

Kentucky St

Project Purpose, Scope, Approach, Budget & Timeline

The purpose of this project is to reduce the vehicle collision rate and improve cycling facilities along Kentucky St between Barret Ave and S 8th St by reducing the number of vehicular travel lanes to one full lane in each direction, one peak hour restriction lane in each direction and buffered bike lanes without significantly increasing travel time or congestion. The reconfigured cross-section improves safety by eliminating conflict points at the intersections and along the route and reduces the average vehicle speed within acceptable ranges of the posted speed limit. The excess pavement from the removed lane can then be used to provide an additional buffer for cyclists by separating the bicycles from the vehicle travel lanes.

The changes to Kentucky St, which is the east-bound route, being proposed with this plan are as follows:

1. Between Barret and Swan, replace the east-bound drive lane on the north side of the street with a 5' bike lane surrounded by 2' buffers.
2. Between Swan and S 6th St, replace the east-bound drive lane on the north side of the street with a 5' bike lane surrounded by 2' buffers and widen the peak hour traffic lane to a 9' lane width.
3. Between S 6th St and S 8th St, , replace the east-bound drive lane on the north side of the street with 5' to 6' bike lane and a variable width buffer due to the parking restrictions along the south side of the street.

To rate the success of this proposed project, a series of measures have been established that will provide a clear comparison between the pre-project and post-project traffic characteristics. The methods used to measure the effectiveness of this project have been detailed in this document and includes the following:

1. Collision study to determine the change in number and type of collisions
2. Speed studies to determine changes in prevailing speeds and percentage of drivers that are "excessive speeders" (10 mph or more above the posted speed limit)
3. Traffic counts and travel time studies to determine change in traffic volumes, lane utilization and traffic delays
4. Bike counts to determine change in ridership

Budget:

This project will be funded thru Mayor Greg Fischer's Urban Bike Network allocation established in the 2014 Fiscal Year budget. The design and engineering for this project is to be provided by the Departments of Public Works & Assets and Codes & Regulations with assistance from Economic Growth & Innovation for the public outreach component.

Cost

Remove existing dashed lane lines x 1 =	4,400	ft @	\$0.52	per ft =	\$2,288
Skip 4" double paint =	2,508	ft @	\$0.16	per ft =	\$401
Thermo 4" buffer parking parking=	10,030	ft @	\$0.58	per ft =	\$5,817
Paint 4" buffer Drive bike lane=	10,030	ft @	\$0.16	per ft =	\$1,605
Paint 4" buffer Drive bike lane=	10,030	ft @	\$0.16	per ft =	\$1,605
Thermo 4" buffer driveside =	10,030	ft @	\$0.58	per ft =	\$5,817
Thermo bike symbol 9C-3B =	60	ea @	\$130.00	per ea =	\$7,800
Solid 4" paint cx hatch =	20060	ft @	\$0.29	per ft =	\$5,817
Solid 12" Thermo bike lane =	137.5	ft @	\$0.64	per ft =	\$88
Paint 4" Yellow =	100	ft @	\$0.16	per ft =	\$16
Total					\$31,255

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Measurements of Effectiveness

1. Collision Reductions:

To determine the effectiveness of the roadway treatments in improving the collision rates, a comparison of the collision types occurring before and after the improvements will be conducted. The collision history for the last three years will be gathered through the Kentucky State Police's Collision Data website. Queries will be conducted in accordance with the *Collision Reporting Guideline* and the data obtained will be ranked by Manner of Collision and Directional Analysis. Each type of collision will then be converted to a specific collision type per vehicle mile traveled using the current traffic volumes for this section of roadway.

Upon completion of the road reconfiguration project, collisions within the boundary of the project will be evaluated monthly for the first 6 months in order to identify any immediate deficiencies. After the first 6 months, collisions will then be evaluated every 6 months for 3 years. Once the three years of collision history has been gathered, a comparison can be made between the pre- and post-project collision rates to determine effectiveness.

The road reconfiguration should show improvements in the number of sideswipe (same & opposite direction) and single vehicle collisions in which the vehicle left the roadway and collided with a fixed object. There should also be modest reductions in the rate of opposing left turn and rear end collisions since the total number of conflicts will be reduced. There should also be no increase in the number of cyclist and pedestrian related collisions despite an increase in the total number of users.

Collision Analysis:

The collision history for this section of road was obtained through the Kentucky State Police's public crash analysis website. The collision history was evaluated for the past 3 years and a crash modification formula, developed by the FHWA, was applied to the results to determine how effective the proposed cross-section would be in reducing the number of collisions.

Kentucky St from S 8th St to Barret Ave	2013	2012	2011	TOTAL	CMF	Reduction
Total Collisions	44	52	48	144	109	35
Injury	8	16	14	38	29	9
Fatality	0	0	0	0	0	0

Manner of Collision

ANGLE	17	25	15	57	43	14
BACKING	2	1	1	4	3	1
HEAD ON	0	2	0	2	2	0
OPPOSING LEFT TURN	1	0	0	1	1	0
REAR END	9	7	6	22	17	5
REAR TO REAR	0	0	0	0	0	0
SIDESWIPE-OPPOSITE DIRECTION	1	0	0	1	1	0
SIDESWIPE-SAME DIRECTION	11	12	23	46	35	11
SINGLE VEHICLE	3	5	3	11	8	3

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2. Traffic Volume, Speed & Travel Time:

To determine the effectiveness of the roadway treatments and its impact to the traffic flow and volumes, several pre- and post-project traffic counts and travel time studies will be conducted. Comparisons will be made between the before and after counts to determine the total change in traffic volume utilizing this section of road, the change in the average and 85th percentile speed, and the change in the travel time and delay. The data gathered during the pre-project surveys will also be used to calibrate the traffic simulation models for the project corridor.

A travel time and delay study will be conducted in accordance with attached *Travel Time Study Guidelines*, and will be used to determine the impact the road reconfiguration has on the quality of traffic movement along the route.

Pre-project traffic counts -

Count 1:

Location: E Kentucky St between Clay & Shelby, 2 east-bound lanes and 1 peak-hour restricted lane

Equipment: (3) NC-200 Traffic Analyzer

Dates: Tuesday, April 8, 2014 thru Wednesday, April 9, 2014

Data: This will be a traffic volume and speed count for 24 hours, with one counter in each lane of travel. This count will establish an Average Daily Traffic volume in each lane and the average and 85th percentile speeds.

Results:

Left travel lane:

2,534 ADT with 32.2 mph 85th percentile

Center travel lane:

948 ADT with 32.7 mph 85th percentile

Peak Hour restricted lane:

791 ADT with 28.5 mph 85th percentile

Total for all lanes:

4,273 ADT with 31.6 mph 85th percentile

Count 2:

Location: W Kentucky St between S 3rd & S 4th St, 2 east-bound lanes and 1 peak-hour restricted lane

Equipment: (3) NC-200 Traffic Analyzer

Dates: Thursday, April 10, 2014 thru Friday, April 11, 2014

Data: This will be a traffic volume and speed count for 24 hours, with one counter in each lane of travel. This count will establish an Average Daily Traffic volume in each lane and the average and 85th percentile speeds.

Results:

Left travel lane:

2,973 ADT with 30.6 mph 85th percentile

Center travel lane:

2,863 ADT with 31.1 mph 85th percentile

Peak Hour restricted lane:

416 ADT with 28.7 mph 85th percentile

Total for all lanes:

6,252 ADT with 30.7 mph 85th percentile

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Count 3:

Location: E Kentucky & Barret Ave intersection

Equipment: Mio-Vision

Date: 12-hour count conducted 3/5/2013

Data: This will be a 12-hour turning movement count at the signalized intersection.

Count 4:

Location: E Kentucky & Clay St intersection

Equipment: Mio-Vision

Date: 12-hour count conducted 3/19/2013

Data: This will be a 12-hour turning movement count at the signalized intersection.

Count 5:

Location: E Kentucky & Brook St intersection

Equipment: Mio-Vision

Date: 12-hour count conducted 1/10/2012

Data: This will be a 12-hour turning movement count at the signalized intersection.

Count 6:

Location: E Kentucky & S 5th St intersection

Equipment: Mio-Vision

Date: 12-hour count conducted 5/20/14

Data: This will be a 12-hour turning movement count at the signalized intersection.

Count 7:

Location: E Kentucky & S 7th St intersection

Equipment: Mio-Vision

Date: 12-hour count conducted 10/28/10

Data: This will be a 12-hour turning movement count at the signalized intersection.

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3. Bike lanes:

To determine the effectiveness of the bike lanes, counts will be conducted before and after the project. This before and after comparison will demonstrate the change in ridership associated with the dedicated bike lanes.

Pneumatic tube counters will be placed at several locations to gather data on the total number of cyclists traveling in each direction in the corridor. Each count will be about 1 week and during more favorable weather conditions.

Pre-project bicycle counts -

Count 1:

Location: E Kentucky St between Clay & Shelby, west-bound outside drive lane

Equipment: Eco-Combo #2696

Dates: April 8, 2014 thru April 16, 2014

Count 2:

Location: W Kentucky St between S 3rd & S 4th, west-bound outside drive lane

Equipment: Eco-Twin

Dates: April 8, 2014 thru April 16, 2014

ERROR IN RECORDED DATA, working on resolution with Eco-Counter

Post-project counts shall be conducted at the above locations several months after the completion of the project to compare the change in ridership along this section of road. Annual counts will be conducted and the data extracted will be used to establish trends in ridership along Grinstead Dr. Data extracted from future counts will also be used in extrapolating the latent demand that may exist in other areas of the city to aid in the design of future road reconfiguration projects.

Bike Volume

btn Clay & Shelby		btn 5th & 6th	
	Total		Total
Tue, Apr 8, 2014	7	Tue, Apr 8, 2014	!
Wed, Apr 9, 2014	9	Wed, Apr 9, 2014	!
Thu, Apr 10, 2014	18	Thu, Apr 10, 2014	!
Fri, Apr 11, 2014	10	Fri, Apr 11, 2014	!
Sat, Apr 12, 2014	0	Sat, Apr 12, 2014	!
Sun, Apr 13, 2014	2	Sun, Apr 13, 2014	!
Mon, Apr 14, 2014	8	Mon, Apr 14, 2014	!
Tue, Apr 15, 2014	1	Tue, Apr 15, 2014	!
Wed, Apr 16, 2014	16	Wed, Apr 16, 2014	!

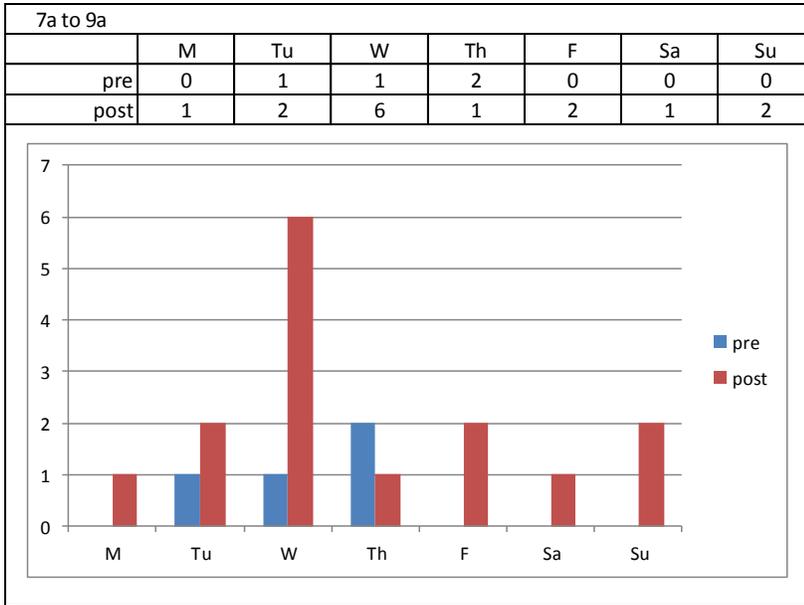
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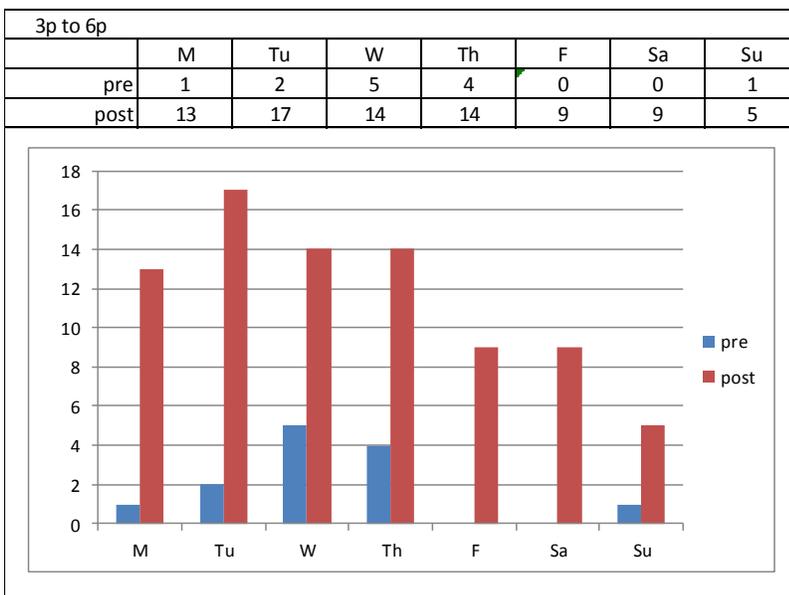
Preliminary Findings from Post-Project Data

The following data was gathered immediately upon the completion of the project to determine early impacts but does not account for the seasonal variation in traffic experienced when school is not in secession or the effect that driver familiarity will have on the ultimate outcome. Additional counts will be conducted, as well as a comprehensive accident analysis, in early 2015.

E Kentuck St between Clay & Shelby AM Peak Hour comparison of cyclist volume



E Kentucky St between Clay & Shelby PM Peak Hour comparison of cyclist volume



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Traffic Volume & Speed Comparison		
E Kentucky between Clay & Shelby		
	Pre-Project	Post-Project
ADT	4,273	3,146
85% speed	31.6	29.8
W Kentucky between 3rd & 4th		
	Pre-Project	Post-Project
ADT	6,252	unavailable
85% speed	30.7	unavailable