

2013 MASITE Annual Meeting  
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# Data Collection – A Road Map

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Traffic Engineering Technology Session



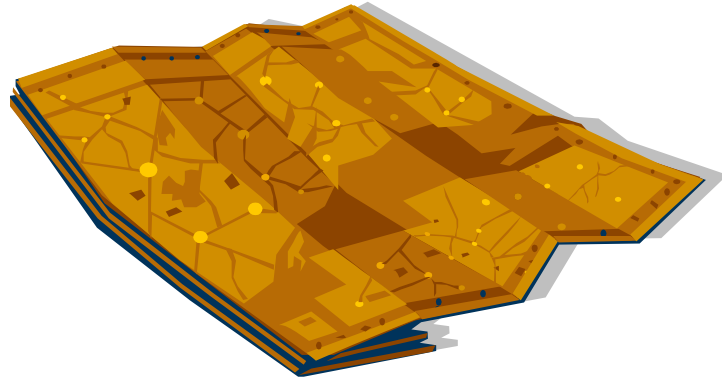
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# Road Map

- Data Sources
- Study Types
- Conclusions





# Data Sources

Probe-Based  
Spot Sensor-Based

# Data Sources

## Probe-Based Measures

Technology	Definition	Providers
Bluetooth	Identifies and matches MAC address of Bluetooth enabled devices as they pass reader	AWAM, TRAFFAX, TrafficCast, Savari Networks
Toll Tag Readers	Readers record toll tag ID numbers	E-ZPass
Private 3 <sup>rd</sup> Party Data Providers	Combination of probe data form multiple technologies	INRIX, TomTom, TrafficCast, HERE
Wireless Location	Uses signaling information from cell phones to anonymously track devices	Cellient, AirSage, Delcan
Crowd-Sourcing	Obtaining real-time traffic information from GPS-enabled mobile phones	Google Maps, TomTom MapShare, Trapster, Waze

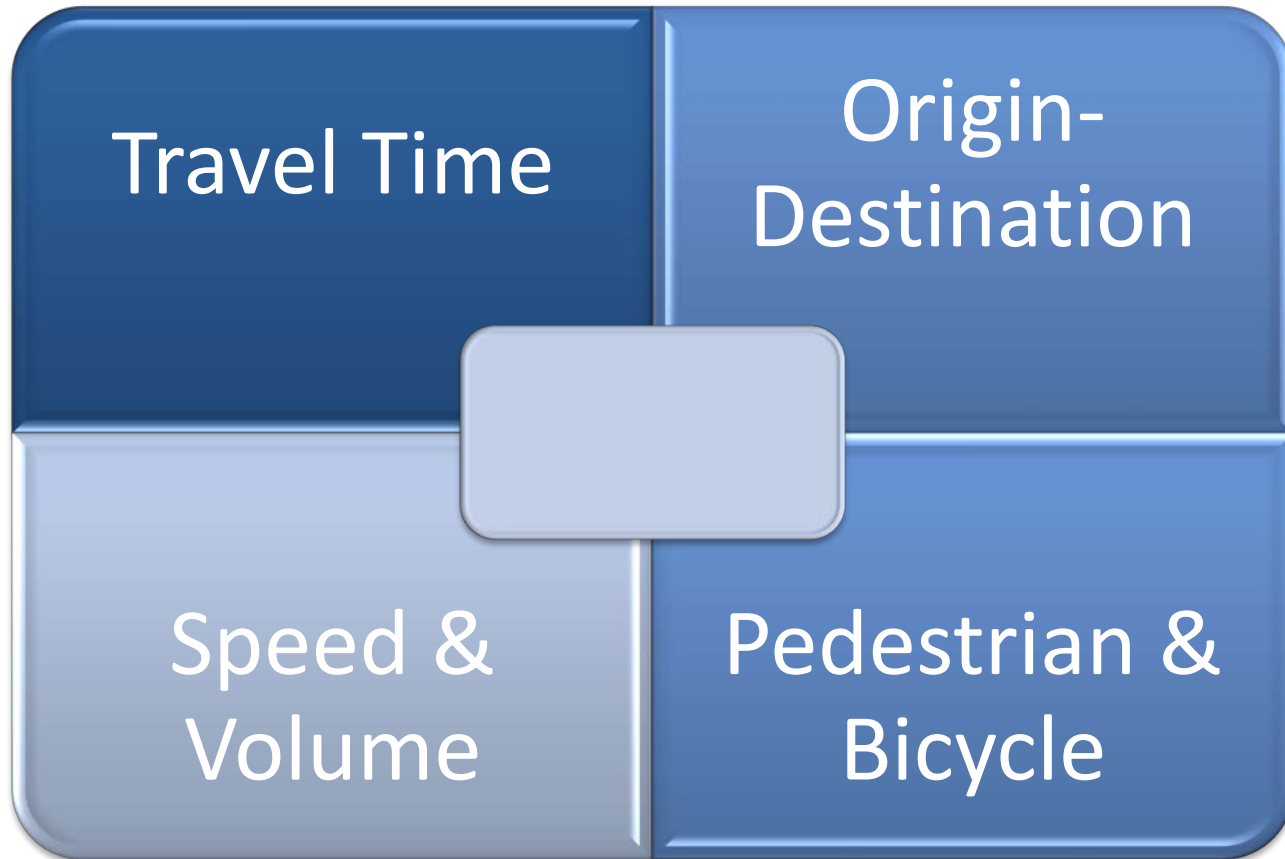


# Data Sources

## Spot Sensor-Based Measures

Technology	Definition
In-Road Sensors	Loop detectors or magnetic detectors
Radar	Directly measures speeds of vehicles
Video	Video image vehicle detection system

# Study Types



# Origin-Destination Studies

- Find out where vehicles are coming from, where they are going, and when trips occur.
- Used to support:
  - Travel demand model
  - Regional transportation system analysis



# Origin-Destination Studies

	Roadway Type		Area Type		Ability to Capture Individual Vehicle Experience
	Freeway	Arterial	Urban	Rural	
Bluetooth	✓	✓	✓	✓	x
Toll Tag Readers	✓	✓	✓	✓	x
Vehicle Observation	✓	✓	✓	✓	✓
In-Road Sensors	✓	✓	✓	✓	x
Video (license plate reading)	✓	✓	✓	✓	✓



# Spot Speed & Volume Studies

- Determine speed and/or volume at a specific point or section of roadway
- Must capture individual vehicles
- Can be used to determine:
  - 85<sup>th</sup> Percentile Speeds
  - Traffic volumes
  - Vehicle Classifications



# Spot Speed & Volume Studies

	Roadway Type		Area Type		Ability to Capture Individual Vehicle Experience
	Freeway	Arterial	Urban	Rural	
Vehicle Observation	✓	✓	✓	✓	✓
In-Road Sensors	✓	✓	✓	✓	✓
Radar	✓	✓	✓	✓	✓
Video	✓	✓	✓	✓	✓

# Pedestrian and Bicycle Studies

- Determine speed and/or volume of pedestrians or bicycles at a specific point or section of roadway
- Must capture individuals



# Pedestrian and Bicycle Studies

	Roadway Type	Area Type		Ability to Capture Individual Experience
	Arterial	Urban	Rural	
Vehicle Observation	✓	✓	✓	✓
In-Road Sensors	✓	✓	✓	✓
Video	✓	✓	✓	✓

# Travel Time Studies

- Study of travel time and associated delay on a selected corridor
- Can be used to determine:
  - Efficiency of given route
  - System performance
  - Capacity analysis
  - Problem locations



# Travel Time Studies

	Roadway Type		Area Type		Ability to Capture Individual Vehicle Experience
	Freeway	Arterial	Urban	Rural	
Bluetooth	✓	✓	✓	✓	x
Private Data Providers	✓	✓	✓	✓	x
Toll Tag Readers	✓	✓	✓	✓	x
Wireless Networks	✓	✓	✓	✓	x
Crowd Sourcing	✓	✓	✓	✓	x
Floating/Avg Car Method	✓	✓	✓	✓	✓
In-Road Sensors	✓	✓	✓	✓	✓
Radar	✓	✓	✓	✓	✓
Video	✓	✓	✓	✓	✓



# Travel Time Studies Using Wireless Networks

- North Carolina Capital Area MPO – Reduced costs of travel time studies from \$300,000 using floating car method to \$25,000 using AirSage wireless technology

Badger, Emily (2013, February 3) You Already Own the Next Most Important Transportation Planning Tool. *The Atlantic Cities*



# Travel Time Studies Using Crowd Sourcing

- Mobile Millennium Project – 2008 – Nokia and Navteq (HERE) used GPS data from thousands of cell phones to monitor freeway and arterial travel demand patterns in the San Francisco Bay Area

RITA Report Number FHWA-JPO-11-088



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# Conclusions

- Don't be afraid to explore new ways of collecting data
- New technologies could be less expensive and faster than you thought
- Shorter time, less money, more accuracy





Questions?

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