Chapter

14

DESIGN EXCEPTION PROCESS

14.1 GENERAL

The information in this section describes the design exception process for planning studies and project development projects. In addition, this section details the design elements and features that require design exceptions as well as the information needed to justify approvals of design exceptions. The design standards are generally described in Chapter 1 and further defined for particular highway classification and environments in Chapter 5 through Chapter 13.

It is the designer's responsibility to design from the best practices perspective to incorporate design elements that optimize the operation and safety of the system but stay within constrained funding limits. This is the quintessence of practical design, getting the most out of limited funds for the benefit of the entire system not just the project. In the context of the project, if the proposed impacts from the design are deemed too great then, with proper justification, a design exception can be entertained.. The S.C.O.P.E. elements as outlined in Chapter 1 provide context for conflicting parameters to coexist.

Project and corridor context are important to keep in mind. While any one solution may be appropriate in a rural setting does not automatically mean that the solution is to be used statewide in complex urban contexts. A right of way impact in one context may mean a purchase of property and in a different context a design exception is used to avoid any right of way impacts. Consultation with Roadway Engineering Unit staff in Technical Services will assist the design engineer in evaluating the specific context of the project and when a design exception is required.

Design exceptions typically originate during the project development process through Project Teams, or in some instances, during the planning process. The intent of design exceptions are to determine and justify that good engineering decisions are made involving design standards in constrained areas. Design exceptions in high density urban areas can be more common due to the constraints in an urban setting, such as right of way impacts and construction costs.

The authority for determination of design standards on State and Federal-Aid projects has been delegated to the Technical Services Manager/Chief Engineer.

- Approval of exceptions to design standards for ODOT projects has been delegated to the Technical Services Manager/Chief Engineer and subsequently to the State Traffic-Roadway Engineer. FHWA approves design exceptions on Full Federal Oversight (FFO) projects and on projects that involve the interstate highway system. FHWA limits itself reviewing the 13 controlling criteria shown in Table 14-3. If the design exception does not include any of the 13 criteria, FHWA does not need to approve the exception.

Design exceptions formally obtained in writing during the Planning, Environmental or Survey phases need not be requested again unless significant changes have been made to the design. A review of the approved design exception needs to be made prior to the Design Acceptance

Package (DAP) to ensure that the exception is still valid for the project. A list of the design standards that must be considered in the exception process, depending on the type of project, can be found in Table 14-2.

14.1.1 JUSTIFICATION OF DESIGN EXCEPTIONS

14.1.1.1 PROJECT DEVELOPMENT PROJECTS

Exceptions to design standards should be first discussed at project scoping, project team meetings, or during reconnaissance studies. When enough data is available, agreement on standards and from which standards to request exceptions should be reached at these meetings. Requests for design exception require justification. Some considerations which **may** cause a request for an exception to the design standards are listed below:

- Excessive construction cost or cost/benefit
- Compatibility with adjacent sections
- No plans for improvement of adjacent sections in the foreseeable future
- Proposed improvements or changes in standards for the highway corridor
- Preservation of historic property or scenic value
- Additional right of way requirements
- Environmental impacts
- Low crash history and/or crash potential
- Low traffic volumes

Simply making a request for a design exception is not assurance that the request will be granted. Therefore early submittal of the request is paramount to a smooth design process. Design Exceptions shall be submitted prior to or at the Design Acceptance Package (DAP) milestone.

14.1.1.2 PLANNING PROJECTS

Design exceptions to standards may be needed for planning studies. Transportation System Plans, Refinement Plans, Facility Plans, Transportation Growth Management studies, Access Management Plans, or Corridor Plans should not be adopted with nonstandard highway features unless a Design Exception has been approved by the State Traffic-Roadway Engineer or the State Traffic-Roadway Engineer has indicated in writing that one would likely be approved. Corridor studies are usually not developed at a level of detail that involves design standard exceptions. Transportation Growth Management (TGM) funded projects and refinement plans may have enough detail and information that would support design exception requests. As

with normal project development projects, the appropriate background information and justification must be obtained or be available to initiate the design exception process.

For a project that may be constructed within five years, the planner or project leader in charge of the planning project should contact the Region Roadway Manager to assist in putting together the design exception request. The design exception request should be processed in the same manner as a project development design exception, which is listed in Section 14.3.

For projects that may be constructed within five to ten years, the design exceptions should be identified and the State Traffic-Roadway Engineer should give a written indication that a design exception is warranted and would probably be approved.

For projects anticipated beyond 10 years to construction consultation with Roadway Engineering Unit staff in Technical Services about non-standard items should be made, but no formal action is required on these types of projects. Non-standard design items should not be shown on plans or maps when the project is more than ten years to construction. A change of context can occur such that proposed justification would no longer be valid at the time of construction.

14.1.1.3 DESIGN EXCEPTIONS FOR LOCAL AGENCY PROJECTS

For all projects on State Highways or NHS roads, any design element that does not meet HDM or AASHTO standards respectively must be justified and documented by means of a design exception. Generally, ODOT is the agency with authority to approve design exceptions; and FHWA also needs to review and approve design exceptions for all projects subject to Full Federal Oversight. However, the local government may process and approve design exceptions in the following cases.

14.1.1.3.1 FEDERALLY FUNDED CERTIFIED LOCAL AGENCY PROJECTS ON LOCAL AGENCY JURISDICTION ROADS

Certified local agencies approve design exceptions on federally-funded projects, except those on bridges and state highways. The ODOT Regional Local Agency Liaison uses an established audit process for Certified Local Agencies to ensure consistent design quality.

14.1.1.3.2 FEDERALLY FUNDED PROJECTS ON (NON-CERTIFIED) LOCAL AGENCY JURISDICTION ROADS

For all federally-funded projects on NHS and non-NHS local agency jurisdiction roads, contract plans and design exceptions are processed through the ODOT Regional Local Agency Liaison who then reviews with the Region Tech Center to ensure consistent design quality.

14.1.1.3.3 NON-FEDERALLY FUNDED PROJECTS ON NHS LOCAL AGENCY JURISDICTION ROADS

For non-federally funded projects on local agency jurisdiction NHS roads, certified and non-certified local agencies may process and approve design exceptions, and ODOT ensures design quality by means of an audit process. The contract plans and design exceptions for all non-federally funded projects on local agency jurisdiction NHS roads are provided to the ODOT Technical Services Roadway Engineering Unit either on a project by project or annual basis. In addition, a list of all projects is to be submitted on an annual basis. Some of these projects are then selected for review. ODOT works with FHWA and local governments to correct any issues as needed. See Appendix Q for information on roles and responsibilities and lane width requirements.

14.2 INFORMATIONAL NEEDS

Prior to submitting a request for a design exception, a sufficient amount of information gathering and design work is required to justify the design exception. Again, the purpose of design exceptions is to determine that a professional engineering decision has been justified and documented involving engineering standards and practices in constrained locations. The information required includes the following items:

14.2.1 ROADSIDE INVENTORY

A roadside inventory is typically completed as part of project information gathering. The roadside inventory provides valuable information on existing roadside features and can be used to help justify design exceptions. Identification of roadside appurtenances, both man-made and natural, that are not crash worthy is important to the overall safety of the facility. While the item may not be removed with the current project, the man-made items are placed into the database and scheduled for upgrade. Particularly barrier systems that are in place and were developed prior to NCHRP – Report 230 crash criteria need to be inventoried for replacement. Roadside Inventory information is outlined in Chapter 11.

14.2.2 LOCAL PLAN COORDINATION

Due to the constrained environment of urban areas, design exceptions are frequently required on downtown urban projects. In these urban environments there may be transportation system plan elements or goals that relate to the roadway design. The design exception justification process should take into consideration local planning efforts. For example local plans for projects such as Transportation System Plans (TSP) may provide a context for the future highway corridor that can be used in looking at non-standard roadway elements. The local plan vision should be in alignment with the vision of the statewide transportation system. As projects are developed, these assumptions must be reevaluated in light of the current context of the developed highway and can be used in the design exception process if appropriate.

14.2.3 TRAFFIC AND CRASH ANALYSIS

A traffic analysis is required. The level of information and analysis will need to be sufficient to assure that the proposed design exception will not significantly affect safety. Generally the traffic analysis required for the specific project type will be sufficient to evaluate the merits of proposed design exceptions. However, in some situations, additional analysis and detail may be required such as:

- Long term (20 year) volume/capacity and operational analysis.
- Vehicle classifications.
- Peak hour and daily turning movements.
- Detailed operational analysis (i.e., intersection, interchange, weaving, etc.).
- Other analyses as deemed necessary for the particular action.

Proper designs on all projects should always consider the crash potential and history, and its relationship to the improvements proposed. Generally, the crash analysis required for the specific project type is sufficient to evaluate the potential ramifications of a particular design exception. However, in some situations, more detailed analysis is required. This could include a more detailed review of crash history over a longer time frame, greater research into cause and effect, and even discussing existing safety deficiencies with local emergency provider agencies such as state police, local police, county sheriff and local fire officials. The proposed design exception needs to be evaluated to document the potential impacts to the safety of the highway users. Various predictive models are available to assist the designer analyzing multiple combinations of cross sectional elements. Making an incremental increase in safety predictions can be included in the justification for a design exception.

Crash data should include:

- Number and type of crashes.
- Crash rate and comparison to the average rate for that type of facility.
- The Safety Priority Index System (SPIS) sites and their ranking.

14.2.4 IMPACTS AND RIGHT OF WAY

The design should be completed to a sufficient degree to determine with reasonable certainty what the potential impacts are if the proposed exception is not approved. These impacts could include residential displacement, commercial displacement, and environmental impacts to wetlands, streams, historic properties, 4f and 6f resources, threatened and endangered habitat, etc. Other impacts could require additional right of way. Community goals and livability impacts should also be determined where applicable as well as impacts from planning and policy documents such as the Oregon Highway Plan.

Generally, to determine these levels of impacts, the design should be developed to concept level plans. This generally is sufficient to determine approximate right of way footprints for the specific project.

14.2.5 COSTS

The design should be completed to sufficient detail to estimate project costs with and without the proposed design exception(s) being approved. The cost information can also be used to calculate approximate cost/benefit ratios related to the proposed design exception. Cost is not the only justification for approving design exceptions. Other items include compatibility with other sections, environmental impacts, additional right of way and other items listed in Section 14.1.1. Costs to improve the deficiency while not meeting full design standards should be considered and evaluated, if appropriate.

14.2.6 INCREMENTAL IMPROVEMENTS

While not meeting full standards, the design engineer can use a lower cost solution as an incremental step to address legitimate safety concerns. Multiple alternatives should be assessed using various techniques including the use of prediction models. Lower cost treatments such as rumble strips or signs have a proven record of offering a reduced level of crashes when implemented at strategic locations. Incremental improvements are to be recited in the design exception request as either justification or mitigation as an improvement based outcome for inclusion in the project.

14.2.7 PROPOSED MITIGATION

The project team should evaluate potential mitigation measures that could be implemented as part of the project that could offset the potential safety reductions of the proposed design exception. Mitigation actions can range from very small and inexpensive to large scale options. Each design team will need to evaluate, on a project by project basis, if cost effective mitigation strategies are to be included as part of the design exception request. Each project team should use the creative abilities of the team members to strategize the range of potential mitigation measures. Identifying standard practice mitigation items (replaced striping, replacing signs, etc) in the design exception under the category of proposed mitigation needs to be separated from the enhanced mitigation items that are included in the project (upgraded striping, new signs, new rumble strips, etc.)

14.3 STEPS FOR DESIGN EXCEPTION APPROVAL

14.3.1 GENERAL

In order to obtain timely State Traffic-Roadway Engineer and FHWA approvals, design exception requests should be recommended by the Region Roadway Manager and Area Manager (or equivalent) and forwarded to the State Traffic-Roadway Engineer as soon as the need is identified. Design Exceptions shall be submitted prior to or at the Design Acceptance Package (DAP) milestone. For design exceptions critical to the project design, approval should be obtained as early as possible. Requests for design exceptions must be accompanied by justification documentation and should include mitigation. Processing of exceptions to design standards will be undertaken as soon as agreement is reached in the Region. Table 14-2 shows the design exception request form.

Local Agency project design exceptions not on a State Highway follow a slightly different process. Although the approval of design exceptions is under the authority of the State Traffic-Roadway Engineer, the intervening steps between the request and approval may differ from the standard design exception process. Designers involved in local agency contracts should contact the Local Government Section Manager and review the Local Area Governments (LAG) manual for processing design exceptions on local agency projects.

Requests for exceptions to design standards with justification and mitigation shall be submitted to the State Traffic-Roadway Engineer and approved prior to or at the DAP milestone and prior to incorporation of design features into project plans and/or other documents.

14.3.2 DESIGN EXCEPTION PROCEDURES

- Step 1 — Project Teams determine justification for design exception(s) at scoping, prospectus, design phases, or planning process.
- Step 2 — Roadway Designer prepares design exception with supporting justification with review from Region Roadway Manager. The data should include the information shown in Table 14-1 and described in Section 14.2. If the Designer is the Engineer of Record, the Designer stamps the design exception request and signs the "Prepared By" line, otherwise the Engineer of Record stamps and signs the exception request. Consultation with Technical Service's Roadway Engineering staff is encouraged during the preparation of the request.

- Step 3 — The program manager is the ODOT Area Manager, District Manager, BDU Manager, Private Public Partnerships Manager, or the Local Government Unit. The program manager reviews request and consults with Engineer of Record to assure that the request accurately describes the conditions that warrant a design exception. The Program Manager then signs the design exception request on the "Concurred by" line and forwards to the ODOT Region Technical Center Manager or the Region Roadway Manager.

- Step 4 — The ODOT Region Technical Center Manager or the Region Roadway Manager reviews the request and consults with the engineer of record and other applicable groups in Region, such as Traffic or Safety. The Region Technical Center Manager or the Region Roadway Manager signs the design exception if they concur with the request.

  NOTE: Design exceptions formally obtained in writing during the Planning, Environmental or Survey phases need not be requested again. A list of the design standards that must be considered in the exception process, depending on the type of project, can be found in Table 14-2 .

- Step 5 — The Design Exception is forwarded to the State Traffic-Roadway Engineer in Technical Services. On Full Federal Oversight (FFO) projects and projects on the Interstate Highway System, the State Traffic-Roadway Engineer submits the request letter to FHWA for exceptions on nonconforming geometric standards (see Table 14-2). The Design Exception is assigned to a member of the Design Exception Review team for review and a formal recommendation is prepared by the member. This team meets twice monthly to review exceptions and discuss the merits of all Design Exceptions. Informal reviews are completed as required based upon the complexity of the project.

- Step 6 — The State Traffic-Roadway Engineer reviews the design exception request and recommendation from the Design Exception Review team. The State Traffic-Roadway Engineer signs and stamps the request if sufficiently justified.

- Step 7 — The State Traffic-Roadway Engineer receives FHWA approval (if necessary) for design exceptions and forwards copy to the signers of the Design Exception. The State Traffic-Roadway Engineer maintains the original request in approved design exception file

- Step 8 — Where agreement between the Region Technical Center Manager and the State Traffic-Roadway Engineer cannot be reached, the

State Traffic-Roadway Engineer forwards the request to the Technical Services Manager/Chief Engineer. The Technical Services Manager/Chief Engineer makes the final decision on approval or denial of the design exception request.

Table 14-1: Data Needs For Exception Justification

1. Summary of the proposed exception
2. Project description or /purpose/need statement from the project charter
3. Impact on other standards
4. Cost to build to standard
5. Reasons (low cost/benefit, relocations, environmental impacts, etc.) for not attaining standard
6. Compatibility with adjacent sections (route continuity)
7. Crash history and potential (specifically as it applies to the requested exception)
8. Probable time before reconstruction of the section due to traffic increases or changed conditions
9. Mitigation measures to be used. These can include low cost measures such as lane departure detectable warning devices (rumble strips or profiled pavement markings) or additional signs. Mitigation needs to be appropriate to the site conditions and installed correctly to be effective in reducing crashes.
10. Plans, Cross Sections, Alignment Sheets, Plan Details and other supporting documents.

NOTE: Any data omitted from the submittal package can cause a delay in the processing the request.

14.3.3 CLEAR ZONE

For 4R projects when an unmitigated hazard will remain within the project clear zone distance required, as prescribed in Chapter 4 on Tables 4-3 and 4-4, a design exception will be processed. The clear zone design exception will follow the same procedure as all other design exceptions with approval being granted by the State Traffic-Roadway Engineer and when appropriate, FHWA. This will be shown on the Design Exception Request form where "Clear Zone" is specifically listed next to the check box.

For 3R projects, clear zone design is the responsibility of the Region Technical Center, specifically approval is granted by the Region Roadway Manager using the same form shown in Table 14-2. When an unmitigated hazard will remain within the project clear zone distance required, as prescribed in Chapter 4 on Tables 4-3 and 4-4, a design exception will be processed. The State Traffic-Roadway Engineer and FHWA will not be formally involved with clear zone design on 3R projects. Clear zone must be evaluated and improved as appropriate The Region Roadway Manager will keep on file all 3R clear zone design exceptions that they approve. The process for these specific regional exceptions closely follows the standard method, with only the approval and filing being modified.

Existing barrier systems used to shield fixed objects inside of the clear zone that do not, at a minimum, meet NCHRP Report-230 must be replaced on 4R and 3R projects. See Section 4.6 for additional information.

14.3.4 ADA EXCEPTIONS

There are two conditions that will be considered for design exceptions on ADA features; technical infeasibility, and undue financial and administrative burdens. Both of these types of exceptions should occur infrequently. There are helpful publications by the US Access Board to assist design staff with solutions that are within the ADA requirements such as:

1. Accessible Public Rights-of-Way Planning and Design for Alterations
   http://www.access-board.gov/prowac/alterations/guide.htm

2. Proposed Accessibility Guideline for Pedestrian Facilities in the Public Right-of-Way
   http://www.access-board.gov/prowac/nprm.htm

Technical infeasibility is when the physical constraints do not allow for a solution, or there are conflicting interests that do not allow for a solution. Sometimes the designer is unable to place the geometric requirements for the feature without adverse impacts to historic or archeological artifacts. While it might be technically infeasible to meet full ADA standards, a design exception does not give relief to addressing ADA concerns where some improvements can still be made.

When a feature is technically infeasible, the design exception is processed with no changes to the process outlined in this chapter.

Undue financial and administrative burden is when the cost of proceeding with the ADA solution will put such a burden on the agency that it can not meet its obligation to perform its duties. This is when the ADA solution will take most of the agency's total financial resource, beyond just the funding for the project. This type of a design exception is extremely rare and should be discussed with the Roadway Engineering Unit staff when consideration is given to its use.

An undue financial and administrative burden exception to ADA will follow the process outlined in this chapter and in addition must be agreed to in writing by the head of the public entity or their designee. For ODOT this is the Highway Division Administrator. The memorandum for the head of the public entity's signature will include the design exception that gives justification for the decision that the ADA feature is an undue burden financially for that public entity.

For ODOT projects use the following memorandum and for local agency projects use the same text as appropriate.

Oregon
John A. Kitzhaber, M.D., Governor

Department of Transportation
Transportation Building
Roadway Engineering Services
4040 Fairview Industrial Dr, MS #5
Salem, Oregon 97302-1142
Phone: (503) 986-3568
Fax: (503) 986-3749

To:
Highway Division Administrator

From:
State Traffic-Roadway Engineer

Project Key Number:
Section Name:
Highway Name:
County Name:

Declaration of Financial and Administrative Burden For ADA Non-compliance

In accordance with the Code of Federal Regulation 28 CRF §35.150 it is determined that the agency can not include the specific ADA feature(s) with this project because of the financial and administrative burden that inclusion would cause to this public entity.

The specific ADA feature(s) not included in the project: *<insert the specific feature that will not be constructed here.>*

The documentation for the justification of this declaration is included in the design exception for this project and attached to this memorandum.

I concur with this declaration.

_____ Date: _____
Highway Division Administrator
Oregon Department of Transportation

Table 14-2: Design Exception Request Form

OREGON DEPARTMENT OF TRANSPORTATION

DESIGN EXCEPTION REQUEST

For Roadway Section Office use only	
Control No:	

Section Name:						**Route No.:**	
Highway Name:						**Highway No.:**	**1**
County Name:		**Region:**		**Key No.:**	**2**	**EA No.:**	**3**
Begin MP:		**Roadway ID:**	**1** ☐ **2** ☐ **4**			**Mileage Type: 5**	**0** ☐ **Z** ☐
End MP:		**Mileage Overlap Code:**				**0** ☐ **1** ☐ **2** ☐ **6**	

PROJECT DATA

Functional Classification:		**7**					
Current ADT (Year):					**Design ADT (Year):**		
% Trucks:		**Vertical Clearance Route:**			☐ Yes ☐ No **8**		
Posted Speed:		**Design Speed:**	**9**		**Bid Date:**		
Funding:							
Current Estimate:				**Additional Cost to Meet Standard:**			
Federal Highway Approval Required: 10	**Yes** ☐ **No** ☐	**Design Category**	**3R** ☐ **1R** ☐ **4R** ☐ **SF** ☐	**NHS:** ☐ **Non NHS:** ☐		**Top 10% SPIS Site:**	**Yes** ☐ **11** **No** ☐

Design Exceptions (FHWA 13 Controlling Criteria in BOLD)		
☐ **Design Speed 12**	☐ **Superelevation**	☐ Design Life and V/C Ratio
☐ **Lane Width**	☐ **Vertical Clearance**	☐ Bike Lane/Multi-Use Path Width
☐ **Shoulder Width/Shy Distance**	☐ **Structural Capacity**	☐ Sidewalk Width
☐ **Bridge Width**	☐ **Clear Zone**	☐ Median Width
☐ **Horizontal Alignment**	☐ ADA Standards **12**	☐ Parking Width
☐ **Vertical Alignment**	☐ Spiral Length	☐ Diagonal Parking
☐ **Grade**	☐ Superelevation Runoff	☐ Bridge Rail **12**
☐ **Stopping Sight Distance**	☐ Pavement Design Life	☐ Interchange Spacing
☐ **Pavement Cross Slope**		☐ (Other)

Description of Exception:
13

Description of Project (From Prospectus):

Location of Design Feature:

Crash History & Potential: (Specifically as it applies to requested exception)
14

Reasons For Not Attaining Standard: (Such As Cost/ Benefit, Crash History, Environmental, Etc.)

Effect on Other Standards:

Compatibility with Adjacent Sections:

Probable Time before Reconstruction of Section:

Mitigation for Exception Included In Design:
15

Supporting Documentation (Include the appropriate Plan Section, Cross Section, Alignments Sheets & Plan Details):
16

SIGNATURES

Prepared By: _____ **Date:** _____

(Engineer of Record)

Print Name:		**Phone:**			
Company Name:					
Company Address:					
City:		**ST:**		**Zip:**	
Email Address:					

Concurred By: _____ **Date:** _____

(ODOT Program Manager: Area Manager, District Manager, BDU, Private Public Partnerships, Local Government)

_____

(Print Name)

Concurred By: _____ **Date:** _____

(ODOT Region Tech Center Manager or Region Roadway Manager)

_____

(Print Name)

Approved By: _____ **Date:** _____

(State Roadway Engineer)

_____

(Print Name)

PREPARED BY:	**APPROVED BY:**
ENGINEER OF RECORD PROFESSIONAL ENGINEER STAMP	**STATE ROADWAY ENGINEER PROFESSIONAL ENGINEER STAMP**

1 **State Highway Number**: The ODOT, 3-digit number given to each state highway for identification purposes. Generally, this is not the same as the route number. If the project is off the State Highway System, use "Local" for the highway number.

2 **Key Number:** The ODOT unique 5-digit number given to each project.

3 **EA Number and Sub-Job**: The ODOT internal account number for the project including the sub-job number.

4 **Roadway ID**: In ODOT's GIS, the roadway identifier code determines the alignment when there is a separated highway alignment such as a freeway. Code 1 is for the primary alignment that increases with the mile point. Code 2 is for the alignment with the decreasing mile points. Note: state highway 001 (I-5) is opposite to this rule.

5 **Mileage Type**: In ODOT's GIS, the mileage type code is for when there are unique mile points along a highway. The Z code indicates an overlap in the mile points. During realignment that lengthens the highway, an overlap in the mile points will result. The Z code indicates the repeated mile points.

6 **Mileage Overlap Code**: In ODOT's GIS, the mileage overlap code is used when the "Z" code is used to indicate each unique occurrence of duplicate mile points. A code of 1 is use for the first occurrence, a code of 2 for the second occurrence, etcetera.

7 **Functional Classification**: The functional classification for State Highways can be found in ODOT's Highway Design Manual (HDM) in Appendix A.

8 **Vertical Clearance Route**: These specific routes designated for high loads are listed in ODOT's Highway Design Manual (HDM) in Appendix C.

9 **Design Speed**: The design speed is a critical design component that defines multiple design standards. It is not necessarily the same as posted speed. The HDM in Chapter 2 and AASHTO's "*A Policy on Geometric Design of Highways and Streets - 2011*" in the chapter titled Design Controls and Criteria, discuss the design speed at great length. The selection of design speed is made by the Regional Roadway Manager with consultation given by Technical Services Roadway Engineering Unit.

10 **Federal Highway Approval Required:** FHWA and ODOT have an agreement document known as the Stewardship Agreement. In the agreement, FHWA must approve exceptions to standards on pre-selected projects. The pre-selected projects are designated as Full Federal Oversight (FFO). In addition to the FFO projects, any project on the Interstate Highway System that has an exception to any of the 13 controlling criteria also must be approved by FHWA.

11 **SPIS Site:** The Safety Priority Indexing System (SPIS) rates specific location of crashes. Safety funding may be available to correct locations that are in the top 10%. This information is available from the ODOT Traffic Management Section.

12 **Design Speed, ADA Standards, and Bridge Rail**: These are items that are the most difficult to justify. These will only be considered in extreme situations with mitigation measures included.

Design Speed effects many other design standards that can have unintended reductions in inappropriate locations.

ADA standards get into civil rights issues. Documentation of specific project decisions is required for these sensitive designs. Physical inability to comply with prescribed design standards requires a design exception. Fiscal constraints for not complying with standards require an additional letter signed by the agency head or designee.

The Bridge Rail exception refers to the NCHRP Report 350 crash test level requirement or the AASHTO MASH test level requirements. Variations from the Bridge Standard Drawings are considered Deviations granted by the State Bridge Engineer.

13 **Description of Exception**: Limit the number of exceptions to 3 types per form. The use of multiple forms helps to segregate the issues.

When multiple exceptions are being requested, grouping like items on the same form is encouraged. For example, horizontal alignment, vertical alignment, and super elevation share closely related issues.

When multiple exceptions are contained in one form, number the exceptions beginning in this section and keep consistent numbering through the document's remaining sections.

14 **Crash History & Potential**: Evaluation of the Safety Priority Index System (SPIS) for specific locations within the project limits that are in the top 10% of the index. SPIS sites include funding from the Safety Investment Program. This information is available from the Traffic Management Unit. Compare crash rates to average crash rates for similar highways in this section. Discuss the potential for increase or decrease in crash rates. Include the types of crashes and the relationship to the design exception.

15 **Mitigation:** Include the items that are included in the project to mitigate the specific design exception. There are suggested items to use in the HDM in Chapter 6.

16 **Supporting Documentation:** The Design Exception submittal must include appropriate plan section, cross section, alignment sheet and plan details. Digital pictures may also be included.

Note: On all projects, exceptions are required when the below geometric design elements do not meet or exceed the minimums given in the ODOT Highway Design Manual for the type of project.

Table 14-3: Design Exception List

Design Elements / Features	Requires FHWA approval for FFO projects and Interstate Highway projects	Requires ODOT approval for all projects
Design Speed	√	√
Lane Width	√	√
Shoulder Width/Shy Distance	√	√
Bridge Width	√	√
Horizontal Alignment	√	√
Vertical Alignment	√	√
Grade	√	√
Stopping Sight Distance	√	√
Pavement Cross Slope	√	√
Superelevation	√	√
Vertical Clearance	√	√
Structural Capacity	√	√
Clear Zone[1]	√	√
ADA Standards		√
Spiral Length (curves 1 degree or sharper)		√
Superelevation Runoff (match spiral length)		√
Pavement Design Life		√
Design Life and V/C Ratio		√
Bike Lane/Multi-Use Path Width		√
Sidewalk Width		√
Median Width		√
Parking Width		√
Diagonal Parking (Jointly with State Traffic Engineer)		√
Bridge Rail		√
Interchange Spacing		√
Other[2]		√

[1] Design exceptions are required for 4R projects. For 3R projects clear zone design will be the responsibility of the Region Technical Center. Contact the Region Roadway Manager for exact procedures to be followed. FHWA approval of clear zone design on 3R projects not required.

[2] Items that are in the Highway Design Manual that require approval of the State Roadway Engineer but not specifically listed above. These include existing guard rail upgrade, live stock under passes, barrier placement, acceleration lanes from at-grade intersections, right turn lanes, and interchange design.

14.3.5 ADDITIONAL INFORMATION

14.3.5.1 CLEAR ZONE

The Engineer of Record is responsible for determining the clear zone issues. For 4R projects the clear zone design exception will follow the same procedure as all other design exceptions with approval being granted by the State Traffic-Roadway Engineer. This will be shown on the Design Exception Request form where "Clear Zone" is specifically listed next to the check box.

For 3R, 1R and Single Function projects, clear zone design exception will be the responsibility of the Region Technical Center. Contact the Region Roadway Manager for exact procedures to be followed.

14.3.5.2 DESIGN EXCEPTION REVIEWS

The review of the Design Exception is accomplished by Technical Services Roadway Engineering staff. A formal recommendation is made to the State Traffic-Roadway Engineer for approval or rejection. Early informal consultation with Roadway Engineering staff is encouraged. Draft Design Exceptions are accepted and formal reviews are conducted. When submitting final Design Exceptions, please include the names of Roadway Engineering staff that was involved in preliminary discussions or draft reviews. This will assist in having the same reviewer through out the process.

14.3.5.3 EXAMPLES OF DESIGN EXCEPTIONS

The following examples of design exceptions are include giving the designer an idea of the level of detail required for a typical design exception.

OREGON DEPARTMENT OF TRANSPORTATION
DESIGN EXCEPTION REQUEST

For Roadway Section Office use only	
Control No:	15555-01

Section Name:	OR212/224: SUNRISE CORRIDOR (I-205 – SE 122ND AVE)					Route No.:	OR 224
Highway Name:	Sunrise					Highway No.:	171
County Name:	Clackamas	Region:	1	Key No.:	15555	EA No.:	PE001727/020

PROJECT DATA

Functional Classification:		Urban Principal Arterial-Other (OR 213 – 82nd Avenue)					
Current ADT (Year):		8,000 for on-ramp from 82nd Ave to I-205 SB (2010)			Design ADT (Year):	6,000 for on-ramp from 82nd Ave to I-205 SB (2020)	
% Trucks:	4-6	Freight Route:	☒ Yes ☐ No				
Posted Speed:	55 mph	Design Speed:	55 mph		Bid Date:	March 2013	
Funding:		Modernization (JTA)					
Current Estimate:		$100 million		Additional Cost to Meet Standard:		$5 million	
Cost over $5 M :	Yes ☒	Design Standard	3R ☐	SIP Category:	(1-5) 5	Top 10% SPIS Site:	Yes ☐ No ☒
Cost over $1 M :	Yes ☐		4R ☒				
NHS:	☒	Federal Highway Approval Required:			Yes ☐ No ☒		
Non NHS:	☐						

Design Exceptions		
☐ Design Speed	☐ Pavement Cross Slope	☐ Design Life and V/C Ratio
☒ Lane Width (Ramp Meter)	☐ Superelevation	☐ Bike Lane/Multi-Use Path Width
☒ Shoulder Width/Shy Distance	☐ Clear Zone	☐ Sidewalk Width
☐ Bridge Width	☐ Structural Capacity	☐ Median Width
☐ Horizontal Alignment	☐ ADA Standards	☐ Parking Width
☐ Vertical Alignment	☐ Spiral Length	☐ Diagonal Parking
☐ Grade	☐ Superelevation Runoff	☐ Bridge Rail
☐ Stopping Sight Distance	☐ Pavement Design Life	☐ Vertical Clearance
☐ Interchange Spacing		☐ (Other)

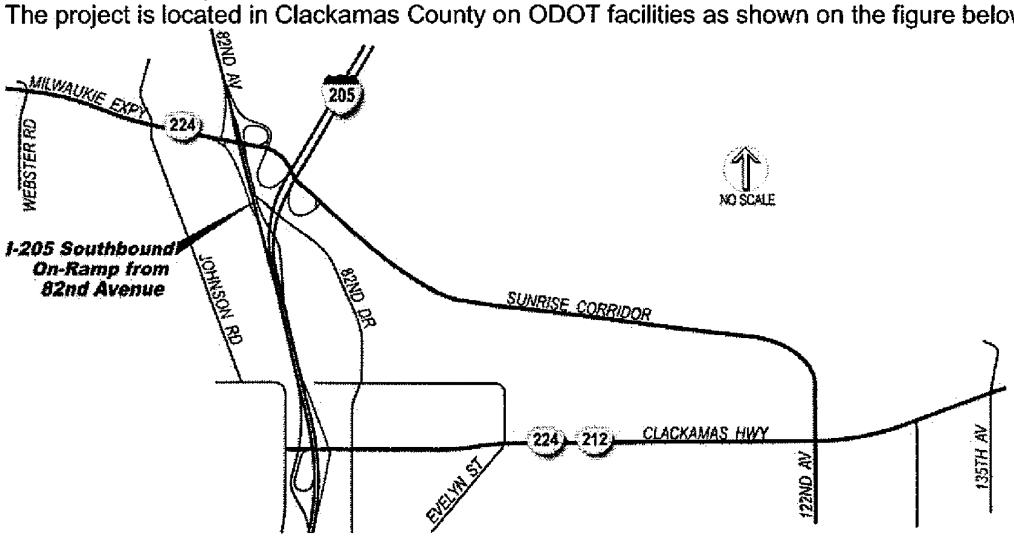
Description of Exception:
The Highway Design Manual (page 9-57) requires two-lane ramp meters to be built to full two-lane ramp standards. An exception is requested for the I-205 southbound on-ramp from 82nd Avenue. The I-205 southbound on-ramp from 82nd Avenue to I-205 is part of the I-205/Milwaukie Expressway/82nd Avenue interchange south of Clackamas Town Center. Today there are two southbound lanes from 82nd Avenue controlled by a ramp meter located about 1,200 feet south of the gore of the 82nd Avenue off-ramp to Milwaukie Expressway. The project will split those two lanes, sending one to southbound 82nd Drive and keeping one as the southbound I-205 on-ramp. The existing ramp meter will be removed and the proposed ramp meter will be installed on the ramp to I-205 about 275 feet to the south of the current ramp meter location. A single 16-foot ramp will be striped with two-lane ramp meter markings per the ODOT Standard Drawings (see attached Draft DAP plans ST-5, 00020, and 00021).

Standard = 2 – 12' lanes, 10' right shoulder, 6' left shoulder
Proposed = 1 – 16' lane striped for a two lane ramp meter, 6' right shoulder, 4' left shoulder

OREGON DEPARTMENT OF TRANSPORTATION
DESIGN EXCEPTION REQUEST

Description of Project (From Prospectus):
The Sunrise JTA project is a 2-mile mainline extension of the Milwaukie Expressway (OR 224) from I-205 to 122nd Avenue. It also includes widening 122nd Avenue near OR 212/224, local access modifications, and a reconfiguration of the 82nd Ave/82nd Drive connection.

Location of Design Feature:
The project is located in Clackamas County on ODOT facilities as shown on the figure below.



Crash History & Potential: (Specifically as it applies to requested exception)
Available collision data for the I-205 southbound on-ramp from 82nd Avenue was reviewed for the recent five-year period of January 1, 2006 to December 31, 2010. The data included collisions from about 1,000 feet north of the existing ramp meter to the gore point of ramp about 750 feet south of the existing ramp meter. During that period of five years, there were nine crashes, none of which resulted in fatalities. Eight out of the nine crashes resulted in injuries. All were rear-end collisions upstream of the existing ramp meter.

Reasons For Not Attaining Standard: (Such As Cost/ Benefit, Crash History, Environmental, Etc.)
The proposed lane configuration for the Sunrise JTA project will split the existing 2 lane section of 82nd Ave SB into two single lanes (one to 82nd Dr and one to I-205 SB). Widening to two full lanes on the I-205 southbound on-ramp from 82nd Avenue would require replacement of the existing bridge over 82nd Avenue to gain proper width for three lanes (existing bridge wide enough for two lanes). Widening of the ramp would also require reconfiguration of the Milwaukie Expressway to I-205 SB ramp due to the limited space available between 82nd Ave northbound and the Milwaukie Expressway to I-205 SB ramp.

In total these modifications would cost about $5 million. This ramp meter is an interim condition (does not exist as part of the Sunrise FEIS preferred alternative) and would be consistent with a typical two-lane retrofit layout. When the ramp meter is not operating, the roadway will function as a single lane ramp to I-205.

Effect on Other Standards:
None.

Compatibility with Adjacent Sections:
Although the standard requires two full ramp lanes at ramp meters, most of the existing ramp meters in the Metro area are not built to that standard. Drivers in the region are very familiar with the configuration of forming two lines at a ramp meter on a one-lane on-ramp.

Probable Time before Reconstruction of Section:
Funding has not been determined for the future phase of the Sunrise Corridor, so the construction schedule is unknown.

OREGON DEPARTMENT OF TRANSPORTATION
DESIGN EXCEPTION REQUEST

Mitigation For Exception Included In Design:
The overall project includes significant capacity improvements, new/modified traffic signals and ramp meters, improved roadway illumination, updated ITS/communication elements, and updated signing/striping.

Supporting Documentation (Include the appropriate Plan Section, Cross Section, Alignments Sheets & Plan Details):
Draft DAP ramp meter and striping plans

OREGON DEPARTMENT OF TRANSPORTATION
DESIGN EXCEPTION REQUEST

For Roadway Section Office use only	
Control No:	17806-61

Section Name:	US101: Pistol River Bridge					**Route No.:**	
Highway Name:	US101 OREGON COAST					**Highway No.:**	9
County Name:	CURRY	**Region:**	3	**Key No.:**	17800	**EA No.:**	PE001907

PROJECT DATA

Functional Classification:	RURAL PRINCIPAL ARERIAL						
Current ADT (Year):	3200				**Design ADT (Year):**	3420	
% Trucks: 15	**Freight Route:**	☐ Yes ☒ No					
Posted Speed: 55	**Design Speed:**	60			**Bid Date:**	October 1, 2012	
Funding:	STIP_$6.134 million						
Current Estimate:	$5.0 million			**Additional Cost to Meet Standard:**	$17.0 million		
Cost over $5 M : Yes ☒	**Design Standard**	3R ☒	**SIP Category:**	**(1-5)** NA	**Top 10% SPIS Site:**	Yes ☐	
Cost over $1 M : Yes ☐		4R ☐				No ☒	
NHS: ☒	**Federal Highway Approval Required:**				Yes ☒ No ☐		
Non NHS: ☐							

Design Exceptions		
☐ Design Speed	☐ Pavement Cross Slope	☐ Design Life and V/C Ratio
☐ Lane Width	☐ Superelevation	☐ Bike Lane/Multi-Use Path Width
☒ Shoulder Width/Shy Distance	☐ Clear Zone	☐ Sidewalk Width
☒ Bridge Width	☐ Structural Capacity	☐ Median Width
☐ Horizontal Alignment	☐ ADA Standards	☐ Parking Width
☐ Vertical Alignment	☐ Spiral Length	☐ Diagonal Parking
☐ Grade	☐ Superelevation Runoff	☐ Bridge Rail
☐ Stopping Sight Distance	☐ Pavement Design Life	☐ Vertical Clearance
☐ Interchange Spacing		☐ (Other)

Description of Exception:
4 foot shoulder width on bridge (zero shy) and 4 to 6 foot shoulder widths in guardrail transition areas at the bridge approaches.

Description of Project (From Prospectus):
The existing structure is showing corrosion, deck wear and the bridge has structural deficiencies throughout. The Pistol River bridge is a good candidate for repair versus a full replacement. Proposed repairs include cathodic protection for all elements above the Ordinary High Water Line, removing and replacing the existing bridge rail, cross beam strengthening, seismic restraints, poly deck overlay, and asphaltic plug joints. The proposed repair will extend the life and functional use of the bridge for the traveling public. The costs of repairs present the best value to correct the structural deficiencies currently found.

Location of Design Feature:
US101 MP338.72 to MP339.50. The reduced shoulder width varies from 4 foot on the north side of the bridge, 4 foot on the bridge, and 4 to 6 foot south of the bridge. The existing bridge deck width is 30' wide and as part of this project new bridge rail will be installed on the structure and will widen the deck width to 32'. The guardrail runs on the north end of the structure will be completely replaced with the same 4 foot offset from fog line as they are today.

OREGON DEPARTMENT OF TRANSPORTATION
DESIGN EXCEPTION REQUEST

Crash History & Potential: (Specifically as it applies to requested exception)
In the last three years there has been one collision reported. The collision was a head on at MP339.35 with one occupant a fatal and another injury A. Shoulder widths off the structure will remain 4 foot, the same as they are currently and the shoulders on the structure will be increased from 3 to 4 foot wide with this project. As this section of rural highway is not a freight route or truck route, given the low accident history on this tangent section of highway, the available sight distances above standard, it would be unreasonable to meet standard.

Reasons For Not Attaining Standard: (Such As Cost/ Benefit, Crash History, Environmental, Etc.)
According to the bridge engineer for this project the entire structure would need to be replaced to attain a standard deck width of 44 feet. In addition, given the topography, steep cut and fill slopes to the north and south of structure, it would not be practical to widen shoulders to meet standard.

Effect on Other Standards:
None.

Compatibility with Adjacent Sections:
The lane and shoulder widths of this section of rural coast highway is consistant with both north and south directions from this project.

Probable Time before Reconstruction of Section:
20 years

Mitigation For Exception Included In Design:
The brigde deck will have new microsilica surfacing and the highway will be paved for 200 feet off both approaches. There will be new guarail with energy absorbing, non-flared, terminals, new bridge rails that will allow 1 foot wider shoulders on structure and new striping installed with this project.

Supporting Documentation (Include the appropriate Plan Section, Cross Section, Alignments Sheets & Plan Details): Sheets 2, 3 thu 5, and bridge drawing showing the deck sections.

OREGON DEPARTMENT OF TRANSPORTATION
DESIGN EXCEPTION REQUEST

For Roadway Section Office use only	
Control No:	16051-01

Section Name:	North Unit Canal Bridge #31C98					**Route No.:**	n/a
Highway Name:	Culver Hwy					**Highway No.:**	n/a
County Name:	Jefferson	**Region:**	4	**Key No.:**	16051	**EA No.:**	PE001689

PROJECT DATA

Functional Classification:		Rural Local					
Current ADT (Year):		175 ('07)				**Design ADT (Year):**	206 ('27)
% Trucks:	Unknown	**Freight Route:**	☐ Yes ☒ No				
Posted Speed:	55	**Design Speed:**	55			**Bid Date:**	December 1, 2012
	Funding:	Highway Bridge Program					
	Current Estimate:	$830,000		**Additional Cost to Meet Standard:**		$700,000	
Cost over $5 M :	Yes ☐	**Design Standard**	**AASHTO** ☒	**SIP Category:**	**(1-5)** n/a	**Top 10% SPIS Site:**	Yes ☐ No ☒
Cost over $1 M :	Yes ☐						
NHS:	☐	**Federal Highway Approval Required:**			Yes ☐ No ☒		
Non NHS:	☒						

Design Exceptions		
☐ Design Speed	☐ Pavement Cross Slope	☐ Design Life and V/C Ratio
☐ Lane Width	☐ Superelevation	☐ Bike Lane/Multi-Use Path Width
☐ Shoulder Width/Shy Distance	☐ Clear Zone	☐ Sidewalk Width
☐ Bridge Width	☐ Structural Capacity	☐ Median Width
☒ Horizontal Alignment	☐ ADA Standards	☐ Parking Width
☒ Vertical Alignment	☐ Spiral Length	☐ Diagonal Parking
☐ Grade	☐ Superelevation Runoff	☐ Bridge Rail
☐ Stopping Sight Distance	☐ Pavement Design Life	☐ Vertical Clearance
☐ Interchange Spacing		☐ (Other)

Description of Exception:
This project replaces an existing bridge with a wider single span structure in it's existing location.This section of roadway has a speed limit of 55 mph (basic rule). The existing horizontal alignment contains a horizontal curve of 358 feet radius (~38 mph). Whereas an 835 foot radius (55mph) curve is required by AASHTO (Very Low-Volume Local Roads) standards. It is proposed to construct the project on the existing horizontal alignment, and as such, an exception for horizontal degree of curvature is being requested.

Replacing the bridge requires raising the bridge deck from it's existing elevation to accommodate canal flows and a deeper super-structure. The proposed vertical alignment contains a crest vertical curve with a rate of vertical curvature (K) of 48 (~47mph). AASHTO (Very Low-Volume Local Roads) guidelines calls for a K value of 76 (55mph) in this situation, so we are also requesting an exception for vertical curvature.

Description of Project:
This project is on a Jefferson County local road and consists of replacing the existing load rated, 3-span wooden bridge rated as "Intolerable" and "Structurally Deficient" in 2006, with a new single-span bridge over the North Unit Canal.

Location of Design Feature:
The horizontal curve element is located on Culver highway from station 12+39.54 to 14+55.13. The vertical curve element is located from station 11+55.78 to 13+05.79.

OREGON DEPARTMENT OF TRANSPORTATION
DESIGN EXCEPTION REQUEST

Crash History & Potential:
A crash history search revealed no crashes in the project area in the last five years (see attachment). The existing substandard horizontal curve is obvious to drivers and limits speeds. There are also sharp curves nearby that also contribute to speed control.

Reasons For Not Attaining Standard:
Realignment of the road exceeds the scope and budget of the project which is the replacement of the canal bridge. Realignment would not be able to be restricted to the subject horizontal curve. It would affect the subsequent curves which would require multiple acres of right of way acquisition as well as extensive excavation. To attain the proper crest vertical curve element, fill slopes requiring right of way purchases would be necessary along the entire northern end of the project. Because this section of road has no history of crashes with the current alignment, improving the existing geometry (superelevation, etc.) of the road to the proposed vertical alignment should not decrease the safety of this section of the corridor.

Effect on Other Standards:
None

Compatibility with Adjacent Sections:
The section of road encompassing the lower design speed curves is located between two tangent sections, both over a mile in length. The curves exist to climb a vertical grade, and are apparent to drivers approaching this area of the road.

Probable Time before Reconstruction of Section:
Greater than 50 years.

Mitigation For Exception Included In Design:
The new bridge incorporates wider shoulders and shy distance, resulting in seven feet of additional width over the existing bridge. The reconstruction also improves the superelevation which will be safer, more predictable, and more comfortable to drivers.

Supporting Documentation:
Curvature layouts, alignment review, typical sections, and crash history report attached.

Signatures

Prepared By: Brian D Paslay — Engineer of Record — **Date:** 2-2-12

Print Name:	Brian Paslay	**Phone:**		541-388-6447	
Company Name:	ODOT				
Company Address:	63034 O.B. Riley Rd.				
City:	Bend	**ST:**	OR	**Zip:**	97701

Concurred By: — ODOT Area Manager — **Date:** 2/2/12

Norman C. "Butch" Hansen

Concurred By: — ODOT Region Roadway Manager — **Date:** 02/02/2012

Della Mosier, P.E.