

DEPARTMENT OF TRANSPORTATION

DESIGN DIVISION

SUITE 1200, JAMES K. POLK BUILDING 505 DEADERICK STREET NASHVILLE, TENNESSEE 37243-1402 (615) 741-0835

CLAY BRIGHT COMMISSIONER BILL LEE GOVERNOR

INSTRUCTIONAL BULLETIN NO. 19-17

Regarding Revised Design Exception Request and Design Waiver Request

Effective immediately, the Design Exception Request Form has been updated and a Design Waiver Request has been created.

The Design Exception Request is for controlling elements and is now more descriptive to allow designers to better explain and justify their reasoning behind the design exception.

A Design Waiver form has been created to address non-controlling criteria design deviations. This form includes: Geometric Design Non-Controlling Elements, Multimodal Features, Crash History, TDOT Directives, and Geometric Design Data. This form now incorporates the Multimodal Design Deviation Request form. The Multimodal Design Deviation Request form should no longer be used.

The online Roadway Design Guidelines Sections 3-110.02, 3-110.03, and 9-908.00 do not reflect these changes.

Gennifer Llay

This IB voids IB 17-02.

Jennifer Lloyd, PE Civil Engineering Director

KJL:JDK:ADP:LHC

KJL:JDK:ADP:LHC October 29, 2019

3-110.02 DESIGN EXCEPTION REQUESTS

Despite the range of flexibility that exists with respect to the controlling elements of design, there are situations in which the accepted criteria are not applicable to the project circumstances or cannot reasonably be met. For such instances, when it is appropriate, the <u>design exception</u> process allows for the use of criteria other than the accepted values. Design exceptions can be viewed as opportunities to add practicality or value to the design. They should not necessarily be viewed as violation of policy.

The design exception process requires formal approval for exceptions relating to the following 10 controlling criteria of design:

Type I Exception to Controlling Criteria

- Design Speed
- Design Loading Structural Capacity

For exceptions based on Type I Criteria, all roadways on the **NHS** require FHWA's approval, otherwise the Roadway Design Division Director provides final approval. Exceptions to Type I criteria are rare and additional information shall be provided.

Type II Exception to Controlling Criteria

- Lane Width
- Horizontal Curve Radius
- Stopping Sight Distance
- Shoulder Width

- Cross Slopes
- Vertical Clearance
- Superelevation Rate
- Maximum Grade

For exceptions based on Type II Criteria, all roadways on the **NHS** with design speeds ≥ 50 mph require FHWA's approval, otherwise the Roadway Design Division Director provides final approval.

All other roadways (non-NHS) exceptions to controlling criteria do not require FHWA's approval; the Roadway Design Division Director provides final approval.

Projects designated as Limited Scope do not require a design exception.

Note: Roadways on the Appalachian Development Highway System, or FHWA Projects of Division Interest (PODI) require FHWA's approval for design exceptions regardless of the controlling criteria.

Design exception requests for projects shall be submitted to the Regional Director of Project Development using the Design Exception Form, shown in *Figure 2-4, Design Exception Form.* Once reviewed and recommended for approval, the Regional Director of Project Development shall forward the design exception request form to the Roadway Design Division Director, who will either provide final approval or forward to FHWA for final approval, as appropriate.

Approved design exceptions **shall** be noted, with approval date, in the lower right corner of the title sheet as well as on the cover sheet for the R.O.W. and Construction checklist.

All applicable material from the following list shall be addressed in narrative form on the Design Exception Request Form, shown in *Figure 2-4, Design Exception Form,* by the Designer. For locally developed projects, the highest local official responsible for the project is responsible for this task.

- 1. Accident experience or data.
- 2. The effect of the variance from the design standard on safety and operation of the facility.
- 3. Any safety mitigation measures considered and provided to minimize the effect of the reduced design.
- 4. The compatibility of the design and operation with adjacent sections.
- 5. The comparative cost of the full standard versus the reduced design being proposed.
- 6. The long-term effect of the reduced design as compared to the full standard.
- 7. The difficulty in obtaining the full standard such as right-of-way restriction, delays, environmental impacts, etc.
- 8. Any capacity reductions or operational problems caused by the proposed exception.
- 9. Level of service for full standards versus the reduced design.
- 10. The cumulative effect of more than one standard that is being reduced.
- 11. The possibility of improving or correcting the reduced design feature in the future.

DESIGN EXCEPTION REQUEST FORM



TO: Choose One FROM: Choose One

DATE: Click here to enter a date.

This form is to be used on projects requesting a Design Exception where roadway projects do not meet the 10 controlling elements of the geometric design criteria.

Design Exception:

Type I Exception to Controlling Criteria

- Design Speed
- Design Loading Structural Capacity

For exceptions based on Type I Criteria, all roadways on the **NHS** require FHWA's approval, otherwise the Roadway Design Division Director provides final approval. Exceptions to Type I criteria are rare and additional information shall be provided.

Type II Exception to Controlling Criteria

- Lane Width
- Horizontal Curve Radius
- Stopping Sight Distance
- Shoulder Width

- Cross Slopes
- Vertical Clearance
- · Superelevation Rate
- Maximum Grade

For exceptions based on Type II Criteria, all roadways on the **NHS** with design speeds ≥ 50 mph require FHWA's approval, otherwise the Roadway Design Division Director provides final approval.

All other roadways (non-NHS) exceptions to controlling criteria do not require FHWA's approval; the Roadway Design Division Director provides final approval.

Note:

Roadways on the Appalachian Development Highway System, or FHWA Projects of Division Interest (PODI) require FHWA's approval for design exceptions regardless of the controlling criteria.

DOCUMENTATION

A design **exception** is a variance based on one or more of the controlling criteria (either Type I or Type II). 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 exception requests 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

Page 1 of 7

Figure 2-4
Design Exception Request Form

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.

Type I Exception to Controlling Criteria requires additional documentation:

- Design Speed exceptions. Length of section with reduced design speed compared to overall length of project. Measures used in transitions to adjacent sections with higher or lower design or operating speeds.
- Design Loading Structural Capacity exceptions. Verification of safe load-carrying capacity (load rating) for all State unrestricted legal loads or routine permit loads, and in the case of bridges and tunnels on the Interstate, all Federal legal loads.

Type II Exception to Controlling Criteria requires additional documentation:

- Specific design criteria that will 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 Exception Requests located within the city limits require a letter from the local agency approving the request.

All other geometric design variances on facilities outside the category I and II criteria shall be documented on a Design Waiver Request form.

Page 2 of 7

Figure 2-4 (Continued)
Design Exception Request Form

IB 19-17

		PROJECT DA	TA	
Current Project Phase	Planning	Design □	Construction [Scope change ☐ Evaluate NEPA impact)
County/ City	Ť			
PIN				
Federal Project No.	Î			
State Project No.				
Project Limits				
Local Program Project	Yes□	No □		
	If yes, then	N. Mariana		
State Let	Yes□	No 🗆		
Local Let		No 🗆		
Project Type				
	Reconstruction			
	Resurfacing I		- 414 - 5	
				Diet Evaluation form may
	Maintenance		be requi	rea)
	Road Safety			
	Bridge Repair			
	Bridge Rehalt Signilization			
	Other	ш		
US Route/NHS	Yes□	No □		
State Route	163L	NO L		
State House	Yes□	No □		
Appalachian		.,		
Development Highway	Yes□	No □		
System System	Yes□	No □		
FHWA PODI Project Project Scope (Briefly	res⊔	NO □		
describe the objective of				
project)				
p. ojoši,				
Project Commitments				
1 Toject communication				
	S			

Figure 2-4 (Continued)
Design Exception Request Form

	OADWAY GEOMETRIC DESIGN DATA
Highway Functional Classification:	Freeway □
Classification:	Arterial□
(See Green Book 2011	Collector
Section 1.3)	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	orban core (in the met openium gereniment janearetter)
Standard Drawing:	
Existing Design Speed:	
Existing Posted Speed:	
Proposed Design Speed:	
Proposed Posted Speed:	
Type of Terrain:	Level Rolling Mountainous
Traffic Data:	ADT (20 <u>XX</u>): D: _/_
	ADT (20 <u>XX</u>): T:%
	DHV:
Access Control	None □ Partial □ Full □
Multimodal Design	Pedestrian □
Elements Included in the	Curb Ramps □
scope of the Project	Pedestrian Signals □
	Shared-Use Path □
	New sidewalks
	Non-motorized Enhancement □
	Bicycle ☐ (including bike route/lane, tract addition to existing
	roadway facility)
	Toadway facility)
Bus Route	Yes□ No □

Figure 2-4 (Continued)
Design Exception Request Form

	Controlling el	DESIGN CONTROLLING (ements must be compli- sign Exception Requests	leted for all			
		Existing	Propos	ed		
Design Speed:		CONTROL SECTION	But Alexander			
	tructural capacity:					
Lane width:	2000 00000 000 000 000 000 000 000 000					
Shoulder width (in	side/outside):					
Cross Slope:	- 32					
Superelevation Ra						
Horizontal Curve I	Radius:					
Stopping Sight Dis						
Maximum Grade:						
Vertical Clearance						
Navigational W						
Grade separati						
Railroad crossi	ing:					
Outside Shoulder	Midthe-					
Inside Shoulder W Sufficiency Rating	Vidths: j:	CRASH HISTORY				
Inside Shoulder W Sufficiency Rating	Vidths: 1: Total	CRASH HISTORY Fatal Crashes	Injury Crasl	hes		
Outside Shoulder Inside Shoulder W Sufficiency Rating Years Reviewed	Vidths: j:		Injury Crasl	hes		
Inside Shoulder W Sufficiency Rating Years Reviewed	/idths: i: Total Crashes Crashes/VMT		Injury Crasl	hes/VI		
Inside Shoulder W Sufficiency Rating Years Reviewed VMT	/idths: i: Total Crashes Crashes/VMT	Fatal Crashes FatalCrashes/VMT	Injury Crasl	hes/VIII		
Inside Shoulder W Sufficiency Rating Years Reviewed VMT TDOT	Total Crashes Crashes/VMT	Fatal Crashes FatalCrashes/VMT CONSIDERED FOR THE F	Injury Crasl	hes/VIII	ST NO	N/A
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Figure 2-4 (Continued)
Design Exception Request Form

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he proposed design does no ravel demand management							
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is not feasible to meet the m	inimum roady	vav de	sion stand	ards due to right-of-			
ay restrictions, environmenta			sign stand	alus due to rigin. or			
he proposed design maintair			service co	mpared to the		1	
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esign based on minimum roa he proposed design can mee							
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Figure 2-4 (Continued)
Design Exception Request Form

DESCRIBE THE ALTERNATIVES CONSIDE (Provide an explanation of proposed mitigatic environmental, multimodal, safety and operat adjacent section of the roadway)	RED on measures to offset impact such as cost, ROW, tion, community and usability, or compatibility with
DESIGN EXCEPTION IS REVIEWED AND R	ECOMMENDED FOR APPROVAL BY:
Choose an item.	Click here to enter a date.
Regional Project Development Director	Date
Choose an item.	Click here to enter a date.
Roadway Design Division Director	Date
DESIGN EXCEPTION APPROVED BY:	
Choose an item.	Click here to enter a date.
Roadway Design Division Director, or FHWA Director	Date
 □ Reviewer Comments Attached □ Attachments 	

Figure 2-4 (Continued)
Design Exception Request Form

3-110.03 DESIGN WAIVER REQUESTS

A Design Waiver is a variance not based on the 10 controlling design criteria. It is any variance from the TDOT Standard Drawings. These requests include, but are not limited to, clear zone width, passing sight distance, vertical curves, and multimodal features. A Design Waiver Request Form, see *Figure 2-7, Design Waiver Request Form,* shall be submitted for approval by the Regional Project Development Director and then approved by the Roadway Design Director (or Designee).

Approved design waivers **shall** be noted, with approval date, in the lower right corner of the title sheet as well as on the cover sheet for the R.O.W. and Construction checklist. Justification shall be provided on the Design Waiver Request Form.

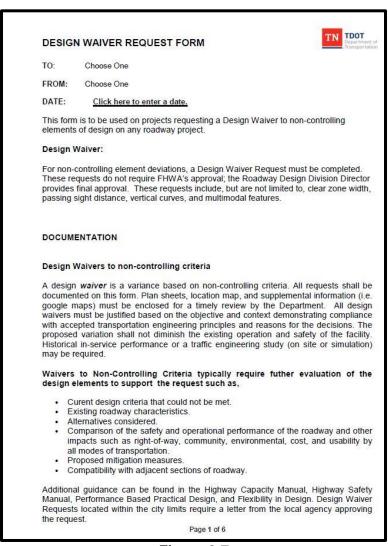


Figure 2-7
Design Waiver Request Form

IB 19-17

		PROJECT DA	TA	
Current Project Phase	Planning	Design 🗆	Co	nstruction ☐ Scope change ☐ (Evaluate NEPA impact)
County/ City	8			
PIN	1			
Federal Project No.	3			
State Project No.	2			
Project Limits				
Local Program Project	Yes□	No 🗆		
Local Frogram Froject	If yes, then			
State Let	Yes□	No 🗆		
Local Let	Yes□	No □		
Project Type	New Alignme	ent 🗆		
	Reconstruction	on 🗆		
	Resurfacing			
			ion 🗆	(Note: Road Diet Evaluation form may
	Maintenance			be required)
	Road Safety	Control of the Contro		22.1242.127
	Bridge Repai			
	Bridge Rehal			
	Signilization			
	Other			
US Route/NHS	Yes□	No □		
State Route	i es 🗆	NO L		
State Route	Yes□	No 🗆		
Appalachian Development Highway System	Yes□	No □		
FHWA PODI Project	Yes□	No 🗆		
Project Scope (Briefly	100	110 =		
describe the objective of				
project)				
B 1 (6)				
Project Commitments				
	6			
	· ·			

Figure 2-7 (Continued)
Design Waiver Request Form

R	DADWAY GEOMETRIC DESIGN DATA
Highway Functional Classification:	Freeway □ Arterial □
(See Green Book 2011 Section 1.3)	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:	
Existing Design Speed:	
Existing Posted Speed:	
Proposed Design Speed:	
Proposed Posted Speed:	<u></u>
Type of Terrain:	Level □ Rolling □ Mountainous □
Traffic Data:	ADT (20 <u>XX</u>): D: _/_ ADT (20 <u>XX</u>): T:% DHV:
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 □

Figure 2-7 (Continued)
Design Waiver Request Form

		NON-CONTROLLING			0.50	
100		Design Waiver reques		eu io.		
		Existing	Propos	sed		
Passing Sight Dist Crest/Sag Vertical Design vehicle: Clear Zone width: Other:	Curve:		081000 * 1100			
		MULTIMODAL FEATUR	Ee			
Facility Type:		AND RESIDENCE OF THE PARTY OF T	estrian 🗆 Bicycle		Phoroc	d-Use [
гасніц туре.		Existing Fede	Propo		Share	u-056 :
Curb Shape: Curb Ramp: Sidewalk: Shared-use Path: Mid-block Crossin RRFB or HAWK: Bike Lane: Bike Lane Buffer: Bike Route: Bike Lane at Inter: Cycle Track: Transit Facility/Sto Other:	section:					
Other.						
Other.		CRASH HISTORY				
Years Reviewed	Total Crashes	CRASH HISTORY Fatal Crashes	Injury Cras	shes		
			100 c€ 00 € 000 ce0 700		МТ	
Years Reviewed	Crashes Crashes/VMT	Fatal Crashes	Injury Cras	shes/V		
Years Reviewed VMT TDO	Crashes Crashes/VMT	Fatal Crashes FatalCrashes/VMT	Injury Cras	shes/V		N/A
Years Reviewed VMT TDO	Crashes Crashes/VMT	Fatal Crashes FatalCrashes/VMT BE CONSIDERED FOR	Injury Cras	QUES YES	T NO	
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Years Reviewed VMT TDO SAFETY Crash history data All roadway and ro provided. The proposed variadversely affect th The Highway Safe OPERATIONS	Crashes Crashes/VMT T DIRECTIVES TO That has been reviewed badside safety mitigation in the minimum of the facility with the safety of the facility with the safety Manual was used	Fatal Crashes FatalCrashes/VMT BE CONSIDERED FOR and is enclosed. ation measures have been um roadway design stately.	Injury Cras THE WAIVER RE en considered and ndards does not aiver.	QUES YES	NO O	

Figure 2-7 (Continued)
Design Waiver Request Form

design based on minimum roadway design standards.				
The proposed design does not impact the existing access cor Travel demand management solutions have been evaluated. ROADWAY DESIGN It is not feasible to meet the minimum roadway design standa way restrictions, environmental impacts, etc. The proposed design maintains the same level of service con design based on minimum roadway design standards.				
Travel demand management solutions have been evaluated. ROADWAY DESIGN It is not feasible to meet the minimum roadway design standa way restrictions, environmental impacts, etc. The proposed design maintains the same level of service con design based on minimum roadway design standards.	ntrol.	100000		
ROADWAY DESIGN It is not feasible to meet the minimum roadway design standa way restrictions, environmental impacts, etc. The proposed design maintains the same level of service con design based on minimum roadway design standards.				
It is not feasible to meet the minimum roadway design standa way restrictions, environmental impacts, etc. The proposed design maintains the same level of service con design based on minimum roadway design standards.				
way restrictions, environmental impacts, etc. The proposed design maintains the same level of service con design based on minimum roadway design standards.	-de due to right-of-			
The proposed design maintains the same level of service con design based on minimum roadway design standards.	las que to rigin. o.			
design based on minimum roadway design standards.	npared to the			
	• 3075 (ACC) (CONSTOLES			
The proposed design results in a significant cost savings com	pared to the	9500		226
design based on minimum roadway design standards.				
The proposed design can meet minimum roadway design sta	ndards in the			
future. ENVIRONMENTAL				
Does the request affect environmental permit requirements?		1	Ť	T.
(TDEC/TVA/CORPs/TWRA, etc.)				
Historical Section 106				
WORK ZONE		100		lust:
Will the proposed variation affect the TMP?		To		Io
Will the proposed variation affect the Tiving		Ш		
GEOMETRIC DESIGN D Controlling elements must be co Design Waiver Reque	ompleted for all			
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Figure 2-7 (Continued)
Design Waiver Request Form

				Design	n Guidance Met
Design Guidance Source	YES	NO	N/A	Do Not Know	Source Reference if answered "Yes (page, section, drawing, etc.)
AASHTO Publication					2 00 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Highway Safety Manual					
Highway Capacity Manual					
FHWA Publication					
NCHRP Publication					
TRB Publication					
TDOT Design Guidelines					
TDOT Standard Drawings					
Guidance from other states					
Other				99	
	safety a				to offset impact such as cost, ROW, nity and usability, or compatibility with
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environmental, multimodal, adjacent section of the road	safety a dway)	and op	peration	n, commun	nity and usability, or compatibility with
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environmental, multimodal, adjacent section of the road DESIGN WAIVER IS REVI Choose an item. Regional Project Develop	EWED A	AND F	Deration	MMENDED Click he Date	of the properties of the prope

Figure 2-7 (Continued)
Design Waiver Request Form

9-908.00 MULTIMODAL DESIGN DEVIATION

Designing a multimodal facility/roadway is not a one-size-fits-all approach. It requires an analysis of various site conditions to determine appropriate treatments and solutions. Using standard design elements, criteria, and dimensions may not be possible in these contexts that are often in constrained right-of-way. Applying flexibility in the geometric design process is often justified. Despite the range of flexibility that exists with respect to the controlling elements of design, there are situations in which the accepted criteria are not applicable to the project circumstances or could not reasonably be met. For such instances, when it is appropriate, the design deviation process allows for the use of criteria other than the normally accepted values.

TDOT's *Design Waiver Request Form* should be used whenever the designer recommends the use of design elements, criteria or dimensions not in conformance with the standards outlined in this Chapter 9 of the *Roadway Design Guidelines*. Justification sources could include, but are not limited to, AASHTO, NACTO, FHWA, NCHRP, or design guidance from other states. The *Design Waiver Request Form* is part of the DDocs.exe and can be downloaded from TDOT's *Roadway Design Standard Design and Survey CADD Files and Documents* website at https://www.tn.gov/content/dam/tn/tdot/roadway-design/documents/cadd_files/DDocs.zip.