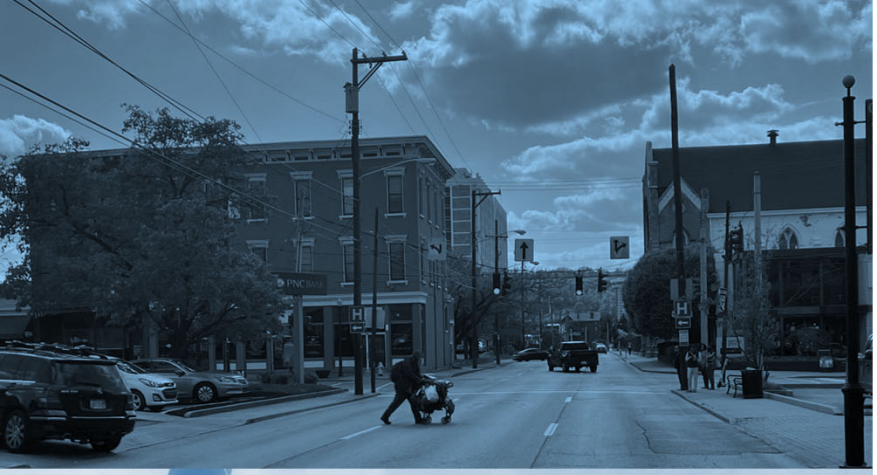


4th Street Roadway Reconfiguration

Covington, Kenton County, KY | December 2023

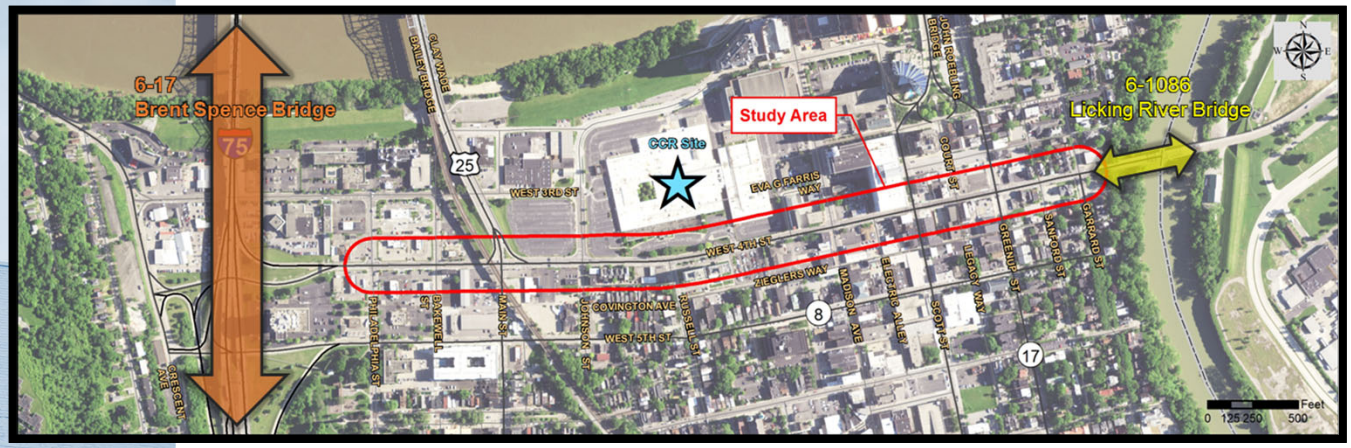
Prepared for:

TEAM KENTUCKY
TRANSPORTATION CABINET

In partnership with:

QK4
Engineering Planning

Groundbreaking by Design.



4th Street Roadway Reconfiguration

A corridor study along KY 8 (4th Street) in Covington on the feasibility of reconfiguring the existing highway: losing a westbound thru lane to accommodate a dedicated bike lane.

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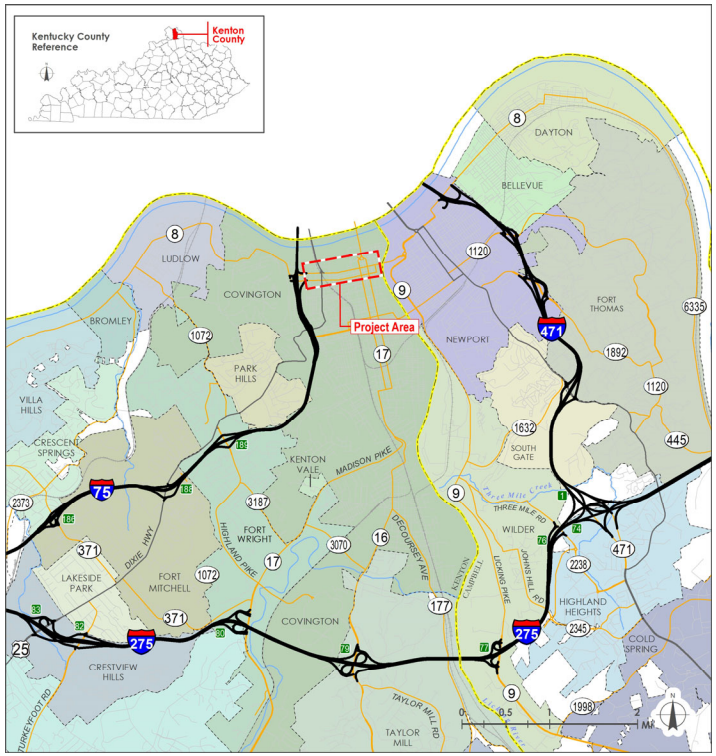

4th Street Roadway Reconfiguration

Covington, Kenton County, KY | December 2023

Kentucky Transportation Cabinet (KYTC) initiated a corridor study for KY 8 (4th Street) in Covington in Kenton County. The study limits stretch between Philadelphia Street and the Licking River Bridge, milepoints (MP) 6.670 to 7.662. The study examines the feasibility of reconfiguring the existing highway, losing a thru lane to accommodate a dedicated bike lane. The study area abuts several other ongoing projects: Brent Spence Bridge corridor (Item No. 6-17) to the west, the Covington Central Riverfront (CCR) mixed use development to the north, and the Licking River Bridge replacement (Item No. 6-1086) to the east. **Figure 1** shows the study area and adjacent projects.

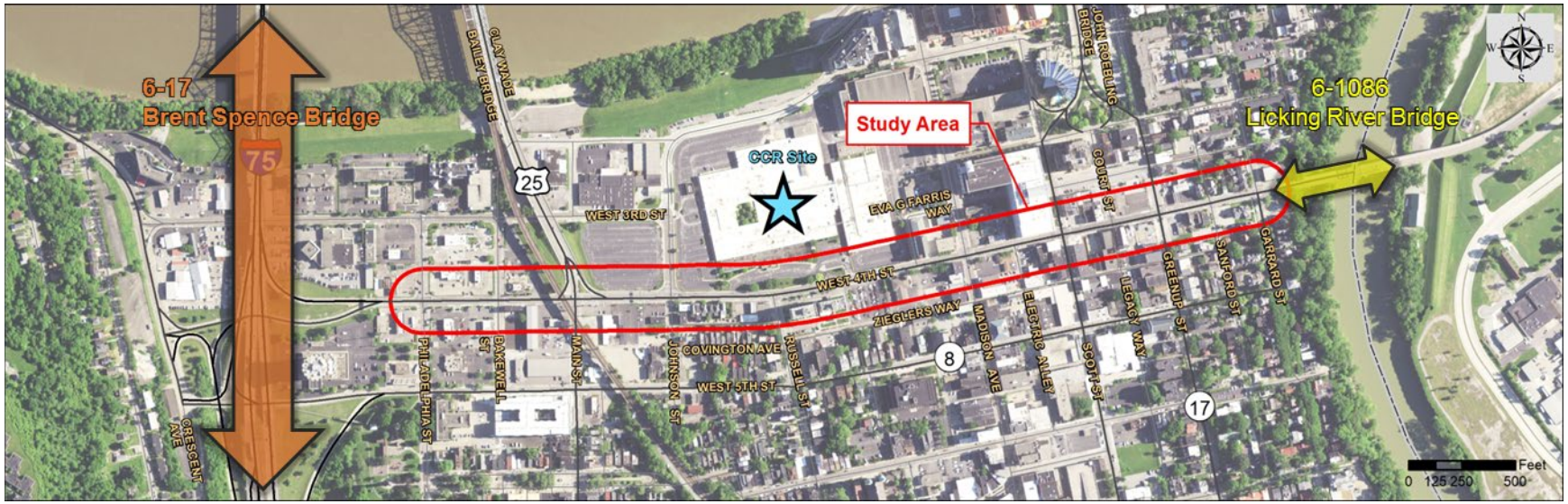

Figure 1: Study Area and Adjacent Projects

1. Existing Conditions

4th Street is an urban principal arterial on the National Highway System. It currently carries three 12-foot-wide westbound lanes with a 30-mph posted speed limit. Surrounding land use is primarily residential towards the eastern end of the study area, transitioning to primarily commercial moving westward.

There are nine signalized intersections along the one-mile length, plus additional intersections with two-way stop controlled cross-streets and numerous interim driveways. The Transit Authority of Northern Kentucky (TANK) transit center is located one block north of the study area along Madison Avenue. There are currently two bus stops on 4th Street—at Madison Avenue and Johnson Street—which are served by eight scheduled routes. Both stops provide informational signage, a bench, and trashcan with buses stopping in the right-most traffic lane to load/unload passengers.

Varying width sidewalks line both sides of the street, generally five to nine feet wide. However, utility poles, landscaping, building features, and other street furnishings encroaching onto the existing sidewalks can limit usable width and pose a challenge for limited mobility users. Signalized intersections feature standard crosswalks (transverse striping), actuated pedestrian signals, and ADA-compliant truncated dome pads at corners. Representative photos are presented in **Figure 2**.

Figure 2: Representative Sidewalks along 4th Street with Mobility Obstructions

Crash Patterns. During 2018-2022, 432 crashes were reported within the study area. This included two fatalities and 39 injury collisions, with the remainder property damage only (PDO) crashes. By type, the majority of crashes are angle collisions (34%) or same direction sideswipes (34%), followed by rear end crashes (20%). About 73% of reported crashes clustered at intersections, with the busier western section of the study area having a higher concentration of crashes. The intersection of 4th Street/Philadelphia Street had the highest number of crashes (56 crashes), followed by the intersection with Bakewell Street (48), Johnson Street (40), and Main Street (39). **Figure 3** summarizes the geographic distribution of crashes by severity and manner of collision while **Figure 4** presents a heat map of the same data. Crash records are included as **Appendix A**.

During the five-year analysis period, eight crashes involved vulnerable roadway users—one of six emphasis areas identified in KYTC's 2020-2024 Strategic Highway Safety Plan.[1] A summary of each incident is presented in **Figure 5** on the following page.

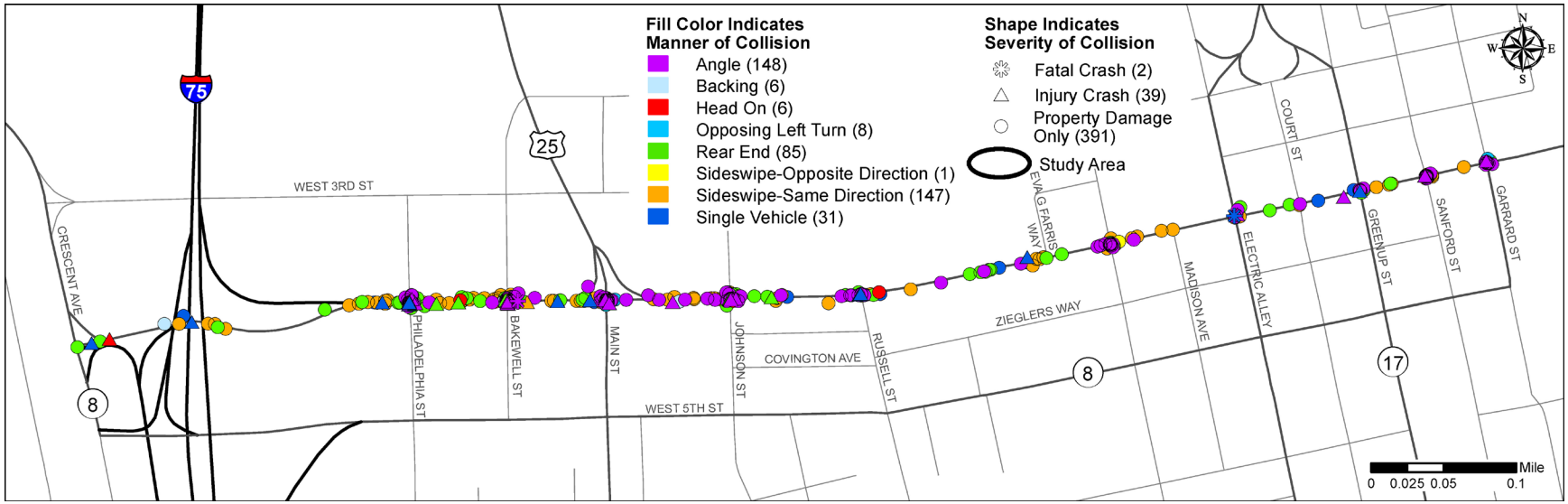

Figure 3: 2018-2022 Crashes by Severity and Type

[1] Online at https://transportation.ky.gov/HighwaySafety/KYStrategicHighwaySafetyPlan/KY_SHSP_2020-2024.pdf

Figure 4: Heat Map of 2018-2022 Crashes

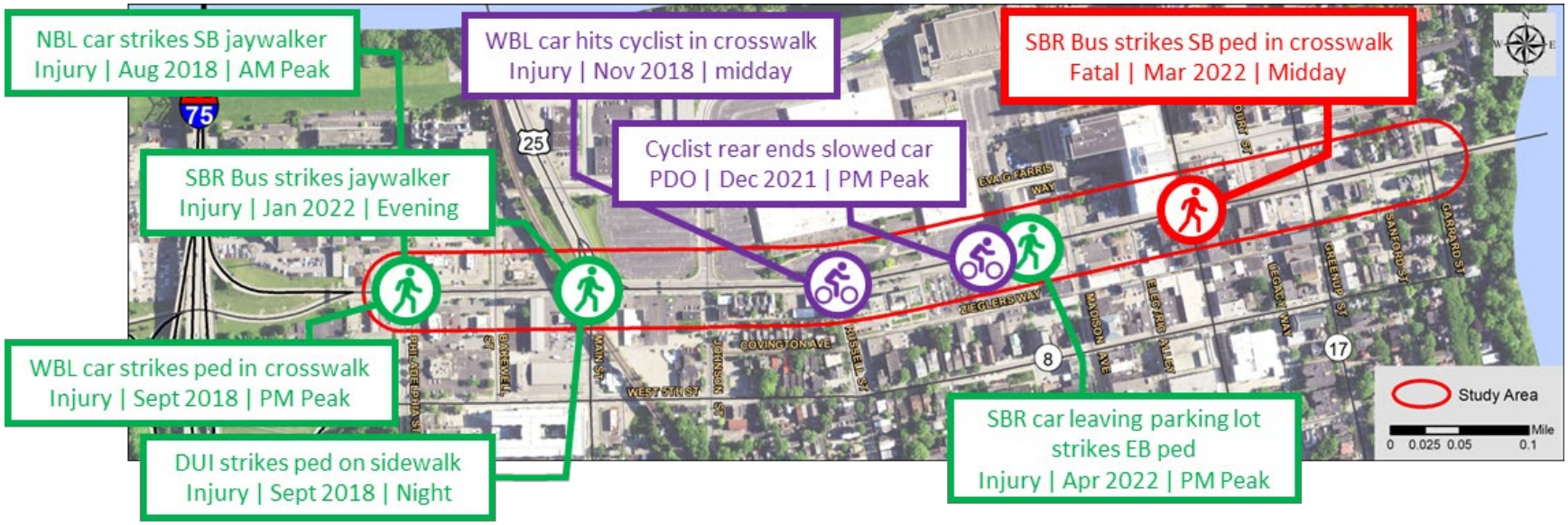

Figure 5: Crashes involving Bicyclists or Pedestrians

Existing Traffic. Historic KYTC traffic counts show 10,000-12,000 vehicles per day (vpd) using the corridor with volumes trending steadily downward over the past two decades (**Figure 6**). Notably, the closure of the IRS facility in 2019 eliminated 1,800 jobs previously accessing the office site daily.

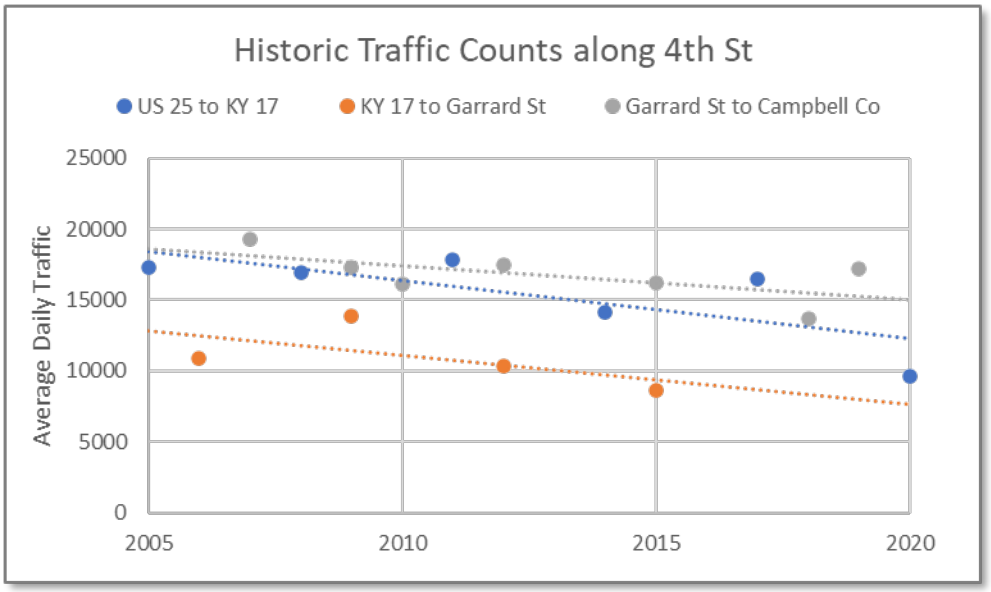

Figure 6: Historic Traffic Counts along Study Corridor

The consultant conducted video-based peak period turning movement counts at seven of nine signalized study intersections during April 2023, with September 2022 counts from an adjacent project applied at Philadelphia and US 25 (Main) streets. It should be noted that the northbound on-ramp to the Brent Spence Bridge closed in December 2022, routing northbound traffic to the southbound on-ramp at Pike Street as part of the new "Texas Turnaround" to improve safety. This closure has further decreased traffic on 4th Street west of Main Street and increased volumes on the Clay Wade Baily Bridge. Existing 2023 AM and (PM) peak hour turning movements are presented in **Appendix B**; PM peak hour volumes (650-1,200 vehicles per hour) are consistently higher than AM peak hour volumes (500-750 vehicles per hour) along the corridor.

April 2023 counts also provided information about the types of peak hour users traveling along the corridor:

- Truck traffic makes up 1.1% to 3.8% of the 4th Street AM peak hour traffic, and 0.6% to 1.2% of the PM peak hour traffic. Truck traffic is generally increasing approaching I-71/I-75.
- Up to 11 buses traveled along 4th Street during the AM peak hour, compared to 19 buses during the PM peak hour. The highest bus volumes along 4th Street were between Madison Avenue and Bakewell Street.
- Minimal bicycle traffic travels the corridor today, with no more than five bikes in an hour observed during April 2023 and none seen west of US 25 (Main Street). Third-party data from StreetLight estimates up to 17 cyclists per day along the study corridor, with the highest volumes near the Licking River Bridge. OKI Regional Council of Governments assigns a Bike Level of Stress in

its Bike Route Guide,[2] with 4th Street identified as the lowest category for higher speed highways, considered "likely stressful" even for experienced bike commuters.

- Numerous pedestrians were noted walking along or across 4th Street, as shown in **Appendix B**. The highest volumes were observed at the KY 17 and Madison Avenue intersections, with 65-120 pedestrians during the PM peak hour. StreetLight data estimates up to 730 pedestrians per day along the corridor in 2021, with the busiest stretches on the blocks east of Main Street and east of Madison Avenue.

Existing Traffic Operations. A Vissim microsimulation model was developed to measure traffic operations along the corridor, calibrated based on observed volumes, current signal timing, queue lengths, travel speeds, and drone footage (see **Figure 7**). The model calculates delay, queue lengths, and Level of Service (LOS) for each turning movement at each study intersection. In addition to illustrating existing needs within the study area, the microsimulation model forms a baseline to test how proposed improvements would affect traffic operations. While any model has limitations—particularly in over capacity, congested conditions—it represents the best tool available to approximate current and future traffic scenarios.

Level of Service (LOS) is a qualitative measure that describes traffic conditions based on measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. It is rated on a scale of A (free-flow) to F (over capacity, gridlocked) and is measured for each stop-controlled approach and for the overall intersection.

Figure 7: Drone Footage (Left) versus Microsimulation Model (Right) during PM Peak Hour

[2] Online at https://www.oki.org/portfolio-items/bike-route-guide/

LOS at each signalized study intersection is summarized in **Table 1**. For example, the signalized intersection at 4th Street/Philadelphia Street operates at LOS D overall during the AM peak hours and LOS B during the PM peak, applying existing signal timing plans. At that intersection, the northbound left turn movement operates at LOS E in the PM peak hour but all other turn movements are at LOS D or better in both AM and PM peaks.

Table 1: 2023 Intersection LOS during AM (PM) Peak Hours

	Philadelphia	Bakewell	Main	Johnson	Russell	Madison	Scott	Greenup	Garrard
Overall LOS	D (B)	A (A)	A (B)	B (A)	A (A)	B (B)	A (A)	B (B)	B (C)
Seconds Delay	40 (19)	4 (6)	9 (19)	10 (9)	6 (8)	12 (14)	8 (8)	14 (15)	11 (28)
LOS E/F Moves	NBL	NBL	-	NBL	-	-	-	-	All SB

2. Future Conditions

By the 2045 future analysis year, the City's CCR mixed-use development at the former IRS complex is expected to be built out. A Traffic Impact Study for the site is under development concurrent with this planning study. As of March 2023 conceptual plans, build out of the CCR development is assumed to include 776 residential units, 100,000 SF retail space, 440,000 SF office space, a hotel, and two entertainment venues. Combining these uses, the development is anticipated to add roughly 2,300 vehicle trips to/from the site during each peak hour. Generated trips are assumed to follow the geographic distribution shown in **Figure 8** with access points along Madison Avenue, 4th Street, and Johnson Street. These trips were added onto the 2045 scenario assumptions, along with additional background growth[3] (approximately 0.8% annual growth) to be consistent with the future year forecasts from the Brent Spence Bridge project.

Figure 8: Assumed Trip Distribution for CCR Development Traffic

[3] The Ovation mixed use development in Newport was incorporated as part of the background growth assumptions.

Other projects in the vicinity also affect future year travel patterns:

- Design work is underway for the reconstruction of the Licking River Bridge (Item No. 6-1086)[4] immediately east of the study corridor. While a final configuration has not been decided, all build options considered assume two travel lanes per direction plus shared use paths on both sides of the structure. The 4th Street/Garrard Street lane configuration may be modified as part of the bridge project but, as no decision has been reached as of this study, the existing layout was modeled.

- To the west, the Brent Spence Bridge project (Item No. 6-17)[5] includes numerous modifications to the interstate, connections to local streets, and abutting properties. The project improves approximately 8 miles of interstate with a new companion bridge over the Ohio River to reduce congestion, improve traffic flow and safety, and maintain key regional and national transportation corridors. Other community benefits are also included in the multi-billion dollar project: improved bicycle and pedestrian connections, park enhancements, streetscaping, and more.

  As part of the project, the recently closed on-ramp to northbound I-71/I-75 will reopen, carrying local traffic across the river from 4th Street.

Figure 9: Rendering of Brent Spence Bridge Project, looking NW from KY

Applying the 2045 traffic volumes that incorporate these changes (**Appendix B**) to the existing roadway geometrics and signal timing results in the No-Build scenario, operations are summarized in **Table 2**. As shown, operations degrade, particularly at the 4th Street intersections with Philadelphia and Main Streets that reach LOS E in the PM peak hour.

[4] Online at https://www.ky8bridge.org/
[5] Online at https://brentspencebridgecorridor.com/

3. Build Concept: Short Term

The Build scenario begins with the 2045 No-Build traffic discussed above, modifying the roadway geometrics to test one or more other configurations.

Comparative Traffic. The 2045 Two-Lane scenario assumes one thru lane east of Johnson Street is removed, converted to a bike lane. Lane configurations west of Johnson remain the same as today. LOS by intersection is summarized in **Table 2**. As shown, increased 2045 traffic volumes impact performance, but there is little difference between the No-Build and Two-Lane traffic scenarios. Build scenarios with two lanes west of Main Street were tested but did not perform well; traffic volumes and lane continuity in this section require three thru lanes to accommodate peak period traffic flows.

Table 2: PM Peak Intersection LOS Comparison

Scenario	Philadelphia	Bakewell	Main	Johnson	Russell	Wash.[1]	Madison	Scott	Greenup	Garrard
Existing LOS & Delay	B 19	A 6	B 19	A 9	A 8	-	B 14	A 8	B 15	C 28
LOS E/F Moves	NBL	NBL	-	NBL	-	-	-	-	-	All SB
2045 No-Build LOS & Delay	E 65	A 6	E 70	C 20	B 18	A 1	B 15	A 8	B 15	C 34
LOS E/F Moves	NBL, All SB	SBT	NB & SB	-	-	-	-	-	-	All SB
2045 Two-Lane LOS & Delay	E 61	A 4	E 70	C 20	B 18	A 2	B 15	A 9	B 17	D 37
LOS E/F Moves	NBL, All SB	-	NB & SB	-	-	-	-	-	-	All SB

[1] Washington Avenue proposed to be extended south to intersect 4th Street as part of the CCR development and is assumed to be right-in/right-out.

Per the Vissim model, travel time along the corridor increases in each scenario, summarized in **Figure 10**. As shown, it takes an average of 16 seconds to travel the block from Garrard to Greenup streets in the Existing Scenario, increasing to 20 seconds in the 2045 No-Build scenario, or 23 seconds in the Two-Lane Build scenario. The largest difference between scenarios is associated with the block from Bakewell to Philadelphia streets, driven by the large traffic growth projected along Philadelphia in the Item No. 6-17 forecasts developed for that project. West of Johnson Street, all scenarios in **Table 2** provide identical lane configurations.

End-to-end, the study corridor is projected to take an average of 127 seconds to navigate in the Existing scenario, 186 seconds in the 2045 No-Build, and 189

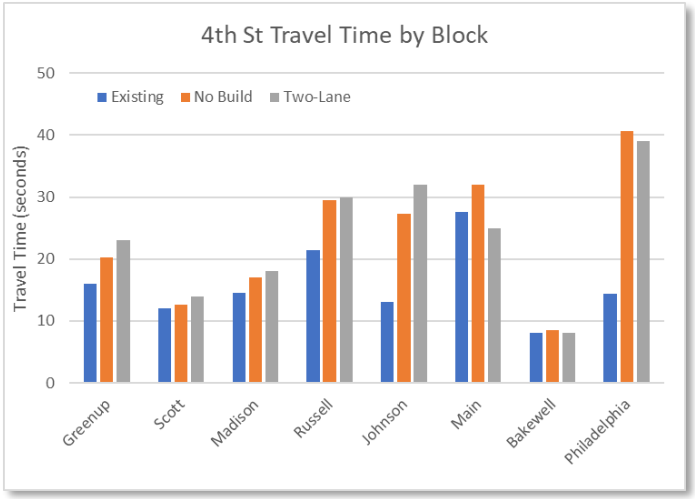

Figure 10: Travel Time Comparison

seconds in the 2045 Two-Lane. This represents a 2% increase in travel time associated with loss of a thru travel lane east of Johnson Street.

Proposed Bike Lane. Accordingly, the proposed Build concept includes two 11-foot-wide westbound thru lanes along 4th Street between Garrard and Johnson streets. Remaining space between existing curbs is reallocated to sidewalks and a bike lane. A typical section is presented in **Figure 11**. Short-term, the concept could be implemented via pavement markings, incorporated with the upcoming resurfacing project in 2024.[6] As funding becomes available or adjacent projects reconstruct public infrastructure, a more permanent hardscaping solution could be implemented with additional streetscaping elements.

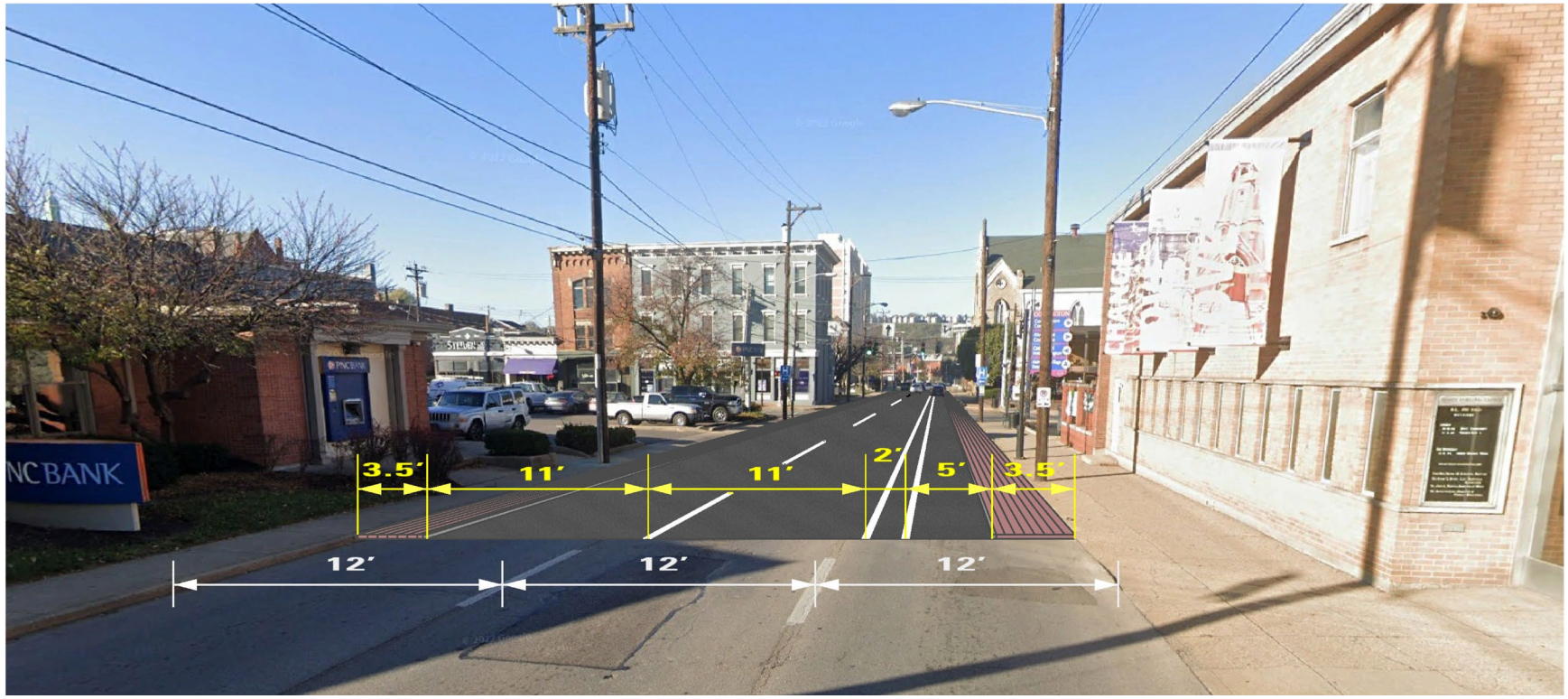

Figure 11: Proposed Typical Section

[6] Proposed stiping plans included as **Appendix C**.

From east to west, the restriping project begins immediately west of the intersection with Garrard Street, which is assumed to be improved as part of the #6-1086 bridge project with shared use paths on both sides of the 4th Street bridge. The proposed 5-foot bike lane runs along the north side of the street.

At the existing bus stop east of Johnson Street, a section of bike lane could be designated as a bus pull off to provide a refuge for loading/unloading. Long term, the adjacent development could incorporate a more formal pull off, coordinated with aesthetic treatments and design elements of the abutting land use. Alternatively, shifting the stop north onto Johnson Street is an option as well, with the upstream signal providing gaps in traffic for the bus to reenter thru traffic lanes from a separate bay.

Forecast 2045 volumes suggest a second northbound thru lane on Johnson would be beneficial to handle anticipated traffic volumes. South of 4th Street, Johnson Street has two 10-foot lanes, 8-foot parking lanes on both sides, curb/gutter, and 5- to 12-foot sidewalks on both sides. North of 4th Street, Johnson Street has four 10-foot lanes—including two northbound receiving lanes, curb/gutter, and 4.5- to 8-foot sidewalks on both sides. With an added lane, the northbound thru movement in the PM peak hour drops from 35 seconds delay to 24 seconds. Average queue lengths decrease from 150 feet to 50 feet.

Short term, the westbound bike lane would end at Johnson Street, routing cyclists along a shared lane with thru traffic to 3rd Street to continue westward. From 3rd and Johnson streets, cyclists can access the new CCR site, the graffiti park, and the Riverfront Commons trail.

4. Build Concept: Long Term

Long term, other projects in the area provide opportunities to extend the 4th Street bike lane and incorporate other connections.

Main Street/Clay Wade Bailey Bridge. Bicycle accommodations will be evaluated for feasibility on the Clay Wade Bailey Bridge by the Design-Build team as part of the #6-17 Brent Spence Bridge Corridor Project. The current 4th Street/Main Street intersection poses several challenges (**Figure 12**) for cyclists and/or pedestrians—including a dedicated right turn lane on 4th that leads to the bridge with a sweeping, free-flow channelized curve. A channelized right turn lane from the bridge to 4th is stop controlled, but the large radius increases the crossing width for pedestrians to clear the intersection. Connected parking lots with

Figure 12: 4th St/Main St intersection layout

multiple access points in the southeast quadrant of the intersection provide opportunities for turning cars to cheat around queues at the signal and introduce additional conflict points for pedestrians. An adjacent elevated rail line constrains improvement options.

The City is also exploring options to enhance the corridor: incorporating access management principles, crosswalks, landscaping, and aesthetic gateway treatments.

Within the microsimulation model, test scenarios were run to evaluate the feasibility of eliminating the sweeping turn movements between 4th Street and the bridge.

- Realigning the southbound right turn lane to meet 4th Street at 90° has minimal impact on traffic operations as the movement is stop controlled today.
- Realigning the westbound right turn lane—so turns are integrated with signal phasing—increases the total intersection delay from 69 to 74 seconds. The westbound right turn movement itself operates at LOS B with 15 seconds of delay in the PM peak hour; average queue lengths are estimated at 90 feet. The longest westbound right queue length (which may last only a few seconds) is estimated at 572 feet, extending beyond the upstream signal at Johnson Street, which is approximately 390 to the east. The max queue for the westbound thru movement also spills back past the upstream signal, with or without the channelized right.

Depending on the findings of the Design-Build team, the westbound bike lane on 4th Street could be extended to connect to a future cross-river link on the Clay Wade Bailey Bridge.

CCR Development Site. As investments and tenants join the CCR Development site, additional opportunities to enhance connectivity for cyclists and pedestrians will be incorporated into site designs. The multi-use nature of the development is likely to increase both pedestrian and bicycle usage throughout the study area. Preliminary conversations suggest a new off-road bicycle link between 3rd and 4th streets may be developed on the property. Details have not been developed as of the publication of this planning study, but coordination efforts should continue as the projects advance.

Park Connections. As part of the #6-17 Brent Spence Bridge Corridor Project, expansions and enhancements are proposed for the city's park system. This includes more public greenspaces, multi-use paths, streetscaping along key corridors (including 4th Street), recreational spaces for gathering, green infrastructure, and more.

As of October 2023, the draft aesthetic guidelines for the project state that "streetscape improvements on 3rd, 4th, 5th, and 9th streets are crucial for creating an attractive, functional environment for both pedestrians and motorists. The improvements include new sidewalks, improved lighting, enhanced landscaping, and the simplification of intersections, which will reduce congestion and make

the streets safer." Within Covington, the project's aesthetic treatments build on the 2018 *Streetscape & Public Realm Design Guidelines*[7] developed by the City. While 4th Street is not specifically discussed in the city's guidelines, citywide design standards for concrete sidewalks, container planters, benches, trashcans, and lighting apply. **Figure 13** includes a representative image from the #6-17 guidance for 4th Street.

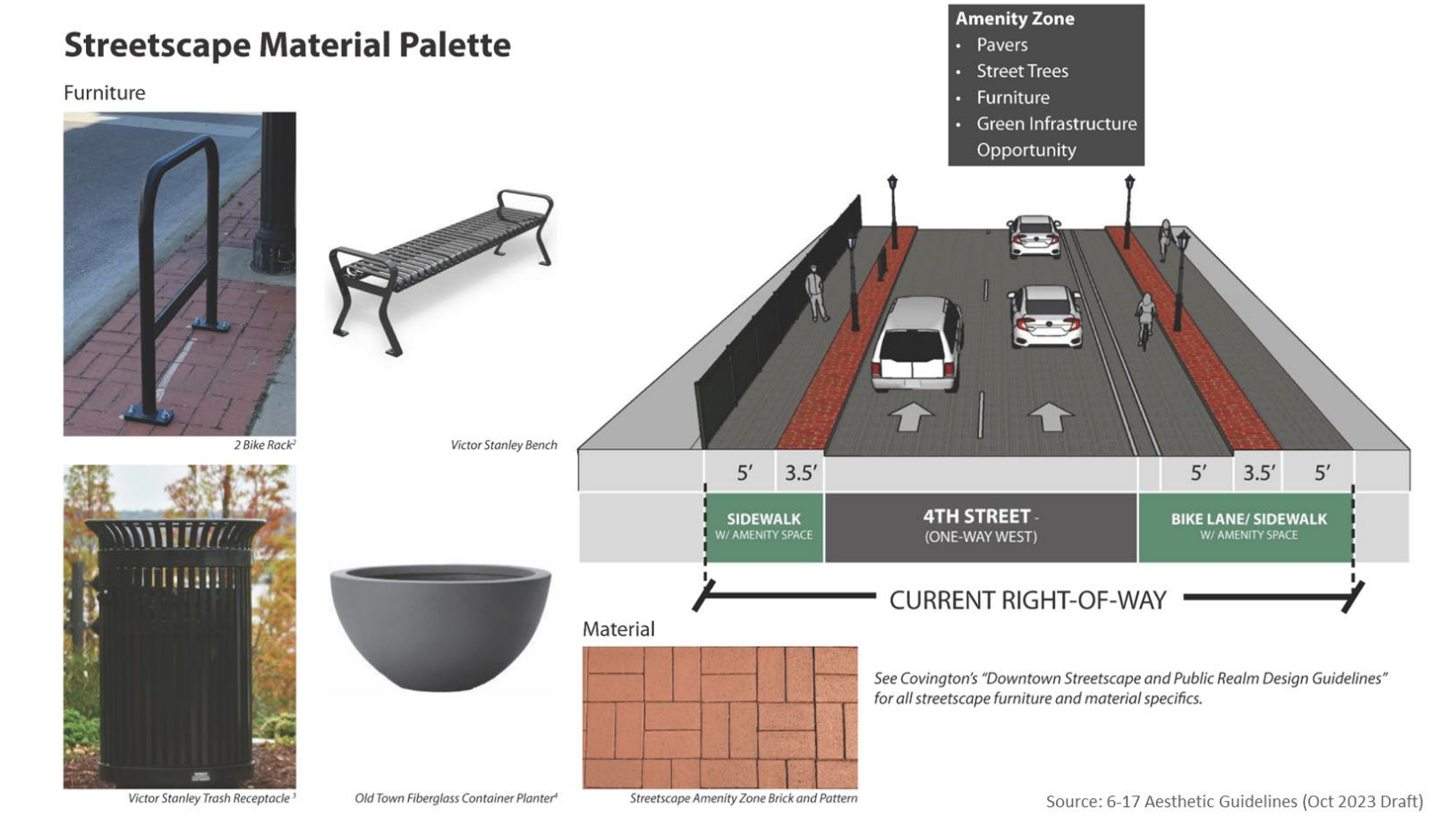

Figure 13: Item No. 6-17 Streetscaping Recommendations

[7] Online at https://thecovky.gov/wp-content/uploads/2022/12/0927_COV_SDG_Final_LR-Design-Guidelines.pdf

The #6-17 aesthetic guidelines also identify a multi-use path along the I-71/I-75 corridor, with an access point along 5th Street to Philadelphia Street. A potential future connection extending to 4th Street and the Riverfront Commons trail is depicted (**Figure 14**), potentially along Bakewell Street. With projected future traffic volumes along Bakewell, it will be challenging to allocate space within the existing right-of-way to accommodate such a facility. Should such a linkage be developed, it should consider connectivity to the proposed 4th Street bike lane as well.

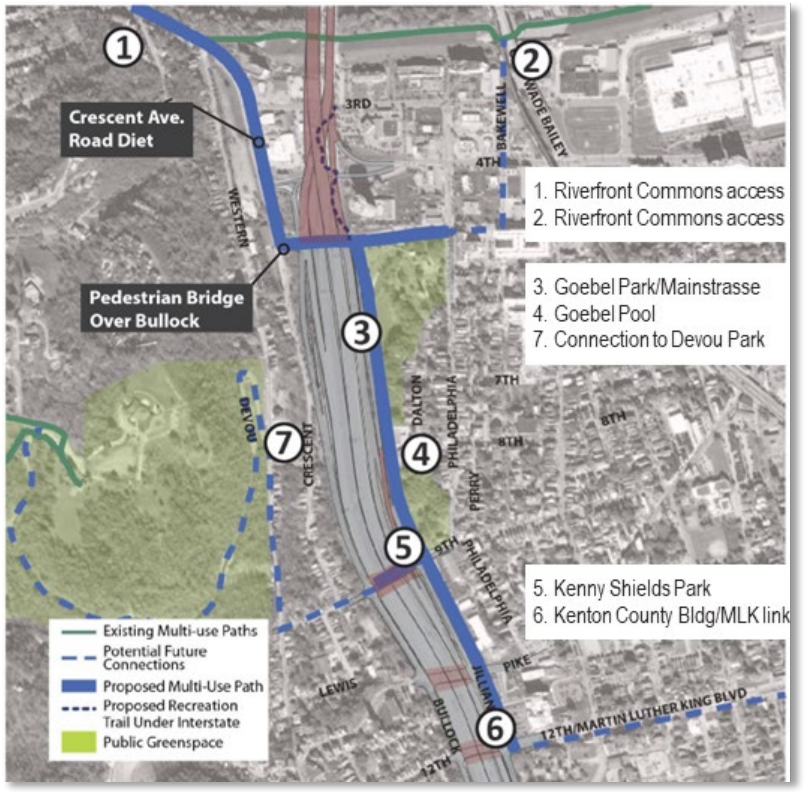

Figure 14: Item No. 6-17 Multi-Use Path Plan

4.1 Cost Estimate

Using the short-term restriping as a baseline, costs were estimated in 2023 dollars to shift the curb/gutter, adding brick pavers as shown in **Figure 11**. For the half-mile project length, this comes to $1.6 million. It should be noted that additional aesthetic elements (e.g., benches, planters, positive separation for bike lane, etc.) or utility work will increase this baseline cost.

5. Coordination

This study primarily represents a technical analysis derived from the Vissim microsimulation network, layered with current assumptions from ongoing project concepts for adjacent transportation improvements and private developments. While no project-specific public involvement activities have been undertaken at this time, coordination meetings with key stakeholders and project team members occurred during the process.

- Regular coordination calls were scheduled between the KYTC project manager, consultant staff, and city representative to provide monthly updates on progress.
- On July 24, 2023, the larger project team met to discuss the existing conditions, area projects, traffic simulations, and preliminary build concepts for the corridor. The project team included staff from KYTC, OKI, TANK, and the consultant team. A meeting summary is included in **Appendix D**.

- On August 16, 2023, a subset of the project team met with Covington Economic Development staff. Discussions focused on the future lane assignments on the Clay Wade Bailey bridge, proposed gateway treatments at the Main/4th Street intersection, and an update on the CCR development site to ensure each agency was aware of the latest progress.

Prior to implementation with the 4th Street resurfacing project, the proposed 4th Street reconfiguration should be shared with key stakeholders, adjacent property owners, and the public. While minimal outreach may be adequate for a typical resurfacing project, the community is highly interested in the unfolding plans for the region. Nearby mega-projects have contributed to an expectation of transparency and engagement in transportation projects. Some level of public outreach, including an opportunity to submit comments and ask questions, is recommended as this project advances.