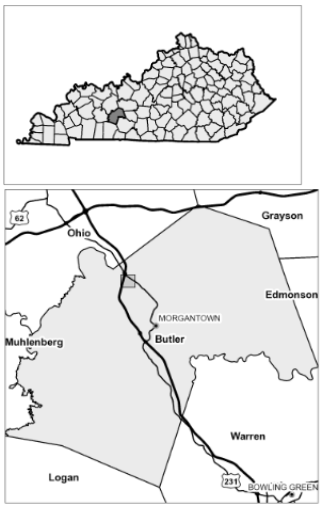
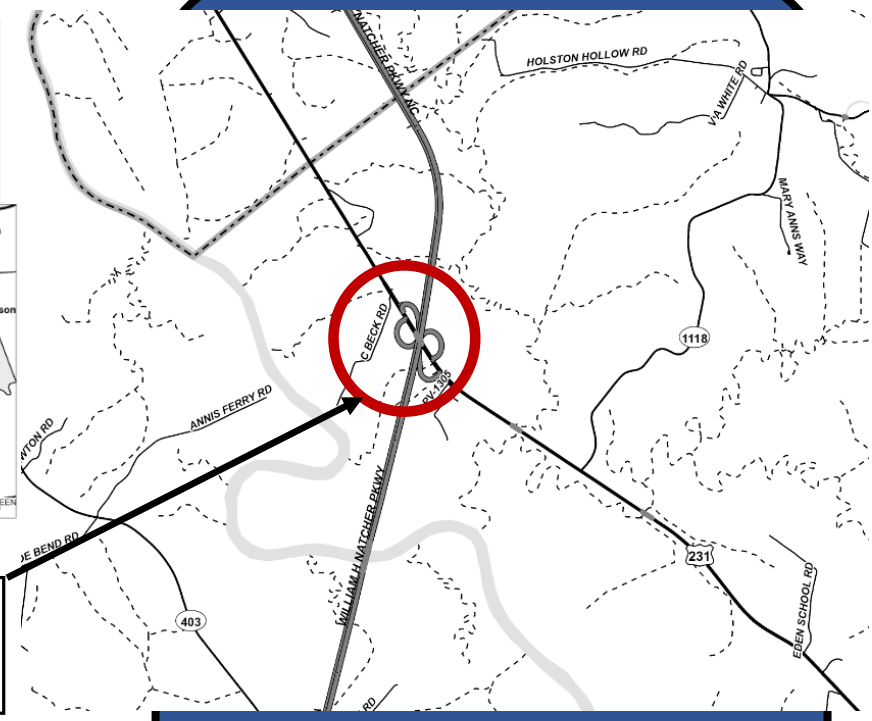
Data Needs Analysis





Project Location

Scoping Study

Natcher Parkway (WN 9007)/ US 231 Interchange Exit 36

Butler County
Item No. 3-2042.30

Prepared by
KYTC District 3

November 2016

KENTUCKY TRANSPORTATION CABINET

I. PRELIMINARY PROJECT INFORMATION

County:	Butler	**Item No.:**	3-2042.30
Route Number(s):*	WN 9007/US 231	**Road Name:**	WN Parkway/US 231 I-Change
Program No.:	92419	**UPN:**	FD52 16 9007 035-037
Federal Project No.:	NHPP 9007 017	**Type of Work:**	I-Change Rconst (O)

2016 **Highway Plan Project Description:**

I-65 Spur Corridor; Reconstruct the existing Natcher Parkway/US 231 Interchange(Exit 36) in Butler County. (2016 BOP)

Beginning MP: 35.4 **Ending MP:** 36.5 **Project Length:** 1.1

In TIP: ☐ Yes ☑ No Reconcile Project Information in Clearview

State Class.: ☑ Primary ☐ Secondary **Route is on:** ☑ NHS ☐ NN ☑ Ext Wt

Functional Class.: ☐ Urban ☑ Rural Interstate **Truck Class.:** AAA **% Trucks:** 34.75%

MPO Area: Not Applicable **Terrain:** Rolling

ADT (current): 8403/1445 (2015 WN 9007)/(2016 Ramps)

Access Control: ☐ None ☐ Permit ☑ Fully Controlled ☐ Partial Spacing: 2

Median Type: ☐ Undivided ☑ Divided (Type):

Existing Bike Accommodations: US 231: Shared Lane **Ped:** ☐ Sidewalk

Posted Speed: ☐ 35 mph ☐ 45 mph ☐ 55 mph ☑ Other (Specify): 70 mph/50 mph

KYTC Guidelines Preliminarily Based on : **50 MPH Proposed Design Speed** WN 9007/Ramps

Roadway Data:	**EXISTING**	**COMMON GEOMETRIC PRACTICES****
No. of Lanes	1	1
Lane Width	Varies	15'
Shoulder Width	4-6'	4-6'
Max. Superelevation***	10%	8%
Minimum Radius***	238.73'	760'
Maximum Grade	4%	5%
Minimum Sight Dist.	205'	425'
Sidewalk Width(urban)	N/A	N/A
Clear-zone†	Varies	16-20'

Existing Rdwy. Plans available? ☑ Yes ☐ No Year of Plans: 1971

☑ Traffic Forecast Requested Date Requested: 11/14/2016

☑ Mapping/Survey Requested Date Requested:

Type: Aerial

Project Notes/Design Exceptions?

Bridge No.:‡	016B0054N	US 231 @ MP 17.808
Sufficiency Rating	89.2	
Total Length	297'	
Width, curb to curb	48'	
Span Lengths	145.013'	
Year Built	1972	
Posted Weight Limit	No restrictions	
Structurally Deficient?	No	
Functionally Obsolete?	No	
Existing Bridge Type	Stringer/Girder	

Existing Geotech Data Available? ☐ Yes ☑ No

Detour Length(s):

Minimum Vertical Clearance: 16.88'

*If more than one road is included in the project, include additional sheets.
**Based on proposed Design Speed
***AASHTO's A Policy on Geometric Design of Highways and Streets
†AASHTO's Roadside Design Guide
‡If more than two bridges are located on the project, include additional sheets.

II. PROJECT PURPOSE AND NEED

A. Legislation

The following funding is a breakout from parent project 3-2042.00 which was listed in the 2016 General Assembly's Enacted Highway Plan. This funding was pulled from the parent project to the subject project 3-2042.30.

Funding	*Phase*	*Year*	*Amount*
NH	D	2017	$1,300,000
NH	R	2017	$1,300,000
NH	U	2017	$1,200,000
NH	C	2019	$8,400,000

B. Project Status

The design funds were authorized on 11/9/2016.

C. System Linkage

WN 9007 is federally functionally classified as an Urban and Rural Expressway that connects the city of Bowling Green to the city of Owensboro. US 231 is federally functionally classified as a Major Rural Collector connecting the city of Bowling Green to the city of Cromwell and extending on through Owensboro. Both highways serve as connections between the city of Bowling Green and the western portion of the state. The interchange helps connect the adjacent rural communities to the commercial/economic hubs of Bowling Green and Owensboro. US 231 also serves as a detour route for WN 9007 when incidents close the parkway between Exit 28 and Exit 43. Upgrading this interchange is part of the upgrade of the Natcher Parkway to interstate standards and Interstate Spur status.

D. Modal Interrelationships

The Natcher Parkway does have considerable truck traffic but the area around the interchange is generally rural. Trucks use the interchange to access the Perdue Chicken Processing Plant (PCPP) in Cromwell. Also farm trucks can access the farmland in the area from this interchange. The exiting cloverleaf interchange configuration mandates a weaving motion for vehicles entering and exiting the parkway. This is not recommended for large trucks, nor does it meet interstate standards. There are presently no bike or pedestrian facilities along this section of roadway. The interchange is also not a bus route for area schools. This interchange is a former toll plaza location but in the mid 2000's the toll booths were removed.

E. Social Demands & Economic Development

Butler County has not experienced robust residential or industrial growth. Green River Youth Development Center, Rust Construction Company, and Tichenors Tree Service are near the interchange and are accessed through this segment of US 231. The PCPP (noted in section D above) is a user of this interchange.

II. PROJECT PURPOSE AND NEED (cont.)

F. Transportation Demand

The last actual traffic count (2016) for this interchange at Stations: 816 (SB Entrance Ramp), 817 (SB Exit Ramp), 818 (NB Entrance Ramp), and 819 (NB Exit Ramp) were 239, 489, 476, and 241 respectively. Totaling all 4 ramps at the interchange, an AADT of 1,445 was counted in 2016. For future Traffic (2040) on WN 9007 without Interstate Spur Designations, the projected annual growth rates range from 0.9% to 3.1% and for future Traffic (2040) with Interstate Spur Designations, the projected annual growth rate range from 1.1% to 3.6% (See key findings of I-69/I-66/I-65 Spurs, and US 60 Connection Strategic Planning Corridor Study May 2014). Additionally, on WN 9007, the traffic count at MP 32.1, Station 813 is 8,403, and at MP 37.1, Station 289 the count is 7,240. US 231 traffic near the interchange at MP 15.9 is 1,829 (5.515% trucks), and at MP 18.9 is 2,065.

G. Capacity

According to the May 2014 study (noted in section F above) the WN 9007 currently operates at a LOS A. Neither WN 9007 or US 231 have any capacity issues. The interchange will operate at a LOS A in the 2040 design year as well.

H. Safety

This interchange between WN 9007 and US 231 has not been flagged as a high crash location with a Critical Rate Factor (CRF) greater than 1. Since 2010 there have been 18 crashes between MP 35.68-36.49 on the parkway, 2 crashes reported on the ramps, and 1 crash at MP 17.95 on US 231. A third of these were deer related. By observation, it appears conflict causes by weaving and confusion over who has the right-of-way when merging contributes to unsafe conditions at this interchange. Water ponding during heavy rains also appear to contribute to crashes near this interchange.

I. Roadway Deficiencies

The WN 9007/US 231 Interchange (Exit 36 of William Natcher Parkway) has several geometric deficiencies that do not meet current interstate standards as defined in AASHTO's A Policy on Design Standards Interstate System (DSIS) May 2016 nor AASHTO's A Policy on Geometric Design of Highways and Streets Current Edition (Green Book). The issues are as follows: It has inadequate weaving lengths between entrance and exit ramps which contribute to safety issues at the interchange. The length is approximately 250'. A yield condition at the ramps also contributes to rear end crash risks. Weaving conflicts between entering and exiting traffic at adjacent ramps along with the inadequate weaving length do not meet interstate standards. The exiting ramps do not meet the minimum criteria for acceleration and deceleration lengths. Per the Green Book, these lengths should be 800 and 550 feet respectively. The configuration of the interchange itself is geometrically deficient compared to interstate standards. The interchange does not meet interstate entrance and exit taper criteria. The entrance and exit radii are also deficient for all four ramps. The nearest driveway access measures 282' from the north bound entrance ramp which is less than the 300' minimum per standards. This interchange is a former toll booth location. As a toll booth the interchange operated as a stop condition. After the removal of the toll booth the safety risks and deficiencies are more severe for the continuous flow of traffic.

III. PRELIMINARY ENVIRONMENTAL OVERVIEW

A. Air Quality

Project is in: ☑ PM 2.5 County

STIP Pg.#: Admin Mod 2016.004 FY 2017-2020 **TIP Pg.#:**

This project is from the Parent project number 3-2042.00

B. Archeology/Historic Resources

☐ Known Archeological or Historic Resources are present

There was one archaeology site located southwest of the interchange at the cell tower. This is Site 15Bt117, a non-descript prehistoric site, that was not recommended for additional work. This site is not located within the impact area of the project.

C. Threatened and Endangered Species

Listed T & E Species for Butler: Gray Bat, Indiana Bat, Northern Long-eared Bat, Catspaw, Clubshell, Fanshell, Northern Riffleshell, Orangefoot Pimpleback, Pink Mucket, Rabbitsfoot, Ring Pink, Rough Pigtoe, Sheepnose, Snuffbox, and Speataclease. The listed mussel species will be "No Effect" as there is no habitat present for these species. The listed bats species could be present.

D. Hazardous Materials

☐ Potentially Contaminated Sites are present ☐ Potential Bridge or Structure Demolition

No sites are visible within the project area. The bridge over Natcher Parkway will not be demolished.

E. Permitting

Check all that may apply: ☐ Waters of the US ☐ MS4 area ☑ Floodplain Impacts ☐ Navigable Waters of the US Impacts

Are 401/404 Permits likely to be required? ☑ Yes ☐ No Impacts to: ☐ Wetlands ☑ Stream/Lake/Pond

☑ ACE LON ☐ ACE NW ☐ ACE IP ☐ DOW IWQC ☐ Special Use Waters

There are small drainage ditches in the existing interchange. The new interchange design will most likely impact these drainage ditches. Project is in close proximity to the Flood Zone AE of West Prong of Indian Camp Creek.

F. Noise

Are existing or planned noise sensitive receptors adjacent to the proposed project? ☑ Yes ☐ No

Is this considered a "Type I Project" according to the KYTC Noise Analysis and Abatement Policy? ☑ Yes ☐ No

The project is the physical alteration of the exiting Exit 36 US 231 Natcher Interchange. There are a couple of houses and businesses near the current interchange.

G. Socioeconomic

Check all that may apply: ☑ Low Income/Minority Populations ☐ Relocations ☐ Local Land Use Plan available

There is a mobile home park with rental units available. Relocations are not anticipated. The reconstruction of the Exit 36 Interchange will benefit the community by providing safer entry and exit to and from the future Natcher Parkway/I-65 Spur.

H. Section 4(f) or 6(f) Resources

The following are present on the project: ☐ Section 4(f) Resources ☐ Section 6(f) Resources

No 4 (f) or 6(f) resources within the direct impacts area are known.

Anticipated Environmental Document: CE Level 3

IV. PROJECT SCOPING, NEEDS & PURPOSE

A. Scoping & Need:

The existing ramps have safety issues in the weaving conflict between entering and exiting traffic. The future I-65 Spur to Owensboro would traverse through this corridor. The existing WN 9007/US 231 Interchange (Exit 36 of William Natcher Parkway) ramps are geometrically deficient when measured against the DSIS or the Green Book. Presently, the interchange does not meet the standards required for the Natcher Parkway to become an interstate spur.

B. Draft Project Purpose:

The purpose of this project is to improve the safety and traffic flow on the interchange as well as upgrade the interchange to interstate standards for the future I-65 Spur connecting Bowling Green to Owensboro.

V. PROJECT ESTIMATE & METHODOLOGY

Estimate Methodology:

A construction cost estimate was developed for a standard diamond interchange. The estimate was developed with statewide LiDAR data, archived construction plans of the exiting interchange, and current unit costs from the KYTC Estimator Catalog using 30% Contingency. Right of Way and utility impacts were analyzed and compared to highway plan estimates. These are sufficient for both. No further estimates were developed for Right of Way or utility impacts (no proximity damages or relocations are anticipated). Construction cost in the highway plan assumed replacement of the exiting US 231 Bridge. It is not anticipated that this will be necessary and the current estimate reflects this cost savings.

Current Estimate

Phase	Estimate
Planning	$0
Design	AUTHORIZED
R/W	N/A
Utilities	N/A
Const	$5,864,200
Total	$5,864,200

VI. UTILITIES POTENTIALLY AFFECTED - CONTACT INFORMATION

Company Name -	Warren Rural Electric Cooperative Corporation
Contact -	Jonathan Lindey, Field Engineer
Address -	951 Fairview Avenue, P. O Box 1118, Bowling Green, KY 42102
Phone No. -	270-842-6541
Company Name -	AT&T - KY
Contact -	Travis Parsley, GEO Manager
Address -	1150 State Street, Bowling Green, KY 42101
Phone No. -	270-846-3196
Company Name -	Mediacom Southeast, LLC
Contact -	Albert Gaboriault
Address -	90 North Main, Benton, KY 42025
Phone No. -	270-339-6040
Company Name -	Warren County Water District
Contact -	Ryan Leisey, P.E., Manager of Engineering
Address -	523 Highway US-31W Bypass, Bowling Green, KY 42102
Phone No. -	270-842-0052
Company Name -	Butler County Water System, Incorporated
Contact -	Lewis Sorrels, Manager
Address -	South Tyler Street, Morgantown, KY 42261
Phone No. -	270-934-2051

VII. TABLES AND EXHIBITS

Photo 1: On WN 9007 at US 231 ramp facing north.

Photo 2: On WN 9007 at US 231 ramp facing south.

VII. TABLES AND EXHIBITS (cont.)

Photo 3: Aerial view of the WN 9007 Interchange with US 231.

Photo 4: A view of the weaving area that entering and exiting vehicles must navigate.