DIVISION OF PLANNING AND PERMITTING
FREDERICK COUNTY, MARYLAND
SIGHT DISTANCE ANALYSIS

PROJECT NAME —————————————————

MAJOR ROAD ——————————————————

MINOR ROAD (DRIVEWAY) ——————————

<u>INTERSECTION DRAWING:</u>
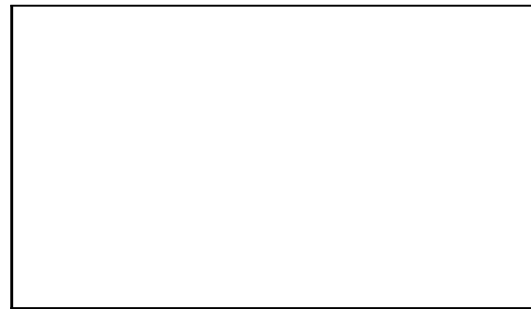
VICINITY MAP

MAJOR ROAD POSTED SPEED —————

MAJOR ROAD SPEED _____ CALCULATED ☐ ESTIMATED ☐ 85th PERCENTILE SPEED ☐

ACTUAL (MEASURED) SIGHT DISTANCE **: LEFT _____ FT., RIGHT _____ FT.

"MOST LIMITING - HORIZONTAL AND / OR VERTICAL

INTERSECTION SIGHT DISTANCE (ISD)

MINOR ROAD DRIVEWAY APPROACH GRADE _____

NUMBER OF LANES LEFT TURNING VEHICLE MUST CROSS _____

DESCRIPTION OF SUBSTANTIAL VOLUME OF MAJOR ROAD TRAFFIC MAKE-UP _____

REQUIRED (CALCULATED) SIGHT DISTANCE: LEFT _____ FT., RIGHT _____ FT.

Notes:

I, _____, certify that the proposed entrance described above meets AASHTO standards for intersection sight distance.

Signed _____ PE/PLS/ MD Reg. No. _____ Date _____

STOPPING SIGHT DISTANCE (SSD)

REQUIRED (CALCULATED) SIGHT DISTANCE: LEFT _____ FT.; RIGHT _____

Notes:

I, _____, certify that the proposed entrance described above meets AASHTO standards for intersection sight distance.

Signed _____ PE/PLS/ MD Reg. No. _____ Date _____

SIGHT DISTANCE STANDARDS

(Applies to Full Movement Access on Undivided Highways with Nominal Truck Usage)

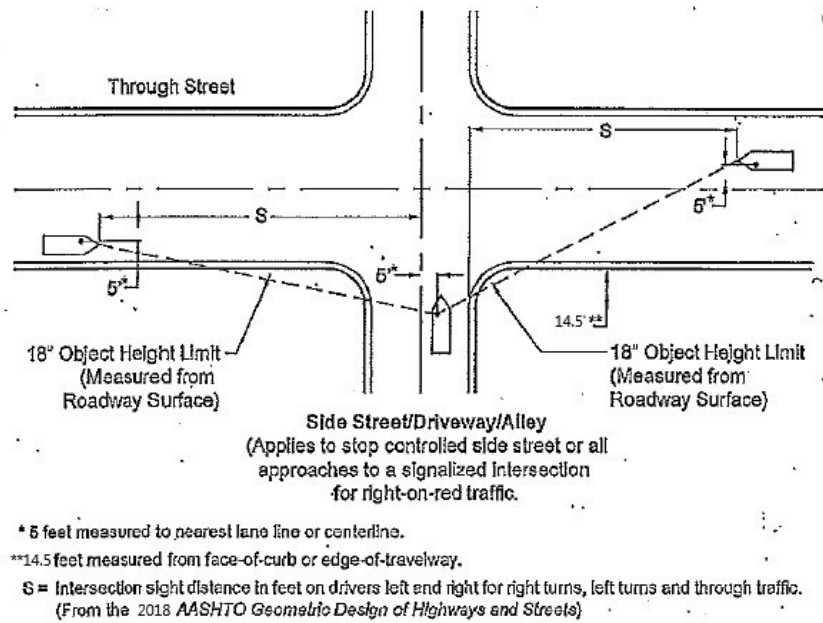| Actual Posted Speed (mph)	Assumed Design Speed (mph)	Stopping Sight Distance Required (ft)	Intersection Sight Distance Required (ft)		
			One Lane	Two Lanes Crossed	Three Lanes Crossed
25	35	250	390	415	440
30	40	305	445	475	500
35	45	360	500	530	565
40	50	425	555	590	625
45	55	495	610	650	690
50	60	570	665	710	750
55	65	645	720	765	815

Notes:

1. *Values and methodology based on A Policy on Geometric Design of Highways and Streets, AASHTO, 2018 for the design speeds shown. Intersection sight distance values shown are governed by the left turn movement from the access point onto the state highway (Case B1, p. 9-44).*
2. ***Assumes passenger vehicle for design purposes and level grade ±3% maximum.***
3. *Refer to AASHTO guidelines to address different conditions (e.g. access limited to specific turning movements, more than two opposing lanes of traffic to be crossed, steep grade, median crossover, other design vehicles, etc.).*
4. *Sight distance measurement most conform to the AASHTO models.*
5. *Refer to p3-4 for discussion of sight distance requirements and any substandard conditions.*

INTERSECTION AND DRIVEWAY SIGHT DISTANCE (ISD)

In order to provide the opportunity for vehicles at an intersection to safely cross or make left or right turns onto a through street, adequate sight distance must be provided. Sight distance should be based on the design speed for roadway. The sight distance requirements outlined below are required for all public street intersections and at all intersections of commercial driveways onto public streets generating more than 5 trips/hour. Internal driveway intersections on private property and residential driveways are excluded from these requirements.

The figure below depicts the technique used to determine the driver's eye location and an approaching vehicle; a line is then drawn to connect these 2 points. Continuous unobstructed line of sight must be provided along this and throughout the approach to the intersection, providing an unobstructed line of sight triangle to the side street driver. Sight lines are to be drawn on roadway and landscaping plans to represent the areas that must be free of all objects and topography in excess of 18 inches above the roadway surface, however, certain vegetation will be allowed. Vegetation placed within the sight triangle will be of a low variety that remains below 18 inches when mature. Trees within the triangle may be considered as long as the canopies are above 8 feet, they are a single trunk variety, and they are not spaced in a configuration that created a visually obstructive "picket fence" effect.

Through Street

18" Object Height Limit
(Measured from
Roadway Surface)

18" Object Height Limit
(Measured from
Roadway Surface)

Side Street/Driveway/Alley
(Applies to stop controlled side street or all
approaches to a signalized intersection
for right-on-red traffic.

* 5 feet measured to nearest lane line or centerline.
**14.5 feet measured from face-of-curb or edge-of-travelway.
S = Intersection sight distance in feet on drivers left and right for right turns, left turns and through traffic.
(From the 2018 *AASHTO Geometric Design of Highways and Streets*)

Intersection sight distance (ISD) is calculated as follows:

$$S = 1.47 * V_{major} * t_g;$$

Where t_g = time gap for major road   See AASHTO p9-44
V_{major} = 85th percentile speed (mph) **
t_g = 7.5/6.5 sec for Passenger Cars; left/right turn, respectively
    9.5 sec for Single Unit Trucks
    11.5 sec for Combination Trucks
    (add 0.5 sec for each extra lane traversed for passenger cars)

** 85th percentile speed may be different in each direction due to grade, alignment, etc. Please calculate separately.

If grades are in excess of 3%, consult AASHTO for additional factors.

STOPPING SIGHT DISTANCE (SSD)

The minimum stopping sight distance (SSD) is the roadway distance required by the driver of a vehicle, traveling at a given speed, to bring the vehicle to a stop after an object on the road becomes visible, in this case a vehicle crossing the roadway or stopped in the thru lane to make a left turn . Stopping sight distance is therefore measured from the driver's eyes, 3.5 feet above the pavement surface, to an object (another vehicle) 3.5 feet high on the roadway. If grades are in excess of 3%, consult AASHTO for additional factors.

SSD is calculated as follow:

$$S = 1.47 * V * t + 1.075 * \frac{V^2}{a}$$

Where: $V = 85^{th}$ Percentile Speed   See AASHTO p.3-5
$t = 2.5$ sec
$a = 11.2$ ft/sec^2