Temporary Trials for Transportation Safety Projects

Neil Kopper, P.E.
City of Bloomington, IN
March 6th, 2019
Outline

- Benefits/ Limitations
- 10th & Lincoln
- Sheridan/ Southdowns
- Allen St Greenway
- Sare-Roger's Roundabout
- 14th & College Crosswalk
- Temporary Traffic Calming
- Questions/ Discussion
Why temporary trials?

- Low Cost
- Quick
- Gather Public Input
- Easy Adjustments
Limitations

- Maintenance
- Aesthetics
- Equivalence
- MUTCD requirements
10th & Lincoln

- Before conditions
- Crash history
10th & Lincoln: Temporary Trial
10th & Lincoln Permanent Install
10th & Lincoln: Crash history data

- Before: 4.67 crashes per year
- After: 1.5 crashes per year
Sheridan/Southdowns

- Temporary trial
- Costs
- Next steps
Sheridan/Southdowns

- Proposed temporary trial
- Costs
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>UM</th>
<th>Price</th>
<th>Extension</th>
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</thead>
<tbody>
<tr>
<td>1485-02422</td>
<td>Speed Hump, 14&quot; Wide x 24&quot; Long x 4&quot; Tall, Black Rubber, for 15-18 MPH zones, hardware included</td>
<td>1</td>
<td>EA</td>
<td>6,058.75</td>
<td>$6,058.75</td>
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<tr>
<td>1485-00054A-24</td>
<td>Speed Hump 7&quot; wide, 24&quot; Long, 3&quot; High, Hardware Included, Made of rubber</td>
<td>1</td>
<td>EA</td>
<td>3,147.50</td>
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<td>1485-00062</td>
<td>Speed Cushion 6&quot; wide x 7&quot; long x 3&quot; tall Intended for speed up to 25 mph with arrow pattern</td>
<td>20</td>
<td>EA</td>
<td>812.50</td>
<td>$16,250.00</td>
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<td>373-04386</td>
<td>W17-1,24&quot; x 24&quot; HIP, Speed Hump (Worded) Fed Spec</td>
<td>24</td>
<td>EA</td>
<td>29.66</td>
<td>$711.84</td>
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<td>112936</td>
<td>Bike Lane Delineator, 29.5&quot;L x 7.5&quot;W x 4&quot;H, Rubber, Black w/ Yellow Reflective Tape, Spikes for Install</td>
<td>150</td>
<td>EA</td>
<td>56.25</td>
<td>$8,437.50</td>
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<td>1485-00014</td>
<td>Rubber Vehicle Stops 6&quot;, w/four spikes for asphalt installation, black with white stripes</td>
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<td>EA</td>
<td>36.58</td>
<td>$1,829.00</td>
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<tr>
<td>274-00017</td>
<td>Cone, 28&quot;, Orange, w/2 Reflective Collars, 7lbs, PVC UV Stabilized, MUTCD &amp; NCHRP-350</td>
<td>50</td>
<td>EA</td>
<td>13.31</td>
<td>$665.50</td>
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<td>1636-00050</td>
<td>Tuff Post Tubular Marker, 36&quot; White, Fixed w/two 3&quot; White DG Reflective Bands, w/out base</td>
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<td>EA</td>
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<td>Surface Mount Fixed Base, 8&quot; x 8&quot; x 1&quot;, Black, Use w/Crosswalk Fixed Signs, Sign Not Included</td>
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<td>10.31</td>
<td>$515.50</td>
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<td>045-00067</td>
<td>Temporary Construction Reflective Striping Tape 4&quot; x 100 yards, White</td>
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<td>74.83</td>
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<td>045-00031</td>
<td>Temporary Construction Reflective Striping Tape, 4&quot; x 100 yards, Yellow</td>
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<td>EA</td>
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<td>134943</td>
<td>Type III Barricade, Break-Away, 3 - 6&quot; Boards w/ HIP Dbl Sided</td>
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<td>EA</td>
<td>214.95</td>
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<td>274-00024</td>
<td>Channelizer Drum, Director, with four 6&quot; HIP bands without base</td>
<td>12</td>
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<td>100409</td>
<td>Tire Ring 24# For Channelizer Drum Inside Dia. 22.5&quot;</td>
<td>12</td>
<td>EA</td>
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<td>310504</td>
<td>R6-4.30&quot;x24&quot;x.080 HIP White/Black CHEVRON Sign</td>
<td>12</td>
<td>EA</td>
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**Temporary Trials Toolkit**

<table>
<thead>
<tr>
<th>Merchandise</th>
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<th>Tax</th>
<th>Total</th>
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<td>$44,777.29</td>
<td>$1,890.18</td>
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<td>$46,667.47</td>
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</table>
Allen St. Greenway: Before

Goals
- Safety
- Comfort
- Placemaking
- Connectivity

Data
- Speed
- Volume
- Parking
Allen Street Greenway:
Public Outreach
Neighborhood Greenways

Neighborhood Greenways are residential streets with low volumes of auto traffic and low speeds where people walking and people bicycling are given priority. Neighborhood Greenways allow access to motor vehicles, but priority is placed on walking and bicycling.

Neighborhood Greenway Goals:

- **Improve Safety**: Prioritize walking and bicycling and ensure they are safe options.
- **Design for Comfort**: Make the neighborhood greenway feel comfortable for walking with kids, bicycling with your family, and visiting neighbors. It should feel like the B-Line.
- **Promote neighborhood interaction**: Slower motor vehicle speeds and reduced vehicle volumes can promote and encourage increased neighborhood interaction.
- **Increase connectivity**: The Allen Street Neighborhood Greenway connects Bryan Park neighborhood to Bryan Park and to the B-Line and thereby Downtown and Switchyard Park.
- **Increase high-comfort connectivity**: To encourage more walking, bicycling, and transit use in the community, we need a complete network of facilities that link people with destinations.

Goals into Action:

- **Reduce auto speeds** - Speed bumps and other tools help slow automobile traffic on greenways.
- **Reduce auto cut-through** - Speed bumps, traffic circles, traffic diverters, and other tools prevent cars trying to avoid larger streets from cutting through on neighborhood streets.
- **Guide people on the route and help get them where they are going** - Markings on the pavement and signage let you know where the Greenway goes and what's nearby, like parks and business districts.
- **Contribute to community safety and health** - More people out on the street walking and bicycling leads to safer streets and a healthier community.

Safety and why it is important:

When we talk about comfort, this is the level we want:

Let's do a temporary install to see which design solutions are best for the neighborhood and the context.
Allen St. Greenway

- Temporary Trial
- Speed Cushions
  - Installation
  - Markings
  - Snow Plows
- Installation
- Speed/Volume Data
- Feedback
  - For and Against
  - Aesthetics
- Next Steps
Allen St. Greenway

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MUTCD 3B.26 generally discusses these markings and their use "...where added visibility is desired..." It also notes that they "...shall be a series of eight white 12-inch transverse lines that become longer and are spaced closer together as the vehicle approaches the speed hump or other deflection. If advance markings are used, they shall comply with the detailed design shown in Figure 3B-31".

Figure 3B-31 displays the markings detail whose total length is 100' on one side of a speed hump.

MUTCD 1A.09 notes that "...while providing Standards, Guidance, and Options for design and application of traffic control devices, this Manual should not be considered a substitute for engineering judgment. Option 04 When an engineering study or application of engineering judgment determines that unusual site-specific conditions at a particular location or others with same condition make compliance with a Standard statement in this Manual impossible or impractical, an agency may deviate from that standard statement at that location or others with the same condition."

The existing speed humps (speed cushions) on Allen Street between Walnut and Henderson are spaced as close as 260' apart. Following Figure 3B-31 would result in markings that are nearly continuous from one set to the next.

The measured 85th percentile speed on this section of Allen Street is only 17mph. It appears that Figure 3B-31 was designed with the intention of providing adequate warning to motor vehicle drivers operating at much higher speeds who may not expect a speed hump.

The primary reason we desire additional visibility for these particular speed humps is based on feedback from bicyclists who have noted difficulty seeing them, particularly at night.

Based on the bullet points noted above, I believe it would be impractical and unnecessary to strictly follow Figure 3B-31. The attached sketch indicates a deviation from Figure 3B-31 based on these site-specific conditions. The sketch generally follows the same principles behind Figure 3B-31 (a series of white transverse lines that become longer and are spaced closer together as they approach the speed hump) while significantly reducing the size and length of the markings and adjusting for this context.

Note also that at locations where the series of lines would only be provided on the approach side of a speed cushion, we have chosen to also include one transverse line on the departure side of the speed cushion to provide additional visibility due to the fact that most vehicles, including bicycles, tend to travel down the middle of this residential street. This added marking is expected to reduce the risk of vehicles attempting to avoid one speed cushion and unexpectedly encountering another.

I concur with the process and direction. Thank you for the thoughtful evaluation and its documentation.

I also understand we discussed using 6" wide markings rather than 12" wide markings given the context of the street.
Allen St. Greenway

- Temporary Trial
- Speed Cushions
  - Installation
  - Markings
  - Snow Plows
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  - Aesthetics
- Next Steps
Allen St. Greenway

- Temporary Trial
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  - Markings
  - Snow Plows
- Installation
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- Feedback
  - For and Against
  - Aesthetics
- Next Steps
Before:
- Issues
- Capacity Analysis
Trial Installation:
- Implementation issues
- Next steps?
"multilane roundabouts often cannot achieve the same levels of safety improvement as their single-lane counterparts."

"it [is] important to use the minimum number of entry, circulating, and exit lanes subject to capacity considerations."

"While it is important to plan for future traffic volume and capacity needs, the immediate effects on pedestrian and bicycle users should also be considered... [A] phased implementation may be an appropriate way to accommodate current users’ needs while still providing an opportunity for the roundabout to be expanded for future traffic volume growth."
Before Conditions:

- Crossing Length = 57’
14th - College Crosswalk

Temporary Trials:
- Crossing Length = 30'
14th - College Crosswalk

Temporary Trials:
- Crossing Length = 30’
Tapp-Rockport Traffic Calming

- Background
- Installation
- Next steps
Tapp - Rockport Traffic Calming

- Background
- Installation
- Next steps
Questions & Discussion

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