Cobb County Driver Satisfaction Study

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Outline

- Study Overview
- Methodology
- Survey Results
- Conclusions
Study Overview
Study Objectives

• Develop and test methodology for assessing changes in driver satisfaction due to ITS enhancements

• Measure changes in driver satisfaction with their driving experience on an urban arterial due to the implementation of an adaptive traffic signal system
  ○ Hypothesis: there will be an increase in driver satisfaction due to the ITS enhancement

• Establish driver satisfaction as a measure of improvement to transportation network operations
General Approach

Pre/Post Treatment Group

• Survey panel of drivers before and after installation of the adaptive signal system

Pre/Post Control Group

• Survey second panel of drivers who drive on a comparable route (with no deployment) at same times as treatment panel
Background

- SCATS adaptive signal timing system being deployed along two mile corridor in Cobb County, Georgia
- Cobb County to determine if 55 additional intersections should be instrumented
- Georgia Institute of Technology conducts pre/post travel time and delay study on Paces Ferry (fielded at same time as Volpe study)
Characteristics of Study Route

- Two mile corridor along Paces Ferry Road; 15 signalized intersections
- Mix of residential, office park, retail development; crosses Interstate 285
- Number of lanes varies from 1 lane in each direction up to 6 lanes in each direction at highway interchange
- Traffic signals recently re-timed
Treatment Route: Paces Ferry
Control Route: Spring Road
Methodology
Sample Design

• Randomly sample households living in census tracts that include the study routes

• Over-sample off-peak drivers
  – Benefits of new system expected to be greatest off-peak

• Use telephone recruitment survey to identify eligible drivers and schedule their “typical” drive
  – Respondent not employed by Cobb County, Georgia DOT, USDOT
  – Respondent between the ages of 18 to 75
  – Household owns at least one vehicle
  – Respondent has valid driver’s license
  – Drivers must regularly drive the route (Tuesday, Wednesday, Thursday, Saturday or Sunday)
Background survey
• Obtain information on respondents’ driving habits, characteristics of their “typical drive”

Driver Survey
• Importance and satisfaction ratings for:
  – Number of times stopped by a red light
  – Amount of time spent at red lights
  – Coordination of traffic signals along the route
  – Amount of green time for side streets
  – Your overall travel speed
• Other satisfaction measures with roadway driving experience:
  - Lane width
  - Quality of road pavement
  - Quality of pavement markings
  - Roadside landscaping
  - Driving behavior of other drivers
  - Availability of turn lanes
  - Overall level of traffic congestion

• Document drive date, time, and route; drive conditions; schedule flexibility; concern with on-time arrival
Pilot Test: September 2004

Wave 1: October 2004 – February 2005

• Send brochure to all eligible households
• Conduct recruitment
• Mail survey materials and $5 incentive to recruited drivers
• Reminder phone call/postcard before the drive
• Drivers complete survey immediately following drive and mail it back (or internet/fax)
Panel maintenance: letter and $2 incentive

Wave 2: April – May 2005

• Re-contact drivers
  – determine eligibility
  – schedule drive

• Mail out survey and $10 incentive

• Reminder phone call

• Drivers complete survey immediately following drive & mail it back (or internet/fax)
Wave 1: 32% response rate
- 1470 drivers recruited (50% recruitment rate)
- 924 complete drive (63% completion rate)
  - 570 Paces Ferry Road; 354 Spring Road

Wave 2: 71% response rate
- 724 drivers re-recruited (out of 840 eligible)
- 594 complete wave 2
  - 380 Paces Ferry Road; 214 Spring Road
Survey Results
Who are the Drivers?

• Both samples well distributed with regard to gender, age, trip purpose

• Paces Ferry drivers tend to be better educated and higher income
  - 39% have graduate degrees (vs. 22% for Spring Road)
  - 46% earn $100K or more (vs. 18% for Spring Road)
What Matters to Drivers: Background Survey

Same attributes rated as most important by Paces Ferry and Spring Road drivers:
• Traffic congestion, driving behavior of others, traffic signal coordination

Attributes rated as least important by both samples:
• Roadside landscaping, lane width, amount of green time to side streets

Spring Road Drivers rate “roadside landscaping” & “driving behavior of others” as more important
Importance Ratings: Background Survey

- Overall Traffic Congestion
- Driving Behavior of Others
- Traffic Signal Coordination
- Amount of Time at Red Light
- # Times Stopped at Red Light
- Road Pavement Quality
- Pavement Markings Quality
- Availability of Turn Lanes
- Overall Travel Speed
- Amount of Green to Side Streets
- Lane Width
- Roadside Landscaping

Graph showing importance ratings for various factors with categories such as Total, Paces Ferry, and Spring Rd.
Satisfaction Ratings: Wave 1

Both Paces Ferry and Spring Road drivers:

• **Highest ratings for:**
  - Road pavement quality
  - Lane width
  - Pavement marking quality
  - Availability of turn lanes

• **Lowest ratings for:**
  - Number of times stopped by a red light
  - Amount of time at red lights
  - Driving behavior of other drivers
Satisfaction Ratings: Paces Ferry vs. Spring Road

Despite overall similarities, some differences between the two samples.

- Paces Ferry drivers more satisfied with:
  - Road pavement quality
  - Overall travel speed
  - Traffic congestion
  - Driving behavior of others
Gap Between Importance and Satisfaction (wave 1)

- Availability of Turn Lanes
- Overall Travel Speed
- Traffic Signal Coordination
- Amount of Green to Side Streets
- Amount of Time at Red Light
- # Times Stopped at Red Light
- Overall Traffic Congestion
- Driving Behavior of Others
- Roadside Landscaping
- Pavement Markings Quality
- Road Pavement Quality
- Lane Width

Legend:
- Total
- Paces Ferry
- Spring Rd
Factors Related to Satisfaction

Off-Peak drivers more satisfied with:

- Driving behavior of others, traffic congestion, # times stopped by red light, traffic signal coordination, availability of turn lanes

Those very concerned with on-time arrival less satisfied with:

- Traffic congestion, # times stopped by red light, amount of time at red lights, traffic signal coordination, overall travel speed

No consistent difference in ratings by age or gender
Drivers on both routes continue to be most satisfied with:
- Road pavement quality
- Lane width
- Pavement marking quality
- Availability of turn lanes

Differences between Paces Ferry and Spring Road drivers consistent with wave 1. Paces Ferry drivers more satisfied with:
- Road pavement quality
- Driving behavior of others
- Overall level of traffic congestion
## Change in Satisfaction Ratings for Paces Ferry Road

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Wave 1</th>
<th>Wave 2</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Pavement Quality</td>
<td>5.60</td>
<td>5.59</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Pavement Marking Quality</td>
<td>5.31</td>
<td>5.30</td>
<td>-0.2%</td>
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<tr>
<td>Lane Width</td>
<td>5.30</td>
<td>5.48</td>
<td>3.4%</td>
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<tr>
<td>Availability of Turn Lanes</td>
<td>5.21</td>
<td>5.20</td>
<td>-0.2%</td>
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<tr>
<td>Traffic Congestion</td>
<td>5.12</td>
<td>5.02</td>
<td>-2.0%</td>
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<tr>
<td>Overall Travel Speed</td>
<td>5.11</td>
<td>5.07</td>
<td>-0.8%</td>
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<tr>
<td>Roadside Landscaping</td>
<td>4.76</td>
<td>5.04</td>
<td>5.9%</td>
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<tr>
<td>Traffic Signal Coordination</td>
<td>4.72</td>
<td>4.57</td>
<td>-3.2%</td>
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<tr>
<td>Green Time for Side Streets</td>
<td>4.71</td>
<td>4.68</td>
<td>-0.6%</td>
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<tr>
<td>Driving Behavior of Others</td>
<td>4.63</td>
<td>4.64</td>
<td>0.2%</td>
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<tr>
<td>Time at Red Lights</td>
<td>4.49</td>
<td>4.38</td>
<td>-0.4%</td>
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<tr>
<td># Times Stopped by Red Light</td>
<td>4.40</td>
<td>4.26</td>
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</tr>
<tr>
<td>Overall</td>
<td>5.11</td>
<td>5.14</td>
<td>0.6%</td>
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</tbody>
</table>
Satisfaction Ratings: Wave 1 vs. Wave 2

Treatment group (Paces Ferry):
- Only significant changes in satisfaction:
  increased satisfaction with lane width and roadside landscaping

Control group (Spring Road):
- Significant increase in satisfaction with roadside landscaping
### Attribute Change in Satisfaction

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Change</th>
<th>Peak (n=123)</th>
<th>Off-Peak (n=182)</th>
<th>Saturday (n=78)</th>
</tr>
</thead>
<tbody>
<tr>
<td># Times Stopped by Red Light</td>
<td>Decrease</td>
<td>36.4%</td>
<td>41.7%</td>
<td>44.9%</td>
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<tr>
<td></td>
<td>No Change</td>
<td>31.4%</td>
<td>23.9%</td>
<td>21.8%</td>
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<tr>
<td></td>
<td>Increase</td>
<td>32.2%</td>
<td>34.4%</td>
<td>33.3%</td>
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<tr>
<td>Time at Red Lights</td>
<td>Decrease</td>
<td>38.8%</td>
<td>35.0%</td>
<td>42.3%</td>
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<tr>
<td></td>
<td>No Change</td>
<td>30.6%</td>
<td>28.9%</td>
<td>25.6%</td>
</tr>
<tr>
<td></td>
<td>Increase</td>
<td>30.6%</td>
<td>36.1%</td>
<td>32.1%</td>
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<tr>
<td>Green Time for Side Streets</td>
<td>Decrease</td>
<td>35.9%</td>
<td>34.1%</td>
<td>40.3%</td>
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<td>No Change</td>
<td>31.6%</td>
<td>29.5%</td>
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<tr>
<td></td>
<td>Increase</td>
<td>32.5%</td>
<td>36.4%</td>
<td>31.2%</td>
</tr>
<tr>
<td>Traffic Signal Coordination</td>
<td>Decrease</td>
<td>36.4%</td>
<td>41.3%</td>
<td>37.7%</td>
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<tr>
<td></td>
<td>No Change</td>
<td>22.3%</td>
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<td>37.7%</td>
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<tr>
<td></td>
<td>Increase</td>
<td>41.3%</td>
<td>34.1%</td>
<td>24.7%</td>
</tr>
<tr>
<td>Overall Travel Speed</td>
<td>Decrease</td>
<td>34.2%</td>
<td>35.2%</td>
<td>42.3%</td>
</tr>
<tr>
<td></td>
<td>No Change</td>
<td>28.3%</td>
<td>31.8%</td>
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<td></td>
<td>Increase</td>
<td>37.5%</td>
<td>33.0%</td>
<td>29.5%</td>
</tr>
</tbody>
</table>
Explanatory Factors

1. Adaptive signal system did not result in reduced travel time or delay (Georgia Institute of Technology Study)

2. Corridor already functioning at optimal levels

3. Minor problems reported with operation of the adaptive signal system during wave 2 of the study
Conclusions

1. The methodology worked as a means of measuring driver satisfaction
   - Good response rates
   - Drivers consistent in their ratings
   - Ratings consistent with observable roadway conditions

2. Drivers least satisfied with aspects of driving experience that are most important to them (i.e. traffic signal coordination)

3. If adaptive traffic signal system does not perform better than a well-timed traditional system, drivers will not notice a difference
Comments or Questions?

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