Welcome!

- Why do we need data collection?
- What type of data do we collect?
- How is the data collected?
- How long do we need to collect data?
- What are our standards for collection?
- How Much is Enough?
Karl Rothermel, P.E., PTOE

- Didn't start out as an engineer
- 20+ years as traffic engineer
- ITE member since 2000
- Works for: CobbFendley
My Journey...

Pre-Historic Times

1985

1993

1995

2006

Today

1985

1993

2006

The Peak of Transportation 2018

Keystone

Joint Western & Texas District Meeting

LSU

PTOE Professional Traffic Operations Engineer
Where I've worked
This isn't something new

Collection of twelve papers from the International Workshop on Traffic Data Collection held in 2008.
Foreword

'Traffic data is the cornerstone' to everything from the most classical traffic control analysis to the most advanced real-time control and management implementing modern Intelligent Transportation Systems (ITS) applications.

These applications are primarily based on the availability of traffic data supplied by a Data Collection System which, equipped with more or less sophisticated technologies, provides measurements on the fundamental traffic variables, ideally with the required level of temporal aggregation, and perhaps, when the technology allows it, additional measurements on other variables of interest, depending on the type of application in which they will be used.

The applications are in turn supported by models, and in fact the primary use of the data is to provide the input to traffic models whose quality depends on the quality, consistency, robustness, completion and other characteristics of the data.'
DATA COLLECTION: How Much is Enough?

- Technology
- Duration
- Standards
- Data Collection Types
- Traffic Studies
- Intro

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Traffic Studies

"I need that traffic study complete by Friday…"
Traffic Studies

"I need that traffic study complete by Friday...."

Pretty vague to everyone... EXCEPT to traffic engineers
Traffic Impact Analysis

How does the proposed site affect the local network?

- Site Access
- Trip Generation
- TMCs
- Site Access
- Trip Generation
- TMCs
Corridor Studies

- Capacity Improvements
- Signal Coordination
- Pedestrian Access
Access Management

Short Term Access Management Improvements

Proposed Median
Innovative Intersections

- Restricted Crossing U-Turns
- J-Turn Intersections
- Diverging Diamond Intersections
- Continuous Flow Intersections
- Roundabouts
Signal Timing Plans
DATA COLLECTION: How Much is Enough?

- Intro
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- Discussion
Volume
# FHWA Vehicle Classifications

<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Motorcycles</td>
<td>2 axles, 2 or 3 tires</td>
<td><img src="image1" alt="Motorcycle" /></td>
</tr>
<tr>
<td>2. Pedestrians</td>
<td>0 axles</td>
<td><img src="image2" alt="Pedestrian" /></td>
</tr>
<tr>
<td>3. Pedal Cycles</td>
<td>2 axles, 2 or 3 tires</td>
<td><img src="image3" alt="Bicycle" /></td>
</tr>
<tr>
<td>4. Buses</td>
<td>2 or 3 axles, less than 24 ft.</td>
<td><img src="image4" alt="Bus" /></td>
</tr>
<tr>
<td>5. Single Unit 2-Axle Trucks</td>
<td>2 axles, not part of a trailer, single unit</td>
<td><img src="image5" alt="Single Unit 2-Axle Truck" /></td>
</tr>
<tr>
<td>6. Single Unit 3-Axle Trucks</td>
<td>3 axles, single unit</td>
<td><img src="image6" alt="Single Unit 3-Axle Truck" /></td>
</tr>
<tr>
<td>7. Single Unit 4 or More-Axle Trucks</td>
<td>4 or more axles, single unit</td>
<td><img src="image7" alt="Single Unit 4 or More-Axle Truck" /></td>
</tr>
<tr>
<td>8. Multi-Trailer 2-Axle Trucks</td>
<td>2 axles, multiple units</td>
<td><img src="image8" alt="Multi-Trailer 2-Axle Truck" /></td>
</tr>
<tr>
<td>9. Multi-Trailer 3-Axle Trucks</td>
<td>3 axles, multiple units</td>
<td><img src="image9" alt="Multi-Trailer 3-Axle Truck" /></td>
</tr>
<tr>
<td>10. Multi-Trailer 4 or More-Axle Trucks</td>
<td>4 or more axles, multiple units</td>
<td><img src="image10" alt="Multi-Trailer 4 or More-Axle Truck" /></td>
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</tbody>
</table>
Speed
Driveway
Travel Time

- How much time is needed to get from point A to point B?
- Helps in simulation model calibration

How is it computed?
Field Observations

- Queue Lengths
- Queue Durations
- Unmet Demand
- Driver Behavior
Verification
DATA COLLECTION: How Much is Enough?

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Technology has radically improved on how we collect data.
Tubes
Video
Bluetooth
Google Traffic (Waze)

- Real-time notifications of crashes and road closures
- Ability to find crash scenes easier and faster
- Ability for dispatch center to enter road closures
- Best navigation to incidents using Waze SDK
- Reducing response times
Duration

- Hours vs. Days vs. Weeks
- Determining Peak Hours
- Days of the Week
- Macro vs. Micro
Hours vs. Days vs. Weeks

YEEEEAAAHH!

I'M GONNA NEED YOU TO BRING MORE DATA.
Determining Peak Time

[Graph showing the number of variables over time of day for different days of the week]
Determining Peak Time
### Days of the Week

<table>
<thead>
<tr>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
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</table>
Macro vs. Micro

- Macroscopic level
- Mesoscopic level
- Microscopic level
- Hybrid simulation
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Standards

- ITE
- AASHTO
- HCM
- State
- Local
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Let's get down to brass tacks...

- Data collection is not glamorous
- Traffic engineering studies are the basis for intersection, roadway, and highway design
- Studies depend on adequate and accurate data collection
- Communicate with client and focus on the project goal.
- 2 examples of what can go wrong
Thank you for your time!

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