Enhanced Role of Activity Center Transportation Organizations in Regional Mobility – Do Not Block the Box Campaign

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Activity Center Transportation Organizations

• Business Improvement Districts (BIDs)
• Community Improvement Districts (CIDs)
• Transportation Management Associations (TMAs)

• Services Offered
  – Capital Improvements
  – Consumer Marketing
  – Economic Development
  – Maintenance
  – Parking and Transportation
  – Policy Advocacy
  – Public Space Regulation
  – Security
  – Social Services
TMA Surveys

- 1989: Association for Commuter Transportation (ACT) Survey: TMA characteristics
- 1990: The Urban Land Institute (ULI): Transportation management through partnerships survey, with a particular focus on TMAs
- 1991: Georgia Tech / Urban Mass Transportation Administration: national TMA survey on how private sector participation affected and was affected by key TMA characteristics
- 1993: Commuter Transportation Services, Inc. (CTS): national TMA survey focusing on policies and procedures, especially management and personnel issues
- 1995: ACT: compiled a new national TMA directory
- 2002: ETF Associates: national TMA internet search to identify the survival characteristics of TMAs
- 2003: The Center for Urban Transportation Research (CUTR) at the University of South Florida: update of 1993 and 1998 survey
### Comparison of services provided to TMO members

(Killen, Luten, and Owen, 2010)

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Relocation services</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>28%</td>
</tr>
<tr>
<td>Tax benefit program assistance</td>
<td>--</td>
<td>--</td>
<td>38%</td>
<td>28%</td>
</tr>
<tr>
<td>Direct ridesharing incentives</td>
<td>--</td>
<td>--</td>
<td>39%</td>
<td>26%</td>
</tr>
<tr>
<td>Personalized journey planning, individual marketing</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>25%</td>
</tr>
<tr>
<td>Telework program assistance</td>
<td>--</td>
<td>18%</td>
<td>31%</td>
<td>25%</td>
</tr>
<tr>
<td>Subsidized transit passes</td>
<td>--</td>
<td>18%</td>
<td>35%</td>
<td>24%</td>
</tr>
<tr>
<td>Vanpool services</td>
<td>78%</td>
<td>33%</td>
<td>35%</td>
<td>24%</td>
</tr>
<tr>
<td><strong>Real-time travel alerts (email, SMS)</strong></td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>21%</td>
</tr>
<tr>
<td>Shuttle / transit provision</td>
<td>31%</td>
<td>16%</td>
<td>27%</td>
<td>21%</td>
</tr>
<tr>
<td>Social media communications (Facebook, Twitter)</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>18%</td>
</tr>
<tr>
<td>Vanpool subsidies</td>
<td>24%</td>
<td>26%</td>
<td>36%</td>
<td>18%</td>
</tr>
<tr>
<td><strong>Web-based mapping or journey planner</strong></td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>17%</td>
</tr>
<tr>
<td>Sample workplace policies</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>13%</td>
</tr>
<tr>
<td>Carshare program (e.g., Zipcar)</td>
<td>--</td>
<td>--</td>
<td>13%</td>
<td>11%</td>
</tr>
<tr>
<td>Freight delivery plans</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>4%</td>
</tr>
</tbody>
</table>
Comparison of services provided to TMO members
(Killen, Luten, and Owen, 2010)

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Promotional / marketing materials</td>
<td>84%</td>
<td>43%</td>
<td>47%</td>
<td>47%</td>
</tr>
<tr>
<td>Employer travel surveys</td>
<td>67%</td>
<td>--</td>
<td>--</td>
<td>45%</td>
</tr>
<tr>
<td>Promotional events</td>
<td>90%</td>
<td>55%</td>
<td>44%</td>
<td>44%</td>
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<tr>
<td>Trip reduction plan / travel plan development</td>
<td>69%</td>
<td>41%</td>
<td>38%</td>
<td>44%</td>
</tr>
<tr>
<td>Rideshare matching</td>
<td>73%</td>
<td>33%</td>
<td>37%</td>
<td>40%</td>
</tr>
<tr>
<td>Email newsletters</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>38%</td>
</tr>
<tr>
<td>Guaranteed Ride Home</td>
<td>67%</td>
<td>56%</td>
<td>51%</td>
<td>38%</td>
</tr>
<tr>
<td>Advocacy</td>
<td>96%</td>
<td>57%</td>
<td>41%</td>
<td>35%</td>
</tr>
<tr>
<td>Employer travel coordinator training</td>
<td>61%</td>
<td>49%</td>
<td>34%</td>
<td>35%</td>
</tr>
<tr>
<td>Cycling program assistance</td>
<td>--</td>
<td>--</td>
<td>32%</td>
<td>34%</td>
</tr>
<tr>
<td>Transit pass sales</td>
<td>39%</td>
<td>--</td>
<td>--</td>
<td>31%</td>
</tr>
<tr>
<td>Employer networking events</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>30%</td>
</tr>
<tr>
<td>Parking management planning</td>
<td>41%</td>
<td>22%</td>
<td>15%</td>
<td>29%</td>
</tr>
<tr>
<td>Web-based travel information</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>29%</td>
</tr>
</tbody>
</table>
GEORGIA TECH TMA Survey
## TDM services offered by organizations

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent (based on 42 responses)</th>
<th>Response Percent (in context to all 51 respondents)</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rideshare matching</td>
<td>60.5%</td>
<td>50.0%</td>
<td>26</td>
</tr>
<tr>
<td>Guaranteed ride home</td>
<td>58.1%</td>
<td>48.1%</td>
<td>25</td>
</tr>
<tr>
<td>Trip reduction plan preparation</td>
<td>51.2%</td>
<td>42.3%</td>
<td>22</td>
</tr>
<tr>
<td>Bicycle program</td>
<td>39.5%</td>
<td>32.7%</td>
<td>17</td>
</tr>
<tr>
<td>Vanpool services</td>
<td>39.5%</td>
<td>32.7%</td>
<td>17</td>
</tr>
<tr>
<td>Shuttle/Local transit</td>
<td>37.2%</td>
<td>30.8%</td>
<td>16</td>
</tr>
<tr>
<td>Telecommuting program</td>
<td>34.9%</td>
<td>28.8%</td>
<td>15</td>
</tr>
<tr>
<td>Direct rideshare incentives</td>
<td>30.2%</td>
<td>25.0%</td>
<td>13</td>
</tr>
<tr>
<td>Coordinated travel plan</td>
<td>27.9%</td>
<td>23.1%</td>
<td>12</td>
</tr>
<tr>
<td>Subsidized transit passes</td>
<td>25.6%</td>
<td>21.2%</td>
<td>11</td>
</tr>
<tr>
<td>Transit pass sales</td>
<td>18.6%</td>
<td>15.4%</td>
<td>8</td>
</tr>
<tr>
<td>Carshare program</td>
<td>18.6%</td>
<td>15.4%</td>
<td>8</td>
</tr>
<tr>
<td>Parking services provision</td>
<td>9.3%</td>
<td>7.7%</td>
<td>4</td>
</tr>
<tr>
<td>Parking pricing or management</td>
<td>9.3%</td>
<td>7.7%</td>
<td>4</td>
</tr>
<tr>
<td>N/A</td>
<td>23.3%</td>
<td>19.2%</td>
<td>10</td>
</tr>
</tbody>
</table>

**Answered question:** 43 (82.6%)

**Skipped question:** 9 (17.6%)
Traffic Operations Services by TMOs

- Involved in traffic operations?
  - Yes 20% (9)
  - No 80% (36)

- Considered implementing real-time info projects
  - Yes 14.29% (6)
  - No 85.71% (36)

- Implemented real-time info projects

Bar chart showing:
- Traffic control improvements: 50%
- Signal timing: 50%
- Signal coordination planning: 50%
- Optimization of timing plans: 50%
- HOV priority treatment: 33.33%
- Bus priority signal: 33.33%
- Traffic counts: 66.67%
- Traffic speeds: 16.67%
- Travel time: 33.33%
- Simulation: 33.33%
- N/A: 33.33%
- Other (please specify): 50%
Potential Implementation Strategies

• Long Term measure
  – Leverage Connected Vehicle Initiative

• Medium Term measure
  – Congestion predictive analytics

• Short Term measure
  – Do not Block the Box Campaign
Do Not Block the Box Campaign

- Problems with blocking the box
  - Operations
    - Congestion (possible gridlock)
    - Emission
    - Impact on local businesses
  - Safety
    - Pedestrian safety issues due to vehicles stopped on crosswalk
• Survey sent to 415 organizations
• 75 responded (13 partial responses)
  – 29 Local jurisdictions
  – 11 police departments
  – 8 BIDs
  – 4 TMAs
  – 1 State DOT
  – 1 University
  – 1 CID
Is there a positive public perception for your organization's DBTB campaign?

Answered: 9  Skipped: 63

- Yes
- No
- Don't know

If DBTB campaigns are shown to be an economical alternative in traffic management, would your organization consider starting a DBTB campaign to help with congestion and safety concerns?

Answered: 41  Skipped: 29

- Yes 76.74% (33)
- No 23.26% (10)
In your organization's opinion, what is the level of improvement in traffic operations since the DBTB campaign started?

Answered: 9  Skipped: 63

- Minimal
- Moderate
- Sufficient
- Don't know

Assuming the DBTB campaign was initially successful, did the observed benefits decline over time?

Answered: 9  Skipped: 63

- Yes
- No
- DBTB campaign was not...
- Don't know
DBTB Data Collection
Data Processing Methodology

- Data extraction using Video Analyzer
  - Entry Point
  - Exit Point
  - Start Time of Blocking
  - End Time of Blocking
  - Signal Indication timestamps

- Data collection manually
  - Assign block ID
  - Determine which approach was blocked
  - Degree of each block
  - Calculate duration of each blocking session
  - Fill in any missing information
Degree of Blockage and Capacity Reduction

- **Full Blocking**: Vehicle on the conflicting approach cannot pass the vehicle that is blocking their approach (Full capacity loss)

- **Partial Blocking**: Vehicle on the conflicting approach can bypass the blocking vehicle by entering another lane to go around the blocking vehicle.
  - *Type 1*: Conflicting approach vehicles could easily go around the blocking vehicle (no capacity loss)
  - *Type 2*: Conflicting approach vehicles bypass blocking vehicle in slower and non-safe way (capacity loss)
  - *Type 3*: Conflicting approach vehicles choose to not to bypass the blocking vehicle (full capacity loss)
Observed Frequency and Impact of Blocking

Intersection 4: Peachtree Road & Highland Drive (7 days of data during 2 hour peak)

Average Number of Blocks

Day of Week:
- Monday
- Tuesday
- Wednesday
- Thursday
- Friday

- Full Block
- Partial Block

Average Percent of Green Time Wasted

32.00%
28.00%
24.00%
20.00%
16.00%
12.00%
8.00%
4.00%
0%

NCTSPM
Georgia Institute of Technology
Georgia Transportation Institute
Georgia Department of Transportation
### Observed Frequency of Blocking and Green Time Loss

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Total Analysis Period (days/minutes)</th>
<th>Total Green Time</th>
<th>Total Green Time that Experienced Blocking</th>
<th>Overall Percent of Green Time that Experienced Blocking</th>
<th>Total Partial Blocking Time</th>
<th>Total Full Blocking Time</th>
<th>Average Green time lost due to Partial Blocking Each 2 hr Period</th>
<th>Average Green time lost due to Full Blocking Each 2 hr Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peachtree Rd. &amp; Mathieson Dr.</td>
<td>(14/20,160)</td>
<td>1468 minutes and 50 seconds</td>
<td>82 minutes and 48 seconds</td>
<td>5.6%</td>
<td>69 minutes and 1 second</td>
<td>13 minutes and 48 seconds</td>
<td>4 minutes and 56 seconds</td>
<td>0 minutes and 59 seconds</td>
</tr>
<tr>
<td>Peachtree Rd. &amp; Piedmont Rd.</td>
<td>(11/15,840)</td>
<td>881 minutes and 24 seconds</td>
<td>22 minutes and 34 seconds</td>
<td>2.5%</td>
<td>17 minutes and 41 seconds</td>
<td>4 minutes and 53 seconds</td>
<td>1 minute and 58 seconds</td>
<td>0 minutes and 33 seconds</td>
</tr>
<tr>
<td>Peachtree Rd. &amp; Highland Dr.</td>
<td>(7/10,080)</td>
<td>671 minutes and 5 seconds</td>
<td>73 minutes and 14 seconds</td>
<td>10.9%</td>
<td>67 minutes and 29 seconds</td>
<td>5 minutes and 45 seconds</td>
<td>9 minutes and 38 seconds</td>
<td>0 minutes and 49 seconds</td>
</tr>
<tr>
<td>Peachtree Rd. &amp; Stratford Rd.</td>
<td>(7/10,080)</td>
<td>698 minutes and 57 seconds</td>
<td>120 minutes and 34 seconds</td>
<td>17.2%</td>
<td>80 minutes and 15 seconds</td>
<td>40 minutes and 19 seconds</td>
<td>11 minutes and 28 seconds</td>
<td>5 minutes and 46 seconds</td>
</tr>
<tr>
<td>Peachtree Rd. &amp; Lenox Mall entrance</td>
<td>(31/44,640)</td>
<td>3492 minutes and 34 seconds</td>
<td>360 minutes and 32 seconds</td>
<td>10.3%</td>
<td>240 minutes and 55 seconds</td>
<td>109 minutes and 32 seconds</td>
<td>8 minutes and 13 seconds</td>
<td>3 minutes and 32 seconds</td>
</tr>
<tr>
<td>10th Street &amp; Williams Street</td>
<td>(3/4,320)</td>
<td>319 minutes and 6 seconds</td>
<td>139 minutes and 9 seconds</td>
<td>43.6%</td>
<td>105 minutes</td>
<td>34 minutes and 9 seconds</td>
<td>35 minutes</td>
<td>11 minutes and 23 seconds</td>
</tr>
</tbody>
</table>
Building network model using VISSIM 5.20 to simulate the effect of Don’t Block the Box.
Using GDOT RTOPs interface the signal phase data was extracted and incorporated in the VISSIM model.

VISSIM model consists of following intersections:
- Peachtree-Piedmont
- Peachtree-Highland
- Peachtree-Tower Pl
- Peachtree-Stratford
- Peachtree-Lenox Pkwy
- Peachtree-Lenox Mall Entrance
Priority Rule in VISSIM consists of
• One stop line (red color)
• One or more conflict markers that are associated with the stop line (green color)

How does Priority Rule function?

Depending on the current conditions at the conflict marker(s) the stop line allows vehicles to cross or not.

The two main conditions to check at the conflict marker(s) are:
• Minimum headway: Min distance between conflict marker and next approaching vehicle
• Minimum gap time: Min gap time between conflict marker and next vehicle upstream
• Max speed: vehicle approaching conflict marker will be taken in account for headway condition if its speed is same or lower as max. speed
Testing VISSIM sample network using Priority Rules to create blocking scenario

- Blue: non-blocking cars
- Red: blocking cars

Red cars block the minor approach

Blue cars don’t get in the box
Lessons Learned

• Involvement of TMOs in traffic operations is currently limited
• TMOs typically operate on low budget
  – Prefer low cost high impact solutions (DBTB costs < $2000 per intersection)
  – TMOs are receptive to DBTB campaign if benefits can be documented
  – Existing DBTB implementations are perceived to have positive effects
• DBTB campaign does not work in isolation
  – Enforcement is essential
  – Require co-ordination with law enforcement and local jurisdictions
  – Continuation of driver education and enforcement
  – Address source of problem e.g. heavy turn volumes