

13.0 DESIGN EXCEPTION PROCESS

13.1 GENERAL

The information in this section describes the design exception process for planning studies and 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 2 and further defined for particular highway classification and environments in Chapters 5 through 12. This section also provides information on the design concurrence process to be used for nonconforming roadside features.

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 Roadway Engineering Manager. Non-exempt projects on the NHS system also require approval of design exceptions by FHWA. The FHWA Non-Exempt projects are those:

- **Projects using ODOT New/4R standards on NHS routes with a construction cost of \$1,000,000 or more.**
- **Projects using ODOT 3R standards on NHS routes with a construction cost of \$5,000,000 or more.**

13.1.1 JUSTIFICATION OF DESIGN EXCEPTIONS

- **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. Some considerations which may cause a request for an exception to the design standards are listed below:

- Excessive construction cost or benefit/cost
- 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 accident history and/or accident potential
- Low traffic volumes

- **Planning Projects**

Design exceptions to standards may be needed for planning studies. 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 Technical Services Resource Manager (TSRM) 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 13.3. For projects that may be constructed within five to ten years, the design exceptions should be identified and the TSRM or the Roadway Engineering Manager should give an indication that a design exception is warranted and would probably be approved.

13.2 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:

- **Roadside Inventory and Design Concurrence**

A roadside inventory is typically completed as part of project information gathering. The level of detail required for the roadside inventory is the same as required for the project type in accordance with the Safety Investment Program Category for that section. For more information on roadside inventory requirements refer to Chapter 3. The roadside inventory provides valuable information on existing roadside features and can be used to help justify design concurrences. Those features found not to be in conformance with Standards and Standard Drawings are to be evaluated and

brought into conformance where it is reasonable and cost effective. A design concurrence must be obtained for those nonconforming elements that will not be corrected or mitigated with the project. Potential mitigation for projects may be limited to low-cost measures that are listed in Table 7-6 and Table 8-9. Roadside Inventory information is outlined in Section 3.3. Design concurrences shall follow the same procedure that is used for design exceptions that is outlined in Section 13.3. Figure 13-2 shows the design concurrence request form.

- **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.

- **Traffic and Accident 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 accident potential and history, and its relationship to the improvements proposed. Generally, the accident 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 accident 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.

- **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 be the need to buy 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.

- **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 benefit/cost 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 13.1.1.

- **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.

13.3 DESIGN EXCEPTION PROCESS

- **General**

In order to obtain timely Roadway Engineering Manager and FHWA approvals, design exception requests should be recommended by the TSRM and Area Manager (or equivalent) and forwarded to the Roadway Engineering Manager as soon as the need is identified. This can occur at any phase of the project. 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 between the Area Manager and the TSRM. Figure 13-1 shows the design exception request form.

Local Agency project design exceptions follow a different process. Although the approval of design exceptions is under the authority of the Roadway Engineering Manager, the intervening steps between the request and approval differ from the standard design exception process. Designers involved in local agency contracts should contact the Local Government Section Manager for processing design exceptions on local agency projects.

Requests for exceptions to design standards with justification and mitigation shall be submitted to the Roadway Engineering Manager and approved prior to incorporation of design features into project plans and/or other documents.

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 TSRM or Central Design Team Leader. The data should include the information shown in Table 13-1 and described in Section 13.2. Designer signs the design exception request on “Prepared by” line. If the Designer is the Engineer of Record, the Designer stamps the design exception request.

- Step 3 Project Leader signs the design exception request on “Submitted by.” Forwards request to TSRM or Central Design Team Leader.

- Step 4 TSRM or Central Design Team Leader reviews request and any supporting documentation and signs the design exception request on the first “Recommended by” line if in agreement. If not in agreement, consult with Project Leader and Area Manager to resolve. If TSRM or Central Design Team Leader is the Engineer of Record, they stamp the design exception request.

- Step 5 Area Manager reviews request and consults with TSRM to assure that the request accurately describes the conditions that warrant a design exception. Area Manager then signs the design exception request on the second “Recommended by” line and forwards to the Roadway Engineering Manager.

- Step 6 Roadway Engineering Manager reviews the design exception request and recommendation from the Area Manager. The Roadway Engineering Manager signs and stamps the request if sufficiently justified. On non-exempt Federal-Aid projects, the Roadway Engineering Manager submits the request letter to FHWA for exceptions on nonconforming geometric standards (see Table 13-2). 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 13-2.

- Step 7 Roadway Engineering Manager receives FHWA approval (if necessary) for design exceptions and forwards copy to Project Leader, TSRM, and Engineer of Record. The Roadway Engineering Manager maintains the original request in approved design exception file.
- Step 8 Where agreement between the Area Manager and Roadway Engineering Manager cannot be reached, the Roadway Engineering Manager 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 13-1
Data Needs For Exception Justification

<ol style="list-style-type: none">1) Summary of the proposed exception2) Project description/purpose3) Impact on other standards4) Cost to build to standard5) Reasons (low benefit/cost, relocations, environmental impacts, etc.) for not attaining standard6) Compatibility with adjacent sections (route continuity)7) Accident 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 conditions9) Mitigation measures to be used

**Figure 13-1
Design Exception Request Form**

**OREGON DEPARTMENT OF TRANSPORTATION
DESIGN EXCEPTION REQUEST**

Section:

County:

Highway:

Key No.:

PROJECT DATA

Functional Classification:		Design Standard:	
Current ADT (Year):		Design ADT (Year):	
% Trucks:	Posted Speed: mph	Design Speed: km/h	
Current Estimate:			
Additional Cost to Meet Standard:			

Design Exception Requested For:

Location of Design Feature:

Accident History and Potential (specifically as it applies to requested exception) :

Reasons for Not Attaining Standard (such as benefit/cost, accident history, environmental, etc.):

Effect on Other Standards:

Compatibility with Adjacent Sections:

Probable Time Before Reconstruction of Section:

Mitigation for Exception Included in Design:

Prepared by: _____ Date: _____
(Designer)

Submitted by: _____ Date: _____
(Project Leader)

Recommended by: _____ Date: _____
(Technical Services Resource Manager)

Recommended by: _____ Date: _____
(Area Manager)

Approved by: _____ Date: _____
(Roadway Engineering Manager)

**ENGINEER
OF RECORD
PROFESSIONAL
ENGINEER
STAMP**

**ROADWAY
MANAGER
PROFESSIONAL
ENGINEER
STAMP**

**Table 13-2
Design Exception List**

Design Elements / Features	Requires ODOT and FHWA approval for New/4R and 3R Freeway Non-Exempt projects on the NHS¹	Requires ODOT approval for 3R Non-Freeway Projects²	Requires ODOT approval for all projects
Design Speed	v		v
Lane Width	v	v	v
Shoulder Width	v	v	v
Bridge Width	v	v	v
Horizontal Alignment	v	v(Criteria B)	v
Vertical Alignment	v	v	v
Grade	v		v
Stopping Sight Distance	v		v
Pavement Cross Slope	v	v(New Const.)	v
Superelevation	v	v(New Const.)	v
Vertical Clearance	v	v	v
Structural Capacity	v		v
ADA Standards	v	v	v
Spiral Length (curves less than 2000 m)	v		v
Superelevation Runoff (match spiral length)	v		v
Pavement Design Life		v	v
Design Life and V/C Ratio			v
Bike Lane/Multi-Use Path Width			v
Sidewalk Width			v
Median Width			v
Parking Width			v
Diagonal Parking (Jointly with State Traffic Engineer)			v

1. On all New Construction, 4R, and Freeway 3R projects, exceptions shall be approved by ODOT when the above geometric design elements do not meet or exceed the minimums given in the ODOT *Highway Design Manual*.
2. On all 3R Non-Freeway projects, exceptions must be approved by ODOT when the above geometric design elements do not meet or exceed the minimum 3R or New Construction Standards (as appropriate) given in the ODOT *Highway Design Manual*.

**Figure 13-2
Design Concurrence Request Form**

**OREGON DEPARTMENT OF TRANSPORTATION
DESIGN CONCURRENCE REQUEST**

Section:

County:

Highway:

Key No.:

PROJECT DATA

Functional Classification:		Design Standard:	
Current ADT (Year):		Design ADT (Year):	
% Trucks:	Posted Speed: mph	Design Speed: mph	
Current Estimate:			
Additional Cost to Meet Standard:			

Design Concurrence Requested For:

Location of Design Feature:

Accident History and Potential (specifically as it applies to requested concurrence):

Reasons for Not Attaining Standard (such as benefit/cost, accident history, environmental, etc.):

Effect on Other Standards:

Compatibility with Adjacent Sections:

Probable Time Before Reconstruction of Section:

Mitigation for Concurrence Included in Design:

Prepared by: _____ Date: _____
(Designer)

Submitted by: _____ Date: _____
(Project Leader)

Recommended by: _____ Date: _____
(Technical Services Resource Manager)

Recommended by: _____ Date: _____
(Area Manager)

Approved by: _____ Date: _____
(Roadway Engineering Manager)

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Design Exception Example

OREGON DEPARTMENT OF TRANSPORTATION DESIGN EXCEPTION REQUEST

Section: 33rd St.– Hamburg Ave. (Astoria)
Highway: Lower Columbia - Coast

County: Clatsop
Key No.: 10803

PROJECT DATA

Functional Classification Urban Principal Arterial Design Standard ODOT 3R
Current ADT (Year 14,000 – 22,000 (2000)) Design ADT (Year 18,200-28,600 (2010))
% Trucks: 6 % Posted Speed 25 – 30 mph Design Speed 25 mph- 30 mph
Current Estimate \$1,300,000
Additional Cost to Meet Standard \$2,500,000

Design Exception Requested For: 3.3m travel lane width, 3.3m to 4.0m turn lane width, 100mm curb height exposure, E (shy distance) 0.3 m to 0.6 m.

Location of Design Feature: The majority of the work will occur entering an existing central business district couplet. Maintenance overlay two years ago still gives sufficient pavement life in the couplet. Cold plane pavement removal inlay at gutter line – parking lanes will bring back an average 100 mm curb exposure to maintain acceptable drainage in the couplet. The remainder of the project will be a combination of cold plane overlay/inlay with isolated excavation rebuild areas to achieve the minimum 8 year pavement life cycle. Through city acquired grant money and bike pedestrian funds infill walks will be included. At these areas of work a minimum 150mm of average curb exposure will be constructed. Existing drainage will be maintained. Access management will require the closing of numerous old and existing accesses matching new curb height with existing. Existing roadway widths range from 20 m to 12.2 m. Safety improvements will include adding center turn lanes by restriping and eliminating parking as recommended by the City of Astoria and the Astoria Traffic Safety Committee. This will result in minimum 3.3 m travel lanes with 3.3 m to 4.0 m center turn lanes, 2.4 m parking, 1.2 m to 1.8 m bike lanes with a 0.3 m to 0.6 m shy distance.

Accident History & Potential: (Specifically as it applies to requested exception) Rear end collisions yr 1996 to 2000 (123 total) (see attachment). Within this congested area there have been numerous collisions. The additional left turn lane should lower the number of collisions.

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

(1) Astoria is an older city with chairwall sidewalk and roadway type of construction. Bringing up to current standards would be a high cost undertaking currently estimated at \$2,500,000+. Cold plane pavement removal/inlay paving at the parking and outer lanes with a maximum cross slope of 6% will help bring the average curb exposure to 100 mm. (2) Insufficient right of way width within the business district. (3) The AASHTO "A Policy on Geometric of Highways and Streets" allows for 3.3 m travel lanes and 3.3 m to 4.0 m left turn lanes given the low speed and low truck volumes and the existing left turn lane configuration. The proposed restriping for consistent 3.3 m travel lanes throughout and 3.3 m to 4.0 m center turn lane additions and providing 1.2 m to 1.8 m bike lanes and 2.4 m parking with 0.3 m to 0.6 m shy distance to curb line and parking. (4) The narrow lanes and minimal shy distances should help calm traffic.

Effect on Other Standards: None

Compatibility with Adjacent Sections: The easterly end entering Astoria is mainly residential – business which has a calming effect on traffic. The westerly end is the termini for the proposed roundabout . This facility should provide a high level of traffic calming.

Probable Time Before Reconstruction of Section: 10 years before another preservation project. 20 years before a major roadway – sidewalk rebuild.

Mitigation For Exception Included In Design: Slower traffic speed, none needed.

Submitted by: _____ Date: _____
(Project Leader)

Recommended by: _____ Date: _____
(Technical Services Resource Manager)

Approved by: _____ Date: _____
(Area Manager)

Approved by: _____ Date: _____
(Roadway Engineering Manager)

