

TECHNICAL MEMORANDUM

To: Joe Van Esley – Van Esley Real Estate
From: Jean M. Hartline, PE, PTOE
CC: Van Defibaugh, PE, Shannon Selby, DRP
Date: December 18, 2024
Project #: 401.2401267 DRP VIP Site – Canton Distribution Center
Re: Preliminary Desktop Traffic Study

Background

The Detroit Regional Partnership has been assisting site owners to cover the costs associated with due diligence and promotion. The goal of this study is to clearly define the traffic requirements for the development of the site. This is not a full traffic study, but it is intended as a high-level analysis. A Traffic Impact Study will still be required for the site to be reviewed by City of Mt. Morris, Genesee County, Genesee Township, and MDOT.

Site Location and Township Zoning

The 80-acre site is shown in **Figure 1**. The multiple parcels on the lot are planned to share access point on the E Stanley Road.



Figure 1: Site Plan

The lots fall under zoning category of Single-Family/Two-Family Residential, the lots are shown in Figure 2 below.

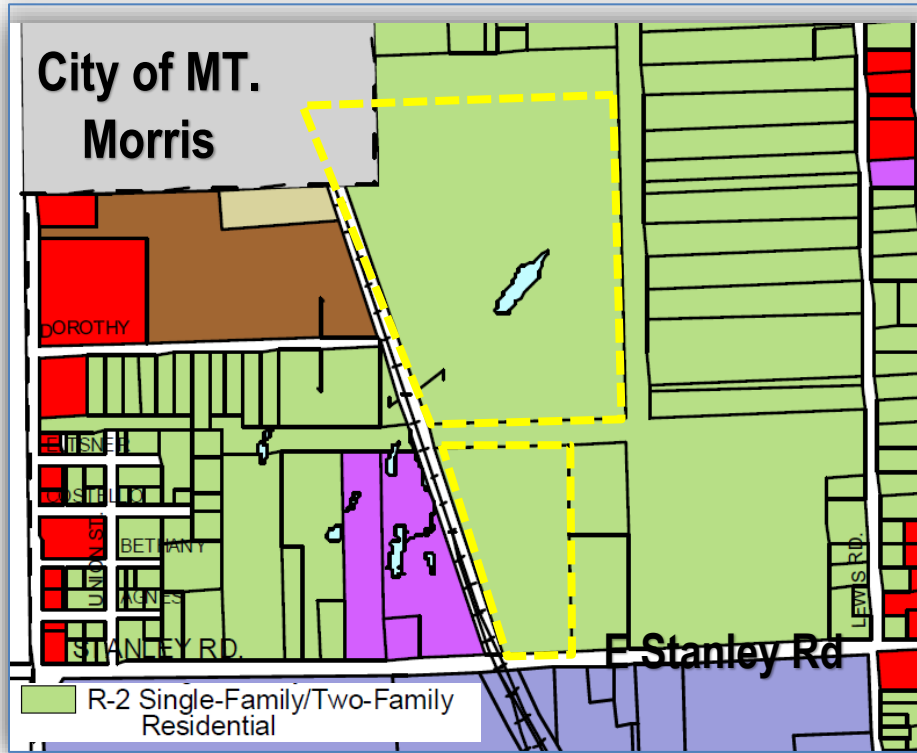


Figure 2: Zoning Map of Site

Adjacent Roadway Network and Intersections

Driveway access point for the site is expected to be on E Stanley Road. The summary on the roadway features for the surrounding network are provided in Table 1.

Table 1: Surrounding Roadways Features

Characteristic	Study Roadway			
	E Stanley Rd	N Saginaw Rd	N Lewis Rd	M-54 (N Dort Hwy)
Functional Classification	Major Collector	Other Principal Arterial	Local Road	Other Principal Arterial
Roadway Direction	East-West	North-South	North-South	North-South
Lane Width	11 ft	11 ft	11 ft	11 ft
Shoulder Width	6 ft	-	-	-
Posted Speed Limit	45 mph	45 mph	45 mph	55 mph
Average Daily Traffic (ADT)	4,585	16,697	-	11,015
Pavement Condition	Good	Poor	Fair	-
Roadway Classification	Not Available			

ADT Data from MDOT TCDS

Due to the nature of the trips coming to and from the site, the industrial heavy vehicles have a greater effect on the deterioration of the pavement when compared with passenger vehicles. Shown in Figure 3 is a map of pavement condition surrounding the site. N Saginaw Street is in poor condition, and E Stanley Road is in good condition. The trips heading east to N Saginaw Street will be traveling along poor condition pavement.



Figure 3: Pavement Condition

Site Driveway

The current site consists of two separate lots and these lots are expected to operate the traffic flow by having a cross access between these two lots as shown in **Figure 4**. The main driveway access for the site is expected to be on E Stanley Road. The driveway is located about 360 feet east of the railroad crossing. With 200 feet being the minimum distance away from the railroad before signal preemption is required. As shown in **Figure 4** it is observed that there is no other possibility of connectivity to have more than one site access on surrounding roads. Also, there is no future chances of having cut through traffic since there is a rail track on west side of the lots and there is a power supply towers in between the two lots and east side of the lots as well. The Streetview image of the potential drive location is shown in **Figure 5**.

List of expected needs at this driveway access are given below:

- On Stanley Road the site driveway is located about 360 feet east of the rail crossing.
- Southbound approach out of the site with a left and a right turn lane.
- Potentially could require an eastbound left turn lane into the site.
- Signal preemption is not required, as the drive is located about 360 feet east of the railroad crossing.

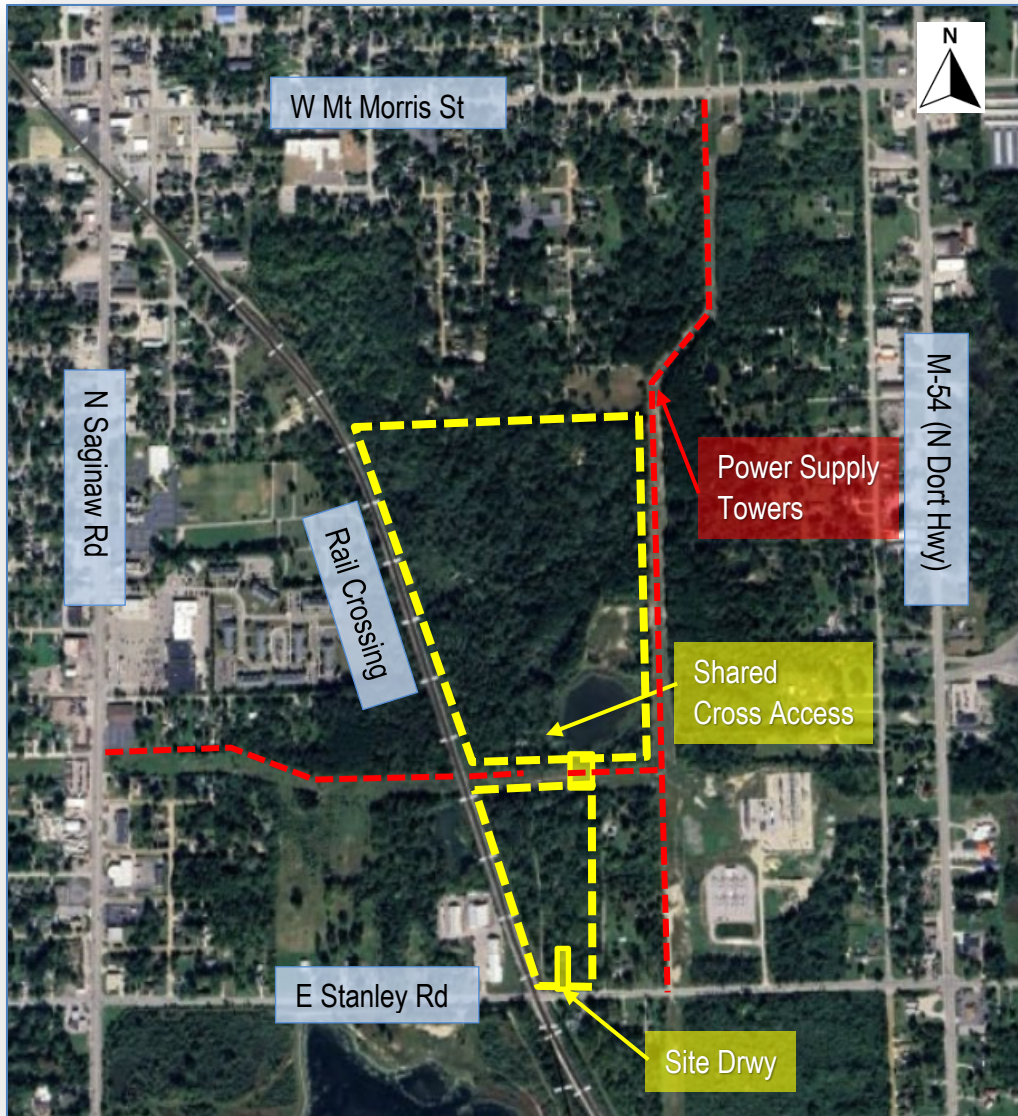


Figure 4: Potential Roadway Network with Site Driveway

Surrounding Area Intersections

The trips generated by the site are expected to have potential impacts at some surrounding intersections that could require further investigation in a TIS. Below are some of the expected intersections that need investigated. Others may be required by the reviewing agencies.

- E Stanley Road and Saginaw Street - (Signalized Intersection)
- E Stanley Road and N Lewis Road - (Two-way Stop Controlled "TWSC")
- E Stanley Road and M-54 (N Dort Highway) - (Signalized Intersection)

Features of Railway Crossing

The site access driveway is located about 360 feet east of the railroad crossing on E Stanley Road. With the safety features including:

- Active crossing signal
- Crossing box and flashers
- Railway gate

Freeway Access Locations

For the vehicles connecting with the network, it is expected that 80% of site traffic head west to I-475 and remaining 20% east. Shown in **Table 2** is the ramp information for the potential interchange access location.

Table 2: Freeway Ramp Access Characteristics

Interchange	Ramp	ADT	AM Peak	PM Peak	Traffic Control	Number of Lanes
N Saginaw Rd and I-475	EB Off	2,408	174	258	Signalized	2
	EB On	3,037	294	242	Signalized	1
	WB Off	2,669	179	345	Signalized	2
	WB On	1,897	168	169	Signalized	1

ADT and Peak Hour Data from MDOT TCDS

Regional Roadway Safety

Safety inefficiencies along a roadway are sometimes indicated by a reoccurrence of crashes in one area of the roadway. Shown below in **Figure 5** is a crash density map of the surrounding area around the site. The areas around the site show a low density of crashes in the last 5 years (2019-2023). This crash data is not expected to have an effect on a future traffic study.

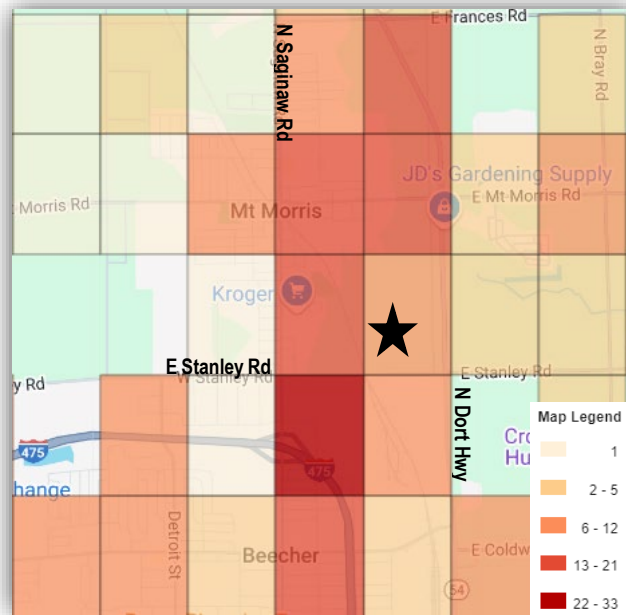


Figure 5: Crash Density Map

Trip Generation and Distribution

Shown in **Table 3** below is the expected trips that are to be generated based on different scenarios for the land uses on the site. The potential trips are shown for two different peak hour scenarios. The adjacent street traffic peak hour focuses on the peak hour for the roadway network around the site which can differ from the peak hour of generator with is the peak hour from the trips entering and exiting the site ignoring the roadway traffic. When there is a large amount of surrounding roadway traffic the new generated traffic may not be enough to adjust the peak hour however, with this development it could be important to analyze the peak hour of the generator due to the small vehicle volumes on the surrounding network.

The lot is 80 acres in total, and ITE trip generation is based on building square footage. This requires an assumption; 525,000 square foot is used for the building square footage as a conservative estimate for the building development. Three different scenarios were analyzed as shown in **Table 3**.

The land use codes (LUC's) were used for analyzing three different scenarios as listed below:

1. (LUC #110) is a light industrial facility is a free-standing devoted to a single use. Other than manufacturing and typically has minimal office space. Activities that include are printing, material testing, and assembly of data processing.
2. (LUC #140) is a manufacturing facility typically has an office and may provide space for warehouse, research, and associated functions.
3. (LUC#150) a warehouse is primarily devoted to store the materials, but is may also include office and maintenance area.

Among all three scenarios (LUC 110) generates more site trips and is used to develop the further traffic calculations. Since warehouse tends not to generate much traffic.

Table 3: ITE Trip Generation

Scenario Number	Building Square Footage	Land Use	Adjacent Street Traffic Peak Hour						Peak Hour of Generator					
			AM			PM			AM			PM		
			In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
1	525K	Light Industrial (LUC 110)	342	47	389	48	293	341	416	62	478	76	344	420
2	262.5k	½ Manufacturing (LUC 140)	136	43	179	60	134	194	153	57	210	88	122	210
	262.5k	½ Warehouse (LUC 150)	34	11	45	13	34	47	36	19	55	14	46	60
	Total (Scenario 2)		170	54	224	73	168	241	189	76	265	102	168	270
3	262.5k	½ Light Industrial (LUC 110)	171	23	194	24	147	171	208	31	239	38	172	210
	262.5k	½ Manufacturing (LUC 140)	136	43	179	60	134	194	153	57	210	88	122	210
	Total (Scenario 3)		307	66	373	84	281	365	361	88	449	126	294	420

Focusing on existing traffic patterns seen on Saginaw Street and I-475, trips will be distributed from the site to follow the existing roadway patterns. Shown in **Table 4** are the existing traffic patterns on the freeway.

Table 4: Existing Traffic Patterns

Roadway	Direction of Travel	ADT	Percentage of Traffic
Saginaw St	Northbound	7,619	30%
	Southbound	7,672	30%
I-475	Westbound	4,566	18%
	Eastbound	5,445	22%
Total		25,302	100%

To distribute the traffic onto the network, 80% of traffic will be modeled to enter and exit through the freeway following an assumption based on the existing traffic pattern shown above. The 80% of traffic planned to use the freeway are modeled as 80% of site trips going to and from I-475 with 20% of trips expected to travel east from the site driveway of using N Dort Hwy. I-475 is 0.33 miles from south of E Stanley Road and Saginaw Street Intersection. The distribution of the peak hour of generator from Scenario 1 (Table 3) with existing peak hours traffic are shown for the AM peak hour and PM peak hour in **Figure 6** and **Figure 7** below. This split has been planned due to most of the development being located on the south of the site as well as the nearby residential houses located south.

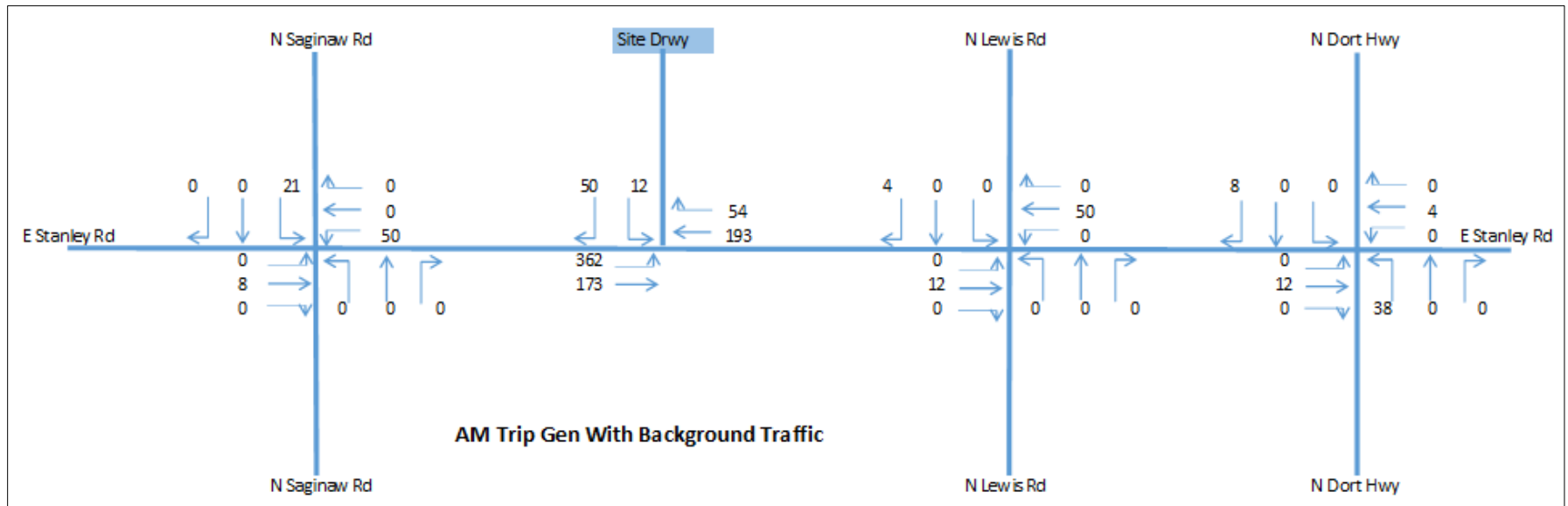


Figure 6: AM Peak Hour Trips with Background Traffic

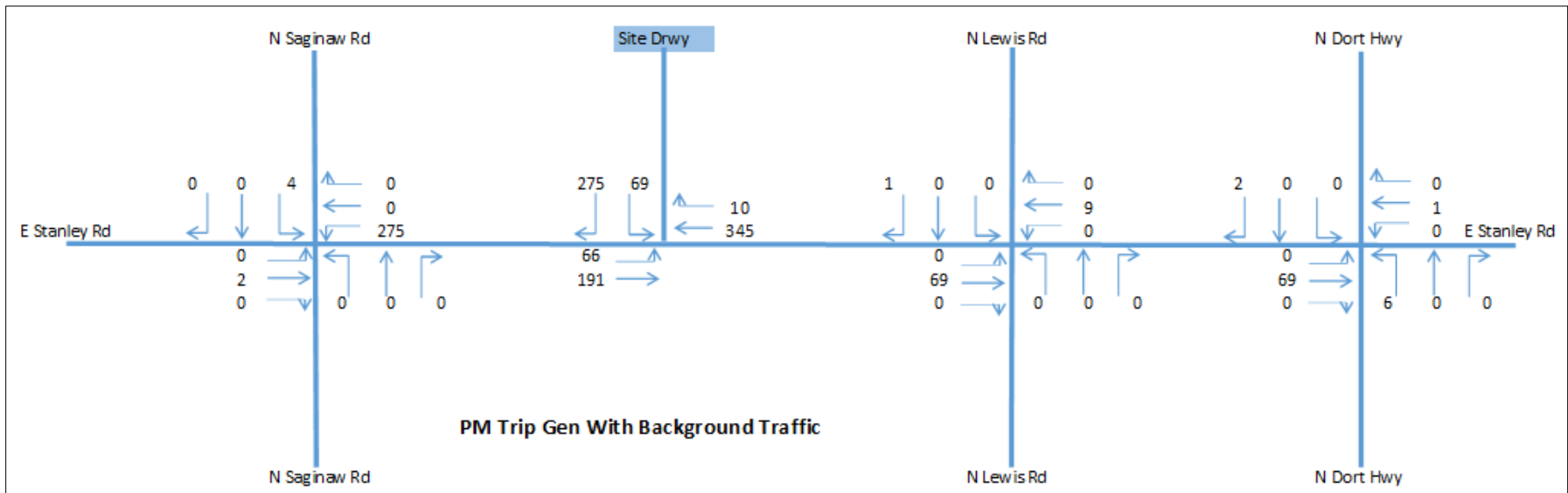


Figure 7: PM Peak Hour Trips with Background Traffic

Anticipated Infrastructure Improvements

To address potential negative outcomes that can come from additional trips being added to the roadway network mitigations can be required to ensure efficient vehicular movement. The main infrastructure that can be needed are signalized intersections at the site drives and turn lanes being added. Below are the warrants for turn lanes.

Shown in **Figure 8** below is the peak hour signal warrant graph. The signal warrant is met during the PM peak hour for the site driveway. However, the driveway will need to be analyzed under the 4-hour and 8-hour warrant with counted data. The railroad proximately will also need to be considered if a signal is constructed. Roadway improvements could be required to ensure pavement conditions remain satisfactory from the heavy industrial vehicles that can lead to increased deterioration.

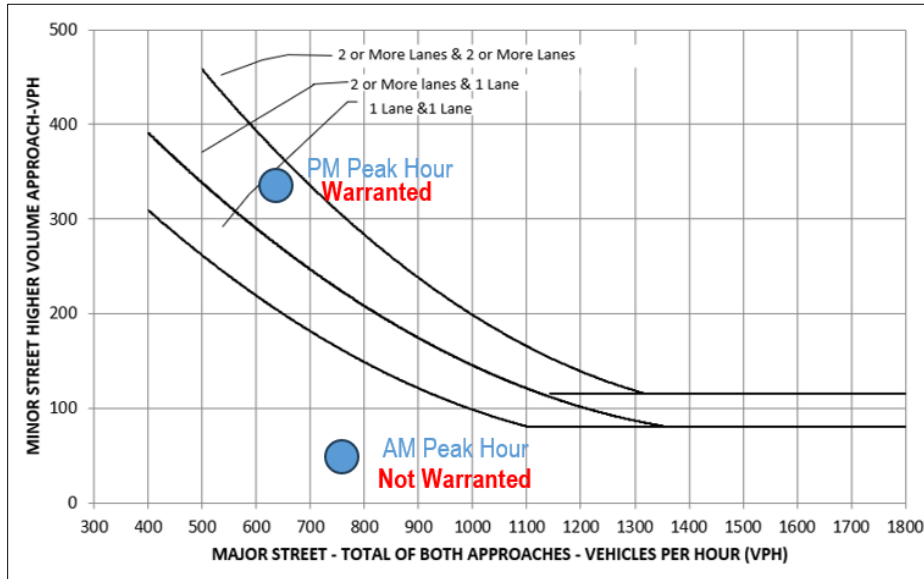


Figure 8: Peak Hour Signal Warrant

Turn lane warrants have been run for driveway and shown in **Figure 9** and **Figure 10**. From these graphs, a right turn lane is not warranted for entering the site from westbound approach. Whereas left turn lane is warranted entering from eastbound approach at the site driveway.

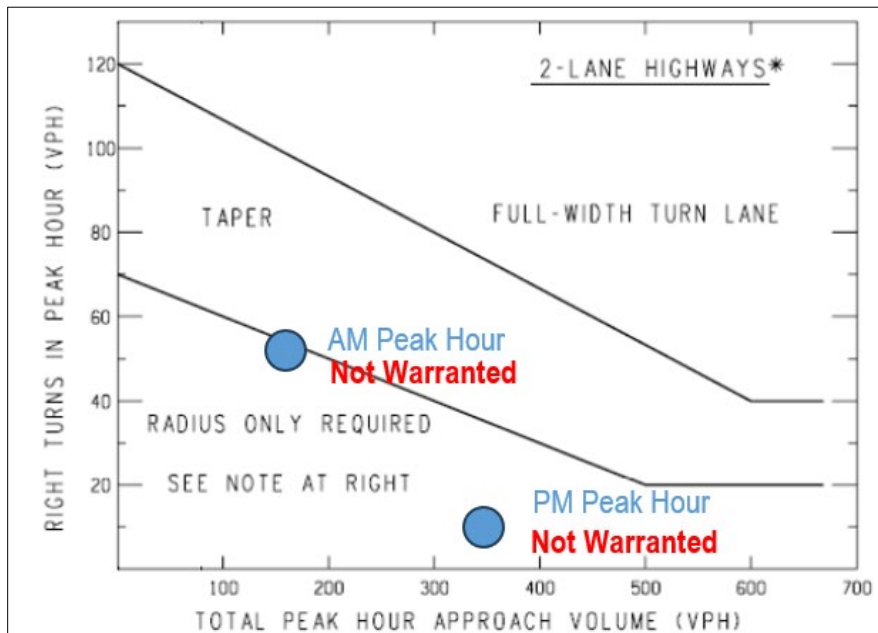


Figure 9: Right Turn Lane Warrant

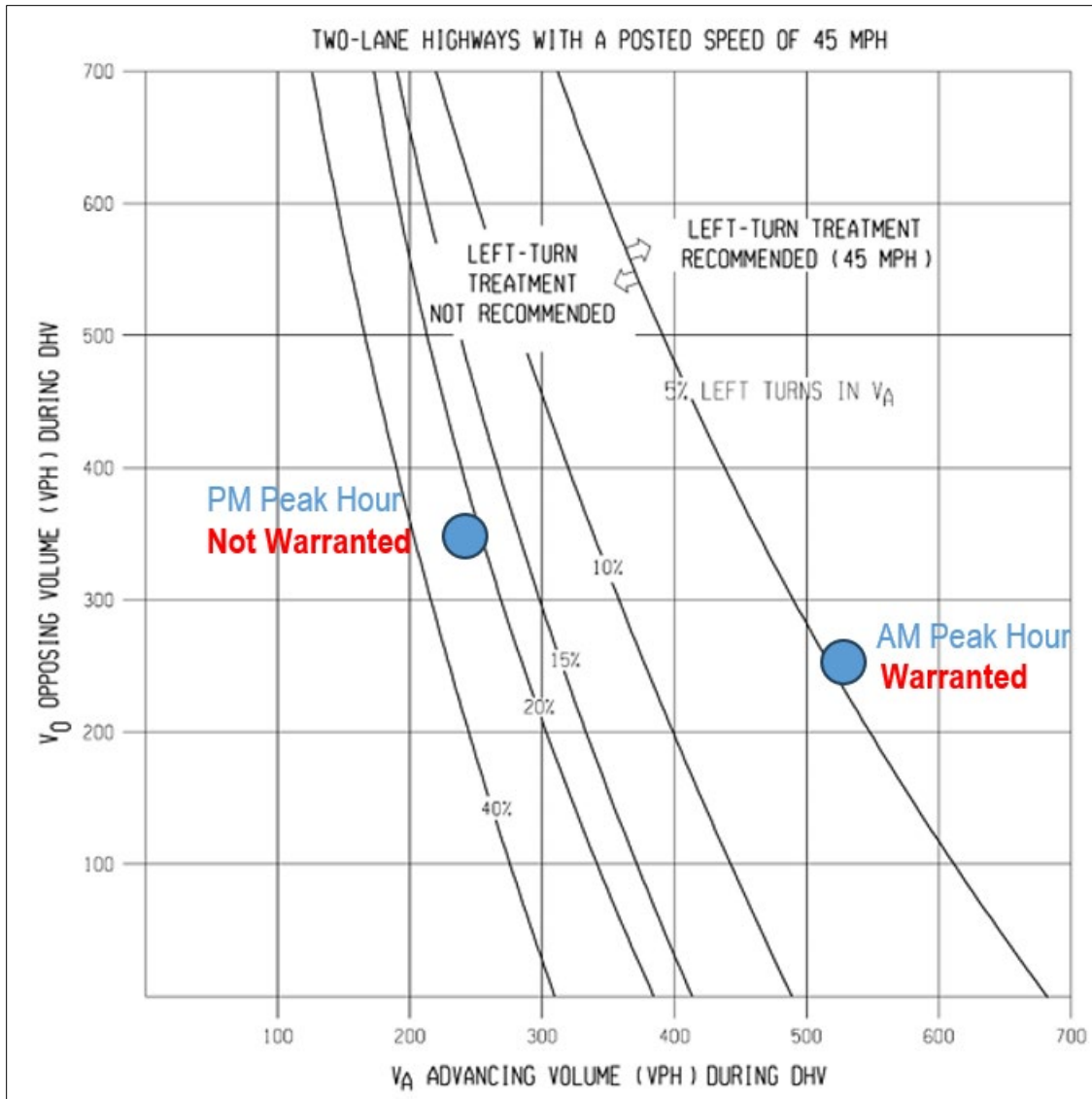


Figure 10: Left Turn Lane Warrant

Mitigation Impacts

E Stanley Road and Saginaw Street - (Signalized Intersection)

E Stanley Road is a two-lane undivided roadway having a left turn lane on both eastbound and westbound approaches. The existing left-turn storage on westbound approach is approximately 165-feet, which is about 8 vehicles expected to be queued. The site development will have an impact on the westbound left turn lane since 80% of the site traffic expected to head west to I-475. In the future, the westbound left turn lane on Stanley Road would require an extension to accommodate the added future site traffic. The extension of the left turn lane could impact the surrounding properties with required Right of Way (ROW) acquisitions. The traffic addition may also require a modification to the signal to add a westbound left turn phase (left green arrow).

Conclusions

The expected traffic added to the roadway network by any proposed development is expected to have impacts on the network that require investigation and mitigations. These items that need investigated are:

- Based on the site traffic generation a traffic impact study is required by the Code of Ordinances City of Mt. Morris, Michigan, Genesee County.
- The signal warrant was met at the site driveway during PM peak hour.
- At E Stanley Road and potential site driveway, a right turn lane is not warranted for the peak hours. Only the left turn lane warrant that is met.
- At the intersection E Stanley Road and Saginaw Street the traffic addition may also require a modification to the signal to add a westbound left turn phase (left green arrow)
- Connections to surrounding freeways are expected to operate satisfactorily but will require deeper analysis to ensure operations.

APPENDIX
ITE Trip Generation



Land Use: 110

General Light Industrial

Description

A light industrial facility is a free-standing facility devoted to a single use. The facility has an emphasis on activities other than manufacturing and typically has minimal office space. Typical light industrial activities include printing, material testing, and assembly of data processing equipment. Industrial park (Land Use 130) and manufacturing (Land Use 140) are related uses.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The sites were surveyed in the 1980s, the 2000s, and the 2010s in Colorado, Connecticut, Indiana, New Jersey, New York, Oregon, Pennsylvania, and Texas.

Source Numbers

106, 157, 174, 177, 179, 184, 191, 251, 253, 286, 300, 611, 874, 875, 912

Land Use: 140

Manufacturing

Description

A manufacturing facility is an area where the primary activity is the conversion of raw materials or parts into finished products. Size and type of activity may vary substantially from one facility to another. In addition to the actual production of goods, a manufacturing facility typically has an office and may provide space for warehouse, research, and associated functions. General light industrial (Land Use 110) and industrial park (Land Use 130) are related uses.

Additional Data

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The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, Minnesota, Missouri, New Jersey, New York, Oregon, Pennsylvania, South Dakota, Texas, Vermont, Washington, and West Virginia.

Source Numbers

177, 179, 184, 241, 357, 384, 418, 443, 583, 598, 611, 728, 747, 875, 879, 940, 969, 1067, 1068, 1082

Land Use: 150

Warehousing

Description

A warehouse is primarily devoted to the storage of materials, but it may also include office and maintenance areas. High-cube transload and short-term storage warehouse (Land Use 154), high-cube fulfillment center warehouse (Land Use 155), high-cube parcel hub warehouse (Land Use 156), and high-cube cold storage warehouse (Land Use 157) are related uses.

Additional Data

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The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, Connecticut, Minnesota, New Jersey, New York, Ohio, Oregon, Pennsylvania, and Texas.

Source Numbers

184, 331, 406, 411, 443, 579, 583, 596, 598, 611, 619, 642, 752, 869, 875, 876, 914, 940, 1050