ACTIVE CORRIDOR MANAGEMENT “LITE” DURING THE I-440 CONSTRUCTION PROJECT
I-440 Project Overview

- Nashville continues growing
- Safety improvements needed along 7.8 miles of I-440
- Crash rates on I-440 are nearly double (1.8 times) the statewide average
- Since 2008, there have been 16 fatalities on I-440
- Road widening, adding medians and landscaping enhancements
- Improvements funded by the Improve Act
- Project completion August 2020
Traffic Diversion Analysis

VISSIM and Synchro Models

LEGEND
- I-440 project
- 15 Corridors
- Interstates
Traffic Diversion Analysis

Regional Travel Demand Model

Model predicted diversion percentages:

Model predicted a reduction in traffic volumes on I-440 ranging between -17% and -31%
Actual reduction in traffic volumes has ranged between -15% to -33%
### I-440 Percent AADT Change (2018 vs. 2019)

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Begin Log Mile</th>
<th>End Log Mile</th>
<th>2018 AADT</th>
<th>2019 AADT</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-40</td>
<td>West End Avenue</td>
<td>0.00</td>
<td>1.50</td>
<td>83,050</td>
<td>69,975</td>
<td>-16%</td>
</tr>
<tr>
<td>West End Avenue</td>
<td>Hillsboro Pike</td>
<td>1.50</td>
<td>2.86</td>
<td>94,780</td>
<td>72,800</td>
<td>-23%</td>
</tr>
<tr>
<td>Hillsboro Pike</td>
<td>I-65</td>
<td>2.86</td>
<td>4.85</td>
<td>103,690</td>
<td>79,250</td>
<td>-24%</td>
</tr>
<tr>
<td>I-65</td>
<td>Nolensville Pike</td>
<td>4.85</td>
<td>6.33</td>
<td>109,280</td>
<td>84,000</td>
<td>-23%</td>
</tr>
<tr>
<td>Nolensville Pike</td>
<td>I-24</td>
<td>6.33</td>
<td>7.66</td>
<td>109,170</td>
<td>84,275</td>
<td>-23%</td>
</tr>
<tr>
<td><strong>I-440 Corridor (average)</strong></td>
<td></td>
<td></td>
<td></td>
<td>99,994</td>
<td>78,060</td>
<td>-22%</td>
</tr>
</tbody>
</table>

### I-440 Eastbound

#### AADT

<table>
<thead>
<tr>
<th>Year</th>
<th>2018</th>
<th>2019</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>37,375</td>
<td>52,130</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td>49,175</td>
<td>60,140</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>48,880</td>
<td>60,045</td>
<td>3%</td>
</tr>
</tbody>
</table>

### I-440 Westbound

#### AADT

<table>
<thead>
<tr>
<th>Year</th>
<th>2018</th>
<th>2019</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45,675</td>
<td>42,859</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>43,550</td>
<td>49,125</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td>43,680</td>
<td>43,395</td>
<td>3%</td>
</tr>
</tbody>
</table>

#### % AADT Reduction

- I-40 - West End Ave: 16%
- West End Ave - Hillsboro Pike: 3%
- Hillsboro Pike - I-65: 18%
- Nolensville Pike - I-24: 15%

- I-440 Corridor (average): 22%
Active Corridor Management

• Monitor real time traffic flow
• Adjust signal timing to minimize delay

Benefits
• Better utilization of street network ~ reduced delay
• Real time adjustments ~ instant queue reduction
• Decrease incident response times via CCTV surveillance.
Active Corridor Management

Detection & CCTV Intersections on Priority East-West Corridors

Intersections

31st/Blakemore/Wedgewood
- 31st Ave @ West End
- 31st Ave @ Natchez Trace
- Blakemore @ 21st Ave
- Blakemore @ 17th Ave
- Wedgewood @ 12th Ave
- Wedgewood @ 8th Ave
- Wedgewood @ Bransford Ave

White Bridge/Woodmont/Thompson/SR 155
- White Bridge Pike @ Charlotte Pike/Charlotte Ave
- White Bridge Pike @ Knob Rd
- White Bridge Pike @ Post Rd
- White Bridge Pike/Woodmont Blvd @ Harding Pike
- Woodmont Blvd @ Hillsboro Pike
- Woodmont Blvd @ Lealand Lane
- Woodmont Blvd/Thompson Lane @ Bransford Ave
- Thompson Lane @ Nolensville Pike

Harding/Battery
- Harding Place @ Hillsboro Pike
- Harding Place/Batter Lane @ Granny White Pike
- Harding Place/Battery Lane @ Franklin Rd
- Harding Place @ I-65 NB Ramp
- Harding Place @ Trousdale Dr
- Harding Place @ Nolensville Pike
- Harding Place @ Tampa Dr
- Harding Place @ Metroplex Dr/Perimeter Park Dr
**Active Corridor Management**

Full Active Corridor Management was not achievable for this project:

- Time frame – lack of sufficient time to upgrade network before project began.
- Additional resources needed
- Existing signal interconnect consists of copper twisted pair that does not provide a reliable communication network.
- No existing Metro Traffic Management Center
- Lack of CCTVs on any of the project corridors make it difficult to monitor field conditions remotely
I-440 Active Corridor Management “Lite”

- Updated Signal timing and time of day plans for 58 signals
  - Longer cycles to handle diversion traffic
- Arcadis Installed 21 BlueTOAD devices
  - Installed in January of 2019 to capture pre-construction data.
  - Allow staff to monitor changes in traffic patterns during the various phases of construction
- Respond / Investigate citizen and council member complaints
  - Pull BlueTOAD data to verify complaint
  - Provide response to complaint and corrective action taken if any
I-440 Temporary Signal Timing

8 Signal Groups Updated:

- 58 Traffic Signals
- Optimized Coordination and Time of Day Settings

<table>
<thead>
<tr>
<th>Cycle Length - Zone A</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOD</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>AM</td>
</tr>
<tr>
<td>MD</td>
</tr>
<tr>
<td>PM</td>
</tr>
<tr>
<td>DP</td>
</tr>
<tr>
<td>WKND</td>
</tr>
<tr>
<td>WKND OP</td>
</tr>
</tbody>
</table>
I-440 Temporary Signal Timing

Field Implementation Schedule:
- March 11th to March 23rd
- Nashville Schools Spring Break March 11th to 15th
- Schedule set in January with limited information from contractor

### SIGNAL GROUP ASSIGNMENTS AND PRIORITY LIST
2019 TDOT I-440 TEMPORARY SIGNAL TIMING PROJECT
(Dates Tentative/Subject to Change)

<table>
<thead>
<tr>
<th>Priority</th>
<th>Group</th>
<th>Group Zone</th>
<th>Name</th>
<th># of Signals</th>
<th>Proposed Timings / TOD Plan</th>
<th>Database Programming (MPW)</th>
<th>Begin Field Implementation</th>
<th>Download Proposed Timings to Controllers</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>17</td>
<td>17A-17B-17C</td>
<td>Franklin Road / Wedgewood</td>
<td>9</td>
<td>3/4</td>
<td>3/4</td>
<td>3/11</td>
<td>10:30 AM on Monday 3/11</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>5A</td>
<td>Nolensville Road</td>
<td>13</td>
<td>3/4</td>
<td>3/4</td>
<td>3/12</td>
<td>10:00 AM on Tuesday 3/12</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>10A-10B</td>
<td>Hillsboro Road</td>
<td>4</td>
<td>3/4</td>
<td>3/4</td>
<td>3/13</td>
<td>10:00 AM on Wednesday 3/13</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>3A-3B</td>
<td>21st Ave. S / Hillsboro Pike</td>
<td>5</td>
<td>3/4</td>
<td>3/4</td>
<td>3/14</td>
<td>10:00 AM on Thursday 3/14</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>4A</td>
<td>West End Ave / Murphy Rd</td>
<td>8</td>
<td>3/4</td>
<td>3/4</td>
<td>3/14</td>
<td>10:00 AM on Thursday 3/14</td>
</tr>
</tbody>
</table>
I-440 Weekend Lane Shift Schedule: 3/1 to 3/29

Traffic Switch #1: Weekend of 3/1
Traffic Switch #2: Weekend of 3/8
Traffic Switch #3: Weekend of 3/15
Traffic Switch #4: Weekend of 3/22
Traffic Switch #5: Weekend of 3/29
21 BlueTOAD Deployment Locations
What is BlueTOAD?

**Blue**tooth **T**ravel-Time **O**rigination **A**nd **D**estination
Bluetooth Technology

• Bluetooth is an open wireless technology standard for exchanging data over short distances from fixed and mobile devices: hands free technology in vehicles, head phones, mobile phones, wearable technology, etc.

• A MAC (Media Access Control) Address) is a unique, and anonymous, identifier assigned to Bluetooth devices
Device info:

- Data Provided:
  - corridor speeds
  - travel time
  - origin-destination
  - Does NOT collect volumes
- 300’ detection radius
- Devices must be “paired” to gather data
- Separated by at least ¼ mile
- Pairs collect data. Routes are a tool for viewing information
- Software removes outliers
  - Runners with Fitbits
  - Vehicles that stop between devices
How is the information collected?
From Hardware to Software

BlueTOAD Devices
Ethernet or Cellular Comm. to BlueARGUS Server

BlueARGUS Server
TrafficCast OR customer hosted

BlueARGUS Applications
Web Based Software Suite
BlueARGUS Dashboard: Example Report

Edit Report Parameters

- Show inactive pairs/routes

BlueTOAD Pair / Route:
Pair NVTN-38068: Thompson Ln - I24 to Nolensville Pk

- Include reverse Pair NVTN-58070: Thompson Ln - Nolensville Pk to I24

Start Date: 07/24/2019
End Date: 07/24/2019

- All
- Weekdays
- Sun
- Mon
- Tue
- Wed
- Thu
- Fri
- Sat

Start Time: 00
End Time: 00

Report Type:
- Smoothed Speed (15-min)

- Show previous value if no current data (smoothed reports only)
- Display Level of Service (LOS)
- Show MAC addresses

Output Type:
Graph

Generate
BlueARGUS Dashboard: Example Report

Historical Trends for Nolensville Pk - NB
(Harding Pl to Peachtree St / Melrose Ave - 3.3 miles)
BlueARGUS Dashboard: Example Report

Historical Trends for Thompson Ln WB
(I-24 to Powell Ave / Bransford Ave – 2.5 miles)
BlueARGUS Dashboard: Example Report

Comparison Report: Smoothed Speed (15-min)

Time Interval: 00:00:00 - 24:00:00

- Thompson Ln WB - Historical Avg of Mon/Tue/Wed/Thu/Fri: From 2019-03-25 to 2019-03-29
- Nolensville Pk - NB - Historical Avg of Mon/Tue/Wed/Thu/Fri: From 2019-03-25 to 2019-03-29
BlueARGUS Dashboard: Example Report

Comparison Report: Smoothed Speed (15-min)

Time Interval: 00:00:00 - 24:00:00

- Thompson Ln WB - Historical Avg of Mon/Tue/Wed/Thu/Fri: From 2019-04-08 to 2019-04-12
- Nolensville Pk - NB - Historical Avg of Mon/Tue/Wed/Thu/Fri: From 2019-04-08 to 2019-04-12
Comparison of Peak Hour Average Travel Times

Analysis Periods: 1/1/19 to 3/1/19 compared to 3/25/19 to 5/17/19
Corridor Management Challenges:
Thompson Ln and Nolensville Pike
Corridor Management Challenges:

Citizen Complaints:

Bradley Parkway/Thompson Lane 155 at Nolensville Road Issues due to I-440 construction

Dear Ms. Schulte,

I wanted to reach out regarding the recent construction on the railroad tracks and the increased traffic on Sid Dining Drive. I have been dealing with this issue for several months, and it has become increasingly frustrating. I have resided on the road for over ten years, and I have never experienced anything like this before.

The traffic on Sid Dining Drive is particularly at Nolensville Road. The road is now a constant stream of cars, and it takes about 20 minutes every afternoon to make a 1 mile drive. As people are forced into traffic, they have to drive slower, making the commute even more unbearable. I have reached out to the planning department in January, but I have not received any resolution to this problem.

I would like to see the lights on Bradley Parkway/Thompson Lane 155 adjusted to better manage the extra traffic caused by the I-440 construction. I have included a map of the area below, which highlights the issue. Please do a traffic study quickly to get the stoplights on Bradley Parkway/Thompson Lane 155 adjusted for the extra traffic the I-440 construction has caused.

Thank you for your attention to this matter. I am looking forward to hearing from you soon.

Respectfully,
Carl
Citizen Memo:

- Describes coordination between TDOT and Metro Nashville.
- Explains what is being done to address traffic issues caused by the I-440 project in simple terms.
- For distribution to concerned council members and citizens.
QUESTIONS?