Introduction

Background

The Interstate 471 (I-471) corridor centers on one of northern Kentucky’s major transportation spines. Within this nine mile long corridor, major arteries including I-471, US 27 (Alexandria Pike and Monmouth Street), I-275, KY 8 and KY 9 (Licking Pike and the AA Highway), accommodate current travel volumes of close to one million vehicles every day. The major north-south demand on three of these routes, I-471, Alexandria Pike and Licking Pike combined, account for over 150,000 vehicles per day.

The I-471 Corridor Study was conducted in two phases, Phase I Corridor Planning and Phase II Interchange Modification Study. Phase I also included two substudies: US 27 Alexandria Pike Access Management Plan and US 27 Alexandria Pike Traffic Signal Optimization Plan. The study was managed by a Project Management Team which was composed of the following entities: Campbell County Fiscal Court, City of Newport, Kentucky Transportation Cabinet, Northern Kentucky University, Federal Highway Administration and the Ohio-Kentucky-Indiana Regional Council of Governments.

Study Purpose and Goals

The challenge of the I-471 Corridor Study was to go beyond searching for ways to best handle the high traffic numbers. Its focus included gaining a clearer understanding of the land use/transportation interrelationship and ultimately, determining how best to enhance the quality of life of the residents, businesses, and communities of northern Campbell County. For nearly two years, the Project Management Team conducted the I-471 Corridor Study with the following purpose:

“The I-471 Corridor Study will result in a well-defined strategic transportation vision to protect and enhance quality of life for residents, businesses, the communities, and other stakeholders in this corridor.”

Goals of the Study

• To improve mobility in developing and re-developing parts of the county
• To improve regional accessibility and connectivity
• To improve safety and reduce congestion
• To improve air quality in the region
• To enhance economic vitality
• To plan transportation consistent with, and capable of assisting in the realization of comprehensive plan visions in northern Campbell County
Public Participation

In addition to the Project Management Team, an Advisory Committee composed of representatives of organizations, communities, agencies and interested groups served a key role in reviewing and guiding the study's development. The Advisory Committee met at important junctures in the study to review information and provide input. These meetings were open to the public to encourage public engagement throughout the study. In addition, three public open houses were held within the I-471 Corridor at key points to solicit public input.

**Project Management Team Meeting Dates**
August 9, 2006  
September 27, 2006  
November 15, 2006  
January 17, 2007  
May 2, 2007  
October 24, 2007  
March 3, 2008

**Advisory Committee Meeting Dates**
October 10, 2006  
May 17, 2007  
March 25, 2008

**Public Open House Dates**
October 26, 2006  
June 13, 2007  
March 25, 2008

In an effort to further engage stakeholders in this study and plan development, project information, announcements and study updates were regularly posted to a website specifically created for the I-471 Corridor Study—www.471study.org.

Nearly 300 persons attended three I-471 Corridor Study Open Houses, providing valuable input.
Identifying Needs

Changing Demographics

Mobility needs are expected to intensify as both population and employment in Campbell County are forecasted to increase. Population is expected to increase by 23 percent from 87,500 to 108,000 by 2030 (growth of 20,500 persons). Employment is predicted to increase from 27,700 in 2005 to 35,100 in 2030, an increase of 27 percent (growth of 7,400 jobs). Recent development opportunities span the corridor, from multi-million dollar condominium, office, retail and entertainment plans in Newport and Bellevue along the Ohio Riverfront, to the expanding Technology Commercialization Triangle and Northern Kentucky University’s expansion in Highland Heights. There are also a number of redevelopment plans throughout the corridor.

The development and evaluation of potential roadway improvements to meet existing and projected needs was focused on three fronts: I-471 and I-275 and their interchanges; major arterials in the study area; and Ohio River crossings in the study area (Daniel Carter Beard and Taylor Southgate bridges). This evaluation included the consideration of both capacity and safety needs, as identified by the stakeholders, including level of service, critical crash rate analysis, and modern design standards.

The following graphic depicts the forecasted change in traffic volume on major routes from 2005 to 2030 expected from growth in population and employment.

Crashes by Year and by Type of Road

<table>
<thead>
<tr>
<th>Year and Type of Road</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate</td>
<td>152</td>
<td>190</td>
<td>385</td>
<td>435</td>
<td>433</td>
</tr>
<tr>
<td>State Routes</td>
<td>330</td>
<td>328</td>
<td>430</td>
<td>480</td>
<td>483</td>
</tr>
<tr>
<td>US Route</td>
<td>368</td>
<td>376</td>
<td>469</td>
<td>445</td>
<td>381</td>
</tr>
<tr>
<td>Total by Year</td>
<td>880</td>
<td>894</td>
<td>1284</td>
<td>1360</td>
<td>1297</td>
</tr>
</tbody>
</table>
Growing Travel Demands

The projected traffic volume increases 2005 to 2030 expected from growth in employment and population.
Substudies

As part of the I-471 Corridor Study, two substudies were completed:

**US 27 Signal Optimization Study**

The **US 27 Signal Optimization Study** resulted in a short range plan to improve traffic flow along US 27 from Sunset Avenue to the AA Highway through the synchronization of 13 signalized intersections:

- Alexandria Pike/Sunset Drive
- Louie B. Nunn Drive/Hidden Valley Drive
- Marshall Lane
- Johns Hill Road (KY 3490)
- Bon Jan Lane
- Martha Layne Collins Boulevard
- Furniture Fair entrance
- KY 1998, Pooles Creek Road/Industrial Road
- St. Michael Drive
- East Alexandria Pike
- Plaza Drive/Crossroads Boulevard
- KY 9 (AA Highway) eastbound ramps
- Meijer store entrance

The signal timing is programmed for KYTC’s implementation.

The US 27 signal optimization recommendations will result in over 14 percent reduction in vehicle emissions.
The second substudy, the **US 27 Alexandria Pike Access Management Plan**, covered a section of US 27 from Crowell Avenue in Fort Thomas to the AA Highway in Cold Spring. The recommendations consisted of both short and long range plans. Key recommendations include:

- Implementation of the US 27 Access Management Plan site specific recommendations for driveway consolidation and future service roads, and the development of guidelines and policy to better manage future access;
- The endorsement and expansion of access management guidelines and policy on a countywide basis; and
- Two major capital improvements for US 27: the three-lane conversion north of Sunset Avenue and the installation of a non-traversable median south of that intersection. The lane reduction project is already underway by KYTC and will be completed in 2008.

*The US 27 access management recommendations can have significant impact on reducing vehicular crashes by up to 60 percent according to national case studies.*

**Example:** Dixie Highway, Crestview Hills, Kentucky
What is Recommended?

Transportation improvement alternatives for roadway, transit service and ITS components were developed to address existing and forecasted safety and capacity issues in the corridor. In addition, special consideration was given to addressing projected 2015 needs, particularly related to the likely disruption of traffic in the region due to the Brent Spence Bridge replacement construction anticipated in that time period. The following represents a summary of the multimodal recommendations of the study.
## Roadway Recommendations

<table>
<thead>
<tr>
<th>Map Id. #</th>
<th>Project</th>
<th>Description</th>
<th>2030 Plan?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roadway Recommendations: Interstate</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Ramp from I-471 Southbound to I-275 Westbound</td>
<td>Widen ramp one additional lane to provide increased capacity.</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>I-471/I-275 interchange</td>
<td>Upgrade I-471/I-275 interchange, including I-275/NKU access enhancements. Due to inadequate spacing, the Three Mile Road partial interchange would be eliminated when I-471/I-275 is upgraded.</td>
<td>✗</td>
</tr>
<tr>
<td>5</td>
<td>I-275 and I-471</td>
<td>Expand ARTIMIS capability along I-275 and I-471, upgrading equipment and adding fiber optic cable, cameras and detectors.</td>
<td>✓</td>
</tr>
<tr>
<td>7</td>
<td>I-275/KY 9 Interchange</td>
<td>Reconstruct interchange for safety and capacity improvements.</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>I-275</td>
<td>Add one additional lane in each direction from I-75 to AA Highway.</td>
<td>✗</td>
</tr>
<tr>
<td>3</td>
<td>I-471 mainline and interchanges at Memorial, Grand and US 27</td>
<td>Widen one lane in each direction from I-275 to Ohio state line and upgrade three interchanges.</td>
<td>✓</td>
</tr>
<tr>
<td>10</td>
<td>I-471/US 27 interchange – southbound exit ramp</td>
<td>Reconfigure southbound off ramp to US 27 westbound to improve safety to Moock Road access.</td>
<td>+</td>
</tr>
<tr>
<td>6</td>
<td>I-275</td>
<td>Add one additional lane in each direction from AA Highway to Ohio state line.</td>
<td>✗</td>
</tr>
<tr>
<td><strong>Roadway Recommendations: Arterials</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Taylor Southgate Bridge approach (north)</td>
<td>Reconfigure Taylor Southgate/3rd Street (Kentucky approach) and I-71 southbound left turn to Broadway (Ohio approach) to improve bridge access.</td>
<td>+</td>
</tr>
<tr>
<td>9</td>
<td>Taylor Southgate Bridge approach (south)</td>
<td>Provide new KY 9 connection through Ovations property and bridge approach intersection.</td>
<td>✓</td>
</tr>
<tr>
<td>13</td>
<td>US 27</td>
<td>Implement traffic signal optimization from Sunset Avenue to Meijer entrance – Highland Heights and Cold Spring.</td>
<td>+</td>
</tr>
<tr>
<td>14</td>
<td>US 27</td>
<td>Sunset to KY 1120: Three lane conversion (KYTC planning 2008 resurfacing to include re-stripping to 3 lane).</td>
<td>+</td>
</tr>
<tr>
<td>18</td>
<td>KY 8</td>
<td>Realign KY 8 from Veterans Memorial (4th St.) Bridge to US 27.</td>
<td>✓</td>
</tr>
<tr>
<td>12</td>
<td>US 27</td>
<td>Add one additional lane in each direction from KY 2345 (Martha Layne Collins Blvd) to I-471</td>
<td>✓</td>
</tr>
<tr>
<td>15</td>
<td>US 27</td>
<td>Sunset to AA Highway: implementation of non-traversable median with mid-block U-Turns at some locations.</td>
<td>+</td>
</tr>
<tr>
<td>16</td>
<td>US 27</td>
<td>Implement Crowell to AA Highway access management plan recommendations.</td>
<td>+</td>
</tr>
<tr>
<td>19</td>
<td>KY 8</td>
<td>Widen Veterans Memorial (4th Street) Bridge to 6 lanes (add 3 lanes).</td>
<td>✓</td>
</tr>
<tr>
<td>11</td>
<td>US 27</td>
<td>Reconstruct US 27 from KY 1892 (Carothers Road) to KY 1120 (11th Street); including sidewalks on the east side of US 27.</td>
<td>✓</td>
</tr>
<tr>
<td>20</td>
<td>KY 8</td>
<td>Reconstruction from Tower Hill Road to KY 445.</td>
<td>+</td>
</tr>
<tr>
<td>21</td>
<td>KY 9</td>
<td>Add one additional lane in each direction from I-275 to US 27.</td>
<td>✓</td>
</tr>
<tr>
<td>22</td>
<td>KY 1632 (Moock Road)</td>
<td>Reconstructed KY 1632 from KY 9 to US 27.</td>
<td>✗</td>
</tr>
</tbody>
</table>

✓ = Specifically listed in Plan  
+ = Consistent with Plan  
✗ = Not in 2030 Plan
Intelligent Transportation Systems (ITS) Recommendations

An important, potentially invaluable, transportation tool for improved congestion management and safety is the expansion and increased use of Intelligent Transportation Systems (ITS). Currently, the Advanced Regional Traffic Interactive Management and Information System (ARTIMIS) is in use along Fort Washington Way, I-275 and I-471 in the project corridor and immediate vicinity. The system is the first ITS in the nation to operate seamlessly across state boundaries. In the I-471 corridor, expansion of ARTIMIS is already underway to add two additional closed circuit cameras, one at the I-471/I-275 interchange and one above the US 27 bridge over I-275.

Additional improvements and enhancements of the existing ITS have great potential to assist in short- and mid-term traffic management, and may be especially useful in helping to handle the anticipated traffic diversion in the corridor when the Brent Spence Bridge replacement is under construction.

ITS technologies provide four primary functions:
• Motorist information (dynamic signage, radio alerts)
• Incident management (monitoring, dispatch)
• Traffic management (ramp metering, pricing, speed sensors)
• Planning (volume sensors, weather sensors)

### Intelligent Transportation Systems (ITS) Recommendations

<table>
<thead>
<tr>
<th>Map Id. #</th>
<th>Project</th>
<th>Description</th>
<th>2030 Plan?</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>I-471 Interchanges</td>
<td>Ramp Metering (potential short and long term implementation)</td>
<td>+</td>
</tr>
<tr>
<td>23</td>
<td>I-471 and I-275</td>
<td>Package (fiber optics, additional messaging signs, incident management upgrades)</td>
<td>+</td>
</tr>
</tbody>
</table>

✓ = Specifically listed in Plan
+ = Consistent with Plan
*= Not in 2030 Plan
Transit Recommendations

Increased transit ridership can reduce congestion, reduce emissions and improve travel safety by helping to decrease the number of vehicles on the roadway network. With close to three million riders annually, buses currently provide service for an important share of the existing travel demand in and through the I-471 Corridor.

The consideration of transit improvement options followed the direction set by the TANK Network Study:

- Build on existing bus service—Transit Authority of Northern Kentucky (TANK) bus routes, Soutbank Shuttle, and park-and-ride lots; and
- Build on previous plans by giving priority to hubs, airport service and transitways

Transit Recommendations

<table>
<thead>
<tr>
<th>Map Id. #</th>
<th>Project</th>
<th>Description</th>
<th>2030 Plan?</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>NKU Transit Center</td>
<td>New transit hub and circulator serving NKU and connecting routes.</td>
<td>✓</td>
</tr>
<tr>
<td>25</td>
<td>Newport Transit Center</td>
<td>New transit hub and circulator service in the vicinity of Monmouth and Third Streets.</td>
<td>✓</td>
</tr>
<tr>
<td>28</td>
<td>I-471 Bus on Shoulder (requires interstate re-construction)</td>
<td>With the I-471 additional lane in each direction (US 27 to Ohio River) full shoulders would be constructed which would allow for future transit on shoulder use.</td>
<td>✓</td>
</tr>
<tr>
<td>29</td>
<td>Express Route Service I-275 and I-471</td>
<td>Promotion of existing express bus routes on I-471 and I-275 (TANK, METRO, and CTC).</td>
<td>+</td>
</tr>
<tr>
<td>27</td>
<td>Eastern Corridor Multi-modal Projects</td>
<td>Multi-modal improvements between Eastgate and I-71 including new highway, passenger rail and bus transit components.</td>
<td>✓</td>
</tr>
</tbody>
</table>

✓ = Specifically listed in Plan
+ = Consistent with Plan
* = Not in 2030 Plan
Additional Recommendations

Recommendations for Further Studies

Several important recommendations deal with the need for more detailed studies to address issues and concerns identified in the I-471 Corridor Plan.

| Map Id. # | Project                                                      | Description                                                                 | 2030 Plan?
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>KY 8 Traffic/Access Management Studies</td>
<td>KY 8 through Bellevue and Dayton</td>
<td>✓</td>
</tr>
<tr>
<td>31</td>
<td>Northern Campbell County Traffic Study</td>
<td>Review of surface street connection needs: Riviera, Donnermeyer, 6th Street (after I-471/KY 8 Interchange Project recommendation determined)</td>
<td>+</td>
</tr>
<tr>
<td>32</td>
<td>Southern Campbell County Access Management Study</td>
<td>Access Management study of US 27, south of AA Highway/US 27</td>
<td>+</td>
</tr>
<tr>
<td>33</td>
<td>Long Range Transit HOV and Bus on Shoulder Study</td>
<td>Study potential for High Occupancy Vehicle (HOV) lanes during peak hours and bus on interstate shoulder when I-471 additional lanes recommendation implemented</td>
<td>+</td>
</tr>
</tbody>
</table>

✓ = Specifically listed in Plan  
+ = Consistent with Plan  
*x* = Not in 2030 Plan

KY 8 through Bellevue and Dayton

Bus on shoulder has demonstrated success in many states (Minnesota is depicted here) including the I-71 corridor in Cincinnati
2015 Plans to Address Brent Spence Bridge Reconstruction Impact

The Brent Spence Bridge reconstruction or replacement is expected in 2015. In anticipation of the disruption in I-75/I-71 traffic during the construction period, plans to accommodate the diversion of traffic to alternate Ohio River bridges need to be developed now.

Although the I-471 Corridor Plan includes projects to address long range transportation needs to the year 2030, some of the recommendations can and should be considered for advanced implementation sooner to help address the traffic impacts during the Brent Spence Bridge construction period.

Three projects are considered critical and feasible for short term implementation consideration:

- Express bus service
- Ramp monitoring
- Ramp metering
Preliminary Interchange Modification Study

An important task of Phase I of the corridor study was to identify the interchange to advance for more in-depth study in Phase II. The I-471/I-275 interchange was selected by the Project Management Team based on its high service volumes, potential design and capacity needs and safety issues.

Phase I explored the need for design, safety and capacity improvements at the I-471/I-275 interchange based on a comparison of the existing configuration with current state and federal design standards and an initial analysis of existing and projected level of service deficiencies. The Phase II study further assessed five build alternatives and the No Build alternative.

The figure below shows the improvement Alternative 1A and a generic Alternative 2 interchange improvement at I-275 and Three Mile Road. The more detailed configuration options of Alternative 2 (2A thru 2D) are presented on the following page.
Alternatives 2A through 2D include the same improvements to I-471/I-275 as Alternative 1, plus a new full access interchange south of Three Mile Road.

A preliminary cost estimate for Alternative 1 is $114 million in 2015 dollars. Alternatives 2A through 2D range from $142 million to $160 million in 2015 dollars. Cost estimates include construction and contingencies, but do not include costs for right-of-way, utilities, environmental studies, or any impact mitigation that may be required.

Inclusion of the proposed I-275 interchange near NKU in Alternative 2 would require the closing of the existing Three Mile Road interchange due to spacing between nearby interchanges. However, the benefit of adding improved freeway access to and from the north and east directly improves traffic flow on US 27 along the east side of NKU in the range of 10 percent or more. NKU would benefit by having the additional access point and more evenly distributed traffic entering campus.

From this preliminary interchange modification/alternatives analysis, it is recommended that the I-471/I-275 interchange upgrade and the potential new I-275/NKU interchange be further studied.
The successful completion of the I-471 Corridor Study was possible only through the collaborative planning, review and participation of many dedicated people.

Project Management Team
Judge Steve Pendery, Campbell County Judge Executive
Melissa Williams, Campbell County Fiscal Court
Peter Klear, Campbell County Fiscal Court
Beth Fennell, City of Newport
Greg Tulley, City of Newport
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Alternate: Mike Bezold
Larry Blake, Northern Kentucky University
Alternate: Mary Paula Schuh
Mary Murray, Federal Highway Administration
Mark Policinski, Ohio-Kentucky-Indiana Regional Council of Governments

Advisory Committee
Participants:
Alliance for Regional Transit
Campbell County Consolidated Dispatch
Campbell County Economic Progress Authority
Campbell County Senior Center
Capital Investment Group
City of Bellevue
City of Cincinnati
City of Cold Spring
City of Dayton
City of Ft. Thomas
City of Highland Heights
City of Newport
City of Southgate
City of Wilder
East Row Historic Foundation
Harbor Greene
Kentucky Transportation Cabinet (KYTC), District 6
Newport on the Levee
Northern Kentucky Area Planning Commission
Northern Kentucky Chamber of Commerce
Northern Kentucky Convention and Visitors Bureau
Northern Kentucky University
Ohio Department of Transportation (ODOT), District 8
Southbank Partners, Inc.
Southwest Ohio Regional Transit Authority (SORTA)
St. Luke Hospitals
Transit Authority of Northern Kentucky (TANK)

Other Interested Agencies:
Brighton Center
Castellini Company
Cincinnati USA Regional Chamber
City of Woodlawn
Federal Highway Administration (FHWA)-Kentucky
Hispanic Resource Center
Newport Independent Schools
Newport Steel
Northern Kentucky Tri-Ed

State and National Officials:
James Bunning, United States Senator
Geoff Davis, United States Congressman
Dennis Keene, Kentucky State Representative
Katie Stine, Kentucky State Senator

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