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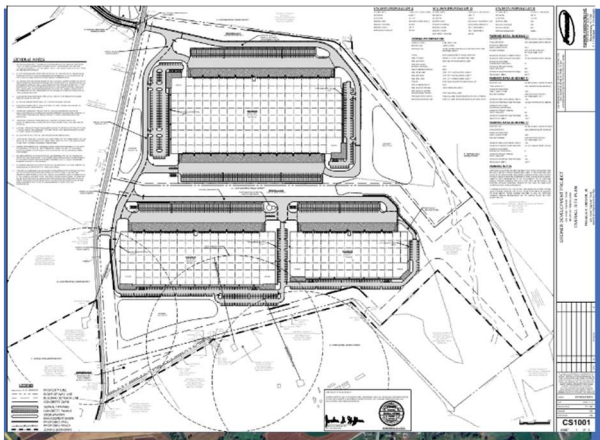

Transportation Impact Study

GREINER DEVELOPMENT PROJECT

Mount Joy Township, Lancaster County, PA

For Submission To:

Mount Joy Township, Lancaster County, PA

Moving ***Forward Together***®

GREINER DEVELOPMENT PROJECT – 2843 MT. PLEASANT RD TRANSPORTATION IMPACT STUDY

FOR SUBMISSION TO:

Mt. Joy Township, Lancaster County, PA

Prepared For:
Frank B. Greiner Jr.
700 Cornwall Mountain Road
Lititz, PA 17543

November 13, 2025

TPD # ETHD.00004

Prepared By:
TPD, Inc.
4000 Crums Mill Road, Suite 102
Harrisburg, Pennsylvania 17112

Phone: (717) 234-1430
Fax: (717) 234-4490
E-mail: TPD@TrafficPD.com
Web Site: www.trafficpd.com

11/13/25

Craig D. Mellott, P.E., PTOE
Vice President
Pennsylvania License Number PE071485

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EXECUTIVE SUMMARY

The purpose of this Transportation Impact Study (TIS) is to examine the potential traffic impact associated with the proposed Greiner Development Project on the roadway network in Mt. Joy Township, Lancaster County, PA. Based on this evaluation, the following conclusions were reached:

1. This report has been prepared in accordance with *Appendix A – Policies and Procedures for Transportation Impact Studies Related to Highway Occupancy Permits* of PennDOT *Publication 282*, dated June 2025 and the Mount Joy Township Subdivision and Land Development Ordinances (SALDO) and zoning ordinances, as applicable.

2. The project scope and the extent of the study area intersection assumed for this project are as follows, which corresponds to the major intersections contained within a one-mile concentric circle of the proposed development driveways (§119-32(C)(5)(a) from Mount Joy Twp SALDO):

   - Cloverleaf Road (SR 4025) & Mt. Pleasant Road (SR 4010);
   - Cloverleaf Road (SR 4025) & Steel Way;
   - Cloverleaf Road (SR 4025) & Route 283 West Ramps;
   - Cloverleaf Road (SR 4025) & Route 283 East Ramps;
   - Cloverleaf Road (SR 4025) & Merts Drive;
   - Cloverleaf Road (SR 4025) & Schwanger Road;
   - Schwanger Road/Campus Road & Merts Drive/Schwanger Road;
   - Mt. Pleasant Road (SR 4010) & Schwanger Road;
   - Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Eastern (Car-Only) Driveway;
   - Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Western Driveway/ Archers Lane.

3. The project site is located along the northern side of Mt. Pleasant Road (SR 4010) between Cloverleaf Road (SR 4025) and Stauffer Road at 2843 Mt. Pleasant Road.

4. At full build-out, the proposed Greiner Development Project is expected to consist of three (3) warehouse buildings as follows: (1) 603,200 s.f. building; (2) 378,000 s.f. building; and (3) 246,580 s.f. building.

5. Mount Joy Township's official map shows construction of a new local road (Archers Lane) connecting Steel Way with Mt. Pleasant Road. In conjunction with the Griener Development Project, Archers Lane will be constructed and intersect Mt. Pleasant Road directly opposite the proposed western development driveway. The truck route for the development will utilize Archers Lane, with truck traffic coming to/from the Cloverleaf Road/Route 283 intersection using Steel Way to proposed Archers Lane and crossing Mount Pleasant Road directly into the western site driveway (and vice versa). Trucks will be prohibited from turning left or right at the proposed western site driveway/proposed Archers Lane intersection via appropriate signing and restrictive geometry. This designated truck route can safely accommodate truck traffic associated with the proposed development, and implements a connecting link identified on the Township's official map and therefore will not cause access for neighboring properties to be made unsafe or inconvenient.

6. Access for the proposed Greiner Development Project is proposed via the following:

   - One (1) full-movement low-volume driveway (eastern site driveway) to Mt. Pleasant Road (SR 4010), which will serve <u>only passenger cars</u>.

   - One (1) full-movement low-volume driveway (western site driveway to Mt. Pleasant Road (SR 4010), which will be located directly opposite the proposed Steel Way extension (Archers Lane) that will be constructed in conjunction with the development. This access will serve combination trucks and passenger vehicles associated with the warehouse.

7. Upon full build-out, the Greiner Development Project is expected to generate 2,422 new trips during the average weekday, 199 new trips during the weekday A.M peak hour, and 229 new trips during the weekday P.M peak hour.

8. Capacity analyses were conducted to determine the quality of operation (LOS) at the study area intersections for the 2025 existing, 2030 base (no-build) and 2030 projected (build) conditions, and 2035 base and projected conditions. The capacity analyses were conducted in accordance with the standards contained in *Appendix A – Policies and Procedures for Transportation Impact Studies Related to Highway Occupancy Permits* of PennDOT *Publication 282*, dated June 2025 and section 119-32.C of Mount Joy Township's Subdivision and Land Development Ordinance (SALDO) requirements.

9. Levels of Service (LOS) for the study area intersections have been summarized in matrix form. The overall intersection LOS for each study area intersection and condition is detailed in **Table I**.

TABLE I - OVERALL INTERSECTION LEVEL OF SERVICE SUMMARY

Intersection	Time Period	Existing	2030 Opening Year			2035 Horizon Year			Meet LOS Requirements?
			Base	Projected	Projected w/ Imp[1]	Base	Projected	Projected w/ Imp[1]	
Cloverleaf Road (SR 4025) & Mt. Pleasant Road (SR 4010	AM	**A (1.6)**	**A (1.7)**	**A (2.0)**	--	**A (1.7)**	**A (2.0)**	--	Yes
	PM	**A (0.9)**	**A (1.0)**	**A (1.7)**	--	**A (1.0)**	**A (1.7)**	--	Yes
Cloverleaf Road (SR 4025) & Steel Way	AM	**A (0.7)**	**A (0.7)**	**A (1.4)**	**B (18.6)**	**A (0.7)**	**A (1.4)**	**C (20.8)**	Yes
	PM	**A (4.3)**	**A (4.9)**	**B (11.3)**	**C (31.5)**	**A (5.2)**	**B (13.4)**	**C (33.6)**	Yes
Cloverleaf Road (SR 4025) & Route 283 West Ramps	AM	**C (20.1)**	**C (29.8)**	**C (31.4)**	**A (1.6)**	**D (36.1)**	**D (39.1)**	**A (1.7)**	Yes
	PM	**B (19.2)**	**C (26.8)**	**C (32.6)**	**A (1.3)**	**C (30.4)**	**D (37.3)**	**A (1.3)**	Yes
Cloverleaf Road (SR 4025) & Route 283 East Ramps	AM	**A (3.7)**	**A (5.0)**	**B (12.2)**	**A (6.8)**	**A (5.8)**	**B (14.9)**	**A (7.3)**	Yes
	PM	**C (23.5)**	**E (56.1)**	**E (64.5)**	**A (6.2)**	**E (69.8)**	**F (80.2)**	**A (6.3)**	Yes
Cloverleaf Road (SR 4025) & Merts Drive	AM	**A (0.2)**	**A (0.3)**	**A (0.3)**	Eliminate Intersection	**A (0.4)**	**A (0.5)**	Eliminate Intersection	Yes
	PM	**A (0.9)**	**A (2.0)**	**A (2.2)**		**A (2.6)**	**A (2.8)**		Yes
Cloverleaf Road (SR 4025) & Schwanger Road	AM	**C (21.6)**	**C (30.2)**	**C (34.9)**	**C (33.8)**	**D (36.5)**	**D (42.2)**	**D (41.5)**	Yes
	PM	**C (26.8)**	**D (43.2)**	**D (49.3)**	**D (38.1)**	**D (53.7)**	**E (59.9)**	**D (47.7)**	Yes
Schwanger Road/Campus Road & Merts Drive/Schwanger Road	AM	**A (2.7)**	**A (2.8)**	**A (2.8)**	--	**A (2.9)**	**A (2.9)**	--	Yes
	PM	**A (2.9)**	**A (3.1)**	**A (3.1)**	--	**A (3.1)**	**A (3.1)**	--	Yes
Mt. Pleasant Road (SR 4010) & Schwanger Road	AM	**A (2.8)**	**A (2.8)**	**A (3.2)**	--	**A (2.7)**	**A (3.1)**	--	Yes
	PM	**A (2.9)**	**A (2.9)**	**A (2.7)**	--	**A (2.9)**	**A (2.7)**	--	Yes
Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Eastern (Car-Only) Driveway	AM	--	--	**A (2.2)**	--	--	**A (2.2)**	--	Yes
	PM	--	--	**A (3.0)**	--	--	**A (2.9)**	--	Yes
Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Western Driveway/ Archers Lane	AM	--	--	**A (6.3)**	--	--	**A (6.3)**	--	Yes
	PM	--	--	**A (6.2)**	--	--	**A (6.2)**	--	Yes

Base = No-Build scenario *Projected = Build scenario* *ILOS = Overall Intersection Level of Service*

[1] Projected conditions with implementation of improvements recommended in this TIS or in Mount Joy Township's ACT 209 Capital Improvement Plan

10. Under 2030 and 2035 projected conditions, with implementation of the recommended improvements outlined below and/or improvements programmed on Mount Joy Township's Capital Improvement

Plan (associated with the Township's ACT 209 traffic impact fee), all overall intersection level of service (ILOS) will operate in accordance with the standards contained in *Appendix A – Policies and Procedures for Transportation Impact Studies Related to Highway Occupancy Permits* from PennDOT *Publication 282*, dated June 2025, and applicable Township ordinance requirements.

11. Traffic Planning and Design Inc. (TPD) recommends the following roadway improvements as outlined at the study area intersections.

Cloverleaf Road (SR 4025) & Steel Way

- Modify intersection geometry so that tractor-trailers can turn to/from the south without encroaching upon opposing lanes.

Proposed Archers Lane

- Construct a new local road (Archers Lane) connecting Steel Way and Mount Pleasant Road as identified on Mount Joy Township's official map in accordance with applicable Township design/ordinance standards.

Mt. Pleasant Road (SR 4010) & Proposed Western Site Driveway/Proposed Archers Lane

- Construct proposed Archers Lane to Mt. Pleasant Road (SR 4010) in accordance with PennDOT standards for local roads.
- Construct a full-movement, low-volume site driveway to Mt. Pleasant Road (SR 4010) in accordance with PennDOT standards, intersecting Mt. Pleasant Road directly opposite proposed Archers Lane.
- Design the radii for the western driveway and proposed Archer Lane to accommodate the turning movements of passenger vehicles; smaller radii for passenger vehicles will also provide additional visual cues that trucks are not to turn at the intersection from side streets.
- Prohibit turning movements of trucks at intersection (on both western driveway and Steel Way extension approaches) using appropriate signing.
- Erect a "Stop" sign, R1-1, 30"x30" on the egress driveway approach to Mt. Pleasant Road (SR 4010) and egress Steel Way approach to Mt. Pleasant Road (SR 4010).
- Provide and perpetually maintain required sight distances at the proposed driveway.

Mt. Pleasant Road (SR 4010) & Proposed Eastern (Car-Only) Site Driveway

- Construct a full-movement, low-volume driveway to Mt. Pleasant Road (SR 4010) in accordance with PennDOT standards.
- Design the driveway to accommodate the turning movements of passenger cars.
- Erect a "Stop" sign, R1-1, 30"x30" on the egress driveway approach to Mt. Pleasant Road (SR 4010).
- Provide and perpetually maintain required sight distances at the proposed driveway.

Proposed Archers Lane and Steel Way

- Construct proposed Archers Lane to Steel Way in accordance with applicable Township ordinance standards.
- If feasible, widen eastbound Steel Way to provide a 150' left turn lane with 75' bay taper approaching proposed Archers Lane. The left turn lane is not warranted based on typical PennDOT standards but will be implemented if feasible to enhance operation.

ACT 209 Transportation Impact Fee

- Contribute to off-site road improvements through appropriate application of the Mt. Joy Township Transportation Impact Fee. The subject tract is located within the Transportation Service Area TSA, which has an associated fee of $1,766.00 per site-generated weekday P.M. peak hour vehicular trip. This TIS identifies a total PM peak hour trip generation of 229 trips at full build-out, which amounts to a total impact fee of $404,414.

As part of PennDOT's HOP process and the Township's applicable land development approval processes, the applicant will coordinate and fund the implementation of the recommended roadway improvements identified above. ***With implementation of the recommendations in this report, the peak traffic generated by the proposed development will be accommodated in a safe and efficient manner, and development traffic will not cause access to neighboring properties to be made unsafe or inconvenient***.

INTRODUCTION

Traffic Planning and Design, Inc. (TPD) has completed a Transportation Impact Study (TIS) for the proposed Greiner Development Project in Mt. Joy Township, Lancaster County, PA. As shown in **Figure 1-2**, the project site is located along the northern side of Mt. Pleasant Road (SR 4010) between Cloverleaf Road (SR 4025) and Stauffer Road at 2843 Mt. Pleasant Road.

At full build-out, the proposed Greiner Development Project is expected to consist of three (3) warehouse buildings as follows: (1) 603,200 s.f. building; (2) 378,000 s.f. building; and (3) 246,580 s.f. building.

Access for the proposed Greiner Development Project is proposed via the following:

- One (1) full-movement low-volume driveway (eastern site driveway) to Mt. Pleasant Road (SR 4010), which will serve only passenger cars.
- One (1) full-movement low-volume driveway (western site driveway to Mt. Pleasant Road (SR 4010), which will be located directly opposite the proposed Steel Way extension (Archers Lane) that will be constructed in conjunction with the development. This access will serve combination trucks and passenger vehicles associated with the warehouse.

A preliminary sketch plan is provided in **Figure 3**.

This report has been prepared in accordance with PennDOT's *Policies and Procedures for Transportation Impact Studies*, found in PennDOT's Publication 282, Appendix A, dated June 2025 and Section 119-32.C of the Mt. Joy Township Subdivision and Land Development Ordinance (SALDO) and Section 110-901 of the Zoning Ordinance.

EXISTING ROADWAY NETWORK

A field review of the existing roadway system in the study area was conducted. The existing roadway characteristics within the study area are summarized in **Table 1**. Photographs of the study area intersections are included in **Appendix A**.

TABLE 1
ROADWAY CHARACTERISTICS WITHIN STUDY AREA

Roadway	Ownership	Functional Classification/ Roadway Type	Predominant Directional Orientation	Average Daily Traffic	Posted Speed Limit
Cloverleaf Road	State (SR 4025)	Minor Collector[1]	North-South	3,921[1]	35 mph[1]
		Major Collector[2]		4,307[2]	40 mph[2 3]
		Minor Arterial[3]		15,961[3]	
Route 283 West Ramps	Interstate (SR 8013)	Interchange Ramps	East-West	Off 5,630 On 3,897	Not Posted
Route 283 East Ramps	Interstate (SR 8013)	Interchange Ramps	East-West	Off 3,946 On 5,519	Not Posted
Schwanger Road	Township (T-843)	Major Collector	East-West	2,092[4]	35 mph
		Local Road		--	
Campus Road	Township (T-887)	Major Collector	East-West	2,092	35 mph
Mt. Pleasant Road	State (SR 4010)	Local Road [7]/ Collector Road [8]	East-West	725	35 mph[5]
					40 mph[6]
Merts Drive	Township (T-833)	Local Road	East-West	--	30 mph
			North-South	--	35 mph
Steel Way	Township (T-834)	Local Road	East-West	--	30 mph

[1]ADT north of Mt Pleasant
[2]ADT south of Mt Pleasant north of east ramps
[3]ADT south of east ramps
[4]ADT west of Cloverleaf
[5]ADT east of Stauffer Road
[6]ADT west of Stauffer Road
[7] PennDOT classification is local road
[8] Township identifies as collector road

The existing intersection controls, lane configurations, lane widths, shoulder widths and approach grades for the study area intersections are summarized in **Table 2**.

TABLE 2
EXISTING INTERSECTION CONTROLS, LANE WIDTHS, SHOULDER WIDTHS, AND APPROACH GRADES

Intersection	Control	Lane Configuration	Lane Width	Shoulder Width	Approach Grade
Cloverleaf Road (SR 4025) & Mt. Pleasant Road (SR 4010	Stop	WB L/T/R	10′	3′	-1%
	Free	NB L/T/R	11′	5′	1%
		SB L/T/R	11′	2′	-1%
Cloverleaf Road (SR 4025) & Steel Way	Stop	WB L/T/R	14′	4′	-5%
	Free	NB T/R	11′	4′	2%
		SB L/T	11′	4′	-2%
Cloverleaf Road (SR 4025) & Route 283 West Ramps	Signal	WB L/T	11′	3.75′	-2%
	Yield	WB R	10′	3.5′	
	Signal	NB L	11′	--	2%
		NB T	11′	4.5′	
		SB T/R	11′ Channelized Right	0′	-2%
Cloverleaf Road (SR 4025) & Route 283 East Ramps	Stop	EB L	13′	3′	-1%
		EB R	14′ Channelized	3′	
	Free	NB T/R	11′	5′	-1%
		SB L	11′	--	-2%
		SB T	12′	5′	
Cloverleaf Road (SR 4025) & Merts Drive	Stop	EB L/R	13′	4′	0%
	Free	NB L/T	11′	10′	-2%
		SB T/R	11′	7′	1%
Cloverleaf Road (SR 4025) & Schwanger Road	Signal	EB L	10′	--	-5%
		EB T/R	13′	0′	
		WB L	10′	--	3%
		WB T/R	13′	0′	
		NB L	10′	--	-3%
		NB T/R	11′	5′	
		SB L	10′	--	-4%
		SB T/R	11′	5′	
Schwanger Road/Campus Road & Merts Drive/Schwanger Road	Free	EB L	10′	0′	0
		EB T/R	10′	0′	
		WB L	10′	0′	-1
		WB T/R	10′	0′	
	Stop	NB L/T/R	14′	0′	1
		SB L/T/R	20′	0′	-3
Mt. Pleasant Road (SR 4010) & Schwanger Road	Free	EB T/R	10′	0′	-2
		WB L/T	10′	0′	0
	Stop	NB L/R	10′	0′	0

Land Use Context

In PennDOT *Publication 13, Design Manual Part 2 (Contextual Roadway Design), there is* guidance pertaining to defining the land use context(s) for a given area. Based upon review of this information, the study area surrounding the proposed site is a mixture of rural and suburban contexts.

Roadway Type

PennDOT *Publication 13, Design Manual Part 2 (Contextual Roadway Design), contains* guidance pertaining to defining the transportation context(s) for a given area. Comparing the existing condition roadway characteristics to the various options presented in this document, the study area roadways best fit the following designations:

Arterial, corridors of regional importance connection large centers of activity.

- Cloverleaf Road (SR 4025) – South of Route 283 West Ramps;

Collector, corridors of lower community importance proving connections between arterials and local roads:

- Cloverleaf Road (SR 4025) – North of Route 283 West Ramps;
- Schwanger Road – West of Cloverleaf Road (SR 4025);
- Campus Road.
- Mt. Pleasant Road (Township classification of road)

Local Road, roadways with no regional importance, providing local circulation and access:

- Schwanger Road – East of Cloverleaf Road (SR 4025);
- Mt. Pleasant Road (SR 4010) – PennDOT functional classification of road;
- Merts Drive;
- Steel Way;

Bicycle and Pedestrian Facilities

Based on field observations at the study area intersections, paved shoulders and/or travel lanes currently accommodate pedestrian and bicycle traffic in the vicinity of the proposed development. The traffic signals are generally equipped with pedestrian signals and crosswalks except where pedestrian crossings are prohibited via signage. The proposed development will not adversely impact existing pedestrian or bicycle facilities.

Mass Transit Facilities

Lancaster County and Mt. Joy Township are provided with mass-transit accommodations via Red Rose Transit (RRTA)/South Central Transit Authority (SCTA). Route 18 (Elizabethtown/Mount Joy) currently operates along the study area with the nearest scheduled stop at the intersection of Main Street (SR 0230) and Cloverleaf Road (SR 4025). An unofficial Park-N-Ride lot exists on the southwestern corner of the Route 283 East Off-Ramp approach to Cloverleaf Road (SR 4025).

Coordinated Traffic Signal System

Coordinated traffic signal systems currently exist along the Cloverleaf Road (SR 4025) corridor. Details of the coordinated traffic signal system are provided below.

- **Cloverleaf Road (SR 4025):** The Cloverleaf Road coordinated traffic signal system includes four (4) signalized intersections along the corridor between the intersections of Main Street/Market Street (SR 0230) to the 283 westbound off ramps. The master controller is located at the intersection of Cloverleaf Road (SR 4025) & Schwanger Road.

EXISTING TRAFFIC CONDITIONS

Average Daily Traffic

The existing Average Daily Traffic (ADT) volumes are based on data obtained from Automatic Traffic Recorders (ATR) or PennDOT Traffic Information Repository (TIRe) website. Where applicable, the traffic volume map contained on the PennDOT TIRe website was reviewed in October 2025 to determine the Average Daily Traffic (ADT) for a typical weekday along the State-maintained roadways in the vicinity of the proposed site. The existing ADT volumes are shown on **Table 1**. Based on the collected ADT volumes, weekday volumes on Cloverleaf, Mount Pleasant Road, and Schwanger Road are substantially higher during the weekdays than during Saturday or Sunday. As such, evaluation of the weekday, weekday AM and weekday PM peak hours is appropriate for this TIS since it represents worst-case (i.e. highest volume) conditions and better measures the impacts of the proposed use. Related ATR data, along with a comparison between weekday and Saturday/Sunday existing volumes, is provided in **Appendix B**.

Manual Turning Movement Counts

Manual traffic counts were conducted in 15-minute intervals during the weekday morning (6:00 to 9:00 A.M.), weekday evening (3:00 to 6:00 P.M) peak hours. Data pertaining to heavy vehicles, pedestrians and right turn on reds were observed during the manual counts. Peak hours and count dates for the study area intersections are identified in **Table 3**.

TABLE 3
MANUAL TRAFFIC COUNT INFORMATION

Intersection	Date of Traffic Counts	Time Period	Intersection Peak Hour1
Cloverleaf Road (SR 4025) & Mt. Pleasant Road (SR 4010)	Wednesday, October 8, 2025	Weekday A.M.	7:00 to 8:00 A.M.
		Weekday P.M.	4:30 to 5:30 P.M.
Cloverleaf Road (SR 4025) & Steel Way	Wednesday, October 8, 2025	Weekday A.M.	6:45 to 7:45 A.M.
		Weekday P.M.	3:30 to 3:30 P.M.
Cloverleaf Road (SR 4025) & Route 283 West Ramps	Wednesday, October 8, 2025	Weekday A.M.	7:00 to 8:00 A.M.
		Weekday P.M.	4:15 to 5:15 P.M.
Cloverleaf Road (SR 4025) & Route 283 East Ramps	Wednesday, October 8, 2025	Weekday A.M.	7:00 to 8:00 A.M.
		Weekday P.M.	4:15 to 5:15 P.M.
Cloverleaf Road (SR 4025) & Merts Drive	Wednesday, October 14, 2025	Weekday A.M.	7:00 to 8:00 A.M.
		Weekday P.M.	4:15 to 5:15 P.M.
Cloverleaf Road (SR 4025) & Schwanger Road	Wednesday, October 14, 2025	Weekday A.M.	7:00 to 8:00 A.M.
		Weekday P.M.	4:15 to 5:15 P.M.
Schwanger Road/Campus Road & Merts Drive/Schwanger Road	Wednesday, October 14, 2025	Weekday A.M.	7:00 to 8:00 A.M.
		Weekday P.M.	3:30 to 4:30 P.M.
Mt. Pleasant Road (SR 4010) & Schwanger Road	Wednesday, October 14, 2025	Weekday A.M.	7:15 to 8:15 A.M.
		Weekday P.M.	3:30 to 4:30 P.M.

[1]Peak Hour consists of the four consecutive 15-minute intervals where the highest traffic volumes occur.

The existing condition traffic volumes for the weekday A.M. and weekday P.M. peak hours are illustrated in **Figure 5**. Traffic volumes were balanced along Cloverleaf Road (SR 4025) from Route 283 West Ramps to the Merts Drive as appropriate. Manual traffic count data sheets are provided in **Appendix B**.

BASE (NO-BUILD) CONDITIONS

Annual Background Growth

A background growth factor for the roadways in the study area was developed based on growth factors for August 2025 to July 2026 obtained from the PennDOT Bureau of Planning and Research (BPR). The PennDOT BPR suggests using a background growth trend factor of 0.46% per year in Lancaster County for urban non-interstate roadways. As such, a background growth factor was applied annually to yield overall growth percentages for the 2030 opening year of the development and 2035 design year of the development. To provide for a conservative assessment that accounts for growth in the area not identified in the Nearby Proposed Developments section (below), TPD assumed 10% background growth for the 2030 opening year and 15% for the 2035 design year, ***which is substantially more conservative than PennDOT's annual growth rate noted above.***

Nearby Proposed Developments

Base (no-build) traffic conditions were calculated to include traffic volumes from proposed developments, which, though not operating under existing conditions, may be operating by the opening year (2030) of the proposed development. Based on TPD's knowledge of the area the following nearby developments were included in this analysis:

- **156 Harrisburg Avenue Warehouse** is a proposed warehouse building totaling 392,040 s.f. along the south side of W. Harrisburg Avenue (SR 4018). Trip generation and distributions for the proposed site were obtained from TPD's TIA, dated 9/21/2022 Trip distributions for this background development are shown in **Appendix C**.

- **Westmount Residential Development** is a proposed residential development (288 dwelling units) located to the north of Harrisburg Avenue (SR 4018), just east of Nolt Road. Trip generation and distributions for the proposed site were obtained from TRG's TIS for Proposed Westmount Development, dated November 2022. Trip distributions for this background development are shown in **Appendix C**.

- **Westbrooke IV – Phase 1** is a proposed residential development located to the north of Market Street (SR 0230), adjacent to Andrew Avenue. Trip generation and distributions for the proposed site were obtained from ELA Group's Traffic Impact Assessment for the Westbrooke IV – Phase 1 Residential Development, dated May 2018. Trip distributions for this background development are shown in **Appendix C**.

The total nearby development trips were combined and are shown on **Figure 6**. The additional traffic volumes due to background growth and nearby developments were added to the existing traffic data to produce 2030 and 2035 base (no-build) condition traffic volumes. Base condition volumes for the weekday A.M. and weekday P.M. peak hours are illustrated in **Figure 7** for the 2030 opening year conditions and **Figure 8** for the 2035 design year conditions.

SCHEDULED ROADWAY IMPROVEMENTS

Programmed Improvements

Based on a review of the Transportation Improvement Program (TIP) for PennDOT and the Lancaster County Planning Commission, there are no programmed roadway improvement projects within the study area.

Capital Improvement Plan

The Township has a Capital Improvement Plan (CIP) that was established in conjunction with the ACT 209 traffic impact fee. The CIP includes significant improvements within the study area for this TIS; the Township's CIP is summarized here: https://www.mtjoytwp.org/wp-content/uploads/2019/04/Capital-Improvements-Plan-2016.pdf

PROPOSED SITE ACCESS

Access for the proposed Greiner Development Project is proposed via the following:

- One (1) full-movement low-volume driveway (eastern site driveway) to Mt. Pleasant Road (SR 4010), which will serve only passenger cars.
- One (1) full-movement low-volume driveway (western site driveway to Mt. Pleasant Road (SR 4010), which will be located directly opposite the proposed Steel Way extension (Archers Lane) that will be constructed in conjunction with the development. This access will serve combination trucks and passenger vehicles associated with the warehouse.

Sight Distance Analysis

A sight distance analysis was prepared for the proposed site driveway locations and proposed Archers Lane extension. In general, recommended safe sight distances depend upon the posted speed limit and roadway grades. The existing sight distances at the proposed driveway was measured in accordance with PennDOT Publication 282 Highway Occupancy Permit Guidelines and compared to PennDOT's desirable sight distance standard, which is identified in 67 PA Code Chapter 441.8(h), "Access to and Occupancy of Highways by Driveways and Local Roads." The study was also compared to AASHTO's intersection sight distance standard, which is identified in Chapter 9.5 of the "A Policy on Geometric Design of Highways and Streets", 2018 7th Edition. In addition, measured sight distances were compared to PennDOT's safe stopping sight distance standard, which is calculated by the following equation:

$$\mathbf{SSSD = 1.47VT + V^2/[30(f \pm g)]}$$

SSSD = safe stopping sight distance (acceptable sight distance)
V = Vehicle Speed
T = Perception Reaction Time of Driver (2.5 seconds)
f = Coefficient of Friction for Wet Pavements
g = Percent of Roadway Grade Divided by 100

Table 4 shows the measured, desirable (DES), AASHTO's Intersection Sight Distance (ISD), and acceptable (SSSD) sight distances at the site driveway for vehicles entering and exiting the site.

TABLE 4
SIGHT DISTANCE ANALYSIS

Movement	Direction	Posted Speed	Grade1	Sight Distances (feet)			
				DES Cars/Trucks	ISD Cars/Trucks	SSSD	EXIST Cars/Trucks
Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Eastern (Car-Only) Driveway							
Exiting Movements	To the left	40 mph	3%	538′	N/A	299	600′+
	To the right	40 mph	3%	460′	N/A	299	600′+
Entering Left Turns	Approaching same direction	40 mph	3%	--	N/A	299	600′+
	Approaching opposite direction	40 mph	3%	373′	N/A	299	600′+
Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Western Driveway							
Exiting Movements	To the left	40 mph	0%	N/A	445′/680′	314′	1000′+
	To the right	40 mph	-1%	N/A	445′/680′	319′	750′
Entering Left Turns	Approaching same direction	40 mph	-1%	N/A	--	319′	750′
	Approaching opposite direction	40 mph	0%	N/A	325′/445′	314′	1000′+
Mt. Pleasant Road (SR 4010) & Proposed Archers Lane							
Exiting Movements	To the left	40 mph	0%	N/A	445′/680′	314′	750′
	To the right	40 mph	0%	N/A	445′/680′	314′	1000′+
Entering Left Turns	Approaching same direction	40 mph	0%	N/A	--	314′	1000′+
	Approaching opposite direction	40 mph	0%	N/A	325′/445′	314′	750′
Steel Way & Proposed Archers Lane							
Exiting Movements	To the left	30 mph	2%	N/A	N/A	191′	500′+
	To the right	30 mph	-5%	N/A	N/A	210′	350′
Entering Left Turns	Approaching same direction	30 mph	-5%	N/A	N/A	210′	400′
	Approaching opposite direction	30 mph	2%	N/A	N/A	191′	500′+

DES =PennDOT Desirable Criteria
ISD = AASHTO's Intersection Sight Distance
SSSD = PennDOT Acceptable Sight Distance/Twp SSSD standard
1 = Roadway Grade Approaching Driveway
EXIST = Existing (measured) Sight Distance

As shown in **Table 4** above, the measured sight distances at the site driveway locations exceed PennDOT/AASHTO or Township standards, as applicable.

TRIP GENERATION

The trip generation equations for the proposed development were obtained from the *Trip Generation Manual*, 12th Edition, an Institute of Transportation Engineers (ITE) Informational Report. The data are categorized by Land Use Codes, with total vehicular trips for a given land use estimated using an independent variable and statistically generated rates or equations.

For the proposed warehouse development, Land Use Code 150 (Warehousing), and 154 (High-Cube Transload and Short-Term Storage Warehouse) from the Trip Generation Manual was used to calculate the number of vehicular trips the development will generate during the following time periods: (1) average weekday; (2) weekday A.M. peak hour and (3) weekday P.M. peak hour. The following should be noted regarding trip generation:

- Land use code 150 (Warehousing) was filtered by region (Northeast & Mid-Atlantic) for the data set under 500,000 s.f. This method was utilized as required by PennDOT Publication 282, Appendix A (Attachment H).
    - New truck trips for AM and PM land use code 150 (Warehousing) followed the filtered 11th edition data/PennDOT's Publication 282/Attachment H requirements because the 12th edition does not currently have the capacity to create filtered peak hour truck data at the time of analysis for this TIS. ITE correspondence is provided within **Appendix D** with the trip generation data. ITE 12th edition truck data has since been issued for the filtered data set, but the 11th edition truck trip percentages were maintained in the TIS since they are more conservative.

Table 5 shows the trip generation equations and directional split for the analyzed time periods. It should be noted that PennDOT has established a statewide methodology for calculating trip generation for speculative warehouse development; this methodology is identified in Appendix A/Attachment H of PennDOT's Publication 282, dated June 2025, ***which is identified as PennDOT's best practice guidance for speculative warehouse facilities based on the findings of a PennDOT study***. This methodology is a trip generation policy that PennDOT implements statewide for speculative warehousing. **This TIS has been prepared in accordance with PennDOT's statewide best practice guidance for speculative warehouse trip generation**. It should also be noted that PennDOT's Appendix A/Attachment H guidance for speculative warehouse in Publication 282 was issued before ITE issued the 12th Edition of the *Trip Generation Manual* in August 2025. TPD confirmed with PennDOT District 8-0 personnel that the methodology/flow charts identified in Appendix A/Attachment H for speculative warehousing are still applicable and can be updated to incorporate the current ITE *Trip Generation Manual* data from the 12th edition, which is the methodology TPD followed for trip generation in this TIS. Relevant correspondence with PennDOT District 8-0 confirming trip generation requirements for speculative warehousing is provided **Appendix D**.

TABLE 5
ITE TRIP GENERATION DATA – TOTAL SITE TRIPS

Land Use	ITE #	Time Period	Trip Type	Average Rate	Directional Splits	
					Enter %	Exit %
Warehousing	150 [1]	Average Weekday	All Vehicular	T = 2.52 * (X)	50%	50%
			Truck	T = 0.40 * (X)	50%	50%
		A.M. Peak Hour	All Vehicular	T = 0.24*(X)	71%	29%
			Truck	T = 0.05 * (X)	56%	44%
		P.M. Peak Hour	All Vehicular	T = 0.27*(X)	27%	73%
			Truck	T = 0.06 * (X)	53%	47%
High-Cube Transload and Short-Term Storage	154	Average Weekday	All Vehicular	T = 1.40 * (X)	50%	50%
			Truck	T = 0.22 * (X)	50%	50%
		A.M. Peak Hour	All Vehicular	T = 0.08 * (X)	77%	23%
			Truck	T = 0.02 * (X)	49%	51%
		P.M. Peak Hour	All Vehicular	T = 0.10*(X)	28%	72%
			Truck	T = 0.01 * (X)	47%	53%

T = number of site-generated trips *X = independent variable (1000 s.f. of gross floor area)*

[1] Filtered for Northeast/Mid-Atlantic Region for data points under 500 ksf to total trip generation; filtered Truck data taken from 11th edition since related data in the 12th edition was not available at time of analysis; 12th edition truck data has since been issued for the filtered data set, but the 11th edition truck trip percentages were maintained since they are more conservative

The truck traffic volumes were deducted from the total warehouse trip generation to yield the passenger car traffic volumes. The calculated trip generation for the proposed development is shown in **Table 6**.

TABLE 6
TRIP GENERATION SUMMARY

Land Use	Size (X)	Trips: Total			Trips: Trucks			Trips: Passenger Cars		
		Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit
Average Weekday										
Building #1 (LUC 154)	603.2 ksf	844	422	422	133	66	67	711	356	355
Building #2 (LUC 150)	378 ksf	953	476	477	151	76	75	802	400	402
Building #3 (LUC 150)	248 ksf [1]	625	312	313	99	50	49	526	262	264
Total	**--**	**2422**	**1210**	**1212**	**383**	**192**	**191**	**2039**	**1018**	**1021**
A.M. Peak Hour										
Building #1 (LUC 154)	603.2 ksf	48	37	11	12	6	6	36	31	5
Building #2 (LUC 150)	378 ksf	91	64	27	19	11	8	72	53	19
Building #3 (LUC 150)	248 ksf [1]	60	42	18	12	7	5	48	35	13
Total	**--**	**199**	**143**	**56**	**43**	**24**	**19**	**156**	**119**	**37**
P.M. Peak Hour										
Building #1 (LUC 154)	603.2 ksf	60	17	43	6	3	3	54	14	40
Building #2 (LUC 150)	378 ksf	102	28	74	23	12	11	79	16	63
Building #3 (LUC 150)	248 ksf [1]	67	18	49	15	8	7	52	10	42
Total	**--**	**229**	**63**	**166**	**44**	**23**	**21**	**185**	**40**	**145**

[1] At time of analysis, building was 248 ksf; current site plan shows a slightly smaller footprint, but the 248 ksf was maintained for trip generation to provide a conservative assessment.

Based on the trip generation analysis summarized in **Table 6**, the Greiner Development Project will generate approximately 199 new trips during the weekday A.M. peak hour, and 229 new trips during the weekday P.M. peak hour peak hour at full build out. ITE correspondence and related trip generation data is provided within **Appendix D**.

Note: Trip generation was also evaluated for the Average Saturday, Average Sunday, Peak Hour of Generator Saturday and Peak Hour of Generator Sunday. The methodologies for this evaluation followed ITE LUC 150 and 154 data as available. Based on this analysis the trips generated during the Saturday and Sunday time periods are significantly less than the weekday AM or PM peak hours. Trip generation calculations are provided within **Appendix D**.

TRIP DISTRIBUTION

New Trips (Passenger Cars)

The distribution of new passenger car trips generated by the proposed development were determined using a gravity model based on where employees who are employed within the municipality reside. The trip assignments were further refined based on the following: (1) proximity to the major routes/interstates; (2) available routes for travel; (3) the proposed driveway locations and configurations; and (4) shortest travel time and/or distance when multiple routes were available.

New Trips (Trucks)

The distribution of truck trips was calculated based on the existing heavy vehicle traffic patterns at the Route 283 interchange ramps, specifically turning movements on/off the ramps. It is anticipated that truck traffic will exclusively use Cloverleaf Road to/from Route 283 ramps based on the proposed site location. From the interchange, trucks will travel to/from Steel Way to proposed Archers Lane and enter/exit the development at the western site driveway.

The new vehicle trips for the proposed warehouses will be distributed to the local roadway network based on the percentages shown in **Table 7**.

TABLE 7
TRIP DISTRIBUTION PERCENTAGES – NEW TRIPS

Direction To/From	Assignment (To/From)	Distribution Percentage (%), Weekday, Weekday Peaks	
		Passenger Cars	Trucks
East	via Route 283	32%	56%
	via Mt. Pleasant Road (SR 4010)	5%	--
West	via Route 283	19%	44%
	via Campus Road	6%	--
North	via Cloverleaf Road (SR 4025)	8%	--
South	via Colebrook Road (SR 4025)	30%	--

The distribution percentages and assignments for site-generated trips for the proposed development are shown in **Figures 9-13.**

PROJECTED (BUILD) CONDITION TRAFFIC VOLUMES

The site-generated trips for the proposed development were added to the 2030 and 2035 base (no-build) condition traffic volumes to calculate 2030 and 2035 projected (build) condition traffic volumes. Projected condition traffic volumes are shown in **Figure 14** for the 2030 opening and are shown in **Figure 15** for the 2035 design year for the weekday A.M. and weekday P.M. peak hours.

Traffic volume development worksheets for the study area intersections are contained in **Appendix E**.

LEVELS OF SERVICE FOR AN INTERSECTION

For analysis of intersections, level of service is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. LOS criteria is stated in terms of control delay per vehicle for a one-hour analysis period. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The criteria are shown in **Table 8**. Delay, as it relates to level of service, is a complex measure and is dependent upon a number of variables. For signalized intersections, these variables include the quality of vehicle progression, the cycle length, the green time ratio, and the volume/capacity ratio for the lane group in question. For unsignalized intersections, delay is related to the availability of gaps in the flow of traffic on the major street and the driver's discretion in selecting an appropriate gap for a particular movement from the minor street (straight across, left or right turn).

TABLE 8
LEVEL OF SERVICE CRITERIA
UNSIGNALIZED AND SIGNALIZED INTERSECTIONS [1]

Level of Service	Control Delay Per Vehicle (Seconds)	
	Signalized	Unsignalized
A	< 10	< 10
B	> 10 and < 20	> 10 and < 15
C	> 20 and < 35	> 15 and < 25
D	> 35 and < 55	> 25 and < 35
E	> 55 and < 80	> 35 and < 50
F	> 80 or v/c > 1.0	> 50 or v/c > 1.0

[1] Obtained from the Transportation Research Board's Highway Capacity Manual, 7th Edition

CAPACITY ANALYSIS METHODOLOGY

Capacity analyses were conducted for the weekday A.M. and P.M. peak hours at the study area intersections. These analyses were conducted according to the methodologies contained in the *Highway Capacity Manual 7th Edition* (HCM) using *Synchro 12* software (version 12.2, build 4, revision 32), a Trafficware product.

The following conditions were analyzed, as applicable:

- 2025 Existing conditions;
- 2030 Base conditions (Build-out year/opening year without development);
- 2030 Projected conditions (Build-out year/opening year with full build-out of proposed development);
- 2030 Projected conditions with improvements (Build-out/opening year with construction of recommended improvements or Township's Capital Improvement Plan);
- 2035 Base conditions (Design year without development);
- 2035 Projected conditions (Design year with full build-out of proposed development);
- 2035 Projected conditions with improvements (Design year with construction of recommended improvements or Township's Capital Improvement Plan).

The following items should be noted with respect to the capacity analyses:

- The Pennsylvania default values for signalized intersections in a suburban land use context contained in Chapter 10 of PennDOT's *Publication 46* were utilized for the base saturation flow rate (1800 pcphpl), start-up lost time (2.5 seconds), extension of effective green time (3.5 seconds) and number of left turn sneakers (2 vehicles).

- The Pennsylvania default values for two-way stop controlled intersections in a suburban land use context contained in Chapter 10 of PennDOT's *Publication 46* were utilized for the base critical headway and base follow-up headways. Worksheets related to the calculated critical and follow-up headways are included at the beginning of **Appendix F**.
- Heavy vehicle percentages were adjusted for the future base and projected condition scenarios, as applicable. To be conservative the 2030 percentages were applied to the 2035 conditions.
- Per PennDOT TIS standards, the signal timings at the study area intersections were optimized under the base (no-build) conditions. If further signal timing optimization is needed due to the impact of the proposed development, the optimized timings were applied to the projected build) with improvements conditions. The PennDOT signal permit plans are provided in **Appendix H**.
- Link Origin-Destination volumes were adjusted in Synchro at the Cloverleaf Rd. (SR 4025) intersections with I-283 east and west ramps, as applicable.
- Due to limitations within HCM 7th Edition with respect to the Non-NEMA signal phasing, Synchro percentile delay methodology were utilized to obtain LOS and queue results as appliable.
- Road segment analysis was conducted for the street abutting the site (Mt. Pleasant Road). Related road segment analysis results are provided in **Appendix K**; all road segment LOS will operate within acceptable ranges per Township ordinance requirements through 2035 projected conditions.

In addition, capacity analyses were conducted at the proposed site driveway intersections under the 2030 and 2035 projected conditions. The capacity analysis worksheets are included in **Appendix F**.

PennDOT Standards

PennDOT's Transportation Impact Study Guidelines outlined in PennDOT's Policies and Procedures for Transportation Impact Studies, found in PennDOT's Publication 282, Appendix A, dated February 2024 contain the following criteria regarding levels of service:

- Page 38 of the Guidelines state that if evaluation of the With Development Design Year Scenario to the Without Development Design Year Scenario indicates that the overall intersection level of service has dropped, the applicant will be required to mitigate the level of service if the increase in overall intersection delay is greater than 10-seconds. If the overall intersection delay increase is less than or equal to 10-seconds, mitigation of the intersection will not be required. If the intersection level of service meets the level of service requirements, applicants may still be required to provide mitigation to address critical lanes or approaches. For locations where the level of service of the design year without the development is LOS F and with development, the delay increases more than 10 seconds, the remedies shall provide an estimated delay which will be no worse than the delay for the design year without the development.
- Page 39 of the Guidelines state that for mitigation scenarios, applicants are expected to mitigate the overall intersection LOS to the original Without Development LOS; the 10-second delay variance is not applied to mitigation scenarios. Applicants may be required to address available storage and queue lengths at critical movements or approaches even if the overall LOS requirements are met.
- Page 41 of the Guidelines state that if signalization is the preferred alternative for mitigation, overall intersection LOS C in rural areas and LOS D in urban areas is acceptable.
- Page 41 of the Guidelines states new signalized or unsignalized intersections established to serve as access to the development shall be designed to operate at minimum LOS C for rural areas, and minimum LOS D for urban areas.

Mt. Joy Township Standards

Section 119-32.C of the Mt. Joy Township SALDO contains the following specific requirements related to future condition levels of service:

- If the level of service on an abutting street, major intersection, or lane group of any major intersection within the TISA is presently "D" or worse or is projected to be "D" or worse in the design year and the traffic impact study determines that the level of service shall be reduced, or if the level of service is projected to be "F" and the delay increases, then descriptions of the street improvements and traffic control devices then will be required to restore the level of service to that level of service and delay existing prior to the development of the tract. *The applicant shall specify whether such improvements are programmed within the Township's adopted Roadway Sufficiency Analysis and Transportation Capital Improvements Plan. If the necessary improvements are programmed by the Roadway Sufficiency Analysis and Transportation Capital Improvements Plan, the applicant may consider those improvements as to be constructed by others*. If the necessary improvements are not programmed within the Roadway Sufficiency Analysis and Transportation Capital Improvements Plan, the applicant shall address whether the levels of service may be maintained by revising traffic regulations, reducing the level of intensity of the proposed development or by any other means.

LEVELS OF SERVICE IN THE STUDY AREA

Level of service (LOS) matrices for the study area intersections are shown in **Tables 9-10** for the weekday A.M. and weekday P.M. peak hours, respectively.

TABLE 9:
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY – A.M. PEAK

Intersection	Movement	Existing Conditions	2030 Opening Year			2035 Horizon Year		
			Base	Projected	Proj. w/ Imp[1]	Base	Projected	Proj. w/ Imp[1]
Cloverleaf Road (SR 4025) & Mt. Pleasant Road (SR 4010	WB L/R	B	B	B	--	B	B	--
	SB L/T	A	A	A	--	A	A	--
	ILOS	**A (1.6)**	**A (1.7)**	**A (2.0)**	--	**A (1.7)**	**A (2.0)**	--
Cloverleaf Road (SR 4025) & Steel Way[2]	EB R	--	--	--	A	--	--	A
	WB L/R, WB L/T/R	B	B	B	D	B	B	D
	NB L	--	--	--	B	--	--	C
	NB T/R	--	--	--	A	--	--	A
	SB L/T: SB L	A	A	A	C	A	A	C
	SB L/T: SB T/R				D			D
	ILOS	**A (0.7)**	**A (0.7)**	**A (1.4)**	**B (18.6)**	**A (0.7)**	**A (1.4)**	**C (20.8)**
Cloverleaf Road (SR 4025) & Route 283 West Ramps	WB L/T	C	D	D	--	D	D	--
	WB R	A	A	A	B	A	A	C
	NB L	B	C	C	--	D	D	--
	NB T	A	A	A	--	A	A	--
	SB T/R	C	D	D	--	D	D	--
	ILOS	**C (20.1)**	**C (29.8)**	**C (31.4)**	**A (1.6)**	**D (36.1)**	**D (39.1)**	**A (1.7)**
Cloverleaf Road (SR 4025) & Route 283 East Ramps	EB L/T	E	F	F	C	F	F	C
	EB R	C	C	C	A	C	C	A
	NB T/R	--	--	--	A	--	--	A
	SB L	B	B	B	B	B	C	B
	SB T	--	--	--	A	--	--	A
	ILOS	**A (3.7)**	**A (5.0)**	**B (12.2)**	**A (6.8)**	**A (5.8)**	**B (14.9)**	**A (7.3)**
Cloverleaf Road (SR 4025) & Merts Drive	EB L/R	D	E	E	Eliminate Intersection	F	F	Eliminate Intersection
	NB L/T	B	B	B		B	B	
	ILOS	**A (0.2)**	**A (0.3)**	**A (0.3)**		**A (0.4)**	**A (0.5)**	
Cloverleaf Road (SR 4025) & Schwanger Road	EB L	C	D	D	D	D	D	D
	EB T/R	B	C	C	B	C	C	B
	WB L	B	C	C	B	C	C	B
	WB T/R	B	C	C	B	C	C	B
	NB L	B	C	C	B	C	C	C
	NB T/R	C	D	F	F	F	F	F
	SB L	C	D	D	C	D	D	C
	SB T/R	B	B	B	B	B	B	B
	ILOS	**C (21.6)**	**C (30.2)**	**C (34.9)**	**C (33.8)**	**D (36.5)**	**D (42.2)**	**D (41.5)**

Base = No-Build scenario Projected = Build scenario ILOS = Overall Intersection Level of Service

Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies.

[1] Projected conditions with implementation of improvements recommended in this TIS or in Mount Joy Township's ACT 209 Capital Improvement Plans

[2] HCM 7th unable to determine LOS due to Non-NEMA phasing, synchro percentile delay methodology provided

TABLE 9 CONTINUED:
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY – A.M. PEAK

Intersection	Movement	Existing Conditions	2030 Opening Year			2035 Horizon Year		
			Base	Projected	Proj. w/ Imp[1]	Base	Projected	Proj. w/ Imp[1]
Schwanger Road/Campus Road & Merts Drive/Schwanger Road	EB L	A	A	A	--	A	A	--
	WB L	A	A	A	--	A	A	--
	NB L/T/R	B	B	B	--	B	B	--
	SB L/T/R	B	B	B	--	B	B	--
	ILOS	**A (2.7)**	**A (2.8)**	**A (2.8)**	--	**A (2.9)**	**A (2.9)**	--
Mt. Pleasant Road (SR 4010) & Schwanger Road	NB L/R	A	A	A	--	A	A	--
	WB L/T	A	A	A	--	A	A	--
	ILOS	**A (2.8)**	**A (2.8)**	**A (3.2)**	--	**A (2.7)**	**A (3.1)**	--
Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Eastern (Car-Only) Driveway	EB L/T	--	--	A	--	--	A	--
	SB L/R	--	--	A	--	--	A	--
	ILOS	--	--	**A (2.2)**	--	--	**A (2.2)**	--
Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Western Driveway/ Archers Lane	EB L/T/R	--	--	A	--	--	A	--
	WB L/T/R	--	--	A	--	--	A	--
	NB L/T/R	--	--	B	--	--	B	--
	SB L/T/R	--	--	B	--	--	B	--
	ILOS	--	--	**A (6.3)**	--	--	**A (6.3)**	--

Base = No-Build scenario Projected = Build scenario ILOS = Overall Intersection Level of Service
Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies.
[1] Projected conditions with implementation of improvements recommended in this TIS or in Mount Joy Township's ACT 209 Capital Improvement Plans

TABLE 10:
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY – P.M. PEAK

Intersection	Movement	Existing Conditions	2030 Opening Year			2035 Horizon Year		
			Base	Projected	Proj. w/ Imp[1]	Base	Projected	Proj. w/ Imp[1]
Cloverleaf Road (SR 4025) & Mt. Pleasant Road (SR 4010	WB L/R	B	B	B	--	B	B	--
	SB L/T	A	A	A	--	A	A	--
	ILOS	**A (0.9)**	**A (1.0)**	**A (1.7)**	--	**A (1.0)**	**A (1.7)**	--
Cloverleaf Road (SR 4025) & Steel Way[2]	EB R	--	--	--	D	--	--	D
	WB L/R, WB L/T/R	B	C	D	D	C	E	D
	NB L	--	--	--	C	--	--	D
	NB T/R	--	--	--	B	--	--	B
	SB L/T: SB L	A	A	A	C	A	A	C
	SB L/T: SB T/R				C			C
	ILOS	**A (4.3)**	**A (4.9)**	**B (11.3)**	**C (31.5)**	**A (5.2)**	**B (13.4)**	**C (33.6)**
Cloverleaf Road (SR 4025) & Route 283 West Ramps	WB L/T	C	C	D	--	D	D	--
	WB R	A	A	A	B	A	A	B
	NB L	B	C	C	--	C	C	--
	NB T	B	B	B	--	B	B	--
	SB R	C	D	D	--	D	D	--
	ILOS	**B (19.2)**	**C (26.8)**	**C (32.6)**	**A (1.3)**	**C (30.4)**	**D (37.3)**	**A (1.3)**
Cloverleaf Road (SR 4025) & Route 283 East Ramps	EB L/T	D	F	F	B	F	F	B
	EB R	F	F	F	A	F	F	A
	NB T/R	--	--	--	A	--	--	A
	SB L	A	A	B	A	B	B	A
	SB T	--	--	--	A	--	--	A
	ILOS	**C (23.5)**	**E (56.1)**	**E (64.5)**	**A (6.2)**	**E (69.8)**	**F (80.2)**	**A (6.3)**
Cloverleaf Road (SR 4025) & Merts Drive	EB L/R	F	F	F	Eliminate Intersection	F	F	Eliminate Intersection
	NB L/T	B	B	C		C	C	
	ILOS	**A (0.9)**	**A (2.0)**	**A (2.2)**		**A (2.6)**	**A (2.8)**	
Cloverleaf Road (SR 4025) & Schwanger Road	EB L	C	C	C	D	C	C	D
	EB T/R	C	C	C	C	C	C	C
	WB L	C	C	C	C	C	C	C
	WB T/R	C	C	C	C	C	C	C
	NB L	D	D	D	D	D	D	D
	NB T/R	A	A	A	A	A	A	A
	SB L	B	B	B	A	B	B	B
	SB T/R	D	F	F	F	F	F	F
	ILOS	**C (26.8)**	**D (43.2)**	**D (49.3)**	**D (38.1)**	**D (53.7)**	**E (59.9)**	**D (47.7)**

Base = No-Build scenario Projected = Build scenario ILOS = Overall Intersection Level of Service
Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies.
[1] Projected conditions with implementation of improvements recommended in this TIS or in Mount Joy Township's ACT 209 Capital Improvement Plans
[2] HCM 7th unable to determine LOS due to Non-NEMA phasing, synchro percentile delay methodology provided

TABLE 10 CONTINUED:
LEVEL OF SERVICE DELAY (SECONDS) SUMMARY – P.M. PEAK

Intersection	Movement	Existing Conditions	2030 Opening Year			2035 Horizon Year		
			Base	Projected	Proj. w/ Imp	Base	Projected	Proj. w/ Imp
Schwanger Road/Campus Road & Merts Drive/Schwanger Road	EB L	A	A	A	--	A	A	--
	WB L	A	A	A	--	A	A	--
	NB L/T/R	B	B	B	--	B	B	--
	SB L/T/R	B	C	C	--	C	C	--
	ILOS	**A (2.9)**	**A (3.1)**	**A (3.1)**	--	**A (3.1)**	**A (3.1)**	--
Mt. Pleasant Road (SR 4010) & Schwanger Road	NB L/R	A	A	A	--	A	A	--
	WB L/T	A	A	A	--	A	A	--
	ILOS	**A (2.9)**	**A (2.9)**	**A (2.7)**	--	**A (2.9)**	**A (2.7)**	--
Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Eastern (Car-Only) Driveway	EB L/T	--	--	A	--	--	A	--
	SB L/R	--	--	A	--	--	A	--
	ILOS	--	--	**A (3.0)**	--	--	**A (2.9)**	--
Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Western Driveway/ Archers Lane	EB L/T/R	--	--	A	--	--	A	--
	WB L/T/R	--	--	A	--	--	A	--
	NB L/T/R	--	--	B	--	--	B	--
	SB L/T/R	--	--	B	--	--	B	--
	ILOS	--	--	**A (6.2)**	--	--	**A (6.2)**	--

Base = No-Build scenario Projected = Build scenario ILOS = Overall Intersection Level of Service
Unsignalized ILOS calculated in accordance with Figure 5 of Policies and Procedures for Transportation Impact Studies.
[1] Projected conditions with implementation of improvements recommended in this TIS or in Mount Joy Township's ACT 209 Capital Improvement Plans

PennDOT/Mt. Joy Township Standards

Under the 2030 and 2035 projected (build) conditions, with implementation of the recommended improvements, the study area intersections will operate in accordance with the standards contained in Appendix A – Policies and Procedures for Transportation Impact Studies Related to Highway Occupancy Permits of PennDOT Publication 282, dated June 2025 in PennDOT's *Policies and Procedures for Transportation Impact Studies* and section 119-32.C of the Mt. Joy Township SALDO as described below:

Cloverleaf Road (SR 4025) & Steel Way

» Under the 2030 and 2035 weekday p.m. peak hours with full build-out, the westbound left approach LOS will operate at a D or below in the projected (build) conditions. The Township's Roadway Sufficiency Analysis and Capital Improvement Plan (CIP) identify traffic signalization of the intersection as a programmed improvement in conjunction with reconfiguration to relocate the SR 0283 West Ramps opposite the Steel Way intersection. With traffic signalization of the intersection, site-related impacts are mitigated. Pursuant to §119-32(C)(5)(i)(1), since traffic signalization is programmed by the Roadway Sufficiency Analysis and Transportation Capital Improvement Plan, the applicant may consider those improvements to be constructed by others.

Cloverleaf Road (SR 4025) & Route 283 West Ramps

» Under the 2030 and 2035 weekday a.m. and weekday p.m. peak hours with full build-out, multiple approach LOS and intersection LOS will operate at a D or below in the base (no-build) and projected (build) conditions. The Township's Roadway Sufficiency Analysis and Capital Improvement Plan(CIP) identify rerouting the westbound ramps to Cloverleaf Road (SR 4025) & Steel Way intersection as a programmed improvement. The existing intersection will become a T intersection without a signal (serving SR 0283 WB offramp movements wishing to turn north onto Cloverleaf Road), restricting

movements to right only from Route 283 West. With this new configuration, site-related impacts are mitigated. Pursuant to §119-32(C)(5)(i)(1), since the new configuration is programmed by the Roadway Sufficiency Analysis and Transportation Capital Improvement Plan, the applicant may consider those improvements to be constructed by others.

Cloverleaf Road (SR 4025) & Route 283 East Ramps

- Under the 2030 and 2035 weekday a.m. and weekday p.m. peak hours with full build-out, the eastbound off-ramp approach LOS will operate at below D in the existing, base (no-build) and projected (build) conditions. The Township's Roadway Sufficiency Analysis and Capital Improvement Plan(CIP) identify traffic signalization of the intersection as a programmed improvement. With traffic signalization of the intersection, site-related impacts are mitigated. Pursuant to §119-32(C)(5)(i)(1), since traffic signalization is programmed by the Roadway Sufficiency Analysis and Transportation Capital Improvement Plan, the applicant may consider those improvements to be constructed by others.

Cloverleaf Road (SR 4025) & Merts Drive

- Under the 2030 and 2035 weekday a.m. and weekday p.m. peak hours with full build-out, the eastbound approach LOS will operate at a D or below in the existing, base (no-build) and projected (build) conditions. The Township's Roadway Sufficiency Analysis and Capital Improvement Plan (CIP) identify closing this intersection and rerouting the traffic to Schwanger Road/Campus Road & Merts Drive/Schwanger Road intersection as a programmed improvement. With removal of the intersection, site-related impacts are mitigated. Pursuant to §119-32(C)(5)(i)(1), since removal of the intersection is programmed by the Roadway Sufficiency Analysis and Transportation Capital Improvement Plan, the applicant may consider those improvements to be constructed by others.

Cloverleaf Road (SR 4025) & Schwanger Road

- Under the 2030 and 2035 weekday a.m., and weekday p.m. peak hours with full build-out, multiple approach LOS and intersection LOS will operate at a D or below in the existing, base (no-build) and projected (build) conditions. The Township's Roadway Sufficiency Analysis and Capital Improvement Plan(CIP) identify retiming the intersection as a programmed improvement. With this intersection retiming, site-related impacts are mitigated. Pursuant to §119-32(C)(5)(i)(1), since the retiming is programmed by the Roadway Sufficiency Analysis and Transportation Capital Improvement Plan, the applicant may consider those improvements to be constructed by others.
- With implementation of the CIP improvements, the NB and SB thru/right movements at the intersection are projected to operate at LOS F with or without the development. Theoretically, to obtain LOS D or better on these approaches through 2035, a second northbound thru lane and a second southbound thru lane would be required on Cloverleaf Road; this improvement is required with or without the development to achieve LOS D and therefore is not the responsibility of the Developer.

95TH PERCENTILE QUEUE ANALYSIS

A queue analysis was conducted that evaluated the 95th percentile queue lengths (as applicable) for the study area intersections. This analysis was completed using the *Synchro 12* software and includes both the HCM 7th Edition and Synchro Percentile queues (as applicable). The queue analysis results are summarized in **Tables 11-12** for the weekday A.M. and weekday P.M. peak hours, respectively.

Queue analysis worksheets are included with the capacity analysis worksheets provided in **Appendix F.**

TABLE 11
QUEUE ANALYSIS: WEEKDAY A.M. PEAK HOUR

Approach/ Movement	Available Storage w/ Imp [1]	2025 Existing Condition		Design Year 2035: No-Build		Design Year 2035: Build		Design Year 2035: Build w Imp[1]	
		Synchro 95th	HCM 95th	Synchro 50th	Synchro 95th	HCM 95th	Synchro 50th	Synchro 95th	HCM 95th
Cloverleaf Road (SR 4025) & Mt. Pleasant Road (SR 4010)									
WB L/R	500'+	--	8'	--	8'	--	10'	--	--
SB L/T	500'+	--	3'	--	3'	--	3'	--	--
Cloverleaf Road (SR 4025) & Steel Way									
EB R	1000'+	--	--	--	--	--	--	0'	--
WB L/R, WB L/T/R	1000'+	--	3'	--	5'	--	13'	69'	--
NB L	700'	--	--	--	--	--	--	481'	--
NB T/R	700'	--	--	--	--	--	--	86'	--
SB L/T: SB L	500'+ / 100'	--	3'	--	3'	--	3'	26'	--
SB L/T: SB T/R	500'+ / 500'+							335'	--
Cloverleaf Road (SR 4025) & Route 283 West Ramps									
WB L/T	875'	309'	233'	500'	390'	500'	408'	--	--
WB R	400'	36'	8'	45'	10'	54'	15'	--	40'
NB L	225'	387'	233'	670'	483'	689'	553'	--	--
NB T	400'	50'	28'	67'	53'	91'	80'	--	--
SB T/R	500+	182'	123'	292'	225'	382'	255'	--	--
Cloverleaf Road (SR 4025) & Route 283 East Ramps									
EB L	1,000'	--	30'	--	63'	--	178'	51'	45'
EB R	450'+	--	65'	--	128'	--	133'	78'	0'
NB T	1,500'	--	--	--	--	--	--	1145'	85'
SB L	200'	--	20'	--	30'	--	40'	110'	68'
SB T	500'	--	--	--	--	--	--	110'	28'
Cloverleaf Road (SR 4025) & Merts Drive									
EB L/R	1000'+	--	8'	--	18'	--	18'	Eliminate Intersection	
NB L/T	1000'+	--	0'	--	0'	--	3'		
Cloverleaf Road (SR 4025) & Schwanger Road									
EB L	225'	271'	215'	339'	310'	345'	320'	316'	310'
EB T/R	550'	39'	30'	44'	38'	46'	40'	43'	35'
WB L	75'	11'	3'	13'	5'	17'	8'	15'	5'
WB T/R	325'	35'	38'	39'	48'	40'	50'	37'	43'
NB L	100'	16'	15'	19'	20'	19'	10'	17'	18'
NB T/R	1000'+	620'	458'	798'	778'	838'	905'	737'	820'
SB L	75'	14'	13'	16'	18'	16'	18'	13'	15'
SB T/R	1500'+	357'	280'	555'	365'	563'	373'	498'	313'

[1] Projected conditions with implementation of improvements recommended in this TIS or in Mount Joy Township's ACT 209 Capital Improvement Plans

TABLE 11 CONTINUED
QUEUE ANALYSIS: WEEKDAY A.M. PEAK HOUR

Approach/ Movement	Available Storage w/ Imp [1]	2025 Existing Condition		Design Year 2035: No-Build		Design Year 2035: Build		Design Year 2035: Build w Imp[1]	
		Synchro 95th	HCM 95th	Synchro 50th	Synchro 95th	HCM 95th	Synchro 50th	Synchro 95th	HCM 95th
Schwanger Road/Campus Road & Merts Drive/Schwanger Road									
EB L	175′	--	0′	--	3′	--	3′	--	--
WB L	150′	--	3′	--	3′	--	3′	--	--
NB L/T/R	1000′+	--	5′	--	5′	--	5′	--	--
SB L/T/R	400′	--	10′	--	13′	--	13′	--	--
Mt. Pleasant Road (SR 4010) & Schwanger Road									
NB L/R	1000+	--	3′	--	3′	--	5′	--	--
WB L/T	1000+	--	3′	--	3′	--	3′	--	--
Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Eastern (Car-Only) Driveway									
EB L/T	500′+	--	--	--	--	--	3′	--	--
SB L/R	100′+	--	--	--	--	--	3′	--	--
Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Western Driveway/ Archers Lane									
EB L/T/R	500′+	--	--	--	--	--	3′	--	--
WB L/T/R	500′+	--	--	--	--	--	0′	--	--
NB L/T/R	100′+	--	--	--	--	--	13′	--	--
SB L/T/R	100′+	--	--	--	--	--	5′	--	--

[1] Projected conditions with implementation of improvements recommended in this TIS or in Mount Joy Township's ACT 209 Capital Improvement Plans

TABLE 12
QUEUE ANALYSIS: WEEKDAY P.M. PEAK HOUR

Approach/ Movement	Available Storage w/ Imp [1]	2025 Existing Condition		Design Year 2035: No-Build		Design Year 2035: Build		Design Year 2035: Build w Imp[1]	
		Synchro 95th	HCM 95th	Synchro 50th	Synchro 95th	HCM 95th	Synchro 50th	Synchro 95th	HCM 95th
Cloverleaf Road (SR 4025) & Mt. Pleasant Road (SR 4010)									
WB L/R	500'+	--	5'	--	5'	--	5'	--	--
SB L/T	500'+	--	3'	--	3'	--	13'	--	--
Cloverleaf Road (SR 4025) & Steel Way									
EB R	1000'+	--	--	--	--	--	--	264'	--
WB L/R, WB L/T/R	1000'+	--	45'	--	70'	--	213'	291'	--
NB L	700'	--	--	--	--	--	--	173'	--
NB T/R	700'	--	--	--	--	--	--	160'	--
SB L/T: SB L	500'+ / 100'	--	0'	--	0'	--	0'	10'	--
SB L/T: SB T/R	500'+ / 500'+	--	--	--	--	--	--	167'	--
Cloverleaf Road (SR 4025) & Route 283 West Ramps									
WB L/T	875'	544'	338'	818'	593'	818'	705'	--	--
WB R	400'	36'	10'	42'	15'	44'	18'	--	28'
NB L	225'	177'	128'	301'	255'	376'	293'	--	--
NB T	400'	114'	70'	142'	133'	159'	168'	--	--
SB T/R	500+	218'	135'	283'	230'	518'	345'	--	--
Cloverleaf Road (SR 4025) & Route 283 East Ramps									
EB L/T	1,000'	--	40'	--	85'	--	175'	64'	35'
EB R	450'+	--	410'	--	858'	--	903'	412'	0'
NB T	1,500'	--	--	--	--	--	--	606'	25'
SB L	200'	--	8'	--	10'	--	20'	116'	23'
SB R	500'	--	--	--	--	--	--	285'	63'
Cloverleaf Road (SR 4025) & Merts Drive									
EB L/R	1000'+	--	33'	--	70'	--	75'	Eliminate Intersection	
NB L/T	1000'+	--	0'	--	0'	--	0'		
Cloverleaf Road (SR 4025) & Schwanger Road									
EB L	225'	158'	108'	205'	150'	206'	153'	222'	188'
EB T/R	550'	44'	38'	51'	48'	52'	48'	54'	53'
WB L	75'	16'	8'	19'	8'	31'	18'	32'	18'
WB T/R	325'	40'	25'	47'	33'	50'	35'	52'	38'
NB L	100'	49'	40'	60'	50'	60'	50'	60'	50'
NB T/R	1000'+	195'	148'	263'	185'	273'	190'	235'	150'
SB L	75'	22'	20'	25'	28'	26'	28'	21'	25'
SB T/R	1500'+	704'	613'	885'	1,238'	915'	1,388'	892'	1,100'

[1] Projected conditions with implementation of improvements recommended in this TIS or in Mount Joy Township's ACT 209 Capital Improvement Plans

TABLE 12 CONTINUED
QUEUE ANALYSIS: WEEKDAY P.M. PEAK HOUR

Approach/ Movement	Available Storage w/ Imp [1]	2025 Existing Condition		Design Year 2035: No-Build		Design Year 2035: Build		Design Year 2035: Build w Imp[1]	
		Synchro 95th	HCM 95th	Synchro 50th	Synchro 95th	HCM 95th	Synchro 50th	Synchro 95th	HCM 95th
Schwanger Road/Campus Road & Merts Drive/Schwanger Road									
EB L	175′	--	3′	--	3′	--	3′	--	--
WB L	150′	--	8′	--	10′	--	10′	--	--
NB L/T/R	1000′+	--	8′	--	10′	--	10′	--	--
SB L/T/R	400′	--	10′	--	13′	--	13′	--	--
Mt. Pleasant Road (SR 4010) & Schwanger Road									
NB L/R	1000+	--	3′	--	3′	--	3′	--	--
WB L/T	1000+	--	3′	--	3′	--	3′	--	--
Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Eastern (Car-Only) Driveway									
EB L/T	500′+	--	--	--	--	--	0′	--	--
SB L/R	100′+	--	--	--	--	--	5′	--	--
Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Western Driveway/ Archers Lane									
EB L/T/R	500′+	--	--	--	--	--	0′	--	--
WB L/T/R	500′+	--	--	--	--	--	3′	--	--
NB L/T/R	100′+	--	--	--	--	--	8′	--	--
SB L/T/R	100′+	--	--	--	--	--	15′	--	--

[1] Projected conditions with implementation of improvements recommended in this TIS or in Mount Joy Township's ACT 209 Capital Improvement Plans

As shown in **Tables 11-12**, under the 2035 projected (build) conditions, with implementation of recommended improvements, queues will be accommodated within the available existing or proposed storage length. If the projected (build) condition queues cannot be accommodated within the available storage length, the queue will be less than or comparable to the corresponding base (no-build) queue.

AUXILIARY TURN LANE ANALYSIS

Methodology

TPD evaluated auxiliary turn lane warrants at the site access intersections. The warrant analysis methodology contained within Chapter 11 of PennDOT's *Publication 46*, Section 11.17 was utilized for this evaluation.

Findings

Table 13 summarizes the results of the auxiliary turn lane analysis at the site access intersections.

TABLE 13
AUXILIARY TURN LANE ANALYSIS SUMMARY

Intersection	Auxiliary Lane	Warrant Satisfied?	Required Lane Length	Proposed Lane Length
Mt. Pleasant Road (SR 4010) & Proposed Greiner Tract Eastern (Car-Only) Driveway	EB Left Turn Lane	No	--	--
	WB Right Turn Lane	No	--	--
Mt. Pleasant Road (SR 4010) & Proposed Western Driveway	EB Left Turn Lane	No	--	--
	WB Right Turn Lane	No	--	--
Mt. Pleasant Road (SR 4010) & Proposed Archers Lane	WB Left Turn Lane	No	--	--
	EB Right Turn Lane	No	--	--
Proposed Archers Lane & Steel Way	EB Left Turn Lane	No	--	150'
	WB Right Turn Lane	No	--	--

Turn Lanes warrants were designed based on full build out requirements. The calculations for the auxiliary turn lane warrants are included in **Appendix G**. For the proposed eastbound left turn lane on Steel Way approaching proposed Archers Lane, it is noted that this turn lane is not warranted based on PennDOT standards, but the Applicant is proposing to construct the improvement if feasible relative to available ROW, etc.

PROJECTED IMPROVEMENTS - ACT 209

This Traffic Impact Study ("TIS") has been prepared in accordance with the requirements of the Township's Subdivision and Land Development Ordinance and the Township's Traffic Impact Fee Ordinance, which incorporates the Township's Roadway Sufficiency Analysis and Transportation Capital Improvements Plan, which were adopted in accordance with Act 209. Consistent with the ordinance and Act 209 program, the analysis in the current traffic study assumes construction of the roadway improvements identified within the Capital Improvements Plan study area. Because the property is within the Township's Transportation Service Area, pursuant to the Township's Traffic Impact Fee Ordinance, the Applicant will pay traffic impact fees as required, which are intended to proportionately fund the improvements identified in the Township's Capital Improvements Plan.

When performing a mitigation analysis for a project, section 119-32.C.5.i., of the Township's Subdivision and Land Development Ordinance provides that "if the necessary improvements are programmed by the Roadway Sufficiency Analysis and Transportation Capital Improvements Plan, the applicant may consider those improvements as to be constructed by others." Accordingly, based on this prescribed methodology, the TIS identified the traffic road improvements that are within the Township's Transportation Capital Improvements Plan and considered those improvements as being constructed by others for purpose of the study's mitigation analysis. Pursuant to the Township's ordinances as well as applicable state law, the Applicant is entitled to consider the planned Act 209 improvements as being constructed by others when evaluating traffic impacts associated with the proposed development. The TIS demonstrates that the proposed development complies with the Township's traffic and transportation standards and operates within the analytical framework set forth by the Township.

Although the Applicant is not required to construct off-site Act 209 improvements or address pre-existing regional transportation issues, the Applicant recognizes that the Cloverleaf/I-283 Interchange has long been

a significant concern for Township residents and a priority infrastructure need for the Township and region. In this context, the Applicant is committed to being a long-term community partner and is prepared to voluntarily collaborate with the Township, PennDOT, and other agencies to advance improvements to this critical interchange.

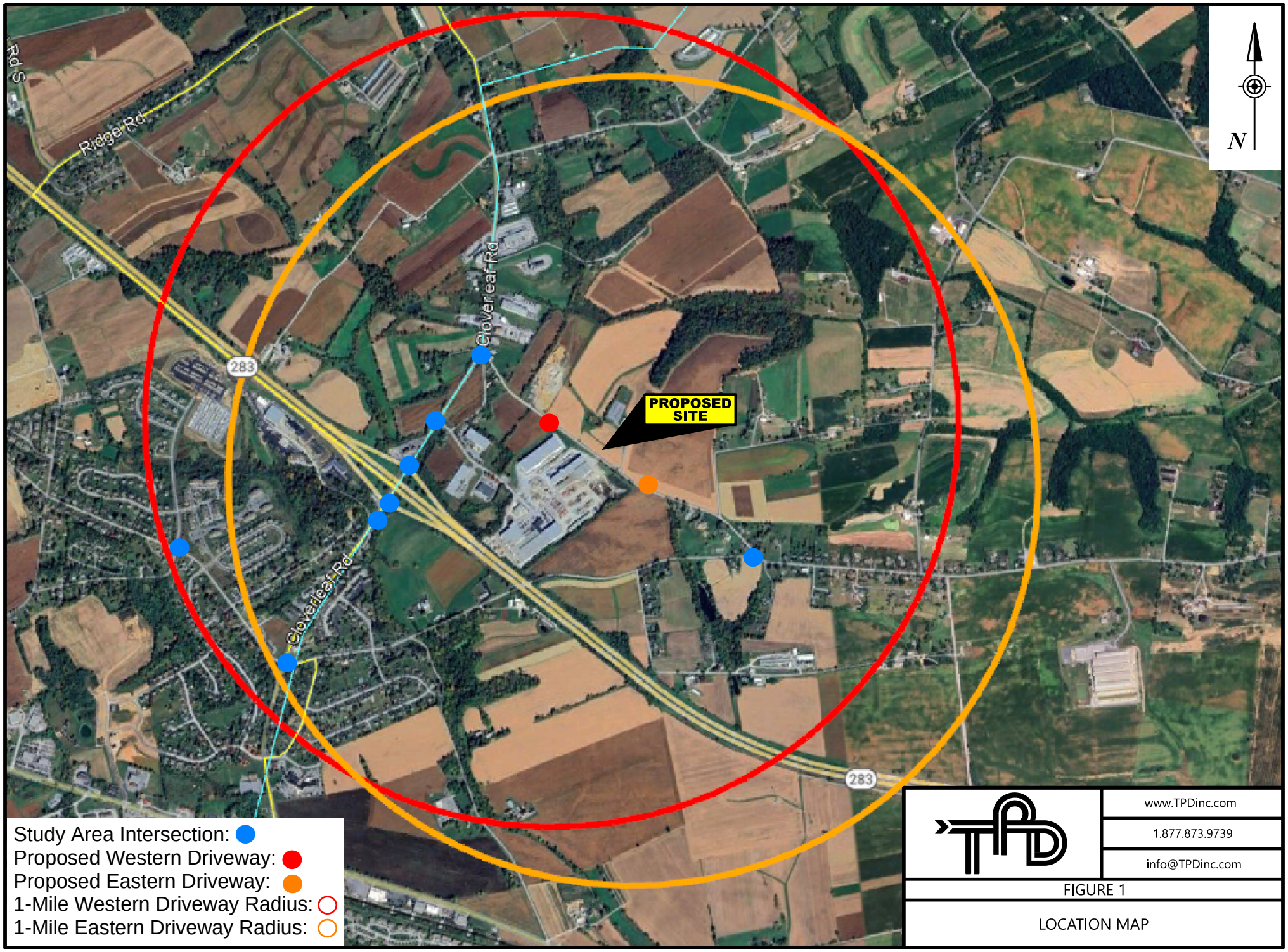
To that end, the Applicant is prepared to fully engage with the Township and its consultants to evaluate and advance a potential "Alternative Design" approach to the Act 209 strategy for the Cloverleaf/I-283 Interchange — as conceptually outlined in **Appendix I** — that may be more cost-effective, implementable, and beneficial to long-term traffic operations than the currently programmed improvement. Importantly, the conceptual Alternative Design would require use of a portion of land owned by the Applicant near the interchange. As part of this cooperative effort and subject to final design and approvals, the Applicant is willing to consider donating or granting the necessary easement(s) for this land to facilitate construction of the interchange improvement.

In addition, advancing the Alternative Design would help unlock approximately $4 million in state grant funding previously awarded to the Township for improvements at the Schwanger Road and Cloverleaf Road intersection — one of the most challenging and heavily-impacted intersections in the Township. That grant award was contingent upon private-sector participation in the broader Cloverleaf/I-283 Interchange improvement effort. The Applicant's willingness to consider voluntarily supporting the Interchange upgrade would not only address much needed road improvements at the Route 283 and Cloverleaf interchange, but also activate critical funding for a second, highly needed improvement that will provide substantial public benefit and long-term safety and operational enhancements.

The Applicant is willing to consider contributing substantial voluntary funds, resources, and expertise — above and beyond all ordinance requirements and Act 209 impact fees — to help pursue grant opportunities, accelerate planning, and support implementation of these regional improvements. The proposed development, as submitted, is fully compliant with the Township's traffic regulations and Act 209 ordinance. All voluntary participation by the Applicant toward improvements at the Cloverleaf/I-283 Interchange and the Schwanger Road/Cloverleaf Road corridor, including evaluation of the Alternative Design described in Appendix I and provision of any land or easements required for construction, is expressly independent of, and not a condition of, the special exception application or approval but would be reviewed and considered during the land development review and approval process.

RECOMMENDATIONS AND CONCLUSIONS

The recommendations and conclusions for this Transportation Impact Study are identified in the Executive Summary.


Ridge Rd
Cloverleaf Rd
Cloverleaf Rd
283
283
PROPOSED SITE
N
Study Area Intersection:
Proposed Western Driveway:
Proposed Eastern Driveway:
1-Mile Western Driveway Radius:
1-Mile Eastern Driveway Radius:
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info@TPDinc.com
FIGURE 1
LOCATION MAP

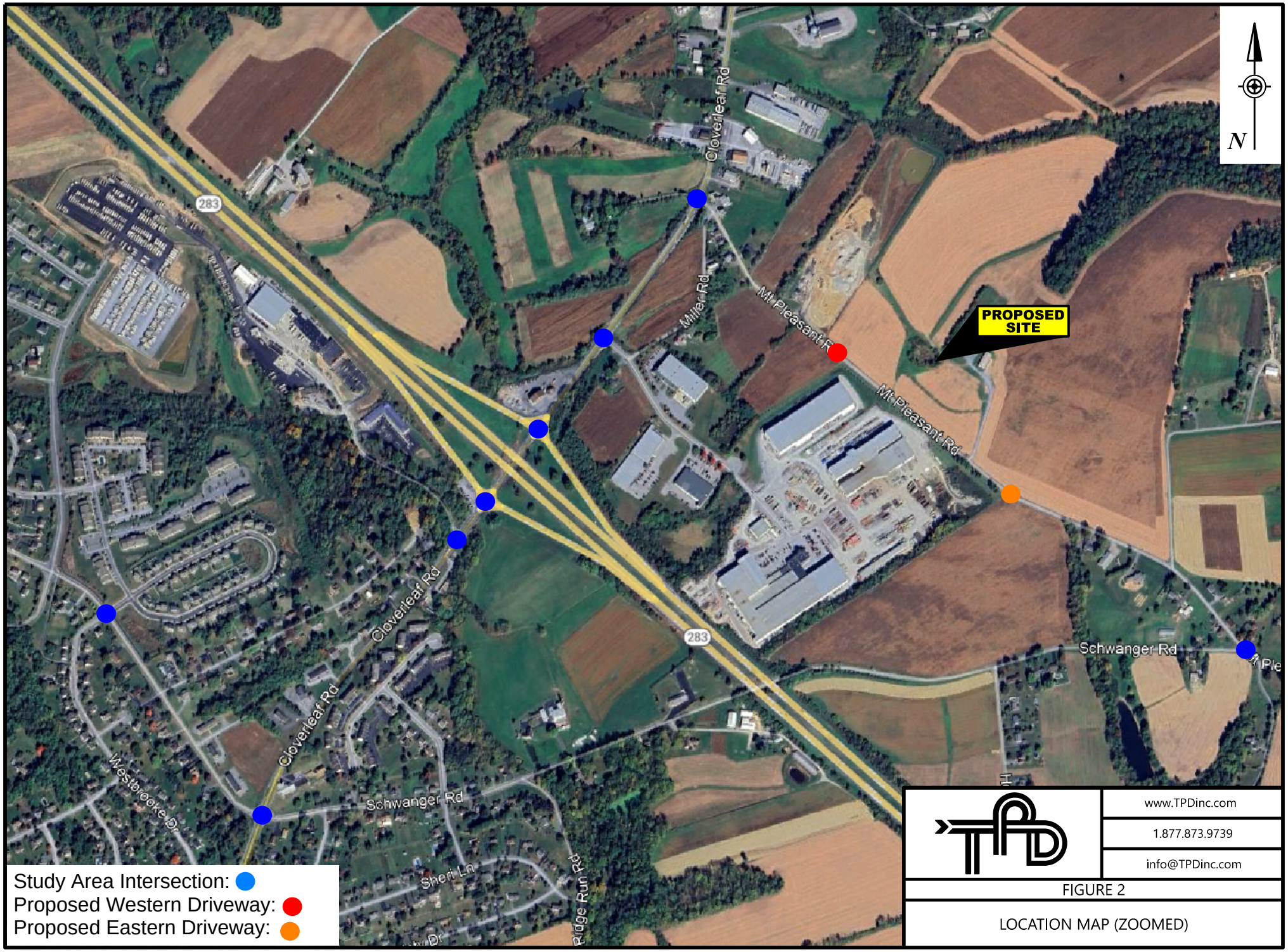

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FIGURE 2

LOCATION MAP (ZOOMED)

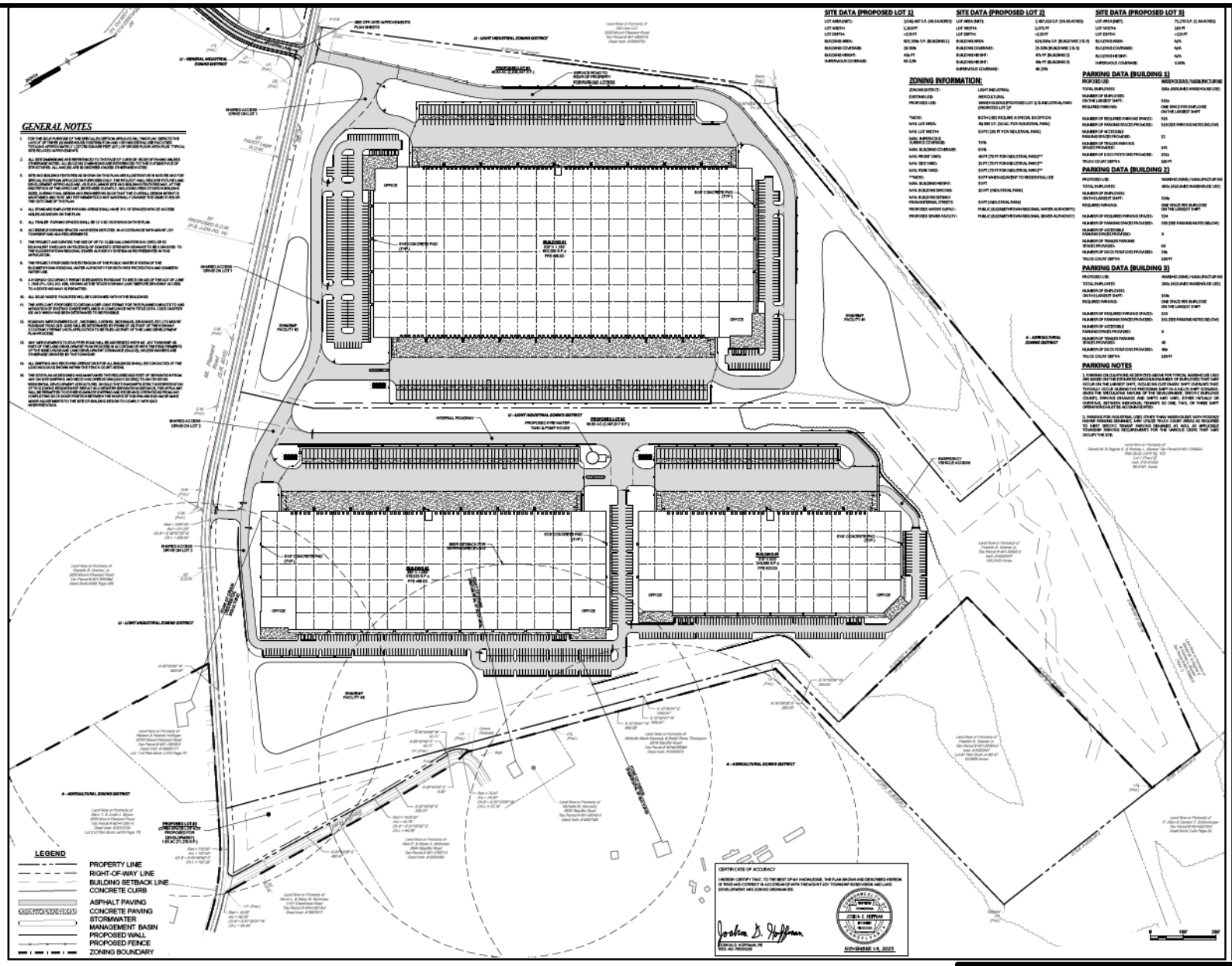

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FIGURE 3

SITE PLAN

KEY:

SCHEMATIC DRAWING:NOT TO SCALE

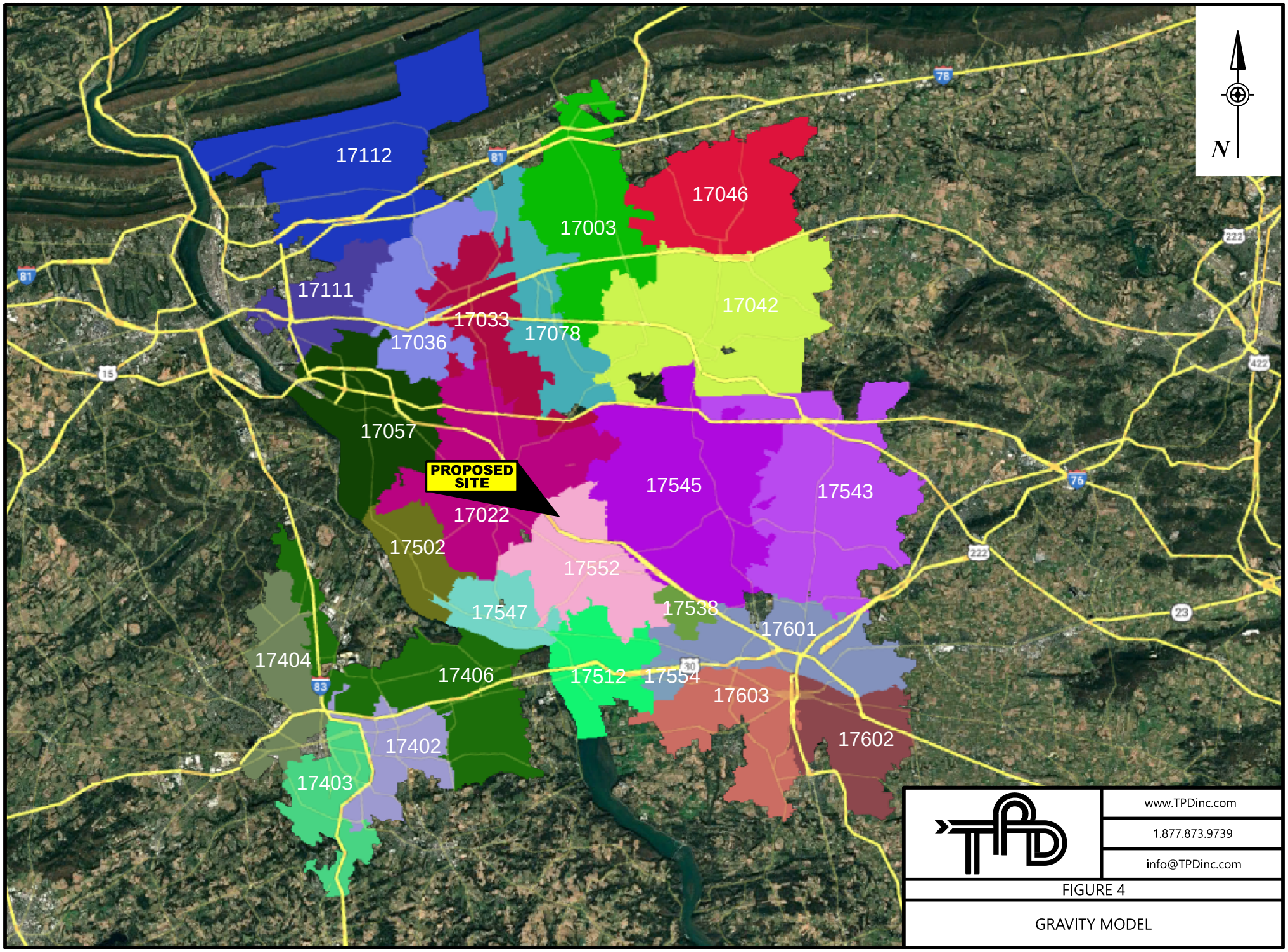
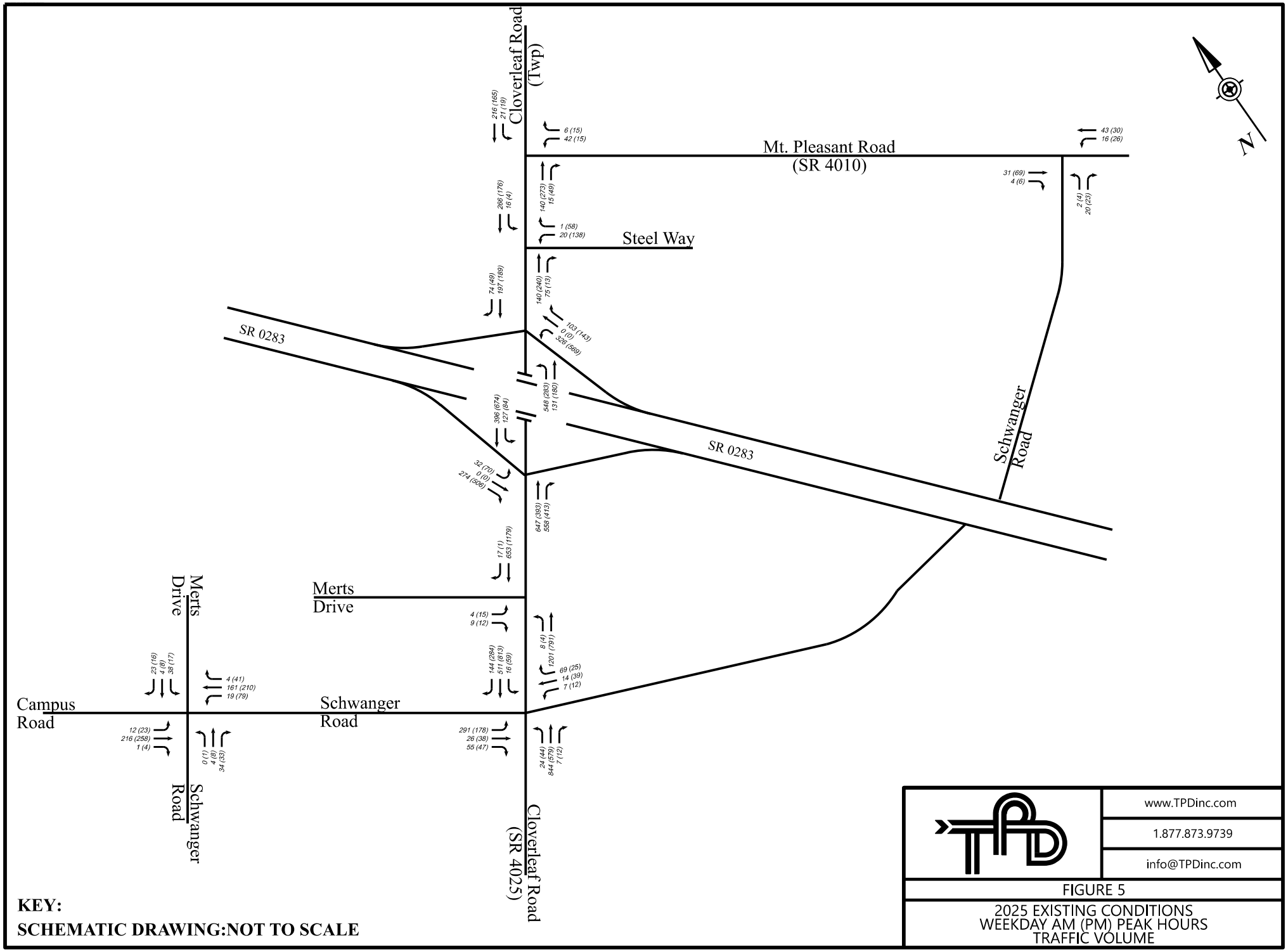


FIGURE 4

GRAVITY MODEL



KEY:

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FIGURE 5

2025 EXISTING CONDITIONS
WEEKDAY AM (PM) PEAK HOURS
TRAFFIC VOLUME

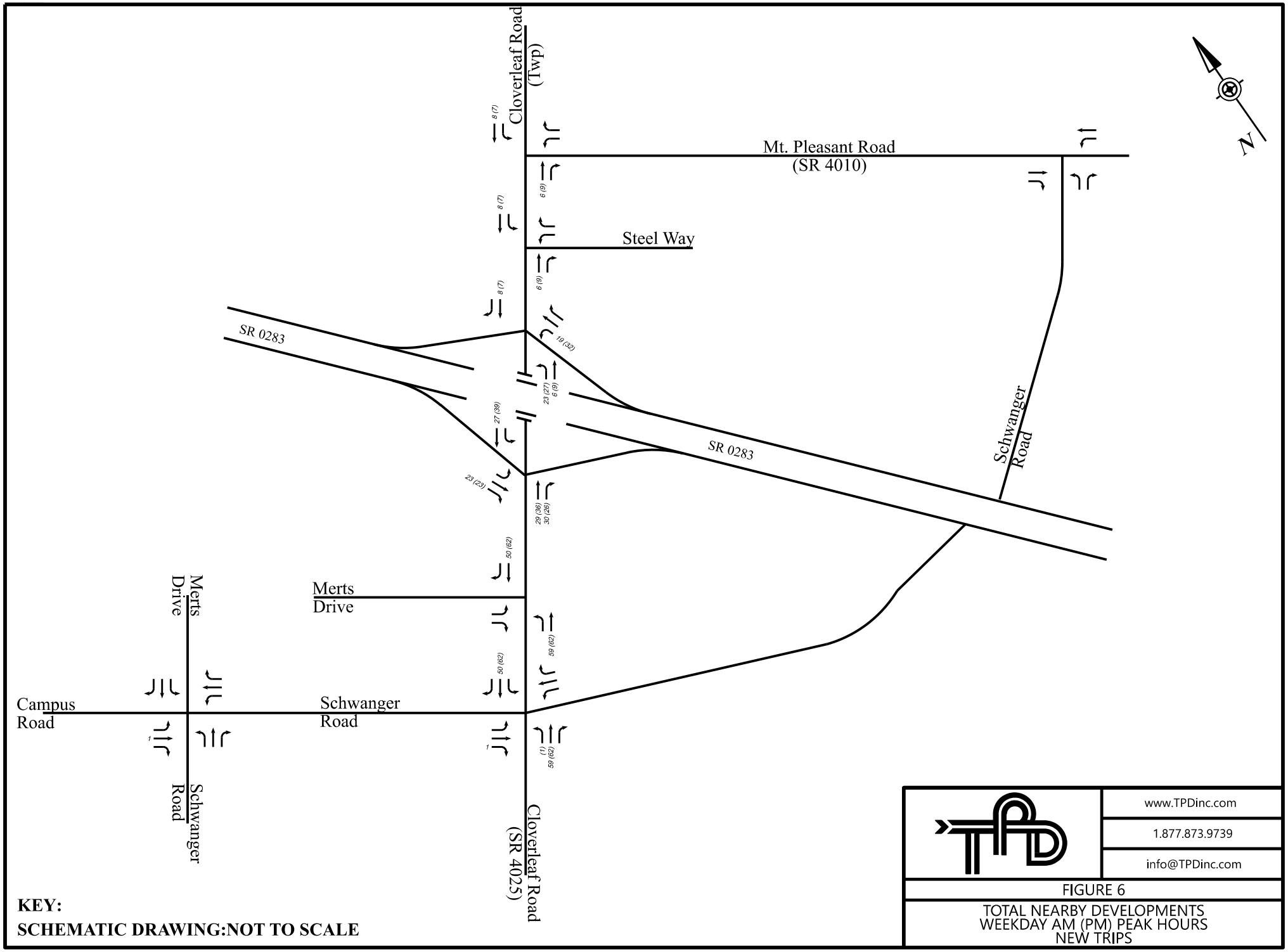
Cloverleaf Road
(Twp)
Mt. Pleasant Road
(SR 4010)
Steel Way
SR 0283
SR 0283
Schwanger
Road
Merts
Drive
Merts
Drive
Campus
Road
Schwanger
Road
Schwanger
Road
Cloverleaf Road
(SR 4025)
8 (7)
8 (7)
8 (7)
6 (9)
6 (9)
19 (32)
23 (27)
6 (9)
27 (39)
23 (23)
29 (36)
30 (26)
50 (62)
50 (62)
59 (62)
59 (62)
(1)
1
1
N
KEY:
SCHEMATIC DRAWING:NOT TO SCALE
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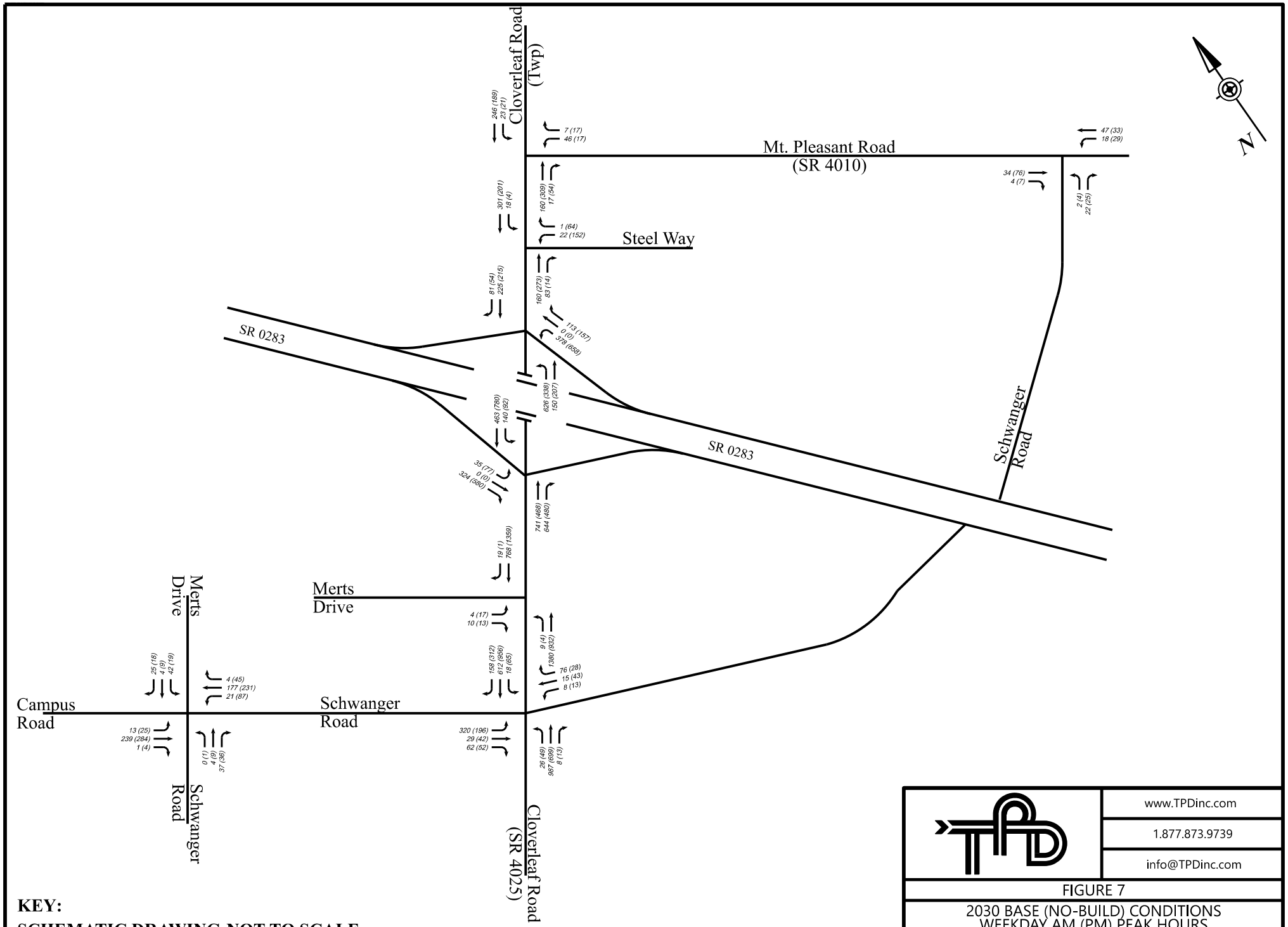
FIGURE 6
TOTAL NEARBY DEVELOPMENTS
WEEKDAY AM (PM) PEAK HOURS
NEW TRIPS



KEY:

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FIGURE 7

2030 BASE (NO-BUILD) CONDITIONS
WEEKDAY AM (PM) PEAK HOURS
TRAFFIC VOLUME

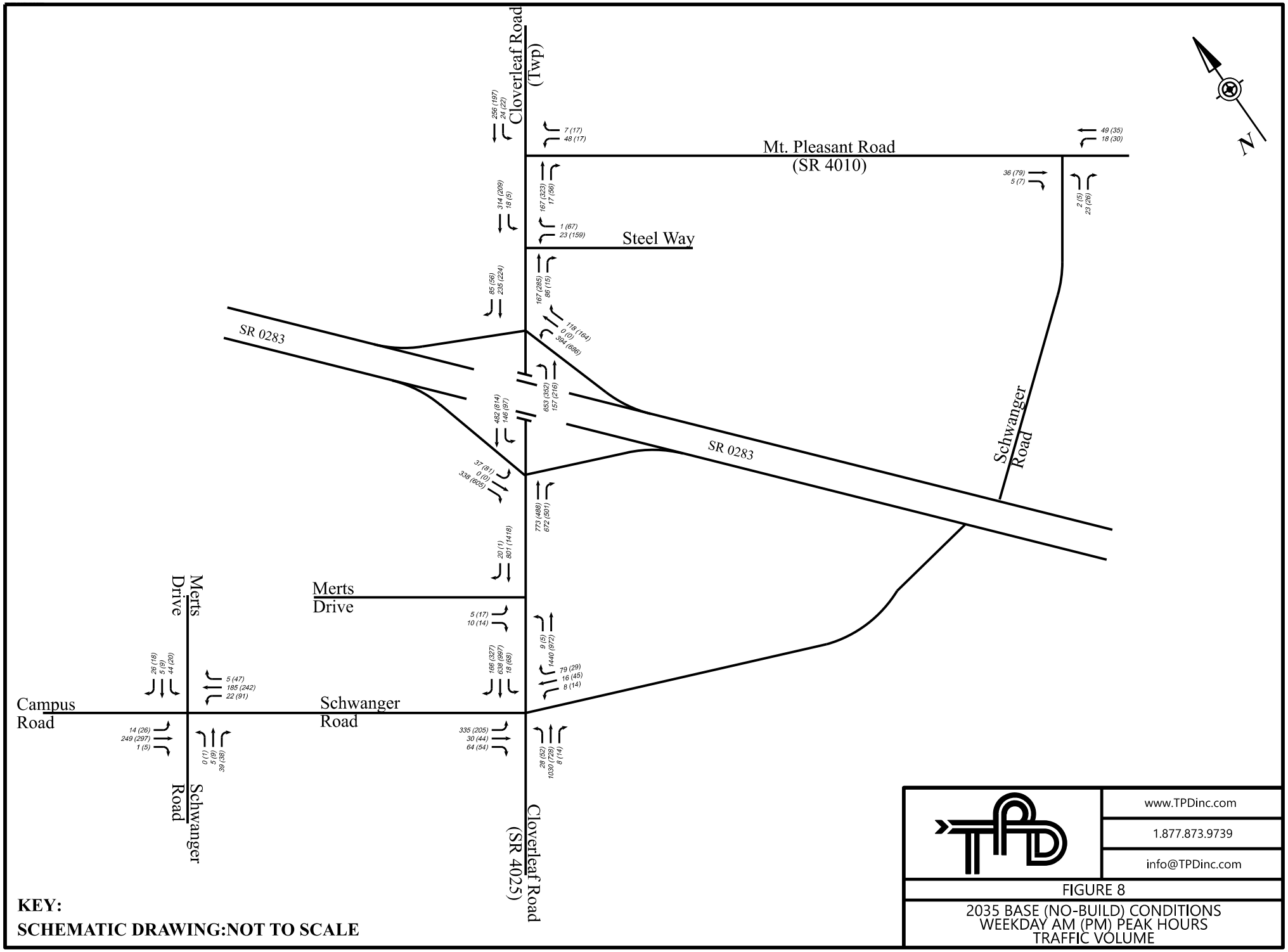
Cloverleaf Road (Twp)
Mt. Pleasant Road (SR 4010)
Steel Way
SR 0283
SR 0283
Schwanger Road
Merts Drive
Merts Drive
Campus Road
Schwanger Road
Schwanger Road
Cloverleaf Road (SR 4025)
N
256 (197)
24 (22)
7 (17)
48 (17)
49 (35)
18 (30)
36 (79)
5 (7)
2 (5)
23 (26)
314 (209)
18 (5)
167 (323)
17 (56)
1 (67)
23 (159)
85 (56)
235 (224)
167 (285)
86 (15)
118 (164)
0 (0)
384 (698)
653 (352)
157 (216)
482 (814)
146 (97)
37 (81)
0 (0)
338 (605)
773 (488)
672 (501)
20 (1)
801 (1418)
5 (17)
10 (14)
9 (5)
1440 (972)
166 (327)
638 (997)
18 (68)
79 (29)
16 (45)
8 (14)
28 (18)
5 (9)
44 (20)
5 (47)
185 (242)
22 (91)
14 (26)
249 (297)
1 (5)
0 (1)
5 (9)
39 (38)
335 (205)
30 (44)
64 (54)
28 (52)
1030 (728)
8 (14)
KEY:
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FIGURE 8
2035 BASE (NO-BUILD) CONDITIONS
WEEKDAY AM (PM) PEAK HOURS
TRAFFIC VOLUME

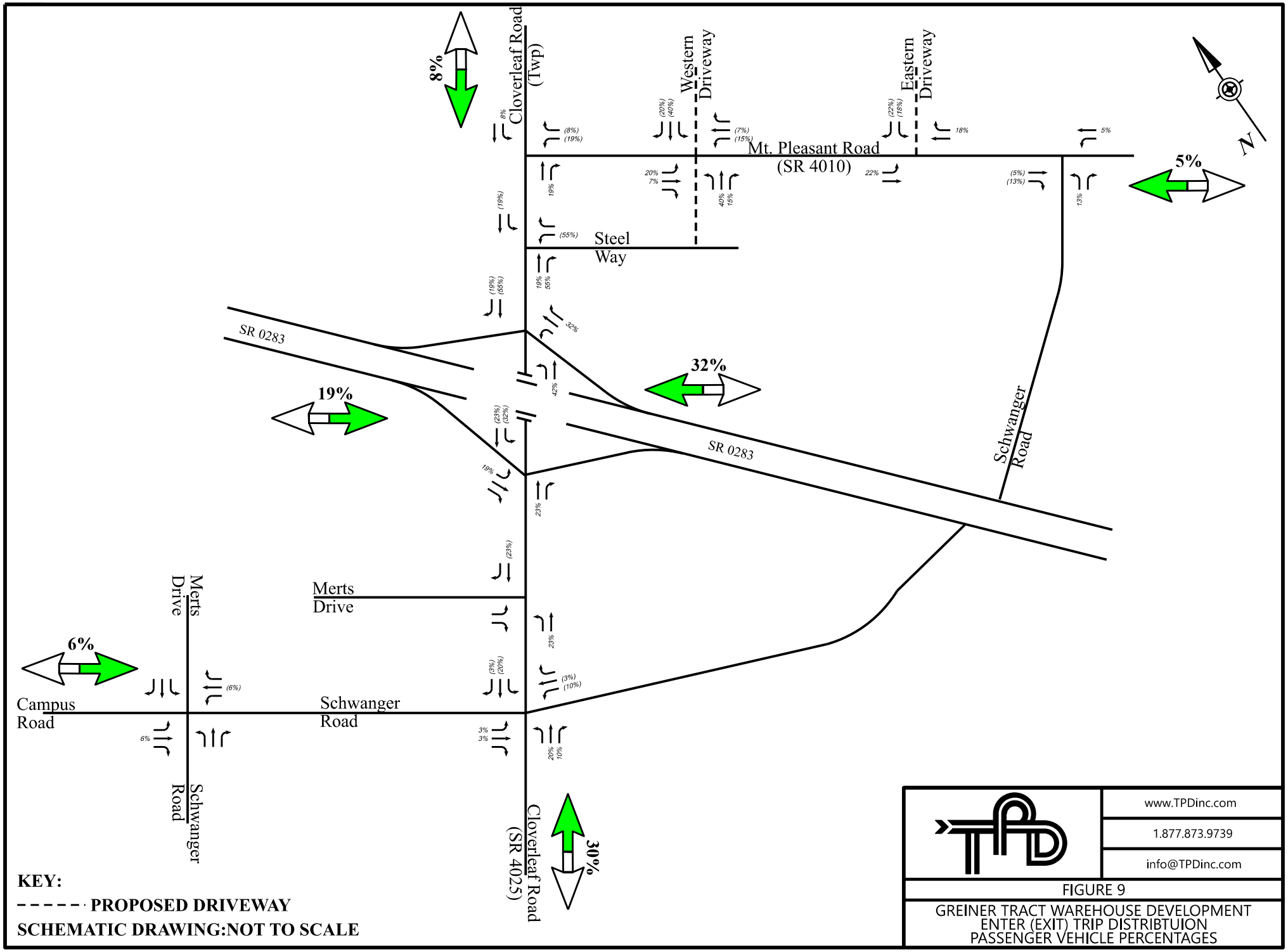
8%
Cloverleaf Road (Twp)
Western Driveway
Eastern Driveway
Mt. Pleasant Road (SR 4010)
5%
N
Steel Way
SR 0283
19%
32%
SR 0283
Schwanger Road
Merts Drive
Merts Drive
6%
Campus Road
Schwanger Road
Schwanger Road
Cloverleaf Road (SR 4025)
30%
KEY:
PROPOSED DRIVEWAY
SCHEMATIC DRAWING:NOT TO SCALE
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FIGURE 9
GREINER TRACT WAREHOUSE DEVELOPMENT
ENTER (EXIT) TRIP DISTRIBTUION
PASSENGER VEHICLE PERCENTAGES

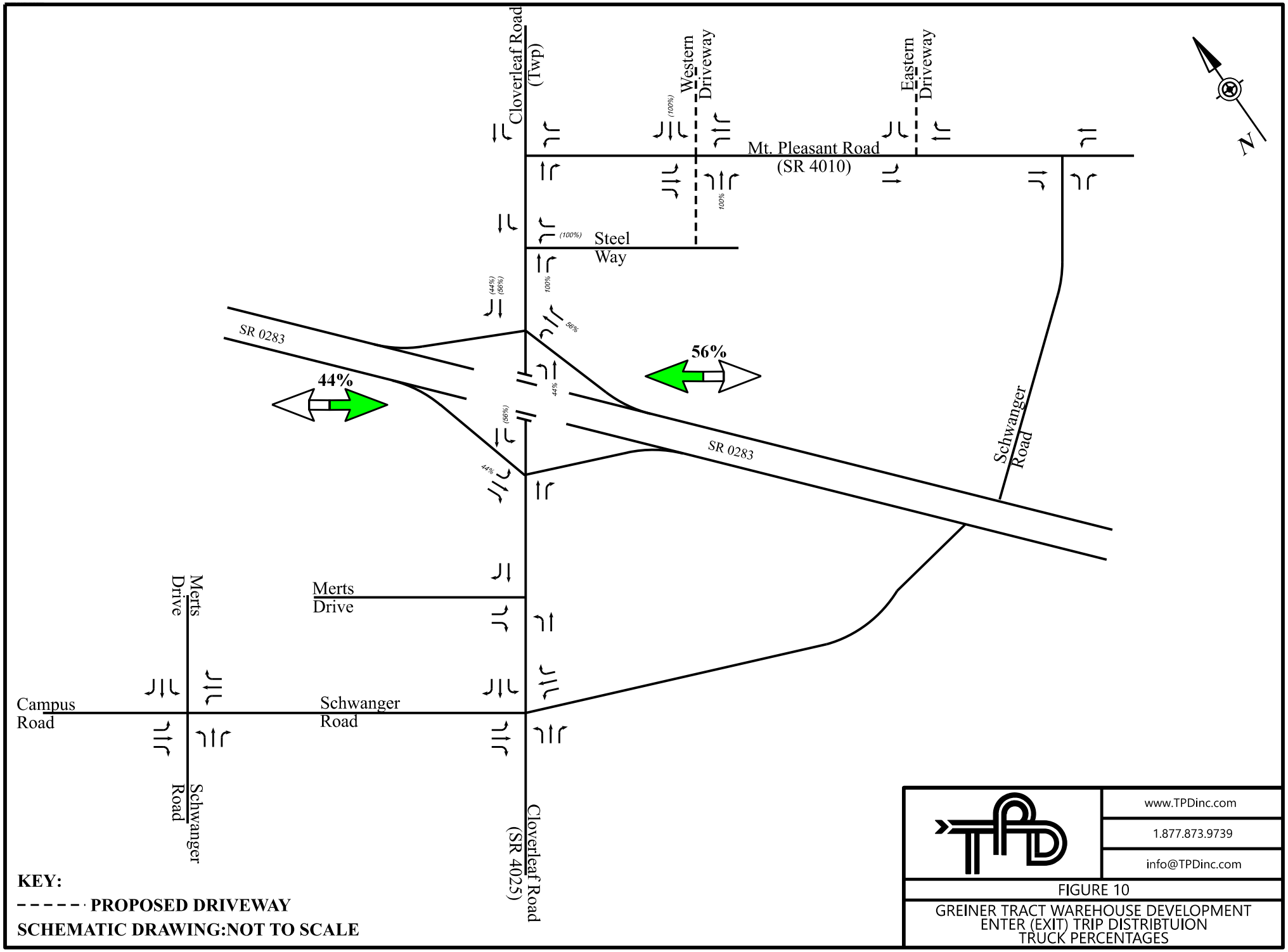
Cloverleaf Road (Twp)
Western Driveway
Eastern Driveway
Mt. Pleasant Road (SR 4010)
Steel Way
(100%)
100%
(44%) (56%)
56%
44%
SR 0283
44%
56%
SR 0283
Schwanger Road
Merts Drive
Merts Drive
Campus Road
Schwanger Road
Schwanger Road
Cloverleaf Road (SR 4025)
N
KEY:
PROPOSED DRIVEWAY
SCHEMATIC DRAWING:NOT TO SCALE
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FIGURE 10
GREINER TRACT WAREHOUSE DEVELOPMENT
ENTER (EXIT) TRIP DISTRIBTUION
TRUCK PERCENTAGES

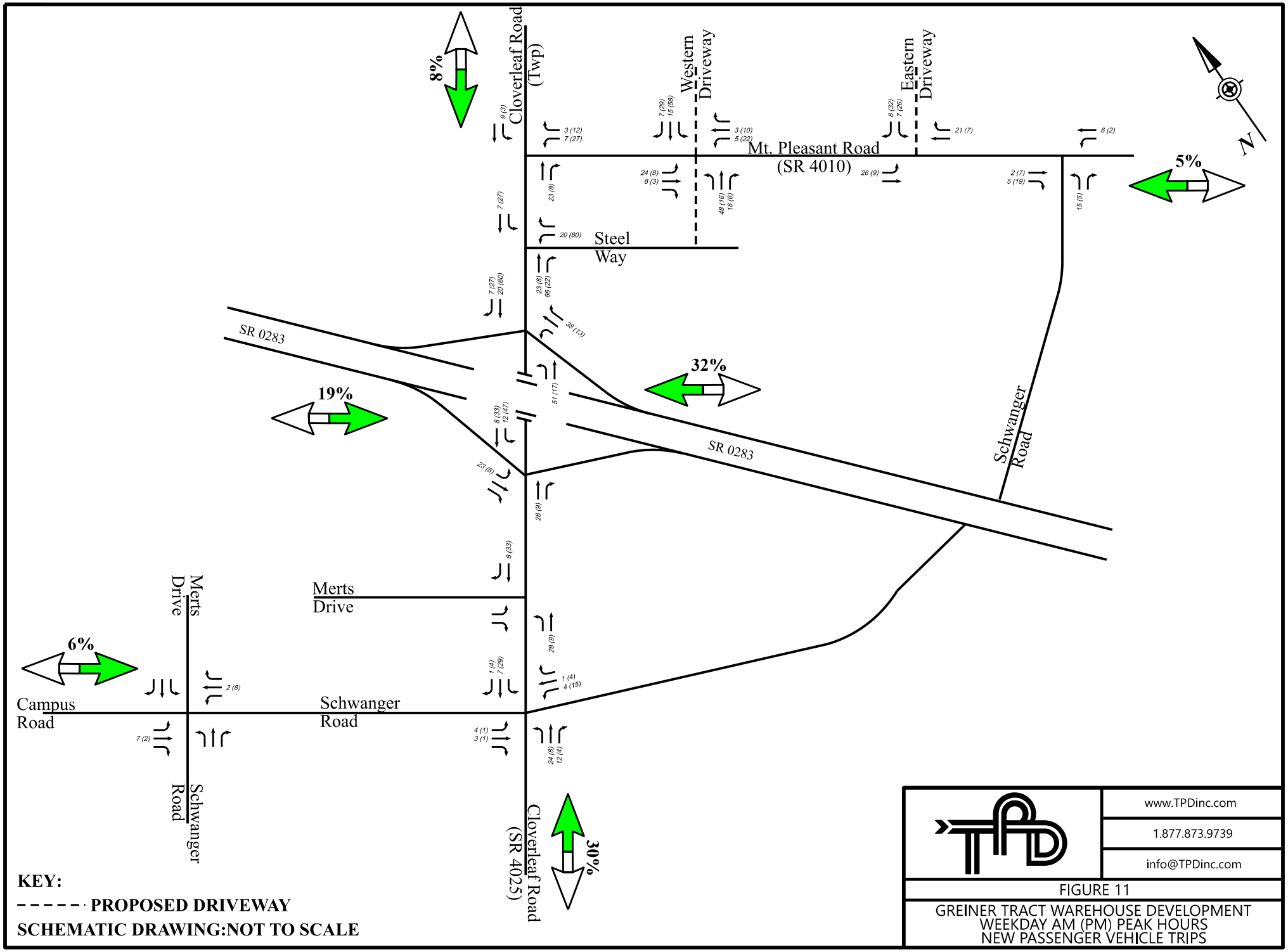
Cloverleaf Road (Twp)
Western Driveway
Eastern Driveway
Mt. Pleasant Road (SR 4010)
Steel Way
SR 0283
SR 0283
Schwanger Road
Merts Drive
Merts Drive
Campus Road
Schwanger Road
Schwanger Road
Cloverleaf Road (SR 4025)
8%
5%
32%
19%
6%
30%
N
9 (3)
3 (12)
7 (27)
7 (29)
15 (58)
3 (10)
5 (22)
8 (32)
7 (26)
21 (7)
6 (2)
24 (8)
8 (3)
26 (9)
2 (7)
5 (19)
15 (5)
48 (16)
18 (6)
23 (8)
7 (27)
20 (80)
7 (27)
20 (80)
23 (8)
66 (22)
38 (13)
51 (17)
8 (33)
12 (47)
23 (8)
28 (9)
8 (33)
28 (9)
1 (4)
7 (29)
1 (4)
4 (15)
2 (8)
7 (2)
4 (1)
3 (1)
24 (8)
12 (4)
KEY:
PROPOSED DRIVEWAY
SCHEMATIC DRAWING:NOT TO SCALE
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FIGURE 11
GREINER TRACT WAREHOUSE DEVELOPMENT
WEEKDAY AM (PM) PEAK HOURS
NEW PASSENGER VEHICLE TRIPS

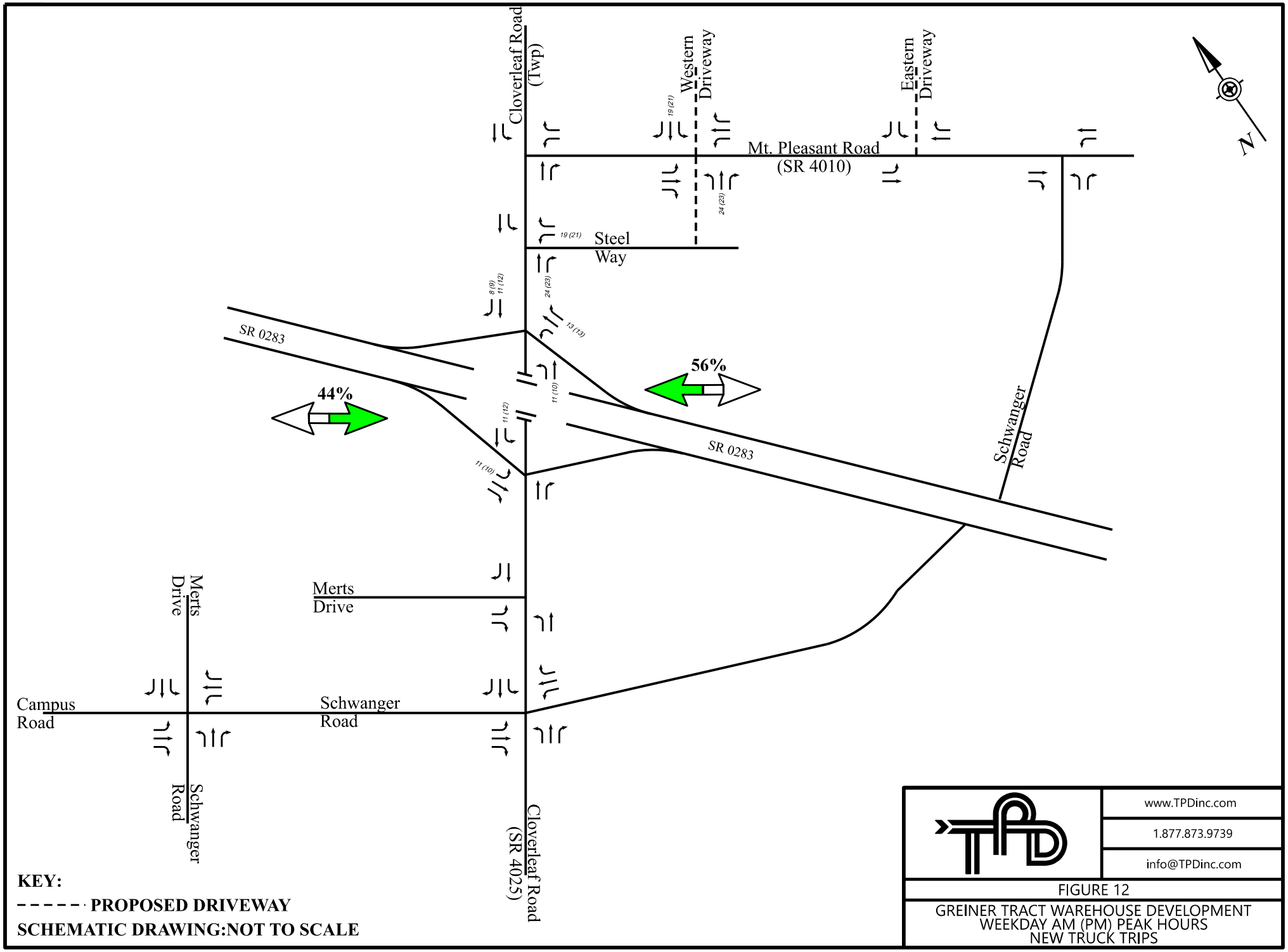
Cloverleaf Road (Twp)
Western Driveway
Eastern Driveway
Mt. Pleasant Road (SR 4010)
Steel Way
SR 0283
44%
56%
Schwanger Road
Merts Drive
Campus Road
Schwanger Road
Cloverleaf Road (SR 4025)
N
19 (21)
24 (23)
8 (9)
11 (12)
13 (15)
11 (10)
KEY:
PROPOSED DRIVEWAY
SCHEMATIC DRAWING:NOT TO SCALE
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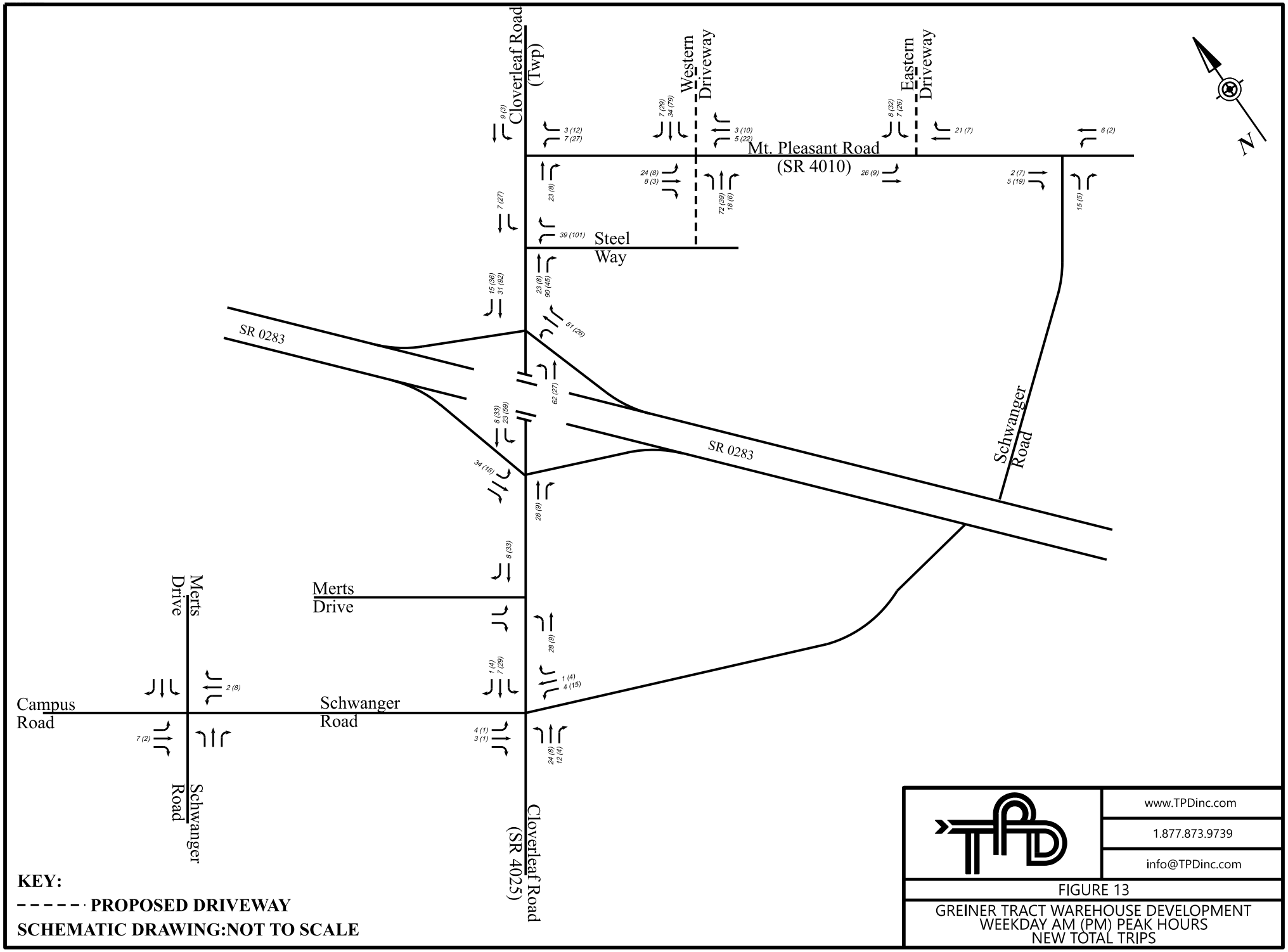
FIGURE 12
GREINER TRACT WAREHOUSE DEVELOPMENT
WEEKDAY AM (PM) PEAK HOURS
NEW TRUCK TRIPS



KEY:

- - - - - PROPOSED DRIVEWAY

SCHEMATIC DRAWING:NOT TO SCALE

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FIGURE 13

GREINER TRACT WAREHOUSE DEVELOPMENT
WEEKDAY AM (PM) PEAK HOURS
NEW TOTAL TRIPS

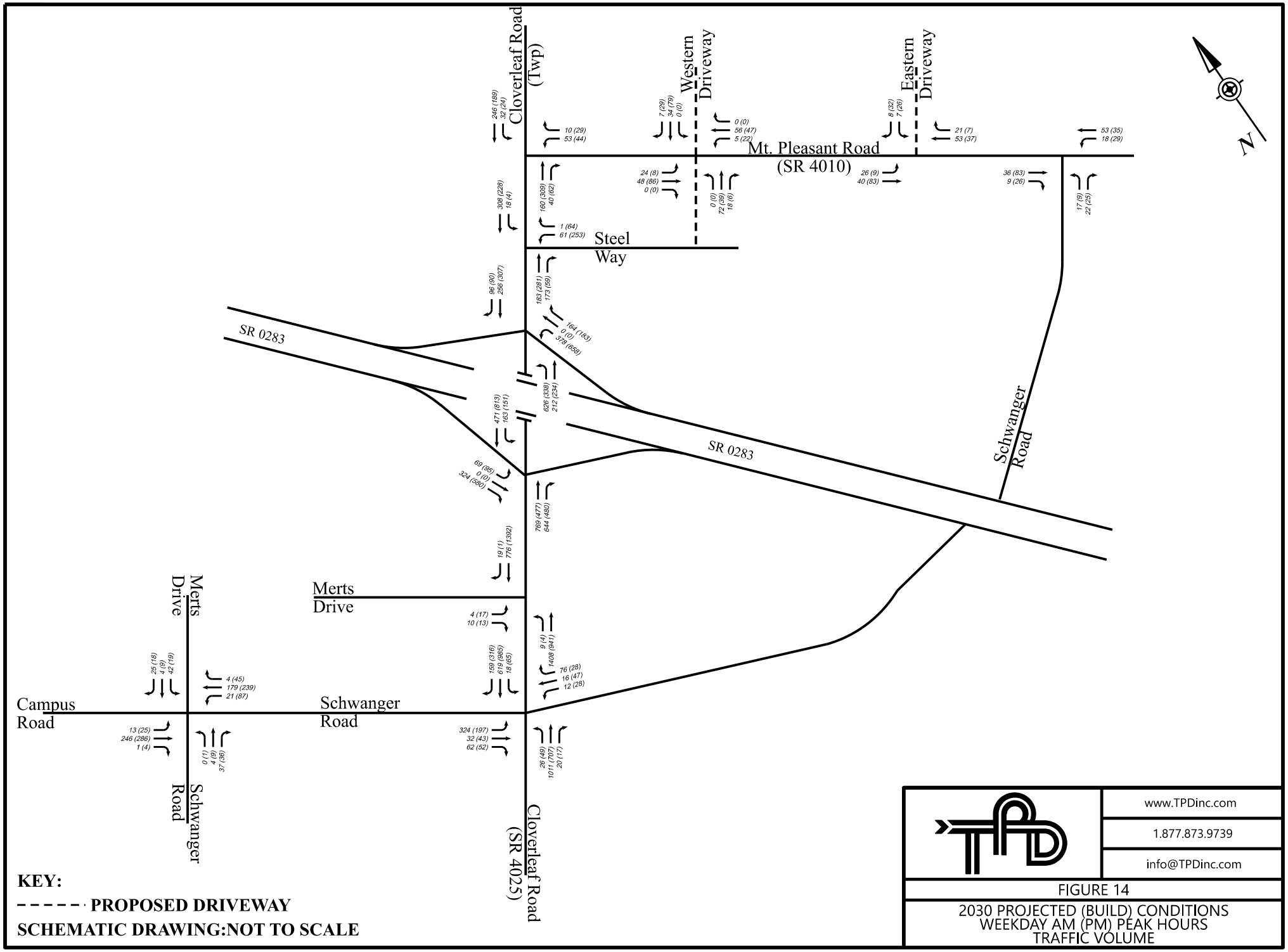
Cloverleaf Road (Twp)
Western Driveway
Eastern Driveway
Mt. Pleasant Road (SR 4010)
Steel Way
SR 0283
SR 0283
Schwanger Road
Merts Drive
Merts Drive
Campus Road
Schwanger Road
Schwanger Road
Cloverleaf Road (SR 4025)
N
246 (189)
32 (24)
10 (29)
53 (44)
7 (29)
34 (79)
0 (0)
0 (0)
56 (47)
5 (22)
8 (32)
7 (26)
21 (7)
53 (35)
18 (29)
24 (8)
48 (86)
0 (0)
26 (9)
40 (83)
36 (83)
9 (26)
17 (9)
22 (25)
0 (0)
72 (39)
18 (6)
308 (228)
18 (4)
160 (309)
40 (62)
1 (64)
61 (253)
96 (90)
256 (307)
183 (281)
173 (59)
164 (183)
0 (0)
378 (658)
626 (338)
212 (234)
471 (813)
163 (151)
68 (95)
0 (0)
324 (380)
769 (477)
644 (480)
19 (1)
776 (1392)
4 (17)
10 (13)
9 (4)
1408 (941)
159 (316)
619 (865)
18 (65)
76 (28)
16 (47)
12 (28)
25 (18)
4 (9)
42 (19)
4 (45)
179 (239)
21 (87)
13 (25)
246 (286)
1 (4)
0 (1)
4 (9)
37 (36)
324 (197)
32 (43)
62 (52)
26 (49)
1011 (707)
20 (17)
KEY:
PROPOSED DRIVEWAY
SCHEMATIC DRAWING:NOT TO SCALE
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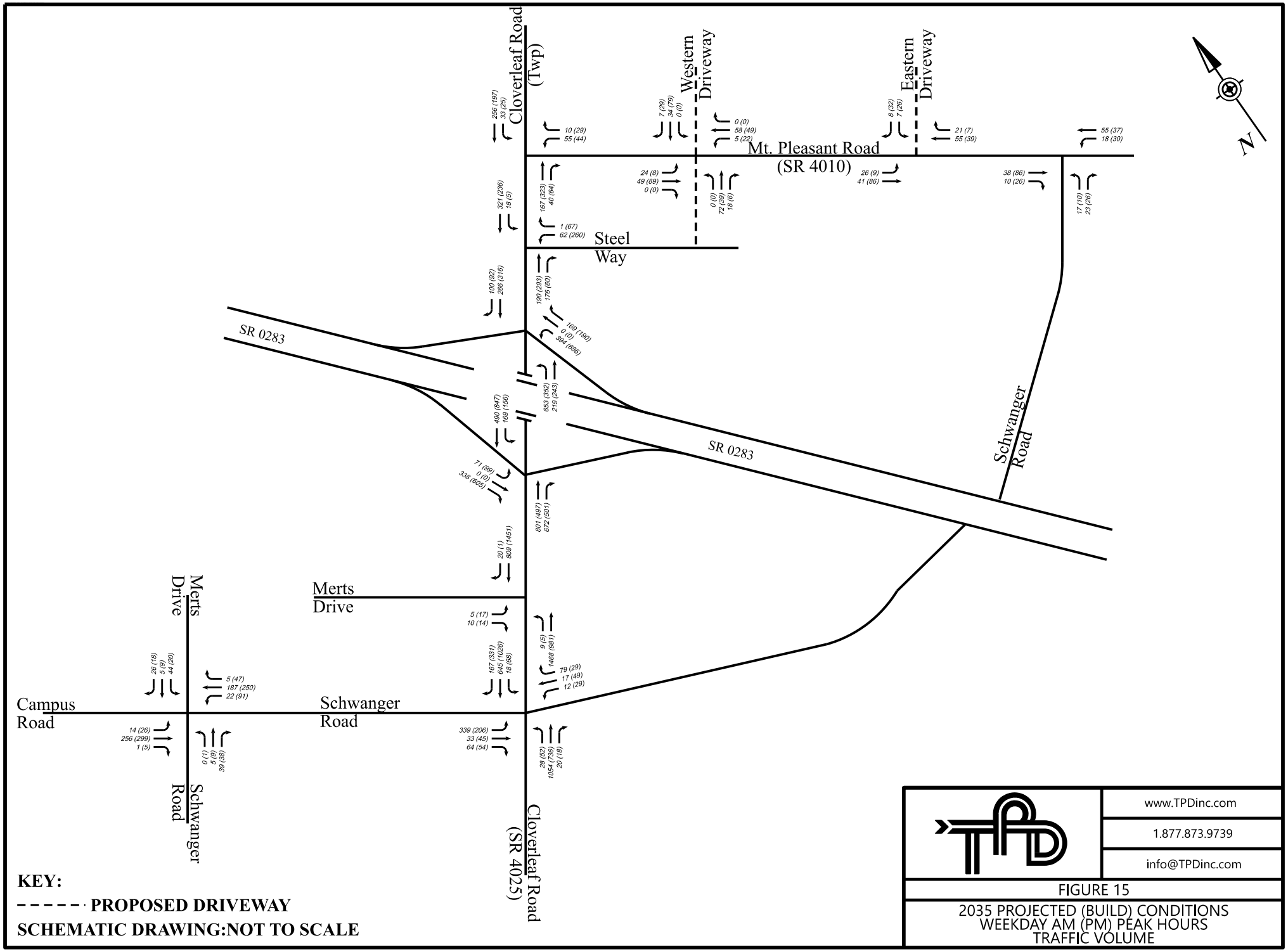
FIGURE 14
2030 PROJECTED (BUILD) CONDITIONS
WEEKDAY AM (PM) PEAK HOURS
TRAFFIC VOLUME


Cloverleaf Road (Twp)
Western Driveway
Eastern Driveway
Mt. Pleasant Road (SR 4010)
Steel Way
SR 0283
SR 0283
Schwanger Road
Merts Drive
Merts Drive
Campus Road
Schwanger Road
Schwanger Road
Cloverleaf Road (SR 4025)
N
256 (197)
33 (25)
10 (29)
55 (44)
7 (29)
34 (79)
0 (0)
0 (0)
58 (49)
5 (22)
8 (32)
7 (26)
21 (7)
55 (39)
55 (37)
18 (30)
321 (236)
18 (5)
167 (323)
40 (64)
24 (8)
49 (89)
0 (0)
0 (0)
72 (39)
18 (6)
26 (9)
41 (86)
38 (86)
10 (26)
17 (10)
23 (26)
1 (67)
62 (260)
100 (92)
266 (316)
190 (239)
176 (60)
169 (190)
0 (0)
384 (698)
653 (352)
219 (243)
490 (847)
169 (156)
71 (99)
0 (0)
338 (605)
801 (497)
672 (501)
20 (1)
809 (1451)
5 (17)
10 (14)
9 (5)
1468 (901)
167 (331)
645 (1026)
18 (68)
79 (29)
17 (49)
12 (29)
28 (18)
5 (9)
44 (20)
5 (47)
187 (250)
22 (91)
14 (26)
256 (299)
1 (5)
0 (1)
5 (9)
39 (38)
339 (206)
33 (45)
64 (54)
28 (52)
1054 (736)
20 (18)
KEY:
PROPOSED DRIVEWAY
SCHEMATIC DRAWING:NOT TO SCALE
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info@TPDinc.com
FIGURE 15
2035 PROJECTED (BUILD) CONDITIONS
WEEKDAY AM (PM) PEAK HOURS
TRAFFIC VOLUME