



## New ADOT Design Decision Guide

**Chris Cooper** <ccooper@azdot.gov>

To: "Deitering, Thomas (FHWA)" <thomas.deitering@dot.gov>, Jerry James <JJJames@azdot.gov>, "Todd A. Emery" <TEmery@azdot.gov>, Gregory Byres <GByres@azdot.gov>, Hiren Shah <hshah@azdot.gov>, Paul O'Brien <PO'Brien@azdot.gov>, Bill Fay <bfay@azdot.gov>, Victoria Bever <vbever@azdot.gov>, Doug Smith <dsmith2@azdot.gov>, Michael Culp <mculp@azdot.gov>, Raul Amavisca <RAmavisca@azdot.gov>, "Acuna, Jennifer (FHWA)" <jennifer.acuna@dot.gov>, David Locher <dlocher@azdot.gov>, Anthony Brozich <abrozich@azdot.gov>, Steve Boschen <SBoschen@azdot.gov>, Susan Anderson <seanderson@azdot.gov>, Paul Patane <PPatane@azdot.gov>, Bret Anderson <banderson@azdot.gov>, James Windsor <jwindsor@azdot.gov>, Paula Gibson <pgibson@azdot.gov>, Barry Crockett <bcrockett@azdot.gov>, Kerry Wilcoxon <kwilcoxon@azdot.gov>, Steve O'Brien <SO'Brien@azdot.gov>, Matt Moul <MMoul@azdot.gov>, Susan Stumfoll <sstumfoll@azdot.gov>, Adam Bieniek <abieniek@azdot.gov>, Audra Merrick <amerrick@azdot.gov>, Kirstin Huston <khuston@azdot.gov>, David Benton <dbenton@azdot.gov>, Randy Everett <reverett@azdot.gov>, James Wilson <jwilson@azdot.gov>, Jesus Sandoval-Gil <jsandoval-gil@azdot.gov>, Anthony Casselman <acasselman@azdot.gov>, Michael DenBleyker <mdenbleyker@azdot.gov>, Brenden Foley <BFoley@azdot.gov>, Shane Alden <salden@azdot.gov>

**SENT ON BEHALF OF MICHAEL DENBLEYKER, STATE ROADWAY ENGINEER**

**TO ALL ADOT AND CONSULTANT DESIGN PERSONNEL**

**RE: NEW ADOT DESIGN DECISION GUIDE**

Effective January 1, 2025, Federal Highway Administration has assigned responsibility to the Arizona Department of Transportation for review and approval of non-interstate roadway design features on the National Highway System that vary from the published design controlling criteria per 23 CFR 625.3(f). FHWA and ADOT have established new guidance related to the documentation and approval of design features that vary from published design values, criteria or standards. Previously known as "design exceptions" and "variances", ADOT will now refer to these as "design decisions".

Planners and Engineers shall follow the guidance and requirements outlined in the new *ADOT Design Decision Guide* attached below and located on the Roadway Engineering webpage at <https://azdot.gov/business/engineering-and-construction/roadway-engineering/roadway-design-standards-and-guidelines>. The *ADOT Design Decision Guide* and accompanying *Design Decision Document* shall replace the *Design Exception and Design Variance Process Guide* dated December 14, 2009 for all project design decisions initiated after January 1, 2025.

Please distribute this notice to all design personnel, project managers, consultants and other affected parties within your Groups and Districts. Contact Hiren Shah, Predesign & Standards Team Manager at 602-712-7794 if you have any questions.

--



**Chris Cooper**  
ROADWAY STANDARDS ENGINEER  
**ARIZONA DEPARTMENT  
OF TRANSPORTATION**

205 S 17th Ave  
Phoenix, AZ 85007

602.712.8365



## MEMORANDUM

TO: Roadway Design and Project Delivery Personnel - ADOT and Consultants

FROM: Michael J DenBleyker, PE - ADOT State Roadway Engineer

CC: Greg Byres, State Engineer - Arizona Department of Transportation

Karla S. Petty, Division Administrator - Federal Highway Administration

DATE: January 8, 2025

RE: Implementation of ADOT's Design Decision Guide & Documentation

---

Consistent with the Stewardship and Oversight Agreement between FHWA and ADOT (executed July 23, 2024), effective January 1, 2025, Federal Highway Administration (FHWA) has assigned responsibility to the Arizona Department of Transportation (ADOT) for review and approval of non-interstate roadway design features on the National Highway System (NHS) that vary from the published design controlling criteria. **[23 CFR 625 (f)]**

ADOT supports the consistent approach and application of design standards for projects on the national and state highway system. For projects on the national and state highway system, the ADOT Roadway Design Guidelines (RDG) serves as the principal source of design guidance and criteria for Roadway Planners and Designers. For roadway design features on the NHS, the Code of Federal Regulations (23 CFR 625.4A9a) lists additional design guidance to be used in conjunction with the RDG. Inherent to guidance provided in ADOT's Roadway Design Guidelines and AASHTO's "A Policy on Geometric Design of Highways and Streets", sufficient flexibility is permitted and planners and designers are encouraged to use the Performance Based Practical Design (PBPD) approach to develop designs tailored to particular situations and needs, while emphasizing the need to meet project and system objectives, including safety and operational performance. Planners and designers are encouraged to consider a range of factors when determining and applying design criteria in developing designs.

FHWA and ADOT have established guidance related to the documentation and approval of design features that vary from published design values, criteria or standards.<sup>1</sup> Planners and Engineers shall follow the guidance and requirements outlined in "ADOT's Design Decision Guide". The "ADOT Design Decision Guide" and "Design Decision Document" replace the following previous guidance document on all projects initiated after this document's implementation date:

- Design Exception and Design Variance Process Guide - December 14, 2009

<sup>1</sup> Previously known as Design Exceptions (DE) or Design Variances (DV), ADOT will now refer to these as Design Decision(s) (DD).



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

Arizona Division  
January 2, 2025

4000 N. Central Ave, Suite 1500  
Phoenix, Arizona 85012-3500  
(602) 379-3646  
(602) 382-8998 (FAX)  
<http://www.fhwa.dot.gov/azdiv>

In Reply Refer to:  
Implementation of ADOT's Design Decision Guide & Documentation  
ENGI 15

SENT ELECTRONICALLY

Jennifer Toth  
Director  
Arizona Department of Transportation  
206 South 17<sup>th</sup> Avenue  
Phoenix, AZ 85007  
Via Email: [mdenbleyker@azdot.gov](mailto:mdenbleyker@azdot.gov)

Attention: Michael Denbleyker

Dear Ms. Toth:

This letter serves to document the FHWA Arizona Division's acceptance of the 2025 ADOT Design Decision Guide & Documentation process. With this acceptance the Arizona Division concurs that ADOT has a process in place to accept delegation to approve exceptions to design standards for Non-Interstate NHS projects as documented in Attachment A in the Stewardship and Oversight Agreement signed July 2024. This concurrence is effective as of January 1, 2025.

Please contact Jennifer Acuña at 602-382-8976 if you have any questions.

Sincerely,

Karla S. Petty  
Division Administrator

By: Jennifer Acuña  
Senior Urban Engineer

cc: Greg Byres, Steve Boschen, Hiren Shah, Matt Moul, Chris Cooper, Anthony Sarhan,  
Thomas Deitering

## *ADOT Design Decision Guide* *in support of* Performance Based Practical Design (PBPD)

This document has been prepared to provide guidance on required documentation of design decisions made during the development of a project (specifically rehabilitation, reconstruction and new construction projects), including evaluations of different design alternatives, decisions about retaining existing features, or the design of new roadway features that vary from published design values, criteria or standards. ADOT supports incorporating flexibility in applying design values, criteria and standards and supports the engineer's use of the Performance Based Practical Design (PBPD) approach in diligently evaluating design decisions and alternatives that meet the project and system objectives and needs. When conditions warrant, approval may be granted for a project design that proposes one or more design features/elements to have or retain design values that vary from published design values, criteria or standards. Consistent with engineering best management practices, documentation of planning and design decisions, including those associated with features that vary from published design values, criteria and standards within the project work limits must be identified, quantified, evaluated, justified and approved in accordance with FHWA and ADOT requirements.

In support of ADOT's Performance Based Practical Design initiative, and to standardize required documentation for project specific design decisions, ADOT has created a project-specific "**Design Decision Document**" to record key decisions related to design standards utilized on a project (specifically those that deviate from established design guidance or fall outside the range of values provided for that element in the design manual(s)). The "**Design Decision Document**" is a process and a tool used to document not only decisions made, but also the justification (including data, evaluations, etc.) supporting design decisions. Planners and Engineers are encouraged to use this process and tool for all design decisions, but it is required to be used for all decisions to use design values that vary from values published in accepted design guidance published by AASHTO and ADOT (exemptions from this requirement are listed below). The designer shall prepare and submit a **Design Decision Document** prior to, or along with the Stage II (30%) project milestone for all projects, except as described below (however, the process and documentation does not change regardless of what stage a project is in). The **Design Decision Document** provides a uniform method for considering and evaluating design standards, controlling criteria, alternatives, and for documenting design decisions and standards used. The form shall be completed in its entirety by the Engineer of Record, who is responsible for all the documentation, analysis, recommendations and decisions outlined in the document. Upon completion, and based on the design feature evaluated, the form shall be submitted for acceptance and approval by the State Roadway, Bridge and/or Traffic Engineer (as applicable to the design feature), and retained as part of the project design documentation.

### **Design Decision Document Guidance**

Effective January 1, 2025, FHWA and ADOT have established the following guidance related to the approval of design features that vary from published design values, criteria or standards. :

- In support of retaining existing features or the design of new or modified roadway features on the National Highway System (NHS) and State Highway System (SHS) that vary from established controlling design criteria by FHWA or documented in AASHTO Guidelines and ADOT's Roadway Design Guidelines (RDG), the designer shall complete, submit and obtain approval of the required "**Design Decision Document**" , including all supporting required analyses and documentation. Approval by the State Roadway, Bridge and/or Traffic Engineer is required (based on the applicable design feature) prior to any request for authorization of construction of the project.
- This guidance replaces the following previous guidance document on all projects initiated after this document's implementation date:
  - o Design Exception and Design Variance Process Guide - December 14, 2009

- The following types of projects are exempt from the need to prepare and submit a Design Decision Document:
  - Roadway & Bridge Maintenance Projects \*\*
  - Roadway & Bridge Preservation Projects \*\*

**\*\* In order to claim these exemptions:**

- *The objective and need of the project must be solely for system preservation of the roadway or bridge surface. No change to three dimensional elements of the roadway or bridge (horizontal and vertical geometry and profile) are included as part of the project's scope of work, including changes to striping configuration.*
- *Projects do not change the structural pavement section or strength of the existing roadway.*
- *A crash analysis within the project limits must not indicate any apparent geometric feature that is resulting in higher crash/safety risks or that require safety improvements to be included as part of the project's scope of work.*

**ADOT Accepted Design Documentation**

The following documents provide the established design criteria or standards:

- AASHTO's A Policy on Geometric Design of Highways and Streets (Green Book), 2018
- AASHTO's A Policy on Design Standards - Interstate System, 2016
- ADOT's Roadway Design Guidelines (RDG), in effect at the time of design.
- ADOT's Roadway Design Memorandums (RDMs), in effect at the time of design.
- ADOT's Bridge Design Guidelines, in effect at the time of the design.

**ADOT Project Types & Definitions**

ADOT Project Type	Project Type Description & Examples
Maintenance	<p>Planned upkeep and reactionary work performed to repair an asset or respond to specific conditions, incidents or events.</p> <p><i><u>Pavement Maintenance Project Examples:</u> Concrete Repair, Flush Shoulder/Edge Repair, Leveling with premix, Patching, Pothole Repair, Slide removal and rock patrol, Spot Filling Cracks/Crack Seal, Spot Pavement profiling/grinding, spot mill/fill.</i></p> <p><i><u>Bridge Maintenance Project Examples:</u> Approach Overlay, Barrier Repair, Drainage/Hydrovac, Channel Work, Cleaning, Minor Crash Repair, Pipe/Culvert Repair, Scour Repair (existing), Slab Jacking, Spall/Pothole Repair, Structure Maintenance, Washing.</i></p>
Preservation (aka: Surface Treatment)	<p>Improvements that extend the service life of an existing asset.</p> <p><i><u>Life Extension Projects &amp; Pavement Preservation Project Examples:</u> AC Grinding/milling less than 2.5" (see LE Guidance for further information on Life Extension project scope), Cape Seal, Chip Seal, Crack Seal/Fill, Fog Seal/flush, Friction Course mill &amp; fill or overlay of friction course, Micro Surface, PCCP Cross Stitching, PCCP dowel-bar retrofit, PCCP Diamond Grinding, Slurry Seal, Spot Repair, Thin Bonded Overlay</i></p> <p><i><u>Bridge Preservation Project Examples:</u> Deck Joint/Seal replacement, Deck Overlay, Deck Seal, Major Channel Repair, Painting, Scour Retrofit, Seismic Retrofit</i></p>
Rehabilitation	<p>Structural improvements that extend the service life of an existing asset, re-establish load-bearing capacity and bring it back to a fully functioning system as originally designed and constructed.</p> <p><i><u>Pavement Rehabilitation Project Examples:</u> Major AC Overlays, Mill &amp; Fill (existing AC) - Equal to or greater than 2.5"</i></p> <p><i><u>Bridge Rehabilitation Project Examples:</u> Major Bridge Element Rehab/replacement, Major Crash Repair, Superstructure Replacement</i></p>
Reconstruction	<p>Completely rebuilding an existing road, bridge or other transportation asset.</p> <p><i><u>Pavement Reconstruction Project Examples:</u> Removal and Replacement of existing Roadway Section, Spot Reconstruction</i></p> <p><i><u>Bridge Reconstruction Project Examples:</u> Bridge/Culvert (over 20ft) replacement</i></p>
Modernization	<p>Improvements that upgrade efficiency, functionality and safety.</p> <p><i><u>Modernization Project Examples:</u> ADA/Pedestrian, Bicycle Lane/Shoulder, Climbing/Passing Lanes, Drainage, Fence, Guardrail (new/replace), Intersection/interchange enhancement, ITS, Pedestrian Crossings, Rockfall Mitigation, Safety Modifications/enhancements, Tree Removal/recovery area, Traffic Control/management, widening or narrowing existing lanes/shoulders (construction or restriping), Wildlife crossings/mitigation</i></p>
Expansion	<p>New construction work planned and performed to add capacity to the state transportation system.</p> <p><i><u>Expansion Project Examples:</u> New Grade-separated overpass/underpass, New Lanes, New Rail, New routes/bypass</i></p>

### **Special Note - AASHTO Design Controlling Criteria**

As of May 5, 2016, the FHWA identified that design features on high-speed roadways (i.e. Interstate Highways, other freeways, and roadways with design speed  $\geq$  50 mph) on the NHS that vary from the following 10 published design controlling criteria require approval:

- **Design Speed**
- **Lane Width**
- **Shoulder Width**
- **Cross Slope**
- **Maximum Grade**
- **Stopping Sight Distance** (Vertical and Horizontal Curves)
- **Horizontal Curve Radius**
- **Superelevation Rate**
- **Vertical Clearance**
- **Design Loading Structural Capacity**

On low-speed roadways (i.e. non-freeways with design speed  $<$ 50 mph) on the NHS, only the following two controlling criteria apply: **Design Speed** and **Design Loading Structural Capacity**.

Effective January 1, 2025, FHWA has assigned responsibility to ADOT for review and approval of non-interstate roadway design features on the NHS that vary from the published design controlling criteria (See above)\*\*. FHWA approval is still required for use of design features on interstate roadways on the NHS that vary from the published design controlling criteria (See above). Approval of design features on the NHS, regardless of the roadway classification, that vary from the ten published design controlling criteria remains a federal action and requires an appropriate NEPA clearance **prior** to final approval.

### **Special Note - Arizona Department of Transportation - Design Guidelines**

Approval is required for existing features to remain or the design of new roadway features on the NHS and SHS that vary from the design criteria or standards documented in ADOT's Roadway Design Guidelines (RDG) and ADOT Design Memorandums. *Similar Project Type Exemptions and requirements for AASHTO Controlling Criteria apply.*

#### **Additional Notes:**

1. ADOT will retain records of all approved Design Decision Documentation. ADOT will provide FHWA with copies of approved Design Decision Documentation for non-interstates on the NHS.
2. Approval of design features on the NHS that vary from the published design controlling criteria is considered a federal action which requires compliance with the National Environmental Policy Act (NEPA). Required clearances must be approved prior to final approval of the Design Decision Documentation by either ADOT or FHWA. Design teams remain responsible for obtaining all required clearances for work as required by ADOT and FHWA.
3. Encroachment permits submitted by a local public agency or private entity for work on the NHS or SHS that includes requested design features that vary from the published design criteria, will require the applicant to submit completed ADOT Design Decision Documentation as part of their permit application. Acceptance and approval of this documentation is required prior to approval of the encroachment permit.
4. The current version of the "Design Decision Guide" and "Design Decision Document" is available on ADOT's website. It is the responsibility of the engineer preparing the documentation to confirm and utilize the latest version as part of their submittal.

## **Design Decision Documentation and Approval Process**

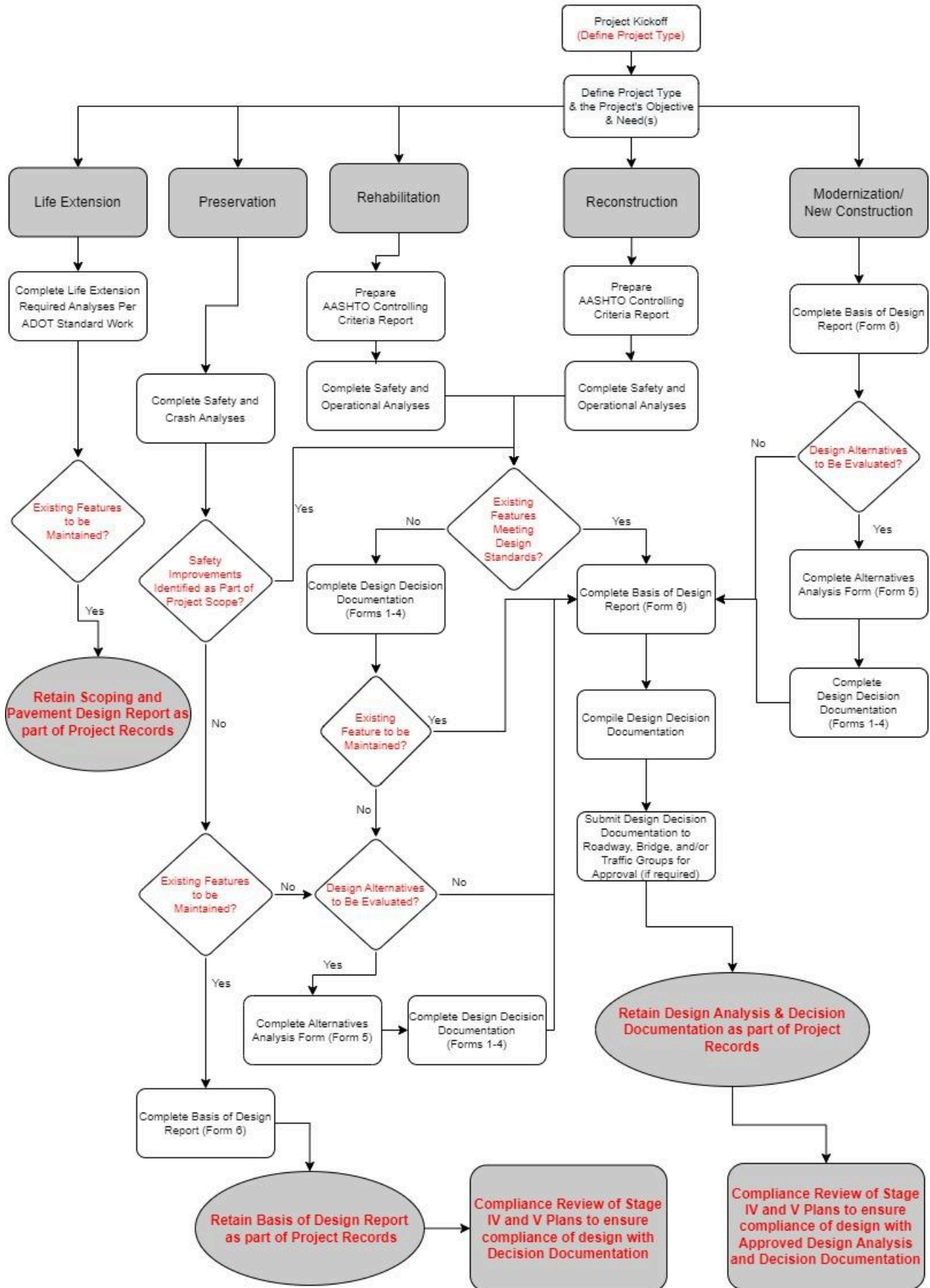
The process for requesting and obtaining approval of Design Decision does not change regardless of what stage a project is in. However, it is best if requests for approval for features to be constructed or retained should occur at the earliest stage feasible, so as to minimize any impact to a project's scope, schedule or budget. The designer shall prepare and submit a **Design Decision Document** prior to, or along with the Stage II (30%) project milestone for all projects, except as described in this document (however, the process and documentation does not change regardless of what stage a project is in). All requests for approval of Design Decision Documentation must use and follow the requirements of the "Arizona Department of Transportation – Design Decision" forms (see attached). Content and information required is summarized below, but is further explained in the "**Design Decision Document**" form.

1. Project Data and Description (Form 1)
  - a. Project Name, Number Type, Scope and Location
  - b. Project Data & Criteria
  - c. Baseline Project Description
  - d. Primary Objective & Baseline Need Statements
  - e. Project Scope Statements, Performance Metric(s), and Potential Risks
  - f. Safety & Traffic Operational Analyses
2. Summary of Design Features (Form 2)
  - a. Identification of Design Features that Require Design Justification
3. Analysis & Justification Form (Form 3)
  - a. Design Feature - Detail Information Table
  - b. Justification & Supporting Recommendation Supported by Analysis
    - i. Traffic Analysis
    - ii. Crash Analysis
    - iii. Alternatives Considered and Evaluated
    - iv. Other Impacts and Considerations
    - v. Mitigation Measures Evaluated & Proposed
    - vi. Supporting Documentation
  - c. Conclusion & Recommendation
4. Design Decision Signature Form (Form 4)
  - a. Engineer of Record Information and Signature
  - b. Approval Agency Signature(s)
5. Design Alternatives Analysis (Form 5)
  - a. Design Feature Name
  - b. Alternatives Considered
  - c. Preferred Alternatives Analysis & Recommendation
6. Basis of Design Report (Form 6)
7. Sample Cover Letter/Memorandum (Form 7)

\*\* As part of the engineer's approach to support approval of design analyses and decisions, appropriate consideration should be given and documentation provided on the impacts to the traveling public, the environment, and available budget, functional classification, transportation mode, traffic characteristics, existing conditions and performance (operations and safety), alternatives, future projects, mitigations measures and the type of project. The objective and need of the (Type of) project should determine the level of justification required for the analysis. For all Design Decisions, an existing and proposed conditions operational and safety analysis shall be performed based on the Highway Capacity Manual and Highway Safety Manual or other relevant methods. The extent of the feature being analyzed and its impact on the project or future projects within the corridor should be considered, as well as, the proximity and impact of the feature with respect to others.

A copy of all approved **Design Decision Form** shall be retained as part of the project design records in accordance with records retention requirements. Prior to completion of Stage IV & V design documentation, the Project Manager and Design Engineer shall review the designs to ensure they comply with the approved Design Decision Form documentation (including applicable mitigation measures). If plans do not comply with the Design Decision Form documentation, the applicable Design Decision Form documentation must be revised and reapproved before the project may be advertised.

## Design Analysis & Decision Standard Workflow





**Design Decision - Project Data and Description (Form 1)**

Project Name:					Project Number:	
District Name:					Hwy/Route No.:	
Highway/Route Name:					Highway No.:	
County Name:		Begin MP		End MP	Classification:	
Municipality Name:						
Type of Project:						

**PROJECT DATA**

Functional Classification:							
Current AADT (Year):		Design AADT (Year):					
% Trucks and Truck DHV:		Vertical Clearance Route:	<input type="checkbox"/> Yes <input type="checkbox"/> No				
Posted Speed:		Design Speed:		Bid Date:			
Programmed Year and Funding Source:							
Current Estimate:			Additional Cost to Meet Standard:				
Federal Highway Approval Required:	Yes <input type="checkbox"/> No <input type="checkbox"/>	Alt. Modal Considerations	Yes <input type="checkbox"/> No <input type="checkbox"/>	NHS: Non NHS:	<input type="checkbox"/> <input type="checkbox"/>	SHS: Non SHS:	<input type="checkbox"/> <input type="checkbox"/>

**BASELINE PROJECT DESCRIPTION**

<b>Primary Objective of the Project</b>	<i>Statement summarizing the desired outcomes/goals that ADOT intends to fulfill as part of the successful design and construction of the project - specifically identifying performance and/or safety objectives that are targeted to be achieved by the successful completion and construction of this project.</i>
<b>Baseline Need(s)</b>	<i>Identify the problem or problems that the proposed action (design and construction) is intended to address and explain, to the extent possible, the underlying cause(s) of those problems.</i>
<b>Safety Analysis</b>	<b>Yes <input type="checkbox"/> No <input type="checkbox"/> (If Yes, enter the title and date. If NO, enter why it was not needed.)</b> <i>Document source and results/recommendations from the "Basic" or "HSM-Based Safety Assessment" of existing conditions. Crash Analysis shall include 5-yr crash history (including collision data like type, severity, time of day, cause, MP limits). Analysis shall document patterns, contributing factors, types of crashes that could be attributed to substandard features, field observations, and conclusion based on crash history. Crash/Safety Analysis shall be prepared or reviewed/concurred with by ADOT's Traffic Safety Section.</i>
<b>Traffic Operational Analysis</b>	<b>Yes <input type="checkbox"/> No <input type="checkbox"/> (If Yes, enter the title and date. If NO, enter why it was not needed.)</b> <i>Document source and results/recommendations from the Traffic Operational Analysis of existing conditions. All appropriate traffic data (and sources) should be included.</i>
<b>AASHTO Controlling Criteria Report</b>	<b>Yes <input type="checkbox"/> No <input type="checkbox"/> (If Yes, enter the title and date. If NO, enter why it was not needed.)</b> <i>Required for all Rehabilitation, Reconstruction, Modernization and Expansion Projects.,</i>
<b>Environmental Clearance Required</b>	<b>CE <input type="checkbox"/> EA <input type="checkbox"/> Other <input type="checkbox"/> _____</b> <b>Date: _____</b>



**ARIZONA DEPARTMENT OF TRANSPORTATION  
DESIGN DECISION DOCUMENT  
(In Support of Performance Based Practical Design)**

**Design Decision - Summary Of Design Features (Form 2)**

<b>Project Name:</b>	<b>Project Number:</b>
----------------------	------------------------

The Project contains the following design features that require Design Decision:

Design Feature(s) Analyzed		
FHWA-10 Controlling Criteria	RDG Chapter 100 – Design & Criteria	RDG Chapter 400 – At-Grade Intersections
<input type="checkbox"/> Design Speed	<input type="checkbox"/> Level of Service	<input type="checkbox"/> Use RODEL Software Model
<input type="checkbox"/> Lane Width	<b>RDG Chapter 200 – Elements of Design</b>	<input type="checkbox"/> Skewed Intersections Exceeding 20 degrees
<input type="checkbox"/> Shoulder Width	<input type="checkbox"/> Superelevation Transition Length	<input type="checkbox"/> Access Openings on Freeways
<input type="checkbox"/> Cross Slope	<input type="checkbox"/> Ramp and Lane Taper Cross Slope	<input type="checkbox"/> Crossovers
<input type="checkbox"/> Maximum Grade	<input type="checkbox"/> Horz. Align. Control Coincident to Axis	<input type="checkbox"/> Private Road Connections
<input type="checkbox"/> Stopping Sight Distance	<input type="checkbox"/> Use of Spiral Curves	<input type="checkbox"/> Intersection Stopping Sight Distance
<input type="checkbox"/> Horizontal Curve Radius	<input type="checkbox"/> Profile Grade Line Coincident to Axis	<input type="checkbox"/> Intersection Sight Distance
<input type="checkbox"/> Superelevation Rate	<input type="checkbox"/> Minimum Highway Grade over 4000ft	<input type="checkbox"/> Intersection Grades
<input type="checkbox"/> Vertical Clearance	<input type="checkbox"/> Maximum Grade Break w/o Vert. Curve	<input type="checkbox"/> Free Right Turns
<input type="checkbox"/> Design Loading Structural Capacity	<input type="checkbox"/> Separate Grade Lines for Div.Highway	<b>RDG Chapter 500 – Traffic Interchanges</b>
	<b>RDG Chapter 300 – Cross Section Elements</b>	<input type="checkbox"/> Crossroad Grade at Ramp Termini
	<input type="checkbox"/> Horz. Clearance to Obstruction	<input type="checkbox"/> Paved Gore Crossover Rates
	<input type="checkbox"/> Shoulder Wedge Steeper than 6:1	<input type="checkbox"/> Loop Ramp Minimum Radius
	<input type="checkbox"/> Min. Median Width w/o Barrier (Rural Highway)	<input type="checkbox"/> Ramp Taper and Ramp Gore Crossover Rate
	<input type="checkbox"/> Median Barrier Warrants	<input type="checkbox"/> Ramp Width
	<input type="checkbox"/> Median Curb Types (Urban Highways)	<input type="checkbox"/> Parallel Exit Ramps in Urban Areas
	<input type="checkbox"/> Guard Rail at Embankment Curbs	<input type="checkbox"/> No Curbed Gores
	<input type="checkbox"/> Long Barrier End Treatment	<input type="checkbox"/> Parallel Entrance Ramps in Urban Areas
	<input type="checkbox"/> Rural Cross Section – Section RA	<input type="checkbox"/> No Curbed Gores
	<input type="checkbox"/> Fringe Urban Section – Median Width	<input type="checkbox"/> Maximum Ramp/Crossroad Intersection Angle
	<input type="checkbox"/> Sidewalk Ramps Conform to ADA	<input type="checkbox"/> Access Control Limits
	<input type="checkbox"/> Right of Way Fence	<b>RDG Chapter 600 - Highway Drainage Design</b>
	<input type="checkbox"/> Detour Horizontal Alignment	<input type="checkbox"/> **See Note 1 Below
	<input type="checkbox"/> Detour Stopping Sight Distance	<b>RDG Chapter 700 – Earthwork Design</b>
	<input type="checkbox"/> Detour Sidewalks have Temp. Concrete Barrier	<input type="checkbox"/> Ground Compaction App. To Embankment

Note 1: All variances to guidance and design values outlined in "Section 600 - Highway Drainage Design" of the RDG require approval by ADOT's Chief Drainage Engineer.

Design Features requiring Design Decision Approval have been identified at the following locations:

Design Feature Summary		
Feature Number	Location and Direction (Station and Milepost)	Feature Description & Existing Roadway Characteristics

**Design Decision Document - Analysis & Justification Form (Form 3)**

For Each Design Feature Type identified in Form 2, complete the following table and provide the required Justification and Supporting Documentation.

<b>Design Feature Type:</b>						
<b>Feature Number</b>	<b>Location and Direction (Station and Milepost)</b>	<b>Type</b> Guidance Source (AASHTO or ADOT RDG)	<b>Published Design Value</b>	<b>Existing Condition (Y/N)</b> (If Yes, provide data)	<b>Provided</b> (Proposed Project Conditions)	<b>Difference</b> (from Published Design Value)

*\*\*This is an example of a table that contains minimum required information. The Design Engineer may customize to add or adjust data types based on relevant Design Feature Elements.*

**Justification and Supporting Recommendation supported by Analysis:**

- **Traffic Analysis - Existing Conditions (if feature is existing) & Proposed Conditions:**  
*Include operational and safety analysis of both existing and proposed conditions, including analysis and recommendations that support the change from standard.*
  
- **Crash Analysis (Existing Conditions):**  
*Include 5-year crash safety analysis of existing conditions (type, severity, time of day, cause, MP limits, etc.). Include analysis that identifies patterns, contributing factors, substandard features, field observations, and conclusion(s) based on crash history.*
  
- **Alternatives Considered and Evaluated (Operational, Performance and Safety Comparison):**  
*Document design alternatives considered and evaluated.*
  - *Include costs, practicality, existing operational safety and performance results and predicted operation and safety performance results from alternatives evaluated and selected.*
  - *The Predictive Safety Analysis for alternatives shall include no-build, full standards (with recommended design standard), and alternatives. Include discussion on anticipated safety performance - speed, severity, lane continuity, weaving, types of crashes, etc..*
  - *Operational Analysis (if applicable) of alternatives evaluated.*
  
- **Other Impacts and Considerations (Compatibility, Cost, Environmental, ROW, etc.):**  
*Additional considerations may include ROW or environmental constraints, impact to community, project costs, other modes of roadway use, etc. If appropriate, include B/C analysis or other analyses performed (compatibility with adjacent sections of road, future planned and/or programmed improvements or reconstruction, maintenance, added cost to make/meet standard, and other risks) in support of design the alternative recommended and selected.*
  
- **Mitigation Measures & Strategies Evaluated & Proposed (Not Included & Included):**  
*Include a list of all safety mitigation measures that will be implemented on this project. Include analysis of predictive safety performance results by including the mitigation measures as part of this project and quantitative analysis that supports implementation of the mitigation measure and proposed improvements. Designers should review and evaluate applicability and effectiveness of "FHWA's "Design Decision Documentation and Mitigation Strategies for Design Exceptions" as a helpful guide and resource. If none, provide a reason why.*
  
- **Supporting Documentation**  
*Include appropriate Plan Section(s), Maps, Exhibits, Cross Section(s), Alignment Sheet(s), Plan Detail(s), IHSDM Analysis, and Previously approved design documentation, including Design Standard/Criteria Change(s).*

**Conclusion and Recommendation:**

*Document the engineer's reasons and recommendation(s) for approving the change from standard instead of using established design guidance. Include a statement that supports the recommendation based on maintaining or improving the system's operational and safety performance if the change is approved and its alignment with the project's documented objective and need.*

**\*\*Add additional pages for additional Design Features Analyzed (Design Feature No. 2, No. 3, etc.)**



**ARIZONA DEPARTMENT OF TRANSPORTATION**  
**DESIGN DECISION DOCUMENT**  
*(In Support of Performance Based Practical Design)*

**Design Decision - Signature Form (Form 4)**

**Signatures**

**Prepared By:** \_\_\_\_\_

**Date:** \_\_\_\_\_

(Engineer of Record)

<b>Print Name:</b>		<b>Phone:</b>	
<b>Company/Agency Name:</b>			
<b>Company/Agency Address:</b>			
<b>City:</b>		<b>ST:</b>	<b>Zip:</b>
<b>Email Address:</b>			

*(AZ PE Sign/Seal)*

**Approved By:**

*(if required\*\*)*

**Date:** \_\_\_\_\_

(ADOT State Roadway Engineer)

\_\_\_\_\_  
 (Print Name)

**Approved By:**

*(if required\*\*)*

**Date:** \_\_\_\_\_

(ADOT State Bridge Engineer)

\_\_\_\_\_  
 (Print Name)

**Approved By:**

*(if required\*\*)*

**Date:** \_\_\_\_\_

(ADOT State Traffic Engineer)

\_\_\_\_\_  
 (Print Name)

*\*\*ADOT Review and Approval only required for designs not meeting ADOT or AASHTO Design Guidelines, Standards, Values or Criteria.*

<b>Agency Review Comments</b>	
<b>ADOT/FHWA Name &amp; Department:</b>	<b>Comment(s):</b>

**Design Decision - Alternatives Analysis Form (Form 5)**

<b>Design Feature Analysis</b>		
<u>Design Feature Name:</u>	<u>Alternative Name &amp; Description</u>	
<b><u>Alternatives Considered (circle the preferred alternative)</u></b>	<b>A</b>	<i>Provide a brief description of each alternative considered. Talk about key elements of the alternative that came into consideration when selecting the preferred alternative (include cost).</i>
	<b>B</b>	
	<b>C</b>	
	<b>D</b>	
	<b>E</b>	
<p><b>Preferred Alternative _____ was selected because:</b></p> <p><i>Describe why (reasons) you selected the preferred alternative. Attach copies or provide information regarding alternatives analysis, cost comparisons, operational analysis, safety performance analysis, or similar exercises that have been completed for this project. Any mitigation measures anticipated or proposed as part of the alternatives being evaluated and selected should be included. If the prime considerations for selecting an alternative were documented in another document, you do not need to go into detail here but document where that information can be found. Instead, provide a summary, reference the document, and include it in the Design Approval.</i></p>		

**Basis of Design - Design Standards For (Form 6) (DRAFT EXAMPLE ONLY)**

Project info: Route County Milepost Tracs Name									
Terrain	Type, New Reconstruction, Rehabilitation, Preservation								
AADT, K,D,T	DHV, TDHV								Numbers in Paren = desirable, typical, etc.
Posted Speed Limit									Elevation
Design Year Construction Year									Functional Classification
Freeway - Controlled Access - Mainline									Functional Context
									NHS Status
									Interstate 3R projects may use Standards at time of construction.
									Vertical Sag Stopping Sight distance not a NHS Controlling Design Criteria
<b>Design Feature - Primary (features requiring a design exception)</b>									
	Existing	Proposed	AASHTO 2016	AASHTO 2018	ADOT				Final Design Justification
Design Speed			Page 3 Rural (non-mountainous) 70 Rural (mountainous) 50 Urban 50	Section 8.2.1 Rural 50 - 85 (70) Mountainous Terrain 50-60 Urban/Urban Core 50-60 Suburban 60	Table 101.3 Level Terrain 75 Rolling Terrain 75 Mountainous Terrain 65 Urban/Fringe Urban Ar 65				Design Speed
DE Required	YES/NO								
Lane Width			Page 4 12'	Section 8.2.4 12'	Section 301.3 12'				Lane Width
DE Required	YES/NO								
Shoulder Width			Page 4 4-Lane Left Paved 4' Right Paved 10' (12') 6-Lane + Left Paved 10' (12') Right Paved 10' (12') (TDDHV 250) 8' Paved Right shoulder in mountainous terrain 4' Paved Left shoulder in mountainous terrain 8' Paved Right and Left shoulder in mountainous Existing Long bridges may retain 3.5' shoulders left and right.	Section 8.2.4 4-Lane Left Paved 4' Right Paved 10' (12') 6-Lane + Left Paved 10' (12') Right Paved 10' (12') (TDDHV 250) 8' Paved Right shoulder in mountainous 4' Paved Left shoulder in mountainous terrain for 4 & 6 lane Freeway 8' Paved Right and Left shoulder in mountainous terrain	Section 302.4 4-Lane Left Paved 4' Right Paved 10' (12') 6-Lane + Left Paved 10' (12') Right Paved 10' (12') (TDDHV 250) Auxiliary Lanes Right Shoulder 10'			Shoulder Width	
DE Required	YES/NO								
Cross Slope			Page 5 1.5% (2%) or higher for intense rainfall Paved Shoulders 2.0% - 6% but not less than adjacent traveled way Max 8% breakover on high side of superelevated Sections	Section 8.2.4 1.5%-2.0% 2.5% for heavy rainfall	Section 301.2 2% for all paved surfaces Normal Crown with 4% algebraic difference Max 4% breakover to adjacent traveled way Max 1% breakover same lane direction See section 302.6 for shoulder slopes				Cross Slope
DE Required	YES/NO								
Sideslopes (Not CDC)			Page 5 1V:6H Typical or Flatter 1V:4H - 1V:6H allowable Steeper than 1V:4H see AASHTO RDG						Sideslopes
Horizontal Curve Radius			Page 3 Per AASHTO Greenbook	N/A - Controlled by HSSD? Dependent upon DS, f, and e	Section 203 See Tables 202.3B-D Controlled by HSSD? minimum radius 22,920 ft Dependent upon DS, f, e and M				Horizontal Curve Radius
DE Required	YES/NO								
Superelevation Rate			Page 3 Per AASHTO Greenbook	Section 8.2.6 6%-12% 6%-8% where snow and ice may be present 6% in those climates with slow moving traffic Max Breakover between shoulder and travel lane	Section 202.1 Urban Freeway 6% < 4000ft 10% 4000ft-6000ft 8% > 6000ft 6%				Superelevation Rate
DE Required	YES/NO								
Grade			Page 3 Design Speed 50 55 60 65 70 75 80 4 4 3 3 3 3 3 Level 5 5 4 4 4 4 4 Rolling 6 6 6 5 5 - - Mountainous 1% Steeper may be used in Urban areas	Section 8.2.7 Design Speed 50 55 60 65 70 75+ 4 4 3 3 3 3 Level 5 5 4 4 4 4 Rolling 6 6 6 5 5 - Mountainous 1% Steeper may be used in Fringe urban	Section 204 Design Speed 50 55 60 65 70 75+ - - 3 3 3 Level - - 4 4 4 Rolling 6 6 6 5 - - Mountainous 4 3 3 3 - -			Grade	
DE Required	YES/NO								
Vertical Clearance			Page 7 Rural 16' Clearance Urban 16' Clearance, 14' nonconnecting routes Urban Pedestrian overpass 17' and 17.5' for truss cross bracing Urban Sign Trusses 17' Urban 1' greater for for sign trusses if other structures have less than 16' clearance						Vertical Clearance
DE Required	YES/NO								
Stopping Sight Distance			Page 3 Per AASHTO Greenbook	Show Equation	Horizontal and Sag Vertical Show Equation				Stopping Site Distance
DE Required	YES/NO								
Design Loading Structural Capacity			AASHTO LRFD Bridge Design Specification						Design Loading Structural Capacity
DE Required	YES/NO								

**Design Decision - Sample Cover Letter/Memorandum (Form 7)**

(Date)

To: (Name), ADOT State Roadway Engineer

Through: (Name), ADOT Project Manager

From: (Name), *Title & Company/Agency (Engineering of Record)*

Re: Design Decision Documentation

Project Name, Route/Location, Limits, ADOT Project Number, Federal ID No. (if applicable)

This letter, along with the accompanying Design Decision documentation, is being submitted to you in support of the above referenced project, which is a *{Provide brief project description}*.

These improvements are intended to address the project objectives of *{Provide brief description of the documented project objectives and needs}*.

The accompanying Design Decision documentation has been prepared and is being submitted for approval in support of using *(or maintaining)* the following design features within the project limits that vary from published design values: *{List Design Features that are documented in the Design Decision Documentation}*.

This letter, along with the enclosed Design Decision Document and supporting information identifies the specific design features, evaluations, and recommendations in support of this request to approve the Design Decision Documentation. Based upon the information contained in the attached Design Decision documentation, the proposed improvements and the associated design decision meets the project objectives and is anticipated to result in a net improvement in the operations without having an adverse effect on the safety performance of the system at this location. ADOT is requesting approval of these Design Decisions.

ADOT Environmental Planning approved a Categorical Exclusion (CE) *(or other appropriate type of NEPA Clearance)* on *{date}* for the Design Decision.

Please advise if further action is required on the above matter.

Attachments: *Include Design Decision Documentation*

cc: ADOT Pre-Design Section Manager