned facilities while the remaining 91 percent were at privately owned facilities. All six locations had over a 70 percent usage rate, with four of the locations at 97 percent or higher. Once again there was a higher rate of usage at the privately owned facilities, with 95 percent of their spaces in use compared to 71 percent at state-owned locations.

**Table 25**. Summary of Commercial Vehicle Parking Data on I-71 by Site (Night)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | % Used |
| I-71 Exit 28 Pilot (1) | Wed Jul 23 2014 00:22:16 | 72 | 15 | 2 | 0 | 89 | 74 | 83% |
| I-71 Exit 28 Pilot (2) | Wed Jul 23 2014 00:27:01 | 170 | 5 | 0 | 0 | 175 | 170 | 97% |
| I-71 Exit 55 Love's | Wed Jul 23 2014 01:11:26 | 91 | 1 | 0 | 0 | 92 | 91 | 99% |
| I-71 Exit 55 Big Rig (extra) | Wed Jul 23 2014 01:16:20 | 0 | 0 | 38 | 0 | 38 | 38 | 100% |
| I-71 Exit 62 62 Truck Plaza | Wed Jul 23 2014 01:24:32 | 1 | 0 | 48 | 0 | 49 | 49 | 100% |
| I-71 Exit 75 SB Weigh Station | Wed Jul 23 2014 01:39:14 | 32 | 13 | 0 | 0 | 45 | 32 | 71% |

**Table 26**. Summary of Commercial Vehicle Parking Data on I-71 (Night)

| | Total Spaces Surveyed | | |
|---|---|---|---|
| | All | Used | % Used |
| State Facilities | 45 | 32 | 71% |
| Private Facilities | 443 | 422 | 95% |

Tables 27 and 28 summarize the data collected for commercial vehicle parking on I-75 at night. Of the 34 locations surveyed, only the weigh station on Exit 33 had fewer than 50 percent of the spaces in use. All marked spaces were used at 10 of the locations. The state-owned facilities had a much higher usage rate than observed on other interstates (87 percent). The rate of usage was 89 percent at the privately owned locations. Of the 2,723

parking spaces surveyed, 25 percent were state-owned, while the remaining 75 percent were privately owned.

**Table 27.** Summary of Commercial Vehicle Parking Data on I-75 by Site (Night)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | % Used |
| I-75 Exit 11 Pilot | Fri Aug 08 2014 00:17:43 | 53 | 3 | 5 | 0 | 61 | 58 | 95% |
| I-75 Exit 33 SB Weigh Station | Tue Jul 08 2014 21:01:09 | 8 | 42 | 0 | 0 | 50 | 8 | 16% |
| I-75 Exit 33 NB Weigh Station | Fri Aug 08 2014 00:49:44 | 29 | 24 | 0 | 0 | 53 | 29 | 55% |
| I-75 Exit 38 Shell | Tue Jul 08 2014 21:03:55 | 0 | 0 | 14 | 10 | 24 | 14 | 58% |
| I-75 Exit 41 BP | Tue Jul 08 2014 21:09:46 | 73 | 13 | 29 | 36 | 151 | 102 | 68% |
| I-75 Exit 41 BP | Fri Aug 08 2014 01:02:25 | 63 | 11 | 46 | 11 | 131 | 109 | 83% |
| I-75 Exit 49 49er Truck Plaza | Tue Jul 08 2014 21:28:14 | 17 | 0 | 6 | 15 | 38 | 23 | 61% |
| I-75 Exit 49 49er Truck Plaza | Fri Aug 08 2014 01:15:13 | 38 | 0 | 6 | 0 | 44 | 44 | 100% |
| I-75 Exit 59 Mt Vernon Truck Stop | Tue Jul 08 2014 21:40:16 | 24 | 7 | 4 | 4 | 39 | 28 | 72% |

**Table 27.** (Continued)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | % Used |
| I-75 Exit 62 Derby City Truck Stop | Tue Jul 08 2014 21:47:05 | 0 | 1 | 50 | 2 | 53 | 50 | 0.94 |
| I-75 Exit 76 Truck Center | Tue Jul 08 2014 22:04:30 | 0 | 0 | 20 | 0 | 20 | 20 | 100% |
| I-75 Exit 95 Love's | Tue Jul 08 2014 22:24:00 | 69 | 0 | 13 | 0 | 82 | 82 | 100% |
| I-75 Exit 120 Shell | Fri Jul 18 2014 00:28:40 | 23 | 2 | 0 | 0 | 25 | 23 | 92% |
| I-75 Exit 127 NB Rest Area | Thu Jul 17 2014 21:44:25 | 31 | 18 | 0 | 0 | 49 | 31 | 63% |
| I-75 Exit 127 NB Rest Area | Fri Jul 18 2014 00:19:36 | 50 | 0 | 7 | 0 | 57 | 57 | 100% |
| I75 Exit 127 NB Rest Area | Tue Aug 05 2014 01:29:09 | 48 | 0 | 13 | 0 | 61 | 61 | 100% |
| I-75 Exit 127 NB Rest Area | Wed Aug 13 2014 22:57:03 | 49 | 1 | 10 | 0 | 60 | 59 | 98% |
| I-75 Exit 129 Pilot | Fri Jul 18 2014 00:05:34 | 67 | 3 | 9 | 0 | 79 | 76 | 96% |
| I-75 Exit 129 Pilot 2 | Fri Jul 18 2014 00:09:51 | 80 | 2 | 22 | 0 | 104 | 102 | 98% |
| I-75 Exit 129 Pilot 2 | Tue Aug 05 2014 01:07:21 | 99 | 8 | 20 | 0 | 127 | 119 | 94% |
| I-75 Exit 144 Noble’s | Thu Jul 17 2014 23:48:15 | 0 | 0 | 36 | 2 | 38 | 36 | 95% |
| I-75 Exit 144 Noble’s | Thu Aug 14 2014 00:45:27 | 0 | 0 | 27 | 18 | 45 | 27 | 60% |

**Table 27.** (Continued)

| SiteID | Date | Marked | | Unmarked | | Total Spaces Surveyed | | |
|---|---|---|---|---|---|---|---|---|
| | | Used | Unused | Used | Unused | All | Used | % Used |
| I-75 Exit 144 Noble's | Tue Aug 05 2014 00:47:42 | 0 | 0 | 27 | 18 | 45 | 27 | 60% |
| I-75 Exit 171 Flying J | Thu Jul 17 2014 23:16:41 | 210 | 6 | 37 | 0 | 253 | 247 | 98% |
| I-75 Exit 171 Flying J | Thu Aug 14 2014 00:16:10 | 187 | 33 | 34 | 1 | 255 | 221 | 87% |
| I-75 Exit 175 Travel Plaza | Thu Jul 17 2014 22:55:57 | 101 | 3 | 26 | 0 | 130 | 127 | 98% |
| I-75 Exit 175 Pilot | Thu Jul 17 2014 23:02:17 | 15 | 1 | 5 | 0 | 21 | 20 | 95% |
| I-75 Exit 175 Pilot | Mon Aug 04 2014 23:37:59 | 15 | 0 | 6 | 0 | 21 | 21 | 100% |
| I-75 Exit 175 TA Travel | Thu Aug 14 2014 00:08:17 | 88 | 5 | 23 | 0 | 116 | 111 | 96% |
| I-75 Exit 177 NB Rest Area | Thu Jul 17 2014 22:25:28 | 58 | 0 | 21 | 0 | 79 | 79 | 100% |
| I-75 Exit 177 NB Rest Area | Mon Aug 04 2014 23:42:39 | 53 | 0 | 44 | 0 | 97 | 97 | 100% |
| I-75 Exit 177 SB Rest Area | Thu Jul 17 2014 22:50:21 | 74 | 0 | 9 | 0 | 83 | 83 | 100% |
| I-75 Exit 177 SB rest area | Mon Aug 04 2014 23:23:15 | 70 | 0 | 19 | 0 | 89 | 89 | 100% |
| I-75 Exit 181 TA Travel | Thu Jul 17 2014 22:33:14 | 132 | 1 | 10 | 0 | 143 | 142 | 99% |

**Table 28**. Summary of Commercial Vehicle Parking Data on I-75 (Night)

| | Total Spaces Surveyed | | |
|---|---|---|---|
| | **All** | **Used** | **%Used** |
| State Facilities | 678 | 593 | 87% |
| Private Facilities | 2045 | 1829 | 89% |

Data collectors made the following observations of surveying parking facilities:

- Private facilities were more popular because of their location near restaurants, showers, fuel, and restrooms; state facilities tended to be isolated and only had vending machines.
- There were 20 reserved spaces at the Travel Plaza at Exit 175 on I-75.
- The Exit 86 Extra Lot on I-65 was very unorganized and unmarked.
- The Love's on I-65 Exit 58 was completely full at night, with trucks searching for parking.
- The Big Rig on I-71 at Exit 55 had an extra gravel lot and the facility was full. (Over 15 trucks on ramps).
- The BP at Exit 41 on I-75 had an extended lot.
- The 49er Truck Plaza at Exit 49 on I-75 had 10 trucks on the ramp at night.
- The Derby City Truck Stop at Exit 62 on I-75 was extremely busy and chaotic at night.
- The Love's at Exit 95 on I-75 was completely full at night, with additional trucks looking for parking.
- Exit 144 on I-75 had large holes throughout the lot.
- The Rest Area at Exit 177 on I-75 was overflowing at night. Trucks were parking at entrances, exits, and behind parked vehicles.
- The TA Travel at Exit 181 on I-75 was completely full at night with trucks leaving the lot.

# 6.0 SUMMARY AND FINDINGS

The following conclusions are based on data collection and on the literature review of truck parking research. The focus of the first list is on truck parking demand and safety.

- Truck volumes will continue to increase as a percentage of total traffic. This will likely translate into increased demand for truck parking.
- Truck crashes are generally more severe than crashes involving only passenger vehicles. Therefore, countermeasures to reduce crashes involving trucks can lead to a greater reduction in fatalities and severe injuries than countermeasures that target only personal vehicles.
- The MAP-21 Truck Parking Program was included as an eligible activity under the Discretionary Program. That program could be funded with HSIP, STP, and NHPP funds.
- A survey of highway maintenance engineers indicated that ITS-related applications were favored as a tool to inform truck drivers of parking space availability.
- A positive relationship exists between rest area spacing (> 30 miles) and fatigue-related single-vehicle truck crashes.
- A direct relationship exists between the percentage of full public rest area capacity and downstream nighttime truck crashes.
- SmartPark, a USDOT demo project to test technology for real-time truck parking information, was found to be accurate but suffered from equipment reliability issues.
- The naturalistic study by Virginal Tech found that drivers tended to have less sleep before critical incidents.
- The Virginia Tech study also showed that subject drivers received an average of 6.28 hours of sleep when 2003 HOS regulations were in effect (11 hours driving in 14 consecutive hour period).

The primary findings from crash analysis and the truck parking usage surveys were as follows:

- Of 848 crashes (2010–2013 time period) which matched criteria of being either shoulder-related or fatigue-related, review of collision reports indicated 239 crashes were related to commercial truck parking.
- Two-thirds of all crashes included in the analysis occurred on I-75, I-65, I-64, and I-71. Others routes with five percent or more of the total crashes were I-24, Edward Breathitt (Pennyrile Parkway), and the Western Kentucky Parkway.
- A total of 4,715 parking spaces were surveyed or counted during daytime observations and 7,844 spaces were counted during nighttime observations.
- Of the 4,715 parking spaces surveyed during the day, 2,143 were in use (45 percent).
- Of 7,844 parking spaces surveyed at night, 6,803 were in use, (87 percent).
- Usage ranged from a low of 32 percent on I-24 during daytime observations to a high of 93 percent on I-71 during nighttime observations.
- Crash cluster locations appeared to be directly related to proximity and usage rate of parking facilities.

# 7.0 RECOMMENDATIONS

To address truck parking demand and to improve safety, the following are general recommendations for actions, improvements, or countermeasures that could alleviate the current problems.

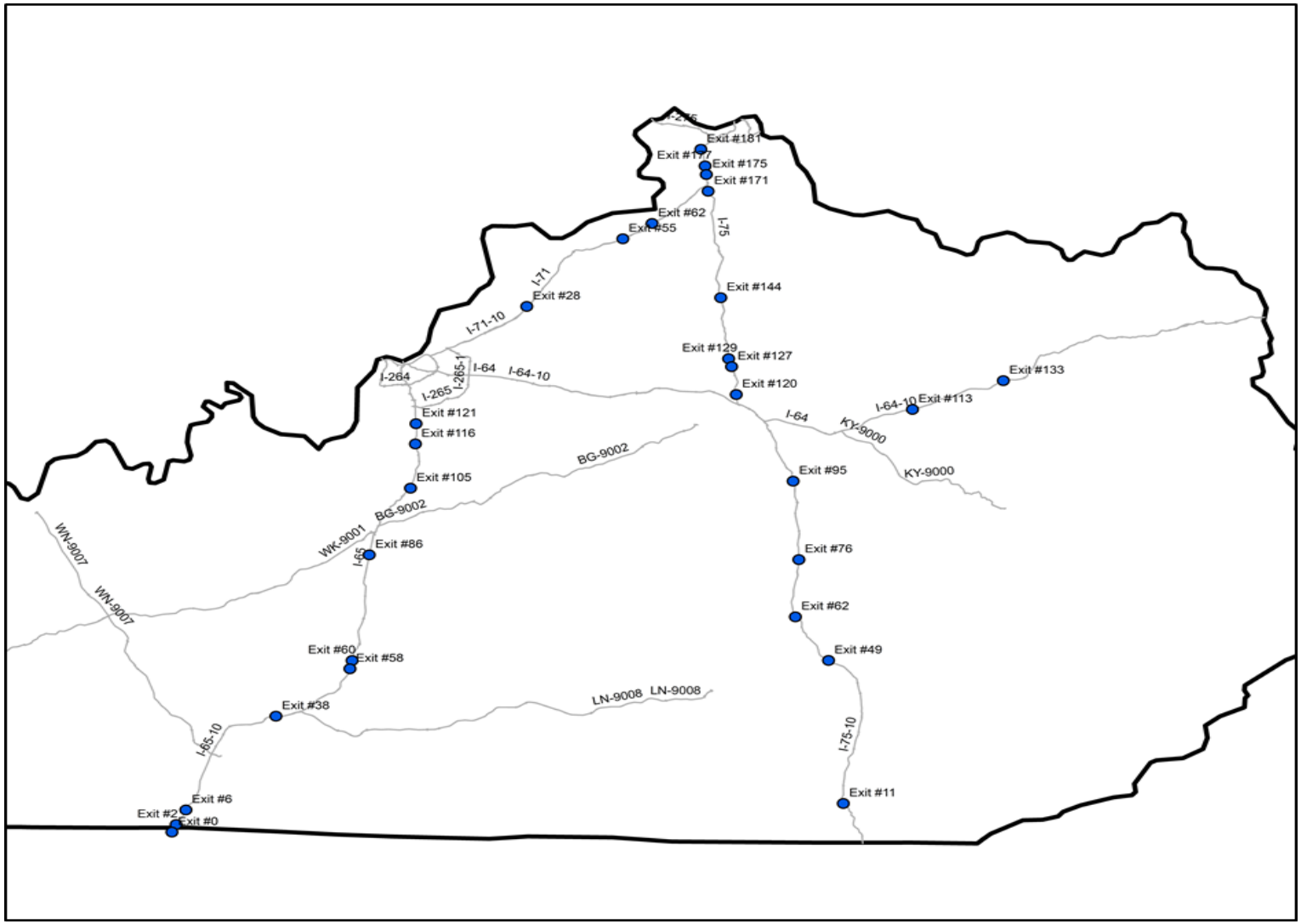
- Use public and private parking areas to increase capacity
- Use ITS to improve use of parking facilities
- Provide real-time information that informs truck drivers of parking facility locations with available spaces
- Combine GPS tracking with electronic communication to notify truckers of nearest parking
- Monitor parking usage rates to determine future needs

Observations at interstate parking sites in Kentucky indicated locations that would benefit from increasing the number of parking spaces, including locations on I-64, I-65, I-71, and I-75. Any site observed to have 90 percent or more available spaces used during the surveys would be a candidate for an expansion of existing parking spaces or for development of a new facility to provide more parking. Those locations surveyed with 90 percent or more usage are listed here:

- I-64 at Exits 113 and 133
- I-65 at Exits 0, 2, 6, 38, 58, 60, 86, 105, 116, and 121
- I-71 at Exits 28, 55, and 62
- I-75 at Exits 11, 49, 62, 76, 95, 120, 127, 129, 144, 171, 175, 177, and 181

Strategic locations for additional parking could be identified at the sites listed above. These sites are mapped in Figure 5, with exits labeled. This could provide the greatest benefit when considering proximity of parking facilities at or near capacity and when considering expansion or development of new facitilies. Specifically, there were two groups of exits on I-75 where usage rates were 90 percent or higher (Exits 120, 127, and 129; and Exits 171, 175, and 177), which would benefit from increased parking capacity. Exit 58 on I-65, exit 55 on I-71, and exits 49, 177, and 181 on I-75 were overfilled. Trucks had to search for parking or park on the shoulder.

**Figure 5.** Location of Surveyed Facilities with Usage Rates of 90 Percent or Higher



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# APPENDIX A
# Analysis of Crash Data (Commercial Vehicle Parked on Shoulder) and Parking Facility Proximity

**Appendix A.** Analysis of Crash Data (Commercial Vehicle Parked on Shoulder) and Parking Facility Proximity

| Route | Crash Milepoint | Nearest Parking Facility | Day Usage Rate | Night Usage Rate |
|---|---|---|---|---|
| 008-I -0071 | 73.504 | Exit 75 Weigh Station | 11% | 71% |
| 008-I -0071 | 72.226 | Exit 75 Weigh Station | 11% | 71% |
| 008-I -0075 | 178.348 | Exit 177 Rest Area | 42% | 100% |
| 015-I -0065 | 114.516 | Exit 116 Love's | 46% | 99% |
| 021-I -0071 | 39.645 | Exit 28 Pilot | 24% | 97% |
| 021-I -0071 | 51.768 | Exit 55 Love's | 79% | 99% |
| 034-I -0075 | 104.455 | Exit 95 Love's | N/A | 100% |
| 037-I -0064 | 49.29 | Exit 43 Flying J | 90% | N/A |
| 039-I -0071 | 65.703 | Exit 62 Truck Stop | 53% | 100% |
| 039-I -0071 | 58.003 | Exit 55 Love's | 79% | 99% |
| 039-I -0071 | 63.531 | Exit 62 Truck Stop | 53% | 100% |
| 039-I -0071 | 54.864 | Exit 55 Love's | 79% | 100% |
| 039-I -0071 | 69.716 | Exit 75 Weigh Station | 11% | 71% |
| 039-I -0071 | 54.138 | Exit 55 Love's | 79% | 100% |
| 039-I -0071 | 67.483 | Exit 62 Truck Stop | 53% | 100% |
| 039-I -0071 | 0.002 | Exit 28 Pilot | 24% | 97% |
| 041-I -0075 | 158.199 | Exit 168 SB Weigh Station | 7% | N/A |
| 047-I -0065 | 95.791 | Exit 91 SB Weigh Station | N/A | 38% |
| 050-I -0065 | 70.502 | Exit 81 Pilot | 29% | 81% |
| 050-I -0065 | 60.587 | Exit 60 NB Rest Area | 11% | 92% |
| 050-I -0065 | 65 | Exit 60 NB Rest Area | 11% | 92% |
| 050-I -0065 | 56.426 | Exit 58 Love's | 51% | 98% |
| 056-I -0064 | 16.427 | Exit 28 Pilot | 91% | N/A |
| 056-I -0064 | 17.433 | Exit 28 Pilot | 91% | N/A |
| 059-I -0075 | 168.561 | Exit 168 SB Weigh Station | 7% | N/A |
| 059-I -0075 | 168.561 | Exit 168 SB Weigh Station | 7% | N/A |
| 062-I -0065 | 78 | Exit 76 Truck Center | N/A | 100% |
| 076-I -0075 | 73.411 | Exit 76 Truck Center | N/A | 100% |
| 093-I -0071 | 13.241 | Exit 28 Pilot | 24% | 97% |
| 102-I -0075 | 58.019 | Exit 59 Truck Stop | N/A | 72% |
| 103-I -0064 | 132.998 | Exit 133 Eagle Travel Plaza | 67% | 93% |
| 105-I -0064 | 68.421 | Exit 43 Flying J | 90% | N/A |
| 106-I -0064 | 30.155 | Exit 29 Rest Area | 48% | N/A |
| 106-I -0064 | 42.914 | Exit 43 Flying J | 90% | N/A |
| 107-I -0065 | 7.853 | Exit 6 Pilot | 51% | 100% |

# APPENDIX B
# Analysis of Crash Cluster Data and Parking Facility Proximity

**Appendix B.** Analysis of Crash Cluster Data and Parking Facility Proximity

| **County** | **Route** | **Milepoint Crash Cluster (1-mile sections)** | **Count** | **Nearest Parking Facility** | **Day Usage** | **Night Usage** |
|---|---|---|---|---|---|---|
| Boone | I-75 | 176.00-176.99 | 5 | Exit 177 SB Rest Area | 42% | 100% |
| Boone | I-75 | 177.00-177.99 | 4 | Exit 177 SB Rest Area | 42% | 100% |
| Simpson | I-65 | 0.00-0.99 | 4 | Exit 0 Welcome Station | 65% | 92% |
| Montgomery | I-64 | 112.00-112.99 | 4 | Exit 113 Pilot | 46% | 100% |
| Hardin | I-65 | 89.00-89.99 | 3 | Exit 91 Weigh Station | N/A | 38% |
| Gallatin | I-71 | 69.00-69.99 | 3 | Exit 75 Weigh Station | 11% | 71% |
| Gallatin | I-71 | 54.00-54.99 | 3 | Exit 55 Love's | 79% | 99% |
| Jefferson | I-65 | 125.00-125.99 | 3 | Exit 121 Pilot | 91% | 98% |
| Jefferson | I-65 | 130.00-130.99 | 3 | Exit 121 Pilot | 91% | 98% |