Capturing the Transportation Benefits of Mixed Use Development

Smart Growth Partners

February 2012
“D” Factors that Reduce Trips and VMT

1. **Density** dwellings, jobs per acre
2. **Diversity** mix of housing, jobs, retail
3. **Design** connectivity, walkability
4. **Destinations** regional accessibility
5. **Distance to Transit** rail proximity
6. **Development Scale** pop, jobs
7. **Demographics** household size, income
8. **Demand Management** pricing …
## Typical 4-Step Model “Blind Spots”

<table>
<thead>
<tr>
<th>Circulation Network</th>
<th>Reality</th>
<th>Model’s View</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image" alt="Reality Map" /></td>
<td><img src="image" alt="Model's View Map" /></td>
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<table>
<thead>
<tr>
<th>Walking Environment</th>
<th>Reality</th>
<th>Model’s View</th>
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<tr>
<td><img src="image" alt="Reality Photo" /></td>
<td><img src="image" alt="Model's View Photo" /></td>
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<tr>
<th>Density, Clustering</th>
<th>Reality</th>
<th>Model’s View</th>
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<tr>
<td><img src="image" alt="Reality Density" /></td>
<td><img src="image" alt="Model's View Density" /></td>
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7D Analysis of Travel Survey Data

- Statistical relationships from travel data for sites meeting ITE multi-use definition
- Assess influence of 7D’s, mix and scale
- Validate through comparison to field data
239 MXD:  Seattle, Portland, Sacramento, Boston, Atlanta, Houston
Validation: Northern and So. Cal, Texas, Georgia, Florida, Utah
7D Factors Correlated with Reduced Travel

- **Density** of population and employment
- **Diversity**: jobs/housing relative to regional balance
- **Diversity**: balance of commercial, office, and public
- **Design**: intersections per square mile
- **Destination Accessibility**: jobs within 1 mile
- **Destination Accessibility**: jobs within a 30 min by transit
- **Distance to Transit**: rail station, bus stops within ¼ mile
- **Development Scale**: MXD population and employment
- **Demographics**: household size, vehicle ownership

*Internal travel and walking, transit use, trip length*
28 Nationwide Validation Sites

- 7 Florida sites
  (including ITE *Trip Generation Handbook*)
- 15 California sites
- 2 sites in Texas
- 2 in Georgia, S Carolina
- 2 sites in Utah
- Variety of scale, mix, design
Atlantic Station, Atlanta

Uptown District, San Diego
Irvine California

Plano Texas
Mixed-Use Centers, California and Florida
## Comparison of MXD Model to Other Methods

(28 Validation Sites)

<table>
<thead>
<tr>
<th></th>
<th>Raw ITE or San Diego</th>
<th>Current Methods</th>
<th>MXD Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Model Error</td>
<td>30%</td>
<td>17%</td>
<td>4%</td>
</tr>
<tr>
<td>%RMSE</td>
<td>42%</td>
<td>28%</td>
<td>17%</td>
</tr>
<tr>
<td>R Squared (% of difference among sites explained by method)</td>
<td>72%</td>
<td>87%</td>
<td>95%</td>
</tr>
</tbody>
</table>
MXD Model Compared with ITE
MXD Acceptance