

Memorandum

To: **Morgan Smith**
From: **Myla Cross**
Jennifer Danziger, PE
Date: **May 15, 2024**
Subject: **18611 NW Sauvie Island Road – Sight Distance Memorandum**



RENEWS: 12/31/2025

This memorandum provides a sight distance analysis to confirm that AASHTO sight distance standards can be met at three existing site accesses along NW Sauvie Island Road in Multnomah County, Oregon providing that removal or trimming of some obstructing foliage south of the site is completed.

Location & Project Description

The project site (Map No. 2N1W17 Tax Lot 500) is located at 18611 NW Sauvie Island Road and encompasses approximately 15.56 acres. The property is zoned Multiple Use Agriculture (MUA-20). Figure 1 shows the subject site outlined in blue with the three site accesses shown with a red circle.

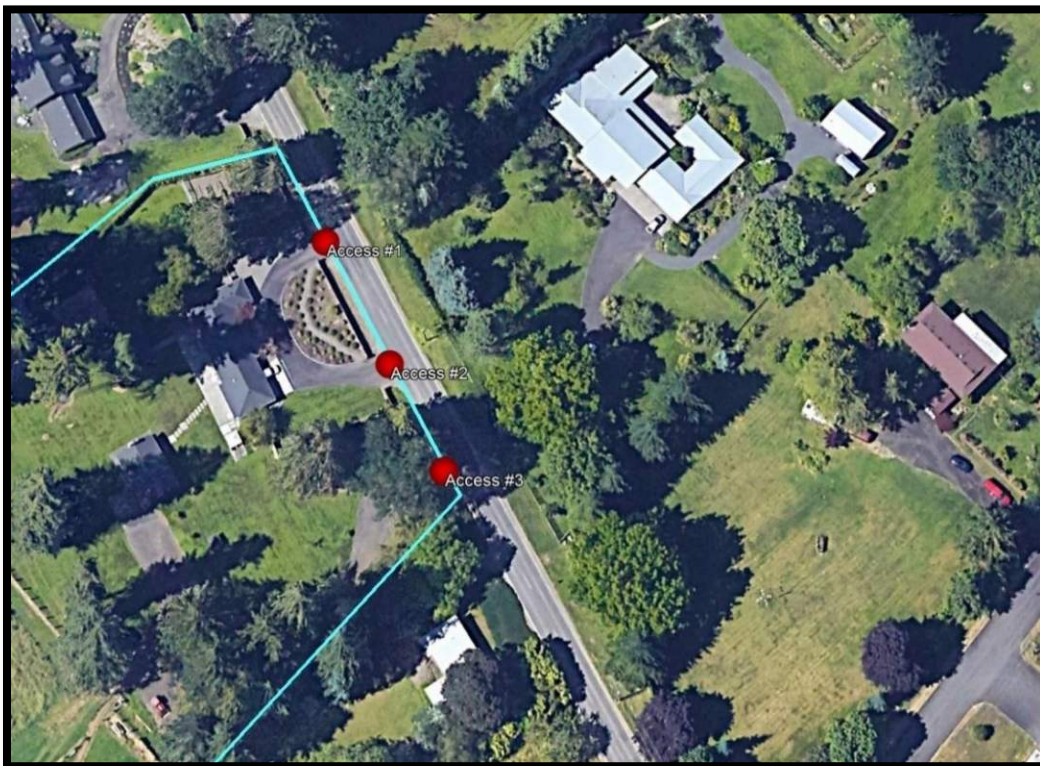


Figure 1: Vicinity Map (Image from Google Earth)

Sight Distance Requirements

Sight distance was measured and evaluated in accordance with the standards established in *A Policy on Geometric Design of Highways and Streets*,¹ as required by Multnomah County Road Rules (MCRR) section 4.5.

According to AASHTO, the driver's eye is assumed to be 14.5 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the approach street pavement. Vehicle/object height is assumed to be 3.5 feet above the cross-street pavement. Using a vehicle/object height equal to the driver's eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle).

Both intersection sight distance (ISD) and stopping sight distance (SSD) are assessed. According to AASHTO, the ISD is an operational measure, intended to provide sufficient line of sight along the major street so that a driver can turn from the minor street without impeding traffic flow. The SSD is considered the minimum requirement and allows an oncoming driver to see a hazard in the roadway, react, and come to a complete stop if necessary to avoid a collision.

NW Sauvie Island Road is relatively flat near the project site with approach grades measuring less than two percent over the braking distance. The posted speed along this two-lane roadway is 45 mph; therefore, the recommended ISD is 500 feet and the required SSD is 360 feet. Calculation worksheets are provided in the appendix to this memorandum.

Sight Distance Measurements

The following observations were made at the proposed site access; all figures are located in the appendix of this memorandum.

Site Access #1

- **Looking North:** The available sight lines north of the access were measured to exceed the minimum ISD recommendation of 500 feet.
- **Looking South:** The available sight lines south of the access were measured to exceed the minimum ISD recommendation of 500 feet.

Site Access #2

- **Looking North:** The available sight lines north of the access were measured to exceed the minimum ISD recommendation of 500 feet.
- **Looking South:** The available sight lines south of the access were measured to be approximately 450 feet, limited by foliage located in the right-of-way and on the adjacent property on the west side of the roadway. The available sight lines exceed the minimum SSD requirement of 360 feet but not the ISD recommendation of 500 feet. If the obstructing foliage is removed, the available sight lines would meet the ISD standard.

¹ American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 7th Edition, 2018.



Site Access #3

- **Looking North:** The available sight lines north of the access were measured to exceed the minimum ISD recommendation of 500 feet.
- **Looking South:** The available sight lines south of the access are limited by the obstructing foliage located in the right-of-way and on the adjacent property on the west side of the roadway. The available sight lines do not meet the SSD or ISD standards. However, if the obstructing foliage is removed, the available sight lines would meet the ISD standard.

Figure 2 shows the SSD and ISD triangles from site access #3. The obstructing foliage is located south of the site on the west side of the roadway. While most of the obstructing foliage is located in the public right-of-way, some does appear to be located on the adjacent property. If the foliage shown within the sight distance triangles is removed or trimmed to a height of 30 inches or less, the ISD standards looking to the south can be met for both site access #2 and #3.



Figure 2: ISD & SSD Triangles from Access #3

Conclusions

Based on the detailed analysis, upon removal of any obstructing foliage, the stopping sight distance requirements and intersection sight distance recommendations in accordance with AASHTO standards can be met to the north and south of all three accesses.

Attachments: Sight Distance Photos, Sight Distance Calculations





Figure A: Available Sight Distance Looking North from Site Access #1





Figure B: Looking South to Site Access #1 from 500 Feet North





Figure C: Available Sight Distance Looking South from Site Access #1





Figure D: Looking North to Site Access #1 from 500 Feet South





Figure E: Available Sight Distance Looking North from Site Access #2





Figure F: Looking South to Site Access #2 from 500 Feet North





Figure G: Available Sight Distance Looking South from Site Access #2





Figure H: Looking North to Site Access #1 from 450 Feet South





Figure I: Available Sight Distance Looking North from Site Access #3





Figure J: Looking South to Site Access #3 from 500 Feet North





Figure K: Available Sight Distance Looking South from Site Access #3





Figure L: Looking North to Site Access #3 from 360 feet South



Stopping Sight Distance

Northbound

Travel Speed	45 mph
Reaction Time	2.5 seconds
Acceleration	11.2 ft/sec ²
Grade (percent)	0.00%

SSD	360 feet
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Reaction Distance

Travel Speed	45 mph
Travel Speed	66.2 fps
Reaction Time	2.5 seconds

Reaction Distance	165.4 feet
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Braking Distance

Travel Speed	45 mph
Acceleration	11.2 ft/sec ²
Grade (percent)	0.00%

Braking Distance	194.1 feet
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Southbound

Travel Speed	45 mph
Reaction Time	2.5 seconds
Acceleration	11.2 ft/sec ²
Grade (percent)	0.00%

SSD	360 feet
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Travel Speed	45 mph
Travel Speed	66.2 fps
Reaction Time	2.5 seconds

Reaction Distance	165.4 feet
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Travel Speed	45 mph
Acceleration	11.2 ft/sec ²
Grade (percent)	0.00%

Braking Distance	194.1 feet
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Note: If grades are less than 3%, no adjustment is needed.

Intersection Sight Distance

	<i>Left Turn Looking Left</i>	<i>Left Turn Looking Right</i>	<i>Right Turn Looking Left</i>
Approach Speed	45 mph	45 mph	45 mph
Number of Lanes	2 lanes	2 lanes	2
Vehicle Type (P/S/C)	P Passenger Car	P Passenger Car	P Passenger Car
Extra Crossing Lanes	0	0	
Time Gap	7.5 seconds	7.5 seconds	6.5 seconds
AASHTO Intersection Sight Dist	500 feet	500 feet	430 feet
Washington County	450 feet	450 feet	450 feet

Notes:

- 1) For Approach speed, use the design speed of the roadway (typically 85th percentile speed).
- 2) For Time Gap, use 7.5 seconds for passenger cars, 9.5 seconds for single-unit trucks, and 11.5 seconds for combination trucks.
- 3) The above values are for 2-lane highways without medians and grades of 3 percent or less.
- 4) For grades in excess of 3 percent on the minor street, add .2 seconds for each percent grade.
- 5) For additional lanes, add 0.5 seconds per lane for passenger cars and 0.7 seconds per lane for trucks.