SUSTAINABLE COMMUNITY PERFORMANCE MEASURES: AN EXAMPLE

Travel Data Users Forum
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- The City of Pasadena, Pasadena DOT, or any other consultants employed by the City
- Any other groups working with Travel Behavior Associates
Sustainability Measures:

System Goals:
- Reduce Congestion
- Complete Sidewalk Network
- Increase Transit Oriented Development
- Increase Mixed-use Development

Impact Measures:
- Reduce Emissions
- Increase Walking
- Increase Transit Use
- Reduce Vehicle Trip Length

Measuring these is challenging, valuable, and expensive.
Sustainability Measures from Existing Data Sources:

- California NHTS Add-on
- ACS three-year estimates
- LEHD Employment
- ORNL’s Transferred Data Model
Sustainability Measures: Encouraging Smart Growth

- Mode share for transit, walk, and bike
- ‘Indicator species’ behavior:
  - Kids walk to school, elderly walk for exercise
  - Trends in non motorized to work
  - Walk/bike for utilitarian purposes
- VMT/Capita and per Household (maps)
- CO₂ per capita by neighborhood ‘type’
- CO₂ per capita by Household ‘type’
SUSTAINABILITY PERFORMANCE MEASURES MODE AND THE EFFECT OF DENSITY

Percent of Person Trips by Mode, Pasadena, CA

Effect of Density-Walk and Transit Pasadena, CA

Low Density (<10K/mile)  | Mid density (10-25K/mile) | High Density (25-999K/Mile)
---|---|---
Walk | Transit | Walk

- POV: 82%
- Transit: 4%
- Bike: 1%
- Walk: 13%
**Sustainability Performance Measures: Safe Routes to School**

### Percent of Students who Walk to School

<table>
<thead>
<tr>
<th></th>
<th>Other</th>
<th>Walk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>67.4</td>
<td>32.6</td>
</tr>
<tr>
<td>Private</td>
<td>91.5</td>
<td>8.5</td>
</tr>
</tbody>
</table>

### Reason for Not Walking: Amount of Traffic

- Not and Issue 22%
- Somewhat of an issue 41%
- Very much or serious issue 37%

### Reason for Not Walking: Speed of Traffic

- Not and Issue 19%
- Somewhat of an issue 38%
- Very much or serious issue 43%
Sustainability Performance Measures

Trends in Travel to Work

<table>
<thead>
<tr>
<th>Year</th>
<th>Percent Carpool</th>
<th>Percent Transit</th>
<th>Percent Walk</th>
<th>Percent Work at Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>16%</td>
<td>8%</td>
<td>6%</td>
<td>2%</td>
</tr>
<tr>
<td>2000</td>
<td>14%</td>
<td>6%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>2006-2008</td>
<td>12%</td>
<td>4%</td>
<td>2%</td>
<td>2%</td>
</tr>
</tbody>
</table>
LEHD ON THE MAP: IN FLOW AND OUT FLOW COMMUTES
LEHD On The Map: Home Tract of Workers in Pasadena
LEHD On The Map: Work Tract of Residents of Pasadena

<table>
<thead>
<tr>
<th>Distance</th>
<th>Count</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total All Jobs</td>
<td>59,519</td>
<td>100.00%</td>
</tr>
<tr>
<td>Less than 10 miles</td>
<td>29,347</td>
<td>49.30%</td>
</tr>
<tr>
<td>10 to 24 miles</td>
<td>19,976</td>
<td>33.60%</td>
</tr>
<tr>
<td>25 to 50 miles</td>
<td>5,928</td>
<td>10.00%</td>
</tr>
<tr>
<td>Greater than 50 miles</td>
<td>4,268</td>
<td>7.20%</td>
</tr>
</tbody>
</table>
Sustainable Community Performance Measures: Modeled Data

Estimated from
(http://nhts.ornl.gov/transferability)

- VMT/Capita (map)
- CO₂ per capita by neighborhood ‘type’
- CO₂ per capita by Household ‘type’
- CO₂ per Household (map)
Sustainability Performance Measure: VMT/Household by Population Density

VMT per Household by Income and Pop Density

<table>
<thead>
<tr>
<th>Density</th>
<th>Low Income (&lt; $40K)</th>
<th>Mid Income ($40-$80K)</th>
<th>High Income ($80K +)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Density</td>
<td>VMT/HH --Nat'n w/o NY</td>
<td>VMT/HH Pasadena</td>
<td></td>
</tr>
<tr>
<td>Mid Density</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Density</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Sustainability Performance Measure: CO$_2$ Emissions per HH per Year
Sustainability Performance Measure: CO₂ Per Capita by Neighborhood Type

CO₂ per Capita by Neighborhood
lbs/person/year

- Daisy Villa/Hastings Ranch: 8,032.55
- West Side/Linda Vista: 7,563.51
- Madison Heights/Grant Park: 5,886.92
- East Orange Grove: 5,886.92
- Rose Villa/Lamanda Park: 5,758.40
- Central District: 5,084.39
- East Arroyo/N. Lincoln/Wash. Sq: 4,396.53
- Lincoln Triangle/Madison Oakland: 3,272.74
Sustainability Performance Measure: CO$_2$ by HH Type

Per capita Estimate of Green House Gas Emission from Vehicle Travel by Residents in Old Town

- People in 1-Person HHs
- People in 2-Person HHs
- People in 3-Person HHs
- People in HHs with 4 or more
‘What if’ scenarios for emissions reduction:

Based on current VMT per vehicle:

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Pct Decrease (Impact)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case (Current Est.)</td>
<td>&lt;null&gt;</td>
</tr>
<tr>
<td>If 20% of vehicle fleet were hybrid (55 mpg)</td>
<td>2.5%</td>
</tr>
<tr>
<td>If fuel efficiency were raised 10% for all vehicles</td>
<td>9.1%</td>
</tr>
<tr>
<td>If all Vans, SUVs and P-U were replaced by cars</td>
<td>11.6%</td>
</tr>
<tr>
<td>If fuel efficiency were raised to 29 mpg for all vehicles</td>
<td>31.7%</td>
</tr>
<tr>
<td>If we doubled fuel efficiency in each vehicle class</td>
<td>50.0%</td>
</tr>
</tbody>
</table>

Source: McGuckin’s analysis
These data can be used to communicate issues and provide context for citizens and policy makers.

These data are useful for setting benchmarks and establishing baselines.

BUT

How do we measure change over time?

Account for changes in land-use at very small geography (Transit Oriented Development)?
A Bicycle Built for Two: Working Together to Reduce the Carbon Impact of Daily Travel

Behavior Changes + Planning Initiatives

Thank You!

Nancy McGuckin

www.Travelbehavior.us