

# Appendix K. Design Exceptions and Design Deviations Summary Table

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**Draft Project Design Exceptions, Deviations, and Approvals Matrix - WORKING**

12/4/2020

Roadway Design Exceptions								
	Design Exception	Location / Description	Approving Agency	Std.	Prop.	Extg.	Basis for Exception	Notes
1	Ramp Shoulder Width - 2 lane & Recovery Taper (SB & NB Exit)	NB I-5 Exit Ramp to NE Weidler St (2-lane) NB I-5 Entrance Ramp from Broadway (1-lane) SB I-5 Exit Ramp to Broadway (2-lane)	ODOT/FHWA	4' Lt, 6' Rt (+2' E) (1-lane) 6' Lt, 10' Rt (+2' E) (2-lane) Recovery Taper Rate 70:1 with 12' Recovery Shoulder	Varies (4' Lt, 8' rt Typ.) Recovery Taper 55:1 Recovery Shoulder 7' (Weidler exit ramp)		The project does not reduce shoulders in any location to less than currently exists. The proposed shoulder widths are consistent with other ramps in the corridor. The shoulder widths are also constrained by adjacent retaining walls as well as by the highway covers.	Assume one DE for Broadway/Weidler ramps. Assume separate DEs for I-405 exit ramp.
2, 3	Ramp Shoulder Width, Lane Width & Recovery Tapers - (I-84 and I-405)	NB I-5 Exit Ramp to N Greeley Ave (1-lane) NB I-5 Exit Ramp to SB I-405 (2-lane) SB I-5 Exit Ramp to EB I-84 (1-lane) I-5 SB Exit to Morrison (1-lane)	ODOT/FHWA	One-Lane: 4' Lt, 6' Rt (+2' E) Two-Lane: 6' Lt, 10' Rt (+2' E) Recovery Taper Rate 70:1 One-Lane Width: 16'	Shoulder: Varies (4' Lt, 4'-6' rt Typ.) Recover Taper: From 50:1 to 60:1 Lane Width: 12'		The project does not reduce shoulders in any location to less than currently exists. In many cases unless extreme retrofits are done to widen out many structures a reduced shoulder from standard is needed to fit the structure.	Assume two DEs (one for Greeley & 405 and another for two SB ramps).
4	Ramp Shoulder Width and ramp lane width	NB I-5 Entrance Ramp from I-84 (2-lane) I-84 WB to Holladay St (1-lane) Holladay Exit lane width	ODOT/FHWA	One-Lane: 4' Lt, 6' Rt (+2' E), 16' Ln Two-Lane: 6' Lt, 10' Rt (+2' E), 12' Ln	Varies		The project does not reduce shoulders in any location to less than currently exists. In many cases unless extreme retrofits are done to widen out many structures a reduced shoulder from standard is needed to fit the structure.	I-84 to I-5 NB entrance ramp and the transition to match Holladay are part of the same DE.
5	Stopping Sight Distance - Mainline	Horizontal curve near south highway cover - Northbound	ODOT/FHWA	730'	620'		Sight distance is obstructed by the proposed Median barrier. To meet 70 mph stopping sight distance the northbound travel lanes would have to open to the right and then introduce a reversing curve to transition back to the proposed 26' total median width.	SSD = 425' for 50 mph (posted speed) SSD = 570' for 60 mph
6, 7, 8	Vertical Clearance	I-5 SB right shoulder I-5 NB right shoulder I-5 NB exit ramp to Weidler Ave I-5 NB entrance ramp from Broadway I-5 SB exit ramp to Broadway	ODOT/FHWA	17' 4" across full pavement width	- Less than 17' 4" within freeway shoulder - 16' 6" min. in at least one ramp travel lane	Less than 17' 4" on both I-5 mainline and interchange ramps	Vertical clearance exception to minimize cross street profile and avoid additional impacts due to local street connections Broadway entrance and exit ramp clearance similar to existing conditions. For the I-5 NB exit ramp, DE is related to the Clackamas overcrossing in order to reduce the total elevation change required to traverse the freeway. The right turn lane and shoulder are proposed at less than 17' 4".	(Draft version). Assume 3 separate DEs (NB I-5; SB exit ramp, NB entrance, and SB I-5; NB exit ramp). Will consider consolidating if practical during DE development.
9	Intersection Offset / Skew angle	I-5 SB ramp terminal at Broadway Ave	ODOT	0' offset	2.3' +	4.5'	HDM Allows up to a 4' offset Sec 8.3.4. Final intersection offset will be determined during 30% Design	(Draft version). ODOT Design Exception required. Intersection geometry requires PBOT review and approval (no design exception).
10, 11	Ramp Interchange Spacing	NB Broadway Entrance to I-405 Exit NB I-84 Entrance to NE Weidler St Exit NB 405 Exit to Greeley Exit SB NE Weidler Entrance to I-84 Exit	ODOT	Entrance to Exit (Weaving) - 2000' Exit to Exit - 1000'	Entrance to Exit - 1060' - 1340' Exit to Exit - 810'	Varies	Ramp spacing limited by multiple existing interchanges within short distance	Assume 2 DEs (I-5 NB (Broadway to 405 and 405 to Greeley); I-5 NB from I-84 to Weidler; I-5 SB Weidler to I-84; I-5 SB from Broadway Exit to I-405 NB Entrance)) Design Exception required as distances do not meet HDM Fig 9-8 for ramp spacing
12	Mainline Median and Outside Shoulder Width Lane Width Striping Taper	Mainline from I-84 interchange to the south end of the project	ODOT/FHWA	Shoulder Width: 10' + 2' Lane Width: 12' Striping Taper: 70:1	Lt. Shoulder: 3' nom. Rt. Shoulder: From 4' to 9' A Lane Width 11' Striping Taper: 50:1	Shoulders: Varies 6' to 9' Lane Width: 12' Striping Taper: None	There is no widening proposed in the NB direction and the SB widening terminates just south of the UPRR tracks in order to avoid widening adjacent to the Eastbank Esplanade. To accommodate the extension of the SB auxiliary lane to the Morrison exit ramp the existing lanes and shoulders will be shifted east, reallocating the existing lane and shoulder widths.	
13a	Superelevation	Existing structures	ODOT/FHWA	Varies based on curve	Varies		Matching existing superelevation on non-reconstructed areas including bridges. Match existing ramp superelevations (TBD with 30% Design)	There may need to be approval for supers on existing bridge structures
13b	Superelevation Transition	Existing structures	ODOT	Varies based on curve	Varies		Matching existing superelevation on non-reconstructed areas including bridges. Match existing ramp superelevations (TBD with 30% Design)	Tier 2. Combine with Super DE. There may need to be approval for transitionsoin substandard spiral lengths
13c	Superelevation	Proposed NB through Covers	ODOT/FHWA	6%	5.50%		Proposed Super Elevation through Covers Reduced to meet Vertical Clearance on NB lanes under Weidler St	
14a	Spiral length - Ramps	NB I-5 Exit Ramp to NE Weidler St NB I-5 Entrance Ramp from N Broadway St SB Entrance Ramp from NE Weidler St SB I-5 Exit Ramp to Broadway	ODOT	360'	0 - 285'		Due to geometric challenges between existing structures and crossing streets some spiral lengths are shortened to either match existing or to accommodate required geometry to tie into the interchange crossing street.	May split into multiple DEs
14b	Ramp Entrance Angle	NB I-5 Entrance ramp from I-84 NB I-5 Entrance ramp from Broadway	ODOT/FHWA	2°30'	3°09'-3°19'		Limited by the widening for the cover. Designed to maximize ramp spacing or recover taper.	
14c	Ramp Exit Angle	NB I-5 Exit Ramp to NE Weidler St SB I-5 Exit Ramp to Morrison	ODOT/FHWA	4°15'	4°58' - 5° 0'		Limited by the widening for the cover. Designed to maximize ramp spacing or recover taper.	Will continue to refine exit angle as part of 30% Design. Assume single DE (may become more than one).
14d	Sag Curve - K Value	SB Exit Ramp to Broadway NB Exit Ramp to Weidler	ODOT/FHWA	67 @ 40MPH	47		Geometric challenges between local street elevation which is needed to achieve 7% grade on Hancock and cover vertical clearance.	

	<i>Design Exception</i>	<i>Location / Description</i>	<i>Approving Agency</i>	<i>Std.</i>	<i>Prop.</i>	<i>Extg.</i>	<i>Basis for Exception</i>	<i>Notes</i>
	<b>Local Streets</b>							
1	Utility encroachments into bicycle and pedestrian zone	Potential to occur on all local streets	PBOT	No utilities	TBD	N/A	The right-of-way will be extremely constrained, and utility encroachments are inevitable. All utility surface features (including lids) and above-ground utility infrastructure will not be permitted within the bicycle or pedestrian through zone without first obtaining a design exception.	Where sidewalks and bicycle zones are modified by the project, PBOT may require relocation of an existing facility in order to meet their no-clearance standard. Existing utility features would be required to have an exception approved in order to remain.
2	Minimum Curve Radius	N Broadway west of Vancouver Ave	PBOT	333'	136'	130'	Matching existing curve radius and there is not room to expand to desired radius.	
3	Minimum Curve Radius	N Weidler St west of Vancouver Ave	PBOT	333'	243'	200'	Matching existing curve radius and there is not room to expand to desired radius.	
4	Minimum Curve Radius	N Vancouver Ave south of N Weidler	PBOT	198'	83'	83'	Matching existing curve radius and there is not room to expand to desired radius.	
5	Minimum Curve Radius	N Hancock St Connection to Hancock-Dixon Crossing	PBOT	107'	25'	N/A	To avoid impacts to adjacent properties.	This section of Hancock St currently serves as access to Flint for several commercial properties
6	Furnishing Zones	At certain locations along Broadway, Weidler, Wheeler, Vancouver & Williams	PBOT	4'	Varies 0 to 4'	Varies	To avoid impacts to adjacent properties.	
7	Horizontal buffer width between ped and bikes	At certain locations along Broadway, Weidler, Wheeler & Williams	PBOT	2'	Varies 0 to 2'	Varies	To avoid impacts to adjacent properties.	
8	Sidewalk Required	Not provided on Williams from midblock between Hancock and Broadway on west side of street.	PBOT	Generally, sidewalk is required on both sides of street where feasible.	N/A	N/A	On Williams, sidewalk has been provided to access businesses on west side of the street but not continued into entrance ramp gore with Williams.	
9	Vertical Sag K Value	N Weidler St Vertical Curves 1 and 3	PBOT	37	28 and 27	N/A	Limit impacts to Cross Streets. Meets design for comfort and sight distance, but not L = 3V	Lmin = 3V not met, but meets 30 mph design for comfort and headlight sight distance
10	Vertical Sag K Value	Hancock-Dixon Crossing at N Dixon Street	PBOT	17	9	N/A	Limit impacts to Cross Street Wheeler Ave.	Meets 20 mph design for comfort and Lmin= 3V, but not headlight sight distance. Need to illuminate
11	Vertical Sag K Value	N Vancouver Ave	PBOT	26	14	N/A	Limit impacts to Cross Street Broadway.	Meets 25 mph design for comfort and Lmin= 3V, but not headlight sight distance. Need to illuminate
12	Vertical Sag K Value	N Williams Ave Vertical Curves 1, 4, and 5	PBOT	26	10, 12, and 8	N/A	Grading over highway cover and approaches to Weidler and Williams intersections	There are multiple DE's need for this segment but all may potentially be eliminated through intersection grading. Sags meet 20 mph comfort, don't meet Lmin=3V, and need illumination
13	Vertical Crest K Value	N Williams Ave Vertical Curve 2	PBOT	12	11	N/A	Grading over highway cover and approaches to Weidler and Williams intersections	There are multiple DE's need for this segment but all may potentially be eliminated through intersection grading. Crests meet 25 mph sight distance, but don't meet Lmin=3V
14	Vertical Sag K Value	NE Victoria Ave	PBOT	26	7	N/A	Approach at Weidler intersection - matching existing Victoria grade	15mph comfort. Illuminate
15	Vertical Clearance	N Russell St	PBOT	16' min, 18' desirable	16'	16.84'	Not a major freight route. Local truck access only.	
16	Sidewalk Grade	Hancock/Dixon pedestrian & bike connection to Flint	PBOT (possibly ODOT since on ODOT structure)	5.00%	7.60%	N/A	Eliminates switchback sidewalk on southside. Grade for sidewalk adjacent to the travelled way on the Hancock-Dixon crossing meets standard as it is part of the roadway prism.	ADA requirements met to the maximum extents feasible. Documentation should include the measures taken to reduce the grade of Hancock/Dixon to 7% and a comparison of ADA compliant route lengths from point A to point B along a theoretical structure vs. alternate route(s) available.
17	Pattered Concrete	Williams between N Ramsay Way and N Weidler Street Center Court at N Wheeler Avenue	PBOT	Flush Concrete	Pattered/Colored Concrete Pavement	N/A	Pattered to indicate to drivers that they are in a pedestrian zone	Similar to what is done on SW Park Ave at Director Park the intention of the patterned concrete is to indicate to drivers that they are in a pedestrian zone and are sharing the space. The sections of stamped concrete will primarily only be used by bus traffic with the occasional other vehicle accessing the garage

18	Street section without Curb	Williams between N Ramsay Way and N Weidler Street Center Court at N Wheeler Avenue	PBOT	Curb	Segments of street for sidewalk is flush with street level	Curb	Raised street section to slow down vehicles and provide free movement of alternative modes to vehicles	Removing the curb in this region allows for more free flowing movement of pedestrians and cyclists headed NB on Williams as they mingle with users of the Clackamas overcrossing or ingress/egress events at Moda Center or Veterans Memorial Coliseum.
<b>Traffic Design Exceptions and Deviations</b>		<i>Location / Description</i>	<i>Approving Agency</i>	<i>Std.</i>	<i>Prop.</i>	<i>Extg.</i>	<i>Basis for Exception</i>	<i>Notes</i>
1	Access Spacing Deviations	Locations vary	ODOT/PBOT	1320' (full intersection) 750' (right-in/right-out) 25' From corner/ADA ramp	100'	Less than 100'	Developed urban area with many existing access points. Requires ODOT Region Access Management Engineer (RAME) approval. Requires PBOT Traffic Engineer approval	Separate approval than ODOT DE Form. Will be combined with Approval 1, 2, and 3 into a single RAME approval letter. Separate DE form and approval from PBOT.
2	Interchange Spacing		ODOT	3 Miles	0.5 Miles	0.5 Miles	Matches Existing Condition. Requires RAME concurrence.	Will be combined with Approval 1, 2, and 3.
3	Interchange Ramp Spacing		ODOT/FHWA	1000'-2000'	810'-1335'	805'-1400'	Matches Existing Condition. Requires RAME concurrence.	Will be combined with Approval 1, 2, and 3. Assume ramp spacing requires FHWA approval due to ramp relocation and IMR.
4	V/C Ratio - Mainline	(1) I-5 NB weave (I-84 entrance ramp to Weidler exit ramp) (2) I-5 NB weave (Broadway entrance ramp to I-405 exit ramp) (3) I-5 SB weave (I-405 entrance ramp to Broadway exit ramp) (4) I-5 SB weave (Weidler entrance ramp to I-84 exit-ramp)	ODOT	ODOT Highway Design Manual V/C standard for Future Year Build Peak Hour: V/C < or = 0.75	V/C > 0.75 (ranges up to 0.99)	V/C > 0.75	The Build Alternative will improve the traffic safety and operations on the freeway as compared to the No-Build Alternative.	See NEPA Report for additional details
5	MUTCD Exit Direction Sign over painted/theoretical gore	Exits 302A SB and 301 SB	ODOT	Except where Overhead Arrow-per-Lane guide signs are used, where a through lane is being terminated (dropped) at an exit, the Exit Direction sign shall be placed overhead at the theoretical gore	Place signs before the theoretical gore where option lane begins for Exit 302A SB and 100'+- before the theoretical gore for Exit 301 SB	All existing sign structures will be removed and replaced	Sign structures are to span full width of the freeway to accommodate signs on both sides and minimize impact to the structure. Placement of full-width sign bridges will be placed slightly off the exit gore for optimal visibility for both directions of travel.	MUTCD 2E.36-05 Except where Overhead Arrow-per-Lane guide signs are used (see Section 2E.21 and Paragraph 6 of this Section), where a through lane is being terminated (dropped) at an exit, the Exit Direction sign shall be placed overhead at the theoretical gore (see Figures 2E-8 through 2E-11, and 2E-14 through 2E-16).
<b>Traffic Approvals</b>		<i>Location / Description</i>	<i>Approving Agency</i>	<i>Std.</i>	<i>Prop.</i>	<i>Extg.</i>	<i>Approval Request Consideration</i>	<i>Notes</i>
1	<del>Crosswalk Closure</del>	<del>East crosswalk on Weidler at Vancouver/Wheeler</del>	<del>PBOT and ODOT</del>	<del>Provide crosswalk at all approaches.</del>		<del>Existing crosswalk on the east side of the intersection.</del>	<del>Safety concern with the SB dual left and NB dual right vehicular conflicts with pedestrians. Operational concern if an exclusive ped phase was to be added.</del>	Revised working assumption to include east side crosswalk.
2	Dual Right Turn Lanes	(1) WB dual right turn lanes on Broadway at Williams (2) NB dual right turn lanes on Vancouver/Wheeler at Weidler (3) EB dual right turn lanes on Weidler at Williams/I-5 SB entrance ramp (4) NB dual right turn lanes on I-5 NB exit-ramp at Weidler	ODOT and PBOT	On ODOT facilities, the installation of multiple turn lanes requires the approval of the State Traffic-Roadway Engineer. Need PBOT's approval for those proposed on City Streets.			The dual right turn lanes at these intersections are needed due to high traffic volumes.	
3	Dual Left Turn Lanes	(1) WB dual left turn lanes on Broadway at Williams (2) SB dual left turn lanes on Vancouver at Weidler (3) NB dual left turn lanes on Victoria to Broadway	ODOT and PBOT	On ODOT facilities, the installation of multiple turn lanes requires the approval of the State Traffic-Roadway Engineer. Need PBOT's approval for those proposed on City Streets.			The dual right turn lanes at the three intersections are needed due to high traffic volumes.	
4	Traffic Signal	All I-5 ramp terminals	ODOT					Removal, modification or installation of traffic signals requires approval by the ODOT State Traffic-Roadway Engineer.
5	Ramp Meters	Entrance ramps	ODOT					Removal, modification or installation of ramp meters requires approval by the ODOT Region Traffic Engineer.

6	Colored Pavements	1. Green paint to be used on most local streets for bike lanes, bike boxes and lane extensions through intersections. Approval by ODOT needed at ramp terminals. 2. Approval needed for red paint for bus only lanes	ODOT					Use of colored pavements requires approval by the ODOT State Traffic-Roadway Engineer.
7	Interchange Modification Request	FHWA modification request based on relocating existing ramp and modifying interchange type at Broaway/Weidler.	FHWA					Will be developed following final Traffic Operations Report and Design Exceptions.

Hydraulic Design Deviations		Location / Description	Approving Agency	Std.	Prop.	Extg.	Basis for Exception	Notes
1	Spread exceeding allowable width	Local Streets with sidewalk-level bike lanes (Broadway/Weidler/Williams/Vancouver)	PBOT/BES	Inlets shall be designed and spaced to limit the width (i.e. spread) of gutter flow to 2 feet or less into the travel lane. If bike lanes are present, then that space can be included when calculating allowable gutter flow width.				With the addition of sidewalk-level bike lanes and no shoulder, stormwater spread will be limited to 2 feet - requiring a significant increase in the amount of inlets or a design deviation to increase the allowable spread.
Geotechnical Design Deviations		Location / Description	Approving Agency	Std.	Prop.	Extg.	Basis for Exception	Notes
1	Field Explorations - Boring Locations	Bridge #16358	ODOT	GDM 3.5.2.5 - Provide one boring at each bent location.	As deemed necessary in the project.		1) Cost-effective field explorations, 2) a lot of existing geotechnical data available for the project, and 3) relatively consistent geologic conditions.	Closed/Accepted: 7/31/2020
2	Field Explorations - Boring Locations	Bridge #08958E	ODOT	GDM 3.5.2.5 - Provide one boring at each bent location.	As deemed necessary in the project.		1) Cost-effective field explorations, 2) a lot of existing geotechnical data available for the project, and 3) relatively consistent geologic conditions.	Closed/Accepted: 6/30/2020
3	Field Explorations - Boring Locations	Bridge #N8958A	ODOT	GDM 3.5.2.5 - Provide one boring at each bent location.	As deemed necessary in the project.		1) Cost-effective field explorations, 2) a lot of existing geotechnical data available for the project, and 3) relatively consistent geologic conditions.	Closed/Accepted: 6/30/2020
4	Field Explorations - Boring Locations	Bridge #08782A	ODOT	GDM 3.5.2.5 - Provide one boring at each bent location.	As deemed necessary in the project.		1) Cost-effective field explorations, 2) a lot of existing geotechnical data available for the project, and 3) relatively consistent geologic conditions.	Closed/Accepted: 5/13/2020
5	Field Explorations - Boring Locations	North Cover Structure	ODOT	GDM 3.5.2.5 - Provide one boring at each bent location.	As deemed necessary in the project.		1) Cost-effective field explorations, 2) a lot of existing geotechnical data available for the project, and 3) relatively consistent geologic conditions.	Closed/Accepted: 6/16/2020
6	Field Explorations - Boring Locations	South Cover Structure	ODOT	GDM 3.5.2.5 - Provide one boring at each bent location.	As deemed necessary in the project.		1) Cost-effective field explorations, 2) a lot of existing geotechnical data available for the project, and 3) relatively consistent geologic conditions.	Closed/Accepted: 6/9/2020
7	Field Explorations - Boring Locations	Clackamas Overcrossing Bridge	ODOT	<del>GDM 3.5.2.5 - Provide one boring at each bent location.</del>	<del>As deemed necessary in the project.</del>		<del>1) Cost-effective field explorations, 2) a lot of existing geotechnical data available for the project, and 3) relatively consistent geologic conditions.</del>	Borings being added to geotechnical exploration plan, resulting in no design deviation required at this location.
8	Field Explorations - Boring Locations	Bridge #08583	ODOT	GDM 3.5.2.5 - Provide one boring at each bent location.	As deemed necessary in the project.		1) Cost-effective field explorations, 2) a lot of existing geotechnical data available for the project, and 3) relatively consistent geologic conditions.	Closed/Accepted: 5/13/2020
9	Field Explorations - Boring Locations	Bridge #08588A	ODOT	GDM 3.5.2.5 - Provide one boring at each bent location.	As deemed necessary in the project.		1) Cost-effective field explorations, 2) a lot of existing geotechnical data available for the project, and 3) relatively consistent geologic conditions.	Closed/Accepted: 6/4/2020
10	Field Explorations - Boring Locations	Bridge #08588C	ODOT	<del>GDM 3.5.2.5 - Provide one boring at each bent location.</del>	<del>As deemed necessary in the project.</del>		<del>1) Cost-effective field explorations, 2) a lot of existing geotechnical data available for the project, and 3) relatively consistent geologic conditions.</del>	Geotechnical exploration plan has sufficient borings at this bridge location to satisfy GDM requirements. No design deviation required.
11	Field Explorations - Boring Locations	Bridge #08588E	ODOT	GDM 3.5.2.5 - Provide one boring at each bent location.	As deemed necessary in the project.		1) Cost-effective field explorations, 2) a lot of existing geotechnical data available for the project, and 3) relatively consistent geologic conditions.	Closed/Accepted: 6/16/2020
12	Wall Design Earth Pressures	Retaining Walls 2b, 4 (Non-yielding walls)	ODOT	GDM 15.3.10	Non-yielding wall design approach used for the static condition and yielding wall used for seismic condition (1000-yr EQ).		ODOT GDM does not provide clear guidance for a non-yielding wall.	Future geotechnical scope for this wall includes advanced numerical analysis that may lead to a revised seismic design criteria.
13	Bridge Foundation Design	All bridge widening locations where it is deemed too costly to design for seismic conditions for structural improvements and geotechnical ground improvements.	ODOT	Bridge widenings designed for seismic requirements in the ODOT BDM and GDM.	Design foundations for static conditions only.		Seismic design of foundations in many locations considered to not be achievable without significant structural and geotechnical improvements.	

	Bridge Design Exceptions and Deviations	Location / Description	Approving Agency	Std.	Prop.	Extg.	Basis for Exception	Notes
1	Bridge End Panel Width	North and South Cover Structures	ODOT	Approximate width of a typical end panel is the width of the bridge. End panels for the cover structures will only be under roadway sections on the Cover structures.			Main purpose of bridge end panel is to provide a smooth roadway approach to the bridge even if some settlement occurs to the soil behind the abutment. End panels not supporting a roadway would not have a useful purpose.	
2	Member Strengthening for LRFD Strength II Condition	Members determined deficient for Strength II load case after widening	ODOT	BDM 1.3.2(4) - Existing members affected by widening need to be designed and potentially strengthened for the LRFD Strength II load case.	Existing members affected by widening need to be designed and potentially strengthened to a lesser amount as long as all LRFR load ratings are greater than 1.0.		Strengthen to a lesser amount for cost savings without the need for a load posting.	
3	Phase 1 Seismic Retrofit	All bridge widenings or bridges with partial replacements.	ODOT	Bridges not receiving a Phase 2 retrofit shall receive a Phase 1 retrofit per ODOT BDM Figure 1.17.2-1A.	Do not perform a Phase 1 seismic retrofit even if Phase 2 is not performed at select bridge sites.		Cost savings when a Phase 1 seismic retrofit will not greatly enhance the seismic performance of the structure when Phase 2 is not performed.	
4	<del>Substandard barriers not being replaced/strengthened</del>	<del>Any bridge with widening on one side of the bridge and substandard barriers on both sides of the bridge.</del>	<del>ODOT</del>	<del>BDM 1.13.2.2(a)(d) - 3R projects (widening and rehabilitation) that affect the bridge rail, involve structural superstructure work, widen the structure, or re-decks (full depth) any complete span require compliance with MASH or NCHRP 350 crash test requirements.</del>	<del>Only update substandard bridge barriers that are directly impacted by the bridge widening work. Substandard barriers on bridge opposite of widening remain as existing.</del>		<del>Cost savings in the project, and barrier updates are not specific to purpose of the project.</del>	Assumptions revised to retrofit existing non-standard bridge rails within areas of bridge widening (applies to I-84 WB to I-5 NB entrance ramp).