Using the LED Program to Substantiate Travel Demand Forecast Modeling

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Robert McHaney, Planning Technical Services Manager, The Goodman Corporation
Since 1980, The Goodman Corporation (TGC) has assisted private and public entities plan, finance and implement various land use and mobility projects throughout the nation.

On behalf of its Houston-based clients, TGC is analyzing the demand for park & ride facilities within the city’s loop system with services to major destinations.
Agenda

- Problem Statement
- Alternative to Auto - Public Transportation
- Travel Demand Forecast Model Overview
- Utilizing LED to Substantiate Travel Demand Forecast Modeling
- Benefits and Challenges of using LED in Travel Demand Forecast Modeling
The overcrowding of the major thoroughfares during commutes causes significant time delays and contributes to poor air quality in Houston, Texas.
Major Destinations in Houston

- Central Business Dist.
- Texas Medical Center
- Uptown - Galleria
- Greenway Plaza
- University of Houston
Average Commute Time to Work

MEANS OF TRANSPORTATION TO WORK BY TRAVEL TIME TO WORK
Universe: Workers 16 years and over who did not work at home
2010 American Community Survey 1-Year Estimates
Public Transportation –
Types of Park & Ride Facilities

• Remote Long-Distance Park & Ride Distance - (40-80 miles)
• Suburban Park & Ride Distance - (4-30 miles)
• Local Service Urban Park & Ride Distance - (1-4 miles)
• Peripheral Park & Ride Distance - (Edge of Destination)

Accurate Travel Forecast Modeling is Key

An accurate 4-step Travel Demand Forecast Model can aid planners in the development of a new or expanded Park & Ride facility. Trip distribution is the second of four steps.

1. Trip Generation
2. Trip Distribution
3. Mode Choice
4. Trip Assignment
Trip Distribution Check

- Trip distribution is a process used to model where trips are beginning and ending.

- It is often one of the more difficult steps of the 4-step modeling process.

- It is possible to use LED and other data to substantiate the accuracy of the Trip Distribution output.
Data Sources

- Houston-Galveston Area Council (H-GAC) – Trip Distribution Table
  - 3,000 traffic analysis zone pairs

- Survey data from 2008 & 2011 employee survey
  - 2008 – Uptown-Houston Employer Survey – 12,080 surveyed
  - 2011 – Uptown-Houston Employer Survey – 956 surveyed

- LED 2008 Distance-Direction Home-Work Data
Zip Code Sub-Regions
LED Data – Step 1
LED Data – Step 2
LED Data – Step 3
LED Data – Step 4
LED Data – Step 5
LED Data – Step 1
LED Data – GIS Results
H-GAC’s TDF Model HBW distributions are consistent with the 2008 & 2011 zip code data, and **U.S. Census Longitudinal Employer-Household Dynamics (LED) data.**

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Within 5 Miles of Uptown (Outside Capture Area)</td>
<td>22,327</td>
<td>28%</td>
<td>282</td>
<td>29%</td>
<td>3,562</td>
<td>29%</td>
<td>11,169</td>
<td>23%</td>
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<tr>
<td>Park and Ride Capture Area</td>
<td>22,145</td>
<td>28%</td>
<td>326</td>
<td>34%</td>
<td>3,966</td>
<td>33%</td>
<td>14,165</td>
<td>30%</td>
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<tr>
<td>Far North</td>
<td>8,907</td>
<td>11%</td>
<td>108</td>
<td>11%</td>
<td>1,169</td>
<td>10%</td>
<td>5,219</td>
<td>11%</td>
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<tr>
<td>East Houston</td>
<td>5,855</td>
<td>7%</td>
<td>18</td>
<td>2%</td>
<td>273</td>
<td>2%</td>
<td>2,838</td>
<td>6%</td>
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<tr>
<td>South and Southeast Houston</td>
<td>4,472</td>
<td>6%</td>
<td>20</td>
<td>2%</td>
<td>224</td>
<td>2%</td>
<td>2,003</td>
<td>4%</td>
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<tr>
<td>Far South and Southeast</td>
<td>5,589</td>
<td>7%</td>
<td>93</td>
<td>10%</td>
<td>1,397</td>
<td>12%</td>
<td>5,815</td>
<td>12%</td>
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<tr>
<td>North Houston</td>
<td>3,487</td>
<td>4%</td>
<td>9</td>
<td>1%</td>
<td>147</td>
<td>1%</td>
<td>1,884</td>
<td>4%</td>
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<tr>
<td>Far East and Northeast</td>
<td>3,950</td>
<td>5%</td>
<td>33</td>
<td>3%</td>
<td>394</td>
<td>3%</td>
<td>2,226</td>
<td>5%</td>
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<tr>
<td>Rosenberg &amp; Sugar Land</td>
<td>2,558</td>
<td>3%</td>
<td>53</td>
<td>6%</td>
<td>827</td>
<td>7%</td>
<td>1,979</td>
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<tr>
<td>Far Northwest</td>
<td>872</td>
<td>1%</td>
<td>10</td>
<td>1%</td>
<td>106</td>
<td>1%</td>
<td>593</td>
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<tr>
<td>Far West</td>
<td>193</td>
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<td>0%</td>
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<td>36</td>
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<td><strong>Total</strong></td>
<td><strong>80,355</strong></td>
<td><strong>956</strong></td>
<td><strong>12,088</strong></td>
<td><strong>47,927</strong></td>
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LED Benefits and Challenges in Park & Ride Facility Planning

- **Benefits** – Within a large-scale study area, LED can enhance the confidence in the trip distribution output of a 4-step model.

- **Challenges** – Within a small-scale study area, payroll data does not necessarily correlate with employment location, which can be especially problematic.

Photo Source: Houston METRO
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Questions/Comments:
Robert McHaney
The Goodman Corporation
(512) 236-8002, ext. 304
rmchaney@thegoodmancorp.com
www.thegoodmancorp.com