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

• Safety
• Mobility
• Economic Analysis
• Technology
• Environment

www.TruckingResearch.org
Board of Directors

The MAASTO TPIMS Project
Research Advisory Committee
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)
# Top Issues Drivers vs. Carriers

## Commercial Drivers
1. ELD Mandate
2. Truck Parking
3. Hours-of-Service
4. Cumulative Economic Impact of Trucking Regulations
5. Driver Distraction
6. CSA
7. Driver Health/Wellness
8. Driver Retention
9. Transportation Infrastructure Congestion/Funding
10. Autonomous Vehicles

## Motor Carrier Execs
1. Driver Shortage
2. ELD Mandate
3. Driver Retention
4. CSA
5. HOS
6. Cumulative Economic Impact of Trucking Regulations
7. Transportation Infrastructure Congestion/Funding
8. Driver Distraction
9. Truck Parking
10. Tort Reform
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>
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<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
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<td>1.9%</td>
<td>13.2%</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>
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<td>3.3%</td>
<td>6.9%</td>
<td>20.9%</td>
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No Vacancy
No Vacancy

Cumberland County, PA Rest Area: I-81 Northbound
January, 2017
The MAASTO TPIMS Project

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
Average Remaining Drive Time

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

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

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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

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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
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
Public Data Feed

Dynamic Public Feed - example

**JSON format**

```json
[{
  "siteId": "WI000941S0012400ERSTARE53",
  "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](https://transportal.cee.wisc.edu/TPIMS/dynamic)

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<th>Description</th>
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<td>string</td>
<td>Unique fixed-length identifier including state, route number, route type,</td>
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<tr>
<td></td>
<td></td>
<td>reference post, side of road and unique location number or name abbreviation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See more detailed description in appendix.</td>
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<tr>
<td>timeStamp</td>
<td>string</td>
<td>Provides the date and time that the site record was last updated. See more</td>
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<tr>
<td></td>
<td></td>
<td>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.</td>
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<tr>
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<td>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</td>
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<tr>
<td></td>
<td></td>
<td>at the total number of parking spots at the site and “Low” is reported if</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the low threshold is reached.</td>
</tr>
</tbody>
</table>

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

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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?
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TPIMS questions?

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