Vanasse & Associates inc
Transportation Engineers & Planners

35 New England Business Center Drive
Suite 140
Andover, MA 01810

Ref: 9620

January 31, 2024

Kevin Grady, P.E.
Grady Consulting
71 Evergreen Street, Suite 1
Kingston, MA 02364

Re: Response to Sight Distance Issue
Country Way Estates,
Scituate, Massachusetts

Dear Kevin:

Vanasse & Associates, Inc. (VAI) has reviewed the sight distance issue associated with the driveway for the site noted above at 817 Country Way in Scituate, Massachusetts. After further review of existing conditions and a proposal for mitigation, I believe we have developed an approach to move beyond the sight distance issue for the Project. Additional data will be collected in the coming weeks, but the relevant points of this approach are noted below:

1. Additional Vegetation Removal – Earlier this month the Applicant was successful in obtaining permission from the owners of the adjacent 809 Country Way property to remove ivy that was on the retaining wall in front of this property and contributed to a limiting effect on sight distance to the south. We expect to have an updated set of sight distance measurements conducted in the next few weeks to identify the improvement to sight distance which will be forwarded to the town's peer reviewer TEC for their review in advance of the February 22, 2024 Planning Board hearing. Discussions with TEC indicate they will attend that hearing to provide input on the issue.

2. Crash History – A review of the crash history at two intersections in the study area was included in the TIA for the Project. However, based on comments at the January 25, 2024 Planning Board meeting, a review of crash data both along Country Way in the vicinity of the site driveway and at the intersection of Mordecai Lincoln Road and Country Way/South Main Street was conducted for the period 2016 to 2020, the most recent 5-year period for which crash data exists that has been approved for use by MassDOT.

   This data indicates that there were **no** crashes at the intersection of Mordecai Lincoln Road during this 5-year period and only **one** crash along Country Way during this period. The one crash on Country Way was a single car crash involving a car and a fence. No personal injury resulted from the crash.

   This lack of crash occurrence indicates that this segment of Country Way is not an unsafe road segment in this area and motorists that have been using the existing driveway to 817 Country Way have done so without incident.

3. Traffic Volume – The trip distribution for the Project was based on a review of existing traffic patterns and Journey to Work data from the US Census. This resulted in a distribution of 23 percent

of site traffic expected to and from the north on Country Way and 77 percent expected to and from the south. This distribution indicated 2 vehicle trips are expected to turn left from the driveway during the weekday morning peak hour and also during the weekday evening peak hour. This equates to an average of one vehicle turning left from the driveway in 30 minutes during these peak hours. This equates to a minor event where motorists would need to look both directions from the driveway.

4. Sight Distance – A review of the Massachusetts Department of Transportation (MassDOT)[1] design guides indicates that "the sight distance at every point along a roadway should be at least the stopping sight distance." (emphasis added) Further, according to American Association of State Highway and Transportation Officials (AASHTO)[2], "The horizontal component of stopping sight distance is measured along the centerline of the inside lane on a horizontal curve."[3] with "An object height of 2.00 feet (0.60 m) is representative of the height of automobile headlights and taillights."[4] This minimum requirement of stopping sight distance is met along Country Way.

   However, the speed data indicated that motorists are exceeding the posted speed limit on an average basis as well as the 85th percentile basis. To address this issue, the Applicant has agreed to install radar speed feedback signs along this segment of Country Way in the northbound and southbound directions. These would be intended to replace the existing speed limit sign assembly located north of the site at the Cohasset Town Line and south of the site near the Bound Brook Court development exit. The northbound sign installation is proposed to be located in this area to minimize any negative noise or light effects on area residences, but the sign could be installed closer to the site if no neighbors object.

   These sign installations are noted to contribute to typical speed reductions ranging from 10 to 20 percent. With the speed posted at the townwide limit of 25 miles per hour, this can have the effect of reducing the speed to the level where the Intersection Sight Distance can be achieved at the existing driveway location.

I look forward to continuing the discussion on this issue. If you should have any questions or require additional information, please feel free to contact me.

Sincerely,

VANASSE & ASSOCIATES, INC.

Scott W. Thornton

Scott W. Thornton, P.E.
Principal

cc: File

[1] *Project Design and Development Guide, 2006 Edition,* Massachusetts Department of Transportation; Boston, MA; 2006.
[2] *A Policy on Geometric Design of Highway and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.
[3] *Ibid, Section 3.2.6.4.*
[4] *Ibid, Section 3.2.6.2.*

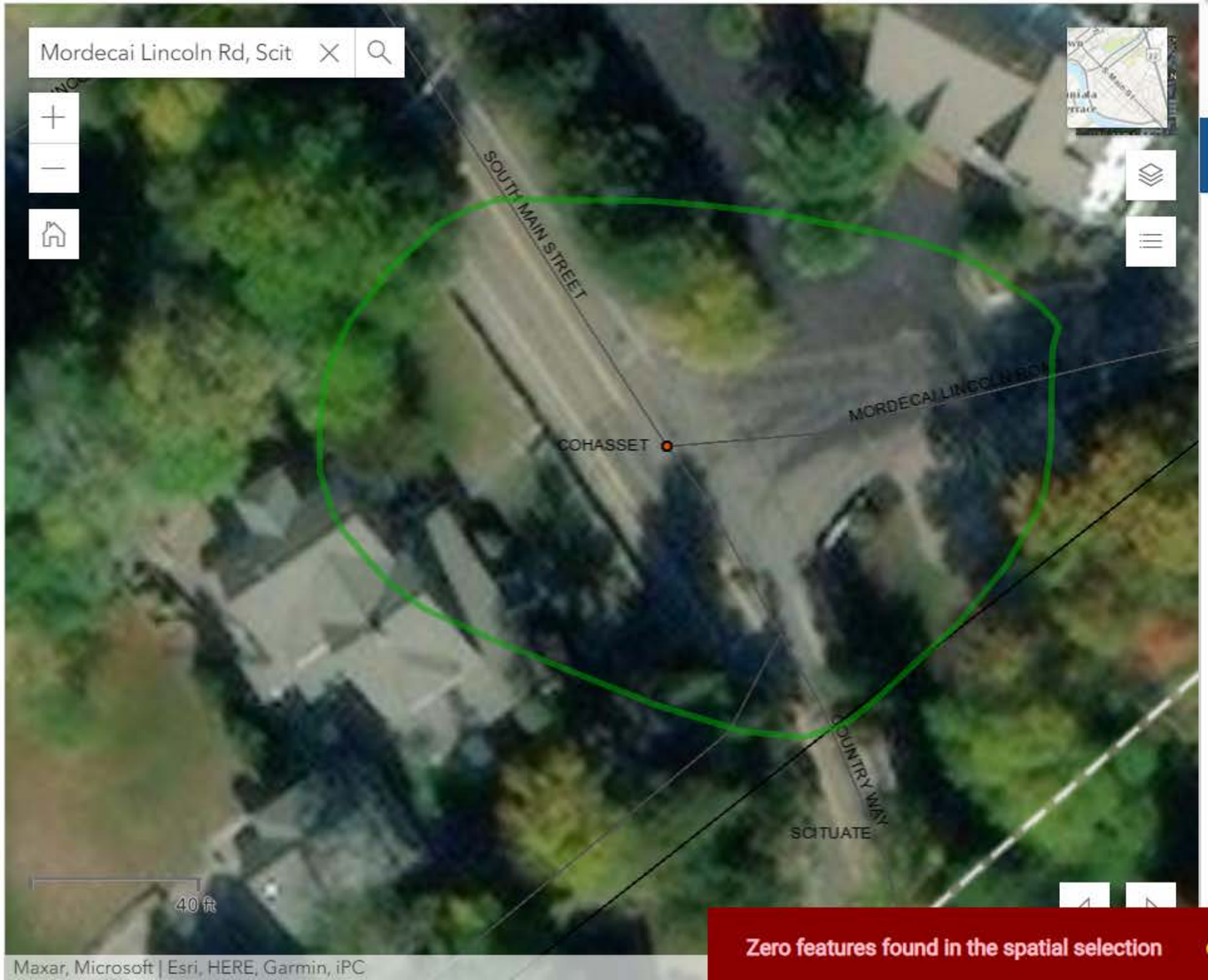
1. Select Fields | 2. Query Type | 3. Define Query | 4. Visualize Results

Basic Search | Spatial Search | Advanced Search

Reset All Filters | Data Level:Crash | Visualize Results

Reset Spatial Filters

Join Basic Filter | Join Advanced Filter



Zero features found in the spatial selection dismiss

crash date from 01/01/2016

crash date to 12/31/2020

Find | Draw | Address

Step 1: Draw Shape Type

Reset Draw

Point | Line | Area

Step 2: Define Buffer (Optional)

buffer distance 1000

buffer units Feet

Buffer

Step 3: Run Query

Click the "Visualize results" button above

42°13'21.1"N 70°47'20.5"W

42°13'21.1"N 70°47'20.5"W

42.222528, -70.789028

Directions

Save

Nearby

Send to phone

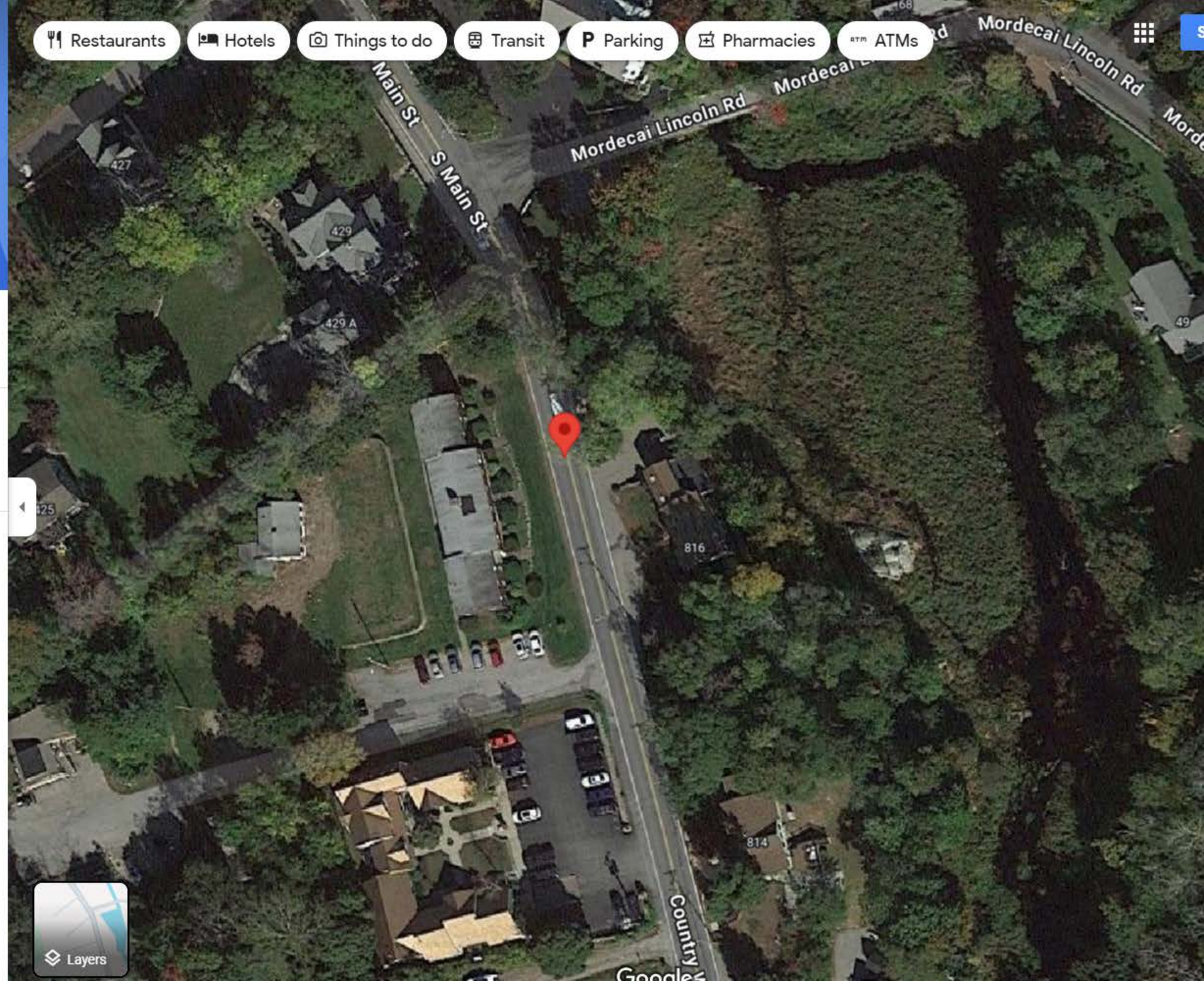
Share

495-499 S Main St, Cohasset, MA 02025

66F6+299 Scituate, Massachusetts

Add a missing place

Add your business

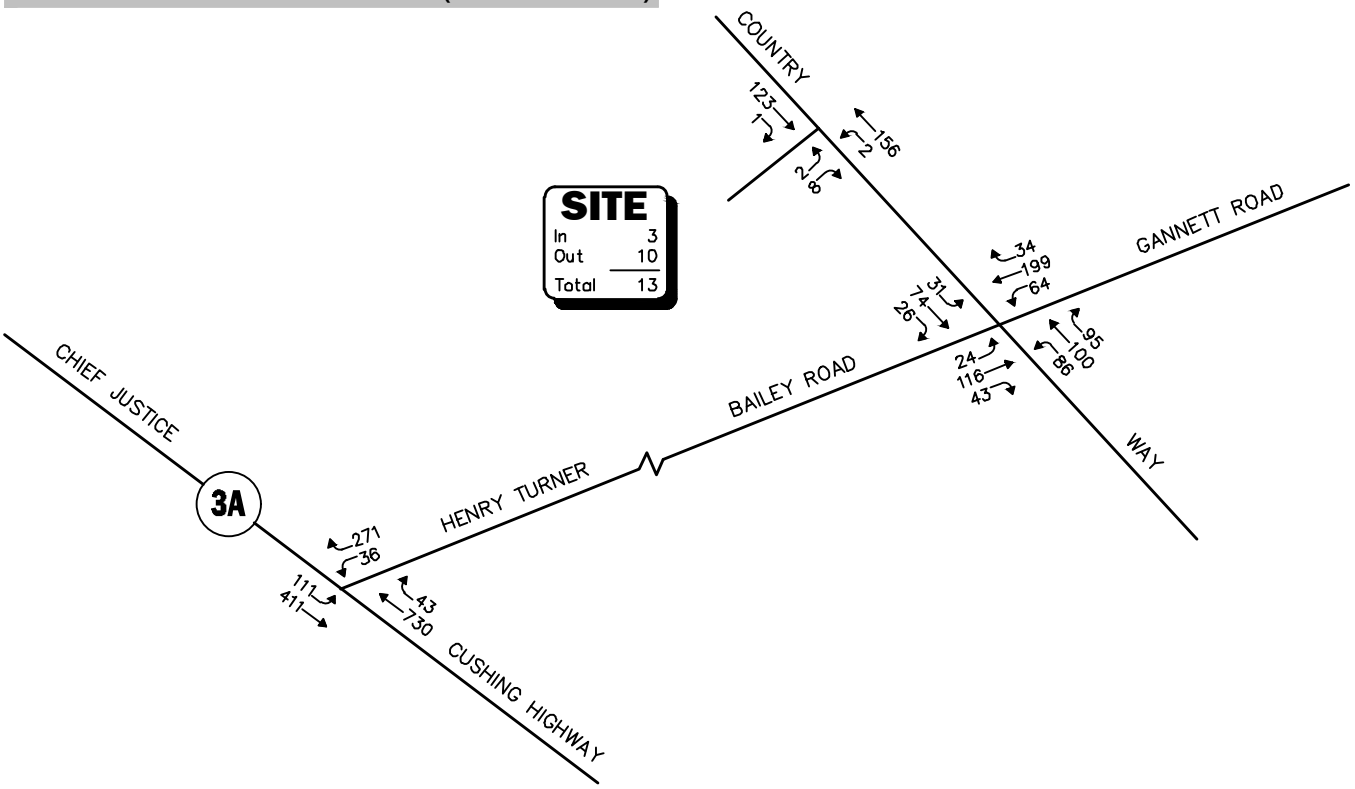


Crash Num	City Town	Crash Date	Crash Severity	Crash Time	Crash Year	Max Injury Se	Number of Vehicles	Driver Contributing Circumstances (All Drivers)	Driver Distracted By (All Vehicles)	First Harmful Event	Is Geocoded
4526422	SCITUATE	02/01/2018	Property damage only (none injured	1:26 PM	2018	No injury	1	D1: (No improper driving)	D1: Not Distracted	Collision with other light pole or other post/support	Yes

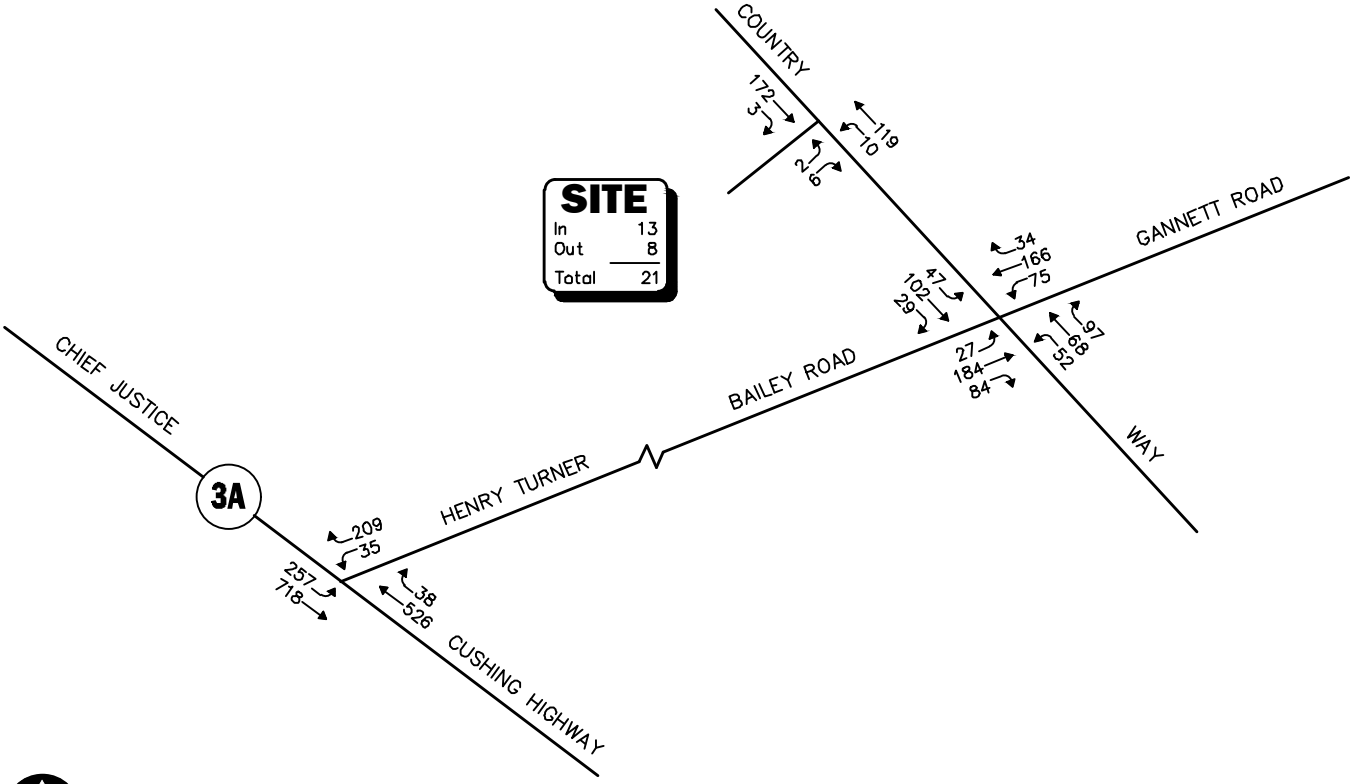
Light Conditions	Manner of Collision	Road Surface Co	Roadway Junction Ty	Traffic Control Device Type	Trafficway Description	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather C
Daylight	Single vehicle crash	Dry	Not at junction	No controls	Two-way, not divided	V1: Other	V1:(Bus (seats for 16 or more, including driver))	V1: W	Clear

First Harmful Event Locati	Geocoding Method	Most Harmful Event (All Vehicles)	Road Cont	School Bus Related	Speed Lim	Traffic Cor	Vehicle Sequence of Events (All Vehicles)	Work Zone
Outside roadway	Operator Designated	V1:(Collision with fence)	None	No, school bus not involved		Not report	V1:(Collision with fence)	No

WEEKDAY MORNING PEAK HOUR (7:30 - 8:30 AM)



WEEKDAY EVENING PEAK HOUR (4:45 - 5:45 PM)



N

Not To Scale

Figure 7

2030 Build
Peak-Hour Traffic Volumes

Vanasse & Associates inc

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3.6.9 Selecting Pedestrian Design Speed

Much like other roadway users, the speed at which people walk varies considerably; however, walking speed usually does not have a substantial influence on the geometric design of roadways. A critical exception to this is the pedestrian's influence on the design of intersections and crosswalks, and the timing of traffic signals. The choice of walking speed for intersections and traffic signal design is discussed in the *Manual on Uniform Traffic Control Devices (MUTCD)* and is further discussed in Chapter 6.

3.7 Sight Distance

Sight distance is the length of roadway ahead that is visible to the roadway user. In most cases, specific sight distance measures apply to motor vehicles and bicyclists. The four following aspects are commonly discussed for motor vehicle sight distance:

- Stopping sight distance,
- Passing sight distance,
- Decision sight distance, and
- Intersection sight distance.

All of these sight distances are related to the design speed of the roadway. The designer should refer to AASHTO's *A Policy on Geometric Design of Highways and Streets* for detailed information for the use and calculation of sight distances.

3.7.1 Stopping Sight Distance

The provision of adequate *stopping sight distance* (SSD) is a critical sight distance consideration for design and is described in more detail below.

3.7.1.1 Motor Vehicle Stopping Sight Distance

Stopping sight distance is the distance necessary for a vehicle traveling at the design speed to stop before reaching a stationary object in its path. The sight distance at every point along a roadway should be at least the stopping sight distance. Exhibit 3-8 provides stopping sight distances for a range of design speeds and grades.

tances calculated on this basis are also considered adequate for night conditions because headlight beams of an opposing vehicle generally can be seen from a greater distance than a vehicle can be recognized in the daytime. The choice of an object height equal to the driver eye height makes passing sight distance design reciprocal (i.e., when the driver of the passing vehicle can see the opposing vehicle, the driver of the opposing vehicle can also see the passing vehicle).

Intersection sight distance object—As in the case of passing sight distance, the object to be seen by the driver in an intersection sight distance situation is another vehicle. Therefore, design for intersection sight distance is based on the same object height used in design for passing sight distance, 3.50 ft [1.08 m].

Decision sight distance object—The 2.00-ft [0.60-m] object-height criterion adopted for stopping sight distance is also used for decision sight distance. The rationale for applying this object height for decision sight distance is the same as for stopping sight distance.

3.2.6.3 Sight Obstructions

On a tangent roadway, the obstruction that limits the driver's sight distance is the road surface at some point on a crest vertical curve. On horizontal curves, the obstruction that limits the driver's sight distance may be the road surface at some point on a crest vertical curve or it may be some physical feature outside of the traveled way, such as a longitudinal barrier, a bridge-approach fill slope, a tree, foliage, or the backslope of a cut section. Accordingly, all highway construction plans should be checked in both the vertical and horizontal plane for sight distance obstructions.

3.2.6.4 Measuring Sight Distance

The design of horizontal alignment and vertical profile using sight distance and other criteria is addressed in Sections 3.3 through 3.5, including the detailed design of horizontal and vertical curves. Sight distance should be considered in the preliminary stages of design when both the horizontal and vertical alignment are still subject to adjustment. Stopping sight distance can easily be determined where plans and profiles are drawn using computer-aided design and drafting (CADD) systems. The line-of-sight that must be clear of obstructions is a straight line for the driver's eye position to an object on the road ahead, with the height of the driver's eye and the object as given above. The vertical component of sight distance is generally measured along the centerline of the roadway. The horizontal component of sight distance is normally measured along the centerline of the inside lane on a horizontal curve. By determining the available sight distances graphically on the plans and recording them at frequent intervals, the designer can review the overall layout and produce a more balanced design by minor adjustments in the plan or profile.

Because the view of the highway ahead may change rapidly in a short travel distance, it is desirable to measure and record sight distance for both directions of travel at each station. Both horizontal and vertical sight distances should be measured and the shorter lengths recorded.

3.2.6 Criteria for Measuring Sight Distance

Sight distance is the distance along a roadway throughout which an object of specified height is continuously visible to the driver. This distance is dependent on the height of the driver's eye above the road surface, the specified object height above the road surface, and the height and lateral position of sight obstructions within the driver's line of sight.

3.2.6.1 Height of Driver's Eye

For all sight distance calculations for passenger vehicles, the height of the driver's eye is considered to be 3.50 ft [1.08 m] above the road surface. This value is based on a study (*19*) that found average vehicle heights have decreased to 4.25 ft [1.30 m] with a comparable decrease in average eye heights to 3.50 ft [1.08 m]. Because of various factors that appear to place practical limits on further decreases in passenger car heights and the relatively small increases in the lengths of vertical curves that would result from further changes that do occur, 3.50 ft [1.08 m] is considered to be the appropriate height of driver's eye for measuring both stopping and passing sight distances. For large trucks, the driver eye height ranges from 3.50 to 7.90 ft [1.80 to 2.40 m]. The recommended value of truck driver eye height for design is 7.60 ft [2.33 m] above the road surface.

3.2.6.2 Height of Object

For stopping sight distance and decision sight distance calculations, the height of object is considered to be 2.00 ft [0.60 m] above the road surface. For passing sight distance calculations, the height of object is considered to be 3.50 ft [1.08 m] above the road surface.

Stopping sight distance object—The selection of a 2.00-ft [0.60-m] object height was based on research indicating that objects with heights less than 2.00 ft [0.60 m] are seldom involved in crashes (*19*). Therefore, it is considered that an object 2.00 ft [0.60 m] in height is representative of the smallest object that involves risk to drivers. An object height of 2.00 ft [0.60 m] is representative of the height of automobile headlights and taillights. Using object heights of less than 2.00 ft [0.60 m] for stopping sight distance calculations would result in longer crest vertical curves without a documented decrease in the frequency or severity of crashes (*19*). Object height of less than 2.00 ft [0.60 m] could substantially increase construction costs because additional excavation would be needed to provide the longer crest vertical curves. It is also doubtful that the driver's ability to perceive situations involving risk of collisions would be increased because recommended stopping sight distances for high-speed design are beyond most drivers' capabilities to detect objects less than 2.00 ft [0.60 m] in height (*19*).

Passing sight distance object—An object height of 3.50 ft [1.08 m] is adopted for passing sight distance. This object height is based on a vehicle height of 4.35 ft [1.33 m], which represents the 15th percentile of vehicle heights in the current passenger car population, less an allowance of 0.85 ft [0.25 m], which represents a near-maximum value for the portion of the vehicle height that needs to be visible for another driver to recognize a vehicle as such (*35*). Passing sight dis-