Transportation Sustainability Rating Systems

Presented by:
Jay Bockisch, PE, PTOE, Principal
Gresham Smith and Partners
Alpharetta, GA
Transportation Sustainability Rating Systems

- Introduction
- Evaluation of four rating systems
  - Overview
  - Differences
  - Point breakdown
- Six projects
- Comparison of rating systems & projects
- Conclusions
- Questions
Transportation Sustainability Rating Systems

- Work done by internal GS&P team:
  - Jay Bockisch, PE, PTOE – led team
  - Jamie Cochran, AICP – Adjunct Professor of Urban Planning at Georgia Tech
  - Kevin Riggs, EIT – Master's thesis at Georgia Tech on transportation sustainability
  - Team had roadway design, traffic engineering and planning expertise

- Input from others:
  - Greenroads - Jeralee L. Anderson, Executive Director
  - STARS – Peter Hurley, Portland DOT
  - Jane Strickland – Cobb County, GA DOT

- Conclusions are of GS&P team
Sustainability is Important

- Helps to evaluate trade-offs
- Promotes what we do
- Meet governmental goals for sustainability
- Citizens are demanding sustainability
- Transportation Industry moving toward Multi-Modal QOS vs LOS
Examples of Sustainability – Multi Modal Quality of Service

**Automobile Level of Service**
- A: No delay at intersections.
- C/D: Drivers wait no more than 1 red light.
- F: Longer delays at intersections.

**Transit Quality of Service**
- A: More frequent service, stops, and amenities.
- C/D: Good bus service, basic stops and amenities.
- F: Limited or no service, fewer stops and amenities.

**Bicycle Quality of Service**
- A: Complete system for all types of users.
- C/D: Good condition, few stops, and conflicts with autos.
- F: More gaps in system, more stops and auto conflicts, poor pavement.

**Pedestrian Quality of Service**
- A: Complete system, easier to cross, improved comfort.
- C/D: An adequately complete network of decent sidewalks.
- F: Gaps in system, poor pavement, less inviting.

Source: Planning Urban Roadway Systems: An ITE Proposed Recommended Practice
How is Sustainability in Transportation Measured?

- Sustainability is measured through a sustainability rating/certification system.
- There are various rating/certification systems have been developed at the national, state and local levels.
- These systems have been developed by academia, government and private entities.
Why Evaluate the Different Sustainability Rating Systems?

- Better understand the different systems
- Can systems handle “real world” situations and tradeoffs?
- How do different systems handle different types of projects?
- Are there common trends among the different rating systems?
- Are these systems sensitive to relatively small scale traffic engineering type projects?
Comparison of Transportation Sustainability Rating Systems

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Various Sustainability Rating Systems

- **National Level**
  - Invest – FHWA
  - Envision – Institute for Sustainable Infrastructure & Harvard
  - LEED ND – US Green Building Council

- **State Level**
  - Greenroads – Washington DOT, U of Washington & CH2M Hill
  - GreenLites – NY State DOT
  - I-Last – Illinois DOT

- **Local**
  - Peach Roads – Cobb County, GA (based on GreenLites)
  - STARS – Portland, OR
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- National Level
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  - STARS – Portland, OR
Greenroads is a project-oriented system
It focuses on design and construction.
So what does a Greenroad look like?
13.

- long-lasting pavement
- life cycle cost analysis
- env. mgmt. sys.
- recycled materials
- local material
- natural cut slope
- scenic views
- warm mix asphalt
- LID stormwater
- quality construction
- local material
ped./bicycle access
recycled materials
bus rapid transit
fewer emissions
art
CSS
regional material
quality construction
LID stormwater
native vegetation
PEACH Roads

Preserving Environment And Community Heritage

Source: Cobb County DOT
What is PEACH Roads?

- Self assessment tool developed by Cobb County
- Based on NYS *GreenLITES* program
- 5 Category areas each with subcategories
- 2 year pilot program with GDOT
- Guiding principles:
  - Recognizing and increasing the awareness of the sustainable methods and practices we already incorporate into our project designs
  - Expanding the use of these and other innovative alternatives which will contribute to improving transportation sustainability
PEACH Roads Categories

- **Sustainable Sites** – enhance the community heritage and improve quality of life
- **Water Quality** – improve water quality & reduce runoff
- **Materials and Resources** – reusing, recycling, and local materials
- **Energy and Atmosphere** – energy conservation and efficiency, air quality improvements, encourages car pooling, mass transit, and non-motorized transportation
- **Innovation/Unlisted**
PEACH Roads Benefits

- Conserve energy, natural resources and promote use of recycled materials
- Promote effective and efficient use of limited public funds
- Provide more sidewalks, transit enhancements and other forms of alternate transportation
- Increase use of roadway materials with longer life and less maintenance
- Encourage more public involvement in project development
- Preserve Cobb’s Heritage as a quality place to live, work and play
Differences In Rating Systems

- Project Level vs. Plan Level (STARS)
- Transportation Focused vs. Overall Infrastructure (ENVISION)
- Self-Evaluation (INVEST & PEACH Roads) vs. Third Party Evaluation (Greenroads & ENVISION)
  - Cost of outside evaluation
  - Value added of outside evaluation
  - Internal bias of self-evaluation (Cobb County experience)
- National Rating System vs. Local Rating System (PEACH Roads)
POINTS BREAKDOWN

Traffic Related Categories
- Transportation Planning
- Traffic Operations/ITS
- Multi Modal
- Intermodal/Truck
- Safety
- Emissions/Fuel Consumption

Roadway Related Categories
- Design (Road, Bridge, Landscape)
- Environment & Water Quality

Construction Related
- Materials
- Construction Methods

Other Disciplines
- Planning
- Emissions/Fuel Consumption
### Points Breakdown – Roadway Design Related

<table>
<thead>
<tr>
<th>Category</th>
<th>INVEST</th>
<th>Envision</th>
<th>GreenRoads</th>
<th>Peach Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design (Road, Bridge, Landscape)</td>
<td>8%</td>
<td>10%</td>
<td>13%</td>
<td>30%</td>
</tr>
<tr>
<td>Environment &amp; Water Quality</td>
<td>17%</td>
<td>25%</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>Roadway Design Total</td>
<td>25%</td>
<td>35%</td>
<td>28%</td>
<td>45%</td>
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</tbody>
</table>
# Points Breakdown – Traffic Engineering & Transportation Planning Related

<table>
<thead>
<tr>
<th>Category</th>
<th>INVEST</th>
<th>Envision</th>
<th>GreenRoads</th>
<th>Peach Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation Planning</td>
<td>12%</td>
<td>13%</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Traffic Operations/ITS</td>
<td>4%</td>
<td>5%</td>
<td>5%</td>
<td>19%</td>
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<tr>
<td>Multimodal (Transit, Ped and Bike)</td>
<td>4%</td>
<td>4%</td>
<td>8%</td>
<td>3%</td>
</tr>
<tr>
<td>Intermodal/Truck</td>
<td>6%</td>
<td>0%</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>Safety</td>
<td>9%</td>
<td>2%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Emissions/Fuel Consumption - Traffic</td>
<td>0%</td>
<td>5%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>Traffic Engineering Related Total</td>
<td>35%</td>
<td>29%</td>
<td>24%</td>
<td>32%</td>
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</table>
## Points Breakdown – Construction

<table>
<thead>
<tr>
<th>Category</th>
<th>INVEST</th>
<th>Envision</th>
<th>GreenRoads</th>
<th>Peach Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>16%</td>
<td>3%</td>
<td>28%</td>
<td>16%</td>
</tr>
<tr>
<td>Construction Methods</td>
<td>12%</td>
<td>5%</td>
<td>9%</td>
<td>1%</td>
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<tr>
<td>Other Disciplines Total</td>
<td>30%</td>
<td>8%</td>
<td>37%</td>
<td>17%</td>
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</table>
## Points Breakdown – Other Disciplines

<table>
<thead>
<tr>
<th>Category</th>
<th>INVEST</th>
<th>Envision</th>
<th>GreenRoads</th>
<th>Peach Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning (not Transportation Planning)</td>
<td>3%</td>
<td>20%</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>Emissions/Fuel Consumption - Other</td>
<td>9%</td>
<td>8%</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Other Disciplines Total</td>
<td>12%</td>
<td>28%</td>
<td>11%</td>
<td>6%</td>
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</tbody>
</table>
## Summary Comparison of Rating Systems

<table>
<thead>
<tr>
<th>Category</th>
<th>INVEST</th>
<th>Envision</th>
<th>GreenRoads</th>
<th>Peach Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Engineering/Transportation Planning Related Total</td>
<td>35%</td>
<td>29%</td>
<td>24%</td>
<td>32%</td>
</tr>
<tr>
<td>Roadway Design Related Total</td>
<td>25%</td>
<td>35%</td>
<td>28%</td>
<td>45%</td>
</tr>
<tr>
<td>Construction Related Total</td>
<td>30%</td>
<td>8%</td>
<td>37%</td>
<td>17%</td>
</tr>
<tr>
<td>Other Disciplines Total</td>
<td>12%</td>
<td>28%</td>
<td>11%</td>
<td>6%</td>
</tr>
</tbody>
</table>
Comparison of Transportation Sustainability Rating Systems

- Introduction to sustainability rating systems
- Evaluation of four rating systems
  - Overview of PEACH Roads
  - Point breakdown
- Six projects
- Comparison of rating systems & projects
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# Overview of Projects Evaluated

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Type</th>
<th>Scale - Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big Creek Parkway – Roswell, GA</td>
<td>New Road Corridor, Complete Street and Bike &amp; Pedestrian facility</td>
<td>Large</td>
</tr>
<tr>
<td>North Peachtree – Dunwoody, GA</td>
<td>Traditional Intersection Improvement with Signal Upgrades and Bike &amp; Pedestrian improvements</td>
<td>Medium</td>
</tr>
<tr>
<td>Grimes Bridge Roundabout – Roswell, GA</td>
<td>Non-Traditional Intersection with Bike &amp; Pedestrian improvements</td>
<td>Medium</td>
</tr>
<tr>
<td>Roswell Shared Parking</td>
<td>Shared Parking with Pedestrian Path</td>
<td>Small</td>
</tr>
<tr>
<td>Dothan Signal Timing</td>
<td>Traffic Operations</td>
<td>Small</td>
</tr>
<tr>
<td>I-85 HOT Lanes – Gwinnett County</td>
<td>ITS, Traffic Operations, HOT and Transit</td>
<td>Large</td>
</tr>
</tbody>
</table>
North Peachtree at Tilly Mill – Dunwoody, GA
Grimes Bridge Roundabout
Roswell Shared Parking

Restaurant/Retail area

City Hall Parking
Roswell Shared Parking
I-85 HOT Lanes
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## Ranking of Projects Evaluated – All Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>INVEST</th>
<th>Envision</th>
<th>GreenRoads</th>
<th>Peach Roads</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big Creek Parkway</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>North Peachtree</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Grimes Bridge Roundabout</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Roswell Shared Parking</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Dothan Signal Timing</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>I-85 HOT Lanes</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>
## Ranking of Projects Evaluated – Traffic

<table>
<thead>
<tr>
<th>Category</th>
<th>INVEST</th>
<th>Envision</th>
<th>GreenRoads</th>
<th>Peach Roads</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big Creek Parkway</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>North Peachtree</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Grimes Bridge Roundabout</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Roswell Shared Parking</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Dothan Signal Timing</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>I-85 HOT Lanes</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
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</table>
## Ranking of Projects Evaluated

<table>
<thead>
<tr>
<th>Category</th>
<th>Type</th>
<th>All</th>
<th>Traffic Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big Creek Parkway</td>
<td>New Corridor Roadway</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>North Peachtree</td>
<td>Traditional Intersection</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Grimes Bridge Roundabout</td>
<td>Non Traditional Intersection</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Roswell Shared Parking</td>
<td>Shared Parking with Ped Path</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Dothan Signal Timing</td>
<td>Signal Timing</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>I-85 HOT Lanes</td>
<td>ITS</td>
<td>5</td>
<td>5</td>
</tr>
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Conclusions

- The type of project and focus of organization will determine “best” rating system to use
  - Agencies should evaluate which rating system works best for them

- Scale of project impacts scoring

- Areas that could be increased
  - Efficiency – ITS, Signal Timing, Managed Lanes/Tolling
  - Multi Modal & HOV/HOT

- No easy way to capture innovative concepts that reduce size, scope and impact of projects
  - DDI vs. New Bridge
  - CFI vs. New Interchange
  - Shared parking vs. New Parking structure
QUESTIONS?

Contact: jay_bockisch@gspnet.com