25TH ANNUAL

GEORGIA TRANSPORTATION SUMMIT

Breakout Session B-1

OpenRoads & Policy Updates

Frank Flanders IV
Michelle Pate
Brent Story

#GTS2019

Georgia Department of Transportation

OpenRoads Implementation

Design Policy & Support – Engineering Software Support Group

OpenRoads Implementation

Where Were We?

- InRoads SS2
- Skipping SS3 and SS4
- Moving Straight into OpenRoads Designer

OpenRoads Implementation

Where Are We?

- Live Survey and Design Pilots
  - 4 In-House Projects
- SU Drainage Structure Development Complete
  - In Use on Pilot Projects
  - 2nd and 3rd Phase of SU Cells Pending
- Beta Workspace
  - DOT.GA.GOV > Business & Government > Design Software > OpenRoads
- CSV File Required for Survey

OpenRoads Implementation

Where Are We Headed?

- Designer Training (GDOT Only)
  - 1st Quarter 2020

- Production Workspace
  - 1st Quarter 2020

- All New Projects to be Surveyed for OpenRoads Designer
  - Beginning Early 2020 for In-House
  - Beginning July 2020 for Consultants

OpenRoads Implementation

FAQ

- No GDOT Tutorial
- Workflows Will Be Developed as Needed
- Managed Workspace Will Require Full Upgrade to PWCE
- Moving to Windows 10 Will Require Upgrade of Desktop to PWCE
- Bentley Is Ending Support for InRoads (SS2/V8i), Not Getting Rid of the Product

ISD Documentation

Design Policy & Support – Design Policy Group

ISD Documentation Requirements

Overview

- September 26, 2018 Memo Added PFPR Submission Requirements
  - Calculations
  - Graphical Drawings
- Other Considerations

GDOT Georgia Department of Transportation

Interoffice Memo

DATE: September 26, 2018

FROM: Brent A. Story, P.E., State Design Policy Engineer

TO: Program Delivery, IPD, TIA, Engineering Services, and Divisions of Engineering, Operations, and Field Districts

SUBJECT: **Intersection Sight Distance (ISD)**

The Department's policy on application of Intersection Sight Distance (ISD) is published in Chapter 4.1.5 of the GDOT Design Policy Manual at:
http://www.dot.ga.gov/PartnerSmart/DesignManuals/DesignPolicy/GDOT-DPM.pdf

In an effort to enhance quality assurance, the Department recently decided to require that all ISD studies including calculations and graphical drawings be provided with the submittal package to request Preliminary Field Plan Review (PFPR). A summary of the ISD studies should be presented in a table format with, at a minimum, intersection name, each applicable ISD case, and a-leg and b-leg values of the sight triangle listed. The PFPR Checklist was updated on August 6, 2018 and is published at:
http://mydocs.dot.ga.gov/info/gdotpubs/Publications/2440-1c.pdf

As discussed in the GDOT Design Policy Manual, ISD studies should include graphical drawings with scaled distances on plan and profile sheets defining the vertex (decision point) and the sight triangle for viewing approaching traffic. Specific cross-section sheets illustrating the location of the sight line with respect to the 3D model of the roadway may also be necessary to validate ISD results. Special attention should be given to verifying that proposed roadway features such as horizontal curvature, vertical curvature, super-elevation, median design, guardrail, barrier walls, retaining walls, embankments, landscaping, signs, and signal control boxes do not obstruct the sight triangle zone. The establishment of adequate required right-of-way to protect the sight triangle zones should be reflected in the plans.

In some design situations it may not be necessary to conduct ISD calculations and graphical studies, for example, existing intersections with obvious clear ISD conditions, no relevant crash history, and no proposed reconstruction or stop-bar striping changes. In these cases the Engineer-Of-Record must provide a justification in support of omitting ISD studies. The justification should be included as a comment in the ISD summary table provided at PFPR.

The Office of Engineering Services will begin to require ISD studies for PFPR requests submitted after November 1, 2018. For questions about ISD, contact Brent Story (bstory@dot.ga.gov) or Frank Flanders (fflanders@dot.ga.gov) at (404) 631-1978. For questions about PFPR checklist, contact Walt Taylor (wtaylor@dot.ga.gov) at (404) 631-1922.

ISD Documentation Requirements

Calculations

- Summary Table with Data
  - Intersection Name
  - Applicable ISD Cases
    - a-Leg Value
    - b-Leg Value

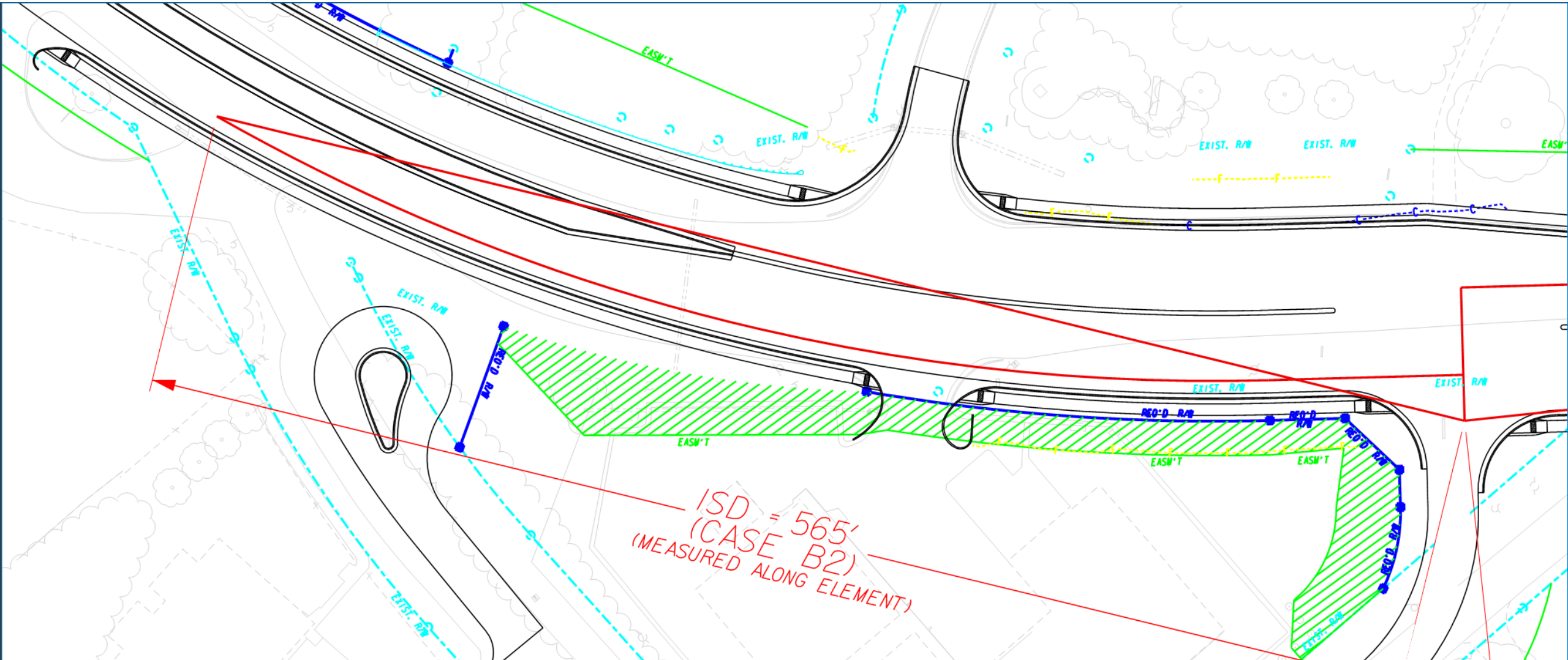
ISD Documentation Requirements

Graphical Drawings

- ISD Triangles
- Sight Line Profile
- InRoads Sight Visibility

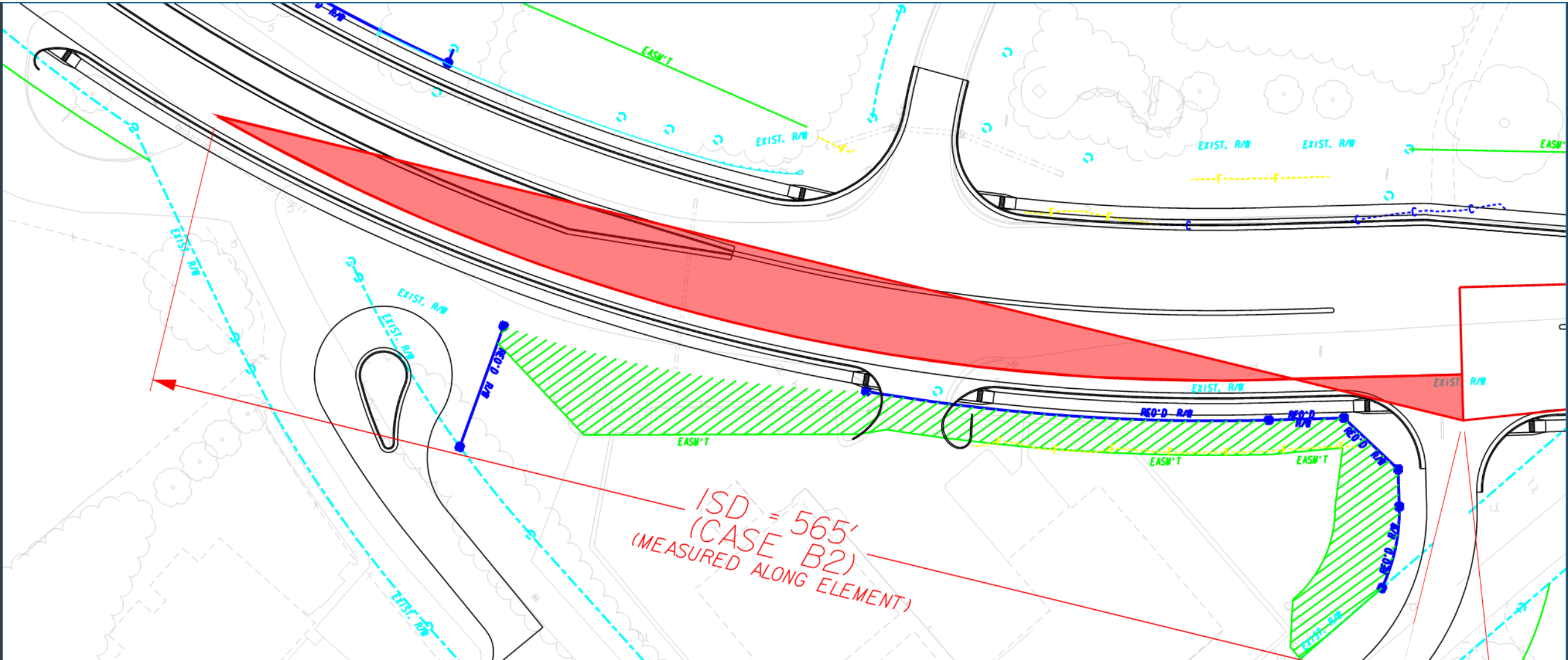
ISD Documentation Requirements

Graphical Drawings – ISD Triangles



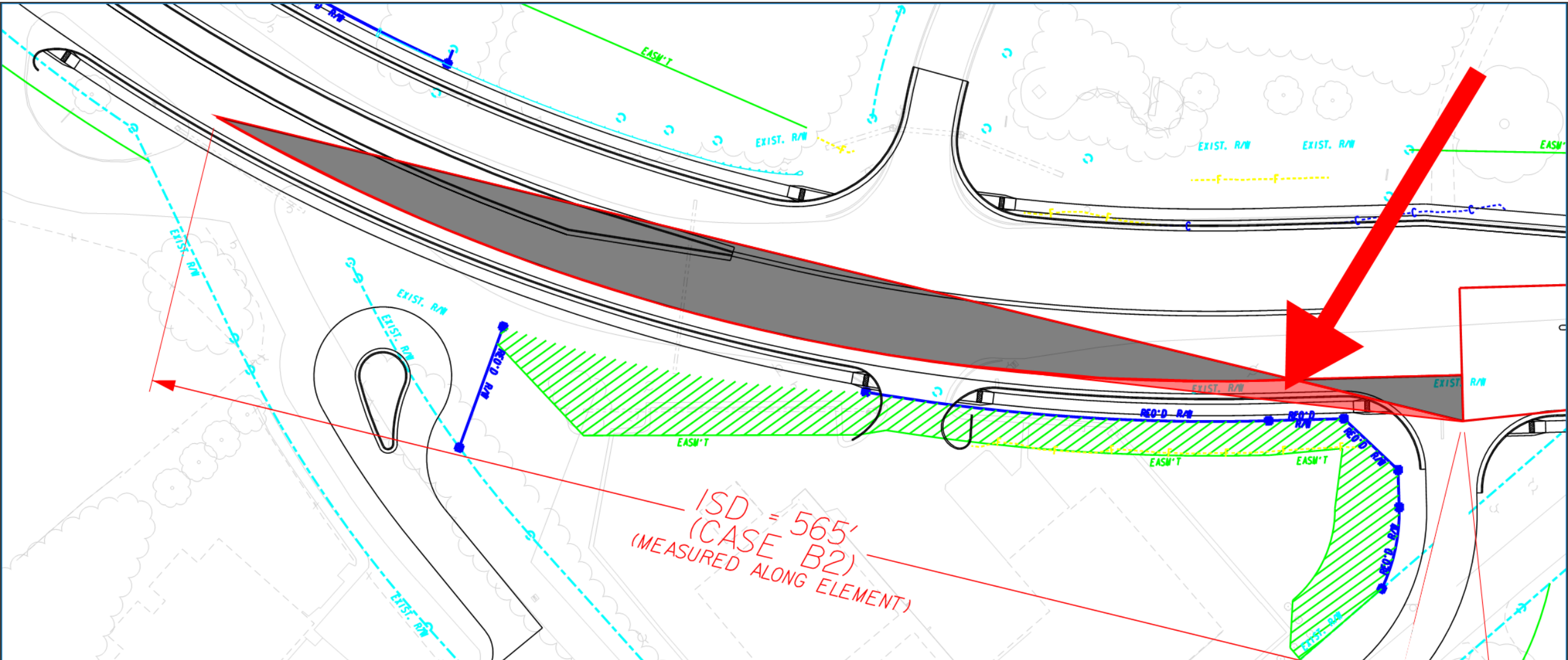
ISD Documentation Requirements

Graphical Drawings – ISD Triangles



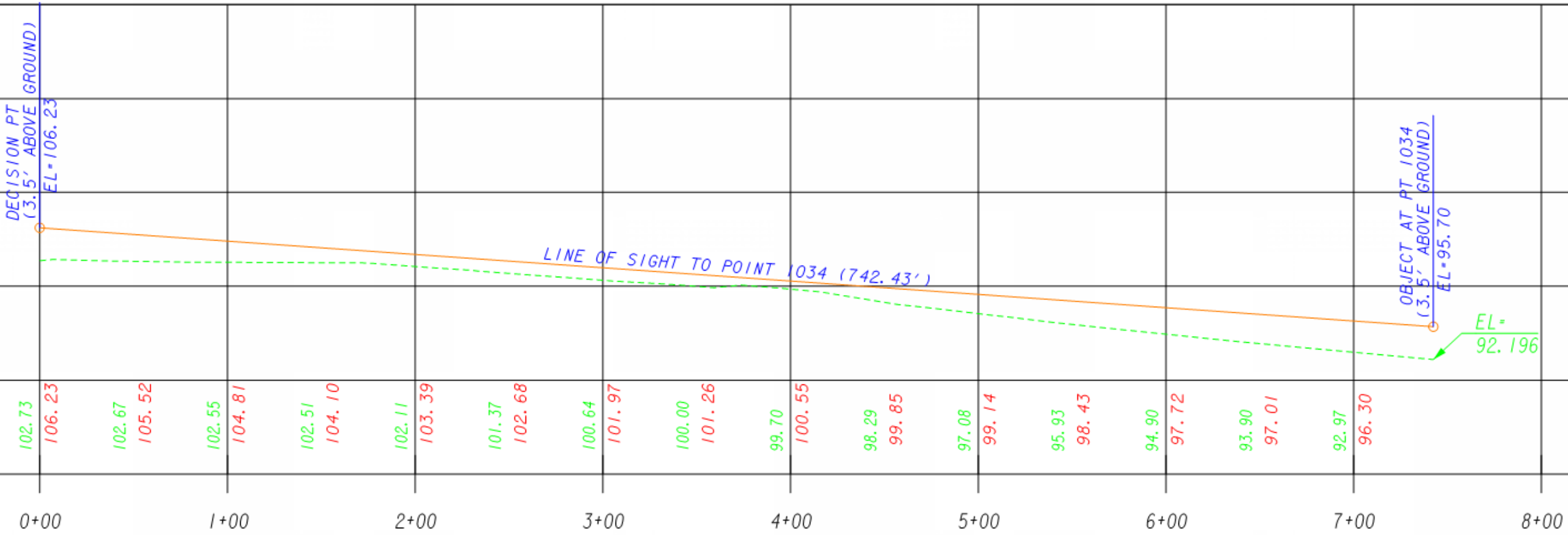
ISD Documentation Requirements

Graphical Drawings – ISD Triangles



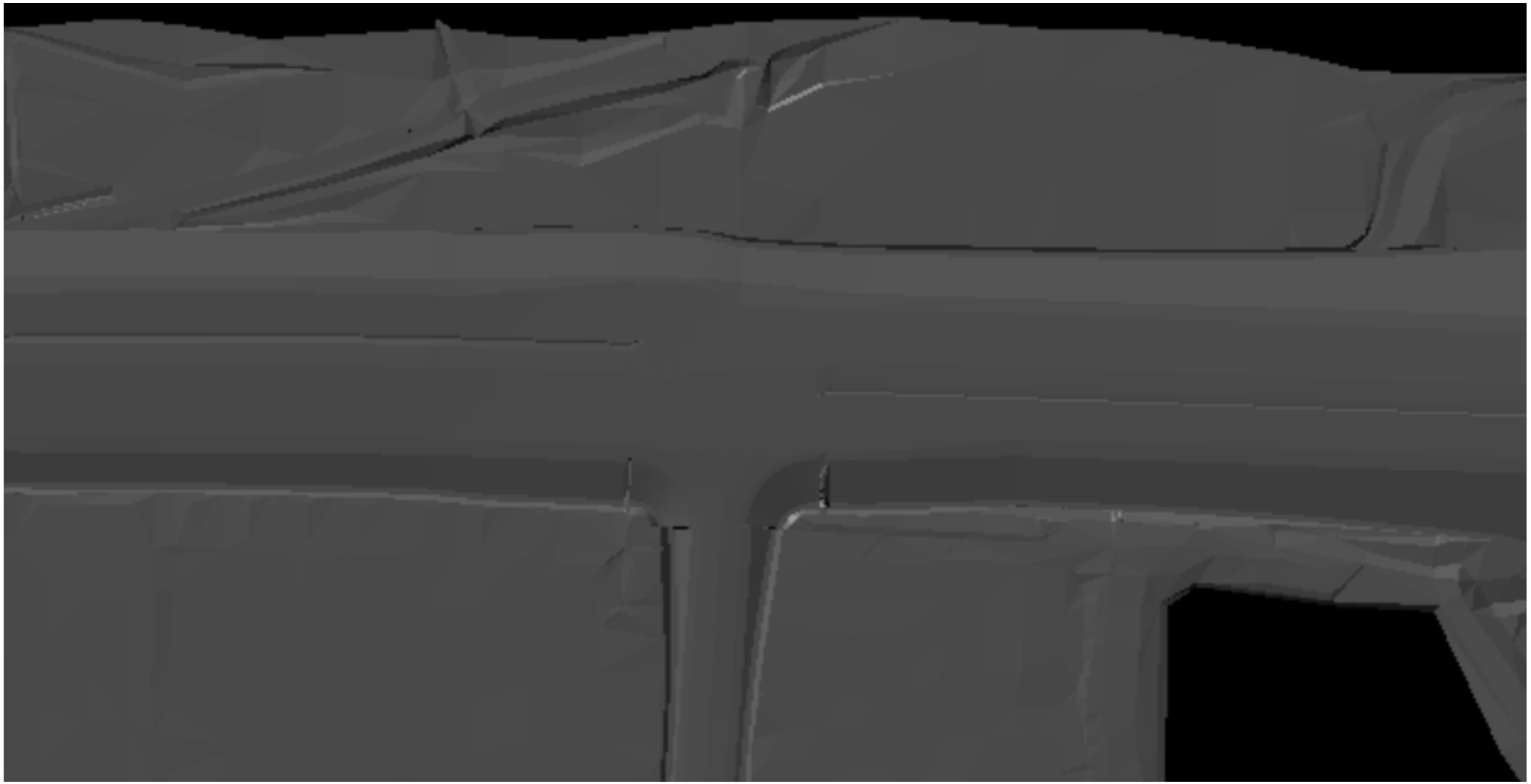
ISD Documentation Requirements

Graphical Drawings – Sight Line Profile



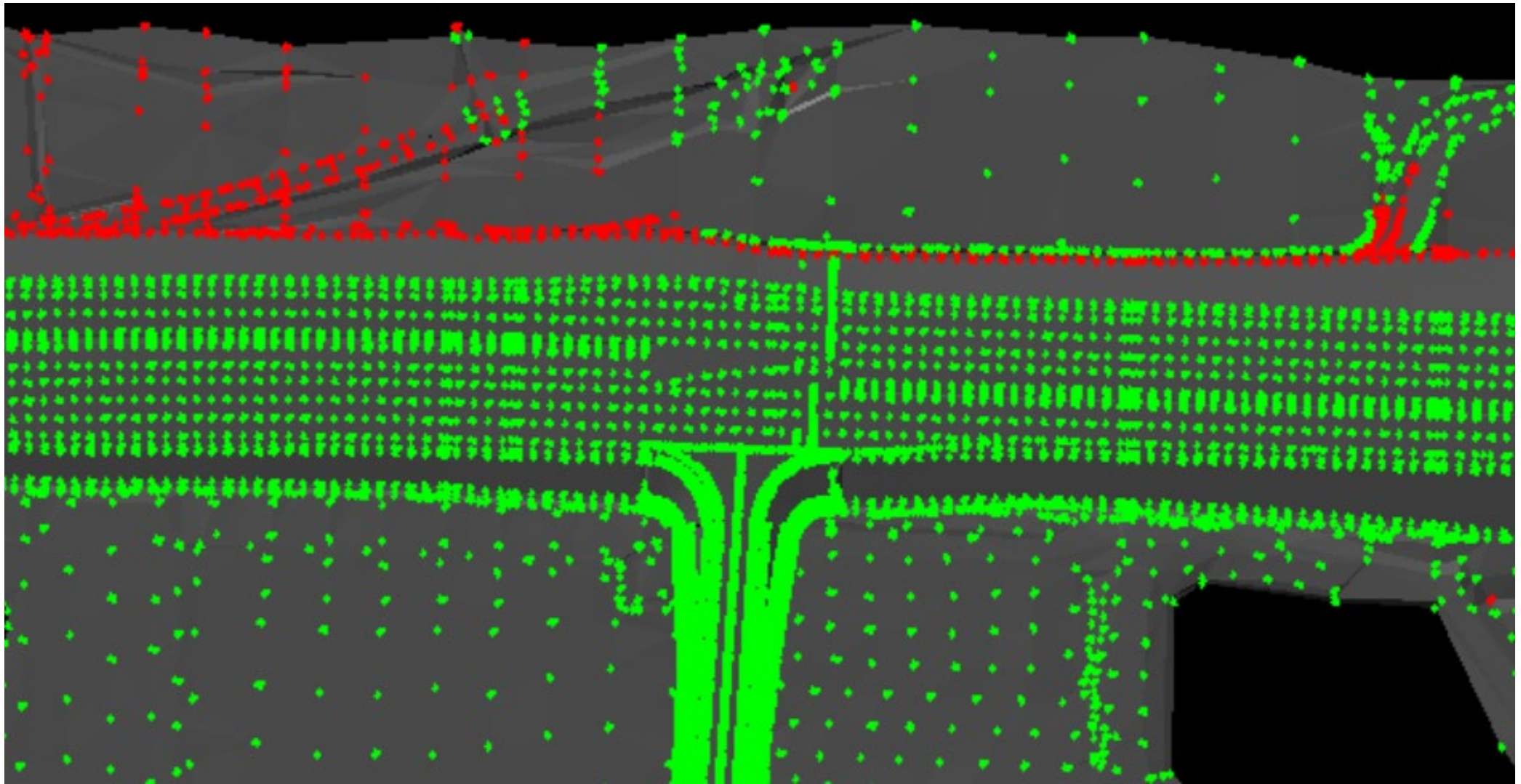
ISD Documentation Requirements

Graphical Drawings – InRoads Sight Visibility Tool



ISD Documentation Requirements

Graphical Drawings – InRoads Sight Visibility Tool



ISD Documentation Requirements

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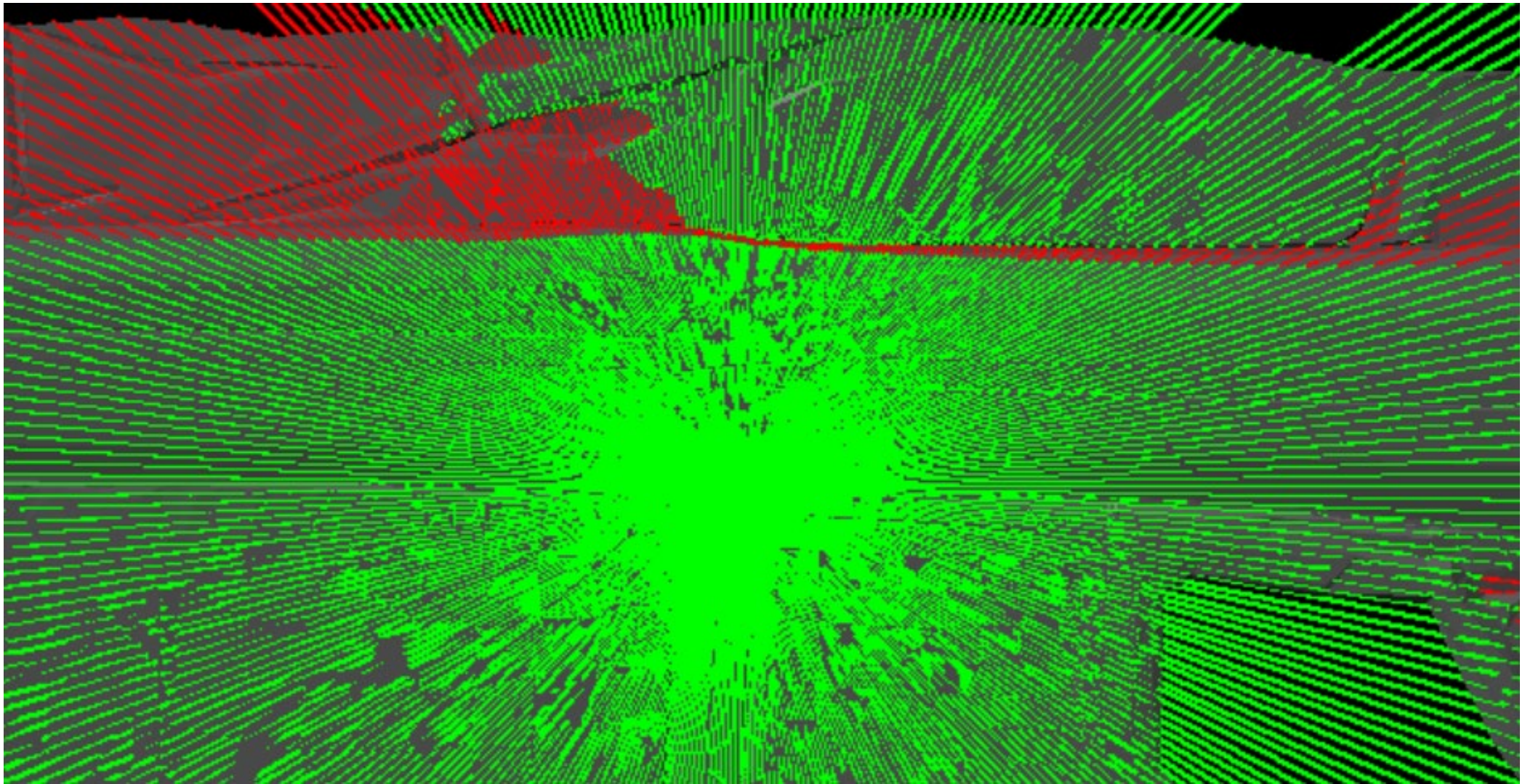
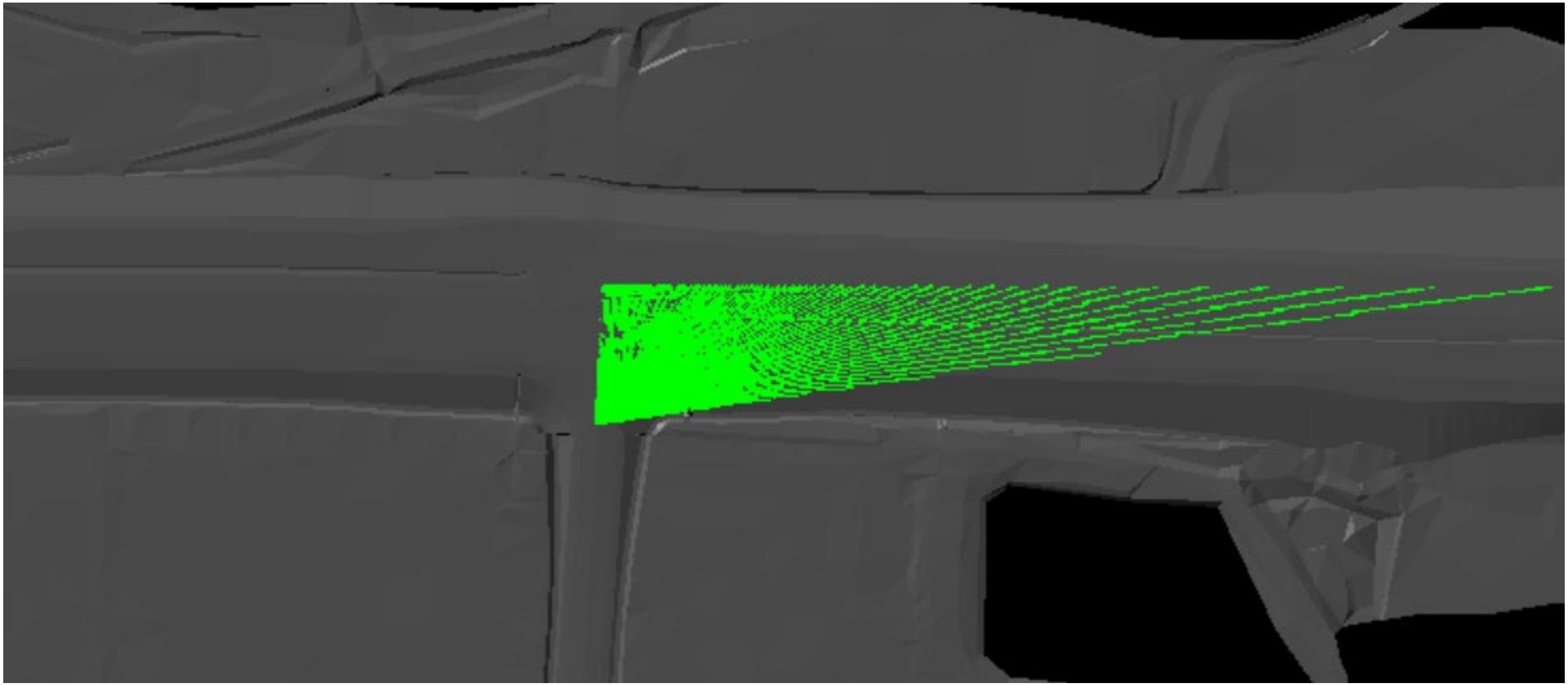


ISD Documentation Requirements

Graphical Drawings – InRoads Sight Visibility Tool



ISD Documentation Requirements

Other Considerations

ISD Documentation Requirements

Other Considerations

9.5.2.2 Departure Sight Triangles

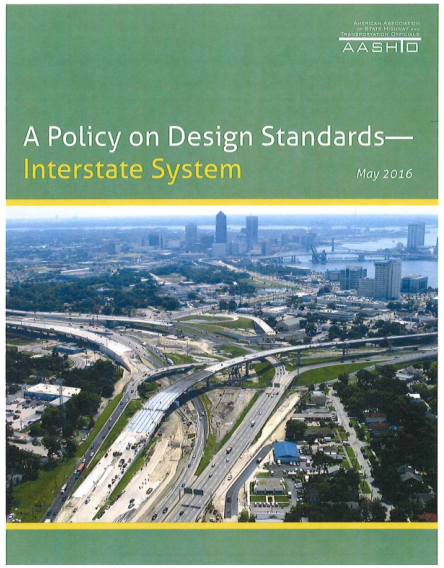
A second type of clear sight triangle provides sight distance sufficient for a stopped driver on a minor-road approach to depart from the intersection and enter or cross the major road. Figure 9-17 shows typical departure sight triangles to the left and to the right of the location of a stopped vehicle on the minor road. Departure sight triangles should be provided in each quadrant of each intersection approach controlled by stop or yield signs from which stopped vehicles may enter or cross a major road on which traffic is not required to stop. Departure sight triangles should also be provided for some signalized intersection approaches (see Section 9.5.3.4). Distance a_2 in Figure 9-17 is equal to distance a_1 plus the width of the lane(s) departing from the intersection on the major road to the right. Distance a_2 should also include the width of any median present on the major road unless the median is wide enough to permit a vehicle to stop before entering or crossing the roadway beyond the median. The appropriate measurement of distances a_1 and a_2 for departure sight triangles depends on the placement of any marked stop line that may be present and, thus, may vary with site-specific conditions.

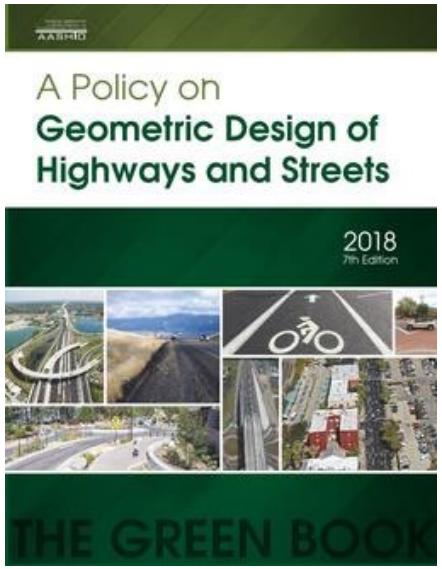
Source: *A Policy on Geometric Design of Highways and Streets, 7th Ed.*

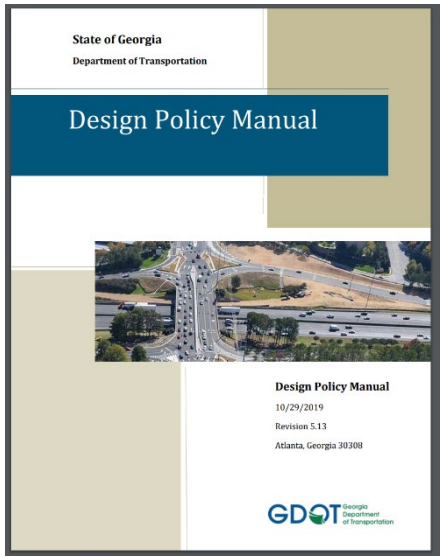
Georgia Department of Transportation

Policy

Design Policy & Support – Design Policy Group







Design Flexibility in the form of Documentation

- Design flexibility is not new to GDOT. Although trending words change, the concept remains the same.
- Flexible Design does not imply or endorse the broad use of criteria that is less than the minimum geometric values listed in AASHTO design guides.
- Standards are applied in a practical and balanced manner that will satisfy all users.

Recent Trends in Design Exceptions/Variances

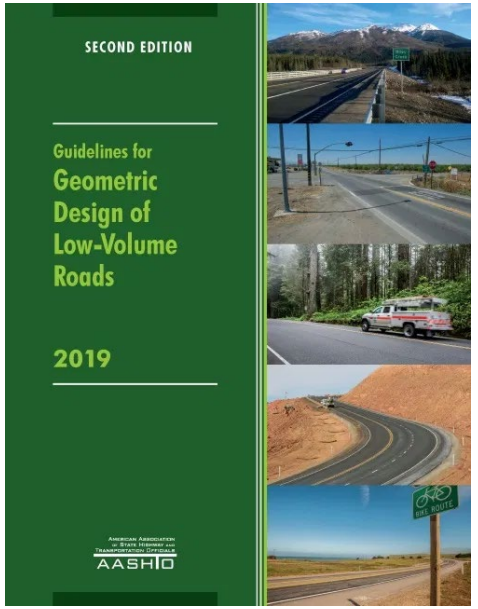
1) GDOT released the 4 foot flush median usage criteria (March 2019)

2) GDOT adopted the AASHTO 2nd Edition, *Guidelines for Geometric Design of Low-Volume Roads* (June 2019)

3) October 1, 2019 Let Date has passed. Designs should meet the 2018 7th Edition, *A Policy on Geometric Design of Highways and Streets*, commonly referred to as "The Green Book"

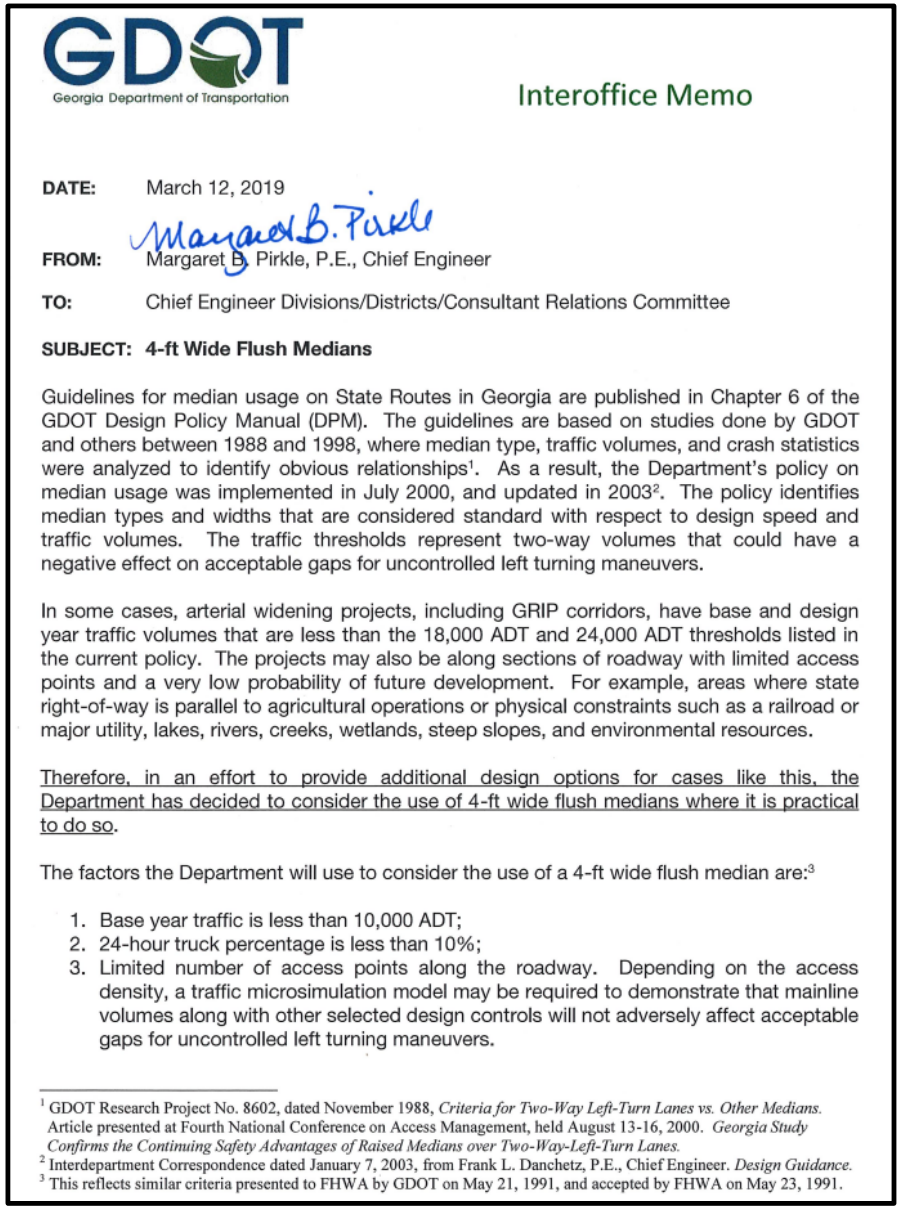
4) Mitigation

5) Other Considerations



1) Four Foot Flush Medians

- The use of the 4 ft flush median requires a meeting with Design Policy and Support.
- Just because you don't meet all the factors doesn't mean it won't be considered.
- The meeting will show if there is an appropriate balance to consider the use of such a median.
- The Department has a research project to study the use of a 4 ft & 14 ft flush median. The research will not be available for at least a year. GDOT will re-evaluate the policy at that time.



GDOT Georgia Department of Transportation

Interoffice Memo

DATE: March 12, 2019

FROM: Margaret B. Pirkle, P.E., Chief Engineer

TO: Chief Engineer Divisions/Districts/Consultant Relations Committee

SUBJECT: 4-ft Wide Flush Medians

Guidelines for median usage on State Routes in Georgia are published in Chapter 6 of the GDOT Design Policy Manual (DPM). The guidelines are based on studies done by GDOT and others between 1988 and 1998, where median type, traffic volumes, and crash statistics were analyzed to identify obvious relationships[1]. As a result, the Department's policy on median usage was implemented in July 2000, and updated in 2003[2]. The policy identifies median types and widths that are considered standard with respect to design speed and traffic volumes. The traffic thresholds represent two-way volumes that could have a negative effect on acceptable gaps for uncontrolled left turning maneuvers.

In some cases, arterial widening projects, including GRIP corridors, have base and design year traffic volumes that are less than the 18,000 ADT and 24,000 ADT thresholds listed in the current policy. The projects may also be along sections of roadway with limited access points and a very low probability of future development. For example, areas where state right-of-way is parallel to agricultural operations or physical constraints such as a railroad or major utility, lakes, rivers, creeks, wetlands, steep slopes, and environmental resources.

Therefore, in an effort to provide additional design options for cases like this, the Department has decided to consider the use of 4-ft wide flush medians where it is practical to do so.

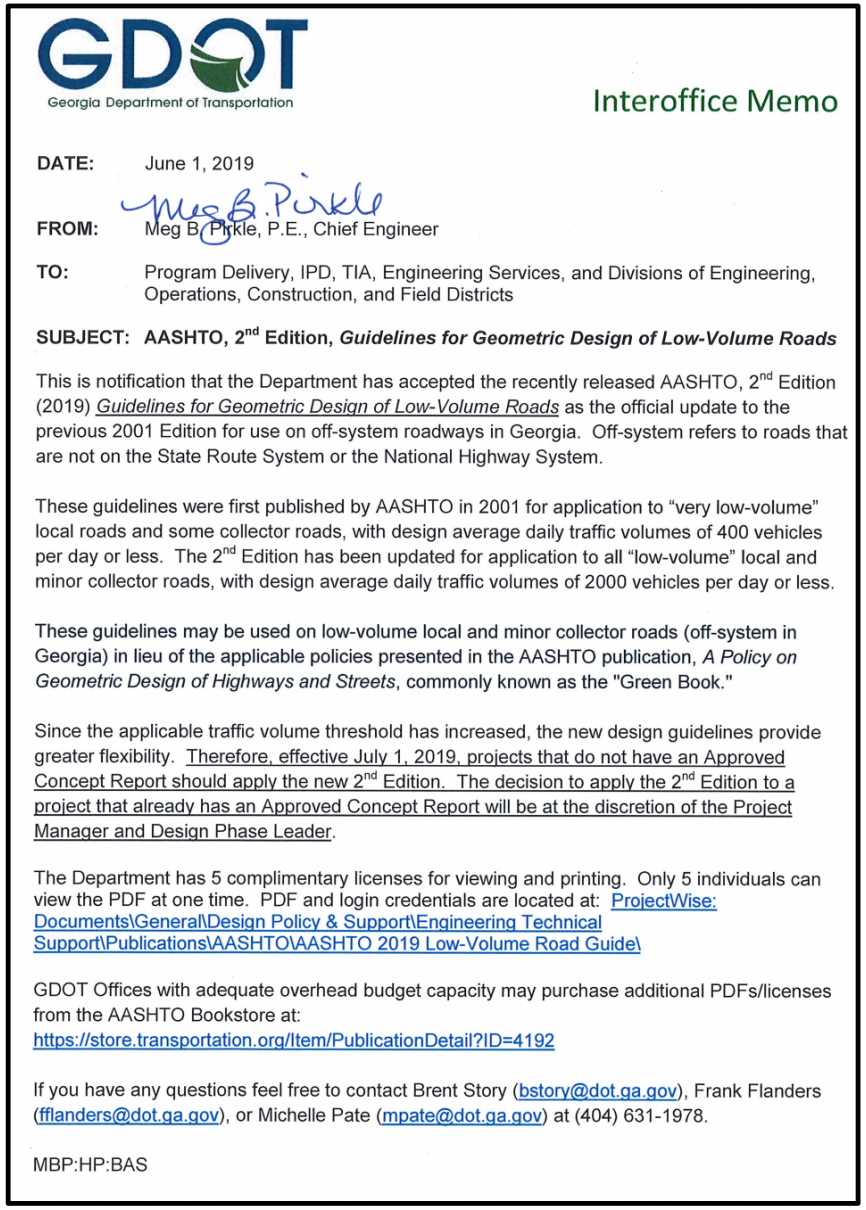
The factors the Department will use to consider the use of a 4-ft wide flush median are:[3]

1. Base year traffic is less than 10,000 ADT;
2. 24-hour truck percentage is less than 10%;
3. Limited number of access points along the roadway. Depending on the access density, a traffic microsimulation model may be required to demonstrate that mainline volumes along with other selected design controls will not adversely affect acceptable gaps for uncontrolled left turning maneuvers.

[1] GDOT Research Project No. 8602, dated November 1988, *Criteria for Two-Way Left-Turn Lanes vs. Other Medians.* Article presented at Fourth National Conference on Access Management, held August 13-16, 2000. *Georgia Study Confirms the Continuing Safety Advantages of Raised Medians over Two-Way-Left-Turn Lanes.*
[2] Interdepartment Correspondence dated January 7, 2003, from Frank L. Danchetz, P.E., Chief Engineer. *Design Guidance.*
[3] This reflects similar criteria presented to FHWA by GDOT on May 21, 1991, and accepted by FHWA on May 23, 1991.

2) Low Volume Roads

- The AASHTO document changed from Very Low Volume Local Roads to Low Volume Roadways. The volume has changed from 400 to 2000 vehicles or less.
- Usage in Georgia applies to minor collectors and below.
- Provides more **FLEXIBILITY** to designers.



GDOT
Georgia Department of Transportation

Interoffice Memo

DATE: June 1, 2019

FROM: Meg B. Pirkle, P.E., Chief Engineer

TO: Program Delivery, IPD, TIA, Engineering Services, and Divisions of Engineering, Operations, Construction, and Field Districts

SUBJECT: **AASHTO, 2nd Edition, *Guidelines for Geometric Design of Low-Volume Roads***

This is notification that the Department has accepted the recently released AASHTO, 2nd Edition (2019) *Guidelines for Geometric Design of Low-Volume Roads* as the official update to the previous 2001 Edition for use on off-system roadways in Georgia. Off-system refers to roads that are not on the State Route System or the National Highway System.

These guidelines were first published by AASHTO in 2001 for application to "very low-volume" local roads and some collector roads, with design average daily traffic volumes of 400 vehicles per day or less. The 2nd Edition has been updated for application to all "low-volume" local and minor collector roads, with design average daily traffic volumes of 2000 vehicles per day or less.

These guidelines may be used on low-volume local and minor collector roads (off-system in Georgia) in lieu of the applicable policies presented in the AASHTO publication, *A Policy on Geometric Design of Highways and Streets*, commonly known as the "Green Book."

Since the applicable traffic volume threshold has increased, the new design guidelines provide greater flexibility. Therefore, effective July 1, 2019, projects that do not have an Approved Concept Report should apply the new 2nd Edition. The decision to apply the 2nd Edition to a project that already has an Approved Concept Report will be at the discretion of the Project Manager and Design Phase Leader.

The Department has 5 complimentary licenses for viewing and printing. Only 5 individuals can view the PDF at one time. PDF and login credentials are located at: ProjectWise: Documents\General\Design Policy & Support\Engineering Technical Support\Publications\AASHTO\AASHTO 2019 Low-Volume Road Guide\

GDOT Offices with adequate overhead budget capacity may purchase additional PDFs/licenses from the AASHTO Bookstore at:
https://store.transportation.org/Item/PublicationDetail?ID=4192

If you have any questions feel free to contact Brent Story (bstory@dot.ga.gov), Frank Flanders (fflanders@dot.ga.gov), or Michelle Pate (mpate@dot.ga.gov) at (404) 631-1978.

MBP:HP:BAS

3) 2018 Green Book

4.1.6. Intersection Skew Angle

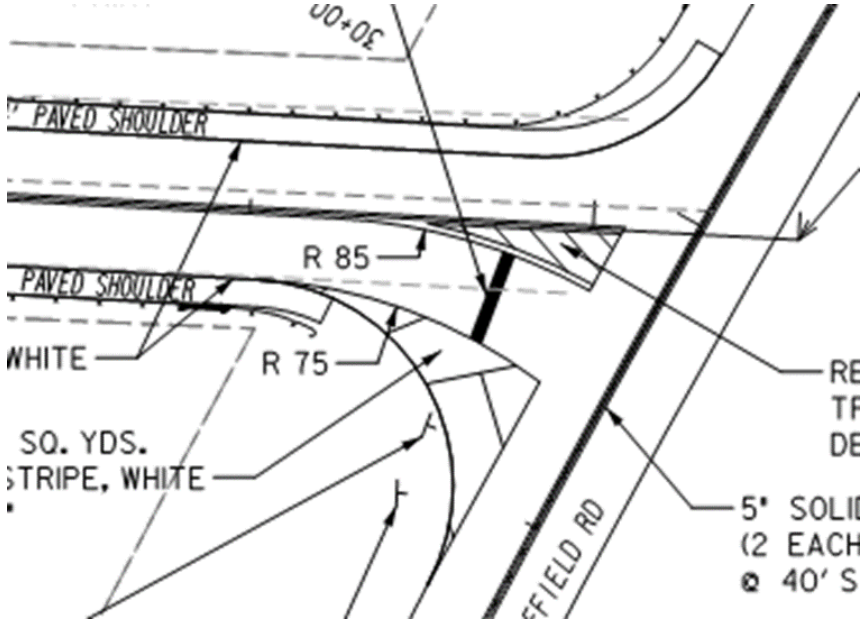
Ideally, intersecting roadways should meet at or near right angles (90-degrees). This will ensure that the lines-of-sight are optimized for intersection sight distance.

Intersection Skew Angle has been identified by the Department as having substantial importance to the operational and safety performance of a roadway such that special attention should be given to the design decision. GDOT has adopted a 75-degree angle as the minimum skew angle at intersections. A decision to use a skew angle less than 75-degrees shall require a comprehensive study by an engineer and the prior approval of a Design Variance from the Department's Chief Engineer.

- The minimum skew angle was previously 60 degrees as per AASHTO
- The minimum skew angle was previously 70 degrees as per GDOT Design Policy Manual.
- The current minimum skew angle is 75 degrees.

4) Mitigation

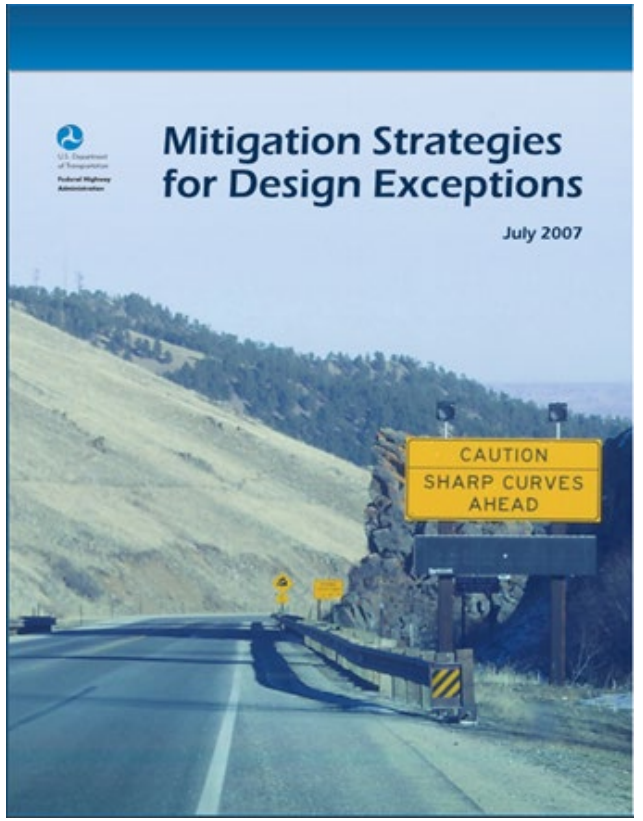
- Although the proposed intersection angle did not meet 75 degrees, the design was changed to make the drivers cone of vision meet at a better angle.
- This is not a new concept just a change in application of striping.



4) Mitigation Continued

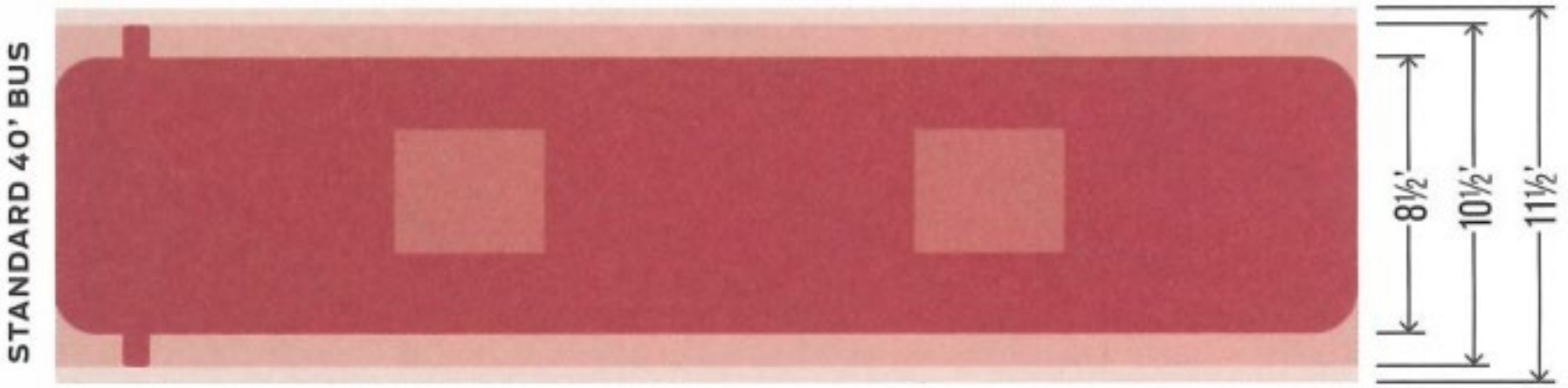
Mitigation Strategies for Design Exceptions

- "**Mitigation Strategies for Design Exceptions** was developed to provide designers with practical information on **design**.
  exceptions and **strategies** that can be implemented to **mitigate** their potential adverse impacts to highway safety and traffic operations." from FHWA introduction.
- This document was archived since it no longer aligns with the FHWA required design exceptions, but is still a great resource for designers.

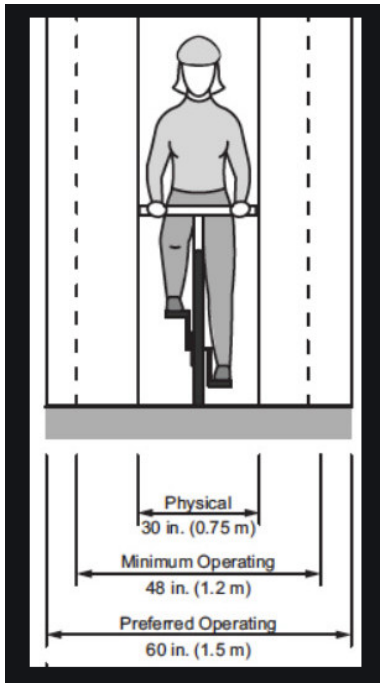


5) Other Considerations

Design for the Appropriate Vehicle:



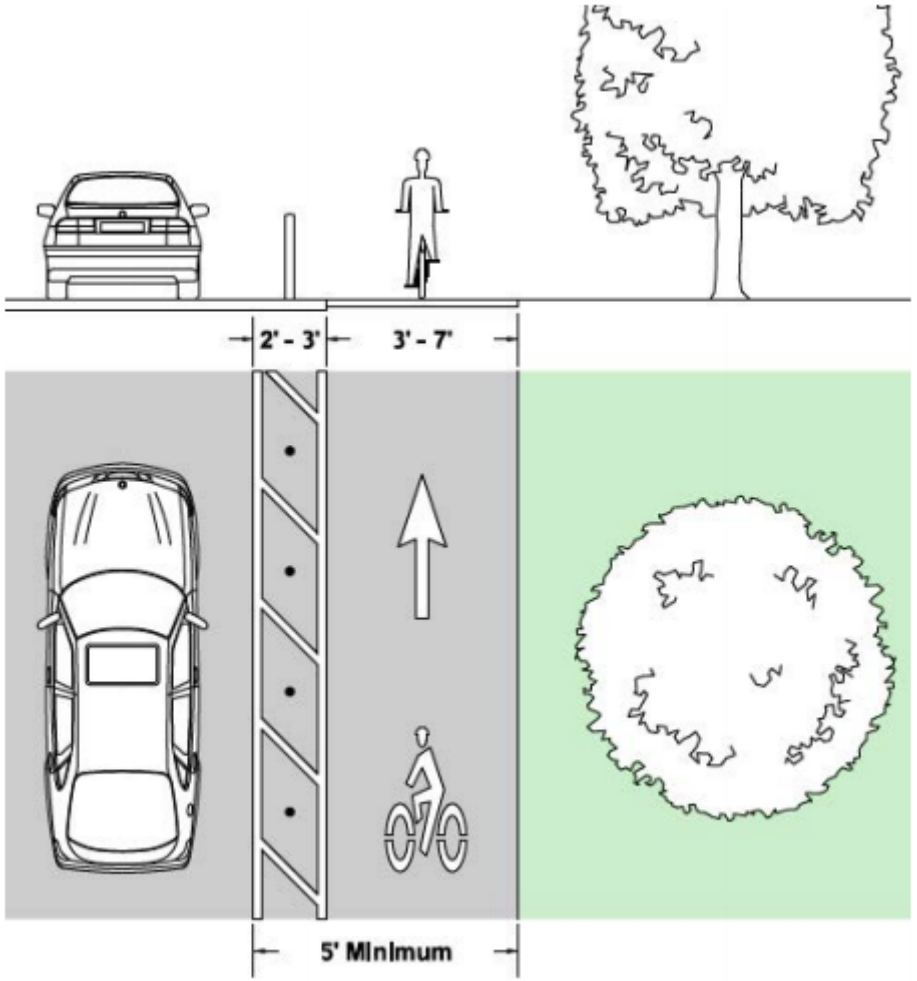
NACTO drawing of a Standard 40 foot Bus



AASHTO Drawing of a Standard Cyclist

5) Other Considerations Cont'd.

Mitigation

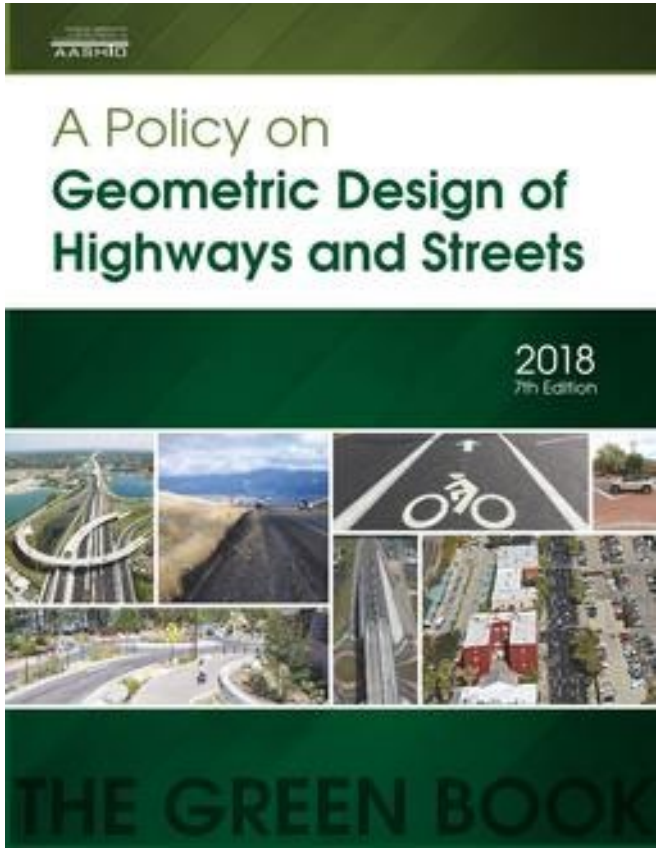


Washington State Drawing of a Buffered Bike Lane

Other Things to Note

Be Aware of the Following:

- The Green Book released errata.
- Stopping Sight Distance is critical. GDOT generally does not consider deviations to this.
- Design Speed is not typically granted as a design exception/variance. Write the exception/variance for the specific element that does not meet the criteria.



Design Policy and Exceptions/Variances

Questions?