Center Street (S.R. 36)  
Road Diet  
Kingsport, TN

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AGENDA

1. BACKGROUND
2. CASE STUDY
3. CAPACITY ANALYSIS
4. RESULTS
5. LESSON LEARNED
**BACKGROUND**

**BENEFITS OF ROAD DIET**

- Improve safety
- Reduce speeds
- Mitigate queues associated with left-turning traffic
- Improve pedestrian environment
- Improve bicyclist accessibility
- Enhance transit stops
- Low-Cost solution

*Source: FHWA Road Diet Informational Guide*
System and capacity expansion was the main focus of roadway projects during the 1950s and 1960s.

Three-lane alternate wasn’t considered during that time.

First Road Diet occurred in 1979 in Billings, Montana.

First installation of Road Diets in urban areas in 1990s in Seattle and Portland.

Now it’s a “PROVEN SAFETY COUNTERMEASURE” by FHWA.
S.R. 36 (Center Street) scheduled to be resurfaced by TDOT in 2014

Before: 2 lanes each direction, no TWLTL

Traffic volumes (AADT, per TDOT):
- Downtown section = 16,000 vpd
- Eastern section = 20,000 vpd
CASE STUDY
CASE STUDY

SR 36 AADT - DOWNTOWN SECTION

SR 36 AADT - EASTERN SECTION
CASE STUDY

Coalition of groups (Downtown Merchant Association, Parks & Rec, Housing Authority, others) along with Assistant City Manager saw this as a once in lifetime opportunity to change the dynamics of downtown:

<table>
<thead>
<tr>
<th>Normalize speeds</th>
<th>Reduce crashes</th>
<th>Provide left turn refuge</th>
<th>On-street parking improvement</th>
<th>Improve pedestrian facilities/Bike Lanes</th>
</tr>
</thead>
</table>

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Mattern & Craig Engineers • Surveyors
City realized that by acting in coordination with resurfacing project, the road diet would incur the City essentially no cost (only cost was for consulting fees)

Limited window of opportunity (repaving cycle is 15-20 years)

Thus, City investigated a road diet on Center Street, focused on the downtown portion
CASE STUDY

June 2013
- City staff began discussions about possibility of road diet

July 2013
- City hired RPM Transportation Consultants and Mattern & Craig to determine if road diet was feasible and produce design plans

September 2013
- Plan submittal and begin review process with TDOT

October 2013
- Plans sent to TDOT design

April 2014
- TDOT Bid Letting

June 2014
- Construction begins

August 2014
- Construction complete
CASE STUDY

Typical Section

- PARKING (where width allows)
- EX. CURB
- 4” SSWL
- 6” SSWL
- 4” SSYL
- 4” SBYL
- 4” SSYL
- 6” SSWL
- 4” SSWL
- 4” SSWL
- EX. CURB

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ENGINEERS • SURVEYORS
### Average Daily Traffic

- The FHWA advises that roadways with ADT of **20,000 vpd** or less may be good candidates for a Road Diet and should be evaluated for feasibility.

### De Facto Three-Lane Roadway Operation

- Approximately **80% of thru traffic used the outside lanes**, making the inner lanes defacto left turn lanes leading to most likely operational success of a Road Diet.

### Level of Service (LOS)

- Synchro and SimTraffic were used to measure delay and LOS along the corridor after conversion and to optimize the operational performance by signal timing and coordination between adjacent signals.

### Bicycle and Pedestrians Considerations

- Bike routes were included in the typical section as one of the city’s priorities to improve the livability of the corridor specifically in downtown segments.
CAPACITY ANALYSIS

[Map of King'sport, Tennessee with Shelby Street and E Sullivan Street highlighted]
CAPACITY ANALYSIS
CAPACITY ANALYSIS
CAPACITY ANALYSIS
# CAPACITY ANALYSIS

## ANTICIPATED TRAVEL TIMES
(BASED ON SYNCHRO/SIMTRAFFIC MODELS)

<table>
<thead>
<tr>
<th>DIRECTION</th>
<th>TRAVEL TIME</th>
<th></th>
<th></th>
<th></th>
<th>FREE-FLOW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM PEAK</td>
<td>MID-DAY PEAK</td>
<td>PM PEAK</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-LANE</td>
<td>ROAD DIET</td>
<td>4-LANE</td>
<td>ROAD DIET</td>
<td>4-LANE</td>
</tr>
<tr>
<td>EASTBOUND</td>
<td>02:30</td>
<td>02:18</td>
<td>02:25</td>
<td>02:24</td>
<td>02:24</td>
</tr>
<tr>
<td>DOWNTOWN</td>
<td>02:31</td>
<td>02:14</td>
<td>02:30</td>
<td>02:24</td>
<td>02:21</td>
</tr>
<tr>
<td>EASTEN</td>
<td>03:06</td>
<td>03:02</td>
<td>03:03</td>
<td>03:37</td>
<td>03:18</td>
</tr>
<tr>
<td>SECTION</td>
<td>02:51</td>
<td>03:06</td>
<td>03:01</td>
<td>03:36</td>
<td>03:06</td>
</tr>
<tr>
<td>ENTIRE</td>
<td>05:36</td>
<td>05:20</td>
<td>05:28</td>
<td>06:01</td>
<td>05:42</td>
</tr>
<tr>
<td>CORRIDOR</td>
<td>05:22</td>
<td>05:20</td>
<td>05:31</td>
<td>06:00</td>
<td>05:27</td>
</tr>
</tbody>
</table>

### Scenario Travel Time Difference (Avg)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Travel Time Difference (Avg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM Peak</td>
<td>3% Decrease</td>
</tr>
<tr>
<td>MD Peak</td>
<td>9% Increase</td>
</tr>
<tr>
<td>PM Peak</td>
<td>11% Increase</td>
</tr>
<tr>
<td>Total</td>
<td>6% Increase</td>
</tr>
</tbody>
</table>
At Clinchfield St., facing east

BEFORE

AFTER
At Clinchfield St., facing west

BEFORE

AFTER
At Clay St., facing east

BEFORE

AFTER
At Clay St., facing west

BEFORE

AFTER
At Shelby St., facing east

BEFORE

AFTER
At Broad St., facing east

BEFORE

AFTER
At Cherokee St.

BEFORE

AFTER
At Wateree St.

BEFORE

AFTER
At Fort Henry Dr.

BEFORE

AFTER
RESULTS

Speeds have normalized
- Downtown section – 85% speed 31 mph after (posted 30) – no data before
- Eastern section – 85% speed 38 mph before, 35 mph after (posted 30)
- Anecdotal evidence suggests speeds prior to road diet were higher, with a significant speed differential between lanes

Crashes have been affected
- Rear end crashes increased
- Angle crashes decreased

<table>
<thead>
<tr>
<th>TIME</th>
<th>ADT</th>
<th># OF CRASHES BY TYPE</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>REAR END</td>
</tr>
<tr>
<td>BEFORE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JUNE '12 - MAY '13</td>
<td>16,265</td>
<td>52</td>
</tr>
<tr>
<td>JUNE '13 - MAY '14</td>
<td>17,665</td>
<td>42</td>
</tr>
<tr>
<td>AFTER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JUNE '14 - MAY '15</td>
<td>17,651</td>
<td>66</td>
</tr>
</tbody>
</table>
RESULTS

Travel times have been affected

- No significant increase in travel times (decrease in several peak periods/directions)

<table>
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<tr>
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<th>TRAVEL TIME (SECONDS)</th>
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<tr>
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<td>PM PEAK</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BEFORE</td>
<td>AFTER</td>
<td>Δ</td>
<td>BEFORE</td>
<td>AFTER</td>
</tr>
<tr>
<td>DOWNTOWN SECTION</td>
<td>EB</td>
<td>120</td>
<td>99</td>
<td>-21%</td>
<td>121</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>116</td>
<td>137</td>
<td>15%</td>
<td>152</td>
</tr>
<tr>
<td>EASTERN SECTION</td>
<td>EB</td>
<td>231</td>
<td>190</td>
<td>-22%</td>
<td>246</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>221</td>
<td>206</td>
<td>-7%</td>
<td>261</td>
</tr>
<tr>
<td>ENTIRE CORRIDOR</td>
<td>EB</td>
<td>351</td>
<td>289</td>
<td>-21%</td>
<td>367</td>
</tr>
<tr>
<td></td>
<td>WB</td>
<td>337</td>
<td>343</td>
<td>2%</td>
<td>413</td>
</tr>
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</table>
Lessons Learned

More public education/advertisement was needed

- Although public notices were mailed, businesses were personally visited, and press releases made (newspaper, radio, TV), there were still people who seemed surprised by the change.

Help partner/supportive organizations to be more vocal & involved in promoting project

Better coordination with TDOT & contractor was needed

More data should have been collected prior to change

- Before/after travel time studies
- Volume/speed data

You can’t please everyone!
Questions?

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