



I-71 Re-Routing Traffic Modeling Memorandum

DATE: 11.18.2015

HNTB conducted a planning-level traffic study to determine if re-routing I-71 from I-75 to I-471 would result in any significant changes in travel patterns. See **Exhibit 1** for a regional map illustrating the re-routing of I-71. The following three scenarios were examined (see **Exhibits 3, 4 and 5**):

- Scenario 1: Southbound I-71 Modifications
 - Widen the southbound ramp from I-71 to I-471 from one lane to two lanes
- Scenario 2: Southbound and Northbound I-71 Modifications
 - Widen the southbound ramp from I-71 to I-471 from one lane to two lanes
 - Widen the northbound ramp from I-471 to I-71 from one lane to two lanes
- Scenario 3: I-71 and Fort Washington Way Modifications
 - Widen the southbound ramp from I-71 to I-471 from one lane to two lanes
 - Widen the northbound ramp from I-471 to I-71 from one lane to two lanes
 - Reduce the southbound ramp from I-71 to I-75 at Fort Washington Way from two lanes to one lane
 - Create a third lane on southbound I-75 over the Brent Spence Bridge

Based on the planning-level analysis, none of the above scenarios significantly reduced the number of trips across the Brent Spence Bridge. Therefore, further investigation of these scenarios is not warranted.

Methodology

The 2040 No Build Travel Demand Model (TDM) for the Brent Spence Bridge (BSB) Corridor project was utilized to model the three scenarios described above. The TDM was previously calibrated based on existing traffic counts for the BSB project extents, including the downtown river crossings and the I-471 (Dan C. Beard) bridge. Existing traffic counts were also collected at the US-42/Liberty/I-471 intersection and along I-471 and I-275 south of the BSB corridor. The changes to the transportation network incorporated into Scenarios 1, 2 and 3 are located within the portions of the TDM that



were previously calibrated. The BSB and the I-471 bridge are also located within the validated portion of the model. Therefore, additional in-depth calibration was not performed, as it would not meaningfully affect the broad-based scope of this analysis.

Each scenario was modeled on a macroscopic level by adjusting the lane capacity for the appropriate links in the TDM for the 2040 Base No Build condition. The TDM model runs used only a traffic assignment script with fixed demands developed previously from the BSB Bridge Corridor Project. Once the TDM processed the changes, difference plots were prepared to compare each scenario to the 2040 Base No Build condition. Difference plots were developed for the AM peak hour¹, PM peak hour² and daily (24-hour) traffic volumes. For the purposes of this analysis, peak hour volume changes of 50 vehicles or less were considered to be within the margin of error for the TDM and were not found to be significant. Likewise, daily traffic volume changes of 250 vehicles or less were not considered to be significant.

Results

The difference plots for Scenarios 1, 2 and 3 are included in **Exhibits 5** through **13**. A brief summary of the results for each scenario is included below.

Scenarios 1 and 2 only resulted in minor changes in traffic volumes. The only significant volume changes were localized effects on the links immediately surrounding the widened I-71/I-471 ramps. No significant volume differences were projected across the BSB. Both Scenario 1 and 2 represented changes on very small links within the larger TDM. Furthermore, capacity was added to links that were not experiencing marked travel time reductions under the Base No Build condition. Therefore, the lane additions in Scenarios 1 and 2 did not result in significant travel time differences that would influence behavior in the TDM.

The modeling results for Scenario 3 indicated that the changes to the transportation network effected local trips, with very little effects to regional travel patterns. Eliminating a lane on the I-71 to I-75 ramp at Fort Washington Way significantly increased the travel time, which caused traffic to shift from that link. However, trips generally still favored the BSB, particularly with the additional capacity on southbound I-75. As a result, local traffic diverted to other arterial routes and local ramps to reach the BSB. However, no significant volume differences were projected across the BSB. Further analysis is required to determine if the increases on the arterial network would negatively impact local traffic operations.

Conclusions

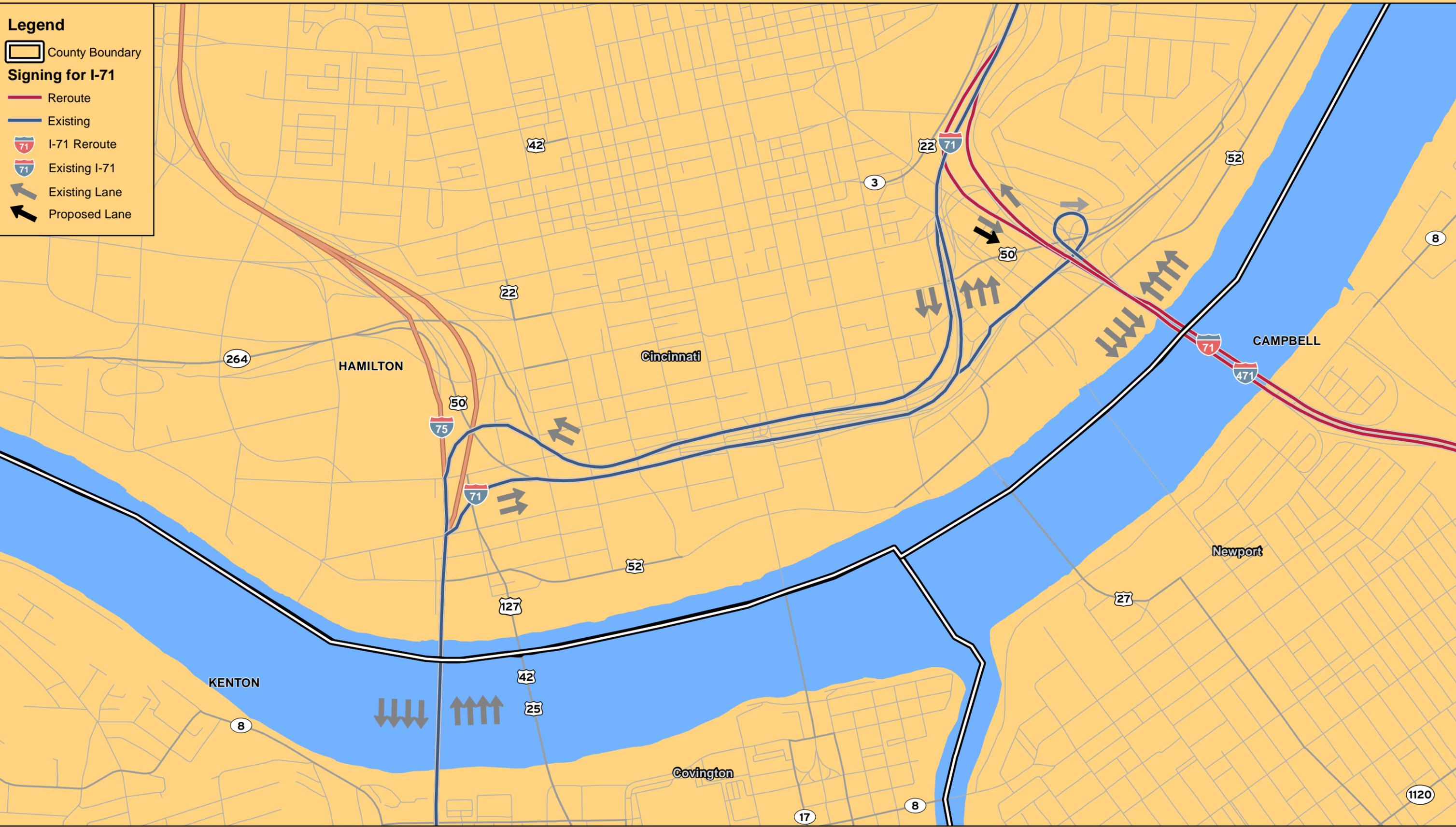
- Scenarios 1 and 2 did not result in significant volume differences across the BSB.

¹ AM peak hour = AM peak period * 0.430

² PM peak hour = PM peak period * 0.294



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- Scenario 3 shifted volume from the I-71 to I-75 ramp at Fort Washington Way to the local arterial network and other local ramps. However, no significant volume differences were projected across the BSB.
 - Scenario 3 requires additional analysis to determine if traffic operations on the arterial network would be negatively impacted.
 - Given the above, scenarios for re-routing I-71 to I-471 do not warrant further investigation.



Brent Spence Bridge
 Cincinnati, OH / Covington, KY
 I-71 Reroute over Dan C. Beard Bridge
 Scenario 1

Date: 10/26/2015
 Prepared by: TVF

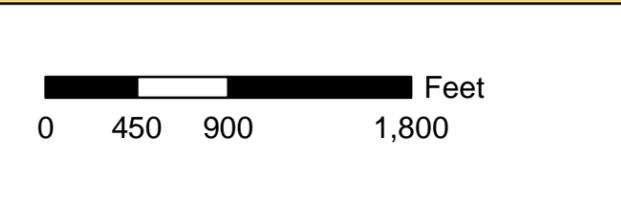
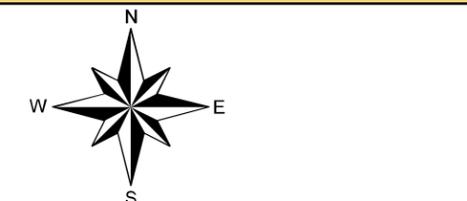
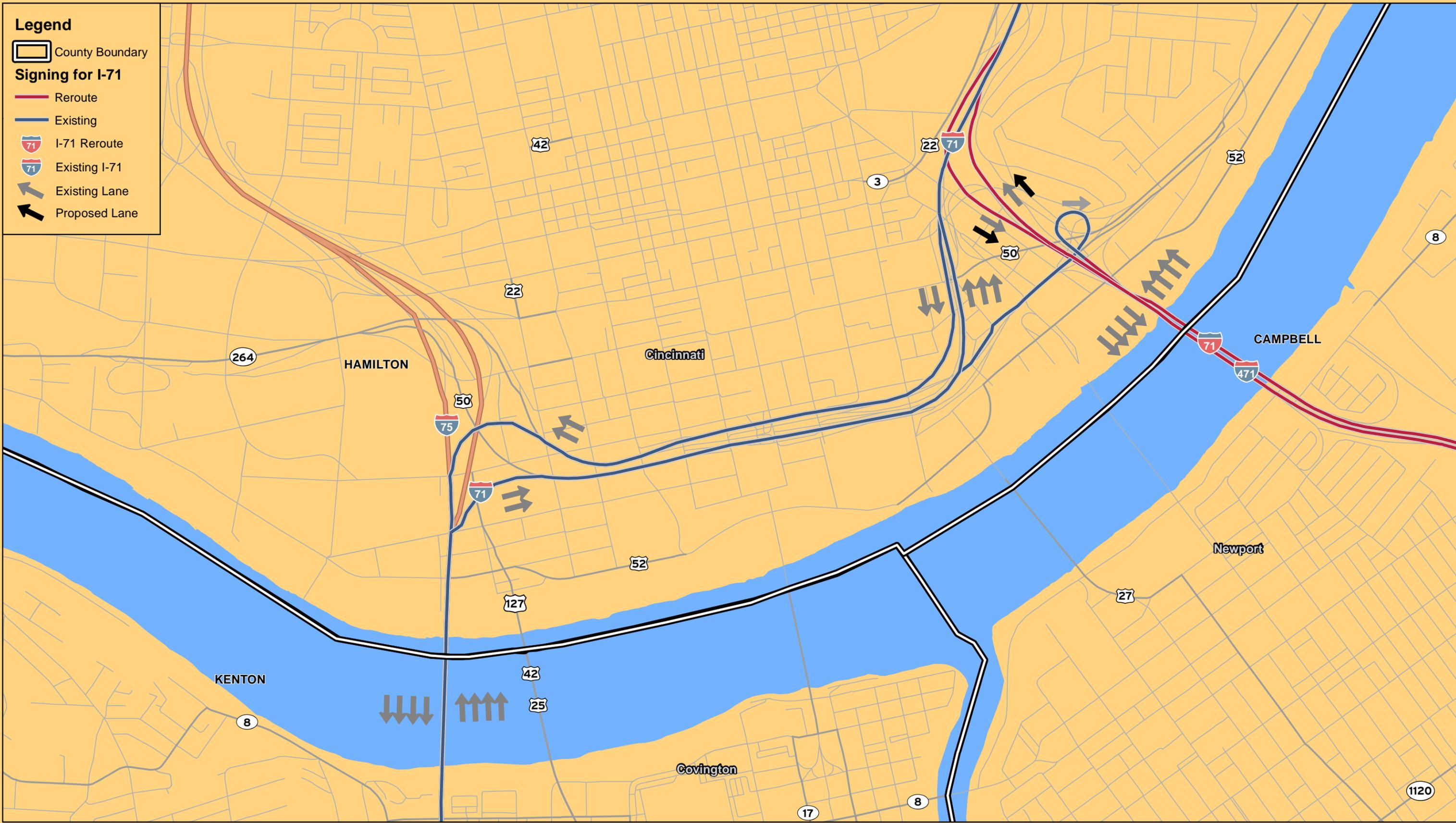


Exhibit 2:
 Scenario 1 Lane Use

Legend

-  County Boundary
- Signing for I-71**
-  Reroute
-  Existing
-  I-71 Reroute
-  Existing I-71
-  Existing Lane
-  Proposed Lane



Brent Spence Bridge
 Cincinnati, OH / Covington, KY
 I-71 Reroute over Dan C. Beard Bridge
 Scenario 2

Date: 10/26/2015
 Prepared by: TVF

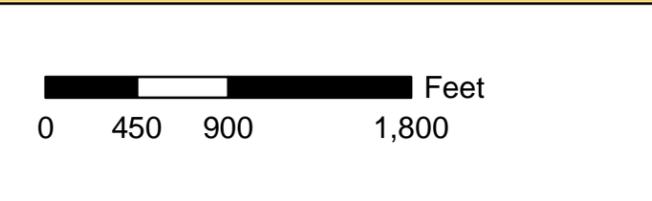
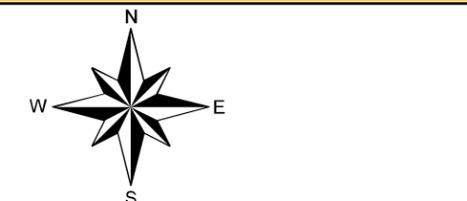
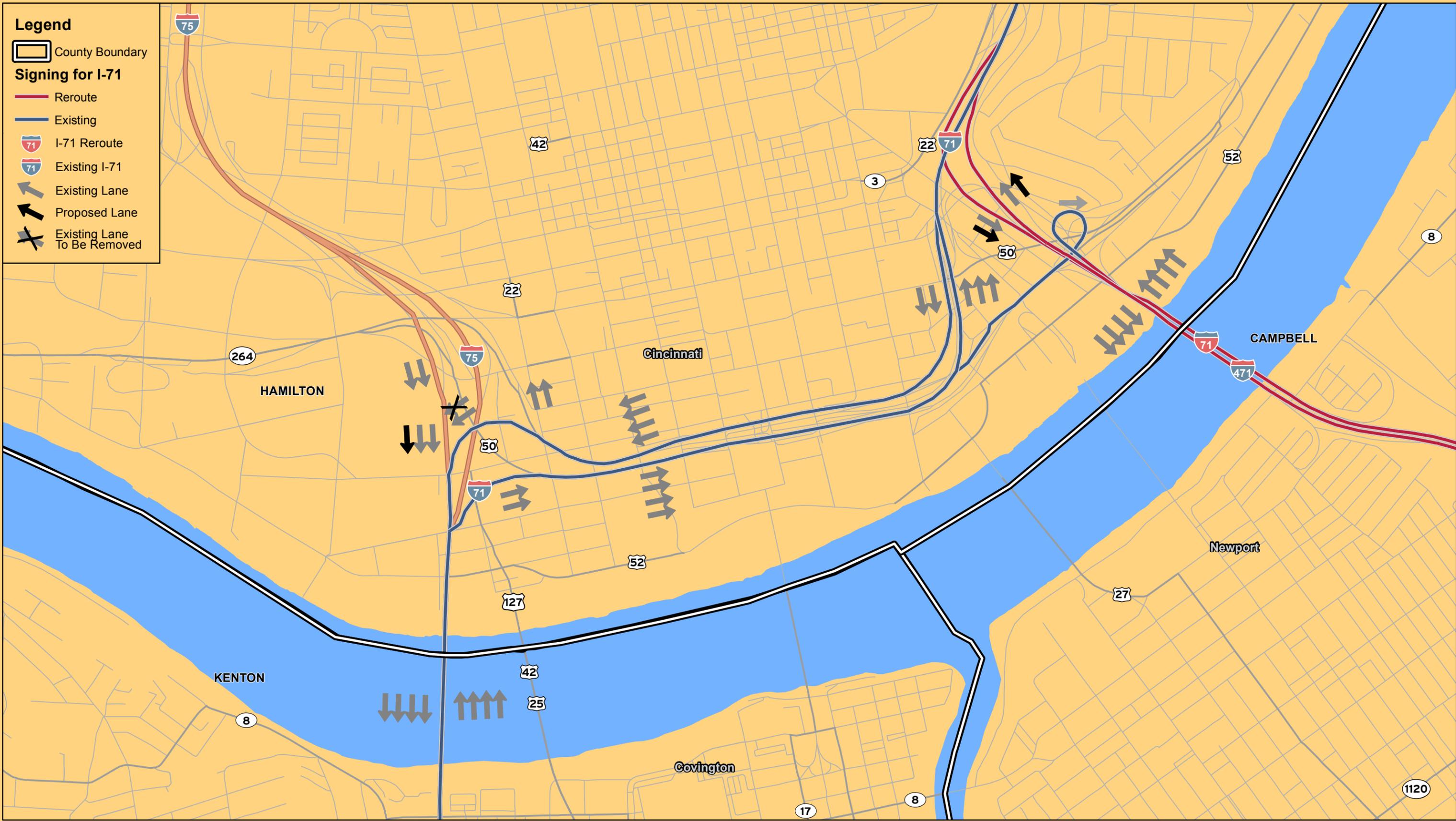


Exhibit 3:
 Scenario 2 Lane Use

Legend

-  County Boundary
- Signing for I-71**
-  Reroute
-  Existing
-  I-71 Reroute
-  Existing I-71
-  Existing Lane
-  Proposed Lane
-  Existing Lane To Be Removed



Brent Spence Bridge
 Cincinnati, OH / Covington, KY
 I-71 Reroute over Dan C. Beard Bridge
 Scenario 3

Date: 11/13/2015
 Prepared by: TVF

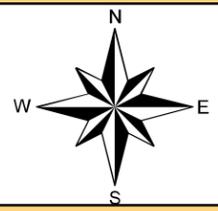
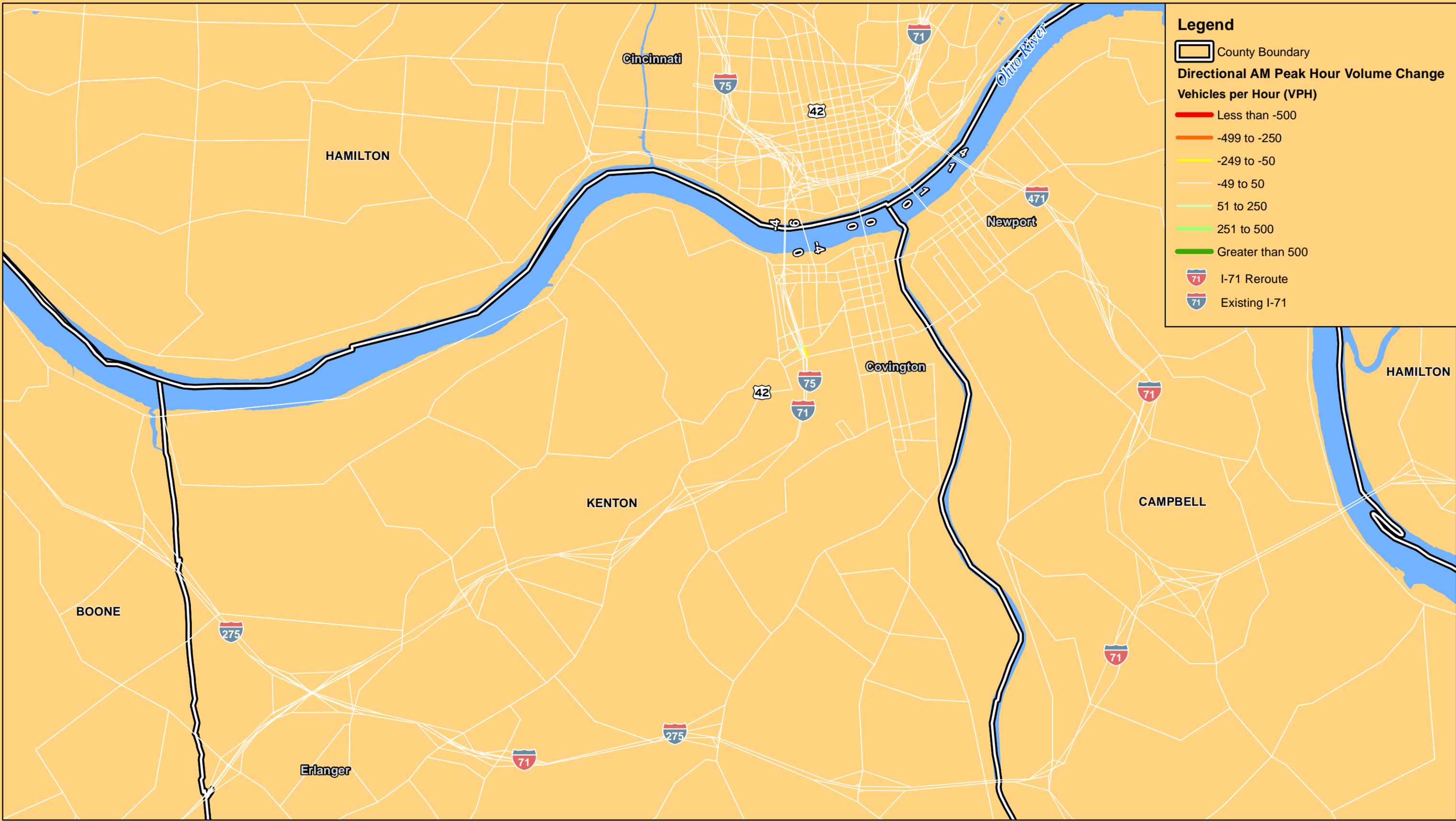


Exhibit 4:
 Scenario 3 Lane Use



Brent Spence Bridge
 Cincinnati, OH / Covington, KY
 I-71 Reroute over
 Dan C. Beard Bridge

Date: 10/29/2015
 Prepared by: TVF

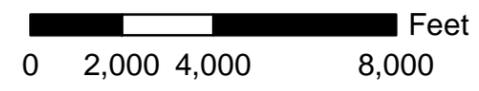
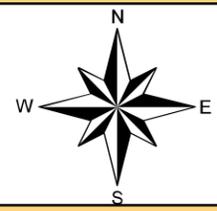
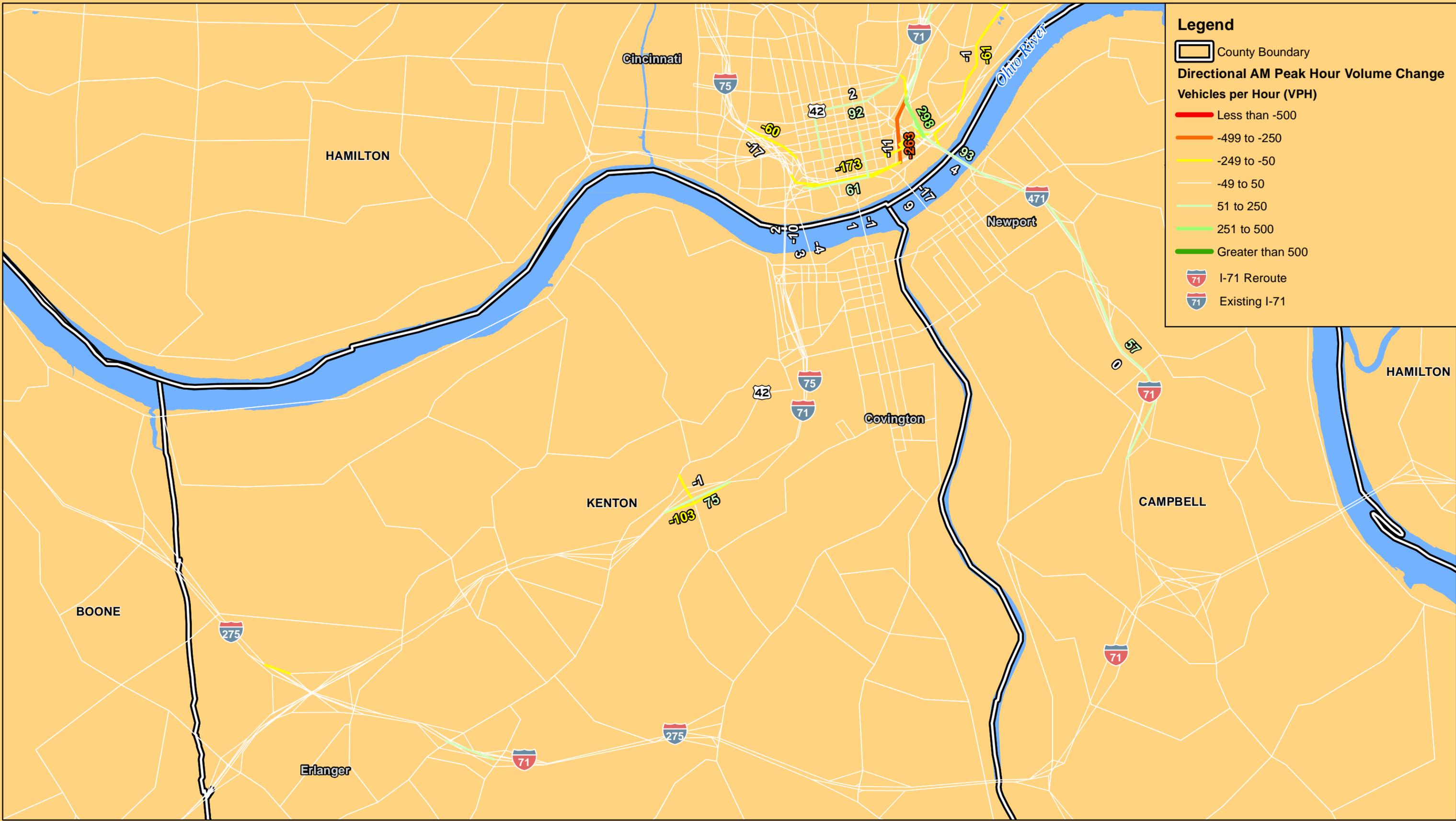


Exhibit 5:
 Scenario 1 2040 AM Peak Traffic Volume
 Comparison to Base No Build
 AM Peak Hour is equal to 43% of AM Period



Legend

- County Boundary
- Directional AM Peak Hour Volume Change Vehicles per Hour (VPH)**
- Less than -500
- 499 to -250
- 249 to -50
- 49 to 50
- 51 to 250
- 251 to 500
- Greater than 500
- I-71 Reroute
- Existing I-71

Brent Spence Bridge
 Cincinnati, OH / Covington, KY
 I-71 Reroute over
 Dan C. Beard Bridge

Date: 10/29/2015
 Prepared by: TVF

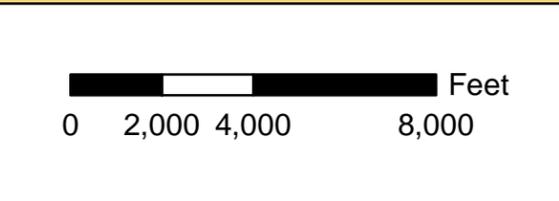
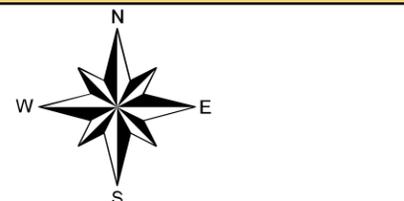
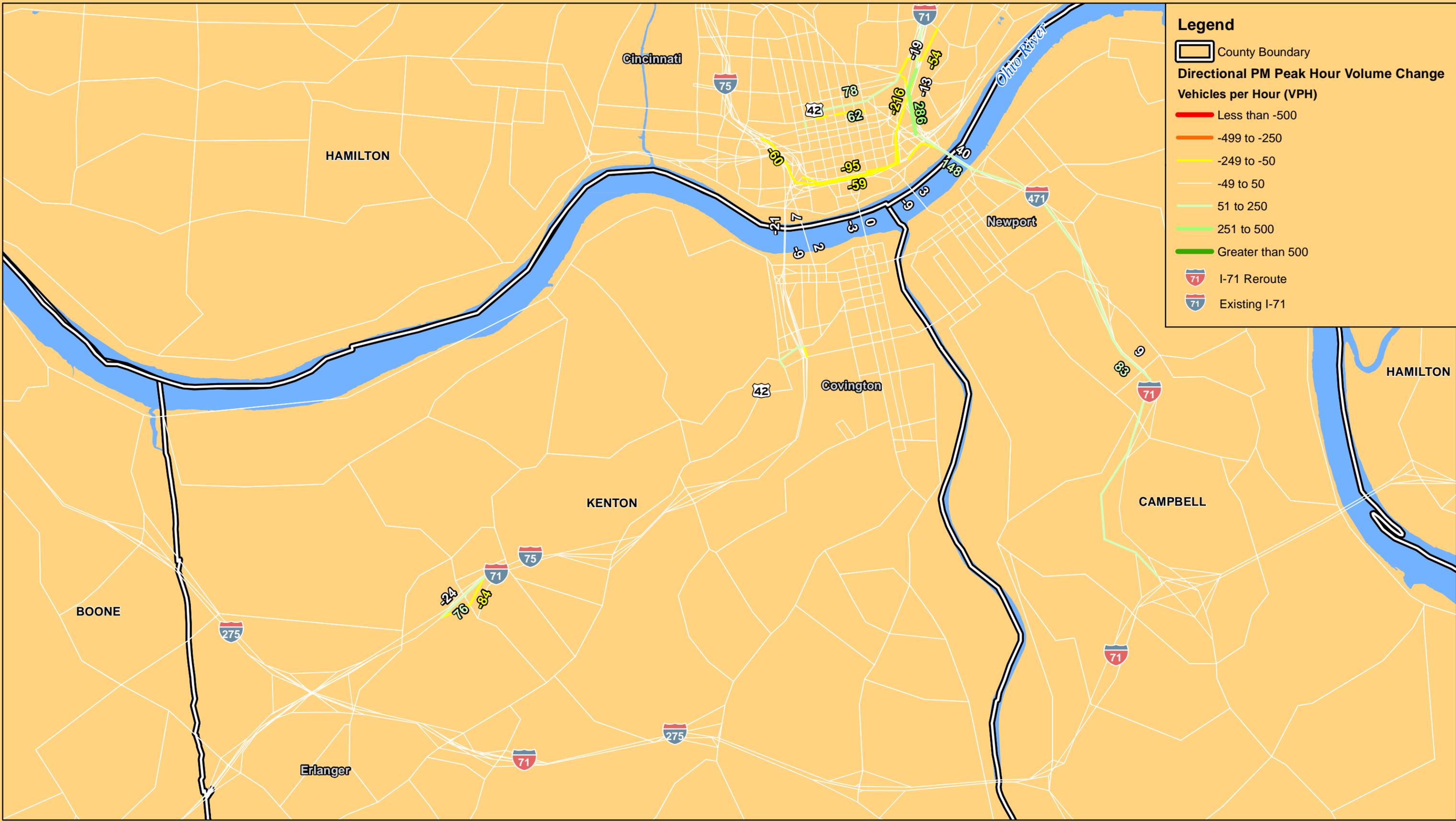


Exhibit 6:
 Scenario 2 2040 AM Peak Traffic Volume
 Comparison to Base No Build
 AM Peak Hour is equal to 43% of AM Period



Brent Spence Bridge
 Cincinnati, OH / Covington, KY
 I-71 Reroute over
 Dan C. Beard Bridge

Date: 10/29/2015
 Prepared by: TVF

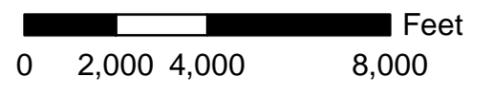
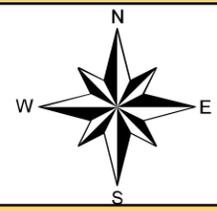
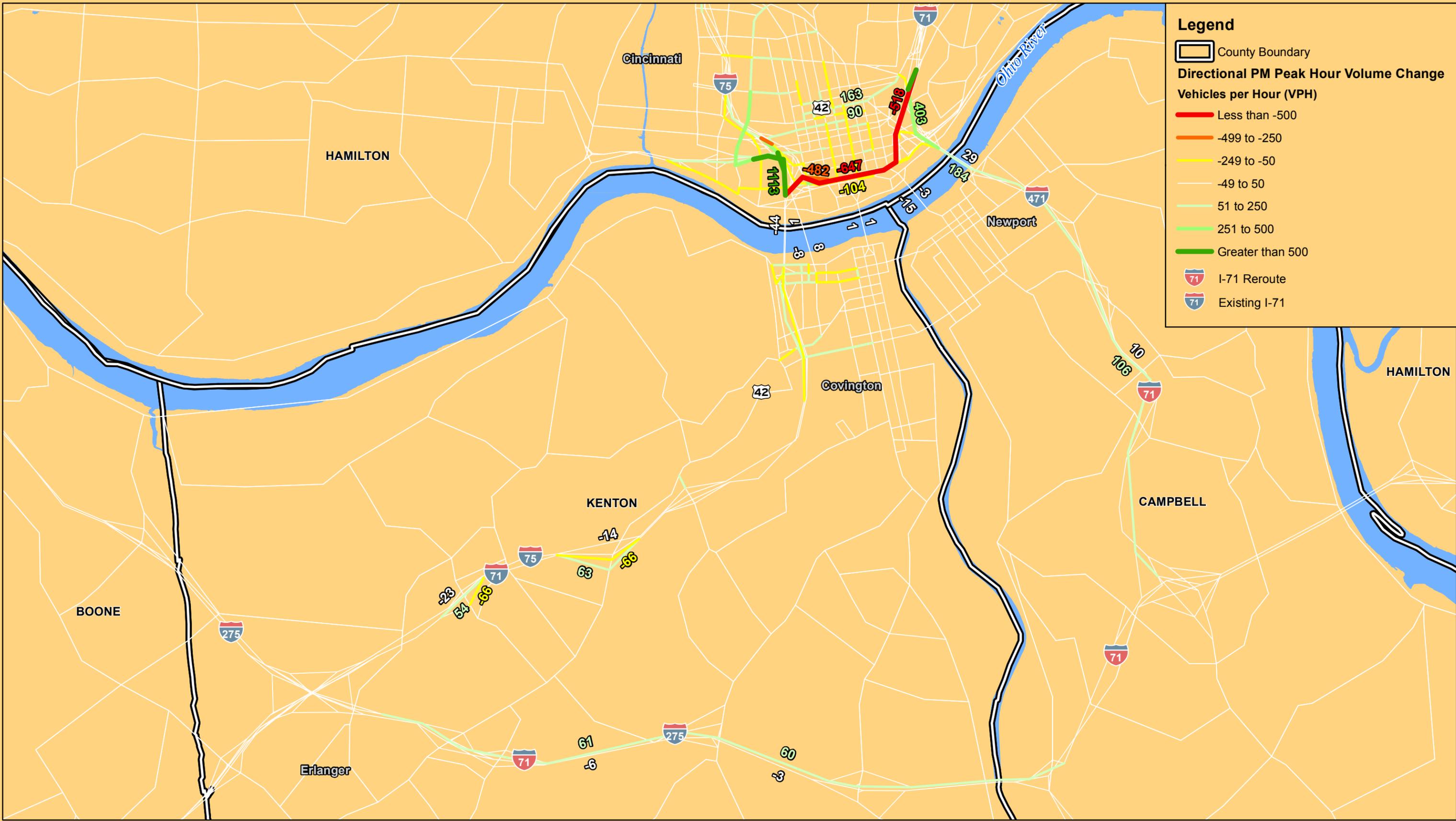


Exhibit 8:
 Scenario 1 2040 PM Peak Traffic Volume
 Comparison to Base No Build
 PM Peak Hour is equal to 29.4% of PM Period



Legend

- County Boundary
- Directional PM Peak Hour Volume Change Vehicles per Hour (VPH)**
- Less than -500
- 499 to -250
- 249 to -50
- 49 to 50
- 51 to 250
- 251 to 500
- Greater than 500
- I-71 Reroute
- Existing I-71

Brent Spence Bridge
 Cincinnati, OH / Covington, KY
 I-71 Reroute over
 Dan C. Beard Bridge

Date: 11/13/2015
 Prepared by: TVF

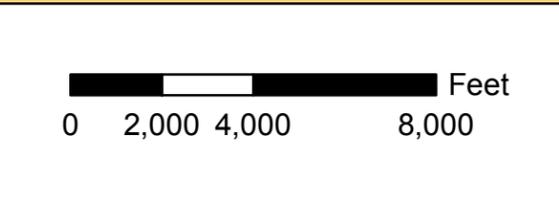
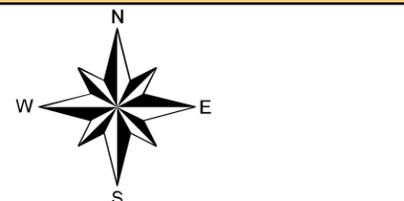
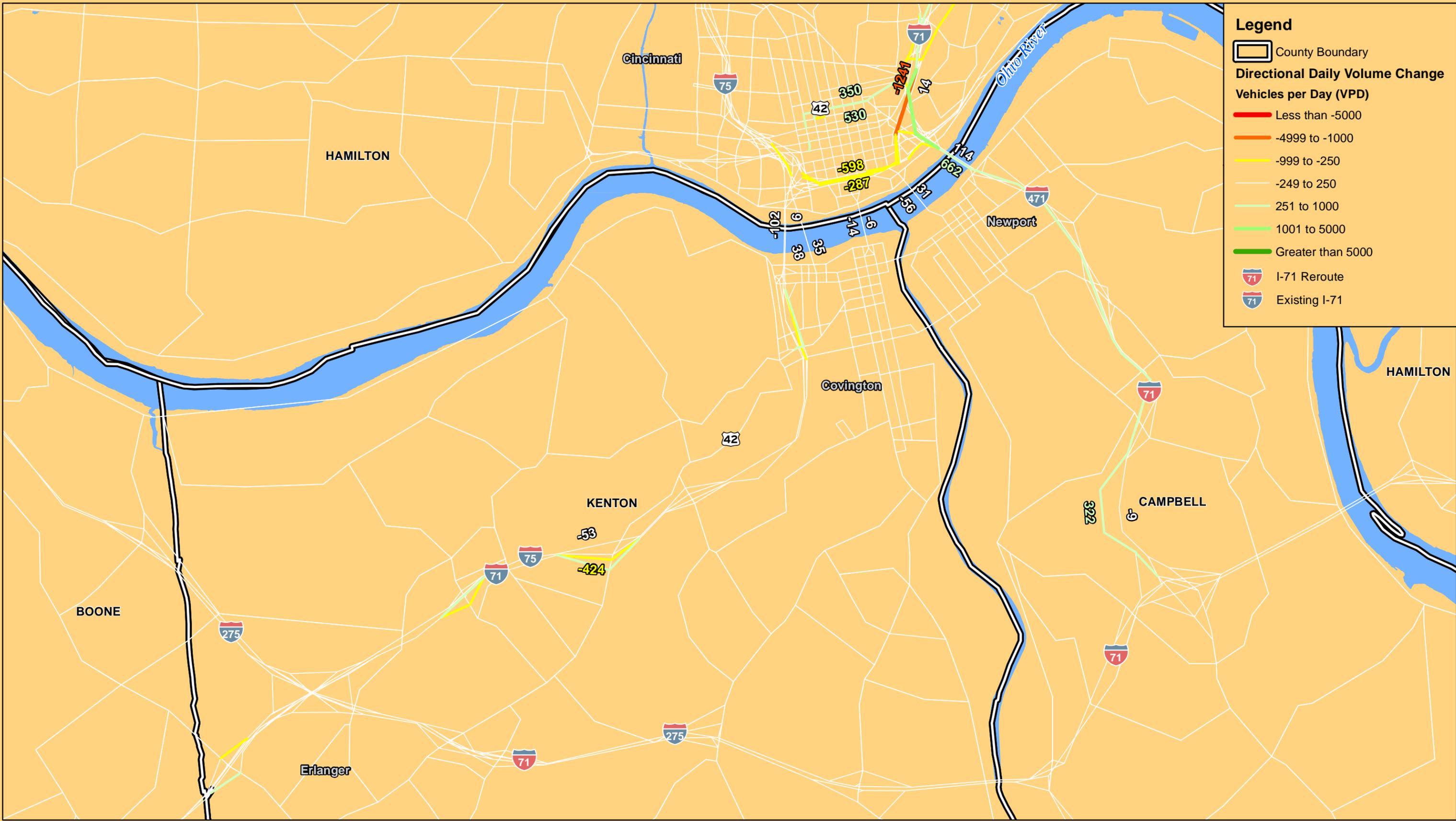


Exhibit 10:
 Scenario 3 2040 PM Peak Traffic Volume
 Comparison to Base No Build
 PM Peak Hour is equal to 29.4% of PM Period



Legend

- County Boundary
- Directional Daily Volume Change Vehicles per Day (VPD)**
- Less than -5000
- 4999 to -1000
- 999 to -250
- 249 to 250
- 251 to 1000
- 1001 to 5000
- I-71 Reroute
- Existing I-71

Brent Spence Bridge
 Cincinnati, OH / Covington, KY
 I-71 Reroute over
 Dan C. Beard Bridge

Date: 10/29/2015
 Prepared by: TVF

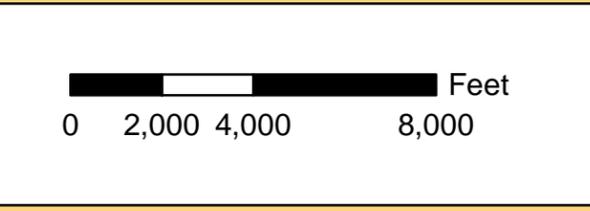
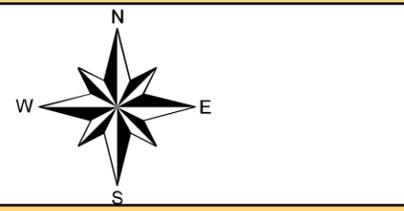
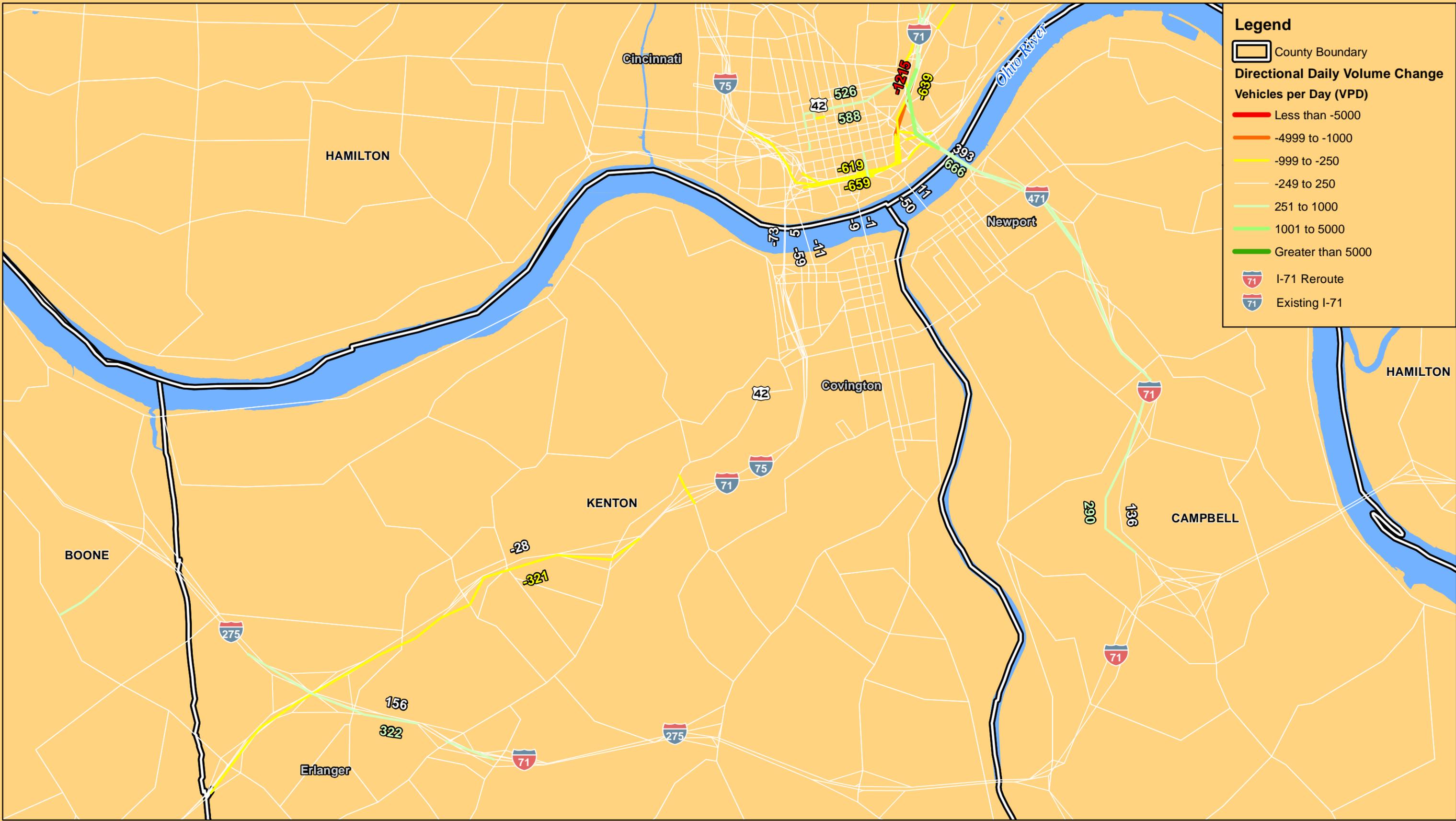


Exhibit 11:
 Scenario 1 2040 Daily Traffic Volume
 Comparison to Base No Build



Legend

- County Boundary
- Directional Daily Volume Change Vehicles per Day (VPD)**
- Less than -5000
- 4999 to -1000
- 999 to -250
- 249 to 250
- 251 to 1000
- 1001 to 5000
- Greater than 5000
- I-71 Reroute
- Existing I-71

Brent Spence Bridge
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 I-71 Reroute over
 Dan C. Beard Bridge

Date: 10/29/2015
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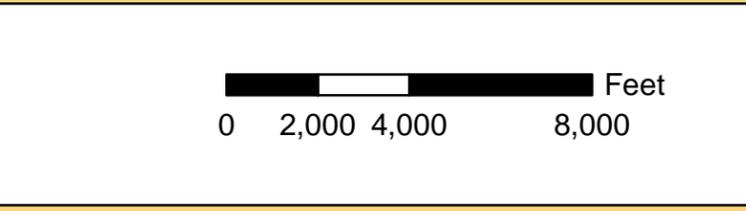
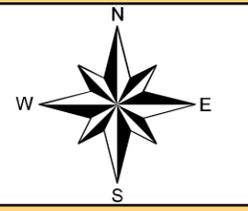
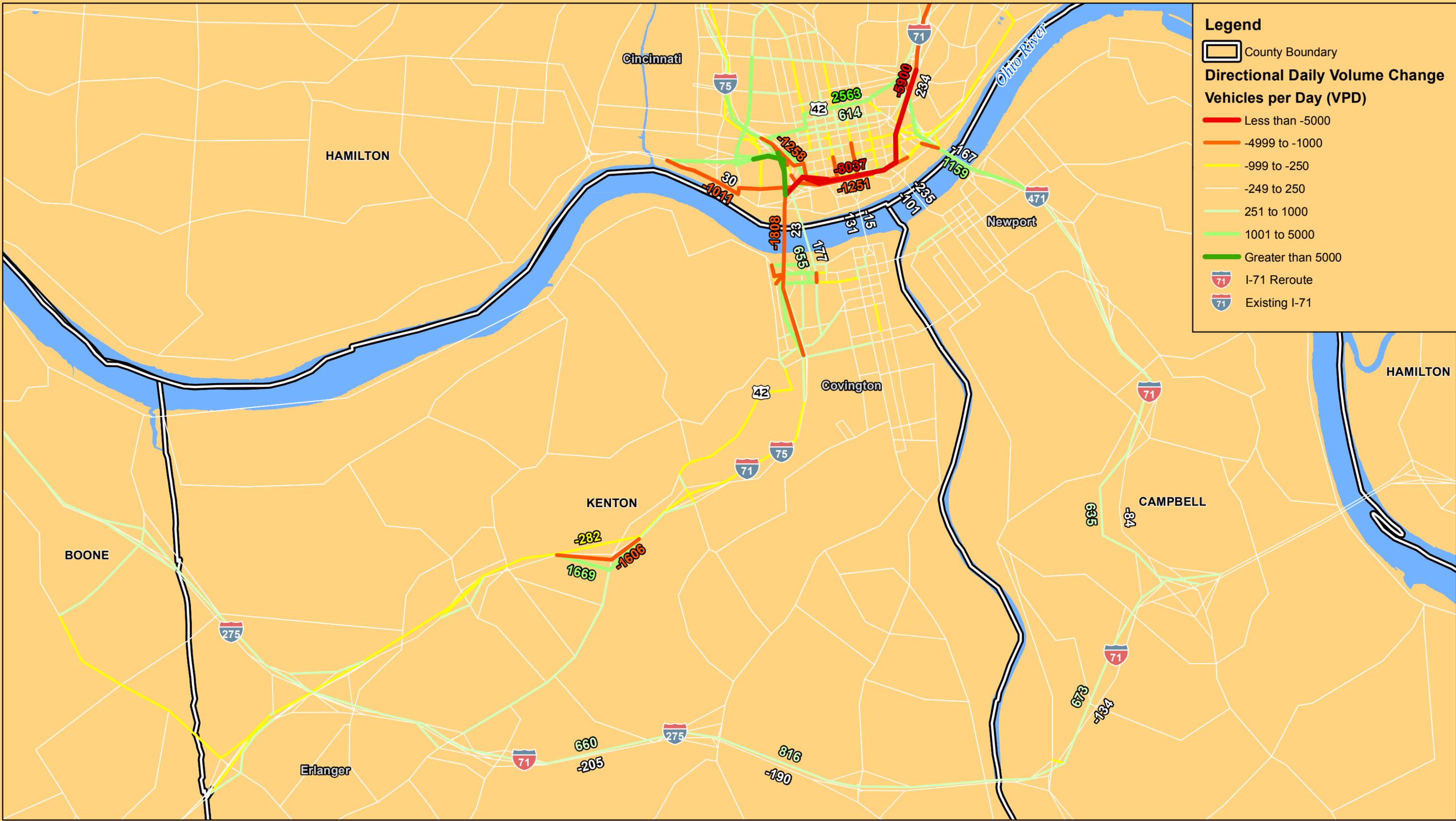


Exhibit 12:
 Scenario 2 2040 Daily Traffic Volume
 Comparison to Base No Build



Brent Spence Bridge
 Cincinnati, OH / Covington, KY
 I-71 Reroute over
 Dan C. Beard Bridge

Date: 11/12/2015
 Prepared by: TVF

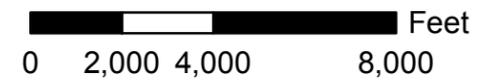
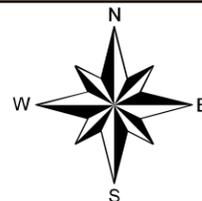


Exhibit 13:
 Scenario 3 2040 Daily Traffic Volume
 Comparison to Base No Build