MAASTO Regional Truck Parking Information Management System (TPIMS)
Trucking industry’s NFP research organization

- Safety
- Mobility
- Economic Analysis
- Technology
- Environment

www.TruckingResearch.org
2017 Top Industry Issues

1. Driver Shortage (7)
2. ELD Mandate (1)
3. Hours-of-Service (2)
4. Truck Parking (4)
5. Driver Retention (8)
6. CSA (6)
7. Cumulative Economic Impact of Regulations (3)
8. Driver Distraction (10)
9. Transportation Infrastructure/Congestion/ Funding (9)
10. Driver Health and Wellness (12)
<table>
<thead>
<tr>
<th>Commercial Drivers</th>
<th>Motor Carrier Execs</th>
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<tbody>
<tr>
<td>1. ELD Mandate</td>
<td>1. Driver Shortage</td>
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<tr>
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<td>Congestion/Funding</td>
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<td>9. Truck Parking</td>
</tr>
<tr>
<td>10. Autonomous Vehicles</td>
<td>10. Tort Reform</td>
</tr>
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</table>
Travel Diaries and Surveys

**Truck Parking Diaries**
- 14 days of parking activity
- 148 diaries completed in 2016
- 2,035 days of truck parking activity
- 4,763 unique stops

**Truck Driver Survey**
- Jason’s Law: 8,150
- Kansas DOT: 1,300
- MAASTO: 2,659
- North Carolina DOT: 777
Ease of Finding Parking

It is easy to find truck parking in the 10 MAASTO states in comparison to truck parking in other regions.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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<tr>
<td>1.9%</td>
<td>13.2%</td>
<td>33.1%</td>
<td>35.5%</td>
<td>16.3%</td>
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It is easy to find truck parking in the 10 MAASTO states for the required Hours of Service 10-hour break.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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<tbody>
<tr>
<td>3.3%</td>
<td>6.9%</td>
<td>20.9%</td>
<td>47.8%</td>
<td>21.1%</td>
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No Vacancy
Frequency of Unauthorized/Undesignated Parking

- Daily: 9.5%
- Never: 10.8%
- Twice per Month: 5.4%
- 1 - 2 Times per Week: 25.7%
- 3 - 4 Times per Week: 36.5%
- 5 - 7 Times per Week: 12.2%
Safer, faster parking

Source: Survey data presented by Desiree Wood, Andrew Warcaba Associates and Hope Rivenburg
The MAASTO TPIMS Project

Average Remaining Drive Time

- 31 - 60 Minutes: 40%
- 61 - 120 Minutes: 32%
- 121+ Minutes: 14%
- 30 Minutes or Less: 14%

Average = 56 minutes/day  Opportunity Cost = $4,600 annually
ELDs: nearly 2x as likely to spend 30+ minutes looking for parking
TPIMS at a glance

• 139 public and private sites
• $31.2 million in federal funding
• Collect, aggregate and communicate real-time parking availability
• Measure impact on truck parking and safety
• System launch: January 2019
How does TPIMS help?

- Give parking information to drivers in route
- Rely initially on dynamic messaging signs
- Locate signs at routing decision points
- Provide drivers with multiple parking options
- Make system seamless for users
# Seamless system challenge

<table>
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<tr>
<th>Functions</th>
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Key TPIMS decisions

• Public vs. Private Sites
• Data Collection
  – Entrance and exit or individual space counts
• Data Aggregation
  – Integrated with ATMS or separate
  – Local or cloud
• Data Communication
Public vs. private sites

**Public sites**
- Owned, maintained and operated by state agencies
- Rest areas, weigh stations
- Direct access
- Limited parking slots, simpler designs
- Greater control over data collection and distribution

**Private sites**
- Owned, maintained and operated by private sector
- Truck stops
- Indirect access, often with multiple driveways and mixed truck-car traffic
- Greatest number of parking slots
- 3 states participating: KY, IA and MI
The MAASTO TPIMS Project

Data collection

Entrance and Exit Counts
- In-pavement magnetometer
- Video cameras
- Laser technology
- Radar

Space Occupancy Counts
- Infrared/magnetometers
- Microwave/magnetometers
- Video cameras
Indiana TPIMS

- 10 Sites on I-65
- 3 Sites on I-69
- 6 Sites on I-70
- Technology: In/Out
How the Indiana TPIMS works

Entrance and Exit Counts

- In-pavement magnetometer
- Video cameras
Data aggregation
The MAASTO TPIMS Project

Public Data Feed

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>siteId</td>
<td>string</td>
<td>Unique fixed-length identifier including state, route number, route type,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>reference post, side of road and unique location number or name abbreviation. See more detailed description in appendix.</td>
</tr>
<tr>
<td>timeStamp</td>
<td>string</td>
<td>Provides the date and time that the site record was last updated. See more detailed data and time representation description in appendix.</td>
</tr>
<tr>
<td>timeStampStatic</td>
<td>String</td>
<td>Provides the date and time that the site static record was last updated. See more detailed data and time representation description in appendix.</td>
</tr>
<tr>
<td>reportedAvailable</td>
<td>string</td>
<td>Number of available spots shared through the data feed. The number is capped at the total number of parking spots at the site and “Low” is reported if the low threshold is reached.</td>
</tr>
</tbody>
</table>

Dynamic Public Feed - example

JSON format

```
[{"siteId":"WI00094IS0012400ERSTARE53","timeStamp":"2016-08-15T20:35:15Z","timeStampStatic":"2015-05-03T12:24:19Z","reportedAvailable":"25","trend":"FILLING","open":true,"trustData":true}]
```

Dynamic Public Feed - live URL

https://transportal.cee.wisc.edu/TPIMS/dynamic

Optional. Reports whether the site is emptying, steady or filling. Accepted values: “CLEARING” / “STEADY” / “FILLING” / null. See more detailed description in appendix.

Will report open unless the parking site is closed to parking for maintenance or another situation. Possible values: true / false / null

This flag will report that the site is operating normally. Possible reasons for a “false” value include periods where the site is under construction while open to traffic, IT maintenance windows, or equipment failures. Possible values: true / false / null
Data communication
Performance measures

Parking Utilization
• Are drivers utilizing TPIMS to inform their parking decisions?
• Have driver-perceived parking shortages declined?

Safety and Security
• Are truck parking facilities more safe and secure?
• Is there a reduction in illegal or informal parking?
• Is there a reduction in fatigue-related crashes?

System Reliability
• Is there a decline in the average time spent looking for parking?
• Is the system meeting its performance requirements for accuracy?
TPIMS questions?

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