

MEMORANDUM

DATE: January 27, 2021

TO: Mr. Richard S. Novak, Chairman
Sherborn Zoning Board of Appeals Town Hall
19 Washington Street
Sherborn, MA 01770

FROM: Robert J. Michaud, P.E. – Managing Principal
Daniel A. Dumais, P.E. – Senior Project Manager



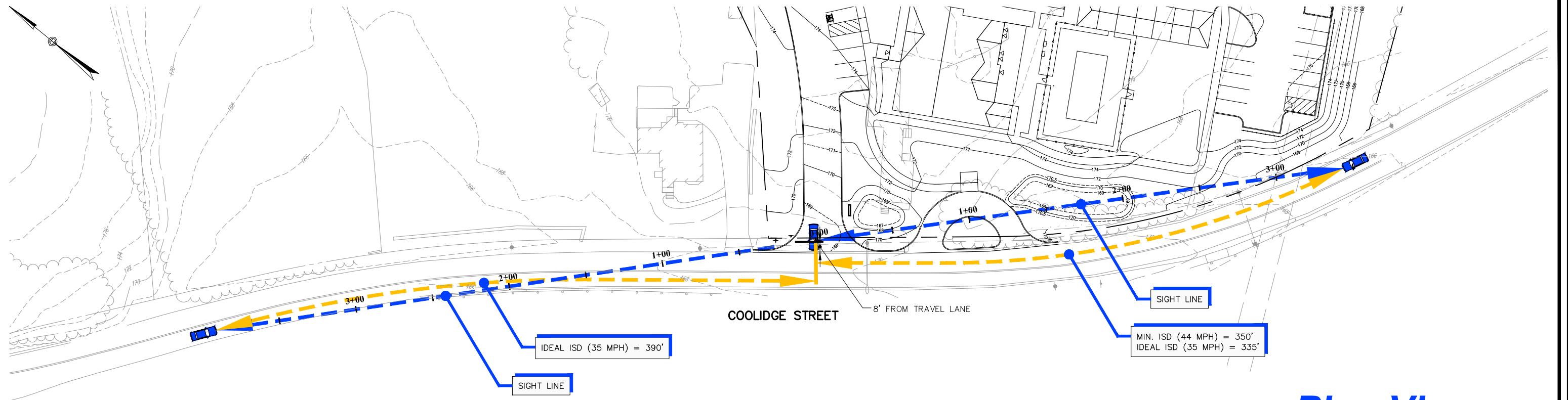
RE: **Response to Comments**
Proposed Coolidge Crossing
84-86 Coolidge Street – Sherborn, MA

MDM Transportation Consultants, Inc. (MDM) has prepared the following responses to transportation-related comments as issued in a Tetra Tech dated January 14, 2021. To facilitate review, specific comments that require additional responses are paraphrased with corresponding responses.

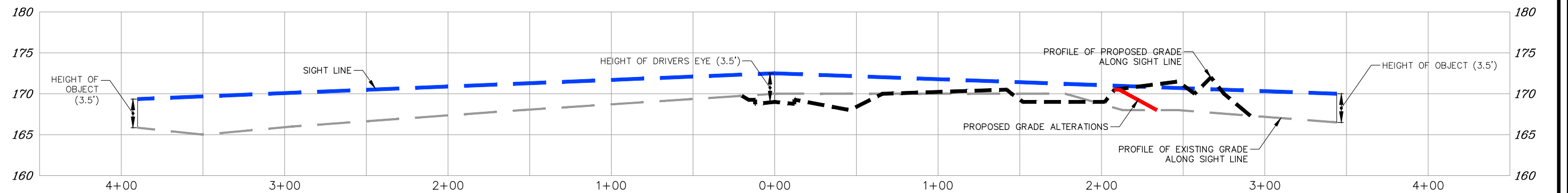
Traffic

Comment T1: "The TIAS presents Stopping Sight Distance (SSD) for both the posted speed limit (35 mph) and the observed 85th percentile speed (44 mph); however, Intersection Sight Distance (ISD) is only noted for the posted speed limit. Since the observed 85th percentile travel speeds are higher than the posted speed limit, TT recommends the Applicant include a discussion of the available ISD compared to the desired ISD using the observed travel speed. TT also recommends the Applicant confirm the SSD is listed in the appropriate directions in Table 4, as the available SSD eastbound and westbound appear to be reversed."

Response: The intersection sight distance shown in the September 2020 Traffic Impact and Access Study (TIAS) has been updated as shown in **Table R1** to reflect the minimum ISD for the observed 85th percentile speed and the ideal ISD for the regulatory speed limit along Coolidge Street with respect to the latest plan set prepared by Civil Design Group, LLC. Furthermore, the plan view and profile on the latest Site Plan is presented in **Figure 1** which indicates that the with a minor change in grading which MDM will continue to work with the Civil Design Group on as the site design evolves, the recommended sight line requirements from AASHTO will be satisfied.



Plan View



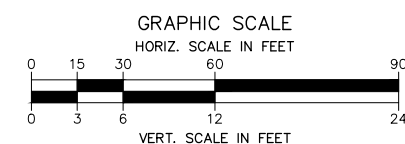
Profile View

Site Plan Source: Civil Design Group, LLC

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

28 Lord Road, Suite 280
Marlborough, MA 01752

Proposed Development
Sherborn, Massachusetts



Scale: As Noted
DWG No. 1096 Fig 2-Autoturn-Sight Dist (1-28-2021).dwg

Date: January 2021
Project No. 1096

Figure 1
Intersection Sight Distance Analysis
The Villages at Sherborn

TABLE R1
INTERSECTION SIGHT DISTANCE SUMMARY
PRIMARY SITE DRIVEWAY DEPARTURE TO COOLIDGE STREET

Approach/ Travel Direction	Available ISD	AASHTO Minimum ¹	AASHTO Ideal ¹
		85 th Percentile Speed ³	Regulatory Speed Limit ²
Looking East	380± Feet	350 Feet	335 Feet
Looking West	485+ Feet	350 Feet	390 Feet

¹Recommended sight distance based on AASHTO, A Policy on Geometric Design of Highways and Streets. Based on driver height of eye of 3.5 feet and an object height of 3.5 feet. Minimum value as noted represents SSD per AASHTO guidance. Adjustments for driveway grade have been made as needed.

²Regulatory (posted) speed limit is 35 mph in the EB and WB direction.

³85th Percentile speed is 44 mph in the EB and WB direction.

Comment T2: “As currently shown on the Plan View in Figure 4, the Ideal ISD line is drawn through a wooded area on the site (looking left from the site driveway). There appears to be a number of large trees within that wooded area that may hinder the line of sight. The TIAS notes that the recommended sight lines will be satisfied “with selective clearing and grading as part of the installation of the Site driveway.” If any of the trees within the wooded area are to be removed, they should be noted on the plan. The sight triangles and area of clearing for the 44-mph observed speed should be shown on the plan.”

Response: The large trees within the sight line areas will be inventoried and added to the final site plan set to be prepared by Civil Design Group, LLC. Likewise, the sight line triangles from the proposed site driveway looking onto Coolidge Street will be added to the final plan set.

Comment T3: “The crash analysis has generally been prepared in accordance with industry standards and includes an evaluation of data from the MassDOT crash database for the study intersections for the five-year period between 2015 and 2019. However, the volumes included on the crash rate worksheets are inconsistent with the volumes presented in Figure 3. The results of the crash rate calculation with the volumes presented in Figure 3 do not change significantly, however, so no further action is required.”

Response: The crash rate calculations have been updated (see **Attachments**) to reflect the 2020 Baseline conditions. MDM concurs that no further action is required.

Comment T4: “Vehicle trip generation estimates for the project were developed based on trip rates published in ITE’s Trip Generation for Land Use Code (LUC) 221 – Multifamily Housing (Mid-Rise) applied to 120 units. The site program evaluated in the TIAS is expected to generate approximately 652 daily trips on a weekday (43 vph during the morning peak hour and 53 vph during the evening peak hour). TT agrees with the trip generation and trip distributed methodology used in the TIAS.”

Response: MDM concurs, to further action is required.

Comment T5: “The TIAS utilized Highway Capacity Manual (HCM) 6th edition methodology for the unsignalized intersections using Synchro software. TT generally agrees with the methodology used in the TIAS but notes some discrepancies with some of the data inputs used in the analysis (i.e., lane use assumption for the Coolidge Street approach to North Main Street is inconsistent with the text). The TIAS notes that the Coolidge Street eastbound approach is a single lane, while the capacity analysis shows separate left- and right-turn lanes on the approach. If analyzed with a single approach lane, the Coolidge Street eastbound approach is likely to exceed capacity and operate at LOS F during both peak hours under baseline conditions and will worsen under future conditions with and without the proposed project. While the delay for the approach will be higher than reported in the TIAS, the end result is still the same for the eastbound approach (LOS F) under Build conditions. The project is expected to add no more than 24 peak hour trips to the intersection.”

Response: MDM concurs that the project will not materially change the operations of the Coolidge Street approach to North Main Street during the peak hours. Field observations as shown in the video counts (transmitted electronically) indicated that while the Coolidge Street approach to North Main Street is marked as a single lane approach it is currently being used as two lanes for the first 50 feet or so to allow right turns to by-pass a small number of left turns onto North Main Street.

Comment T6: “The Applicant shows a proposed bus shelter and pull-out just south of the site driveway. The shelter is to be located outside of the sight triangle. Since the ideal sight distance shown on Figure 4 was based on the posted speed limit and not the observed 85th percentile speed, this bus shelter may need to be relocated further back from the edge of the roadway to provide an adequate line of sight looking left from the site driveway. Additionally, the need for a bus pull-out is unclear at this location. There was no discussion of any transit in the TIAS. A school bus would be safer stopping directly in the roadway as the bus stops traffic in both directions with the use of the flashing red lights and STOP sign. TT recommends the Applicant clarify the need for this bus pull-out and the relocation of the bus shelter to be outside of the ideal ISD line based on the 85th percentile speed.”

Response: The proposed bus shelter and bus turn around area has been designed to accommodate a MWRTA shuttle bus (see **Attachments** for Concept Plan and AutoTurn Exhibit). If MWRTA agrees to extend bus service for bus routes 10 and 11 or another route to the Site, then the turnaround area will be constructed. The shuttle bus would arrive from the northwest from Speen Street travel to the Site along Coolidge Street and then use the turn around to reverse direction back to Speen Street to continue its designated route. MDM concurs and as presented at the December 10, 2020 ZBA hearing for the project the school bus per policy will stop within the travel lane and use their flashing red light and STOP sign; therefore, the turnaround area has not been designed for a school bus. The bus shelter is located outside the sight line area.

Comment T7: "The Applicant shows an entry sign on the Site Planting Plan. It should be confirmed that this entry sign will not interfere with the line of sight looking left from the site driveway or the sign should be relocated. "

Response: The entry sign has been re-located and verified to be outside of the sight line triangle looking to the left from the site driveway onto Coolidge Street. The sight line triangles will be added to the final site plan set by Civil Design Group, LLC.

ATTACHMENTS

- Updated Crash Data
- Bus Turn Around Concept

□ Updated Crash Data

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Sherborn, MA COUNT DATE : Sep-20

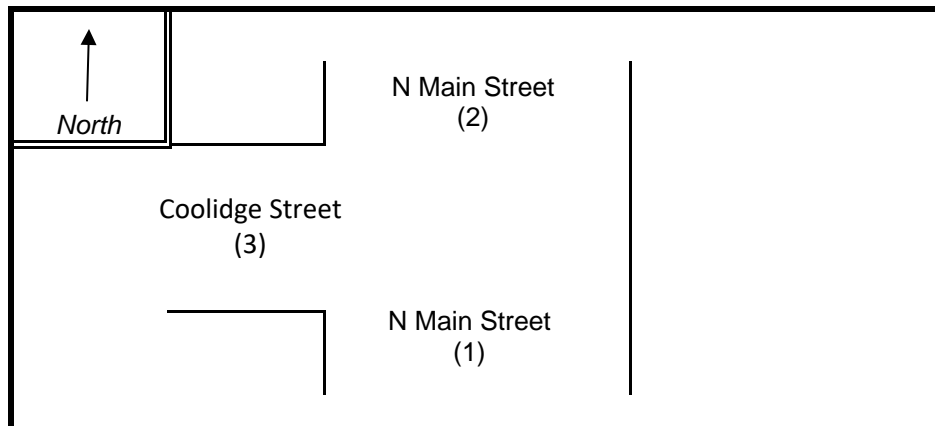
DISTRICT : 3 UNSIGNALIZED : ☒ X SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : North Main Street

MINOR STREET(S) : Coolidge Street

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	620	469	458			1,547

" K " FACTOR :

0.086

INTERSECTION ADT (V) = TOTAL DAILY
APPROACH VOLUME :

17,988

TOTAL # OF CRASHES :

13

OF
YEARS :

5

AVERAGE # OF
CRASHES PER YEAR (A) :

2.60

CRASH RATE CALCULATION :

0.40

RATE = $\frac{(A * 1,000,000)}{(V * 365)}$

Comments : MassDOT District 3 Avg: Signalized = 0.89; Unsignalized = 0.61

Project Title & Date: 1096 - Sherborn

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Sherborn, MA COUNT DATE : Sep-20

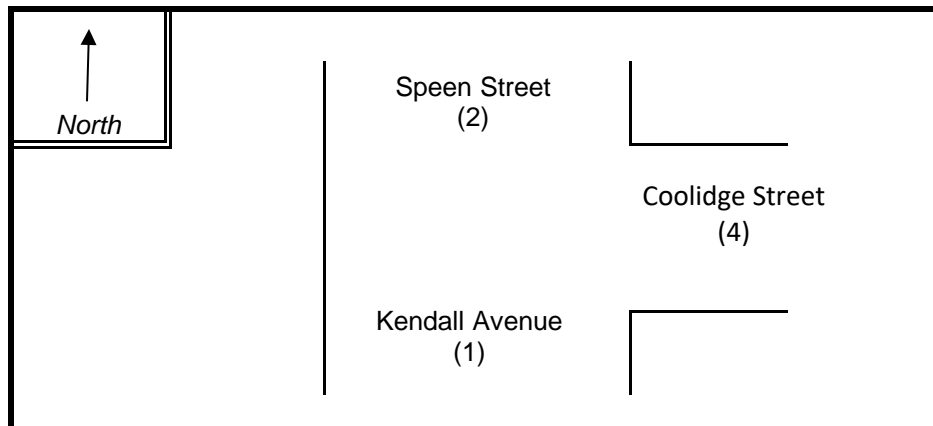
DISTRICT : 3 UNSIGNALIZED : ☒ X SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : Speen Street/Kendall Avenue

MINOR STREET(S) : Coolidge Street

INTERSECTION
DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	252	672		451		1,375

" K " FACTOR :

0.086

INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

15,988

TOTAL # OF CRASHES :

11

OF YEARS :

5

AVERAGE # OF CRASHES PER YEAR (A) :

2.20

CRASH RATE CALCULATION :

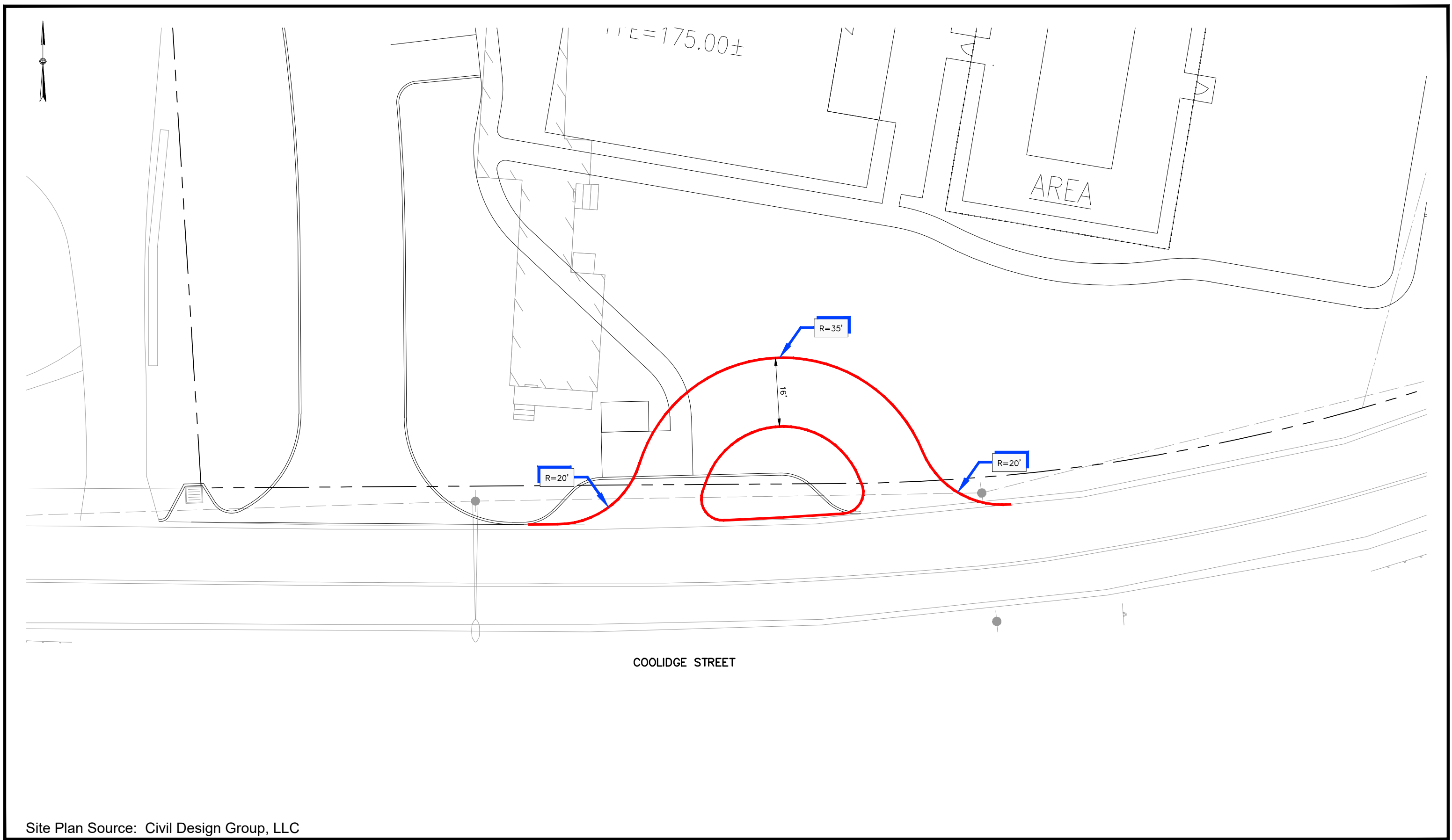
0.38

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : MassDOT District 3 Avg: Signalized = 0.89; Unsignalized = 0.61

Project Title & Date: 1096 - Sherborn

□ Bus Turn Around Concept



MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

28 Lord Road, Suite 280
Marlborough, MA 01752

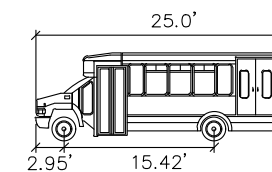
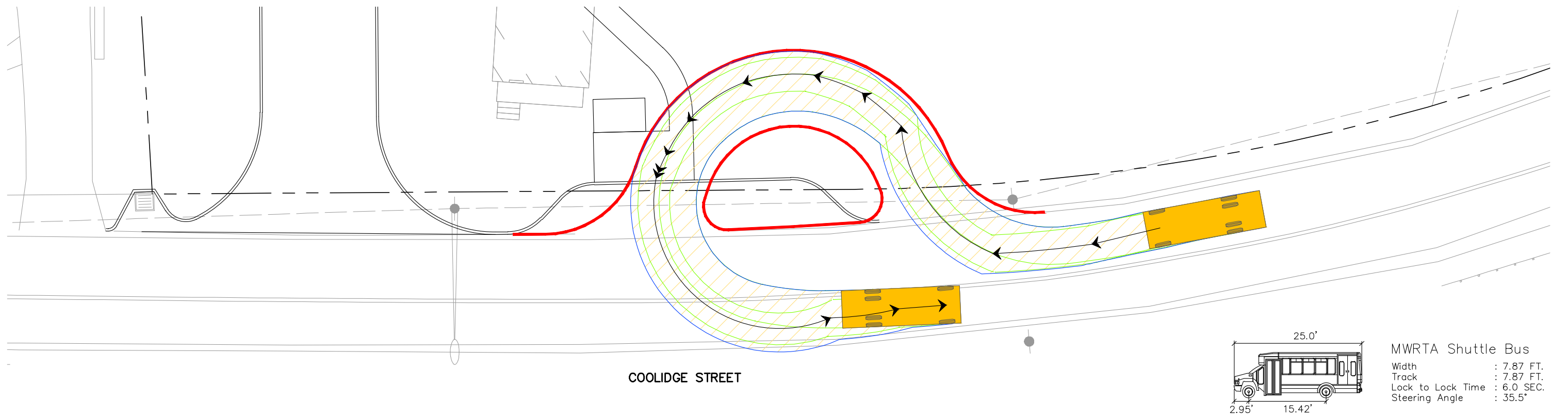
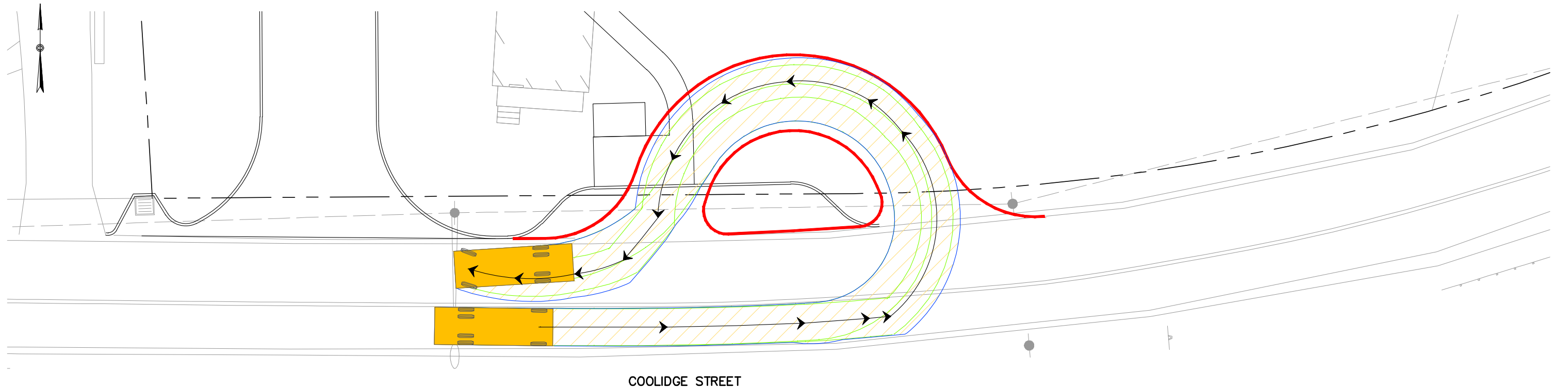
Proposed Development
Sherborn, Massachusetts

Scale: As Noted
DWG No. 1096 Concept-Bus Turnaround (12-11-2020)-2.dwg

Date: December 2020
Project No. 1096



Exhibit 1
Conceptual Plan
Shuttle Bus Turnaround



MWRTA Shuttle Bus
 Width : 7.87 FT.
 Track : 7.87 FT.
 Lock to Lock Time : 6.0 SEC.
 Steering Angle : 35.5°

Site Plan Source: Civil Design Group, LLC

MDM TRANSPORTATION CONSULTANTS, INC.
 Planners & Engineers

28 Lord Road, Suite 280
 Marlborough, MA 01752

Proposed Development
 Sherborn, Massachusetts



Exhibit 2
Autoturn Analysis
MWRTA Shuttle Bus

Scale: As Noted
 DWG No. 1096 Concept-Bus Turnaround (12-11-2020)-2.dwg

Date: December 2020
 Project No. 1096