

Prepared by the

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Arlington, VA



The American Transportation Research Institute (ATRI), on behalf of the Mid America Association for State Transportation Officials (MAASTO), completed a face-to-face survey with truck drivers regarding truck parking at the Mid-America Trucking Show (MATS) in Louisville, Kentucky on March 23-25, 2018. Goals of the survey are to monitor project awareness, ease of parking, personal safety, etc. in the ten-state region. The MAASTO region is comprised of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. 393 surveys were completed at MATS. To generate further findings, the survey is posted at www.trucksparkhere.com.

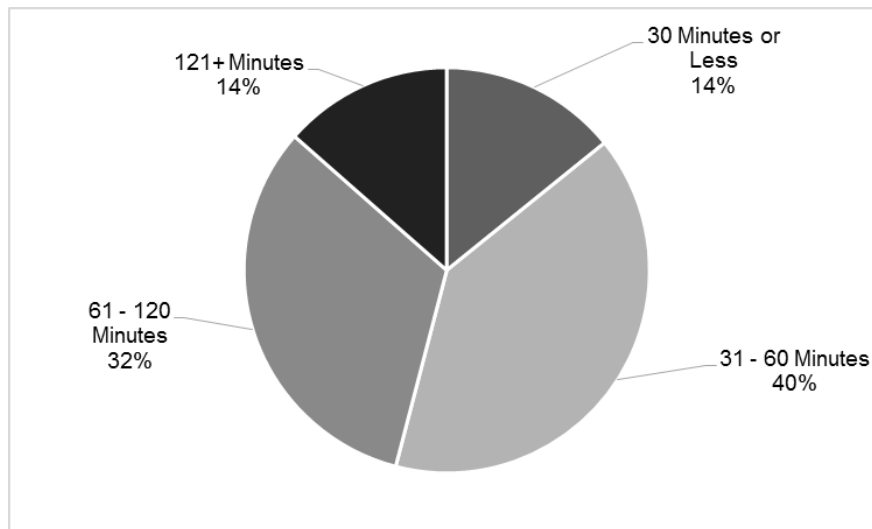
In 2016, ATRI conducted the Phase I survey of drivers operating in the MAASTO region, to better understand issues in the region and inform TPIMS development. The Phase II truck parking survey results will be compared to the 2016 baseline survey.

Truck parking is a critical issue in the trucking industry. “Truck parking” consistently ranks in the top ten industry issues in the annual survey conducted by ATRI, shown in Table 1. Parking scarcity impacts operational efficiency and directly relates to safety. If available parking cannot be found within a driver’s available Hours of Service (HOS), they may be forced to parking in an illegal or unsafe location or continue driving while fatigued.

Table 1: Top Industry Issues - 2017

Rank	Commercial Drivers	Motor Carrier Executives
1	Electronic Logging Device (ELD) Mandate	Driver Shortage
2	Truck Parking	ELD Mandate
3	Hours-of-Service (HOS)	Driver Retention
4	Cumulative Economic Impact of Trucking Regulations	CSA
5	Driver Distraction	HOS
6	CSA	Cumulative Economic Impact of Trucking Regulations
7	Driver Health/Wellness	Transportation Infrastructure / Congestion / Funding
8	Driver Retention	Driver Distraction
9	Transportation Infrastructure / Congestion / Funding	Truck Parking
10	Autonomous Vehicles	Tort Reform

Figure 1: Average Daily Productivity Loss per Driver

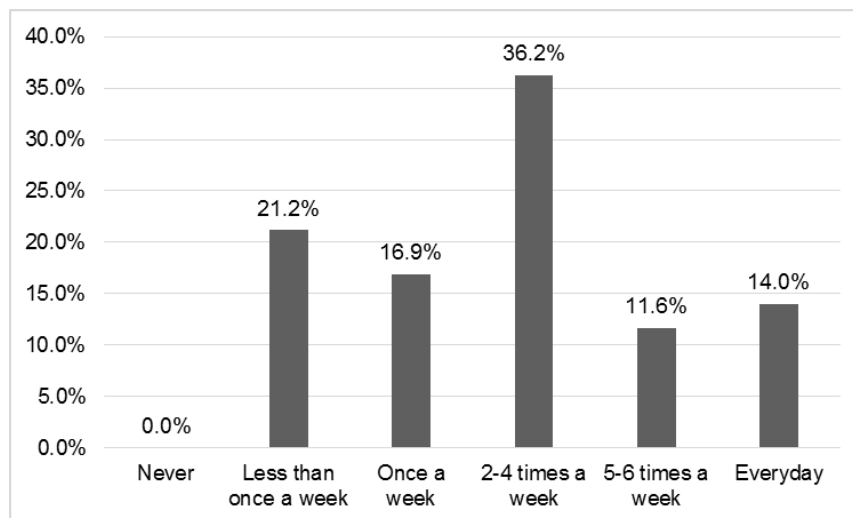


RESULTS

ATRI developed and deployed a 20-question truck driver survey. The survey gathered information on demographics, the severity and frequency of parking-related issues in the MAASTO region and how to best disseminate parking information to drivers.

Nearly all drivers surveyed require parking in the MAASTO region at least once a week with over 60 percent of drivers needing parking two to seven days each week. Figure 2 displays the frequency that drivers require truck parking in MAASTO states.

Figure 2: Frequency Respondents Require Parking in MAASTO Region



DEMOGRAPHICS

Information on driver age and gender was gathered to determine if the sample were representative of the industry as a whole. 84.6 percent of respondents were men and 15.4 were women. Relative to the industry overall, where women represent 6 to 8 percent of drivers, the sample over-represents women.¹

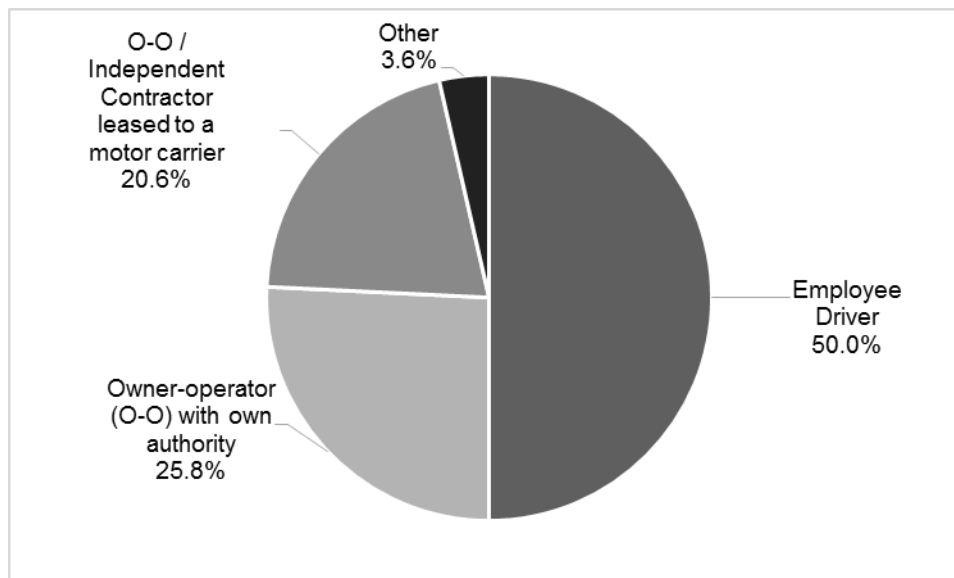
Driver age is displayed in Table 2. Drivers younger than 45 are under-represented, while drivers 45 and older are over-represented.

Table 2: Driver Age

Age	MAASTO Driver Respondents	Industry ²
Less than 25 years	0.0%	4.4%
25-44 years	24.8%	38.8%
45-64 years	67.8%	50.6%
65 or more years	7.4%	6.3%

A majority of respondents were employee drivers (50.0%), followed by owner-operators (O-Os)/independent contractors with their own authority (25.8%). Respondent operating status is shown in Figure 3.

Figure 3: Respondent Operating Status



¹ American Trucking Trends (2017). American Trucking Associations. Arlington, VA.

² Short, Jeffrey. 2017 Update to Analysis of Truck Driver Age Demographics Across Two Decades. American Transportation Research Institute. Arlington, VA.

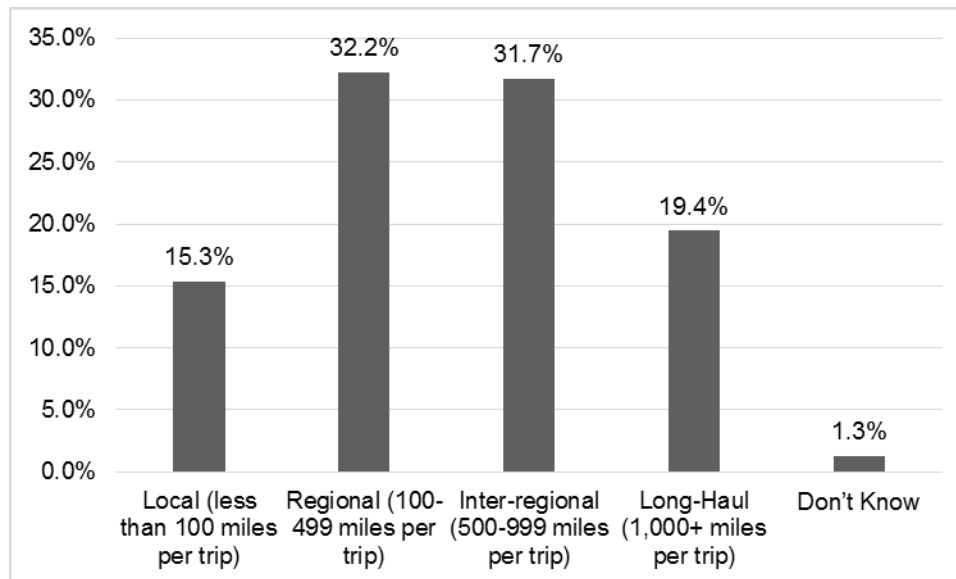
As show in Table 3, the majority of respondents operate in the for-hire segment (67.1%). The truckload sector was the most common for-hire driver segment, comprising 42.3 percent of respondents.

Table 3: Industry Segment and Sector

Segment	Percent	
Private	29.0%	
For-Hire	67.1%	
Sector	Truckload	42.3%
	Less-than-Truckload	4.4%
	Specialized, Flatbed	5.9%
	Specialized, Tanker	0.0%
	Express / Parcel Service	1.5%
	Intermodal Drayage	1.3%
	Other	5.3%
	Don't Know	6.4%
Don't Know	3.9%	

In regard to the drivers average length of haul, roughly one third of drivers drive regionally (32.2%), and nearly another third drive inter-regionally (31.7%). Inter-regional and long-haul trip lengths are particularly important to understand their parking needs, as these drivers likely require parking for both the 10-hour HOS break and the 30-minute HOS break.

Figure 4: Average Length of Haul



Nearly half of respondents belong to small (less than 50 power unit) fleets. Most of the remaining drivers belonged to fleets with 51 – 250 power units (20.0%) or more than 1,000 power units (15.3%). Fleet size may influence parking through a number of channels. First, large fleets are more likely to have large trailer pools which facilitate drop and hook operations, reducing the impact of shipper/receiver delays on truck parking. Additionally, some truck stops allow drivers access to waive parking fees if the driver purchases products, such as fuel. Fleets contracting with specific truck stops for fuel may offer their drivers an edge if fueling allows drivers "free" access to paid parking.

Table 4: Survey Respondent Fleet Size

Fleet Size	Percent
Less than 50	42.2%
51 - 250	20.0%
251 - 1,000	12.8%
More than 1,000	15.3%
Don't Know	6.3%

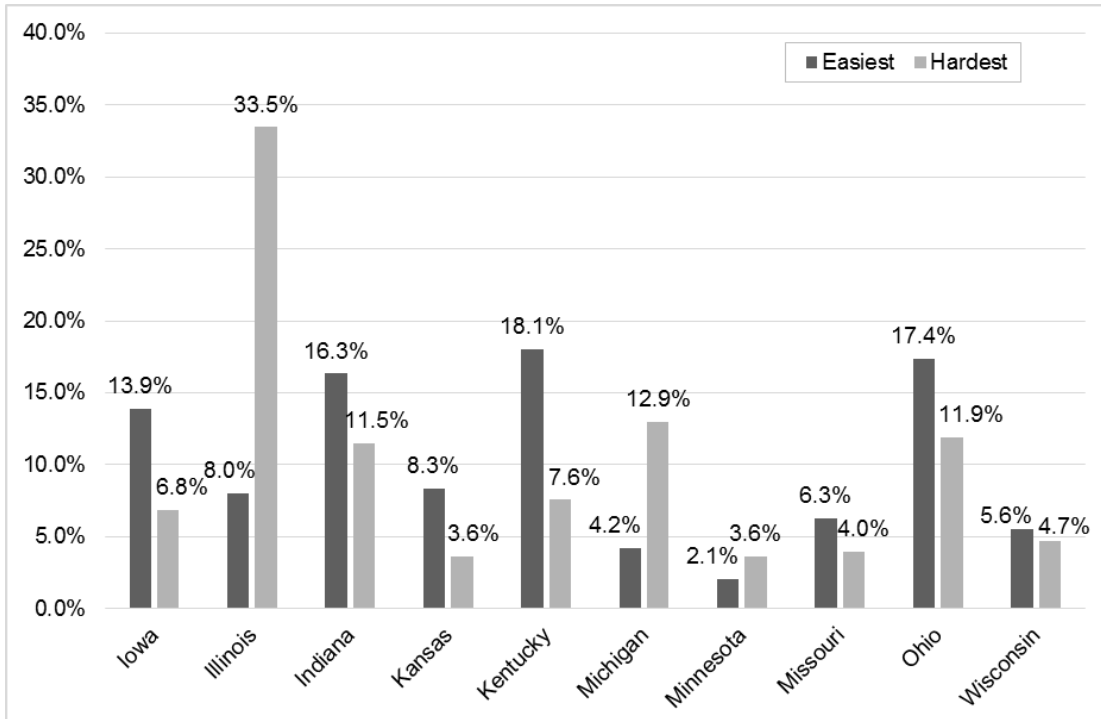
TRUCK PARKING ISSUES

To understand the truck drivers needs for safe, efficient parking and to compare to the Phase I baseline survey, respondents were asked a series of questions about truck parking issues.

The first question asked which MAASTO state is easiest and which state is the hardest to find truck parking (Figure 5). As in the Phase I truck parking survey, Illinois was overwhelmingly reported by respondents as the hardest state for finding truck parking (33.5%), followed by Michigan (12.9%), Ohio (11.9%) and Indiana (11.5%). Kentucky (18.1%), Ohio (17.4%) and Indiana (16.3%) are the states most frequently voted as the easiest states to locate available truck parking. These results differ from the Phase I survey, where drivers indicated that Iowa is the easiest state to find parking in.

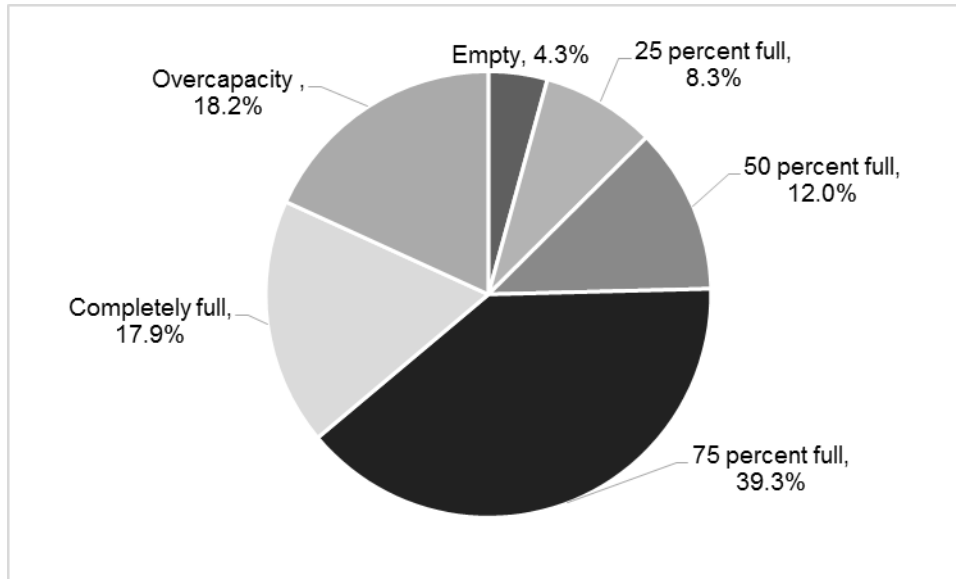
In the most recent survey findings, it is unclear why Ohio and Indiana were listed as both “hardest” and “easiest” states for truck parking. Anecdotally, the answer may reside with specific corridors and times of day that different truck drivers operate on. While additional analysis – such as comparing haul length or the frequency a driver parks in the MAASTO region – might add additional insight, the low number of drivers for each state category likely precludes this analysis.

Figure 5: Easiest and Hardest MAASTO States to Find Truck Parking In



The survey represents that it is difficult to find available parking at existing facilities in the MAASTO region. Nearly 40 percent of drivers reported that facilities are typically 75 percent full. In addition, 36 percent of respondents reported that facilities were typically completely full or over capacity. Over capacity facilities were defined as having trucks in unauthorized parking spaces – where vehicles are parked outside of unmarked spaces, or potentially at entrance/exit ramps and road shoulders. Unauthorized parking presents safety risks for the general motoring public, particularly on roadway shoulders and ramps, while parking outside of marked spaces may increase the risk of property damage if drivers no longer have adequate space to maneuver their vehicle.

Figure 6: MAASTO Region Parking Facility Utilization



Similar to the Phase I survey, drivers were more likely to disagree (35.5%) or strongly disagree (16.3%) with the statement "It is easy to find truck parking in the MAASTO region in comparison to truck parking in the rest of the U.S.". Since the Phase I survey, drivers find parking to be more difficult in the MAASTO region. Figure 7 shows a comparison of Phase I survey compared to Phase II.

Figure 7: Relative Ease of Truck Parking in the MAASTO Region

It is easy to find truck parking in the MAASTO region in comparison to truck parking in the rest of the U.S.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Phase 1 Survey	11.9%	30.0%	37.7%	17.0%	3.4%
Phase 2 Survey	16.3%	35.5%	33.1%	13.2%	1.9%

Drivers were asked to indicate how frequently they park in an unauthorized location, such as a road shoulder or ramp, in the MAASTO region (Table 5). Often, unauthorized parking is used as a proxy measure for truck parking shortages. This sample does not provide a clear conclusion on whether unauthorized parking is often the only option. Over half of drivers indicated they park in unauthorized locations sometimes (34.9%) or often (19.6%). On the other hand, 40 percent indicated that they never (20.4%) or rarely (22.0%) park in unauthorized locations.

Table 5: Frequency Drivers Park in an Unauthorized Location in the MAASTO Region

Never	Rarely	Sometimes	Often	Always
20.4%	22.0%	34.9%	19.6%	3.2%

The TPIMS project aims to reduce average search times for drivers looking for safe parking. In Phase II, drivers were less likely to report search times of over an hour (10.9% rather than 18.0%), and more likely to report search times of less than 15 minutes (20.6% rather than 9.9%). As in Phase I, a majority of responses indicated search times of 15 minutes to one hour (68.5%). Drivers state that parking is getting worse, which is expected in a growing economy. However, drivers appear to be getting more proficient at finding parking, based on the search time data. This may be due to increasing resources for drivers, such as parking applications to indicate parking availability. Despite the decline, search times still have significant impacts on operational efficiency and driver compensation. A conservative estimate of annual lost productivity for each driver in this sample equates to 2,000 miles and over \$3,000.00 of lost revenue. This was calculated with the following assumptions:

- a truck GPS-generated average speed of 39.98 miles per hour³
- an average marginal cost of \$63.66 per hour⁴
- 50 work weeks annually
- parking twice in the MAASTO region per week
- 30 minutes spent searching for parking

Table 6: Average Search Time

Search Time	Phase 1	Phase 2
Less than 15 minutes	9.9%	20.6%
15 minutes - 30 minutes	30.0%	36.7%
30 minutes - 1 hour	42.1%	31.8%
More than 1 hour	18.0%	10.9%

³ ATRI derived this speed using several datasets from the ATRI/Federal Highway Administration (FHWA) Freight Performance Measures (FPM) program. ATRI analyzed one full week of national FPM data in each of the four seasons in 2010 (February, May, August, October). This dataset consisted of over 110 million truck speed data points. The average speed figure was also validated by multiple motor carriers from various sectors of the industry. The 39.98 mph figure more accurately represents an average operational speed since it includes speeds in all types of operational conditions.

⁴ Hooper, A. and Murray, D. (2017). An Analysis of the Operational Costs of Trucking: 2017 Update. American Transportation Research Institute. Arlington, VA.

The survey asked drivers to provide information about their experience with specific issues in the MAASTO region (Table 7). Issue severity information gathered in Phase II differs slightly from Phase I. Several truck parking issues – particularly parking only being available on shoulders/ramps, parking only being available in unsafe locations, and parking not being available for oversize vehicle configurations – appear to have no discernible trend in terms of the prevalence of the issue. Answers on this question were very evenly divided between answers. Of those showing more of a trend, only 15 percent of drivers indicated that rest area time limits were an issue and only 4.5 percent indicated that they had issues with their truck being damaged while parked.

Table 7: MAASTO Region Truck Parking Issues

Issue	Always / Often	Sometimes	Rarely / Never
Rest area time limit restrictions	15.1%	36.9%	48.0%
Parking is only available on ramps or shoulders	33.1%	37.7%	29.2%
Parking is only available in unsafe locations	27.7%	39.3%	33.0%
Truck damaged while parked	4.5%	19.9%	75.6%
No parking available for oversize vehicle configurations	31.5%	23.2%	45.2%

TECHNOLOGY USE AND INFORMATION DISTRIBUTION

TPIMS will utilize smart phone applications and in-cab navigation systems so it is crucial to understand how drivers use technology while driving. A majority of drivers use smart phones (74.9%), followed by in-cab information systems (38.7%) and on-board communications (36.5%). Drivers who selected “other” typically specified they use GPS devices. For parking planning, drivers typically used smartphone apps (57.8%), followed by roadside signs (24.5%) and parking directories (23.4%).

Table 8: Technologies Used in the Truck

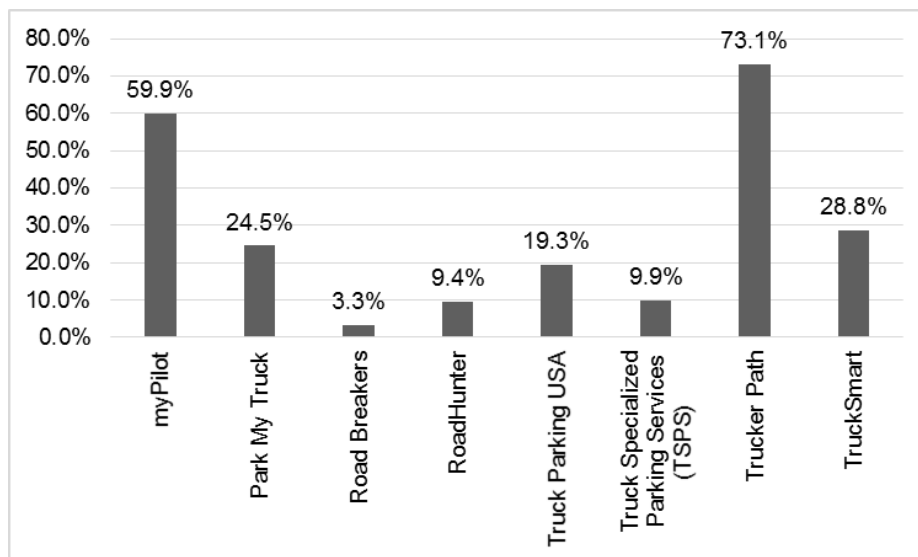
Technology	Percent
On-board Communication	36.5%
In-cab information system (e.g. PeopleNet, Omnitrac)	38.7%
Laptop in Vehicle	33.8%
Smartphone	74.9%
Other	6.5%
I do not use any of these technologies in my truck	6.5%

Table 9: Parking Planning Tools

Parking Planning Tools	Percent
Smartphone App	57.8%
Parking Directory	23.4%
Traveler Information Website	7.6%
Roadside Changeable Message Signs	7.9%
Roadside Signs	24.5%
Other	0.3%
I do not use any planning tools	19.1%

Drivers using smartphone applications to find truck parking indicated that 73 percent use Trucker Path, 60 percent use myPilot and 29 percent use TruckSmart. Trucker Path was the most commonly used application in the Phase I survey.

Figure 8: Smartphone Apps Used to Locate Parking



To understand how to best market the TPIMS system to drivers, the survey asked drivers to indicate the top three trucking media outlets they utilize. With almost half of drivers indicating that they get trucking industry news through Land Line magazine, it was the most popular media outlet. One third of drivers get their news from the Road Dog Trucking, while another 27 percent use other satellite radio stations to get trucking news.

Table 10: Preferred Trucking Industry News Media

Media	Percent
Land Line Magazine	42.8%
Satellite Radio - Road Dog Trucking	34.3%
Satellite Radio - Other	27.0%
American Trucker	22.1%
Truckers News	20.4%
Transport Topics	12.5%
Heavy Duty Trucking	9.8%
Fleet Owner Magazine	9.5%
eTrucker.com	6.3%
Trucks.com	5.4%
TruckingInfo.com	4.4%
Commercial Carrier Journal	3.8%
Today's Trucking	3.8%
Bulk Transporter	2.7%
Other	0.3%

CONCLUSION

Parking Difficulty. Over half of drivers think that finding parking in the MAASTO region is more difficult than the rest of the U.S. and since the publishing of the Phase I survey, responses indicate that the situation has gotten more difficult. Three quarters of drivers reported MAASTO parking facilities are typically at least 75 percent full, if not over capacity.

Search Times. Driver search times in the MAASTO region have decreased since the Phase I survey. Most drivers spend 15 minutes to one hour searching for parking. A conservative estimate of the lost productivity resulting from drivers searching for parking is 2,000 revenue miles or \$3,000.00 of revenue annually. Drivers may be getting more proficient at locating available parking, as search times are decreasing despite drivers indicating that parking in the MAASTO region has become more difficult since the Phase I survey.

Unauthorized Parking. Over one third of those surveyed park in unauthorized locations when necessary.

Frequency that Drivers Experience Parking-Related Issues. Questions related to the frequency drivers experience specific issues demonstrated that rest area time limits and having their truck damaged while parked were relatively uncommon issues. The trends for other issues – parking only being available on shoulders/ramps or in unsafe locations and no parking for oversize vehicle configurations – were less clear.

Information Dissemination. Survey results indicate Smartphones are the most commonly used in-truck technology and Trucker Path is the most common application used for parking planning. Land Line magazine is the most common media outlet for trucking news, followed by Road Dog Trucking on satellite radio.