Making Data Meaningful for Arterial Analysis

Presented by:
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Topics

• Purpose and Meaning
• Evaluating Options
• Adding Value
• Lessons Learned
Typical Transportation Questions

- Travel time/congestion: intersection, corridor, region
- Who and why are the users of the system?
- Will this solution work in 10, 20, or 30 years?
- How much will it cost to implement and maintain?
- How can we better manage our system/program?
- How confident are we in the recommendation?

Approach to Making Data Meaningful

Data → Information → Knowledge → Wisdom
Speed Matters…

At 40 mph the driver’s focus is on the roadway in the distance.

At 30 mph the driver begins to see things at the road edges in the background.

Pedestrian Fatality Rates for Collisions at Different Speeds

- 40 mph
- 30 mph
- 20 mph

By Reid Ewing and Eric Dumbaugh
Speed Matters....

Relationship of Freeway LOS, Speed, and CO2 Emissions Factors

![Graph showing the relationship between Average Vehicle Speed (mph) and Normalized Emission Rate with LOS F, E, D, and C or Better levels indicated.]

Evaluation of Facility User

![Image of two women walking and talking, with a chart showing sample traffic count location and data collection methods.]

Sample Traffic Count Location

- Data Missed with Traditional Method
- Data Collected with Traditional Method
Evaluation of Aggregation

Evaluation of Multiple Options

<table>
<thead>
<tr>
<th>Method</th>
<th>Pros</th>
<th>Cons</th>
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<tbody>
<tr>
<td>Telephone Survey</td>
<td>Provides detailed vehicle trip making information such as vehicle trip generation rates, trip purpose, occupancy and class of vehicle.</td>
<td>Extreme potential for under reporting and survey bias due to reliance on survey taker for all vehicle trip information (including origin, destination, trip length, etc. which can be observed through the use of other methods). Development and implementation of survey of a sufficient size to be statistically valid can be costly. Does not isolate intra and interregional travel or target the travelers within the region. Labor intensive process to provide data in a format suitable for comparison and integration with travel demand models.</td>
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<td>(Considered and Rejected)</td>
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<td>Roadside Interview</td>
<td>Provides information such as the number of vehicles that travel through the region, their entry and exit points, and their percent makeup of total traffic.</td>
<td>Potential for under reporting and survey bias due to reliance on survey taker for most vehicle trip information (including origin or destination, trip length, etc. which can be observed through the use of other methods). Development and implementation of survey of a sufficient size to be statistically valid can be costly.</td>
</tr>
<tr>
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Evaluation of Data Source

Adding Value by Describing Variation

5 Fulton Reliability
PM period (4 PM to 7 PM)

Average Speed

StDev of Travel Time

StDev of Travel Time / Average Travel Time

Source: SFMTA bus AVL data from May 2012. GIS analysis tool developed by Fehr & Peers

Mean speed (mph)
- 0 - 10
- 10 - 12.5
- 12.5 - 15
- 15 - 17.5
- 17.5 - 20
- 20 +
  - stops

Stdev travel time (s)
- 0 - 20
- 20 - 35
- 35 - 50
- 50 - 65
- 65 - 80
- 80 +
  - stops

Travel time coeff. of var.
- 0 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 +
  - stops
Adding Value by Combining Data

Passengers at Study Locations

Rank Improvement Locations

Lessons Learned

• Not All Data Are Created Equal
• Better (Data + Understanding) = Better Decisions
• Human and Technology Resources
Making Data Meaningful for Arterial Analysis

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