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TRAFFIC PRODUCTS

FHWA Speed data collection changes...

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“If you cannot measure it, you cannot improve it.” – Lord Kelvin

Can your equipment collect the data you need?

Conclusion: Speed data can be collected using existing equipment in most cases to meet or exceed the FHWA Speed requirements.

Presence

Accuracy in measuring speed is better with axle based sensors. But newer higher resolution presence sensors do better than older models.

Is the difference that much?

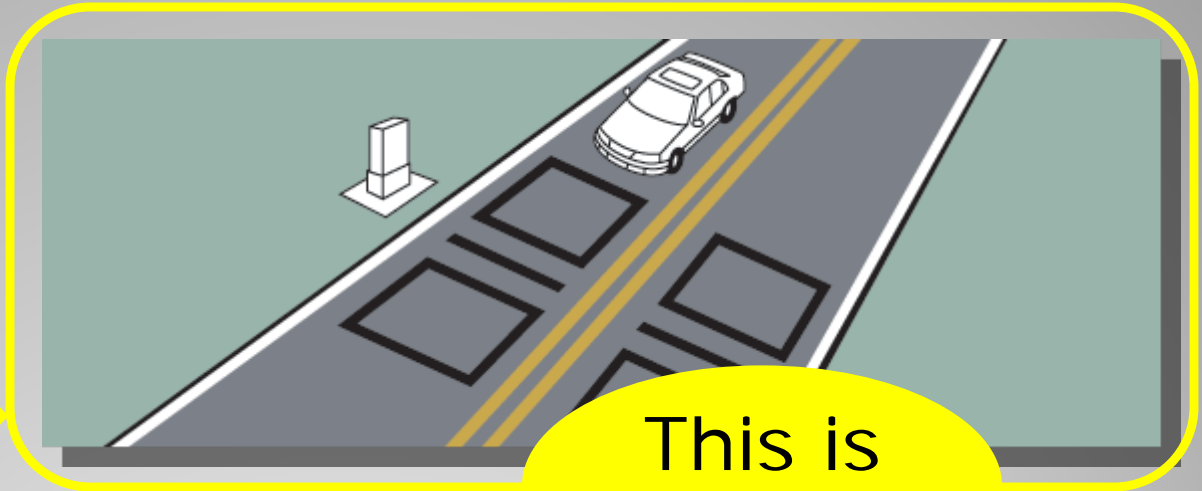
Overall the measurement of speeds statistically will not be affected significantly by measuring with a presence array versus an axle array. However on a per vehicle case by case basis there is a difference in the accuracy of the speed measurement.

Equipment Types

Pres - Axle - Pres

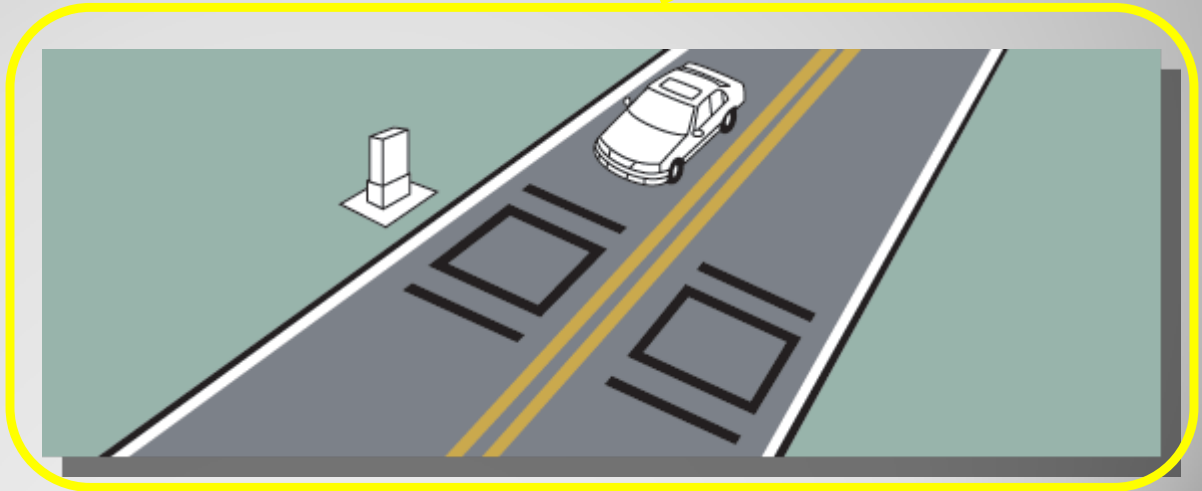
Presence sensors are used to calculate speed.

This is more common



Axle - Pres - Axle

Axle sensors are used to calculate speed.



Speed = distance / time

Can your Equipment support the changes?

Most equipment manufactured since the early 90's allows for 30 or more bins for speed, axle and length binning (traditional loop/piezo classifiers).

Some older non-intrusive technology does not allow this accuracy or binning options. Most of the newer products however provide this if the sensor is accurate enough.

What challenges will equipment face with collecting speed data?

- Slow speeds
- Congestion
- High speeds
- Equipment/sensor errors

Slow Speeds / Congestion



Slow Speeds / Congestion

Vehicles travelling at non-constant speeds pose a problem when measuring them.

Since the sensors measure the vehicle travelling from sensor A→B to then calculate speed, if the vehicle changes speed while in/over the sensor array, the calculation of axle spacing and length will then be affected.

The principal is the same with non-intrusive technologies. There are exceptions though about how speed is calculated with some technologies and implementations by equipment vendors.

High Speeds

Most equipment can handle high speeds in traffic detection without a large sacrifice in accuracy.

In speeds above 70MPH some sensors and spacings of sensors are less accurate the faster traffic becomes due to physical factors and resolution of sensor measurements.

Generally the accuracy of the speed measured is acceptable in these cases and not a major concern as most equipment is designed to be as accurate as possible in these conditions.



Equipment/Sensor Errors

Error percentages from equipment types vary. While Axle sensors may be better at collecting speed data, they wear more quickly and are more prone to failure and false/miss detection than Inductive loops.

Non-intrusive technologies face obstacles such as occlusion but may be better at detecting vehicles between lanes.

All equipment types will have a certain error and how those errors manifest with speed detection varies.



“Better to trust the man who is frequently in error than the one who is never in doubt.” - Eric Sevareid

Collecting the Data

Most agencies will need to change the data they collect to meet the new standard. However, you may want to look into going further than the FHWA standard.

The New Standard:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
< 20.0	20.1 25.0	25.1 30.0	30.1 35.0	35.1 40.0	40.1 45.0	45.1 50.0	50.1 55.0	55.1 60.0	60.1 65.0	65.1 70.0	70.1 75.0	75.1 80.0	80.1 85.0	85.1 <

A Step Further: (more bins)



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
< 10.0	10.1 15.0	15.1 20.0	20.1 25.0	25.1 30.0	30.1 35.0	35.1 40.0	40.1 45.0	45.1 50.0	50.1 55.0	55.1 60.0	60.1 65.0	65.1 70.0	70.1 75.0	75.1 80.0	80.1 85.0	85.1 90.0	90.1 95.0	95.1 100	100 <

A Leap Beyond: (Per Vehicle Data)



Lane	Time	Speed	Axles	Length
1	14:32.67	57.8MPH	5	87.4ft

How to implement changes on equipment?

Equipment will need to be programmed the new speed tables to work. Almost all classification equipment will allow programming through the communication port of the unit bin tables or schemas using vendor provided software. Some equipment collects static data that requires software to “bin” the data afterwards (ex: timestamp units) and cannot be programmed.

If implemented, many vendors will most likely make the new speed binning schema a default setting or provide users with the table to use. However, your older equipment will need to be programmed to match.

Most vendor software allows for some type of exporting and reporting of binning data formats for flexibility.

Data changes will affect you

Reconciling the new speed binning format with the old binning format may be the biggest challenge agencies face in dealing with data. This challenge will be up to users to determine how to approach and address this issue.

Since many agencies have custom software or custom data sets, the way in which users approach the issue of data reconciliation will differ.

Can your equipment collect the data you need?

Conclusion: Speed data can be collected using existing equipment in most cases to meet or exceed the FHWA Speed requirements.