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Roadway Sufficiency Analysis

Mount Joy Township, Lancaster County PA

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CONTENTS

FIGURES

APPENDICES

Introduction

In 2003-2004, Traffic Planning and Design, Inc. (TPD) completed a Roadway Sufficiency Analysis Report for Mount Joy Township in compliance with the Pennsylvania Impact Fee Law as defined in §§501-A through 506-A of the Municipalities Planning Code (MPC). This Report updates the 2004 document for the purpose of revising the Transportation Impact Fee for the 2014-2024 planning horizon. §§501-A through 506-A of the MPC were added to the code on December 19, 1990 by Act 209 of 1990 and were recently amended by Act 68 of 2000. The MPC authorizes municipalities within the Commonwealth to enact, amend and repeal impact fee ordinances and to charge impact fees to cover the cost of off-site road improvements necessitated by new land development.

The Township's growth projections and resultant traffic volume for the ten-year planning period are documented in the Land Use Assumptions Report (LUAR). The Mount Joy Township Board of Supervisors adopted the original Land Use Assumptions Report on March 15, 2004, and adopted an updated LUAR on November 16, 2015. Supported by the details of the Roadway Sufficiency Analysis and Capital Improvements Plan, the traffic impact fees help ensure that the Township is equipped to provide the necessary infrastructure to accommodate the expected growth as outlined in the LUAR.

Mount Joy Township is located in Lancaster County. As shown in Figure 1, Mount Joy Township is bordered by South Londonderry Township, Lebanon County to the north, Rapho Township to the east, Mount Joy Borough and East Donegal Township to the south, and Elizabethtown Borough and West Donegal, Conewago and Londonderry Townships to the west.

In compliance with §504-A(b)(1) of the MPC, Mount Joy Township established a single Transportation Service Area (TSA) for the Roadway Sufficiency Analysis. §501-A of the MPC stipulates that a TSA cannot exceed an area of seven square miles. The TSA for Mount Joy Township, as shown in Figure 2, is 6.94 square miles in size.

Existing Conditions

Existing Road Network

The table below lists the roads within the TSA used in the Roadway Sufficiency Analysis. It contains the state or township identification number, roadway classification, general directional orientation, speed limit, and additional characteristics. Existing lane configurations and intersection control within the TSA are shown in Figure 3. In the following section, key intersections between these roads are identified and used in the analysis as well.

Road Name	ID Number	Roadway Classification	# of Lanes	General Direction	Speed Limit	Additional Characteristics
PA 283	SR 0283	Expressway	4	W-E	65	Interchanges at Route 743 & Cloverleaf Road
Route 230 – West Main Street/South Market Street	SR 0230	Arterial	3	W-E	45	Includes two-way center turn lane
Route 743 – Hershey Road	SR 0743	Arterial	2	N-S	45	
Route 241 – Mount Gretna Road	SR 0241	Collector	2	W-E	25-50	
Elizabethtown Road	SR 4008	Collector	2	W-E	40-45	
Mount Pleasant Road	SR 4010	Collector	2	W-E	40	
Harrisburg Avenue/ Anchor Road	SR 4018	Collector	2	W-E	35	
Cloverleaf Road	SR 4025 T-335	Collector / Local	2	N-S	35-45	Township road north of Mt. Pleasant Road
Colebrook Road	SR 4025	Collector	2	N-S	35	
Oberholtzer Road	SR 4023	Local	2	N-S	40	
Schwanger Road	T-843	Collector	2	W-E	35	
Sheaffer Road	T-888	Collector	2	N-S	35	
Campus Road	T-887	Collector	2	N-S	35	
East College Avenue	T-313	Collector	2	W-E	25	
Ridge Run Road	T-327	Collector	2	N-S	35	
Greentree Road	T-320	Collector	2	N-S	35	
Ridge Road	T-855	Collector	2	W-E	35	

Road Name	ID Number	Roadway Classification	# of Lanes	General Direction	Speed Limit	Additional Characteristics
Ridgeview Road North	T-889	Collector	2	N-S	35	Split at Elizabethtown Road
Ridgeview Road South	T-889	Collector	2	N-S	35	Split at Elizabethtown Road
Buckingham Boulevard	T-333	Collector	2	N-S	25	
Veterans Drive	T-301	Collector	2	W-E	n/a	
Beverly Road	T-871	Collector	2	W-E	35	
Andrew Avenue	T-351	Local	2	W-E	25	
Rob Drive	T-352	Local	2	N-S	25	
Jonlyn Road	T-837	Local	2	N-S	n/a	Dead-end road
Parkview Drive	T-842	Local	2	W-E	25	Dead-end road
Merts Drive	T-833	Local	2	N-S	25	Dead-end road
Steelway Drive	T-834	Local	2	N-S	30	Dead-end road
Hereford Road	T-324	Local	2	N-S	30	
Holly Street	T-610	Local	2	W-E	n/a	

Transportation Service Area Intersections Studied

Signalized Intersections:

- Route 743, Holly Street and Route 241
- Route 743 and PA 283 Westbound Ramps
- Route 230 and Sheaffer Road
- Route 230 and Cloverleaf Road/Colebrook Road
- Cloverleaf Road and Andrew Avenue/Norlanco Drive

- Cloverleaf Road and Schwanger Road
- Cloverleaf Road and PA 283 Westbound Ramps

Unsignalized Intersections:

- Route 743 and Veterans Drive
- Route 743 and PA 283 Eastbound Ramps
- Route 241 and Ridgeview Road North
- Route 241 and Buckingham Boulevard
- Route 230 and Carey Lane
- Route 230 and Anchor Road
- Route 230 and Market Street Square
- Route 230 and Jonlyn Drive
- Route 230 and Ridge Run Road
- Colebrook Road and Harrisburg Avenue
- Cloverleaf Road and Merts Drive
- Cloverleaf Road and PA 283 Eastbound Ramps
- Cloverleaf Road, Steelway Drive and PA 283 Westbound Ramps
- Cloverleaf Road and Mount Pleasant Road
- Greentree Road and Cloverleaf Road
- Greentree Road and Ridge Road
- Elizabethtown Road and Greentree Road
- Elizabethtown Road and Ridgeview Road South
- Elizabethtown Road and Ridgeview Road North
- Ridge Road and Ridgeview Road
- Ridge Road and Sheaffer Road
- East College Avenue and Campus Road
- Ridge Road and Campus Road
- Campus Road and Sheaffer Road
- Schwanger Road and Sheaffer Road
- Schwanger Road, Campus Road and Eagle Parkway
- Ridge Run Road and Schwanger Road

Proposed Intersections:

- Route 743 and Buckingham Boulevard
- Route 230 and Eagle Parkway
- Conifer Drive, Eagle Parkway and PA 283 Off-ramp

Existing Traffic Volumes

Manual turning movement counts were conducted by Mount Joy Township or obtained from recently submitted traffic studies that were performed within the past three years. For intersections that could not be obtained from recently completed traffic studies in the Township, manual counts were completed. Manual counts were conducted in October 2014 during the P.M. peak period (4:00 P.M. to 6:00 P.M.).

The volumes obtained from other studies were adjusted to represent year 2014 volumes by applying a growth rate of 1.0 percent per year to each turning movement volume. The Existing Conditions P.M. peak hour traffic volumes are shown in Figure 4 and the manual traffic count sheets are included in Appendix A.

Planned Improvements

PENNDOT Twelve Year Transportation Program / Lancaster County TIP

The PennDOT 2011-2022 Twelve Year Program contains three local projects within the "Lancaster-Highway" section. The projects are in various stages, two of which had construction money programmed and one that was granted engineering and design funding.

- SR 230 Existing Signal Improvement (construction) - $200,000
- SR 743 Hershey Road Bridge Replacement (preliminary engineering/final design) - $312,973
- SR 4010 Risser Mill Bridge Replacement (construction) - $140,000

The Lancaster County 2013-2016 Transportation Improvement Program (TIP) contains three local projects involving state roads. Although two of the programmed projects are different from the PennDOT Twelve Year Program, the Hershey Road Bridge Replacement project is common among the two lists. However, the TIP has allocated money for construction and right-of-way acquisition in addition to engineering and design for the Hershey Road project.

- SR 743 Hershey Road Bridge Replacement over Conewago Creek (final design/utilities/right-of-way/construction) - $2,263,048
- SR 743 Hershey Road Resurfacing from Dauphin County to PA 230 (preliminary engineering/utilities/construction) - $1,510,000
- SR 4033 Meadowview Road Bridge #3 Replacement over Little Chiques Creek (final design/utilities/right-of-way/construction) - $1,447,400

Lancaster County also recognizes two local unfunded problems/projects in the *Connections 2040* transportation plan that are consistent with the Township's Capital Improvements Plan/Official Map:

- PA 283 & Cloverleaf Road Interchange Area ["B", #16, #17 & #18 on Figure 9]
- Buckingham Boulevard Extension ["T" on Figure 9]

Other Planned Improvements

There are other projects in progress within the TSA that are currently not on the PennDOT Twelve Year Program or the Lancaster County TIP. These projects are locally driven, whether by the Township, private developer, or some combination of the two.

- PA 283 Eastbound Off-Ramp Relocation – in design/permitting stage as joint project between a private developer and the Township, which includes the following:
  - New off-ramp approximately 3,000 feet west of current ramp ["B" on Figure 9]
  - Roundabout intersection at end of off-ramp [#22 on Figure 9]
  - North Conifer Drive extension and signalization of intersection with Cloverleaf Road & PA 283 Eastbound On-Ramp ["L" & #16 on Figure 9]
  - Merts Drive cul-de-sac and elimination of intersection with Cloverleaf Road [#15 on Figure 9]
  - Eagle Parkway extension from roundabout to existing "Merts Drive" stub ["F" on Figure 9]
- SR 743 & Veterans Drive Signalization [#2 on Figure 9] – in construction phase
- Buckingham Boulevard Extension and SR 743 Intersection Improvements ["T" & #3 on Figure 9] – under consideration as part of a mixed-use development project
- Eagle Parkway extension from Campus Road/Schwanger Road intersection to Route 230 ["F" On Figure 9] – under consideration as part of a residential development project

Traffic Volume Analysis

Overview

In compliance with the MPC, the LUAR uses a ten-year planning horizon for anticipated growth in the Township's TSA. The Roadway Sufficiency Analysis bases traffic volume projections off of these land development assumptions to determine capital improvements necessary to maintain a preferred level of service. The Township's traffic impact fee may only be based on improvements needed to accommodate this future development in the TSA. This means that costs associated with improvements that are necessary to remedy deficiencies due to the following ***cannot be included*** in the calculation of the traffic impact fee:

- Existing traffic
- Future growth due to increased traffic passing through the municipality (pass-thru traffic)
- Traffic due to growth in the Township that is outside the TSA

In order to determine the improvements that are necessary to remedy level of service deficiencies due to each scenario separately, traffic volumes were developed in in the following order:

1. 2014 Existing Conditions

2. 2024 Base Conditions, which include the following:
    a. Future growth due to increased traffic passing thru the municipality (pass-thru traffic)
    b. Growth in the Township that is outside of the TSA
    c. Traffic due to developments that had preliminary or tentative applications filed before the first publication of the municipality's intention to adopt the original impact fee ordinance
3. 2024 Projected Conditions that are equal to the 2024 Base Conditions plus traffic from anticipated developments located in the TSA (per the LUAR)

Trip generation rates for land uses associated with anticipated future development are referenced from the *Trip Generation* manual, 9th Edition, 2012, produced by the Institute of Transportation Engineers. The statistics in *Trip Generation* are empirical data based on more than 3,000 trip generation studies. 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. These rates are used to translate projected development yields into the expected number of vehicle trips from the anticipated developments.

According to *Trip Generation*, commercial buildings such as retail establishments attract two types of traffic: new trips to the local road network, and those that are part of the stream of traffic passing by the site frontage (i.e., pass-by trips). For the purposes of this study, only new trips were considered in the 2024 Projected Conditions unless a proposed development that typically has pass-by trips is located on a corner of an intersection that is included in the study. Pass-by trips for corner sites have been included because pass-by trips can affect turning volumes at intersections by providing a means for vehicles to "cut through" the site. However, pass-by trips were not treated as new trips for sites located mid-block or at intersections that were not included in the study since volumes at the study intersections will not be affected by these trips.

2024 Base Conditions

The PennDOT publication *2010 Pennsylvania Traffic Data* indicates a Yearly Growth Factor of 1.0% per year. This factor is an annualized growth rate derived from the publication's ten-year traffic growth of 10.2% from 2000-2010. Since the Roadway Sufficiency Analysis includes traffic for 23 development sites, using a background growth rate of 1.0% per year would represent an over estimate of future traffic due to double counting. Therefore, a background growth rate of 0.5% per year was used to determine pass-by traffic volumes.

Included as Appendix B to this report, Table 9 from the LUAR summarizes all of the anticipated development that is expected to occur in the Township within the upcoming ten-year planning horizon. Since only four residential lots are left in the sole remaining development submitted prior to the Township advertising the original notice of intent to adopt the traffic impact fee, none of the anticipated developments in Appendix B are factored into the 2024 Base Conditions. Therefore, background pass-by traffic is the sole contributor of volume growth on top of the 2014 Existing Conditions. The 2024 Base P.M. peak hour traffic volumes determined by adding the pass-thru trips to the 2014 Existing Conditions are shown in Figure 5 and in the volume worksheets in Appendix D.

2024 Projected Conditions

Table 1 summarizes trip generation for the 23 development sites listed in Appendix B according to future land use, driving the 2024 Projected Conditions. Detailed trip generation data can be found in Appendix C.

TABLE 1
PROJECTED DEVELOPMENT P.M. PEAK HOUR TRIP GENERATION
TRANSPORTATION SERVICE AREA

			P.M. PEAK HOUR		
LAND USE CODE	LAND USE	TOTAL UNITS/SIZE	ENTER (PASS-BY)	EXIT (PASS-BY)	TOTAL (PASS-BY)
RESIDENTIAL					
210	Single Family Detached	352 units	242	142	384
220	Apartment	140 units	62	33	95
230	Duplex	290 units	118	59	177
230	Townhouse/Condominium	169 units	73	37	110
Total Residential Trips			***495***	***271***	***766***
NON-RESIDENTIAL					
140	Manufacturing	215,000 s.f.	55	97	152
150	Warehousing	969,500 s.f.	44	300	344
151	Mini-Warehouse	15,000 s.f.	2	2	4
310	Hotel	123 rooms	37	37	74
565	Day Care Center	5,000 s.f.	29	33	62
710	General Office	62,120 s.f.	13	66	79
730	Municipal	9,120 s.f.	3	8	11
820	Retail	673,719 s.f.	1,476 (762)	1,602 (825)	3,078 (1,587)
826	Specialty Retail	1,050 s.f.	8 (4)	8 (4)	16 (8)
853	Convenience Store	6,849 s.f.	60 (115)	59 (115)	119 (230)
911	Walk-In Bank	1,000 s.f.	5	7	12
912	Drive-In Bank	7,000 s.f.	45 (40)	45 (40)	90 (80)
934	Fast Food Restaurant	11,290 s.f.	106 (105)	98 (97)	204 (202)
944	Fueling Station	2 fueling positions	6 (8)	6 (8)	12 (16)
Total Non-Residential Trips			***1,889 (1,034)***	***2,368 (1,089)***	***4,257 (2,123)***
TOTAL PROJECTED TRIPS			**2,384**	**2,639**	**5,023**

Pass-by trips were determined based on the existing traffic patterns in the vicinity of the proposed sites. Trip distributions for the anticipated developments were entered into the volume development worksheets, which are attached in Appendix D and are reflected in Table 1.

A distribution gravity model was performed for the proposed developments based on 2010 Census data. First, the destinations of commuters from Mount Joy Township for employment and the origins of commuters traveling

to Mount Joy Township for employment were determined from the Census data. Next, travel routes were determined to/from each of the surrounding municipalities. Then, distribution percentages were calculated for each of the travel routes by determining the percentage of commuters using each route to/from the surrounding municipalities.

The result of this analysis was the directional distribution chart shown below in Table 2, which was used for the distribution of primary trips to/from the future developments. The trip distribution percentages for the retail/office/commercial developments were based on the Census data statistics for commuters destined for Mount Joy Township. The trip distribution percentages for the residential developments were based on the Census data statistics for commuters originating from Mount Joy Township. More detailed information on trip distribution percentages are contained in Appendix E.

TABLE 2
TRIP DISTRIBUTION PERCENTAGES

	TRIP DISTRIBUTION RATES	
DIRECTION TO/FROM	NONRESIDENTIAL	RESIDENTIAL
E-town Borough	27%	23%
East via E-town Road	4%	3%
West via Route 230	1%	3%
West via Route 283	3%	17%
East via Route 230	12%	7%
East via Route 283	21%	30%
South via Colebrook Road	27%	8%
North via Route 743	3%	8%
North via Route 241	2%	1%
Total:	100%	100%

In order to simplify the trip distributions, trips were distributed to the road network assuming that all traffic originated from or was destined to locations outside of Mount Joy Township. Therefore, it was assumed that no one who lives in Mount Joy Township would work or shop in Mount Joy Township. Although this assumption may seem impractical, it was necessary to simplify the distributions since traffic had to be distributed for 23 development sites. Also, it would be impossible to determine the exact locations where commuters would live and work in Mount Joy Township.

However, trips can be overestimated as a result of this assumption. Therefore, in order to account for commuters living and working or shopping in Mount Joy Township, reduction percentages were applied to the trip distributions in the volume worksheets in Appendix D. The reduction percentages were based on diverted-linked percentages contained in the *Trip Generation Manual*. Based on the diverted-linked percentages, the office/industrial trips were reduced by 12% and retail trips were reduced by 22%.

The trip distributions were also adjusted to account for the lag that typically exists from the time that a development receives approval to the time that a development is constructed. Since it generally takes two years from the time that a development receives approval until it is constructed, the developments that receive approval

in the years 2021 and 2022 will not be completed until after the study year, 2024. Therefore, the number of trips generated by all development was reduced by 20%.

In order to develop 2024 Projected Conditions traffic volumes, the trips associated with the anticipated developments with the aforementioned adjustments were added to the 2024 Base Conditions traffic volumes. The 2024 Projected Conditions P.M. peak hour traffic volumes are shown in Figure 6 and in the volume worksheets in Appendix D.

Intersection Level of Service

Background and Preferred LOS

When evaluating intersections, level of service is expressed as the control delay per vehicle for a one-hour analysis period. Control delay includes the initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Simply stated, delay quantifies driver discomfort and frustration, fuel consumption, and lost travel time. Established criteria for this measure are shown in Table 3.

Delay, as it relates to level of service, is a complex measure that depends upon a number of variables. For signalized intersections, these variables include the quality of vehicle progression, cycle length, green time ratio, and 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 (e.g., straight across, left, or right turn).

It is important to understand that the level of service criteria outlined in Table 3 merely represent guidelines for quantifying the acceptability of delay to drivers. This can be highly subjective and varies from region to region, usually according to the intensity of development in an area. A more universal measure of acceptability to drivers is the number of cycles (i.e., the time it takes for the signal to go through all of its phases once) through which they must wait before proceeding through an intersection. In general, if a driver is able to proceed through a signalized intersection within one complete cycle of the signal, the experienced delay is usually considered acceptable.

TABLE 3
LEVEL OF SERVICE CRITERIA

	STOPPED DELAY PER VEHICLE (SECONDS)		
LEVEL OF SERVICE	UNSIGNALIZED	SIGNALIZED	GENERAL DESCRIPTION (SIGNALIZED INTERSECTIONS)
A	≤10	≤10	Free flow
B	>10 - 15	>10 - 20	Stable flow (slight delays)
C	>15 - 25	>20 - 35	Stable flow (acceptable delays)
D	>25 - 35	>35 - 55	Approaching unstable flow (tolerable delay)

E	>35 - 50	>55 - 80	Unstable flow (intolerable delay)
F	>50	>80	Forced flow (jammed)

Source: The Transportation Research Board's Highway Capacity Manual (HCM), 2000 Edition

In accordance with the MPC, a preferred level of service (LOS) of D has been established for the Mount Joy Township TSA. Each intersection approach, lane group, and overall intersection were analyzed for the Existing, Base, and Projected Conditions. If an intersection approach, lane group, or overall intersection has been determined as operating at LOS E or worse, improvements are identified in order to achieve LOS D or better. Improvements necessary to bring the Existing Conditions and 2024 Base Conditions to the preferred LOS are the responsibility of the Township. Impact fees in a TSA can be used only for improvements needed to accommodate the 2024 Projected Conditions traffic volumes within the TSA at LOS D.

Capacity Analysis

The primary goal of this report is to determine what roadway improvements will be needed in the next ten years to accommodate the level of growth that has been projected in the LUAR. In order to determine the level of improvements due to "new" development, capacity analyses were conducted for the P.M. peak hour conditions at 37 study area intersections. The capacity analyses were conducted according to the methodologies contained in the 2000 Highway Capacity Manual (HCM) for the conditions listed below. For reference, the capacity analysis worksheets are included in Appendix F.

A brief summary of the analysis is found below for the Existing, Base, and Projected Conditions with and without the remedial improvements listed in Table 4:

2014 Existing Conditions: Of the 37 intersections analyzed, only five intersections currently have at least one movement at LOS E or worse. Improvements needed to achieve the preferred LOS include three intersections being signalized or fitted with a roundabout, and two intersections having signal timings modified.

2024 Base Conditions: The same five intersections identified in the Existing Conditions are also shown to have at least one movement at LOS E or worse in the 2024 Base Conditions. However, signal retiming is anticipated to be the only action necessary to maintain the preferred LOS if the Existing Conditions improvements are implemented.

2024 Projected Conditions: Assuming that the improvements associated with the Existing and Base Conditions are completed, impacts of the anticipated developments (as detailed in the Land Use Assumptions Report) on the 37 study intersections create the 2024 Projected Conditions. In this condition, 19 of those intersections require improvements in order to restore them to the preferred LOS. The proposed improvements are wide-ranging and significant, and will form the basis for the Capital Improvements Plan. These comprise the majority of the work listed in Table 4.

It should be noted that the results of the analyses show that significant capacity improvements would be needed to achieve a preferred LOS for Cloverleaf Road, including an additional travel lane in each direction and numerous turning lanes at intersections. These improvements have significant right-of-way impacts, including one business and several residential displacements. MPC §504-A(d)(1)(ii)(B) stipulates that the preferred LOS may be waived

for a particular road segment or intersection if geometric design limitations, topographic limitations, or unavailability of necessary right-of-way effectively precludes provision of road improvements to the meet the preferred LOS.

Projected Conditions Scenarios

Two general scenarios were used in the analysis for the 2024 Projected Conditions: "With New Roads" and "Without New Roads". The Without New Roads scenario assumes that the projected traffic flows will use the existing roadway network, while the With New Roads alternative plans for several catalytic road extensions or new roads to be constructed throughout the planning horizon. Most of the roadway projects integrated into the With New Roads scenario would be constructed in conjunction with the anticipated developments identified in the Land Use Assumptions Report since those sites contain the rights-of-way of the proposed projects.

The 2004 Roadway Sufficiency Analysis used a similar approach, contemplating a scenario where two parallel routes to Cloverleaf Road would alleviate congestion on that critical arterial. As a heavily-traveled conduit for traffic from the surrounding neighborhoods and communities from the greater region to the Route 283 interchange, it was expected to see significant traffic volume increases over time. A western parallel roadway (now referred to as Eagle Parkway) and an extension of Ridge Run Road to the east would provide motorists alternatives to Cloverleaf Road.

While today's transportation planning efforts have changed this vision slightly, the principles remain the same. The With New Roads scenario involves significant work to reduce motorists' dependency on Cloverleaf Road, as well as to create a more direct route between Route 743 and the residential areas to the southeast. Specifically, the following roadway improvements are considered as part of this scenario:

- Relocate the Route 283 Cloverleaf Road interchange's eastbound off-ramp approximately 3,000 feet westward per Point of Access Study Alternative #4 ["B" on Figure 9]
- Reconfigure Route 283 westbound ramps at the Cloverleaf Road interchange (per Point of Access Study Alternative #4) ["B" on Figure 9]
- Extend Eagle Parkway as a suburban arterial from Conifer Drive to intersect with Route 230 ["F" on Figure 9]
- Connect Route 283 eastbound off-ramp to Cloverleaf Road (eastward) and Sheaffer Road (westward) via new Conifer Drive ["B" on Figure 9]
- Extend Buckingham Boulevard through Route 241 and Route 743 to Old Hershey Road ["T" on Figure 9]

The impacts of these improvements on level of service are reflected in Figure 8, and are shown on a proposed update to the Township's Official Map (Figure 9). The majority of the improvements will be constructed as on-site improvements for land development projects, thus reducing the traffic impact fee that would be required to construct the improvements outlined above. The additional improvements for this project attributable to new development will be identified in the Capital Improvements Plan and factored into the traffic impact fee.

Improvements

Based on the results of the Roadway Sufficiency Analysis, many improvements have been identified to maintain or improve the system to LOS D. A detailed description of the improvements needed to bring the deficient movements up to a LOS D or better are listed in Table 4. The new LOS with improvements can be seen in Figure 8. The updated Capital Improvements Plan will provide cost estimates, potential funding sources, and a schedule of implementation for each intersection improvement identified in Table 4 and the roadway improvements in the With New Road scenario.

The funding collected through traffic impact fees cannot be used to fund improvements that have been recommended to maintain a LOS D for each intersection approach, lane group, or overall intersection for the 2014 Existing and 2024 Base Conditions. The fees will, however, be utilized to fund the improvements which are necessary to maintain the preferred LOS D for the 2024 Projected Conditions, which includes the traffic that will be generated by "new" development within Mount Joy Township anticipated to occur over the next ten years.

The improvements that will be necessary to maintain the preferred LOS D for the Existing, Base, and Projected Conditions are listed in Table 4. ***Note that only the improvements associated with the 2024 Projected Conditions can be funded by traffic impact fees.*** The revised traffic impact fee calculation for each new P.M. peak hour trip generated by development in the Mount Joy Township TSA will be provided in the Capital Improvements Plan, which will provide cost estimates for the improvements.

Because two scenarios were used to generate the improvements associated with the Projected Conditions, Table 4 differentiates between them using asterisks. In the 2024 Projected Conditions column, tasks tied to the With New Roads scenario only have a single asterisk next to them. Those tied to the Without New Roads scenario only have two asterisks, and those needed regardless of the scenario do not have an asterisk.

TABLE 4
IMPROVEMENTS REQUIRED FOR PREFERRED LOS D

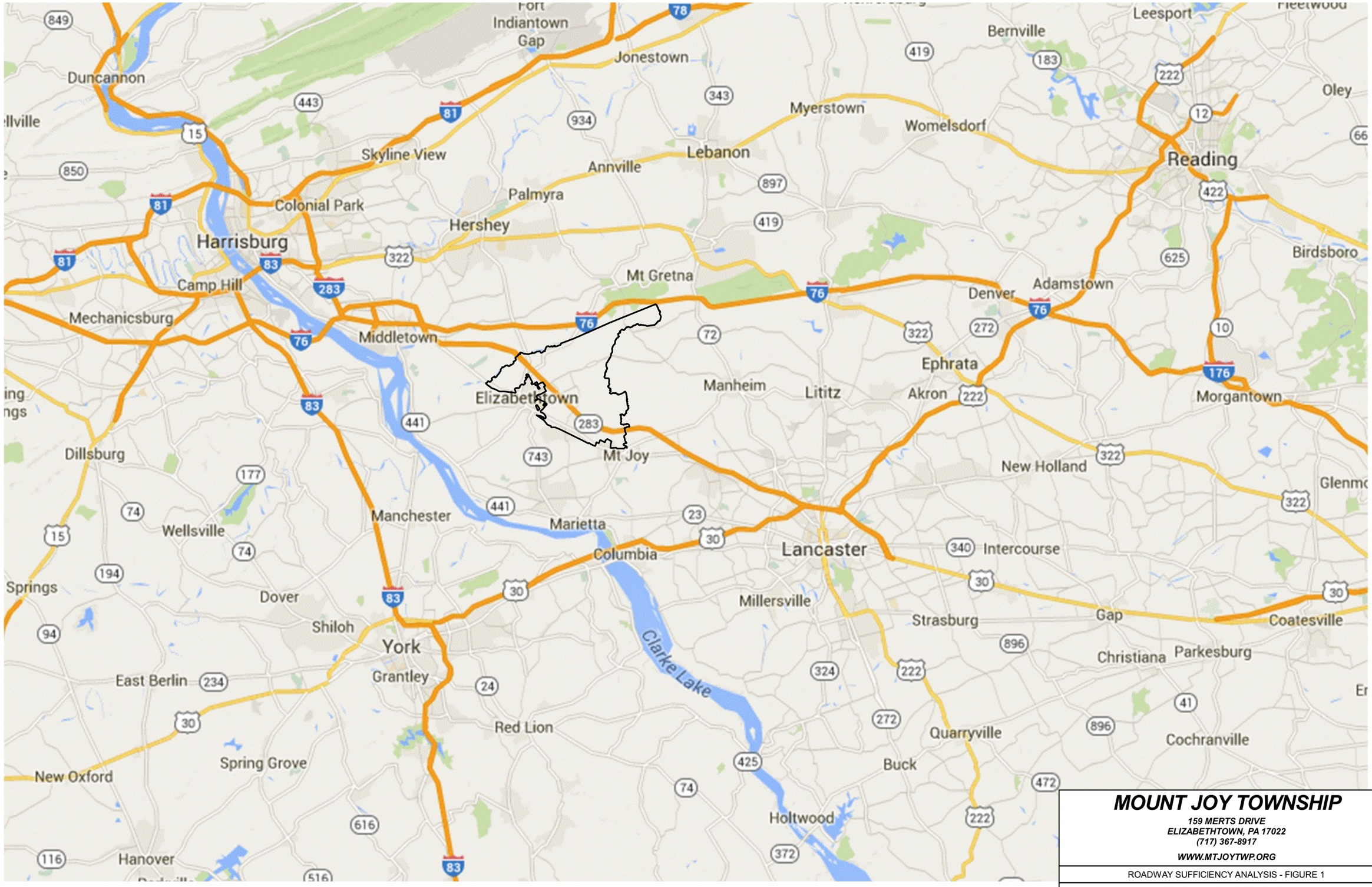
OFFICIAL MAP#	LOCATION	EXISTING CONDITIONS IMPROVEMENTS	2024 BASE CONDITIONS IMPROVEMENTS	2024 PROJECTED CONDITIONS IMPROVEMENTS
1	Route 743, Holly Street and Route 241	Modify traffic signal timings	---	Construct dual-lane roundabout
2	Route 743 and Veterans Drive	---	---	Signalize intersection
3	Route 743 and Buckingham Boulevard	---	---	Signalize intersection Construct WB right turn lane Construct 2nd NB thru lane Construct SB left turn lane
4	Route 743 and PA 283 EB Ramps	Signalize intersection	---	Add SB left turn phase

OFFICIAL MAP#	LOCATION	EXISTING CONDITIONS IMPROVEMENTS	2024 BASE CONDITIONS IMPROVEMENTS	2024 PROJECTED CONDITIONS IMPROVEMENTS
5	Route 743 and PA 283 WB Ramps	---	---	Modify traffic signal timings
	Route 241 and Ridgeview Road North	---	---	---
6	Route 241 and Buckingham Boulevard	---	---	Construct EB and WB left turn lanes Implement all-way stop control
7	Route 230 and Carey Lane	---	---	Convert WB right turn lane to shared thru/right turn lane Construct 2nd WB receiving lane
8	Route 230 and Anchor Road	---	---	Construct 2nd WB thru lane
9	Route 230 and Market Street Square	---	---	Convert WB right turn lane to shared thru/right turn lane Construct 2nd WB receiving lane
10	Route 230 and Sheaffer Road	---	---	Modify traffic signal timings Construct 2nd WB thru lane Construct SB right turn lane**
	Route 230 and Jonlyn Drive	---	---	---
11	Route 230 and Eagle Parkway	---	---	Signalize intersection Construct 2nd WB thru lane Construct SB left & right turn lanes
12	Route 230 and Cloverleaf Road/Colebrook Road	---	---	Modify traffic signal timings Add WB left turn phase Construct 2nd EB/WB thru lane* Construct NB right turn lane Construct 2nd WB, NB & SB thru lanes** Construct 2nd EB & SB left turn lanes** Convert EB right turn lane to shared thru/right turn lane**
	Route 230 and Ridge Run Road	---	---	---
13	Colebrook Road and Harrisburg Avenue	---	---	Signalize intersection & synchronize with Cloverleaf Road signals Construct NB & SB left turn lanes
	Cloverleaf Road and Andrew Avenue/Norlanco Drive	---	---	Modify traffic signal timings** Construct NB & SB left turn lanes** Construct 2nd SB thru lane**

OFFICIAL MAP#	LOCATION	EXISTING CONDITIONS IMPROVEMENTS	2024 BASE CONDITIONS IMPROVEMENTS	2024 PROJECTED CONDITIONS IMPROVEMENTS
14	Cloverleaf Road and Schwanger Road	Modify traffic signal timings	---	Modify traffic signal timings** Add NB, SB & EB left turn phases** Construct 2nd EB left turn lane** Construct 2nd NB & SB thru lanes** Construct SB right turn lane**
15	Cloverleaf Road and Merts Drive	Signalize intersection	---	Remove signal Close intersection (reroute traffic to North Conifer Drive)* Construct 2nd NB & SB thru lanes** Modify traffic signal timing**
16	Cloverleaf Road and PA 283 EB Ramps	Signalize intersection	---	Reconstruct EB ramp as N. Conifer Drive* Provide EB left, thru & right lanes* Construct NB left & right turn lanes* Construct SB right turn lane Signalize intersection** Construct NB right turn lane** Construct 2nd SB thru lane** Add SB left turn phase** Add EB right turn phase**
17	Cloverleaf Road and PA 283 WB Ramps	---	---	Remove traffic signal* Existing ramp right turn only* Modify traffic signal timings** Construct 2nd WB & NB left turn lanes** Construct 2nd SB thru lane**
18	Cloverleaf Road and Steelway Drive/PA 283 WB Ramps	---	---	Signalize intersection Construct NB & WB left turn lanes* Construct cloverleaf ramp for WB PA 283*
19	Cloverleaf Road and Mt. Pleasant Road	---	---	Construct EB right turn lane
	Greentree Road and Cloverleaf Road	---	---	---
	Greentree Road and Ridge Road	---	---	---
	Elizabethtown Road and Greentree Road	---	---	---
20	Elizabethtown Road and Ridgeview Road South	---	---	Construct EB right turn lane* Construct roundabout**

OFFICIAL MAP#	LOCATION	EXISTING CONDITIONS IMPROVEMENTS	2024 BASE CONDITIONS IMPROVEMENTS	2024 PROJECTED CONDITIONS IMPROVEMENTS
	Elizabethtown Road and Ridgeview Road North	---	---	---
	Ridge Road and Ridgeview Road	---	---	---
	Ridge Road and Sheaffer Road	---	---	---
	E College Avenue and Campus Road	---	---	---
	Ridge Road and Campus Road	---	---	---
	Campus Road and Sheaffer Road	---	---	Construct roundabout**
	Schwanger Road and Sheaffer Road	---	---	---
21	Schwanger Road/Campus Road and Eagle Parkway	---	---	Signalize intersection Restripe Eagle Parkway to provide NB & SB left turn lanes* Construct SB right turn lane* Construct WB right turn lane**
22	Conifer Drive, Eagle Parkway and PA 283 EB Off-ramp	---	---	Signalize intersection Construct EB right turn lane Construct WB left turn lane Construct NB channelized right turn lane Construct SB left & right turn lanes Provide WB & NB left turn lanes
	Ridge Run Road and Schwanger Road	---	---	---

* for "With New Roads" scenario only
** for "Without New Roads" scenario only



MOUNT JOY TOWNSHIP

159 MERTS DRIVE
ELIZABETHTOWN, PA 17022
(717) 367-8917

WWW.MTJOYTWP.ORG

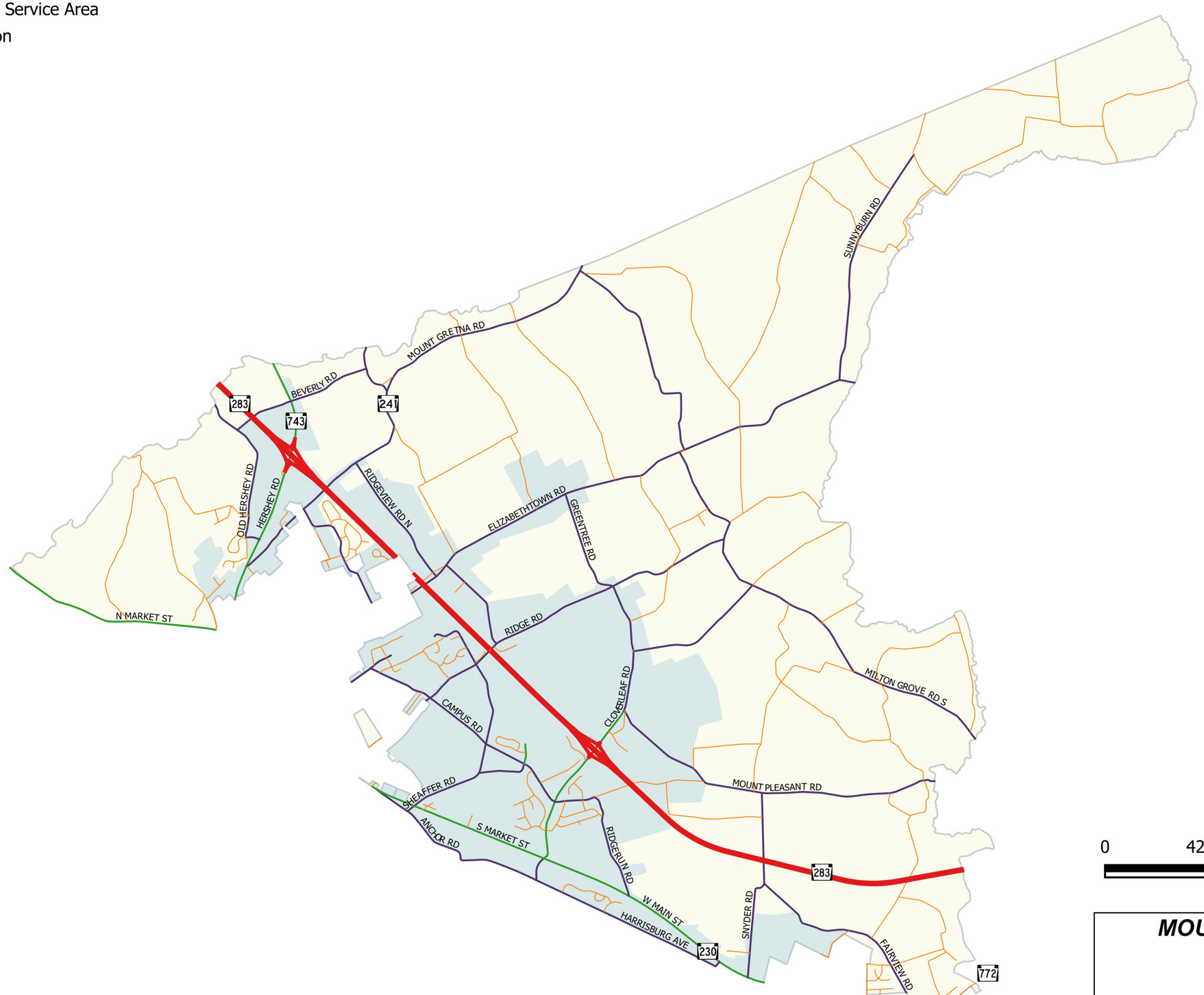
ROADWAY SUFFICIENCY ANALYSIS - FIGURE 1

LOCATION MAP - OCTOBER 2015

Transportation Service Area

Road Classification

- Expressway
- Arterial
- Collector
- Local



0 4200 8400 feet

N W E S

MOUNT JOY TOWNSHIP

159 MERTS DRIVE
ELIZABETHTOWN, PA 17022
(717) 367-8917

WWW.MTJOYTWP.ORG

ROADWAY SUFFICIENCY ANALYSIS - FIGURE 2

TRANSPORTATION SERVICE AREA - OCTOBER 2015

ELIZABETHTOWN RD

RIDGE RD

CLOVERLEAF RD

MT PLEASANT RD

STEEL WAY DR

ROUTE 283

RIDGE-VIEW RD N

RIDGE-VIEW RD

MT GRETNA RD

SHEAFFER RD

COLLEGE AVE

MERTS DR

MERTS DR

BUCKINGHAM BLVD

VETERANS DR

CAMPUS RD

SCHWANGER RD

SCHWANGER RD

ANDREW AVE

RIDGE RUN RD

TURKEY HILL

HOLLY ST

CAREY LN

CVS

MARKET ST SQ

JONLYN DR

S MARKET ST

W MAIN ST

GIANT

ANCHOR RD

HARRISBURG AVE

● TRAFFIC SIGNAL CONTROL

▲ YIELD CONTROL

⊥ STOP CONTROL

SCHEMATIC DRAWING - NOT TO SCALE

FIGURE 3

2014 EXISTING CONDITIONS LANE CONFIGURATION AND INTERSECTION CONTROL

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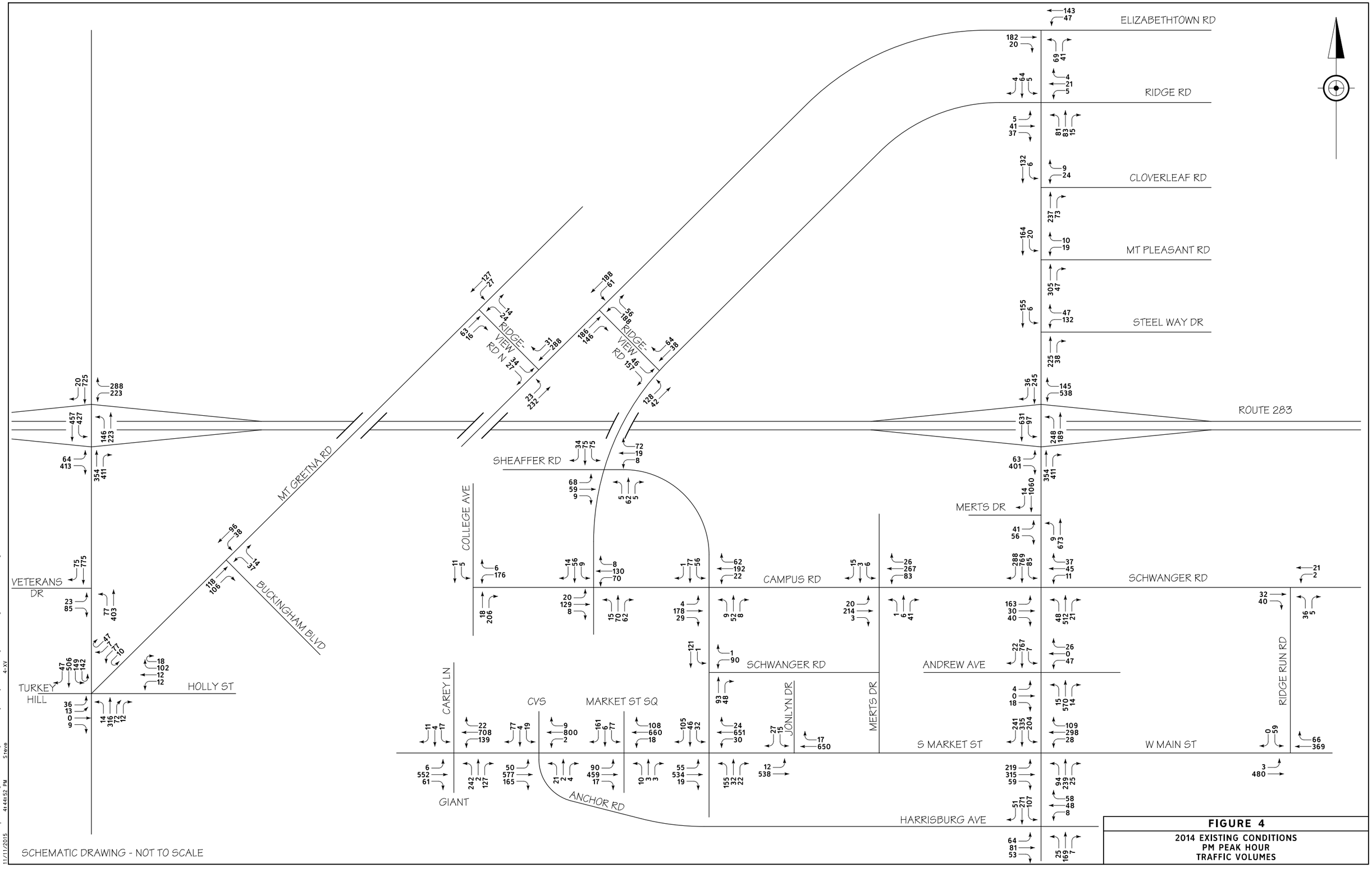

FIGURE 4

2014 EXISTING CONDITIONS
PM PEAK HOUR
TRAFFIC VOLUMES

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4-XV

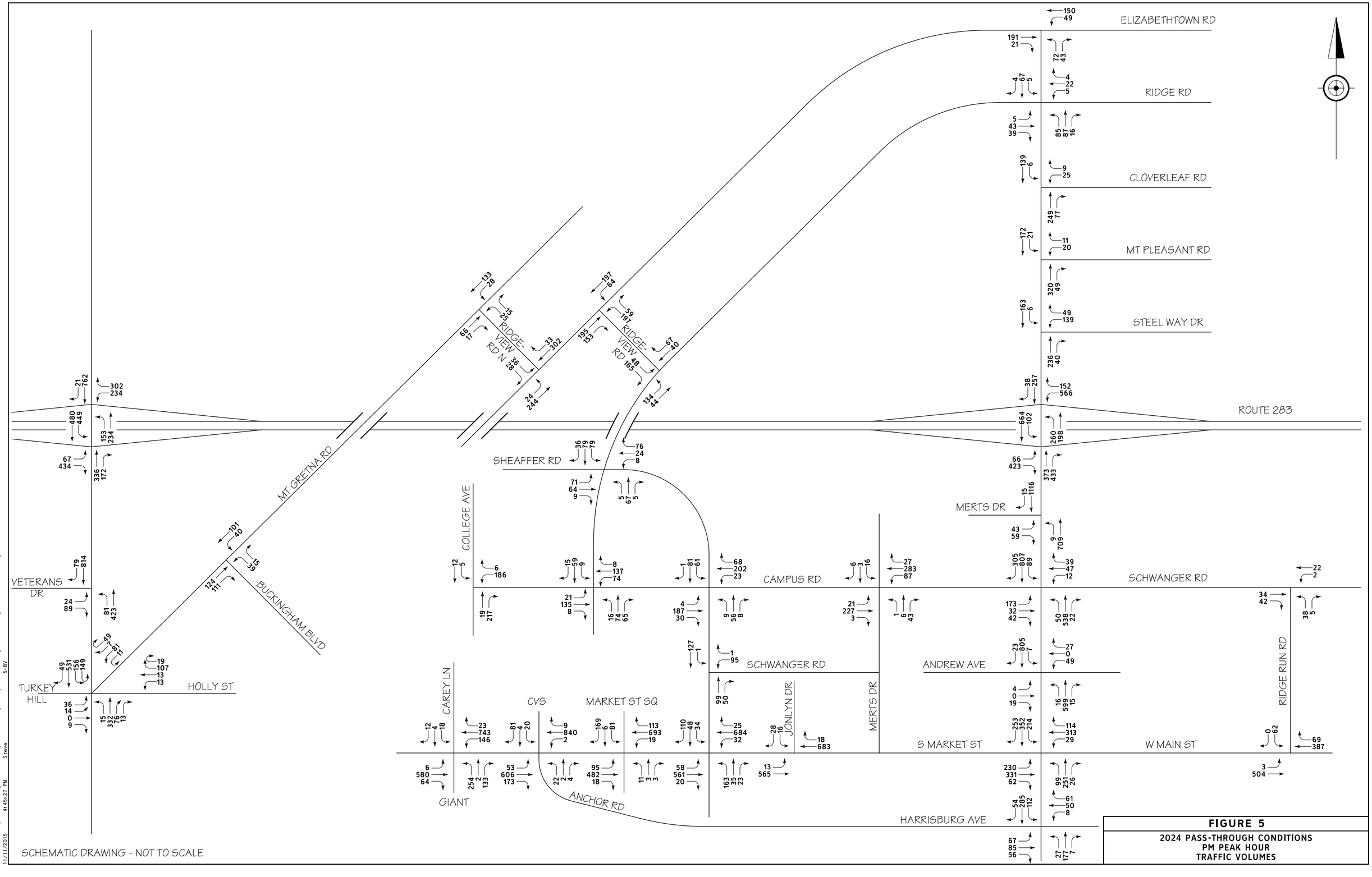

FIGURE 5

2024 PASS-THROUGH CONDITIONS
PM PEAK HOUR
TRAFFIC VOLUMES

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11/11/2015 4:45:27 PM Steve
5-BV

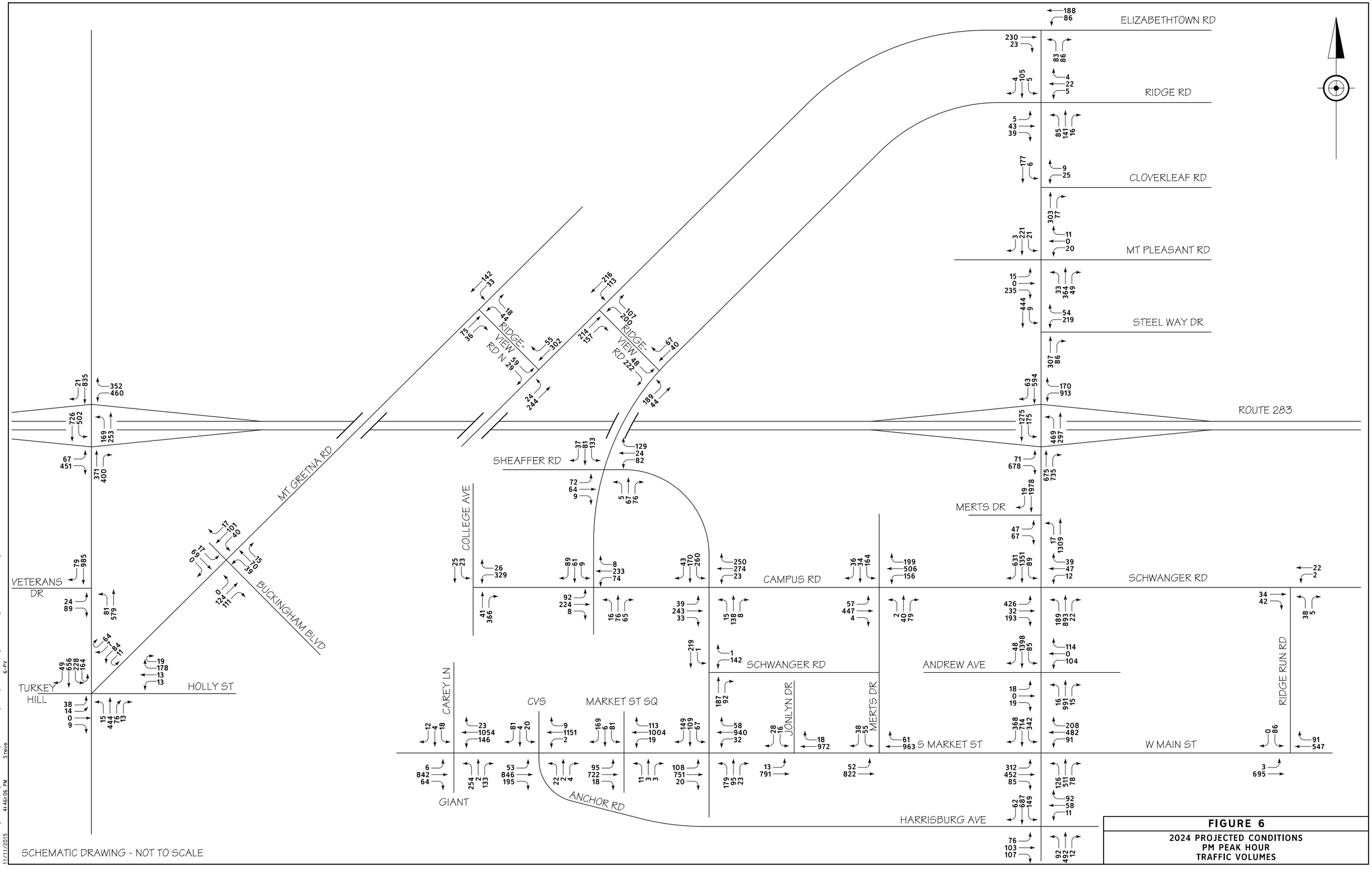

FIGURE 6

2024 PROJECTED CONDITIONS
PM PEAK HOUR
TRAFFIC VOLUMES

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6-PM

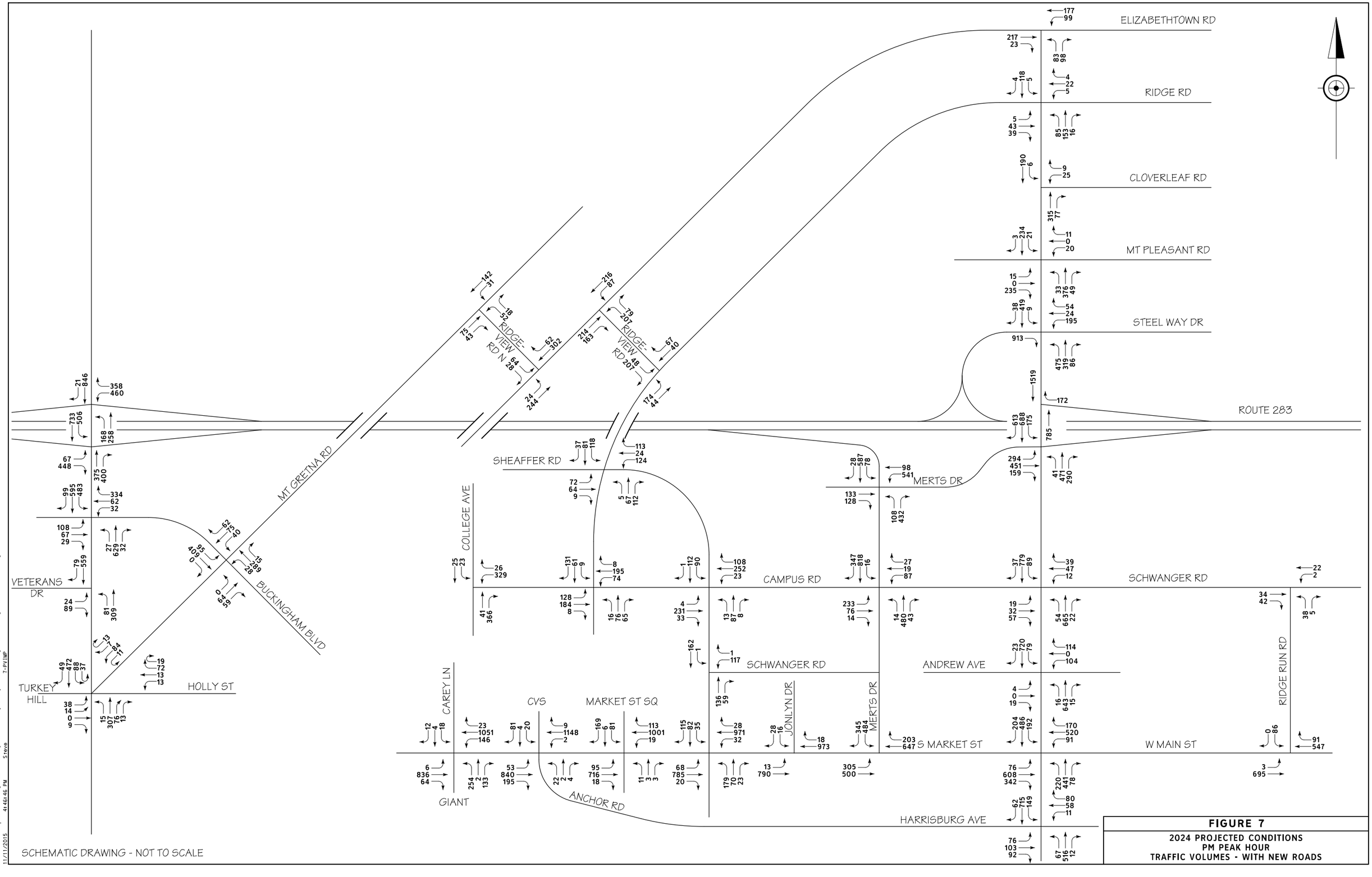

FIGURE 7

2024 PROJECTED CONDITIONS
PM PEAK HOUR
TRAFFIC VOLUMES - WITH NEW ROADS

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7-PV1.NP

Figure 8 – Level of Service (delay) Summary

Intersection	Lane	Weekday PM Peak Hour							
		Existing	Existing w/ Imp.	Base	Base w/ Imp.	Projected	Projected w/ Imp.	Projected w/ Roads	Projected Rds & Imp
743 & 241 & Holly St	EB LTR	D	D	D		D	C	D	
	WB LTR	E	E	E		F (87.6)	D	D	
	NB L	C	C	C		D	D	C	
	NB T	D	E	E		F (134.0)		D	
	NB R						A		
	SB L	F (95.8)	E	F (118.2)		F (289.5)	A	D	
	SB TR	C	B	C		D	D	B	
	SW LTR	E	E	E		E	C	D	
	ILOS	D	D	E		F (116.7)	C	C	
Hershey Road (SR 743) & PA 283 WB Ramp O (SR 8015)	WB L	C		C		E	D	E	D
	WB R	A		A		A	A	A	A
	NB L	A		A		B	C	B	B
	NB T	A		A		A	B	A	A
	SB TR	C		C		C	C	C	C
	ILOS	B		B		C	C	C	C
South Market St (SR 230) & Sheaffer Road	EB L	A		A		F (180.4)	B	D	B
	EB TR	A		A		B	A	B	B
	WB L	A		A		B	A	B	B
	WB TR	B		B		F (110.4)	B	F (85.5)	C
	NB L	D		D		F (85.6)	D	E	D
	NB TR	C		C		C	C	C	C
	SB LT	C		C		C	C	C	C
	SB R						C		
	ILOS	B		B		E	B	D	C

ILOS=INTERSECTION LEVEL OF SERVICE *DELAY EXCEEDS CAPACITY (ERROR)

Figure 8 – Level of Service (delay) Summary

Intersection	Lane	Weekday PM Peak Hour							
		Existing	Existing w/ Imp.	Base	Base w/ Imp.	Projected	Projected w/ Imp.	Projected w/ Roads	Projected Rds & Imp
South Market St (SR 230) & Market Street Square	EB L	A		A		B	A	B	A
	EB TR	A		A		B	B	B	A
	WB L	A		A		A	A	A	A
	WB T	A		A		B	A	B	A
	WB R	A		A		A		A	
	NB LTR	C		C		C	C	C	C
	SB L	D		D		D	D	D	D
	SB TR	C		C		C	C	C	C
	ILOS	B		B		B	B	B	A
South Market St (SR 230) & Carey Lane/Giant	EB L	B		B		B	B	B	A
	EB T	B		B		D	D	C	C
	EB R	B		B		B	B	B	A
	WB L	A		A		D	D	D	C
	WB T	A		A		D	A	D	A
	WB R	A		A		A		A	
	NB L	D		D		D	D	D	D
	NB TR	C		C		C	C	C	C
	SB L	C		C		C	C	C	C
	SB TR	C		C		C	C	C	C
	ILOS	B		B		D	C	D	C
South Market St/ W Main St (SR 230) & Cloverleaf Rd/ Colebrook Rd (SR 4025)	EB L	C		C		F (147.8)	D	C	D
	EB T	C		C		C	C	C	D
	EB R	B		B		B		B	D
	WB L	D		C		C	C	D	C
	WB T	D		D		E	D	D	D
	WB R	C		C		C	C	C	
	NB L	C		C		E	D	F (158.1)	D
	NB T	D		D		F (389.1)	D	F (250.8)	D
	NB R								C
	SB L	C		C		F (244.4)	D	D	D
	SB T	C		D		F (333.0)	B	F (135.3)	D
	SB R	D		D		E	B	D	D
	ILOS	D		D		F (179.7)	C	F (91.0)	D

ILOS=INTERSECTION LEVEL OF SERVICE *DELAY EXCEEDS CAPACITY (ERROR)

Figure 8 – Level of Service (delay) Summary

Intersection	Lane	Weekday PM Peak Hour							
		Existing	Existing w/ Imp.	Base	Base w/ Imp.	Projected	Projected w/ Imp.	Projected w/ Roads	Projected Rds & Imp
Cloverleaf Rd (SR 4025) & Andrew Ave/ Norlanco Dr	EB LT	C		C		C	C	C	
	EB R	C		C		C	C	C	
	WB LTR	C		C		E	D	D	
	NB L	A		A		F (441.1)	B	B	
	NB TR						D		
	SB L	A		A		F (232.3)	C	B	
	SB T						A	A	
	SB R	A		A		A			
	ILOS	A		A		F (286.5)	C	B	
Cloverleaf Rd (SR 4025) & Schwanger Rd	EB L	E	D	F (84.5)		F (693.7)	D	C	
	EB TR	C	C	C		D	C	C	
	WB L	C	C	C		C	D	C	
	WB TR	C	C	C		C	D	C	
	NB L	C	C	C		F (333.5)	D	A	
	NB TR	B	A	B		B	C	A	
	SB L	A	A	A		C	A	A	
	SB T	D	C	D		F (415.9)	D	A	
	SB R						C		
	ILOS	C	C	D		F (308.7)	D	B	
Cloverleaf Rd & PA 283 WB Ramp B (SR 8015)	WB L	D		D		F (304.2)	D	---	
	WB R	B		B		C	C	D	
	NB L	C		C		F (455.3)	D	---	
	NB T	B		B		B	A	---	
	SB TR	D		D		F (199.2)	D	---	
	SB R						D	---	
	ILOS	C		C		F (251.6)	D	---	
South Market Street (SR 230) & Jonlyn Dr.	EB L	A		A		B		B	
	SB LR	C		C		C		C	

ILOS=INTERSECTION LEVEL OF SERVICE *DELAY EXCEEDS CAPACITY (ERROR)

Figure 8 – Level of Service (delay) Summary

Intersection	Lane	Weekday PM Peak Hour							
		Existing	Existing w/ Imp.	Base	Base w/ Imp.	Projected	Projected w/ Imp.	Projected w/ Roads	Projected Rds & Imp
Colebrook Rd (SR 4025) & Harrisburg Ave (SR 4018)	EB LTR	B		B		D	D	D	D
	WB LTR	B		B		C	C	C	C
	NB L	B		B		F (68.9)	B	F (68.3)	B
	NB TR						B		A
	SB L	C		D		F (68.9)	B	F (68.3)	A
	SB LTR						C		B
	ILOS	C		C		F (58.9)	C	F (58.3)	B
West Main St (SR 230) & Ridge Run Rd	EB L	A		A		A		A	
	SB LR	B		B		C		C	
Schwanger Rd & Ridge Run Rd	WB L	A		A		A		A	
	NB LR	A		A		A		A	
Schwanger Road & Campus Rd & Merts Dr	EB L	A		A		A	B	A	D
	EB TR	---		---		---	B	---	C
	WB L	A		A		A	C	A	C
	WB T	---		---		---	B	---	C
	WB R						B		
	NB L	B		B		E	B	F (*)	A
	NB TR								B
	SB L	B		B		F (*)	C	F (*)	A
	SB T								D
	SB R								A
	ILOS						B		C
Sheaffer Rd & Schwanger Rd	WB LR	B		B		C		B	
	SB L	A		A		A		A	
Campus Rd & Sheaffer Rd	EB LTR	B		B		F (63.9)	B	C	
	WB LTR	B		B		F (70.9)	B	D	
	NB LTR	A		A		C	A	B	
	SB LTR	B		B		F (72.4)	A	C	
	ILOS	B		B		F (64.7)	B	C	

ILOS=INTERSECTION LEVEL OF SERVICE *DELAY EXCEEDS CAPACITY (ERROR)

Figure 8 – Level of Service (delay) Summary

Intersection	Lane	Weekday PM Peak Hour							
		Existing	Existing w/ Imp.	Base	Base w/ Imp.	Projected	Projected w/ Imp.	Projected w/ Roads	Projected Rds & Imp
Ridge Rd & Campus Rd	EB LTR	A		A		B		B	
	WB LTR	A		A		B		B	
	NB LTR	B		B		C		B	
	SB LTR	A		A		C		C	
	ILOS	A		A		C		C	
College Ave & Campus Rd	EB TR	A		A		C		C	
	WB LT	A		A		B		B	
	NB LR	B		B		D		D	
	ILOS	A		A		C		C	
Ridge Rd & Sheaffer Rd	EB LTR	A		A		B		B	
	WB LTR	B		B		B		C	
	NB LTR	A		A		B		C	
	SB LTR	B		B		B		B	
	ILOS	A		B		B		B	
Ridge Rd & Ridgeview Rd	EB L	A		A		A		A	
	SB LR	B		B		B		B	
E-town Rd (SR 4008) & Ridgeview Rd (S)	EB TR	---		---		---	A	---	---
	WB LT	A		A		A	A	A	A
	NB LR	C		D		F (51.9)	A	E	D
E-town Rd (SR 4008) & Ridgeview Rd N	EB L	A		A		A		A	
	SB LR	B		B		B		C	
Mt Gretna Rd (SR 241) & Ridgeview N	WB L	A		A		A		A	
	NB LR	A		B		B		B	
Mt Gretna Rd (SR 241) & Buckingham Blvd	EB L	---		---		C	C	F (178.8)	B
	EB TR								D
	WB LTR	B		B		C	C	F (56.4)	C
	NB L	---		---		A	A	A	B
	NB TR	---		---		---	---		B
	SB L	A		A		A	A	A	B
	SB TR	---		---		---	---		B
	ILOS	---		---		---		---	C

ILOS=INTERSECTION LEVEL OF SERVICE *DELAY EXCEEDS CAPACITY (ERROR)

Figure 8 – Level of Service (delay) Summary

Intersection	Lane	Weekday PM Peak Hour							
		Existing	Existing w/ Imp.	Base	Base w/ Imp.	Projected	Projected w/ Imp.	Projected w/ Roads	Projected Rds & Imp
743 & Veterans Drive	EB L	D		E		F (85.5)	D	C	
	EB R						D		
	NB L	A		A		A	A	A	
	NB T	---		---		---		---	
	SB TR	---		---		---	A	---	
	ILOS	---		---		---	A	---	
Hershey Rd (SR 743) & PA 283 EB Ramps (SR 8015)	EB LT	F (466.1)		F (656.3)		F (*)	D	F (*)	C
	EB R	C		C		D	A	D	D
	NB TR	---		---		---	B	---	C
	SB L	A		B		B	D	B	C
	SB T	---		---		---	A	---	A
	ILOS	---		---		---	B	---	C
E-town Rd (SR 4008) & Greentree Road	WB L	A		A		A		A	
	NB LR	B		B		C		C	
Ridge Rd & Greentree Road	EB LTR	A		A		A		A	
	WB LTR	A		A		A		A	
	NB LTR	A		A		B		B	
	SB LTR	A		A		A		A	
	ILOS	A		A		A		A	
Cloverleaf Rd & Greentree Rd	WB LR	C		C		D		D	
	NB TR	A		A		A		A	
	SB LT	A		A		A		A	
Cloverleaf Rd (SR 4025) & Mt Pleasant Rd (SR 4010)	EB LTR	---		---		B	C	B	C
	EB R	---		---		---	B	---	B
	WB LTR	B		B		E	C	E	D
	NB L	---		---		A	A	A	A
	SB L	A		A		A	A	A	A

ILOS=INTERSECTION LEVEL OF SERVICE *DELAY EXCEEDS CAPACITY (ERROR)

Figure 8 – Level of Service (delay) Summary

Intersection	Lane	Weekday PM Peak Hour							
		Existing	Existing w/ Imp.	Base	Base w/ Imp.	Projected	Projected w/ Imp.	Projected w/ Roads	Projected Rds & Imp
Cloverleaf Rd (SR 4025) & Steelway Dr	EB R	---		---		---	---	F (349.9)	A
	WB L	C		C		F (275.8)	D	F (*)	D
	WB TR								C
	NB L						B	A	C
	NB TR								B
	SB L	A		A		A	B	A	C
	SB TR								D
	ILOS	---		---		---	C	---	C
Cloverleaf Rd (SR 4025) & PA 283 EB Ramps (SR 8013)	EB L	F (67.4)		F (96.6)		F (*)	D	F (*)	B
	EB T								C
	EB R						D		B
	NB L	---		---		---	---	A	B
	NB T	---		---		---	B	---	B
	NB R	---		---		---	B	---	C
	SB L	A		A		B	B	A	B
	SB T	---		---		---	C	---	B
	SB R	---		---		---	---	---	A
	ILOS	---		---		---	C	---	B
Cloverleaf Rd (SR 4025) & Merts Dr	EB LR	F (418.2)		F (565.8)		F (*)	D	---	---
	NB LT	A		A		C	A	---	---
	SB TR						C		
	ILOS	---		---		---	B	---	---
S Market St (SR 230) & Anchor Rd/ CVS Shopping Ctr.	EB L	B		B		C	B	C	B
	WB L	A		A		B	B	B	B
	NB LTR	D		D		F (307.9)	D	F (298.3)	C
	SB LTR	C		C		F (71.7)	C	F (70.3)	C

ILOS=INTERSECTION LEVEL OF SERVICE *DELAY EXCEEDS CAPACITY (ERROR)

Figure 8 – Level of Service (delay) Summary

Intersection	Lane	Weekday PM Peak Hour							
		Existing	Existing w/ Imp.	Base	Base w/ Imp.	Projected	Projected w/ Imp.	Projected w/ Roads	Projected Rds & Imp
Hershey Road (SR 743) & Buckingham Blvd.	EB LTR	---		---		---	---	F (*)	D
	WB LT	---		---		---	---	F (*)	C
	WB R	---		---		---	---		B
	NB L	---		---		---	---	A	C
	NB TR	---		---		---	---	---	
	SB L	---		---		---	---	C	C
	SB TR	---		---		---	---	---	B
	ILOS	---		---		---	---	---	C
Merts Drive & PA 283 EB Off-Ramp	EB T	---		---		---	---	---	D
	EB R								D
	WB L	---		---		---	---	B	D
	WB T	---		---		---	---	---	C
	NB L	---		---		---	---	F (*)	C
	NB R	---		---		---	---	C	B
	SB L	---		---		---	---	F (*)	C
	SB T	---		---		---	---	F (*)	D
	SB R	---		---		---	---	---	B
	ILOS	---		---		---	---	---	D
Market Street (SR 230) & Merts Drive	EB L	---		---		---	---	B	D
	EB T	---		---		---	---	---	B
	WB TR	---		---		---	---	---	D
	SB L	---		---		---	---	F (*)	D
	SB R	---		---		---	---		B
	ILOS	---		---		---	---	---	D

ILOS=INTERSECTION LEVEL OF SERVICE *DELAY EXCEEDS CAPACITY (ERROR)

GENERAL NOTES:

ALL ARTERIALS ARE CONTROLLED ACCESS IN ACCORDANCE WITH ARTERIAL STREET DESIGN CRITERIA WITHIN CHAPTER 119 "SUBDIVISION AND LAND DEVELOPMENT" AND PENNDOT DESIGN MANUAL 2.

PROVIDE LEFT TURN LANES ON ALL APPROACHES OF SIGNALIZED INTERSECTIONS UNLESS OTHERWISE NOTED.

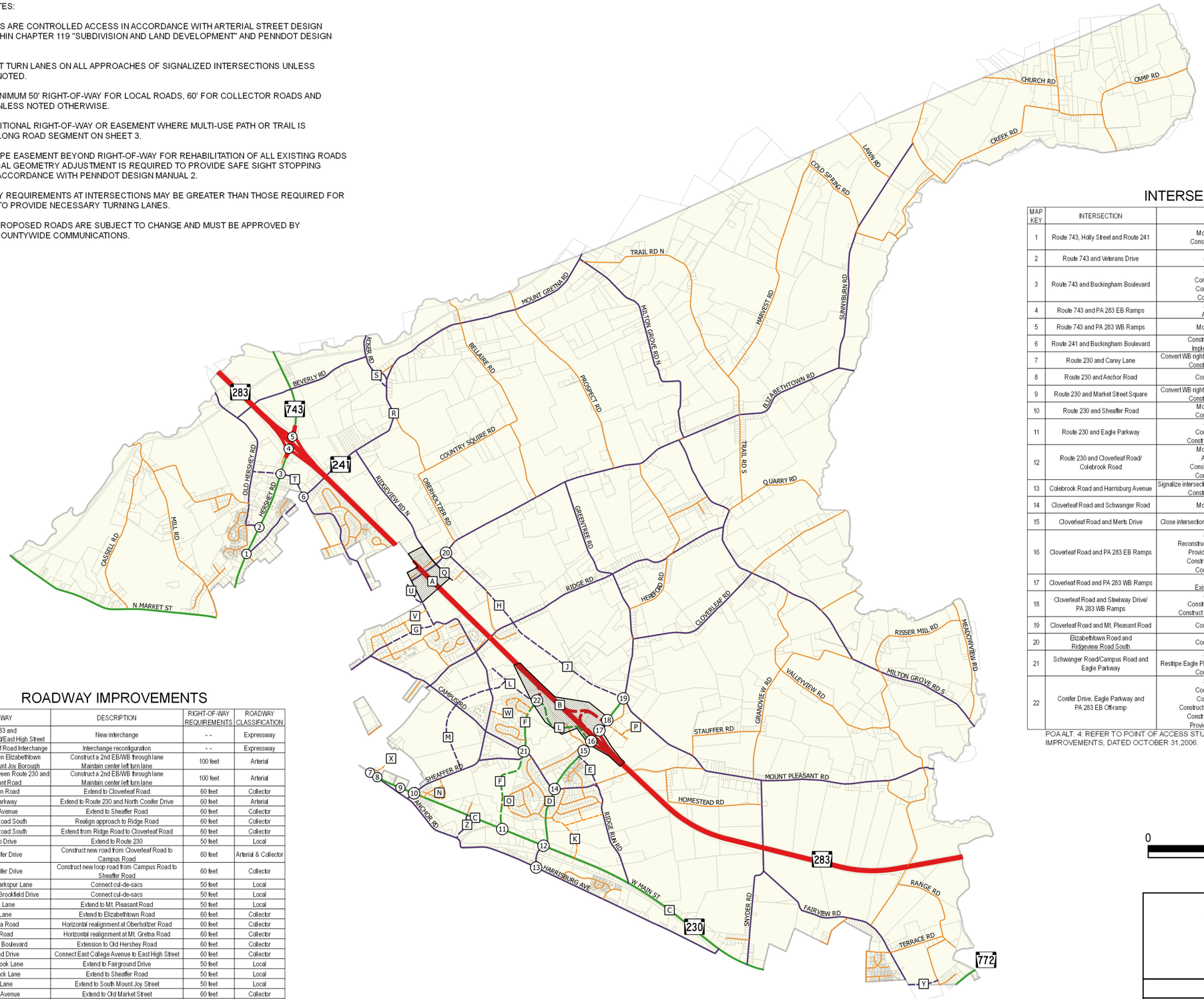
PROVIDE A MINIMUM 50' RIGHT-OF-WAY FOR LOCAL ROADS, 60' FOR COLLECTOR ROADS AND ARTERIALS UNLESS NOTED OTHERWISE.

PROVIDE ADDITIONAL RIGHT-OF-WAY OR EASEMENT WHERE MULTI-USE PATH OR TRAIL IS IDENTIFIED ALONG ROAD SEGMENT ON SHEET 3.

PROVIDE SLOPE EASEMENT BEYOND RIGHT-OF-WAY FOR REHABILITATION OF ALL EXISTING ROADS WHEN VERTICAL GEOMETRY ADJUSTMENT IS REQUIRED TO PROVIDE SAFE SIGHT STOPPING DISTANCE IN ACCORDANCE WITH PENNDOT DESIGN MANUAL 2.

RIGHT-OF-WAY REQUIREMENTS AT INTERSECTIONS MAY BE GREATER THAN THOSE REQUIRED FOR CORRIDORS TO PROVIDE NECESSARY TURNING LANES.

NAMES FOR PROPOSED ROADS ARE SUBJECT TO CHANGE AND MUST BE APPROVED BY LANCASTER COUNTYWIDE COMMUNICATIONS.



LEGEND

CLASSIFICATION	EXISTING	PROPOSED
EXPRESSWAY		
ARTERIAL		
COLLECTOR		
LOCAL		

INTERCHANGE IMPROVEMENT

1 INTERSECTION IMPROVEMENT

A ROADWAY IMPROVEMENT

INTERSECTION IMPROVEMENTS

MAP KEY	INTERSECTION	DESCRIPTION	RIGHT-OF-WAY REQUIREMENTS	ADDITIONAL REQUIREMENTS
1	Route 743, Holly Street and Route 241	Modify traffic signal timings Construct dual-lane roundabout	Route 743: 60 ft. Holly Street: 60 ft. Route 241: 60 ft.	---
2	Route 743 and Veterans Drive	Signalize intersection	Route 743: 60 ft. Veterans Drive: 60 ft.	---
3	Route 743 and Buckingham Boulevard	Signalize intersection Construct WB right turn lane Construct 2nd NB thru lane Construct SB left turn lane	Route 743: 60 ft. Buckingham Boulevard: 60 ft.	---
4	Route 743 and PA 283 EB Ramps	Signalize intersection Add SB left turn phase	Route 743: 60 ft.	---
5	Route 743 and PA 283 WB Ramps	Modify traffic signal timings	Route 743: 60 ft.	---
6	Route 241 and Buckingham Boulevard	Construct EB & WB left turn lanes Implement all-way stop control	Route 241: 60 ft. Buckingham Boulevard: 60 ft.	---
7	Route 230 and Carey Lane	Convert WB right turn lane to shared thru/right turn lane Construct 2nd WB receiving lane	Route 230: 100 ft. Carey Lane: 50 ft.	---
8	Route 230 and Anchor Road	Construct 2nd WB thru lane	Route 230: 100 ft. Anchor Road: 60 ft.	---
9	Route 230 and Market Street Square	Convert WB right turn lane to shared thru/right turn lane Construct 2nd WB receiving lane	Route 230: 100 ft.	---
10	Route 230 and Sheaffer Road	Modify traffic signal timings Construct 2nd WB thru lane	Route 230: 100 ft. Sheaffer Road: 80 ft.	---
11	Route 230 and Eagle Parkway	Signalize intersection Construct 2nd WB thru lane Construct SB left & right turn lanes	Route 230: 120 ft. Eagle Parkway: 80 ft.	Construct NB and SB approaches
12	Route 230 and Cloverleaf Road/ Colebrook Road	Modify traffic signal timings Add WB left turn phase Construct 2nd WB/WB thru lane Construct NB right turn lane	Route 230: 120 ft. Cloverleaf Road: 80 ft. Colebrook Road: 60 ft.	---
13	Colebrook Road and Harrisburg Avenue	Signalize intersection & synchronize with Cloverleaf Road Construct NB & SB left turn lanes	Colebrook Road: 60 ft. Harrisburg Avenue: 60 ft.	---
14	Cloverleaf Road and Schwanger Road	Modify traffic signal timings	Cloverleaf Road: 60 ft. Schwanger Road: 60 ft.	---
15	Cloverleaf Road and Merts Drive	Close intersection (reroute traffic to North Conifer Drive)	Cloverleaf Road: 60 ft. Merts Drive: 100 ft (R)	Construct cul-de-sac
16	Cloverleaf Road and PA 283 EB Ramps	Signalize intersection Reconstruct EB ramp as N. Conifer Drive Provide EB left, thru & right lanes Construct NB left & right turn lanes Construct SB right turn lane	Cloverleaf Road: 120 ft.	POA Alt. 4
17	Cloverleaf Road and PA 283 WB Ramps	Remove traffic signal Existing ramp right turn only	Cloverleaf Road: 120 ft.	POA Alt. 4
18	Cloverleaf Road and Steelway Drive/ PA 283 WB Ramps	Signalize intersection Construct NB & WB left turn lanes Construct cloverleaf ramp for PA 283 WB	Cloverleaf Road: 80 ft. Steelway Drive: 50 ft.	POA Alt. 4
19	Cloverleaf Road and Mt. Pleasant Road	Construct EB right turn lane	Cloverleaf Road: 60 ft. Mt. Pleasant Road: 60 ft.	---
20	Elizabethtown Road and Ridgeview Road South	Construct EB right turn lane	Elizabethtown Road: 60 ft. Ridgeview Road South: 60 ft.	---
21	Schwanger Road/Campus Road and Eagle Parkway	Signalize intersection Restripe Eagle Pkwy to provide NB & SB left turn lanes Construct SB right turn lane	Schwanger Road: 60 ft. Campus Road: 60 ft. Eagle Parkway: 60 ft.	---
22	Conifer Drive, Eagle Parkway and PA 283 EB Off-ramp	Signalize intersection Construct EB right turn lane Construct WB left turn lane Construct NB channelized right turn lane Construct SB left & right turn lanes Provide WB & NB left turn lanes	Conifer Drive: 60 ft. Eagle Parkway: 60 ft.	POA Alt. 4

POA ALT. 4: REFER TO POINT OF ACCESS STUDY FOR ROUTE 283/CLOVERLEAF ROAD INTERCHANGE IMPROVEMENTS, DATED OCTOBER 31,2006.

ROADWAY IMPROVEMENTS

MAP KEY	ROADWAY	DESCRIPTION	RIGHT-OF-WAY REQUIREMENTS	ROADWAY CLASSIFICATION
A	Route 283 and Elizabethtown Road/East High Street	New interchange	- -	Expressway
B	Route 283/Cloverleaf Road Interchange	Interchange reconfiguration	- -	Expressway
C	Route 230 between Elizabethtown Borough and Mount Joy Borough	Construct a 2nd EB/WB through lane Maintain center left turn lane	100 feet	Arterial
D	Cloverleaf Road between Route 230 and Mt. Pleasant Road	Construct a 2nd EB/WB through lane Maintain center left turn lane	100 feet	Arterial
E	Ridge Run Road	Extend to Cloverleaf Road	60 feet	Collector
F	Eagle Parkway	Extend to Route 230 and North Conifer Drive	60 feet	Arterial
G	College Avenue	Extend to Sheaffer Road	60 feet	Collector
H	Ridgeview Road South	Realign approach to Ridge Road	60 feet	Collector
J	Ridgeview Road South	Extend from Ridge Road to Cloverleaf Road	60 feet	Collector
K	Norlanco Drive	Extend to Route 230	50 feet	Local
L	North Conifer Drive	Construct new road from Cloverleaf Road to Campus Road	60 feet	Arterial & Collector
M	South Conifer Drive	Construct new loop road from Campus Road to Sheaffer Road	60 feet	Collector
N	Sager Road/Larkspur Lane	Connect cul-de-sacs	50 feet	Local
O	Andrew Avenue/Brookfield Drive	Connect cul-de-sacs	50 feet	Local
P	Archers Lane	Extend to Mt. Pleasant Road	50 feet	Local
Q	Dairy Lane	Extend to Elizabethtown Road	60 feet	Collector
R	Mt. Gretna Road	Horizontal realignment at Oberholtzer Road	60 feet	Collector
S	Koser Road	Horizontal realignment at Mt. Gretna Road	60 feet	Collector
T	Buckingham Boulevard	Extension to Old Hershey Road	60 feet	Collector
U	Fairground Drive	Connect East College Avenue to East High Street	60 feet	Collector
V	Meadowbrook Lane	Extend to Fairground Drive	50 feet	Local
W	Canvasback Lane	Extend to Sheaffer Road	50 feet	Local
X	Carey Lane	Extend to South Mount Joy Street	50 feet	Local
Y	Birchland Avenue	Extend to Old Market Street	60 feet	Collector
Z	Jonlyn Drive	Extend to Anchor Road	60 feet	Collector

0 4000 8000 feet

N W E S

MOUNT JOY TOWNSHIP

159 MERTS DRIVE
ELIZABETHTOWN, PA 17022
(717) 367-8917

WWW.MTJOYTWP.ORG

ROADWAY SUFFICIENCY ANALYSIS - FIGURE 9

DRAFT OFFICIAL MAP - NOVEMBER 2015