



Process for Determining and Documenting Design Controls and Criteria

General

New construction projects or reconstruction projects that require total reconstruction of the pavement and involve a change in the basic roadway type, should meet all applicable design controls and criteria. Thorough documentation of design controls and criteria is essential. The design controls and criteria for a project should be determined, documented, and approved using the **DelDOT Design Control Checklist** and the **DelDOT Design Criteria Form** during the initial stages of the design of a project. These approved documents in conjunction with the **DelDOT Design Exception Request Form**, if a design exception is required, should be maintained as a package in the project file.

Design Controls

Plans for transportation projects are based on established geometric design criteria. These criteria are dictated by a project's design controls which are influenced by the type of project and the project area. Each project has its own unique characteristics which need to be considered when determining a project's design controls. These design controls include functional classification, design speed, traffic volumes, design vehicles, and design level of service. **DelDOT's Design Control Checklist** should be used to document and obtain concurrence for a project's design controls. Design controls are utilized to determine a project's design criteria; therefore, documentation and concurrence is required very early in the design process, preferably at, or shortly after, the Survey Plan submittal.

Design Criteria

Once a project's design controls are established and approved the design criteria can be determined. The design criteria are used to ensure that the geometrics and physical characteristics of a project are consistently designed with due consideration of safety, appropriate levels of service, economy, and driver expectancy. **DelDOT's Design Criteria Form** should be used to document and obtain concurrence for a project's design criteria as early as possible in the design process, preferably prior to, or no later than concurrent with the Preliminary Plan submittal. The **DelDOT Design Control Checklist** and the **DelDOT Design Criteria Form** should be reevaluated at the Semi-Final Plan stage to ensure none of the design controls or criteria have changed during the development of the project. If changes have occurred, the **DelDOT Design Control Checklist** and/or the **DelDOT Design Criteria Form** should be modified to document and obtain concurrence for the changes.



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Design Exceptions

Occasionally, there may be conditions that warrant consideration of a design value that differs from established design criteria. The FHWA has established ten controlling criteria for design which are included on the **DelDOT Design Criteria Form**. New construction and reconstruction projects that change the basic roadway type that deviate from any of the ten controlling criteria for design require a design exception. The need for exceptions to design criteria must be identified early in the design process in order that approvals or denials will not delay the completion of the design or require extensive redesign of the project. If it is determined that a design exception is required, the **DelDOT Design Control Checklist** and the **DelDOT Design Criteria Form** should be used as the basis for documenting the request for the design exception. Design exceptions require completion of the **DelDOT Design Exception Request Form** and approval by DelDOT's Chief Engineer. The **DelDOT Design Exception Request Form** should be accompanied by documentation that provides supporting justification for the design exception request as well as the **DelDOT Design Control Checklist** and the **DelDOT Design Criteria Form**.

Variations from design criteria that require design exceptions on FHWA Projects of Division Interest (PODI) or Oversight projects are also subject to the approval of FHWA. Project managers should refer to the most current Stewardship and Oversight Agreement between FHWA and DelDOT for an up-to-date listing of PODI projects subject to FHWA oversight.

Design exceptions for design speed should be extremely rare as this element establishes most of the other design criteria to be met. Design criteria that cannot be met within a selected design speed should be supported by seeking a design exception for those specific design criteria.

Advisory (Non NHS Routes)

Formal design exceptions may only be required on new construction and reconstruction projects; however, it is good practice to document deviations from design criteria in the project file for many types of projects. The level of documentation required depends on the project type and scope but supporting information should include analysis of crash records, existing roadway characteristics, required and proposed design criteria, cost analysis, compatibility of adjacent roadway sections or intersections, and proposed measures to mitigate deviations from design criteria. Although many types of system preservation projects such as pavement rehabilitation, traffic, and maintenance do not require any documentation on design decisions, designers may determine that it is advisable to document select design decisions in the project file.



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Advisory (NHS Routes)

Review and approval of design exceptions on non-interstate NHS routes have been delegated to DelDOT. If a design exception is requested on an NHS route, regardless of funding source, this is a federal action and NEPA documentation is also required in the following cases:

- NHS routes with a speed greater than or equal to 50 mph: Any design variance/analysis associated with the ten controlling criteria.
- NHS routes with a speed less than 50 mph: Only design variance/analysis associated with the following two controlling criteria: design loading structural capacity and design speed.

The FHWA expects documentation of design exceptions to include all the following:

- Specific design criteria that will not be met.
- Existing roadway characteristics and alternatives considered.
- Comparison of the safety and operational performance of the roadway and other impacts such as right of way, community, environmental, cost, and usability by all modes of transportation.
- Proposed mitigation measures and compatibility with adjacent sections of roadway with the level of analysis being commensurate with the complexity of the project.

Design speed and design loading structural capacity are fundamental criteria in the design of a project. Design exceptions to these criteria should be extremely rare and FHWA expects the documentation to provide the following additional information:

- Design speed exceptions: length of section with reduced design speed compared to overall length of project and measures used in transitions to adjacent sections with higher or lower design or operating speeds.
- Design loading structural capacity exceptions: verification of safe load-carrying capacity (load rating) for all State unrestricted legal roads or routine permit loads, and in the case of bridges and tunnels on the interstate, all Federal legal loads.