

# EAST LAKE SAMMAMISH MASTER PLAN TRAIL SIGHT DISTANCE TRIANGLE MEMORANDUM

March 2014

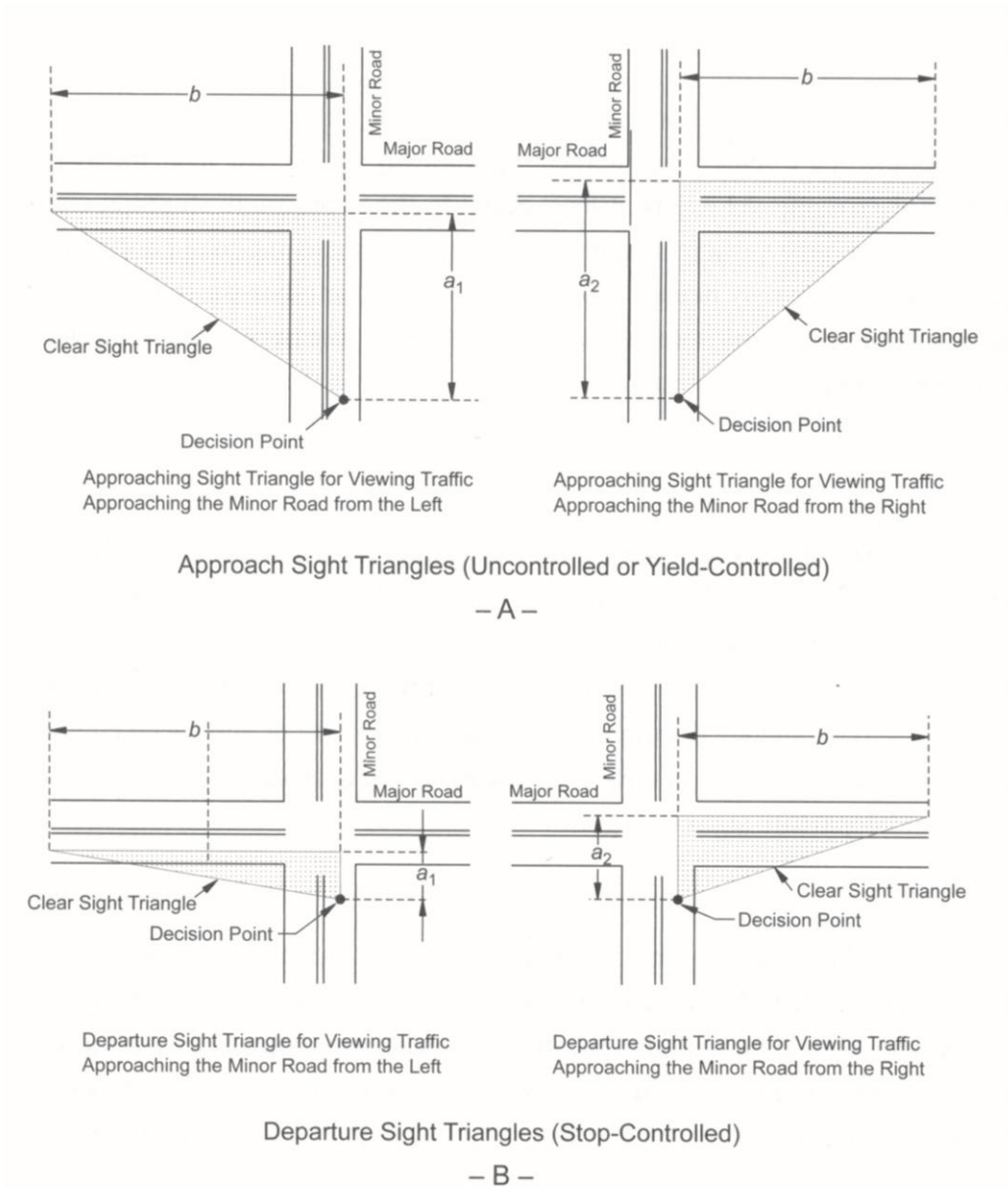
Intersection sight distances and traffic control measures are important design considerations for the 11-mile East Lake Sammamish Trail, which intersects over 60 roads and driveways. The purpose of this document is to summarize how sight distances were evaluated and traffic control assigned for the East Lake Sammamish Trail.

Priority is assigned to the trail. As a result, sight triangles for the East Lake Sammamish Trail are calculated from the perspective of the intersecting vehicle. Vehicle sight distances were sourced from the American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets, 2011* (Green Book). Figure 1 provides an illustration of sight triangles taken from the AASHTO Green Book.

In these schematics, the trail is considered the major road and the intersecting driveway the minor road. As shown by these figures, the sight distance triangles are larger where vehicles yield rather than stop. When constraints like topography, the angle of the crossing, and the presence of other features such as retaining walls present challenges for providing recommended sight distance triangles, a more restrictive control on the minor road (in this case, the driveway) is considered. At many intersections along the corridor, stop control is assigned to the minor road because of these constraints.

Procedures to determine the dimensions of sight distances at intersections are presented as Cases A through F in the AASHTO Green Book. Sight distances for a facility with a slower design speed could be calculated using the figures accompanying the *Intersection Control Case* presented in the AASHTO Green Book and formulas. This methodology was used for calculating sight triangles at the intersection of East Lake Sammamish Trail with driveways. The design speeds used for calculations are 15 mph for a minor roadway/driveway and 20 mph for trail. The trail will be signed for 15 mph speed limit, but it was designed for 20 mph to improve safety on the trail.

**Figure 1. Intersection Sight Triangles**



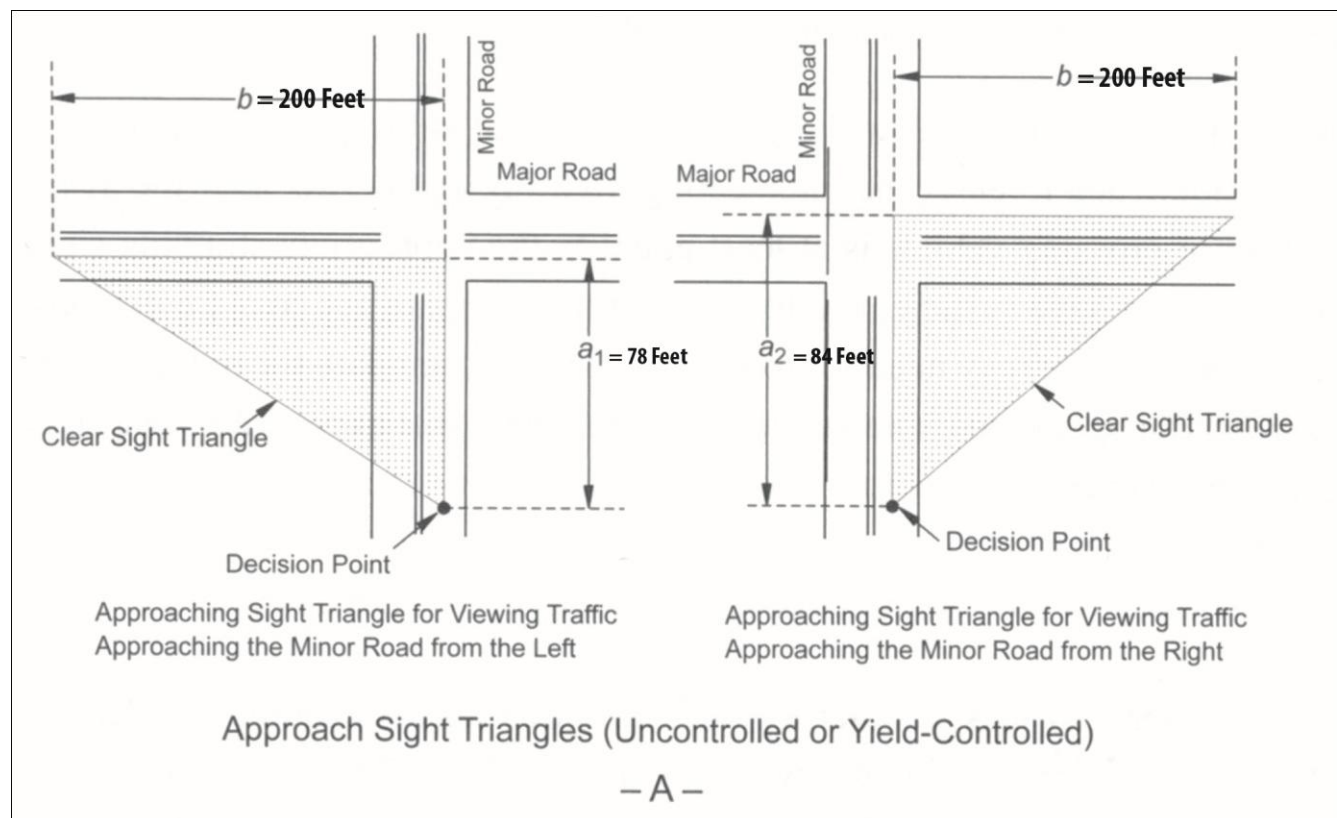
## Where Drivers Yield

Based on the design speeds, a sight distance triangle of 75 feet (measured along the driveway) by 200 feet (measured along the trail) is required. When applying this triangle to a site specific situation, the width of traveled lanes of the major road (in this case, the trail) is considered for each intersection.

For the sight line looking to the left, as shown in Figure 2 (left) below, the smaller side of the triangle along the driveway is measured 75 feet from the edge of the intersecting traveled way (edge of the asphalt for the trail). This line is extended to the center of the travel lane of the trail coming from the left. For East Lake Sammamish Trail, that distance would be 3 feet. The total length of this smallest side of the triangle would be 78 feet ( $a_1 = 78$  feet ← trail is 12-foot-wide, trail lane is 6-foot-wide, half of 6 feet is 3 feet, thus  $75+3=78$ ). Then the triangle extends 200 feet along the centerline of the travel lane of the trail ( $b=200$  feet).

For the sight line looking to the right, as shown in Figure 2 (right) below, the smaller side of the triangle along the driveway is also measured 75 feet from the edge of the intersecting traveled way. This line is then extended to the center of the travel lane of the trail coming from the right. For this project, that distance would be 9 feet ( $a_2 = 84$  feet ← trail is 12-foot-wide, trail lane is 6-foot-wide, one and half of trail lane is 9 feet, thus  $75$  feet +  $9$  feet =  $84$  feet). The triangle also extends 200 feet along the centerline of the travel lane of the trail ( $b=200$  feet).

**Figure 2. Intersection Sight Triangles for Yield Control**



## Where Drivers Stop

Based on the design speeds, a sight distance triangle of 14.5 feet (measured along the driveway) by 195 feet (measured along the trail) is required. When applying this triangle to a site specific situation, the width of traveled lanes of the major road (in this case, the trail) is considered for each intersection.

For the sight line looking to the left, as shown in Figure 3 (left) below, the smaller side of the triangle along the driveway is measured 14.5 feet from the edge of the intersecting traveled way (such as a road or trail). This line is extended to the center of the travel lane of the trail coming from the left. For East Lake Sammamish Trail, that distance would be 3 feet. The total length of this smallest side of the triangle would be 17.5 feet ( $a_1 = 17.5$  feet ← trail is 12-foot-wide, trail lane is 6-foot-wide, half of 6 feet is 3 feet, thus 14.5 feet+3 feet=17.5 feet). Then the triangle extends 195 feet along the center of the travel lane of the trail ( $b=195$  feet).

For the sight line looking to the right, as shown in Figure 3 (right) below, the smaller side of the triangle along the driveway is measured 14.5 feet from the edge of the intersecting traveled way. The line is extended to the center of the travel lane of the trail coming from the right. For this project, that distance would be 9 feet. The total length of this smallest side of the triangle would be 23.5 feet ( $a_2 = 23.5$  feet ← trail is 12-foot-wide, trail lane is 6-foot-wide, one and half of trail lane is 9 feet, thus 14.5 feet+9 feet=23.5 feet). Then the triangle extends 195 feet along the center of the travel lane of the trail ( $b=195$  feet).

**Figure 3. Intersection Sight Triangles for Stop Control**

