Scenario Planning: A Case Study & Lessons Learned

November 8th, 2016

HRTPO Scenario Planning Workshop
Outline

- Charlottesville-Albemarle MPO’s use of scenario planning
- Our scenario planning process
- Lessons Learned
- How we will conduct scenario planning in the future
CA-MPO Background

- Established: 1982
- Population: 122,638 (2010 census)
- Size: 215 square miles
Transportation Context
Scenario Planning for 2040 Long Range Transportation Plan

- 2040 LRTP was CA-MPO’s first comprehensive scenario planning effort
- Viewed the system as a network of interdependent facilities
- Rather than access benefits of individual projects in isolation, projects evaluated in scenarios
- Selecting which combination of projects fit well together
Scenario
6-Step Process

Step 1: Develop Goals for the Region

Step 2: Create Performance Measures

Step 3: Identify Transportation Deficiencies

Step 4: Develop a Candidate List of Capacity Improvement Projects

Step 5: Evaluate Projects as Scenarios

Step 6: Develop the Preferred Scenario
Step 1: Develop Goals

- Staff and decision-makers develop a list of goals:
  - A multimodal transportation network
  - A cohesive relationship between land use and multimodal transportation planning
  - A more structured and proactive method for pursuing transportation funding for all modes.

- Considered in conjunction with 8 Planning Factors
  - *Title 23, United States Code (USC), Section 134*
Step 2: Create Performance Measures

• Developed 16 performance measures that corresponded with regional goals

• Allowed for an objective evaluation of each scenario

• Provided staff, decision-makers, and residents with the opportunity to understand implications of each scenario
Step 2: Create Performance Measures

Mobility Measures:

- Congestion
- Delay
- Mode Share
- Vehicle Mobility
- Vehicle Crashes
- Bicycle Connectivity
Step 2: Create Performance Measures

Economic Measures:

- Access to Jobs
- Transit Accessibility
Step 2: Create Performance Measures

Environment:

- Habitat
- Air Quality
- Water Quality
- Flood Plain
- Historic/Archeological Sites
Step 2: Create Performance Measures

Community:

- Land Use
- Environmental Justice and Title VI: Transit Access
- Environmental Justice and Title VI: Impacts
Step 3: Identify Transportation Deficiencies

- Identified deficiencies in network and transit system
Step 4: Develop a Candidate List of Capacity Improvement Projects

- Worked with committees to develop a candidate list of projects
- Initial listed included 10 road projects and 11 transit projects
- Each project modeled individually
- Staff and committees assessed each project to determine whether or not they generated enough benefit to merit moving forward
Step 5: Evaluate Projects as Scenarios

Repeated process for 3 rounds of scenarios

1. Develop a scenario of capacity-building projects
2. Analyze the scenario using the performance measures
3. Present findings from the analysis

<table>
<thead>
<tr>
<th>Performance Measurement</th>
<th>Base</th>
<th>Scenario 1A</th>
<th>Scenario 1B</th>
<th>Scenario 1C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value</td>
<td>Value</td>
<td>Value</td>
<td>Value</td>
</tr>
<tr>
<td>Congestion (% of roads at LOS E or F)</td>
<td>14.1%</td>
<td>12.6%</td>
<td>14.6%</td>
<td>12.9%</td>
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<tr>
<td></td>
<td>% of Roads</td>
<td>10.5%</td>
<td>-3.5%</td>
<td>8.0%</td>
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<tr>
<td>Congestion (hours of delay per day)</td>
<td>23,181.0</td>
<td>20,187.0</td>
<td>23,757.1</td>
<td>20,907.8</td>
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<tr>
<td></td>
<td>Hours</td>
<td>11.6%</td>
<td>-2.5%</td>
<td>9.8%</td>
</tr>
<tr>
<td>Mode Share (percent of Trips)</td>
<td>759,319</td>
<td>759,334</td>
<td>759,488</td>
<td>759,317</td>
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<tr>
<td></td>
<td>Trips/Day</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
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<tr>
<td>Auto</td>
<td>88.1%</td>
<td>88.1%</td>
<td>87.6%</td>
<td>87.9%</td>
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<td>Percent of Trips</td>
<td>0.1%</td>
<td>0.7%</td>
<td>0.2%</td>
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<tr>
<td>Transit</td>
<td>2.5%</td>
<td>2.5%</td>
<td>3.1%</td>
<td>2.6%</td>
</tr>
<tr>
<td></td>
<td>Percent of Trips</td>
<td>0.1%</td>
<td>25.9%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Bike</td>
<td>2.7%</td>
<td>2.7%</td>
<td>2.7%</td>
<td>2.7%</td>
</tr>
<tr>
<td></td>
<td>Percent of Trips</td>
<td>0.2%</td>
<td>-0.8%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Walk</td>
<td>6.7%</td>
<td>6.8%</td>
<td>6.7%</td>
<td>6.8%</td>
</tr>
<tr>
<td></td>
<td>Percent of Trips</td>
<td>0.9%</td>
<td>-0.6%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Vehicle Mobility (vehicle miles traveled)</td>
<td>6,228,031.0</td>
<td>6,145,450.8</td>
<td>6,214,996</td>
<td>6,193,388</td>
</tr>
<tr>
<td></td>
<td>Miles/Day</td>
<td>0.6%</td>
<td>0.2%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Vehicle Crashes (crashes per year)</td>
<td>2,865.0</td>
<td>2,827.0</td>
<td>2,859.0</td>
<td>2,849.0</td>
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<tr>
<td></td>
<td>Crashes/Year</td>
<td>1.3%</td>
<td>0.2%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Bicycle Connectivity (% in largest connected area)</td>
<td>68.2%</td>
<td>73.4%</td>
<td>79.2%</td>
<td>81.6%</td>
</tr>
<tr>
<td></td>
<td>% of largest area</td>
<td>5.2%</td>
<td>16.1%</td>
<td>19.6%</td>
</tr>
</tbody>
</table>
Step 5: Evaluate Projects as Scenarios

- Compared scenarios to a 2040 baseline that modeled network if no additional projects were constructed
- Presented to committees to determine which projects should be considered for next round
- Worked with a Performance Measure Analysis tool
Step 6: Develop the Preferred Scenario

<table>
<thead>
<tr>
<th>Round 1 Projects</th>
<th>Round 2 Projects</th>
<th>Round 3 Projects</th>
<th>Preferred Scenario Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ROADWAY PROJECTS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-64/US 29 Interchange</td>
<td>I-64/US 29 Interchange</td>
<td>I-64/US 29 Interchange</td>
<td>I-64/US 29 Interchange</td>
</tr>
<tr>
<td>Berkmar Drive Extended</td>
<td>Berkmar Drive Extended</td>
<td>Berkmar Drive Extended</td>
<td>Berkmar Drive Extended</td>
</tr>
<tr>
<td>Widening US 250 - Pantops</td>
<td>Widening US 250 - Pantops</td>
<td>Widening US 250 - Pantops</td>
<td>Widening US 250 - Pantops</td>
</tr>
<tr>
<td>Eastern Connector (4-lane)</td>
<td>Geometric Improvements to Black Cat Road</td>
<td>Geometric Improvements to Black Cat Rd.</td>
<td>Geometric Improvements to Black Cat Rd.</td>
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<tr>
<td></td>
<td>Geometric Improvements to Milton Road</td>
<td>Geometric Improvements to Black Cat Rd.</td>
<td>Geometric Improvements to Milton Road</td>
</tr>
<tr>
<td></td>
<td>Widening 5th Street Extended</td>
<td>I-64/US 250 Interchange (Exit 124)</td>
<td>I-64/US 250 Interchange (Exit 124)</td>
</tr>
</tbody>
</table>
Step 6: Develop the Preferred Scenario
Lessons Learned: Developing Measures

• Stakeholders made recommendations on elements.
• Contributions were useful, but many were impossible to implement due to lack of data or time constraints for analysis.
• There was difficulty in conveying that some suggestions simply could not be accomplished.
Lessons Learned: Available Data

- There were challenges reconfiguring existing data to support identified measures.
  - Example: reliable crash data was difficult to acquire and manipulate into a usable format for the evaluation process.

- Staff managed data in excel and used the eco-logical tool, which the MPO used previously.
Lessons Learned: Data Collection/Management

- MPO committees provided input regarding Performance Measures.

- This was the first time for executing Performance Measures – staff made revisions while implementing.

- The experience was both rewarding and challenging.
  - Resulted in more robust plan
  - POLITICS ARE UNAVOIDABLE!
  - MPO staff dealt with pressure to add projects to the plan after adoption, that have not been appropriately considered through the Performance Measurement process.
Lessons Learned: Political Dynamics

• The approval of the plan coincided with a major transportation funding changes within the MPO.

• A controversial bypass project (fully funded in the LRTP and TIP), was deemed to no longer meet its original purpose and need.

• Virginia’s Secretary of Transportation implemented the Route 29 Solutions process.

• Process developed transportation improvements that would help achieve congestion relief and mobility goals in the MPO’s Route 29 corridor.
Lessons Learned: Political Dynamics

• For future LRTPs, MPO staff recommends that the planning process should be:
  • Outlined carefully from the very beginning; and
  • Structured in such a way that allows maximum flexibility to handle community shifts.

• Staff should also develop a communications plan at the beginning of the process, to prepare for and communicate contingencies.
Lessons Learned: Political Dynamics

- For future LRTPs, MPO staff recommends working with MPO stakeholders to develop regional transportation goals and performance measures that are more closely related.

- MPO staff also recommends working with VDOT and DRPT to ensure that the performance measures are consistent with the State’s prioritization process for funding projects.