

Kennedy Interchange Area Study
Final Report
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Comparison of LSIORB Project versus Proposed 86-64 Alternative

Wilbur Smith Associates (WSA) was asked by the Kentucky Transportation Cabinet (KYTC) to review the potential differences in traffic between the approved Louisville Southern Indiana Ohio River Bridges (LSIORB) Project and the proposal outlined by a local group known as "86-64." The 86-64 Alternative includes moving I-64 out of downtown Louisville while turning the segment of I-64 in downtown into a boulevard with at-grade intersections. The following document outlines the results of this analysis.

This analysis does not include comparisons of costs, level of service, or engineering feasibility. It is intended only as a comparison of regional traffic operations between these two scenarios.

APPROACH

Since the goal of this project is to understand the differences in traffic operations between the two scenarios, the methodology focused specifically on comparing the LSIORB Project and the 86-64 Alternative to one another instead of relating them to the existing conditions or future no-build scenarios. The steps undertaken as part of this study are:

1. Review and confirm the configuration of the LSIORB Project and its coding in the Kentuckiana Regional Planning and Development Agency (KIPDA) Travel Demand Model (TDM);
2. Review the available documentation of the 86-64 Alternative and develop a schematic that reflects the areas where there are differences between the LSIORB Project and the 86-64 Alternative;
3. Review the 2030 future year Build TDM roadway network and understand where future capacity improvements are included in the future roadway network;
4. Develop an understanding of the travel patterns reflected in the TDM that could be affected by the differences in the LSIORB Project and the 86-64 Alternative;
5. Review the traffic assignments associated with the LSIORB Project and develop an understanding of the regional and local downtown Louisville routings related to this configuration;
6. Code the 86-64 Alternative in the TDM, using the 2030 KIPDA TDM as a base;
7. Develop traffic assignments associated with the 86-64 Alternative and develop an understanding of the regional and local downtown Louisville routings related to this configuration;
8. Compare the travel patterns of the LSIORB Project and the 86-64 Alternative; and
9. Based on the comparison, provide KYTC with the identified differences between the alternatives.

In order to provide this analysis with the best available data, the latest KIPDA TDM (2008) was utilized, modeled in the TransCAD platform for a 2030 analysis year. The 1999 TDM used to develop the LSIORB traffic projections presented in the EIS had a

future analysis year of 2025 and was based on traffic assignments run in the MINUTP platform. These key differences will result in different traffic volume assignments in this analysis as compared to previous studies.

Because the analysis within this report is a comparative analysis, there will be no bias between the two alternatives since the same assumptions about socioeconomic data and the highway network will be used. All projects identified in the latest KIPDA Transportation Improvement Plan (TIP) and Long Range Transportation Plan (LRTP) were included in the TDM network for both alternatives. The only difference between networks is the alternative-specific road modifications.

REGIONAL IMPROVEMENTS IMPACTING THE ALTERNATIVE PLAN

Other improvements included in the TIP and LRTP will affect access and flow for either alternative. These improvements (or lack thereof) included in the 2030 TDM network can affect how vehicles access downtown as well as the new East End Bridge. Following is a list of those improvements identified that will affect how either plan operates. (An abbreviated table is also included in the LSIORB Project *Preliminary Traffic and Revenue Study* Table 5.4.)

- Reconstruct the I-265/I-64 Interchange in Kentucky;
- Widening I-265 from four to six lanes (this will result in I-265 being three lanes in each direction from I-65 in Kentucky to US-62 in Indiana and from I-65 to I-64 in Indiana). This will be accomplished in four segments: from I-65 to US-31E in Kentucky, from US-31E to I-64, from I-64 to I-71 in Kentucky, and from I-64 to I-65 in Indiana;
- Addition of auxiliary lanes on I-71 near the Kennedy Interchange;
- Widen I-64 from the Kennedy Interchange to I-265 to three lanes per direction;
and
- Add a new interchange at I-265 and Westport Road.

The widening of I-64 and I-265 in particular could have a significant effect on the routing of traffic through downtown Louisville and on the East End Bridge. To ensure an unbiased comparison between the two build alternatives, the improvements were included in both the LSIORB Project and 86-64 Alternative.

DEFINITION OF THE 86-64 ALTERNATIVE

There have been various proposals that have been titled "86-64" which reflect the basic premise of relocating I-64 out of downtown Louisville and onto the new northern I-265 route created by the completion of the LSIORB East End Bridge. In order to define the 86-64 Alternative for this analysis, WSA reviewed available materials including all information on the website <http://www.8664.org/> and two reports, *86-64 Feasibility Review* by Walter Kulash and a two-page comparison of the LSIORB Project with 86-64 Alternative (a condensed version of the Kulash study) that address the proposal by the 86-64 group.

WSA was unable to find a comprehensive drawing that addressed all the elements of the 86-64 Alternative and as a result defined the 86-64 Alternative based on the above sources. Following is a detailed description of the 86-64 Alternative and its differences from the LSIORB Project.

Schematic figures highlighting the I-64 downtown component of the 86-64 Alternative are included in **Appendix A**. For ease in reference, components in the list below are lettered on the maps in **Appendix A**.

- **East End Bridge** - All the improvements associated with the East End Bridge component of the LSIORB Project are included in the 86-64 Alternative.
- **Downtown Bridge** (*Element A on Sheet 1 of Appendix A*) – The existing Kennedy Bridge configuration of four northbound lanes and three southbound lanes remains in the 86-64 Alternative. The LSIORB Project includes a twelve lane combined (dual six-lane structures including a new bridge and the rehabbed existing bridge) river crossing associated with I-65.
- **I-65 Improvements in Indiana** – The I-65 improvements in Indiana associated with the LSIORB Project are not included in the 86-64 Alternative. Ramp configurations and mainline through movements on I-65 reflect the existing condition.
- **I-64 East of the Mellwood/Story Interchange** (*Element B on Sheet 1*) - I-64 heading east from the Mellwood/Story interchange would be unchanged from the LSIORB Project.
- **Mellwood/Story Interchange Improvements** (*Element C on Sheet 1*) -The proposed LSIORB Project improvements to the Mellwood/Story interchange would be retained in the 86-64 Alternative.
- **I-71/Frankfort Avenue Ramps** (*Element D on Sheet 1*) - The new ramps at I-71 and Frankfort Avenue proposed as part of the LSIORB Project are included in the 86-64 Alternative.
- **I-65 Connection to East** - Traffic on I-64/I-71 traveling to/from the east will have connections to both I-65 north and I-65 south in the 86-64 Alternative. This is the same as the LSIORB Project although the number of lanes on most ramps are reduced.
- **I-65 Connection to West** – There will not be a connection to I-65 from the new boulevard (coming from the west) in the 86-64 Alternative.
- **Other Kennedy Interchange Ramps** - All other ramps associated with the LSIORB Project’s “Kennedy Interchange” are not included in the 86-64 Alternative. This removes westbound I-64 to southbound I-65 and all connections to I-65 from the west.
- **I-64 Through Downtown** (*Elements E through G in Appendix A figures*) - Through traffic on I-64 and I-71 would be terminated at an at-grade intersection with what is presently East Witherspoon Street (*Element E*). This is one of the key differences between the LSIORB Project and the 86-64 Alternative. The segment of I-64 beginning just east of I-65 to a point just west of the 22nd Street interchange will be demolished in the 86-64 Alternative. A new four lane at-

grade boulevard (*Element F*) will be constructed that runs approximately in the footprint of the existing footprint between the current I-64/22nd street interchange and near the I-65 route junction. A bridge over the railroad tracks between 22nd and 9th Streets will be required (*Element G*). There will be signalized intersections with appropriate turn lanes at the following locations: 22nd Street, 9th Street, 7th Street, 6th Street, 4th Street, 3rd Street, Brook Street, Floyd Street, Preston Street, Jackson Street, Clay Street, Campbell Street, and River Road.

- **I-64/I-71 Interchange** - The I-64/I-71 interchange remains within the existing footprint of the interchange, unlike in the LSIORB Project. This means that Adams Street would remain open.

COMPARISON OF RESULTS

After running both the LSIORB Project and the 86-64 Alternative in TransCAD, analysts compared four primary performance metrics:

1. Cross-river traffic volumes on the four bridges in the Louisville Metro Area;
2. Volume to capacity at the bridges;
3. Operations in the downtown area, specifically on the new boulevard in the 86-64 Alternative; and
4. System-wide performance measures of Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT).

Cross-River Traffic Volumes

Cross-river trips for the two alternatives are shown side-by-side in **Table 1**. The total number of cross-river trips between alternatives does not change significantly.

Table 1
River Crossing Volumes (vpd)

	I-64 (Sherman Minton Bridge)	US-31 (Clark Memorial Bridge)	I-65 (Kennedy Bridge)	I-265 (East End Bridge)	Total Cross- River Trips
LSIORB Project	114,000	23,000	172,000	71,000	380,000
86-64 Alternative	112,000	32,000	151,000	82,000	377,000
Change	- 2,000	+ 9,000	- 21,000	+ 11,000	- 3,000

The 86-64 Alternative creates a shift in traffic from the I-65 Kennedy Bridge to the US-31 Clark Memorial Bridge and the I-265 East End Bridge. The shift to the East End Bridge occurs because of increased travel time through downtown: I-64 is changed to a four-lane boulevard with traffic signals and fewer lanes are available approaching I-65 from the east on I-64 and I-71.

Bridge Volume-to-Capacity

The volume-to-capacity ratio (V/C) describes the volume of traffic using a roadway segment compared to the amount of traffic that segment is designed to handle. A V/C of 1.0 indicates the volume is equal to the capacity. A V/C greater than 1.0 indicates the traffic using a link is greater than the link capacity, indicating congestion and delays are likely to occur.

V/C for each of the bridges is presented in **Table 2**. Reducing the number of lanes on the I-65 Bridge has a significant impact on the capacity and performance of the bridge.

Table 2
Volume-to-Capacity on Bridges

	I-64 (Sherman Minton Bridge)	US-31 (Clark Memorial Bridge)	I-65 (Kennedy Bridge)	I-265 (East End Bridge)
# Lanes	6	4	7-12*	6
LSIORB Project	1.26	1.20	0.95	0.79
86-64 Alternative	1.24	1.78	1.44	0.91

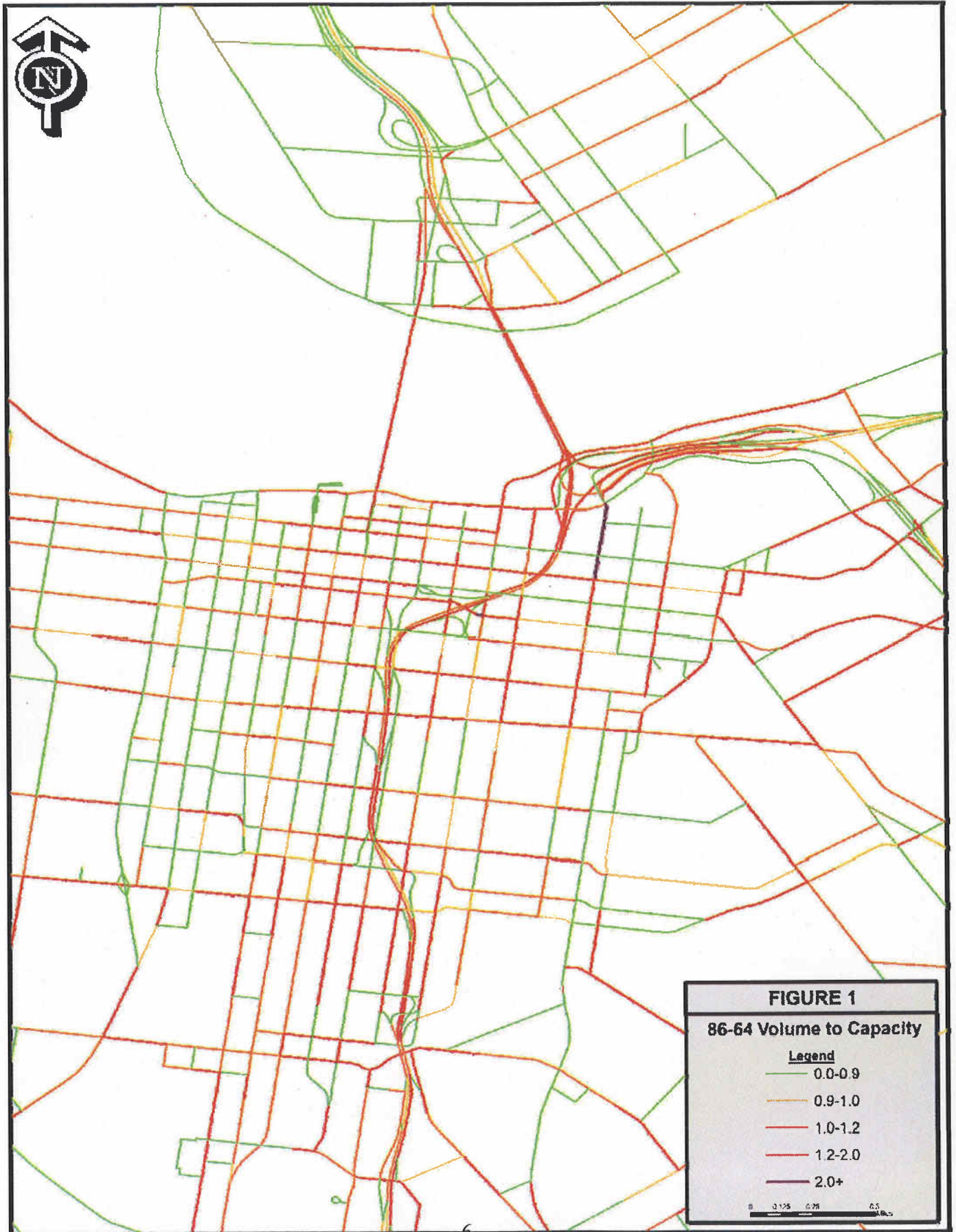
* I-65 has 7 lanes in 86-64 Alternative and 12 lanes in LSIORB Project

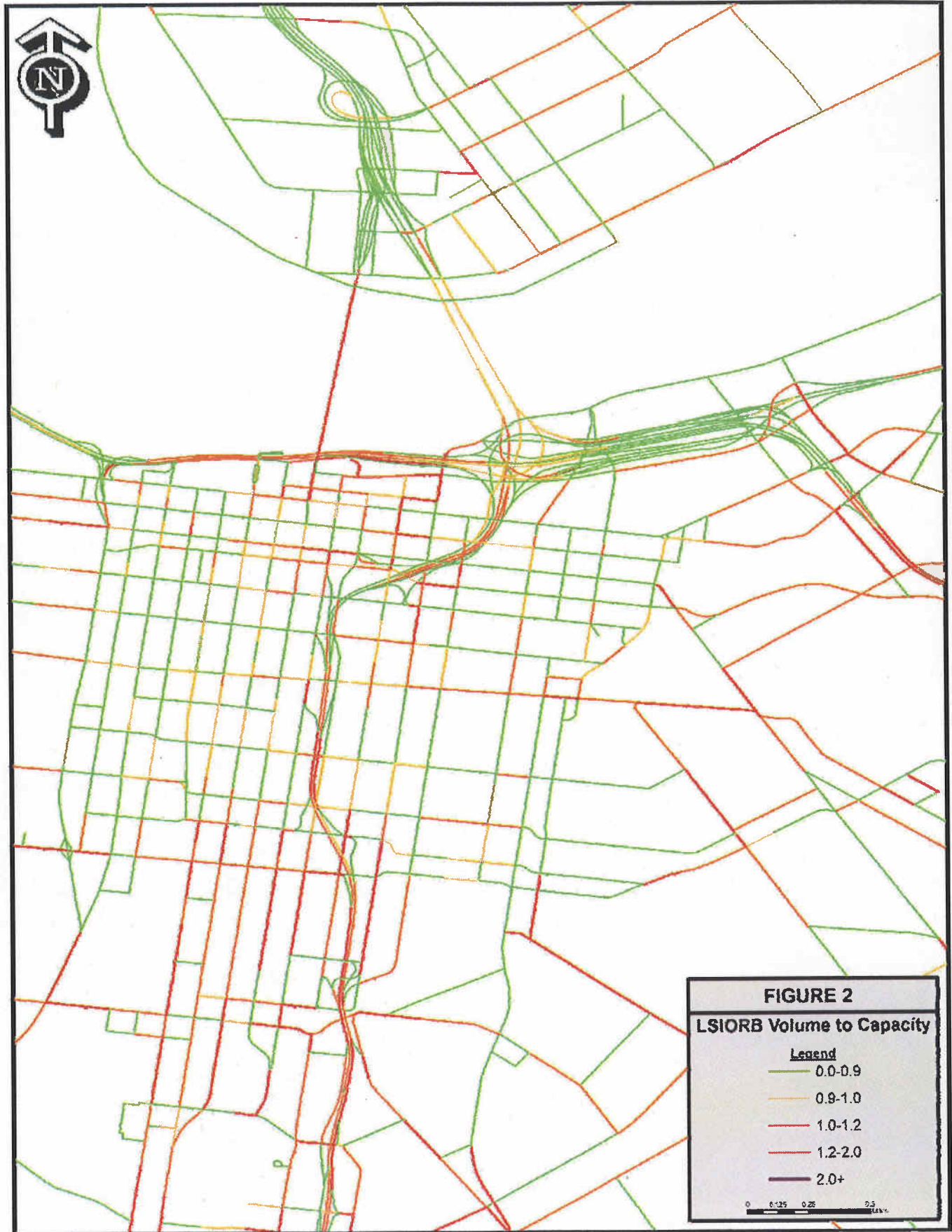
The 86-64 Alternative increases the V/C at three of the four bridges. The newly constructed I-265 East End Bridge is the only river-crossing which is not anticipated to be operating above capacity by 2030.

Downtown Operations

The new four-lane riverfront boulevard in the 86-64 Alternative can be expected to carry 12,000 (east of 9th Street) to 45,000 (approaching I-264) vehicles per day. V/C for downtown links in the 86-64 Alternative are shown in **Figure 1**. For comparison, **Figure 2** shows the V/C for the LSIORB Project. In these figures, green segments represent segments functioning below capacity, yellow segments are approaching capacity, and orange, red, and purple segments are above capacity.

The 86-64 Alternative demonstrates significantly more segments operating above capacity than the LSIORB Project. Reducing the number of lanes in the Kennedy Interchange in the 86-64 Alternative increases the V/C of this interchange over 1.0. Also in the 86-64 Alternative, I-64 and I-71 ramps terminate at Clay Street to provide local access downtown. This street, between the ramp terminals and Market Street, has a V/C greater than 2.0 based on daily volumes. Significant portions of all east-west streets downtown and a number of north-south streets are anticipated to operate over capacity in the 86-64 Alternative.





As a result of increased congestion at the Kennedy Interchange and on local streets in the 86-64 Alternative, a number of trips to and from the east, specifically on I-64, were shown to detour to earlier interchanges and rely on local streets to access downtown. Specially, the number of vehicles using the Mellwood/Story and Grinstead interchanges to access downtown increased by 13,000 and 3,000 respectively.

System-Wide Measures

VMT and VHT for each scenario provide a comparison of system-wide performance. **Table 3** shows these values.

Table 3
Regional Daily VMT/VHT Comparison

	VMT (miles)	VHT (hours)
LSIORB Project	42,800,000	2,860,000
86-64 Alternative	43,000,000	2,900,000

The 86-64 Alternative does not provide any savings in either VMT or VHT over the LSIORB Project. In both cases, the 86-64 Alternative yields higher values, translating to increased trip lengths, congestion, and emissions.

ADDITIONAL CONSIDERATIONS

This study is a traffic modeling analysis only; it does not take into account other issues which must be considered when evaluating alternatives for implementation and construction. In order to determine if the 86-64 Alternative is a prudent and feasible solution, decision-makers must also consider the following, and possibly other factors:

- **Costs.** The 86-64 Alternative requires removing the existing I-64 infrastructure west of I-65, and building three miles of a new four lane at-grade divided arterial. These additional costs, in conjunction with the changes to the Kennedy Interchange east of I-65 may or may not result in additional cost savings over the LSIORB Project.
- **Maintaining Traffic During Construction.** The 86-64 Alternative does not address the needed major rehabilitation of the Kennedy Bridge. Completing maintenance and rehabilitation activities on the bridge under traffic will compound safety and operational concerns. It also does not address how traffic will flow during demolition of the existing I-64 and the construction of the new four lane boulevard. This could also increase costs and raise constructability issues.
- **Engineering Feasibility.** No known work has been completed to determine if necessary clearances or other design standards for roadway and ramp geometry will meet applicable design criteria. Additionally, no review has been done to

determine if the 86-64 Alternative addresses the existing crash and safety issues within the junction of I-64/I-71/I-65.

- **Environmental Impacts.** Additional environmental impacts and different environmental impacts than those discussed in the Record of Decision for the LSIORB Project will likely occur if the 86-64 Alternative were implemented. This would cause the Record of Decision to be reopened. As a result, the timeline for construction would be extended.
- **Impacts to the Great Lawn.** The 86-64 Alternative would remove a large section of the Great Lawn that is currently under the existing I-64 viaduct. Accessibility to the Great Lawn by pedestrians could be hindered as a result of having to cross a much wider River Road. Any right-of-way taking from the Great Lawn will be considered a Section 4(f) impact and require additional documentation and approval by FHWA. This would additionally delay the construction of this section of the project.
- **Floodplain Concerns.** As an at-grade facility, the new boulevard would likely lie in the floodplain of the Ohio River and may not be usable during flood events.
- **Emergency Evacuation.** Removing an interstate facility from downtown Louisville limits opportunities for mass evacuations in emergency situations.

CONCLUSIONS

While this analysis is not a comprehensive analysis of the 86-64 Alternative, it does demonstrate that:

1. All of the existing Louisville area river crossings are approaching or exceeding their capacity by 2030 in the 86-64 Alternative. The three bridges downtown (I-65, I-64, and US 31) all would significantly exceed their capacity, by amounts ranging from 24% to 78%.
2. Operations on local streets in the downtown area degrade in the 86-64 Alternative. Congestion and delays increase as the majority streets operate over capacity when compared to the LSIORB project.
3. Regional VMT and VHT increase in the 86-64 Alternative. This indicates the 86-64 Alternative will have greater congestion, longer delays, and increased emissions over the LSIORB Project.

In addition, the ability to adequately rehabilitate the existing I-65 Kennedy bridge under the 86-64 Alternative will be limited. It is likely that ongoing maintenance and regular rehabilitation of the bridge will be required to maintain its structural sufficiency. During the construction and maintenance periods for the existing I-65 Kennedy Bridge, additional congestion and potential safety issues will add to the concerns about the operations of the 86-64 Alternative.

Appendix A

86-64 Alternative Layout

Appendix A: 86-64 Alternative Conceptual Layout

