I-10 Truck Parking Availability System (TPAS)

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MAASTO Truck Parking Information Management System (TPIMS)

FHWA Roundtable for I-81

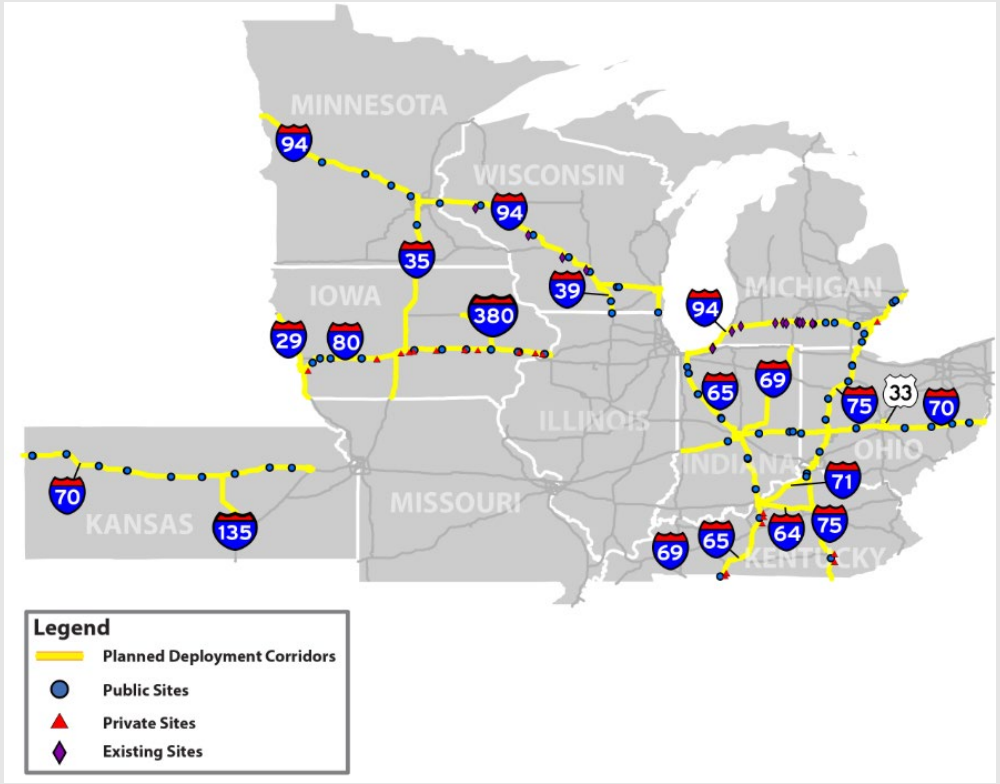
June 29, 2022

I-10 TPAS Overview

- Provides real-time truck parking availability information
- Deployed at 37 rest areas along the corridor
- ATCMTD Grant
- Project website: www.i10connects.org

MAASTO TPIMS At a Glance

- 139 public and private sites
- $31.2 million in federal funding (TIGER)
- Collect, aggregate and communicate real-time parking availability
- Measure impact on truck parking and safety
- System launch: January 2019
- www.trucksparkhere.com



TPIMS/TPAS Objectives

- Reduce fatigued driving
- Reduce travel time searching for truck parking
- Reduce parking along highway shoulders and ramps
- Improve commercial vehicle safety
- Create a system that can be expanded

How does TPIMS/TPAS help?

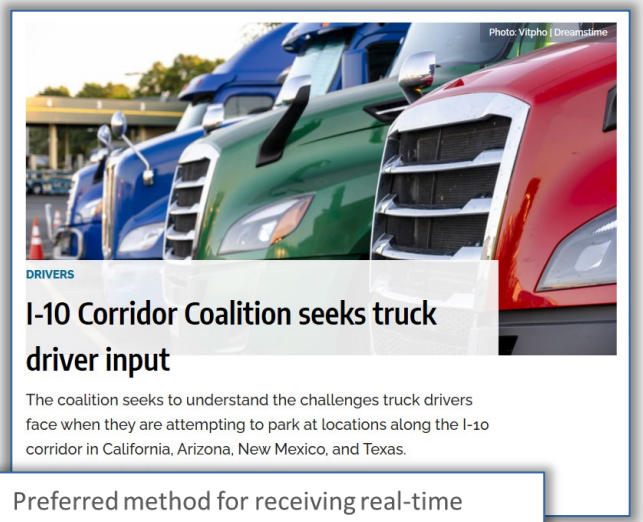
- Give parking information to drivers in route
- Rely initially on dynamic messaging signs
- Locate signs at routing decision points
- Provide drivers with multiple parking options
- Make system seamless for users

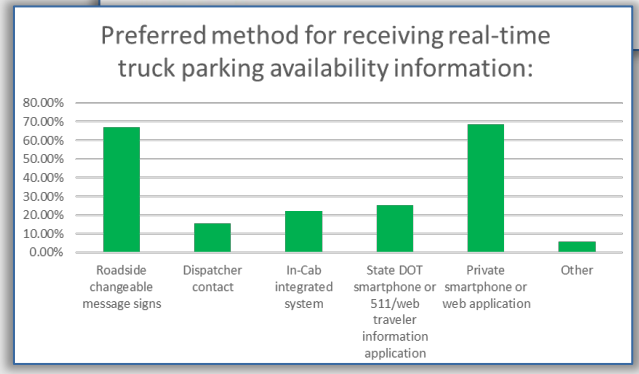
Stakeholder Outreach

- Trucking Industry Stakeholder Workshops
- Trucking Industry Stakeholder Interviews
- Electronic Surveys
- Third Party Application Developer Truck Parking Data Feed Awareness and Educational Outreach
- Freight Advisory Committee Outreach
- I-10 Corridor Coalition website www.i10connects.com

Truck Industry Feedback

- Aware of TPAS and use similar systems throughout the country
- System accuracy and reliability is important
- More information is always helpful and preferred
- Dynamic parking availability signs and smartphone and online applications are preferred
- 5 minutes is considered reliable for “real-time” information
- Additional parking capacity is a priority





How TPIMS/TPAS Works

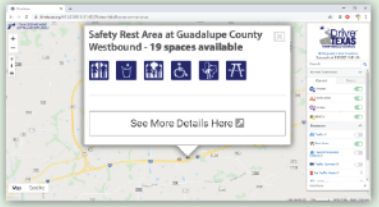
1 **Vehicle detection systems measure available truck parking in rest areas and/or travel information centers across each state**

2 **Parking data goes to states and 3rd party processors**

3* **Data is delivered to drivers**

Dynamic Parking Availability Signs

State Traveler Information Website



* Examples are for illustrative purposes only

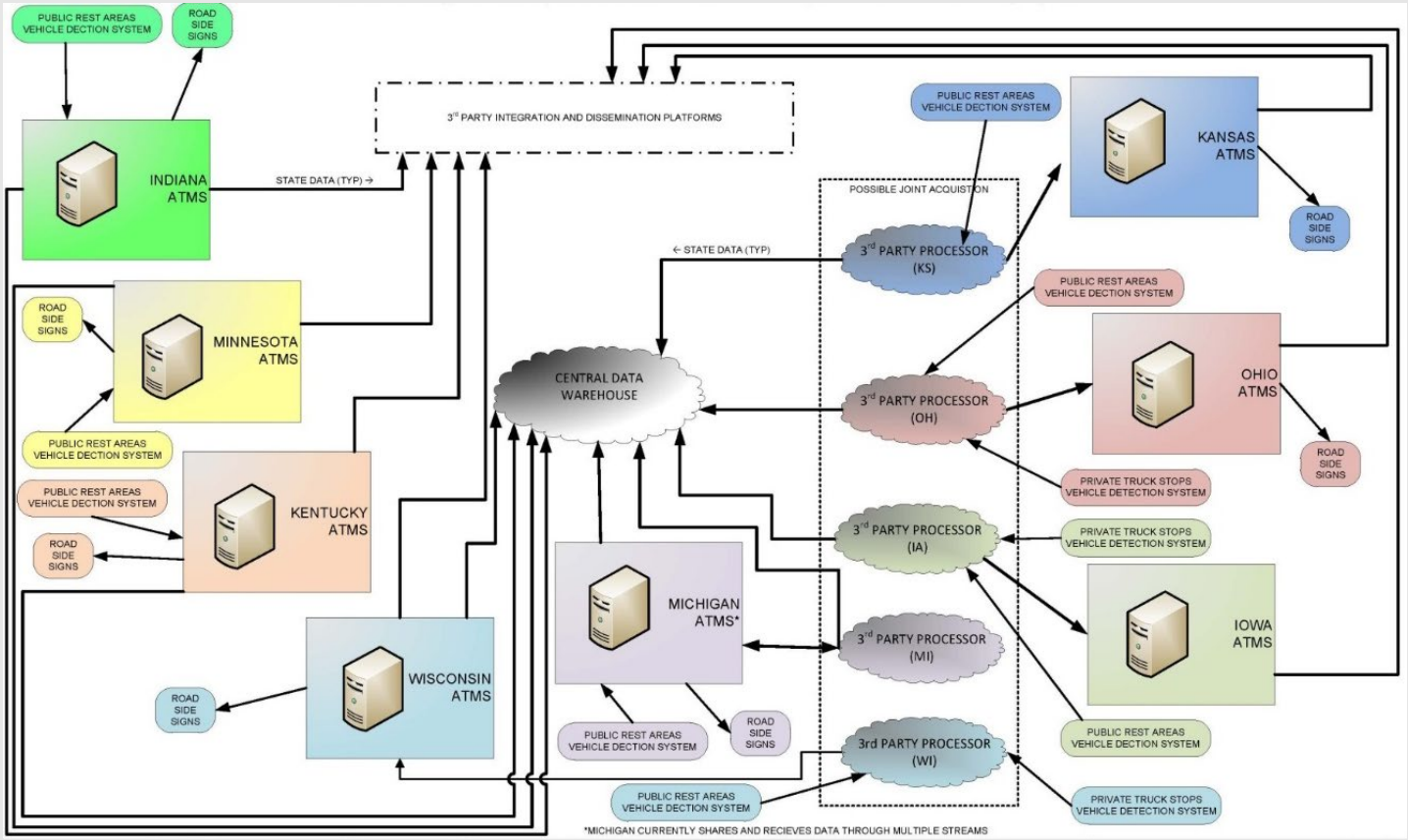
Key Deployment Decisions

- 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

Seamless System – tracking core functions

Functions	Type	Iowa	Ohio	Michigan	Kentucky	Wisconsin	Indiana	Kansas	Minnesota
Procurement	Public	DBOM	DBOM	DBB	DBB	DBB	DBB	DBB	DBB
	Private		N/A	DBOM		N/A	N/A	N/A	N/A
Data Collection Method	Public	Functional Requirements	Functional Requirements	In/Out	In/Out	In/Out	In/Out	Space-by-Space	Space-by-Space
	Private		N/A			N/A	N/A	N/A	N/A
Data Collection Technology[6]	Public	Functional Requirements	Functional Requirements[1,2]	Video	Magnetometer	Magnetometer	Magnetometer	Video[2]	Magnetometer
	Private		N/A	Video		N/A	N/A	N/A	N/A
Operations & Maintenance	Public	Third Party	Third Party	Internal[3]	Third Party[4]	Third Party	Internal	Third Party	Internal
	Private		N/A	Third Party		N/A	N/A	N/A	N/A
	Sign Operations	N/A	Internal	Internal	Internal	Internal	Internal	Internal	Internal
Data Analytics & Sharing	Processing	Third Party	Third Party	In-House ATMS[7]	In-House ATMS	Third Party	In-House ATMS	In-House[8]	In-House ATMS
	Software	Not Developed	Not Developed	Current	Not Developed	Current	Not Developed	Not Developed	Needs Additional Development
	Sharing Format	XML Data Feed	XML Data Feed	XML Data Feed	XML Data Feed	XML Data Feed	XML Data Feed	XML Data Feed	XML Data Feed
Information Dissemination	Signs	No Signs	DTPS	DTPS	DTPS	DTPS	DTPS	DTPS	Full-Matrix Color DMS
	Website	State and Third Party[5]	State and Third Party[5]	State and Third Party[5]	State and Third Party[5]	State and Third Party[5]	State and Third Party[5]	State and Third Party[5]	State and Third Party[5]
	Mobile Website/ Mobile App	State and Third Party[5]	State and Third Party[5]	State and Third Party[5]	State and Third Party[5]	State and Third Party[5]	State and Third Party[5]	State and Third Party[5]	State and Third Party[5]

Data Aggregation – System of Systems



Public Data Feed

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

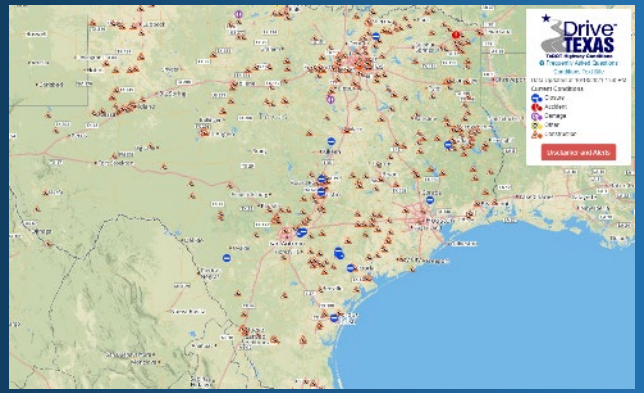
https://transportal.cee.wisc.edu/TPIMS/dynamic

https://trucksparkhere.com/developer-info/

Element	Type	Description
siteId	string	Unique fixed-length identifier including state, route number, route type, reference post, side of road and unique location number or name abbreviation. See more detailed description in appendix.
timeStamp	string	Provides the date and time that the site record was last updated. See more detailed data and time representation description in appendix.
timeStampStatic	String	Provides the date and time that the site static record was last updated. See more detailed data and time representation description in appendix.
reportedAvailable	string	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.
trend	string	Optional. Reports whether the site is emptying, steady or filling. Accepted values: **"CLEARING"** / **"STEADY"** / **"FILLING"** / **null**. See more detailed description in appendix.
open	boolean	Will report open unless the parking site is closed to parking for maintenance or another situation. Possible values: **true** / **false** / **null**
trustData	boolean	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**

How the Information is Shared

Truck Parking Signs



Integrated into State Travel Sites

Data Feed for 3rd-party Applications

Data Feed for In-cab Integration

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?

Corridor/Region Project Lessons Learned

LESSON 1

FOCUS ON OUTCOMES

Focusing on outcomes – safety, ease of use, consistent regional access to parking information – was critical for success. Agreed-to goals enabled the Partnership to reframe discussions about technological solutions in terms of end-user benefits rather than agency custom. It removed potential conflicts about how each state delivered those benefits since each one could achieve the goal in its own way, reflecting its operational, regulatory and statutory preferences and constraints.

LESSON 2

LINK GOALS AND PERFORMANCE

The ability to rule particular technology in or out of consideration based on agreed-to goals and performance measures reduces opportunities for delay. It shifts the focus from "how we do it" to "will it help achieve the end results." In the process, partner agencies can better accept differing agency approaches if they see they don't affect the ultimate delivery of services and results. Finally, it is simpler to address late-breaking project questions or changes by analyzing them in light of whether they improve or degrade results under agreed-upon performance measures.

Corridor/Region Project Lessons Learned continued…

LESSON 3

COMMUNICATE EARLY AND OFTEN

Team members may differ regarding the manner of system design and testing. But common standards for testing and communication increase the likelihood of success. Early in design, for example, it became clear that moving parking facility utilities could require more coordination than expected. Sharing this enabled agency partners to adapt construction and testing approaches, eliminating potential delay. As each state was completing final design and installation prior to testing, monthly project team meetings coupled with individual WebEx conference calls combined to make sure that work was proceeding on schedule and that partner agencies could benefit from each other's experiences.

LESSON 4

DEFINE ROLES CLEARLY

Federal grants require a lead applicant - for MAASTO TPIMS, KDOT administers the TIGER grant; for I-10 TPAS TxDOT administers the ATCMTD grant. The lead agency also manages the group's activities in support of monthly and milestone progress; and facilitates group and stakeholder meetings designed to ensure that the system meets partner and end-user needs and expectations. This frees up each state to focus on only its own implementation plan, schedule and budget.

OTHER SUCCESS FACTORS TO CONSIDER

- Verify proposed sign locations to preclude field issues.
- Locate signs to maximize truck driver decision making.
- Market new system internally and externally to maximize acceptance and use.
- Coordinate with other current and proposed truck parking system to ensure consistent regional and national protocols for information distribution.