Study Objectives

1. Purpose & Need
2. Reasonable Alternatives
3. Ready for NEPA
Why Now?
The Bridge
Construction in 1955
Built in 1954

Replaced in 2010

Paseo replaced at 56 years old – Broadway is currently 60+
Study Process
Typical NEPA process:
1. One preferred option, funding source, NEPA clock

How is this different?

Planning & Environmental Linkages (PEL):
1. Multiple options (reasonable alternatives)
2. Costs estimated (funding does not have to be identified)
3. Output: FHWA Questionnaire - Summary of process to ease transition from planning to NEPA analysis.
Timeline & Process

2016

INITIAL VISIONING

Data Collection

Traffic Modeling

2016

REVIEW DRAFT ALTERNATIVES

SPRING/SUMMER 2017

FALL/WINTER 2017

REVIEW FINAL DOCUMENT

SPRING/SUMMER 2018

Technical Advisory Group

Study Management Team

Public Engagement

Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Public Engagement
108
PowerPoint Presentations

Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Activities:

- Five Public Meeting Activities 578 participants
- Two Online Surveys 1957 participants
- 10+ governing body briefings 250+ participants
- 53 Small Group Meetings 700+ participants
- ULI National TAP Visit 100+ participants
- Twitter / Facebook 540 Followers
- Conference Presentations (TRB/TEAM) 500+ participants
- And more!

Over a dozen local news stories. Thousands of data points collected. Thousands of community members engaged.
Thinking 60 years into the future – what do you hope the planning focuses on now, for both the bridge and corridor:

Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Thinking about the next 60 years, how would you prioritize the following issues in the study area? (High-Low)

- Transportation safety for all modes - 3rd
- Speed of travel - 9th
- Access to and from neighborhoods - 6th
- Travel choices (driving, transit, biking, walking, etc.) - 1st
- Neighborhood character - 2nd
- Economic development - 5th
- Reliable travel time (commute is always the... - 7th
- Environmental quality - 4th
- Freight movement - 8th

When poll is active, respond at PollEv.com/beyonddkc
NEEDS & GOALS

1. NEED 1: Improve Physical Conditions –
   Ensure that existing and new transportation assets in the Study Area better serve the region and are maintained in a state of good repair.

   Does it improve the condition of the O’Neil Bridge, the US-169 Corridor, the I-70 North Loop, or the Lewis & Clark Viaduct?

2. NEED 2: Optimize System Performance –
   Manage the operations of the existing transportation facilities to achieve reliable and efficient performance.

   Does the strategy improve regional connectivity or improve traffic operations?

3. NEED 3: Improve Safety and Security –
   Identify reasonable improvements to ensure the safety and security of the affected area.

   Does the improvement provide for the safe operation of vehicular traffic, improve safety for bicyclists and pedestrians, or improve emergency response times and provide improved system redundancy?
NEEDS & GOALS

GOAL 1: Improve Transportation Choices – Provide viable, accessible, multi-modal transportation options.

Does the strategy provide for bicyclist and pedestrian opportunities or improve transit accessibility?

GOAL 2: Improve Economic Vitality and Placemaking – Improve transportation and land-use linkages in the Study Area.

Does the improvement provide for additional economic development opportunities, enhance regional freight movements, or promote quality places?

GOAL 3: Improve Sustainability – Protect and enhance the region's natural, cultural, and social resources. Explore ways to mitigate the adverse impacts of the existing system and proposed alternatives.

Does the improvement promote social equity and neighborhood revitalization, minimize impacts to historical and natural environmental resources, or integrate new transportation technologies?
Reasonable Alternatives

Full listing and description of all considered alternatives can be found www.beyondtheloopkc.com

www.marc.org/beyondtheloop
AVERAGE 8.89
MEDIAN 10
AVERAGE
6.74

MEDIAN
8

NEW BRIDGE CLOSER TO DOWNTOWN

NEW BRIDGE MORE DIRECT TO I-35
This option would maintain the current I-70 alignment. Highway 9 would be brought down to grade and connect at Independence Ave. and 6th Street. Independence Ave. would be reconnected across Highway 9 and maintain one-way (Westbound).
This option would shift I-70 to the north and reduce the interstate footprint. Highway 9 would be brought down to grade and connect with the street grid. Increased development opportunities would be available on the Central Business District side.

**HIGHLIGHTS**

- A reconnected Independence Ave. would be configured as a 2-way complete street with protected cycle track. Maintenance cost would decrease by $21.8 million through 2040.

- North Compressed with two-way Independence Ave. will cost approximately $118 million (cost does not include lowering Highway 9 to grade—see Neighborhood Board for additional costs).

- This compressed footprint would free up 7.2 acres of land valued at $22 million.

- The compressed alignment generally increases highway speed and decreases delay. However, it will increase traffic on the local street network.

**COST $$$$$**
This option would shift I-70 to the south and reduce it from three lanes to two lanes in each direction. Highway 9 would be brought down to grade and connect with the street grid. Increased development opportunities would be available on the River Market side.

HIGHLIGHTS

- A reconnected Independence Ave. would be configured as a 2-way complete street with protected cycle track with connected development and on-street parking. Maintenance cost would decrease by $21.8 million through 2040.

- South Compressed with two-way Independence Ave. will cost approximately $113 million (cost does not include lowering Highway 9 to grade—see Neighborhood Board for additional costs).

- This compressed footprint would free up 11.3 acres of land valued at $33 million.

- The compressed alignment generally increases highway speed and decreases delay. However, it will increase traffic on the local street network.

COST $$$$$
This option would remove I-70 in the North Loop. The current I-670 on the south side of the downtown loop would be redesignated as I-70. Highway 9 would be brought down to grade and connect with the street grid. Independence Ave. would be reconnected as a 2-way complete street.

HIGHLIGHTS
- A reconnected Independence Ave. would be configured as a 2-way complete street with protected cycle track with connected development and on-street parking. Maintenance cost would decrease by $23.1 million through 2040.
- Full Removal with two-way Independence Ave. will cost approximately $65 million (cost does not include lowering Highway 9 to grade—see Neighborhood Board for additional costs).
- Full removal of the interchange would free up 26.9 acres of land valued at $80 million.
- Changes would need to made on the south side of the downtown loop in order to accommodate the traffic rerouted to the removal of I-70 on the North Loop.
- Traffic delays will increase on the south side of the loop.

COST $$$$$
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Existing Planning Documents

Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Precedent Studies

Utrechtsebaan Highway — The Hague, NL

- Project Type: Reconstruction — Three buildings were constructed on top of existing highways
- Length of Vehicular Corridor: 0.63 miles
- Changes in Developable Land: Increase of $15,000 square feet of varying uses
- Economics: N/A
- Impact on Traffic: Traffic volume unaffected
- Impact on Access: Several City streets were reconnected across the highway
- Safety: Increased bike / pedestrian safety

General Overview:

- The City grid of The Hague was once interrupted by the introduction of the Utrechtsebaan Highway. The government sought to stitch the city back together and this project was the solution to that desire.
- Three primary buildings were constructed, each with a different purpose. One was to serve as a “city gate” to mark the point at which the Utrechtsebaan enters the inner city.
- The buildings were created as a new civic center with metro station, parking, and a mix of uses designed to attract people to the area and promote urban vitality.
- The third building was designed to add transparency to the area and stitch together residential neighborhoods isolated by the highway.

Sources:
- Pre-Construction (2004)
- Post-Construction (2008)

Corresponding Redevelopment Activity:

- The adjacent riverfront area has seen tremendous growth and redevelopment. The Paul Brown Stadium and garage, National Underground Railroad Freedom Center, Cincinnati Reds Ball Park, parking garages, transit center, several acres of mixed-use development and an expansive riverfront park have been constructed in wake of this project.

Sources:
- http://www.westl.fr/projects/madrid_riu/
- http://www.tifp.org/tifp-blog/madrid-%E2%80%94%20%E2%80%94project-changed-madrid.html

Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Past Development Trends

Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Ramp Consolidation

Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Compressed Footprint
(South Alignment)

Exploring the Future of the
Broadway/O’Neil Bridge and North Loop
Compressed Footprint
(North Alignment)

Exploring the Future of the
Broadway/O’Neil Bridge and North Loop
Removal and Reclassify

Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O'Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Transportation Planning

• Detailed Technical Process
  • Data Collection
  • Development of Model
  • Technical aspects of study
  • Results of public meeting
Traffic Data

- Turning Movement Counts
- 24-hour Counts
- Origin and Destination
Origin and Destination

- Video
- License Plate
- Bluetooth
- SkyComp
- INRIX
Origin/Destination (O/D)
Data
Origin and Destination
What Do We Want To Know?

▪ What will our region look like 30 Years from today if the status quo does not change?
▪ How will our alternatives impact the region as a whole?
▪ Emissions/Fuel Consumption
▪ How much more/less time do people travel when each alternative is implemented?
▪ Are there any spots with serious traffic operation issues (long queues, gridlock, etc.)?
Model Framework

Macro ➔ Meso ➔ Micro
### Why Model?

<table>
<thead>
<tr>
<th>Level</th>
<th>Tool</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macroscopic</td>
<td>MARC Regional Model</td>
<td>• Demand Estimation</td>
</tr>
<tr>
<td></td>
<td><strong>EMME</strong></td>
<td>• OD Pair identification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Demand by Analysis Hours for Meso and Micro analysis</td>
</tr>
<tr>
<td>Mesoscopic</td>
<td>Dynamic Traffic Assignment Model</td>
<td>• Use of ODME with Regional Model Trip tables for Microscopic</td>
</tr>
<tr>
<td></td>
<td><strong>Dynamemc</strong></td>
<td>analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Alternative comparison</td>
</tr>
<tr>
<td>Microscopic</td>
<td>Vissim</td>
<td>• Operation Analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Mitigation Analysis</td>
</tr>
</tbody>
</table>
PEL Study: Alternatives

• E = Exiting
• AC = Access Consolidation
• CF = Compressed Footprint
• RR = Re-designate and Reclassify I-70
Re-designate and Reclassify I-70 Strategy Figure

Independence two-way six lanes & 6th Street two-way four lanes

Route 9 at-grade intersections at 3rd, 5th, and Independence
DTA Model Analysis: Alternative Impacts

DTA Delta Volumes E vs AC AM Peak Hour
DTA Model Analysis: Alternative Impacts

DTA Delta Volumes E vs CF
AM Peak Hour
DTA Delta Volumes E vs RR AM Peak Hour
Micro Model: VISSIM Simulation Model

Spots VISSIM Analysis
Micro Model: VISSIM Simulation Model

EB I-670 Approaching Bartle Hall (SW Quadrant)

**Three Lanes**
- 2-670
- I-35 SB from Wyoming

**Two Lanes**
- Wyandotte St Exit
- I-670
Micro Model: VISSIM Simulation Model

Mitigation – Southeast Interchange traffic forecasts

### WB I-670

<table>
<thead>
<tr>
<th>Source</th>
<th>Scenario</th>
<th>Volume</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>VISSIM</td>
<td>2016 Existing</td>
<td>5174 (4420)</td>
<td>34.0 (37.0)</td>
</tr>
<tr>
<td>DTA</td>
<td>2016 Base</td>
<td>4914 (4809)</td>
<td>44.0 (44.0)</td>
</tr>
<tr>
<td>DTA</td>
<td>2040 No Build</td>
<td>5276 (4706)</td>
<td>41.5 (40.2)</td>
</tr>
<tr>
<td>DTA</td>
<td>2040 RR</td>
<td>6429 (5263)</td>
<td>34.5 (33.2)</td>
</tr>
</tbody>
</table>

### EB I-670

<table>
<thead>
<tr>
<th>Source</th>
<th>Scenario</th>
<th>Volume</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>VISSIM</td>
<td>2016 Existing</td>
<td>3350 (4140)</td>
<td>40.0 (34.0)</td>
</tr>
<tr>
<td>DTA</td>
<td>2016 Base</td>
<td>4045 (3922)</td>
<td>44.0 (26.0)</td>
</tr>
<tr>
<td>DTA</td>
<td>2040 No Build</td>
<td>4127 (3695)</td>
<td>42.4 (10.6)</td>
</tr>
<tr>
<td>DTA</td>
<td>2040 RR</td>
<td>4466 (3536)</td>
<td>19.9 (9.5)</td>
</tr>
</tbody>
</table>
Micro Model: VISSIM Simulation Model

Mitigation – Southeast Interchange
Micro Model : VISSIM Simulation Model

Mitigation – Southeast Interchange
Special Model Analysis: CV/AV Consideration

- 20% Increase in Saturation Flow Rate
- Increase Only Applied to Freeways and Freeway-Freeway Connectors
- Matches Approach Used on Los Angeles Study
# DTA Model Analysis: CV/AV Consideration

## Existing 2016 vs No Build 2040 – AM Peak

<table>
<thead>
<tr>
<th>AM PEAK PERIOD (6-9AM)</th>
<th>Freeway &amp; Expressway</th>
<th>All Ramps</th>
<th>Arterials</th>
<th>System Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vehicle Miles Travelled</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing 2016</td>
<td>1,381,960</td>
<td>128,822</td>
<td>574,171</td>
<td>2,084,952</td>
</tr>
<tr>
<td>No Build 2040</td>
<td>1,580,254</td>
<td>138,616</td>
<td>601,108</td>
<td>2,319,979</td>
</tr>
<tr>
<td>No Build 2040 wAV/CV</td>
<td>1,597,264</td>
<td>139,686</td>
<td>588,375</td>
<td>2,325,426</td>
</tr>
<tr>
<td><strong>Change vs Existing Conditions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Build 2040</td>
<td>14.3%</td>
<td>7.6%</td>
<td>4.7%</td>
<td>11.3%</td>
</tr>
<tr>
<td>No Build 2040 wAV/CV</td>
<td>15.6%</td>
<td>8.4%</td>
<td>2.5%</td>
<td>11.5%</td>
</tr>
</tbody>
</table>

| **Vehicle Hours Travelled** |                      |           |           |              |
| Existing 2016          | 25,537               | 4,103     | 25,387    | 55,625       |
| No Build 2040          | 30,042               | 4,424     | 30,387    | 64,853       |
| No Build 2040 wAV/CV   | 28,618               | 4,404     | 28,056    | 61,079       |
| **Change vs Existing Conditions** |                  |           |           |              |
| No Build 2040          | 17.6%                | 7.9%      | 16.5%     | 16.6%        |
| No Build 2040 wAV/CV   | 12.1%                | 7.4%      | 8.0%      | 9.8%         |

| **Vehicle Hours of Delay** |                      |           |           |              |
| Existing 2016          | 1,867                | 567       | 7,838     | 10,273       |
| No Build 2040          | 3,035                | 652       | 11,418    | 15,105       |
| No Build 2040 wAV/CV   | 1,316                | 603       | 9,449     | 11,348       |
| **Change vs Existing Conditions** |                  |           |           |              |
| No Build 2040          | 62.5%                | 15.0%     | 45.7%     | 47.0%        |
| No Build 2040 wAV/CV   | -29.5%               | 6.3%      | 20.5%     | 10.7%        |

## With CV/AV Consideration

<table>
<thead>
<tr>
<th></th>
<th>Freeway/Expressway</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VMT</strong></td>
<td>![Upward Arrow]</td>
<td></td>
</tr>
<tr>
<td><strong>VHT</strong></td>
<td>![Downward Arrow]</td>
<td></td>
</tr>
<tr>
<td><strong>Vehicle Hours Delay</strong></td>
<td>![Downward Arrow]</td>
<td></td>
</tr>
</tbody>
</table>
DTA Model Analysis : Path Analysis

Gate-to-Gate Travel Times

<table>
<thead>
<tr>
<th>Movement</th>
<th>2040 Base</th>
<th>Access Consolidated</th>
<th>Compressed Footprint</th>
<th>Redesignated Reclassified</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM</td>
<td>PM</td>
<td>AM</td>
<td>PM</td>
</tr>
<tr>
<td>WB I-70 East to WB LC Viaduct</td>
<td>04:35</td>
<td>04:15</td>
<td>05:42</td>
<td>04:12</td>
</tr>
<tr>
<td>EB LC Viaduct to EB I-70 East</td>
<td>04:22</td>
<td>04:46</td>
<td>04:12</td>
<td>04:30</td>
</tr>
<tr>
<td>EB I-670 West to EB I-70 East</td>
<td>02:49</td>
<td>06:14</td>
<td>02:43</td>
<td>09:04</td>
</tr>
<tr>
<td>WB I-70 East to WB I-670 West</td>
<td>03:20</td>
<td>02:35</td>
<td>03:41</td>
<td>02:38</td>
</tr>
</tbody>
</table>
Public Information

TRAVEL TIME MODEL ASSESSMENT

**2017 EXISTING POINT-TO-POINT TIME:**

**AM PEAK** 4:38

**PM PEAK** 4:42

**2040**

**NO BUILD 2040 POINT-TO-POINT TIME:**

**AM PEAK** 4:58

**PM PEAK** 6:17

**FULL REMOVAL 2040 POINT-TO-POINT TIME:**

**AM PEAK** 6:12 (+1:14)

**PM PEAK** 7:33 (+1:16)

**FULL REMOVAL 2040 AV/CV POINT-TO-POINT TIME:**

**AM PEAK** 4:58 (0:00)

**PM PEAK** 4:44 (-1:33)

(Time in minutes)

* NO BUILD means that the Buck O’Neil Bridge is replaced but no other new projects are added.

** FULL REMOVAL assumes a new bridge and I-70 is replaced with a two-way boulevard between Broadway and I-29.

*** 2040 AV/CV assumes a new bridge and Future Autonomous and Connected Vehicles (AV/CV) will improve existing freeway capacity. Based on other similar studies, generally travel time improves by approximately 20%.

---

I-35 South from northeast corner of the Loop (Bond Bridge) to Southwest Trafficway.
<table>
<thead>
<tr>
<th></th>
<th>AM PEAK</th>
<th>PM PEAK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOW</strong></td>
<td>4:38</td>
<td>4:42</td>
</tr>
<tr>
<td><em>NO BUILD 2040</em></td>
<td>4:58</td>
<td>6:17</td>
</tr>
<tr>
<td><strong>FULL REMOVAL 2040</strong></td>
<td>6:12 (+1:14)</td>
<td>7:33 (+1:16)</td>
</tr>
<tr>
<td><strong>FULL REMOVAL 2040 AV/AV</strong></td>
<td>4:58 (:00)</td>
<td>4:44 (-1:33)</td>
</tr>
</tbody>
</table>

(Time in minutes)

- *NO BUILD* means that the Buck O’Neil Bridge is replaced but no other new projects are added.
- **FULL REMOVAL** assumes a new bridge and I-35 is replaced with a two-way buffered between Broadway and I-29.
- **2040 AV/AV** assumes a new bridge and future Autonomous and Connected Vehicles (AV/AV) will improve existing freeway capacity. Based on other similar studies, generally travel time improves by about 20%.

Average: 7  
Median: 7
Nice travel time estimates if freeway removed in Kansas City.

@BeyondTheLoopKC

Exploring the Future of the Broadway/O’Neil Bridge and North Loop
TRAVEL TIME MODEL ASSESSMENT

IT'S YOUR TURN:
HOW WOULD YOU RATE THESE CHANGES IN THE TIME IT TAKES TO DRIVE ACROSS THE LOOP?

NOTE: Ramp Consolidation and Compressed Footprint options result in the same or faster 2040 highway travel times when compared to 2040 no build options.

1 2 3 4 5 6 7 8 9

▲ THESE TIMES ARE UNACCEPTABLE

▲ THESE TIMES SEEM REASONABLE

Place a dot to tell us what you think.
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Exploring the Future of the Broadway/O’Neil Bridge and North Loop
Study Deliverables

• **Purpose and Need Statement** to be carried into NEPA
• **Traffic models** to inform future studies
• **Reasonable Alternatives & Priorities** for further study and future implementation:
  1) Buck O'Neil Bridge & Airport Connection Alternatives
  2) MO Route 9 Alternatives
  3) West Bottom Alternatives
  4) I-70/North Loop Alternatives
• **Study Documents** at beyondtheloopkc.com
Outstanding Issues

I-70 North Loop Remove and Reclassify Alternative
• Opposed by Unified Government
• Retained as a reasonable alternative due to public support and redevelopment potential
• Will require additional analysis and community engagement for final decisions
Next Steps

- **Environmental Assessment** for Buck O’Neil Bridge (MoDOT & KCMO) underway in 2018.
- **Future Studies** - All segments and alternatives will require additional analysis before implementation. No resources are currently identified to study other segments.
- **Plan Amendments** - Some alternatives may require amendments to *Transportation Outlook 2040* or future regional transportation plan updates.
Next Up: Let’s Build a New Bridge!

BeyondtheLoopKC.com
marc.org/beyondtheloop