

**SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION
POLICY LETTER**

Policy Number:

Title:

Purpose:

Key Topic Areas: Roadway Design

Responsible Program: Road Design

Supersedes Policy Numbers or New Policy:

Related Documents:

Recommended:

Approved:

Tim Bjorneberg, Program Manager

Leon Schochenmaier, Director

Approved:

Approved:

Approval Date:
Effective Date:
Expiration Date:
Last Review Date:
Next Review Date:
Superceded by Policy #

Implement immediately and review for effectiveness in one year

In order to economize all major highway construction projects in South Dakota, a formal process to establish the proper scope for all projects is needed. This process is intended to address the needs of the highways as well as better inform those involved in the design process, maintain consistency across the state, provide more accurate cost estimates and utilize the available funding in the most effective manner possible.

This guide should be applied to all pertinent projects in the current STIP. In some cases, design currently under way should be reviewed to authenticate its current scope. After the current 5 year STIP is properly scoped, implementation should begin on prioritized projects in the long range program as determined from the management systems available.

A review of the policy will be made following one year's use and adjustments will be made accordingly.

PROJECT TYPES TO SCOPE

At a minimum, the following project types (as provided in the current 1998-2002 STIP and future 1999-2003 STIP) on state highways are to go through the scoping process:

1. Construct New
2. Reconstruction
3. Grading
4. Shoulder Widening
5. Traffic Signals/Roadway Lighting
6. Structure & Approaches
7. Replace structures
8. CRC Unbonded overlay
9. PCC Paving
10. Asphalt concrete resurfacing

The following projects types are to be used to better inform the public, contracting industry, department personnel, etc.:

1. **New construction** for a new highway
2. **Complete reconstruction** on a **new** highway alignment (Heavy Grading)¹
3. **Complete reconstruction** on a **new** highway alignment (Medium Grading)²
4. **Complete reconstruction** on a **new** highway alignment (Light Grading)³
5. **Complete reconstruction** on a **new** highway alignment (Rehab Grading)⁴
6. **Complete reconstruction** on or near **same** highway alignment (Heavy Grading)
7. **Complete reconstruction** on or near **same** highway alignment (Medium Grading)
8. **Complete reconstruction** on or near **same** highway alignment (Light Grading)
9. **Complete reconstruction** on or near **same** highway alignment (Rehab Grading)
10. **Complete urban reconstruction** with new c&g, storm sewer, pavement,
11. **Partial urban reconstruction** with spot c&g, complete pavement replacement
12. **Shoulder/ditch widening**⁵ with spot grading⁶, process in-place surfacing⁷, pipe end treatments w/spot replacement⁸
13. **Shoulder/ditch widening** with process in-place surfacing, pipe end treatments w/spot replacement
14. **Shoulder/ditch widening** with spot grading, AC resurface, pipe end treatments w/spot replacement
15. **Shoulder/ditch widening** with AC resurface, pipe end treatments w/spot replacement
16. **Shoulder widening**⁹ with spot grading, process in-place surfacing, pipe end treatments w/spot replacement
17. **Shoulder widening** with process in-place surfacing, pipe end treatments w/spot

¹ >100,000 cy/mile

² >50,000 and <100,000 cy/mile

³ <50,000 cy/mile

⁴ Uses Rehab Standards developed by South Dakota DOT for use on non-NHS highways with future ADT less than 1500 (see attached tables)

⁵ Same gradeline with full standard shoulder width and ditch section. Typically requires ROW & utility relocation

⁶ Standards applied to spot grading is to be consistent with adjacent section and determined on a site by site basis

⁷ Self explanatory?

⁸ Pipe/RCBC to be extended and/or new ends or replaced to meet safety/hydraulic needs. To be determined on a site by site basis using policy "Clear Zone, Approach Pipe, Cross Pipe and Approach Slope Treatment".

⁹ Same gradeline with inslope work only to achieve full standard shoulder width

- replacement
18. **Shoulder widening** with spot grading, AC resurface , pipe end treatments w/spot replacement
 19. **Shoulder widening** with AC resurface, pipe end treatments w/spot replacement
 20. **Surface widening**¹⁰ with spot grading, process in-place asphalt concrete surfacing, pipe end treatments w/spot replacement
 21. **Surface widening** with spot grading, process in-place asphalt concrete surfacing, pipe end treatments
 22. **Surface widening** with process in-place asphalt concrete surfacing, pipe end treatments w/spot replacement
 23. **Surface widening** with process in-place asphalt concrete surfacing, pipe end treatments
 24. **Surface widening** with process in-place asphalt concrete surfacing
 25. **Surface widening** with spot grading, asphalt concrete resurface (need?)
 26. **Surface widening** with asphalt concrete resurface (need?)
 27. **CRC unbonded overlay** with spot grading, slope flattening, pipe end treatments
 28. **CRC unbonded overlay** with slope flattening, pipe end treatments
 29. **CRC unbonded overlay** with pipe end treatments
 30. **CRC unbonded overlay** only
 31. **PCC repaving** with spot grading, slope flattening, pipe end treatments
 32. **PCC repaving** with slope flattening, pipe end treatments
 33. **PCC repaving** with pipe end treatments
 34. **PCC repaving** only
 35. **Structure replacement** with approach slabs, ___ miles of approach grading, no detour
 36. **Structure replacement** with approach slabs, ___ miles of approach grading, on-site constructed detour
 37. **Structure replacement** with approach slabs, detour route on local roads
 38. **Structure replacement** with approach slabs, one-way staged structure detour
 39. **Asphalt concrete resurfacing** with spot grading¹¹, slope flattening, pipe end treatments
 40. **Asphalt concrete resurfacing** with slope flattening, pipe end treatments
 41. **Asphalt concrete resurfacing** with pipe end treatments
 42. **Asphalt concrete resurfacing** only
 43. **PCCP rehabilitation** (underseal, grinding, joint/spall repair and/or sealing)
 44. **Interchange Lighting** with towers
 45. **Interchange Lighting** with standard poles
 46. **Interchange Lighting** with standard poles at off-ramp gores and cross road terminals
 47. **Roadway Lighting**
 48. **New Traffic Signals**
 49. **Upgrade Traffic Signals**
 50. **Cold Plastic Pavement Marking**
 51. **Cold Plastic Pavement Marking** with grooving
 52. **Epoxy Paint Pavement Marking**
 53. **Epoxy Paint Pavement Marking** with grooving
 - 54.

¹⁰ Obtains as much surface width as the existing section will allow and be a uniform typical section for a substantial length of highway. No ditch work required, however, the inslope may be bladed down during construction.

¹¹ ROW/Utilities likely involved. This includes bridge and/or RCBC sites requiring replacement, widening or extended.

PROCESS

The following is a summary of a full scoping process. Some portions of the process may not be pertinent to some projects and should be noted accordingly as “na”.

Initial Scope Determination

The following is to be performed within the first year the project is authorized in the Surface Transportation Improvement Program. As we get caught up, it should extend into the long range program as prioritized need.

1. Initial Scope Information Packet

- a. Notification of project’s need is prioritized from PCEMS and, eventually, as prioritized by need in the long range program
- b. Chief Road Design Engineer (CRDE) sends e-mail to assigned Engineering Supervisor (ES) assigned design duties with preferred completion date
- c. ES to perform the task and e-mail CRDE when packet is complete
- d. Refer to project description and project background information checklist for packet contents
- e. CRDE to distribute packet to involved offices

2. Initial Scope Preview

- a. To be accomplished when convenient during 1 month prior to the “review”
- b. Videolog preview with packet and policies by following representatives:
 - Office of Materials & Surfacing
 - Office of Road Design
 - Office of Bridge Design
 - Estimator
- c. On-site preview with packet and policies by following field representatives:
 - Area Office (including maintenance)
 - Region Designer
 - Region Traffic Engineer
 - Region Materials Engineer
- d. Previewing offices to E-mail report of recommendations to CRDE
- e. Summary report distributed by CRDE to Chief Materials & Surfacing Engineer (CMSE) and Chief Bridge Engineer (CBE)

3. Initial Scope Review

- a. To be done at request of CRDE, CMSE and/or CBE if recommendations requested on-site review, are conflicting or are inconclusive.
- b. Review to be organized by CRDE
- c. On-site review by following representatives making up the scoping TEAM:

- Office of Materials & Surfacing
- Office of Road Design
- Office of Bridge Design
- Area Office (including maintenance input)
- Region Designer
- Region Traffic Engineer
- Region Materials Engineer
- Estimator

4. Initial Scope Analysis

- a. Completed by TEAM with at least the following information as shown on Analysis Checklist and cost analysis shown as necessary:
 - Geometric improvement needs identified
 - Maintenance issues and proposed remedy
 - Safety improvement needs identified
 - Traffic improvement needs identified
 - Surface type alternatives identified. Recommendation made if possible.
 - Drainage improvement needs identified
 - Structure improvement needs identified
 - Value Engineering need identified
 - Alternate cost estimates
 - Constructability issues identified. Review meeting with contracting industry prior to completing analysis.
 - Project's type identified with incremental sections noted by MRM for different types if applicable
 - Right-of-way and/or environmental needs identified
 - Design exception needed? Obtain approval before completing analysis.
 - Survey need identified with preferred completion date.
- b. CRDE to record decisions

5. Initial Scope Report

- a. Scope report completed by CRDE containing "Analysis" decisions and cost estimate
- b. Survey request(s) made by CRDE with outline of limits shown on either aerial photos, old plans, quadrangle map or county map (in order of preference). If none of these are readily available, a detailed description should be written. Completion date goal provided too.
- c. Identified cost savings over "old philosophy"

- d. Draft Design Summary completed
- e. Preferred 25% design scope completion date
- f. Approval received from the State Highway Engineer

6. Initial Scope Report Communication

- a. All data, checklists, reports, request letters, etc. to be located on the U: drive in the project's directory (U:\proj\CountyPCEMS).
- b. PCEMS Engineer to create/adjust PCEMS schedule according to scope
- c. Cost estimate updated in STIP (eventually for STIP initial input)

25% Design Scope Follow-up

The following is to be performed after the preliminary design, but prior to the public hearing is completed as a follow-up to confirm the initial scope and/or detail the scope further:

1. Scope Information Packet

- a. ES responsible for design activities shall distribute packet to appropriate offices
 - Plan sheets
 - Initial scope report
 - Draft Design Summary
 - Questions and/or issues with recommendations 25% Scope Preview
- b. To be accomplished ASAP by offices receiving packet
- c. Previewing offices to E-mail recommendations to ES within 2 weeks
- d. Summary report distributed by ES to CRDE, CMSE and CBE

2. 25% Scope Review Meeting

- a. To be done at request of CRDE, CMSE and/or CBE if recommendations requested meeting, are conflicting or are inconclusive.
- b. Review Meeting to be organized by CRDE
- c. Review Meeting to have the scoping TEAM available either in person, via conference call or on-site.

3. 25% Scope Analysis

- a. Completed by TEAM by using ES information and reflection on initial scope determination
- b. ES to record decisions

4. 25% Scope Report

- a. Scope report completed by ES containing "Analysis" decisions
- b. Additional survey request(s) made by ES as necessary
- c. Approval received from the State Highway Engineer
- d. Obtain approval on final Design Summary from the State Highway Engineer

5. 25% Scope Report Communication

- a. New decisions to be located on the U: drive in the project's directory (U:\proj\CountyPCEMS).
- b. PCEMS Engineer to adjust PCEMS schedule according to scope as necessary
- c. Cost estimate updated in STIP as necessary

Public Opinion Affect on Scope

The following is to be performed after the public hearing and landowner meeting on projects that require ROW. This is necessary ONLY if the public's input requires a review of the department's previous scope.

- 1. Public Information Packet**
 - a. ES responsible for design activities shall distribute packet to appropriate offices
 - Public comments and/or requests
 - Recommendations

- 2. Public Comments Preview**
 - a. To be accomplished ASAP by offices receiving packet
 - b. Previewing offices to E-mail recommendations to ES
 - c. Summary report distributed by ES to CRDE, CMSE and CBE

- 3. Public Comments Review Meeting**
 - a. To be done at request of CRDE, CMSE and/or CBE if recommendations requested meeting, are conflicting or are inconclusive.
 - b. Review Meeting to be organized by CRDE if necessary
 - c. Review Meeting to have the scoping TEAM available either in person, via conference call or on-site.

- 4. Public Comments Analysis**
 - a. Completed by TEAM by using ES information and reflection on initial scope determination
 - b. ES to record decisions

- 5. Public Comments Response Report**
 - a. Public comments response report completed by ES containing "Analysis" decisions
 - b. Additional survey request(s) made by ES as necessary
 - c. Approval received on revised scope and and/or Design Summary from the State Highway Engineer

- 6. Public Comments Response Report Communication**
 - a. New decisions to be located on the U: drive in the project's directory (U:\proj\CountyPCEMS).
 - b. PCEMS Engineer to create/adjust PCEMS schedule according to scope
 - c. Environmental or ES respond to public as necessary via letter
 - d. Cost estimated updated in STIP as necessary

The ES shall submit a scope revision letter to the State Highway Engineer if at ANYTIME deviations to the scope is sought.

SCOPE INFORMATION

PROJECT DESCRIPTION microfilm number()

Project Number(s)	
PCEMS #	
County(s)	
Location of Project (STIP Listing)	
Length (mi. or km)	
Type of Improvement (STIP Listing)	
Cost, Fiscal Year & STIP category page/priority	
Metric or English	
Project Coordinator(ES)	
Other Projects in STIP Within Area	

PROJECT BACKGROUND INFORMATION

Functional Class		Current ADT	
MRM to MRM		Future ADT	
Year Last Graded		# of Trucks	
Year Last Improved			
		Accident Rate	
Surf. Condition Index		# of Fatal	
Roughness Index		# of Injury	
Average Strength		# of Property Damage	
Surface Type		# of Bridges	
Shoulder Type		# of Box Culverts (NBIS)	
Surface Width			
Shoulder Width			
Total Width			
Right of Way Width			
Information from Video Log		Information from Underlying Plans	
Posted Speed Limit		# of Horiz. Curves at each Design Speed	
Passing %		# of Vertical Curves at each Design Speed	
# of Guardrail Sites		Typical Inslope	
		# of grades > 4%	
		# of grades > 5%	
		C&G?	
		# of Box Culverts (Others)	

SCOPE PREVIEW CHECKLIST	Comments/Recommendations
1. Shoulders (See E-2-98 & Policy E-3-98)	
a. Widening needed?	
b. How much needed?	
c. How much shoulder can be gained by "surface widening"?	
2. Ditch	
a. Improvement needed for maintenance reasons?	
b. Improvement needed for clear zone reasons? (refer to E-2-98)	
c. Improvement needed for steep inslope reasons (steeper than 3:1)?	
d. Ditch work entire length of project?	
e. "Clean out" only?	
f. 4:1 inslope, 3.5' deep, 20' bottom, 5:1/7:1 backslope?	
3. Drainage (See E-1-98 & Policy E-2-98)	
a. Bridge/RCBC need replacement?	
b. Bridge need widening?	
c. Bridge need rehab?	
d. RCBCs need extending?	
e. RCBCs need replacement?	
f. Pipe need extending?	
g. Pipe need replacement?	
4. Vertical Alignment	
a. % and length of gradeline meeting E-2-98 (3R) standards?	
b. % and length of gradeline meeting minimum stopping sight distance?	
c. % and length of gradeline meeting desirable stopping sight distance?	
d. Length of grading needed to improve snow and/or drainage problems?	
e. Signing, entrance/intersection relocation or other mitigation to retain?	

SCOPE PREVIEW CHECKLIST (Cont)	Comments/Recommendations
5. Horizontal Alignment	
a. Number of horizontal curves under South Dakota Standards for 65 mph (or present posted speed limit) on non-interstate and under 75 mph on interstate?	
b. Horizontal curve advisory speed plates adequate?	
c. Signing, entrance/intersection relocation or other mitigation to retain?	
6. Entrances (E-1-98)	
a. Slope flattening needed?	
b. Pipe treatment needed?	
c. Entrance relocation needed?	
7. Surfacing	
a. AC Overlay?	
b. Mill & AC Overlay?	
a. Cold-in-Place Recycle & AC Overlay?	
b. Process-in-Place & AC Overlay?	
c. Process-in-Place & PCCP?	
d. Pavement Restoration?	
e. Grind?	
f. Undersealing?	
g. Dowel Bar Retrofit?	
h. CRC Unbonded Overlay?	
i. PCC Repaving?	
j. AC over PCCP?	
k. Crack & Seat with AC over PCCP?	
l. Base & Blotter?	
m. Reconstruct & AC Overlay?	
n. Reconstruct & PCCP?	
8. Safety Devices	
a. Upgrade guardrail?	
b. Eliminate guardrail?	
9. ROW	
a. Relocation	
b. Additional ROW needed? (additional width, signals, lighting, etc.)	
10. Other	
a. FEMA	
b. Cold Water Fishery	
c. Environmental Issues	
d. Future Development	

SCOPE PREVIEW CHECKLIST (Cont)	Comments/Recommendations
11. Other Governmental Agency Coordination (City/County/Forest Service/etc.)	
a. Utilities	
b. Signal Upgrades	
c. Lighting	
d. other	
12.	

GEOMETRIC IMPROVEMENT NEEDS

	RECOMMENDATION	ACTION TO BE TAKEN
Proposed Design Speed		
Lane Width		
Shoulder Width		
Horizontal Curves Below Design Speed		
Vertical Curves Below Design Speed		
Intersection Vertical Sight Distance		
Intersection Horizontal Sight Distance		
Grades > Design Speed		
Cross Slope		
Superelevation		
Climbing Lanes		
Curb & Gutter		
Parking		
Sidewalk/Rec. Trail		
Design Vehicle		
Intersections Turning Improvements		
Median Needs		

SAFETY IMPROVEMENT NEEDS

	RECOMMENDATION	ACTION TO BE TAKEN
Substandard Bridge Rails		
Substandard Guardrail		
Steep Inslopes		
Approach Slopes		
Pipe Ends		
Animal Strike Areas		
Mailboxes		
Obstacles Inside Clear Zone		
Construction Barriers Needs		

DRAINAGE IMPROVEMENT NEEDS

	LOCATIONS	ACTION TO BE TAKEN
Replace RC Pipe		
Replace CM Pipe		
Extend RC Pipe		
Extend CM Pipe		
Line Existing Pipe		
Plug Existing Pipe		
Remove Existing Pipe		
Special Outlets		
FEMA		
Stream Relocation		

TRAFFIC IMPROVEMENT NEEDS

	RECOMMENDATION	ACTION TO BE TAKEN
LOS		
More Lanes Needed?		
Turn Lanes		
Unnecessary Access		
Intersection Treatment		
Traffic Signal		
Permanent Signing		
Pavement Marking		
Frontage Roads		
Weaving		
Pedestrian		
Construction Signing		
Construction Detour		

SURFACE IMPROVEMENT NEEDS

	RECOMMENDATION	ACTION TO BE TAKEN
AC Overlay		
Mill & AC Overlay		
Cold-in-Place Recycle & AC Overlay		
Process-in-Place & AC Overlay		
Process-in-Place & PCCP		
Pavement Restoration		
Grind		
Undersealing		
Dowel Bar Retrofit		
CRC Unbonded Overlay		
PCC Repaving		
AC over PCCP		
Crack & Seat with AC over PCCP		
Base & Blotter		
Reconstruct & AC Overlay		
Reconstruct & PCCP		

MAINTENANCE IMPROVEMENT NEEDS

	RECOMMENDATION	ACTION TO BE TAKEN
Snow Drift Problem Areas		
Water Overtop Areas		

STRUCTURE IMPROVEMENT NEEDS

	RECOMMENDATION	ACTION TO BE TAKEN
Bridge Width		
Structural Capacity		
Detour		
Vertical Clearance		
Horizontal Clearance		
Replace Bridge		
Replace RCBC		
Extend RCBC		
Line Existing RCBC		
Plug Existing RCBC		
Remove Existing RCBC		

OTHER IMPROVEMENT NEEDS

	RECOMMENDATION	ACTION TO BE TAKEN
Roadway Lighting		
Rest Areas, Info Centers, Scenic		
Landscape Development		
Aesthetics		
Erosion Control		
Noise Barriers		
Utilities		

PROJECT'S DESIGN SCOPE SUMMARY

RIGHT-OF-WAY AND/OR ENVIRONMENTAL NEEDS

SURVEY NEED

DESIGN EXCEPTION APPROVAL NEEDED? IF SO, WHAT MITIGATION IS BEING DONE? FILL OUT FORM PROVIDED IN 3R POLICY.

I hereby certify the design meets or exceeds current minimum SDDOT 3R Design Standards.

Date Recommended by:

Date Approved by:

Program Engineer, SDDOT

L. L. Weiss, P.E.
State Highway Engineer, SDDOT

Questions to Ask while Scoping if Rehab Only is acceptable on Non-NHS Highways

1. When to consider Vertical Curve reconstruction
 - a. Crest Vertical curves hides a driveway, intersection, narrow bridge, horizontal curve or other major hazard; or
 - b. The ADT is more than 1500 with stopping sight less than Green Book arterial standard for preferred design speed (5 mph over speed limit); or
 - c. The design speed of the curve based on available stopping sight distance, is more than 10 mph (32 km/h) below the 85th percentile speed of vehicles going over the crest (posted speed limit).
2. When to consider Horizontal Curve reconstruction
 - a. ADT > 750; **and**
 - b. Existing curve's design speed is > 15 mph (25 km/h) below approaching 85th percentile speed (posted speed limit)
3. Shoulder Widths advantage
 - a. Increased opportunity for safe recovery (reduced single vehicle accidents like run off the road)
 - b. Increased lateral separation between overtaking and meeting vehicles (reduced sideswipe and head-on accidents)
 - c. Reduced interruption from both emergency stopping and road maintenance activities
 - d. Less wear at the lane edge
 - e. Added stability to lane edge
 - f. Improved sight distance at critical horizontal curves
 - g. Improved roadway surface drainage
 - h. Lessens frequency of accidents (not necessarily accident severity however)

"Rehab Grading Design Standards" that meet the 85th percentiles' driver expectancy and a 1.5 foot object height. These standards are allowable on non-NHS routes only. These standards are for the following which are similar to the 3R standards:

- Lane Widths
- Shoulder Widths
- Clear Zone
- Steepest Inslope
- Bridge Width
- Minimum "K" Value for Vertical Curves
- Minimum Radius for Curves
- Maximum Grades

The following tables list the 13 geometric elements and the associated criteria to be used to determine when reconstruction improvements should be considered on a South Dakota state highway. These criteria are only to be used to determine need and not necessarily reflect the standard to use if reconstruction becomes necessary. However, these tables can be used for “Rehab Grading” projects for non-NHS projects with a future ADT less than 1500. Consistency of design along a route should be considered when determining the final design standards used on reconstruction projects. NHS routes should use AASHTO Green Book standards for the appropriate classification of highway.

INTERSTATE GEOMETRIC NEEDS CRITERIA

GEOMETRIC ELEMENT	URBAN CRITERION	RURAL CRITERION
Design Speed	65 mph	75 mph
Lane Width	12'	12'
Shoulder Width	See Policy	See Policy
Bridge Width	30'	30'
Structural Capacity (Operating)	HS-20	HS-20
Horizontal Alignment (Maximum Degree of Curve)	6°45'	4°15'
Vertical Alignment (Minimum Crest K Value)	80	150
Stopping Sight Distance	See K value	See K value
Maximum Grade	Not a factor	Not a factor
Cross Slope	2%	2%
Superelevation	6%	6%
Horizontal Clearance	30'	30'
Vertical Clearance	16'	16'

NHS (NON-INTERSTATE) GEOMETRIC NEEDS CRITERIA FOR 65 MPH POSTING

GEOMETRIC ELEMENT	<551 ADT CRITERION	551-1500 ADT CRITERION	1501-2500 ADT CRITERION	>2500 ADT CRITERION
Design Speed	65 mph	65 mph	70 mph	70 mph
Lane Width	12'	12'	12'	12'
Shoulder Width	2'	3'	4'	6'
Bridge Width	28'	28'	28'	28'
Structural Capacity (Operating)	HS-20	HS-20	HS-20	HS-20
Horizontal Alignment (Maximum Degree of Curve)	6°45'	6°45'	5°15'	5°15'
Vertical Alignment (Minimum K Value)	80	80	110	110
Stopping Sight Distance	See K value	See K value	See K value	See K value
Maximum Grade	7%?	7%?	5%?	5%?
Cross Slope	2%	2%	2%	2%
Superelevation	6%	6%	6%	6%
Horizontal Clearance	30'	30'	30'	30'
Vertical Clearance	14'	14'	14'	14'

NON-NHS GEOMETRIC NEEDS CRITERIA FOR 65 MPH POSTING

GEOMETRIC ELEMENT	<551 ADT CRITERION	551-1500 ADT CRITERION	1501-2500 ADT CRITERION	>2500 ADT CRITERION
Design Speed	65 mph	65 mph	70 mph	70 mph
Lane Width	12'	12'	12'	12'
Shoulder Width	0'	0'	1'	2'
Bridge Width	24'	24'	26'	28'
Structural Capacity (Operating)	HS-15	HS-15	HS-20	HS-20
Horizontal Alignment (Maximum Degree of Curve)	6°45'	6°45'	5°15'	5°15'
Vertical Alignment (Minimum K Value)	80	80	110	110
Stopping Sight Distance	See K value	See K value	See K value	See K value
Maximum Grade	9%?	9%?	7%?	7%?
Cross Slope	2%	2%	2%	2%
Superelevation	6%	6%	6%	6%
Horizontal Clearance	10'	15'	20'	30'
Vertical Clearance	14'	14'	14'	14'

NHS (NON-INTERSTATE) GEOMETRIC NEEDS CRITERIA FOR 55 MPH POSTING

GEOMETRIC ELEMENT	<551 ADT CRITERION	551-1500 ADT CRITERION	1501-2500 ADT CRITERION	>2500 ADT CRITERION
Design Speed	55 mph	55 mph	60 mph	60 mph
Lane Width	12'	12'	12'	12'
Shoulder Width	2'	3'	4'	6'
Bridge Width	26'	26'	28'	28'
Structural Capacity (Operating)	HS-20	HS-20	HS-20	HS-20
Horizontal Alignment (Maximum Degree of Curve)	11°15'	11°15'	9°00'	9°00'
Vertical Alignment (Minimum K Value)	40	40	60	60
Stopping Sight Distance	See K value	See K value	See K value	See K value
Maximum Grade	7%?	7%?	5%?	5%?
Cross Slope	2%	2%	2%	2%
Superelevation	6%	6%	6%	6%
Horizontal Clearance	30'	30'	30'	30'
Vertical Clearance	14'	14'	14'	14'

NON-NHS GEOMETRIC NEEDS CRITERIA FOR 55 MPH POSTING

GEOMETRIC ELEMENT	<551 ADT CRITERION	551-1500 ADT CRITERION	1501-2500 ADT CRITERION	>2500 ADT CRITERION
Design Speed	55 mph	55 mph	60 mph	60 mph
Lane Width	12'	12'	12'	12'
Shoulder Width	0'	0'	1'	2'
Bridge Width	24'	24'	26'	28'
Structural Capacity (Operating)	HS-15	HS-15	HS-20	HS-20
Horizontal Alignment (Maximum Degree of Curve)	11°15'	11°15'	9°00'	9°00'
Vertical Alignment (Minimum K Value)	40	40	60	60
Stopping Sight Distance	See K value	See K value	See K value	See K value
Maximum Grade	9%?	9%?	7%?	7%?
Cross Slope	2%	2%	2%	2%
Superelevation	6%	6%	6%	6%
Horizontal Clearance	10'	15'	20'	30'
Vertical Clearance	14'	14'	14'	14'