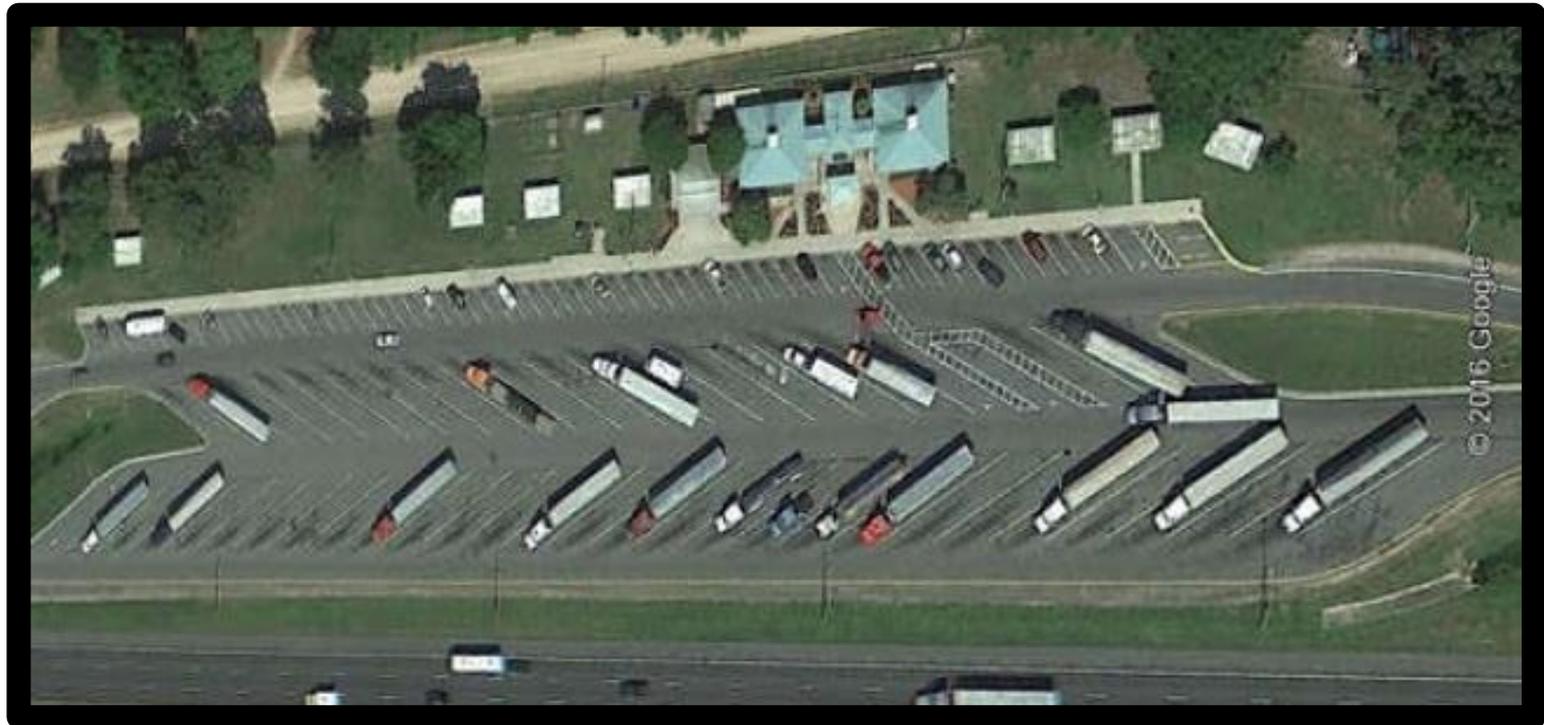




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# Illinois State Freight Advisory Council - October 2019

## IDOT Truck Parking Information Management System (TPIMS) Project





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## Truck Parking Issues:

- Promote access to safe/convenient truck parking.



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- Provide information on Parking Demand vs. Supply and real-time parking availability to drivers.
- Improve Security/Safety for Rest Area Patrons.
- Reduce need for truckers to park illegally or unsafely on the shoulders of highways, on off-ramps or at abandoned facilities.
- Provide information to drivers to better plan their rest periods, to increase drivers' overall productivity and efficiency.

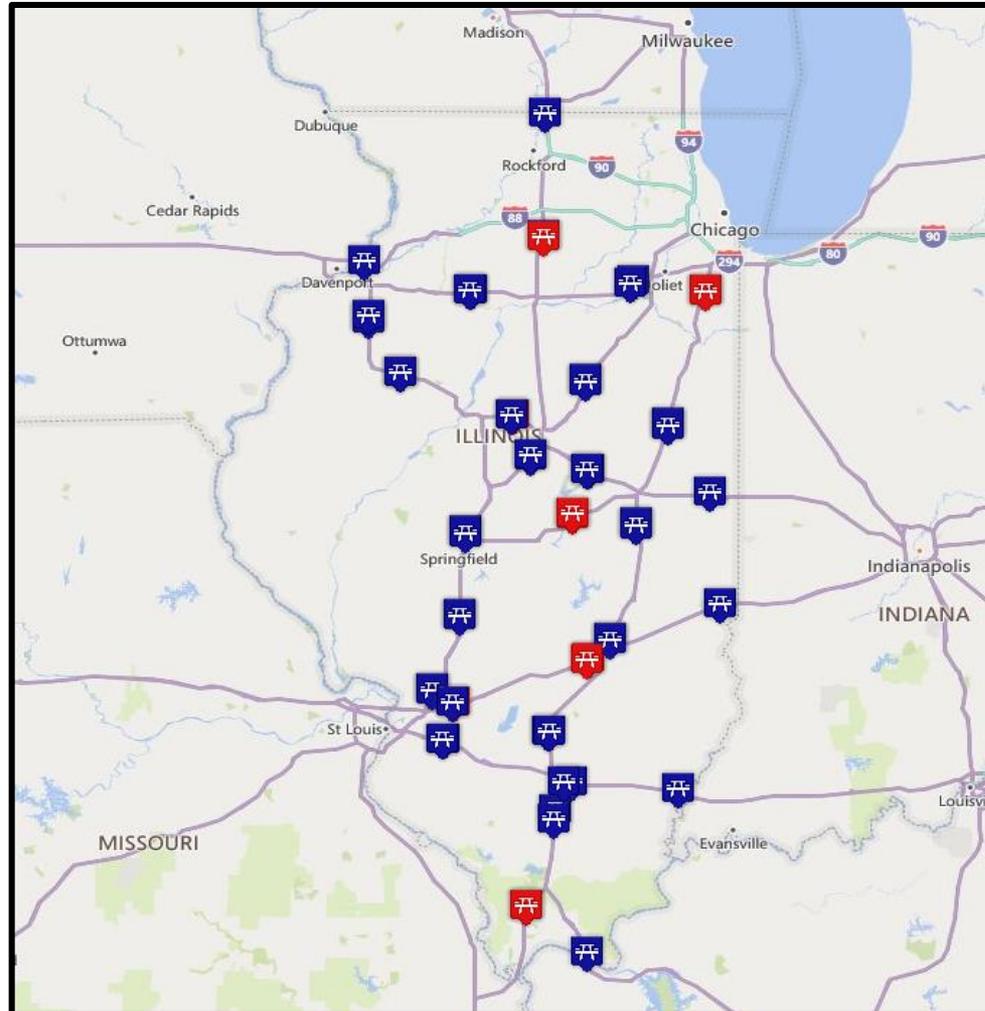


FMCSA regulation now requires electronic logging of hours-of-service records of duty.





# Illinois Public Rest Areas





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## Illinois Public Rest Areas

Most of the IDOT Rest Area plazas are in pairs with one rest area in each direction. TPIMS will be installed in all IDOT Rest Area plazas on the **Interstate System** that **include truck parking**.

There will be a total of 53 IDOT Rest Areas plazas that will be addressed as part of this project. There will be some plazas omitted in the initial improvements due to pending rest area reconstruction projects.



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## **IDOT Truck Parking Information Management System - Focused on IDOT Public Rest Areas**

Will include:

- Improved Video Security System



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- Cameras to verify Truck Parking Counts
- Provide data via Websites and Truckers Apps



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**IDOT Truck Parking Information Management System** - Focused on IDOT Public Rest Areas

Estimated Timeline:

FY20 - Enhanced Rest Area Security System and Informational Kiosks



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**IDOT Truck Parking Information Management System** - Focused on IDOT Public Rest Areas

Estimated Timeline:

FY20 - Enhanced Rest Area Security System and Informational Kiosks

FY21-22 - Truck Counting System Installations



## **Informational Kiosks**

Within the Rest Areas buildings, new video display information kiosks will provide traveler information. This information will include travel, construction, and weather information.

Status – contract procurement documents are drafted and under review by IDOT Bureau of Business Services and IDOT Legal.



## **Rest Area Security**

Existing Rest Area Video Security system will be replaced with new high definition surveillance cameras and recording system.

Security video from this system is for the use of Illinois State Police.

Status – contract procurement documents are drafted and under review by IDOT Bureau of Business Services and IDOT Legal.



## **Truck Parking Counting System**

Two primary ways to determine available parking at a rest area.

In/Out Counting – detect truck volumes entering and exiting the truck parking lot within the plaza.



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Two primary ways to determine available parking at a rest area.

In/Out Counting – detect truck volumes entering and exiting the truck parking lot within the plaza.

Stall Occupancy Detection – detect presence of a truck parked in a stall.

# Collecting the Information

Truck parking availability data will be collected using a variety of **Detection Technologies**. Camera snapshots images of truck parking in the rest area will be collected about every five minutes.

## Height Sensors



Source

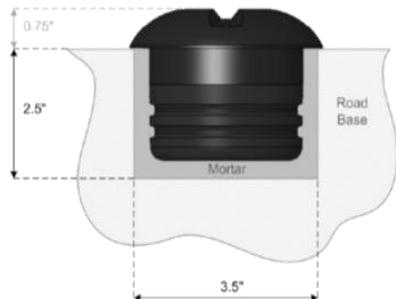


Detector



## Radar Detection

## Video Detection



## Puck Sensors



**Height Sensors** - Optic beam sensors installed at the entrance and exit ramps detect and classify vehicles by their height, and provides In/Out truck counts to determine parking occupancy.



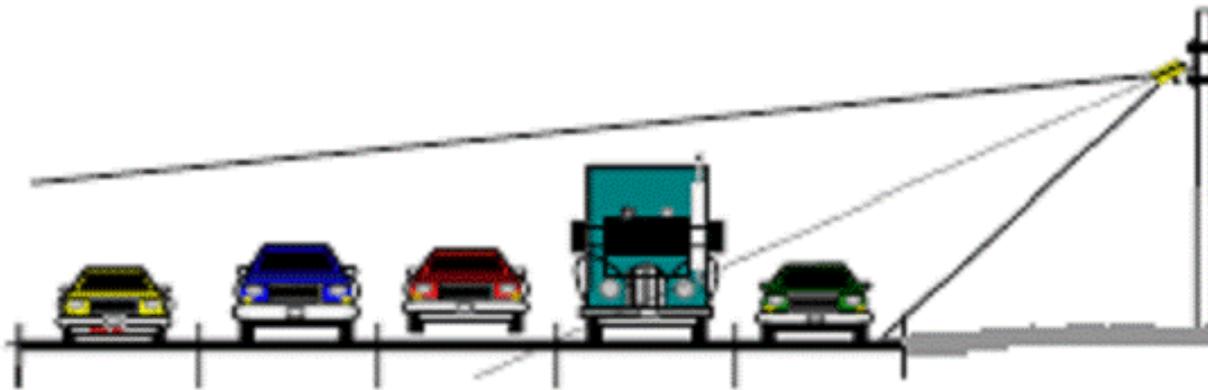
**Source**



**Detector**



**Radar, Microwave and Lidar Detection** – roadside or under pavement detectors are used to either sense passage, presence, or determine classification of vehicles.





## Video Detection

Cameras and Video Analytics include vehicle classification, passage and presence detection, and License Plate Readers.



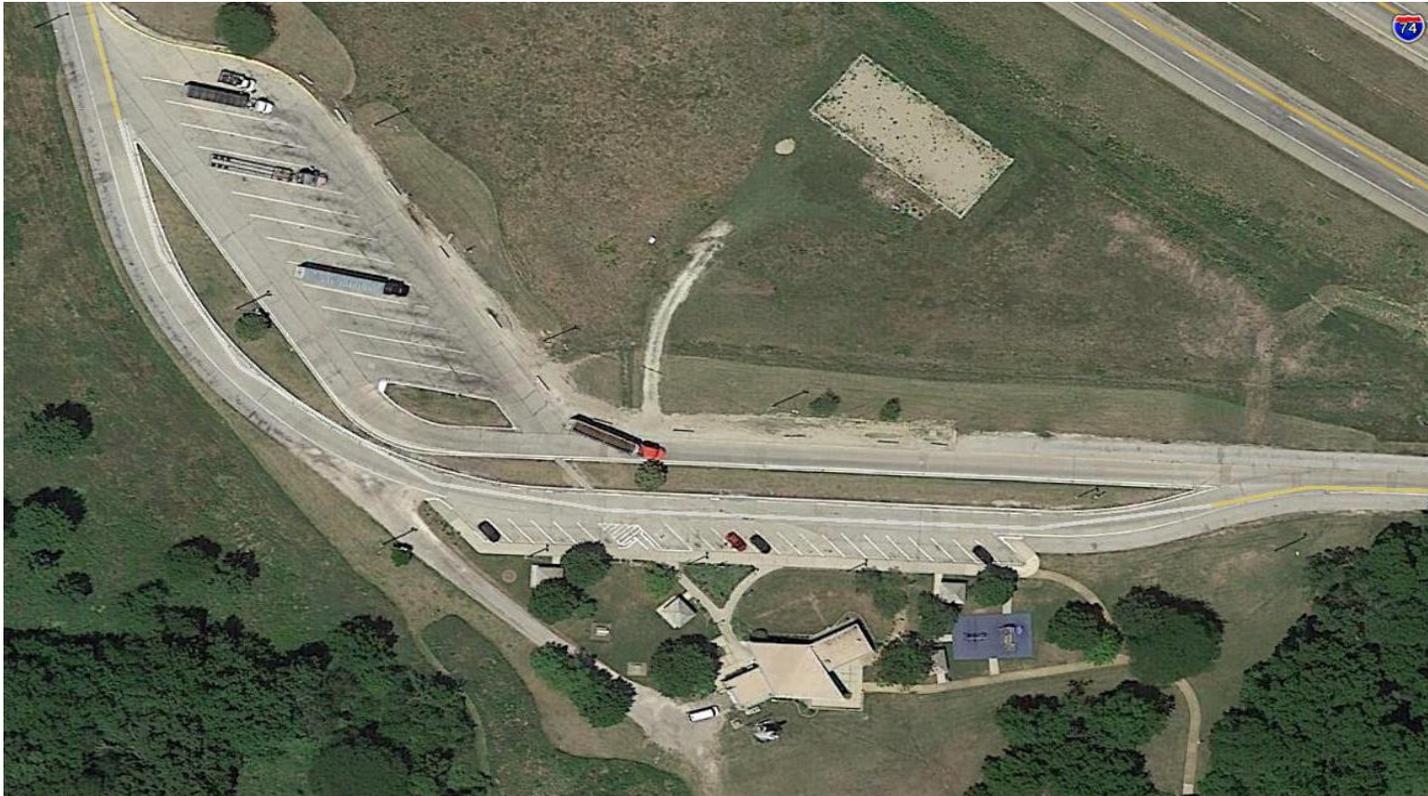


**CCTV cameras** will collect video to be used for system verification, fine tuning, and to collect parking occupancy images for website and app distribution.



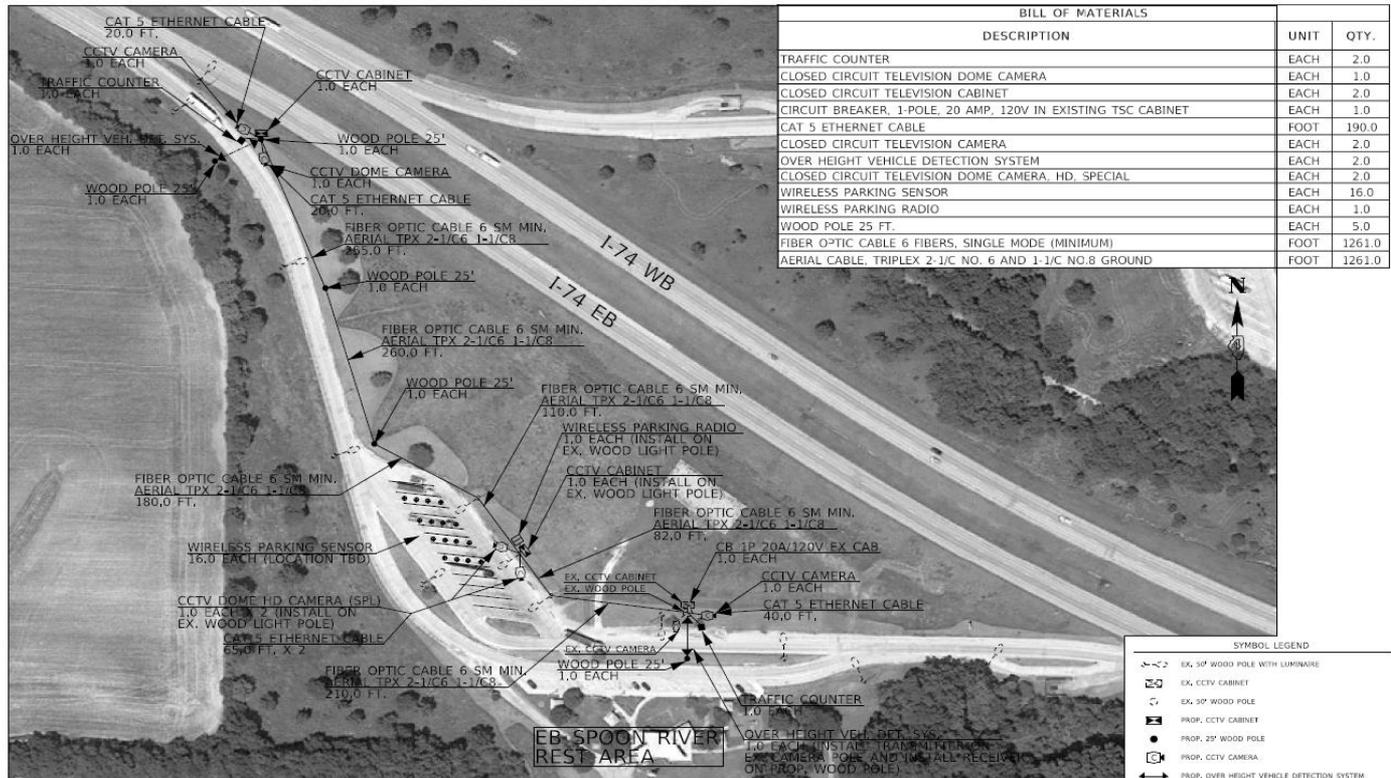


IDOT Pilot Truck Parking Count Installation - testing two technologies at the EB Spoon River Rest Area:





# Installed in the EB Spoon River Rest Area I-74, 12 miles East of Galesburg (Mile Post 62)



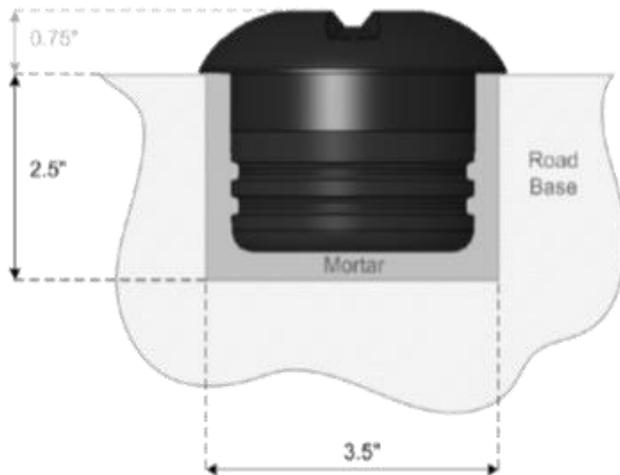
THE CONTRACTOR SHALL FIELD VERIFY LOCATION OF EXISTING FACILITIES PRIOR TO ORDERING MATERIAL.

THE LOCATION OF WIRELESS PARKING SENSORS SHALL BE APPROVED BY THE ENGINEER OF TRAFFIC BEFORE INSTALLATION.

DESIGNER: _____ CHECKED: _____ DATE: _____	REVISIONS: _____ REVISIONS: _____ REVISIONS: _____	<b>STATE OF ILLINOIS</b> <b>DEPARTMENT OF TRANSPORTATION</b>	<b>PROPOSED TRUCK PARKING ITS SYSTEM</b> <b>EASTBOUND SPOON RIVER REST AREA</b>	COUNTY: _____ SHEET NO.: _____ TOTAL SHEETS: _____	CONTRACT NO.: _____ DATE: _____
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- Magnetic/Infrared sensor pucks installed under truck parking bays sense presence of trucks to provide stall occupancy. Fixed position CCTV cameras provide coverage of the parking lots to verify truck stall occupancy counts and provide snapshot images for viewing on the web.





## Detection Technology

Height  
Sensors



Source



Detector

Radar  
Detection





We will use IDOT traveler information websites and 3rd party Apps to disseminate the information. This information will include parking availability and camera snapshots.



**ROADBREAKERS**

OVERNIGHT TRUCK PARKING APP



**TRUCKER PATH**



## **Automated Truck Parking Count System**

We will continue to evaluate data from our Spoon River Pilot and from the MAASTO Quarterly Data Quality reports. We will choose our technologies and prepare contract plans for deployment.

The deployments will occur in FY21 and FY22.



## **Dissemination of Truck Parking Count Data**

We will use the data supplied from our Spoon River Pilot to develop the display of truck parking counts and images. As the truck parking systems are deployed statewide, the data will be included on IDOT websites, the MAASTO TrucksParkHere.com website and via other Truckers Apps.

This preparation work will be done in FY20.



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MAASTO Q2 2019 Data Quality - Iowa

Accuracy 97% Downtime 6%

Small lots use 2 magnetic/infrared pucks per stall. They have had some failures of these puck going dormant after installation under pavement.

Large lots count ins/out using cameras, and this video image data is sent to video analytic software for data processing.

Truck parking data then goes to traveler information websites, in-house Iowa truckers apps including snapshots and audible message, and third-party apps.



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## MAASTO Q2 2019 Data Quality - Kansas

Accuracy 90% Downtime 14%

Technology is University of Minnesota Computer vision system – produces a 3-D image space by space counting. Some adjustments to pole mast arms during construction. This system requires very good lighting to work.

Parking data will then go to traveler information websites, message signs, and truckers apps.



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MAASTO Q2 2019 Data Quality - Ohio

Accuracy 87% Downtime 10%

This is a Design/Build/Operate/Maintain contract.

In/Out counting using magnetic/infrared pucks.

Stall counts using magnetic/infrared pucks.

Data goes to traveler information websites, message signs, truckers apps. Their contractor is responsible for dissemination.



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## MAASTO Q2 2019 Data Quality - Kentucky

Accuracy 82% Downtime 3%

Technology uses side-fire radar to count in/out.

Data goes to traveler information websites, message signs, truckers apps.



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MAASTO Q2 2019 Data Quality - Wisconsin

Accuracy 84% Downtime 24%

Technology uses two magnetic pucks in series on each in/out drive.

Data goes to traveler information websites, message signs, truckers apps.



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MAASTO Q2 2019 Data Quality - Minnesota

Accuracy 98% Downtime 52%

Technology uses two magnetic pucks in each Stall.

Data goes to traveler information websites, message signs, truckers apps.



## MAASTO Q2 2019 Data Quality - Indiana

Accuracy 70% Downtime 6%

Technology uses two magnetic pucks in entrance and exits backed by lasers. They also use License Plate Reader cameras to match the time stamps of the in/out data with the License Plate Reader data.

Data goes to traveler information websites, message signs, truckers apps.



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## MAASTO Q2 2019 Data Quality - Michigan

Accuracy 43% Downtime 7%

Technology uses video cameras and video analytic signal software – takes video feed in and analyzes – this has taken a fair amount of custom development and tweaking.

Data goes to traveler information websites, message signs, truckers apps.



# Open Discussion

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- Questions?
- Comments?
- Ideas?
- Additional Information?
- Others?

