

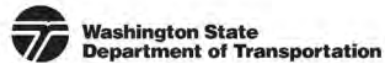
Design Policy at WSDOT



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Washington State Transportation Commission
December 13, 2016

- Practical solutions
- Design policy highlights
- Design process example
- Training support



Design Manual

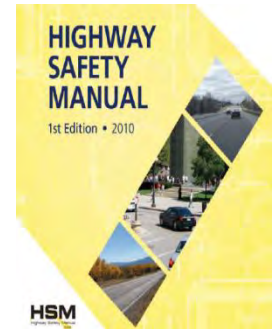
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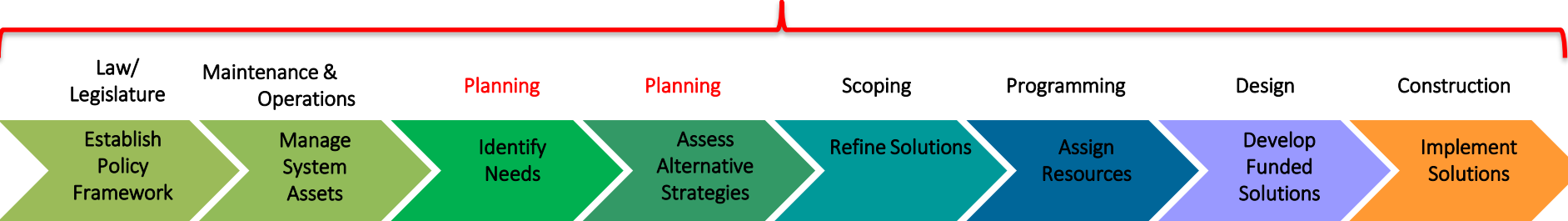
Division 1 – General Information
Division 2 – Hearings, Environmental, and Permits
Division 3 – Project Documentation
Division 4 – Surveying
Division 5 – Right of Way and Access Control
Division 6 – Soils and Paving
Division 7 – Structures
Division 8 – Hydraulics
Division 9 – Roadside Development
Division 10 – Traffic Safety Elements
Division 11 – Practical Design
Division 12 – Geometrics
Division 13 – Intersections and Interchanges
Division 14 – HOV and Transit
Division 15 – Pedestrian and Bicycle Facilities
Division 16 – Roadside Safety Elements
Division 17 – Roadside Facilities

Engineering and Regional Operations
Development Division, Design Office

- **Operations/Demand Management** first
- Results that benefit our **Transportation System**
- Does **not compromise safety**
- **Performance-Based** decisions
- Focus on **Need** and **Least Cost Solution**
- Emphasizes **Community Engagement**
- **Multidisciplinary/Collaborative** decision making



PRACTICAL SOLUTIONS



Practical Design

Design Policy 2016

Design Matrices

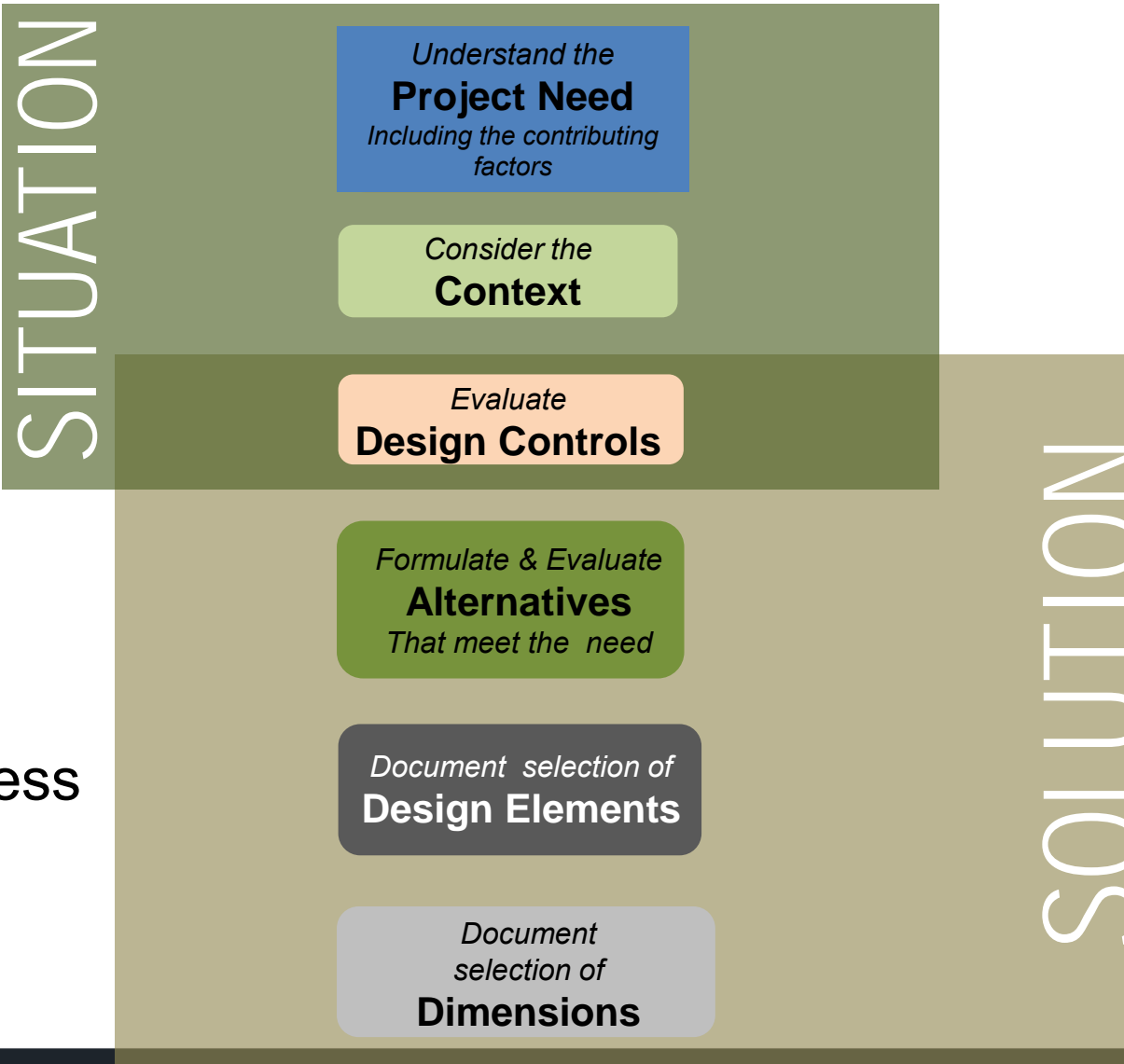


Past practice

↓ Project Type	Main Line								
	Horizontal Alignment	Vertical Alignment	Lane Width	Shoulder Width	Lane Transition	On/Off Connection	Median Width	Cross Slope Lane	Cross Slope Shoulder
(3-1) Preventative Maintenance									
Preservation									
Roadway									
(3-2) BBT									
(3-3) Milling With HMA Inlays								E	
(3-4) HMA Overlays								E	E
(3-5) Replace HMA w/PCCP at IS			E/U/M	E/U/M	E/U/F			E/U/M	E/U/I
Structures									
(3-6) Bridge Replacement	F ^[2]	F ^[2]	F ^[2]	F ^[2]	F	F ^[2]	F ^[2]	F ^[2]	F ^[2]
(3-7) Bridge Deck Rehab.									
Improvements ^{[1][2]}									
Mobility									
(3-8) Non-Interstate Freeway	F	F	F	F	F	F	F	F	F

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New Process Highlights



New process

Understand the
Project Need
*Including the
contributing factors*

- Establish **baseline** and **contextual** needs
- Develop **performance** metrics and targets
- Examine contributing factors (root causes)
- Engage the **community** about needs

Consider the
Context

- Understand the **land use** context
- Identify the **transportation** context
- Consider existing **and future** contexts
- Understand the community design **vision**
- Consider the needs of **all modes**

Evaluate

Design Controls

- Design year, Design user(s)
- **Modal priorities, target speed**
- Consider phased solutions
- Verify access control

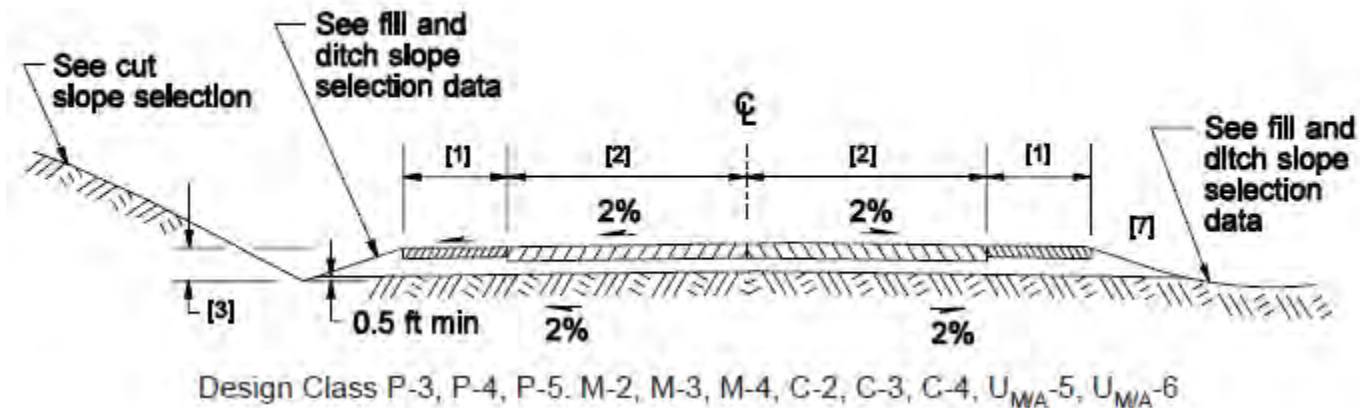
Formulate & Evaluate

Alternatives

That meet the need

- Use **performance metrics** to evaluate alternatives
- Document **tradeoffs** using *Alternatives Comparison Table*

**From
This . . .**



Two-Lane Highway Roadway Sections *Exhibit 1230-3*

Modal priority – motor vehicles

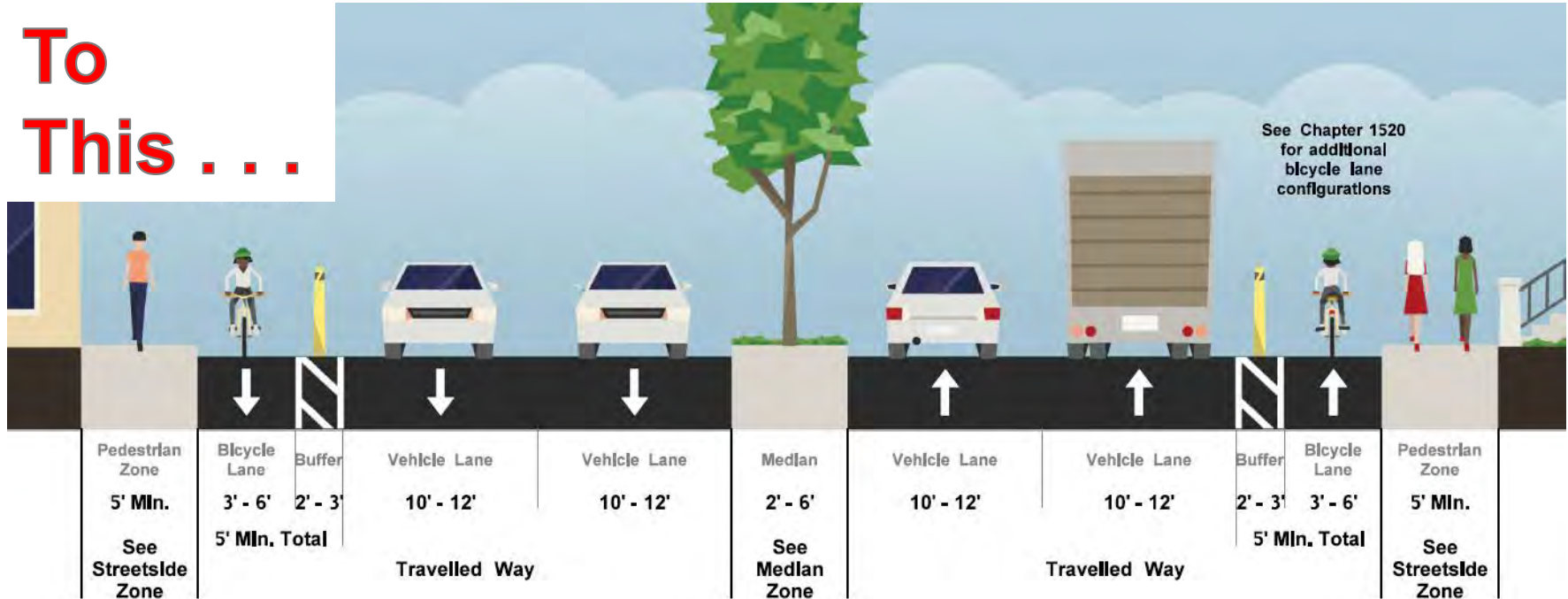
From “*WSDOT Design Manual, 2014*”
<http://www.wsdot.wa.gov/Publications/Manuals/M22-01.htm>

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New Process Highlights



To
This . . .

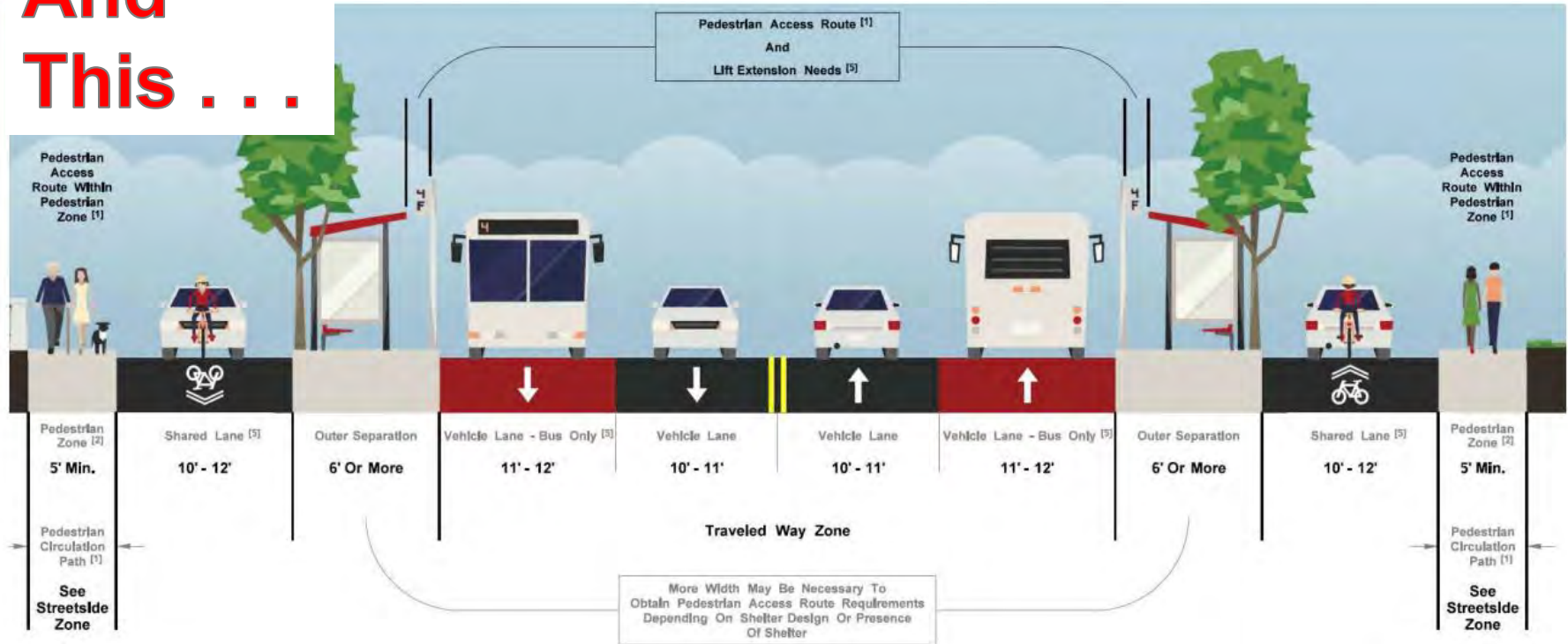


Example - Bicycle Oriented Cross Section

From "WSDOT Design Manual, 2015"

<http://www.wsdot.wa.gov/Publications/Manuals/M22-01.htm>

**And
This . . .**



Example – Multimodal Cross Section

From “WSDOT Design Manual, 2015”

<http://www.wsdot.wa.gov/Publications/Manuals/M22-01.htm>

Project Team / Steering Committee Roles

1. Project team charters an **advisory** committee
2. Committee includes multiple **disciplines** and **stakeholders**
3. Decision process - consensus / collaborative / other
 - Need Identification
 - Context Identification
 - Design Control Selection
 - Alternative Formulation/Evaluation
 - Performance Trade-off Decisions



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Advances in practice



Image credit: "NACTO Urban Street Design Guide", 2014

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Advances in practice

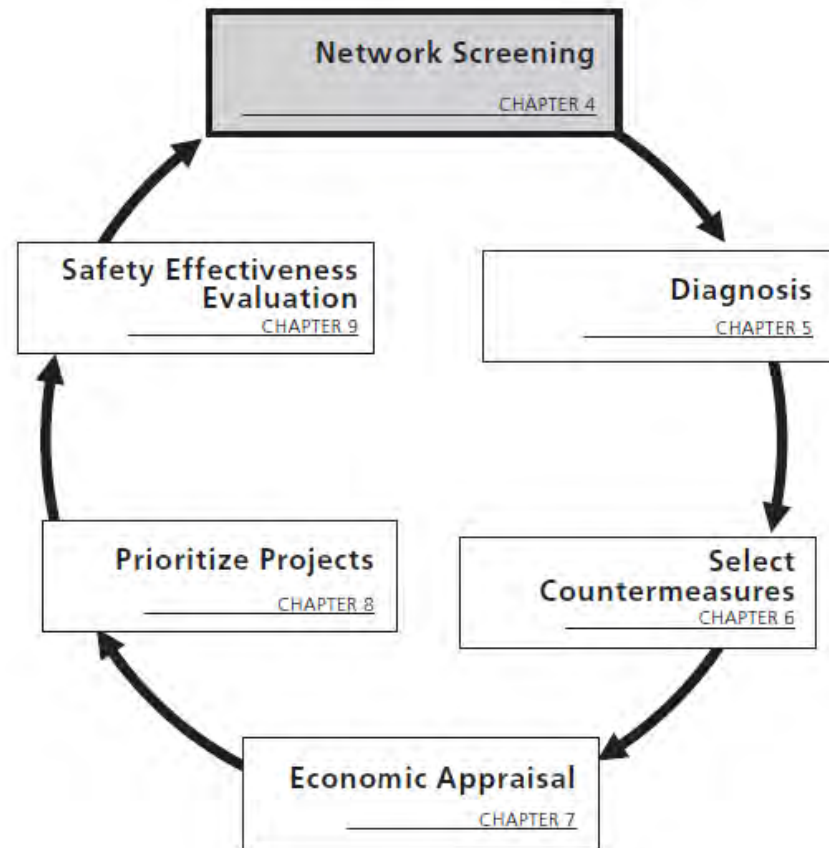
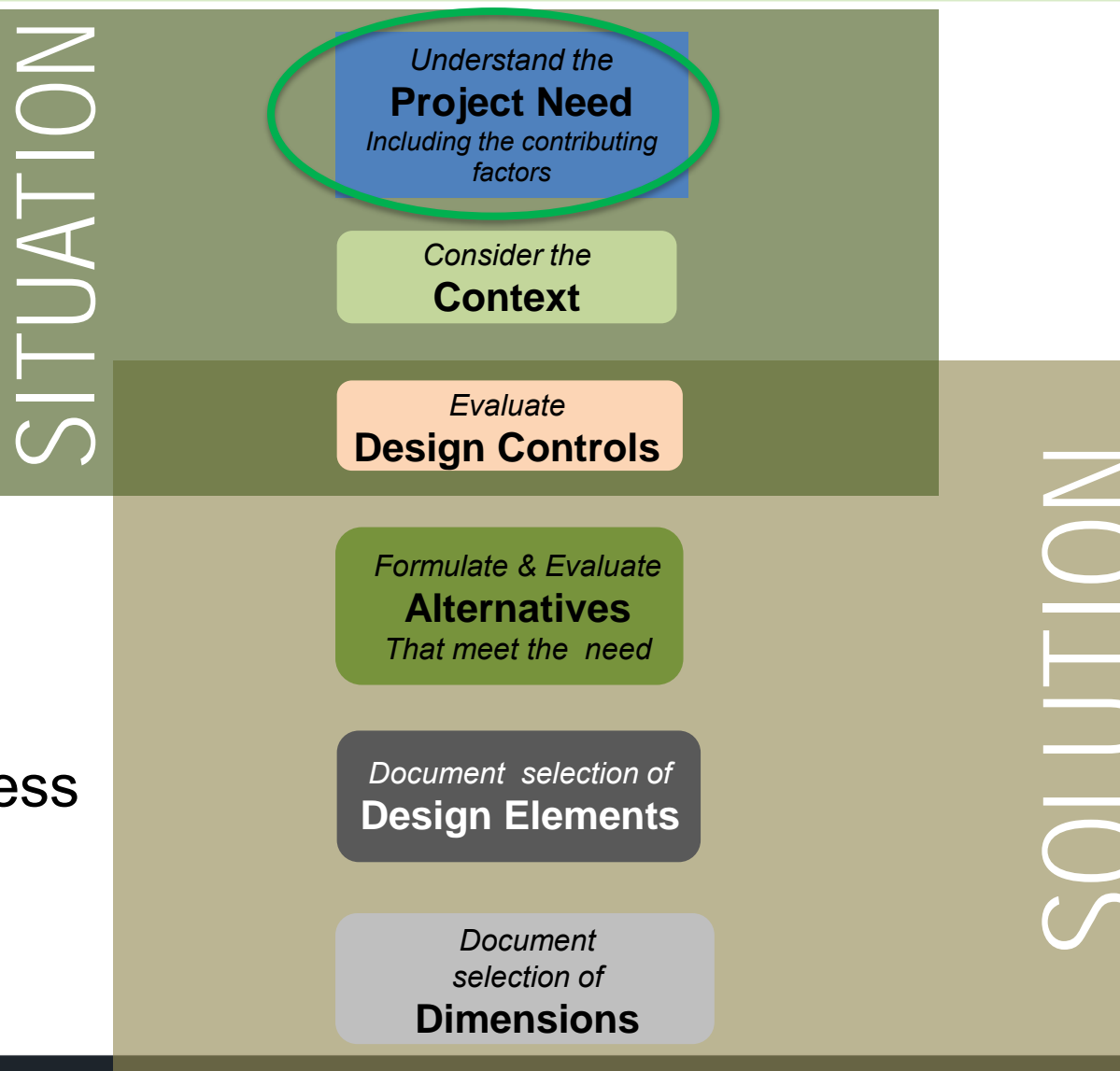


Image credit: "AASHTO Highway Safety Manual", 2010

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New Process Highlights



New process

Section 1) Project Needs

Note for I-2 Safety Projects: If a Crash Analysis Report already exists, some of the information required in this section may already be covered in the report. See the Bases of Design Instructions for more details.

List the project's **BASELINE NEED(S)**. Include the performance metrics that will be used to evaluate alternatives and the performance targets for those metrics.

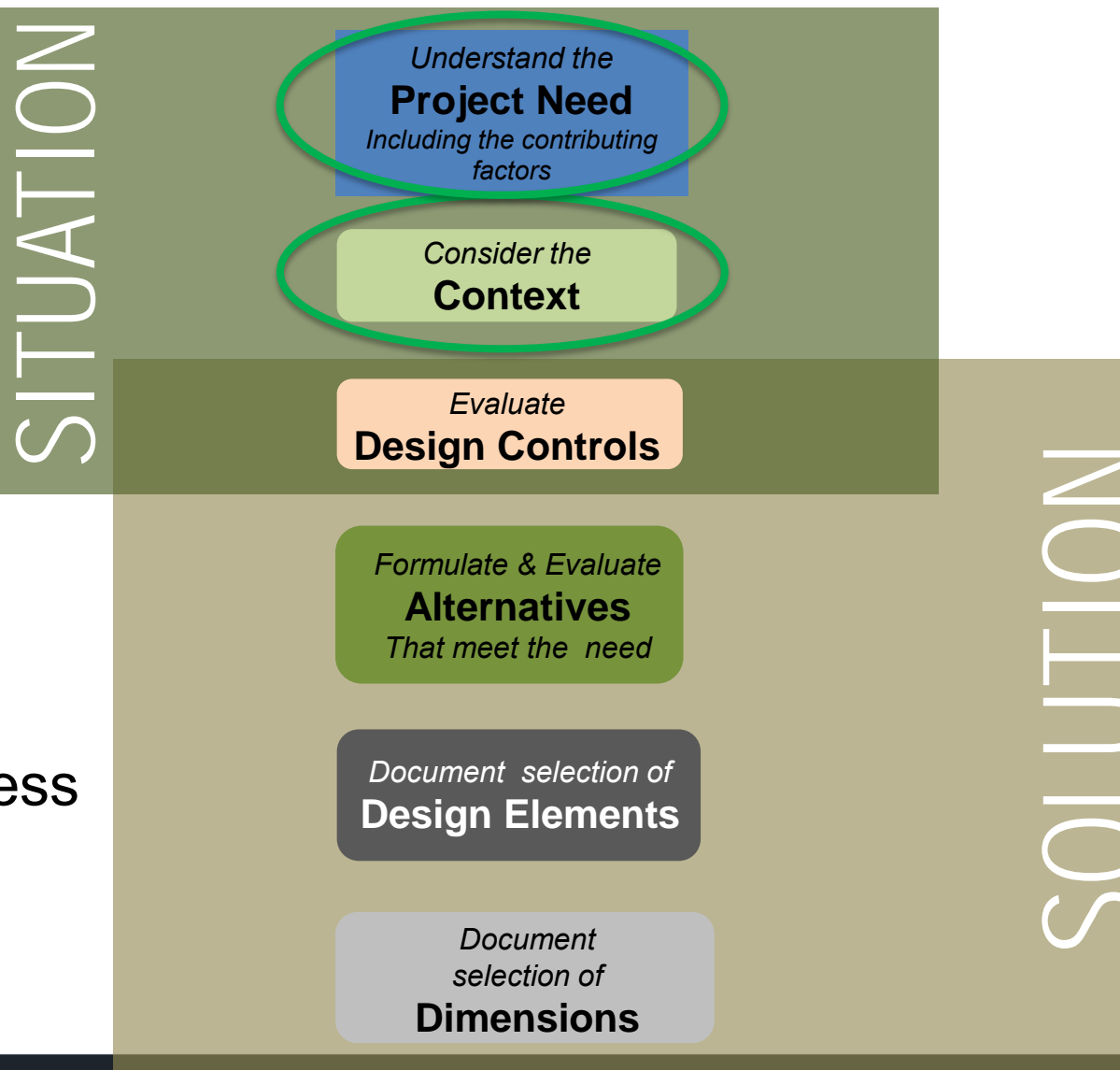
Plane and pave existing HMA to rehabilitate roadway and to reduce the severity of crashes at the beginning of the project where the roadway shoulder width drops below 4' and where existing unrecoverable slopes exist without a barrier.

Metric: Rehabilitate existing HMA and reduce the severity of crashes at the beginning of the project.

Target: Replace existing HMA along with making existing shoulders at the beginning of the project a minimum of 4' in width and install guardrail through the canal/cattle crossing area.

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New Process Highlights



New process

Design Policy 2016

Basis of Design



Section 2) Context

Community Engagement

Benton–Franklin Council of Governments (BFCG) along with the City of Kennewick have had several open houses during their normal planning processes discussing alternative transportation needs including public, pedestrian, and cycling. BFCG along with the City of Kennewick are trying to design and plan for "complete streets" where possible to safely open up diverse transportation options for the community.

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Basis of Design



Section 1) Project Needs

List the project's CONTEXTUAL NEED(S). Include the performance metrics that will be used to evaluate alternatives. List performance targets for the metrics, if applicable.

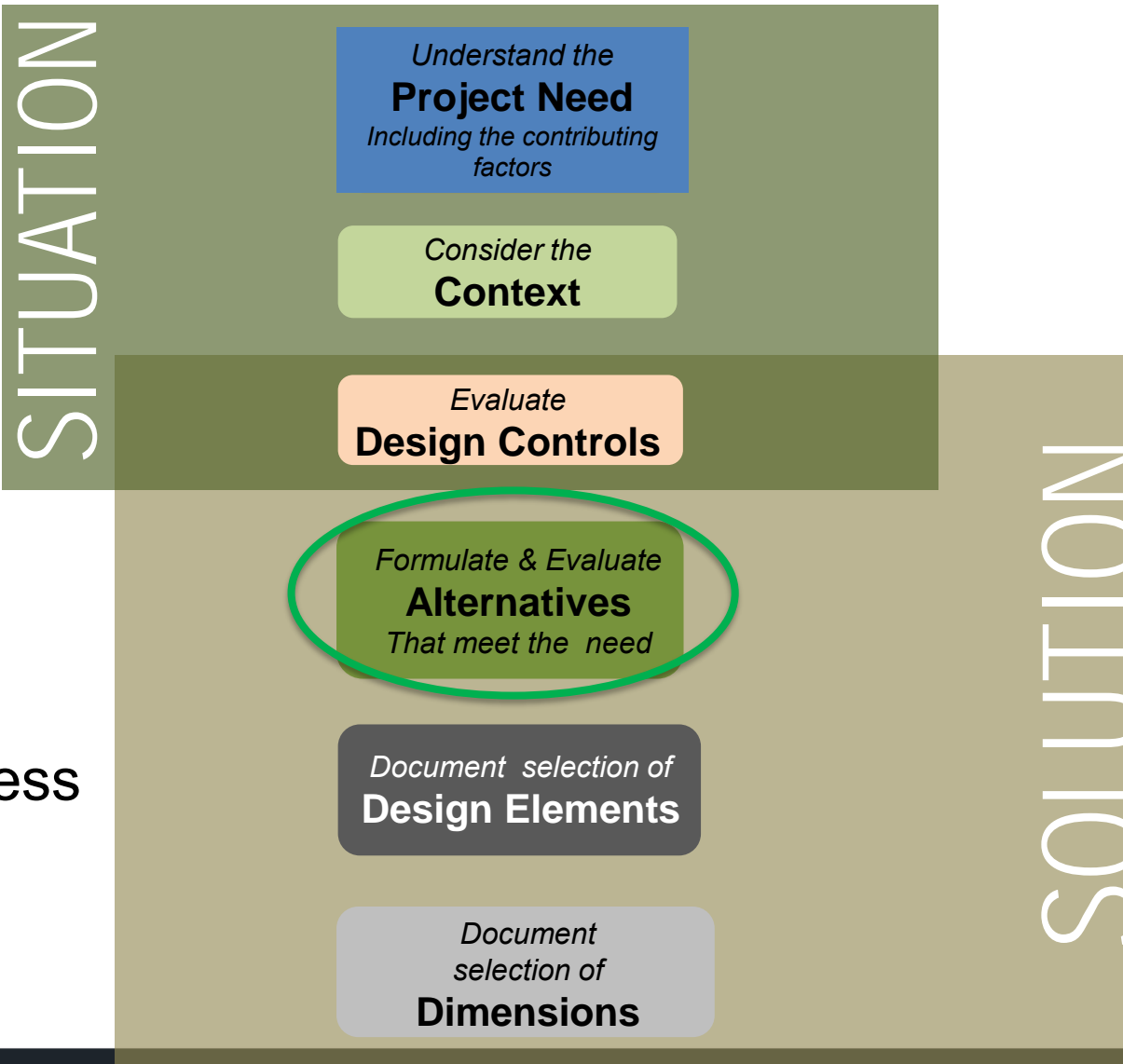
Congestion at busy intersections due to lack of turn storage and need of bike lanes identified by the City of Kennewick and SCR Traffic Office.

Metric: Level of Service (LOS)

Target: Improve LOS by lengthening turn pockets at busy intersections and adding bike paths where they can fit within the current roadway prism so bicyclists can safely ride through this area.

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New Process Highlights



New process

Design Policy 2016

Basis of Design



Section 4) Alternatives Analysis

Section 4) Alternatives Analysis		
Alternatives Considered	No Build	Leave lane widths as is and do not add bicycle lanes or remove median islands to extend left turn pockets and just plane and pave back distressed HMA leaving all configurations as is.
	A	Remove median islands to extend left turn pockets but leave lane width as is and do not add bicycle lanes.
	B	<p>Remove median islands to extend left turn pockets and drop all lane widths to 11' to accommodate a 5' bike lane NB and SB from Gum St over the cable bridge (397/20) to Ainsworth.</p> <p>Existing roadway width will not accommodate a required minimum 5' bike lane from Gum st to 1st or up onto and over the cable bridge due to lack of existing roadway width and there is not money in our current budget to purchase right of way and add new roadway width to make this addition at this time.</p>
	C	Remove median islands to extend left turn pockets and <u>drop all lane widths to 11'</u> to accommodate a 5' bike lane NB and SB from 1 st to the cable bridge (397/20). Also <u>change lane widths over the cable bridge from 12' to 11'</u> increasing the shoulder width on both sides from 1' to 2' left and from 4' to 5' right in travel direction. This would give more shy distances on both sides while still meeting the WSDOT's requirement of 5' bike lane.

Section 4) Alternatives Analysis

Option C is the preferred alternative to get the most use out of the existing roadway width and make the area more accessible for all modes of transportation. WSDOT and the City of Kennewick have worked together through the design process of this project to make sure that we were getting the most use out of the existing roadway width and Option C does this. The City of Kennewick is currently trying to design and delineate a comprehensive bicycle path through the city for leisure and transportation purposes and this addition on US 397 will eventually close a gap in their system bringing it to the path along the south side of the Columbia River. The City of Kennewick did request to have the bike lanes go from Gum to Ainsworth, but existing roadway widths could not accommodate this so the city plans on doing some work to bring their bicycle path from 10th over to 1st to meet up with the new paths SB and NB along US 397. This alternative is the least expensive alternative in accomplishing the City of Kennewick's "complete street" goals, making this corridor more accessible for all modes of transportation by providing bicycle lanes in both directions. It also lengthens some turn lanes that are too short, which are currently causing through conflicts.

Section 4 tradeoffs discussion

“WSDOT and the City of Kennewick have worked together through the design process . . . “

“this alternative is the least expensive alternative in accomplishing the City of Kennewick’s “complete street goals . . . “

“. . . making this corridor more accessible for all modes of transportation . . .”

Training highlights

Current delivery

- Design Manual Update Training
- Practical Solutions Approach to Project Development Overview
- Highway Safety Manual (various levels)
- FHWA CSS Technical Assistance

In development

- e-learning for Design Manual Update Training
- Design Documentation
- Multimodal Project Development

Thank You



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