

May 26, 2022

SENT VIA E-MAIL

Kenneth Kovalchik
Town Planner
Town of Guilderland
P.O. Box 339
Guilderland, NY 12084-0339

**RE: TDE Review – Roundabout feasibility Analysis for Rapp Road at Costco North Driveway
Proposed Costco @ Crossgates Mall Road/Rapp Road/Western Ave**

Dear Mr. Kovalchik,

GPI has reviewed the following documents provided by JMT of New York, Inc.:

- A memo titled “Preliminary Roundabout Discussion for Rapp Road at Costco Northerly Driveway”, dated May 13, 2022.
- A sketch plan set (3 sheets) “Rapp Road Roundabout”, dated April 5, 2022.

Based on a review of the submitted documents, the applicant has circumstantiated that there is no technical need for a roundabout. GPI has reviewed the provided materials and analyzed the roundabout concept against NYSDOT criteria and concur that a roundabout is not warranted for the intersection into the Costco facility. Further technical review of the roundabout concept is not required unless there is a change to the design. GPI commentary of the review of the above-mentioned materials is provided below:

1. Preliminary Roundabout Discussion for Rapp Road at Costco Northerly Driveway”, dated May 13, 2022:

In NY State there are no warrants for a roundabout, but given their cost to construct, there should be some need to justify their installation. JMT uses information sourced from other States and National publications discussing several factors. GPI concurs with several points made in their memo; The northern driveway should not produce excessive queue or delays that would benefit from a roundabout, and the northbound driveway does not produce enough traffic to meet traffic signal warrants.

Additionally, the queues produced at the US 20 and Rapp Rd intersection have the potential to extend back to the roundabout during peak shopping times, which would gridlock a roundabout. Given the low driveway volumes that are unbalanced with the Rapp Rd volumes, the potential for queue overruns into the roundabout from adjacent signals, and the fact that acceptable levels of service can be achieved with a standard stop controlled intersection, a roundabout is not justified at this location.

2. Sketch plan set (3 sheets) “Rapp Road Roundabout”, dated April 5, 2022:

The three sketches provided by JMT illustrate an Urban Compact, Urban Single-Lane and Urban Double-Lane configurations. The placement of each alternative is subjective and is heavily influenced by the existing and/or proposed configuration of Rapp Road, which for the sake of simplicity, is not part of this review. GPI concurs that the Inscribed Circle Diameters as shown fall within the prescribed design ranges of the selected options.

Additionally, GPI observes that while geometrically there is space for a roundabout, other elements such as underground utilities, availability of right-of-way and adjacent topography would unnecessarily impact the amount of space occupied versus a conventional “T” intersection.

3. GPI also prepared a NYSDOT preliminary design criteria memo for Rapp Road and a single-lane roundabout and are included as attachments. These were used in the evaluation of the roundabout concept comparing to NY State requirements.

Please feel free to contact me with any questions.

Regards,

GPI/GREENMAN-PEDERSEN, INC.



Ryan Trunko, PE
Project Manager
80 Wolf Road, Suite 300, Albany, NY 12205
518-898-9551 | rtrunko@gpinet.com

Encl: NYSDOT Design Criteria Rapp Road
NYSDOT Design Criteria Roundabout

Exhibit 2-8 Critical Design Elements for Rapp Road					
PIN:		XXXX.XX	NHS/Non-NHS	Non-NHS	
Route No. & Name:		Rapp Road	Functional Classification:	Urban Minor Arterial	
Project Type:		New Intersection Construction	Design Classification/Character:	Urban Arterial	
% Trucks:		4%	Terrain:	Rolling	
Design Year ADT:		9298 (2042)	Truck Access/Qualifying Hwy.	Access-No; Qualifying-No	
Element		Standard		Existing Condition	Proposed Condition ²
1	Design Speed	40 mph ¹ HDM Section 2.7.2.3.A.			
2	Lane Width	11 ft HDM Section 2.7.2.3.B.			
	Approach Lane Width				
3	Shoulder Width	5 ft HDM Section 2.7.2.3.C.			
	Approach Shoulder Width				
4	Horizontal Curve Radius	357 ft Min (at e _{max} =4%) HDM Section 2.7.2.3.D.			
5	Superelevation	4% Max. HDM Section 2.7.2.3.E.			
6	Stopping Sight Distance (Horizontal and Vertical)	271 ft Min. HDM Section 2.7.2.3.F.			
7	Maximum Grade	8% (Rolling) HDM Section 2.7.2.3.G.			
8	Cross Slope	1.5% Min. to 3% Max. HDM Section 2.7.2.3.H.			
9	Vertical Clearance	14 ft Min. BM Section 2.3			
10	Design Loading Structural Capacity	NYSDOT LRFD Specifications AASHTO HL-93 Design Live Load with LRFR 1.2 or higher BM Section 1.3 NYSDOT LRFD Specifications AASHTO HL-93 Live Load and NYSDOT Design Permit Vehicle HDM Section 19.5.3			
11	Americans with Disabilities Act Compliance ³	HDM Chapter 18			

Notes:

- 1 The Regional Traffic Engineer has concurred that the use of a Design Speed of 40 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.
- 2 ** Denotes non-standard feature
- 3 Refer to Section 2.3.5 for detailed pedestrian facility information.
- 4 Pedestrian facility nonstandard features to be retained or created will be justified in final design using PDM Exhibit 2-15a.

Exhibit 2-8 Single Lane Roundabout Controlling Features

Element		Parameter ¹	North Leg	West Leg	South Leg	East Leg
1	Design Vehicle	See HDM § 5.7.1 ⁷	WB-67	N/A	WB-67	WB-67
2	Maximum Entry Speed <25 mph 1 lane	Entry Path Radius Method				
		Per Equation 6.3 ²				
3	Entry Width	12' - 23' - 1 lane				
		17' - 21' typical 1 lane				
4	Entry Radius	65' – 150'				
		90'-110' typ.				
5	Entry Angle ^{4,5}	Crit. #1 - 20°-60° (30°-40° des.) Crit. #2 - ≥2/3 obstructed view?				
6	Entry Angle of Visibility	≥75° per Section 6.7.4 ³				
7	Splitter Island Length					
	Approach ≥45 mph	NA				
	Approach <45 mph	≥ 30' (≥ 50' des.) 1 lane				
8	Approach Stopping Sight Distance	Per Section 6.7.3 ³				
9	Circulating Roadway Sight Distance	Per Section 6.7.3 ³				
10	Intersection Sight Distance	Per Section 6.7.3 ³				
11	Sight Distance to Crosswalk	Per Section 6.7.3 ³				

Exhibit 2-8 Single Lane Roundabout Controlling Features

Element		Parameter ¹	North Leg	West Leg	South Leg	East Leg
12	Inscribed Circle Diameter	100' - 180' - 1 lane 110' - 150', typ. - 1 lane				
13	Circulatory Roadway Width OR Circulatory Roadway Lane Width	12'-23', 16'- 20' typ. - 1 lane				
14	Minimum Exit Radius ⁶	Single lane - 65' – ∞, 300' - 800' ty				
15	Americans with Disabilities Act Compliance ¹⁰	Comply with HDM Chapter 18				
16	Truck Access Highway or Oversize/Overweight Route	See HDM § 5.7.1				

1. Parameters per NCHRP Report 672, "Roundabouts: An Informational Guide (Second Edition)" and/or Main Office Intersection Design Squad, as applicable.
2. Equation 6-3 on page 6-58 incorrectly contains an addition sign (+) as an operator. The correct operator should be a subtraction sign (-).
3. Section numbers and equations listed in the table above refer to NCHRP Report 672, "Roundabouts: An Informational Guide (Second Edition)"
4. Criterion #1 for the entry angle shall be the angle (in degrees) that represents the degree of curvature of the approach entry radius. It is understood that this may be contrary to what is illustrated on Figure 1 in EI 00-021.
5. To determine Criterion #2 for the entry angle, the designer shall project the tangent portions of the right approach lane's left and right lane lines into the circulating roadway. At the splitter island's bull-nose in the vicinity of the projection (between the approach and circulating roadways), it is preferred that 2/3 or more of the width of the projection at the bull-nose, measured perpendicular to the projections, is taken up by the splitter island.
6. Exit radius is measured along the right curb line at exit.
7. Consult with the Regional Traffic safety and Mobility Office if the highway is designated as a Truck Access Route. A larger design vehicle may be needed.
8. Not typical, desired or preferred, but within the general range of acceptance.
9. Not typical, desired, or preferred and outside the general range of acceptance. These are nonconforming features.
10. Noncompliant pedestrian facilities that must be retained or created are nonstandard and will be justified as nonstandard in final design.