I-65 SB Ramp to Brook/Jefferson Street
Roadway Configuration Safety Project
RAISE Grant Application 2024

TRAFFIC ANALYSIS OVERVIEW

The traffic analysis assessed the system level changes that would result from the project with respect to:

1. Vehicle Miles Traveled (VMT)
2. Vehicle Hours Traveled (VHT)
3. Safety (Crashes by Severity)

This project will make the downtown Louisville transportation system safer and more efficient. By providing a more direct and safe route to Louisville's Medical and Educational District, it will improve safety for all users, reduce travel times, and reduce emissions and user costs. This will in turn provide numerous quality of life and other benefits to the hundreds of thousands of people that access that district and the surrounding area from this Interstate ramp. This summary outlines how the transportation outcomes of performance metrics were calculated.

VEHICLE MILES TRAVELED

A major transportation benefit of this project is that it provides a more direct route to Louisville's Medical and Educational District (LOUMED) and the surrounding areas including the Pheonix Hill Neighborhood. This travel distance and time are reduced. This first part of the analysis focused on the change in travel distance with the proposed project.

Currently, drivers headed southeast from the ramp terminus must first travel west if they exit onto Jefferson Street or north if they exit onto Brook Street. They can then turn south or east, respectively. Routes 1, 2, and 3 on **Figure 1** show existing routes that can be used to access the center of LOUMED. All of these routes require out of direction travel. Route 3 has historically served as the signed route to access the LOUMED area. Routes 4 and 5 would become the new preferred routes with the construction of the proposed project. Drivers would be able to use the new ramp connection to eastbound Jefferson Street. This would decrease the travel distance for most drivers headed to LOUMED and nearby areas.

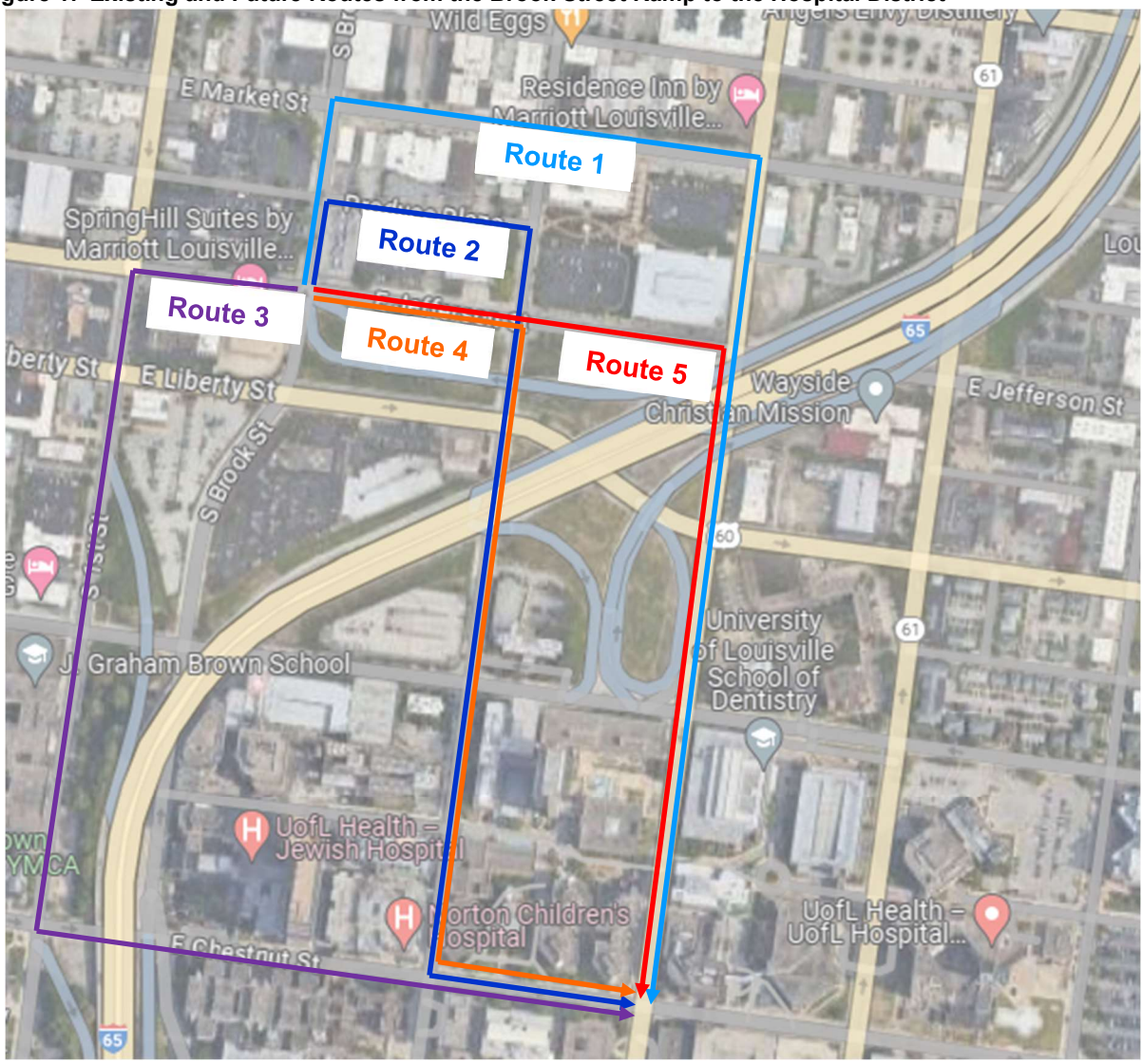
Benefit Area and Number of Benefited Ramp Users

The geographic area that would most directly benefit from the proposed ramp reconfiguration was estimated and entered into the Streetlight Data portal. Streetlight Data was used to estimate the volume of traffic traveling from the ramp to the benefit area. It was also used to estimate the current routes used by those drivers to reach the benefit area. Based on that analysis it was estimated that approximately 4,450 drivers per day (which is 31% of all drivers using the ramp) use the ramp to access the benefit area and they use the routes shown in **Table 1**.

Table 1: Benefit Area Traffic and Route Assumptions

		No Build	Build
Percent of All Ramp Traffic Headed to Benefit Area		31%	31%
Route from Ramp to Benefit Area	Route 1	25%	-
	Route 2	15%	-
	Route 3	60%	20%
	Route 4	-	40%
	Route 5	-	40%

Figure 1: Existing and Future Routes from the Brook Street Ramp to the Hospital District



Once the project is complete it is expected that most drivers will switch to the new shorter routes (Routes 4 and 5), which will also be the signed routes to access the hospitals. However, some drivers are still expected to use Route 3.

Number of Ramp Users in 2029 and 2048

The number of average daily vehicles projected to use the ramp in the future was estimated by increasing the volume 0.6% per year consistent with the traffic growth projections from the Kentuckiana Regional Planning & Development Agency (KIPDA) regional travel demand model. This resulted in a very modest increase from the base year traffic analysis volumes. This modeling work was completed as part of the detailed Operations and Safety Analysis Report (OSAR) that was completed for this project.

The volume data and the distance data for the five analysis routes were used to calculate the system level change in VMT for the proposed project. it should be noted that the volumes used were estimated Average Annual Daily Traffic (AADT) volumes. They were therefore assumed to represent an average day for the entire year. The new routes are shorter with generally faster travel times resulting in a savings of overall vehicle miles traveled (VMT) and vehicle hours traveled (VHT).

VEHICLE HOURS TRAVELED

To calculate the change vehicle hours traveled (VHT), average daily travel speeds were obtained from the Streetlight Data portal. These link speeds were combined with estimated turning delays from the Synchro traffic analysis software used for the OSAR to estimate travel times for each of the five routes.

The average daily traffic using the routes to access the benefit area from the ramp was used along with the travel times for the routes to estimate a No-Build and a Build VHT. This process was essentially similar to the VMT process described above, substituting time for distance.

SAFETY (CRASHES BY SEVERITY)

Historical crash data for the five study routes was obtained from Kentucky State Police (KSP) for the five-year period from 2018 to 2022. Parking lot crashes were excluded. The remaining crashes were assigned to either intersections if they occurred within 200 feet of the center of the intersection or the segments between intersections otherwise. This data was combined with traffic volumes obtained from Streetlight Data to estimate crash rates (by severity) for each intersection and segment along the routes.

It was assumed that the general safety characteristics of the roadways would remain the same in the build scenario, and any change to total safety would be related to the change in volume or exposure. The No-Build exposure was based on the No-Build VMT estimates. This exposure was used with the crash rates to set an annual No-Build baseline for crashes by severity.

Subsequently, the Build VMT was used to estimate annual crashes for the Build scenario using the same set of crash rates. Based on a comparison of the results, the reduction in vehicle miles traveled is expected to translate into a reduction in crashes on the local street network.

In addition, the OSAR indicated that the Build scenario would substantially lower the ramp queue lengths, which would clear the I-65 Collector-Distributor (C-D) of the ramp queues that currently block it at times. This is expected to improve safety as the end of queue would be on the ramp closer to the intersection where speeds are generally lower and where drivers would expect stopped traffic. A small reduction in queue related crashes (on the C-D road and ramp section near the C-D road) was assumed based on this analysis, but this change did not contribute substantially to the safety results due to the low severity of the historical C-D road crashes.