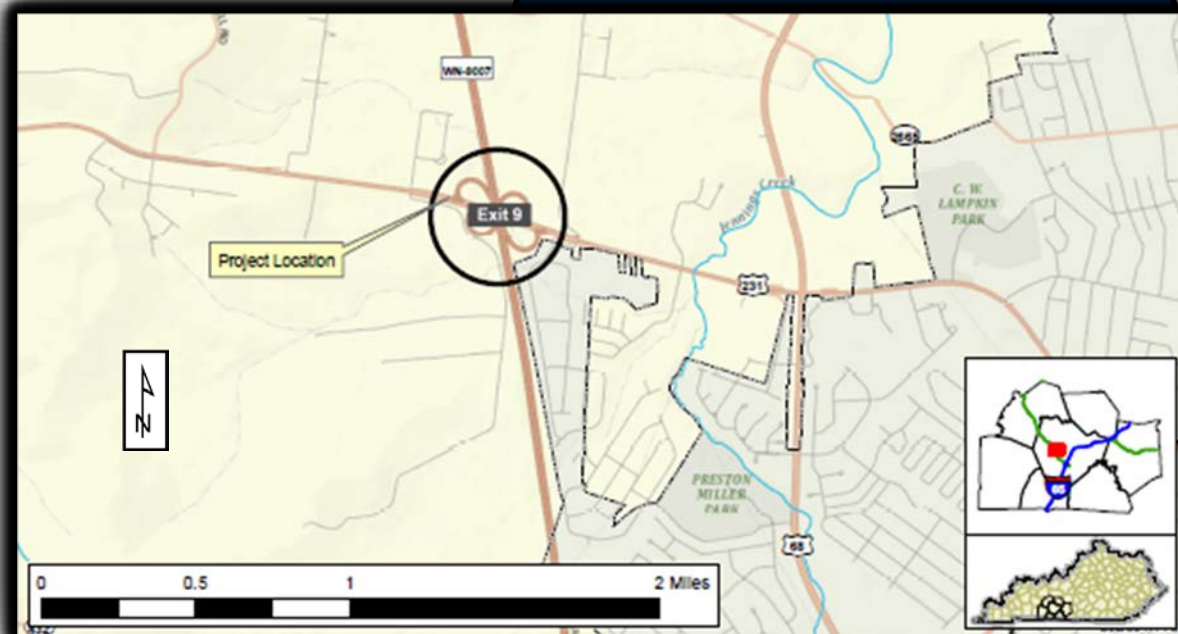
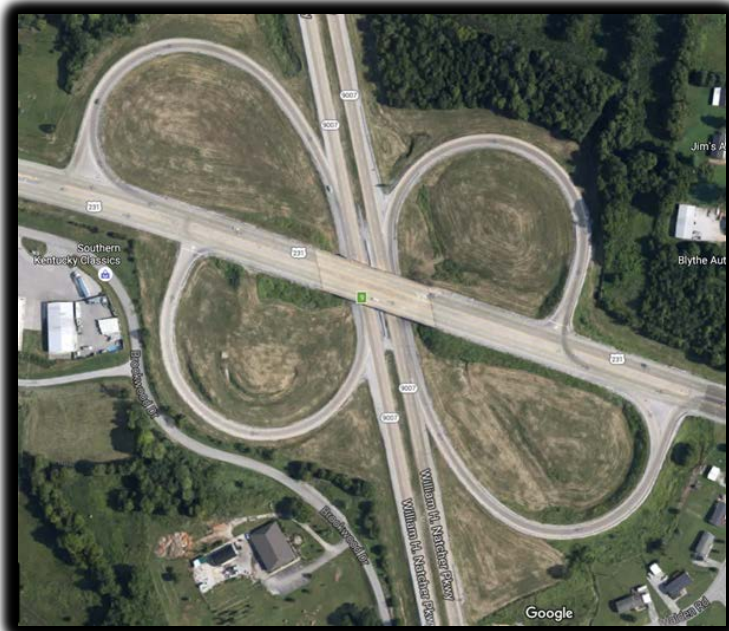


Data Needs Analysis



Scoping Study



Natcher Parkway
(WN 9007)/
US 231 interchange,
Warren County
Item No. 3-202.00

Prepared by the
KYTC District 3

October 2016



3-202.00 Warren	Data Needs Analysis Scoping Study	WN 9007/US 231 Safety
I. PRELIMINARY PROJECT INFORMATION		
County:	Warren	Item No.: 3-202.00
Route Number(s):*	WN 9007/US 231	Road Name: William Natcher Parkway/Morgantown Road
Program No.:	9176501D	UPN: 114 9007 009-010 1.00
Federal Project No.:	NHPP 0031010	Type of Work: Safety
2016 Highway Plan Project Description:		
Reconstruct the existing Natcher Parkway/US 231 Interchange (Ramps) on west side of Bowling Green (12CCR)		
Beginning MP:	9.4	Ending MP: 9.6 Project Length: 0.2
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: 14.69%
MPO Area:	Bowling Green	Terrain: Rolling
ADT (current):	11,035/3600 (2015)	
Access Control:	☐ None ☐ Permit ☒ Fully Controlled ☐ Partial	Spacing: 2
Median Type:	☐ Undivided ☒ Divided (Type):	
Existing Bike Accommodations:	None	Ped: ☐ Sidewalk
Posted Speed:	☐ 35 mph ☐ 45 mph ☐ 55 mph	☒ Other (Specify): 70mph/50 mph
KYTC Guidelines Preliminarily Based on : 50 MPH Proposed Design Speed		
COMMON GEOMETRIC		
Roadway Data:	EXISTING	PRACTICES**
No. of Lanes	1	1
Lane Width	Varies	15'
Shoulder Width	4-6'	4-6'
Max. Superelevation***	varies	8%
Minimum Radius***	230'	760'
Maximum Grade	4%	6%
Minimum Sight Dist.	205'	425'
Sidewalk Width(urban)	N/A	N/A
Clear-zone [†]	varies	20-26'
Existing Rdwy. Plans available? ☒ Yes ☐ No Year of Plans: 1971 ☒ Traffic Forecast Requested Date Requested: 9/12/2016 ☒ Mapping/Survey Requested Date Requested: 9/2/2016 Type: Aerial		
Bridge No.:#	114B00055N	
Sufficiency Rating	96.1	
Total Length	294'	
Width, curb to curb	72'	
Span Lengths	86'	
Year Built	1972	
Posted Weight Limit	no restrictions	Detour Length(s):
Structurally Deficient?	no	
Functionally Obsolete?	no	
Existing Bridge Type	stringer/girder	
*If more than one road is included in the project, include additional sheets. +AASHTO's Roadside Design Guide **Based on proposed Design Speed ***AASHTO's A Policy on Geometric Design of Highways and Streets #If more than two bridges are located on the project, include additional sheets.		

II. PROJECT PURPOSE AND NEED

A. Legislation

The following funding was listed in the 2016 General Assembly's Enacted Highway Plan.

<i>Funding</i>	<i>Phase</i>	<i>Year</i>	<i>Amount</i>
NH	D	2017	\$1,250,000
NH	R	2019	\$1,740,000
NH	U	2019	\$1,690,000
NH	C	2021	\$9,130,000

B. Project Status

The design funds were authorized on 6/13/2016 and the project will be included in the STIP.

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 Urban Minor Arterial connecting the city of Bowling Green to the city of Morgantown and extending on through Owensboro. Both highways serve as connections between the city of Bowling Green and the western portion of the state. Both highways connect the city of Bowling Green to residential and industrial areas, educational and sports facilities. The interchange helps connect 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 9 and Exit 28.

D. Modal Interrelationships

Because of the large percentage of industrial uses along the William Natcher Parkway Corridor, the movement of large trucks (freight) needs to be considered. The existing 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.

E. Social Demands & Economic Development

Warren County continues to experience residential and industrial growth. Several residential and religious institutions are accessed through this segment of US 231. US 231 also serves as the primary access point to the Southcentral Kentucky Community and Technical College, the Kentucky National Guard Recruiting Offices, Lamkin Park, residential developments, religious institutions, Warren Central High School, and Morgantown Rd. Wal-Mart as well as the most western route to reach the Western Kentucky University campus. The Barren River Volunteer Fire Department also uses the facilities.

II. PROJECT PURPOSE AND NEED (cont.)

F. Transportation Demand

The last actual traffic count (2015) for the interchange station 590 between MP 9.5 and MP 9.6 was 3600 AADT. Totalling all 4 ramps at the interchange, an AADT of 12443 was counted in 2015. Future Traffic (2040) without Interstate Spur Designations: The projected annual growth rates range from 0.9% to 3.1% on WN 9007. Future Traffic (2040) with Interstate Spur Designations: The projected annual growth rates range from 1.1% to 3.6% on WN 9007 (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, traffic count at MP 7.3 at station 597 is 11,035 and MP 12.5 at station 795 is 14,583.

G. Capacity

The WN 9007 currently operates at a LOS A. Neither WN 9007 or US 231 have any capacity issues. The northeast ramp (exiting the northbound lane off the parkway turning left towards Bowling Green) currently meets signal warrants. Installation of a signal at this location is proposed in 2017.

H. Safety

This interchange between WN 9007 and US 231 has historically been flagged as a high crash location with Critical Rate Factors (CRF) greater than 1. Since 2011 there have been 17 crashes between MP 9.4-9.7 on the parkway, 22 crashes reported on the ramps, and 25 crashes between MP 14.6-15.0 on US 231. One of the crashes on US 231 resulted in a fatality. KYTC Highway Information System shows a critical rate factor of 2.606 on US 231 within the one mile segment from MP 14.77 to 15.77 from years 2010 to 2014. By observation, conflict caused by weaving and confusion over who has the right-of-way when merging is a primary cause of the crashes at this interchange.

I. Roadway Deficiencies

The WN 9007/US 231 interchange (Exit 9 off the William Natcher Parkway) has several deficiencies that do not meet current standards as defined in AASHTO's A Policy on Design Standards Interstate System January 2005. The issues are as follows: It has inadequate weaving lengths between entrance and exit ramps which contribute to safety problems at the interchange. A yield condition at the ramps also contributes to rear end crash risks. Weaving conflict between entering and exiting traffic at adjacent ramps along with the inadequate weaving length do not meet interstate standards. The existing ramps do not meet the minimum criteria for acceleration and deceleration lengths. The configuration of the interchange itself is deficient and is not an acceptable configuration under interstate standards. The interchange does not meet interstate entrance and exit taper criteria. The interchange ramps do not meet interstate standard design speeds.

III. PRELIMINARY ENVIRONMENTAL OVERVIEW

A. Air Quality

Project is in: ☒ Attainment area ☐ Nonattainment or Maintenance Area ☐ PM 2.5 County

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TIP Pg. #:

B. Archeology/Historic Resources

☐ Known Archeological or Historic Resources are present

There are no known Archeological sites listed in this area. If we stay within the foot print of the existing interchange we shouldn't find any intact arch sites as this area has been disturbed. There is potential for arch sites near undisturbed sinkhole areas.

C. Threatened and Endangered Species

Listed T & E Species for Warren County: Kentucky Cave Shrimp, Gray Bat, Indiana Bat, Northern Long-eared Bat, Catspaw, Clubshell, Fanshell, Northern Riffleshell, Orangefoot Pimpleback, Pink Mucket, Rabbitsfoot, Rayed Bean, Ring Pink, Rough Pigtoe, Sheepnose, Snuffbox, and Speataclease and Price's Potato Bean. I feel the listed mussel species, Prices's Potatoo Bean and the KY Cave Shrimp 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

There are oil wells in the area that could have potential for contamination. Sinkholes are sometimes used as dump sites.

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

Project is located in a MS4 area. There is a stream that currently runs through the existing Interchange. The new interchange design will most likely impact this stream. I measured 1,120 feet of possible stream impacts.

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 existing US231 Natcher Interchange. It should increase the distance between noise receptors and the ramps.

G. Socioeconomic

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

Project is in close proximity to a mobile home subdivision, church, automotive repair center and a county road. I think a small footprint of the new interchange configuration will not impact these sites.

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 areas

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 9 off the William Natcher Parkway) ramps are deficient when measured against AASHTO's A Policy on Design Standards Interstate System January 2005.

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:	Current Estimate	
Construction cost estimates were developed for a standard diamond and a flop diamond interchange. The flop diamond utilizes the loop ramps on the north side of the existing interchange. These estimates were developed with statewide lidar data, archived construction plans of the existing interchange, and current unit costs from the KYTC Estimator Catalog with a 30% contingency. Right of way and utility impacts were analyzed for both alternates and no significant differences were found. No estimates were developed for right of way or utility impacts. The dollar amount listed for each phase in the highway plan are adequate to cover the costs of the current estimates. Construction costs in the highway plan assumed replacement of the existing US 231 Bridge. It is not anticipated that this will be necessary and the current estimates reflect this cost savings.	<u>Phase</u>	<u>Estimate</u>
	Planning	\$0
	Design	AUTHORIZED
	R/W	N/A
	Utilities	N/A
	Const	\$5,790,800
	Standard Diamond	
	Const Flop Diamond	\$4,031,800

VI. UTILITIES POTENTIALLY AFFECTED - CONTACT INFORMATION

Company Name -	Warren Rural Electric Cooperative Corporation
Contact -	Jonathan Lindsey, Field Engineer
Address -	951 Fairview Avenue, P.O. Box 1118, Bowling Green, KY 42102
Phone No. -	270-842-6541
Company Name -	Bowling Green Municipal Utilities
Contact -	Teresa Newman, General Services Manager
Address -	801 Center Street, P.O. Box 10300, Bowling Green, KY 42102-4300
Phone No. -	270-782-1200
Company Name -	Atmos Energy
Contact -	Ryne White, Engineer II
Address -	3275 Highland Point Drive, Owensboro, KY
Phone No. -	270-685-8140
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 -	Boardwalk Pipeline Partners Northern Division - Texas Gas
Contact -	Jason Blevins, PMP
Address -	11115 Industriplex Blvd, Suite 800, Baton Rouge, Louisiana 70809
Phone No. -	713-479-8279
Company Name -	Level 3 Communications, LLC
Contact -	Kevin Webster, Outside Plant Technician
Address -	848 South 8th Street, Louisville, KY 40203
Phone No. -	502-777-8622
Company Name -	Time Warner Cable
Contact -	Tom 'Tosh' Mracek, Project Supervisor
Address -	515 Double Springs Road, Bowling Green, KY 42102-0659
Phone No. -	270-780-2186
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

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.