Transportation Index for Sustainable Places (TISP)
“What gets measured, gets managed”
Mobility Aspect of Transportation

- Level of Service
- Congestion
- Travel Time
Bigger Picture of Transportation
Transportation Sustainability

Canadian Centre for Sustainable Transport (CST)

European Commission on Sustainable Development
Transportation Sustainability

Environment
- Resource Consumption
- Land Use
- Ecological Systems
- Pollution

Society
- Health & Safety
- Social Equity
- Community Input
- Accessibility

Economy
- Affordability
- Finance Equity
- Efficient Mobility
- Resiliency
Environmental Elements

1. Minimize consumption of renewable and non-renewable resources for transportation
2. Transportation and placemaking system is designed to maximize land use efficiency
3. Minimize transportation and placemaking system’s impact on ecological systems
4. Limit transportation related wastes and pollution
5. Transportation meets access needs while consistent with human health and safety
6. Planning and management of transportation incorporates government and community input
7. Transportation and placemaking system promote social equity
8. Transportation and placemaking system meets basic access needs of all individuals
Economic Elements

9. Transportation is affordable for individuals
10. Transportation is financed in an equitable manner
11. Transportation provides efficient movement of people and goods for economic growth
12. Transportation is resilient to economic fluctuations
Sustainability

World Commission on Environment and Development (WCED), 1987

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

Principles of Equity (Graham Haughton)

Defines sustainability as equity issues between groups of people

Green & Brown Environmental Agendas

Defines sustainability with perspective for direct, indirect, short-term, and long-term issues
Sustainability

Environment

Society

Economy
## Economic Elements

### State Wide Scale (1997-2007)

<table>
<thead>
<tr>
<th>Element</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 Affordable for Individuals</td>
<td>% of household income spent on transportation</td>
</tr>
<tr>
<td>10 Financed in an Equitable Manner</td>
<td>federal funding for transportation per capita</td>
</tr>
</tbody>
</table>
| 11 Provides Efficient Movement for Economic Activity | change in ratio of GDP per VMT  
|                                              | current ratio of GDP per VMT            |
| 12 Resilient to Economic Fluctuations       | fuel expenditure as % of GDP             |
Affordability

% of household income spent on transportation

Related to Accessibility

Measure Cost of Car Ownership, Car Use, and Transit Use

Compare to Median Household Income

<table>
<thead>
<tr>
<th>State</th>
<th>Median HH Income</th>
<th>Annual Expenditure on Cars/Transit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mississippi</td>
<td>$37,000</td>
<td>$16,500</td>
</tr>
<tr>
<td>Connecticut</td>
<td>$64,000</td>
<td>$14,500</td>
</tr>
</tbody>
</table>
Equitably Financed

**federal funding per capita ($/capita)**

Equity is a topic throughout all the Social, Environmental, & Economic Elements.

For the economic perspective, look at Federal Funding Combined FHWA & FTA funding per capita (multi-year average).

CA $103  NV $111  MT $333  WY $147  SD $302  ND $361  AK $612  VA $96  MI $112
Efficient Mobility (part 1)

current level of GDP per VMT ($/miles)

Costs of travel are Monetary and Non-monetary

Two Parts to this Element

- AK $5.9
- D.C. $20
- NY $6.9
- MA $5.6
- CT $5.6
- WY $2.2
- OK $2.2
- WV $2.2
- AL $2.2
- MS $1.6
Efficient Mobility (part 2)

**growth rate of GDP per VMT**

**Relationship Between VMT & GDP**

**Compared Vehicle Growth to Economic Growth**

<table>
<thead>
<tr>
<th></th>
<th>1997 GDP/VMT</th>
<th>2007 GDP/VMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miss.</td>
<td>$2</td>
<td>$1.6</td>
</tr>
<tr>
<td>Oregon</td>
<td>$3</td>
<td>$4</td>
</tr>
</tbody>
</table>

- CA +28%
- NY +25%
- SC +28%
- ID +29%
- OR +41%
- AK -8%
- MS -17%
- LA -4%
Resiliency

fuel expenditure as % of GDP

Congestion and Disruption in Transportation Networks

Impact of Rising Fuel Prices on Travel

<table>
<thead>
<tr>
<th>State</th>
<th>GDP (nominal dollars, billions)</th>
<th>Total Expenditure Petroleum (billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mississippi</td>
<td>$92</td>
<td>$7</td>
</tr>
<tr>
<td>D.C.</td>
<td>$92</td>
<td>$0.3</td>
</tr>
</tbody>
</table>
Overall Scores (Element 9-12 Combined)

Scores for Economic Components of TISP

Worst  |  Best
Sustainability & Economic Growth

Sustainability does not mean “no growth”

In our study, the higher scoring states generally exhibit lower VMT growth and greater GDP growth

<table>
<thead>
<tr>
<th>State</th>
<th>VMT Growth ('97-'07)</th>
<th>GDP Growth ('97-'07)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon</td>
<td>8%</td>
<td>51%</td>
</tr>
<tr>
<td>Illinois</td>
<td>8%</td>
<td>21%</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>9%</td>
<td>33%</td>
</tr>
<tr>
<td>Mississippi</td>
<td>37%</td>
<td>14%</td>
</tr>
<tr>
<td>Arizona</td>
<td>45%</td>
<td>66%</td>
</tr>
<tr>
<td>Florida</td>
<td>54%</td>
<td>48%</td>
</tr>
</tbody>
</table>
Urbanization & Mode Share

Urbanization assessed as density and percentage of state population living in Central Cities, Small Towns, Suburbs, & Rural Areas

<table>
<thead>
<tr>
<th>Density Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Density Rural-Suburban</td>
</tr>
<tr>
<td>Low Density Mixed</td>
</tr>
<tr>
<td>Medium Density Suburban</td>
</tr>
<tr>
<td>High Density Suburban-Urban</td>
</tr>
</tbody>
</table>
Overall Scores (Element 9-12 Combined)

Low Density Rural-Suburban

Scores for Economic Components of TISP
Worst  —  Best
Urban Form & Mode Share

Score for Economic Domain vs. % Mode Share as Automobile

- Low Density Rural-Suburban
- Low Density Mixed
- Medium Density Suburban
- High Density Suburban-Urban
Urban Form & Mode Share

Score for Economic Domain

Low Density Rural-Suburban

% Mode Share as Automobile
Urban Form & Mode Share

Score for Economic Domain

% Mode Share as Automobile

Low Density Mixed
Urban Form & Mode Share

Score for Economic Domain

% Mode Share as Automobile

High Density Suburban-Urban
Conclusions

Performance of transportation systems goes beyond measurements of automobility
Conclusions

Urbanization is a factor

Both rural states and urban states can be sustainable
Conclusions

In general, we find that the most affordable, efficient, equitable, and resilient states are those that tend to be more urban and have diverse transportation options.
Questions

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