UTAH INTERSTATE 15 TRUCK PARKING STUDY

(DRAFT August 7, 2012)

udot.utah.gov

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Utah's I-15 Truck Parking study was funded by a Truck Parking Initiative grant from the United States Department of Transportation Federal Highway Administration through Section 1305 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) Section 1305, Truck Parking Facilities. Funds were requested under Title 23 U.S.C., Section 120 (b). The grant was received by the Utah Department of Transportation, Systems Planning and Programming Planning Division.

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Sources:

1. Study of Adequacy of Commercial Truck Parking Facilities – Technical Report, Report Number FHWA-RD-01-158; Report Date: March 2002 Sponsoring Agency: Federal Highway Administration, Office of Safety Research and Development (HRDS)

2. Freight Analysis Framework (FAF^3) – Regional Database for 2007, 2010 Provisional Annual Data, and forecasts through 2040. Website: www.ops.fhwa.gov/freight/freight_analysis/faf/

3. UDOT's Statewide Rest Area Plan (April 2007)

Executive Summary

In August 2010, the Utah Department of Transportation (UDOT) received a grant for the Utah Interstate 15 Truck Parking Study, which was funded by the Truck Parking Initiative from the United States Department of Transportation (U.S. DOT) Federal Highway Administration (FHWA) through the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) Section 1305, Truck Parking Facilities. The purpose of the grant was to complete a truck parking study along the approximately 400 mile I-15 corridor in Utah.

The study included the formation of a project management committee that guided the study, which included the following work:

1. Reviewed previous truck parking studies including the National Commercial Motor Vehicle (CMV) Drivers Survey;

2. Reviewed Utah safety data centered on large truck crashes;

3. Conducted Utah's own survey of CMV drivers along the I-15 corridor;

4. Performed an inventory of truck parking on the interstates in Utah;

5. Identified current and future truck parking demand using Freight Analysis Framework version 3;

6. Conducted focus groups with commercial truck stop facility managers and CMV drivers for reaction to the survey results, their perception of truck parking along the I-15 corridor, as well as to explore possible truck parking solutions;

7. Conducted a limited warehouse survey for truck parking;

8. Worked with private property owners for potential public/private partnerships for additional truck parking locations;

9. Developed and distributed a Utah truck parking map;

10. In process of developing and implemented a Utah truck parking Smartphone application; and,

11. Created a website that provided and housed the study information along with interactive maps, study presentations, final written report, and other study information.

Utah's I-15 Truck Parking Study sought to determine the answers to three questions:

- Does the I-15 corridor have a truck parking problem
- What do CMV drivers think about truck parking along the I-15 corridor and in Utah
- If there is a truck parking problem, what can UDOT do to help alleviate the issues

In August 2010, InterPlan, a transportation planning and engineering firm, was hired by UDOT and a local Project Management Committee was formed to guide the direction of the I-15 Truck Parking Study. Utah looked to the Truck Parking National Survey (March 2002) as a model, but modified it as necessary to capture the essence of local issues related to long-term truck parking along the I-15 corridor. Approximately 433 surveys were completed by CMV drivers at commercial truck stops, representing a statistically valid survey size, asking questions about their experience with long-term truck parking.

Utah Survey Findings

The Utah survey results were very similar to the National survey. Some highlights follow. The full survey results are part of the Appendix of this document.

Figure 1: Survey Responses

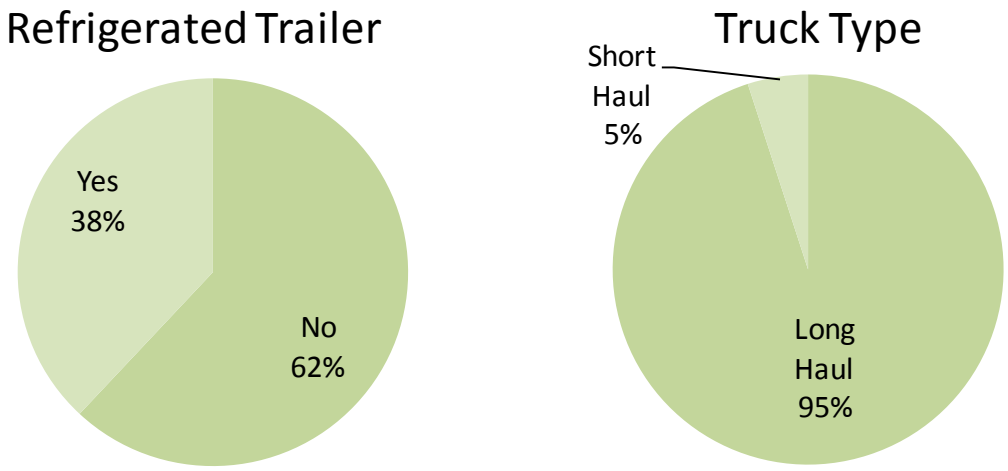
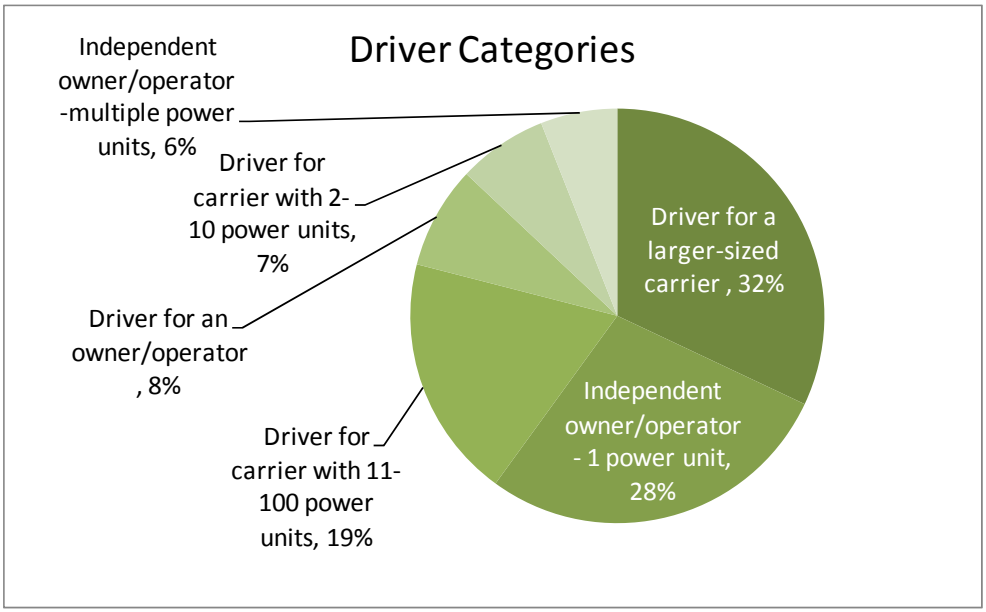
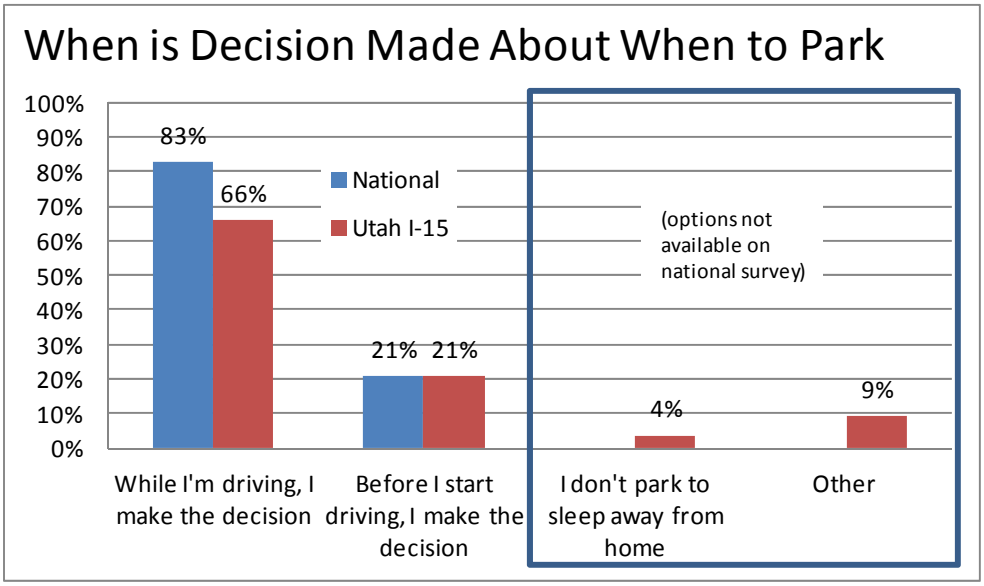


Figure 2: Which One of the Following Driver Categories Best Describes You?



Comparisons between the Utah survey and the National survey can be made when the questions had similar wording.

Figure 3: Parking and Preferences of Commercial Motor Vehicle Drivers



1. 97 percent decide themselves where to park and 66 percent of the 97 percent make that decision while they are driving

2. 82 percent of commercial vehicle drivers say that ramps and shoulders are sometimes used for parking because there are no empty spaces at commercial truck stops or public rest areas; 72 percent say it is because there is no nearby parking

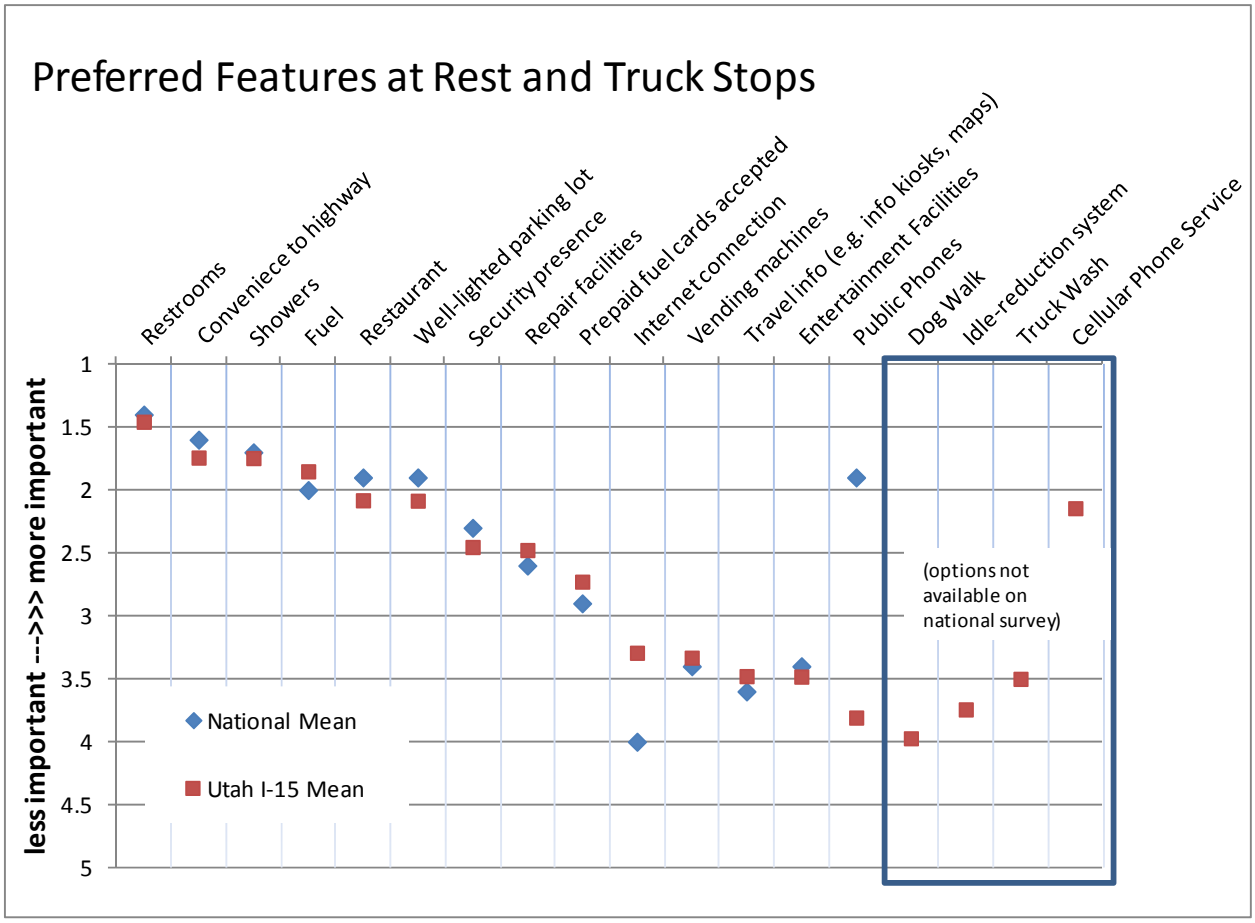
facility; 33 percent because of an unawareness of the availability of parking in nearby commercial truck stops or public rest areas

3. Restrooms, convenience to highway, showers and fuel are the top four features that are important when a driver parks at a commercial truck stop or public rest area

4. Approximately 50 percent of the time, drivers encounter available parking with the features they need

5. Drivers prefer a commercial truck stop for long-term rest (more than two hours) and to eat a meal

Figure 4: Utah's I-15 Commercial Motor Vehicle Driver Preferences



Parking Solutions Identified by CMV Drivers

- 69 percent indicated that knowing the location of parking facilities along I-15 would help them to plan stops for long-term rest; 51 percent indicated that knowing the number of truck parking spaces available at upcoming parking facilities would help; 56 percent want to know what features are available at upcoming parking facilities (food, fuel, showers, etc.)

- 84 percent of commercial vehicle drivers have a CB radio available in their truck; 82 percent a mobile phone

- The top three ways a driver would like to receive information about availability of long-term parking is a variable message sign (VMS), a paper map of truck parking locations or through highway advisory radio (HAR)

Parking Improvements Identified by CMV Drivers

The top three identified truck parking improvements to I-15 are:

- Build more commercial truck stop parking spaces
- Build more public rest area parking spaces
- Stop enforcement from waking drivers

Additional Efforts and Results

In addition to the spring 2011 survey, focus groups were conducted with long-haul, CMV drivers and facility managers of commercial truck stops along the I-15 corridor to identify parking solutions that will most effectively solve the problem of long-haul truck parking. With the long-haul, CMV drivers, proposed solutions were presented for input as well as to determine drivers' willingness to use or adopt a solution that will help CMV drivers locate truck parking. Additionally, efforts were made to determine key elements or barriers to communicating with drivers about truck parking availability. The truck stop facility manager focus group effort was aimed at better understanding the decision-making inputs necessary to expand truck parking at commercial truck stops.

A Utah Interstate Truck Parking map was developed as a result of the on-site survey results as well as the focus group discussions with the long-haul, CMV drivers. The map shows locations of public rest areas and commercial truck stops along with some amenities for locations along the I-15 corridor and other Interstates in Utah such as I-70, I-80, I-84, and I-215.

A warehouse survey was completed at selected locations along the I-15 corridor to determine if locations with excess parking capacity would be willing to allow the space to be used for long-term truck parking (overnight). Most respondents indicated that they were unwilling to use excess parking capacity for long-term parking because of security and space issues.

Utah's Statewide Rest Area Plan (April 2007) is part of the solution to increasing long-term truck parking along the I-15 corridor. UDOT strives to provide useful and efficient highway rest facilities that allow for short- and long-term rest for drowsy drivers as well as CMV drivers needing to comply with Federal hours-of-service regulations. The Rest Area Plan provides specific recommendations for increasing long-term truck parking along the I-15 corridor including location, cost and possible funding sources.

Introduction to Utah I-15 Truck Parking Study

In August 2010, InterPlan, a transportation planning and engineering firm, was hired by the Utah Department of Transportation (UDOT) and a local Project Management Committee was formed to guide the direction of the Utah I-15 Truck Parking Study.

Congressional Action to Understand Truck Parking Needs on the National Highway System

In June 1998, Congress passed the transportation bill entitled the Transportation Equity Act for the 21st Century (TEA-21) which provided for a truck parking study. Specifically, in Section 4027 of TEA-21, Congress directed that an assessment be completed to determine the location and quantity of parking spaces at public rest areas and commercial truck stops along the National Highway System that could be used by motor carriers to comply with Federal hours-of-service rules. The national survey collected more than 2,000 surveys from on-site efforts in seven states and mail-in efforts in 27 states. However, there were no on-site or mail-in locations in Utah. The National study, titled the Study of Adequacy of Commercial Truck Parking Facilities, was published in March of 2002 and gave Congress information about Commercial Motor Vehicle (CMV) driver parking needs and the adequacy of parking facilities.

On August 10, 2005, Congress passed the next transportation bill entitled Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Section 1305 of SAFETEA-LU created the Truck Parking Facilities pilot program that provides funding to address the shortage of long-term parking for CMVs on the National Highway System.

The Utah survey questions focused on:

- How CMV drivers plan for and address their parking needs
- How CMV drivers select when, where, and at which facilities they park
- What CMV drivers think of the adequacy of current parking facilities

Utah's Statewide Rest Area Plan (April 2007) provided a plan that established future priorities, allocated resources, and developed policies related to public rest areas, welcome centers, and view areas. UDOT's goal is to provide useful and efficient highway rest facilities that allow for short- and long-term rest for drowsy drivers as well as CMV drivers needing to comply with Federal hours-of-service regulations.

In February 2008, UDOT submitted an application to the United States Department of Transportation's (U.S. DOT) Federal Highway Administration (FHWA) Truck Parking Initiative to conduct a truck parking study along I-15 corridor in Utah. The FHWA awarded UDOT $545,000 in August 2010 to begin the study.

Utah's I-15 Truck Parking Study

InterPlan was hired to assist UDOT's Railroad and Freight Planner and Project Manager, Daniel B. Kuhn, to complete the Utah I-15 Truck Parking Study. A Project Management Committee was formed in September of 2010. The selection of the Project Management Committee members was based primarily on interest and perspective in freight issues in the state of Utah. Project Management Committee members consisted of representatives from the Utah Trucking Association, Utah Highway Safety Office, FHWA Utah Division, UDOT's Planning Group, Motor Carrier Division and Traffic Operations Center.

Table 1: Project Management Committee Members

Name	Affiliation	Title
Daniel Kuhn, Project Manager	UDOT Planning	Railroad & Freight Planner
David Beach	Utah Highway Safety Office	Director
Rob Clayton	UDOT Traffic Operations Center	Director
Kelly Lund	Federal Highway Administration	Transportation Specialist
Chad Sheppick	Utah Motor Carrier Division	Director
Terry Smith	Utah Trucking Association	Director of Safety
Walt Steinvorth	UDOT Planning	Planning Manager

One function of the Project Management Committee was to provide input and feedback to the Consultant Team on the design of Utah's truck parking survey along the I-15 corridor. The Project Management Committee started meeting bimonthly in October 2010 and continued through March 2012, to monitor the study's progress and provide needed guidance.

Defining the Need for Truck Parking

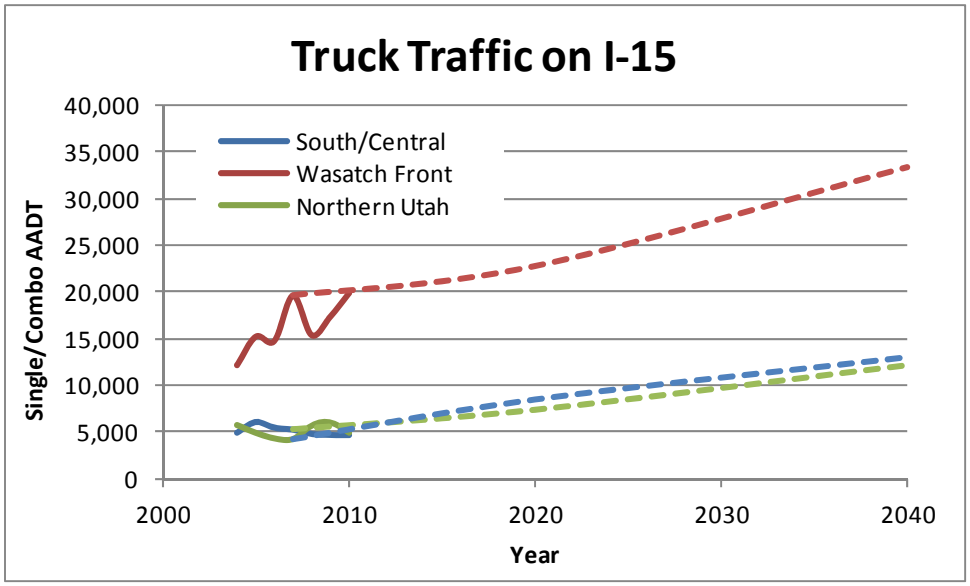
I-15 begins in San Diego, California and ends in Montana north of Great Falls at the Canadian border and is an important part of the National Highway System for commerce. From Las Vegas to the Canadian border, I-15 is part of the CANAMEX Trade Corridor, a high priority corridor, which was designated by Congress in the 1995 National Highway Systems Designation Act. I-15 is the primary north/south transportation corridor through most of Utah traveling through rural and urban areas from St. George to the Wasatch Front and proceeding north to the Idaho border. However, while I-15 is a north/south corridor for

Utah travel, it is very much an east/west corridor for truck traffic south of I-80 en route to Southern California.

Average Annual Truck Traffic on the I-15 Corridor

Three Segments (defined in next chapter) were analyzed for past truck traffic. A weighted average was calculated from the UDOT Traffic on Utah Highways data for combo and single trucks on the I-15 corridor. Projections were also based on this data. It is anticipated that Average Annual Daily Traffic (AADT) will increase during the next thirty years.

Figure 5: Historical and Projected AADT Trucks on I-15



Crashes Involving Heavy Trucks along Utah's I-15 Corridor

Transportation safety is a key component of the transportation system. Top priority is usually given to funding roadway improvements that will reduce accidents and to correct hazardous situations.

Below is a summary of crashes along the I-15 corridor in Utah from 2006 through 2010 for trucks classified by the U.S. DOT FHWA Class 8 and above. A Class 8 truck has a gross vehicle weight of 33,000 pounds and is usually characterized as a tractor hauling a trailer.

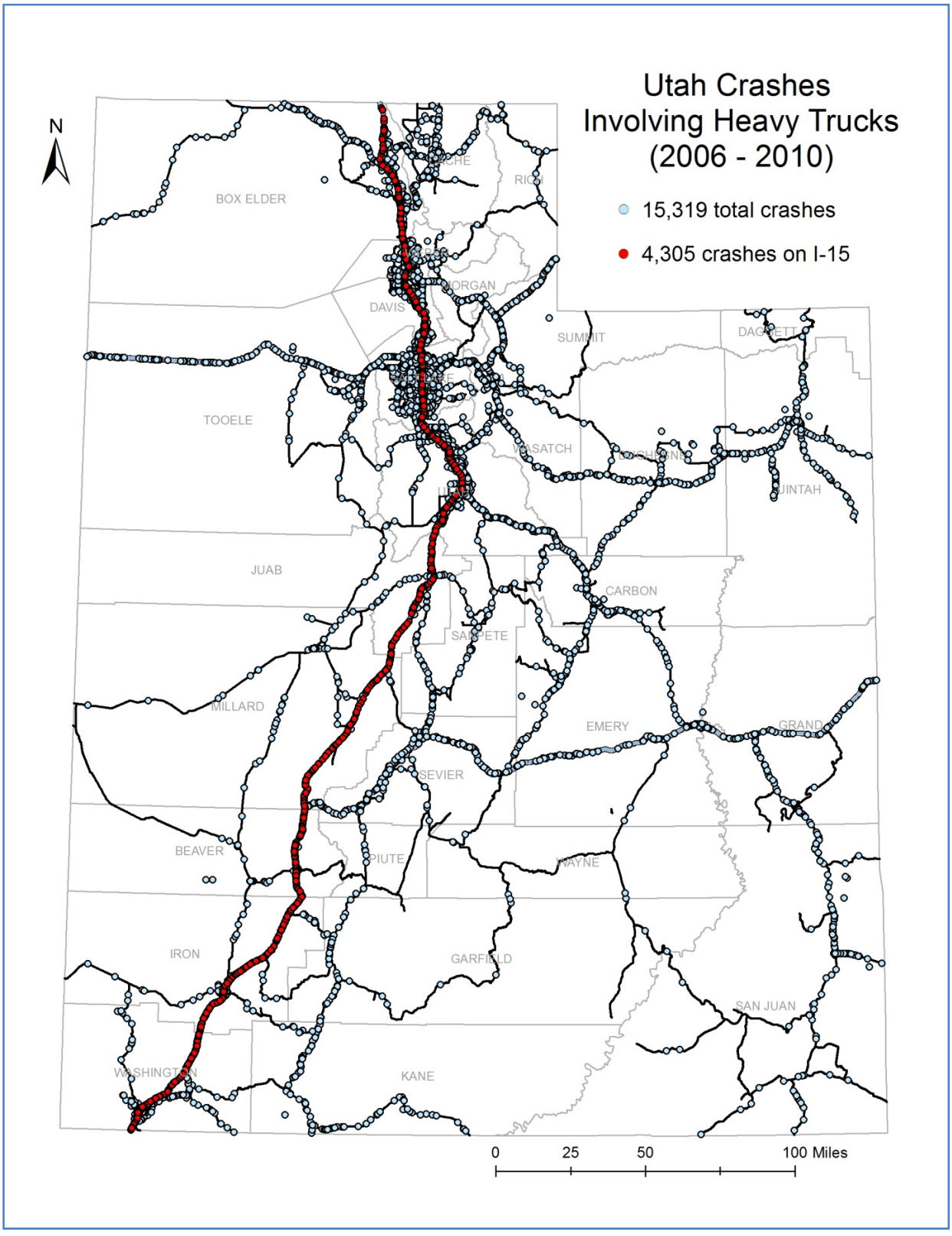
1. While nine percent of all crashes involved a truck, trucks represent 12 percent of all vehicle miles traveled (VMT) on Utah state roads, including I-15

2. Truck crashes on I-15 involved licensed drivers from all 50 states, the District of Columbia, and 7 Canadian Provinces

3. The statewide average truck crash rate is 11.6 crashes per 100 million VMT on state routes. This means that for every 100 million miles traveled on state roads in Utah, there are 11.6 truck crashes

4. The truck crash rate on I-15 in Utah is 13.6. The rate of I-15 is slightly higher than the rate statewide

Figure 6: Utah Crashes Involving Heavy Trucks (2006-2010)

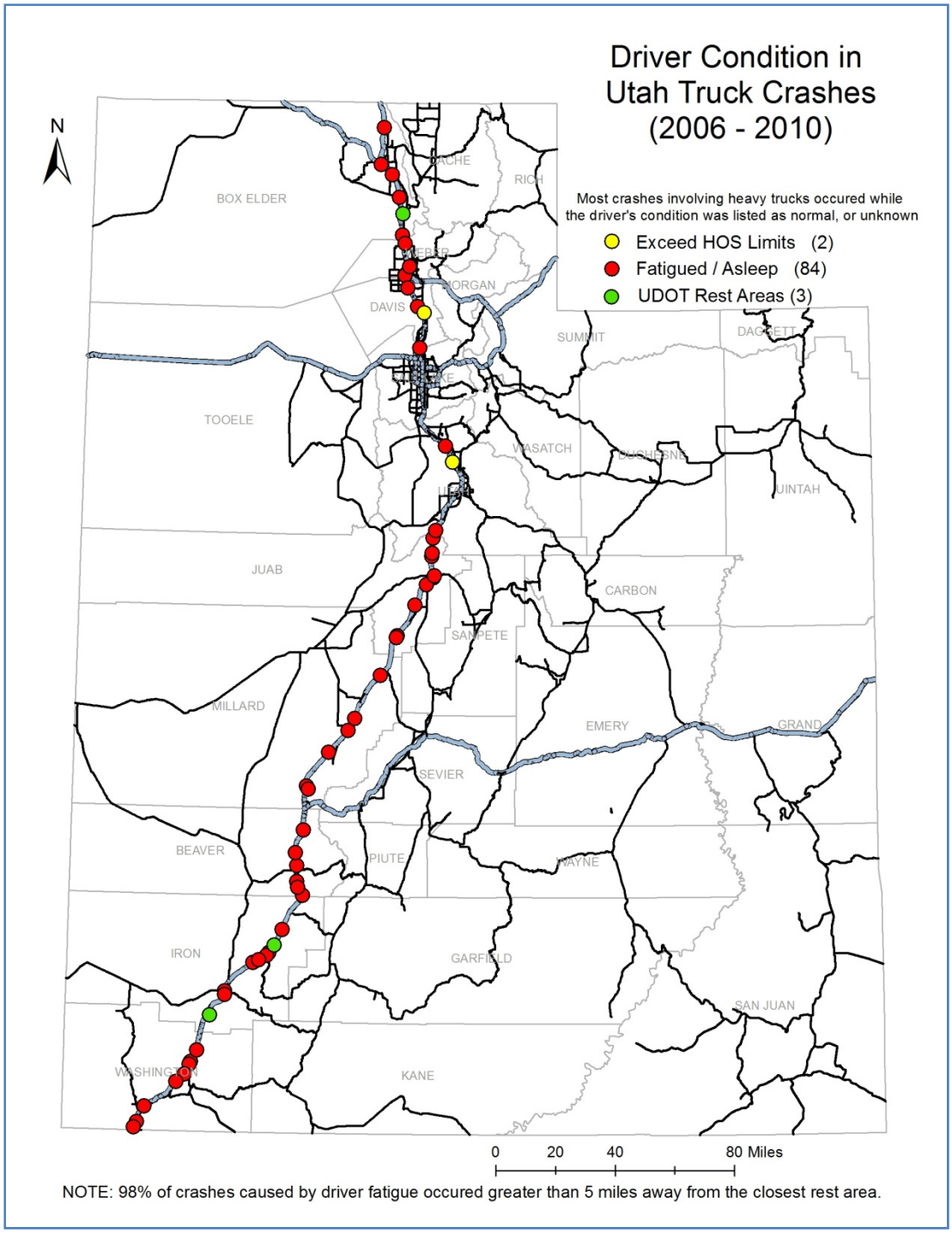


Crashes caused by driver fatigue:

- Between 2006 and 2010 84 crashes involving heavy trucks occurred while the driver's condition was listed as fatigued or asleep

- Two crashes occurred when drivers had exceeded the hours-of-service restrictions

Figure 7: Driver Condition in Utah Truck Crashes on I-15



Identifying the Supply

To prepare for surveying I-15 CMV drivers, an analysis of the parking supply along the corridor was developed. Commercial truck stops are dynamic businesses with a variety of facilities and amenities. Thus, a range of truck parking supply figures was identified.

Supply Methodology

An inventory of known commercial truck stops, public rest areas, and ports-of-entry was completed along the Utah I-15 corridor in May 2011. This inventory was then compared to six commercial truck stop directories/guides. Three included information for all long-term truck parking while the other three included information only for that particular company – Love's Travel Stops, Pilot Flying J Travel Centers, and Travel Centers of America. The public rest areas inventory was compared to the Utah Statewide Rest Area Plan. The port-of-entry inventory was developed through calls to the individual ports-of-entry for confirmation of the number of spaces available for long-term truck parking that did not interfere with port operations. The map below shows the location of all public rest areas and commercial truck stops along the I-15 corridor as of March 2012.

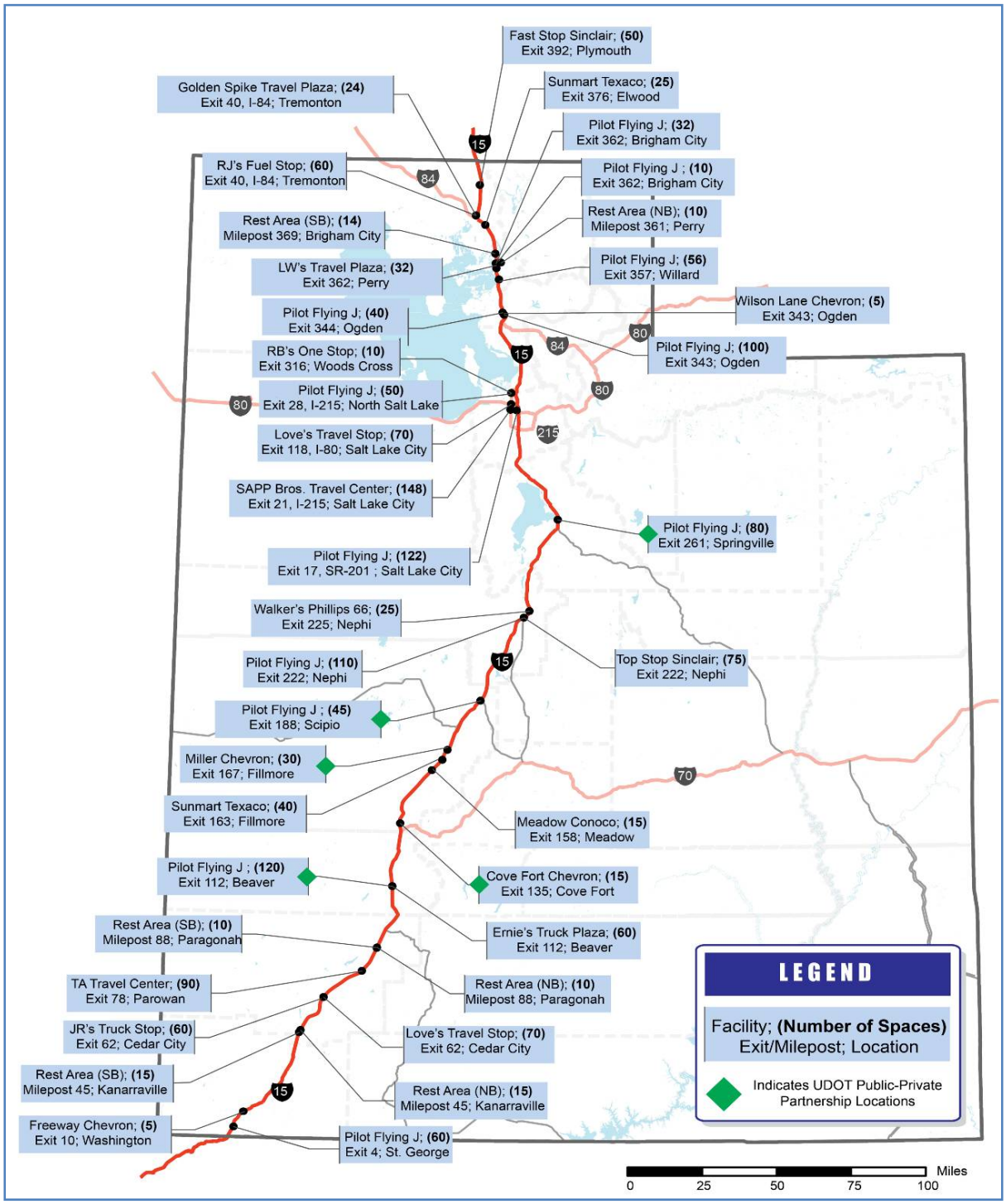
Using the base inventory developed in 2007 and updated to 2012, the I-15 corridor was divided into three segments from the Arizona/Utah border to the Utah/Idaho border as follows:

- South/Central Utah Segment – Washington, Iron, Beaver, Millard and Juab counties
- Wasatch Front Segment – Utah, Salt Lake, Davis and Weber counties
- Northern Utah Segment – Box Elder County

These areas are separated for their rural or urban development types. Because of variables in long-term truck parking spaces, a range was defined for each segment to be more accurate in the base assumptions. For instance, CMV drivers prefer not to park at ports-of-entry unless it is absolutely necessary. Further, sometimes commercial truck stops close or

new ones are constructed, adding or subtracting available truck parking spaces. Additionally, public rest areas can expand to include more long-term truck parking spaces.

Figure 8: Public Rest Areas and Commercial Truck Stops on Utah's I-15 (April 2012)



South/Central Utah Segment (240 miles)

The South/Central Utah Segment is mostly rural except for the St. George area. There are 16 commercial truck stops with approximately 900 long-term truck parking spaces, four public rest areas with 50 long-term truck parking spaces and two ports-of-entry with approximately 108 long-term truck parking spaces. The South/Central segment total on I-15 is 1,058 truck parking spaces.

Low Range: Total spaces available 912

- Subtracted 38 spaces for closing truck stop (average number of long-term truck parking spaces located in a commercial truck stop for this segment)
- Subtracted 108 ports-of-entry spaces
- Total subtracted 146 (14 percent)

High Range: Total spaces available 1,186

- Added 38 spaces for new truck stop (average number of long-term truck parking spaces located in a commercial truck stop for this segment)
- Added 90 spaces for vacant truck stop (Sunshine)
- Total added 128 (12 percent)

Wasatch Front Segment (110 miles)

The Wasatch Front Segment is located in the urbanized area along I-15. There are nine commercial truck stops with approximately 596 long-term truck parking spaces, one fast-food restaurant with approximately 10 long-term truck parking spaces, one retail location with approximately 30 truck long-term parking spaces, and two UDOT locations with 20 long-term truck parking spaces for a total of 656. No public rest areas or ports-of-entry are located within this segment.

Low Range: Total spaces available 590

- Subtracted 66 spaces for closing truck stop (average number of long-term truck parking spaces located in a commercial truck stop for this segment)
- Total subtracted 66 (10 percent)

High Range: Total spaces available 788

- Added 66 spaces for new truck stop (average number of long-term truck parking spaces located in a commercial truck stop for this segment)
- Added 66 spaces for vacant truck stop (Payson Pilot Flying J)
- Total added 132 (20 percent)

Northern Utah Segment (50 miles)

The Northern Utah Segment is mostly rural and is located in Box Elder County. There are six commercial truck stops with approximately 197 long-term truck parking spaces, two public rest areas with approximately 24 long-term truck parking spaces and two ports-of-entry with approximately 12 long-term truck parking spaces for a total of 233.

Low Range: Total spaces available 188

- Subtracted 33 spaces for closing truck stop (average number of long-term truck parking spaces located in a commercial truck stop for this segment)
- Subtracted 12 ports-of-entry spaces
- Total subtracted 45 (19 percent)

High Range: Total spaces available 266

- Added 33 spaces for new truck stop (average number of long-term truck parking spaces located in a commercial truck stop for this segment)
- Total added 33 (14 percent)

Supply Summary

There are many places where trucks can be found parking in addition to commercial truck stops, public rest areas, ports-of-entry, and closed commercial truck stops. They may include, but are not limited to, on- and off-ramps, warehouses, truck terminals, big-box retail/wholesale parking lots, mall parking lots, vacant parking lots, park and ride lots and local streets. If truck parking spaces are not available to CMV drivers, then drivers will park wherever they can to obtain the federally mandated rest.

Identifying the Demand

Comparing the supply to the demand provides an analysis tool for suggesting next steps. The United States Department of Transportation Federal Highway Administration Freight Analysis Framework version 3 (FAF3) data was utilized to quantify the Utah need for truck parking.

Demand Methodology

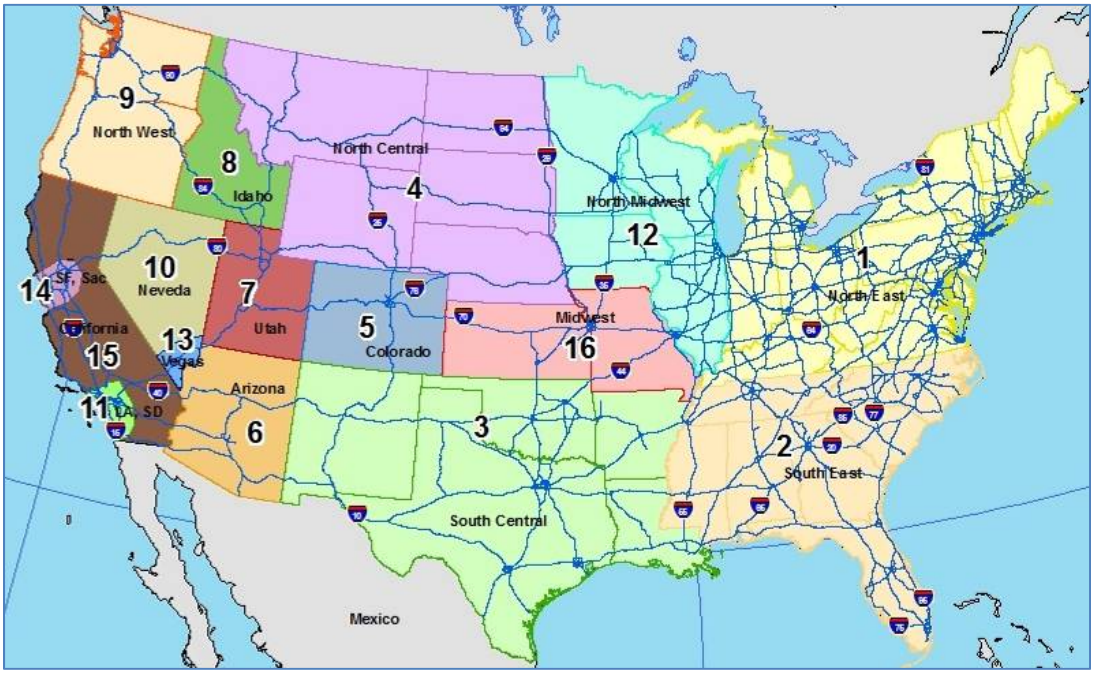
The national truck parking study completed for the FHWA, Study of Adequacy of Commercial Truck Parking Facilities (March 2002), developed a model to estimate the demand for commercial truck parking on highway segments. This model is based on the theory that demand for parking is better explained by hours driving than by attributes of commercial truck stops and public rest areas.

I-15 Corridor Truck Traffic

Long-haul Truck Traffic

As part of the study, 16 national freight districts were established for use in combination with FAF3 data. FAF3 data provides freight movement information for states and major metropolitan areas by mode of transportation for 2007 and forecasts through 2040. Figure 9 shows the 16 freight districts that were established for the I-15 corridor parking demand analysis.

Figure 9: Freight Districts



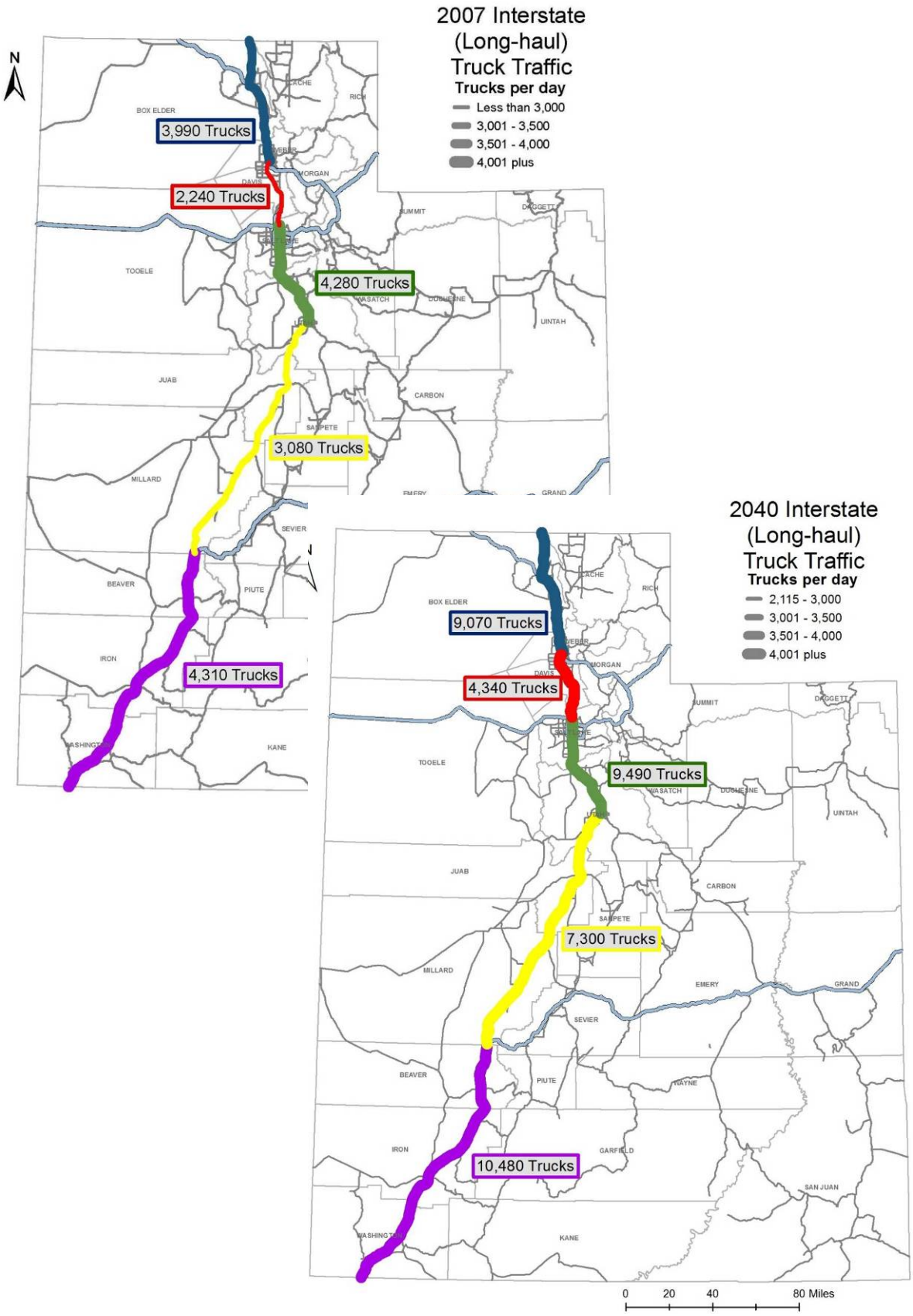
The district-to-district truck flows were routed on I-15 using the shortest path between districts. These flows were then adjusted using origin and destination data from the Utah I-15 Truck Parking Survey so that the 2007 flows matched the reported combo truck traffic at the Utah borders. These resulting district-to-district truck flows represent an approximation of the interstate truck traffic on I-15. Figure 10 show the estimated existing and future long-haul (interstate) truck traffic on I-15.

In order to estimate demand, I-15 was divided into five segments: Segment 1 is from the Idaho/Utah border to I-84 in Weber County; Segment 2 is from I-84 to I-80 in Salt Lake City; Segment 3 is from I-80 to U.S. 6 in Spanish Fork; Segment 4 is from U.S. 6 to I-70 in Millard County; Segment 5 is from I-70 to the Utah/Arizona border.

Table 2: 2007, 2040 Long-Haul Interstate Truck Traffic on the I-15 Corridor

Segment	2007	2040	Percent Change
Segment 1: Idaho/Utah border to I-84	3,990	9,070	127%
Segment 2: I-84 to I-80	2,240	4,340	94%
Segment 3: I-80 to U.S. 6	4,280	9,490	122%
Segment 4: U.S. 6 to I-70	3,080	7,300	137%
Segment 5: I-70 to the Utah/Arizona border	4,310	10,480	143%

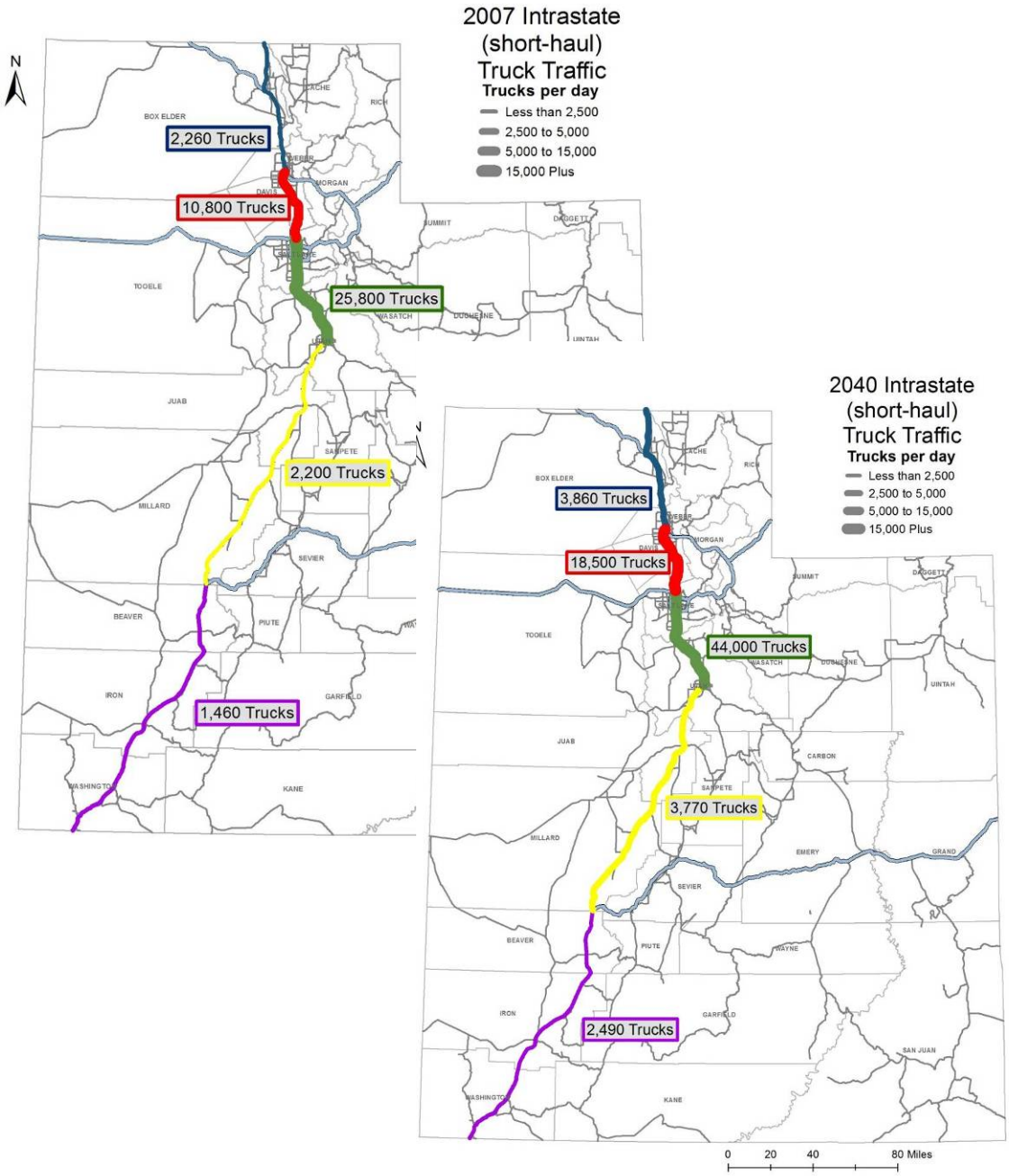
Figure 10: 2007, 2040 Long-Haul Interstate Truck Traffic on Utah's I-15



Short-haul Truck Traffic

Intrastate, or short-haul truck traffic, was estimated using the reported combo truck traffic on I-15 from UDOT's Truck Traffic on Utah Highways and the estimated long-haul truck traffic. The short-haul truck traffic was simply calculated by subtracting the estimated long-haul truck traffic on each highway segment from the reported truck traffic. While short-haul truck traffic was calculated for small segments of I-15, Figure 11 shows the average short-haul truck traffic for the large segments that were used to route long-haul truck traffic. Future intrastate truck traffic was estimated by growing existing intrastate truck traffic by the forecast growth of Utah to Utah truck flows from the FAF3 data.

Figure 11: 2007, 2040 Short-Haul Intrastate Truck Traffic on Utah's I-15



Utah I-15 Corridor Truck Parking Demand

The demand for truck parking spaces on highway segments is based upon the daily truck-hours of travel on the segment and the average parking time per truck-hour of travel. Analysis was completed in several steps to develop an estimate of the demand for commercial motor vehicle parking spaces at commercial truck stops and public rest areas as well as ports-of-entry along three segments of the I-15 corridor: South/Central Utah, Wasatch Front and Northern Utah.

The truck parking demand model was applied to the I-15 corridor with minor modifications to allow it to be used with FAF3 truck data and districts. The most significant modification was the use of the FAF3 estimates of interstate truck traffic for the long-haul truck traffic volumes on each segment rather than assuming a percentage of truck traffic to be short-haul and long-haul trucks (e.g., seven percent short-haul and 93 percent long-haul). This was done to provide more detailed estimates of existing and future truck parking demand based upon FAF3 data than could be provided by using the percentage from the Utah or national survey.

The daily truck-hours of travel on each I-15 segment were calculated from the estimated truck traffic, segment length and average speed. For this analysis, the average speed was assumed to be 75 mph in rural areas and 65 mph in urbanized areas.

With the daily truck-hours of travel calculated for each segment, the truck-hours of parking demand (THP) per day can be calculated based upon P_{avg} (ratio of parking time to driving time). For stops whose primary purpose is a short break, the default model value assumes that both short- and long-haul drivers will stop for five minutes per hour of driving.

The model first estimates the daily truck-hours of travel on the highway segment based upon the amount of truck traffic, the length of highway segment, and the speed limit or average truck speed. The other parameter is the number of hours of parking required by drivers given the number of hours they drive. The demand (D) for truck parking spaces on highway segments is based upon the daily truck-hours of travel (THT) on the segment and the average parking time per truck-hour of travel (P_{avg}).

$$D = THT * P_{avg}$$

Since parking time per truck-hour of travel differs significantly between long-haul and short-haul trucks, the parking demand is estimated separately for long-haul and short-haul trucks which are then summed to estimate total demand. Finally, peak parking factors are used to adjust for seasonal and daily variations in truck parking demand producing a peak-hour estimate of parking spaces demanded for a given highway segment.

For long-haul drivers, Federal hours-of-service regulations also determine the number of hours spent parking. The national model used a weekly average of parking time to driving based upon the national survey which is 49 hours of parking to 70 hours of driving. Rather than use weekly average parking time to drive time from the National survey results, the ratio of truck parking time to the truck driving time was estimated directly from zone-to-zone drive times for the selected representative cities for each zone. Table 2 lists the zone-to-zone drive times used in the analysis. The time spent parking was calculated from the drive time and Federal hours-of-service regulations and is shown in Table 3.

Table 3: Estimated Zone-to-Zone Drive Times (Hours)

		From															
	Zone	1 New York	2 Atlanta	3 Dallas	4 Omaha	9 Seattle	12 Chicago	16 Kansas City	12 Denver	6 Phoenix	7 Salt Lake City	8 Boise	10 Reno	13 Las Vegas	15 Bakersfield	11 Los Angeles	14 Oakland
	1 New York					46					34	39	42	40	45	44	
	2 Atlanta					43					30	35					
	3 Dallas					35					21	27					
	4 Omaha					27				35	14	19		20	25	24	
	9 Seattle	46	43	35	27		33	33	21	25	14			21			
	12 Chicago					33					22	26		27	32	32	
	16 Kansas City					33					21	26		25	29	29	
TO	5 Denver					21				17	8	13		12	17	17	20
	6 Phoenix				35	25			17		12	16					
	7 Salt Lake	34	30	21	14	14	22	21	8	12		5	8	6	11	11	12
	8 Boise	39	35	27	19		26	26	13	16	5			12	16	16	
	10 Reno	42									8						
	13 Las Vegas	40			20	21	27	25	12		6	12					
	15 Bakersfield	45			25		32	29	17		11	16					
	11 Los Angeles	44			24		32	29	17		11	16					
	14 Oakland								20		12						

Source: maps.google.com

Table 4: Estimated Zone-to-Zone Required Hours-of-Rest from Federal Hours-of-Service Regulations (Hours)

		From															
	Zone	1 New York	2 Atlanta	3 Dallas	4 Omaha	9 Seattle	12 Chicago	16 Kansas City	12 Denver	6 Phoenix	7 Salt Lake City	8 Boise	10 Reno	13 Las Vegas	15 Bakersfield	11 Los Angeles	14 Oakland
	1 New York					40					30	30	30	30	40	40	
	2 Atlanta					30					20	30					
	3 Dallas					30					10	20					
	4 Omaha					20				30	10	10		10	20	20	
	9 Seattle	40	30	30	20		30	30	10	20	10			10			
	12 Chicago					30					20	20		20	20	20	
	16 Kansas City					30					10	20		20	20	20	
T	5 Denver					10				10		10		10	10	10	10
O	6 Phoenix				30	20			10		10	10					
	7 Salt Lake	30	20	10	10	10	20	10		10					10	10	10
	8 Boise	30	30	20	10		20	20	10	10				10	10	10	
	10 Reno	30															
	13 Las Vegas	30			10	10	20	20	10			10					
	15 Bakersfield	40			20		20	20	10		10	10					
	11 Los Angeles	40			20		20	20	10		10	10					
	14 Oakland								10		10						

Source: maps.google.com

Peak-hour truck parking demand was then calculated for short- and long-haul trucks using the daily truck-hours of parking demand calculated previously and peak-hour parking factors (PPF). The default PPF model values of 0.02 for short-haul and 0.09 for long-haul were used for the analysis.

Finally, the peak-hour parking demand was seasonally adjusted to account for seasonal variation in truck traffic. The default model value for seasonal peaking is 15 percent (1.15) and was compared to the seasonal variation in truck traffic for two locations on I-15 as shown in Figures 12 and 13 for vehicles that are 50 feet or more in length. The seasonal variation of truck traffic on the southern end (milepost 5) of I-15 is 13 percent while only seven percent on the northern end (milepost 360). For standard application, and to provide a conservative estimate of peak-season, peak-hour truck parking demand, the default model value for seasonal peaking of 15 percent was assumed.

Figure 12: Seasonal Variation in Truck Traffic in Southern Utah (2010-2011)

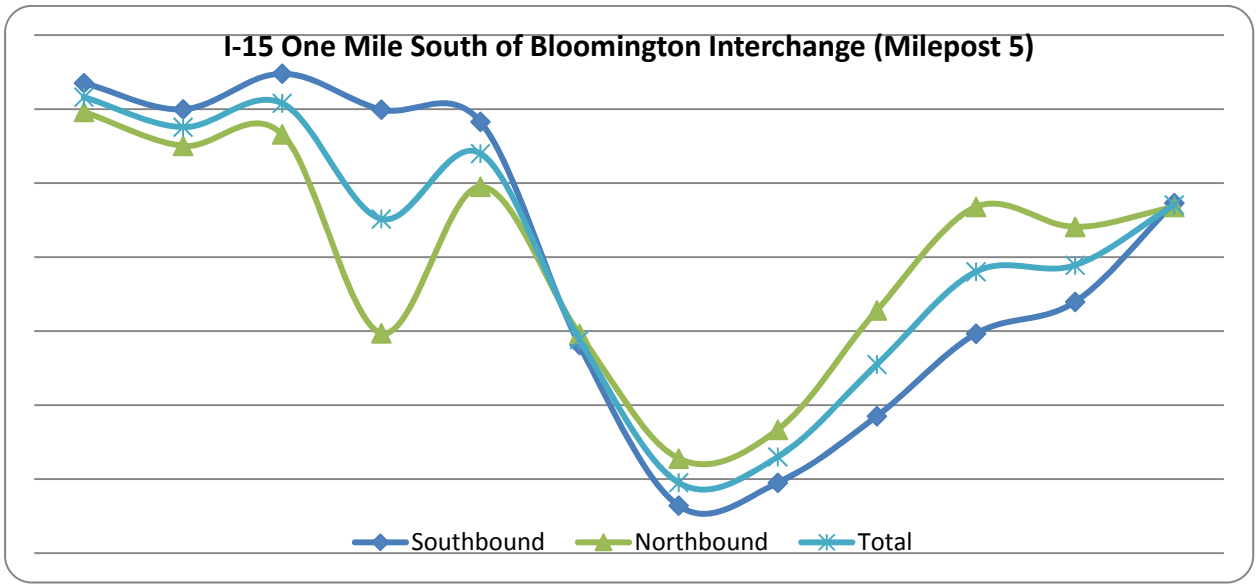
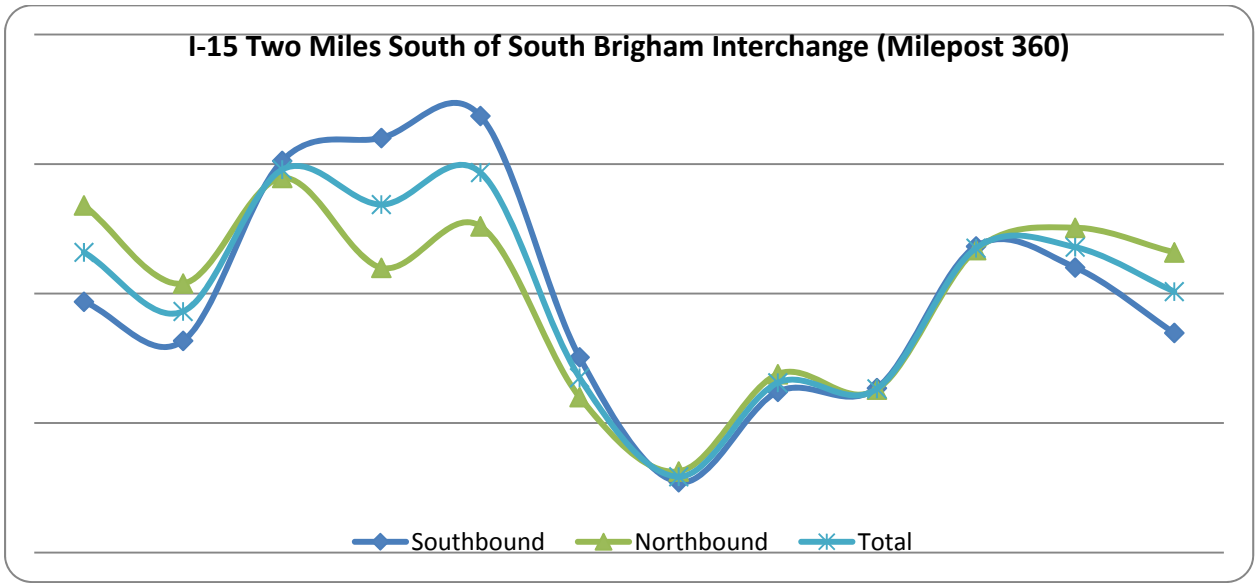


Figure 13: Seasonal Variation in Truck Traffic in Northern Utah (2010-2011)



I-80 Parking Demand

I-80 truck parking demand was also estimated for Salt Lake County since both I-80 and I-15 share truck parking in this area. The I-80 truck parking demand was estimated using truck traffic information from UDOT's Truck Traffic on Utah Highways and the default model parameters discussed previously (FAF districts and long-haul truck traffic flows were not created for I-80 truck traffic).

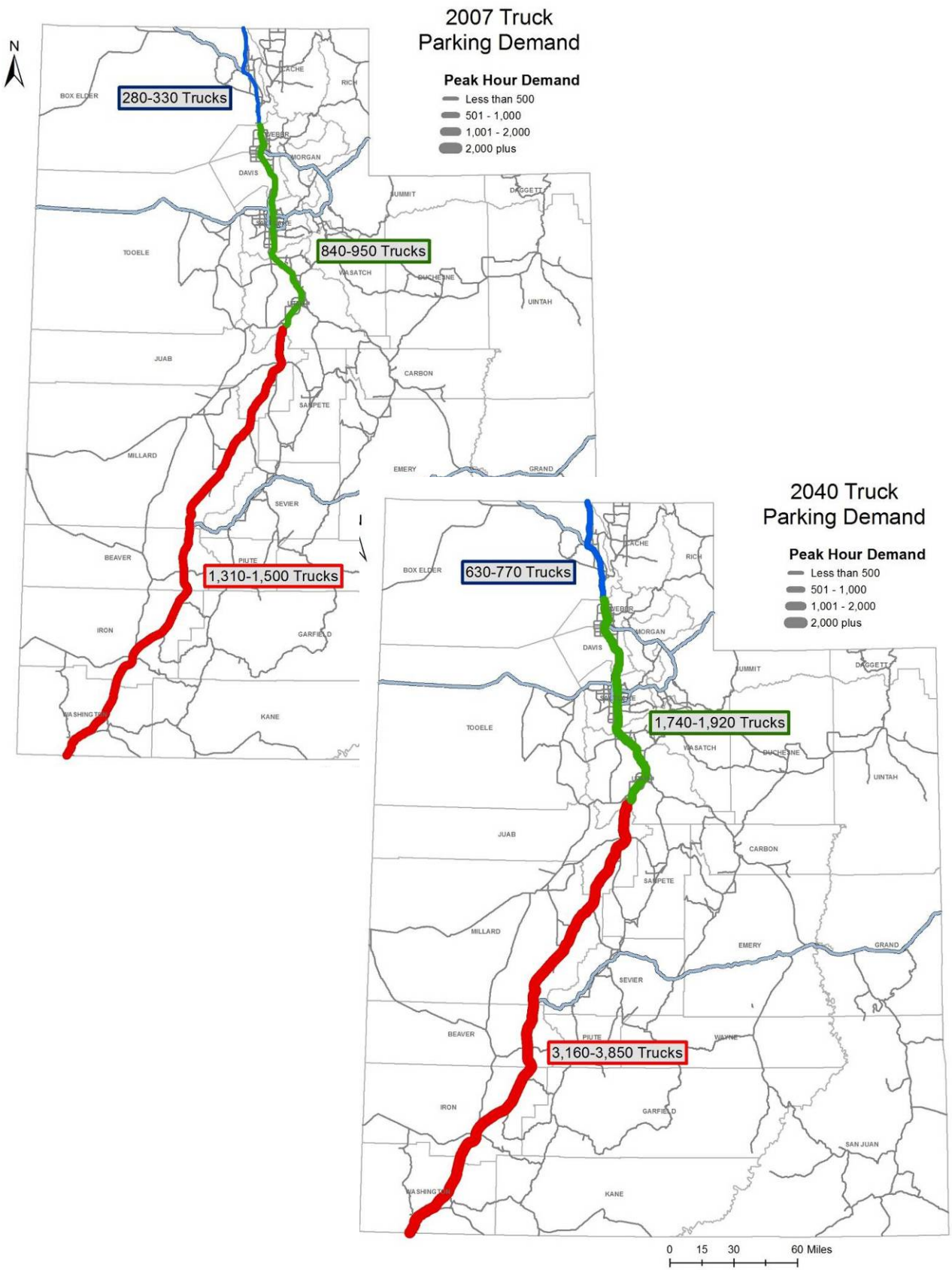
I-15 Corridor Total Parking Demand

Once the I-15 and I-80 parking demand was estimated, total parking demand was calculated. Figure 14present the estimated peak-season peak-hour truck parking demand for the I-15 corridor.

Demand Summary

Using a national methodology based upon the number of hours a CMV driver drives, analysis was completed in several steps to develop an estimate of the demand for CMV parking spaces at commercial truck stops and public rest areas as well as ports-of-entry along three segments of the I-15 corridor: South/Central Utah, Wasatch Front and Northern Utah. Our model inputs included the National FAF3 district-to-district data modified to include 16 districts to better estimate truck parking peak demand in Utah. Next, the truck parking demand model was applied to estimate peak parking demand. The results were then expressed in a range within each of the three segments. Additionally, the model was calibrated to reflect local factors such as seasonal adjustments. Rather than identifying specific locations for increased truck parking, the three segments were used to determine areas of peak parking demand.

Figure 14: 2007, 2040 Peak Season, Peak-hour Truck Parking Demand



Utah I-15 Truck Parking Needs and Preferences Survey

Utah's I-15 Truck Parking Study was funded by a Truck Parking Initiative grant from the United States Department of Transportation Federal Highway Administration through Section 1305 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) Section 1305, Truck Parking Facilities. Funds were requested under Title 23 U.S.C., Section 120 (b). The grant was received by the Utah Department of Transportation, Systems Planning and Programming, Planning Group.

Review of Other Truck Parking Studies to Inform Utah's Survey Methodology

At the beginning of the survey development phase, the Project Management Committee and consultant team reviewed recent truck parking studies from across the county to determine the most effective survey methodology to deploy in Utah. The following studies are illustrative of the types of efforts that helped to form Utah's I-15 Truck Parking Survey:

- The Wisconsin Department of Transportation hired the National Center for Freight & Infrastructure Research & Education (CFIRE) Wisconsin Transportation Center at the University of Wisconsin, Madison to conduct a study of truck parking issues along the major freight corridors in the 10 state MVFC (now Mid-America Freight Coalition) region, which includes Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Ohio and Wisconsin. An online Geographic Information System (GIS) instrument was developed to administer surveys and to allow for continuous public participation. The study surveyed highway patrol officers, public freight planners and truckers to identify parking facilities incommensurate with truck parking needs. In person carrier interviews were also conducted to further clarify truck parking problem causes and solutions.

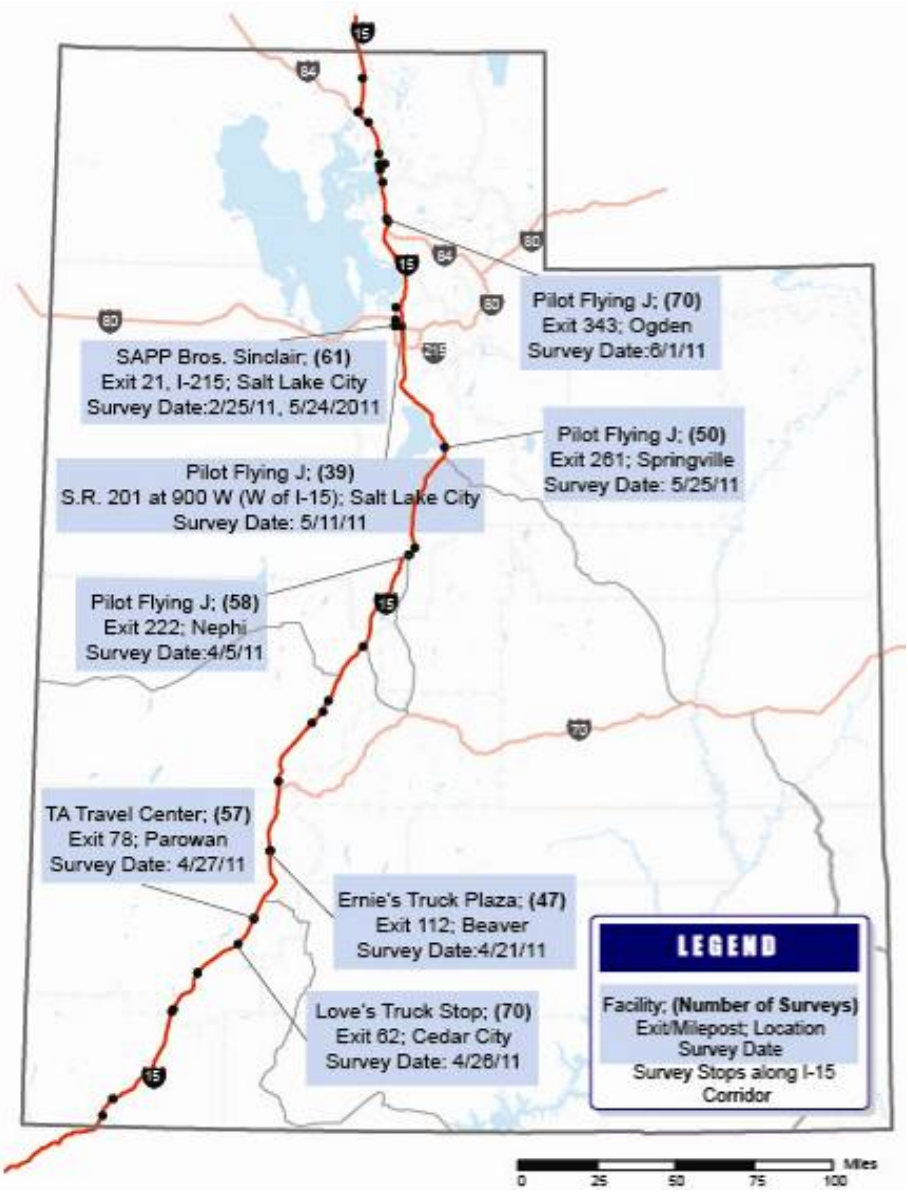
- The Illinois Institute of Technology conducted a study for the Illinois Center for Transportation that examined the current state of truck parking and rest area facilities in the Northeast Illinois Region to determine if and how problems from truck parking affect freight transportation infrastructure, safety and the region's economy and

environment. Interviews were conducted with state, county, municipal authorities, and truck drivers.

- The Washington Department of Transportation (WSDOT) hired a consulting firm, PRR, to conduct two online surveys to establish how truck drivers and trucking companies view the adequacy and availability of truck parking and services in the state of Washington. These surveys were directed at truck drivers who drive in Washington, and trucking companies who have operations in Washington; they were notified about the surveys through e-mails from WSDOT to various groups. WSDOT received 473 surveys from truck drivers, and 99 trucking companies answered the truck company survey.

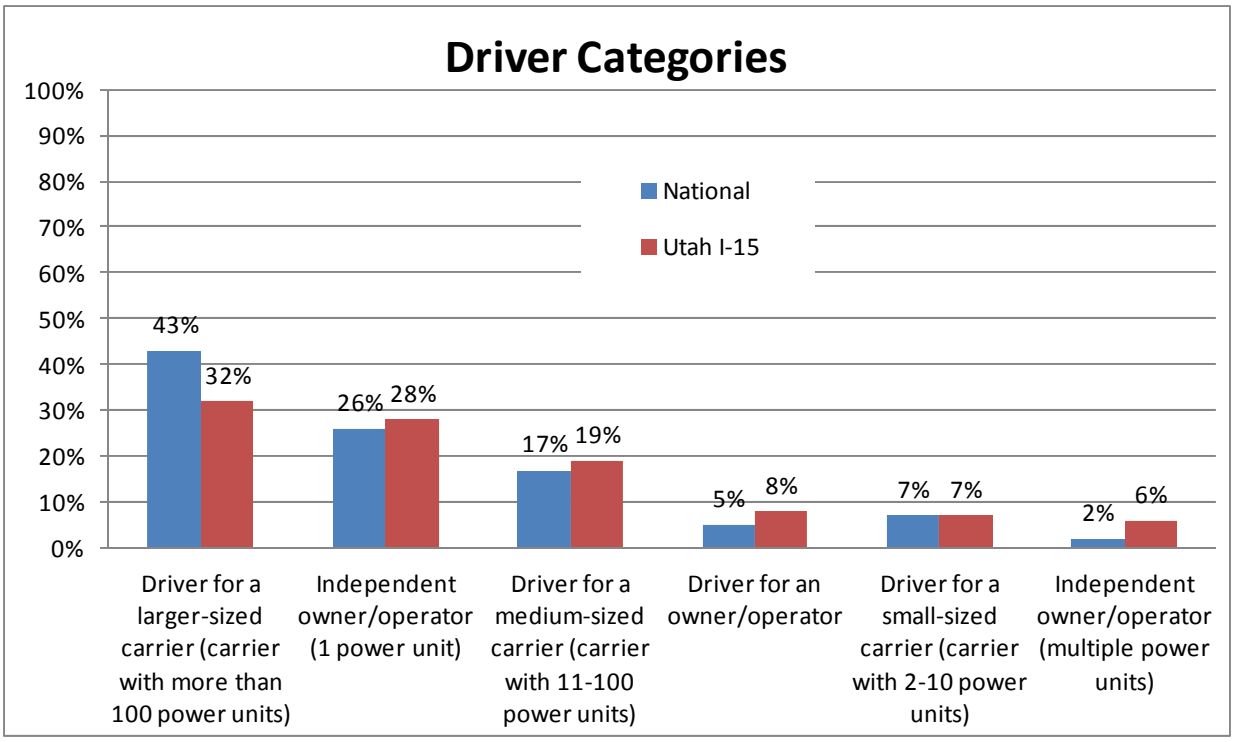
A major portion of this I-15 Truck Parking Study had CMV drivers complete surveys on-site at commercial truck stops. The purpose of the study was to understand CMV drivers' experience with long-term parking (more than four hours) along the I-15 corridor in Utah. What follows is a map of the locations where the on-site truck parking survey was conducted as well as summary highlights of the survey results. Full survey results are part of the Appendix to this document.

Figure 15: 2011 Commercial Truck Stop Survey Locations



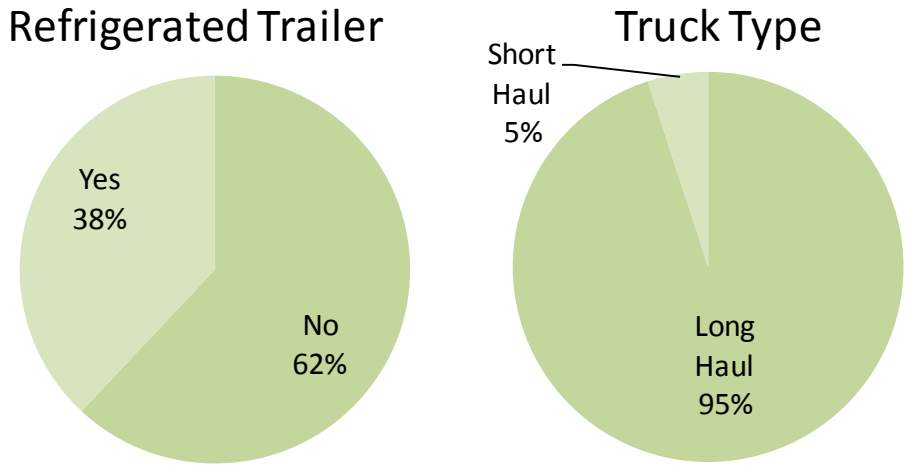
Background of Survey Respondents

Figure 16: National Survey versus Utah's Survey of CMV Drivers



CMV drivers surveyed on I-15 in Utah are less likely to drive for larger-sized carriers than the national, 2002 findings. This may reflect a difference in route choice for large carriers, or may be due to economic conditions which vary from 2002. Utah respondents were most likely (95percent) to be long-haul drivers and had someone else in the truck only 21percent of the time.

Figure 17: Refrigerated Trailers and Surveyed Haulers



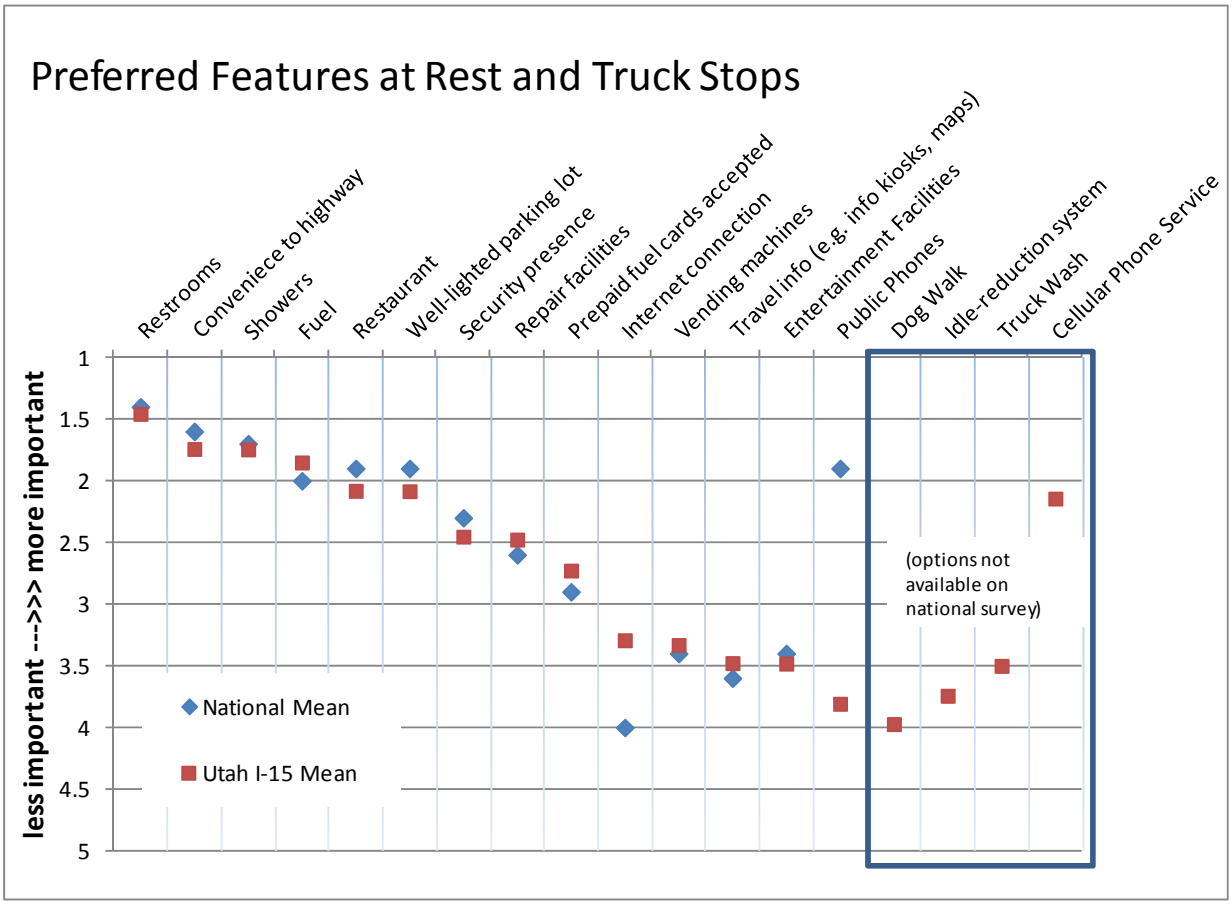
How do CMV Drivers Plan for and Address Their Parking Needs

In an effort to better meet CMV drivers' needs for rest and services in Utah, the survey tried to identify the process by which drivers select stops. Because CMV driving is a business, it could be that management or dispatchers determine parking locations. This survey found, however, that almost all drivers determine their own stops and most decide while they are driving. Road conditions and speed may affect hours-of-service and therefore rest locations may need to be decided upon once underway. Only 21percent of drivers planned where to stop before they started driving for the day.

There are many locations which could be selected in which to park a truck. Usually, the reason for the stop determines the location of the stop. A driver looking for a haircut probably wouldn't stop at a public rest area, just as one with a dog to walk might prefer one. Restrooms, convenience to the highway, showers and fuel are the top four features that are important when a CMV driver parks at a commercial truck stop or public rest area. Drivers prefer a commercial truck stop for long-term rest (more than two hours) and to eat a meal.

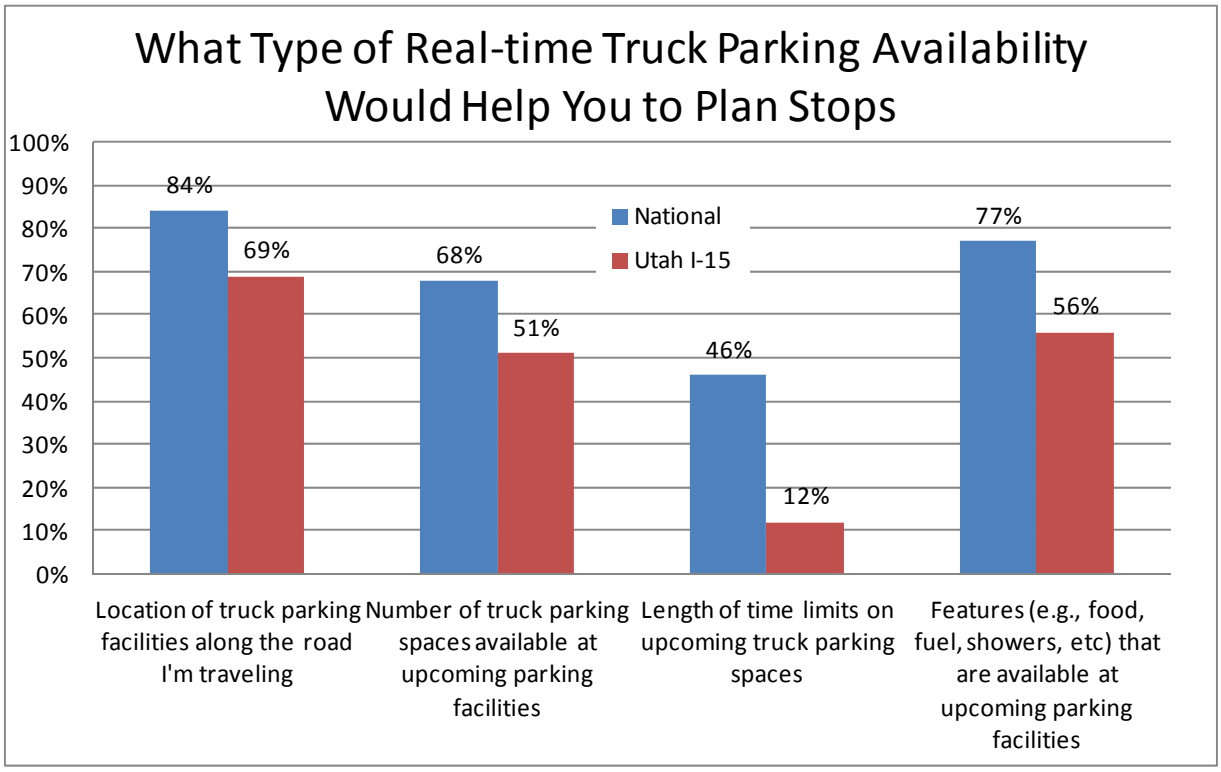
According to the Utah survey, CMV drivers seek similar features to those sought nationally. There is disparity in Internet connection desirability and public phone needs. These, however are more reflective of the societal changes since the National survey, taken in 2002, than in a difference in Utah survey patterns.

Figure 18: Public Rest Area and Commercial Truck Stop Features



The Utah survey found that 66 percent of drivers decide where to park once they're on the road. Most would plan long-term rest stops better if they knew where parking facilities on I-15 were located. Half of those surveyed would like to know how many spaces are available to them at the stops ahead. Over half wanted to know what features were available at upcoming parking locations.

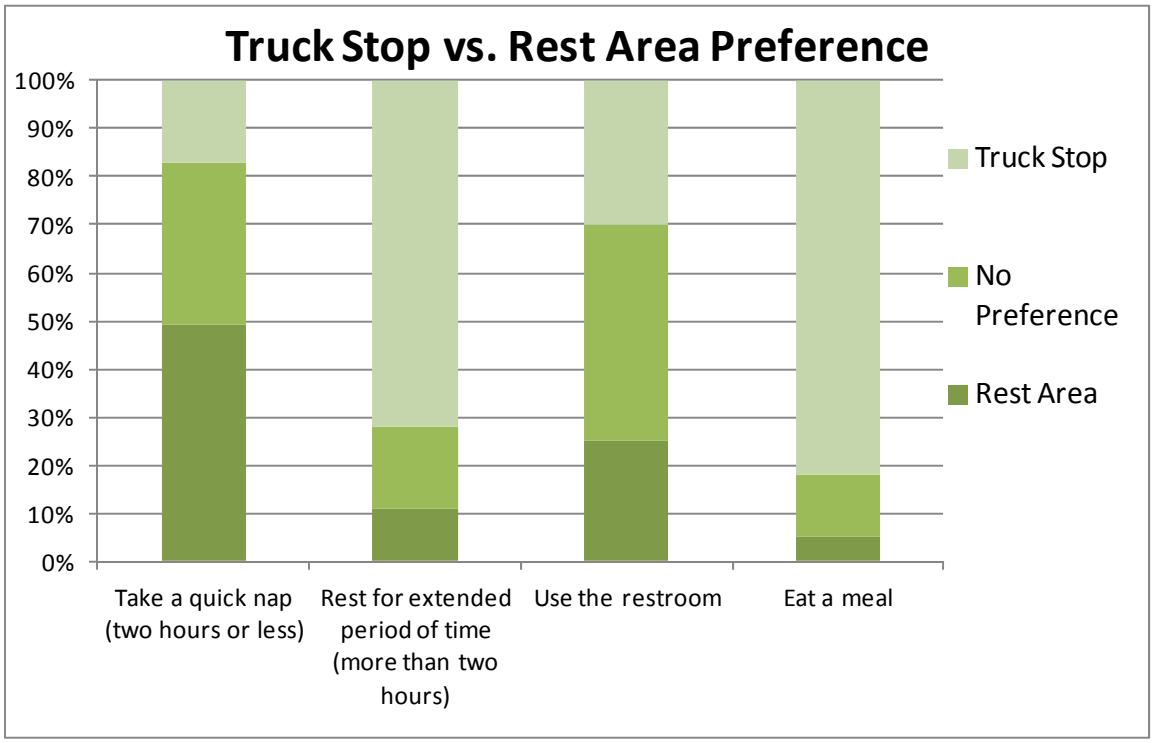
Figure 19: Real-time Truck Parking Information



How do CMV Drivers Select When, Where and at Which Facilities They Park

The two primary options available to CMV drivers for stop locations are commercial truck stops and public rest areas. For a quick nap, CMV drivers from the Utah survey prefer public rest areas. For extended rest or a meal, CMV drivers would rather stop at a commercial truck stop.

Figure 20: Commercial Truck Stop versus Public Rest Area Preference



Some drivers choose poor locations for parking their truck. This may be because federal hours-of-service rules force a stop before a driver can reach the next commercial truck stop or public rest area. It may also be because those areas are at capacity and cannot park anymore trucks. In these situations, highway on- and off-ramps or shoulders sometimes have parked trucks. When asked for the four most common reasons CMV drivers park on shoulders or on- and off-ramps, more than 70 percent of Utah survey respondents indicated the following:

1. There are no empty spaces at commercial truck stops or public rest areas
2. There is no nearby parking facility

The next most common reasons, selected by a third of the drivers were:

3. They didn't know of the availability of parking in nearby commercial truck stops or public rest areas
4. Empty spaces are blocked
5. Less likely to be bothered by strangers
6. The ramp/shoulder is convenient to getting back on the road

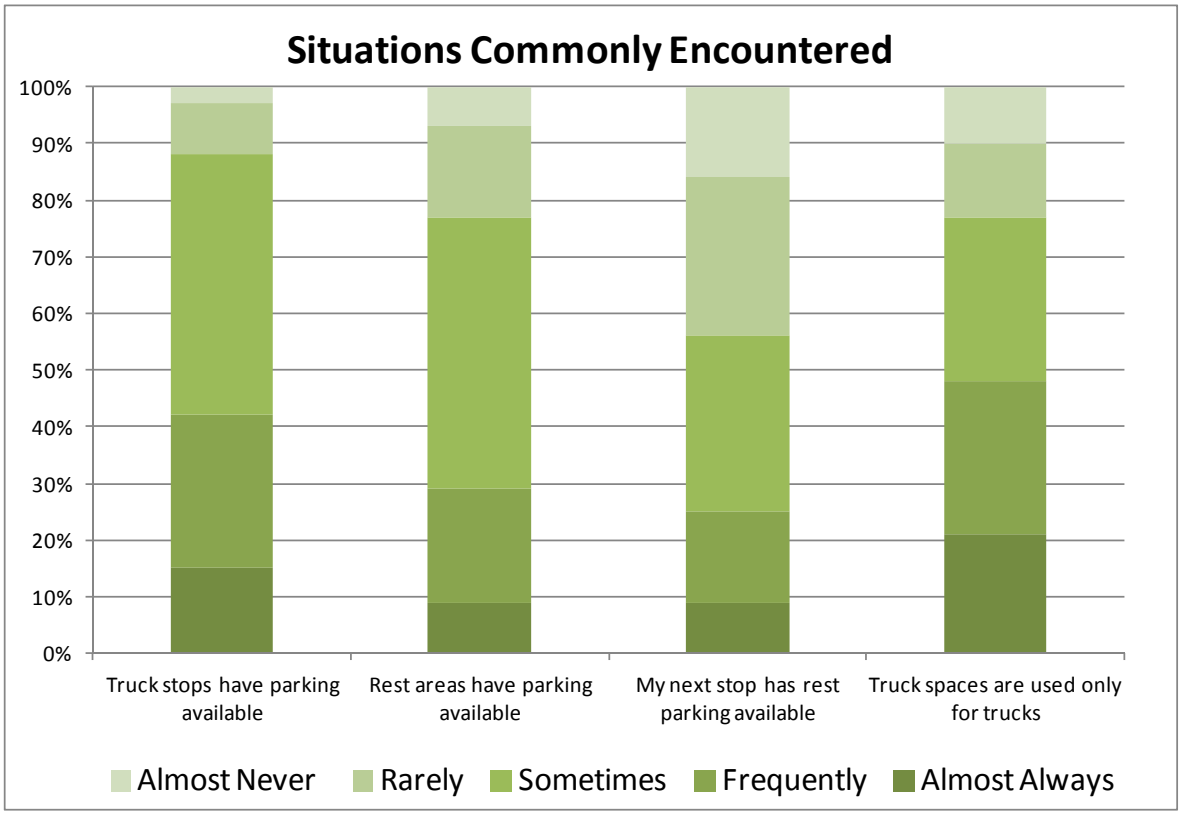
Communication about upcoming parking availability and amenities needs to be improved. The Utah survey found that while more than 80 percent of drivers have a CB radio or mobile

phone on board, they would prefer to be notified via variable message signs and a paper map. Highway advisory radio was the third most common preference.

What do CMV Drivers Think of the Adequacy of Current Parking Facilities

Knowing the patterns and desires of CMV drivers is important. The survey also sought to examine how well the I-15 facilities met drivers' needs. Public rest areas were cited as being deficient in the number of parking spaces available and truck parking spaces were used by non-trucks too often. Parking for CMV drivers' rest was generally not available to drivers at the shipping or receiver's location.

Figure 21: Parking on the I-15 Corridor



When asked for the three most desired improvements along I-15 in Utah for truck parking, over 50 percent of Utah respondents indicated:

1. Build more commercial truck stop parking spaces
2. Build more public rest area parking spaces

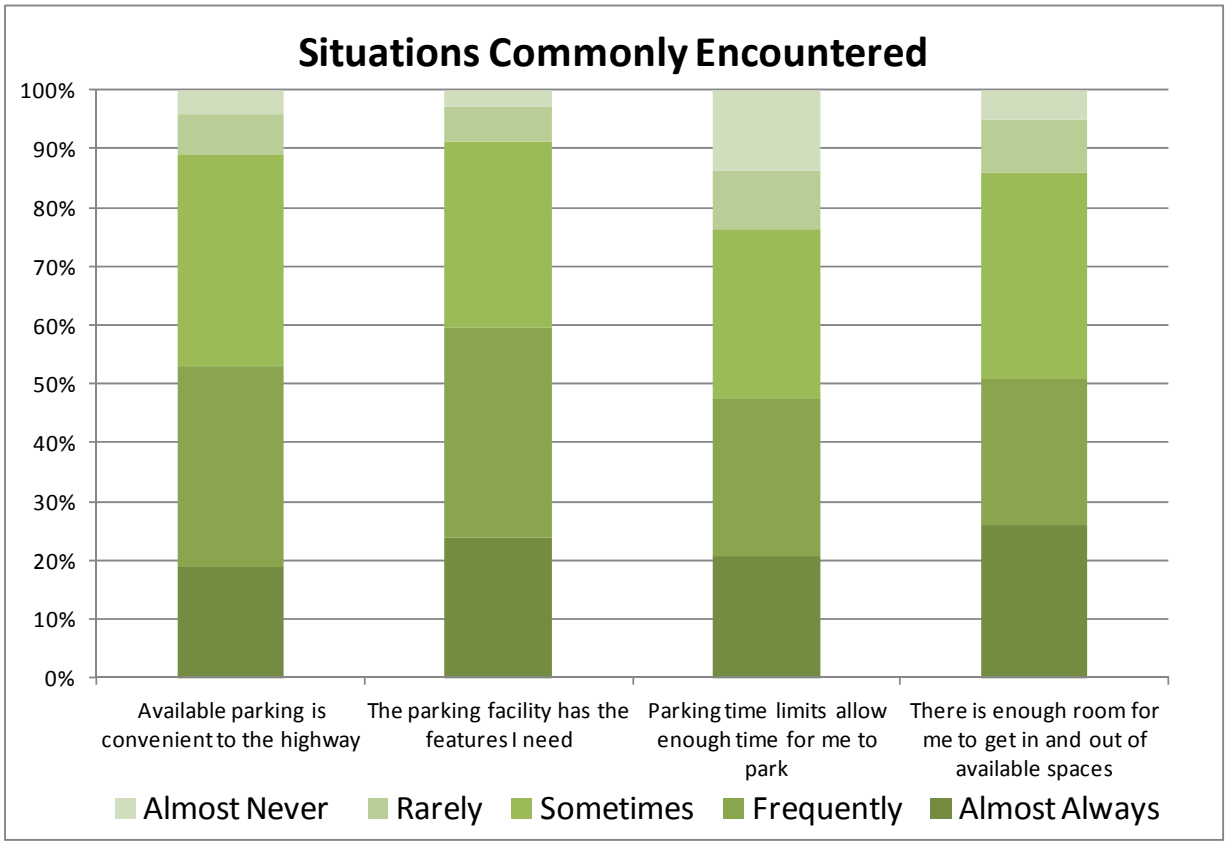
The next most common reasons, selected by a third of the drivers were:

3. Stop enforcement officers from waking drivers

4. Eliminate time limits on truck parking
5. Improve parking layout/configuration (e.g., pull-through spaces, marked spaces)
6. Separate truck, car, and RV parking

Most drivers agree that parking is convenient to the highway and has enough room to park. Time limits on parking do appear to restrict drivers and do not allow them enough time to park.

Figure 22: Availability and Space of Parking on the I-15 Corridor



Quotes from Commercial Vehicle Drivers from I-15 Truck Parking Survey Indicating Lack of Available Long-term Truck Parking Locations

Only 30 percent of CMV drivers wrote open ended comments. The most frequent comment was related to the lack of parking at public rest areas (74 comments) and commercial truck stops (72 comments). A small number of drivers indicated that parking on I-15 is not a problem while others felt that closed public rest areas were a problem. Rest areas that function as public/private partnerships did not meet the needs of approximately six CMV drivers. A dozen felt that truck parking was not clearly marked or that the layout of truck parking did not work for them at long-term parking locations. Others felt that cars and/or

recreational vehicles that were blocking access to their long-term truck parking were a problem.

Selected Comments about Long-term Truck Parking along Utah's I-15 by Survey Respondents

I run an oversized load all the time. I rarely can find a place to park, most of the time it's along the side of the road on the on or off ramp. Officers are no help, just hassle!

I haul oversize loads and there is almost NEVER, EVER room enough to park.

There are too few truck stops. If you are not there by 4:00-5:00 p.m. you can't find a parking spot. Plus, if you do, it's too far to walk to facilities.

After 10:00 p.m. it (parking) can be a real joke.

Not enough after dark parking if truck stops in St George and rest areas are full. I have frequently have had to drive illegally to find parking that is safe (not on shoulder of road).

Open up closed areas so we can at least park there and provide trash cans to dispose of trash.

Stop closing rest areas and reopen any possible.

Reopen closed rest areas.

Yes, there needs to be more parking spaces for trucks only.

Utah has the same problem that all other states have. Not enough parking spaces for trucks and the spaces that are available are used by recreational vehicles and other vehicles that could park elsewhere.

Focus Group Results

Focus groups were conducted with long-haul, CMV drivers and facility managers of commercial truck stops along the I-15 corridor to identify parking solutions that will most effectively solve the problem of long-haul truck parking.

Three focus groups were conducted by Lighthouse Research whose purpose was to receive more information from CMV drivers as well as facility managers of commercial truck stops about long-term truck parking along the I-15 corridor. There were two focus groups for CMV drivers and one for commercial truck stop facility managers. Below are highlights of the focus group experiences as provided from the Lighthouse Research Executive Focus Groups Summary; the full report is available as part of the Appendix of this document.

Long-haul CMV Drivers Focus Groups

I-15 Truck Parking – When asked if there is a long-term truck parking shortage in Utah, participants unanimously agreed. Many participants specifically stated that there is a shortage of parking for trucks hauling double or triple loads. They felt the greatest shortage of truck parking exists in Salt Lake City along the I-15 corridor.

Many participants suggested increasing the amount of signage on the road to communicate with drivers. Specifically, participants suggested adding signs that say “Truck Stop Ahead” or “Next Rest Area.” Drivers also suggested distributing materials to CMV drivers to let them know about available parking in the state and to add symbols to maps that they already use.

Evaluation of Visor Card Solutions – Participants were presented with five different versions of conceptual truck parking maps commonly referred to in this effort as “visor cards.” The concept visor card maps identified Utah truck parking facilities on the following interstates in Utah: I-70, I-80, I-84, I-15 and I-215. Based upon input from the CMV drivers through the focus group process, a map of truck parking along these routes should be developed and distributed to CMV drivers for their use.

Smartphone Application Solution – Although drivers liked the idea of having a Smartphone application to help them find truck parking, many participants voiced concerns about using their phones while driving. Participants were asked what they wanted in a Smartphone application and their answers are below.

1. Include rest stops
2. Which services and amenities are available at commercial truck stops
3. Provide fuel prices and parking availability at any given location
4. Indicate whether parking is available for trucks pulling double or triple loads

Barriers Affecting Communication with Long-Haul, CMV Drivers – Many participants said they use commercial truck parking guides and maps to find the information they need about commercial truck stops. Participants indicated that the biggest barrier preventing them from being informed about long-term parking availability in Utah is the lack of communication in general. Participants felt that not any one source exists to inform CMV drivers about long-term parking; and if such a resource does exist, CMV drivers are not aware of it. Participants also suggested placing such information in state welcome centers, ports-of-entry, public rest areas, and commercial truck stops. In addition, participants suggested distributing such materials through affiliations such as the Utah Trucking Association or the Utah Travel Council.

Commercial Truck Stop Owner/Operator Focus Group

Commercial Truck Stop Owner/Operator Concerns with Truck Parking – Participants agreed that finding available truck parking in the state of Utah is a challenge for many CMV drivers. Participants indicated that the greatest shortage of truck parking exists along the entire Utah I-15 corridor. While some participants said there is a shortage of truck parking in the Salt Lake City area, others said that truck parking is scarce in industrial areas between Salt Lake City and Logan.

When asked to identify the best and most feasible ideas for assisting CMV drivers and providing them with more information about parking in the state of Utah, owners/operators targeted three main areas:

- Expand or open public rest areas
- Provide information to CMV drivers via global position system (GPS) locators
- Increase signage (specifically UDOT road sign markers) along freeways and highways telling CMV drivers about commercial truck stops with truck parking

Commercial Truck Stop Expansion – Participants said they have considered expanding, but that expansion does not seem feasible or profitable. Many facility managers said they would consider expansion if they received some sort of compensation for the construction of additional parking, specifically in the form of tax breaks or incentives. Others said they would consider expanding if they would be guaranteed a return on their investment or if they received assistance in maintaining their parking facilities.

Multiple participants suggested that perhaps the solution for increasing the amount of truck parking does not exist in expanding commercial truck stop parking, but in opening public rest areas that have been closed along the I-15 corridor. A couple of participants have considered opening additional commercial truck stop locations. However, these participants indicated that their efforts have been met with resistance and that local communities make it difficult for them to open additional commercial truck stop locations.

Communication with CMV Drivers – Facility managers, in general, do not track availability of truck parking at their locations. Participants agreed that this would be a difficult task to oversee, as there is constant movement of trucks at each of their locations. However, a couple of owners/operators said they track parking availability loosely for internal purposes only. Facility managers acknowledged that word of mouth is one of the primary methods of communication among drivers. Participants, in general, do not communicate with CMV drivers. However, these participants reported seeing a lot of "regulars" and indicated that drivers will call and ask if they have parking available. Participants also indicated that company dispatch staff route CMV drivers to specific destinations because of corporate agreements on the bulk purchase of gasoline, and that owners/operators do not have a lot of control about the business they receive from CMV drivers.

Smartphone Application and Visor Card Solution – When asked what should be included in a Smartphone application that CMV drivers might use to locate truck parking availability, participants said it would be important for drivers to know parking availability at various commercial truck stops, especially on weekends. Participants, did, however express concern with having a Smartphone application. Specifically, participants questioned the accuracy and validity of the information provided by the application. In addition, some participants were unsure of whether drivers would use such an application.

Participants were neutral to slightly negative toward the idea of having paper maps available to drivers to show parking availability. Participants, in general, felt that drivers already have access to GPS locators and that drivers already have a "routine" they follow regularly. Participants were; however, open to the idea of listing their establishments on such a map.

I-15 Corridor
Truck Parking Next Steps

Potential Solutions

Throughout the I-15 Truck Parking Study, the Project Management Committee worked to identify possible solutions to truck parking issues along the I-15 corridor in Utah. Two possible solutions were identified and further research was conducted to determine the feasibility for a demonstration project.

Warehouse Parking

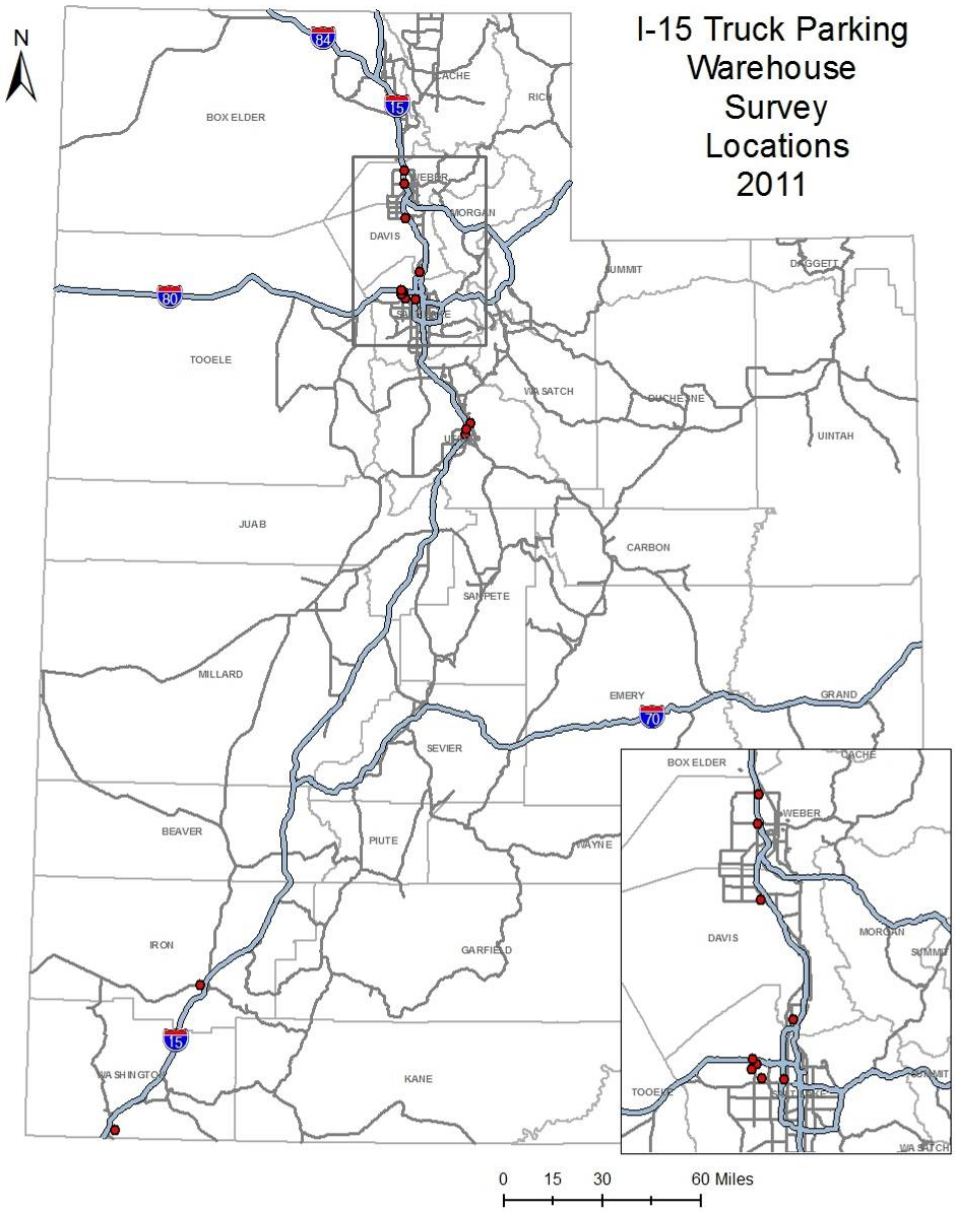
A limited survey was completed to determine if warehouses with large parking lots might allow for truck parking at their facilities to help CMV drivers comply with Federal hours-of-service regulations. This survey found that parking availability at warehouse locations was limited to non-existent. There are a number of reasons why warehouses are not willing to allow long-term truck parking, including liability, security, maintenance, and physical space issues. While there are amenities at the warehouse such as the use of a rest room or break area, these are only available for the short period of time while the freight is being loaded or unloaded from the trailer. Mostly, warehouse personnel were unwilling to have drivers from other truck transportation companies use their unused parking area for long-term rest. The warehouse parking solution was determined to be unfeasible. Below is a map of the locations where the warehouse survey was administered.

Visor Card (Truck Parking Map)

A visor card or truck parking map has been developed that indicates the location of commercial truck stops and public rest areas along the National Highway System in Utah (I-15, I-70, I-80, I-84 and I-215). This map was developed based upon the information provided by CMV drivers to the I-15 Truck Parking Survey and responses to questions in the two focus groups conducted by Lighthouse Research. Subsequently, the truck parking map was designed to provide useful information such as the location or exit number of the facility, how many long-term parking spaces are available as well as what amenities such as food and showers among other information. Other information included on the map feature road condition telephone numbers of surrounding states.

Initially, 10,000 maps were printed and partially distributed at a kickoff event that occurred at the 2012 Utah Trucking Association Management Conference and Trucking Expo at the Dixie Convention Center at St. George. The Utah Trucking Association conference attracts approximately 400 individuals annually representing management from commercial trucking companies within Utah and others with an interest in the trucking industry.

Figure 23: Warehouse Survey Locations



UDOT Traffic Smartphone Application for Trucks

The UDOT Traffic Operations Center (TOC) has developed a Smartphone application or "app" for the iPhone and Android market. The app is featured as part of the UDOT Traffic Smartphone Application which allows access to road conditions and traffic information on mobile devices. Currently the UDOT Traffic app is geared primarily towards motorists, but

there is a lot of information that also applies to CMV drivers such as current traffic conditions, crashes, road construction and other hazard alerts, current road weather conditions and road weather forecasts along with traffic camera images and electronic roadway sign messages. Additionally, information will be available in the near future that is freight specific such as the locations of commercial truck stops and public rest areas and their amenities. The freight specific information will help CMV drivers identify the location of long-term parking (four hours or more) that meets their needs for food, showers, and rest to comply with Federal hours-of-service regulations.

Figure 24: Smartphone App

Image from http://www.udot.utah.gov/main March, 2012

Utah I-15 Truck Parking Website

An I-15 Truck Parking Study website at www.udot.utah/truckparking has been created for CMV drivers, study stakeholders and individuals wanting to learn more about long-term truck parking issues in Utah. Each group has a specific area on the website that provides information and resources related to their area of interest in truck parking in Utah.

Commercial Motor Vehicle (CMV) Drivers:

An interactive map is available on the website allowing CMV drivers to determine the location of commercial truck stops and public rest areas along with amenities that they might utilize. Basically, the paper map that was developed as part of the I-15 Truck Parking Study will be available on the website. Several links will be provided to key resources for CMV drivers such as a link to the iPhone App Store and the Android Market to download the UDOT Traffic Smartphone app to their Smartphone, the UDOT website to access the Motor Carrier Division page and other freight related pages including the Utah Trucking Association website.

Key Stakeholders and Other Individuals Interested in Truck Parking in Utah

Those interested in learning more about the planning process of the I-15 Truck Parking Survey in Utah have available to them many of the key documents that have been produced as part of the effort. From the materials available on the website, individuals will be able to have a comprehensive overview of how the I-15 Truck Parking Study unfolded in Utah and the results of the effort to increase the availability of long-term truck parking along the National Highway System.

Utah 511 Travel Information Line

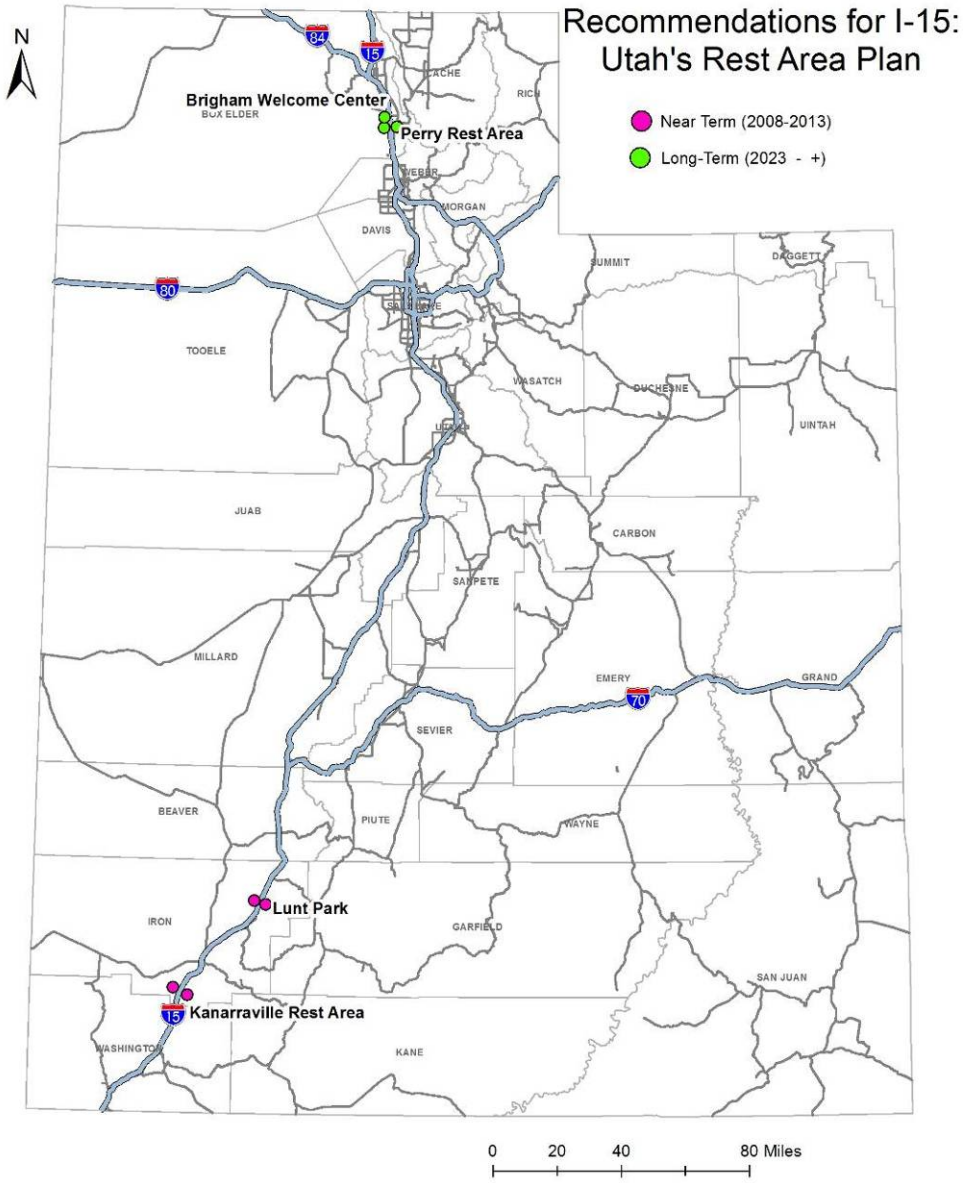
The 5-1-1 Travel Information Line is a free phone number that offers statewide updates on transportation, including traffic, winter road conditions, public transit, and Lake Powell Ferry services. Similar to dialing 911 for an emergency or 411 for directory assistance, those who travel in Utah can dial 511 toll-free to obtain transportation information. Travelers wishing to access the system from outside the state can call 866-511-UTAH (8824). The system is voice-activated, allowing callers to simply speak their requests instead of having to select options by dialing more numbers. Utah was one of the first states to launch 511 after the Federal Communications Commission officially designated 511 in July 2000. Now a truck parking section is planned to be added to Utah's 511 later this year because of the information from this study.

Role of the Utah Statewide Rest Area Plan

The purpose of the Utah Statewide Rest Area Plan (April 2007) is to provide a plan that successfully guides UDOT in establishing future priorities, allocating resources, and developing policies related to public rest areas, welcome centers, and view areas. UDOT's goal is to provide useful and efficient highway rest facilities that allow for short- and long-term rest for drowsy drivers as well as CMV drivers needing to comply with Federal hours-of-service regulations.

As part of gathering information about needs for the Utah Statewide Rest Area Plan, UDOT completed a facility patron survey to target three patron groups: general motorists, CMV drivers and public/private partnership rest stop patrons. The CMV drivers indicated that generally there is a need to increase the number of convenient and safe parking stalls at public rest area facilities. The following map displays recommendations from the Utah Statewide Rest Area Plan.

Figure 25: Rest Area Recommendations for I-15



Summary for Near-Term (2 through 5 years planning horizon 2008-2013)

- Construct new truck parking at northbound and southbound Kanarraville Rest Areas, Lunt Park Rest Areas, Perry Rest Area, and the Brigham Welcome Center

Summary of Long-Term (11 through 20 years planning horizon 2023 plus)

- Construct a new joint use facility to replace the Perry Rest Area and Brigham Welcome Center facilities
- Convert the old Perry Rest Area and Brigham Welcome Center facilities to truck parking only facilities
- Permanently remove the old Perry Rest Area and Brigham Welcome Center facility elements

Establishment of a Highway Rest Facility Committee

The Utah Statewide Rest Area Plan Steering Committee recommended the organization of a Highway Rest Facility Committee (HRFC) to oversee the development and implementation of a formal Highway Rest Facility System Program (HRFP).

The Utah Statewide Rest Area Plan provides for an effort to increase truck parking at public rest areas along the I-15 corridor. The plan identifies locations and provides a cost estimate as well as identifies potential funding sources. The development of a Highway Rest Facility Committee to oversee the development and implementation of a formal Highway Rest Facility System Program is supported by the comments from the long-haul, CMV drivers from the focus group indicating that public rest areas are attractive to them for long-term rest (four hours or more). The Utah Statewide Rest Area Plan suggests the committee's roles and responsibilities as well as committee composition.

Appendix