I-95 CORRIDOR COALITION WEBINAR:

INSIDE THE MAASTO TRUCK PARKING INFO MANAGEMENT PROJECT

March 13, 2020

I-95 CORRIDOR COALITION

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Webcast and Audio Information

- This is a **virtual meeting** experience
  - **Please mute your line** until you are making a comment or asking a question (press *6 to mute/unmute individual phone lines)
  - Please do not place call “on hold” as your hold music will be heard by the group
- **This web meeting is being recorded**
- **Meeting materials will be available to participants after the web meeting**

Make Comments & Ask Questions

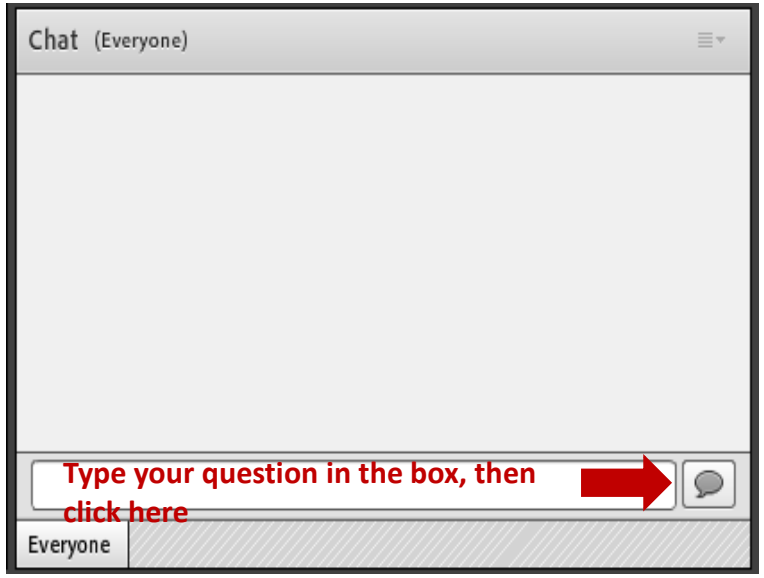
We encourage EVERYONE to participate……

VERBALLY

- Please give your name and agency before asking your question (at least the first time)
- Keep your line muted when not asking a question

IN THE CHAT BOX

- You may pose your questions using the chat box



While you are not speaking….
Please confirm you are
MUTED

For your phone line - press *6

&

Mute your computer

Thank
You!

Welcome & Introductions

Marygrace Parker, Intermodal Freight Director,
I-95 Corridor Coalition

Agenda

Topic	Speaker
Welcome and Objectives	Marygrace Parker, I-95 Corridor Coalition
MAASTO Regional Truck Parking Project Overview	Cory Davis, Kansas DOT/Brian Comer, HNTB
Iowa DOT Truck Parking Project	Eric Strack and Chuck Miller, HNTB for Iowa DOT
Truck Parking Technologies; Private Sector Engagement	Scott Grenerth and Carl Rundell, Truck Specialized Parking Services Inc.
Minnesota DOT Truck Parking Project	Andrew Andrusko, Minnesota DOT
Q&A, Wrap Up	Marygrace Parker, I-95 Corridor Coalition

Opening Remarks

Marygrace Parker, Intermodal Freight Director,
I-95 Corridor Coalition

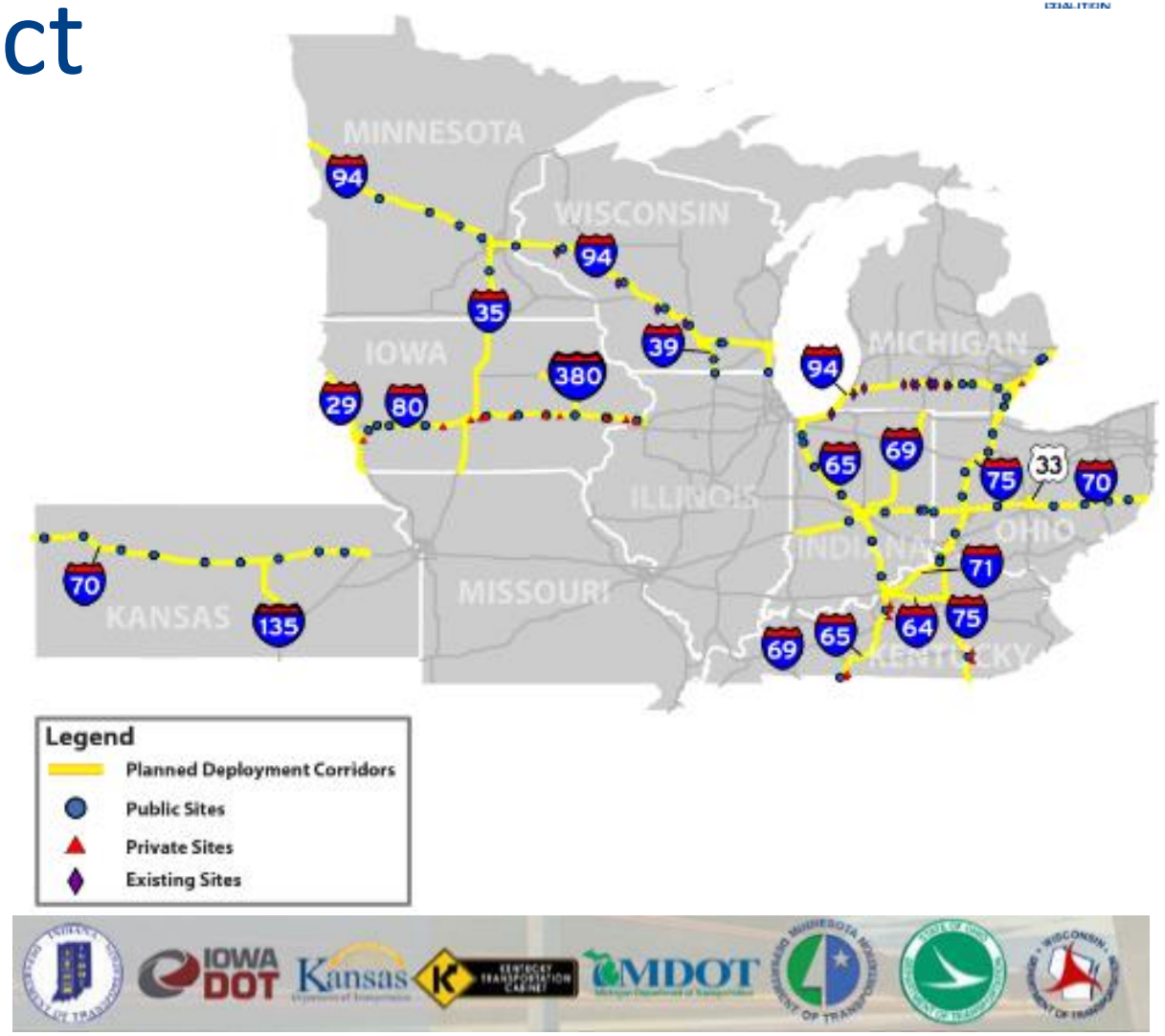
MAASTO Regional Truck Parking Project Overview

Cory Davis, Regional PM
Kansas DOT

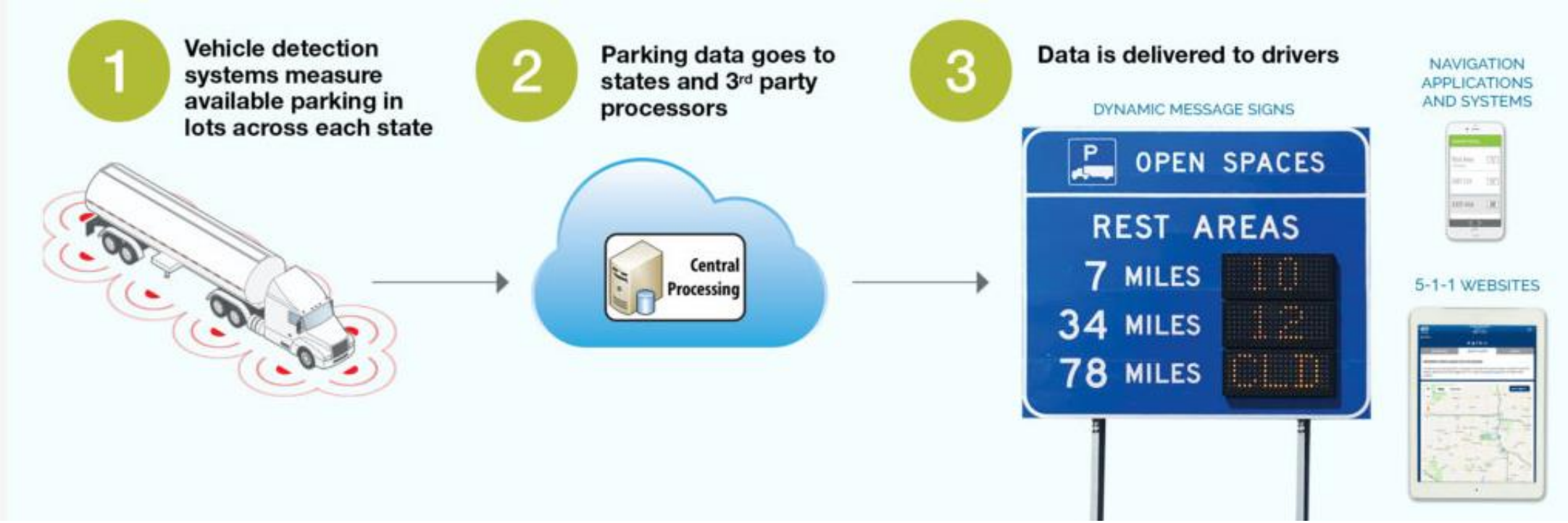
Gretchen Ivy, Consultant PM
Brian Comer, Planning, Reporting
HNTB

MAASTO TPIMS Project

- Focus on Midwest freight corridors
- Collect real-time parking data
- Monitor 130+ public and private sites
- Aggregate and analyze data
- Share parking availability data through common API
- Measure impact on parking, truck-related safety



How TPIMS works

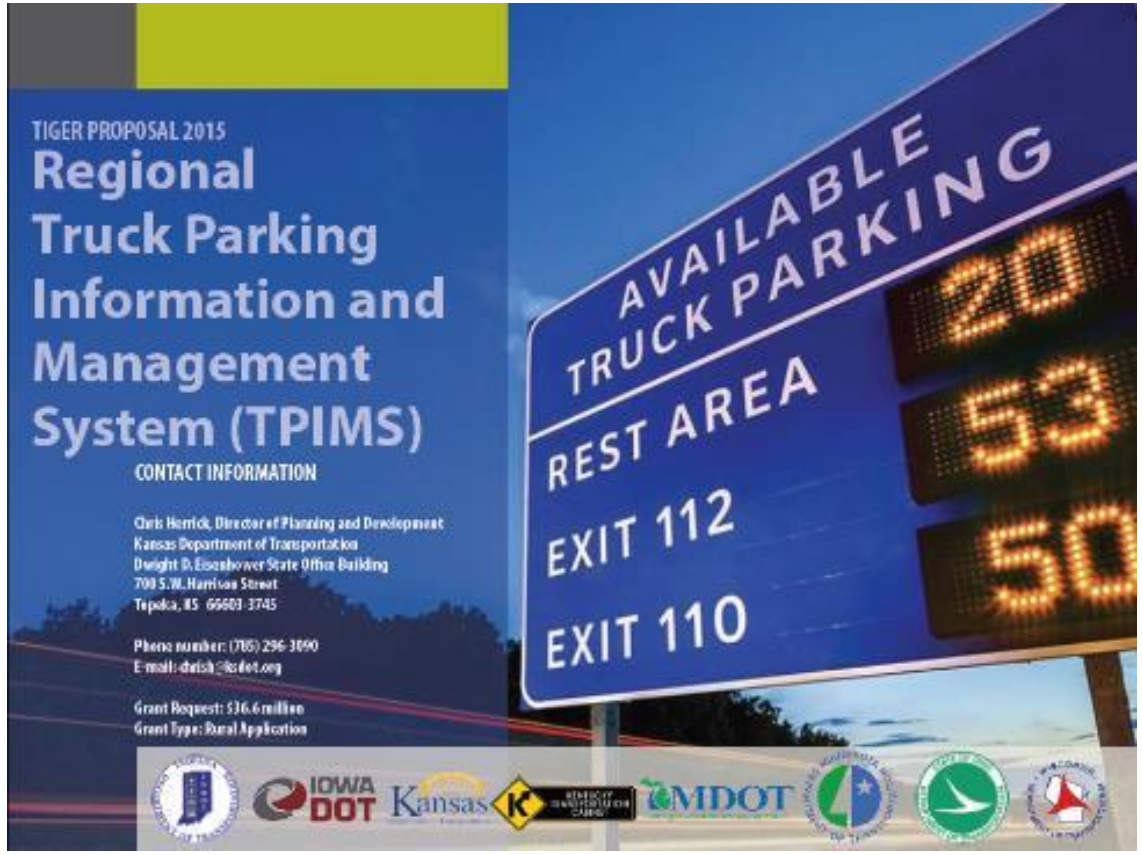


MAASTO partnership coordination

- Coordination calls
  - Bi-weekly through design
  - Monthly through construction
  - Quarterly after go-live
- In-person workshops at major project milestones:
  - Project kick-off
  - ConOps/systems requirements
  - PS&E approval
  - Testing/burn-in

Funding and grant administration

- 2015 $25M TIGER Grant; 2018 awarded an additional $6.25M Federal funds
- KDOT is the lead agency; Kansas developed state-to-state agreements with partner states
- States set aside a portion of funding for regional services:
  - Concept of Operations and System Requirements
  - 30% design
  - Regional project oversight

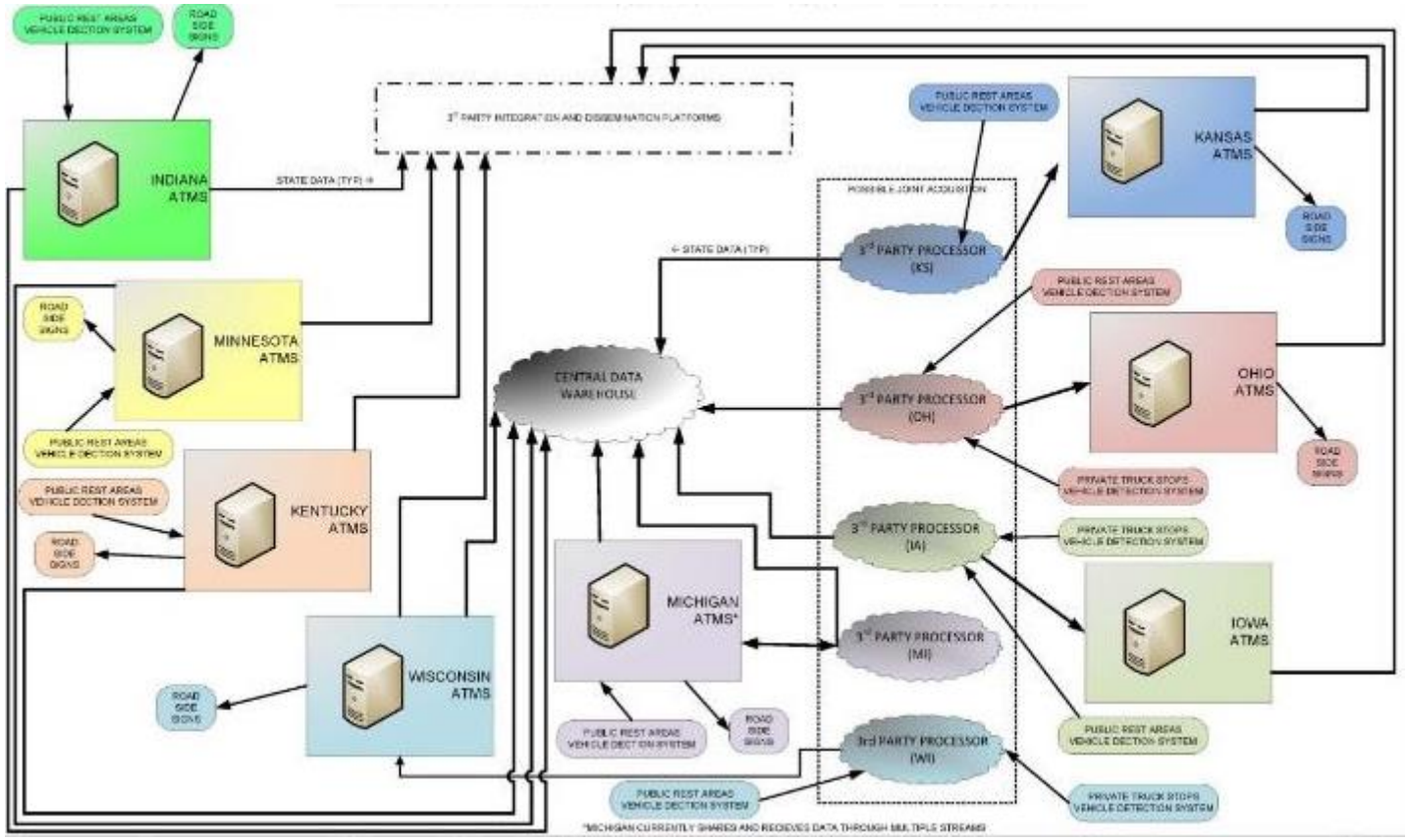


Seamless regional system

Functions	Type	Iowa	Ohio	Michigan	Kentucky	Wisconsin	Indiana	Kansas	Minnesota
Procurement	Public	DBOM	DBOM	DBB	DBB	DBB	DBB	DBB	DBB
	Private		N/A	N/A	DBB	N/A	N/A	N/A	N/A
Data Collection Method	All	Functional Requirements	Functional Requirements	In/Out	In/Out	In/Out	In/Out	Space-by-Space	Space-by-Space
Data Collection Technology	Public	Functional Requirements	Functional Requirements	Video	Radar	Magnetometer	Magnetometer	Video Rendering	Magnetometer
	Private			N/A	Video	N/A	N/A	N/A	N/A
Operations & Maintenance	Public	DBOM	DBOM	MDOT	KYTC	3rd Party	INDOT	3rd Party	MNDOT
	Private			N/A		N/A	N/A	N/A	N/A
Information Dissemination	All	State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed

Data sharing and archiving

- Public data feed
  - 511/traveler information websites and applications
  - 3rd party applications
- Archive data feed: Mid-America Freight Coalition (MAFC) Data Warehouse



Dynamic Public data 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

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**

Dynamic message signs

- Dedicated truck parking signs
- Two or three locations per sign
- Hybrid static/dynamic message signs

Data communication

TSPS

Smart Truck Route

Mile On

TruckMap

NACFE

Trucker Tools

American Truck Parking

Road Hunter

Truck Parking USA

Performance measures

- Parking Utilization and Demand Cycles
- Corridor Safety
  - Change in Hours-of-Service violations
- System Accuracy
- Reliability
  - System downtime
  - User complaints
  - Accuracy

Ease-of-use resources

TrucksParkHere.com

Questions?

For Kansas/MAASTO TPIMS Questions:

Cory Davis, Regional PM
Kansas DOT
cory.davis@ks.gov

For HNTB:

Brian Comer
bcomer@hntb.com
Gretchen Ivy
givy@hntb.com

Iowa TPIMS

Eric Strack, Consultant Support
HNTB*

Chuck Miller, Consultant Support
HNTB*

**On behalf of Phil Mescher, Iowa DOT*

Iowa TPIMS deployment

Deployed on I-80, I-29, I-35, I-235 and I-380 at:

- 29 public sites
- 14 private sites

Types of sites

- Public rest areas
- Truck weigh stations
- Private truck parking
  - Truck stops
  - Prairie Meadows Racetrack and Casino
  - Kum&Go Stores
  - Casey's General Stores
  - Kwik Star
  - Taylor Quick Pick
  - McDonalds

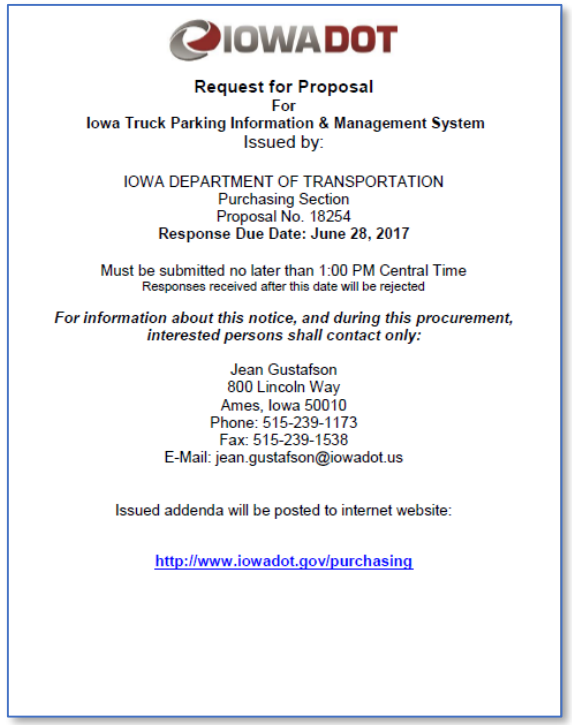
- No participation by most Pilot and Travel America truck stops
- Interest in own reservation system

Contracting approach

- Hire contractor to provide truck parking availability data
- Contractor
  - Deployed their own equipment
  - Operates/monitors/resets/maintains the system
  - Provides data feed
- DOT obtains data for 511 through data feed

Deployment schedule/process

- Developed high level system requirement with 8-state group
- Developed detail functional requirements for RFP
- Worked with DOT purchasing to develop full RFP
- Evaluated proposals (Including cost)
- Selected contractor (Most advantageous)
- Rolled RFP requirements into a contract
- Phase 1 Construction – Public rest areas
- Phase 2 Construction – Private truck stops



IOWADOT

Request for Proposal
For
Iowa Truck Parking Information & Management System
Issued by:

IOWA DEPARTMENT OF TRANSPORTATION
Purchasing Section
Proposal No. 18254
Response Due Date: June 28, 2017

Must be submitted no later than 1:00 PM Central Time
Responses received after this date will be rejected

For information about this notice, and during this procurement, interested persons shall contact only:

Jean Gustafson
800 Lincoln Way
Ames, Iowa 50010
Phone: 515-239-1173
Fax: 515-239-1538
E-Mail: jean.gustafson@iowadot.us

Issued addenda will be posted to internet website:

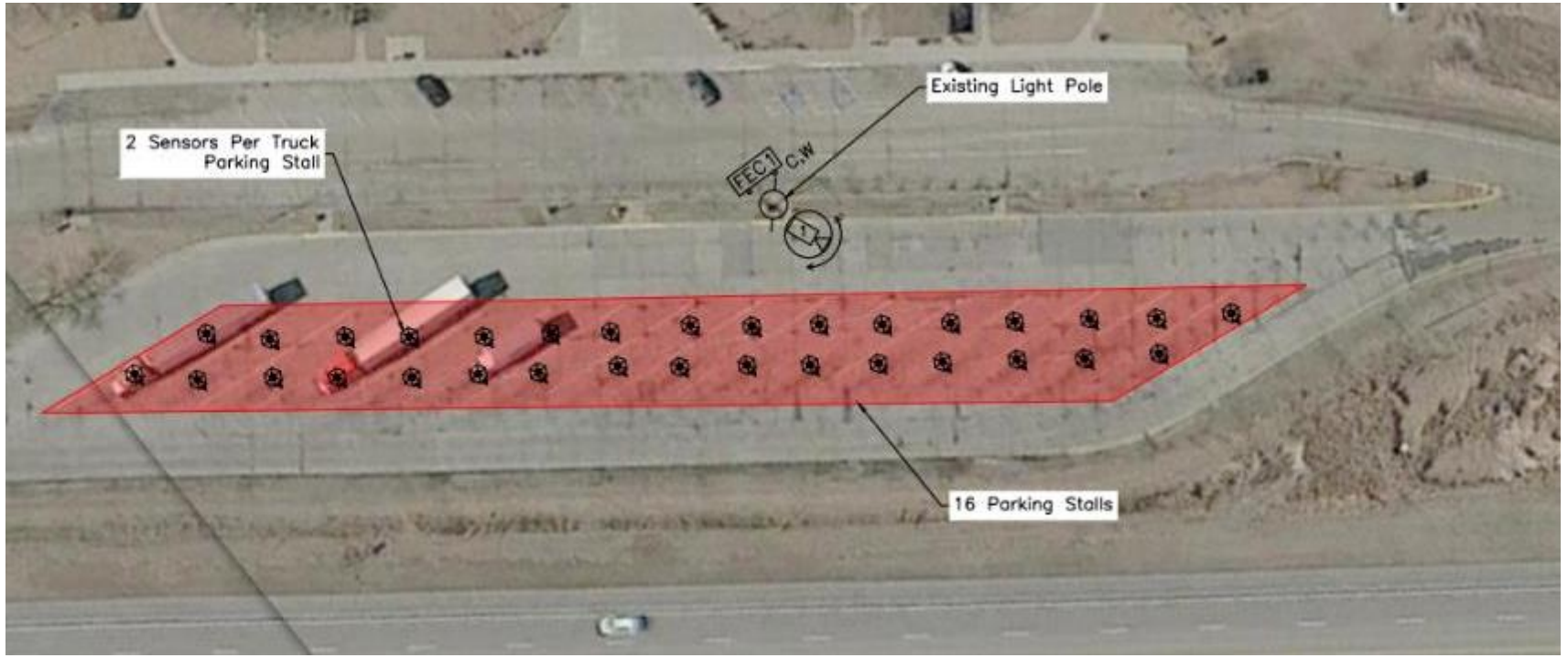
http://www.iowadot.gov/purchasing

Iowa TPIMS approach

- Combination of space-by-space and ins/outs
- Space-by-space - magnetometer puck sensors
- Ins/outs - Fixed cameras with video analytics for count data
- Pan/tilt/zoom cameras used for ongoing site validation

Technology solution

- In-ground magnetometer puck



Technology solution

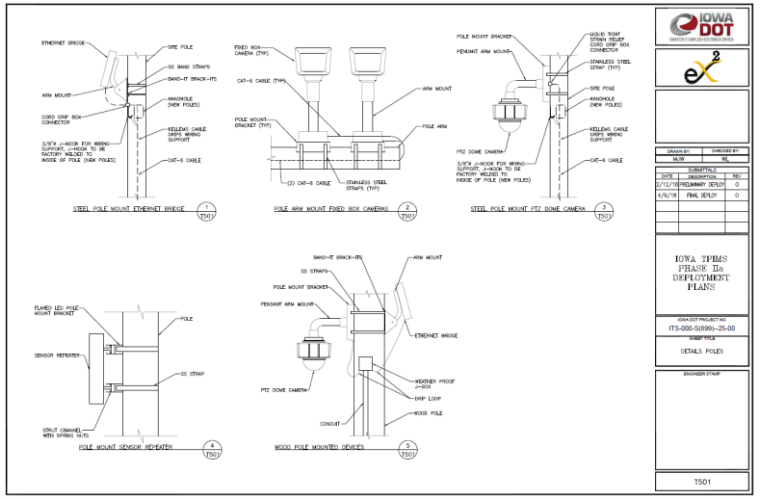
- Driveway counting using video analytics/fixed cameras
- System validation with pan/tilt/zoom cameras

Dynamic message signs

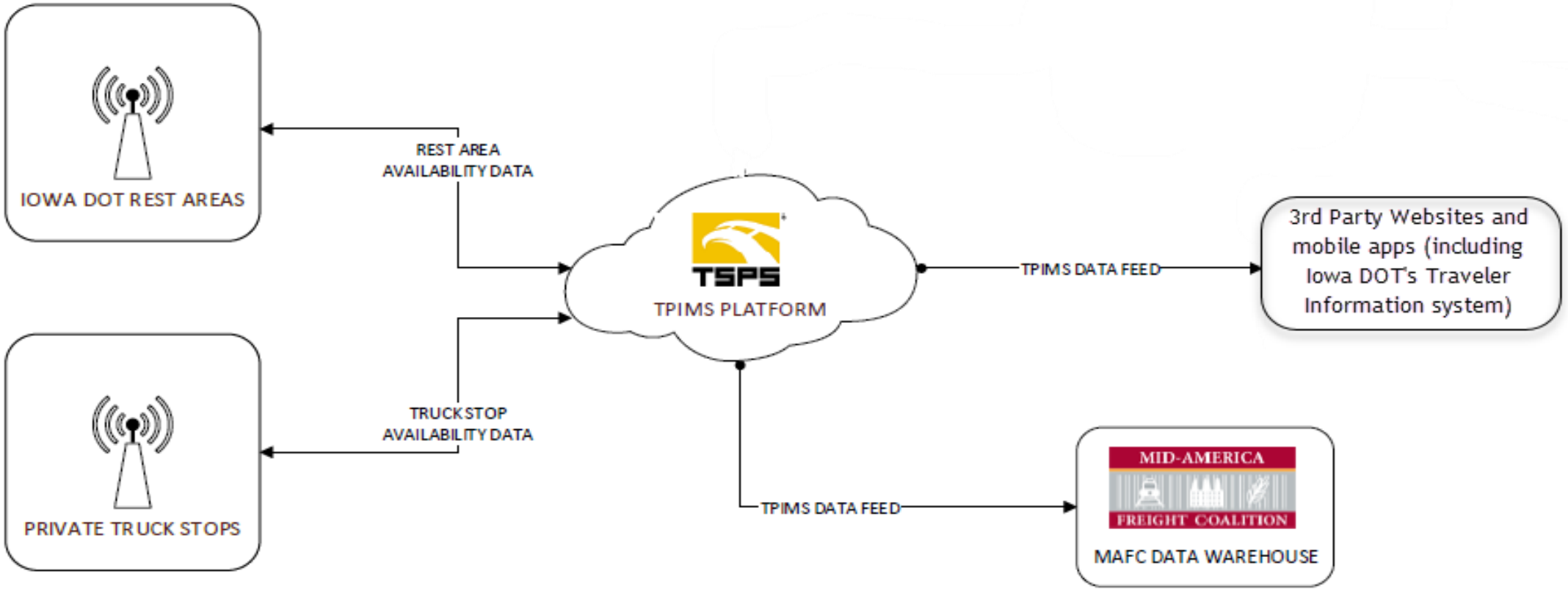
- Moratorium on new signs in ROW
- Expensive
  - Ability to deploy more sites
- Rely on technology to make data publicly available
- Smartphone apps, in-cab navigation, 511
- Iowa State effectiveness assessment

Construction schedule

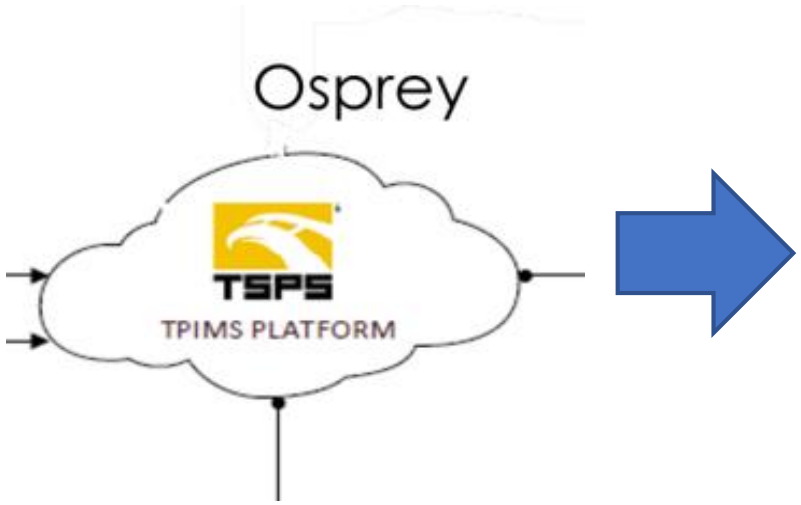
- Contract signed early October 2017
- All sites fully constructed by mid-October 2018
- Additional sites constructed by April 2020



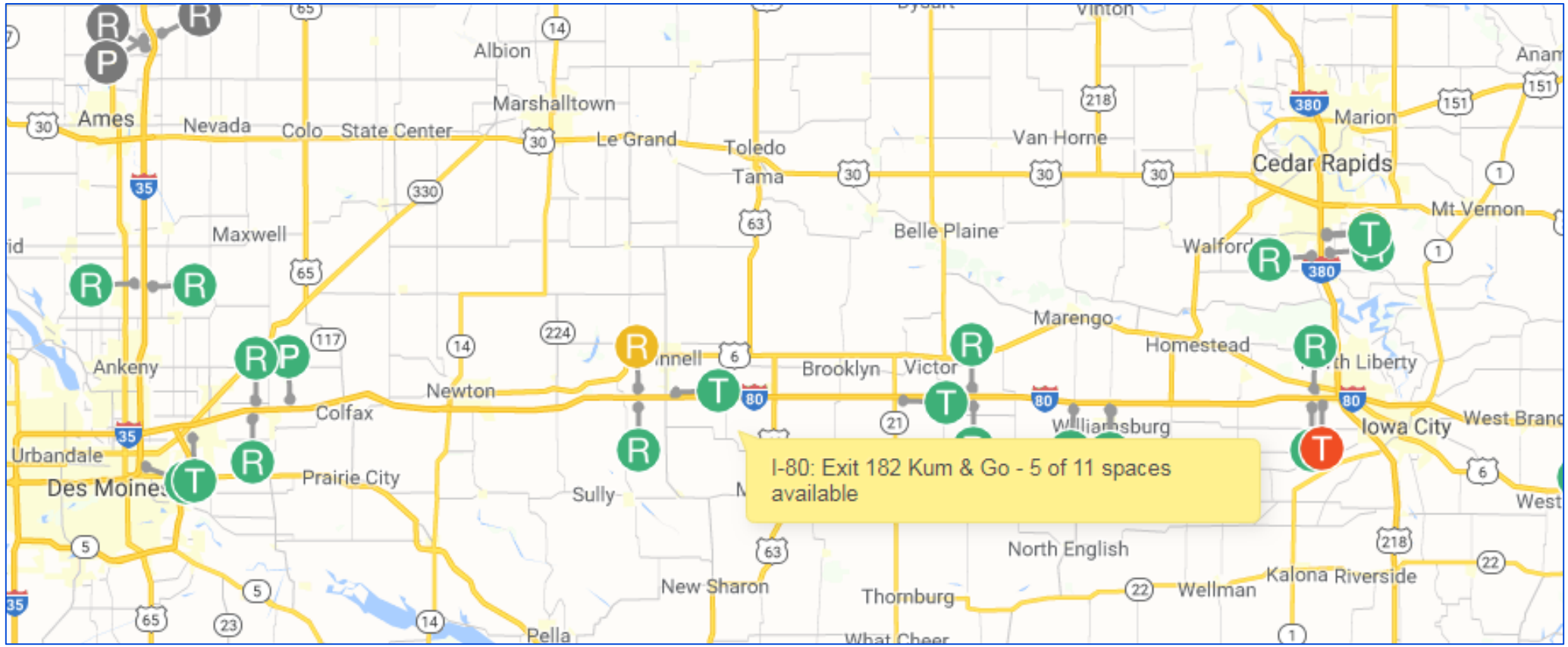
Information dissemination



511 traveler website



511 map

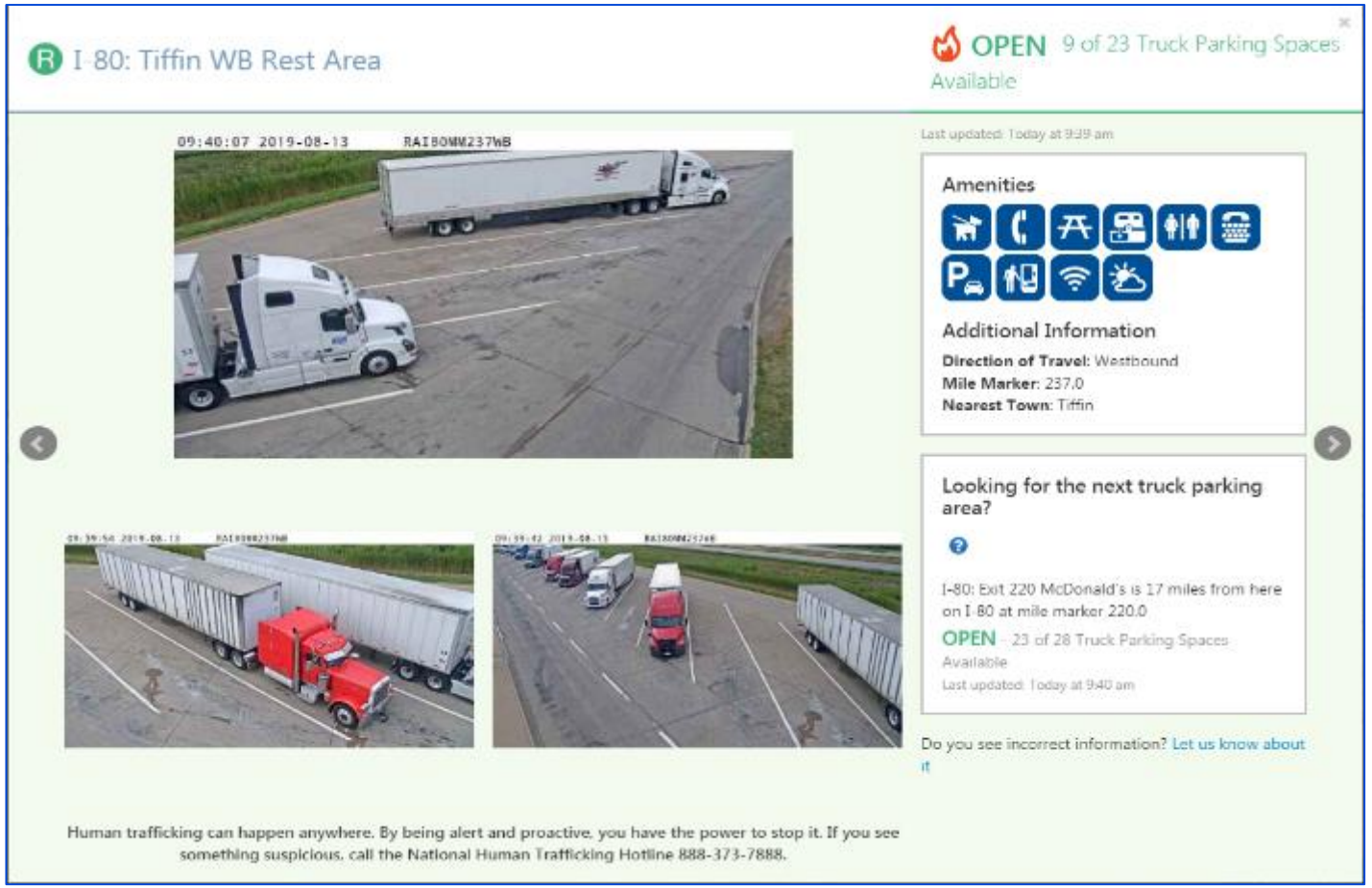

I-80: Exit 182 Kum & Go - 5 of 11 spaces available
Albion
Marshalltown
Ames
Nevada
Colo
State Center
Le Grand
Toledo
Tama
Van Horne
Cedar Rapids
Marion
Mt Vernon
Belle Plaine
Maxwell
Ankeny
Newton
Colfax
Brooklyn
Victor
Marengo
Homestead
Iowa City
Urbandale
Des Moines
Prairie City
Sully
North English
New Sharon
Thornburg
Wellman
Kalona
Riverside
Pella

511 map legend

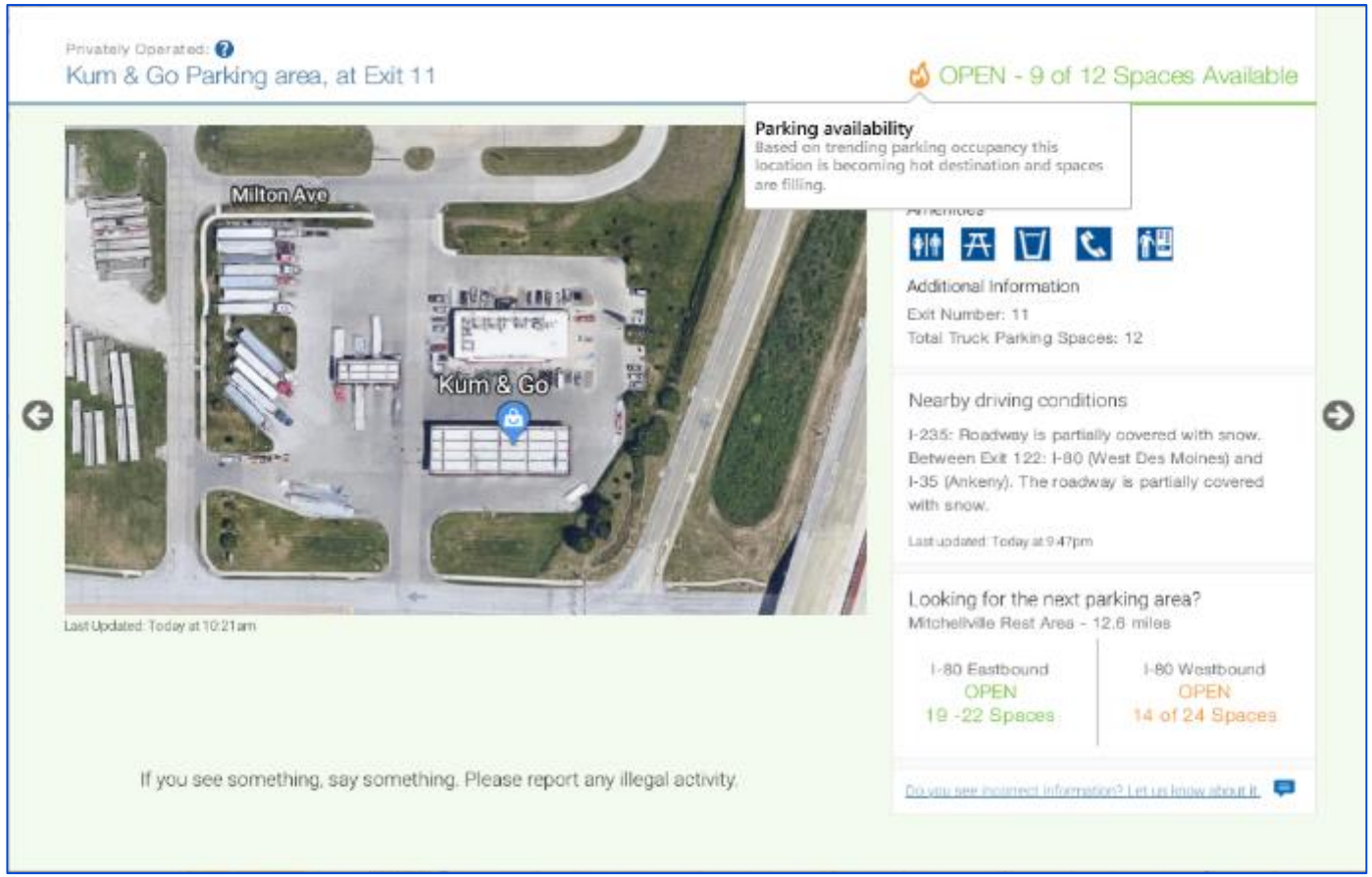
Icon	Meaning	Configuration
	Open	Parking area is 0-70% full ***OR*** at least 5 available spaces
	Open, but busy	TPIMS feed ≠ LOW Parking area is 70-95% full ***AND*** Only 4 spaces available
	Low Availability	TPIMS feed = LOW OR (Less than 5% of capacity remains open ***OR*** 0-3 spots are available) *CARS-Park shall never report a site as "Full." Instead, it shall always use the phrase "Low Availability."*

Icon	Meaning	Configuration
	Closed	If the site is closed either per TPIMS data are the Rest Area Update tool, the Closed icon shall be displayed.
	No real-time data	Real-time data for parking area isn't currently available; only static information is available. *This shall also be used if a "null" value is returned in the TPIMS Open data element.*

511 traveler website



511 traveler website

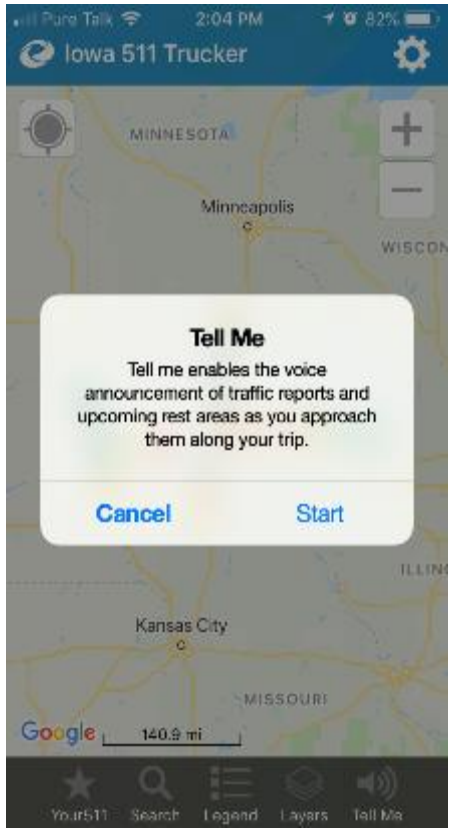


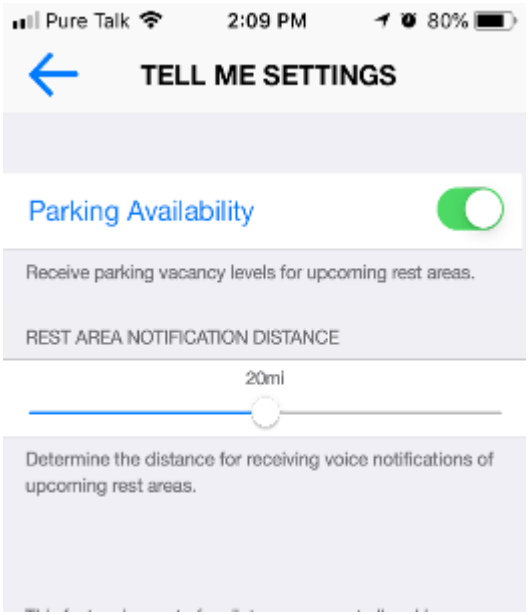
Traveler information integration: Privately owned truck stops (no pictures due to privacy considerations)

Mobile app


9:41 AM
100%
Cancel
Rest area
Done
I-35: Lamoni - North/Southbound
Welcome Center
OPEN - 10 of 16 Spaces Available
Amenities
Restrooms
Family Facilities
Picnic
Phone

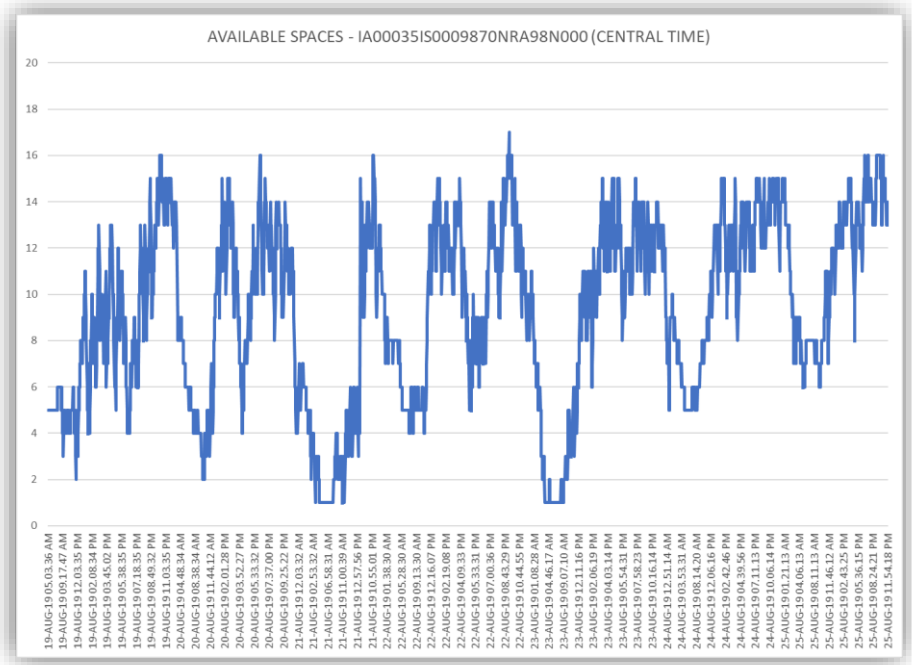

9:41 AM
100%
Cancel
Rest area
Done
I-35: Lamoni - North/Southbound
Welcome Center
CLOSED
REST AREA
CLOSED
Amenities
Restrooms
Family Facilities
Picnic
Phone


Pure Talk
2:04 PM
82%
Iowa 511 Trucker
MINNESOTA
Minneapolis
Tell Me
Tell me enables the voice announcement of traffic reports and upcoming rest areas as you approach them along your trip.
Cancel
Start
Kansas City
MISSOURI
Google
140.9 mi
Your511
Search
Legend
Layers
Tell Me


Pure Talk
2:09 PM
80%
TELL ME SETTINGS
Parking Availability
Receive parking vacancy levels for upcoming rest areas.
REST AREA NOTIFICATION DISTANCE
20mi
Determine the distance for receiving voice notifications of upcoming rest areas.

Contractor monitoring

- Evaluating frequency and magnitude of resets
- Graphing availability over time
  - High baseline of trucks parked
  - Lots that do not fill
- Visual verification of data feed
  - Utilizing static images from 511



Questions?

For Iowa TPIMs Questions:
Phil Mescher, Iowa PM
Iowa DOT
Phil.Mescher@iowadot.us

For HNTB:
Eric Strack:
estrack@hntb.com
Chuck Miller:
cmiller@hntb.com

Truck Parking Technologies; Private Sector Parking Facilities Engagement

Scott Grenerth
Truck Parking Specialized Services

Carl Rundell
Truck Parking Specialized Services

Topics

- Hands-on perspective
- Overview on MAASTO technologies utilized from our experience
- Which systems are best suited for different applications
- Lessons learned
- Your questions

MAASTO Deployed

Great deal of time and millions $ spent creating truck parking resources you can utilize

MAASTO (8 State)
$25M TIGER Grant

MAASTO TPIMS
Deployed

Jason Rivenburg
Murdered

Jason's Law
Enacted

MI Deploys TSPS
TPIMS

Deployment possible in as little as 9 months

2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019

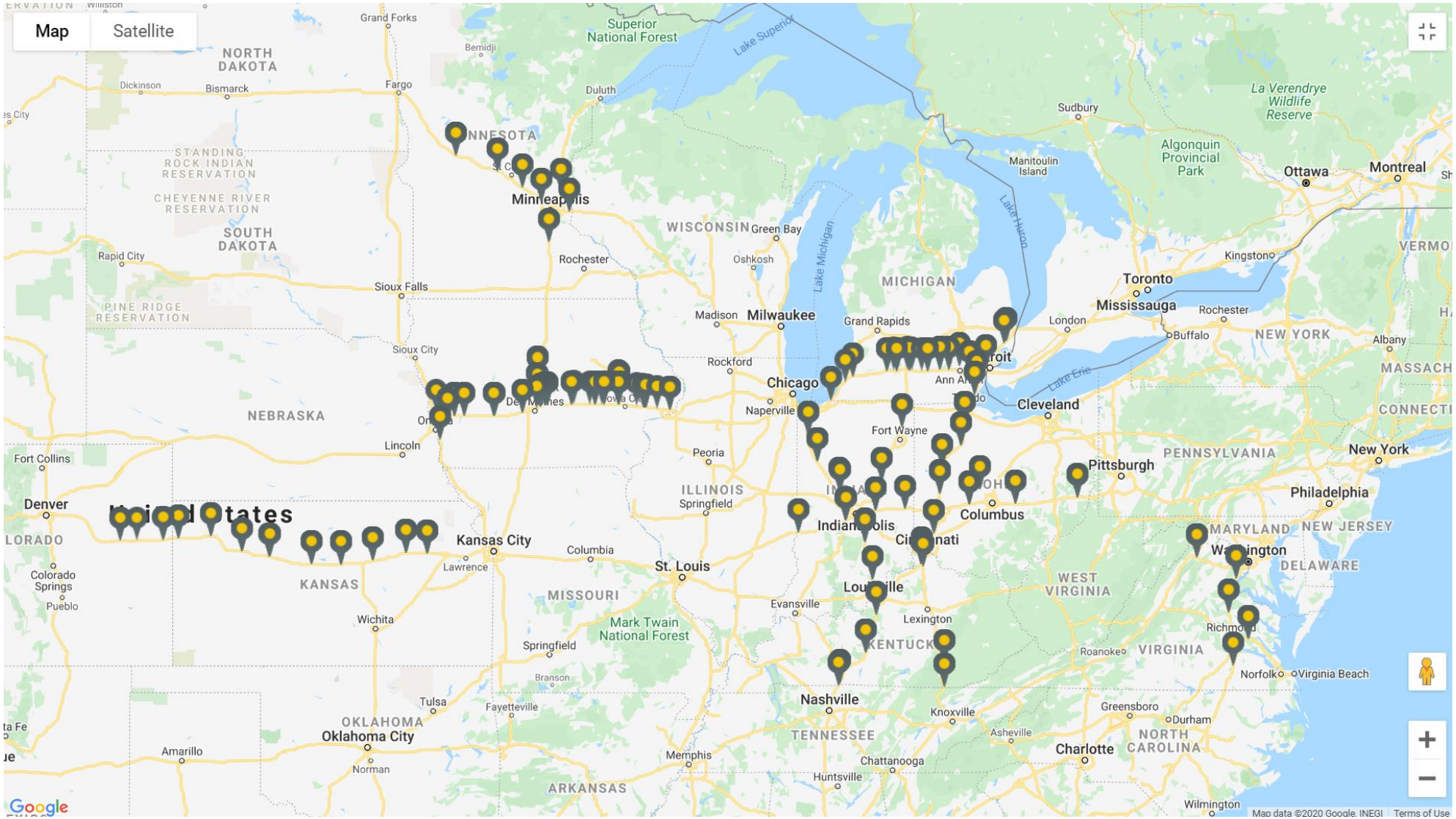
Michael Boeglin
Murdered

Highlight of linked Multi-state system

- Truckers & industry appreciate the seamlessness

- Address the parking needs that are across state lines
  - All resources are equally visible and equally utilized
  - Less fuel burned when trucker directed to a parking space on the first attempt, not half hour + searching

Multi-state visualized



Technologies, benefits/challenges

Light Curtain:

-When beam of light is broken a vehicle entry or exit is counted.

Benefits

- Captures entry/exit counts at unidirectional flow sites, e.g, rest areas

Challenges

- More expensive where multiple entry/exit points, e.g., private truck stops

Technologies, benefits/challenges.

Pucks:

Magnetometers which detect the presence of a metal object (a vehicle) directly above it.

Benefits

- Captures entry/exit counts at unidirectional flow sites, e.g, rest areas
- Can capture occupancy of marked parking spaces in private truck stop or rest area

Challenges

- Must be installed into pavement, preferably two per space. Servicing requires pavement access. Accumulation of snow can affect accuracy. Proprietary software can provide improved accuracy.

Technologies, benefits/challenges.

Video Analytics:

Camera detects a vehicle passing through or into a zone.

Camera detects the occupancy of a specifically defined marked parking space.

Benefits

- Captures entry/exit counts at unidirectional flow sites, e.g, rest areas
- Can capture occupancy of marked parking spaces in private truck stop or rest area

Challenges

- Snowflakes falling can create inaccurate counts

Technologies, benefits/challenges.

Combination of pucks & video analytics (truckstop):

Benefits

- Increased accuracy by combining systems, especially with proprietary software to analyze data.

Challenges

- Pucks into pavement/access
- Falling snowflakes
- Higher cost.

Technologies, benefits/challenges.

RADAR 60 Ghz mm Wave Detection (imminent field deployment IA).

- Very fine granularity of detail and captures entire area (not only the parking spaces)
- Detection data includes
  - Vehicle entry into area, movement within area to parking space, duration in the space
  - Vehicle occupant exit of vehicle and path traveled by occupant
  - Differentiation of vehicle types, e.g., a non-commercial vehicle parked in truck parking area
- System is easily mounted on any pole, and can easily be replaced if needed
- Standard electric requirements and data connectivity
- Cold temperatures and snow do not affect the system
- Cost savings: Once you surpass a unidirectional flow site of 20 spaces or greater this system has lower cost than puck-based system, depending upon variables
- Individual sensor can capture up to 160,000 square feet (3 football fields)

Data Collection Method

Functions	Type	Iowa	Ohio	Michigan	Kentucky	Wisconsin	Indiana	Kansas	Minnesota
Procurement	Public	DBOM	DBOM	DBB	DBB	DBB	DBB	DBB	DBB
	Private		N/A	N/A	DBB	N/A	N/A	N/A	N/A
Data Collection Method	All	Functional Requirements	Functional Requirements	In/Out	In/Out	In/Out	In/Out	Space-by-Space	Space-by-Space
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Operations & Maintenance	Public	DBOM	DBOM	MDOT	KYTC	3rd Party	INDOT	3rd Party	MNDOT
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Information Dissemination	All	State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed	Roadside Signs, State Traveler Information site; 3rd party data feed

Functional requirements allows for best current methods to be chosen.

Data Collection Technology

Functions	Type	Iowa	Ohio	Michigan	Kentucky	Wisconsin	Indiana	Kansas	Minnesota
Procurement	Public	DBOM	DBOM	DBB	DBB	DBB	DBB	DBB	DBB
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Technology changes

Agnostic = flexibility

Handling O & M

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Data Collection Method	All	Functional Requirements	Functional Requirements	In/Out	In/Out	In/Out	In/Out	Space-by-Space	Space-by-Space
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Operator can take on O&M cost efficiently.

Combination of sites – utilizing private facilities

- Trucker needs vary
  - Quite place to park, then sleep = Rest Area
  - Fuel, park, shower, food, laundry, repair… = Truckstop
- "We are from the government and we are here to help," maybe not
- They need to be spoken with, not at
- Approaching corporate chain or mom & pop?
- # entrances/exits
- Geometry

<u>Ensure your locations meet trucker needs</u> and that private sites are included and engagement is successful.

Lessons Learned

- Don’t reinvent the wheel!
- Include private truck stops. Truckers have varied needs, rest areas can’t always meet them
  - Sum of all states’ DOT truck parking inventory, is less than 10% of existing inventory
- Ensure there is an effective plan to include private truck stops
- Recognize highway safety is on the line; industry is frustrated with slow pace
- Autonomous trucks will not be truck parking solution
- Consider all O&M, from detection hardware to any roadside signs
- Insist that standards compliance is adhered to

Questions?

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Over million miles accident-free CMV driving

Carl Rundell

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Installation of over 3,500 TPIMS parking spaces

Minnesota DOT Truck Parking Project

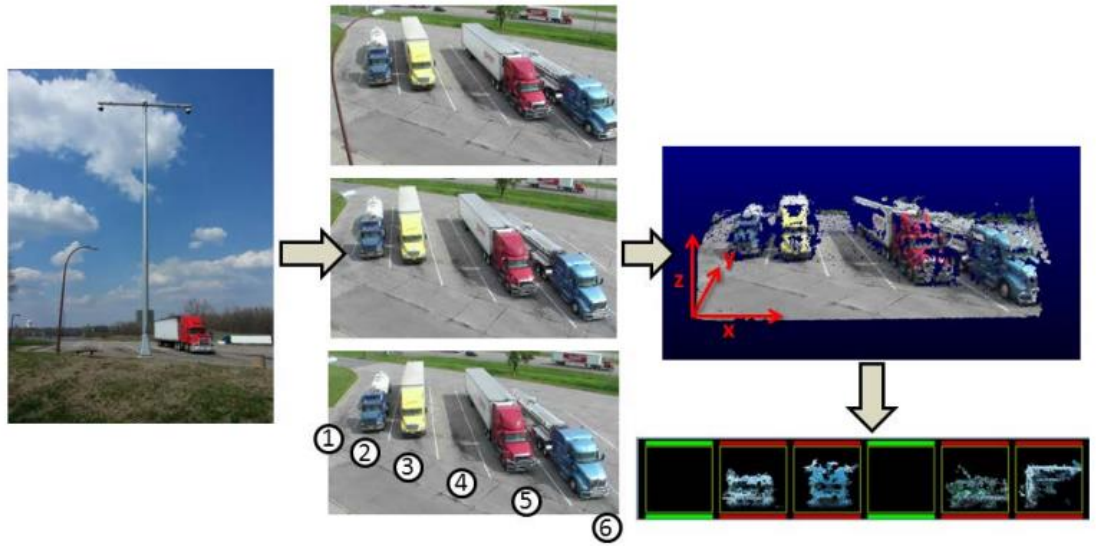
Andrew Andrusko, AICP
Minnesota DOT

Funding and Deployment

- Original interest in deployment at 9 sites – pared that down to 7 sites –
- Lake Latoka, Big Spunk, Enfield, Elm Creek, Forest Lake, St. Croix, Heath Creek Public Rest Areas
- Currently in trial phase in Minnesota
- Received ~$1.6 million in federal funding, matched with $177,500 state funds (operating dollars)

Vehicle Detection

- Minnesota had developed/tested previous research using stereo spectroscopy via a system of cameras to determine space usage in real time
- Due to the complexity of the system we went with sensor pucks
- Are not using gate sensors/system to verify counts
- Each space is monitored and data is relayed to our Regional Traffic Monitoring Center (RTMC)

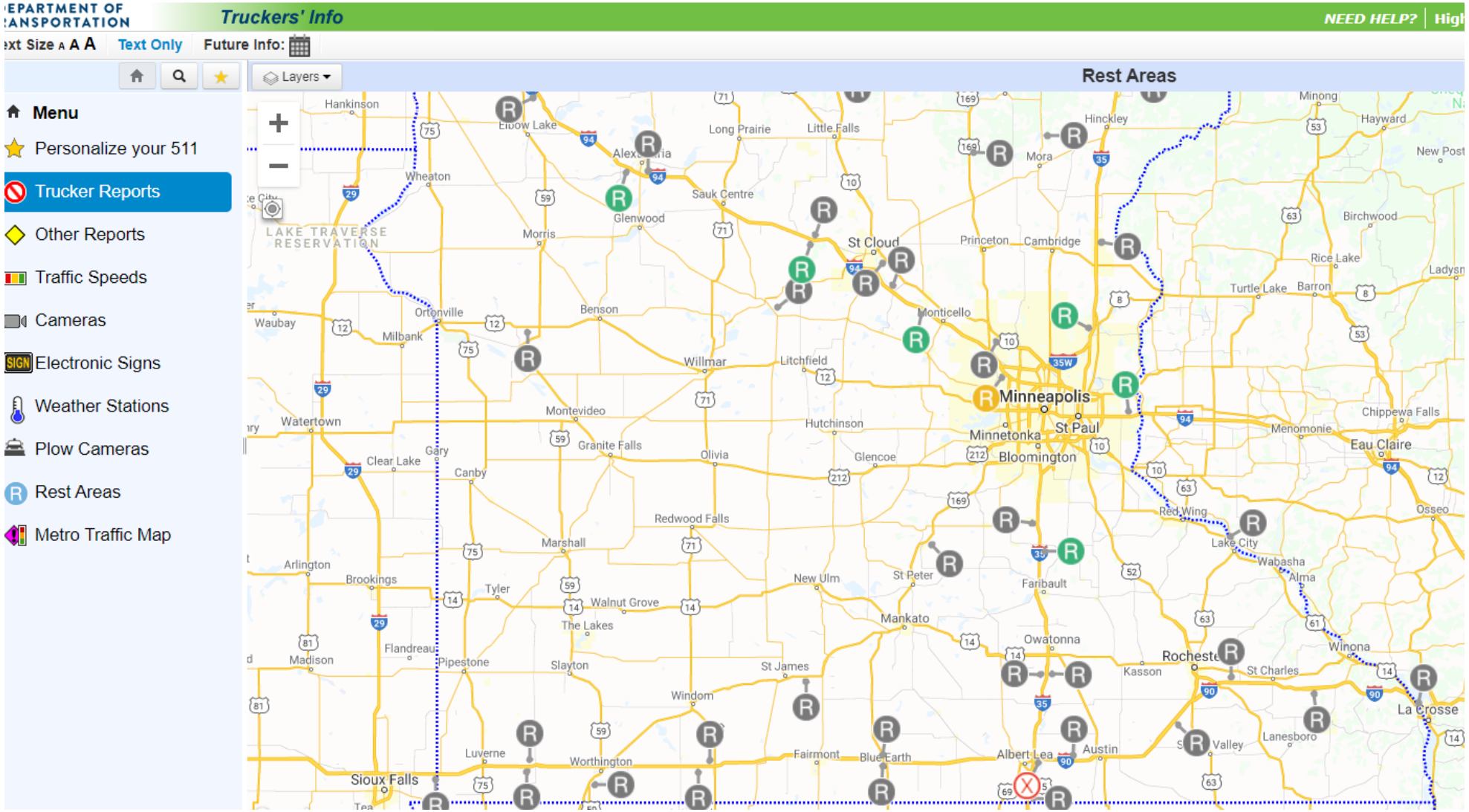


cy vehicle detection for a group of parking spaces.

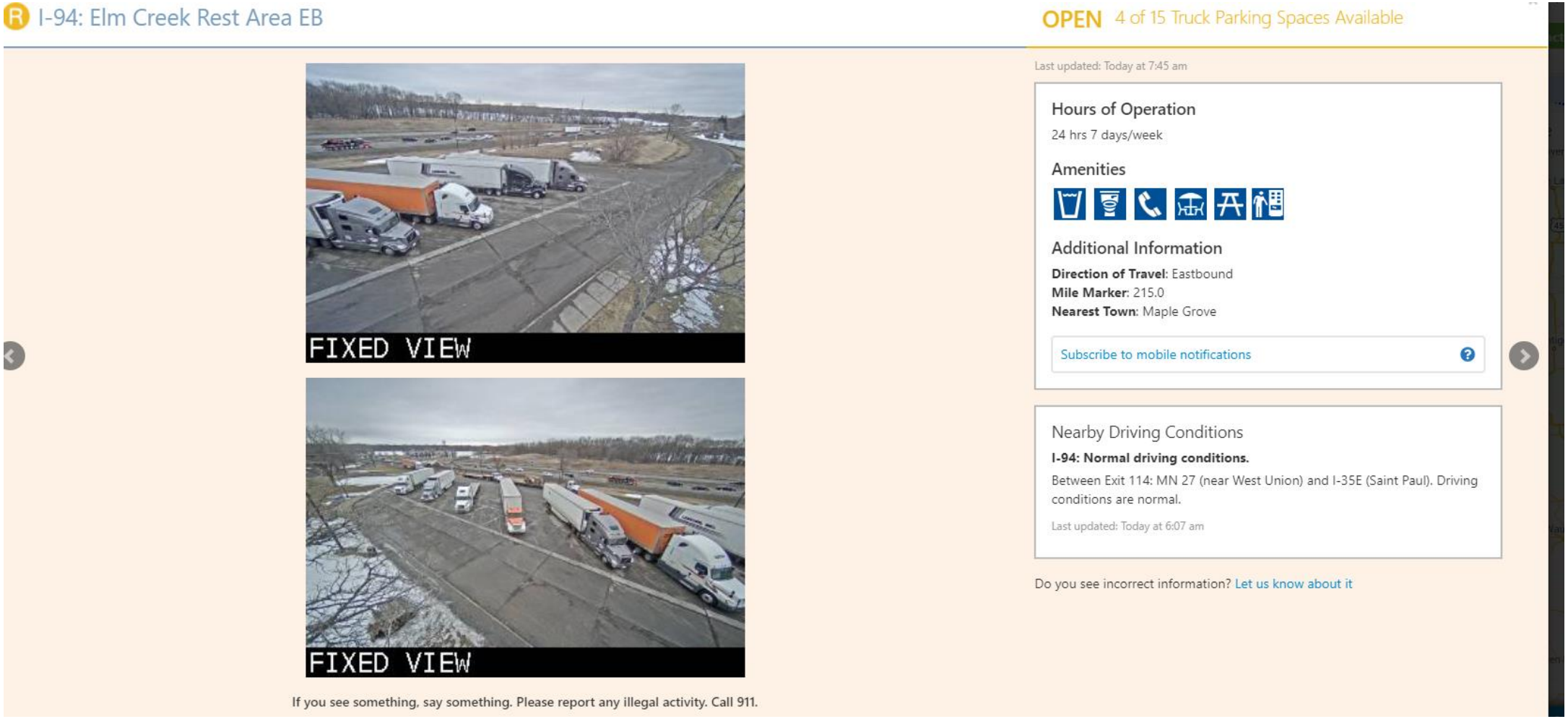
Information Displays

- To allow for flexibility in emergencies MnDOT implemented TPIMS information with full color, full size digital message sign boards
- During significant crashes or emergency situations signs may be used to show alternative information
- Significantly per unit higher costs
- Part of the roll out of our ITS Plan

MnDOT 511 Truckers Page



MnDOT 511 – Truckers Page



System Management

- **Upfront internal agreement** on who will manage is important
- Understanding of **how the system will be maintained and funded long term**
- Currently MnDOT is working to determine these items

Performance and Measurement

MAASTO TPIMS Performance Measures Summary - Q2 2019

State	Number of Live Sites	Average Accuracy Measure 1	Average Accuracy Measure 2	Average System Downtime	Utilization
Indiana	16	70%	61%	6%	47%
Iowa	43	97%	95%	6%	75%
Kansas	18	90%	85%	14%	69%
Kentucky	13	82%	81%	3%	74%
Michigan	14	43%	31%	7%	55%
Minnesota	7	98%	97%	52%	72%
Ohio	18	87%	77%	10%	85%
Wisconsin	10	84%	72%	24%	66%
Total/Average	139	81%	75%	15%	68%

Questions?

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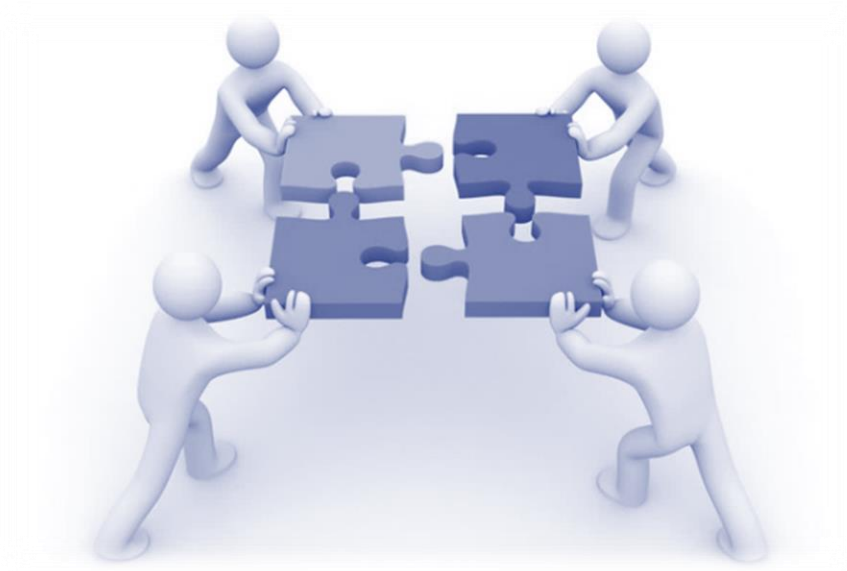
Wrap Up

Marygrace Parker, Intermodal Freight Director,
I-95 Corridor Coalition

Questions?



In Closing….

Thank you for joining today

For Additional Information, please contact:

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