Disclaimer – This document was developed to help support the use of the Design Criteria Form (DCF) by providing examples of references within design guidelines. This is not intended to be an all-inclusive document, the development of design criteria requires engineering judgement and experience.

The Design Criteria Form is intended to capture design criteria, and should be used in conjunction with the existing and/or proposed information captured in the Design Report. Consider adding links or file paths in the comments section to the related documents, such as the Design Report or the Existing Alignment Package, to steer the designer and/or checker to other appropriate design information. This form is intended to document the **TYPICAL** conditions. If it is considered that more than one typical condition exists, such as changes in posted/design speed or transition between rural and urban settings, consider developing separate Design Criteria Forms for each typical condition. However, this document is not intended to capture every variation along a project corridor.

It is likely that, based on the date of the Highway Design Manual (HDM) (1999) versus the AASHTO Policy on Geometric Design of Highways and Streets (aka the "Green Book") (2018) (and other reference documents), conflicts exist between the various documents recommended design criteria. Careful consideration should be given if/when newer references supersede information contained in others based on the published/developed date and current Department practices. The selection of controlling criteria between various references should be noted in the Design Criteria Form and reviewed/approved by the Geometrics Subject Matter Expert (GSME). It is imperative that the form has as much data as possible on the references used (title, date/version, page, table, section, etc) to make review and approval of the selected criteria as easy as possible. This also supports better documentation for future reference.

The following documentation provides insight and/or references into each of the criteria included in the DCF. If multiple references are listed for a design element, they are generally listed in order of importance/relevance (i.e., the first (or **bold**) reference is typically the recommended "primary" source for the criteria, but other general references can provide additional guidance). **All fields should be completed for this form.**

1. **FUNCTIONAL CLASSIFICATION:**
    - **a.** A central organizing criterion for the geometric design process. Functional classification is a system that characterizes roadways by their position in the transportation network and type of service they provide to motor vehicles, while a context classification is a system that characterizes roadways by their surrounding environment and how the roadway fits into the community (AASHTO 2018, pg 1-5 to 1-6).
    - **b. Click on the roadway in NH Roads and Projects Viewer to determine functional classification and/or context classification (urban/rural) - https://nhdotprojects.sr.unh.edu/**
    - c. Alternative sources to the NH Roads and Projects Viewer, noted above, include:
        - i. Functional Classification map - https://www.nh.gov/dot/org/projectdevelopment/planning/gis-data-catalog/documents/functional-system.pdf

ii. Urban population map - https://www.nh.gov/dot/org/projectdevelopment/planning/gis-data-catalog/documents/urban-population.pdf

d. AASHTO Green Book 2018, Sections 1.4 (Functional Classification for Motor Vehicles) and 1.5 (Context Classification for Geometric Design) offer useful general descriptions of the different functional classification considerations.

e. Highway Function: HDM 1999, pg 3-5

f. General Comments

i. Engineering judgment should be used when determining an urban versus rural context.

ii. Once the functional and context classification is determined, refer to the corresponding chapter in AASHTO to establish the applicable design criteria.

2. NHS:

a. National Highway System (NHS) includes interstate Highway System as well as other roads important to the nation's economy, defense and mobility.

b. A higher standard of design is typically required on NHS facilities. Deficiencies may require formal design exceptions based on FHWA controlling criteria. Information regarding documentation of design exception can be found in the Highway Design Manual (HDM) Chapter 3.

c. NHS designation can be found in NH Roads and Project Viewer, as discussed under Functional Classification.

d. NHS Map - https://www.nh.gov/dot/org/projectdevelopment/planning/gis-data-catalog/documents/nhs-miles.pdf

3. DOS AUTHORIZED ROUTE:

a. Department of Safety (DOS) – Routes Authorized for Legal Use for Semi-Trailers 53 Feet in Length or Less identifies roadways that are required to facilitate movement of large semi-trailers (53'). Any roadway on the list, or within the designated areas described on the list, should consider turning movements associated with semi-trailer with a trailer length of 53'. While the current version is dated 2014, confirmation that the referenced list is the most current should occur on a regular basis.

i. NH DOT Geometrics Subject Matter Expert (GSME) John Butler issued a memo on 01/26/2022 recommending use of the WB-62 design vehicle (as opposed to the WB-67 design vehicle) to represent a the swept path of a tractor trailer with a 53' trailer based on RSA 266:11 (max distance between kingpin and centerline of rear axle/midpoint of tandem axle).

b. **DOS 53' Trailer List - https://www.nhsp.dos.nh.gov/resources/documents-and-forms, scroll down to section titled "Inspection Desk" for the most up to date version, see screenshot below.**

4. AADT

a. Average Annual Daily Traffic (AADT) is the volume of traffic that is seen along a corridor, assumed to represent an average day and month condition. Current year data could be taken from the NH TDMS website, and may be considered satisfactory to use in specific instances (recommended to verify with Bureau of Traffic (BOT)), otherwise AADT for current, opening (the year the project construction will be complete) and design (20 years from the opening year) years should be collected by the BOT through submission of a Traffic Forecast Request form.

b. If traffic data is being collected by the Consultant, the proper adjustment factors should be used to determine an appropriate average day and month condition. Final traffic numbers should be vetted through BOT, and included on the Design Criteria Form.

c. If certain segments of the roadway within the project limits have **significantly** different AADTs, often due to turning at side roads, consider developing a second iteration of the DCF for each "AADT" segment of the road, which would help determine appropriate design controls for each condition. The limits of each segment should be clearly stated in the DCF.

d. Its recommended to include a reference to the data used in this section, including the source and date, in the comments section.

5. SPEED

a. Record the proposed design speed for the subject roadway. Design speed is used to determine many of the subsequent design criteria. Refer to the respective roadway functional classification chapter in the AASHTO Green Book 2018, such as Section 7.2.2.1 (Design Speed) for rural arterials, to check that the proposed design speed is within the recommended range. AASHTO guidance gives substantial latitude relative to design speed, and therefore a design exception for design speed should be very rare.

b. Additionally, useful general discussion on facility speeds, including operating, running and design speeds, can be found in AASHTO Green Book 2018, Section 2.3.6 (Speeds). The HDM 1999, pg. 3-12 has additional limited discussion on selecting a design speed.

c. There are many studies and alternative resources that provide design speed selection guidance. Any reference manual or speed study used to determine the final selected design speed should be documented.

d. If certain segments of the roadway within the project limits have distinctly different speeds, often as a result of changing roadway context, consider developing a second iteration of the DCF for each “speed” segment of the road, which would help determine appropriate design controls for each condition. The limits of each segment should be clearly stated in the DCF.

e. NH DOT Bureau of Traffic (BOT) maintains a google earth file of existing posted speed limit signs, available internally only at the following link - \\dot\Data\Global\B34-HighwayDesign\#KML for Google Earth\2018 Speed Signs.kmz

6. TYPICAL SECTION:

a. **Widths (lane, shoulder, sidewalk)** - The logical approach to determining appropriate lane and shoulder width is to provide a width related to the traffic demands while also considering the types of vehicles being served (such as freight or bicycles).

   i. **Minimum lane and shoulder width criteria should be determined by referring to the respective roadway functional classification chapter in the AASHTO Green Book 2018, such as Table 7-3 for rural arterials.**

   ii. **Sidewalk widths should be determined by referring to the HDM Volume 2 Draft Sample Layouts (Rev 08/22/2019) https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/designmanual/volume2-chapter2.htm**

   iii. AASHTO Green Book 2018, Section 4.2 (Traveled Way), Section 4.3 (Lane Width), Section 4.4 (Shoulders), and Section 4.17 (Pedestrian Facilities), also provides additional guidance on typical section widths.

   iv. HDM 1999, pg 3-9 (Travel Lanes, Shoulders, and Medians), offers useful background info on this design element and NHDOT typical widths.

   v. HDM Volume 2 Draft Typical Sections (Rev 08/22/2019) (https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/designmanual/volume2-chapter1.htm)

   vi. NH DOT Highway Design Special Details – Sidewalk Curb Ramp Details

   https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/detailsheets/documents/crb_ramp_1_9.pdf

   vii. Sidewalk widths, as well as other pedestrian paths, should conform to any and all applicable Americans with Disabilities Act (ADA) requirements.

b. **Cross Slope (lane, shoulder, sidewalk) (normal crown conditions)** – Sufficient cross slopes should be proposed to ensure proper drainage while avoiding adverse effects to vehicle (or other facility user) operations.

   i. **Lane and shoulder cross slopes should be determined by referring to the HDM Volume 2 Draft Typical Sections (Rev 08/22/2019) (https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/designmanual/volume2-chapter1.htm)**

   ii. **Sidewalk cross slopes should be determined by referring to the HDM Volume 2 Draft Sample Layouts (Rev 08/22/2019) https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/designmanual/volume2-chapter2.htm**

iii. Also see additional discussion on lane and shoulder cross slopes in the respective roadway functional classification in the AASHTO Green Book 2018, such as Section 7.2.2.7 for rural arterials.

iv. Sidewalk cross slopes, as well as other pedestrian paths, should conform to any and all applicable Americans with Disabilities Act (ADA) requirements.

v. See other general references as listed under "Widths" above for additional information.

vi. HDM 1999, pg 3-12 (Pavement and Shoulder Slopes)

c. **Barrier Offset** – This refers to the distance between the edge of pavement/face of curb and the face of barrier. Offsets should be set to reduce the potential for adverse effects associated with barrier installation (ie vaulting, roll-overs, etc). See later discussion on Clear Zone for when barrier may be warranted.

i. **Barrier offset should be determined by referring to the HDM Volume 2 Draft Typical Sections (Rev 08/22/2019) and/or Draft Sample Layouts (Rev 08/22/2019) (https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/designmanual/volume2-chapter1.htm)**

ii. AASHTO RDG 2011, Section 5.6 (Barrier Placement)

iii. AASHTO Green Book 2018, Section 4.6.2 (Lateral Offset, Roadside Design)

iv. AASHTO RDG 2011, Section 5.6.2.1.1 (Curb/Guardrail Combinations for Strong-Post W-Beam Guardrail)

v. HDM 1999, pg 11-1 (Barriers)

d. **General Note** - Other conditions may exist that warrant design by "Other" references, such as the AASHTO Geometric Design for Low Volume Roads or NCHRP study recommendations.

7. SUPERELEVATION: Adjustment of the roadway cross slope to counterbalance the outward radial (centrifugal) force experienced while traveling in a circular path (i.e. through a horizontal curve), often referred to as roadway "bank".

a. $\mathbf{e_{max}}$ – Maximum full bank superelevation typically based on the facility type

i. HDM 1999, pg 3-13 (Horizontal Curvature and Superelevation)

ii. AASHTO Green Book 2018, Section 3.3.3 (General Considerations) for horizontal alignments, specifically Section 3.3.3.2 (Maximum Superelevation Rates for Streets and Highways)

iii. AASHTO Green Book 2018, under the respective roadway functional classification, such as Section 7.2.2.8 (Superelevation) for rural arterials.

iv. Consider additional design criteria for superelevation on approach to intersections.

b. Superelevation Runoff Distribution – The superelevation runoff is the desirable length of roadway required to accomplish a change in cross slope from a section with adverse crown removed (0% section) to a fully superelevated section. The superelevation runoff distribution is the proportion of the superelevation runoff length that occurs within the tangent section of the roadway (prior to the point of curvature) versus within the adjacent curve portion of the roadway (within the curve, after the point of curvature).

i. **HDM 1999, pg 4-15 through 4-24 (Superelevation). The typical superelevation runoff distribution used in Highway Design is a 70/30 (tan/curve) split. In cases of constrained condition, the runoff may be shifted to 60/40, however, anything below that should be discussed with the GSME.**

ii. AASHTO Green Book 2018, Section 3.3.8 (Transition Design Controls), particularly Section 3.3.8.2.3 (Location with Respect to End of Curve).

iii. Note that the superelevation runoff length is exclusive of the tangent runout, however, the tangent runout is recommended to be at the same transition rate as the superelevation runoff (HDM 1999, pg 4-19).

iv. If spiral curves are used, the superelevation runoff is typically positioned over the length of the spiral. The use of spiral curves is typically reserved for interstate and/or divided highway facilities.

v. AASHTO Green Book Section 3.3 (Horizontal Alignment) for compound curves design criteria, including maximum curve ratios and curve transitions. In general, full superelevation should be achieved for the sharper curve by the point of compound curvature (PCC), so the transition will entirely be within the flatter curve portion.

8. MAXIMUM RELATIVE GRADIENT (MRG):

a. **AASHTO Green Book 2018, Section 3.3.8.2.1 (Minimum Length of Superelevation Runoff)**

b. HDM 1999, **pg 4-15 through 4-24 (Superelevation**), noting however that Table 4-4 (Relationship of Design Speed to Maximum Relative Profile Gradients) has been superseded by updated AASHTO guidelines, referenced above.

c. If necessary, interpolate the MRG between the closest two speeds to determine the appropriate MRG.

9. CLEAR ZONE: Unobstructed, traversable area provided beyond the edge of the through traveled way for the recovery of errant vehicles.

a. Since the clear zone is not necessarily considered a primary design control (meaning its selection does not inform other design criteria within the form itself), the DCF allows two “typical” foreslope/backslope condition combinations. If a condition does not exist (ie there is no backslope within the clear zone, but a continued foreslope), indicate such with an N/A in the particular typical condition.

b. **AASHTO RDG, Chapter 3 (Roadside Topography and Drainage Features), specifically Tables 3.1 – Suggested Clear Zone Distances from Edge of Through Traveled Lane**

c. AASHTO Green Book 2018 under the respective functional classification, such as AAHSTO Green Book 2018, Section 7.2.4 (Roadside Design) for rural arterials.

d. HDM 1999, 3-11 (Lateral Clearances)

e. NH DOT Utility Accommodations Manual (UAM) 2017

10. **HORIZONTAL ALIGNMENT:** Curvature based on the required alignment of the roadway, should be based on an appropriate relationship between design speed, curvature, and their joint relationships with superelevation (roadway banking) and side friction.

a. **Minimum Radius, Minimum Radius with Reverse Crown (RC), Minimum Radius with Normal Crown (NC)**

i. **AASHTO Green Book 2018, Section 3.3.5 (Design Superelevation Tables). Table should correspond with the appropriate e_{max}.**

ii. AASHTO Green Book 2018, Section 3.3.13 (General Controls for Horizontal Alignment) for relationship between adjacent compound curve radii.

iii. HDM 1999, pg 4-3 thru 4-4 (Horizontal Alignment General Controls), 4-11 thru 4-24 (Horizontal Curves, overlapping with previous references in the Superelevation section above). This segment includes superelevation tables that have been superseded by updated guidance in the AASHTO Green Book.

b. **Minimum Curve Length**

i. **AASHTO Green Book 2018, Section 3.3.13 (General Controls for Horizontal Alignment)**

ii. HDM 1999, pg 4-3 (Horizontal Alignment General Controls)

iii. AASHTO Green Book 2018 Section 3.3 (Horizontal Alignment) for spiral design criteria, including minimum spiral length.

iv. AASHTO Green Book Section 3.3 (Horizontal Alignment) for compound curves design criteria, including minimum curve length.

11. **VERTICAL ALIGNMENT:** Profile of the road to align with the natural topography while also promoting uniform operation of the roadway.

a. **Assumed Terrain**

i. AAHSTO Green Book 2018, Section 3.4.1 (Terrain). It should be noted that very few roadways in NH are considered Mountainous.

ii. HDM 1999, pg 4-26 (Maximum Grades) refers to the AASHTO Green Book for terrain.

iii. If certain segments of the roadway within the project limits have distinctly different terrains, often corresponding to a change in roadway context, consider developing a second iteration of the DCF for each “terrain” segment of the road, which would help determine appropriate design controls for each condition. The limits of each segment should be clearly stated in the DCF.

b. **Minimum Grade**

i. **HDM 1999, pg 4-26 (Minimum Grades)**

ii. AASHTO Green Book 2018, Section 3.4.2.2 (Control Grades for Design), particularly Section 3.4.2.2.2 (Minimum Grades)

iii. AASHTO Green Book 2018 under the respective functional classification, such as AAHSTO Green Book 2018, Section 7.2.2.6 (Grades) for rural arterials.

c. **Maximum Grad**

i. **AASHTO Green Book 2018 under the respective functional classification, such as AASHTO Green Book 2018, Section 7.2.2.6 (Grades) for rural arterials, specifically Table 7-2 (Maximum Grades for Arterials Rural Areas)**

ii. AASHTO Green Book 2018, Section 3.4.2.2 (Control Grades for Design)

iii. AASHTO Green Book 2018, Section 3.4.2 (Grades) and Section 3.4.3 (Climbing Lanes) for vertical alignment considerations for heavy vehicles.

iv. HDM 1999, pg 4-26 (Maximum Grades) refers to the AASHTO Green Book for maximum grades.

d. **Minimum K Crest (SSD)**

i. **AASHTO Green Book 2018, Table 3-35 (Design Controls for Crest Vertical Curves Based on Stopping Sight Distance)**

ii. AASHTO Green Book 2018, Section 3.4.6.2.1 (Design Controls: Stopping Sight Distance) for discussion on headlight height SSD evaluation (pg 3-170)

iii. See HDM 1999, pg 4-29 thru 4-39 for general information on vertical curves

e. **Minimum K Sag (SSD)**

i. **AASHTO Green Book 2018, Table 3-37 (Design Controls for Sag Vertical Curves)**

ii. AASHTO Green Book 2018, Section 3.4.6.3 (Sag Vertical Curves) for discussion on headlight height SSD evaluation (pg 3-172)

iii. See HDM 1999, pg 4-29 thru 4-39 for general information on vertical curves

f. **Minimum Length Vertical Curve**

i. **HDM 1981 (English Units), Table 4-6 (Minimum Vertical Curve Lengths), or use converted HDM 1999 Table 4-7 (Minimum Vertical Curve Lengths)**

Design Speed	Length (Ft.)
30	100
40	150
50	200
60	250
70	300

Table 4-6
MINIMUM VERTICAL CURVE LENGTHS
NEW HAMPSHIRE POLICY

ii. Crest – AASHTO Green Book 2018, pg 3-168, pg 3-171

iii. Sag – AASHTO Green Book 2018, pg 3-175 - 3-176

iv. HDM 1999, pg 4-29 thru 4-39 for general information on vertical curves

12. **<u>MINIMUM VERTICAL CLEARANCE:</u> The value recorded for this criteria is intended to be vertical clearance over the subject roadway.** Measured from the lowest point of an overhead structure to the finished roadway surface, provided over the entire useable roadway width, including shoulders.

    a. **HDM 1981 (English Units) Figure 3-2 (Minimum Vertical Clearances) or use converted HDM 1999 (also Figure 3-2). If dealing with vertical clearance over a railroad, be sure to read the footnote to Figure 3-2 in the HDM 1999.**

Figure 3-2

MINIMUM VERTICAL CLEARANCES

Clearances must be shown on all profiles , both preliminary and final.	
Local road under Interstate with interchange	16'-6"
Local road under Interstate without interchange	14'-6"
Local road under all other roads	14'-6"
Local road under railroads	14'-6"
State Route under Interstate with interchange	16'-6"
State Route under Interstate without interchange	14'-6"
State Route under all other roads	14'-6"
State Route under railroads	14'-6"
Interstate Route under all roads	16'-6"
Interstate Route under railroads	16'-6"
Railroad under all roads (statutory*)	22'-0"

    b. If there are roadways or railroads passing under the subject roadway, use the comments section to record the minimum vertical clearance required for that facility. In the event a new/relocated roadway is being proposed above an existing roadway or rail corridor, this envelope will need to be provided for the existing facility, and as a result, will have a direct influence on the profile of the proposed roadway. Clearance should be exclusive of the structural depth of any overhead structure (bridge).

    c. Particular railroad Owners or railroads intended for future "double decker rail" may have different minimum vertical clearance requirements.

13. **<u>STOPPING SIGHT DISTANCE (SSD):</u>** Length of the roadway ahead that is visible to a driver and should be sufficient to enable a moving vehicle (traveling at or near the design speed) to stop before reaching a stationary object in its path.

    a. AASHTO Green Book 2018, Section 3.2.2 (Stopping Sight Distance), specifically Table 3-1 (Stopping Sight Distance on Level Roadways) and Table 3-2 (Stopping Sight Distance on Grades)

    b. AASHTO Green Book 2018, Section 9.6.5 (Stopping Sight Distance at Intersections for Turning Roadways)

c. HDM 1999, pg 3-14 for general information on stopping sight distance

14. **<u>DECISION SIGHT DISTANCE (DSD):</u>** Length of a driver's sight line required to perceive, react and perform a maneuver to adjust speed.

a. This design criteria is rarely used as a design control. However, if the Designer determines this may be a critical aspect of a given project, more precise description of the criteria may be required. Consult with the GSME if necessary.

b. **AASHTO Green Book 2018, Table 3-3 (Decision Sight Distance). Citation of Avoidance Maneuver C, D or E (depending on the context of the roadway) should be provided.**

c. HDM 1999, pg 3-15 for general information on decision sight distance

15. **<u>PASSING SIGHT DISTANCE (PSD):</u>** Length of a driver's sight line needed to safely complete a normal passing maneuver.

a. This design criteria is rarely used as a design control. However, if the Designer determines this may be a critical aspect of a given project, more precise description of the criteria may be required. Consult with the GSME if necessary.

b. AASHTO Green Book 2018, Table 3-4 (Passing Sight Distance of Two-Lane Highways)

i. AASHTO Green Book 2018, Table 3-36 (Design Controls for Crest Vertical Curves Based on Passing Sight Distance)

c. HDM 1999, pg 3-15 for general information on passing sight distance

16. **<u>INTERSECTION DECELERATION LENGTH:</u>** The deceleration length represents a portion of an auxiliary lane on approach to an intersection. The deceleration length typically represents the length required to complete the lane change (taper) and decelerate to a stop condition in advance of the vehicle queue. The distance needed to recognize the upcoming turn lane and prepare for the turn maneuver (i.e. perception reaction) (in advance of the deceleration length), and the storage distance at the end of the deceleration length (vehicle queue), are separate considerations.

a. **AASHTO Green Book 2018, Table 9-20 (Desirable Lane Change and Deceleration Distance)**

b. HDM 1999, pg 5-11 for very limited discussion on deceleration lanes, and intersection geometry in general

c. As noted previously, the overall length of an auxiliary lane is also a function of the storage length (vehicle queue). For additional discussion regarding storage length, see AASHTO Green Book 2018, Section 9.7.2 (Deceleration Lanes).

d. The storage length (vehicle queue) at signalized intersections is typically derived from the traffic analysis, and will depend on signal phasing, cycle length and arrival/departure rates.

e. NH DOT Standard Plan PM – 7 for additional intersection layout guidance. Confer with Design/BOT for additional clarification if necessary

17. <u>DESIGN VEHICLE:</u> A vehicle that is likely to use a facility with considerable frequency or a particular vehicle with special characteristics appropriate to a particular location which will determine critical features such as radii at intersections and turning roadways. Selection of the design vehicle is strongly based on **engineering judgment**.

a. **DCF should note the design vehicle for the roadway segment (through movements) and the design vehicles used for turning movements at all intersections/driveways.**

b. Although there is very general guidance in both the AASHTO Green Book 2018 (Section 2.8 – Design Vehicles) and the HDM, this is a very site specific decision.

c. The design vehicle should represent the vehicle that frequently uses the facility. Consideration should be given to vehicles that may require access to certain parcels within a project, such as a gas station and the need to perpetuate access for delivery of gas via a gas tanker truck.

d. A check vehicle is a vehicle that may need to have access through a corridor given certain circumstances, movements must not be prohibited, but may not be used to actually design the roadway.

e. Review the DOS Route Authorized for Legal use for Semi-Trailers 53 Feet in Length or Less to see if the WB-62 with 53' trailer should be considered as a design vehicle.

<u>FHWA Controlling Criteria Annotation</u>

As noted in the DCF, FHWA has designated 10 controlling criteria, noted with an asterisk (*). Applicability of the controlling criteria depends whether the facility is part of the NHS, and what the design speed is. **When designs do not meet applicable controlling criteria, documentation of the exception/deviation should be provided as follows:**

<u>NHS Facility, High Speed (Design speeds equal to or greater than 50mph)</u>

- A **formal Design Exception/Deviation Report and Cover Memo** is required for any deviation from the 10 controlling criteria, and is subject to NH DOT and FHWA approval (if a Federal oversight project).

<u>NHS Facility, Low Speed (Design speeds less than 50mph)</u>

- A **formal Design Exception/Deviation Report and Cover Memo** is required for 2 of the 10 controlling criteria (design loading structural capacity and design speed), subject to approval from NH DOT and FHWA (if a Federal oversight project).
- Any **deviation** from the remaining 8 controlling criteria shall be informally documented using the **Design Exception/Deviation Report**, which shall be included with the project Design Report, and approved through the overall project design approval process.

<u>Non-NHS, All Speeds</u>

- Any deviation from the 10 controlling criteria shall be **informally** documented using the **Design Exception/Deviation Report**, which shall be included with the project Design Report, and approved through the overall project design approval process.

The NOTES OR OTHER JUSTIFICATIONS section of this form should clearly specify which type of documentation would be required for this facility based on the above information. For example, "This route is on the NHS and has a DS = 50mph, and will require a formal Design Exception/Deviation Report and Cover Memo for any deviation from the 10 controlling criteria".

18. **NOTES OR OTHER JUSTIFICATIONS:** General project notes not included otherwise. Notes should be related to design criteria only.

19. **INTERSECTION SIGHT DISTANCE (ISD):** Sight distance provided at intersections to allow drivers to perceive the presence of potentially conflicting vehicles.

a. **See AASHTO 2018, Section 9.5 (Intersection Sight Distance).**

b. This does not replace the need to account for stopping sight distance, as discussed elsewhere in this form. Stopping sight distance should be provided continuously along each roadway so that drivers have a view of the roadway ahead that is sufficient to allow drivers to stop.

c. Dimension of the legs of the sight triangles depend on the design speeds of the intersecting roadway and the type of traffic control used at the intersection.

d. For a two way stop controlled intersection, the DESIRABLE decision point (vertex) of the departure sight triangle on the minor road is 18' from the edge of the major-road traveled way. However, if that condition cannot be met, alternative offsets should be evaluated, however, the minimum recommended offset from the edge of the major-road traveled way is 14.5' – AASHTO 2018, Section 9.5.3.2 (Case B – Intersections with Stop Control on the Minor Road).

e. Consideration should be given to the location of the decision point (vertex) versus the decision point based on existing pavement markings, such as stop bars. While the location of the decision point does not change the calculated ISD, it will change the layout of the sight triangle, and therefore, may change what is considered an "obstruction" and what is not.