Sustainability Performance Measures for El Paso’s Transit Corridors

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Texas Transportation Institute
A Member of The Texas A&M University System
Overview

- Overall Goal – to develop a framework to apply sustainability performance measures for transit corridors in El Paso

- Project details
  - funded by CIITR, in cooperation with the City of El Paso
  - Phase 1 (nearing completion) – identify appropriate goals, objectives and measures
  - Phase 2 – implementation/application
Background

- Original concept based on interactive workshop series developed for TxDOT
- Informed by recently-completed NCHRP project
- City of El Paso – in process of implementing rapid transit system (RTS) projects
Phase 1 Goals

- Understand sustainability in the context of transit corridors
- Identify a framework and approach for performance measurement to be implemented
- Develop goals, objectives and performance measures
- Discuss application of performance measures
Approach

- Understand sustainability
- Make relevant to City’s strategic plan
- Interactive workshop process

- City of El Paso Strategic Plan
- Sustainability Goals for RTS
- Objectives and Performance Measures for RTS
Performance Measure Implementation Framework

“what does a transportation agency need to be equipped with?”

Framework consisting of:

- Fundamental components
- Overarching components
- Auxiliary components
Principles of Sustainability

- **Sustainability entails meeting human needs for the present and future, while:**
  - preserving and restoring environmental and ecological systems,
  - fostering community health and vitality,
  - promoting economic development and prosperity, and;
  - ensuring equity between and among population groups and over generations.
Framework of Performance Measures

- Goal
  - Objective
    - Performance Measure
    - Performance Measure
    - Performance Measure

- Goal
  - Objective
    - Performance Measure
    - Performance Measure
    - Performance Measure
Performance Measurement

Applications

- Quantify individually, or “index” together
- Application types
  - Describe
  - Evaluate
  - Accountability
  - Decision Making
  - Communication
Definition of Transit Corridor

- Terminal nodes and intermediate nodes
- Links consisting of:
  - Roadway/General Purpose Lanes
  - RTS Facility (may occupy same physical space as roadway)
  - Sidewalks, Bike Lanes
- Influence area (buffer zone)
RTS Sustainability Goals

- Reduce car dependence
- Mitigate traffic congestion
- Improve international mobility
- Increase livability
- Promote economic development
- Ensure system effectiveness and efficiency
- Promote equity
- Improve the environment
## Mapping Goals to Principles

<table>
<thead>
<tr>
<th>Goal</th>
<th>Principle</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Environmental and Ecological Systems</td>
</tr>
<tr>
<td>Reduce car dependence</td>
<td></td>
</tr>
<tr>
<td>Mitigate traffic congestion</td>
<td>Yes</td>
</tr>
<tr>
<td>Improve international mobility</td>
<td></td>
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<tr>
<td>Increase livability</td>
<td></td>
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<td>Promote economic development</td>
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<tr>
<td>Ensure system effectiveness and efficiency</td>
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<tr>
<td>Promote equity</td>
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<tr>
<td>Improve the environment</td>
<td>Yes</td>
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</tbody>
</table>
## Draft Measure Framework

<table>
<thead>
<tr>
<th>Goal</th>
<th>Objective</th>
<th>Indicator</th>
<th>Performance Measure</th>
<th>Unit</th>
<th>Measure Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reduce car dependence</td>
<td>1.1 Shift car users to RTS</td>
<td>RTS users who are car owners</td>
<td>1.1.1 Median/High income users in RTS corridor influence areas</td>
<td>Dimensionless</td>
<td>1.1.1</td>
</tr>
<tr>
<td></td>
<td>1.2 Make RTS an attractive choice for the traveling public</td>
<td>Travel time by RTS compared to travel time by car</td>
<td>1.2.1 Ratio of travel times by car and by RTS along corridor</td>
<td>Percentage</td>
<td>1.2.1</td>
</tr>
<tr>
<td></td>
<td>1.3 Increase the number of persons with access to RTS service</td>
<td>Residents within the proximity of an RTS station</td>
<td>1.3.1 No. of residents within the corridor influence areas</td>
<td>Dimensionless</td>
<td>1.3.1</td>
</tr>
<tr>
<td>2. Mitigate traffic congestion</td>
<td>2.1 Improve mobility on RTS corridor</td>
<td>Reduce peak hour travel times</td>
<td>2.1.1 Travel Time Index on the RTS corridor</td>
<td>Dimensionless</td>
<td>2.1.1</td>
</tr>
<tr>
<td></td>
<td>2.2 Shift single occupant car trips to RTS</td>
<td>Increase person-miles of travel without increasing vehicle-miles of travel</td>
<td>2.2.1 Ratio of daily person-miles of travel to VMT on the RTS corridor</td>
<td>Percentage</td>
<td>2.2.1</td>
</tr>
<tr>
<td>3. Improve international mobility</td>
<td>3.1 Provide connectivity across the border</td>
<td>Connect RTS and cross-border transit points in influence area</td>
<td>3.1.1 Number of cross-border transit transfer points in influence area</td>
<td>Dimensionless</td>
<td>3.1.1</td>
</tr>
<tr>
<td>4. Increase livability</td>
<td>4.1 Support pedestrian and bike modes</td>
<td>Provide pedestrian facilities</td>
<td>4.1.1 Sidewalk quality along the corridor</td>
<td>Good/Poor/Absent</td>
<td>4.1.1</td>
</tr>
<tr>
<td></td>
<td>4.2 Promote mixed use development</td>
<td>Balance land uses</td>
<td>4.2.1 Land-use entropy index per influence area</td>
<td>Dimensionless</td>
<td>4.2.1</td>
</tr>
<tr>
<td></td>
<td>4.3 Promote safety and security</td>
<td>Reduce crashes</td>
<td>4.3.1 Severe crashes by corridor</td>
<td>Dimensionless</td>
<td>4.3.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reduce lighting coverage</td>
<td>4.3.2 Lighting coverage per mile of roadway</td>
<td>Percentage</td>
<td>4.3.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase emergency phone coverage</td>
<td>4.3.3 Emergency phone coverage on the RTS corridor</td>
<td>Percentage</td>
<td>4.3.3</td>
</tr>
<tr>
<td>5. Promote economic development</td>
<td>5.1 Revitalize key nodes along RTS corridors</td>
<td>Support and diversify adjacent businesses</td>
<td>5.1.1 Number of jobs in corridor influence areas</td>
<td>Dimensionless</td>
<td>5.1.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase property values</td>
<td>5.1.2 Value per unit area of commercial property in influence area</td>
<td>Dollars</td>
<td>5.1.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Promote commercial activity</td>
<td>5.1.3 Tax revenue generated from commercial establishments in influence area</td>
<td>Dollars</td>
<td>5.1.3</td>
</tr>
<tr>
<td>6. Ensure system effectiveness and efficiency</td>
<td>6.1 Generate revenue through RTS funds</td>
<td>Increase revenue from fares</td>
<td>6.1.1 Fare recovery ratio on the RTS project</td>
<td>Percentage</td>
<td>6.1.1</td>
</tr>
<tr>
<td></td>
<td>6.2 Establish RTS and funder systems on schedule</td>
<td>The degree of completion of RTS and funder systems</td>
<td>6.2.1 The completion rate of RTS and funder systems according to schedule</td>
<td>Percentage</td>
<td>6.2.1</td>
</tr>
<tr>
<td>7. Promote equity</td>
<td>7.1 Create access to HUD-designated neighborhood areas</td>
<td>HUD-designated neighborhood areas served</td>
<td>7.1.1 HUD-designated neighborhood areas in each influence area</td>
<td>Dimensionless</td>
<td>7.1.1</td>
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<td>7.2 Provide access to critical destinations (jobs, schools, healthcare)</td>
<td>Critical destinations in influence area</td>
<td>7.2.1 No. of schools located in each influence area</td>
<td>Dimensionless</td>
<td>7.2.1</td>
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<td>No. of health centers in each influence area</td>
<td>7.2.2</td>
<td>Dimensionless</td>
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<td>7.3 Affordability of access</td>
<td>Travel cost vs. Income</td>
<td>7.3.1 The ratio of daily travel cost on RTS to the daily personal income</td>
<td>Percentage</td>
<td>7.3.1</td>
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<td>8. Improve the environment</td>
<td>8.1 Reduce Pollutant Emissions</td>
<td>Daily emission of PM, CO and Ozone Precursor</td>
<td>8.1.1 Daily emission of PM per mile of the RTS corridor</td>
<td>mg/mile</td>
<td>8.1.1</td>
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<td></td>
<td>Daily emission of CO per mile of the RTS corridor</td>
<td>8.1.2 Daily emission of CO per mile of the RTS corridor</td>
<td>mg/mile</td>
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<td>Daily emission of Ozone Precursor per mile of the RTS corridor</td>
<td>8.1.3 Daily emission of Ozone Precursor per mile of the RTS corridor</td>
<td>mg/mile</td>
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<td>8.2 Reduce GHG Emissions</td>
<td>Daily emission of CO2</td>
<td>8.2.1 Daily emission CO2 per mile of the RTS corridor</td>
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Example Objectives and Performance Measures

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- Description
- Quantification
- Data sources
- Potential targets/benchmark values
Next Steps

- Quantify selected measures for Mesa corridor
- Phase 2
  - identify the specific applications using the developed goals, objectives and measures
  - quantify the measures and set up a tracking system for each of the application types;
  - Perform pilot applications
Conclusions

- Performance measurement framework successfully adapted for transit corridors
- Goals, objectives and performance measures developed
- Interactive process and linkage to strategic plan – ensures buy-in
- Next steps will result in practical application
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