DESIGN WAIVER REQUEST FORM

TO: TDOT Region 4 Project Development Director

FROM: Stephanie Kissell**,** Design Manager, Project Development, TDOT

DATE: **1/22/2020**

This form is to be used on projects requesting a Design Waiver to non-controlling elements of design on any roadway project.

Design Waiver:

For non-controlling element deviations, a Design Waiver Request must be completed. These requests do not require FHWA's approval; the Roadway Design Division Director provides final approval. These requests include, but are not limited to, clear zone width, passing sight distance, vertical curves, and multimodal features.

DOCUMENTATION

Design Waivers to non-controlling criteria

A design ***waiver*** is a variance based on non-controlling criteria. All requests shall be documented on this form. Plan sheets, location map, and supplemental information (i.e. google maps) must be enclosed for a timely review by the Department. All design waivers must be justified based on the objective and context demonstrating compliance with accepted transportation engineering principles and reasons for the decisions. The proposed variation shall not diminish the existing operation and safety of the facility. Historical in-service performance or a traffic engineering study (on site or simulation) may be required.

Waivers to Non-Controlling Criteria typically require futher evaluation of the design elements to support the request such as,

- Curent design criteria that could not be met.
- Existing roadway characteristics.
- Alternatives considered.
- Comparison of the safety and operational performance of the roadway and other impacts such as right-of-way, community, environmental, cost, and usability by all modes of transportation.
- Proposed mitigation measures.
- Compatibility with adjacent sections of roadway.

Additional guidance can be found in the Highway Capacity Manual, Highway Safety Manual, Performance Based Practical Design, and Flexibility in Design. Design Waiver Requests located within the city limits require a letter from the local agency approving the request.

PROJECT DATA	
Current Project Phase	**Planning** ☐ **Design** ☒ **Construction** ☐ **Scope change** ☐ **(Evaluate NEPA impact)**
County/ City	**Fayette**
PIN	**128113.02**
Federal Project No.	**BR-STP-193(11)**
State Project No.	**24029-0207-94**
Project Limits	**S.R. 193 (Macon Rd.) Bridge Replacement Over Branch at L.M. 11.48**
Local Program Project **State Let** **Local Let**	Yes☐ No ☒ If yes, then Yes☒ No ☐ Yes☐ No ☒
Project Type	New Alignment ☐ Reconstruction ☐ Resurfacing ☐ Road Diet/Road Reconfiguration ☐ (Note: Road Diet Evaluation form may be required) Maintenance ☐ Road Safety Audit ☐ Bridge Repair ☐ Bridge Rehabilitation ☐ Signilization ☐ Other ☒
US Route/NHS	Yes☐ No ☒
State Route	Yes☒ No ☐
Appalachian Development Highway System	Yes☐ No ☒
FHWA PODI Project	Yes☐ No ☒
Project Scope (Briefly describe the objective of project)	Current sufficiency rating of bridge is 68.9. Existing structure (two-span concrete channel beam bridge with timber substructures) to be replaced with a proposed box/slab bridge or culvert. Project will undergo design/build process using preliminary plans and design criteria.
Project Commitments	In accordance with the MOA between USFWS, FHWA, and TDOT Addressing Cliff Swallow and Barn SwallowNesting Sites, 9/30/2015, cliff swallow and barn swallow nests, eggs, or birds (young and adults) will not be disturbed between Aprl 15 and July 31. From August 1 to April 14, nests can be removed or destroyed, and measures implemented to prevent future nest building at the site (e.g. closing off area using netting).

ROADWAY GEOMETRIC DESIGN DATA	
Highway Functional Classification: **(See Green Book 2011 Section 1.3)**	Freeway ☐ Arterial☐ Collector ☒ Local Road/Street ☐
Rural or Urban Context	Rural ☒ Rural Town (city limits) ☐ Suburban (initially designed as rural but currently in city limits) ☐ Urban (city limits) ☐ Urban Core (in the metropolitan government jurisdiction) ☐
Roadway Typical Section Standard Drawing:	RD11-TS-2
Existing Design Speed:	<45
Existing Posted Speed:	45
Proposed Design Speed:	45
Proposed Posted Speed:	45
Type of Terrain:	Level ☐ Rolling ☒ Mountainous ☐
Traffic Data:	ADT (2022): 1540 D: 65/35 ADT (2042): 1730 T: 4% DHV: 190
Access Control	None☒ Partial ☐ Full☐
Multimodal Design Elements Included in the scope of the Project	Pedestrian ☐ Pedestrian Signals ☐ Curb Ramps ☐ Shared-Use Paths ☐ New sidewalks ☐ Non-motorized Enhancement ☐ Bicycle ☐ (including bike route/lane, tract addition to existing roadway facility)
Bus Route	Yes☐ No ☒

GEOMETRIC DESIGN NON-CONTROLLING ELEMENT CRITERIA All applicable non-controlling elements must be completed for Design Waiver requests		
	Existing	**Proposed**
Passing Sight Distance:		700’
Crest/Sag Vertical Curve:		61/79
Design vehicle:		WB-62
Clear Zone width:	8’ +/-	16’
Other:		

MULTIMODAL FEATURES				
Facility Type:	Roadway ☒	Pedestrian ☐	Bicycle ☐	Shared-Use ☐
	Existing		**Proposed**	

Curb Shape:	N/A	N/A
Curb Ramp:	N/A	N/A
Sidewalk:	N/A	N/A
Shared-use Path:	N/A	N/A
Mid-block Crossing:	N/A	N/A
RRFB or HAWK:	N/A	N/A
Bike Lane:	N/A	N/A
Bike Lane Buffer:	N/A	N/A
Bike Route:	N/A	N/A
Bike Lane at Intersection:	N/A	N/A
Cycle Track:	N/A	N/A
Transit Facility/Stop	N/A	N/A
Other:	N/A	N/A

CRASH HISTORY			
Years Reviewed	Total Crashes	Fatal Crashes	Injury Crashes
2015-2019	0	0	0
VMT	Crashes/VMT	FatalCrashes/VMT	Injury Crashes/VMT
562,000	0	0	0

TDOT DIRECTIVES TO BE CONSIDERED FOR THE WAIVER REQUEST			
	YES	**NO**	**N/A**
SAFETY			
Crash history data has been reviewed and is enclosed.	☒	☐	☐
All roadway and roadside safety mitigation measures have been considered and provided.	☒	☐	☐
The proposed variance from the minimum roadway design standards does not adversely affect the safety of the facility.	☒	☐	☐
The Highway Safety Manual was used to justify the Design Waiver.	☐	☒	☐
OPERATIONS			
The operation of the proposed typical cross-section is comparable with operation of the adjacent cross-sections.	☒	☐	☐
The proposed design does not cause a reduction in capacity or adversely affect traffic flow of the facility.	☒	☐	☐
The proposed design does not adversely affect long-term operations.	☒	☐	☐
The proposed design does not impact the existing access control.	☒	☐	☐
Travel demand management solutions have been evaluated.	☒	☐	☐
ROADWAY DESIGN			
It is not feasible to meet the minimum roadway design standards due to right-of-way restrictions, environmental impacts, etc.	☒	☐	☐
The proposed design maintains the same level of service compared to the design based on minimum roadway design standards.	☒	☐	☐
The proposed design results in a significant cost savings compared to the design based on minimum roadway design standards.	☒	☐	☐
The proposed design can meet minimum roadway design standards in the future.	☒	☐	☐
ENVIRONMENTAL			

Does the request affect environmental permit requirements? (TDEC/TVA/CORPs/TWRA, etc.)	☒	☐	☐
Historical Section 106	☐	☒	☐
WORK ZONE			
Will the proposed variation affect the TMP?	☐	☒	☐

GEOMETRIC DESIGN DATA
Controlling elements must be completed for all Design Waiver Requests

	Proposed	N/A
Design Speed:	45	
Design Loading structural capacity:	HL-93	
Lane width:	11’	
Shoulder width (inside/outside):	6’	
Cross Slope:	2%	
Superelevation Rate:	5.8%	
Horizontal Curve Radius:	1376.72	
Stopping Sight Distance:	360’	
Maximum Grade:	8%	
Vertical Clearance:		
Navigational Waterway:		X
Grade separation:		X
Railroad crossing:		X

DESCRIBE THE REASONING OF THE DESIGN WAIVER REQUEST:
(Address project needs, with consideration of all transportation modes, community engagement, safety, and with consistency towards long term planning and vision.)
Use shorter superelevation transition length to achieve design curve superelevation between reverse curves while minimizing project impacts. This issue is created by the substandard existing cross slopes where we must tie. The proposed transition rate of change meets 40 mph design. Full superelevation proposed meets design speed of 45 mph.

JUSTIFICATION OF THE DESIGN WAIVER:
(Provide an explanation of the requested design waiver and describe other nationally recognized guidance that is met and that the design is based upon. Attach documentation of the specific design guidance met.)

The existing and proposed bridge is located between two horizontal curves with radii of 1,950 ft. and 1,376.72 ft. respectively. The PIs of the two curves are 478.98 ft. apart and PT of the first curve and PC of the second curve are 55.03 ft. apart. The proposed grade of the approaches and across the bridge is the same as the existing. Standard lane widths and shoulders are proposed across the proposed bridge and approaches to the limits of the proposed guardrails and the tapered down to the existing lane and shoulder widths. The fill over the proposed box bridge is less than one foot with a minimum fill of 3.25 inches (basically the surface and binder pavement layers as minimum fill). Superelevation is being kept low (0% at sta. 30+74.62) due to the shallow fill. Utilizing standard superelevation transition lengths would lengthen the project, increase right-of-way and environmental impacts, and possibly impact a substandard crest vertical curve east of the current project limits. No accidents have been recorded in the last five years

within 0.1 mile of the bridge. Would propose installing reverse curve warning signs (W1-4) with 40 mph advisory speed plates (W13-1P) if waiver is approved.

DESIGN WAIVER REQUEST – JUSTIFIED BASED ON GUIDANCE FROM THE FOLLOWING:					
Design Guidance Source	Design Guidance Met				
	YES	NO	N/A	Do Not Know	Source Reference if answered "Yes" (page, section, drawing, etc.)
AASHTO Publication	☐	☒	☐	☐	
Highway Safety Manual	☐	☐	☒	☐	
Highway Capacity Manual	☐	☐	☒	☐	
FHWA Publication	☐	☐	☒	☐	
NCHRP Publication	☐	☐	☒	☐	
TRB Publication	☐	☐	☒	☐	
TDOT Design Guidelines	☐	☒	☐	☐	
TDOT Standard Drawings	☐	☒	☐	☐	
Guidance from other states	☐	☐	☐	☒	
Other (MUTCD)	yes				Reverse curve w/adv. speed signs recommended (Table 2C-5, p. 110)

DESCRIBE THE ALTERNATIVES CONSIDERED
(Provide an explanation of proposed mitigation measures to offset impact such as cost, ROW, environmental, multimodal, safety and operation, community and usability, or compatibility with adjacent section of the roadway)
Alternatives Considered include:
1) lengthening the project with increased right-of-way and environmental impacts
2) using the standard transition rate and the max super achievable in the length of curve available
3) lowering the design speed through the improvements

DESIGN WAIVER IS REVIEWED AND RECOMMENDED FOR APPROVAL BY:

Gary Scruggs, C.E. Manager 2 — 1/22/2020
Regional Project Development Director — **Date**

DESIGN WAIVER APPROVED BY:

Jennifer Lloyd
Director, Roadway Design Division, TDOT — 1/22/2020
Roadway Design Division Director or Designee — **Date**

☒ Reviewer Comments Attached
☒ Attachments