Twelve Alternatives Analyzed

- Alternative 1 – Interchange at I-71 and SR 162
- Alternative 2 – Sharon Copley extension
  - Alternative 2a – Interchange at I-71/SR 162, plus Sharon Copley extension
- Alternative 3 – Commerce Drive extension
- Alternative 4 – New north-south arterial (Sharon-Copley to Foote Road)
- Alternative 5 – Removal of truck ban on Reagan Parkway
- Alternative 6 – Signal timing optimization
- Alternative 7 – Downtown one-way pair
- Alternative 8 – Pedestrian mall on Washington St. south of Public Square
- Alternative 9 – New truck route (SR 18 Re-route)
- Alternative 10 – Truck route/wayfinding sign program
- Alternative 11 – Freight rail enhancement
Alternative Review Criteria

- Construction cost
- Right-of-way impacts
- Truck traffic reduction around Public Square
- System-wide traffic impacts:
  - Total travel time savings
  - Total traffic reduction (vehicle miles traveled)
- Benefit Cost Analysis
- Economic development potential
- Environmental impacts
## Evaluation Matrix

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Cost $millions</th>
<th>Right of way impacts</th>
<th>Public Square Truck Traffic Reduction</th>
<th>Traffic Impact (hours &amp; miles saved)</th>
<th>BCA Ratio</th>
<th>Economic Development Potential</th>
<th>Environmental Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Interchange</td>
<td>$20.2</td>
<td>High</td>
<td>Reduces about 40 trucks per day</td>
<td>VHT +1.43% VMT -0.14%</td>
<td>2.65</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>2 – Sharon-Copley Extension</td>
<td>$5.2</td>
<td>High</td>
<td>Minimal</td>
<td>VHT +0.05% VMT -0.03%</td>
<td>0.39</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>2a – Interchange &amp; Extension</td>
<td>$25.4</td>
<td>High</td>
<td>Reduces about 40 trucks per day</td>
<td>VHT +1.56% VMT -0.16%</td>
<td>2.31</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>3 – Commerce Dr</td>
<td>$9.2</td>
<td>Medium</td>
<td>Minimal</td>
<td>VHT 0.05% VMT 0.06%</td>
<td>0.39</td>
<td>Moderate</td>
<td>Medium</td>
</tr>
<tr>
<td>4 – N-S Arterial</td>
<td>$7.0</td>
<td>Medium</td>
<td>Minimal</td>
<td>VHT -0.02% VMT 0.02%</td>
<td>Negative</td>
<td>None</td>
<td>Medium</td>
</tr>
<tr>
<td>5 – Removal of truck ban on Reagan Parkway</td>
<td>- 0 -</td>
<td>None</td>
<td>None</td>
<td>N/A (not modeled)</td>
<td>N/A</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>6 – Signal timing optimization</td>
<td>- 0 -</td>
<td>None</td>
<td>Minimal</td>
<td>N/A (not modeled)</td>
<td>20:1 to 83:1</td>
<td>Low</td>
<td>None</td>
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</tbody>
</table>
## Evaluation Matrix (continued)

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Cost $millions</th>
<th>Right of way impacts</th>
<th>Public Square Truck Traffic Reduction</th>
<th>Traffic Impact (hours &amp; miles saved)</th>
<th>BCA Ratio</th>
<th>Economic Development Potential</th>
<th>Environmental Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 – Downtown One-way Pair</td>
<td>$0.3</td>
<td>None</td>
<td>Not modeled, but highly likely to reduce trucks</td>
<td>VHT 0.09% VMT -0.15%</td>
<td>0.09</td>
<td>Low</td>
<td>None</td>
</tr>
<tr>
<td>8 – Pedestrian Mall on Washington St.</td>
<td>$0.5</td>
<td>None</td>
<td></td>
<td>NA (not modeled)</td>
<td></td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>9 – New Truck Route</td>
<td>$0.02</td>
<td>Low</td>
<td>Not modeled, but highly likely to reduce trucks</td>
<td>NA (not modeled)</td>
<td></td>
<td>Low</td>
<td>None</td>
</tr>
<tr>
<td>10 – Truck route / way-finding sign program</td>
<td>$0.01</td>
<td>None</td>
<td></td>
<td>NA (not modeled)</td>
<td></td>
<td>Low</td>
<td>None</td>
</tr>
<tr>
<td>11 – Freight rail enhancement</td>
<td>- ? -</td>
<td>None</td>
<td></td>
<td>NA (not modeled)</td>
<td></td>
<td>High</td>
<td>None</td>
</tr>
</tbody>
</table>
Alternative 1
Interchange @ I-71 & SR 162

- Cost = $20.2 million
- Right of Way Impacts = High
- Public Square truck traffic reduction = 37 less per day
- Traffic Impact
  - Vehicle Hours of Travel – reduced 1.43%
  - Vehicle Miles of Travel – increased 0.14%
- Benefit/Cost Ratio = 2.65
- Economic Development = High
- Environmental Impacts = High
Traffic Impacts
Alternative 1

Medina County Transportation Plan - Alternatives Analysis
Alternative 1 - Daily Total Volume
- Increased 1000+
- 2501 to 1000
- 501 to 250
- No Change
- 1 to 250
- 25 to 50
- 501 to 500
- 501 to 1000
- Reduced 1000+
Alternative 2
Sharon-Copley Extension (SR 3 to Lake Rd)

- Cost = $5.2 million
- Right of Way Impacts = High
- Public Square truck traffic reduction = Minimal
- Traffic Impact
  - Vehicle Hours of Travel – reduced 0.05%
  - Vehicle Miles of Travel – increased 0.03%
- Benefit/Cost Ratio = 0.39
- Economic Development = Low
- Environmental Impacts = High
Traffic Impacts

Alternative 2
Alternative 2a
New Interchange with Sharon-Copley Extension

- Cost = $25.4 million
- Right of Way Impacts = High
- Public Square truck traffic reduction = Reduces about 40 trucks per day
- Traffic Impact
  - Vehicle Hours of Travel – reduced 1.56%
  - Vehicle Miles of Travel – increased 0.16%
- Benefit/Cost Ratio = 2.31
- Economic Development = High
- Environmental Impacts = High
Traffic Impacts

Alternative 2a
Alternative 3
Commerce Drive - SR 18 to Abbeyville Rd

- Cost = $9.2 million
- Right of Way Impacts = Medium
- Public Square truck traffic reduction = Minimal
- Traffic Impact
  - Vehicle Hours of Travel – reduced 0.05%
  - Vehicle Miles of Travel – increased 0.06%
- Benefit/Cost Ratio = 0.39
- Economic Development = Moderate
- Environmental Impacts = Medium
Traffic Impacts

Alternative 3
Alternative 4
New North-South Arterial Between Sharon-Copley and Foote Road

- Cost = $7.0 million
- Right of Way Impacts = Medium
- Public Square truck traffic reduction = Minimal
- Traffic Impact
  - Vehicle Hours of Travel – reduced 0.02%
  - Vehicle Miles of Travel – increased 0.02%
- Benefit/Cost Ratio = Negative
- Economic Development = None
- Environmental Impacts = Medium
Traffic Impacts

Alternative 4
Alternative 5
Removal of Truck Ban on Reagan Parkway

- Reagan Parkway allows local truck traffic
- Model did not indicate any truck diversion if truck ban was lifted
Alternative 6
Signal Timing Optimization

- Very low cost alternative
- No operations data currently available from city system currently
- Various studies cite positive benefits
  - City of Boston 61:1 to 83:1 (Boston Transportation Department, 2010)
  - Route 23 Northern New Jersey 24:1 (ITE Journal, October 2006)
  - California various locations 58:1 (ITE Journal, April 2004)
  - Texas (26 projects) 38:1 (Online article, “Signal Operations and Management,” mobility.tamu.edu)
Alternative 7
Downtown One-Way Pair Modification

- Cost = $0.3 million
- Right of Way Impacts = None
- Public Square truck traffic reduction = Poor (increases truck traffic by 700 + trucks/day)
- Traffic Impact
  - Vehicle Hours of Travel – reduced 0.09%
  - Vehicle Miles of Travel – increased 0.15%
- Benefit/Cost Ratio = 0.09
- Economic Development =
- Environmental Impacts = None
Traffic Impacts

Alternative 7

- Could not model effectively
- Would definitely shift truck traffic away from Public Square
Alternative 8
Pedestrian Mall on Washington St South of Public Square

- Could not model effectively, but traffic impacts are small
Alternative 9
New Truck Route – SR 18

- Cost = $0.02 million
- Right of Way Impacts = Low
- Public Square truck traffic reduction = not modeled, but highly likely to reduce trucks
- Traffic Impact = NA (not modeled)

- Economic Development = Possible
- Environmental Impacts = None
Alternative 10
Truck Route Way-finding Sign Program

- Could not model effectively
- Very low cost and could be effective
Alternative 11
Freight Rail – Increase Use

- City of Medina-owned rail line has received investment of $950,000 for track upgrades (ARRA funds)
- Rail service is provided by the Wheeling & Lake Erie Railroad
- Increasing the use of freight rail depends on—
  - Economics of rail transport vs. truck transport
  - Success of W&LE in business development and service
Summary

- Interchange Concepts
  Highest benefits, and the highest costs
  Don’t reduce a high number of trucks from around the Public Square
- Operations projects are harder to quantify, but very low cost
  Way-finding sign programs
  Changing signing and truck routes, like an SR 18 truck route
  Signal operation
- Changing one-way pairs, and/or an SR 18 truck route, offers the greatest promise to reduce trucks from around the public square
- Re-timing signals, and signal operation, is by far the lowest cost and highest impact of any activity the region could undertake
## Costs

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Construction</th>
<th>Right-of-Way</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Interchange</td>
<td>$19.2 million</td>
<td>$983,500</td>
<td>$20.2 million</td>
</tr>
<tr>
<td>2 – Sharon-Copley Extension</td>
<td>$4.4 million</td>
<td>$752,700</td>
<td>$5.2 million</td>
</tr>
<tr>
<td>2a – Interchange &amp; Extension</td>
<td>$23.7 million</td>
<td>$1.7 million</td>
<td>$25.4 million</td>
</tr>
<tr>
<td>3 – Commerce Dr</td>
<td>$8.7 million</td>
<td>$572,200</td>
<td>$9.2 million</td>
</tr>
<tr>
<td>4 – N-S Arterial</td>
<td>$6.0 million</td>
<td>$991,200</td>
<td>$7.0 million</td>
</tr>
<tr>
<td>7 – Downtown One-way Pair</td>
<td>$342,000</td>
<td>- 0 -</td>
<td>$342,000</td>
</tr>
<tr>
<td>8 – Pedestrian Mall</td>
<td>$496,400</td>
<td>- 0 -</td>
<td>$496,400</td>
</tr>
<tr>
<td>9 – New Truck Route</td>
<td>$15,200</td>
<td>- 0 -</td>
<td>$15,200</td>
</tr>
<tr>
<td>10 – Truck Route/Wayfinding Signage</td>
<td>$9,200</td>
<td>- 0 -</td>
<td>$9,200</td>
</tr>
</tbody>
</table>
Environmental and Development Impacts

- Ranked relative to each other
  - High = major right-of-way acquisition and/or high level environmental document
  - Medium = limited right-of-way acquisition and lower level (CE-2 or less) environmental document
  - Low = no right-of-way, low level environmental document
Benefit-Cost Analysis

Benefit-Cost Analysis looked at:

- Project construction cost
- Project right-of-way cost
- Traffic impact:
  - Auto travel time savings (valued at $13.21/hour)
  - Truck travel time savings ($26.22/hour)
  - Auto vehicle-miles-traveled reductions (vehicle operating costs valued at $0.30/mile)
  - Truck vehicle-miles-traveled reductions (valued at $0.52/mile)
- Used a 7% Discount Rate (USDOT)

*Other variables not assessed at this point* (safety, development impact)
## Benefit/Cost Ratio

Only Alternatives 1 & 2a show traffic benefits exceeding project costs. Both involve Interchange at SR 162.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Cost $millions</th>
<th>VHT Reduction</th>
<th>VHT Reduction</th>
<th>Benefits $millions</th>
<th>BCA Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Interchange</td>
<td>$20.2</td>
<td>1.43%</td>
<td>-0.14%</td>
<td>$53.8</td>
<td>2.65</td>
</tr>
<tr>
<td>2 – Sharon-Copley Extension</td>
<td>$5.2</td>
<td>0.05%</td>
<td>-0.03%</td>
<td>$1.6</td>
<td>0.39</td>
</tr>
<tr>
<td>2a – Interchange &amp; Extension</td>
<td>$25.4</td>
<td>1.56%</td>
<td>-0.16%</td>
<td>$58.9</td>
<td>2.31</td>
</tr>
<tr>
<td>3 – Commerce Dr</td>
<td>$9.2</td>
<td>0.05%</td>
<td>0.06%</td>
<td>$4.3</td>
<td>0.39</td>
</tr>
<tr>
<td>4 – N-S Arterial</td>
<td>$7.0</td>
<td>-0.02%</td>
<td>0.02%</td>
<td>- $0.5</td>
<td>Negative</td>
</tr>
<tr>
<td>7 – Downtown One-way Pair</td>
<td>$0.3</td>
<td>0.09%</td>
<td>-0.15%</td>
<td>$0.1</td>
<td>0.09</td>
</tr>
</tbody>
</table>