

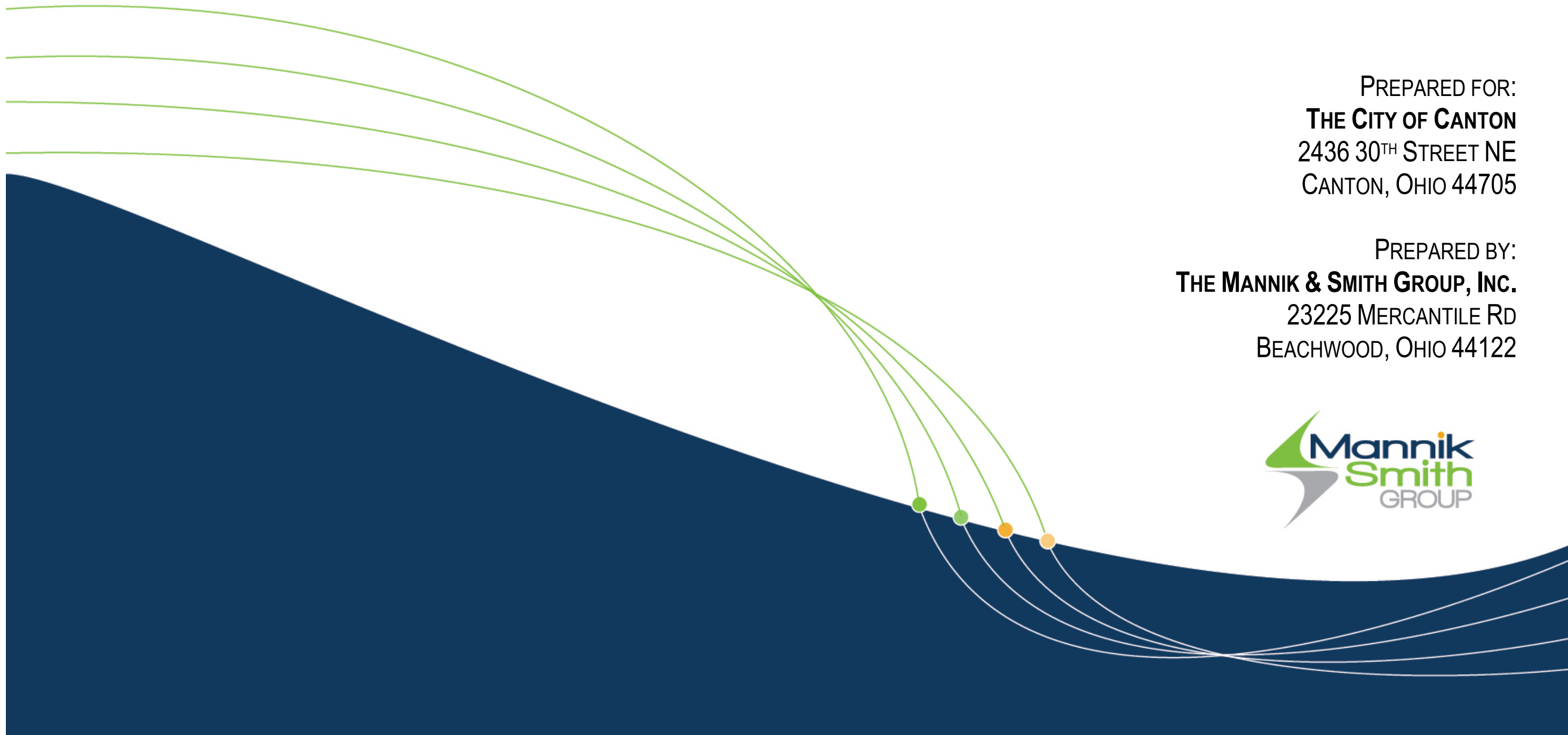
DRAFT FEASIBILITY STUDY

PID: 92562 STA SR 172 11.91
TUSCARAWAS STREET WEST (SR 172) CORRIDOR IMPROVEMENTS:
WHIPPLE AVE. TO SMITH AVE.
CITY OF CANTON

JUNE 2018
REVISED APRIL 2020

PREPARED FOR:
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EXECUTIVE SUMMARY

With its history of rear-end, angle and left turn crashes, SR 172 is ranked as one of the top crash corridors in the State of Ohio. The objective of this project is to evaluate alternatives for improving the SR 172 corridor from Whipple Avenue to Smith Avenue located within the City of Canton. Alternatives were analyzed using results from the 2011 Safety Project Application sponsored by the City of Canton. The existing corridor is a commuter route that accesses I-77 and Downtown Canton. The purpose of this study is to evaluate alternatives for the SR 172 corridor that will address congestion and safety issues. Improvements to this corridor will result in improved vehicular and pedestrian safety. This analysis shows that Alternative 2 (signalized intersections and roundabouts) is the preferred alternative with a total cost of approximately \$13,000,000 for phase 1. Alternative 2 Option A provides Turbo roundabouts instead of multilane roundabouts and should be considered as the project continues into design.

In addition to the no-build, two alternatives were evaluated for this study. Alternative 1 (Signalized Intersections) provides seven signalized intersections with controlled access at each intersection created by the addition of a center median through most of the corridor. Alternative 2 (Roundabouts) provides signals and a center median with roundabouts at Raff Road, Broad Avenue, and Arlington Avenue.

The differences between the build alternatives compared impacts to; Safety, Traffic Operations, impacts (right-of-way, utilities, environmental), maintenance of traffic, roadway geometrics and cost.

Safety – An ECAT analysis indicates that rear end, angle, sideswipe-passing and pedestrian crashes have the largest potential for safety improvement in this corridor. Each of the Build alternatives accomplish the goal of improving safety and would provide more clearly defined vehicular and pedestrian elements.

Traffic Operations – The majority of the corridor has an existing LOS of A-C with the exception of Harrison NW (LOS E). All of the alternatives have mixed results when compared to the 2042 no-build, however all of the LOS are within acceptable limits and the overall delay for the corridor is reduced for all build alternatives.

Impacts (ROW, Utility, and Environmental) – Each of the build alternatives will have various right-of-way impacts through the corridor. Alternative 1 has the fewest impacts at 58 (mostly partial takes), however, there will be some total takes where minor roadways are relocated to align intersections. Alternative 2 will likely impact 77 parcels with an increased number of total takes due to the footprint of the roundabouts.

Utility impacts will be similar for all alternatives, as relocations of utility poles will be necessary due to widening of the roadway. Alternative 2 will likely have a greater impact as drainage and utility poles will need to accommodate the roundabout configuration. Efforts will be made to minimize impacts to underground utilities to the greatest extent possible. The roadways will be widened, therefore storm inlets will need to be relocated and connections retrofitted.

The environmental review focused on identifying, analyzing and quantifying any environmental differences among the studied alternatives to assist in the preferred alternative selection. The following environmental tasks were identified to investigate:

- Social/Economic and Environmental Justice Impacts
- Cultural Resource Impacts
- Hazardous Material Site Impacts

While the analyses performed for each of these tasks identified locations that need to be further studied, no discernable differences among the alternatives were found; the impacts were present regardless of the alternative.

Maintenance of Traffic / Constructability – Alternative 1 would have easier constructability than the other Build alternatives because it has a smaller footprint and can utilize the majority of the existing pavement. With the inclusion of roundabouts in Alternative 2, a more complex maintenance of traffic phasing will be required with possible detours.

Roadway Design Geometrics – The horizontal alignment of the road is proposed to remain unchanged for each alternative, however the addition of a center median to provide access control requires roadway widening and auxiliary lane adjustments resulting in a wider roadway footprint for both build alternatives. Additionally, permissive U-turns are proposed at intersections and the widening of the roadway is necessary in the receiving lane to accommodate this traffic. With the inclusion of roundabouts in Alternative 2, there will be additional parcel impacts at the proposed roundabout intersections at Raff Road, Broad Avenue, and Arlington Avenue. The vertical geometrics are expected to remain similar to existing conditions. Secondary roadways will be realigned at Arlington Road and a new extension of Broad Avenue to Maywood Place SW.

Cost Estimate – The total cost for Alternative 1 is approximately \$31,600,000, Alternative 2 will cost approximately \$34,300,000. Additionally, Alternative 2 Option A would have a similar cost to Alternative 2.

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1.0 INTRODUCTION

The SR 172 corridor (Tuscarawas Street West) is a commuter route that accesses I-77 and Downtown Canton, Ohio. The majority of the roadway is a five-lane facility the entire length of the 1.4-mile section of SR 172 from Whipple Avenue eastward to Smith Avenue (Harrison Avenue NW was included in this analysis due to its proximity to Smith Avenue). This five-lane section involves two through travel lanes in each direction with a center two way left turn lane which at some intersections becomes a dedicated left turn lane. There is one small six-lane section from Whipple Avenue eastward to approximately Valleyview Avenue. The average daily traffic (ADT) of the corridor is approximately 25,330 vehicles per day with significant pedestrian traffic. The corridor has diverse adjacent land uses. Land uses along SR 172 include retail, office, residential, a school and a hospital.

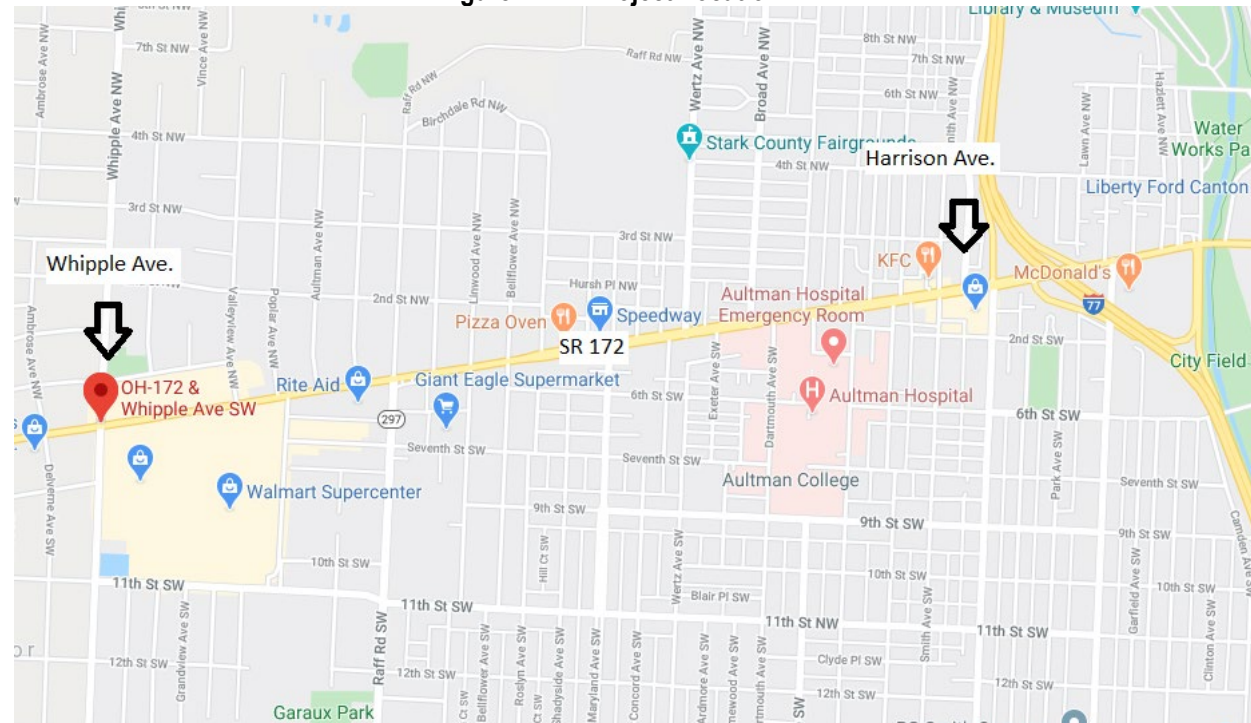
1.1 Project History

This section of SR 172 corridor has been listed in the ODOT Highway Safety Improvement Program (HSIP) as one of the top ranked high crash corridors in the State of Ohio. In 2009, it was ranked as the #22 highest crash corridors in the State. According to the Stark County MPO (SCATS); in 2009 four intersections on this corridor were in the Top 30 highest crash intersections in Ohio. Given the continued listing of this corridor as a high crash location, the City of Canton authorized a Safety Study in June 2011 to determine appropriate countermeasures for reducing crash frequency.

1.2 Location

The SR 172 corridor is located within the limits of the City of Canton. Along this 1.5-mile stretch of project corridor are several residential and commercial land developments.

Figure 1.1 Project Location



1.3 Logical Termini and Project Phasing

Logical termini for project development are defined as (1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts. Choosing a corridor of sufficient length to look at all impacts need not preclude staged construction. Therefore, the limits evaluated for this project are from Whipple Avenue to Harrison Avenue SW along SR 172.

Project phasing considered a logical termini for each phase. The project will be divided into the following three phases:

- Phase 1: Harrison Avenue NW to Broad Avenue NW
- Phase 2: Broad Avenue NW to Raff Road NW (SR 297)
- Phase 3: Raff Road NW (SR 297) to Whipple Avenue NW

2.0 PURPOSE AND NEED

The purpose of the project is to improve transportation safety/operations; improve intersection traffic control efficiency and visibility; improve safety of intersections to meet ADA design standards; enhance non-motorized traffic safety; and to improve access management along the corridor as feasible.

The following needs were identified from the 2011 Safety Study:

Crash History - The corridor from Whipple Avenue eastward to Smith Avenue experienced 383 crashes from 2008 to 2010. Of these crashes, 43.6 percent were rear-end, 24.0 percent were angle, and 8.4 percent were left turn crashes. These values are indicative of congestion and a high number of conflict points. More recent crash patterns are expected to be similar to this historical data since no major safety improvements or traffic pattern changes have occurred on the corridor.

Pedestrian & Bicycle Related Crashes Also included in the crash totals were eight (8) pedestrian or bicycle related crashes (2.1 percent of all crashes) which is 1.5 times higher than the state average. These crashes are slightly more concentrated on the east side of the corridor, in proximity to the hospital and school. Poor visibility and delineation of crossing locations for pedestrians and bikes may contribute to these crash patterns.

Traffic Control and Intersection Safety – Traffic operations analysis indicates poor operations at several intersections and poor progression through the corridor due to uncoordinated signal operations. Furthermore, the crash data indicates a lack of recognition / poor visibility of traffic control devices may be a contributing factor.

Sidewalk and Curb Ramp Deficiencies – In the late 1990's, as part of the R, General Project 1018, new pavement, sidewalk, and curb were installed from Bellflower Avenue to Harrison Avenue. Much of the curb and sidewalk in this section of the corridor is in good condition today, however ADA issues such as cross slope at driveways and appurtenances located on the sidewalk do exist. To the west of Bellflower Avenue, the most recent plan set acquired dated to the late 1950's and more recent records are not available. The sidewalk and curb from Whipple Avenue to Bellflower Avenue is in much worse condition than that to the east of Bellflower Avenue. Sidewalk should be continuous along one side of the corridor for the length of the corridor, and along both sides to the extent feasible.

3.0 ALTERNATIVES CONSIDERED

The build alternatives considered for this study focused on providing standard lane widths and realigned roadways at major intersections. Three alternatives were evaluated:

No Build:

This alternative does not make any improvements to intersections. Lane widths and lane configurations remain as is.

Build Alternatives:**Alternative 1 –Signalized Intersections**

This alternative widens the roadway to allow for a medians throughout much of the corridor. Signals at Bellflower Avenue and Harrison Avenue are removed. Modifications are made to the remaining signals to improve safety and operations. Sidewalk is installed to the extent feasible to ensure continuity along the corridor. Figure 3.1 illustrates the concept for the corridor for Alternative1.

Alternative 2 Signals and Roundabouts

Like Alternative 1, this alternative installs medians throughout much of the corridor, and removes the signals at Bellflower Avenue and Harrison Avenue. Improvements are also made to the remaining signals; however, the signals at Raff Road, Broad Avenue and Bedford Avenue are removed with roundabouts provided at Raff Road, Broad Avenue and Arlington Avenue. Figure 3.2 illustrates the concept for the corridor for Alternative 2.

Figure 3.1 Alternative 1 Concept Plan

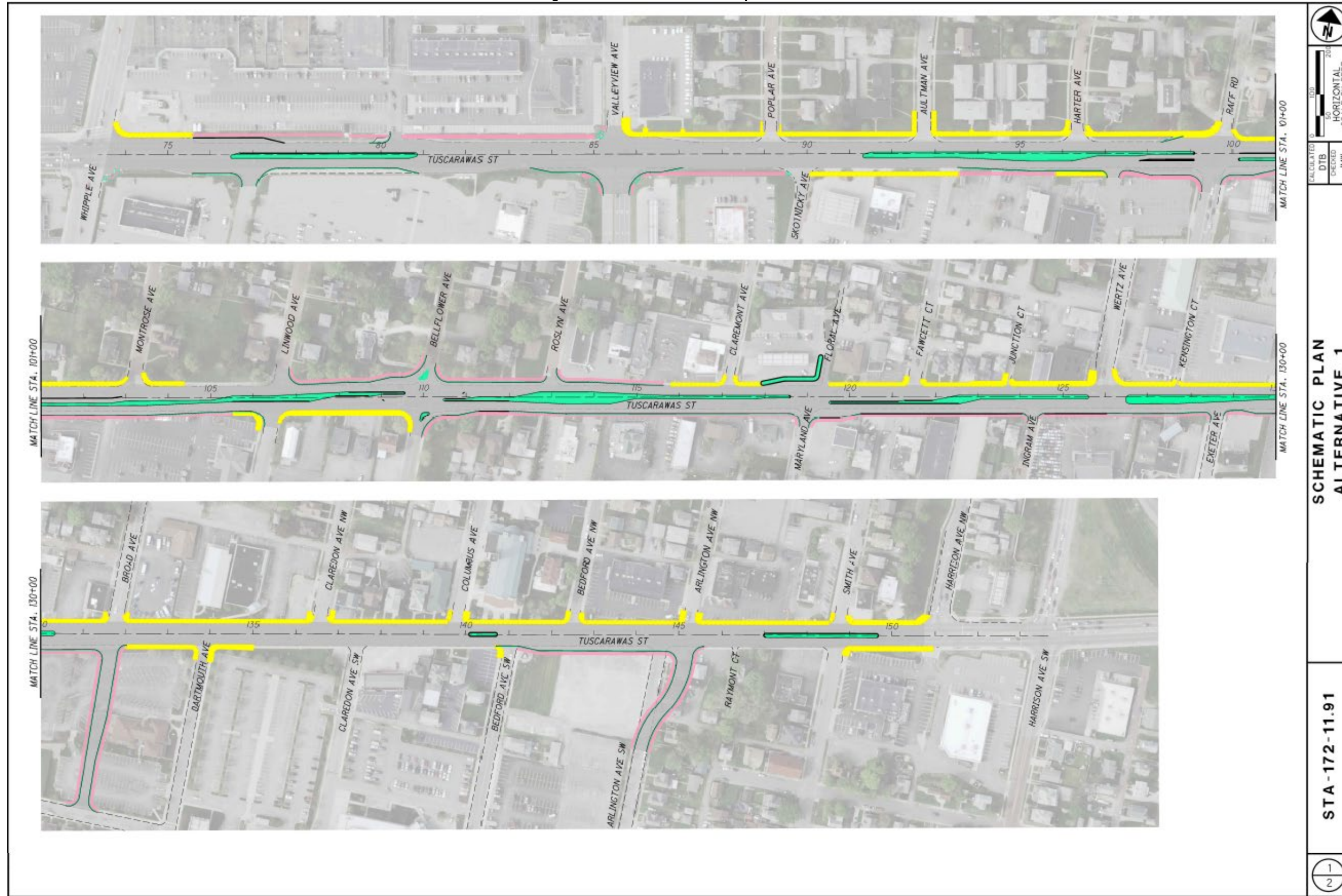


Figure 3.2 Alternative 2 Concept Plan



4.0 KEY ISSUES

4.1 Safety

A safety study was performed in 2011, which examined crash patterns, causes, deficiencies, developed countermeasures, and provided rate of return analyses for the recommended countermeasures. This study is included in the project file. An ECAT analysis of the corridor was conducted to update the 2011 study using 2016 – 2018 data. The ECAT study indicates that rear end, angle, sideswipe-passing and pedestrian crashes have the largest potential for safety improvement in this corridor. The most severe crash type, rear-end; led to the majority of injuries. Evaluation of crashes along SR 172 included the use of ODOT's economic crash analysis tool (ECAT) for the segment between Whipple Avenue and Smith Avenue. Results from the ECAT indicate that the predicted number of crashes along the analysis segment (i.e., the expected number of crashes for a generic roadway with geometric, traffic control, and environmental conditions similar to SR 172), the expected number of crashes (i.e., the estimated number of crashes along SR 172 based on its recent crash history), and the potential for safety improvement (i.e., predicted crashes – expected crashes—this represents the potential for reducing the average crash rate along the corridor) for the existing condition are 46.4 (crashes per year), 49.9, and 3.6, respectively. Among crash types, those with the highest potential for safety improvement under the existing condition include rear end crashes, sideswipe-passing crashes, and angle crashes. Among locations along the corridor, those with the highest potential for safety improvement include the segment between Dartmouth Avenue and Bedford Avenue, the segment between Arlington Avenue and Harrison Avenue SW, and the intersection of SR 172 & Harrison Avenue SW. Under the proposed conditions for Phase 1, Alternative 2, the expected crash frequency along the analysis corridor is 26.3 crashes per year, a potential reduction of 23.6 in the crash rate. The ECAT analysis is shown in Appendix A.

4.2 Traffic

Intersection counts were converted to Design Hour Volumes (DHV) for the AM and PM peak hours based on ODOT peak hour volume to DHV factors ranging from 1.10 to 1.17. Furthermore, SCATS provided historical traffic counts which indicated an annual growth rate of 0.6 percent per year. A certified Traffic Request dated June 7, 2017 was provided to ODOT. Count data used for this study are shown in Appendix B Traffic Volumes.

4.2.1 Intersection Capacity Analysis

Synchro was used to perform intersection capacity analysis for the DHV under the Opening Year (2022) and Design Year (2042) conditions for the three improvement alternatives. Sidra was used to evaluate the roundabouts for Alternative 2. Based on the literature review, and discussions with ODOT, Alternative 2 option A is expected to operate similar to Alternative 2. Minor adjustments were applied to the volumes for the two alternatives, mainly to account for raised median and associated turning restrictions and anticipated rerouting of traffic where applicable. For Principal Arterial roadways, the ODOT Location & Design Manual requires a minimum Level-of-Service (LOS) D for intersections with is met by both alternatives. Table 4.1 Summary of LOS describes the LOS for each intersection. A more detailed summary of LOS by approach is shown in Appendix C Capacity and LOS Summary per Approach. The full Synchro and Sidra data are shown in Appendix D Capacity Analysis (Synchro and Sidra). Alternative 2 has two intersection approaches with LOS E, but all overall intersection LOS was D or better for both.

Some intersections have different LOS or delay values for the build alternatives despite the intersection geometries, traffic control, and traffic volumes being the same between these alternatives. The discrepancies are a result of changes to vehicle platoons along the corridor caused by the conversion of some signalized intersections to roundabouts in Alternative 2. As roundabouts remove the requirement to stop at some intersections (e.g., they are under yield control), vehicles arrive at

downstream traffic signals during different portions of the signal cycle and experience different delays than they would in Alternative 1. Additionally, the update of the yellow and all red clearance intervals to current standards also resulted in a difference (and sometimes reduction) of the LOS between the no Build and Build Alternatives.

Table 4.1 Summary of LOS

		2022			2042		
		No Build	Alt 1	Alt 2	No Build	Alt 1	Alt 2
Whipple Ave.	AM	B	C	C	C	C	C
	PM	C	C	C	C	D	D
Valleyview Ave.	AM	C	C	B	C	C	C
	PM	C	C	D	D	D	D
Raff Rd.	AM	A	B	B	B	B	A
	PM	C	C	A	C	C	A
Bellflower Ave.	AM	A	N/A	N/A	A	N/A	N/A
	PM	A	N/A	N/A	A	N/A	N/A
Maryland/Gas Station	AM	A	B	B	A	B	B
	PM	B	B	C	B	B	C
Wertz Ave.	AM	A	A	A	A	A	A
	PM	A	B	B	A	B	B
Broad Ave.	AM	B	B	A	B	B	A
	PM	B	B	A	C	B	A
Arlington Ave.	AM	N/A	A	A	N/A	A	A
	PM	N/A	B	A	N/A	B	C
Bedford Ave.	AM	C	N/A	N/A	C	N/A	N/A
	PM	B	N/A	N/A	C	N/A	N/A
Harrison Ave. NW	AM	A	A	N/A	A	A	N/A
	PM	B	B	N/A	B	B	N/A

4.3 Road Design

4.3.1 Roadway Characteristics

The following Table 4.2 provides an overview of the roadway characteristic for SR 172.

Table 4.2 Roadway Characteristics

Road Characteristic	SR 172	
	West	East
Opening Year ADT (2022)	8700	10650
Design Year ADT (2038)	9350	11400
K	0.13	0.1
Design Hourly Volume	965	1190
Directional Distribution	0.4	0.6
T ₂₄	3%	3%
T _D	2%	2%
Design Speed	40	40
Posted Speed	35	35
Design Functional Classification	Urban Arterial	Urban Arterial
NHS Project	No	No

Most of the side streets along the SR 172 corridor are designated as local streets; however, there are major intersections within the corridor. Whipple Avenue, Raff Road (SR 297), and Harrison Avenue are classified as Urban Arterials while Broad Avenue, Arlington Avenue, Maryland Avenue and Wertz Avenue are classified as Major Collectors.

4.3.2 Pavement Cross Section

Existing pavement throughout the corridor consists of two 1-½ inch asphalt layers on top of a 4-inch brick roadway on a 6-inch concrete base with a ¾-inch sand layer between the brick and concrete base layers. Where the existing roadway was widened as part of the project performed in 1996, the pavement has a slightly different buildup. This buildup consists of two 1-½ inch asphalt layers on a 9-inch concrete based on a 6-inch aggregate base.

In areas where the roadway is widened or new full depth pavement is required, it is anticipated that the same pavement cross-section implemented in 1996 will be replicated.

4.3.3 Typical Cross Section

For each alternative, a four lane, two-way typical section will be provided, consisting of a 12' outside travel lane and 11' inside travel lane for each direction of travel with a raised center median. Each intersection will provide a designated left turn lane, with the exception of Alternatives 2 where roundabouts are implemented at Raff Road, Broad Avenue, and Arlington Avenue. See the typical sections in Appendix E Typical Sections.

4.3.4 Multimodal Considerations

New sidewalk is recommended on the north and south side of the street for the entire corridor where practical (significant gaps exist on the west side and small gaps on the east). Sidewalk along the

corridor should be reconstructed according to ADA guidelines (where deficient). Decorative trees, signs and poles on the sidewalk which currently restrict sidewalk width to less than four feet should be removed or sidewalk should be constructed to jog around these locations to comply with ADA requirements (roadway widening will address this issue in many locations). Raised median barrier should be installed at locations where there are no left turning movements to provide a refuge for pedestrians crossing mid-block. Traffic signal pedestrian features are summarized in Appendix F Signal Pedestrian Features. The most current standard for concrete crosswalk design that the City has (Appendix G City of Canton's Standard Concrete Crosswalk Detail) is not present along the existing corridor. While bikes are permitted in the road along this corridor, bike facilities such as sharrows or shared use paths are not recommended along this corridor.

Upgraded countdown pedestrian signal heads are recommended at all signalized intersections. Leading pedestrian intervals should be considered during design.

Transit currently exists within the corridor. This should be considered when designing pedestrian facilities. Currently, the Stark Area Regional Transit Authority (SARTA) bus route 102 runs every 30 minutes Monday through Friday and every hour on Saturday along SR 172 (Figure 4.1).

Figure 4.1 Bus Route 102



4.3.5 Property Access

A raised center median will not be developed from Broad Avenue to Arlington Avenue for any alternative to accommodate emergency vehicle access to and from Aultman Hospital. Driveway closures should be pursued during the design phase to limit access along the corridor.

4.3.6 Signals

All existing traffic signals currently meet warrants. A new signal at Dartmouth Avenue is warranted based on volumes, but not recommended. Despite the warrants being met, two signals are targeted for removal; Bellflower Avenue signal (volumes barely meet the warrants) and Harrison Avenue NW signal (due to its very close proximity to the Harrison Avenue SW / SB I-77 off ramp signal). Harrison would be a right-in right-out. A summary of the Signal Warrants is shown on Table 4.3 Signal Warrant Summary with the supporting warrants in Appendix H Signal Warrant Analysis. An inventory of existing signal features is shown in Appendix I Signal Properties. For each alternative, the improvements to signalized intersection is described in Appendix J Signalized Intersection Improvement Impacts and Safety Features.

Table 4.3 Signal Warrant Summary

Cross Street Name	Warrant 1 Eight Hour Volume	Warrant 2 Four Hour Volume	Warrant 3 Peak Hour Volume
1 Whipple Avenue	SATISFIED	SATISFIED	SATISFIED
2 Valleyview Avenue	NOT SATISFIED	SATISFIED	SATISFIED
3 Raff Road	SATISFIED	SATISFIED	SATISFIED
4 Bellflower Avenue	NOT SATISFIED	SATISFIED	SATISFIED
5 Maryland Avenue	SATISFIED	SATISFIED	SATISFIED
6 Wertz Avenue	SATISFIED	SATISFIED	SATISFIED
7 Broad Avenue	SATISFIED	SATISFIED	SATISFIED
8 Dartmouth Avenue	NOT SATISFIED	SATISFIED	SATISFIED
9 Bedford Avenue	SATISFIED	SATISFIED	SATISFIED
10 Harrison Avenue	SATISFIED	SATISFIED	SATISFIED

Whipple Avenue

This signalized intersection is ODOT maintained and has been recently upgraded to a box span with back-plates for signal heads. The build alternatives propose no changes to this intersection, other than downstream intersection and segment changes will cause some changes with the traffic patterns. The operations of this intersection are expected to remain acceptable without changes to the intersection into the Design Year (2042).

Valleyview Avenue

This intersection has outdated mast arm traffic signals which do not meet the current City of Canton streetscape guidelines. Other needs identified here based on the existing crash patterns are to provide pedestrian crossings, add an eastbound right turn lane, and modify access to the post office in the northeast corner. Build alternatives all propose the same improvements here, which consist of the above plus allowing westbound u-turns under protected only left turn phasing. This phasing is less efficient than the protected/permitted phasing, thus the increase in delay compared to the No Build Alternative for Alternatives 2A and 2B.

Raff Road

Alternative 1 for this intersection proposes to upgrade the traffic signal to current City streetscape guidelines, allow U-turn movement east and westbound, and change the eastbound and westbound phasing to protected only from protected/permitted and addition of an eastbound right turn lane. This results in approximately 5 seconds of additional delay in the AM peak hour, but 5 seconds less delay in the PM peak hour. Alternatives 2 proposes roundabouts which requires two entering lanes on all approaches and two circulating lanes all around except for in the southbound direction. This improvement performs similar to No Build Alternative.

Bellflower Avenue

Of the seven signalized intersections evaluated for this project, the Bellflower Avenue intersection consistently had the lowest entering volume. Similarly, it has the fewest crashes shown on the collision diagrams from the Safety Study. Although it meets signal warrants, removal of the signal and the addition of permitted U-turn movement east and westbound is recommended for all build alternatives to increase the efficiency of the overall system. Raised islands are recommended to restrict through and left turn movements from Bellflower. The removal of this signal will result in lower delays.

Maryland Avenue

The north leg of this intersection serves two access points, one is a two-way private driveway to a gas station, and the other is Floral Avenue which is a one-way northbound alleyway. All build alternatives propose to consolidate the north leg into one access point, and to allow U-turns with bump-outs and protected left turn phasing in both directions. Delays will increase with the protected left turn phasing but no operational issues are expected.

Wertz Avenue

A traffic signal upgrade is proposed for this intersection for Alternative 1. Left turn volumes are expected to increase due to the raised medians on SR 172, therefore a slight increase in delay is shown for Alternative 1. Alternatives 2 requires a raised median through the intersection eliminating left turns.

Broad Avenue

All build alternatives propose to close Dartmouth Avenue at SR 172 just east of the Broad Avenue intersection and create a new south leg opposite Broad Avenue. Improvement Alternative 1 proposes traffic signal control for the new, four-leg intersection, while Alternatives 2 proposes a multi-lane roundabout. Alternative 1 essentially has the existing lane configurations with a two-lane approach and one departing lane for the south leg plus an eastbound right turn lane. A roundabout at that same location would feature two entering lanes on all legs except the westbound leg, which would add a channelized right turn only lane in addition to the two through lanes. Two circulating lanes will be provided for the eastbound and westbound directions, and one circulating lane provided for the northbound and southbound directions.

Bedford Avenue/Arlington Avenue

All build alternatives propose to close Bedford Avenue and remove the traffic signal; to create a new four-legged intersection at Arlington Avenue NW with the south leg realigned to meet with Arlington Avenue SW. Access to and from Aultman Hospital would be provided by Arlington Avenue SW. Alternative 1 proposes traffic signal control for the intersection, whereas Alternative 2 proposes a multi-lane roundabout. The traffic signal alternative would have a three lane approach for westbound SR 172 (left turn lane, through lane, and shared through/right lane) and a four lane approach for the eastbound approach (left turn lane, two through lanes, and a right turn only lane). The Arlington Avenue legs would have two-lane approaches (left turn lane and shared through/right turn lane on the northbound approach, left turn lane and shared left/through/right lane on the north leg). It should be noted that this analysis was performed without traffic counts on Arlington Avenue NW or SW. The roundabout will feature two entering lanes on all legs except the westbound approach which will have a third lane, and two circulating lanes will be provided for the eastbound, westbound, and southbound directions with one circulating lane provided for the northbound directions.

Harrison Avenue NW

Given its proximity to the I-77 Southbound Off Ramp / Harrison Avenue SW intersection signal (250 feet) and the desire to reduce conflict points on the corridor, Improvement Alternative 2 removal of the existing signal and installation of a raised median to prohibit left turn movements and through movements on the side street. The raised median will tie into the splitter island for the roundabout at Arlington Avenue. Under Alternative 1, the intersection will remain signalized. The primary heavy movement diverted is the southbound left turn, which has 150 and 270 turns in the AM and PM peak hour in the Design Year (2042), respectively. It is expected that traffic will filter through the adjacent street network to other signalized intersections to make left turns to and from SR 172 (Arlington Avenue or points east). Under stop control with restricted movements, the intersection is expected to operate at LOS A.

4.3.7 Public Involvement

Due to the potential impacts to property owners and businesses and the need for ongoing coordination with Aultman Hospital, three stakeholder meetings have been conducted and one public involvement meeting will be scheduled. Roundabouts will be discussed at this future meeting. The Public Involvement Summary can be found in Appendix K Stakeholder Meetings.

The following key issues are given consideration:

- **Neighborhood Access:** Preference is given to alternatives that provide an acceptable means of access while providing safety enhancements to the adjacent neighborhoods along SR 172, for local traffic, school district transportation, pedestrians, and emergency vehicles.
- **Aultman Hospital Coordination:** Meetings to discuss the project with Aultman Hospital were held in August of 2015, April of 2017 and summer of 2019. Future campus updates to the Aultman Hospital Campus are under consideration for SR 172 corridor planning. The meeting notes are summarized in Appendix F.
- **Commercially Zoned Areas:** Alternatives that minimize direct and indirect impacts to the commercially zoned areas through the SR 172 project corridor, minimize job loss, and retain commercial interests in this area of Canton, are given preference in the evaluation. Efforts have been made in each alternative to limit parcel impacts.)
- **Use of Roundabouts / ROW Impacts:** Roundabouts can be controversial, and will be discussed at the next public meeting.
- **Aesthetics:** The city indicated that aesthetics are an important part of this project, and that roundabouts can provide a gateway to the corridor.

While the Aultman Hospital master plan does not reflect roundabouts, the City has had several meeting with the hospital and they are in support of roundabouts. This issue will be discussed at the next public involvement meeting.

4.4 Design Elements

Arlington Avenue

The existing configuration of the Arlington Avenue intersection is currently offset and has a high crash history at that location. As proposed in Alternative 2, the south leg of the intersection will be realigned to create a concentric four-legged intersection and to improve traffic functionality. Left turn lanes on SR 172 will be included to accommodate turning movements at this intersection.

Floral and Maryland Avenue

The intersection of SR 172 and Maryland Avenue SW is signalized, the north leg (Floral Avenue NW) provides access to the Speedway gas station (Floral Avenue N. is a one-way northbound roadway). The reconfiguration of this intersection and modification of access will improve safety and reduce driver confusion.

Aultman Hospital Campus

Aultman Hospital has been developing a master plan which is currently in preliminary format. As part of their master plan, they propose to realign Dartmouth Avenue SW with Broad Avenue as well as align the offset legs of Arlington Avenue. Both of these re-alignments are consistent with the Build Alternatives developed for the corridor. Their preliminary master plan presented in Appendix L Preliminary Aultman Hospital Master Plan.

Retaining wall

On the south side of SR 172 between Exeter Avenue SW and Dartmouth Avenue SW an existing retaining wall approximately 400' in length supports a parking lot serving the Aultman Hospital campus. This project may

require removal and reconstruction of the retaining wall in this area. The need for a new retaining wall is dependent upon the proposed land use by Aultman Hospital and the need to limit right-of-way impacts.

4.5 Maintenance of Traffic (MOT)

During construction of Alternative 2, both directions of traffic on SR 172 will maintain two lanes of traffic except at intersections where there are proposed roundabouts. SR 172 will be widened and resurfaced to maintain traffic during construction at the roundabouts. Alternate routes are available if necessary. The intersections at Raff Road, Broad Avenue, and Arlington Avenue will be closed for no more than 30 days while each roundabout is built. The anticipated detour route for eastbound traffic would include SR 172 eastbound to SR 297 south. These phases are shown in Appendix M MOT Phases.

4.6 Preliminary Geotechnical Assessment

ODOT geotechnical data was reviewed from adjacent projects including; STA-30-8.83 STA-8-10.86 and STA-62-18.50 which are 1959 projects and STA-8-11.17 which is a project from 1957. This historical data included soil boring logs, soil profiles, and laboratory classification test data and reports. The site is located on the gently rolling Allegheny Plateau that contains glacial drift of as much as 50 feet in depth overlying shale and sandstone bedrock of Pennsylvanian Age. Within the STA-30-8.83 project limits, fill materials originally placed for an abandoned electric railroad line were encountered overlying the drift deposits. Soil conditions encountered at the adjacent project locations primarily consists of gravelly sandy silt (A-4a soils) in the upper 5 to 10 feet overlying gravels and sands (A-1 and A-3 classification). Wet, slightly organic silts and clays were encountered in the upper 7 feet in a few locations as well as wet, near surface silts, sandy silts and silty clays. Once this project moves into design a more detailed geotechnical, analysis will be performed.

4.7 Right-of-Way Requirements

The existing right-of-way on SR 172 varies throughout the corridor ranging from 66' to 100'. From Whipple Avenue to Raff Road, the right-of-way is 100', from Raff Road to Bellflower Avenue the right-of-way is 86', and from Bellflower Avenue to Harrison Avenue the right-of-way is 66'.

Each of the Build Alternatives was designed to limit ROW impacts, however each alternative will impact parcels within the project corridor. Corridor upgrades in Alternative 1 could impact up to 58 parcels. The majority of the impacts are due to roadway widening and intersection upgrades to allow for auxiliary lanes and the addition of a raised median. Alternative 2 could impact up to 77 parcels (Option A would have a similar but slightly smaller impact). All alternatives will affect parcels between Bellflower Avenue NW and Exeter Avenue SW due to roadway widening in this area. Specific ROW impacts for each alternative are summarized in Appendix N ROW Impacts. Specific invocation regarding effected parcels along the corridor are shown in Appendix O Parcel Information.

4.8 Utility Issues

The SR 172 corridor contains many existing utilities including electrical, gas, water, traffic, telephone, cable, and sanitary lines. All alternatives will impact utilities throughout the corridor. A breakdown of utility impacts are provided in Appendix P Utility Impacts.

4.9 Environmental Concerns and Analysis

As part of the Feasibility Study, a cultural resources' Section 106 Request for Review was completed and a review of ODOT's Transportation Information Mappings System (TIMS) for other potential environmental issues. The team did not identify any potential environmental impacts that would have any

measurable bearing on the decision on the Preferred Alternative selection. To verify this conclusion, an Environmental Site Assessment Screening (ESA) Screening and a Phase I History/Architecture Survey have been completed. An Environmental Site Assessment Screening regarding hazardous materials sites was undertaken to determine if any plan notes or additional evaluations of potential hazardous materials sites are warranted. A Phase I History/Architecture Survey was undertaken to determine if any eligible historic properties are located within the limits of the Preferred Alternative.

Following is a summary of the findings and next steps.

Social/Economic and Underserved Populations – Based on a review of TIMS Underserved Populations, the Minority Population ranged from 2.44% to 54.66% and the Low-Income Population ranged from 22.18% to 74.02% within the Census Block Groups located with the proposed project area. The areas closer to the east end of the proposed project area have the higher percentage of minority and low-income populations. The community in the vicinity of the proposed project area is primarily comprised of large tracks commercial developments, intermixed with single and multi-family residential properties, a hospital campus, and a few scattered public properties. The project area is bisected by Tuscarawas Street West and bordered by I-77 to the east and Whipple Avenue to the west. Sidewalks are located on both sides of Tuscarawas Street West and the adjacent side streets. Public Transit bus routes 102 and 103 are located on Tuscarawas Street West within the proposed project area.

The proposed project area may experience indirect effects due to traffic pattern changes. Any indirect effects of the construction are expected to be the same regardless of the alternative selected. As part of the NEPA document, ODOT will evaluate the potential for indirect and cumulative effects per ODOT Office of Environmental Services (OES) guidance. If required, additional analyses regarding Environmental Justice and Title VI issues will also be completed.

Parks and Recreation – Based upon a review of property ownership information and discussion with local officials, no park or recreational resource is located within the proposed project area.

Public Facilities – Based upon a review of property ownership information and discussion with local officials, City of Canton Fires Station No.5, U.S Post Office, Aultman Hospital Campus, and St. Joseph Church and School are located within the proposed project area. Alternative 2 may require the closing of Fire Station No. 5. Both alternatives will require right-of-way from Aultman Hospital's campus for the realignment of the Broad Avenue intersection and the Arlington Avenue intersection. Aultman Hospital is an active project stakeholder and the realignment of the intersections is in compliance with the Hospital's Master Plan.

Cultural Resources – Based upon the Section 106 Request for Review and a records check, OES provided information on the potential for cultural resources impacts on December 22, 2017. OES determined that a Phase I History/Architecture investigation was warranted and that no further archaeological investigations are recommended for the proposed project area.

The Phase I History/Architecture Survey STA-SR172-11.91 (PID92562) Tuscarawas Street West Corridor Improvements, Canton, Stark County, Ohio (Mannik & Smith Group, Inc., 20185) report included 74 properties over 50 years of age, including 19 previously recorded on Ohio Historic Inventory (OHI) sites. Based on the analysis provided in the Phase I History/Architecture Survey and an August 17, 2018 field review conducted by ODOT-OES, three (3) properties are recommended as individually eligible and one (1) historic district has been identified as eligible.

- St. Joseph Catholic Church, 2427 Tuscarawas Street West (STA0000617)
- George Meyer House, 3411 Tuscarawas Street West (STA0010217)
- Canton Post Office, 4025 Tuscarawas Street West (STA0383417)

The Tuscarawas Street West Suburban Historic District includes four residential properties at the following addresses:

- 3309 Tuscarawas Street West (STA0314817)
- 3319 Tuscarawas Street West (STA0315017)
- 3447 Tuscarawas Street West (STA0382717)
- 3501 Tuscarawas Street West (STA0315217)

The boundaries for the historic district include five contiguous lots on the north side Tuscarawas Street West. The boundaries include the individually eligible George Meyer House, 3411 Tuscarawas Street West but is a non-contributing element in the historic district because it is outside the period of significance. No additional history/architecture resources that are listed on or eligible for the NRHP were identified within the APE. Design in the future will consult with OES to determine, based upon the Preferred Alternative, and if any of the four identified eligible resources may adversely affected by the project's Preferred Alternative.

Ecological Resources – Based upon available mapping, no wetland, stream or ecological resources area located within the proposed project area. An Ecologically Exempt Project Documentation Form will be completed in the next phase based upon the limits of the Preferred Alternative.

Floodplains – No regulated floodplain are located within the proposed project area.

Regulated Materials Review (RMR) – Commercial properties are located along Tuscarawas Street West. Environmental Site Assessment (ESA) Screening was initiated to determine if any plan notes or additional evaluations will be required. A total of 10 sites within Alternative 1 were identified as warranting RMR Assessment (Phase I ESA). A total of 14 sites within Alternative 2 were identified as warranting RMR Assessment. A RMR Assessment will be conducted only on those sites that are within the Alternative that is selected as the Preferred Alternative. Appropriate RMR studies and coordination will be conducted during the design phase.

Noise and Air Quality –Residences are located within 500 feet of Tuscarawas Street West and the proposed project area corridor. The proposed project will not add capacity or additional roadway lanes; it is anticipated that a noise analysis will not be required for the project in the next phase. Should a Noise Analysis be required, noise impacts would be similar regardless of the alternative selected. The project is listed on the AMATS TIP and the Ohio STIP. Any required air quality analyses will be conducted during the design phase prior to NEPA approval.

4.10 Construction Cost Estimate

An 80/20 cost estimate was utilized to determine a conservative cost analysis for each alternative. Employing Computer Aided Drafting (CAD) shapes for payable items, quantities were estimated and unit costs were derived from available ODOT Historical Bid Data. Because of the uncertainty surrounding both alternatives, a 40% contingency was added to both. After calculating estimated quantities and unit costs and including design engineering, construction engineering and budgetary costs for right-of-way acquisition, Alternative 1 will cost approximately \$31,600,000, Alternative 2 will cost approximately \$34,300,000. The city of Canton has obtained MPO (SCATS) funding for Streetscaping which is estimated at approximately \$10 Million per alternative. The total project, without Streetscaping, for Alternative 1 and 2 are \$22,600,000 and \$25,300,000

Figure 4.2 Project Phasing



Table 4.4 Project Cost

Phase	Project Component	Alternative 1	Alternative 2
Phase 1	Design	\$ 1,780,000.00	\$ 1,880,000.00
	Construction	\$ 6,100,000.00	\$ 6,600,000.00
	Streetscaping	\$ 2,800,000.00	\$ 2,800,000.00
	ROW	\$ 100,000.00	\$ 1,000,000.00
	Construction Inspection	\$ 712,000.00	\$ 752,000.00
	Subtotal	\$ 11,492,000.00	\$13,032,000.00
Phase 2	Design	\$ 1,420,000.00	\$ 1,560,000.00
	Road/Intersections	\$ 4,500,000.00	\$ 5,300,000.00
	Streetscaping	\$ 2,600,000.00	\$ 2,500,000.00
	ROW	\$ 200,000.00	\$ 700,000.00
	Construction Inspection	\$ 568,000.00	\$ 624,000.00
	Subtotal	\$ 9,288,000.00	\$10,684,000.00
Phase 3	Design	\$ 1,680,000.00	\$ 1,640,000.00
	Road/Intersections	\$ 4,700,000.00	\$ 4,500,000.00
	Streetscaping	\$ 3,700,000.00	\$ 3,700,000.00
	ROW	\$ 100,000.00	\$ 100,000.00
	Construction Inspection	\$ 672,000.00	\$ 656,000.00
	Subtotal	\$ 10,852,000.00	\$10,596,000.00
Total	\$ 31,632,000.00	\$34,312,000.00	

5.0 COMPARISON OF ALTERNATIVES

All of the build alternatives meet the project purpose to improve transportation safety/operations; improve intersection traffic control efficiency and visibility; improve safety of intersections to meet ADA design standards; enhance non-motorized traffic safety; and to improve access management along the corridor. Table 5.1 Alternatives Analysis compares the alternative benefits, impacts and costs.

Table 5.1 Alternatives Analysis

Evaluation Criteria	No-Build	Alternative 1 - Signals	Alternative 2 - Roundabouts
Safety	●	●	●
Traffic Operations	●	●	●
Environmental Impacts	●	●	●
Maintenance of Traffic / Constructability	N/A	●	●
Geometric Issues	●	●	●
ROW	●	●	●
Cost	●	●	●

● Good ● Fair ● Poor

Alternative 2 Option A

A separate cost estimate was not provided for Option A Turbo Roundabout as the costs were be very similar to the standard roundabout.

5.1 Safety

In the ECAT analysis, each alternative was examined to determine the number of predicted crashes that would be expected to occur based on the geometric characteristics. Each of the Build alternatives perform better than the No-Build alternative because each provide more clearly defined vehicular and pedestrian elements, such as upgrading of traffic signals, countdown pedestrian signals, ADA ramps and push buttons, and signal back-plates. The installation of raised medians, closure of redundant driveways, and implementation of turning restrictions to control access will reduce the number of potential conflicts by reducing and controlling permissible turns. For this reason, each build alternative scores equally well.

5.2 Traffic Operations

Using the Synchro 9 traffic analysis software package, the LOS for each segment along the project can be identified and compared against the other alternatives. Alternative 1 and Alternative 2 effectively address the safety issues along the corridor and traffic operations remain similar to the No-Build alternative. The two alternatives are expected to result in acceptable overall intersection LOS (D or better) for all study intersections, except for 1 intersection approach for Alternative 1 (Whipple Ave.) and 2 approaches for Alternative 2 (Whipple Ave. and Valley View Ave.).

5.3 Environmental Impacts

Parks and Recreation – No park or recreational resources are located within the proposed project area, neither alternative will impact this resource.

Public Facilities – Alternative 2 may require the closing of Fire Station No. 5; however, the closure of this station is in alignment with the city of Canton's plans. Alternative 1 does not require the closing of any public facilities

Cultural Resources – No discernable differences among the alternatives were found; the same four identified National Register eligible resources were located within each alternative.

Ecological Resources – No ecological resources are located within the proposed project area, neither alternative will impact this resource.

Floodplains – No floodplains are located within the proposed project area, neither alternative will impact this resource.

Regulated Materials Review (RMR) – A total of 10 sites within Alternative 1 were identified as warranting RMR Assessment. A total of 14 sites within Alternative 2 were identified as warranting RMR Assessment. Any required RMR Assessments, coordination, or additional studies will be completed the design Phase and before the approval of the Environmental Document.

Noise and Air Quality – noise impacts would be similar regardless of the alternative selected. Any required noise analysis would be completed in the design phase. The project is listed on the AMATS TIP and the Ohio STIP. Any required air quality analyses will be conducted during the design phase prior to NEPA approval. Impacts are similar for each alternative.

5.4 Maintenance of Traffic / Constructability

Alternative 1 scores better than the other build alternatives because it has a smaller footprint and can utilize the majority of the existing pavement. With the inclusion of roundabouts in Alternative 2, complex maintenance of traffic phasing will be required along with detours and greater right-of-way impacts.

5.5 Roadway Design Geometrics

The No-Build roadway horizontal alignment is to remain unchanged for each of the build alternatives; however, the addition of a center median, auxiliary lane adjustments and permissive U-turns will result in a wider roadway footprint for both build alternatives. Both alternatives will include widening of the roadway footprint through most of the corridor. Significant changes to the vertical alignment are not proposed. Secondary roadways will be realigned at Arlington Road and a new extension of Broad Avenue to Maywood Place SW.

5.6 ROW

Each of the build alternatives will have various ROW impacts through the corridor. Alternative 1 will primarily have minor impacts, mostly partial takes, however, there will be some total takes where minor roadways are relocated to align intersections. Alternative 2, while providing a similar footprint to Alternative 1, will include three roundabouts which may result in larger ROW impacts due to the need for a larger footprint for the roundabouts to operate optimally

5.7 Costs

Alternative 1 is estimated to cost \$31,600,000 while Alternative 2 has a slightly higher cost of \$34,300,000.

6.0 CONCLUSION

Alternative 2 meets the purpose and need and is the preferred alternative for the SR 172 corridor. Alternative 2 Option A should be considered in design. The benefits of Alternative 2 include:

- Highest potential for crash reductions
- Best operational performance (LOS)
- Provides traffic calming on the corridor through the use of medians and roundabouts
- Improves corridor aesthetics

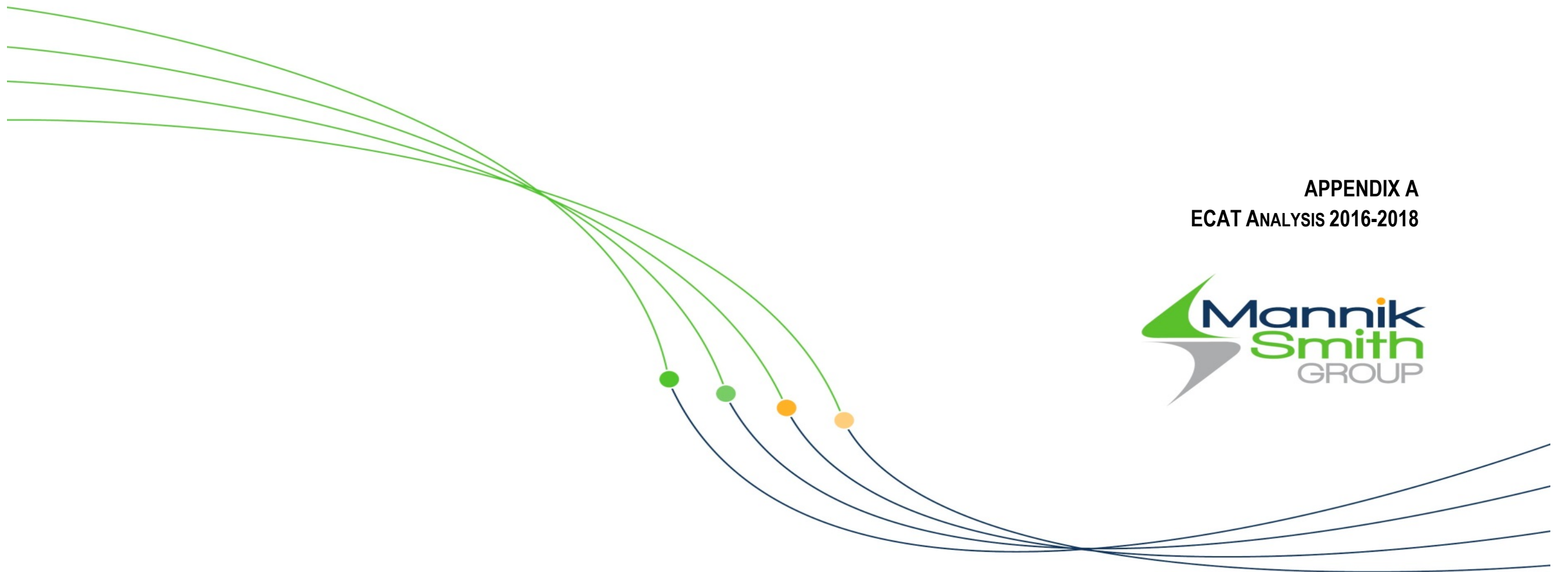
7.0 NEXT STEPS

The evaluation of key issues eliminated Alternative 1 due to traffic operations. Therefore, Alternative 2 is the preferred alternative and it is recommended to be carried to the design phase with consideration of Option A. Currently this project is funded through the Feasibility Study utilizing federal safety funds administered through ODOT. Additional funding sources include others such as Stark County Area Transportation Study (SCATS), the Congestion Mitigation and Air Quality (CMAQ) Program, and continuation of safety funds and/or other funds. Additional Federal funding may be available due to the innovative nature of turbo roundabouts. Funding from some or all of these sources will be necessary to proceed farther with this project into detailed design and construction of the preferred alternative.

Actual phasing of improvements will be determined at a later point, once all input from agency reviews and public input has been received. Project phasing will likely involve three phases that may break down as follows:

- Phase 1** - The section of the corridor around Aultman Hospital, likely from Smith Avenue to just west of Wertz Avenue
Phase 2 - The section of SR 172 from Whipple Avenue east through the Raff Road intersection
Phase 3 - The section of the corridor from Montrose Avenue east to Ingram Avenue (just west of Wertz Avenue)

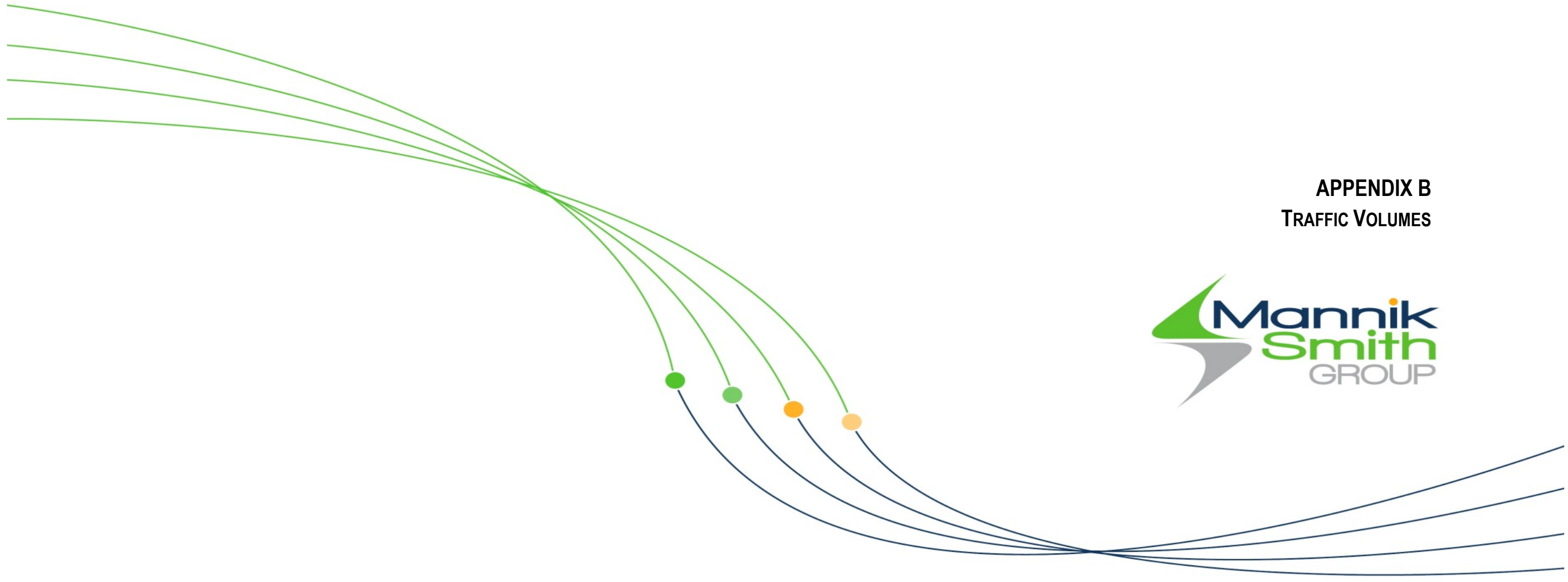
APPENDIX A
ECAT ANALYSIS 2016-2018

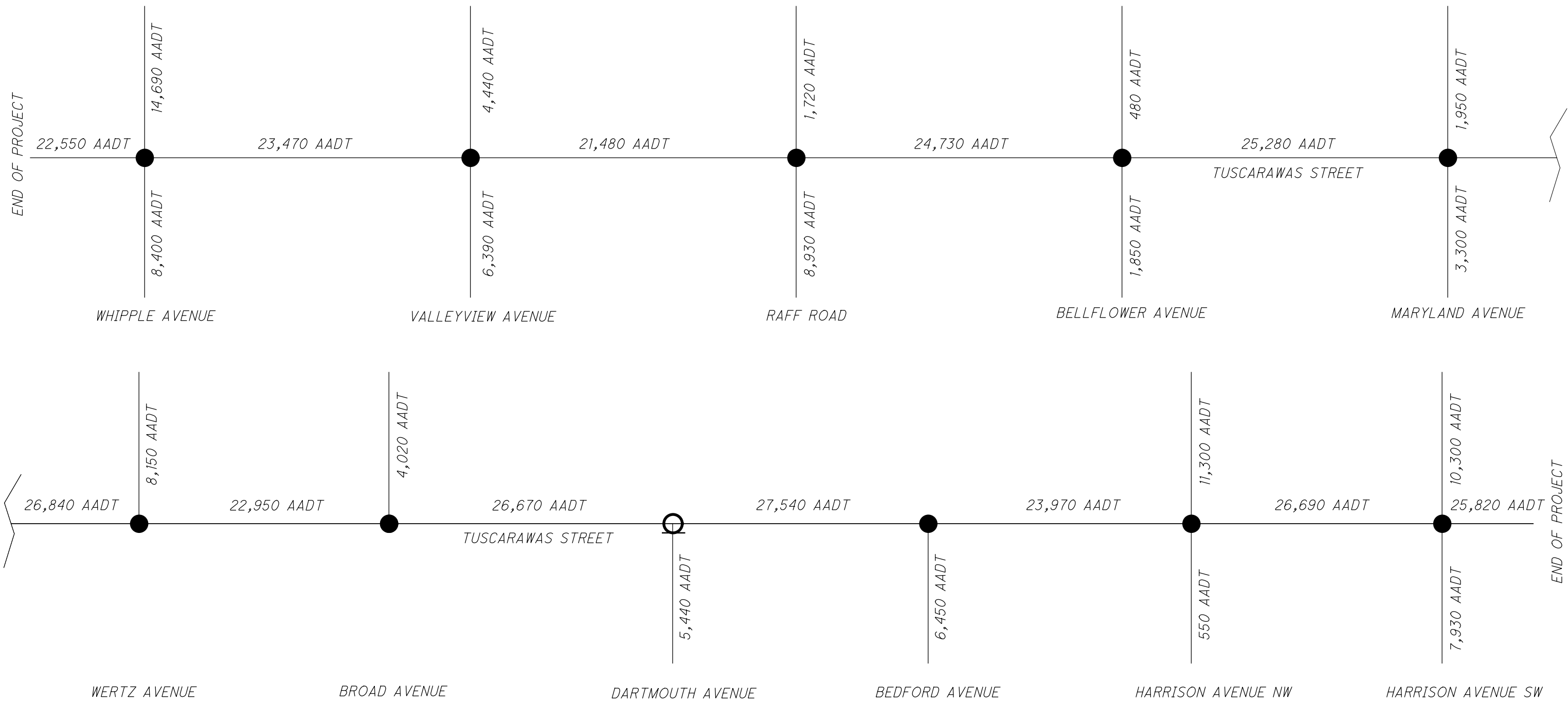


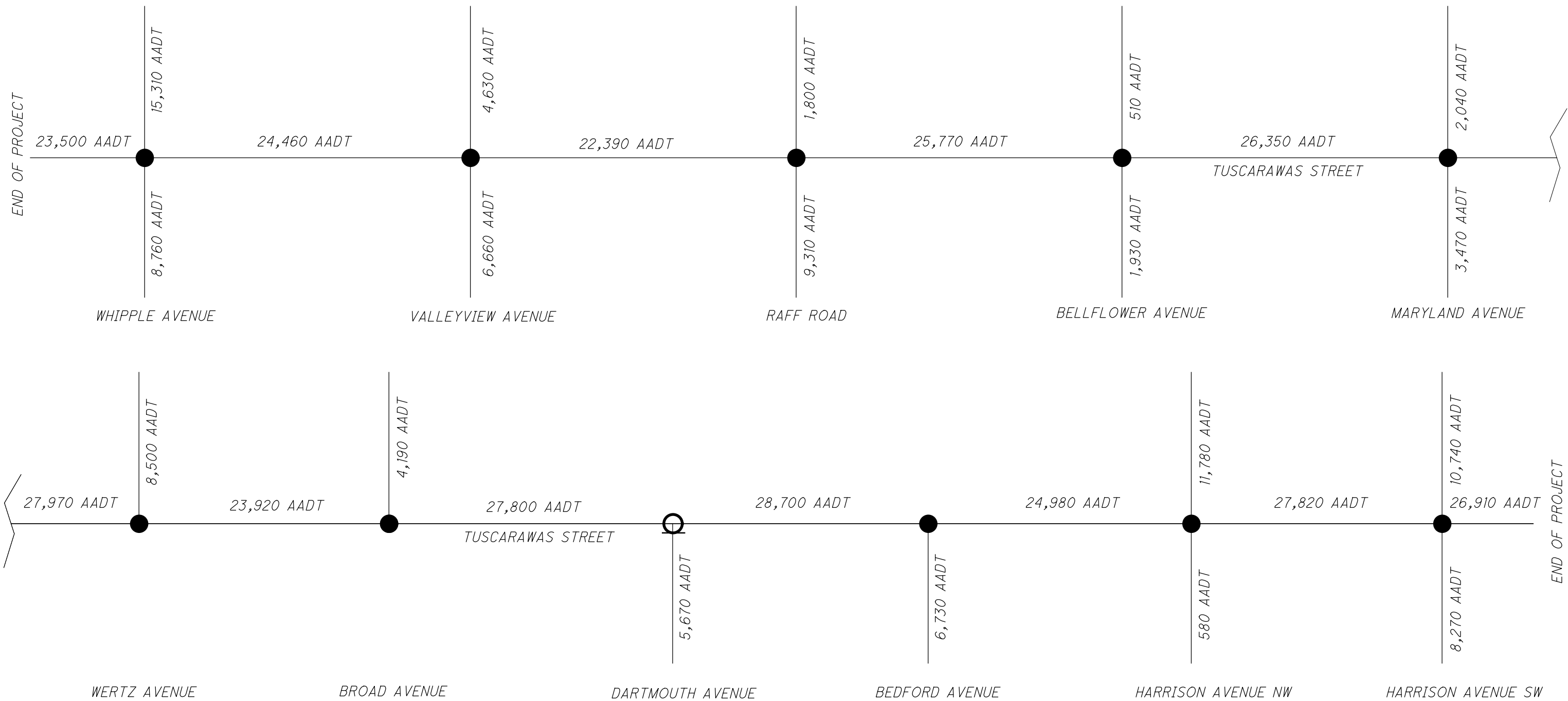
Crash Severity	Site Average		Statewide Average
	Total (2016-2018)	Total (%)	Total (%)
Fatal Crash	5	1.12%	0.93%
Serious Injury Suspected Crash	16	3.60%	4.50%
Minor Injury Suspected Crash	46	10.34%	14.06%
Injury Possible Crash	61	13.71%	7.65%
Property-Damage-Only	317	71.24%	72.86%
Total	445		

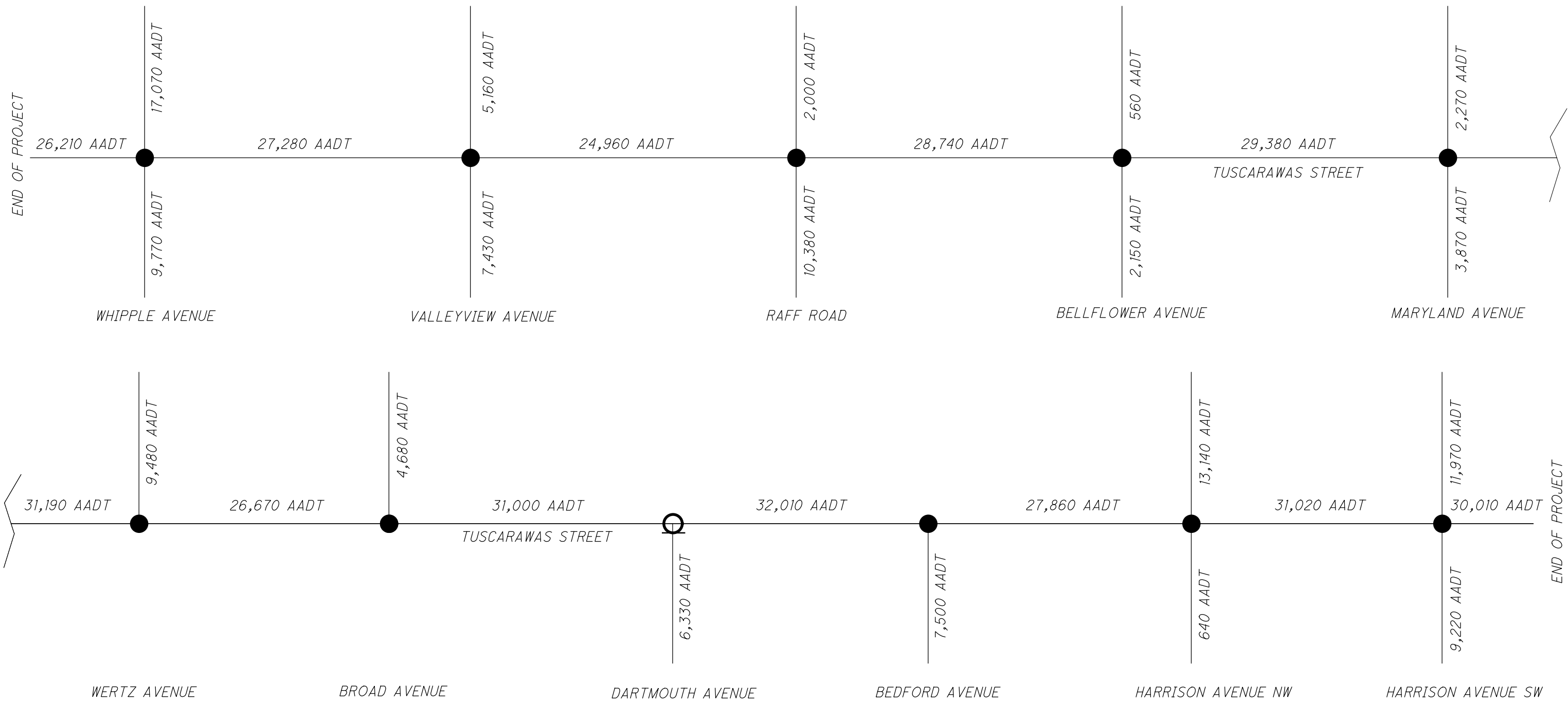
Crashes by Crash Type				
Crash Type	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Unknown	0.01%	0.19%	-0.01%	0.12%
Head On	0.67%	2.86%	2.34%	5.74%
Rear End	44.49%	10.26%	35.16%	15.40%
Backing	2.92%	1.12%	1.56%	0.56%
Sideswipe - Meeting	0.00%	2.30%	0.00%	3.00%
Sideswipe - Passing	11.46%	3.66%	3.91%	3.92%
Angle	19.10%	2.36%	22.66%	4.64%
Parked Vehicle	1.35%	0.81%	0.78%	0.79%
Pedestrian	2.25%	0.26%	7.81%	0.88%
Animal	0.00%	33.28%	0.00%	5.60%
Train	0.00%	0.02%	0.00%	0.03%
Pedalcycles	1.57%	0.14%	4.69%	0.48%
Other Non-Vehicle	0.00%	0.01%	0.00%	0.04%
Fixed Object	3.60%	34.58%	4.69%	47.05%
Other Object	0.22%	0.92%	0.00%	0.21%
Falling From Or In Vehicle	0.00%	0.00%	0.00%	0.00%
Overturning	0.22%	2.75%	0.00%	6.35%
Other Non-Collision	0.00%	1.30%	0.00%	0.54%
Left Turn	7.87%	2.66%	13.28%	4.09%
Right Turn	4.27%	0.52%	3.13%	0.56%

APPENDIX B
TRAFFIC VOLUMES



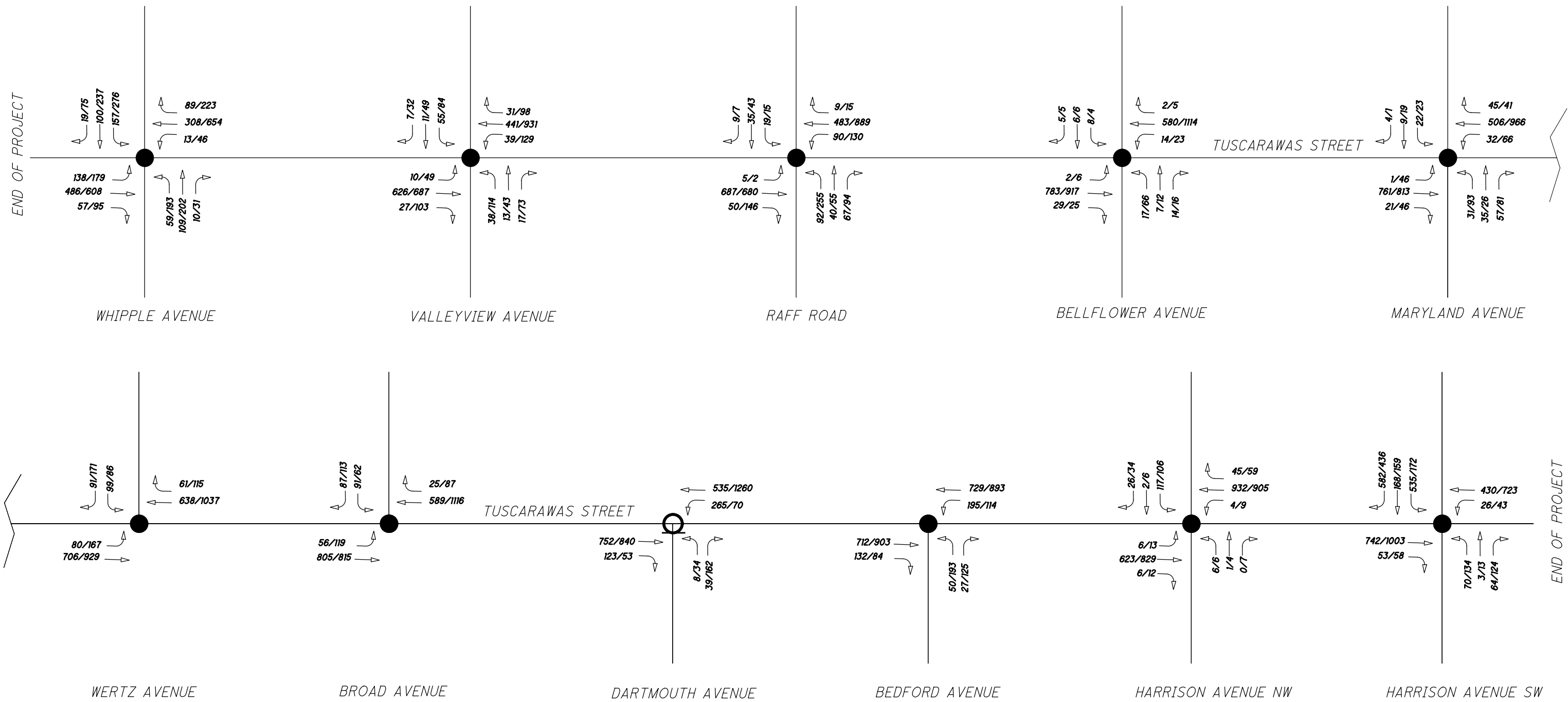


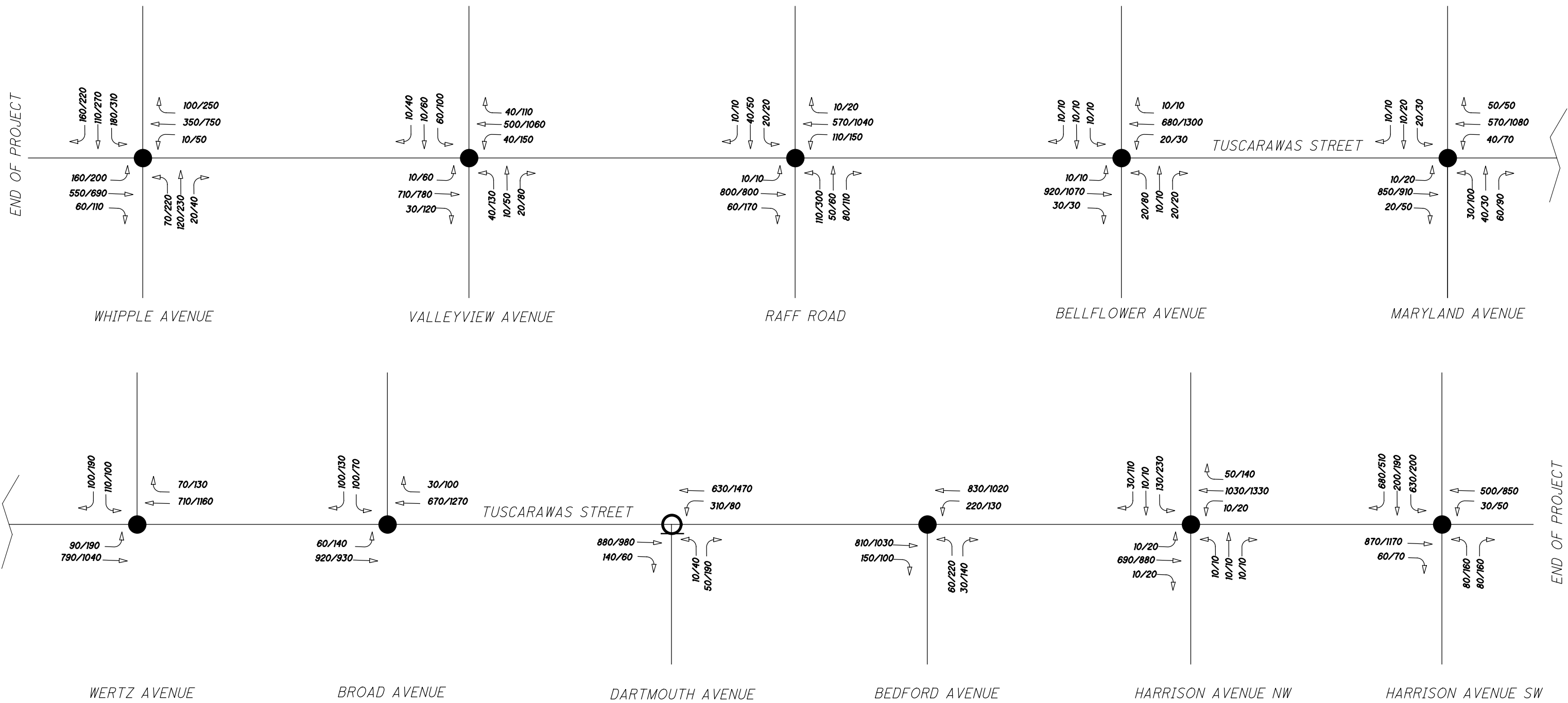


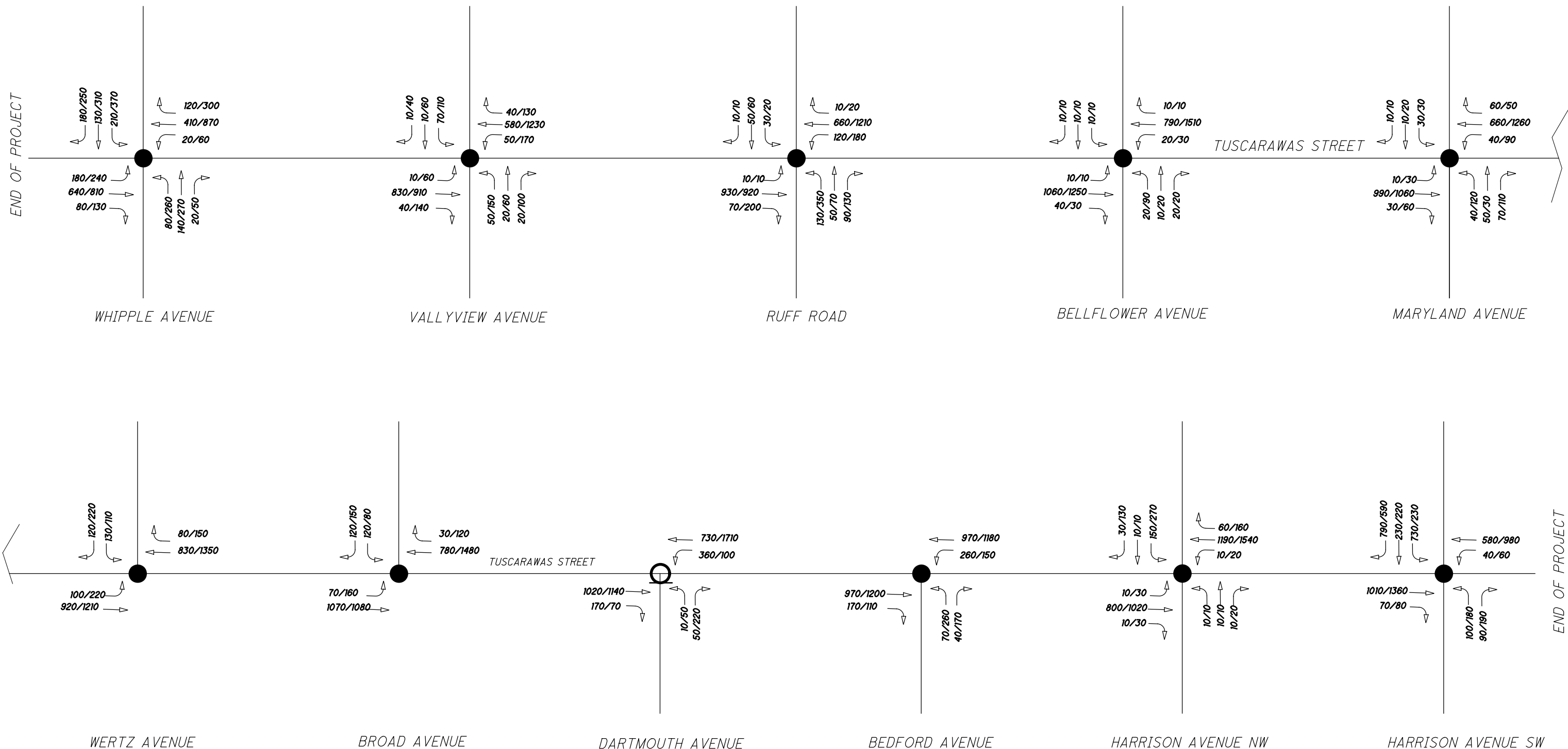


**PLATE 3
 TUSCARAWAS STREET
 2042 AADT**

STA SR 0172 11.91	
2042 NO-BUILD AADT	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
JUNE 27, 2017	NOT TO SCALE







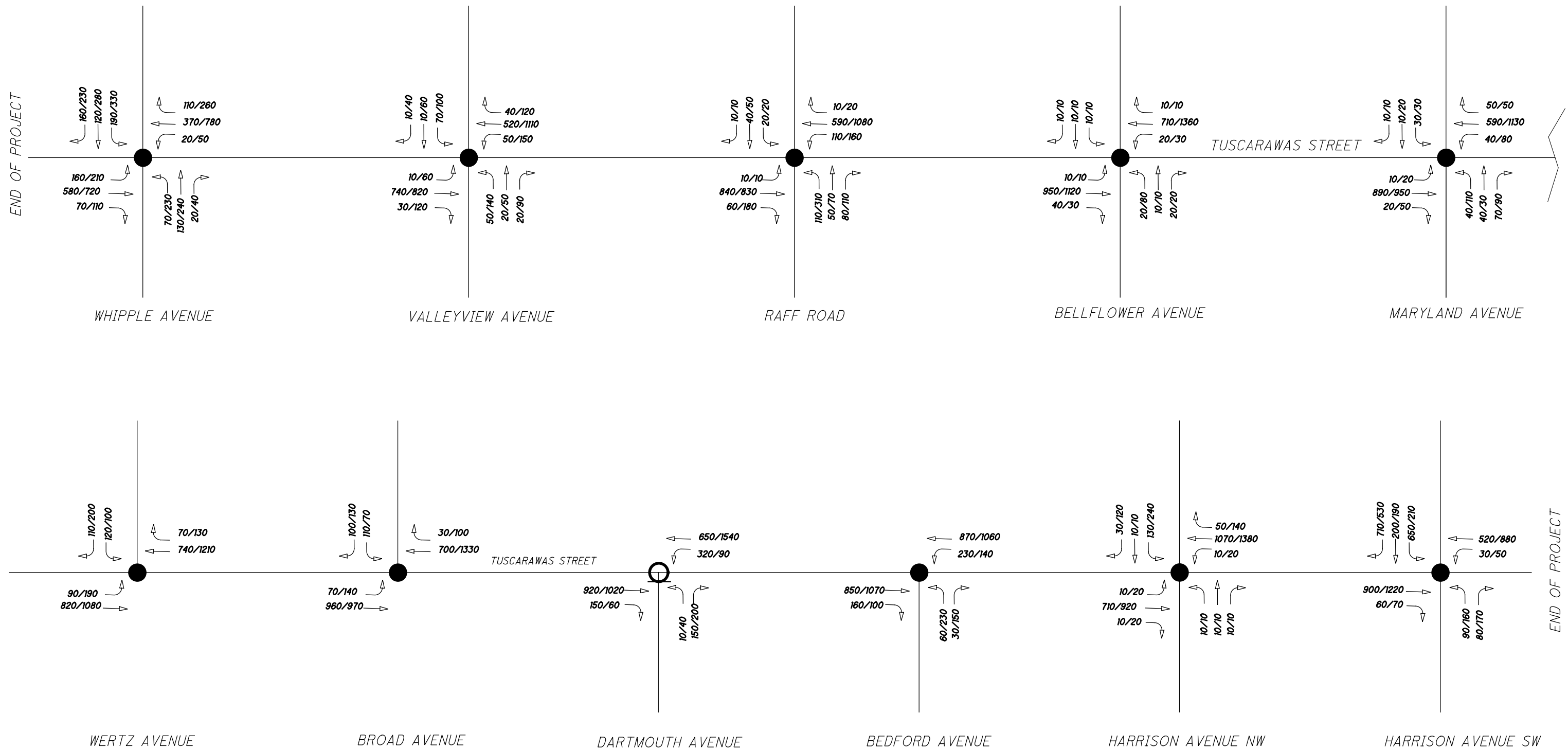
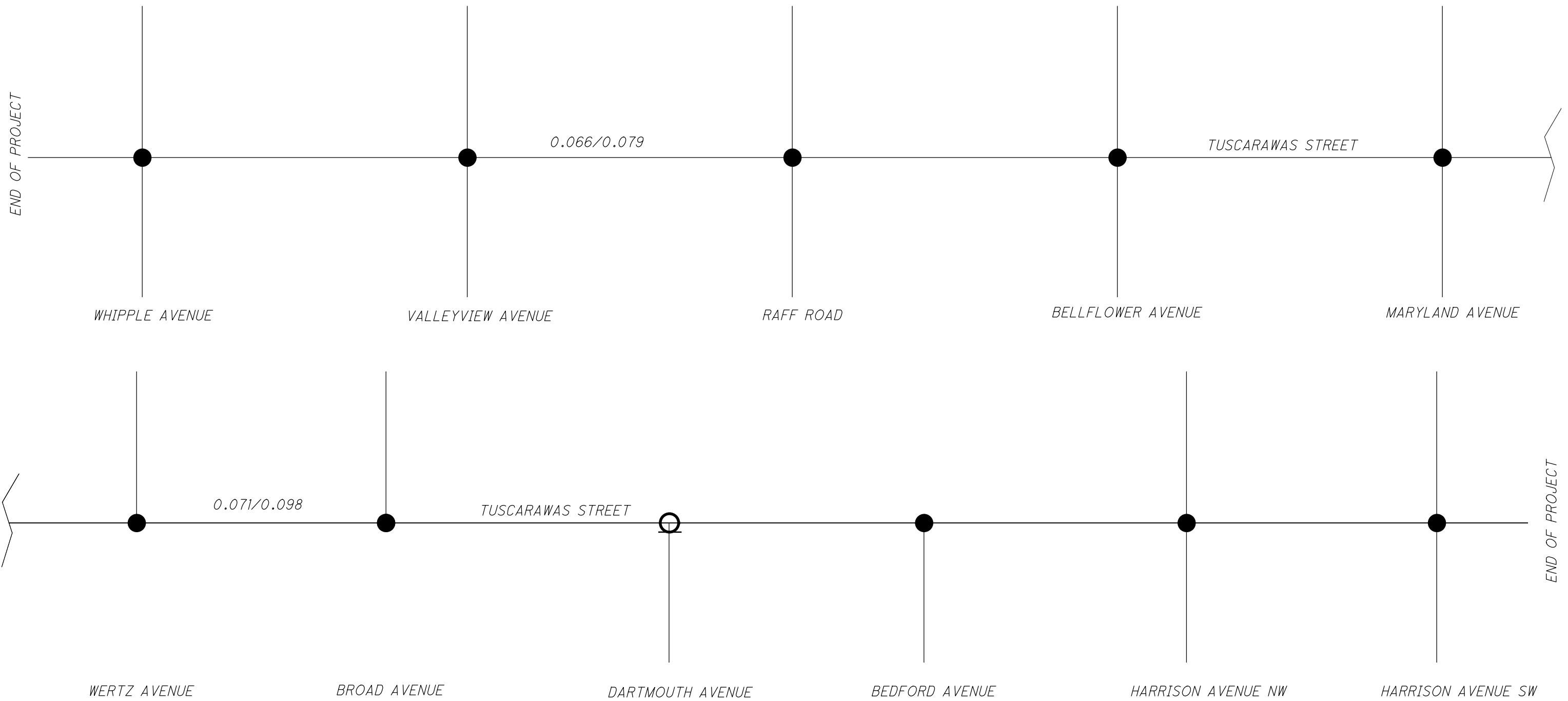


PLATE 6
TUSCARAWAS STREET OPENING YEAR
2022 DESIGN HOUR TRAFFIC VOLUMES

TD / T24



PID 92562 Tuscarawas St. West Study
 Traffic Projection Calculations
 4/26/2017

Growth Rate 0.60%
 2022 0.042
 2042 0.162
 Opening Year 1.042
 Design Year 1.162

DHV Factor
 1.14

AM Peak Hour Design Hour Volume Development

Whipple Avenue & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Whipple Ave.			Westbound Tuscarawas St.			Southbound Whipple Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX AM	138	486	57	59	109	14	13	308	89	157	100	136
AM DHV	157.32	554.04	64.98	67.26	124.26	15.96	14.82	351.12	101.46	178.98	114	155.04
AM DHV Rounded	160	550	60	70	120	20	10	350	100	180	110	160
2022 AM DHV	163.9274	577.3097	67.70916	70.08492	129.4789	16.63032	15.44244	365.867	105.7213	186.4972	118.788	161.5517
2042 AM DHV	182.8058	643.7945	75.50676	78.15612	144.3901	18.54552	17.22084	408.0014	117.8965	207.9748	132.468	180.1565
2022 AM DHV Rounded	160	580	70	70	130	20	20	370	110	190	120	160
2042 AM DHV Rounded	180	640	80	80	140	20	20	410	120	210	130	180

9/22/2015

1.14 DHV Factor
 1.042 Opening Year Growth Rate
 1.162 Design Year Growth Rate

PM Peak Hour Design Hour Volume Development

Whipple Avenue & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Whipple Ave.			Westbound Tuscarawas St.			Southbound Whipple Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX PM	179	608	95	193	202	34	46	654	223	276	237	191
PM DHV	204.06	693.12	108.3	220.02	230.28	38.76	52.44	745.56	254.22	314.64	270.18	217.74
PM DHV Rounded	200	690	110	220	230	40	50	750	250	310	270	220
2022 PM DHV	212.6305	722.231	112.8486	229.2608	239.9518	40.38792	54.64248	776.8735	264.8972	327.8549	281.5276	226.8851
2042 PM DHV	237.1177	805.4054	125.8446	255.6632	267.5854	45.03912	60.93528	866.3407	295.4036	365.6117	313.9492	253.0139
2022 PM DHV Rounded	210	720	110	230	240	40	50	780	260	330	280	230
2042 PM DHV Rounded	240	810	130	260	270	50	60	870	300	370	310	250

1.14 DHV Factor
 1.042 Opening Year Growth Rate
 1.162 Design Year Growth Rate

AM Peak Hour Design Hour Volume Development

Valleyview Avenue & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Valleyview Ave.			Westbound Tuscarawas St.			Southbound Valleyview Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX AM	10	626	27	38	13	17	39	441	31	55	11	7
AM DHV	11.4	713.64	30.78	43.32	14.82	19.38	44.46	502.74	35.34	62.7	12.54	7.98
AM DHV Rounded	10	710	30	40	10	20	40	500	40	60	10	10
2022 AM DHV	11.8788	743.6129	32.07276	45.13944	15.44244	20.19396	46.32732	523.8551	36.82428	65.3334	13.06668	8.31516
2042 AM DHV	13.2468	829.2497	35.76636	50.33784	17.22084	22.51956	51.66252	584.1839	41.06508	72.8574	14.57148	9.27276
2022 AM DHV Rounded	10	740	30	50	20	20	50	520	40	70	10	10
2042 AM DHV Rounded	10	830	40	50	20	20	50	580	40	70	10	10

9/22/2015

- 1.14 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

PM Peak Hour Design Hour Volume Development

Valleyview Avenue & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Valleyview Ave.			Westbound Tuscarawas St.			Southbound Valleyview Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX PM	49	687	103	114	43	73	129	931	98	84	49	32
PM DHV	55.86	783.18	117.42	129.96	49.02	83.22	147.06	1061.34	111.72	95.76	55.86	36.48
PM DHV Rounded	60	780	120	130	50	80	150	1060	110	100	60	40
2022 PM DHV	58.20612	816.0736	122.3516	135.4183	51.07884	86.71524	153.2365	1105.916	116.4122	99.78192	58.20612	38.01216
2042 PM DHV	64.90932	910.0552	136.442	151.0135	56.96124	96.70164	170.8837	1233.277	129.8186	111.2731	64.90932	42.38976
2022 PM DHV Rounded	60	820	120	140	50	90	150	1110	120	100	60	40
2042 PM DHV Rounded	60	910	140	150	60	100	170	1230	130	110	60	40

- 1.14 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

AM Peak Hour Design Hour Volume Development

Raff Road & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Raff Rd.			Westbound Tuscarawas St.			Southbound Raff Rd.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX AM	5	687	50	92	40	67	90	483	9	19	35	9
AM DHV	5.85	803.79	58.5	107.64	46.8	78.39	105.3	565.11	10.53	22.23	40.95	10.53
AM DHV Rounded	10	800	60	110	50	80	110	570	10	20	40	10
2022 AM DHV	6.0957	837.5492	60.957	112.1609	48.7656	81.68238	109.7226	588.8446	10.97226	23.16366	42.6699	10.97226
2042 AM DHV	6.7977	934.004	67.977	125.0777	54.3816	91.08918	122.3586	656.6578	12.23586	25.83126	47.5839	12.23586
2022 AM DHV Rounded	10	840	60	110	50	80	110	590	10	20	40	10
2042 AM DHV Rounded	10	930	70	130	50	90	120	660	10	30	50	10

9/23/2015

- 1.17 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

PM Peak Hour Design Hour Volume Development

Raff Road & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Raff Rd.			Westbound Tuscarawas St.			Southbound Raff Rd.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX PM	2	680	146	255	55	94	130	889	15	15	43	7
PM DHV	2.34	795.6	170.82	298.35	64.35	109.98	152.1	1040.13	17.55	17.55	50.31	8.19
PM DHV Rounded	10	800	170	300	60	110	150	1040	20	20	50	10
2022 PM DHV	2.43828	829.0152	177.9944	310.8807	67.0527	114.5992	158.4882	1083.815	18.2871	18.2871	52.42302	8.53398
2042 PM DHV	2.71908	924.4872	198.4928	346.6827	74.7747	127.7968	176.7402	1208.631	20.3931	20.3931	58.46022	9.51678
2022 PM DHV Rounded	10	830	180	310	70	110	160	1080	20	20	50	10
2042 PM DHV Rounded	10	920	200	350	70	130	180	1210	20	20	60	10

- 1.17 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

AM Peak Hour Design Hour Volume Development

Bellflower Avenue & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Bellflower Ave.			Westbound Tuscarawas St.			Southbound Bellflower Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX AM	2	783	29	17	7	14	14	580	2	8	6	5
AM DHV	2.34	916.11	33.93	19.89	8.19	16.38	16.38	678.6	2.34	9.36	7.02	5.85
AM DHV Rounded	10	920	30	20	10	20	20	680	10	10	10	10
2022 AM DHV	2.43828	954.5866	35.35506	20.72538	8.53398	17.06796	17.06796	707.1012	2.43828	9.75312	7.31484	6.0957
2042 AM DHV	2.71908	1064.52	39.42666	23.11218	9.51678	19.03356	19.03356	788.5332	2.71908	10.87632	8.15724	6.7977
2022 AM DHV Rounded	10	950	40	20	10	20	20	710	10	10	10	10
2042 AM DHV Rounded	10	1060	40	20	10	20	20	790	10	10	10	10

9/23/2015

- 1.17 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

PM Peak Hour Design Hour Volume Development

Bellflower Avenue & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Bellflower Ave.			Westbound Tuscarawas St.			Southbound Bellflower Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX PM	6	917	25	66	12	16	23	1114	5	4	6	5
PM DHV	7.02	1072.89	29.25	77.22	14.04	18.72	26.91	1303.38	5.85	4.68	7.02	5.85
PM DHV Rounded	10	1070	30	80	10	20	30	1300	10	10	10	10
2022 PM DHV	7.31484	1117.951	30.4785	80.46324	14.62968	19.50624	28.04022	1358.122	6.0957	4.87656	7.31484	6.0957
2042 PM DHV	8.15724	1246.698	33.9885	89.72964	16.31448	21.75264	31.26942	1514.528	6.7977	5.43816	8.15724	6.7977
2022 PM DHV Rounded	10	1120	30	80	10	20	30	1360	10	10	10	10
2042 PM DHV Rounded	10	1250	30	90	20	20	30	1510	10	10	10	10

- 1.17 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

AM Peak Hour Design Hour Volume Development

Maryland Avenue & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Maryland Ave.			Westbound Tuscarawas St.			Southbound Maryland Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX AM	1	761	21	31	35	57	32	506	45	22	9	4
AM DHV	1.12	852.32	23.52	34.72	39.2	63.84	35.84	566.72	50.4	24.64	10.08	4.48
AM DHV Rounded	10	850	20	30	40	60	40	570	50	20	10	10
2022 AM DHV	1.16704	888.1174	24.50784	36.17824	40.8464	66.52128	37.34528	590.5222	52.5168	25.67488	10.50336	4.66816
2042 AM DHV	1.30144	990.3958	27.33024	40.34464	45.5504	74.18208	41.64608	658.5286	58.5648	28.63168	11.71296	5.20576
2022 AM DHV Rounded	10	890	20	40	40	70	40	590	50	30	10	10
2042 AM DHV Rounded	10	990	30	40	50	70	40	660	60	30	10	10

9/24/2015

- 1.12 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

PM Peak Hour Design Hour Volume Development

Maryland Avenue & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Maryland Ave.			Westbound Tuscarawas St.			Southbound Maryland Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX PM	20	813	46	93	26	81	66	966	41	23	19	1
PM DHV	22.4	910.56	51.52	104.16	29.12	90.72	73.92	1081.92	45.92	25.76	21.28	1.12
PM DHV Rounded	20	910	50	100	30	90	70	1080	50	30	20	10
2022 PM DHV	23.3408	948.8035	53.68384	108.5347	30.34304	94.53024	77.02464	1127.361	47.84864	26.84192	22.17376	1.16704
2042 PM DHV	26.0288	1058.071	59.86624	121.0339	33.83744	105.4166	85.89504	1257.191	53.35904	29.93312	24.72736	1.30144
2022 PM DHV Rounded	20	950	50	110	30	90	80	1130	50	30	20	10
2042 PM DHV Rounded	30	1060	60	120	30	110	90	1260	50	30	20	10

- 1.12 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

AM Peak Hour Design Hour Volume Development

Wertz Avenue & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Wertz Ave.			Westbound Tuscarawas St.			Southbound Wertz Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX AM	80	706					638	61	99		91	
AM DHV	89.6	790.72					714.56	68.32	110.88		101.92	
AM DHV Rounded	90	790					710	70	110		100	
2022 AM DHV	93.3632	823.9302					744.5715	71.18944	115.537		106.2006	
2042 AM DHV	104.1152	918.8166					830.3187	79.38784	128.8426		118.431	
2022 AM DHV Rounded	90	820					740	70	120		110	
2042 AM DHV Rounded	100	920					830	80	130		120	

9/24/2015

- 1.12 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

PM Peak Hour Design Hour Volume Development

Wertz Avenue & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Wertz Ave.			Westbound Tuscarawas St.			Southbound Wertz Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX PM	167	929					1037	115	86		171	
PM DHV	187.04	1040.48					1161.44	128.8	96.32		191.52	
PM DHV Rounded	190	1040					1160	130	100		190	
2022 PM DHV	194.8957	1084.18					1210.22	134.2096	100.3654		199.5638	
2042 PM DHV	217.3405	1209.038					1349.593	149.6656	111.9238		222.5462	
2022 PM DHV Rounded	190	1080					1210	130	100		200	
2042 PM DHV Rounded	220	1210					1350	150	110		220	

- 1.12 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

AM Peak Hour Design Hour Volume Development

Broad Avenue & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Broad Ave.			Westbound Tuscarawas St.			Southbound Broad Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX AM	56	805					589	25	91		87	
AM DHV	63.84	917.7					671.46	28.5	103.74		99.18	
AM DHV Rounded	60	920					670	30	100		100	
2022 AM DHV	66.52128	956.2434					699.6613	29.697	108.0971		103.3456	
2042 AM DHV	74.18208	1066.367					780.2365	33.117	120.5459		115.2472	
2022 AM DHV Rounded	70	960					700	30	110		100	
2042 AM DHV Rounded	70	1070					780	30	120		120	

9/29/2015

- 1.14 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

PM Peak Hour Design Hour Volume Development

Broad Avenue & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Broad Ave.			Westbound Tuscarawas St.			Southbound Broad Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX PM	119	815					1116	87	62		113	
PM DHV	135.66	929.1					1272.24	99.18	70.68		128.82	
PM DHV Rounded	140	930					1270	100	70		130	
2022 PM DHV	141.3577	968.1222					1325.674	103.3456	73.64856		134.2304	
2042 PM DHV	157.6369	1079.614					1478.343	115.2472	82.13016		149.6888	
2022 PM DHV Rounded	140	970					1330	100	70		130	
2042 PM DHV Rounded	160	1080					1480	120	80		150	

- 1.14 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

AM Peak Hour Design Hour Volume Development

Dartmouth Avenue & Tuscarawas Street West											
Eastbound Tuscarawas St.			Northbound Bedford Ave.			Westbound Tuscarawas St.			Southbound Bedford Ave.		
L	T	R	L	T	R	L	T	R	L	T	R
EX AM	752	123	8		39	265	535				
AM DHV	879.84	143.91	9.36		45.63	310.05	625.95				
AM DHV Rounded	880	140	10		50	310	630				
2022 AM DHV	916.7933	149.9542	9.75312		47.54646	323.0721	652.2399				
2042 AM DHV	1022.374	167.2234	10.87632		53.02206	360.2781	727.3539				
2022 AM DHV Rounded	920	150	10		50	320	650				
2042 AM DHV Rounded	1020	170	10		50	360	730				

9/30/2015

- 1.17 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

PM Peak Hour Design Hour Volume Development

Dartmouth Avenue & Tuscarawas Street West											
Eastbound Tuscarawas St.			Northbound Bedford Ave.			Westbound Tuscarawas St.			Southbound Bedford Ave.		
L	T	R	L	T	R	L	T	R	L	T	R
EX PM	840	53	34		162	70	1260				
PM DHV	982.8	62.01	39.78		189.54	81.9	1474.2				
PM DHV Rounded	980	60	40		190	80	1470				
2022 PM DHV	1024.078	64.61442	41.45076		197.5007	85.3398	1536.116				
2042 PM DHV	1142.014	72.05562	46.22436		220.2455	95.1678	1713.02				
2022 PM DHV Rounded	1020	60	40		200	90	1540				
2042 PM DHV Rounded	1140	70	50		220	100	1710				

- 1.17 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

AM Peak Hour Design Hour Volume Development

Bedford Avenue & Tuscarawas Street West											
Eastbound Tuscarawas St.			Northbound Bedford Ave.			Westbound Tuscarawas St.			Southbound Bedford Ave.		
L	T	R	L	T	R	L	T	R	L	T	R
EX AM	712	132	50		27	195	729				
AM DHV	811.68	150.48	57		30.78	222.3	831.06				
AM DHV Rounded	810	150	60		30	220	830				
2022 AM DHV	845.7706	156.8002	59.394		32.07276	231.6366	865.9645				
2042 AM DHV	943.1722	174.8578	66.234		35.76636	258.3126	965.6917				
2022 AM DHV Rounded	850	160	60		30	230	870				
2042 AM DHV Rounded	940	170	70		40	260	970				

9/29/2015

- 1.14 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

PM Peak Hour Design Hour Volume Development

Bedford Avenue & Tuscarawas Street West											
Eastbound Tuscarawas St.			Northbound Bedford Ave.			Westbound Tuscarawas St.			Southbound Bedford Ave.		
L	T	R	L	T	R	L	T	R	L	T	R
EX PM	903	84	193		125	114	893				
PM DHV	1029.42	95.76	220.02		142.5	129.96	1018.02				
PM DHV Rounded	1030	100	220		140	130	1020				
2022 PM DHV	1072.656	99.78192	229.2608		148.485	135.4183	1060.777				
2042 PM DHV	1196.186	111.2731	255.6632		165.585	151.0135	1182.939				
2022 PM DHV Rounded	1070	100	230		150	140	1060				
2042 PM DHV Rounded	1200	110	260		170	150	1180				

- 1.14 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

AM Peak Hour Design Hour Volume Development

Harrison Avenue NW & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Bedford Ave.			Westbound Tuscarawas St.			Southbound Bedford Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX AM	6	623	6	6	1	0	4	932	45	117	2	26
AM DHV	6.6	685.3	6.6	6.6	1.1	0	4.4	1025.2	49.5	128.7	2.2	28.6
AM DHV Rounded	10	690	10	10	10	10	10	1030	50	130	10	30
2022 AM DHV	6.8772	714.0826	6.8772	6.8772	1.1462	0	4.5848	1068.258	51.579	134.1054	2.2924	29.8012
2042 AM DHV	7.6692	796.3186	7.6692	7.6692	1.2782	0	5.1128	1191.282	57.519	149.5494	2.5564	33.2332
2022 AM DHV Rounded	10	710	10	10	10	10	10	1070	50	130	10	30
2042 AM DHV Rounded	10	800	10	10	10	10	10	1190	60	150	10	30

10/15/2015

- 1.1 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

PM Peak Hour Design Hour Volume Development

Harrison Avenue NW & Tuscarawas Street West												
Eastbound Tuscarawas St.			Northbound Bedford Ave.			Westbound Tuscarawas St.			Southbound Bedford Ave.			
L	T	R	L	T	R	L	T	R	L	T	R	
EX PM	20	801	20	6	4	12	15	1207	124	210	10	104
PM DHV	22	881.1	22	6.6	4.4	13.2	16.5	1327.7	136.4	231	11	114.4
PM DHV Rounded	20	880	20	10	10	10	20	1330	140	230	10	110
2022 PM DHV	22.924	918.1062	22.924	6.8772	4.5848	13.7544	17.193	1383.463	142.1288	240.702	11.462	119.2048
2042 PM DHV	25.564	1023.838	25.564	7.6692	5.1128	15.3384	19.173	1542.787	158.4968	268.422	12.782	132.9328
2022 PM DHV Rounded	20	920	20	10	10	10	20	1380	140	240	10	120
2042 PM DHV Rounded	30	1020	30	10	10	20	20	1540	160	270	10	130

- 1.1 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

AM Peak Hour Design Hour Volume Development

Harrison Avenue SW & Tuscarawas Street West											
Eastbound Tuscarawas St.			Northbound Harrison Ave.			Westbound Tuscarawas St.			Southbound Harrison Ave.		
L	T	R	L	T	R	L	T	R	L	T	R
EX AM	742	53	70		67	26	430		535	168	582
AM DHV	868.14	62.01	81.9		78.39	30.42	503.1		625.95	196.56	680.94
AM DHV Rounded	870	60	80		80	30	500		630	200	680
2022 AM DHV	904.6019	64.61442	85.3398		81.68238	31.69764	524.2302		652.2399	204.8155	709.5395
2042 AM DHV	1008.779	72.05562	95.1678		91.08918	35.34804	584.6022		727.3539	228.4027	791.2523
2022 AM DHV Rounded	900	60	90		80	30	520		650	200	710
2042 AM DHV Rounded	1010	70	100		90	40	580		730	230	790

9/30/2015

- 1.17 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

PM Peak Hour Design Hour Volume Development

Harrison Avenue SW & Tuscarawas Street West											
Eastbound Tuscarawas St.			Northbound Harrison Ave.			Westbound Tuscarawas St.			Southbound Harrison Ave.		
L	T	R	L	T	R	L	T	R	L	T	R
EX PM	1003	58	134		137	43	723		172	159	436
PM DHV	1173.51	67.86	156.78		160.29	50.31	845.91		201.24	186.03	510.12
PM DHV Rounded	1170	70	160		160	50	850		200	190	510
2022 PM DHV	1222.797	70.71012	163.3648		167.0222	52.42302	881.4382		209.6921	193.8433	531.545
2042 PM DHV	1363.619	78.85332	182.1784		186.257	58.46022	982.9474		233.8409	216.1669	592.7594
2022 PM DHV Rounded	1220	70	160		170	50	880		210	190	530
2042 PM DHV Rounded	1360	80	180		190	60	980		230	220	590

- 1.17 DHV Factor
- 1.042 Opening Year Growth Rate
- 1.162 Design Year Growth Rate

PEAK HOUR to DESIGN HOUR FACTORS
FUNCTIONAL CLASSIFICATION = 03upa
(Urban Principal Arterial)

Day Month	Monthly Average by Day-of-Week							
	WEEKDAY MON- THUR	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
January	1.32	1.86	1.35	1.35	1.31	1.27	1.22	1.54
February	1.28	1.76	1.32	1.31	1.25	1.23	1.17	1.54
March	1.29	1.76	1.35	1.26	1.33	1.22	1.13	1.44
April	1.19	1.50	1.23	1.19	1.19	1.16	1.10	1.35
May	1.14	1.41	1.17	1.16	1.14	1.11	1.04	1.31
June	1.14	1.45	1.17	1.15	1.14	1.11	1.06	1.35
July	1.14	1.46	1.17	1.15	1.14	1.09	1.07	1.39
August	1.13	1.41	1.14	1.15	1.12	1.09	1.03	1.30
September	1.15	1.44	1.18	1.14	1.17	1.12	1.04	1.34
October	1.15	1.44	1.18	1.17	1.13	1.10	1.04	1.31
November	1.19	1.56	1.20	1.19	1.20	1.18	1.09	1.44
December	1.19	1.66	1.22	1.21	1.18	1.16	1.14	1.59

peak hour volume * factor = design hour volume

source: year 2013 & 2014 Automatic Traffic Recorders (ATR) Data

ATR STATIONS:

2014:021, 028, 123, 202, 523, 538, 543, 544, 550, 565, 594, 605,
622, 725, 760, 764, 765, 768, 780

2013:021, 028, 123, 200, 202, 538, 543, 544, 550, 565, 594, 605,
622, 725, 760, 765, 768, 780

Ohio Department of Transportation
Modeling & Forecasting Section
April 2015

NOTE: These are NOT seasonal adjustment factors!!!

Mike Walsh - Re: Fwd: City of Canton SR 172 (Tuscarawas St) Growth Rate

From: "Dan Slicker" <dkslicker@starkcountyohio.gov>
To: <MWalsh@manniksmithgroup.com>, "Jeffrey Dutton" <jrdutton@starkcountyohi...
Date: 11/23/2015 10:46 AM
Subject: Re: Fwd: City of Canton SR 172 (Tuscarawas St) Growth Rate

Mike,

I calculate a growth rate of 0.6% per year. That is based on past counts going back to 2000, although we don't have very much data. These counts are from the section west of Raff to Whipple:

2000 - 23,900
2003 - 23,570
2006 - 21,230
2015 - 25,800

Our 2040 transportation model projects traffic volumes in the 27,000 to 28,000 range for the section between Raff and Whipple.

If you have any questions, please let me know.

Dan Slicker, P.E.
Stark County RPC
201 3rd St NE, #201
Canton, OH 44702
330-451-7346

>>> Jeffrey Dutton 11/23/2015 9:59 AM >>>

Dan,

can we provide the information Mike is looking for?

jrd

>>> "Mike Walsh" <MWalsh@manniksmithgroup.com> 11/20/2015 11:10 AM >>>

Jeff,

Good morning, per our conversation I am requesting a growth rate for Tuscarawas Street (SR 172) between the intersections of Whipple Avenue and Harrison Avenue in the City of Canton. The project is a safety study for the City of Canton and the PID is 92562. We would use the growth rate to project traffic for the opening year (2020) and design year (2040).

Please advise at your convenience and let me know if you need any other information.

Thanks,
Mike Walsh

Transportation Engineer
The Mannik & Smith Group, Inc.
419-891-2222
419-704-88780293 cell
www.manniksmithgroup.com

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Mannik & Smith Group Inc.
www.manniksmithgroup.com

Int. : Tuscarawas & Bedford
 Counted By: MJL
 Day: Tuesday
 Weather: Overcast & Rain

File Name : Tuscarawas st and Bedford
 Site Code : 00000000
 Start Date : 9/29/2015
 Page No : 1

Groups Printed- Cars - Trucks

Start Time	BEDFORD AVE From North					TUSCARAWAS ST From East					BEDFORD AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	131	38	0	169	4	0	8	0	12	21	133	0	0	154	335
07:15 AM	0	0	0	0	0	0	179	39	0	218	7	0	12	0	19	28	165	0	0	193	430
07:30 AM	0	0	0	0	0	0	200	61	0	261	10	0	12	0	22	47	208	0	0	255	538
07:45 AM	0	0	0	1	1	0	209	55	0	264	7	0	17	0	24	32	170	0	0	202	491
Total	0	0	0	1	1	0	719	193	0	912	28	0	49	0	77	128	676	0	0	804	1794
08:00 AM	0	0	0	0	0	0	141	40	0	181	3	0	9	0	12	25	169	0	2	196	389
08:15 AM	0	0	0	0	0	0	165	38	0	203	8	0	17	0	25	26	167	0	0	193	421
08:30 AM	0	0	0	0	0	0	173	52	0	225	7	0	29	0	36	27	158	0	0	185	446
08:45 AM	0	0	0	1	1	0	183	25	0	208	13	0	27	1	41	23	135	0	0	158	408
Total	0	0	0	1	1	0	662	155	0	817	31	0	82	1	114	101	629	0	2	732	1664
*** BREAK ***																					
11:00 AM	0	0	0	0	0	0	145	39	0	184	19	0	26	3	48	21	185	0	1	207	439
11:15 AM	0	0	0	0	0	0	185	26	0	211	17	0	28	0	45	17	191	0	0	208	464
11:30 AM	0	0	0	0	0	0	194	22	0	216	23	0	40	0	63	24	171	0	0	195	474
11:45 AM	0	0	0	1	1	0	220	38	0	258	24	0	34	1	59	25	209	0	0	234	552
Total	0	0	0	1	1	0	744	125	0	869	83	0	128	4	215	87	756	0	1	844	1929
12:00 PM	0	0	0	0	0	0	214	18	0	232	20	0	26	0	46	17	196	0	1	214	492
12:15 PM	0	0	0	1	1	0	220	37	0	257	16	0	37	0	53	22	231	0	1	254	565
12:30 PM	0	0	0	0	0	0	239	32	0	271	19	0	19	1	39	19	191	0	1	211	521
12:45 PM	0	0	0	0	0	0	211	26	0	237	18	0	29	1	48	25	234	0	0	259	544
Total	0	0	0	1	1	0	884	113	0	997	73	0	111	2	186	83	852	0	3	938	2122
*** BREAK ***																					
02:00 PM	0	0	0	0	0	0	195	41	0	236	40	0	42	3	85	25	203	0	4	232	553
02:15 PM	0	0	0	0	0	0	208	33	0	241	31	0	28	0	59	25	221	0	1	247	547
02:30 PM	0	0	0	1	1	0	234	35	0	269	31	0	33	1	65	35	210	0	6	251	586
02:45 PM	1	0	0	0	1	0	203	38	0	241	28	0	39	0	67	24	205	0	0	229	538
Total	1	0	0	1	2	0	840	147	0	987	130	0	142	4	276	109	839	0	11	959	2224
03:00 PM	0	0	0	0	0	0	210	36	0	246	29	0	49	0	78	26	231	0	0	257	581
03:15 PM	0	0	0	0	0	0	221	31	0	252	31	0	37	0	68	18	213	0	0	231	551
03:30 PM	0	0	0	0	0	0	214	18	0	232	35	0	57	0	92	19	220	0	2	241	565
03:45 PM	0	0	0	0	0	0	248	29	0	277	30	0	50	1	81	21	239	0	0	260	618
Total	0	0	0	0	0	0	893	114	0	1007	125	0	193	1	319	84	903	0	2	989	2315
04:00 PM	0	0	0	0	0	0	222	18	0	240	26	0	45	1	72	16	234	0	0	250	562
04:15 PM	0	0	0	0	0	0	240	20	0	260	37	0	24	0	61	17	218	0	0	235	556
04:30 PM	0	0	0	0	0	0	221	15	0	236	25	0	37	0	62	8	197	0	1	206	504
04:45 PM	0	0	0	0	0	0	256	22	0	278	27	0	58	0	85	21	227	0	1	249	612
Total	0	0	0	0	0	0	939	75	0	1014	115	0	164	1	280	62	876	0	2	940	2234
05:00 PM	0	0	0	0	0	0	262	15	0	277	23	0	41	0	64	20	232	0	0	252	593
05:15 PM	0	0	0	0	0	0	224	20	0	244	27	0	54	0	81	19	254	0	0	273	598
05:30 PM	0	0	0	2	2	0	181	16	0	197	15	0	34	2	51	24	224	0	2	250	500
05:45 PM	0	0	0	0	0	0	174	10	0	184	16	0	33	0	49	10	228	0	0	238	471
Total	0	0	0	2	2	0	841	61	0	902	81	0	162	2	245	73	938	0	2	1013	2162

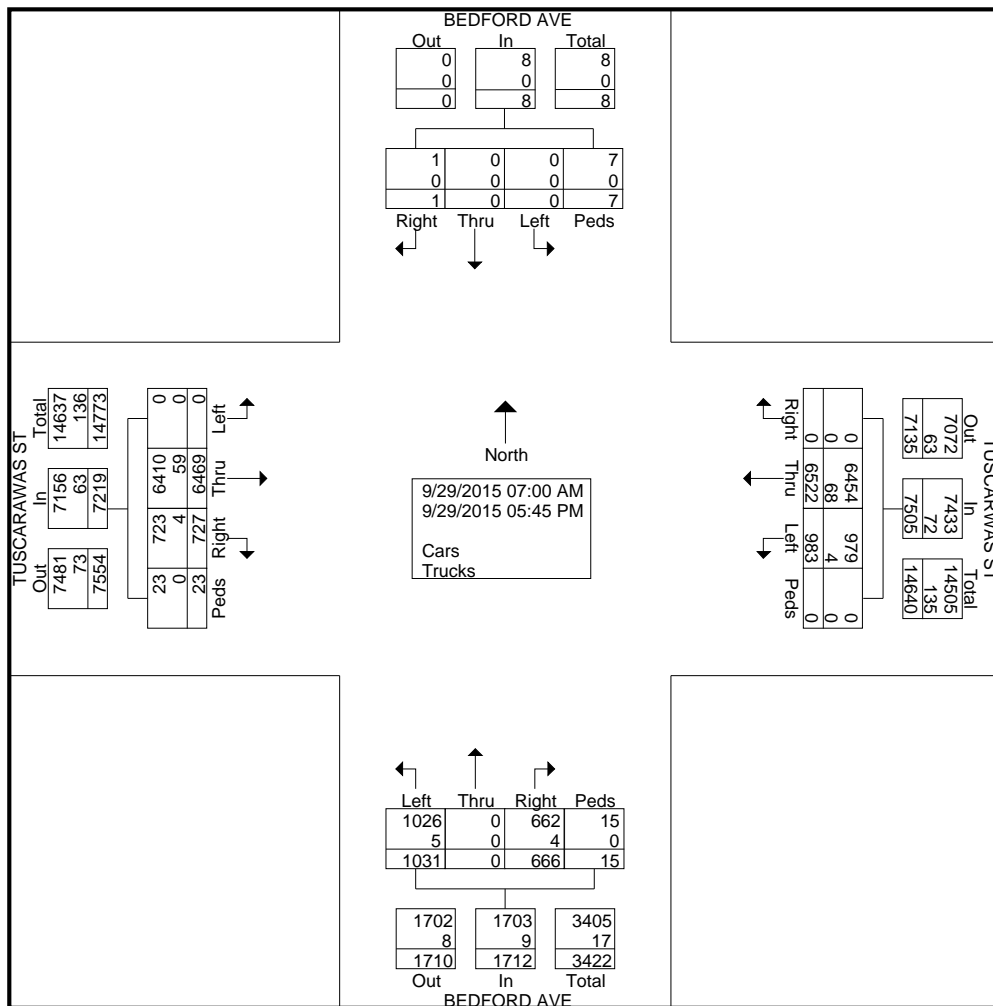


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File Name : Tuscarawas st and Bedford
Site Code : 00000000
Start Date : 9/29/2015
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Groups Printed- Cars - Trucks

	BEDFORD AVE From North					TUSCARAWAS ST From East					BEDFORD AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	1	0	0	7	8	0	6522	983	0	7505	666	0	1031	15	1712	727	6469	0	23	7219	16444
Apprch %	12.5	0	0	87.5		0	86.9	13.1	0		38.9	0	60.2	0.9		10.1	89.6	0	0.3		
Total %	0	0	0	0	0	0	39.7	6	0	45.6	4.1	0	6.3	0.1	10.4	4.4	39.3	0	0.1	43.9	
Cars	1	0	0	7	8	0	6454	979	0	7433	662	0	1026	15	1703	723	6410	0	23	7156	16300
% Cars	100	0	0	100	100	0	99	99.6	0	99	99.4	0	99.5	100	99.5	99.4	99.1	0	100	99.1	99.1
Trucks	0	0	0	0	0	0	68	4	0	72	4	0	5	0	9	4	59	0	0	63	144
% Trucks	0	0	0	0	0	0	1	0.4	0	1	0.6	0	0.5	0	0.5	0.6	0.9	0	0	0.9	0.9



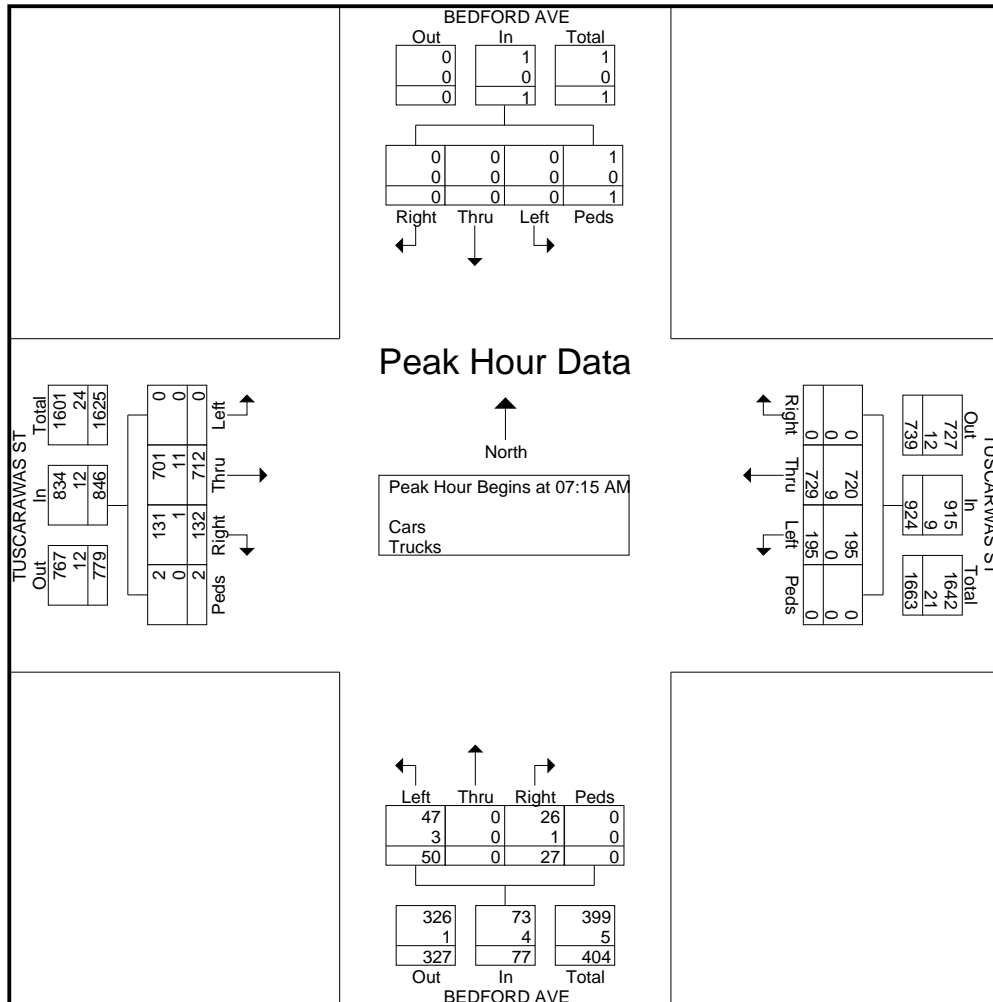


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File Name : Tuscarawas st and Bedford
Site Code : 00000000
Start Date : 9/29/2015
Page No : 3

Start Time	BEDFORD AVE From North					TUSCARAWAS ST From East					BEDFORD AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:15 AM	0	0	0	0	0	0	179	39	0	218	7	0	12	0	19	28	165	0	0	193	430
07:30 AM	0	0	0	0	0	0	200	61	0	261	10	0	12	0	22	47	208	0	0	255	538
07:45 AM	0	0	0	1	1	0	209	55	0	264	7	0	17	0	24	32	170	0	0	202	491
08:00 AM	0	0	0	0	0	0	141	40	0	181	3	0	9	0	12	25	169	0	2	196	389
Total Volume	0	0	0	1	1	0	729	195	0	924	27	0	50	0	77	132	712	0	2	846	1848
% App. Total	0	0	0	100		0	78.9	21.1	0		35.1	0	64.9	0		15.6	84.2	0	0.2		
PHF	.000	.000	.000	.250	.250	.000	.872	.799	.000	.875	.675	.000	.735	.000	.802	.702	.856	.000	.250	.829	.859
Cars	0	0	0	1	1	0	720	195	0	915	26	0	47	0	73	131	701	0	2	834	1823
% Cars	0	0	0	100	100	0	98.8	100	0	99.0	96.3	0	94.0	0	94.8	99.2	98.5	0	100	98.6	98.6
Trucks	0	0	0	0	0	0	9	0	0	9	1	0	3	0	4	1	11	0	0	12	25
% Trucks	0	0	0	0	0	0	1.2	0	0	1.0	3.7	0	6.0	0	5.2	0.8	1.5	0	0	1.4	1.4

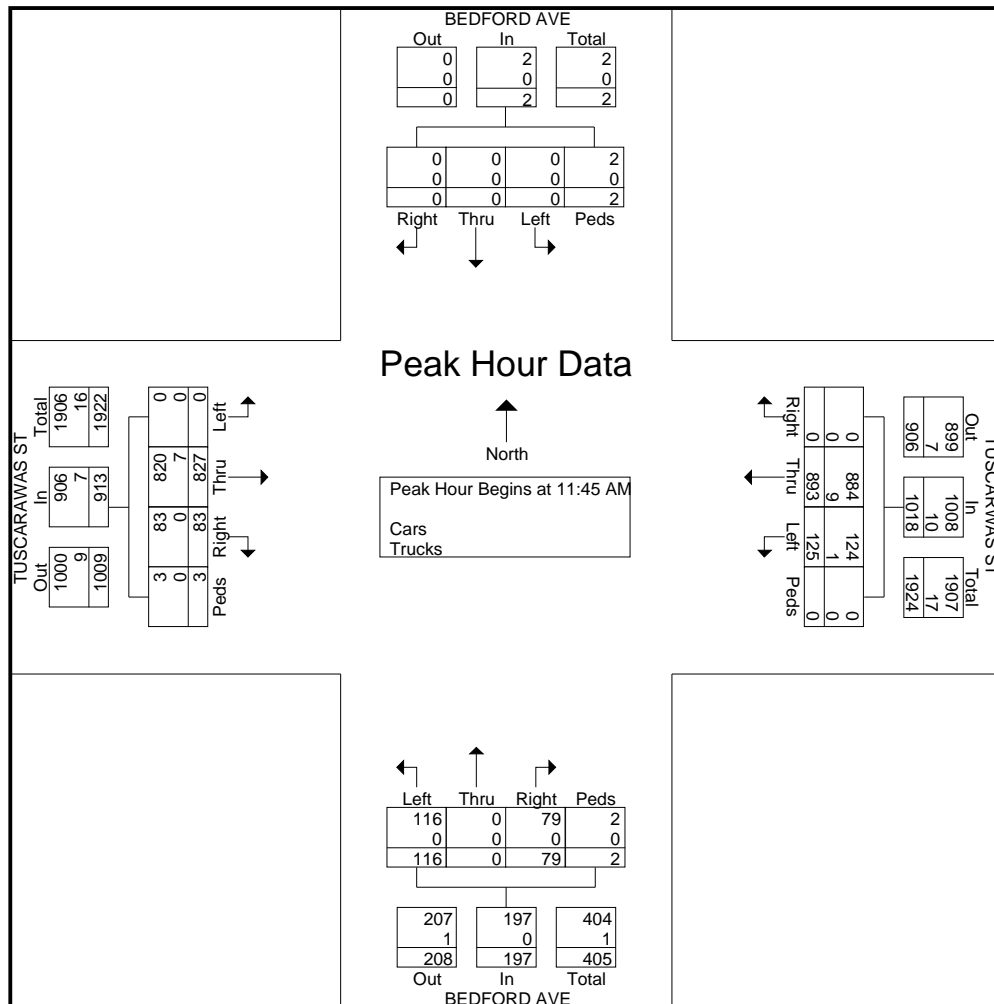
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:15 AM





File Name : Tuscarawas st and Bedford
Site Code : 00000000
Start Date : 9/29/2015
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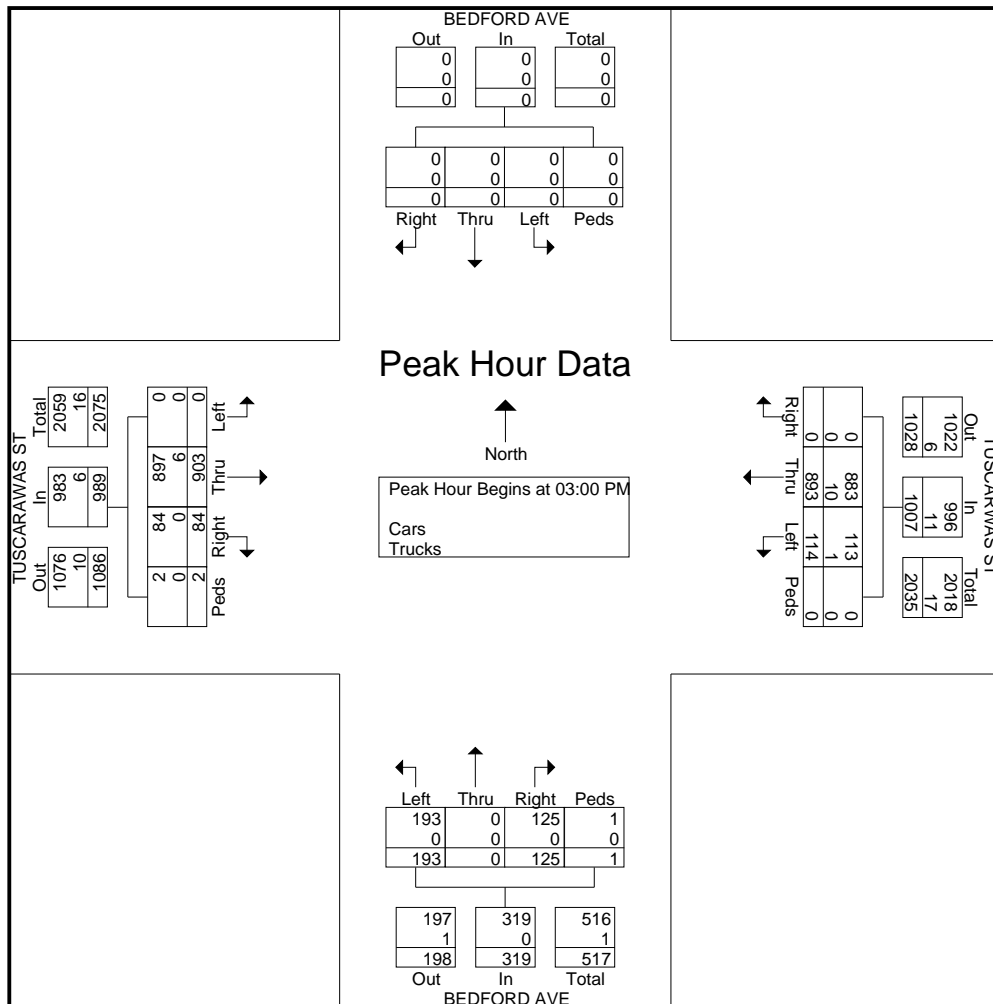
Start Time	BEDFORD AVE From North					TUSCARAWAS ST From East					BEDFORD AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:45 AM																					
11:45 AM	0	0	0	1	1	0	220	38	0	258	24	0	34	1	59	25	209	0	0	234	552
12:00 PM	0	0	0	0	0	0	214	18	0	232	20	0	26	0	46	17	196	0	1	214	492
12:15 PM	0	0	0	1	1	0	220	37	0	257	16	0	37	0	53	22	231	0	1	254	565
12:30 PM	0	0	0	0	0	0	239	32	0	271	19	0	19	1	39	19	191	0	1	211	521
Total Volume	0	0	0	2	2	0	893	125	0	1018	79	0	116	2	197	83	827	0	3	913	2130
% App. Total	0	0	0	100	100	0	87.7	12.3	0	100	40.1	0	58.9	1	100	9.1	90.6	0	0.3	100	100
PHF	.000	.000	.000	.500	.500	.000	.934	.822	.000	.939	.823	.000	.784	.500	.835	.830	.895	.000	.750	.899	.942
Cars	0	0	0	2	2	0	884	124	0	1008	79	0	116	2	197	83	820	0	3	906	2113
% Cars	0	0	0	100	100	0	99.0	99.2	0	99.0	100	0	100	100	100	100	99.2	0	100	99.2	99.2
Trucks	0	0	0	0	0	0	9	1	0	10	0	0	0	0	0	0	7	0	0	7	17
% Trucks	0	0	0	0	0	0	1.0	0.8	0	1.0	0	0	0	0	0	0	0.8	0	0	0.8	0.8





File Name : Tuscarawas st and Bedford
Site Code : 00000000
Start Date : 9/29/2015
Page No : 5

Start Time	BEDFORD AVE From North					TUSCARAWAS ST From East					BEDFORD AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	0	0	0	0	0	0	210	36	0	246	29	0	49	0	78	26	231	0	0	257	581
03:15 PM	0	0	0	0	0	0	221	31	0	252	31	0	37	0	68	18	213	0	0	231	551
03:30 PM	0	0	0	0	0	0	214	18	0	232	35	0	57	0	92	19	220	0	2	241	565
03:45 PM	0	0	0	0	0	0	248	29	0	277	30	0	50	1	81	21	239	0	0	260	618
Total Volume	0	0	0	0	0	0	893	114	0	1007	125	0	193	1	319	84	903	0	2	989	2315
% App. Total	0	0	0	0	0	0	88.7	11.3	0	98.9	39.2	0	60.5	0.3	100	8.5	91.3	0	0.2	99.4	99.3
PHF	.000	.000	.000	.000	.000	.000	.900	.792	.000	.909	.893	.000	.846	.250	.867	.808	.945	.000	.250	.951	.936
Cars	0	0	0	0	0	0	883	113	0	996	125	0	193	1	319	84	897	0	2	983	2298
% Cars	0	0	0	0	0	0	98.9	99.1	0	98.9	100	0	100	100	100	100	99.3	0	100	99.4	99.3
Trucks	0	0	0	0	0	0	10	1	0	11	0	0	0	0	0	0	6	0	0	6	17
% Trucks	0	0	0	0	0	0	1.1	0.9	0	1.1	0	0	0	0	0	0	0.7	0	0	0.6	0.7





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Int. : Tuscarawas St & Bellflower Ave
 Counted By: AK
 Day: Wednesday
 Weather: Sunny

File Name : tuscarawas st and bellflower
 Site Code : 00000000
 Start Date : 9/23/2015
 Page No : 1

Groups Printed- Cars - Trucks

Start Time	BELLFLOWER AVE From North					TUSCARAWAS ST From East					BELLFLOWER AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	3	0	1	0	4	0	80	2	0	82	4	1	4	0	9	7	133	0	0	140	235
07:15 AM	1	1	7	0	9	0	91	2	1	94	4	4	6	0	14	8	159	2	1	170	287
07:30 AM	1	1	3	0	5	0	138	3	0	141	3	0	7	0	10	2	184	0	0	186	342
07:45 AM	1	3	4	0	8	2	145	1	0	148	4	4	6	0	14	7	222	1	0	230	400
Total	6	5	15	0	26	2	454	8	1	465	15	9	23	0	47	24	698	3	1	726	1264
08:00 AM	1	1	0	0	2	0	145	8	2	155	2	0	3	0	5	13	173	0	3	189	351
08:15 AM	3	2	1	0	6	0	149	0	0	149	2	1	5	1	9	7	199	1	0	207	371
08:30 AM	0	0	3	0	3	0	141	5	0	146	6	2	3	1	12	2	189	0	1	192	353
08:45 AM	4	1	2	1	8	0	146	1	0	147	2	2	1	0	5	11	159	4	1	175	335
Total	8	4	6	1	19	0	581	14	2	597	12	5	12	2	31	33	720	5	5	763	1410
*** BREAK ***																					
11:00 AM	4	1	1	0	6	0	186	6	0	192	0	2	7	0	9	4	182	1	1	188	395
11:15 AM	3	2	2	0	7	0	231	5	0	236	2	1	3	0	6	15	162	1	2	180	429
11:30 AM	2	2	4	0	8	2	249	3	1	255	7	2	16	2	27	1	184	1	2	188	478
11:45 AM	3	2	1	0	6	3	252	3	3	261	1	1	9	1	12	1	183	2	3	189	468
Total	12	7	8	0	27	5	918	17	4	944	10	6	35	3	54	21	711	5	8	745	1770
12:00 PM	1	1	3	0	5	4	249	5	0	258	3	2	17	1	23	5	190	2	1	198	484
12:15 PM	3	4	0	0	7	0	286	3	2	291	5	4	13	0	22	14	231	1	3	249	569
12:30 PM	0	1	1	0	2	3	217	4	1	225	6	3	14	0	23	7	229	3	2	241	491
12:45 PM	3	2	1	0	6	1	259	8	4	272	0	2	10	4	16	5	212	1	2	220	514
Total	7	8	5	0	20	8	1011	20	7	1046	14	11	54	5	84	31	862	7	8	908	2058
*** BREAK ***																					
02:00 PM	2	1	1	0	4	3	245	3	3	254	2	4	18	1	25	4	214	1	1	220	503
02:15 PM	5	0	1	0	6	1	250	11	1	263	8	4	10	0	22	8	238	3	1	250	541
02:30 PM	3	1	3	0	7	0	260	4	1	265	3	3	15	2	23	4	241	1	2	248	543
02:45 PM	1	0	0	0	1	2	194	4	0	200	0	3	13	0	16	6	226	3	2	237	454
Total	11	2	5	0	18	6	949	22	5	982	13	14	56	3	86	22	919	8	6	955	2041
03:00 PM	3	1	2	0	6	1	219	7	1	228	6	3	10	2	21	7	237	1	0	245	500
03:15 PM	1	1	1	0	3	3	280	5	0	288	4	2	15	0	21	5	254	1	3	263	575
03:30 PM	1	1	1	0	3	1	300	6	1	308	7	1	22	0	30	7	218	2	1	228	569
03:45 PM	2	4	1	0	7	0	263	6	1	270	4	7	10	0	21	7	222	3	2	234	532
Total	7	7	5	0	19	5	1062	24	3	1094	21	13	57	2	93	26	931	7	6	970	2176
04:00 PM	1	0	1	0	2	1	271	6	0	278	1	2	19	1	23	6	223	0	5	234	537
04:15 PM	1	2	3	0	6	3	283	3	2	291	4	4	13	1	22	5	191	3	1	200	519
04:30 PM	4	0	2	1	7	6	261	4	0	271	2	5	22	0	29	5	199	2	1	207	514
04:45 PM	0	1	3	0	4	1	293	3	2	299	6	4	18	1	29	9	200	3	3	215	547
Total	6	3	9	1	19	11	1108	16	4	1139	13	15	72	3	103	25	813	8	10	856	2117
05:00 PM	2	0	4	0	6	3	262	8	0	273	4	2	30	0	36	5	233	1	1	240	555
05:15 PM	1	0	0	4	5	1	266	10	8	285	4	4	11	1	20	4	199	2	2	207	517
05:30 PM	2	0	1	0	3	2	275	7	1	285	4	1	7	0	12	3	195	3	3	204	504
05:45 PM	1	2	4	0	7	3	261	7	0	271	5	7	4	1	17	7	224	4	1	236	531
Total	6	2	9	4	21	9	1064	32	9	1114	17	14	52	2	85	19	851	10	7	887	2107

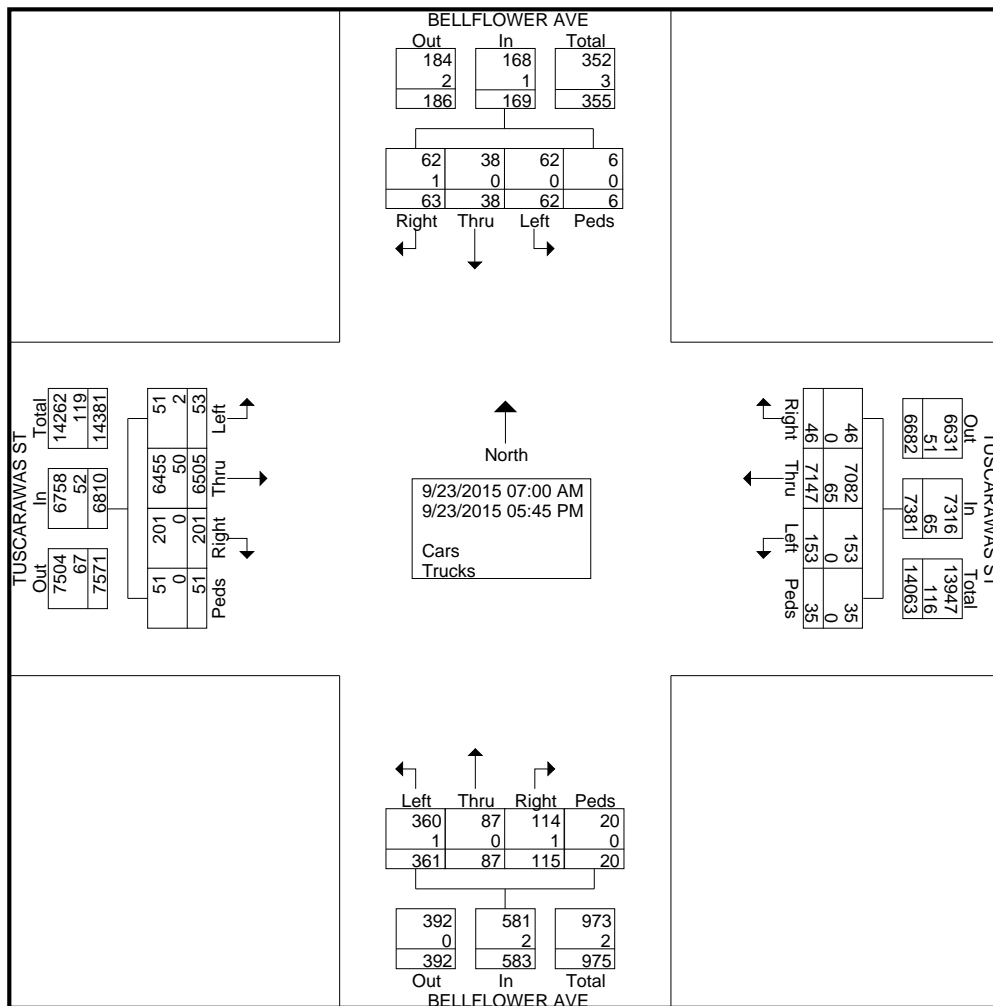


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File Name : tuscarawas st and bellflower
Site Code : 00000000
Start Date : 9/23/2015
Page No : 2

Groups Printed- Cars - Trucks

	BELLFLOWER AVE From North					TUSCARAWAS ST From East					BELLFLOWER AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	63	38	62	6	169	46	7147	153	35	7381	115	87	361	20	583	201	6505	53	51	6810	14943
Apprch %	37.3	22.5	36.7	3.6		0.6	96.8	2.1	0.5		19.7	14.9	61.9	3.4		3	95.5	0.8	0.7		
Total %	0.4	0.3	0.4	0	1.1	0.3	47.8	1	0.2	49.4	0.8	0.6	2.4	0.1	3.9	1.3	43.5	0.4	0.3	45.6	
Cars	62	38	62	6	168	46	7082	153	35	7316	114	87	360	20	581	201	6455	51	51	6758	14823
% Cars	98.4	100	100	100	99.4	100	99.1	100	100	99.1	99.1	100	99.7	100	99.7	100	99.2	96.2	100	99.2	99.2
Trucks	1	0	0	0	1	0	65	0	0	65	1	0	1	0	2	0	50	2	0	52	120
% Trucks	1.6	0	0	0	0.6	0	0.9	0	0	0.9	0.9	0	0.3	0.3	0.3	0	0.8	3.8	0	0.8	0.8

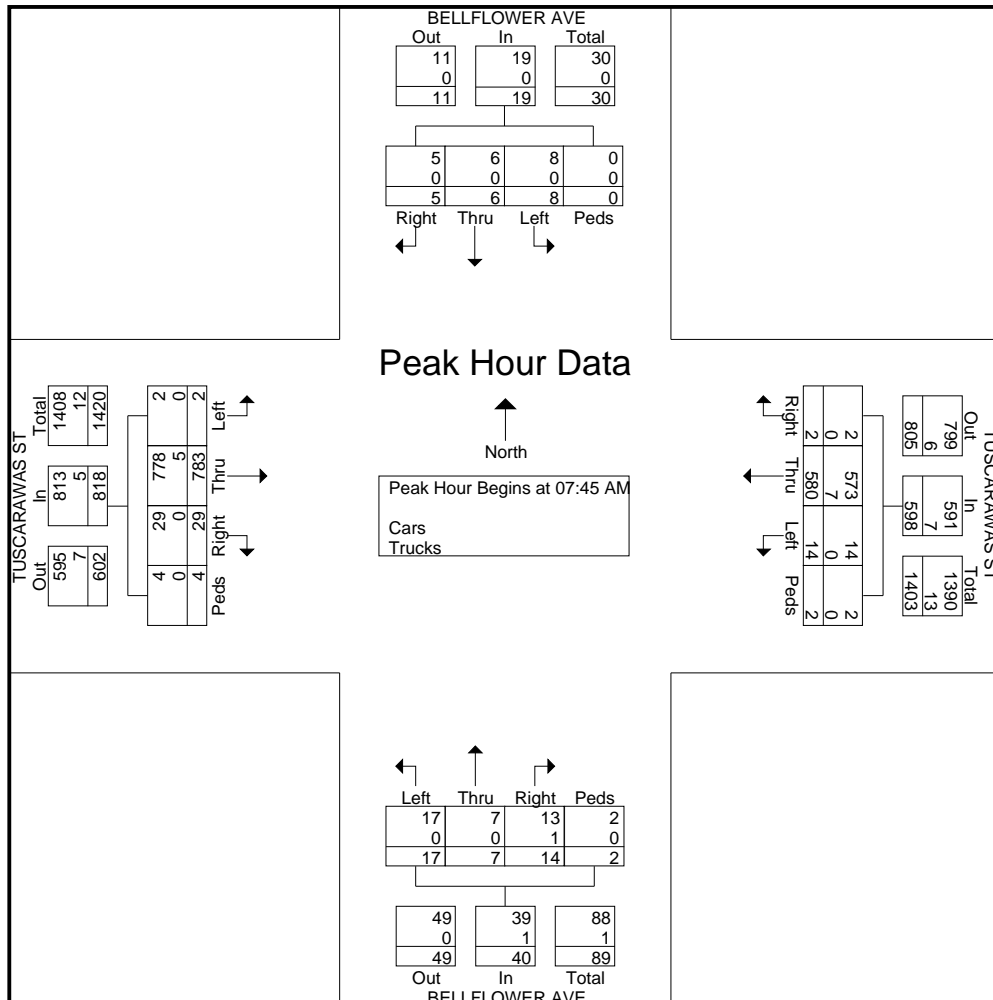




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File Name : tuscarawas st and bellflower
Site Code : 00000000
Start Date : 9/23/2015
Page No : 3

Start Time	BELLFLOWER AVE From North					TUSCARAWAS ST From East					BELLFLOWER AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	1	3	4	0	8	2	145	1	0	148	4	4	6	0	14	7	222	1	0	230	400
08:00 AM	1	1	0	0	2	0	145	8	2	155	2	0	3	0	5	13	173	0	3	189	351
08:15 AM	3	2	1	0	6	0	149	0	0	149	2	1	5	1	9	7	199	1	0	207	371
08:30 AM	0	0	3	0	3	0	141	5	0	146	6	2	3	1	12	2	189	0	1	192	353
Total Volume	5	6	8	0	19	2	580	14	2	598	14	7	17	2	40	29	783	2	4	818	1475
% App. Total	26.3	31.6	42.1	0		0.3	97	2.3	0.3		35	17.5	42.5	5		3.5	95.7	0.2	0.5		
PHF	.417	.500	.500	.000	.594	.250	.973	.438	.250	.965	.583	.438	.708	.500	.714	.558	.882	.500	.333	.889	.922
Cars	5	6	8	0	19	2	573	14	2	591	13	7	17	2	39	29	778	2	4	813	1462
% Cars	100	100	100	0	100	100	98.8	100	100	98.8	92.9	100	100	100	97.5	100	99.4	100	100	99.4	99.1
Trucks	0	0	0	0	0	0	7	0	0	7	1	0	0	0	1	0	5	0	0	5	13
% Trucks	0	0	0	0	0	0	1.2	0	0	1.2	7.1	0	0	0	2.5	0	0.6	0	0	0.6	0.9

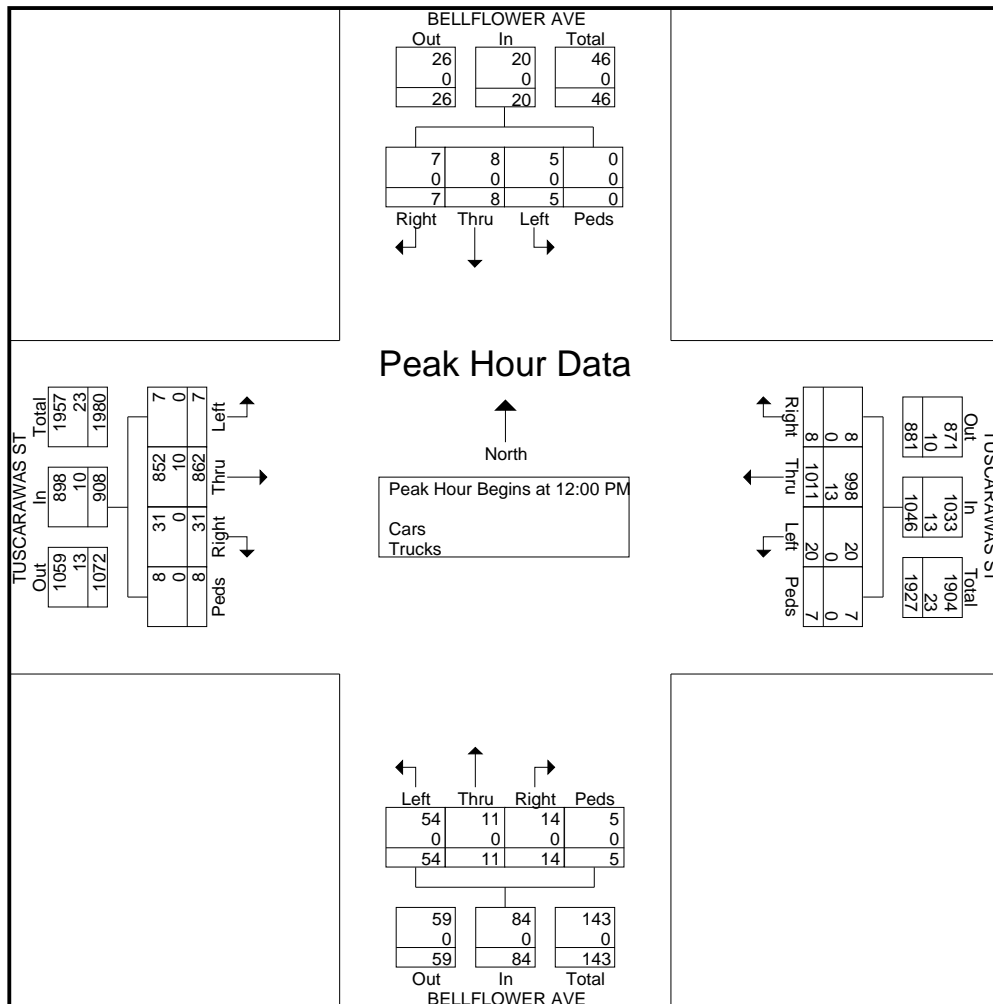




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File Name : tuscarawas st and bellflower
Site Code : 00000000
Start Date : 9/23/2015
Page No : 4

Start Time	BELLFLOWER AVE From North					TUSCARAWAS ST From East					BELLFLOWER AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	1	1	3	0	5	4	249	5	0	258	3	2	17	1	23	5	190	2	1	198	484
12:15 PM	3	4	0	0	7	0	286	3	2	291	5	4	13	0	22	14	231	1	3	249	569
12:30 PM	0	1	1	0	2	3	217	4	1	225	6	3	14	0	23	7	229	3	2	241	491
12:45 PM	3	2	1	0	6	1	259	8	4	272	0	2	10	4	16	5	212	1	2	220	514
Total Volume	7	8	5	0	20	8	1011	20	7	1046	14	11	54	5	84	31	862	7	8	908	2058
% App. Total	35	40	25	0		0.8	96.7	1.9	0.7		16.7	13.1	64.3	6		3.4	94.9	0.8	0.9		
PHF	.583	.500	.417	.000	.714	.500	.884	.625	.438	.899	.583	.688	.794	.313	.913	.554	.933	.583	.667	.912	.904
Cars	7	8	5	0	20	8	998	20	7	1033	14	11	54	5	84	31	852	7	8	898	2035
% Cars	100	100	100	0	100	100	98.7	100	100	98.8	100	100	100	100	100	100	98.8	100	100	98.9	98.9
Trucks	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	0	10	0	0	10	23
% Trucks	0	0	0	0	0	0	1.3	0	0	1.2	0	0	0	0	0	0	1.2	0	0	1.1	1.1

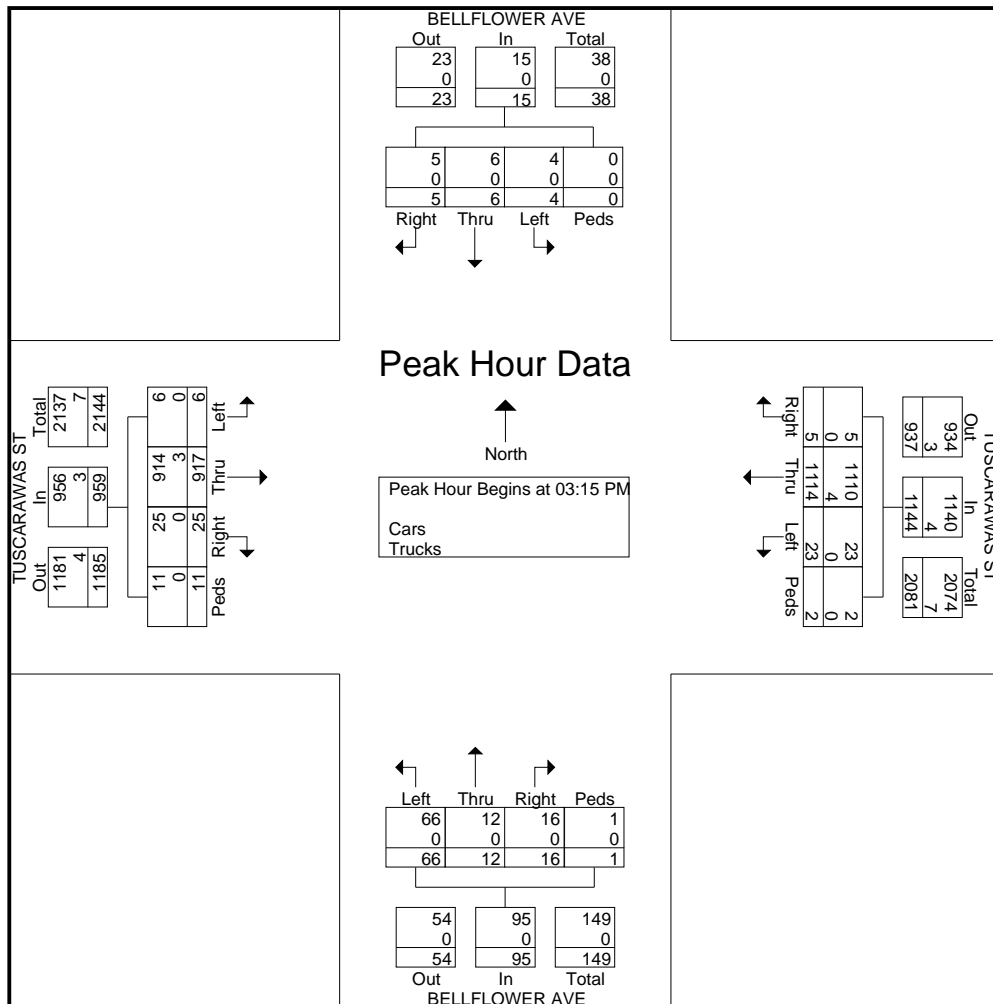




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File Name : tuscarawas st and bellflower
Site Code : 00000000
Start Date : 9/23/2015
Page No : 5

Start Time	BELLFLOWER AVE From North					TUSCARAWAS ST From East					BELLFLOWER AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:15 PM																					
03:15 PM	1	1	1	0	3	3	280	5	0	288	4	2	15	0	21	5	254	1	3	263	575
03:30 PM	1	1	1	0	3	1	300	6	1	308	7	1	22	0	30	7	218	2	1	228	569
03:45 PM	2	4	1	0	7	0	263	6	1	270	4	7	10	0	21	7	222	3	2	234	532
04:00 PM	1	0	1	0	2	1	271	6	0	278	1	2	19	1	23	6	223	0	5	234	537
Total Volume	5	6	4	0	15	5	1114	23	2	1144	16	12	66	1	95	25	917	6	11	959	2213
% App. Total	33.3	40	26.7	0		0.4	97.4	2	0.2		16.8	12.6	69.5	1.1		2.6	95.6	0.6	1.1		
PHF	.625	.375	1.00	.000	.536	.417	.928	.958	.500	.929	.571	.429	.750	.250	.792	.893	.903	.500	.550	.912	.962
Cars	5	6	4	0	15	5	1110	23	2	1140	16	12	66	1	95	25	914	6	11	956	2206
% Cars	100	100	100	0	100	100	99.6	100	100	99.7	100	100	100	100	100	100	99.7	100	100	99.7	99.7
Trucks	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
% Trucks	0	0	0	0	0	0	0.4	0	0	0.3	0	0	0	0	0	0	0.3	0	0	0.3	0.3





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Int:Tuscarawas St & Broad Ave
Counted By: KH
Day: Tuesday
Weather: Overcast & Rain

File Name : Tuscarawas st and Broad Ave
Site Code : 00000000
Start Date : 9/29/2015
Page No : 1

Groups Printed- Cars - Trucks

Start Time	BROAD AVE From North					TUSCARAWAS ST From East					BROAD AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	20	0	17	0	37	7	103	0	0	110	0	0	0	0	0	0	162	5	0	167	314
07:15 AM	12	0	18	0	30	5	152	0	1	158	0	0	0	0	0	0	178	15	0	193	381
07:30 AM	27	0	26	0	53	7	145	0	1	153	0	0	0	0	0	0	246	9	0	255	461
07:45 AM	28	0	26	0	54	4	176	0	1	181	0	0	0	0	0	0	194	16	0	210	445
Total	87	0	87	0	174	23	576	0	3	602	0	0	0	0	0	0	780	45	0	825	1601
08:00 AM	20	0	19	0	39	5	115	0	1	121	0	0	0	0	0	0	188	11	0	199	359
08:15 AM	12	0	20	0	32	9	153	0	0	162	0	0	0	0	0	0	177	20	0	197	391
08:30 AM	15	0	27	0	42	13	162	0	0	175	0	0	0	1	1	0	179	12	0	191	409
08:45 AM	13	0	19	1	33	9	181	0	0	190	0	0	0	1	1	0	149	9	0	158	382
Total	60	0	85	1	146	36	611	0	1	648	0	0	0	2	2	0	693	52	0	745	1541
*** BREAK ***																					
11:00 AM	17	0	18	0	35	8	184	0	3	195	0	0	0	0	0	0	199	18	0	217	447
11:15 AM	30	0	19	0	49	20	212	0	0	232	0	0	0	0	0	0	161	15	0	176	457
11:30 AM	13	0	15	0	28	13	236	0	1	250	0	0	0	0	0	0	199	13	0	212	490
11:45 AM	18	0	29	0	47	15	219	0	0	234	0	0	0	0	0	0	178	14	0	192	473
Total	78	0	81	0	159	56	851	0	4	911	0	0	0	0	0	0	737	60	0	797	1867
12:00 PM	28	0	12	0	40	12	227	0	0	239	0	0	0	0	0	0	196	12	0	208	487
12:15 PM	25	0	19	0	44	11	222	0	0	233	0	0	0	0	0	0	207	17	0	224	501
12:30 PM	23	0	13	0	36	13	236	0	0	249	0	0	0	0	0	0	206	14	0	220	505
12:45 PM	24	0	13	0	37	14	223	0	3	240	0	0	0	0	0	0	215	16	0	231	508
Total	100	0	57	0	157	50	908	0	3	961	0	0	0	0	0	0	824	59	0	883	2001
*** BREAK ***																					
02:00 PM	18	0	23	0	41	16	219	0	0	235	0	0	0	0	0	0	219	11	0	230	506
02:15 PM	21	0	12	1	34	12	240	0	1	253	0	0	0	0	0	0	241	21	0	262	549
02:30 PM	27	0	22	0	49	16	227	0	1	244	0	0	0	0	0	0	200	26	0	226	519
02:45 PM	20	0	19	0	39	12	219	0	0	231	0	0	0	0	0	0	218	17	0	235	505
Total	86	0	76	1	163	56	905	0	2	963	0	0	0	0	0	0	878	75	0	953	2079
03:00 PM	27	0	21	0	48	19	216	0	0	235	0	0	0	0	0	0	221	21	0	242	525
03:15 PM	27	0	13	0	40	11	241	0	1	253	0	0	0	0	0	0	196	24	0	220	513
03:30 PM	29	0	19	0	48	20	259	0	0	279	0	0	0	0	0	0	181	25	0	206	533
03:45 PM	31	0	20	0	51	21	262	0	0	283	0	0	0	0	0	0	200	28	0	228	562
Total	114	0	73	0	187	71	978	0	1	1050	0	0	0	0	0	0	798	98	0	896	2133
04:00 PM	31	0	15	0	46	17	234	0	0	251	0	0	0	0	0	0	198	26	0	224	521
04:15 PM	16	0	13	0	29	15	244	0	1	260	0	0	0	0	0	0	204	29	0	233	522
04:30 PM	23	0	19	0	42	20	265	0	0	285	0	0	0	0	0	0	188	30	0	218	545
04:45 PM	34	0	19	0	53	27	306	0	0	333	0	0	0	0	0	0	214	33	0	247	633
Total	104	0	66	0	170	79	1049	0	1	1129	0	0	0	0	0	0	804	118	0	922	2221
05:00 PM	22	0	13	0	35	15	302	0	3	320	0	0	0	0	0	0	195	25	0	220	575
05:15 PM	34	0	11	0	45	25	243	0	1	269	0	0	0	0	0	0	218	31	0	249	563
05:30 PM	30	0	9	1	40	14	210	0	1	225	0	0	0	0	0	0	218	29	0	247	512
05:45 PM	27	0	11	0	38	12	188	0	0	200	0	0	0	1	1	0	176	21	0	197	436
Total	113	0	44	1	158	66	943	0	5	1014	0	0	0	1	1	0	807	106	0	913	2086

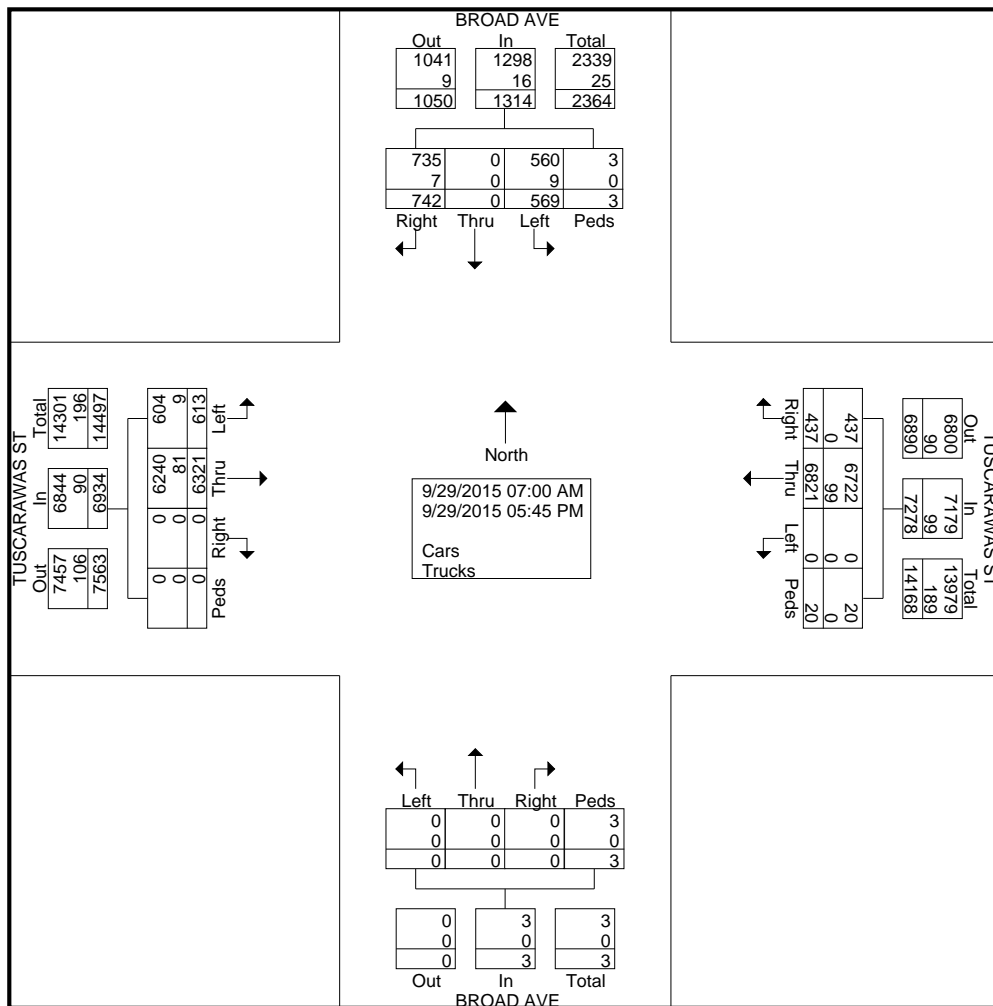


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File Name : Tuscarawas st and Broad Ave
Site Code : 00000000
Start Date : 9/29/2015
Page No : 2

Groups Printed- Cars - Trucks

	BROAD AVE From North					TUSCARAWAS ST From East					BROAD AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	742	0	569	3	1314	437	6821	0	20	7278	0	0	0	3	3	0	6321	613	0	6934	15529
Apprch %	56.5	0	43.3	0.2		6	93.7	0	0.3		0	0	0	100		0	91.2	8.8	0		
Total %	4.8	0	3.7	0	8.5	2.8	43.9	0	0.1	46.9	0	0	0	0	0	0	40.7	3.9	0	44.7	
Cars	735	0	560	3	1298	437	6722	0	20	7179	0	0	0	3	3	0	6240	604	0	6844	15324
% Cars	99.1	0	98.4	100	98.8	100	98.5	0	100	98.6	0	0	0	100	100	0	98.7	98.5	0	98.7	98.7
Trucks	7	0	9	0	16	0	99	0	0	99	0	0	0	0	0	0	81	9	0	90	205
% Trucks	0.9	0	1.6	0	1.2	0	1.5	0	0	1.4	0	0	0	0	0	0	1.3	1.5	0	1.3	1.3

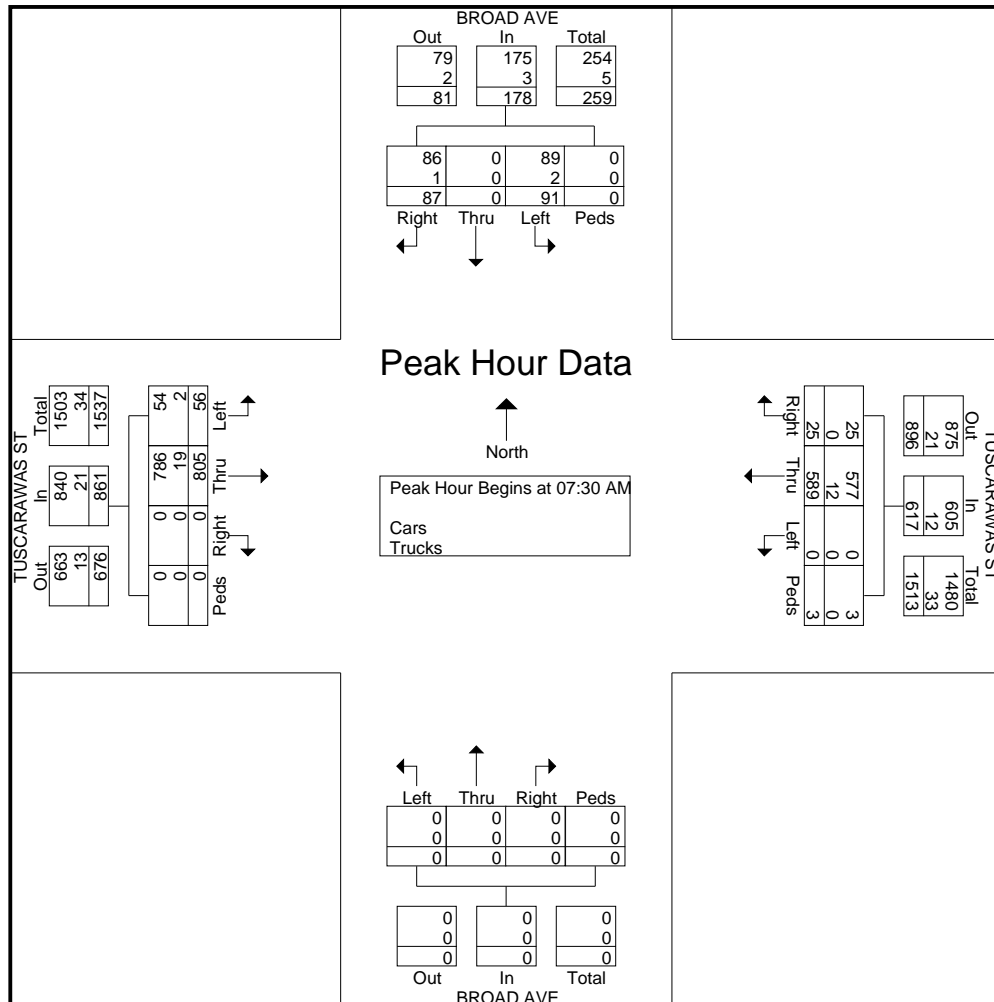




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File Name : Tuscarawas st and Broad Ave
Site Code : 00000000
Start Date : 9/29/2015
Page No : 3

Start Time	BROAD AVE From North					TUSCARAWAS ST From East					BROAD AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	27	0	26	0	53	7	145	0	1	153	0	0	0	0	0	0	246	9	0	255	461
07:45 AM	28	0	26	0	54	4	176	0	1	181	0	0	0	0	0	0	194	16	0	210	445
08:00 AM	20	0	19	0	39	5	115	0	1	121	0	0	0	0	0	0	188	11	0	199	359
08:15 AM	12	0	20	0	32	9	153	0	0	162	0	0	0	0	0	0	177	20	0	197	391
Total Volume	87	0	91	0	178	25	589	0	3	617	0	0	0	0	0	0	805	56	0	861	1656
% App. Total	48.9	0	51.1	0		4.1	95.5	0	0.5		0	0	0	0	0	0	93.5	6.5	0		
PHF	.777	.000	.875	.000	.824	.694	.837	.000	.750	.852	.000	.000	.000	.000	.000	.000	.818	.700	.000	.844	.898
Cars	86	0	89	0	175	25	577	0	3	605	0	0	0	0	0	0	786	54	0	840	1620
% Cars	98.9	0	97.8	0	98.3	100	98.0	0	100	98.1	0	0	0	0	0	0	97.6	96.4	0	97.6	97.8
Trucks	1	0	2	0	3	0	12	0	0	12	0	0	0	0	0	0	19	2	0	21	36
% Trucks	1.1	0	2.2	0	1.7	0	2.0	0	0	1.9	0	0	0	0	0	0	2.4	3.6	0	2.4	2.2

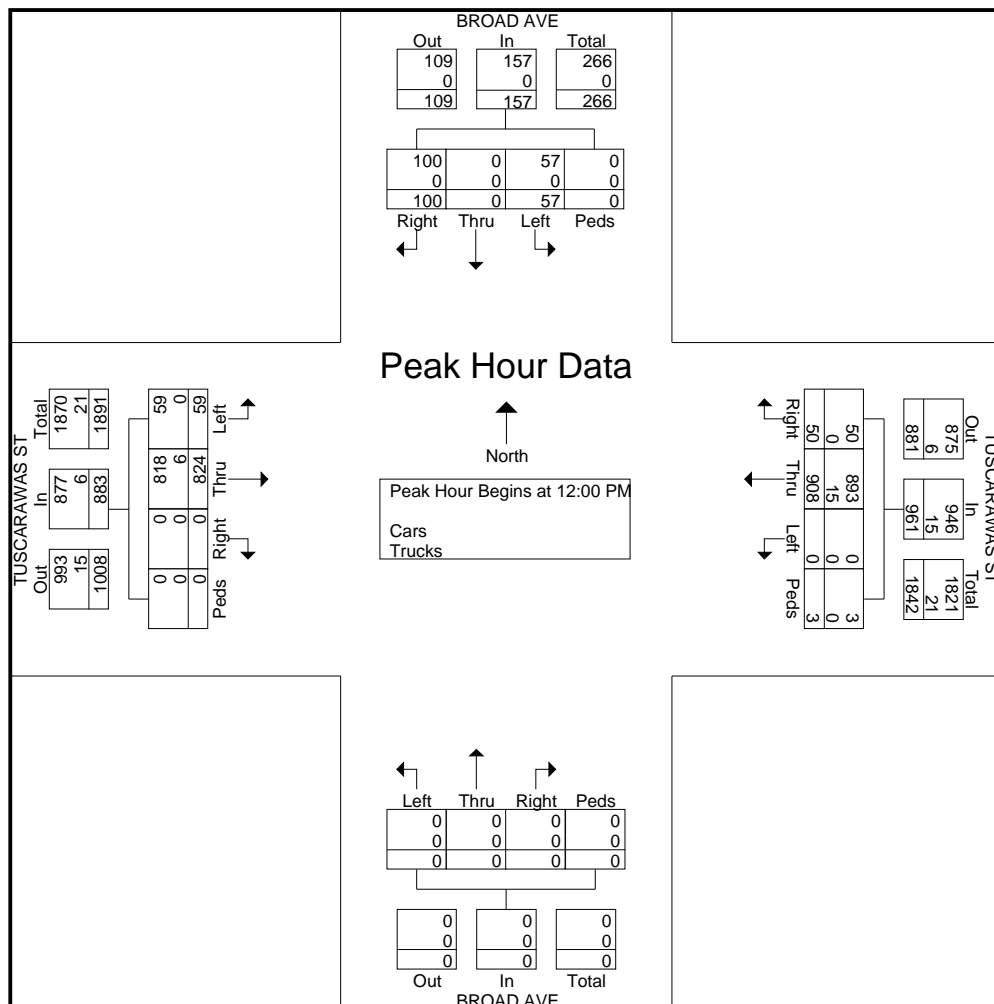




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File Name : Tuscarawas st and Broad Ave
Site Code : 00000000
Start Date : 9/29/2015
Page No : 4

Start Time	BROAD AVE From North					TUSCARAWAS ST From East					BROAD AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	28	0	12	0	40	12	227	0	0	239	0	0	0	0	0	0	196	12	0	208	487
12:15 PM	25	0	19	0	44	11	222	0	0	233	0	0	0	0	0	0	207	17	0	224	501
12:30 PM	23	0	13	0	36	13	236	0	0	249	0	0	0	0	0	0	206	14	0	220	505
12:45 PM	24	0	13	0	37	14	223	0	3	240	0	0	0	0	0	0	215	16	0	231	508
Total Volume	100	0	57	0	157	50	908	0	3	961	0	0	0	0	0	0	824	59	0	883	2001
% App. Total	63.7	0	36.3	0		5.2	94.5	0	0.3		0	0	0	0	0	0	93.3	6.7	0		
PHF	.893	.000	.750	.000	.892	.893	.962	.000	.250	.965	.000	.000	.000	.000	.000	.000	.958	.868	.000	.956	.985
Cars	100	0	57	0	157	50	893	0	3	946	0	0	0	0	0	0	818	59	0	877	1980
% Cars	100	0	100	0	100	100	98.3	0	100	98.4	0	0	0	0	0	0	99.3	100	0	99.3	99.0
Trucks	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	0	6	0	0	6	21
% Trucks	0	0	0	0	0	0	1.7	0	0	1.6	0	0	0	0	0	0	0.7	0	0	0.7	1.0

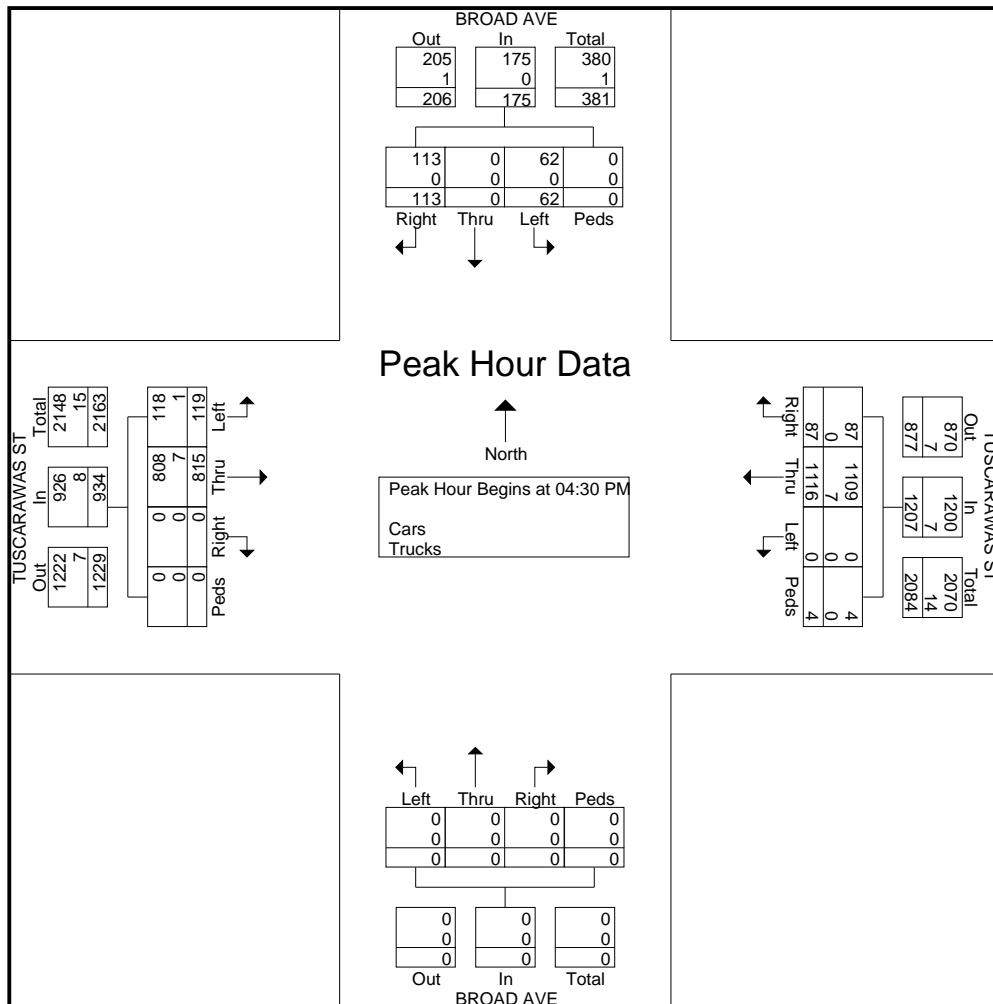




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File Name : Tuscarawas st and Broad Ave
Site Code : 00000000
Start Date : 9/29/2015
Page No : 5

Start Time	BROAD AVE From North					TUSCARAWAS ST From East					BROAD AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	23	0	19	0	42	20	265	0	0	285	0	0	0	0	0	0	188	30	0	218	545
04:45 PM	34	0	19	0	53	27	306	0	0	333	0	0	0	0	0	0	214	33	0	247	633
05:00 PM	22	0	13	0	35	15	302	0	3	320	0	0	0	0	0	0	195	25	0	220	575
05:15 PM	34	0	11	0	45	25	243	0	1	269	0	0	0	0	0	0	218	31	0	249	563
Total Volume	113	0	62	0	175	87	1116	0	4	1207	0	0	0	0	0	0	815	119	0	934	2316
% App. Total	64.6	0	35.4	0		7.2	92.5	0	0.3		0	0	0	0	0	0	87.3	12.7	0		
PHF	.831	.000	.816	.000	.825	.806	.912	.000	.333	.906	.000	.000	.000	.000	.000	.000	.935	.902	.000	.938	.915
Cars	113	0	62	0	175	87	1109	0	4	1200	0	0	0	0	0	0	808	118	0	926	2301
% Cars	100	0	100	0	100	100	99.4	0	100	99.4	0	0	0	0	0	0	99.1	99.2	0	99.1	99.4
Trucks	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	7	1	0	8	15
% Trucks	0	0	0	0	0	0	0.6	0	0	0.6	0	0	0	0	0	0	0.9	0.8	0	0.9	0.6





Mannik & Smith Group Inc.
www.manniksmithgroup.com

Int. : Tuscarawas & Dartmouth
 Counted By: MJL
 Day: Wednesday
 Weather: Overcast

File Name : Tuscarawas st and Dartmouth
 Site Code : 00000000
 Start Date : 9/30/2015
 Page No : 1

Groups Printed- Cars - Trucks

Start Time	DARTMOUTH AVE From North					TUSCARAWAS ST From East					DARTMOUTH AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	86	44	0	130	9	0	3	0	12	20	123	0	0	143	285
07:15 AM	0	0	0	0	0	0	115	69	0	184	13	0	0	0	13	33	159	0	1	193	390
07:30 AM	0	0	0	0	0	0	139	70	0	209	9	0	3	0	12	32	206	0	0	238	459
07:45 AM	0	0	0	0	0	0	137	78	0	215	7	0	0	0	7	35	203	0	1	239	461
Total	0	0	0	0	0	0	477	261	0	738	38	0	6	0	44	120	691	0	2	813	1595
08:00 AM	0	0	0	0	0	0	123	71	0	194	19	0	2	0	21	27	165	0	2	194	409
08:15 AM	0	0	0	0	0	0	136	46	0	182	4	0	3	0	7	29	178	0	0	207	396
08:30 AM	0	0	0	0	0	0	173	44	2	219	22	0	3	0	25	20	186	0	0	206	450
08:45 AM	0	0	0	1	1	0	187	37	5	229	10	0	6	0	16	20	179	0	0	199	445
Total	0	0	0	1	1	0	619	198	7	824	55	0	14	0	69	96	708	0	2	806	1700
*** BREAK ***																					
11:00 AM	0	0	0	0	0	0	217	21	1	239	21	0	7	0	28	9	157	0	0	166	433
11:15 AM	0	0	0	1	1	0	200	10	4	214	28	0	7	0	35	15	172	0	2	189	439
11:30 AM	0	0	0	0	0	0	227	20	3	250	22	0	6	0	28	15	178	0	2	195	473
11:45 AM	0	0	0	0	0	0	195	24	2	221	18	0	15	0	33	18	162	0	1	181	435
Total	0	0	0	1	1	0	839	75	10	924	89	0	35	0	124	57	669	0	5	731	1780
12:00 PM	0	0	0	0	0	0	188	26	1	215	31	0	5	0	36	16	166	0	0	182	433
12:15 PM	0	0	0	0	0	0	257	24	0	281	27	0	3	2	32	11	206	0	1	218	531
12:30 PM	0	0	0	0	0	0	261	22	1	284	25	0	4	0	29	17	201	0	2	220	533
12:45 PM	0	0	0	0	0	0	259	49	0	308	38	0	0	0	38	18	209	0	0	227	573
Total	0	0	0	0	0	0	965	121	2	1088	121	0	12	2	135	62	782	0	3	847	2070
*** BREAK ***																					
02:00 PM	0	0	0	0	0	0	221	29	2	252	23	0	9	1	33	28	193	0	0	221	506
02:15 PM	0	0	0	0	0	0	215	26	2	243	36	0	6	0	42	11	189	0	0	200	485
02:30 PM	0	0	0	0	0	0	248	41	0	289	41	0	4	0	45	12	152	0	2	166	500
02:45 PM	0	0	0	0	0	0	231	51	1	283	25	0	6	0	31	22	224	0	0	246	560
Total	0	0	0	0	0	0	915	147	5	1067	125	0	25	1	151	73	758	0	2	833	2051
03:00 PM	0	0	0	0	0	0	242	25	3	270	35	0	7	0	42	11	205	0	1	217	529
03:15 PM	0	0	0	0	0	0	246	22	5	273	30	0	10	0	40	10	201	0	1	212	525
03:30 PM	0	0	0	0	0	0	257	40	2	299	34	0	4	0	38	18	218	0	0	236	573
03:45 PM	0	0	0	0	0	0	278	25	0	303	41	0	11	0	52	12	184	0	2	198	553
Total	0	0	0	0	0	0	1023	112	10	1145	140	0	32	0	172	51	808	0	4	863	2180
04:00 PM	0	0	0	0	0	0	281	21	2	304	41	0	13	0	54	19	185	0	0	204	562
04:15 PM	0	0	0	0	0	0	264	26	6	296	46	0	6	1	53	13	197	0	1	211	560
04:30 PM	0	0	0	0	0	0	290	22	1	313	60	0	7	0	67	18	214	0	0	232	612
04:45 PM	0	0	0	0	0	0	381	17	1	399	36	0	8	0	44	15	206	0	0	221	664
Total	0	0	0	0	0	0	1216	86	10	1312	183	0	34	1	218	65	802	0	1	868	2398
05:00 PM	0	0	0	0	0	0	298	16	1	315	29	0	10	0	39	9	215	0	1	225	579
05:15 PM	0	0	0	0	0	0	291	15	0	306	37	0	9	0	46	11	205	0	2	218	570
05:30 PM	0	0	0	0	0	0	282	7	0	289	20	0	9	0	29	3	190	0	0	193	511
05:45 PM	0	0	0	0	0	0	239	11	0	250	26	0	4	1	31	6	194	0	1	201	482
Total	0	0	0	0	0	0	1110	49	1	1160	112	0	32	1	145	29	804	0	4	837	2142
Grand Total	0	0	0	2	2	0	7164	1049	45	8258	863	0	190	5	1058	553	6022	0	23	6598	15916
Apprch %	0	0	0	100		0	86.8	12.7	0.5		81.6	0	18	0.5		8.4	91.3	0	0.3		
Total %	0	0	0	0	0	0	45	6.6	0.3	51.9	5.4	0	1.2	0	6.6	3.5	37.8	0	0.1	41.5	

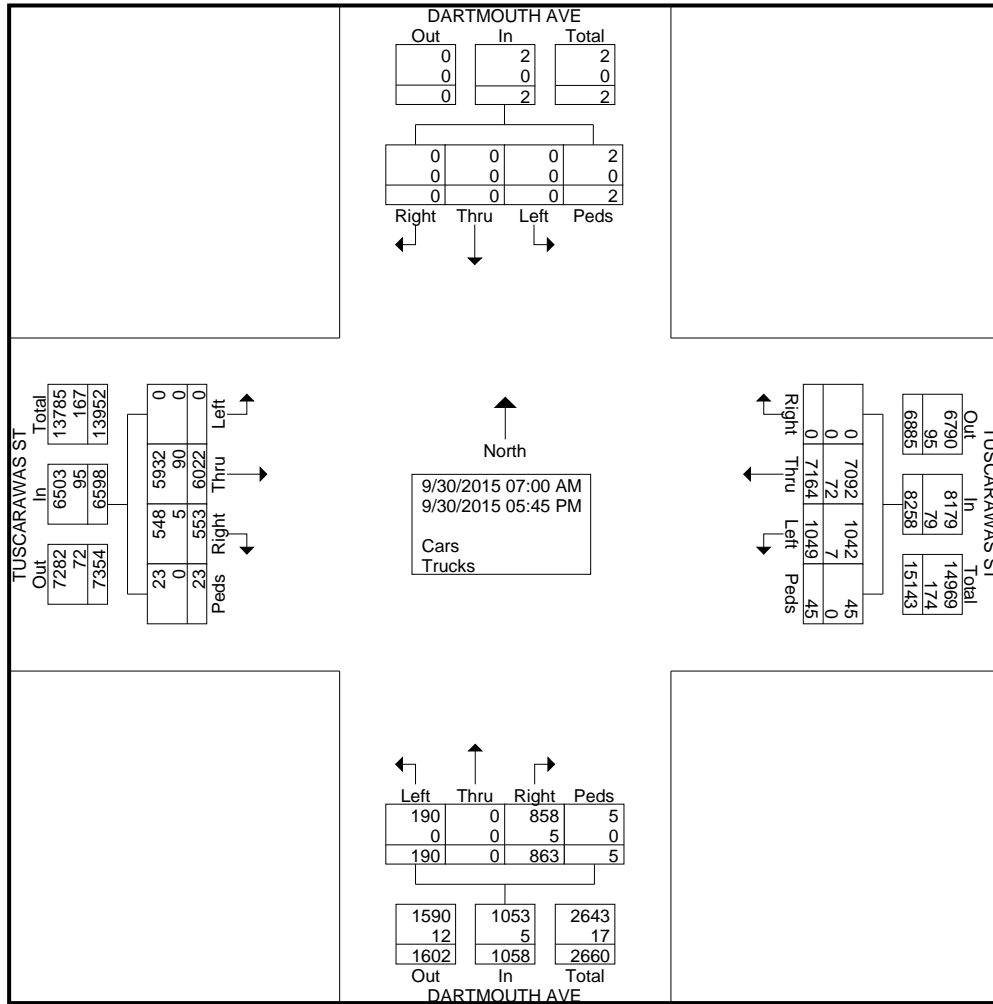


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File Name : Tuscarawas st and Dartmouth
Site Code : 00000000
Start Date : 9/30/2015
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Groups Printed- Cars - Trucks

	DARTMOUTH AVE From North					TUSCARAWAS ST From East					DARTMOUTH AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Cars	0	0	0	2	2	0	7092	1042	45	8179	858	0	190	5	1053	548	5932	0	23	6503	15737
% Cars	0	0	0	100	100	0	99	99.3	100	99	99.4	0	100	100	99.5	99.1	98.5	0	100	98.6	98.9
Trucks	0	0	0	0	0	0	72	7	0	79	5	0	0	0	5	5	90	0	0	95	179
% Trucks	0	0	0	0	0	0	1	0.7	0	1	0.6	0	0	0	0.5	0.9	1.5	0	0	1.4	1.1

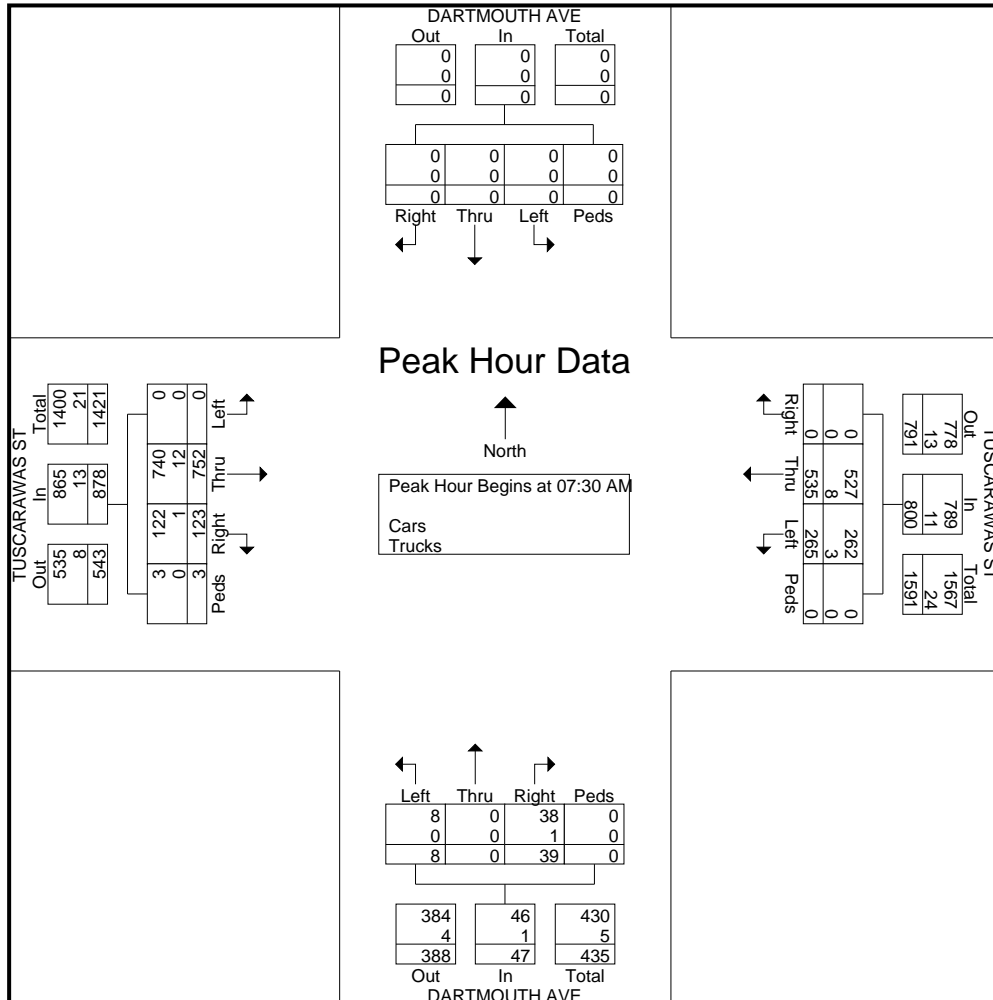




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Start Time	DARTMOUTH AVE From North					TUSCARAWAS ST From East					DARTMOUTH AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	0	139	70	0	209	9	0	3	0	12	32	206	0	0	238	459
07:45 AM	0	0	0	0	0	0	137	78	0	215	7	0	0	0	7	35	203	0	1	239	461
08:00 AM	0	0	0	0	0	0	123	71	0	194	19	0	2	0	21	27	165	0	2	194	409
08:15 AM	0	0	0	0	0	0	136	46	0	182	4	0	3	0	7	29	178	0	0	207	396
Total Volume	0	0	0	0	0	0	535	265	0	800	39	0	8	0	47	123	752	0	3	878	1725
% App. Total	0	0	0	0	0	0	66.9	33.1	0		83	0	17	0		14	85.6	0	0.3		
PHF	.000	.000	.000	.000	.000	.000	.962	.849	.000	.930	.513	.000	.667	.000	.560	.879	.913	.000	.375	.918	.935
Cars	0	0	0	0	0	0	527	262	0	789	38	0	8	0	46	122	740	0	3	865	1700
% Cars	0	0	0	0	0	0	98.5	98.9	0	98.6	97.4	0	100	0	97.9	99.2	98.4	0	100	98.5	98.6
Trucks	0	0	0	0	0	0	8	3	0	11	1	0	0	0	1	1	12	0	0	13	25
% Trucks	0	0	0	0	0	0	1.5	1.1	0	1.4	2.6	0	0	0	2.1	0.8	1.6	0	0	1.5	1.4

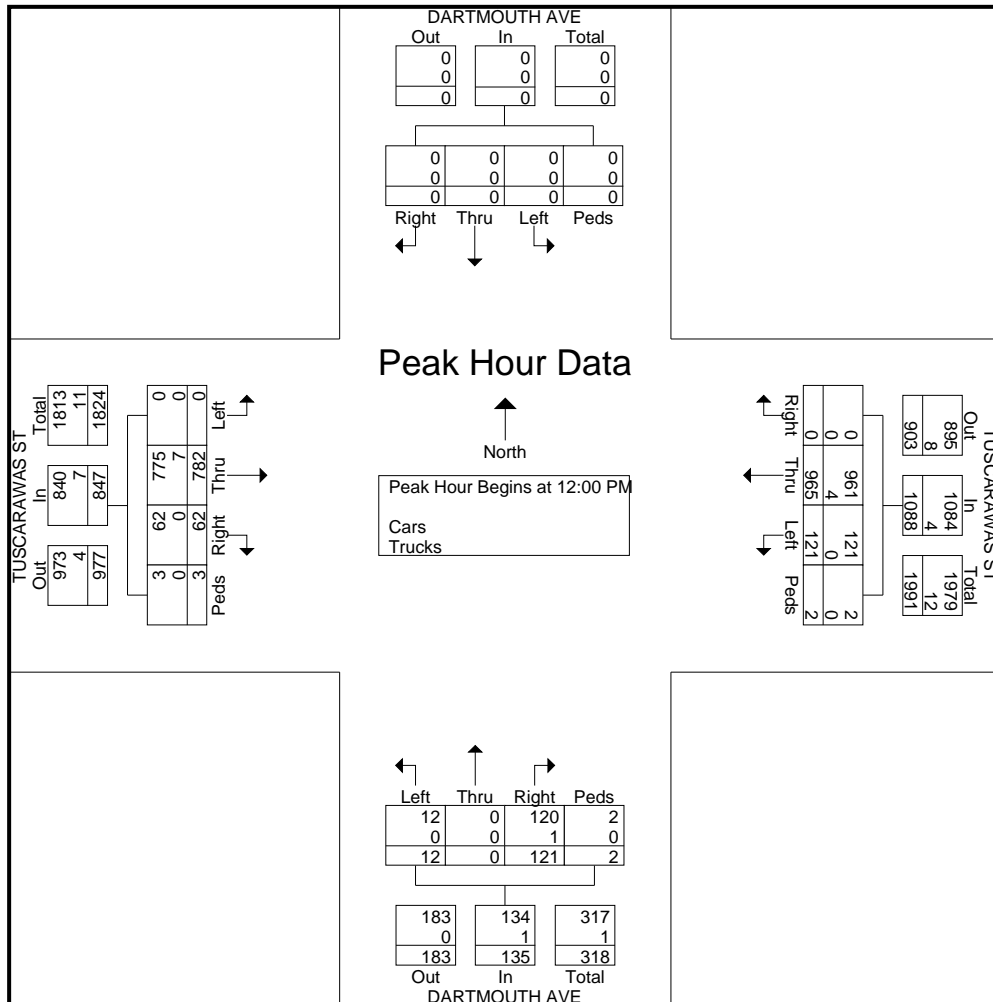




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File Name : Tuscarawas st and Dartmouth
Site Code : 00000000
Start Date : 9/30/2015
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Start Time	DARTMOUTH AVE From North					TUSCARAWAS ST From East					DARTMOUTH AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	0	0	0	0	0	188	26	1	215	31	0	5	0	36	16	166	0	0	182	433
12:15 PM	0	0	0	0	0	0	257	24	0	281	27	0	3	2	32	11	206	0	1	218	531
12:30 PM	0	0	0	0	0	0	261	22	1	284	25	0	4	0	29	17	201	0	2	220	533
12:45 PM	0	0	0	0	0	0	259	49	0	308	38	0	0	0	38	18	209	0	0	227	573
Total Volume	0	0	0	0	0	0	965	121	2	1088	121	0	12	2	135	62	782	0	3	847	2070
% App. Total	0	0	0	0	0	0	88.7	11.1	0.2	89.6	0	0	8.9	1.5	7.3	92.3	0	0.4			
PHF	.000	.000	.000	.000	.000	.000	.924	.617	.500	.883	.796	.000	.600	.250	.888	.861	.935	.000	.375	.933	.903
Cars	0	0	0	0	0	0	961	121	2	1084	120	0	12	2	134	62	775	0	3	840	2058
% Cars	0	0	0	0	0	0	99.6	100	100	99.6	99.2	0	100	100	99.3	100	99.1	0	100	99.2	99.4
Trucks	0	0	0	0	0	0	4	0	0	4	1	0	0	0	1	0	7	0	0	7	12
% Trucks	0	0	0	0	0	0	0.4	0	0	0.4	0.8	0	0	0	0.7	0	0.9	0	0	0.8	0.6





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File Name : Tuscarawas st and Dartmouth
Site Code : 00000000
Start Date : 9/30/2015
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Start Time	DARTMOUTH AVE From North					TUSCARAWAS ST From East					DARTMOUTH AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	290	22	1	313	60	0	7	0	67	18	214	0	0	232	612
04:45 PM	0	0	0	0	0	0	381	17	1	399	36	0	8	0	44	15	206	0	0	221	664
05:00 PM	0	0	0	0	0	0	298	16	1	315	29	0	10	0	39	9	215	0	1	225	579
05:15 PM	0	0	0	0	0	0	291	15	0	306	37	0	9	0	46	11	205	0	2	218	570
Total Volume	0	0	0	0	0	0	1260	70	3	1333	162	0	34	0	196	53	840	0	3	896	2425
% App. Total	0	0	0	0	0	0	94.5	5.3	0.2		82.7	0	17.3	0		5.9	93.8	0	0.3		
PHF	.000	.000	.000	.000	.000	.000	.827	.795	.750	.835	.675	.000	.850	.000	.731	.736	.977	.000	.375	.966	.913
Cars	0	0	0	0	0	0	1250	70	3	1323	162	0	34	0	196	53	829	0	3	885	2404
% Cars	0	0	0	0	0	0	99.2	100	100	99.2	100	0	100	0	100	100	98.7	0	100	98.8	99.1
Trucks	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	11	0	0	11	21
% Trucks	0	0	0	0	0	0	0.8	0	0	0.8	0	0	0	0	0	0	1.3	0	0	1.2	0.9



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Int. : Tuscarawas St and Harrison NW
 Counted By: MJL
 Day: 10 15 2015
 Weather: Sunny

File Name : Tuscarawas st and Harrison NW
 Site Code : 00000000
 Start Date : 10/15/2015
 Page No : 1

Groups Printed- Car - Truck

Start Time	HARRISON AVE NW From North					TUSCARAWAS ST From East					DRYDEN AVE SW From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	1	0	14	0	15	5	159	2	0	166	1	0	0	0	1	1	114	0	0	115	297
07:15 AM	5	0	20	0	25	10	224	1	0	235	0	0	0	0	0	1	172	1	0	174	434
07:30 AM	7	1	21	0	29	10	236	2	0	248	0	0	0	0	0	2	170	1	0	173	450
07:45 AM	11	1	52	1	65	14	262	1	3	280	0	0	2	0	2	2	143	3	0	148	495
Total	24	2	107	1	134	39	881	6	3	929	1	0	2	0	3	6	599	5	0	610	1676
08:00 AM	3	0	24	0	27	11	210	0	1	222	0	1	4	0	5	1	138	1	0	140	394
08:15 AM	6	0	35	0	41	13	212	1	4	230	0	0	2	0	2	3	146	1	0	150	423
08:30 AM	6	1	22	0	29	16	215	1	0	232	2	0	0	0	2	0	147	3	0	150	413
08:45 AM	9	0	16	1	26	14	208	1	1	224	1	1	0	0	2	3	160	2	1	166	418
Total	24	1	97	1	123	54	845	3	6	908	3	2	6	0	11	7	591	7	1	606	1648
*** BREAK ***																					
11:00 AM	12	0	19	0	31	11	216	0	1	228	1	0	0	2	3	4	192	3	0	199	461
11:15 AM	9	1	19	0	29	7	180	2	0	189	1	1	1	4	7	2	166	3	0	171	396
11:30 AM	10	2	29	2	43	13	226	2	0	241	0	1	4	1	6	1	196	6	0	203	493
11:45 AM	12	4	19	0	35	15	225	5	3	248	0	0	1	0	1	7	203	5	0	215	499
Total	43	7	86	2	138	46	847	9	4	906	2	2	6	7	17	14	757	17	0	788	1849
12:00 PM	11	2	22	0	35	16	235	3	4	258	2	0	0	0	2	4	171	2	0	177	472
12:15 PM	5	3	27	2	37	17	225	2	1	245	0	0	2	3	5	4	224	3	0	231	518
12:30 PM	7	0	25	1	33	13	214	0	3	230	3	2	3	3	11	3	220	5	0	228	502
12:45 PM	11	1	32	0	44	13	231	4	0	248	2	2	1	3	8	1	214	3	2	220	520
Total	34	6	106	3	149	59	905	9	8	981	7	4	6	9	26	12	829	13	2	856	2012
*** BREAK ***																					
02:00 PM	12	1	22	3	38	18	267	2	0	287	2	1	2	0	5	1	217	5	0	223	553
02:15 PM	4	1	27	2	34	22	287	1	2	312	1	0	1	0	2	2	219	6	2	229	577
02:30 PM	5	0	18	2	25	12	243	4	4	263	1	0	1	0	2	1	211	7	1	220	510
02:45 PM	12	2	32	0	46	21	292	3	2	318	0	1	1	0	2	0	225	1	0	226	592
Total	33	4	99	7	143	73	1089	10	8	1180	4	2	5	0	11	4	872	19	3	898	2232
03:00 PM	13	5	33	3	54	31	243	3	1	278	0	2	2	0	4	2	228	5	3	238	574
03:15 PM	18	1	27	0	46	25	312	2	1	340	3	0	0	0	3	0	244	4	1	249	638
03:30 PM	6	2	19	3	30	28	269	2	2	301	4	1	0	0	5	2	229	5	1	237	573
03:45 PM	18	4	32	1	55	33	316	2	9	360	2	2	2	2	8	6	200	4	2	212	635
Total	55	12	111	7	185	117	1140	9	13	1279	9	5	4	2	20	10	901	18	7	936	2420
04:00 PM	19	1	51	6	77	33	275	8	5	321	6	1	1	0	8	2	201	11	1	215	621
04:15 PM	28	2	57	2	89	22	313	3	1	339	0	0	1	0	1	9	184	2	0	195	624
04:30 PM	39	3	70	1	113	36	303	2	2	343	4	1	2	2	9	3	216	3	0	222	687
04:45 PM	20	2	29	0	51	28	296	2	1	327	0	3	1	0	4	3	196	3	4	206	588
Total	106	8	207	9	330	119	1187	15	9	1330	10	5	5	2	22	17	797	19	5	838	2520
05:00 PM	15	2	27	1	45	36	288	2	0	326	2	1	4	0	7	2	237	1	3	243	621
05:15 PM	13	1	27	1	42	27	276	5	0	308	3	2	0	0	5	2	176	4	0	182	537
05:30 PM	16	1	38	0	55	20	238	1	1	260	4	2	2	1	9	5	217	7	2	231	555
05:45 PM	12	0	28	0	40	14	226	9	2	251	3	0	0	2	5	1	200	5	0	206	502
Total	56	4	120	2	182	97	1028	17	3	1145	12	5	6	3	26	10	830	17	5	862	2215

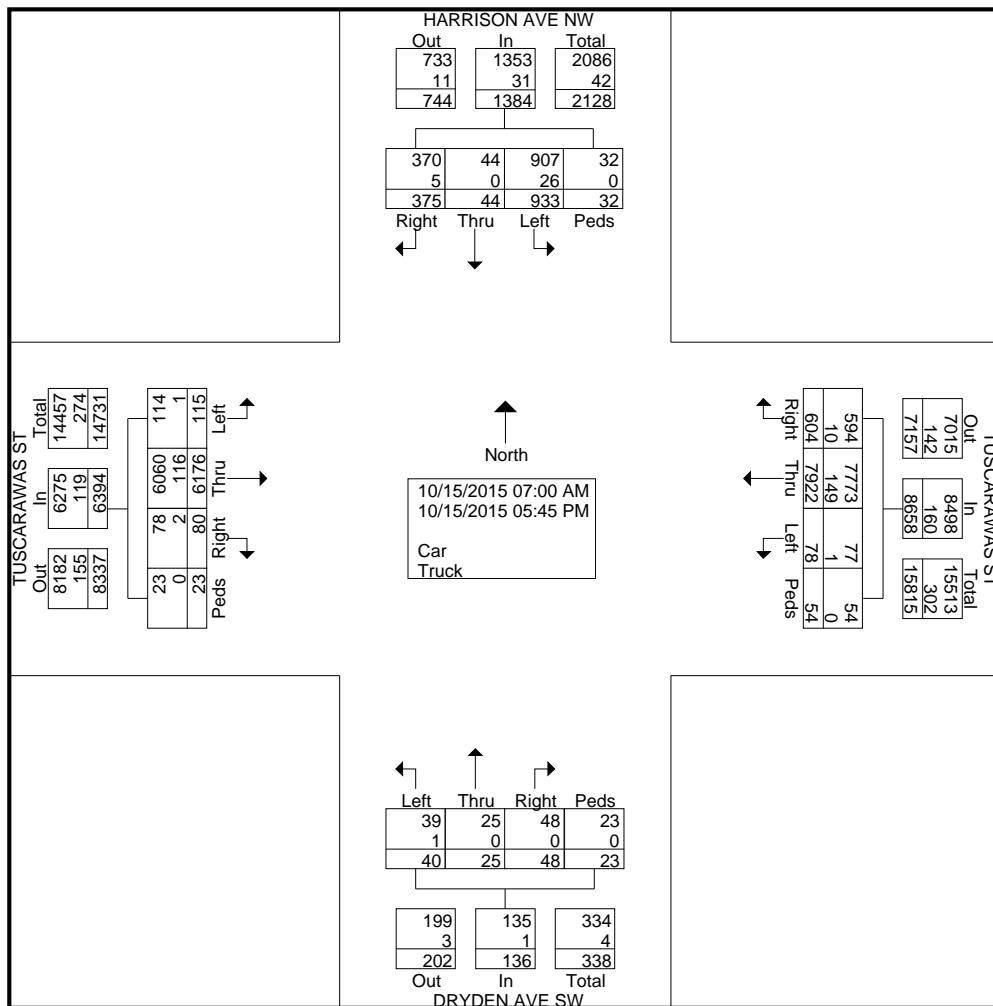


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File Name : Tuscarawas st and Harrison NW
Site Code : 00000000
Start Date : 10/15/2015
Page No : 2

Groups Printed- Car - Truck

	HARRISON AVE NW From North					TUSCARAWAS ST From East					DRYDEN AVE SW From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	375	44	933	32	1384	604	7922	78	54	8658	48	25	40	23	136	80	6176	115	23	6394	16572
Apprch %	27.1	3.2	67.4	2.3		7	91.5	0.9	0.6		35.3	18.4	29.4	16.9		1.3	96.6	1.8	0.4		
Total %	2.3	0.3	5.6	0.2	8.4	3.6	47.8	0.5	0.3	52.2	0.3	0.2	0.2	0.1	0.8	0.5	37.3	0.7	0.1	38.6	
Car	370	44	907	32	1353	594	7773	77	54	8498	48	25	39	23	135	78	6060	114	23	6275	16261
% Car	98.7	100	97.2	100	97.8	98.3	98.1	98.7	100	98.2	100	100	97.5	100	99.3	97.5	98.1	99.1	100	98.1	98.1
Truck	5	0	26	0	31	10	149	1	0	160	0	0	1	0	1	2	116	1	0	119	311
% Truck	1.3	0	2.8	0	2.2	1.7	1.9	1.3	0	1.8	0	0	2.5	0	0.7	2.5	1.9	0.9	0	1.9	1.9

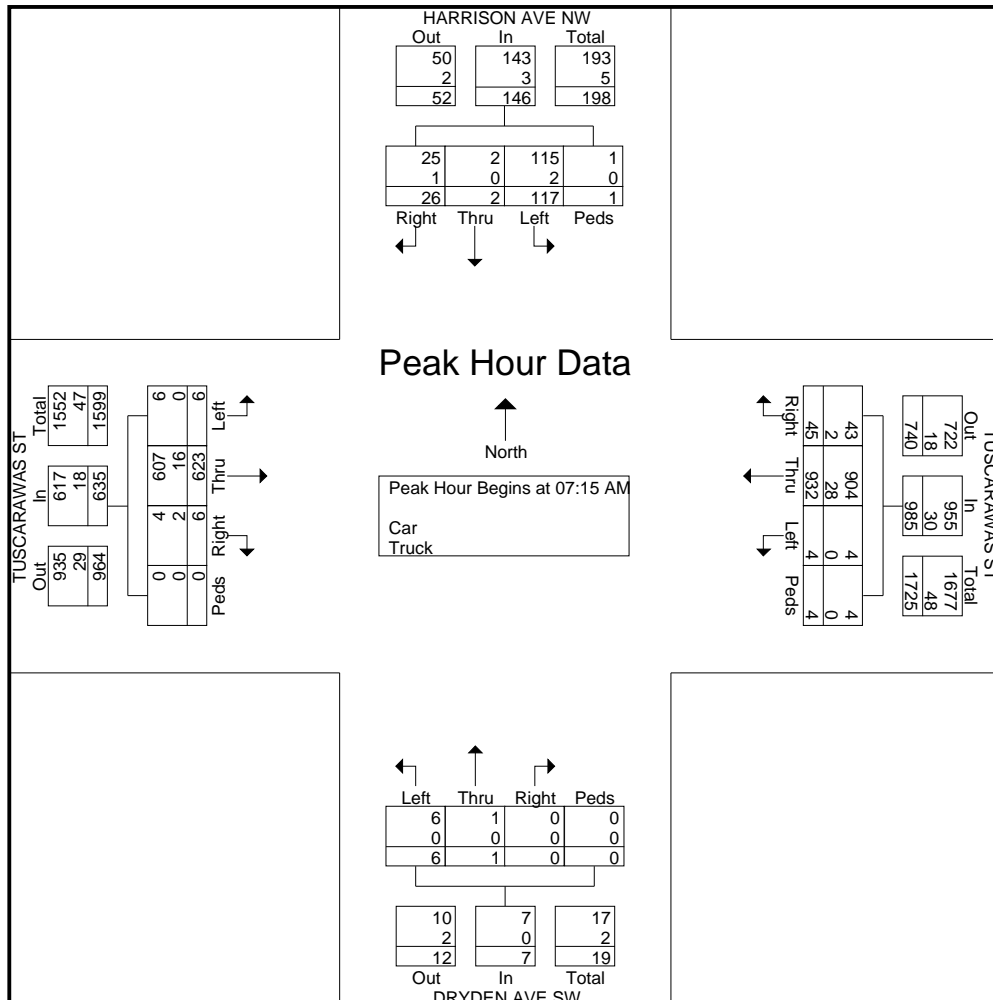




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File Name : Tuscarawas st and Harrison NW
Site Code : 00000000
Start Date : 10/15/2015
Page No : 3

Start Time	HARRISON AVE NW From North					TUSCARAWAS ST From East					DRYDEN AVE SW From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	5	0	20	0	25	10	224	1	0	235	0	0	0	0	0	1	172	1	0	174	434
07:30 AM	7	1	21	0	29	10	236	2	0	248	0	0	0	0	0	2	170	1	0	173	450
07:45 AM	11	1	52	1	65	14	262	1	3	280	0	0	2	0	2	2	143	3	0	148	495
08:00 AM	3	0	24	0	27	11	210	0	1	222	0	1	4	0	5	1	138	1	0	140	394
Total Volume	26	2	117	1	146	45	932	4	4	985	0	1	6	0	7	6	623	6	0	635	1773
% App. Total	17.8	1.4	80.1	0.7		4.6	94.6	0.4	0.4		0	14.3	85.7	0		0.9	98.1	0.9	0		
PHF	.591	.500	.563	.250	.562	.804	.889	.500	.333	.879	.000	.250	.375	.000	.350	.750	.906	.500	.000	.912	.895
Car	25	2	115	1	143	43	904	4	4	955	0	1	6	0	7	4	607	6	0	617	1722
% Car	96.2	100	98.3	100	97.9	95.6	97.0	100	100	97.0	0	100	100	0	100	66.7	97.4	100	0	97.2	97.1
Truck	1	0	2	0	3	2	28	0	0	30	0	0	0	0	0	2	16	0	0	18	51
% Truck	3.8	0	1.7	0	2.1	4.4	3.0	0	0	3.0	0	0	0	0	0	33.3	2.6	0	0	2.8	2.9

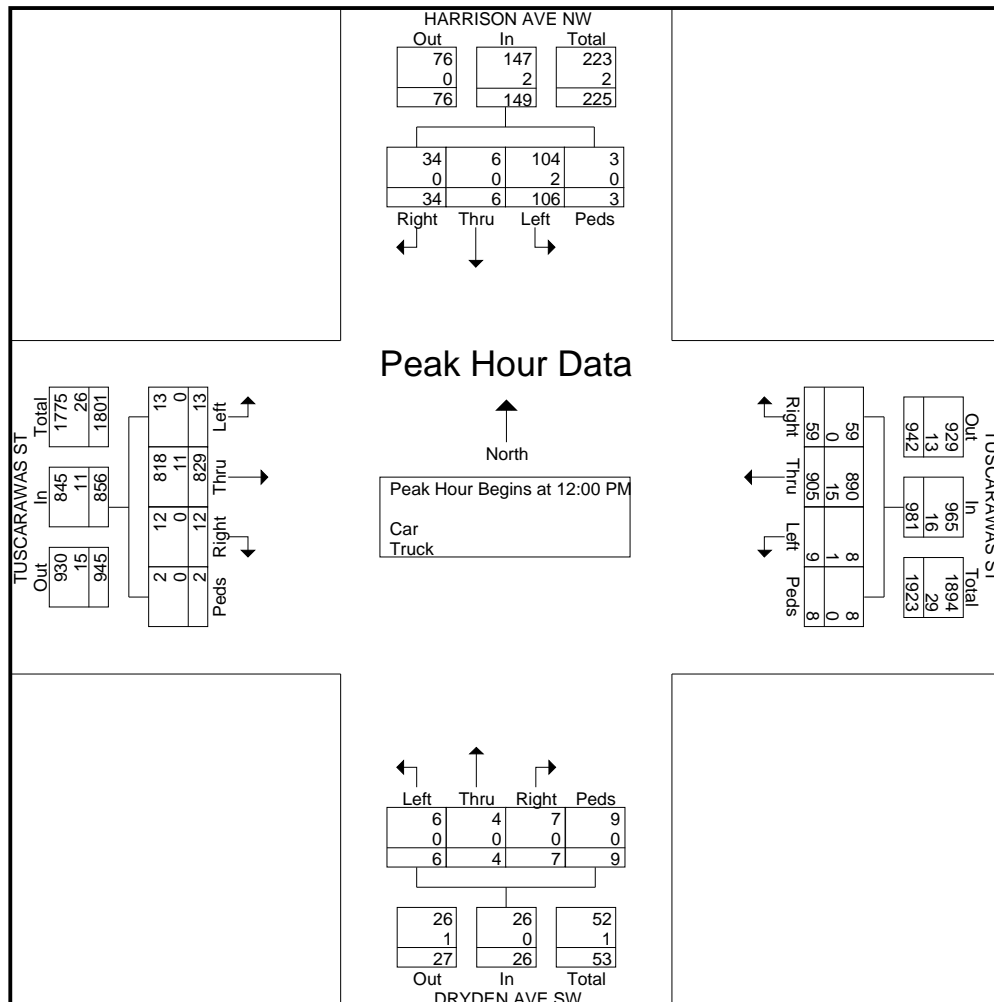




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File Name : Tuscarawas st and Harrison NW
Site Code : 00000000
Start Date : 10/15/2015
Page No : 4

Start Time	HARRISON AVE NW From North					TUSCARAWAS ST From East					DRYDEN AVE SW From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	11	2	22	0	35	16	235	3	4	258	2	0	0	0	2	4	171	2	0	177	472
12:15 PM	5	3	27	2	37	17	225	2	1	245	0	0	2	3	5	4	224	3	0	231	518
12:30 PM	7	0	25	1	33	13	214	0	3	230	3	2	3	3	11	3	220	5	0	228	502
12:45 PM	11	1	32	0	44	13	231	4	0	248	2	2	1	3	8	1	214	3	2	220	520
Total Volume	34	6	106	3	149	59	905	9	8	981	7	4	6	9	26	12	829	13	2	856	2012
% App. Total	22.8	4	71.1	2		6	92.3	0.9	0.8		26.9	15.4	23.1	34.6		1.4	96.8	1.5	0.2		
PHF	.773	.500	.828	.375	.847	.868	.963	.563	.500	.951	.583	.500	.500	.750	.591	.750	.925	.650	.250	.926	.967
Car	34	6	104	3	147	59	890	8	8	965	7	4	6	9	26	12	818	13	2	845	1983
% Car	100	100	98.1	100	98.7	100	98.3	88.9	100	98.4	100	100	100	100	100	100	98.7	100	100	98.7	98.6
Truck	0	0	2	0	2	0	15	1	0	16	0	0	0	0	0	0	11	0	0	11	29
% Truck	0	0	1.9	0	1.3	0	1.7	11.1	0	1.6	0	0	0	0	0	0	1.3	0	0	1.3	1.4

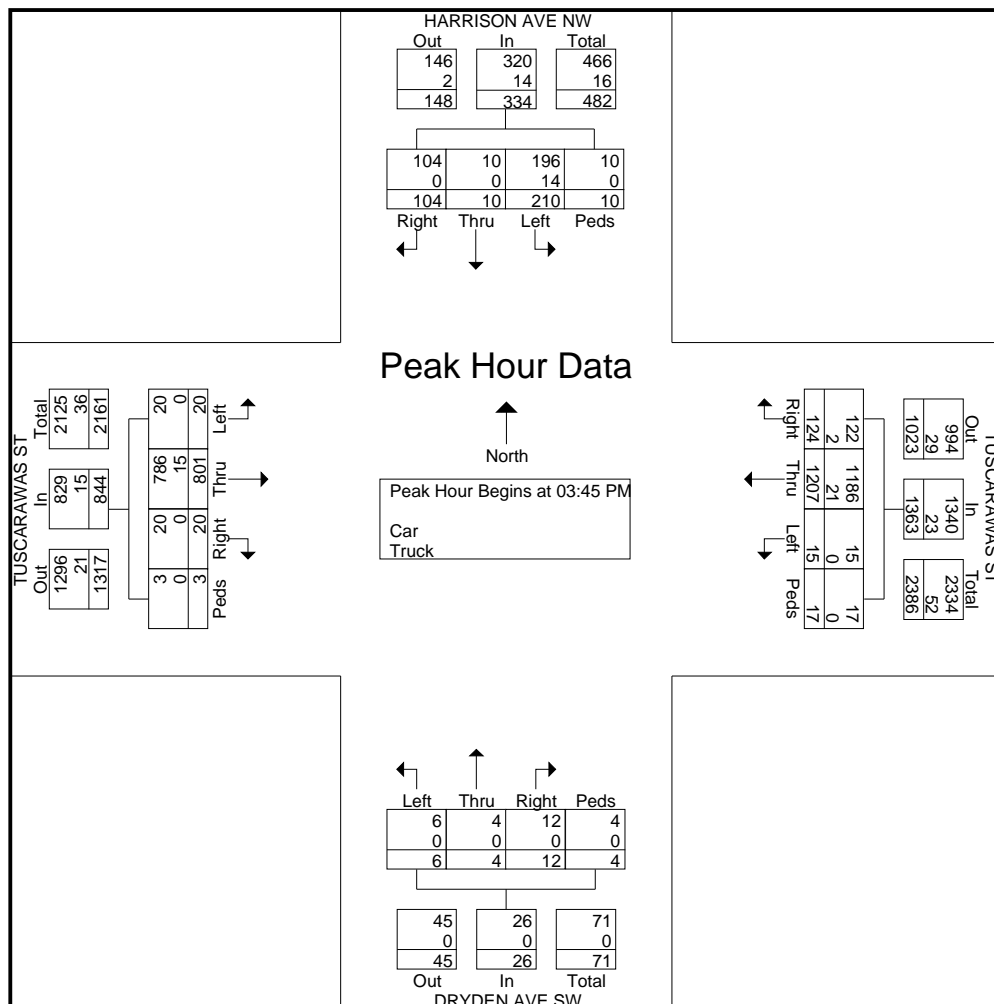




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File Name : Tuscarawas st and Harrison NW
Site Code : 00000000
Start Date : 10/15/2015
Page No : 5

Start Time	HARRISON AVE NW From North					TUSCARAWAS ST From East					DRYDEN AVE SW From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:45 PM																					
03:45 PM	18	4	32	1	55	33	316	2	9	360	2	2	2	2	8	6	200	4	2	212	635
04:00 PM	19	1	51	6	77	33	275	8	5	321	6	1	1	0	8	2	201	11	1	215	621
04:15 PM	28	2	57	2	89	22	313	3	1	339	0	0	1	0	1	9	184	2	0	195	624
04:30 PM	39	3	70	1	113	36	303	2	2	343	4	1	2	2	9	3	216	3	0	222	687
Total Volume	104	10	210	10	334	124	1207	15	17	1363	12	4	6	4	26	20	801	20	3	844	2567
% App. Total	31.1	3	62.9	3		9.1	88.6	1.1	1.2		46.2	15.4	23.1	15.4		2.4	94.9	2.4	0.4		
PHF	.667	.625	.750	.417	.739	.861	.955	.469	.472	.947	.500	.500	.750	.500	.722	.556	.927	.455	.375	.950	.934
Car	104	10	196	10	320	122	1186	15	17	1340	12	4	6	4	26	20	786	20	3	829	2515
% Car	100	100	93.3	100	95.8	98.4	98.3	100	100	98.3	100	100	100	100	100	100	98.1	100	100	98.2	98.0
Truck	0	0	14	0	14	2	21	0	0	23	0	0	0	0	0	0	15	0	0	15	52
% Truck	0	0	6.7	0	4.2	1.6	1.7	0	0	1.7	0	0	0	0	0	0	1.9	0	0	1.8	2.0





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Int. : Tuscarawas St & Harrison Ave
Counted By: KH
Day: Wednesday
Weather: Overcast

File Name : Tuscarawas st and Harrison
Site Code : 00000000
Start Date : 9/30/2015
Page No : 1

Groups Printed- Cars - Trucks

Start Time	I-77 RAMP From North					TUSCARAWAS ST From East					HARRISON AVE SW From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	127	28	94	0	249	0	89	2	0	91	12	0	12	0	24	13	150	0	1	164	528
07:15 AM	164	43	169	0	376	0	105	3	1	109	4	0	10	0	14	15	201	0	0	216	715
07:30 AM	189	59	143	0	391	0	106	5	0	111	12	0	21	0	33	14	192	0	0	206	741
07:45 AM	110	27	95	0	232	0	105	9	0	114	17	0	18	0	35	13	187	0	0	200	581
Total	590	157	501	0	1248	0	405	19	1	425	45	0	61	0	106	55	730	0	1	786	2565
08:00 AM	119	39	128	1	287	0	114	9	0	123	34	0	21	0	55	11	162	0	0	173	638
08:15 AM	119	22	78	0	219	0	130	6	0	136	10	0	19	0	29	9	183	0	0	192	576
08:30 AM	132	39	107	0	278	0	105	6	1	112	16	0	14	1	31	12	175	0	0	187	608
08:45 AM	84	28	71	0	183	0	97	10	0	107	13	0	13	0	26	12	154	0	0	166	482
Total	454	128	384	1	967	0	446	31	1	478	73	0	67	1	141	44	674	0	0	718	2304
*** BREAK ***																					
11:00 AM	100	16	42	1	159	0	137	6	2	145	12	0	19	0	31	12	169	0	1	182	517
11:15 AM	67	22	50	1	140	0	130	6	2	138	20	0	21	0	41	12	193	0	0	205	524
11:30 AM	80	26	63	0	169	0	151	20	1	172	15	0	27	0	42	11	199	0	0	210	593
11:45 AM	59	23	58	0	140	0	133	12	0	145	19	0	15	0	34	14	160	0	0	174	493
Total	306	87	213	2	608	0	551	44	5	600	66	0	82	0	148	49	721	0	1	771	2127
12:00 PM	81	25	48	0	154	0	139	21	0	160	29	0	22	0	51	9	146	0	0	155	520
12:15 PM	92	40	75	0	207	0	139	17	0	156	23	0	18	0	41	4	173	0	1	178	582
12:30 PM	80	34	62	0	176	0	177	17	2	196	13	0	19	0	32	13	220	0	0	233	637
12:45 PM	105	26	58	0	189	0	156	14	1	171	20	0	22	0	42	12	212	0	0	224	626
Total	358	125	243	0	726	0	611	69	3	683	85	0	81	0	166	38	751	0	1	790	2365
*** BREAK ***																					
02:00 PM	68	26	60	1	155	0	147	7	0	154	20	0	25	0	45	16	241	0	1	258	612
02:15 PM	95	41	53	0	189	0	136	9	2	147	17	0	23	0	40	16	215	0	0	231	607
02:30 PM	109	33	60	0	202	0	170	7	1	178	18	0	21	0	39	17	219	0	3	239	658
02:45 PM	120	36	55	0	211	0	147	4	2	153	20	0	29	1	50	17	226	0	1	244	658
Total	392	136	228	1	757	0	600	27	5	632	75	0	98	1	174	66	901	0	5	972	2535
03:00 PM	128	38	53	0	219	0	132	12	1	145	11	0	28	0	39	17	239	0	1	257	660
03:15 PM	96	43	37	0	176	0	176	13	1	190	30	0	18	0	48	15	262	0	0	277	691
03:30 PM	87	45	56	0	188	0	168	7	0	175	41	0	24	0	65	22	243	0	1	266	694
03:45 PM	94	32	53	0	179	0	168	10	3	181	38	0	38	1	77	13	261	0	0	274	711
Total	405	158	199	0	762	0	644	42	5	691	120	0	108	1	229	67	1005	0	2	1074	2756
04:00 PM	100	29	47	2	178	0	176	10	0	186	53	0	42	0	95	9	221	0	2	232	691
04:15 PM	116	40	37	0	193	0	191	10	1	202	30	0	29	0	59	13	253	0	1	267	721
04:30 PM	95	43	41	1	180	0	180	11	1	192	21	0	29	0	50	20	264	0	0	284	706
04:45 PM	125	47	47	0	219	0	176	12	2	190	33	0	34	1	68	16	265	0	0	281	758
Total	436	159	172	3	770	0	723	43	4	770	137	0	134	1	272	58	1003	0	3	1064	2876
05:00 PM	100	37	41	1	179	0	153	12	1	166	24	0	29	1	54	11	266	0	0	277	676
05:15 PM	102	42	38	0	182	0	186	12	3	201	27	0	25	0	52	22	249	0	1	272	707
05:30 PM	102	46	31	1	180	0	139	9	0	148	34	0	14	0	48	15	216	0	0	231	607
05:45 PM	97	35	41	0	173	0	133	11	2	146	19	0	23	2	44	15	244	0	0	259	622
Total	401	160	151	2	714	0	611	44	6	661	104	0	91	3	198	63	975	0	1	1039	2612

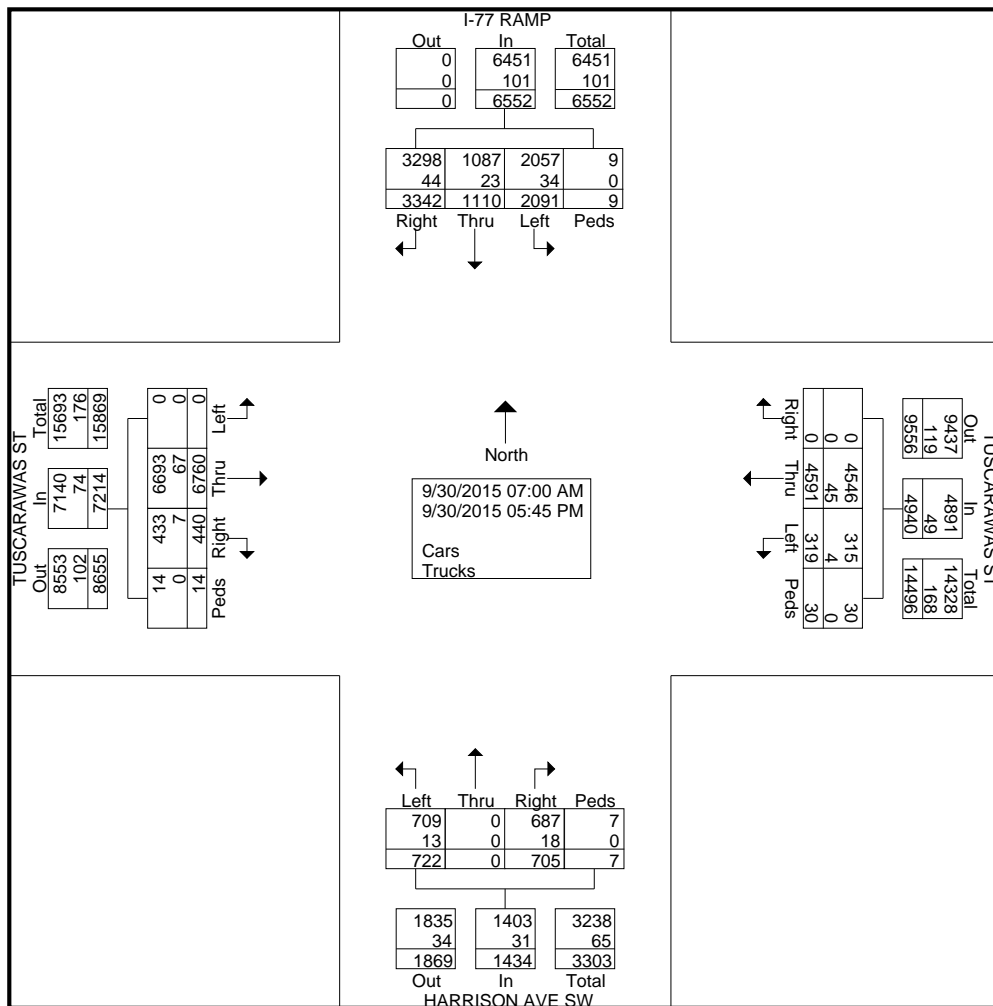


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File Name : Tuscarawas st and Harrison
Site Code : 00000000
Start Date : 9/30/2015
Page No : 2

Groups Printed- Cars - Trucks

	I-77 RAMP From North					TUSCARAWAS ST From East					HARRISON AVE SW From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	3342	1110	2091	9	6552	0	4591	319	30	4940	705	0	722	7	1434	440	6760	0	14	7214	20140
Apprch %	51	16.9	31.9	0.1		0	92.9	6.5	0.6		49.2	0	50.3	0.5		6.1	93.7	0	0.2		
Total %	16.6	5.5	10.4	0	32.5	0	22.8	1.6	0.1	24.5	3.5	0	3.6	0	7.1	2.2	33.6	0	0.1	35.8	
Cars	3298	1087	2057	9	6451	0	4546	315	30	4891	687	0	709	7	1403	433	6693	0	14	7140	19885
% Cars	98.7	97.9	98.4	100	98.5	0	99	98.7	100	99	97.4	0	98.2	100	97.8	98.4	99	0	100	99	98.7
Trucks	44	23	34	0	101	0	45	4	0	49	18	0	13	0	31	7	67	0	0	74	255
% Trucks	1.3	2.1	1.6	0	1.5	0	1	1.3	0	1	2.6	0	1.8	0	2.2	1.6	1	0	0	1	1.3

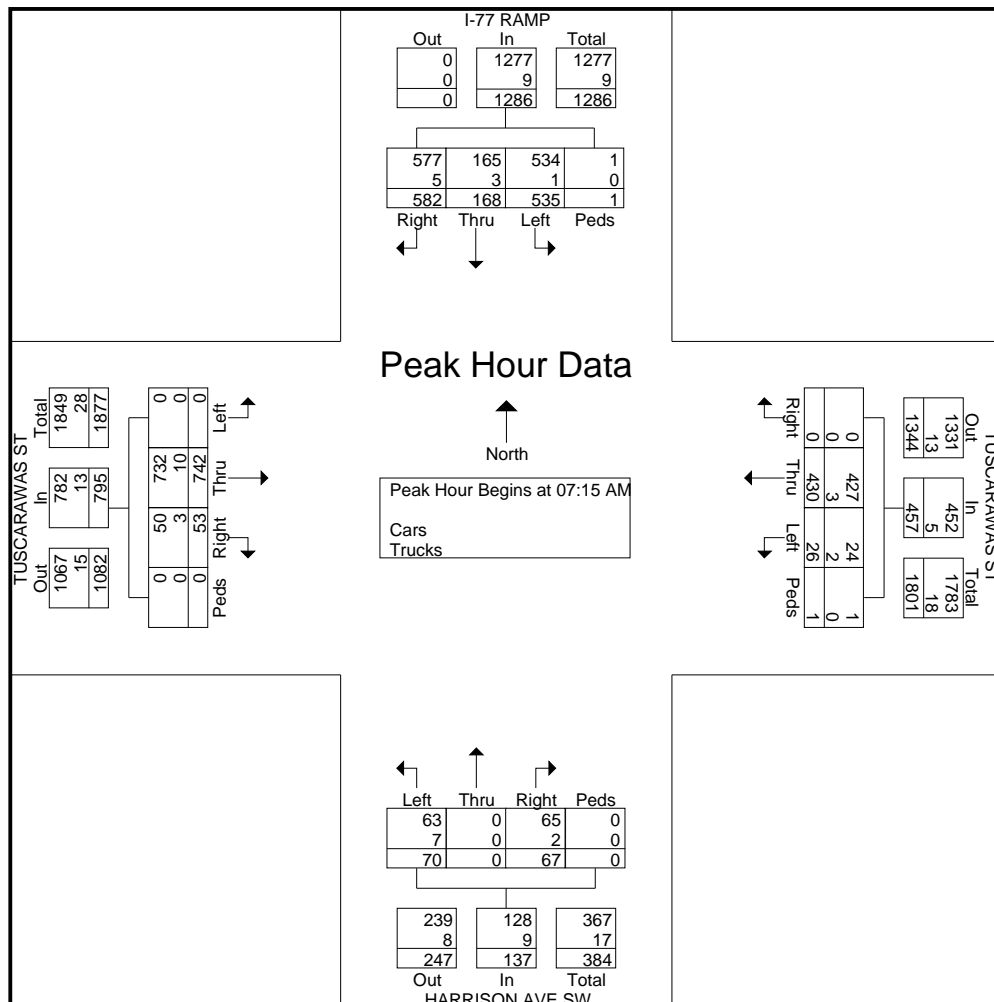




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File Name : Tuscarawas st and Harrison
Site Code : 00000000
Start Date : 9/30/2015
Page No : 3

Start Time	I-77 RAMP From North					TUSCARAWAS ST From East					HARRISON AVE SW From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	164	43	169	0	376	0	105	3	1	109	4	0	10	0	14	15	201	0	0	216	715
07:30 AM	189	59	143	0	391	0	106	5	0	111	12	0	21	0	33	14	192	0	0	206	741
07:45 AM	110	27	95	0	232	0	105	9	0	114	17	0	18	0	35	13	187	0	0	200	581
08:00 AM	119	39	128	1	287	0	114	9	0	123	34	0	21	0	55	11	162	0	0	173	638
Total Volume	582	168	535	1	1286	0	430	26	1	457	67	0	70	0	137	53	742	0	0	795	2675
% App. Total	45.3	13.1	41.6	0.1		0	94.1	5.7	0.2		48.9	0	51.1	0		6.7	93.3	0	0		
PHF	.770	.712	.791	.250	.822	.000	.943	.722	.250	.929	.493	.000	.833	.000	.623	.883	.923	.000	.000	.920	.902
Cars	577	165	534	1	1277	0	427	24	1	452	65	0	63	0	128	50	732	0	0	782	2639
% Cars	99.1	98.2	99.8	100	99.3	0	99.3	92.3	100	98.9	97.0	0	90.0	0	93.4	94.3	98.7	0	0	98.4	98.7
Trucks	5	3	1	0	9	0	3	2	0	5	2	0	7	0	9	3	10	0	0	13	36
% Trucks	0.9	1.8	0.2	0	0.7	0	0.7	7.7	0	1.1	3.0	0	10.0	0	6.6	5.7	1.3	0	0	1.6	1.3

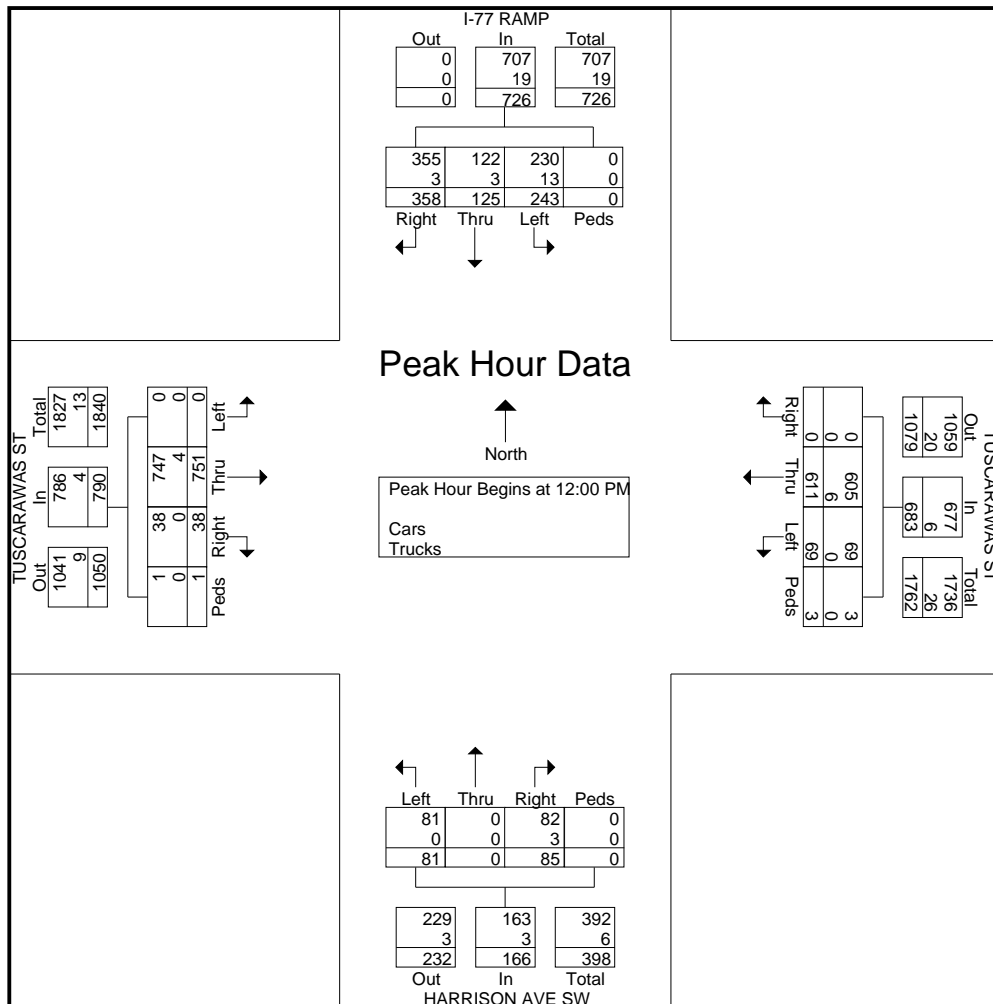




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File Name : Tuscarawas st and Harrison
Site Code : 00000000
Start Date : 9/30/2015
Page No : 4

Start Time	I-77 RAMP From North					TUSCARAWAS ST From East					HARRISON AVE SW From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	81	25	48	0	154	0	139	21	0	160	29	0	22	0	51	9	146	0	0	155	520
12:15 PM	92	40	75	0	207	0	139	17	0	156	23	0	18	0	41	4	173	0	1	178	582
12:30 PM	80	34	62	0	176	0	177	17	2	196	13	0	19	0	32	13	220	0	0	233	637
12:45 PM	105	26	58	0	189	0	156	14	1	171	20	0	22	0	42	12	212	0	0	224	626
Total Volume	358	125	243	0	726	0	611	69	3	683	85	0	81	0	166	38	751	0	1	790	2365
% App. Total	49.3	17.2	33.5	0		0	89.5	10.1	0.4		51.2	0	48.8	0		4.8	95.1	0	0.1		
PHF	.852	.781	.810	.000	.877	.000	.863	.821	.375	.871	.733	.000	.920	.000	.814	.731	.853	.000	.250	.848	.928
Cars	355	122	230	0	707	0	605	69	3	677	82	0	81	0	163	38	747	0	1	786	2333
% Cars	99.2	97.6	94.7	0	97.4	0	99.0	100	100	99.1	96.5	0	100	0	98.2	100	99.5	0	100	99.5	98.6
Trucks	3	3	13	0	19	0	6	0	0	6	3	0	0	0	3	0	4	0	0	4	32
% Trucks	0.8	2.4	5.3	0	2.6	0	1.0	0	0	0.9	3.5	0	0	0	1.8	0	0.5	0	0	0.5	1.4

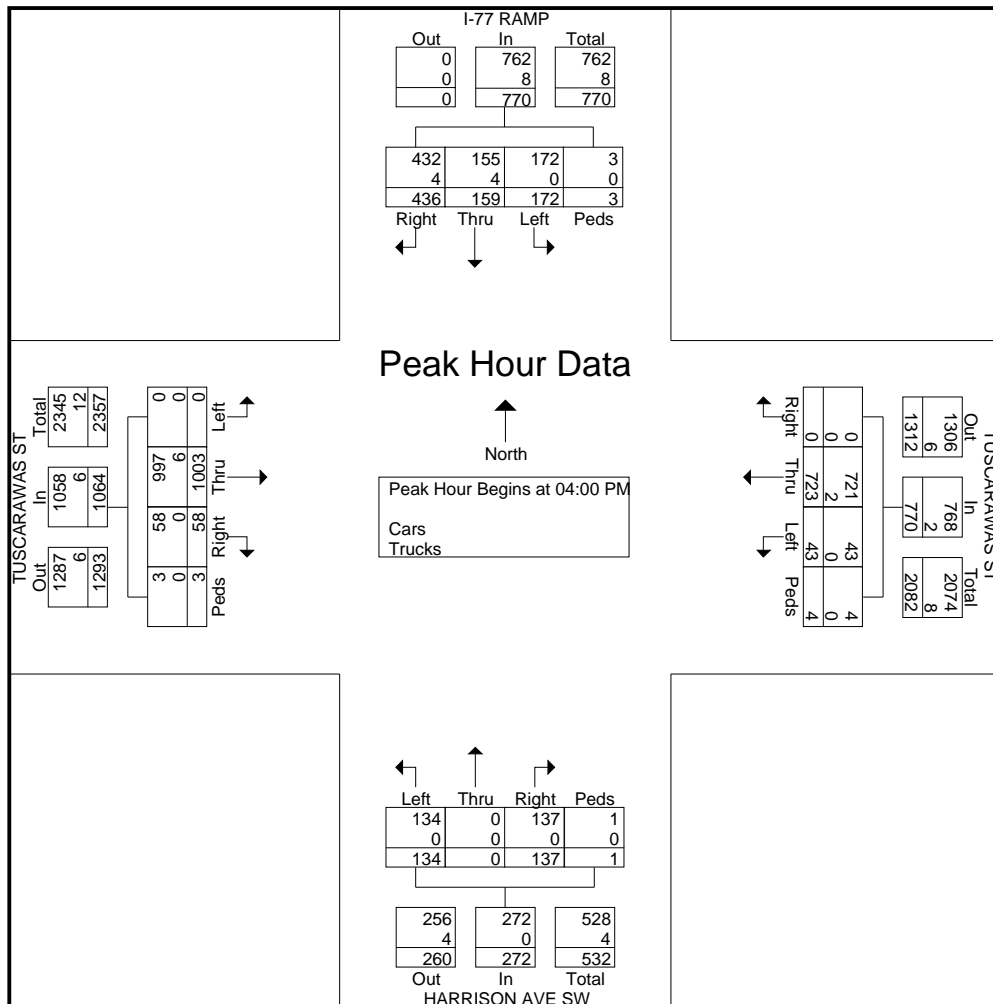




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File Name : Tuscarawas st and Harrison
Site Code : 00000000
Start Date : 9/30/2015
Page No : 5

Start Time	I-77 RAMP From North					TUSCARAWAS ST From East					HARRISON AVE SW From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	100	29	47	2	178	0	176	10	0	186	53	0	42	0	95	9	221	0	2	232	691
04:15 PM	116	40	37	0	193	0	191	10	1	202	30	0	29	0	59	13	253	0	1	267	721
04:30 PM	95	43	41	1	180	0	180	11	1	192	21	0	29	0	50	20	264	0	0	284	706
04:45 PM	125	47	47	0	219	0	176	12	2	190	33	0	34	1	68	16	265	0	0	281	758
Total Volume	436	159	172	3	770	0	723	43	4	770	137	0	134	1	272	58	1003	0	3	1064	2876
% App. Total	56.6	20.6	22.3	0.4		0	93.9	5.6	0.5		50.4	0	49.3	0.4		5.5	94.3	0	0.3		
PHF	.872	.846	.915	.375	.879	.000	.946	.896	.500	.953	.646	.000	.798	.250	.716	.725	.946	.000	.375	.937	.949
Cars	432	155	172	3	762	0	721	43	4	768	137	0	134	1	272	58	997	0	3	1058	2860
% Cars	99.1	97.5	100	100	99.0	0	99.7	100	100	99.7	100	0	100	100	100	100	99.4	0	100	99.4	99.4
Trucks	4	4	0	0	8	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	16
% Trucks	0.9	2.5	0	0	1.0	0	0.3	0	0	0.3	0	0	0	0	0	0	0.6	0	0	0.6	0.6





Mannik & Smith Group Inc.
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Int: Tuscarawas St & Maryland Ave
Counted By: MJL
Day: Thursday
Weather: Sunny

File Name : Tuscarawas st and Maryland
Site Code : 00000000
Start Date : 9/24/2015
Page No : 1

Groups Printed- Cars - Trucks

Start Time	MARYLAND AVE From North					TUSCARAWAS ST From East					MARYLAND AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	3	0	3	6	85	4	0	95	18	2	5	0	25	6	109	0	0	115	238
07:15 AM	0	1	4	1	6	8	103	7	0	118	9	4	4	2	19	16	155	0	0	171	314
07:30 AM	0	1	9	1	11	9	110	7	0	126	5	3	8	0	16	4	144	1	0	149	302
07:45 AM	1	2	5	0	8	10	119	4	0	133	18	6	8	0	32	6	217	0	0	223	396
Total	1	4	21	2	28	33	417	22	0	472	50	15	25	2	92	32	625	1	0	658	1250
08:00 AM	0	2	4	0	6	10	114	8	0	132	11	11	10	1	33	4	194	1	0	199	370
08:15 AM	0	4	4	1	9	13	122	10	0	145	14	10	5	0	29	8	172	0	1	181	364
08:30 AM	3	1	9	4	17	12	151	10	0	173	14	8	8	0	30	3	178	0	1	182	402
08:45 AM	0	4	3	0	7	11	122	10	1	144	32	6	5	2	45	7	144	6	0	157	353
Total	3	11	20	5	39	46	509	38	1	594	71	35	28	3	137	22	688	7	2	719	1489
*** BREAK ***																					
11:00 AM	3	6	8	0	17	3	185	8	0	196	17	10	8	3	38	13	138	4	2	157	408
11:15 AM	1	3	5	0	9	16	178	5	1	200	11	4	12	0	27	8	151	1	2	162	398
11:30 AM	1	1	5	0	7	12	185	8	0	205	12	8	12	0	32	9	183	1	2	195	439
11:45 AM	1	5	6	0	12	12	204	16	1	233	14	10	10	2	36	7	173	0	1	181	462
Total	6	15	24	0	45	43	752	37	2	834	54	32	42	5	133	37	645	6	7	695	1707
12:00 PM	0	5	10	1	16	9	172	7	1	189	9	4	17	1	31	9	174	1	2	186	422
12:15 PM	0	3	4	0	7	7	232	15	1	255	17	1	29	1	48	7	189	9	2	207	517
12:30 PM	0	0	9	0	9	10	188	12	2	212	20	3	16	1	40	10	208	1	2	221	482
12:45 PM	0	2	1	0	3	3	181	20	1	205	16	5	20	2	43	7	231	4	1	243	494
Total	0	10	24	1	35	29	773	54	5	861	62	13	82	5	162	33	802	15	7	857	1915
*** BREAK ***																					
02:00 PM	3	1	5	0	9	6	177	10	0	193	12	3	26	3	44	5	176	1	0	182	428
02:15 PM	1	1	5	0	7	9	216	23	2	250	17	13	18	0	48	7	193	2	1	203	508
02:30 PM	0	4	2	1	7	6	200	13	1	220	20	4	15	0	39	9	191	0	1	201	467
02:45 PM	1	2	4	0	7	8	214	13	1	236	21	8	17	1	47	5	181	0	0	186	476
Total	5	8	16	1	30	29	807	59	4	899	70	28	76	4	178	26	741	3	2	772	1879
03:00 PM	0	5	6	0	11	10	197	13	0	220	27	4	31	2	64	8	216	1	3	228	523
03:15 PM	0	4	5	3	12	10	202	13	1	226	15	1	29	0	45	11	244	13	7	275	558
03:30 PM	1	0	8	1	10	16	228	21	1	266	10	6	14	4	34	7	198	2	1	208	518
03:45 PM	1	0	12	0	13	16	213	27	1	257	15	6	16	1	38	4	175	0	2	181	489
Total	2	9	31	4	46	52	840	74	3	969	67	17	90	7	181	30	833	16	13	892	2088
04:00 PM	0	5	5	1	11	9	248	21	4	282	20	12	22	0	54	13	205	2	0	220	567
04:15 PM	0	6	8	0	14	11	239	12	0	262	16	5	21	3	45	11	218	12	0	241	562
04:30 PM	0	3	6	1	10	12	214	15	0	241	23	4	23	0	50	12	177	4	5	198	499
04:45 PM	1	5	4	1	11	9	265	18	0	292	22	5	27	0	54	10	213	2	3	228	585
Total	1	19	23	3	46	41	966	66	4	1077	81	26	93	3	203	46	813	20	8	887	2213
05:00 PM	1	5	7	4	17	10	235	23	0	268	24	4	17	2	47	7	179	11	0	197	529
05:15 PM	1	2	6	2	11	7	229	17	2	255	20	4	24	0	48	18	192	1	0	211	525
05:30 PM	0	0	5	3	8	6	218	22	0	246	22	5	12	0	39	10	200	0	1	211	504
05:45 PM	2	3	3	1	9	6	206	16	4	232	26	6	12	0	44	7	179	6	0	192	477
Total	4	10	21	10	45	29	888	78	6	1001	92	19	65	2	178	42	750	18	1	811	2035

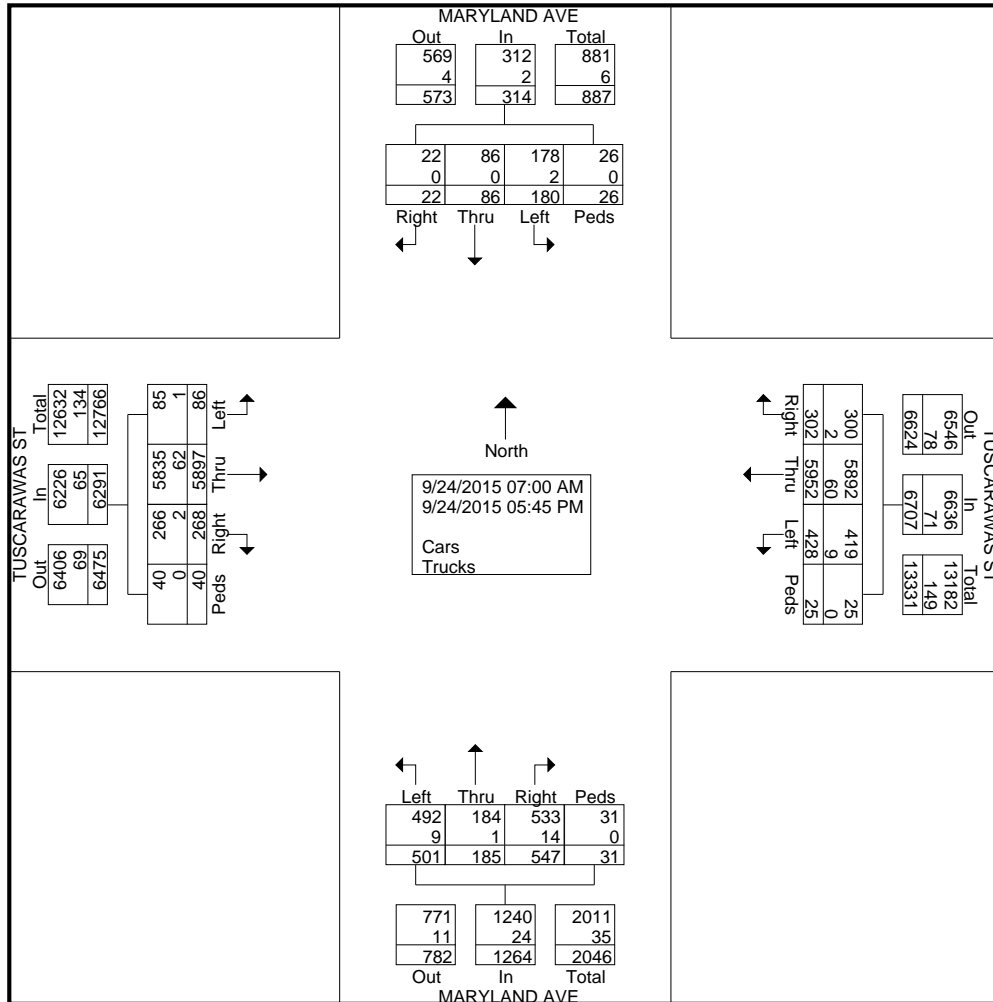


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File Name : Tuscarawas st and Maryland
Site Code : 00000000
Start Date : 9/24/2015
Page No : 2

Groups Printed- Cars - Trucks

	MARYLAND AVE From North					TUSCARAWAS ST From East					MARYLAND AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	22	86	180	26	314	302	5952	428	25	6707	547	185	501	31	1264	268	5897	86	40	6291	14576
Apprch %	7	27.4	57.3	8.3		4.5	88.7	6.4	0.4		43.3	14.6	39.6	2.5		4.3	93.7	1.4	0.6		
Total %	0.2	0.6	1.2	0.2	2.2	2.1	40.8	2.9	0.2	46	3.8	1.3	3.4	0.2	8.7	1.8	40.5	0.6	0.3	43.2	
Cars	22	86	178	26	312	300	5892	419	25	6636	533	184	492	31	1240	266	5835	85	40	6226	14414
% Cars	100	100	98.9	100	99.4	99.3	99	97.9	100	98.9	97.4	99.5	98.2	100	98.1	99.3	98.9	98.8	100	99	98.9
Trucks	0	0	2	0	2	2	60	9	0	71	14	1	9	0	24	2	62	1	0	65	162
% Trucks	0	0	1.1	0	0.6	0.7	1	2.1	0	1.1	2.6	0.5	1.8	0	1.9	0.7	1.1	1.2	0	1	1.1

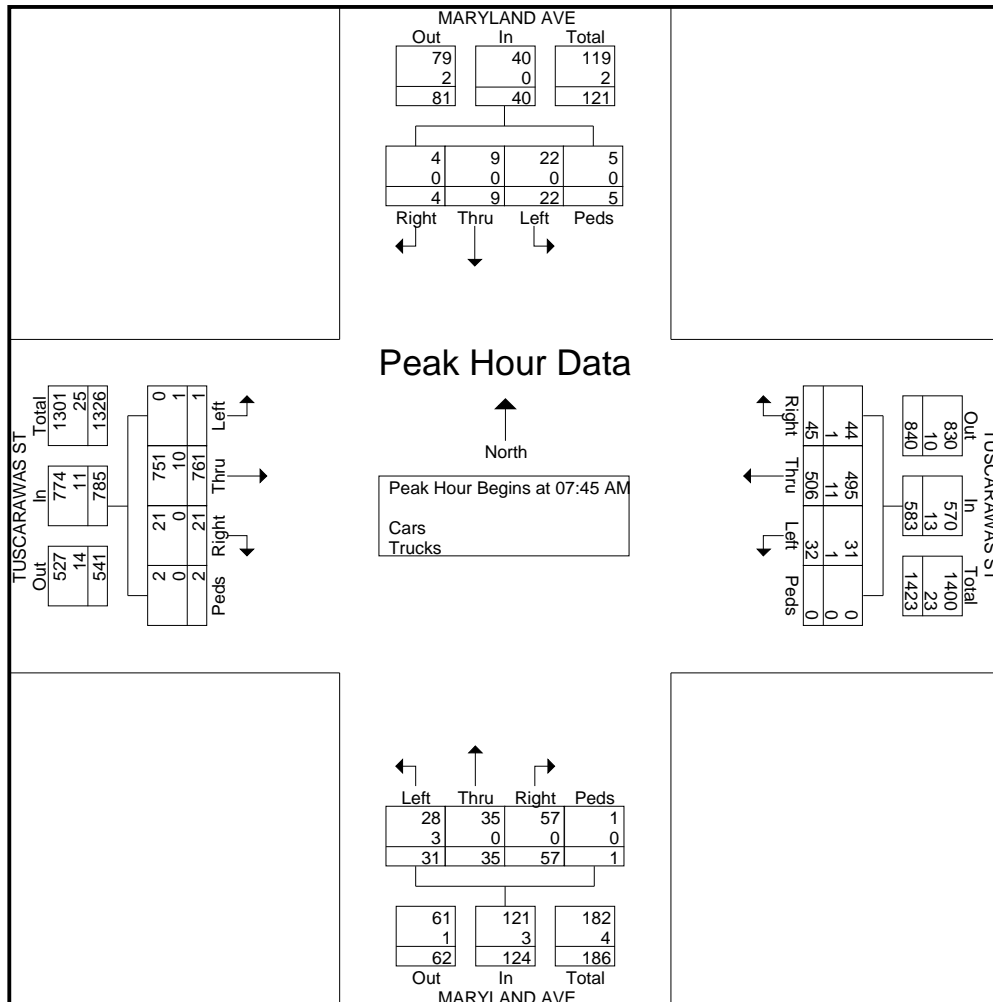




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File Name : Tuscarawas st and Maryland
Site Code : 00000000
Start Date : 9/24/2015
Page No : 3

Start Time	MARYLAND AVE From North					TUSCARAWAS ST From East					MARYLAND AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	1	2	5	0	8	10	119	4	0	133	18	6	8	0	32	6	217	0	0	223	396
08:00 AM	0	2	4	0	6	10	114	8	0	132	11	11	10	1	33	4	194	1	0	199	370
08:15 AM	0	4	4	1	9	13	122	10	0	145	14	10	5	0	29	8	172	0	1	181	364
08:30 AM	3	1	9	4	17	12	151	10	0	173	14	8	8	0	30	3	178	0	1	182	402
Total Volume	4	9	22	5	40	45	506	32	0	583	57	35	31	1	124	21	761	1	2	785	1532
% App. Total	10	22.5	55	12.5		7.7	86.8	5.5	0		46	28.2	25	0.8		2.7	96.9	0.1	0.3		
PHF	.333	.563	.611	.313	.588	.865	.838	.800	.000	.842	.792	.795	.775	.250	.939	.656	.877	.250	.500	.880	.953
Cars	4	9	22	5	40	44	495	31	0	570	57	35	28	1	121	21	751	0	2	774	1505
% Cars	100	100	100	100	100	97.8	97.8	96.9	0	97.8	100	100	90.3	100	97.6	100	98.7	0	100	98.6	98.2
Trucks	0	0	0	0	0	1	11	1	0	13	0	0	3	0	3	0	10	1	0	11	27
% Trucks	0	0	0	0	0	2.2	2.2	3.1	0	2.2	0	0	9.7	0	2.4	0	1.3	100	0	1.4	1.8

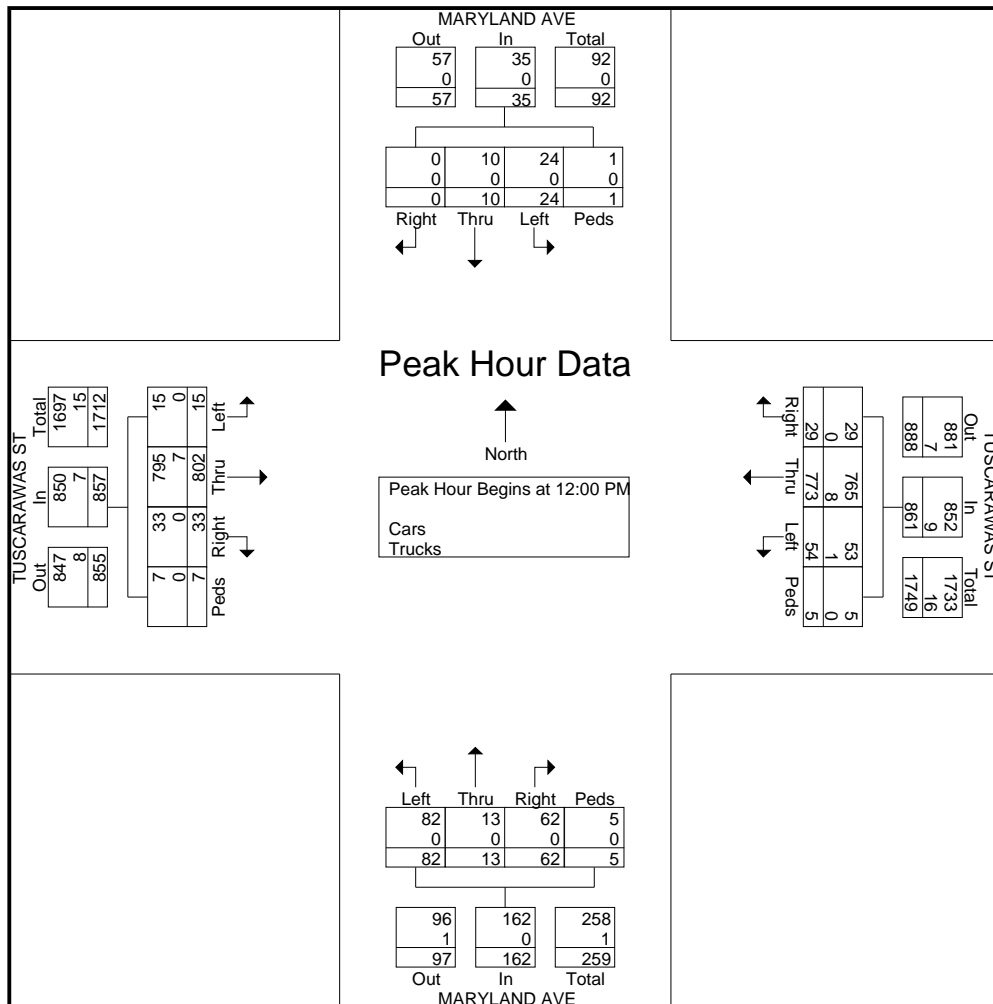




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File Name : Tuscarawas st and Maryland
Site Code : 00000000
Start Date : 9/24/2015
Page No : 4

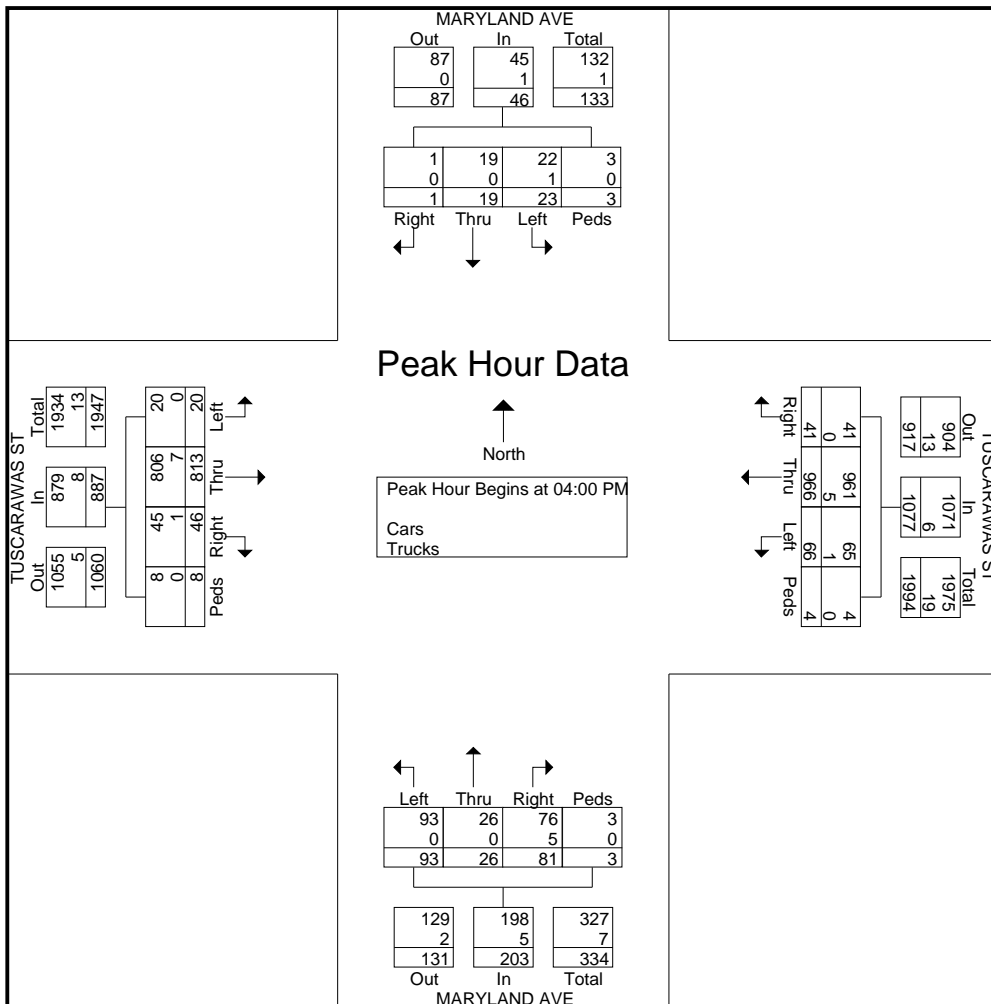
Start Time	MARYLAND AVE From North					TUSCARAWAS ST From East					MARYLAND AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	0	5	10	1	16	9	172	7	1	189	9	4	17	1	31	9	174	1	2	186	422
12:15 PM	0	3	4	0	7	7	232	15	1	255	17	1	29	1	48	7	189	9	2	207	517
12:30 PM	0	0	9	0	9	10	188	12	2	212	20	3	16	1	40	10	208	1	2	221	482
12:45 PM	0	2	1	0	3	3	181	20	1	205	16	5	20	2	43	7	231	4	1	243	494
Total Volume	0	10	24	1	35	29	773	54	5	861	62	13	82	5	162	33	802	15	7	857	1915
% App. Total	0	28.6	68.6	2.9		3.4	89.8	6.3	0.6		38.3	8	50.6	3.1		3.9	93.6	1.8	0.8		
PHF	.000	.500	.600	.250	.547	.725	.833	.675	.625	.844	.775	.650	.707	.625	.844	.825	.868	.417	.875	.882	.926
Cars	0	10	24	1	35	29	765	53	5	852	62	13	82	5	162	33	795	15	7	850	1899
% Cars	0	100	100	100	100	100	99.0	98.1	100	99.0	100	100	100	100	100	100	99.1	100	100	99.2	99.2
Trucks	0	0	0	0	0	0	8	1	0	9	0	0	0	0	0	0	7	0	0	7	16
% Trucks	0	0	0	0	0	0	1.0	1.9	0	1.0	0	0	0	0	0	0	0.9	0	0	0.8	0.8





File Name : Tuscarawas st and Maryland
Site Code : 00000000
Start Date : 9/24/2015
Page No : 5

Start Time	MARYLAND AVE From North					TUSCARAWAS ST From East					MARYLAND AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	5	5	1	11	9	248	21	4	282	20	12	22	0	54	13	205	2	0	220	567
04:15 PM	0	6	8	0	14	11	239	12	0	262	16	5	21	3	45	11	218	12	0	241	562
04:30 PM	0	3	6	1	10	12	214	15	0	241	23	4	23	0	50	12	177	4	5	198	499
04:45 PM	1	5	4	1	11	9	265	18	0	292	22	5	27	0	54	10	213	2	3	228	585
Total Volume	1	19	23	3	46	41	966	66	4	1077	81	26	93	3	203	46	813	20	8	887	2213
% App. Total	2.2	41.3	50	6.5		3.8	89.7	6.1	0.4		39.9	12.8	45.8	1.5		5.2	91.7	2.3	0.9		
PHF	.250	.792	.719	.750	.821	.854	.911	.786	.250	.922	.880	.542	.861	.250	.940	.885	.932	.417	.400	.920	.946
Cars	1	19	22	3	45	41	961	65	4	1071	76	26	93	3	198	45	806	20	8	879	2193
% Cars	100	100	95.7	100	97.8	100	99.5	98.5	100	99.4	93.8	100	100	100	97.5	97.8	99.1	100	100	99.1	99.1
Trucks	0	0	1	0	1	0	5	1	0	6	5	0	0	0	5	1	7	0	0	8	20
% Trucks	0	0	4.3	0	2.2	0	0.5	1.5	0	0.6	6.2	0	0	0	2.5	2.2	0.9	0	0	0.9	0.9





Mannik & Smith Group Inc.
www.manniksmithgroup.com

Int: Tuscarawas St & Raff Rd
 Counted By: MJL
 Day: Wednesday
 Weather: Sunny

File Name : Tuscarawas st and Raff
 Site Code : 00000000
 Start Date : 9/23/2015
 Page No : 1

Groups Printed- Cars - Trucks

Start Time	RAFF RD From North					TUSCARAWAS ST From East					RAFF RD From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	2	5	3	0	10	7	67	17	2	93	11	2	16	2	31	8	113	2	0	123	257
07:15 AM	1	3	3	0	7	1	73	17	1	92	21	5	16	0	42	19	145	1	0	165	306
07:30 AM	0	9	4	0	13	3	107	20	0	130	20	8	22	0	50	16	157	1	0	174	367
07:45 AM	5	15	9	0	29	4	125	28	0	157	18	18	31	0	67	12	196	2	0	210	463
Total	8	32	19	0	59	15	372	82	3	472	70	33	85	2	190	55	611	6	0	672	1393
08:00 AM	1	15	7	1	24	1	115	24	1	141	11	16	16	0	43	16	157	3	0	176	384
08:15 AM	2	2	1	0	5	0	113	22	0	135	21	4	25	0	50	13	166	0	0	179	369
08:30 AM	1	3	2	0	6	4	130	16	0	150	17	2	20	0	39	9	168	0	0	177	372
08:45 AM	2	4	7	0	13	3	128	17	0	148	17	6	23	0	46	14	134	0	0	148	355
Total	6	24	17	1	48	8	486	79	1	574	66	28	84	0	178	52	625	3	0	680	1480
*** BREAK ***																					
11:00 AM	0	8	3	1	12	3	168	23	1	195	27	9	47	0	83	17	134	0	2	153	443
11:15 AM	0	8	1	1	10	0	173	26	1	200	24	6	48	2	80	19	150	0	1	170	460
11:30 AM	4	5	1	0	10	3	189	21	0	213	9	1	39	1	50	31	161	0	0	192	465
11:45 AM	2	7	1	0	10	1	208	26	1	236	30	13	53	3	99	26	153	0	2	181	526
Total	6	28	6	2	42	7	738	96	3	844	90	29	187	6	312	93	598	0	5	696	1894
12:00 PM	2	7	0	0	9	1	220	19	0	240	17	7	61	1	86	28	139	3	0	170	505
12:15 PM	1	5	4	0	10	1	223	30	1	255	17	8	71	0	96	30	214	3	1	248	609
12:30 PM	2	6	0	2	10	1	201	27	3	232	18	8	55	0	81	33	223	0	1	257	580
12:45 PM	2	7	3	0	12	2	205	26	2	235	16	5	48	0	69	36	196	2	0	234	550
Total	7	25	7	2	41	5	849	102	6	962	68	28	235	1	332	127	772	8	2	909	2244
*** BREAK ***																					
02:00 PM	3	8	5	0	16	5	213	33	3	254	26	18	43	0	87	28	176	2	0	206	563
02:15 PM	2	15	8	0	25	5	187	29	0	221	26	10	50	0	86	35	186	0	0	221	553
02:30 PM	3	7	3	0	13	5	236	26	1	268	14	11	48	0	73	27	196	3	1	227	581
02:45 PM	2	13	2	0	17	3	200	23	0	226	21	10	53	1	85	26	195	2	1	224	552
Total	10	43	18	0	71	18	836	111	4	969	87	49	194	1	331	116	753	7	2	878	2249
03:00 PM	1	10	4	1	16	0	167	15	1	183	32	6	44	1	83	25	158	1	1	185	467
03:15 PM	3	10	2	0	15	2	233	25	3	263	23	12	64	1	100	26	231	3	0	260	638
03:30 PM	0	7	4	1	12	5	223	20	1	249	28	11	51	1	91	28	199	0	0	227	579
03:45 PM	2	5	2	0	9	3	221	31	1	256	18	11	54	0	83	36	165	4	2	207	555
Total	6	32	12	2	52	10	844	91	6	951	101	40	213	3	357	115	753	8	3	879	2239
04:00 PM	3	4	4	0	11	0	209	24	0	233	17	21	49	0	87	42	180	3	2	227	558
04:15 PM	1	3	3	0	7	2	204	35	2	243	25	19	57	0	101	33	154	2	1	190	541
04:30 PM	1	15	1	0	17	3	229	26	0	258	28	14	64	0	106	49	137	0	3	189	570
04:45 PM	3	9	2	2	16	4	228	32	1	265	24	13	59	0	96	33	174	2	0	209	586
Total	8	31	10	2	51	9	870	117	3	999	94	67	229	0	390	157	645	7	6	815	2255
05:00 PM	2	9	7	0	18	3	225	30	1	259	24	12	61	0	97	38	193	0	0	231	605
05:15 PM	1	10	5	0	16	5	207	42	3	257	18	16	71	0	105	26	176	0	1	203	581
05:30 PM	4	7	3	0	14	0	177	43	1	221	35	13	55	4	107	47	160	2	1	210	552
05:45 PM	3	9	0	0	12	0	189	28	1	218	34	14	46	1	95	22	189	0	0	211	536
Total	10	35	15	0	60	8	798	143	6	955	111	55	233	5	404	133	718	2	2	855	2274

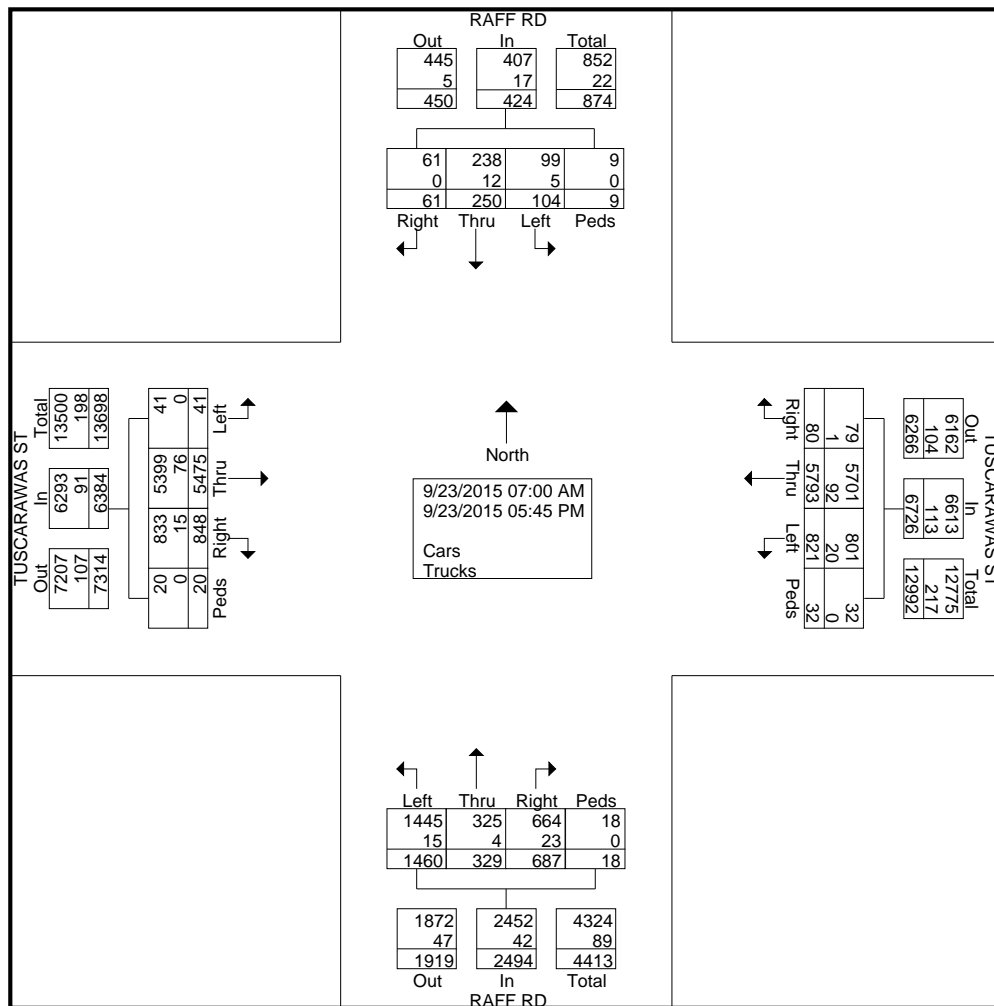


Mannik & Smith Group Inc.
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File Name : Tuscarawas st and Raff
Site Code : 00000000
Start Date : 9/23/2015
Page No : 2

Groups Printed- Cars - Trucks

	RAFF RD From North					TUSCARAWAS ST From East					RAFF RD From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	61	250	104	9	424	80	5793	821	32	6726	687	329	1460	18	2494	848	5475	41	20	6384	16028
Apprch %	14.4	59	24.5	2.1		1.2	86.1	12.2	0.5		27.5	13.2	58.5	0.7		13.3	85.8	0.6	0.3		
Total %	0.4	1.6	0.6	0.1	2.6	0.5	36.1	5.1	0.2	42	4.3	2.1	9.1	0.1	15.6	5.3	34.2	0.3	0.1	39.8	
Cars	61	238	99	9	407	79	5701	801	32	6613	664	325	1445	18	2452	833	5399	41	20	6293	15765
% Cars	100	95.2	95.2	100	96	98.8	98.4	97.6	100	98.3	96.7	98.8	99	100	98.3	98.2	98.6	100	100	98.6	98.4
Trucks	0	12	5	0	17	1	92	20	0	113	23	4	15	0	42	15	76	0	0	91	263
% Trucks	0	4.8	4.8	0	4	1.2	1.6	2.4	0	1.7	3.3	1.2	1	0	1.7	1.8	1.4	0	0	1.4	1.6

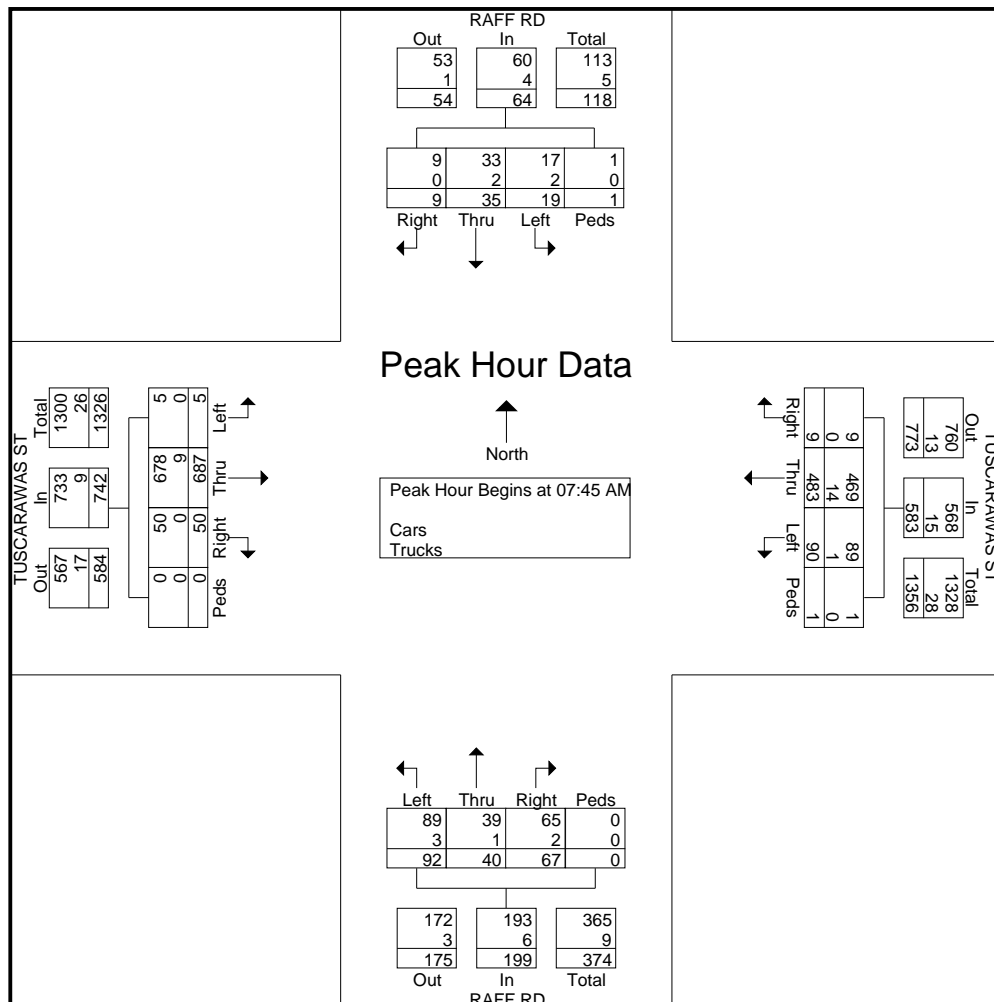




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Start Time	RAFF RD From North					TUSCARAWAS ST From East					RAFF RD From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	5	15	9	0	29	4	125	28	0	157	18	18	31	0	67	12	196	2	0	210	463
08:00 AM	1	15	7	1	24	1	115	24	1	141	11	16	16	0	43	16	157	3	0	176	384
08:15 AM	2	2	1	0	5	0	113	22	0	135	21	4	25	0	50	13	166	0	0	179	369
08:30 AM	1	3	2	0	6	4	130	16	0	150	17	2	20	0	39	9	168	0	0	177	372
Total Volume	9	35	19	1	64	9	483	90	1	583	67	40	92	0	199	50	687	5	0	742	1588
% App. Total	14.1	54.7	29.7	1.6		1.5	82.8	15.4	0.2		33.7	20.1	46.2	0		6.7	92.6	0.7	0		
PHF	.450	.583	.528	.250	.552	.563	.929	.804	.250	.928	.798	.556	.742	.000	.743	.781	.876	.417	.000	.883	.857
Cars	9	33	17	1	60	9	469	89	1	568	65	39	89	0	193	50	678	5	0	733	1554
% Cars	100	94.3	89.5	100	93.8	100	97.1	98.9	100	97.4	97.0	97.5	96.7	0	97.0	100	98.7	100	0	98.8	97.9
Trucks	0	2	2	0	4	0	14	1	0	15	2	1	3	0	6	0	9	0	0	9	34
% Trucks	0	5.7	10.5	0	6.3	0	2.9	1.1	0	2.6	3.0	2.5	3.3	0	3.0	0	1.3	0	0	1.2	2.1

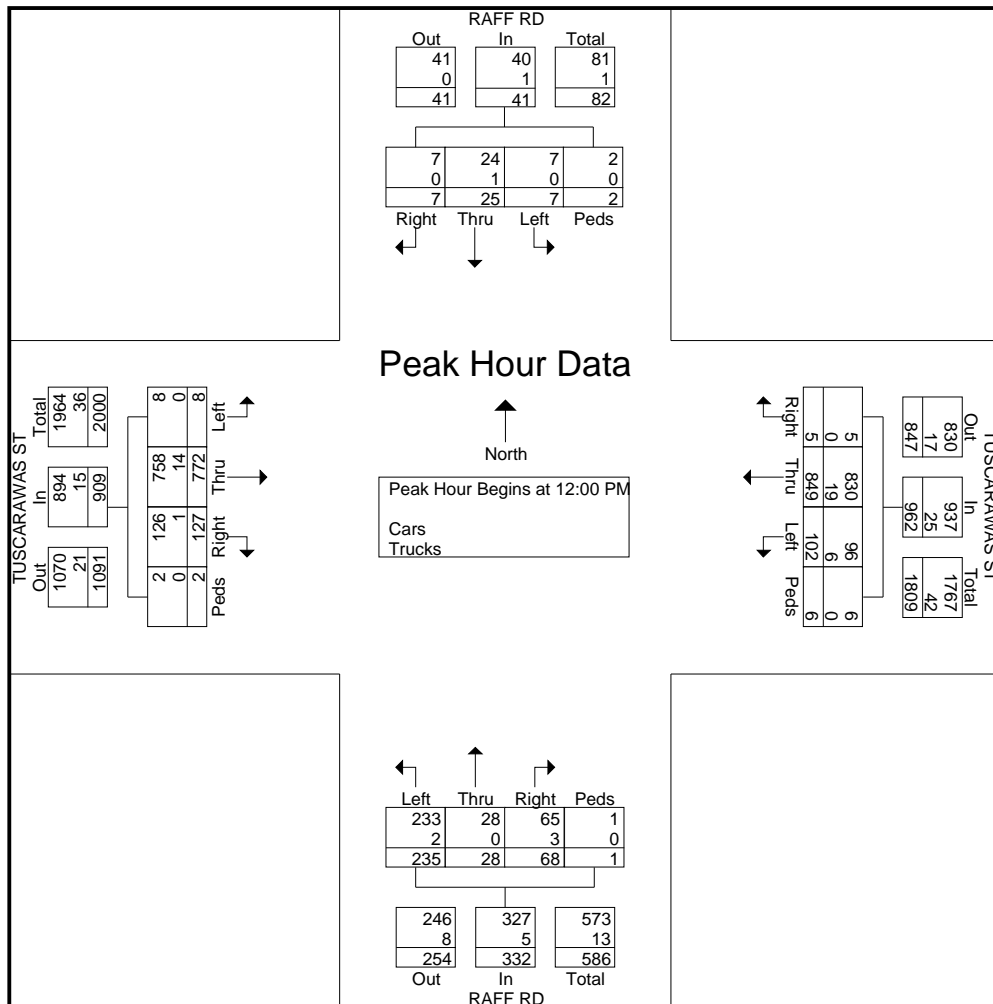




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Start Time	RAFF RD From North					TUSCARAWAS ST From East					RAFF RD From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	2	7	0	0	9	1	220	19	0	240	17	7	61	1	86	28	139	3	0	170	505
12:15 PM	1	5	4	0	10	1	223	30	1	255	17	8	71	0	96	30	214	3	1	248	609
12:30 PM	2	6	0	2	10	1	201	27	3	232	18	8	55	0	81	33	223	0	1	257	580
12:45 PM	2	7	3	0	12	2	205	26	2	235	16	5	48	0	69	36	196	2	0	234	550
Total Volume	7	25	7	2	41	5	849	102	6	962	68	28	235	1	332	127	772	8	2	909	2244
% App. Total	17.1	61	17.1	4.9		0.5	88.3	10.6	0.6		20.5	8.4	70.8	0.3		14	84.9	0.9	0.2		
PHF	.875	.893	.438	.250	.854	.625	.952	.850	.500	.943	.944	.875	.827	.250	.865	.882	.865	.667	.500	.884	.921
Cars	7	24	7	2	40	5	830	96	6	937	65	28	233	1	327	126	758	8	2	894	2198
% Cars	100	96.0	100	100	97.6	100	97.8	94.1	100	97.4	95.6	100	99.1	100	98.5	99.2	98.2	100	100	98.3	98.0
Trucks	0	1	0	0	1	0	19	6	0	25	3	0	2	0	5	1	14	0	0	15	46
% Trucks	0	4.0	0	0	2.4	0	2.2	5.9	0	2.6	4.4	0	0.9	0	1.5	0.8	1.8	0	0	1.7	2.0

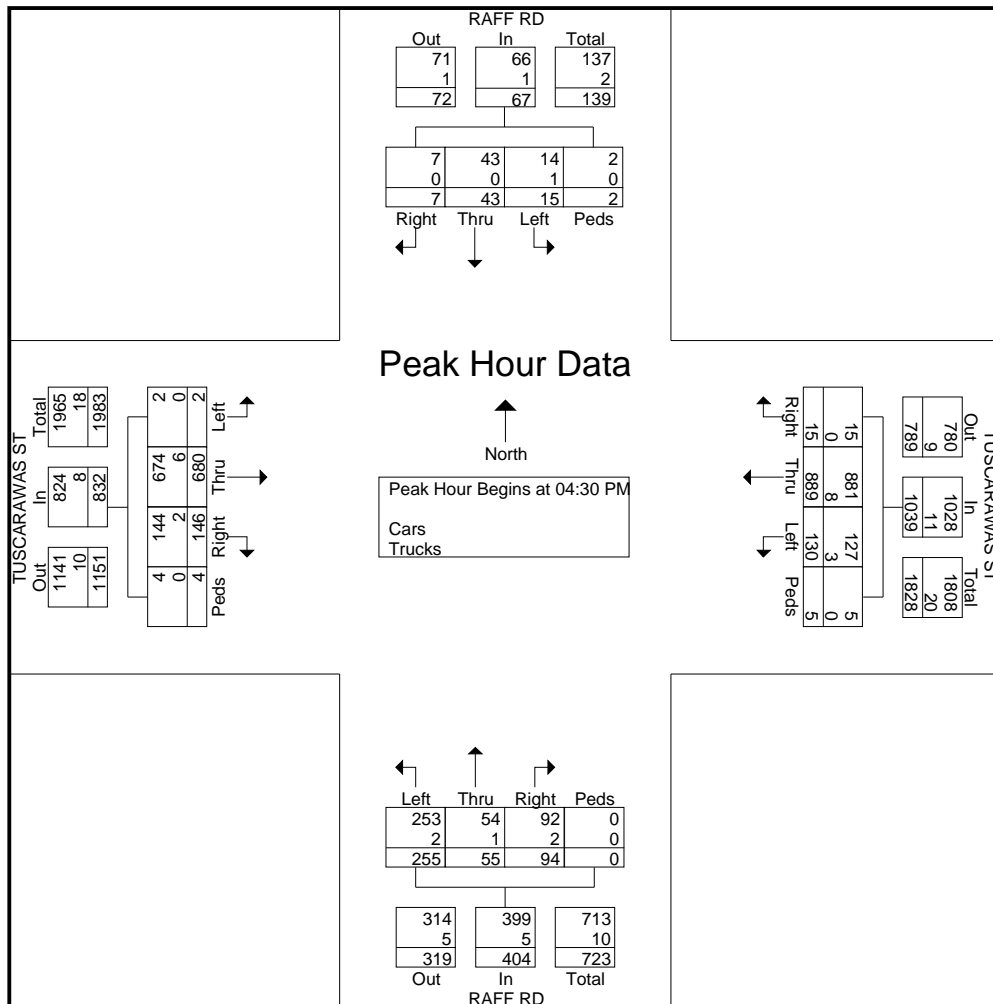




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Start Time	RAFF RD From North					TUSCARAWAS ST From East					RAFF RD From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	1	15	1	0	17	3	229	26	0	258	28	14	64	0	106	49	137	0	3	189	570
04:45 PM	3	9	2	2	16	4	228	32	1	265	24	13	59	0	96	33	174	2	0	209	586
05:00 PM	2	9	7	0	18	3	225	30	1	259	24	12	61	0	97	38	193	0	0	231	605
05:15 PM	1	10	5	0	16	5	207	42	3	257	18	16	71	0	105	26	176	0	1	203	581
Total Volume	7	43	15	2	67	15	889	130	5	1039	94	55	255	0	404	146	680	2	4	832	2342
% App. Total	10.4	64.2	22.4	3		1.4	85.6	12.5	0.5		23.3	13.6	63.1	0		17.5	81.7	0.2	0.5		
PHF	.583	.717	.536	.250	.931	.750	.971	.774	.417	.980	.839	.859	.898	.000	.953	.745	.881	.250	.333	.900	.968
Cars	7	43	14	2	66	15	881	127	5	1028	92	54	253	0	399	144	674	2	4	824	2317
% Cars	100	100	93.3	100	98.5	100	99.1	97.7	100	98.9	97.9	98.2	99.2	0	98.8	98.6	99.1	100	100	99.0	98.9
Trucks	0	0	1	0	1	0	8	3	0	11	2	1	2	0	5	2	6	0	0	8	25
% Trucks	0	0	6.7	0	1.5	0	0.9	2.3	0	1.1	2.1	1.8	0.8	0	1.2	1.4	0.9	0	0	1.0	1.1





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Int. : Tuscarawas St & Valleyview Ave
 Counted By: KH
 Day: Tuesday
 Weather: Sunny

File Name : Tuscarawas st and Valleyview
 Site Code : 00000000
 Start Date : 9/22/2015
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Groups Printed- Cars - Trucks

Start Time	VALLEYVIEW AVE From North					TUSCARAWAS ST From East					VALLEYVIEW AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	7	3	12	0	22	14	69	7	0	90	3	3	7	0	13	7	126	3	0	136	261
07:15 AM	1	5	9	0	15	7	101	8	0	116	7	0	6	0	13	4	138	0	0	142	286
07:30 AM	3	4	12	0	19	10	121	11	0	142	5	8	8	0	21	7	191	1	0	199	381
07:45 AM	1	4	16	0	21	12	100	7	0	119	4	1	12	0	17	6	169	2	0	177	334
Total	12	16	49	0	77	43	391	33	0	467	19	12	33	0	64	24	624	6	0	654	1262
08:00 AM	3	1	13	0	17	6	114	8	1	129	3	3	8	1	15	7	122	3	1	133	294
08:15 AM	0	2	14	0	16	3	106	13	0	122	5	1	10	0	16	7	144	4	0	155	309
08:30 AM	6	1	21	0	28	12	119	13	0	144	8	2	12	0	22	6	154	5	0	165	359
08:45 AM	5	6	17	0	28	12	113	20	0	145	5	8	15	0	28	14	127	7	0	148	349
Total	14	10	65	0	89	33	452	54	1	540	21	14	45	1	81	34	547	19	1	601	1311
*** BREAK ***																					
11:00 AM	5	11	19	0	35	26	148	22	0	196	11	15	25	0	51	13	175	10	0	198	480
11:15 AM	4	15	18	0	37	26	154	27	0	207	14	9	34	0	57	15	129	10	0	154	455
11:30 AM	9	16	29	0	54	22	191	24	0	237	11	10	29	0	50	23	153	19	0	195	536
11:45 AM	7	9	24	0	40	16	175	37	0	228	16	7	28	0	51	23	164	11	0	198	517
Total	25	51	90	0	166	90	668	110	0	868	52	41	116	0	209	74	621	50	0	745	1988
12:00 PM	11	9	17	1	38	18	185	27	0	230	21	13	33	0	67	11	183	7	0	201	536
12:15 PM	8	21	36	0	65	20	188	27	0	235	17	10	26	0	53	18	172	4	0	194	547
12:30 PM	8	15	30	0	53	25	175	23	0	223	12	13	30	0	55	14	197	11	0	222	553
12:45 PM	5	15	32	0	52	20	189	42	0	251	16	12	33	0	61	15	178	6	0	199	563
Total	32	60	115	1	208	83	737	119	0	939	66	48	122	0	236	58	730	28	0	816	2199
*** BREAK ***																					
02:00 PM	5	14	15	0	34	28	179	37	0	244	13	7	37	0	57	18	145	6	0	169	504
02:15 PM	7	17	17	0	41	37	185	23	1	246	19	10	32	1	62	20	155	7	0	182	531
02:30 PM	13	11	21	0	45	23	186	32	1	242	22	11	27	0	60	23	153	2	0	178	525
02:45 PM	3	2	22	0	27	33	176	30	1	240	16	13	36	0	65	20	164	6	0	190	522
Total	28	44	75	0	147	121	726	122	3	972	70	41	132	1	244	81	617	21	0	719	2082
03:00 PM	11	9	17	0	37	28	177	28	0	233	20	11	25	0	56	21	160	9	0	190	516
03:15 PM	6	5	18	1	30	25	253	27	1	306	18	11	19	0	48	18	153	10	0	181	565
03:30 PM	13	15	27	0	55	24	199	29	0	252	15	12	33	0	60	33	150	9	0	192	559
03:45 PM	12	14	28	0	54	31	224	21	3	279	19	15	26	1	61	25	154	6	1	186	580
Total	42	43	90	1	176	108	853	105	4	1070	72	49	103	1	225	97	617	34	1	749	2220
04:00 PM	7	9	18	1	35	23	206	29	0	258	18	10	23	0	51	28	139	3	1	171	515
04:15 PM	7	14	20	0	41	29	194	26	1	250	22	20	33	1	76	18	151	7	3	179	546
04:30 PM	8	12	20	0	40	28	254	27	0	309	18	6	29	1	54	20	184	16	0	220	623
04:45 PM	7	14	24	0	45	25	247	37	0	309	15	16	24	0	55	33	165	12	0	210	619
Total	29	49	82	1	161	105	901	119	1	1126	73	52	109	2	236	99	639	38	4	780	2303
05:00 PM	12	14	24	1	51	24	219	32	0	275	19	14	34	0	67	15	152	9	0	176	569
05:15 PM	5	9	16	0	30	21	211	33	1	266	21	7	27	0	55	35	186	12	2	235	586
05:30 PM	6	12	26	1	45	20	193	33	0	246	15	16	35	0	66	14	167	7	2	190	547
05:45 PM	4	8	23	0	35	18	189	30	1	238	13	12	30	0	55	12	160	6	1	179	507
Total	27	43	89	2	161	83	812	128	2	1025	68	49	126	0	243	76	665	34	5	780	2209

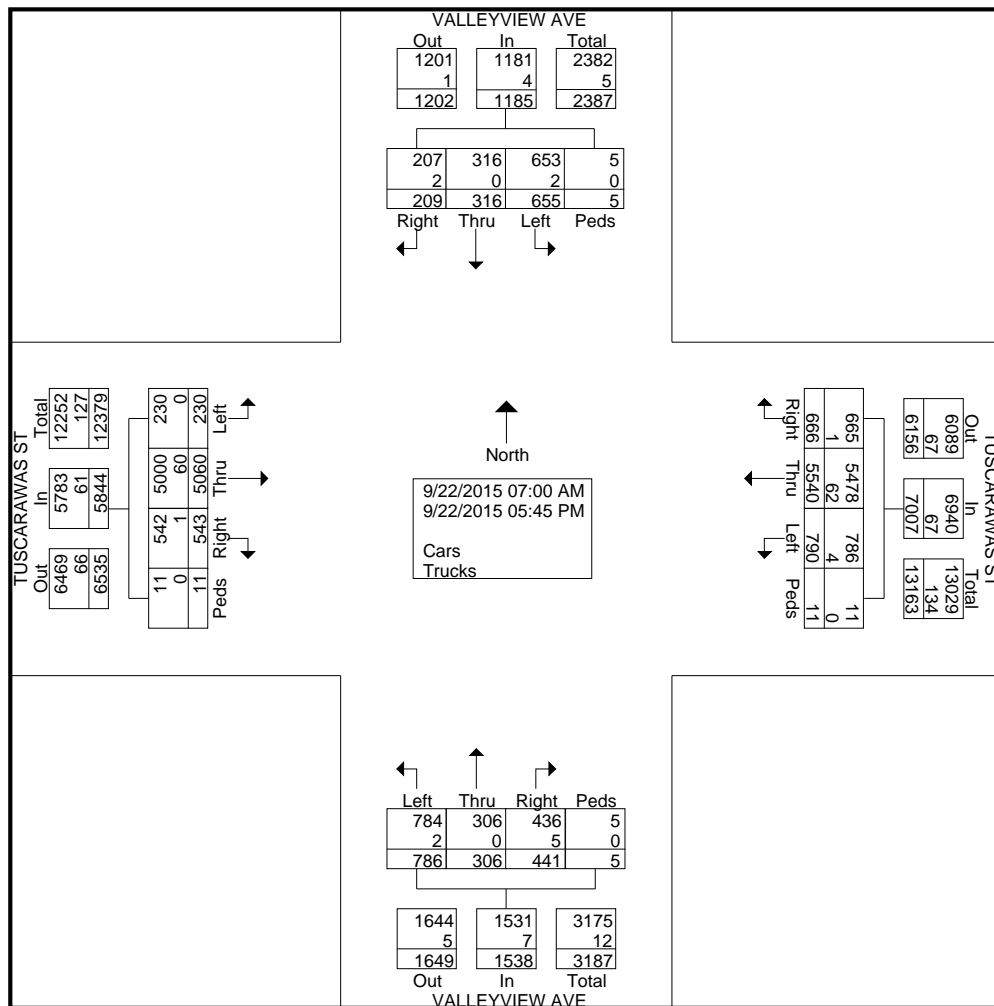


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Groups Printed- Cars - Trucks

	VALLEYVIEW AVE From North					TUSCARAWAS ST From East					VALLEYVIEW AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	209	316	655	5	1185	666	5540	790	11	7007	441	306	786	5	1538	543	5060	230	11	5844	15574
Apprch %	17.6	26.7	55.3	0.4		9.5	79.1	11.3	0.2		28.7	19.9	51.1	0.3		9.3	86.6	3.9	0.2		
Total %	1.3	2	4.2	0	7.6	4.3	35.6	5.1	0.1	45	2.8	2	5	0	9.9	3.5	32.5	1.5	0.1	37.5	
Cars	207	316	653	5	1181	665	5478	786	11	6940	436	306	784	5	1531	542	5000	230	11	5783	15435
% Cars	99	100	99.7	100	99.7	99.8	98.9	99.5	100	99	98.9	100	99.7	100	99.5	99.8	98.8	100	100	99	99.1
Trucks	2	0	2	0	4	1	62	4	0	67	5	0	2	0	7	1	60	0	0	61	139
% Trucks	1	0	0.3	0	0.3	0.2	1.1	0.5	0	1	1.1	0	0.3	0	0.5	0.2	1.2	0	0	1	0.9

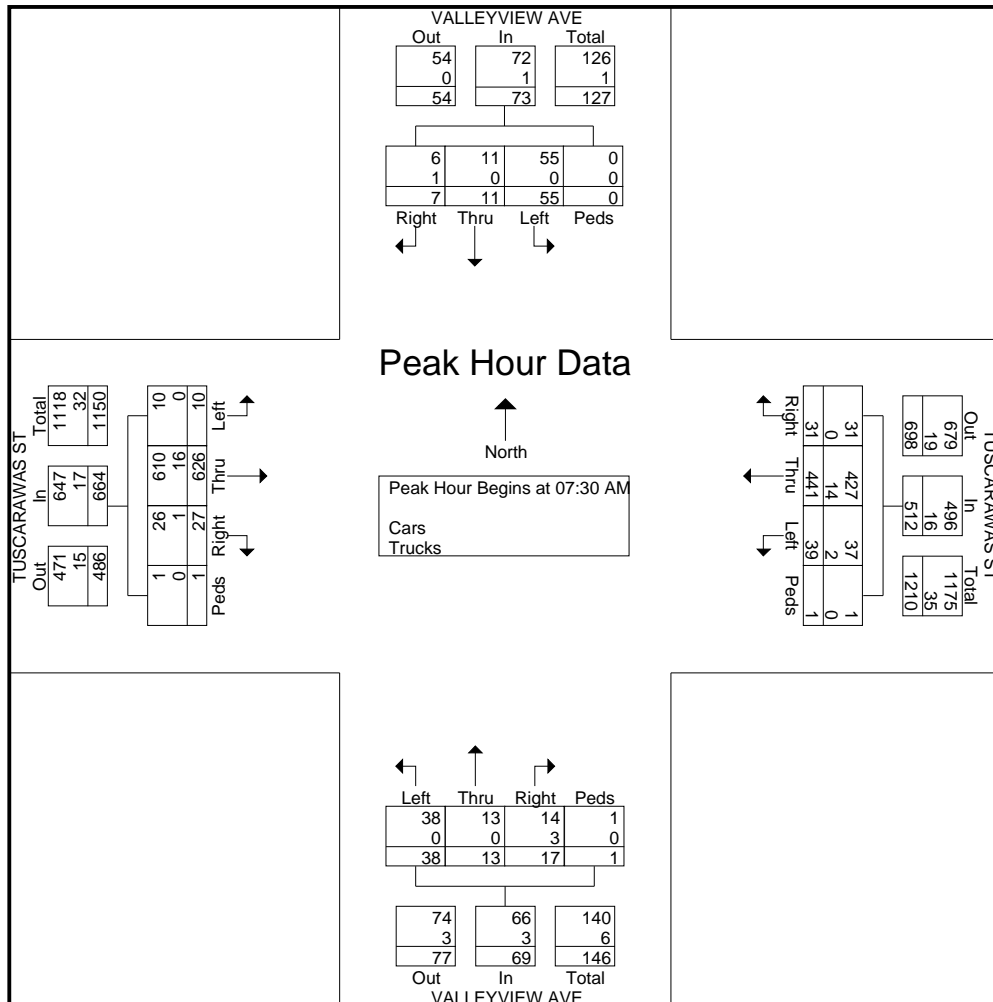




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Start Time	VALLEYVIEW AVE From North					TUSCARAWAS ST From East					VALLEYVIEW AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	3	4	12	0	19	10	121	11	0	142	5	8	8	0	21	7	191	1	0	199	381
07:45 AM	1	4	16	0	21	12	100	7	0	119	4	1	12	0	17	6	169	2	0	177	334
08:00 AM	3	1	13	0	17	6	114	8	1	129	3	3	8	1	15	7	122	3	1	133	294
08:15 AM	0	2	14	0	16	3	106	13	0	122	5	1	10	0	16	7	144	4	0	155	309
Total Volume	7	11	55	0	73	31	441	39	1	512	17	13	38	1	69	27	626	10	1	664	1318
% App. Total	9.6	15.1	75.3	0		6.1	86.1	7.6	0.2		24.6	18.8	55.1	1.4		4.1	94.3	1.5	0.2		
PHF	.583	.688	.859	.000	.869	.646	.911	.750	.250	.901	.850	.406	.792	.250	.821	.964	.819	.625	.250	.834	.865
Cars	6	11	55	0	72	31	427	37	1	496	14	13	38	1	66	26	610	10	1	647	1281
% Cars	85.7	100	100	0	98.6	100	96.8	94.9	100	96.9	82.4	100	100	100	95.7	96.3	97.4	100	100	97.4	97.2
Trucks	1	0	0	0	1	0	14	2	0	16	3	0	0	0	3	1	16	0	0	17	37
% Trucks	14.3	0	0	0	1.4	0	3.2	5.1	0	3.1	17.6	0	0	0	4.3	3.7	2.6	0	0	2.6	2.8

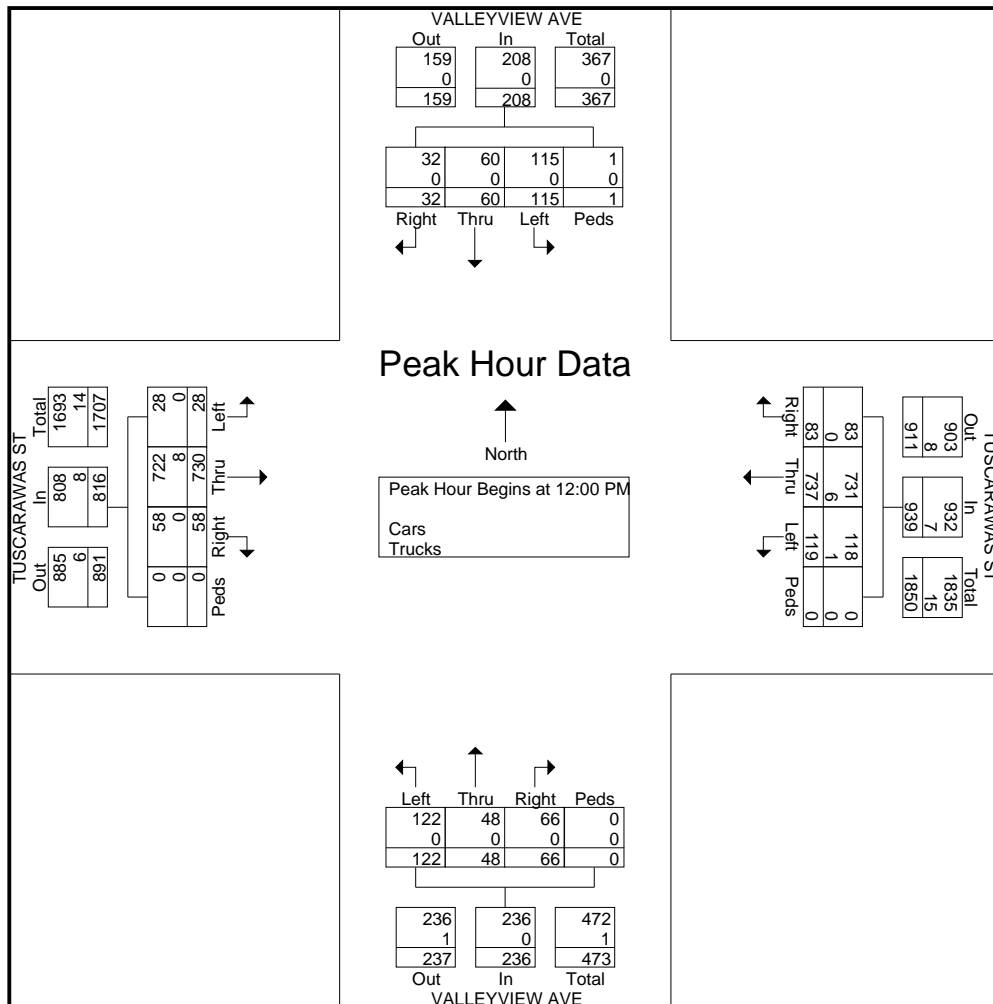




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Start Time	VALLEYVIEW AVE From North					TUSCARAWAS ST From East					VALLEYVIEW AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	11	9	17	1	38	18	185	27	0	230	21	13	33	0	67	11	183	7	0	201	536
12:15 PM	8	21	36	0	65	20	188	27	0	235	17	10	26	0	53	18	172	4	0	194	547
12:30 PM	8	15	30	0	53	25	175	23	0	223	12	13	30	0	55	14	197	11	0	222	553
12:45 PM	5	15	32	0	52	20	189	42	0	251	16	12	33	0	61	15	178	6	0	199	563
Total Volume	32	60	115	1	208	83	737	119	0	939	66	48	122	0	236	58	730	28	0	816	2199
% App. Total	15.4	28.8	55.3	0.5		8.8	78.5	12.7	0		28	20.3	51.7	0		7.1	89.5	3.4	0		
PHF	.727	.714	.799	.250	.800	.830	.975	.708	.000	.935	.786	.923	.924	.000	.881	.806	.926	.636	.000	.919	.976
Cars	32	60	115	1	208	83	731	118	0	932	66	48	122	0	236	58	722	28	0	808	2184
% Cars	100	100	100	100	100	100	99.2	99.2	0	99.3	100	100	100	0	100	100	98.9	100	0	99.0	99.3
Trucks	0	0	0	0	0	0	6	1	0	7	0	0	0	0	0	0	8	0	0	8	15
% Trucks	0	0	0	0	0	0	0.8	0.8	0	0.7	0	0	0	0	0	0	1.1	0	0	1.0	0.7

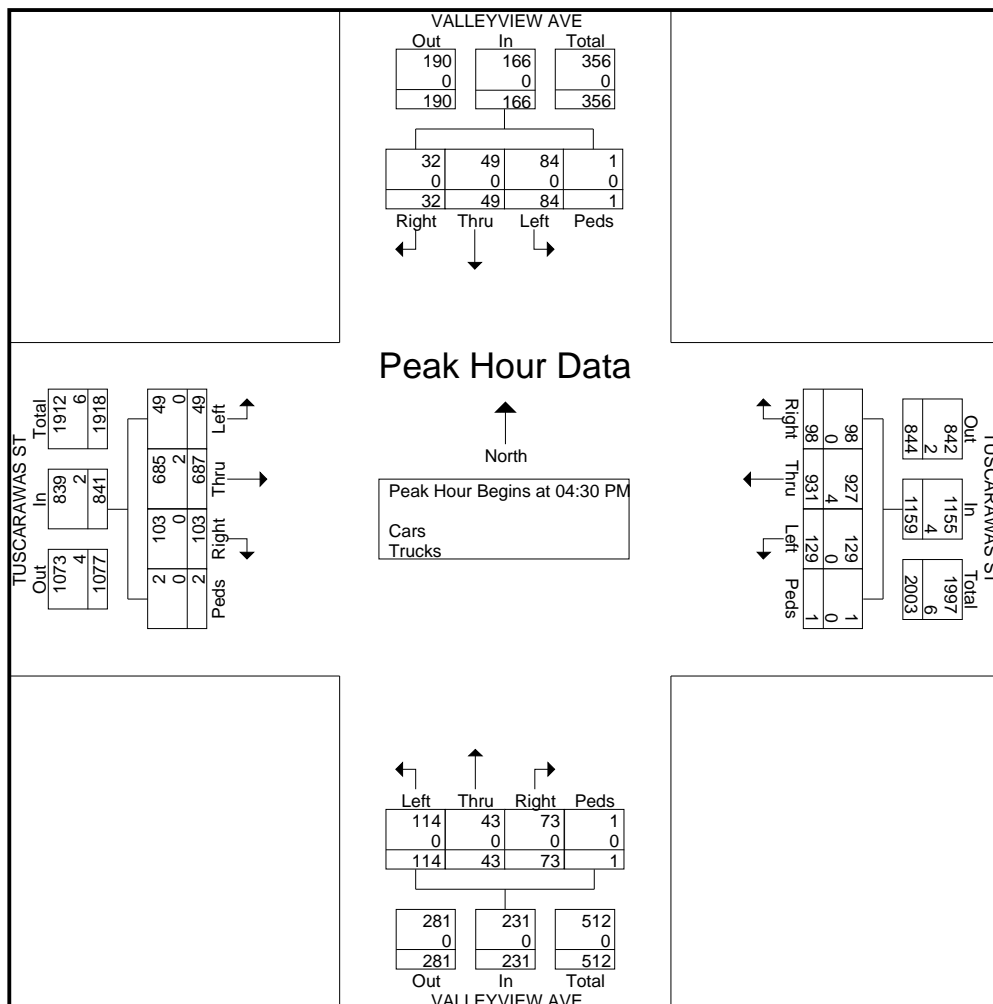




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File Name : Tuscarawas st and Valleyview
Site Code : 00000000
Start Date : 9/22/2015
Page No : 5

Start Time	VALLEYVIEW AVE From North					TUSCARAWAS ST From East					VALLEYVIEW AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	8	12	20	0	40	28	254	27	0	309	18	6	29	1	54	20	184	16	0	220	623
04:45 PM	7	14	24	0	45	25	247	37	0	309	15	16	24	0	55	33	165	12	0	210	619
05:00 PM	12	14	24	1	51	24	219	32	0	275	19	14	34	0	67	15	152	9	0	176	569
05:15 PM	5	9	16	0	30	21	211	33	1	266	21	7	27	0	55	35	186	12	2	235	586
Total Volume	32	49	84	1	166	98	931	129	1	1159	73	43	114	1	231	103	687	49	2	841	2397
% App. Total	19.3	29.5	50.6	0.6		8.5	80.3	11.1	0.1		31.6	18.6	49.4	0.4		12.2	81.7	5.8	0.2		
PHF	.667	.875	.875	.250	.814	.875	.916	.872	.250	.938	.869	.672	.838	.250	.862	.736	.923	.766	.250	.895	.962
Cars	32	49	84	1	166	98	927	129	1	1155	73	43	114	1	231	103	685	49	2	839	2391
% Cars	100	100	100	100	100	100	99.6	100	100	99.7	100	100	100	100	100	100	99.7	100	100	99.8	99.7
Trucks	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	6
% Trucks	0	0	0	0	0	0	0.4	0	0	0.3	0	0	0	0	0	0	0.3	0	0	0.2	0.3





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Int. :Tuscarawas St & Wertz Ave
Counted By: AK
Day: Thursday
Weather: Sunny

File Name : Tuscarawas st and Wertz
Site Code : 00000000
Start Date : 9/24/2015
Page No : 1

Groups Printed- Cars - Trucks

Start Time	WERTZ AVE From North					TUSCARAWAS ST From East					WERTZ AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	14	0	13	0	27	13	104	0	0	117	0	0	0	0	0	0	132	20	0	152	296
07:15 AM	18	0	27	0	45	8	95	0	0	103	0	0	0	0	0	0	163	13	0	176	324
07:30 AM	24	0	27	0	51	9	138	0	0	147	0	0	0	0	0	0	202	13	0	215	413
07:45 AM	17	0	34	0	51	13	149	0	0	162	0	0	0	0	0	0	233	22	0	255	468
Total	73	0	101	0	174	43	486	0	0	529	0	0	0	0	0	0	730	68	0	798	1501
08:00 AM	23	0	20	0	43	10	135	0	0	145	0	0	0	1	1	0	181	16	0	197	386
08:15 AM	12	0	23	0	35	27	148	0	0	175	0	0	0	0	0	0	176	14	0	190	400
08:30 AM	30	0	26	0	56	11	163	0	0	174	0	0	0	0	0	0	168	17	0	185	415
08:45 AM	26	0	30	2	58	13	192	0	0	205	0	0	0	0	0	0	181	33	0	214	477
Total	91	0	99	2	192	61	638	0	0	699	0	0	0	1	1	0	706	80	0	786	1678
*** BREAK ***																					
11:00 AM	30	0	22	1	53	10	200	0	3	213	0	0	0	0	0	0	149	21	0	170	436
11:15 AM	32	0	15	1	48	21	196	0	3	220	0	0	0	4	4	0	169	30	0	199	471
11:30 AM	26	0	21	1	48	20	211	0	0	231	0	0	0	1	1	0	196	23	0	219	499
11:45 AM	25	0	26	1	52	16	226	0	1	243	0	0	0	0	0	0	188	25	0	213	508
Total	113	0	84	4	201	67	833	0	7	907	0	0	0	5	5	0	702	99	0	801	1914
12:00 PM	47	0	26	0	73	13	208	0	2	223	0	0	0	0	0	0	214	35	0	249	545
12:15 PM	28	0	22	0	50	13	221	0	0	234	0	0	0	6	6	0	234	27	0	261	551
12:30 PM	31	0	19	1	51	21	205	0	0	226	0	0	0	1	1	0	221	32	0	253	531
12:45 PM	29	0	16	2	47	20	205	0	2	227	0	0	0	0	0	0	242	29	0	271	545
Total	135	0	83	3	221	67	839	0	4	910	0	0	0	7	7	0	911	123	0	1034	2172
*** BREAK ***																					
02:00 PM	34	0	19	1	54	21	186	0	1	208	0	0	0	1	1	0	179	25	0	204	467
02:15 PM	30	0	27	0	57	48	194	0	2	244	0	0	0	0	0	0	202	30	0	232	533
02:30 PM	39	0	25	4	68	28	238	0	2	268	0	0	0	0	0	0	193	40	0	233	569
02:45 PM	47	0	30	0	77	12	230	0	0	242	0	0	0	0	0	0	226	37	0	263	582
Total	150	0	101	5	256	109	848	0	5	962	0	0	0	1	1	0	800	132	0	932	2151
03:00 PM	54	0	23	1	78	26	256	0	3	285	0	0	0	2	2	0	256	35	0	291	656
03:15 PM	54	0	26	4	84	34	225	0	3	262	0	0	0	0	0	0	226	35	2	263	609
03:30 PM	48	0	13	0	61	22	250	0	1	273	0	0	0	0	0	0	209	34	0	243	577
03:45 PM	38	0	20	0	58	24	256	0	3	283	0	0	0	0	0	0	223	39	1	263	604
Total	194	0	82	5	281	106	987	0	10	1103	0	0	0	2	2	0	914	143	3	1060	2446
04:00 PM	41	0	28	0	69	16	254	0	3	273	0	0	0	3	3	0	163	39	0	202	547
04:15 PM	33	0	24	0	57	26	235	0	2	263	0	0	0	0	0	0	226	32	1	259	579
04:30 PM	44	0	11	3	58	26	219	0	2	247	0	0	0	1	1	0	204	33	1	238	544
04:45 PM	36	0	25	0	61	37	271	0	1	309	0	0	0	0	0	0	227	45	4	276	646
Total	154	0	88	3	245	105	979	0	8	1092	0	0	0	4	4	0	820	149	6	975	2316
05:00 PM	53	0	22	1	76	27	260	0	2	289	0	0	0	0	0	0	257	35	0	292	657
05:15 PM	34	0	20	1	55	23	265	0	1	289	0	0	0	0	0	0	218	48	2	268	612
05:30 PM	48	0	19	1	68	28	241	0	0	269	0	0	0	0	0	0	227	39	1	267	604
05:45 PM	49	0	20	0	69	10	233	0	1	244	0	0	0	0	0	0	195	31	1	227	540
Total	184	0	81	3	268	88	999	0	4	1091	0	0	0	0	0	0	897	153	4	1054	2413

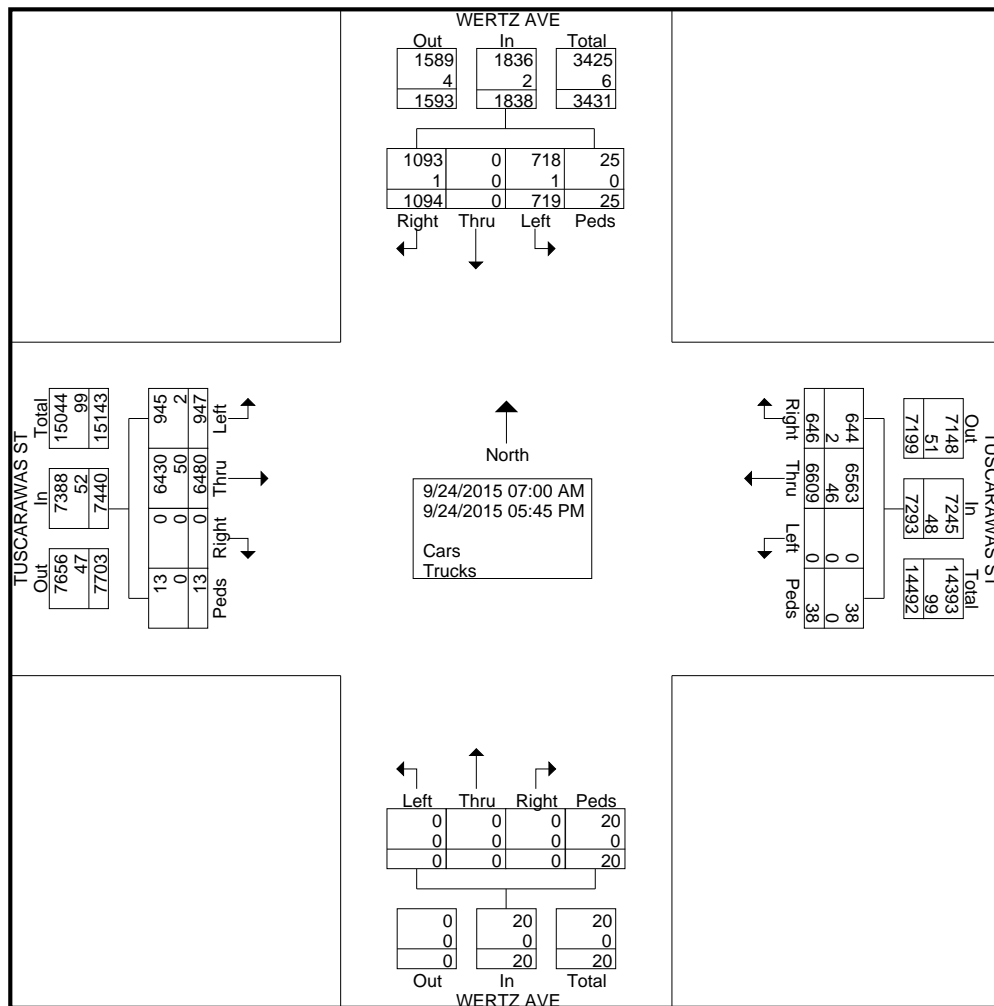


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File Name : Tuscarawas st and Wertz
Site Code : 00000000
Start Date : 9/24/2015
Page No : 2

Groups Printed- Cars - Trucks

	WERTZ AVE From North					TUSCARAWAS ST From East					WERTZ AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	1094	0	719	25	1838	646	6609	0	38	7293	0	0	0	20	20	0	6480	947	13	7440	16591
Apprch %	59.5	0	39.1	1.4		8.9	90.6	0	0.5		0	0	0	100		0	87.1	12.7	0.2		
Total %	6.6	0	4.3	0.2	11.1	3.9	39.8	0	0.2	44	0	0	0	0.1	0.1	0	39.1	5.7	0.1	44.8	
Cars	1093	0	718	25	1836	644	6563	0	38	7245	0	0	0	20	20	0	6430	945	13	7388	16489
% Cars	99.9	0	99.9	100	99.9	99.7	99.3	0	100	99.3	0	0	0	100	100	0	99.2	99.8	100	99.3	99.4
Trucks	1	0	1	0	2	2	46	0	0	48	0	0	0	0	0	0	50	2	0	52	102
% Trucks	0.1	0	0.1	0	0.1	0.3	0.7	0	0	0.7	0	0	0	0	0	0	0.8	0.2	0	0.7	0.6

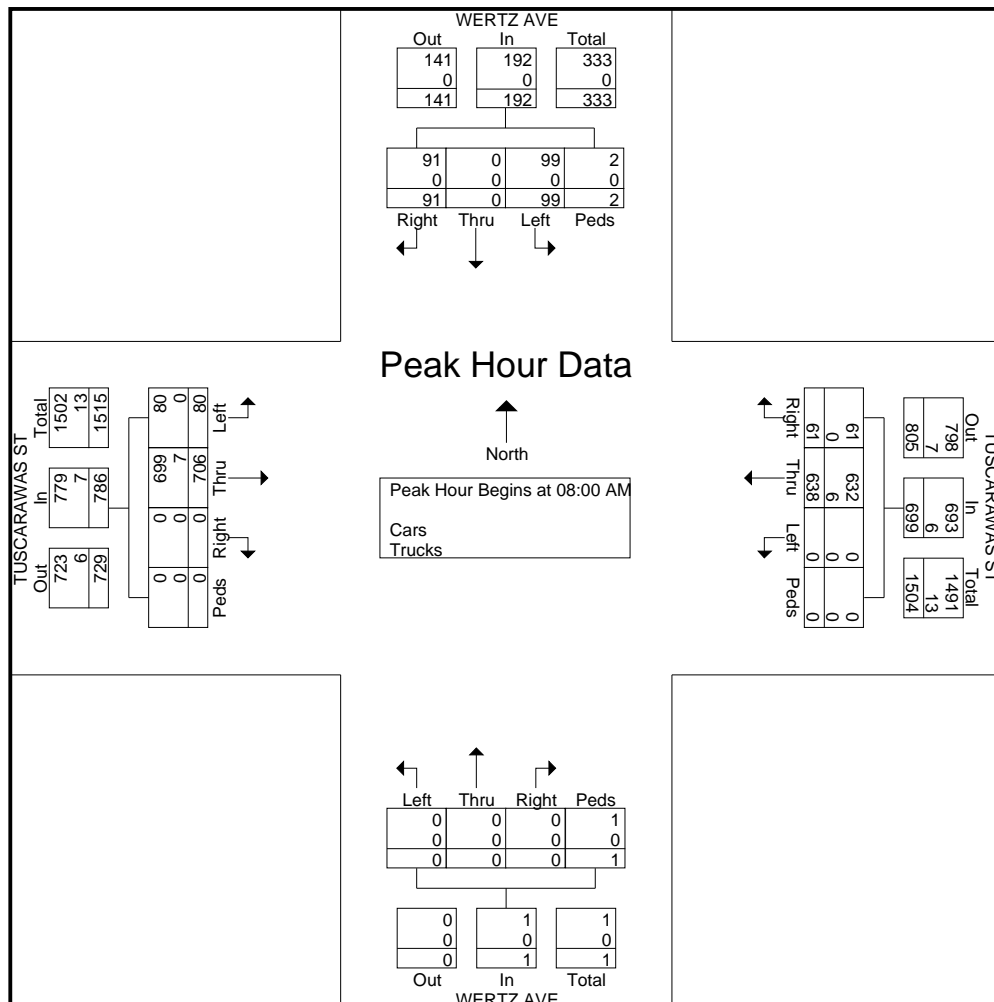




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File Name : Tuscarawas st and Wertz
Site Code : 00000000
Start Date : 9/24/2015
Page No : 3

Start Time	WERTZ AVE From North					TUSCARAWAS ST From East					WERTZ AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	23	0	20	0	43	10	135	0	0	145	0	0	0	1	1	0	181	16	0	197	386
08:15 AM	12	0	23	0	35	27	148	0	0	175	0	0	0	0	0	0	176	14	0	190	400
08:30 AM	30	0	26	0	56	11	163	0	0	174	0	0	0	0	0	0	168	17	0	185	415
08:45 AM	26	0	30	2	58	13	192	0	0	205	0	0	0	0	0	0	181	33	0	214	477
Total Volume	91	0	99	2	192	61	638	0	0	699	0	0	0	1	1	0	706	80	0	786	1678
% App. Total	47.4	0	51.6	1		8.7	91.3	0	0		0	0	0	100		0	89.8	10.2	0		
PHF	.758	.000	.825	.250	.828	.565	.831	.000	.000	.852	.000	.000	.000	.250	.250	.000	.975	.606	.000	.918	.879
Cars	91	0	99	2	192	61	632	0	0	693	0	0	0	1	1	0	699	80	0	779	1665
% Cars	100	0	100	100	100	100	99.1	0	0	99.1	0	0	0	100	100	0	99.0	100	0	99.1	99.2
Trucks	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	7	0	0	7	13
% Trucks	0	0	0	0	0	0	0.9	0	0	0.9	0	0	0	0	0	0	1.0	0	0	0.9	0.8

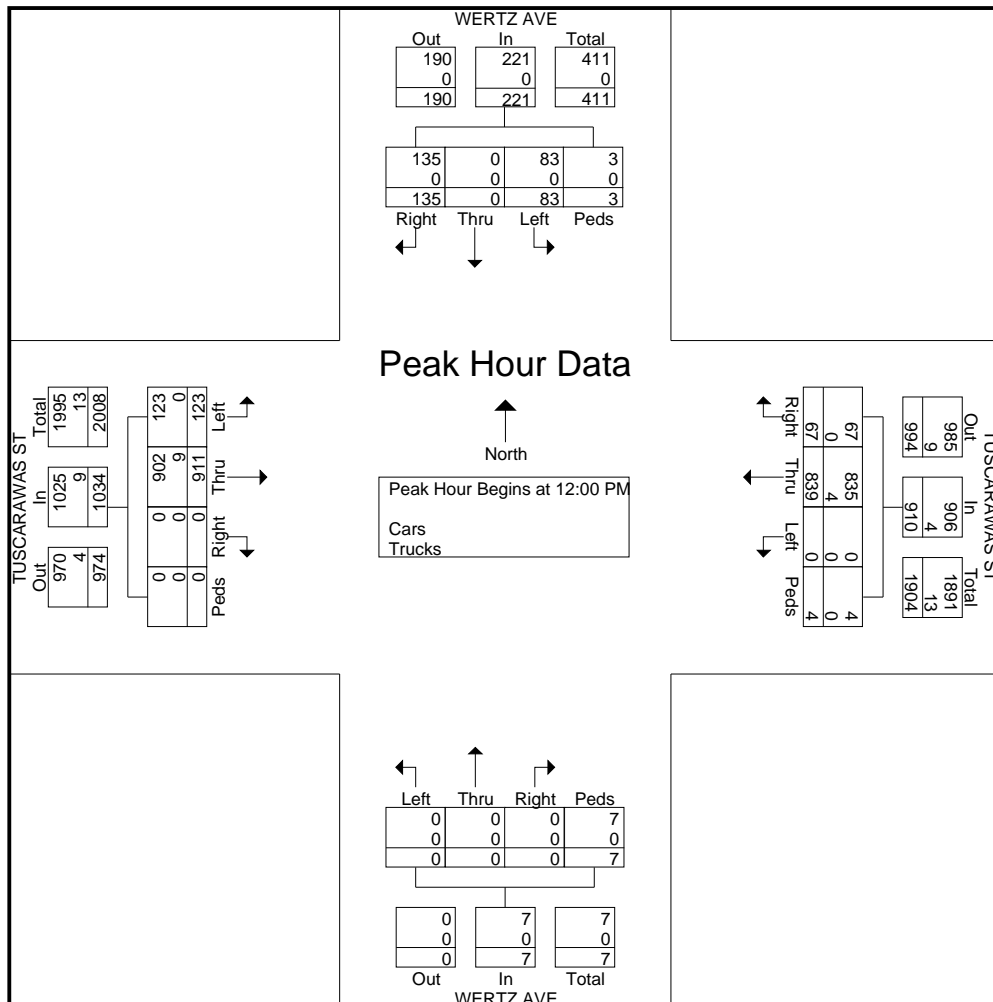




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File Name : Tuscarawas st and Wertz
Site Code : 00000000
Start Date : 9/24/2015
Page No : 4

Start Time	WERTZ AVE From North					TUSCARAWAS ST From East					WERTZ AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	47	0	26	0	73	13	208	0	2	223	0	0	0	0	0	0	214	35	0	249	545
12:15 PM	28	0	22	0	50	13	221	0	0	234	0	0	0	6	6	0	234	27	0	261	551
12:30 PM	31	0	19	1	51	21	205	0	0	226	0	0	0	1	1	0	221	32	0	253	531
12:45 PM	29	0	16	2	47	20	205	0	2	227	0	0	0	0	0	0	242	29	0	271	545
Total Volume	135	0	83	3	221	67	839	0	4	910	0	0	0	7	7	0	911	123	0	1034	2172
% App. Total	61.1	0	37.6	1.4		7.4	92.2	0	0.4		0	0	0	100	100	0	88.1	11.9	0		
PHF	.718	.000	.798	.375	.757	.798	.949	.000	.500	.972	.000	.000	.000	.292	.292	.000	.941	.879	.000	.954	.985
Cars	135	0	83	3	221	67	835	0	4	906	0	0	0	7	7	0	902	123	0	1025	2159
% Cars	100	0	100	100	100	100	99.5	0	100	99.6	0	0	0	100	100	0	99.0	100	0	99.1	99.4
Trucks	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	9	0	0	9	13
% Trucks	0	0	0	0	0	0	0.5	0	0	0.4	0	0	0	0	0	0	1.0	0	0	0.9	0.6

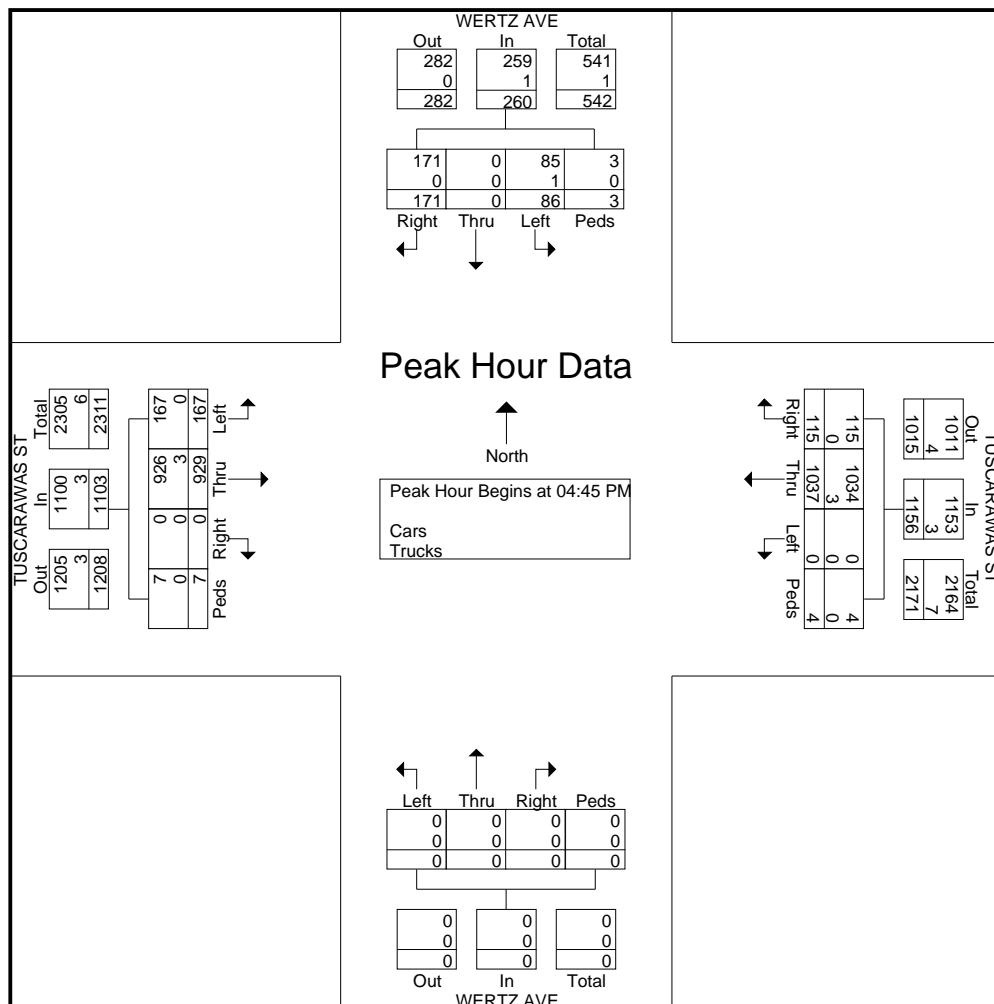




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File Name : Tuscarawas st and Wertz
Site Code : 00000000
Start Date : 9/24/2015
Page No : 5

Start Time	WERTZ AVE From North					TUSCARAWAS ST From East					WERTZ AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	36	0	25	0	61	37	271	0	1	309	0	0	0	0	0	0	227	45	4	276	646
05:00 PM	53	0	22	1	76	27	260	0	2	289	0	0	0	0	0	0	257	35	0	292	657
05:15 PM	34	0	20	1	55	23	265	0	1	289	0	0	0	0	0	0	218	48	2	268	612
05:30 PM	48	0	19	1	68	28	241	0	0	269	0	0	0	0	0	0	227	39	1	267	604
Total Volume	171	0	86	3	260	115	1037	0	4	1156	0	0	0	0	0	0	929	167	7	1103	2519
% App. Total	65.8	0	33.1	1.2		9.9	89.7	0	0.3		0	0	0	0	0	0	84.2	15.1	0.6		
PHF	.807	.000	.860	.750	.855	.777	.957	.000	.500	.935	.000	.000	.000	.000	.000	.000	.904	.870	.438	.944	.959
Cars	171	0	85	3	259	115	1034	0	4	1153	0	0	0	0	0	0	926	167	7	1100	2512
% Cars	100	0	98.8	100	99.6	100	99.7	0	100	99.7	0	0	0	0	0	0	99.7	100	100	99.7	99.7
Trucks	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	7
% Trucks	0	0	1.2	0	0.4	0	0.3	0	0	0.3	0	0	0	0	0	0	0.3	0	0	0.3	0.3





Int: Tuscarawas St & Whipple Ave
Counted By: MJL
Day: Tuesday
Weather: Sunny

File Name : Tuscarawas st and Whipple
Site Code : 00000000
Start Date : 9/22/2015
Page No : 1

Groups Printed- Cars - Trucks

Start Time	WHIPPLE AVE From North					TUSCARAWAS ST From East					WHIPPLE AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	5	10	10	0	25	10	48	0	1	59	2	7	3	0	12	7	65	15	0	87	183
07:15 AM	20	28	30	0	78	15	64	0	0	79	3	15	10	0	28	12	109	40	0	161	346
07:30 AM	31	18	32	0	81	22	91	1	0	114	3	28	17	0	48	18	111	34	0	163	406
07:45 AM	50	23	54	0	127	15	70	7	1	93	6	39	16	0	61	15	157	49	1	222	503
Total	106	79	126	0	311	62	273	8	2	345	14	89	46	0	149	52	442	138	1	633	1438
08:00 AM	27	36	32	2	97	23	73	3	1	100	2	23	14	0	39	9	115	30	0	154	390
08:15 AM	28	23	39	0	90	29	74	2	0	105	3	19	12	0	34	15	103	25	2	145	374
08:30 AM	26	12	35	0	73	19	76	4	2	101	1	23	26	0	50	16	126	38	0	180	404
08:45 AM	37	23	37	0	97	16	90	2	0	108	4	26	15	0	45	17	116	42	0	175	425
Total	118	94	143	2	357	87	313	11	3	414	10	91	67	0	168	57	460	135	2	654	1593
*** BREAK ***																					
11:00 AM	42	33	57	0	132	20	107	1	1	129	8	20	32	0	60	18	138	29	0	185	506
11:15 AM	41	36	46	1	124	25	132	4	1	162	10	33	40	0	83	23	120	35	0	178	547
11:30 AM	34	41	35	0	110	33	138	9	1	181	7	30	24	0	61	16	156	46	0	218	570
11:45 AM	26	29	52	0	107	29	135	5	0	169	4	39	30	0	73	22	141	44	0	207	556
Total	143	139	190	1	473	107	512	19	3	641	29	122	126	0	277	79	555	154	0	788	2179
12:00 PM	35	35	45	0	115	41	148	3	0	192	4	25	46	0	75	19	150	62	0	231	613
12:15 PM	42	36	55	0	133	37	136	4	2	179	7	37	37	0	81	21	170	32	0	223	616
12:30 PM	35	48	57	0	140	36	128	6	1	171	10	40	31	0	81	21	181	39	1	242	634
12:45 PM	48	43	54	0	145	31	118	16	1	166	10	37	30	0	77	26	163	34	0	223	611
Total	160	162	211	0	533	145	530	29	4	708	31	139	144	0	314	87	664	167	1	919	2474
*** BREAK ***																					
02:00 PM	34	30	48	0	112	37	144	7	0	188	16	31	30	0	77	16	150	32	1	199	576
02:15 PM	45	44	50	0	139	37	145	8	0	190	5	36	24	0	65	27	135	40	1	203	597
02:30 PM	41	37	40	1	119	46	155	5	0	206	5	29	42	0	76	16	119	38	0	173	574
02:45 PM	41	41	66	0	148	52	140	14	2	208	7	37	36	0	80	22	139	60	1	222	658
Total	161	152	204	1	518	172	584	34	2	792	33	133	132	0	298	81	543	170	3	797	2405
03:00 PM	40	35	47	0	122	46	127	5	0	178	5	35	27	0	67	25	152	49	0	226	593
03:15 PM	42	48	46	0	136	41	121	10	1	173	5	45	40	0	90	36	139	48	0	223	622
03:30 PM	26	32	47	0	105	38	129	8	1	176	8	36	35	0	79	13	145	40	0	198	558
03:45 PM	31	43	46	0	120	52	181	9	1	243	9	43	46	0	98	35	139	51	0	225	686
Total	139	158	186	0	483	177	558	32	3	770	27	159	148	0	334	109	575	188	0	872	2459
04:00 PM	19	13	35	0	67	31	105	3	0	139	9	24	31	0	64	18	119	30	1	168	438
04:15 PM	28	36	41	1	106	57	136	11	2	206	11	37	39	0	87	23	134	42	0	199	598
04:30 PM	41	42	63	0	146	35	112	9	1	157	9	32	44	0	85	22	126	48	2	198	586
04:45 PM	45	65	66	0	176	61	188	11	0	260	4	48	53	0	105	28	168	54	2	252	793
Total	133	156	205	1	495	184	541	34	3	762	33	141	167	0	341	91	547	174	5	817	2415
05:00 PM	66	68	67	3	204	47	175	21	2	245	11	57	46	0	114	25	155	56	0	236	799
05:15 PM	38	56	82	0	176	65	162	9	0	236	7	52	64	0	123	22	144	42	1	209	744
05:30 PM	42	48	61	0	151	50	129	5	1	185	12	45	30	0	87	20	141	27	0	188	611
05:45 PM	65	33	62	0	160	33	130	6	0	169	7	23	45	0	75	22	133	51	1	207	611
Total	211	205	272	3	691	195	596	41	3	835	37	177	185	0	399	89	573	176	2	840	2765

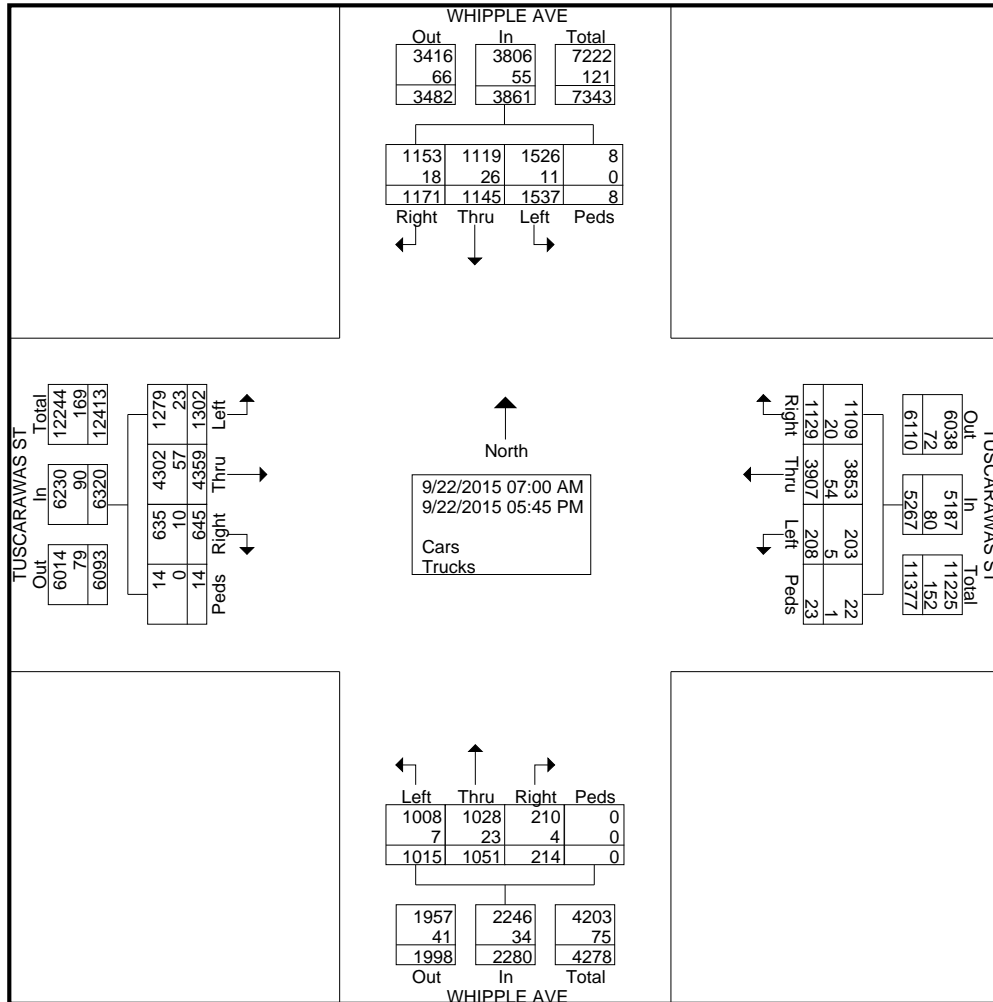


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File Name : Tuscarawas st and Whipple
Site Code : 00000000
Start Date : 9/22/2015
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Groups Printed- Cars - Trucks

	WHIPPLE AVE From North					TUSCARAWAS ST From East					WHIPPLE AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	1171	1145	1537	8	3861	1129	3907	208	23	5267	214	1051	1015	0	2280	645	4359	1302	14	6320	17728
Apprch %	30.3	29.7	39.8	0.2		21.4	74.2	3.9	0.4		9.4	46.1	44.5	0		10.2	69	20.6	0.2		
Total %	6.6	6.5	8.7	0	21.8	6.4	22	1.2	0.1	29.7	1.2	5.9	5.7	0	12.9	3.6	24.6	7.3	0.1	35.6	
Cars	1153	1119	1526	8	3806	1109	3853	203	22	5187	210	1028	1008	0	2246	635	4302	1279	14	6230	17469
% Cars	98.5	97.7	99.3	100	98.6	98.2	98.6	97.6	95.7	98.5	98.1	97.8	99.3	0	98.5	98.4	98.7	98.2	100	98.6	98.5
Trucks	18	26	11	0	55	20	54	5	1	80	4	23	7	0	34	10	57	23	0	90	259
% Trucks	1.5	2.3	0.7	0	1.4	1.8	1.4	2.4	4.3	1.5	1.9	2.2	0.7	0	1.5	1.6	1.3	1.8	0	1.4	1.5

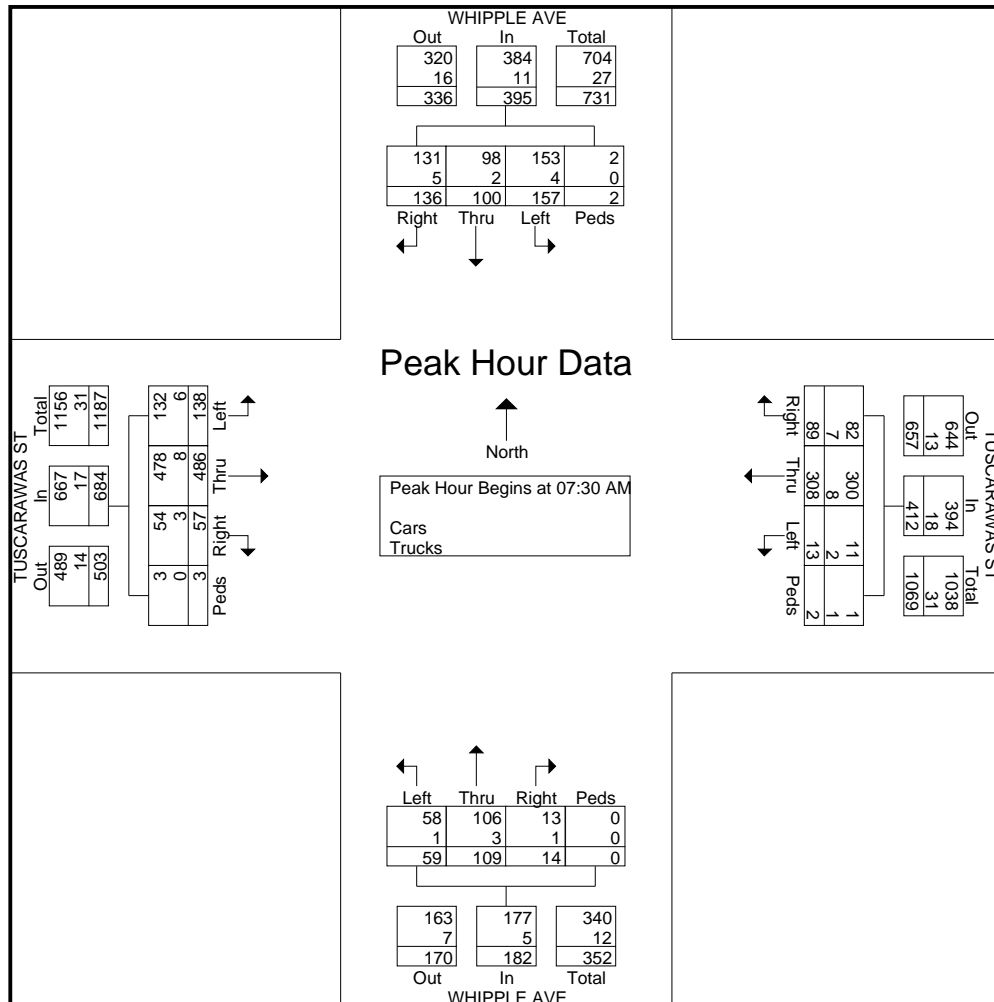




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File Name : Tuscarawas st and Whipple
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Start Time	WHIPPLE AVE From North					TUSCARAWAS ST From East					WHIPPLE AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	31	18	32	0	81	22	91	1	0	114	3	28	17	0	48	18	111	34	0	163	406
07:45 AM	50	23	54	0	127	15	70	7	1	93	6	39	16	0	61	15	157	49	1	222	503
08:00 AM	27	36	32	2	97	23	73	3	1	100	2	23	14	0	39	9	115	30	0	154	390
08:15 AM	28	23	39	0	90	29	74	2	0	105	3	19	12	0	34	15	103	25	2	145	374
Total Volume	136	100	157	2	395	89	308	13	2	412	14	109	59	0	182	57	486	138	3	684	1673
% App. Total	34.4	25.3	39.7	0.5		21.6	74.8	3.2	0.5		7.7	59.9	32.4	0		8.3	71.1	20.2	0.4		
PHF	.680	.694	.727	.250	.778	.767	.846	.464	.500	.904	.583	.699	.868	.000	.746	.792	.774	.704	.375	.770	.832
Cars	131	98	153	2	384	82	300	11	1	394	13	106	58	0	177	54	478	132	3	667	1622
% Cars	96.3	98.0	97.5	100	97.2	92.1	97.4	84.6	50.0	95.6	92.9	97.2	98.3	0	97.3	94.7	98.4	95.7	100	97.5	97.0
Trucks	5	2	4	0	11	7	8	2	1	18	1	3	1	0	5	3	8	6	0	17	51
% Trucks	3.7	2.0	2.5	0	2.8	7.9	2.6	15.4	50.0	4.4	7.1	2.8	1.7	0	2.7	5.3	1.6	4.3	0	2.5	3.0

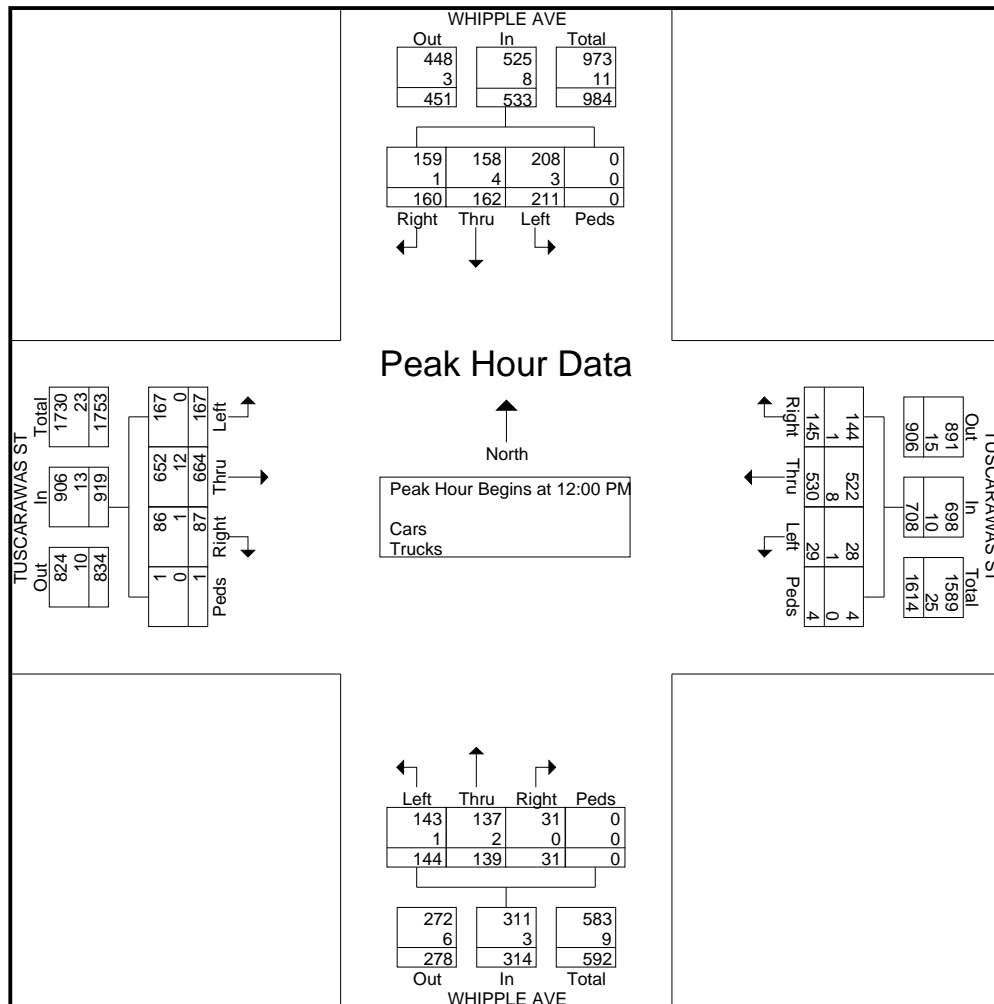




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Start Time	WHIPPLE AVE From North					TUSCARAWAS ST From East					WHIPPLE AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	35	35	45	0	115	41	148	3	0	192	4	25	46	0	75	19	150	62	0	231	613
12:15 PM	42	36	55	0	133	37	136	4	2	179	7	37	37	0	81	21	170	32	0	223	616
12:30 PM	35	48	57	0	140	36	128	6	1	171	10	40	31	0	81	21	181	39	1	242	634
12:45 PM	48	43	54	0	145	31	118	16	1	166	10	37	30	0	77	26	163	34	0	223	611
Total Volume	160	162	211	0	533	145	530	29	4	708	31	139	144	0	314	87	664	167	1	919	2474
% App. Total	30	30.4	39.6	0		20.5	74.9	4.1	0.6		9.9	44.3	45.9	0		9.5	72.3	18.2	0.1		
PHF	.833	.844	.925	.000	.919	.884	.895	.453	.500	.922	.775	.869	.783	.000	.969	.837	.917	.673	.250	.949	.976
Cars	159	158	208	0	525	144	522	28	4	698	31	137	143	0	311	86	652	167	1	906	2440
% Cars	99.4	97.5	98.6	0	98.5	99.3	98.5	96.6	100	98.6	100	98.6	99.3	0	99.0	98.9	98.2	100	100	98.6	98.6
Trucks	1	4	3	0	8	1	8	1	0	10	0	2	1	0	3	1	12	0	0	13	34
% Trucks	0.6	2.5	1.4	0	1.5	0.7	1.5	3.4	0	1.4	0	1.4	0.7	0	1.0	1.1	1.8	0	0	1.4	1.4

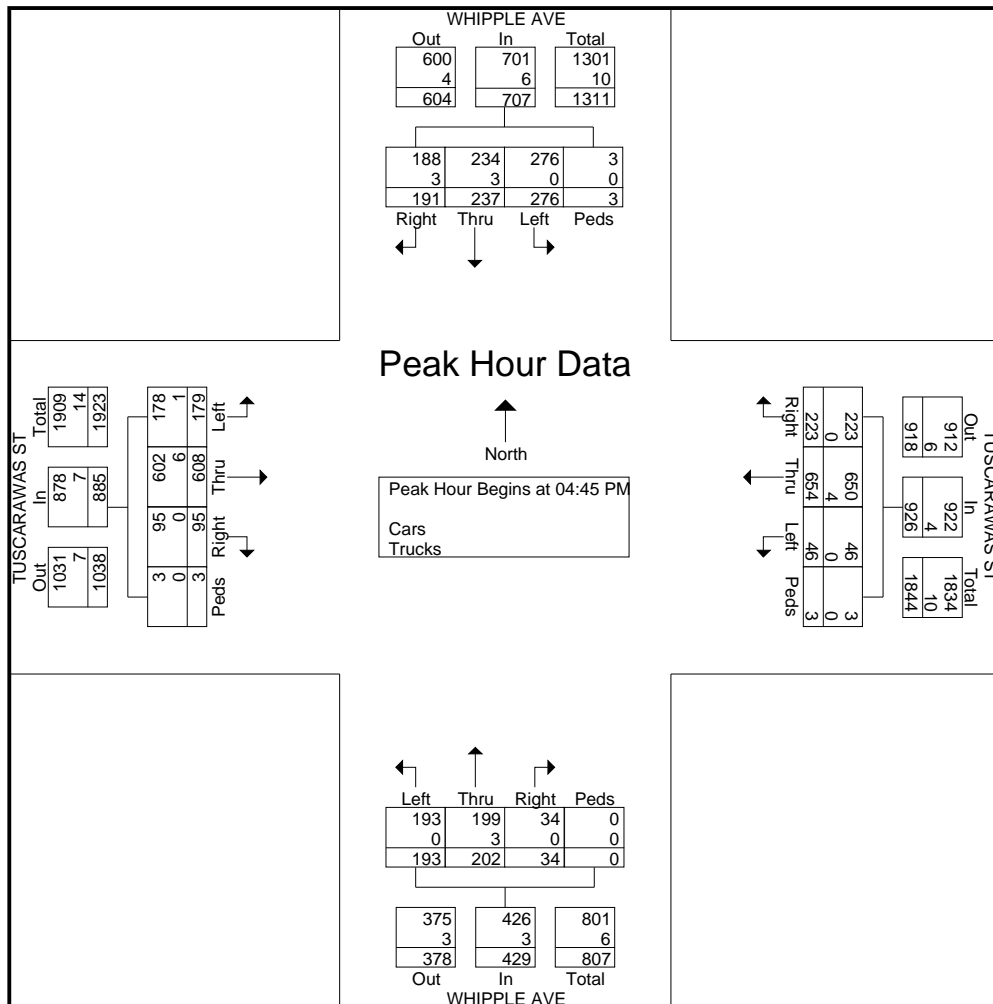




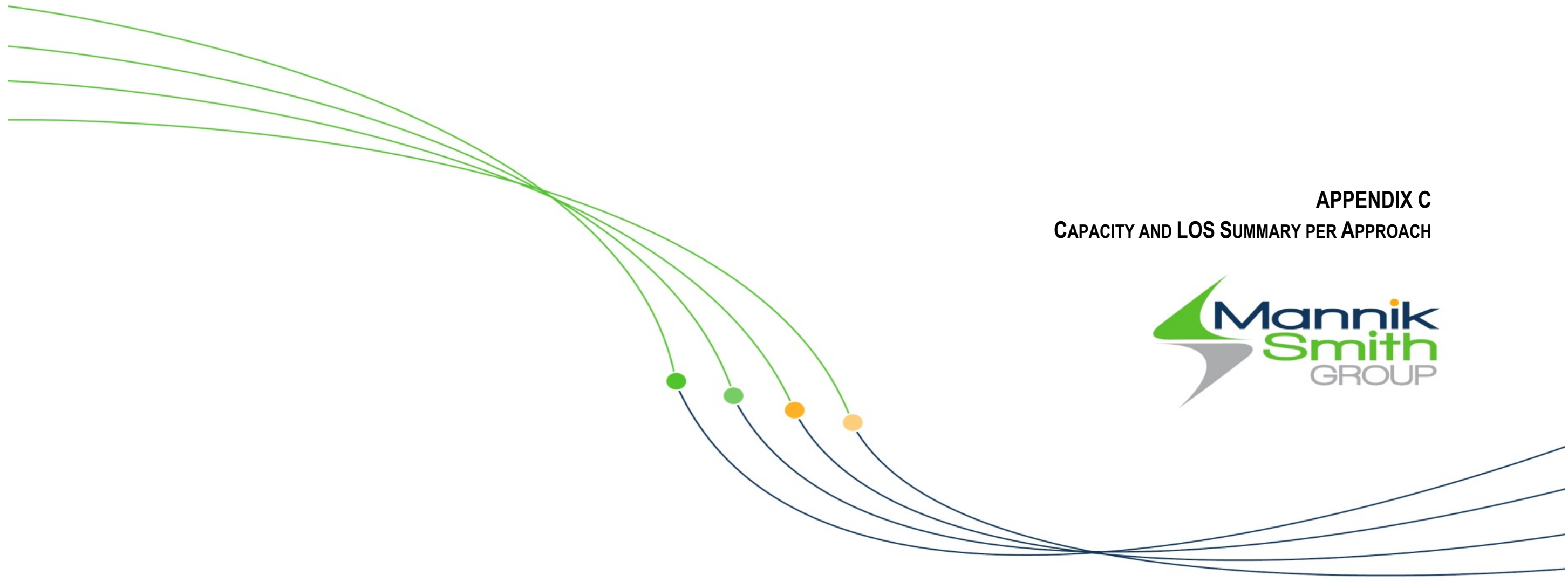
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Start Time	WHIPPLE AVE From North					TUSCARAWAS ST From East					WHIPPLE AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	45	65	66	0	176	61	188	11	0	260	4	48	53	0	105	28	168	54	2	252	793
05:00 PM	66	68	67	3	204	47	175	21	2	245	11	57	46	0	114	25	155	56	0	236	799
05:15 PM	38	56	82	0	176	65	162	9	0	236	7	52	64	0	123	22	144	42	1	209	744
05:30 PM	42	48	61	0	151	50	129	5	1	185	12	45	30	0	87	20	141	27	0	188	611
Total Volume	191	237	276	3	707	223	654	46	3	926	34	202	193	0	429	95	608	179	3	885	2947
% App. Total	27	33.5	39	0.4	24.1	70.6	5	0.3	7.9	47.1	45	0	10.7	68.7	20.2	0.3	885	2947			
PHF	.723	.871	.841	.250	.866	.858	.870	.548	.375	.890	.708	.886	.754	.000	.872	.848	.905	.799	.375	.878	.922
Cars	188	234	276	3	701	223	650	46	3	922	34	199	193	0	426	95	602	178	3	878	2927
% Cars	98.4	98.7	100	100	99.2	100	99.4	100	100	99.6	100	98.5	100	0	99.3	100	99.0	99.4	100	99.2	99.3
Trucks	3	3	0	0	6	0	4	0	0	4	0	3	0	0	3	0	6	1	0	7	20
% Trucks	1.6	1.3	0	0	0.8	0	0.6	0	0	0.4	0	1.5	0	0	0.7	0	1.0	0.6	0	0.8	0.7



APPENDIX C
CAPACITY AND LOS SUMMARY PER APPROACH



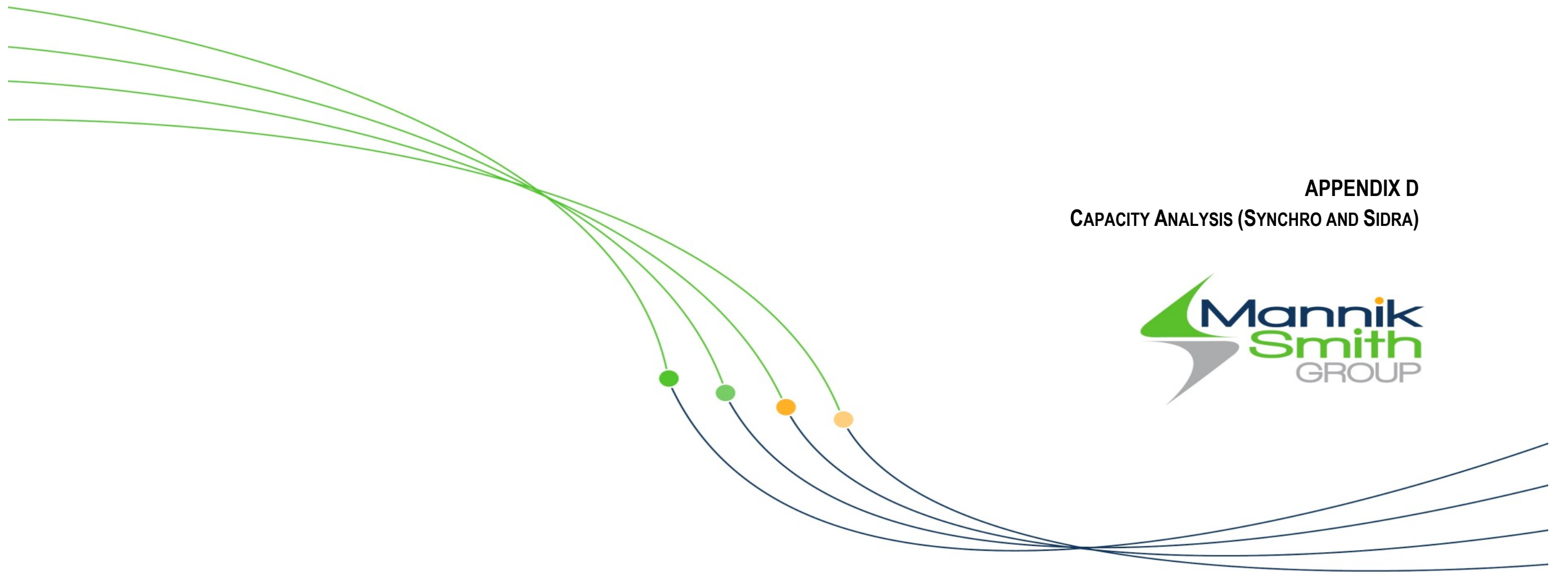
Intersection Capacity Analysis Summary AM Peak Hour												
Intersection Approach	Opening Year (2022) Design Hour Volumes						Design Year (2042) Design Hour Volumes					
	No Build		Alternative 1		Alternative 2		No Build		Alternative 1		Alternative 2	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Whipple Ave.												
Eastbound	B	16.8	B	17.0	B	17.0	B	17.9	B	18.4	B	18.4
Westbound	B	11.2	B	10.6	B	11.4	B	12.4	B	1.5	B	12.3
Northbound	C	34.3	D	39.3	D	39.3	C	34.3	D	39.5	D	39.5
Southbound	C	27.9	C	30.7	C	30.7	C	28.1	C	30.5	C	30.5
Int. Overall	B	20.0	C	21.3	C	21.5	C	20.7	C	22.0	C	22.2
Valleyview Ave.												
Eastbound	C	29.2	B	18.0	B	18.0	C	32.7	C	20.6	C	20.6
Westbound	C	22.8	C	20.9	B	18.8	C	23.5	C	21.5	B	19.8
Northbound	B	18.2	C	25.2	C	25.2	B	18.2	C	24.7	C	24.7
Southbound	C	26.4	C	28.3	C	28.3	C	26.4	C	33.8	C	33.8
Int. Overall	C	25.9	C	20.1	B	19.4	C	28.1	C	21.9	C	21.2
Raff Rd.												
Eastbound	A	2.0	A	6.6	A	1.8	A	1	A	7.3	A	1.9
Westbound	A	7.0	B	13.3	A	1.7	A	9.1	B	13.1	A	1.9
Northbound	D	35.2	D	42.5	A	4.2	C	34.3	D	43.3	A	4.6
Southbound	C	32.1	D	36.1	A	4.6	C	31.0	D	36.3	A	5.0
Int. Overall	A	9.1	B	15.1	A	2.2	B	10.3	B	15.5	A	2.4
Bellflower Ave												
Eastbound	A	0.5	A	0.1	A	0.1	A	0.5	A	0.1	A	0.1
Westbound	A	1.2	A	0.3	A	0.3	A	1.1	A	0.3	A	0.3
Northbound	D	43.1	A	9.8	B	13.1	D	43.1	A	9.6	B	13.9
Southbound	D	40.7	B	10.2	B	10.2	D	40.7	B	10.3	B	10.3
Int. Overall	A	2.6					A	2.4				
Maryland/Gas Station												
Eastbound	A	4.4	A	6.2	B	11.4	A	6.0	A	6.7	B	12.4
Westbound	A	2.7	A	7.8	A	9.2	A	2.9	A	8.6	A	9.8
Northbound	D	37.7	D	43.7	D	43.7	D	37.8	D	43.8	D	43.8
Southbound	C	34.4	D	35.7	D	35.7	C	33.7	D	35.3	D	35.3
Int. Overall	A	7.4	B	10.9	B	14.1	A	8.1	B	11.2	B	14.6

(Cont.) Intersection Capacity Analysis Summary AM Peak Hour												
Intersection Approach	Opening Year (2022) Design Hour Volumes						Design Year (2042) Design Hour Volumes					
	No Build		Alternative 1		Alternative 2		No Build		Alternative 1		Alternative 2	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Wertz Ave.												
Eastbound	A	1.1	A	1.2	A	1.2	A	1.9	A	1.3	A	1.3
Westbound	A	5.9	A	3.2	A	7.7	A	7.0	A	3.9	A	8.6
Southbound	C	34.8	D	40.1	D	40.1	D	35.3	D	39.6	D	39.6
Int. Overall	A	7.1	A	6.8	A	8.7	A	7.8	A	7.0	A	8.9
Broad Ave.												
Eastbound	B	13.2	A	8.1	A	6.3	B	13.3	B	10.6	A	2.4
Westbound	C	6.5	A	8.0	A	2.9	A	6.7	B	10.8	B	17.0
Northbound			C	30.6	A	8.9			C	30.7	A	6.2
Southbound	A	24.1	D	35.3	A	6.8	C	24.2	D	37.2	A	6.7
Int. Overall	B	11.9	B	12.2	A	5.2	B	12.0	B	14.5	A	9.3
Arlington Ave.												
Eastbound			A	3.8	A	6.1			A	3.9	A	1.7
Westbound			A	5.8	A	4.7			A	9.1	A	3.9
Northbound			D	35.2	A	10.0			D	35.9	A	5.0
Southbound			C	33.1	B	11.3			C	33.3	A	4.5
Int. Overall			A	7.4	A	6.4			A	9.1	A	3.0
Bedford Ave.*												
Eastbound	C	23.3					C	32.0				
Westbound	B	17.1					B	19.0				
Northbound	C	20.5					C	20.9				
Southbound												
Int. Overall	C	20.1					C	25.1				
Harrison Ave. NW*												
Eastbound	A	6.3	A	1.6	B	0.0	A	7.0	A	1.5	A	0.0
Westbound	A	3.6	A	5.8	C	0.0	A	4.2	A	6.5	A	0.0
Northbound	C	30.9	D	35.4	B	10.7	C	30.4	C	34.0	B	11.7
Southbound	D	40.0	D	45.2	B	11.2	D	42.5	D	45.6	B	11.6
Int. Overall	A	8.0	A	8.0	A	0.2	A	8.7	A	8.3	A	0.2

Intersection Capacity Analysis Summary PM Peak Hour												
Intersection Approach	Opening Year (2022) Design Hour Volumes						Design Year (2042) Design Hour Volumes					
	No Build		Alternative 1 Signals		Alternative 2 Roundabouts		No Build		Alternative 1 Signals		Alternative 2 Roundabouts	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Whipple Ave.												
Eastbound	C	24.7	C	26.5	C	25.8	C	31.0	C	33.9	C	33.2
Westbound	B	12.5	C	28.3	B	13.4	B	14.5	C	31.3	B	15.3
Northbound	D	41.8	D	46.2	D	43.3	D	48.4	E	57.9	D	50.8
Southbound	D	39.3	D	37.6	D	41.3	D	48.0	D	45.9	E	57.4
Int. Overall	C	26.9	C	32.7	C	28.4	C	32.5	D	39.6	D	36.2
Valleyview Ave.												
Eastbound	D	35.6	D	39.4	C	31.7	D	52.6	D	41.3	C	33.1
Westbound	C	31.2	C	30.6	D	50.3	D	51.6	D	36.1	E	75.2
Northbound	C	20.7	C	24.4	C	21.2	C	21.6	C	24.8	C	21.5
Southbound	C	28.0	C	29.3	C	27.5	C	27.5	C	29.3	C	27.5
Int. Overall	C	31.5	C	32.9	D	39.4	D	47.4	D	36.3	D	52.1
Raff Rd.												
Eastbound	D	44.4	B	19.7	A	5.1	D	49.8	C	20.8	B	14.5
Westbound	A	6.9	B	16.8	A	1.9	B	10.1	C	20.3	A	5.8
Northbound	C	35.0	D	39.5	A	6.7	D	38.2	D	46.2	B	10.8
Southbound	C	22.2	C	21.2	A	5.5	C	21.2	C	20.7	A	8.3
Int. Overall	C	25.6	C	22.3	A	4.0	C	29.4	C	25.2	A	9.3
Bellflower Ave.												
Eastbound	A	10.9	A	0.1	A	0.1	B	13.2	A	0.1	A	0.1
Westbound	A	2.0	A	0.2	A	0.3	A	2.2	A	0.2	A	0.3
Northbound	D	38.2	A	9.4	B	14.0	D	38.5	A	9.6	C	15.1
Southbound	C	32.8	A	9.5	A	9.5	C	31.7	A	9.9	A	9.8
Int. Overall	A	7.6					A	8.8				
Maryland/Gas Station												
Eastbound	A	3.6	B	10.9	B	19.9	A	5.0	B	18.9	C	21.5
Westbound	B	14.5	B	16.4	B	19.2	A	16.6	B	18.4	C	22.6
Northbound	D	37.6	D	39.2	D	42.6	D	37.1	D	42.0	D	44.2
Southbound	C	28.3	C	25.9	C	29.1	C	26.7	C	24.4	C	27.4
Int. Overall	B	12.6	B	16.6	C	22.0	B	14.0	B	18.9	C	24.5
Wertz Ave.												
Eastbound	A	8.5	A	7.7	A	6.9	B	10.7	B	10.7	A	9.4
Westbound	A	1.9	A	7.2	B	14.2	A	2.5	B	10.2	B	19.3
Southbound	D	35.0	C	34.9	C	34.9	C	34.9	C	34.6	C	34.6
Int. Overall	A	8.2	B	10.3	B	13.2	A	9.4	B	12.9	B	16.5
Broad Ave.												
Eastbound	A	9.4	B	10.0	A	6.3	A	10.0	B	12.8	B	18.3
Westbound	C	22.4	B	12.9	A	2.9	D	43.8	B	18.7	A	3.6
Northbound			C	31.9	A	8.9			C	31.9	B	11.7
Southbound	C	23.5	D	45.6	A	6.8	C	23.7	D	54.1	A	8.0
Int. Overall	B	17.5	B	15.6	A	5.2	C	28.6	B	20.0	B	11.4
Arlington Ave.												
Eastbound			B	13.3	A	6.1			B	15.9	C	24.4
Westbound			A	7.2	A	4.7			A	10.0	B	13.5
Northbound			D	38.0	B	10.0			D	43.6	B	17.1
Southbound			C	26.0	B	11.3			C	26.5	C	30.8
Int. Overall			B	13.9	A	6.4			B	16.8	C	20.2

(Cont.) Intersection Capacity Analysis Summary PM Peak Hour												
Intersection Approach	Opening Year (2022) Design Hour Volumes						Design Year (2042) Design Hour Volumes					
	No Build		Alternative 1 Signals		Alternative 2 Roundabouts		No Build		Alternative 1 Signals		Alternative 2 Roundabouts	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Bedford Ave.*												
Eastbound	B	19.3					C	29.4				
Westbound	B	14.9					B	16.2				
Northbound	C	30.2					C	34.1				
Southbound												
Int. Overall	B	18.9					C	24.3				
Harrison Ave. NW*												
Eastbound	A	9.8	A	5.1	A	0.0	B	10.5	A	6.0	A	0.0
Westbound	A	5.7	B	10.1	A	0.0	A	6.8	B	14.2	A	0.0
Northbound	C	28.7	C	25.5	B	12.9	C	28.8	C	24.4	B	14.2
Southbound	E	70.6	D	42.5	B	11.2	F	98.4	D	47.6	B	14.1
Int. Overall	B	15.6	B	12.7			B	19.8	B	15.8		

APPENDIX D
CAPACITY ANALYSIS (SYNCHRO AND SIDRA)



HCM Signalized Intersection Capacity Analysis

1: Whipple & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	
Traffic Volume (vph)	160	580	70	20	370	110	70	130	20	190	120	160
Future Volume (vph)	160	580	70	20	370	110	70	130	20	190	120	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	3466		1569	3505	1481	1768	3416		1752	3172	
Flt Permitted	0.41	1.00		0.38	1.00	1.00	0.57	1.00		0.44	1.00	
Satd. Flow (perm)	756	3466		630	3505	1481	1054	3416		807	3172	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	630	76	22	402	120	76	141	22	207	130	174
RTOR Reduction (vph)	0	9	0	0	0	59	0	14	0	0	140	0
Lane Group Flow (vph)	174	697	0	22	402	61	76	149	0	207	164	0
Confl. Peds. (#/hr)	2		3	3		2	2					2
Heavy Vehicles (%)	4%	2%	5%	15%	3%	8%	2%	3%	7%	3%	2%	4%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	48.6	40.2		35.8	33.0	46.0	18.4	11.6		30.2	17.8	
Effective Green, g (s)	48.6	40.2		35.8	33.0	46.0	18.4	11.6		30.2	17.8	
Actuated g/C Ratio	0.54	0.45		0.40	0.37	0.51	0.20	0.13		0.34	0.20	
Clearance Time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	517	1548		279	1285	849	269	440		407	627	
v/s Ratio Prot	c0.04	c0.20		0.00	0.11	0.01	0.02	0.04		c0.07	0.05	
v/s Ratio Perm	0.14			0.03		0.03	0.04			c0.10		
v/c Ratio	0.34	0.45		0.08	0.31	0.07	0.28	0.34		0.51	0.26	
Uniform Delay, d1	11.0	17.2		16.6	20.4	11.2	29.8	35.7		22.7	30.5	
Progression Factor	1.00	1.00		0.91	0.64	0.19	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.9		0.1	0.6	0.0	0.6	0.5		1.0	0.2	
Delay (s)	11.4	18.2		15.2	13.7	2.1	30.3	36.2		23.7	30.8	
Level of Service	B	B		B	B	A	C	D		C	C	
Approach Delay (s)		16.8			11.2			34.3			27.9	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.4
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Valleyview & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑		↘	↑↑	↗	↘	↑	↗	↘	↗	
Traffic Volume (vph)	10	740	30	50	520	40	50	20	20	70	10	10
Future Volume (vph)	10	740	30	50	520	40	50	20	20	70	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1804	3480		1719	3505	1578	1805	1900	1350	1803	1643	
Flt Permitted	0.43	1.00		0.17	1.00	1.00	0.61	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	817	3480		301	3505	1578	1161	1900	1350	1410	1643	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	804	33	54	565	43	54	22	22	76	11	11
RTOR Reduction (vph)	0	3	0	0	0	26	0	0	15	0	9	0
Lane Group Flow (vph)	11	834	0	54	565	17	54	22	7	76	13	0
Confl. Peds. (#/hr)	1		1	1		1			1	1		
Heavy Vehicles (%)	0%	3%	4%	5%	3%	0%	0%	0%	18%	0%	0%	14%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	31.8	30.5		40.0	35.1	35.1	38.8	27.7	27.7	24.2	16.7	
Effective Green, g (s)	31.8	30.5		40.0	35.1	35.1	38.8	27.7	27.7	24.2	16.7	
Actuated g/C Ratio	0.35	0.34		0.44	0.39	0.39	0.43	0.31	0.31	0.27	0.19	
Clearance Time (s)	3.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6	
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	302	1179		226	1366	615	632	584	415	411	304	
v/s Ratio Prot	0.00	c0.24		c0.02	0.16		c0.02	0.01		c0.02	0.01	
v/s Ratio Perm	0.01			0.09		0.01	0.02		0.01	c0.03		
v/c Ratio	0.04	0.71		0.24	0.41	0.03	0.09	0.04	0.02	0.18	0.04	
Uniform Delay, d1	18.9	25.9		16.2	20.0	16.9	15.1	21.8	21.7	25.1	30.1	
Progression Factor	1.37	1.00		1.32	1.13	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	3.3		0.5	0.9	0.1	0.1	0.1	0.1	0.2	0.1	
Delay (s)	26.0	29.2		21.9	23.4	17.0	15.1	21.9	21.7	25.3	30.2	
Level of Service	C	C		C	C	B	B	C	C	C	C	
Approach Delay (s)		29.2			22.8			18.2			26.4	
Approach LOS		C			C			B			C	

Intersection Summary

HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Raff & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	10	840	60	110	590	10	110	50	80	20	40	10
Future Volume (vph)	10	840	60	110	590	10	110	50	80	20	40	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		4.0	7.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.91		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1803	3541		1787	3496		1750	1674		1626	1753	
Flt Permitted	0.40	1.00		0.23	1.00		0.72	1.00		0.57	1.00	
Satd. Flow (perm)	767	3541		431	3496		1330	1674		972	1753	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	913	65	120	641	11	120	54	87	22	43	11
RTOR Reduction (vph)	0	4	0	0	1	0	0	72	0	0	9	0
Lane Group Flow (vph)	11	974	0	120	651	0	120	69	0	22	45	0
Confl. Peds. (#/hr)	1					1	1					1
Heavy Vehicles (%)	0%	1%	0%	1%	3%	0%	3%	3%	3%	11%	6%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	52.0	52.0		63.4	63.4		15.6	15.6		15.6	15.6	
Effective Green, g (s)	52.0	52.0		63.4	63.4		15.6	15.6		15.6	15.6	
Actuated g/C Ratio	0.58	0.58		0.70	0.70		0.17	0.17		0.17	0.17	
Clearance Time (s)	7.0	7.0		4.0	7.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	5.0	5.0		3.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	443	2045		415	2462		230	290		168	303	
v/s Ratio Prot		c0.28		0.02	c0.19			0.04			0.03	
v/s Ratio Perm	0.01			0.18			c0.09			0.02		
v/c Ratio	0.02	0.48		0.29	0.26		0.52	0.24		0.13	0.15	
Uniform Delay, d1	8.1	11.1		5.3	4.8		33.8	32.1		31.5	31.6	
Progression Factor	0.17	0.12		1.58	1.33		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.7		0.4	0.3		4.0	0.9		0.7	0.5	
Delay (s)	1.5	2.0		8.7	6.7		37.8	33.0		32.2	32.0	
Level of Service	A	A		A	A		D	C		C	C	
Approach Delay (s)		2.0			7.0			35.2			32.1	
Approach LOS		A			A			D			C	

Intersection Summary

HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Bellflower & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	10	950	40	20	710	10	20	10	20	10	10	10
Future Volume (vph)	10	950	40	20	710	10	20	10	20	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.95			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1802	3550		1801	3566			1704			1783	
Flt Permitted	0.35	1.00		0.26	1.00			0.85			0.93	
Satd. Flow (perm)	671	3550		486	3566			1486			1677	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1033	43	22	772	11	22	11	22	11	11	11
RTOR Reduction (vph)	0	1	0	0	0	0	0	20	0	0	10	0
Lane Group Flow (vph)	11	1075	0	22	783	0	0	35	0	0	23	0
Confl. Peds. (#/hr)	2		4	4		2			2	2		
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	7%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	75.4	75.4		75.4	75.4			6.6			6.6	
Effective Green, g (s)	75.4	75.4		75.4	75.4			6.6			6.6	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.07			0.07	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Grp Cap (vph)	562	2974		407	2987			108			122	
v/s Ratio Prot		c0.30			0.22							
v/s Ratio Perm	0.02			0.05				c0.02			0.01	
v/c Ratio	0.02	0.36		0.05	0.26			0.32			0.19	
Uniform Delay, d1	1.2	1.7		1.2	1.5			39.6			39.2	
Progression Factor	0.14	0.09		0.46	0.64			1.00			1.00	
Incremental Delay, d2	0.1	0.3		0.2	0.2			3.6			1.6	
Delay (s)	0.2	0.5		0.8	1.2			43.1			40.7	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		0.5			1.2			43.1			40.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	2.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

5: Maryland/Gas Station & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	10	890	20	40	590	50	40	40	70	30	10	10
Future Volume (vph)	10	890	20	40	590	50	40	40	70	30	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.94			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	902	3561		1750	3498			1697			1787	
Flt Permitted	0.38	1.00		0.27	1.00			0.90			0.72	
Satd. Flow (perm)	359	3561		495	3498			1556			1331	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	967	22	43	641	54	43	43	76	33	11	11
RTOR Reduction (vph)	0	1	0	0	4	0	0	46	0	0	9	0
Lane Group Flow (vph)	11	988	0	43	691	0	0	116	0	0	46	0
Confl. Peds. (#/hr)			2	2			5		1	1		5
Heavy Vehicles (%)	100%	1%	0%	3%	2%	2%	10%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	68.0	68.0		68.0	68.0			14.0			14.0	
Effective Green, g (s)	68.0	68.0		68.0	68.0			14.0			14.0	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.16			0.16	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Grp Cap (vph)	271	2690		374	2642			242			207	
v/s Ratio Prot		c0.28			0.20							
v/s Ratio Perm	0.03			0.09				c0.07			0.03	
v/c Ratio	0.04	0.37		0.11	0.26			0.48			0.22	
Uniform Delay, d1	2.8	3.7		2.9	3.4			34.7			33.2	
Progression Factor	1.39	1.07		0.65	0.76			1.00			1.00	
Incremental Delay, d2	0.3	0.4		0.6	0.2			3.1			1.1	
Delay (s)	4.1	4.4		2.5	2.8			37.7			34.4	
Level of Service	A	A		A	A			D			C	
Approach Delay (s)		4.4			2.7			37.7			34.4	
Approach LOS		A			A			D			C	

Intersection Summary

HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

6: Tuscarawas & Wertz

03/26/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↖↗		↘	↗
Traffic Volume (vph)	90	820	740	70	120	110
Future Volume (vph)	90	820	740	70	120	110
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3531		1805	1591
Flt Permitted	0.27	1.00	1.00		0.95	1.00
Satd. Flow (perm)	520	3574	3531		1805	1591
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	891	804	76	130	120
RTOR Reduction (vph)	0	0	5	0	0	102
Lane Group Flow (vph)	98	891	875	0	130	18
Confl. Peds. (#/hr)					1	2
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	68.2	68.2	59.6		13.8	13.8
Effective Green, g (s)	68.2	68.2	59.6		13.8	13.8
Actuated g/C Ratio	0.76	0.76	0.66		0.15	0.15
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	474	2708	2338		276	243
v/s Ratio Prot	0.01	c0.25	c0.25		c0.07	
v/s Ratio Perm	0.14					0.01
v/c Ratio	0.21	0.33	0.37		0.47	0.08
Uniform Delay, d1	3.4	3.5	6.8		34.8	32.6
Progression Factor	0.22	0.22	0.80		1.00	1.00
Incremental Delay, d2	0.2	0.3	0.4		2.6	0.3
Delay (s)	1.0	1.1	5.9		37.4	32.9
Level of Service	A	A	A		D	C
Approach Delay (s)		1.1	5.9		35.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

7: Tuscarawas & Broad

03/26/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↑↑	↑↑		↗	↗
Traffic Volume (vph)	70	960	700	30	110	100
Future Volume (vph)	70	960	700	30	110	100
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1735	3539	3516		1770	1599
Flt Permitted	0.27	1.00	1.00		0.95	1.00
Satd. Flow (perm)	484	3539	3516		1770	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	1043	761	33	120	109
RTOR Reduction (vph)	0	0	3	0	0	77
Lane Group Flow (vph)	76	1043	791	0	120	32
Confl. Peds. (#/hr)	3			3		
Heavy Vehicles (%)	4%	2%	2%	0%	2%	1%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	55.4	55.4	46.5		26.6	26.6
Effective Green, g (s)	55.4	55.4	46.5		26.6	26.6
Actuated g/C Ratio	0.62	0.62	0.52		0.30	0.30
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	379	2178	1816		523	472
v/s Ratio Prot	0.01	c0.29	0.23		c0.07	
v/s Ratio Perm	0.11					0.02
v/c Ratio	0.20	0.48	0.44		0.23	0.07
Uniform Delay, d1	7.9	9.4	13.6		24.0	22.8
Progression Factor	1.14	1.35	0.43		1.00	1.00
Incremental Delay, d2	0.3	0.7	0.7		1.0	0.3
Delay (s)	9.2	13.5	6.5		25.0	23.1
Level of Service	A	B	A		C	C
Approach Delay (s)		13.2	6.5		24.1	
Approach LOS		B	A		C	

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

8: Dartmouth & Tuscarawas

03/26/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	920	150	320	650	10	50
Future Volume (Veh/h)	920	150	320	650	10	50
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1000	163	348	707	11	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)	233		709			
pX, platoon unblocked			0.84		0.88	0.84
vC, conflicting volume			1163		2131	582
vC1, stage 1 conf vol					1082	
vC2, stage 2 conf vol					1050	
vCu, unblocked vol			806		1563	111
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			49		93	93
cM capacity (veh/h)			688		156	771
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	667	496	348	354	354	65
Volume Left	0	0	348	0	0	11
Volume Right	0	163	0	0	0	54
cSH	1700	1700	688	1700	1700	462
Volume to Capacity	0.39	0.29	0.51	0.21	0.21	0.14
Queue Length 95th (ft)	0	0	72	0	0	12
Control Delay (s)	0.0	0.0	15.5	0.0	0.0	14.1
Lane LOS	C			B		
Approach Delay (s)	0.0		5.1			14.1
Approach LOS				B		
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			61.6%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Bedford & Tuscarawas

03/26/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (vph)	850	160	230	870	60	30
Future Volume (vph)	850	160	230	870	60	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		3.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.95	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3446		1805	3574	1667	
Flt Permitted	1.00		0.10	1.00	0.97	
Satd. Flow (perm)	3446		197	3574	1667	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	924	174	250	946	65	33
RTOR Reduction (vph)	16	0	0	0	0	0
Lane Group Flow (vph)	1082	0	250	946	98	0
Confl. Peds. (#/hr)		2	2		1	
Heavy Vehicles (%)	2%	1%	0%	1%	6%	4%
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases			6			
Actuated Green, G (s)	35.5		50.0	50.0	32.0	
Effective Green, g (s)	35.5		50.0	50.0	32.0	
Actuated g/C Ratio	0.39		0.56	0.56	0.36	
Clearance Time (s)	4.0		3.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.0	5.0	5.0	
Lane Grp Cap (vph)	1359		314	1985	592	
v/s Ratio Prot	0.31		c0.10	0.26	c0.06	
v/s Ratio Perm			c0.34			
v/c Ratio	0.80		0.80	0.48	0.17	
Uniform Delay, d1	24.1		20.5	12.1	19.9	
Progression Factor	0.78		1.00	1.00	1.00	
Incremental Delay, d2	4.6		12.2	0.8	0.6	
Delay (s)	23.3		32.7	12.9	20.5	
Level of Service	C		C	B	C	
Approach Delay (s)	23.3			17.1	20.5	
Approach LOS	C			B	C	

Intersection Summary

HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

10: Harrison & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↖	↗
Traffic Volume (vph)	10	710	10	10	1070	50	10	10	10	130	10	30
Future Volume (vph)	10	710	10	10	1070	50	10	10	10	130	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1		3.0	5.1			5.1			5.1	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.96	1.00
Satd. Flow (prot)	1802	3483		1805	3475			1784			1783	1532
Flt Permitted	0.21	1.00		0.31	1.00			0.89			0.72	1.00
Satd. Flow (perm)	404	3483		597	3475			1610			1338	1532
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	772	11	11	1163	54	11	11	11	141	11	33
RTOR Reduction (vph)	0	1	0	0	3	0	0	9	0	0	0	27
Lane Group Flow (vph)	11	782	0	11	1214	0	0	24	0	0	152	6
Confl. Peds. (#/hr)	4					4	1					1
Heavy Vehicles (%)	0%	3%	33%	0%	3%	4%	0%	0%	0%	2%	0%	4%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2 8		1	6 8			3			3	
Permitted Phases	2 8			6 8			3			3		3
Actuated Green, G (s)	58.4	58.4		62.6	62.6			14.7			14.7	14.7
Effective Green, g (s)	58.4	58.4		57.5	62.6			14.7			14.7	14.7
Actuated g/C Ratio	0.67	0.67		0.66	0.72			0.17			0.17	0.17
Clearance Time (s)				3.0				5.1			5.1	5.1
Vehicle Extension (s)				3.0				3.0			3.0	3.0
Lane Grp Cap (vph)	269	2324		408	2486			270			224	257
v/s Ratio Prot		0.22		0.00	c0.35							
v/s Ratio Perm	0.03			0.02				0.01			c0.11	0.00
v/c Ratio	0.04	0.34		0.03	0.49			0.09			0.68	0.02
Uniform Delay, d1	5.0	6.2		5.4	5.4			30.7			34.2	30.4
Progression Factor	1.00	1.00		0.65	0.65			1.00			1.00	1.00
Incremental Delay, d2	0.1	0.1		0.0	0.1			0.1			7.9	0.0
Delay (s)	5.0	6.3		3.6	3.6			30.9			42.1	30.4
Level of Service	A	A		A	A			C			D	C
Approach Delay (s)		6.3			3.6			30.9			40.0	
Approach LOS		A			A			C			D	

Intersection Summary

HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	18.3
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

11: SB I-77 Off Ramp/Harrison & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑		↖		↖	↖	↖	↖
Traffic Volume (vph)	0	900	60	30	520	0	90	0	80	650	200	710
Future Volume (vph)	0	900	60	30	520	0	90	0	80	650	200	710
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00		1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00		1.00		0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95		1.00	0.95	0.97	1.00
Satd. Flow (prot)		3530		1671	3574		1641		1568	1715	1742	1578
Flt Permitted		1.00		0.12	1.00		0.49		1.00	0.95	0.97	1.00
Satd. Flow (perm)		3530		217	3574		838		1568	1715	1742	1578
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	978	65	33	565	0	98	0	87	707	217	772
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	72	0	0	234
Lane Group Flow (vph)	0	1038	0	33	565	0	98	0	15	460	464	538
Confl. Peds. (#/hr)	1					1						1
Heavy Vehicles (%)	0%	1%	6%	8%	1%	0%	10%	0%	3%	0%	2%	1%
Turn Type		NA		Perm	NA		Perm		Perm	Split	NA	Perm
Protected Phases		2			6					8		8
Permitted Phases				6			7		7			8
Actuated Green, G (s)		28.3		32.5	32.5		14.7		14.7	25.0	25.0	25.0
Effective Green, g (s)		28.3		32.5	32.5		14.7		14.7	25.0	25.0	25.0
Actuated g/C Ratio		0.32		0.37	0.37		0.17		0.17	0.29	0.29	0.29
Clearance Time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Vehicle Extension (s)		5.0		5.0	5.0		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1141		80	1327		140		263	490	497	450
v/s Ratio Prot		c0.29			c0.16					0.27	0.27	
v/s Ratio Perm				0.15			c0.12		0.01			c0.34
v/c Ratio		0.91		0.41	0.43		0.70		0.06	0.94	0.93	1.19
Uniform Delay, d1		28.4		20.4	20.5		34.3		30.6	30.5	30.4	31.2
Progression Factor		0.82		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		11.9		15.0	1.0		14.2		0.1	25.8	24.7	107.7
Delay (s)		35.2		35.4	21.5		48.5		30.7	56.3	55.2	138.9
Level of Service		D		D	C		D		C	E	E	F
Approach Delay (s)		35.2			22.3			40.1			93.6	
Approach LOS		D			C			D			F	

Intersection Summary		
HCM 2000 Control Delay	61.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.96	E
Actuated Cycle Length (s)	87.5	Sum of lost time (s)
Intersection Capacity Utilization	75.3%	18.3
Analysis Period (min)	15	ICU Level of Service
		D

c Critical Lane Group

SimTraffic Simulation Summary
No Build AM 2022

04/12/2018

Summary of All Intervals

Run Number	1	2	3	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	5917	6080	6051	6016
Vehs Exited	5905	6039	6049	5996
Starting Vehs	222	218	221	212
Ending Vehs	234	259	223	232
Travel Distance (mi)	3521	3624	3568	3571
Travel Time (hr)	241.9	279.2	229.5	250.2
Total Delay (hr)	125.0	158.6	110.9	131.5
Total Stops	9788	10496	10051	10109
Fuel Used (gal)	159.0	171.0	157.6	162.5

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1394	1493	1493	1460
Vehs Exited	1426	1474	1513	1470
Starting Vehs	222	218	221	212
Ending Vehs	190	237	201	201
Travel Distance (mi)	855	894	878	876
Travel Time (hr)	49.7	62.6	53.5	55.3
Total Delay (hr)	21.3	32.9	24.3	26.2
Total Stops	2288	2576	2487	2455
Fuel Used (gal)	36.3	40.6	37.9	38.3

SimTraffic Simulation Summary
No Build AM 2022

04/12/2018

Interval #2 Information

Start Time	7:15
End Time	7:30
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	2	3	Avg
Vehs Entered	1635	1598	1576	1605
Vehs Exited	1551	1568	1538	1555
Starting Vehs	190	237	201	201
Ending Vehs	274	267	239	258
Travel Distance (mi)	922	930	927	926
Travel Time (hr)	62.4	72.6	61.7	65.6
Total Delay (hr)	31.8	41.7	30.9	34.8
Total Stops	2538	2765	2626	2640
Fuel Used (gal)	41.4	44.1	41.1	42.2

Interval #3 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1468	1489	1507	1486
Vehs Exited	1506	1501	1493	1502
Starting Vehs	274	267	239	258
Ending Vehs	236	255	253	246
Travel Distance (mi)	888	907	873	889
Travel Time (hr)	64.4	72.0	55.3	63.9
Total Delay (hr)	34.9	41.8	26.2	34.3
Total Stops	2586	2573	2469	2542
Fuel Used (gal)	41.3	43.4	38.5	41.0

Interval #4 Information

Start Time	7:45
End Time	8:00
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1420	1500	1475	1466
Vehs Exited	1422	1496	1505	1475
Starting Vehs	236	255	253	246
Ending Vehs	234	259	223	232
Travel Distance (mi)	855	893	890	880
Travel Time (hr)	65.4	71.9	59.0	65.4
Total Delay (hr)	37.0	42.2	29.5	36.2
Total Stops	2376	2582	2469	2477
Fuel Used (gal)	40.0	42.9	40.1	41.0

Queuing and Blocking Report
No Build AM 2022

04/12/2018

Intersection: 1: Whipple & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T	
Maximum Queue (ft)	122	185	174	37	112	95	69	99	166	144	164	120	
Average Queue (ft)	53	105	81	9	40	44	19	38	68	23	85	43	
95th Queue (ft)	101	166	152	30	85	85	51	83	127	76	146	93	
Link Distance (ft)		636	636		1127	1127			339	339		1018	
Upstream Blk Time (%)													
Queuing Penalty (veh)													
Storage Bay Dist (ft)	235			130				150	90				190
Storage Blk Time (%)				0				2	5				0
Queuing Penalty (veh)				0				1	4				0

Intersection: 1: Whipple & Tuscarawas

Movement	SB
Directions Served	TR
Maximum Queue (ft)	164
Average Queue (ft)	62
95th Queue (ft)	122
Link Distance (ft)	1018
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Valleyview & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	TR
Maximum Queue (ft)	124	209	221	113	179	217	75	73	38	51	90	43
Average Queue (ft)	8	116	128	34	108	140	27	27	11	11	38	12
95th Queue (ft)	48	179	196	84	169	200	79	60	36	38	78	33
Link Distance (ft)		1127	1127		1307	1307		277	277	277		326
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	100			90				50				180
Storage Blk Time (%)			12	1	12	30	0					
Queuing Penalty (veh)			1	2	6	12	0					

Queuing and Blocking Report
No Build AM 2022

04/12/2018

Intersection: 3: Raff & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	24	170	187	100	181	179	174	128	58	64
Average Queue (ft)	2	47	52	45	77	96	69	53	14	26
95th Queue (ft)	14	113	126	90	151	162	134	105	43	59
Link Distance (ft)		1307	1307		948	948	315	315		421
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	50			75				90		
Storage Blk Time (%)			8	1	6					0
Queuing Penalty (veh)			1	1	6					0

Intersection: 4: Bellflower & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	24	64	67	49	106	124	94	48
Average Queue (ft)	4	16	13	10	24	24	30	20
95th Queue (ft)	19	49	46	33	74	76	65	44
Link Distance (ft)		948	948		828	828	190	457
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	50			50				
Storage Blk Time (%)			1	0	2			
Queuing Penalty (veh)			0	1	0			

Intersection: 5: Maryland/Gas Station & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	70	201	211	65	148	156	171	62
Average Queue (ft)	11	95	108	20	52	56	71	29
95th Queue (ft)	47	176	195	55	113	116	137	61
Link Distance (ft)		828	828		611	611	368	47
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	50			50				
Storage Blk Time (%)	1	14		1	6			
Queuing Penalty (veh)	4	1		3	2			

Queuing and Blocking Report
No Build AM 2022

04/12/2018

Intersection: 6: Tuscarawas & Wertz

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	71	157	201	155	166	98	154
Average Queue (ft)	36	37	52	68	80	61	38
95th Queue (ft)	69	108	137	133	144	102	88
Link Distance (ft)		611	611	505	505		575
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	50					75	
Storage Blk Time (%)	4	3				10	0
Queuing Penalty (veh)	15	3				11	0

Intersection: 7: Tuscarawas & Broad

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	74	197	247	100	108	106	150
Average Queue (ft)	39	103	130	54	51	59	36
95th Queue (ft)	72	177	207	96	96	101	84
Link Distance (ft)		505	505	145	145		455
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	50					85	
Storage Blk Time (%)	5	13				3	0
Queuing Penalty (veh)	22	9				3	0

Intersection: 8: Dartmouth & Tuscarawas

Movement	EB	EB	WB	NB
Directions Served	T	TR	L	LR
Maximum Queue (ft)	38	46	251	79
Average Queue (ft)	1	10	141	32
95th Queue (ft)	14	32	216	69
Link Distance (ft)	145	145		643
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			250	
Storage Blk Time (%)			1	
Queuing Penalty (veh)			2	

Queuing and Blocking Report
No Build AM 2022

04/12/2018

Intersection: 9: Bedford & Tuscarawas

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	L	T	LR
Maximum Queue (ft)	273	289	75	421	354
Average Queue (ft)	153	174	72	231	153
95th Queue (ft)	235	256	81	377	270
Link Distance (ft)	650	650		947	947
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			50		
Storage Blk Time (%)			46	26	
Queuing Penalty (veh)			201	60	

Intersection: 10: Harrison & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LT	R
Maximum Queue (ft)	36	159	164	64	174	171	82	597	205
Average Queue (ft)	7	45	53	7	95	84	20	354	51
95th Queue (ft)	28	113	126	34	155	146	55	737	180
Link Distance (ft)		947	947		172	172	126	574	
Upstream Blk Time (%)					0	0		34	
Queuing Penalty (veh)					1	1		0	
Storage Bay Dist (ft)	50			100					180
Storage Blk Time (%)	0	10			5			58	0
Queuing Penalty (veh)	0	1			1			17	0

Intersection: 11: SB I-77 Off Ramp/Harrison & Tuscarawas

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	TR	L	T	T	L	R	L	LT	R
Maximum Queue (ft)	212	231	125	248	196	117	79	425	475	520
Average Queue (ft)	169	177	40	158	90	52	33	307	413	408
95th Queue (ft)	227	242	108	228	179	106	62	412	541	620
Link Distance (ft)	172	172		386	386	297				496
Upstream Blk Time (%)	22	24								7
Queuing Penalty (veh)	92	102								0
Storage Bay Dist (ft)			100				150	450	450	
Storage Blk Time (%)			1	31				0	6	5
Queuing Penalty (veh)			3	9				0	43	46

Network Summary

Network wide Queuing Penalty: 691

HCM Signalized Intersection Capacity Analysis

1: Whipple & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	
Traffic Volume (vph)	210	720	110	50	780	260	230	240	40	330	280	230
Future Volume (vph)	210	720	110	50	780	260	230	240	40	330	280	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3501		1805	3574	1601	1804	3474		1805	3291	
Flt Permitted	0.15	1.00		0.22	1.00	1.00	0.39	1.00		0.32	1.00	
Satd. Flow (perm)	279	3501		417	3574	1601	737	3474		603	3291	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	783	120	54	848	283	250	261	43	359	304	250
RTOR Reduction (vph)	0	13	0	0	0	57	0	15	0	0	166	0
Lane Group Flow (vph)	228	890	0	54	848	226	250	289	0	359	388	0
Confl. Peds. (#/hr)	3		3	3		3	3					3
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	0%	2%	0%	0%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	45.6	34.9		35.4	29.8	46.6	22.9	10.3		31.3	14.5	
Effective Green, g (s)	45.6	34.9		35.4	29.8	46.6	22.9	10.3		31.3	14.5	
Actuated g/C Ratio	0.51	0.39		0.39	0.33	0.52	0.25	0.11		0.35	0.16	
Clearance Time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	320	1357		250	1183	928	336	397		434	530	
v/s Ratio Prot	c0.08	0.25		0.01	0.24	0.05	0.10	0.08		c0.15	0.12	
v/s Ratio Perm	c0.28			0.07		0.10	0.08			c0.13		
v/c Ratio	0.71	0.66		0.22	0.72	0.24	0.74	0.73		0.83	0.73	
Uniform Delay, d1	15.8	22.6		17.6	26.4	12.0	29.2	38.5		24.2	35.9	
Progression Factor	1.00	1.00		0.52	0.46	0.67	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.3	2.5		0.2	2.1	0.1	8.6	6.5		12.2	5.2	
Delay (s)	23.1	25.1		9.4	14.2	8.2	37.8	45.0		36.5	41.1	
Level of Service	C	C		A	B	A	D	D		D	D	
Approach Delay (s)		24.7			12.5			41.8			39.3	
Approach LOS		C			B			D			D	

Intersection Summary

HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.4
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Valleyview & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑		↘	↑↑	↗	↘	↑	↗	↘	↗	
Traffic Volume (vph)	60	820	120	150	1110	120	140	50	90	100	60	40
Future Volume (vph)	60	820	120	150	1110	120	140	50	90	100	60	40
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3500		1805	3574	1578	1804	1900	1593	1803	1777	
Flt Permitted	0.14	1.00		0.12	1.00	1.00	0.57	1.00	1.00	0.72	1.00	
Satd. Flow (perm)	263	3500		236	3574	1578	1084	1900	1593	1370	1777	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	891	130	163	1207	130	152	54	98	109	65	43
RTOR Reduction (vph)	0	13	0	0	0	76	0	0	70	0	28	0
Lane Group Flow (vph)	65	1008	0	163	1207	54	152	54	28	109	80	0
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	35.0	28.9		41.6	32.2	32.2	36.9	25.4	25.4	25.5	17.6	
Effective Green, g (s)	35.0	28.9		41.6	32.2	32.2	36.9	25.4	25.4	25.5	17.6	
Actuated g/C Ratio	0.39	0.32		0.46	0.36	0.36	0.41	0.28	0.28	0.28	0.20	
Clearance Time (s)	3.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6	
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	206	1123		272	1278	564	570	536	449	426	347	
v/s Ratio Prot	0.02	0.29		c0.06	c0.34		c0.05	0.03		0.02	0.04	
v/s Ratio Perm	0.10			0.21		0.03	c0.06		0.02	0.05		
v/c Ratio	0.32	0.90		0.60	0.94	0.09	0.27	0.10	0.06	0.26	0.23	
Uniform Delay, d1	20.4	29.1		18.1	28.0	19.2	17.2	23.9	23.6	24.6	30.5	
Progression Factor	0.73	0.98		1.45	0.71	1.13	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	8.4		2.8	12.6	0.3	0.3	0.4	0.3	0.3	0.7	
Delay (s)	15.5	36.9		29.1	32.5	21.9	17.4	24.2	23.9	24.9	31.2	
Level of Service	B	D		C	C	C	B	C	C	C	C	
Approach Delay (s)		35.6			31.2			20.7			28.0	
Approach LOS		D			C			C			C	

Intersection Summary

HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Raff & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	10	830	180	160	1080	20	310	70	110	20	50	10
Future Volume (vph)	10	830	180	160	1080	20	310	70	110	20	50	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		4.0	7.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00		1.00	0.91		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1801	3467		1770	3563		1783	1692		1687	1847	
Flt Permitted	0.23	1.00		0.13	1.00		0.71	1.00		0.55	1.00	
Satd. Flow (perm)	437	3467		235	3563		1341	1692		982	1847	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	902	196	174	1174	22	337	76	120	22	54	11
RTOR Reduction (vph)	0	19	0	0	1	0	0	67	0	0	8	0
Lane Group Flow (vph)	11	1079	0	174	1195	0	337	129	0	22	57	0
Confl. Peds. (#/hr)	5		4	4		5	2					2
Heavy Vehicles (%)	0%	1%	1%	2%	1%	0%	1%	2%	2%	7%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	38.0	38.0		51.1	51.1		27.9	27.9		27.9	27.9	
Effective Green, g (s)	38.0	38.0		51.1	51.1		27.9	27.9		27.9	27.9	
Actuated g/C Ratio	0.42	0.42		0.57	0.57		0.31	0.31		0.31	0.31	
Clearance Time (s)	7.0	7.0		4.0	7.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	5.0	5.0		3.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	184	1463		288	2022		415	524		304	572	
v/s Ratio Prot		c0.31		0.06	c0.34			0.08			0.03	
v/s Ratio Perm	0.03			0.28			c0.25			0.02		
v/c Ratio	0.06	0.74		0.60	0.59		0.81	0.25		0.07	0.10	
Uniform Delay, d1	15.4	21.8		13.4	12.7		28.6	23.2		21.9	22.1	
Progression Factor	1.93	1.94		1.61	0.26		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	2.2		3.1	1.1		12.9	0.5		0.2	0.2	
Delay (s)	30.2	44.6		24.5	4.4		41.5	23.7		22.1	22.3	
Level of Service	C	D		C	A		D	C		C	C	
Approach Delay (s)		44.4			6.9			35.0			22.2	
Approach LOS		D			A			C			C	

Intersection Summary

HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Bellflower & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	1120	30	30	1360	10	80	10	20	10	10	10
Future Volume (vph)	10	1120	30	30	1360	10	80	10	20	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.98			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	
Satd. Flow (prot)	1804	3556		1798	3570			1784			1784	
Flt Permitted	0.14	1.00		0.19	1.00			0.76			0.91	
Satd. Flow (perm)	269	3556		368	3570			1413			1642	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1217	33	33	1478	11	87	11	22	11	11	11
RTOR Reduction (vph)	0	1	0	0	0	0	0	12	0	0	9	0
Lane Group Flow (vph)	11	1249	0	33	1489	0	0	108	0	0	24	0
Confl. Peds. (#/hr)	2		11	11		2			1	1		
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	67.9	67.9		67.9	67.9			14.1			14.1	
Effective Green, g (s)	67.9	67.9		67.9	67.9			14.1			14.1	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.16			0.16	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Grp Cap (vph)	202	2682		277	2693			221			257	
v/s Ratio Prot		0.35			c0.42							
v/s Ratio Perm	0.04			0.09				c0.08			0.01	
v/c Ratio	0.05	0.47		0.12	0.55			0.49			0.09	
Uniform Delay, d1	2.8	4.2		3.0	4.7			34.7			32.5	
Progression Factor	2.45	2.49		0.32	0.26			1.00			1.00	
Incremental Delay, d2	0.4	0.5		0.8	0.7			3.5			0.3	
Delay (s)	7.4	10.9		1.8	2.0			38.2			32.8	
Level of Service	A	B		A	A			D			C	
Approach Delay (s)		10.9			2.0			38.2			32.8	
Approach LOS		B			A			D			C	

Intersection Summary

HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

5: Maryland/Gas Station & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	950	50	80	1130	50	110	30	90	30	20	10
Future Volume (vph)	20	950	50	80	1130	50	110	30	90	30	20	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.95			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1805	3537		1762	3550			1704			1770	
Flt Permitted	0.17	1.00		0.22	1.00			0.84			0.80	
Satd. Flow (perm)	322	3537		413	3550			1457			1447	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	1033	54	87	1228	54	120	33	98	33	22	11
RTOR Reduction (vph)	0	3	0	0	3	0	0	31	0	0	8	0
Lane Group Flow (vph)	22	1084	0	87	1279	0	0	220	0	0	58	0
Confl. Peds. (#/hr)	4		8	8		4	3		3	3		3
Heavy Vehicles (%)	0%	1%	2%	2%	1%	0%	0%	0%	6%	4%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	61.3	61.3		61.3	61.3			20.7			20.7	
Effective Green, g (s)	61.3	61.3		61.3	61.3			20.7			20.7	
Actuated g/C Ratio	0.68	0.68		0.68	0.68			0.23			0.23	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Grp Cap (vph)	219	2409		281	2417			335			332	
v/s Ratio Prot		0.31			c0.36							
v/s Ratio Perm	0.07			0.21				c0.15			0.04	
v/c Ratio	0.10	0.45		0.31	0.53			0.66			0.17	
Uniform Delay, d1	4.9	6.6		5.8	7.2			31.4			27.8	
Progression Factor	0.49	0.46		1.70	1.96			1.00			1.00	
Incremental Delay, d2	0.8	0.6		2.2	0.7			6.1			0.5	
Delay (s)	3.2	3.6		12.1	14.7			37.6			28.3	
Level of Service	A	A		B	B			D			C	
Approach Delay (s)		3.6			14.5			37.6			28.3	
Approach LOS		A			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

6: Tuscarawas & Wertz

03/26/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↑↗		↙	↘
Traffic Volume (vph)	190	1080	1210	130	100	200
Future Volume (vph)	190	1080	1210	130	100	200
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3515		1787	1589
Flt Permitted	0.11	1.00	1.00		0.95	1.00
Satd. Flow (perm)	200	3574	3515		1787	1589
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	1174	1315	141	109	217
RTOR Reduction (vph)	0	0	7	0	0	185
Lane Group Flow (vph)	207	1174	1449	0	109	32
Confl. Peds. (#/hr)	4			4		3
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	68.8	68.8	55.5		13.2	13.2
Effective Green, g (s)	68.8	68.8	55.5		13.2	13.2
Actuated g/C Ratio	0.76	0.76	0.62		0.15	0.15
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	336	2732	2167		262	233
v/s Ratio Prot	c0.07	0.33	c0.41		c0.06	
v/s Ratio Perm	0.40					0.02
v/c Ratio	0.62	0.43	0.67		0.42	0.14
Uniform Delay, d1	11.7	3.7	11.3		34.9	33.4
Progression Factor	1.99	1.29	0.09		1.00	1.00
Incremental Delay, d2	3.2	0.5	0.8		2.2	0.6
Delay (s)	26.6	5.3	1.9		37.1	34.0
Level of Service	C	A	A		D	C
Approach Delay (s)		8.5	1.9		35.0	
Approach LOS		A	A		D	

Intersection Summary

HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

7: Tuscarawas & Broad

03/26/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↖↗		↘	↗
Traffic Volume (vph)	140	970	1330	100	70	130
Future Volume (vph)	140	970	1330	100	70	130
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	3574	3531		1805	1615
Flt Permitted	0.09	1.00	1.00		0.95	1.00
Satd. Flow (perm)	162	3574	3531		1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	1054	1446	109	76	141
RTOR Reduction (vph)	0	0	6	0	0	99
Lane Group Flow (vph)	152	1054	1549	0	76	42
Confl. Peds. (#/hr)	4			4		
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	55.4	55.4	43.5		26.6	26.6
Effective Green, g (s)	55.4	55.4	43.5		26.6	26.6
Actuated g/C Ratio	0.62	0.62	0.48		0.30	0.30
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	260	2199	1706		533	477
v/s Ratio Prot	c0.06	0.29	c0.44		c0.04	
v/s Ratio Perm	0.30					0.03
v/c Ratio	0.58	0.48	0.91		0.14	0.09
Uniform Delay, d1	16.9	9.4	21.4		23.3	22.9
Progression Factor	2.19	0.45	0.68		1.00	1.00
Incremental Delay, d2	3.1	0.7	7.9		0.6	0.4
Delay (s)	40.1	5.0	22.4		23.9	23.3
Level of Service	D	A	C		C	C
Approach Delay (s)		9.4	22.4		23.5	
Approach LOS		A	C		C	

Intersection Summary

HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

8: Dartmouth & Tuscarawas

03/26/2018

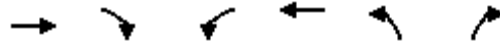


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	1020	60	90	1540	40	200
Future Volume (Veh/h)	1020	60	90	1540	40	200
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1109	65	98	1674	43	217
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)	233		709			
pX, platoon unblocked			0.84		0.87	0.84
vC, conflicting volume			1174		2174	587
vC1, stage 1 conf vol					1142	
vC2, stage 2 conf vol					1033	
vCu, unblocked vol			817		1205	115
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			86		85	72
cM capacity (veh/h)			686		283	771
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	739	435	98	837	837	260
Volume Left	0	0	98	0	0	43
Volume Right	0	65	0	0	0	217
cSH	1700	1700	686	1700	1700	600
Volume to Capacity	0.43	0.26	0.14	0.49	0.49	0.43
Queue Length 95th (ft)	0	0	12	0	0	55
Control Delay (s)	0.0	0.0	11.1	0.0	0.0	15.5
Lane LOS	B			C		
Approach Delay (s)	0.0		0.6			15.5
Approach LOS				C		
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			63.8%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Bedford & Tuscarawas

03/26/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (vph)	1070	100	140	1060	230	150
Future Volume (vph)	1070	100	140	1060	230	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		3.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.95	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3523		1787	3574	1737	
Flt Permitted	1.00		0.10	1.00	0.97	
Satd. Flow (perm)	3523		181	3574	1737	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1163	109	152	1152	250	163
RTOR Reduction (vph)	7	0	0	0	0	0
Lane Group Flow (vph)	1265	0	152	1152	413	0
Confl. Peds. (#/hr)		2	2			1
Heavy Vehicles (%)	1%	0%	1%	1%	0%	0%
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases			6			
Actuated Green, G (s)	38.6		50.0	50.0	32.0	
Effective Green, g (s)	38.6		50.0	50.0	32.0	
Actuated g/C Ratio	0.43		0.56	0.56	0.36	
Clearance Time (s)	4.0		3.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.0	5.0	5.0	
Lane Grp Cap (vph)	1510		250	1985	617	
v/s Ratio Prot	c0.36		0.06	c0.32	c0.24	
v/s Ratio Perm			0.28			
v/c Ratio	0.84		0.61	0.58	0.67	
Uniform Delay, d1	22.9		16.1	13.1	24.5	
Progression Factor	0.60		1.00	1.00	1.00	
Incremental Delay, d2	5.4		2.9	1.2	5.7	
Delay (s)	19.3		19.0	14.4	30.2	
Level of Service	B		B	B	C	
Approach Delay (s)	19.3			14.9	30.2	
Approach LOS	B			B	C	

Intersection Summary

HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

10: Harrison & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	920	20	20	1380	140	10	10	10	240	10	120
Future Volume (vph)	20	920	20	20	1380	140	10	10	10	240	10	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1		3.0	5.1			5.1			5.1	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99			0.99			1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	1.00
Frt	1.00	1.00		1.00	0.99			0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (prot)	1805	3527		1805	3468			1769			1689	1570
Flt Permitted	0.10	1.00		0.21	1.00			0.88			0.71	1.00
Satd. Flow (perm)	194	3527		404	3468			1574			1257	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	1000	22	22	1500	152	11	11	11	261	11	130
RTOR Reduction (vph)	0	2	0	0	8	0	0	9	0	0	0	97
Lane Group Flow (vph)	22	1020	0	22	1644	0	0	24	0	0	272	33
Confl. Peds. (#/hr)	17		3	3		17	10		4	4		10
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	0%	0%	7%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2 8		1	6 8			3			3	
Permitted Phases	2 8			6 8			3			3		3
Actuated Green, G (s)	56.2	56.2		61.7	61.7			19.9			19.9	19.9
Effective Green, g (s)	56.2	56.2		56.6	61.7			19.9			19.9	19.9
Actuated g/C Ratio	0.61	0.61		0.62	0.67			0.22			0.22	0.22
Clearance Time (s)				3.0				5.1			5.1	5.1
Vehicle Extension (s)				3.0				3.0			3.0	3.0
Lane Grp Cap (vph)	118	2159		287	2330			341			272	340
v/s Ratio Prot		0.29		0.00	c0.47							
v/s Ratio Perm	0.11			0.05				0.02			c0.22	0.02
v/c Ratio	0.19	0.47		0.08	0.71			0.07			1.00	0.10
Uniform Delay, d1	7.8	9.7		7.8	9.4			28.6			36.0	28.8
Progression Factor	1.00	1.00		0.53	0.56			1.00			1.00	1.00
Incremental Delay, d2	0.8	0.2		0.1	0.5			0.1			54.6	0.1
Delay (s)	8.6	9.9		4.2	5.7			28.7			90.5	28.9
Level of Service	A	A		A	A			C			F	C
Approach Delay (s)		9.8			5.7			28.7			70.6	
Approach LOS		A			A			C			E	

Intersection Summary

HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	91.8	Sum of lost time (s)	18.3
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

11: SB I-77 Off Ramp/Harrison & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑		↖		↖	↖	↖	↖
Traffic Volume (vph)	0	1220	70	50	880	0	160	0	170	210	190	530
Future Volume (vph)	0	1220	70	50	880	0	160	0	170	210	190	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00	0.95	0.95	1.00
Frt		0.99		1.00	1.00		1.00		0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95		1.00	0.95	1.00	1.00
Satd. Flow (prot)		3547		1805	3574		1805		1615	1715	1764	1599
Flt Permitted		1.00		0.13	1.00		0.61		1.00	0.95	1.00	1.00
Satd. Flow (perm)		3547		240	3574		1156		1615	1715	1764	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1326	76	54	957	0	174	0	185	228	207	576
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	145	0	0	131
Lane Group Flow (vph)	0	1398	0	54	957	0	174	0	40	205	230	445
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	2%	1%
Turn Type		NA		Perm	NA		Perm		Perm	Split	NA	Perm
Protected Phases		2			6					8	8	
Permitted Phases				6			7		7			8
Actuated Green, G (s)		26.2		31.7	31.7		19.9		19.9	24.9	24.9	24.9
Effective Green, g (s)		26.2		31.7	31.7		19.9		19.9	24.9	24.9	24.9
Actuated g/C Ratio		0.29		0.35	0.35		0.22		0.22	0.27	0.27	0.27
Clearance Time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Vehicle Extension (s)		5.0		5.0	5.0		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1012		82	1234		250		350	465	478	433
v/s Ratio Prot		c0.39			c0.27					0.12	0.13	
v/s Ratio Perm				0.23			c0.15		0.02			c0.28
v/c Ratio		1.38		0.66	0.78		0.70		0.11	0.44	0.48	1.03
Uniform Delay, d1		32.8		25.5	26.9		33.2		28.9	27.7	28.0	33.5
Progression Factor		0.84		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		176.9		34.6	4.8		8.2		0.1	0.7	0.8	50.4
Delay (s)		204.6		60.0	31.7		41.3		29.0	28.4	28.8	83.9
Level of Service		F		E	C		D		C	C	C	F
Approach Delay (s)		204.6			33.2			35.0			60.1	
Approach LOS		F			C			C			E	

Intersection Summary

HCM 2000 Control Delay	104.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	91.8	Sum of lost time (s)	18.3
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

SimTraffic Simulation Summary
No Build PM 2022

04/12/2018

Summary of All Intervals

Run Number	1	2	3	Avg
Start Time	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	8328	8310	8273	8303
Vehs Exited	8342	8239	8312	8298
Starting Vehs	377	339	408	370
Ending Vehs	363	410	369	376
Travel Distance (mi)	4988	4916	4989	4965
Travel Time (hr)	536.5	521.8	620.1	559.5
Total Delay (hr)	372.7	360.2	456.3	396.4
Total Stops	14950	14482	15441	14961
Fuel Used (gal)	272.9	268.5	292.3	277.9

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information

Start Time	5:00
End Time	5:15
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	2020	2004	2006	2009
Vehs Exited	2017	2031	2031	2026
Starting Vehs	377	339	408	370
Ending Vehs	380	312	383	356
Travel Distance (mi)	1249	1204	1214	1222
Travel Time (hr)	100.0	95.5	111.8	102.4
Total Delay (hr)	59.0	55.9	71.7	62.2
Total Stops	3709	3441	3628	3590
Fuel Used (gal)	60.7	58.4	62.5	60.5

SimTraffic Simulation Summary
No Build PM 2022

04/12/2018

Interval #2 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	2	3	Avg
Vehs Entered	2263	2208	2225	2232
Vehs Exited	2225	2094	2167	2166
Starting Vehs	380	312	383	356
Ending Vehs	418	426	441	425
Travel Distance (mi)	1319	1232	1316	1289
Travel Time (hr)	134.6	118.3	156.6	136.5
Total Delay (hr)	91.4	77.7	113.2	94.1
Total Stops	4142	3772	4328	4076
Fuel Used (gal)	70.6	65.0	75.4	70.3

Interval #3 Information

Start Time	5:30
End Time	5:45
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	2059	2008	1979	2016
Vehs Exited	2126	2042	2072	2079
Starting Vehs	418	426	441	425
Ending Vehs	351	392	348	359
Travel Distance (mi)	1253	1205	1230	1229
Travel Time (hr)	150.5	136.5	173.1	153.4
Total Delay (hr)	109.2	97.0	133.1	113.1
Total Stops	3710	3431	3726	3620
Fuel Used (gal)	72.1	67.6	76.9	72.2

Interval #4 Information Recording

Start Time	5:45
End Time	6:00
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1986	2090	2063	2047
Vehs Exited	1974	2072	2042	2028
Starting Vehs	351	392	348	359
Ending Vehs	363	410	369	376
Travel Distance (mi)	1168	1275	1229	1224
Travel Time (hr)	151.4	171.5	178.6	167.2
Total Delay (hr)	113.1	129.6	138.2	127.0
Total Stops	3389	3838	3759	3664
Fuel Used (gal)	69.5	77.5	77.5	74.9

Queuing and Blocking Report
No Build PM 2022

04/12/2018

Intersection: 1: Whipple & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	193	272	248	154	220	242	175	115	288	229	206	267
Average Queue (ft)	84	145	143	28	103	113	51	98	143	77	134	110
95th Queue (ft)	152	226	217	79	188	206	137	133	252	161	206	210
Link Distance (ft)		636	636		1127	1127			339	339		1018
Upstream Blk Time (%)	0											
Queuing Penalty (veh)	0											
Storage Bay Dist (ft)	235			130			150	90			190	
Storage Blk Time (%)		0			2	2	0	24	19		2	0
Queuing Penalty (veh)		1			1	5	0	29	44		3	0

Intersection: 1: Whipple & Tuscarawas

Movement	SB
Directions Served	TR
Maximum Queue (ft)	341
Average Queue (ft)	155
95th Queue (ft)	265
Link Distance (ft)	1018
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Valleyview & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	TR
Maximum Queue (ft)	125	338	340	115	370	388	75	153	94	108	154	88
Average Queue (ft)	59	204	216	87	216	236	43	63	31	37	50	45
95th Queue (ft)	131	294	309	139	356	375	96	117	71	75	105	81
Link Distance (ft)		1127	1127		1307	1307		277	277	277		326
Upstream Blk Time (%)	0											
Queuing Penalty (veh)	0											
Storage Bay Dist (ft)	100			90			50				180	
Storage Blk Time (%)	0	30		10	35	48	0				0	
Queuing Penalty (veh)	0	18		54	52	58	1				0	

Queuing and Blocking Report
No Build PM 2022

04/12/2018

Intersection: 3: Raff & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	35	354	374	99	169	159	292	176	59	79
Average Queue (ft)	5	238	256	54	61	69	161	58	16	26
95th Queue (ft)	23	329	349	97	128	129	265	122	44	59
Link Distance (ft)		1307	1307		948	948	315	315		421
Upstream Blk Time (%)	1									
Queuing Penalty (veh)	0									
Storage Bay Dist (ft)	50			75					90	
Storage Blk Time (%)	0	41		4	4					0
Queuing Penalty (veh)	1	4		20	7					0

Intersection: 4: Bellflower & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	41	300	289	52	163	187	128	69
Average Queue (ft)	6	112	121	12	31	36	60	21
95th Queue (ft)	29	243	254	38	82	94	103	52
Link Distance (ft)		948	948		828	828	190	457
Upstream Blk Time (%)	0							
Queuing Penalty (veh)	0							
Storage Bay Dist (ft)	50			50				
Storage Blk Time (%)	0	13		1	3			
Queuing Penalty (veh)	1	1		6	1			

Intersection: 5: Maryland/Gas Station & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	39	255	242	75	279	276	205	77
Average Queue (ft)	10	83	79	33	133	146	100	30
95th Queue (ft)	31	197	191	69	255	261	170	65
Link Distance (ft)		828	828		611	611	368	47
Upstream Blk Time (%)	9							
Queuing Penalty (veh)	0							
Storage Bay Dist (ft)	50			50				
Storage Blk Time (%)	0	9		4	14			
Queuing Penalty (veh)	2	2		20	11			

Queuing and Blocking Report
No Build PM 2022

04/12/2018

Intersection: 6: Tuscarawas & Wertz

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	74	312	287	127	171	98	134
Average Queue (ft)	64	157	143	50	66	58	57
95th Queue (ft)	86	284	257	113	135	102	105
Link Distance (ft)		611	611	505	505		575
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	50					75	
Storage Blk Time (%)	32	12				10	2
Queuing Penalty (veh)	172	22				20	2

Intersection: 7: Tuscarawas & Broad

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	75	240	223	195	189	96	142
Average Queue (ft)	61	90	80	155	159	36	52
95th Queue (ft)	83	185	146	183	176	73	103
Link Distance (ft)		505	505	145	145		455
Upstream Blk Time (%)				20	24		
Queuing Penalty (veh)				159	188		
Storage Bay Dist (ft)	50					85	
Storage Blk Time (%)	39	8				0	3
Queuing Penalty (veh)	187	11				1	2

Intersection: 8: Dartmouth & Tuscarawas

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	28	18	110	229	251	431
Average Queue (ft)	2	2	41	85	92	411
95th Queue (ft)	15	13	82	209	213	506
Link Distance (ft)	145	145		650	650	416
Upstream Blk Time (%)						93
Queuing Penalty (veh)						0
Storage Bay Dist (ft)			250			
Storage Blk Time (%)				0		
Queuing Penalty (veh)				0		

Queuing and Blocking Report
No Build PM 2022

04/12/2018

Intersection: 9: Bedford & Tuscarawas

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	L	T	LR
Maximum Queue (ft)	257	271	75	267	262
Average Queue (ft)	152	163	63	170	165
95th Queue (ft)	236	248	88	298	289
Link Distance (ft)	650	650		947	947
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			50		
Storage Blk Time (%)			29	28	
Queuing Penalty (veh)			153	39	

Intersection: 10: Harrison & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LT	R
Maximum Queue (ft)	74	276	286	70	178	177	104	626	205
Average Queue (ft)	23	133	140	11	110	120	26	586	74
95th Queue (ft)	64	246	253	39	172	180	72	614	228
Link Distance (ft)		947	947		172	172	126	574	
Upstream Blk Time (%)					0	0	1	97	
Queuing Penalty (veh)					3	4	0	0	
Storage Bay Dist (ft)	50			100					180
Storage Blk Time (%)	3	34			6			97	0
Queuing Penalty (veh)	12	7			1			117	0

Intersection: 11: SB I-77 Off Ramp/Harrison & Tuscarawas

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	TR	L	T	T	L	R	L	LT	R
Maximum Queue (ft)	212	230	125	428	426	176	160	249	367	411
Average Queue (ft)	188	195	96	337	309	85	55	99	206	207
95th Queue (ft)	205	216	150	471	474	142	109	237	333	370
Link Distance (ft)	172	172		386	386	297				496
Upstream Blk Time (%)	38	41		34	23					1
Queuing Penalty (veh)	221	238		0	0					0
Storage Bay Dist (ft)			100				150	450	450	
Storage Blk Time (%)			42	46		1	0			1
Queuing Penalty (veh)			183	23		1	0			5

Network Summary

Network wide Queuing Penalty: 2117

HCM Signalized Intersection Capacity Analysis

1: Whipple & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	640	80	20	410	120	80	140	20	210	130	180
Future Volume (vph)	180	640	80	20	410	120	80	140	20	210	130	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	3463		1569	3505	1481	1768	3422		1752	3166	
Flt Permitted	0.38	1.00		0.34	1.00	1.00	0.55	1.00		0.43	1.00	
Satd. Flow (perm)	694	3463		555	3505	1481	1021	3422		801	3166	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	696	87	22	446	130	87	152	22	228	141	196
RTOR Reduction (vph)	0	10	0	0	0	64	0	13	0	0	157	0
Lane Group Flow (vph)	196	773	0	22	446	66	87	161	0	228	180	0
Confl. Peds. (#/hr)	2		3	3		2	2					2
Heavy Vehicles (%)	4%	2%	5%	15%	3%	8%	2%	3%	7%	3%	2%	4%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	48.1	39.7		34.9	32.1	45.5	18.7	11.7		30.7	18.1	
Effective Green, g (s)	48.1	39.7		34.9	32.1	45.5	18.7	11.7		30.7	18.1	
Actuated g/C Ratio	0.53	0.44		0.39	0.36	0.51	0.21	0.13		0.34	0.20	
Clearance Time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	491	1527		246	1250	840	270	444		414	636	
v/s Ratio Prot	c0.05	c0.22		0.00	0.13	0.01	0.03	0.05		c0.08	0.06	
v/s Ratio Perm	0.17			0.03		0.03	0.04			c0.11		
v/c Ratio	0.40	0.51		0.09	0.36	0.08	0.32	0.36		0.55	0.28	
Uniform Delay, d1	11.5	18.1		17.1	21.3	11.5	29.7	35.7		22.7	30.5	
Progression Factor	1.00	1.00		1.01	0.67	0.20	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	1.2		0.1	0.8	0.0	0.7	0.5		1.6	0.2	
Delay (s)	12.1	19.3		17.4	15.0	2.4	30.4	36.3		24.3	30.7	
Level of Service	B	B		B	B	A	C	D		C	C	
Approach Delay (s)		17.9			12.4			34.3			28.1	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.4
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Valleyview & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗	↗	↖	↗	
Traffic Volume (vph)	10	830	40	50	580	40	50	20	20	70	10	10
Future Volume (vph)	10	830	40	50	580	40	50	20	20	70	10	10
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1804	3476		1719	3505	1578	1805	1900	1350	1803	1643	
Flt Permitted	0.38	1.00		0.12	1.00	1.00	0.61	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	728	3476		215	3505	1578	1161	1900	1350	1410	1643	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	902	43	54	630	43	54	22	22	76	11	11
RTOR Reduction (vph)	0	4	0	0	0	26	0	0	15	0	9	0
Lane Group Flow (vph)	11	941	0	54	630	17	54	22	7	76	13	0
Confl. Peds. (#/hr)	1		1	1		1			1	1		
Heavy Vehicles (%)	0%	3%	4%	5%	3%	0%	0%	0%	18%	0%	0%	14%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	31.8	30.5		40.0	35.1	35.1	38.8	27.7	27.7	24.2	16.7	
Effective Green, g (s)	31.8	30.5		40.0	35.1	35.1	38.8	27.7	27.7	24.2	16.7	
Actuated g/C Ratio	0.35	0.34		0.44	0.39	0.39	0.43	0.31	0.31	0.27	0.19	
Clearance Time (s)	3.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6	
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	272	1177		194	1366	615	632	584	415	411	304	
v/s Ratio Prot	0.00	c0.27		c0.02	0.18		c0.02	0.01		c0.02	0.01	
v/s Ratio Perm	0.01			0.11		0.01	0.02		0.01	c0.03		
v/c Ratio	0.04	0.80		0.28	0.46	0.03	0.09	0.04	0.02	0.18	0.04	
Uniform Delay, d1	19.0	27.0		17.0	20.4	16.9	15.1	21.8	21.7	25.1	30.1	
Progression Factor	1.46	1.02		1.28	1.12	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	5.2		0.8	1.1	0.1	0.1	0.1	0.1	0.2	0.1	
Delay (s)	27.7	32.8		22.6	24.0	17.0	15.1	21.9	21.7	25.3	30.2	
Level of Service	C	C		C	C	B	B	C	C	C	C	
Approach Delay (s)		32.7			23.5			18.2			26.4	
Approach LOS		C			C			B			C	

Intersection Summary

HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Raff & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	10	930	70	120	660	10	130	50	90	30	50	10
Future Volume (vph)	10	930	70	120	660	10	130	50	90	30	50	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		4.0	7.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.90		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1803	3539		1787	3497		1750	1666		1626	1760	
Flt Permitted	0.38	1.00		0.19	1.00		0.71	1.00		0.56	1.00	
Satd. Flow (perm)	712	3539		351	3497		1317	1666		954	1760	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1011	76	130	717	11	141	54	98	33	54	11
RTOR Reduction (vph)	0	4	0	0	1	0	0	79	0	0	9	0
Lane Group Flow (vph)	11	1083	0	130	727	0	141	73	0	33	56	0
Confl. Peds. (#/hr)	1					1	1					1
Heavy Vehicles (%)	0%	1%	0%	1%	3%	0%	3%	3%	3%	11%	6%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	49.9	49.9		61.7	61.7		17.3	17.3		17.3	17.3	
Effective Green, g (s)	49.9	49.9		61.7	61.7		17.3	17.3		17.3	17.3	
Actuated g/C Ratio	0.55	0.55		0.69	0.69		0.19	0.19		0.19	0.19	
Clearance Time (s)	7.0	7.0		4.0	7.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	5.0	5.0		3.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	394	1962		365	2397		253	320		183	338	
v/s Ratio Prot		c0.31		c0.03	0.21			0.04			0.03	
v/s Ratio Perm	0.02			0.21			c0.11			0.03		
v/c Ratio	0.03	0.55		0.36	0.30		0.56	0.23		0.18	0.17	
Uniform Delay, d1	9.1	12.9		6.7	5.6		32.9	30.7		30.4	30.3	
Progression Factor	0.17	0.17		1.94	1.42		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.9		0.6	0.3		4.5	0.8		1.0	0.5	
Delay (s)	1.7	3.1		13.5	8.3		37.4	31.5		31.4	30.8	
Level of Service	A	A		B	A		D	C		C	C	
Approach Delay (s)		3.1			9.1			34.3			31.0	
Approach LOS		A			A			C			C	

Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Bellflower & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	1060	40	20	790	10	20	10	20	10	10	10
Future Volume (vph)	10	1060	40	20	790	10	20	10	20	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.95			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1802	3552		1802	3567			1704			1783	
Flt Permitted	0.32	1.00		0.22	1.00			0.85			0.93	
Satd. Flow (perm)	610	3552		425	3567			1486			1677	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1152	43	22	859	11	22	11	22	11	11	11
RTOR Reduction (vph)	0	1	0	0	0	0	0	20	0	0	10	0
Lane Group Flow (vph)	11	1194	0	22	870	0	0	35	0	0	23	0
Confl. Peds. (#/hr)	2		4	4		2			2	2		
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	7%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	75.4	75.4		75.4	75.4			6.6			6.6	
Effective Green, g (s)	75.4	75.4		75.4	75.4			6.6			6.6	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.07			0.07	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Grp Cap (vph)	511	2975		356	2988			108			122	
v/s Ratio Prot		c0.34			0.24							
v/s Ratio Perm	0.02			0.05				c0.02			0.01	
v/c Ratio	0.02	0.40		0.06	0.29			0.32			0.19	
Uniform Delay, d1	1.2	1.8		1.2	1.6			39.6			39.2	
Progression Factor	0.15	0.09		0.38	0.55			1.00			1.00	
Incremental Delay, d2	0.1	0.4		0.3	0.2			3.6			1.6	
Delay (s)	0.2	0.5		0.8	1.1			43.1			40.7	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		0.5			1.1			43.1			40.7	
Approach LOS		A			A			D			D	

Intersection Summary

HCM 2000 Control Delay	2.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

5: Maryland/Gas Station & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	10	990	30	40	660	60	40	50	70	30	10	10
Future Volume (vph)	10	990	30	40	660	60	40	50	70	30	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.94			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	902	3556		1750	3495			1710			1787	
Flt Permitted	0.34	1.00		0.23	1.00			0.91			0.72	
Satd. Flow (perm)	324	3556		425	3495			1578			1324	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1076	33	43	717	65	43	54	76	33	11	11
RTOR Reduction (vph)	0	1	0	0	4	0	0	41	0	0	9	0
Lane Group Flow (vph)	11	1108	0	43	778	0	0	132	0	0	46	0
Confl. Peds. (#/hr)			2	2			5		1	1		5
Heavy Vehicles (%)	100%	1%	0%	3%	2%	2%	10%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	67.3	67.3		67.3	67.3			14.7			14.7	
Effective Green, g (s)	67.3	67.3		67.3	67.3			14.7			14.7	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.16			0.16	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Grp Cap (vph)	242	2659		317	2613			257			216	
v/s Ratio Prot		c0.31			0.22							
v/s Ratio Perm	0.03			0.10				c0.08			0.03	
v/c Ratio	0.05	0.42		0.14	0.30			0.51			0.21	
Uniform Delay, d1	3.0	4.2		3.2	3.7			34.4			32.6	
Progression Factor	1.78	1.34		0.59	0.71			1.00			1.00	
Incremental Delay, d2	0.3	0.5		0.8	0.3			3.4			1.0	
Delay (s)	5.6	6.0		2.7	2.9			37.8			33.7	
Level of Service	A	A		A	A			D			C	
Approach Delay (s)		6.0			2.9			37.8			33.7	
Approach LOS		A			A			D			C	

Intersection Summary

HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

6: Tuscarawas & Wertz

03/26/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↖↗		↖	↗
Traffic Volume (vph)	100	920	830	80	130	120
Future Volume (vph)	100	920	830	80	130	120
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3530		1805	1591
Flt Permitted	0.23	1.00	1.00		0.95	1.00
Satd. Flow (perm)	445	3574	3530		1805	1591
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	1000	902	87	141	130
RTOR Reduction (vph)	0	0	5	0	0	109
Lane Group Flow (vph)	109	1000	984	0	141	21
Confl. Peds. (#/hr)					1	2
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	67.5	67.5	58.6		14.5	14.5
Effective Green, g (s)	67.5	67.5	58.6		14.5	14.5
Actuated g/C Ratio	0.75	0.75	0.65		0.16	0.16
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	422	2680	2298		290	256
v/s Ratio Prot	0.02	c0.28	c0.28		c0.08	
v/s Ratio Perm	0.18					0.01
v/c Ratio	0.26	0.37	0.43		0.49	0.08
Uniform Delay, d1	4.0	3.9	7.6		34.4	32.1
Progression Factor	0.48	0.39	0.85		1.00	1.00
Incremental Delay, d2	0.3	0.4	0.5		2.7	0.3
Delay (s)	2.2	1.9	7.0		37.0	32.4
Level of Service	A	A	A		D	C
Approach Delay (s)		1.9	7.0		34.8	
Approach LOS		A	A		C	

Intersection Summary

HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

7: Tuscarawas & Broad

03/26/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	70	1070	780	30	120	120
Future Volume (vph)	70	1070	780	30	120	120
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1735	3539	3518		1770	1599
Flt Permitted	0.23	1.00	1.00		0.95	1.00
Satd. Flow (perm)	421	3539	3518		1770	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	1163	848	33	130	130
RTOR Reduction (vph)	0	0	3	0	0	92
Lane Group Flow (vph)	76	1163	878	0	130	38
Confl. Peds. (#/hr)	3			3		
Heavy Vehicles (%)	4%	2%	2%	0%	2%	1%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	55.4	55.4	46.5		26.6	26.6
Effective Green, g (s)	55.4	55.4	46.5		26.6	26.6
Actuated g/C Ratio	0.62	0.62	0.52		0.30	0.30
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	345	2178	1817		523	472
v/s Ratio Prot	0.01	c0.33	0.25		c0.07	
v/s Ratio Perm	0.12					0.02
v/c Ratio	0.22	0.53	0.48		0.25	0.08
Uniform Delay, d1	8.2	9.9	14.0		24.1	22.9
Progression Factor	1.03	1.28	0.42		1.00	1.00
Incremental Delay, d2	0.3	0.9	0.8		1.1	0.3
Delay (s)	8.8	13.6	6.7		25.2	23.2
Level of Service	A	B	A		C	C
Approach Delay (s)		13.3	6.7		24.2	
Approach LOS		B	A		C	

Intersection Summary

HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

8: Dartmouth & Tuscarawas

03/26/2018

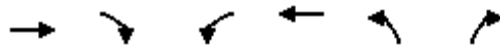


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (veh/h)	1020	170	360	730	10	50
Future Volume (Veh/h)	1020	170	360	730	10	50
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1109	185	391	793	11	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)	233		709			
pX, platoon unblocked			0.81		0.87	0.81
vC, conflicting volume			1294		2380	647
vC1, stage 1 conf vol					1202	
vC2, stage 2 conf vol					1178	
vCu, unblocked vol			889		1684	88
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			37		90	93
cM capacity (veh/h)			618		105	770
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	739	555	391	396	396	65
Volume Left	0	0	391	0	0	11
Volume Right	0	185	0	0	0	54
cSH	1700	1700	618	1700	1700	371
Volume to Capacity	0.43	0.33	0.63	0.23	0.23	0.18
Queue Length 95th (ft)	0	0	112	0	0	16
Control Delay (s)	0.0	0.0	20.3	0.0	0.0	16.7
Lane LOS			C			C
Approach Delay (s)	0.0		6.7			16.7
Approach LOS						C
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			67.2%	ICU Level of Service	C	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Bedford & Tuscarawas

03/26/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Traffic Volume (vph)	970	170	260	970	70	40
Future Volume (vph)	970	170	260	970	70	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		3.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.98		1.00	1.00	0.95	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3451		1805	3574	1664	
Flt Permitted	1.00		0.11	1.00	0.97	
Satd. Flow (perm)	3451		203	3574	1664	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1054	185	283	1054	76	43
RTOR Reduction (vph)	15	0	0	0	0	0
Lane Group Flow (vph)	1224	0	283	1054	119	0
Confl. Peds. (#/hr)		2	2		1	
Heavy Vehicles (%)	2%	1%	0%	1%	6%	4%
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases			6			
Actuated Green, G (s)	34.4		50.0	50.0	32.0	
Effective Green, g (s)	34.4		50.0	50.0	32.0	
Actuated g/C Ratio	0.38		0.56	0.56	0.36	
Clearance Time (s)	4.0		3.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.0	5.0	5.0	
Lane Grp Cap (vph)	1319		337	1985	591	
v/s Ratio Prot	c0.35		c0.12	0.29	c0.07	
v/s Ratio Perm			0.35			
v/c Ratio	0.93		0.84	0.53	0.20	
Uniform Delay, d1	26.6		23.0	12.6	20.1	
Progression Factor	0.77		1.00	1.00	1.00	
Incremental Delay, d2	11.7		15.9	1.0	0.8	
Delay (s)	32.0		38.9	13.6	20.9	
Level of Service	C		D	B	C	
Approach Delay (s)	32.0			19.0	20.9	
Approach LOS	C			B	C	

Intersection Summary

HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

10: Harrison & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	800	10	10	1190	60	10	10	10	150	10	30
Future Volume (vph)	10	800	10	10	1190	60	10	10	10	150	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1		3.0	5.1			5.1			5.1	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.96	1.00
Satd. Flow (prot)	1803	3486		1805	3473			1784			1782	1532
Flt Permitted	0.17	1.00		0.27	1.00			0.89			0.72	1.00
Satd. Flow (perm)	328	3486		521	3473			1608			1334	1532
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	870	11	11	1293	65	11	11	11	163	11	33
RTOR Reduction (vph)	0	1	0	0	4	0	0	9	0	0	0	27
Lane Group Flow (vph)	11	880	0	11	1354	0	0	24	0	0	174	6
Confl. Peds. (#/hr)	4					4	1					1
Heavy Vehicles (%)	0%	3%	33%	0%	3%	4%	0%	0%	0%	2%	0%	4%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2 8		1	6 8			3			3	
Permitted Phases	2 8			6 8			3			3		3
Actuated Green, G (s)	58.3	58.3		62.5	62.5			15.9			15.9	15.9
Effective Green, g (s)	58.3	58.3		57.4	62.5			15.9			15.9	15.9
Actuated g/C Ratio	0.66	0.66		0.65	0.71			0.18			0.18	0.18
Clearance Time (s)				3.0				5.1			5.1	5.1
Vehicle Extension (s)				3.0				3.0			3.0	3.0
Lane Grp Cap (vph)	215	2293		354	2449			288			239	274
v/s Ratio Prot		0.25		0.00	c0.39							
v/s Ratio Perm	0.03			0.02				0.01			c0.13	0.00
v/c Ratio	0.05	0.38		0.03	0.55			0.08			0.73	0.02
Uniform Delay, d1	5.4	6.9		5.9	6.3			30.3			34.3	29.9
Progression Factor	1.00	1.00		0.63	0.65			1.00			1.00	1.00
Incremental Delay, d2	0.1	0.1		0.0	0.1			0.1			10.5	0.0
Delay (s)	5.5	7.0		3.8	4.2			30.4			44.9	30.0
Level of Service	A	A		A	A			C			D	C
Approach Delay (s)		7.0			4.2			30.4			42.5	
Approach LOS		A			A			C			D	

Intersection Summary

HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	88.6	Sum of lost time (s)	18.3
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

11: SB I-77 Off Ramp/Harrison & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑		↖		↗	↖	↗	↖
Traffic Volume (vph)	0	1010	70	40	580	0	100	0	90	730	230	790
Future Volume (vph)	0	1010	70	40	580	0	100	0	90	730	230	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00		1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00		1.00		0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95		1.00	0.95	0.97	1.00
Satd. Flow (prot)		3528		1671	3574		1641		1568	1715	1742	1578
Flt Permitted		1.00		0.12	1.00		0.46		1.00	0.95	0.97	1.00
Satd. Flow (perm)		3528		217	3574		788		1568	1715	1742	1578
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1098	76	43	630	0	109	0	98	793	250	859
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	80	0	0	212
Lane Group Flow (vph)	0	1169	0	43	630	0	109	0	18	515	528	647
Confl. Peds. (#/hr)	1					1						1
Heavy Vehicles (%)	0%	1%	6%	8%	1%	0%	10%	0%	3%	0%	2%	1%
Turn Type		NA		Perm	NA		Perm		Perm	Split	NA	Perm
Protected Phases		2			6					8		8
Permitted Phases				6			7			7		8
Actuated Green, G (s)		28.2		32.4	32.4		15.9		15.9	25.0	25.0	25.0
Effective Green, g (s)		28.2		32.4	32.4		15.9		15.9	25.0	25.0	25.0
Actuated g/C Ratio		0.32		0.37	0.37		0.18		0.18	0.28	0.28	0.28
Clearance Time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Vehicle Extension (s)		5.0		5.0	5.0		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1122		79	1306		141		281	483	491	445
v/s Ratio Prot		c0.33			0.18					0.30	0.30	
v/s Ratio Perm				c0.20			c0.14		0.01			c0.41
v/c Ratio		1.04		0.54	0.48		0.77		0.06	1.07	1.08	1.45
Uniform Delay, d1		30.2		22.3	21.6		34.6		30.2	31.8	31.8	31.8
Progression Factor		0.84		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		37.8		24.3	1.3		22.7		0.1	59.7	62.4	216.0
Delay (s)		63.2		46.6	22.9		57.3		30.3	91.5	94.2	247.8
Level of Service		E		D	C		E		C	F	F	F
Approach Delay (s)		63.2			24.4			44.5			162.9	
Approach LOS		E			C			D			F	

Intersection Summary

HCM 2000 Control Delay	103.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	88.6	Sum of lost time (s)	18.3
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

SimTraffic Simulation Summary
No Build AM 2042

04/12/2018

Summary of All Intervals

Run Number	1	2	3	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	6678	6484	6498	6554
Vehs Exited	6668	6405	6409	6494
Starting Vehs	348	283	281	300
Ending Vehs	358	362	370	363
Travel Distance (mi)	5705	5547	5606	5620
Travel Time (hr)	447.3	472.7	472.7	464.2
Total Delay (hr)	256.9	288.1	286.2	277.1
Total Stops	11978	11804	11561	11786
Fuel Used (gal)	256.3	256.8	258.6	257.2

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1597	1638	1637	1620
Vehs Exited	1649	1592	1596	1612
Starting Vehs	348	283	281	300
Ending Vehs	296	329	322	316
Travel Distance (mi)	1364	1401	1406	1390
Travel Time (hr)	91.0	81.5	86.1	86.2
Total Delay (hr)	45.4	34.6	39.4	39.8
Total Stops	2729	2743	2937	2801
Fuel Used (gal)	57.4	56.2	56.9	56.8

SimTraffic Simulation Summary
No Build AM 2042

04/12/2018

Interval #2 Information

Start Time	7:15
End Time	7:30
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	2	3	Avg
Vehs Entered	1773	1699	1666	1712
Vehs Exited	1721	1623	1589	1644
Starting Vehs	296	329	322	316
Ending Vehs	348	405	399	382
Travel Distance (mi)	1522	1432	1423	1459
Travel Time (hr)	111.7	107.2	118.5	112.5
Total Delay (hr)	60.9	59.7	71.3	64.0
Total Stops	3215	3222	3043	3164
Fuel Used (gal)	66.5	62.9	65.7	65.0

Interval #3 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1674	1574	1576	1609
Vehs Exited	1662	1617	1599	1627
Starting Vehs	348	405	399	382
Ending Vehs	360	362	376	362
Travel Distance (mi)	1410	1372	1363	1382
Travel Time (hr)	115.5	134.7	130.5	126.9
Total Delay (hr)	68.5	89.2	85.1	81.0
Total Stops	2950	3040	2806	2935
Fuel Used (gal)	64.5	67.9	66.6	66.4

Interval #4 Information

Start Time	7:45
End Time	8:00
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1634	1573	1619	1607
Vehs Exited	1636	1573	1625	1615
Starting Vehs	360	362	376	362
Ending Vehs	358	362	370	363
Travel Distance (mi)	1409	1342	1414	1388
Travel Time (hr)	129.0	149.3	137.6	138.7
Total Delay (hr)	82.0	104.5	90.3	92.3
Total Stops	3084	2799	2775	2885
Fuel Used (gal)	67.8	69.8	69.4	69.0

Queuing and Blocking Report
No Build AM 2042

04/12/2018

Intersection: 1: Whipple & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T	
Maximum Queue (ft)	182	165	191	40	115	122	95	114	127	76	191	120	
Average Queue (ft)	66	86	115	9	38	43	20	39	54	23	101	43	
95th Queue (ft)	120	137	174	30	82	89	62	79	103	59	175	83	
Link Distance (ft)		3054	3054		1127	1127		846	846		1242		
Upstream Blk Time (%)													
Queuing Penalty (veh)													
Storage Bay Dist (ft)	235			130				150	90			190	
Storage Blk Time (%)				1	0			0	2			1	
Queuing Penalty (veh)				0	0			0	2			0	

Intersection: 1: Whipple & Tuscarawas

Movement	SB
Directions Served	TR
Maximum Queue (ft)	169
Average Queue (ft)	68
95th Queue (ft)	136
Link Distance (ft)	1242
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Valleyview & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	TR
Maximum Queue (ft)	93	242	247	115	225	234	75	66	68	46	124	50
Average Queue (ft)	11	130	145	39	114	141	24	25	16	9	35	11
95th Queue (ft)	52	203	215	94	192	215	75	59	50	34	82	33
Link Distance (ft)		1127	1127		1307	1307		277	277	277		326
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	100			90				50			180	
Storage Blk Time (%)				18	0	13	30	0				
Queuing Penalty (veh)				2	1	6	12	0				

Queuing and Blocking Report
No Build AM 2042

04/12/2018

Intersection: 3: Raff & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	31	203	220	100	281	277	129	134	70	92
Average Queue (ft)	6	63	64	53	112	122	71	50	19	28
95th Queue (ft)	23	150	160	105	213	212	117	98	51	64
Link Distance (ft)		1307	1307		947	947	519	519		1303
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	50			75				90		
Storage Blk Time (%)	0	11		2	9			0	0	
Queuing Penalty (veh)	0	1		7	11			0	0	

Intersection: 4: Bellflower & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	24	82	62	48	116	123	81	48
Average Queue (ft)	5	16	19	10	29	28	31	20
95th Queue (ft)	21	52	54	33	81	82	67	44
Link Distance (ft)		947	947		829	829	753	1122
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	50			50				
Storage Blk Time (%)				1	1	2		
Queuing Penalty (veh)				0	3	0		

Intersection: 5: Maryland/Gas Station & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	69	244	264	73	174	168	212	80
Average Queue (ft)	8	123	134	19	59	69	84	33
95th Queue (ft)	42	220	229	56	130	139	158	68
Link Distance (ft)		829	829		611	611	912	926
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	50			50				
Storage Blk Time (%)	2	17		2	8			
Queuing Penalty (veh)	9	2		7	3			

Queuing and Blocking Report
No Build AM 2042

04/12/2018

Intersection: 6: Tuscarawas & Wertz

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	74	198	224	211	223	98	190
Average Queue (ft)	42	59	73	99	107	71	53
95th Queue (ft)	71	143	162	174	185	110	137
Link Distance (ft)		611	611	505	505		1344
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	50					75	
Storage Blk Time (%)	5	6				16	0
Queuing Penalty (veh)	25	6				20	0

Intersection: 7: Tuscarawas & Broad

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	74	217	269	110	107	108	193
Average Queue (ft)	42	108	141	59	60	67	50
95th Queue (ft)	80	187	218	103	107	114	129
Link Distance (ft)		505	505	146	146		1243
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	50					85	
Storage Blk Time (%)	7	15				8	0
Queuing Penalty (veh)	37	10				9	0

Intersection: 8: Dartmouth & Tuscarawas

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	18	52	274	388	149	62
Average Queue (ft)	1	9	178	36	5	27
95th Queue (ft)	13	31	276	212	86	54
Link Distance (ft)	146	146		649	649	643
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			250			
Storage Blk Time (%)			6	0		
Queuing Penalty (veh)			20	0		

Queuing and Blocking Report
No Build AM 2042

04/12/2018

Intersection: 9: Bedford & Tuscarawas

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	L	T	LR
Maximum Queue (ft)	304	354	75	664	488
Average Queue (ft)	183	218	72	346	228
95th Queue (ft)	293	339	83	594	463
Link Distance (ft)	649	649		948	948
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			50		
Storage Blk Time (%)			62	22	
Queuing Penalty (veh)			304	56	

Intersection: 10: Harrison & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LT	R
Maximum Queue (ft)	53	177	187	30	189	181	61	1018	205
Average Queue (ft)	9	72	88	6	107	94	20	655	36
95th Queue (ft)	34	157	166	22	164	159	51	1259	156
Link Distance (ft)		948	948		171	171	1007	978	
Upstream Blk Time (%)					0	0		42	
Queuing Penalty (veh)					2	2		0	
Storage Bay Dist (ft)	50			100					180
Storage Blk Time (%)	0	21			7			77	0
Queuing Penalty (veh)	0	2			1			23	0

Intersection: 11: SB I-77 Off Ramp/Harrison & Tuscarawas

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	TR	L	T	T	L	R	L	LT	R
Maximum Queue (ft)	216	229	125	279	231	146	95	405	475	1349
Average Queue (ft)	185	191	47	172	120	67	34	236	389	672
95th Queue (ft)	223	226	108	247	206	121	74	353	553	1317
Link Distance (ft)	171	171		1026	1026	1074				1334
Upstream Blk Time (%)	29	35								5
Queuing Penalty (veh)	142	170								0
Storage Bay Dist (ft)			100				150	450	450	
Storage Blk Time (%)			4	34		0		0	0	10
Queuing Penalty (veh)			11	14		0		0	0	97

Network Summary

Network wide Queuing Penalty: 1020

HCM Signalized Intersection Capacity Analysis

1: Whipple & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	
Traffic Volume (vph)	240	810	130	50	870	300	260	270	50	370	310	250
Future Volume (vph)	240	810	130	50	870	300	260	270	50	370	310	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3498		1805	3574	1601	1804	3467		1805	3294	
Flt Permitted	0.12	1.00		0.16	1.00	1.00	0.38	1.00		0.27	1.00	
Satd. Flow (perm)	220	3498		299	3574	1601	730	3467		514	3294	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	880	141	54	946	326	283	293	54	402	337	272
RTOR Reduction (vph)	0	14	0	0	0	48	0	17	0	0	161	0
Lane Group Flow (vph)	261	1007	0	54	946	278	283	330	0	402	448	0
Confl. Peds. (#/hr)	3		3	3		3	3					3
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	0%	2%	0%	0%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	45.4	34.2		34.2	28.6	46.0	23.4	10.4		32.2	14.8	
Effective Green, g (s)	45.4	34.2		34.2	28.6	46.0	23.4	10.4		32.2	14.8	
Actuated g/C Ratio	0.50	0.38		0.38	0.32	0.51	0.26	0.12		0.36	0.16	
Clearance Time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	305	1329		207	1135	917	344	400		433	541	
v/s Ratio Prot	c0.11	0.29		0.02	0.26	0.06	0.12	0.10		c0.18	0.14	
v/s Ratio Perm	c0.32			0.08		0.11	0.09			c0.15		
v/c Ratio	0.86	0.76		0.26	0.83	0.30	0.82	0.83		0.93	0.83	
Uniform Delay, d1	20.9	24.3		18.8	28.5	12.7	29.5	38.9		24.4	36.4	
Progression Factor	1.00	1.00		0.72	0.47	0.68	1.00	1.00		1.00	1.00	
Incremental Delay, d2	20.3	4.1		0.3	3.2	0.1	14.6	13.0		26.0	10.1	
Delay (s)	41.1	28.4		13.8	16.6	8.7	44.1	51.9		50.4	46.4	
Level of Service	D	C		B	B	A	D	D		D	D	
Approach Delay (s)		31.0			14.5			48.4			48.0	
Approach LOS		C			B			D			D	

Intersection Summary

HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.4
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Valleyview & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑		↘	↑↑	↗	↘	↑	↗	↘	↗	
Traffic Volume (vph)	60	910	140	170	1230	130	150	60	100	110	60	40
Future Volume (vph)	60	910	140	170	1230	130	150	60	100	110	60	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3497		1805	3574	1578	1804	1900	1593	1803	1777	
Flt Permitted	0.14	1.00		0.12	1.00	1.00	0.57	1.00	1.00	0.71	1.00	
Satd. Flow (perm)	267	3497		237	3574	1578	1082	1900	1593	1357	1777	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	989	152	185	1337	141	163	65	109	120	65	43
RTOR Reduction (vph)	0	14	0	0	0	76	0	0	80	0	28	0
Lane Group Flow (vph)	65	1127	0	185	1337	65	163	65	29	120	80	0
Confl. Peds. (#/hr)	1		2	2		1	1		1	1		1
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	34.6	28.5		41.9	32.2	32.2	36.9	23.9	23.9	26.9	17.5	
Effective Green, g (s)	34.6	28.5		41.9	32.2	32.2	36.9	23.9	23.9	26.9	17.5	
Actuated g/C Ratio	0.38	0.32		0.47	0.36	0.36	0.41	0.27	0.27	0.30	0.19	
Clearance Time (s)	3.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6	
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	206	1107		281	1278	564	570	504	423	452	345	
v/s Ratio Prot	0.02	0.32		c0.07	c0.37		c0.05	0.03		0.03	0.04	
v/s Ratio Perm	0.10			0.23		0.04	c0.07		0.02	0.05		
v/c Ratio	0.32	1.02		0.66	1.05	0.11	0.29	0.13	0.07	0.27	0.23	
Uniform Delay, d1	21.1	30.8		19.2	28.9	19.4	17.3	25.1	24.7	23.7	30.6	
Progression Factor	0.67	0.96		1.48	0.81	1.10	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	25.3		3.8	34.2	0.3	0.3	0.5	0.3	0.3	0.7	
Delay (s)	14.6	54.7		32.2	57.5	21.6	17.6	25.7	25.0	24.0	31.3	
Level of Service	B	D		C	E	C	B	C	C	C	C	
Approach Delay (s)		52.6			51.6			21.6			27.5	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	47.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Raff & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	10	920	200	180	1210	20	350	70	130	20	60	10
Future Volume (vph)	10	920	200	180	1210	20	350	70	130	20	60	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		4.0	7.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00		1.00	0.90		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1802	3467		1770	3564		1783	1681		1687	1855	
Flt Permitted	0.17	1.00		0.10	1.00		0.71	1.00		0.53	1.00	
Satd. Flow (perm)	329	3467		186	3564		1328	1681		944	1855	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1000	217	196	1315	22	380	76	141	22	65	11
RTOR Reduction (vph)	0	20	0	0	1	0	0	76	0	0	7	0
Lane Group Flow (vph)	11	1197	0	196	1336	0	380	141	0	22	69	0
Confl. Peds. (#/hr)	5		4	4		5	2					2
Heavy Vehicles (%)	0%	1%	1%	2%	1%	0%	1%	2%	2%	7%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	36.0	36.0		49.5	49.5		29.5	29.5		29.5	29.5	
Effective Green, g (s)	36.0	36.0		49.5	49.5		29.5	29.5		29.5	29.5	
Actuated g/C Ratio	0.40	0.40		0.55	0.55		0.33	0.33		0.33	0.33	
Clearance Time (s)	7.0	7.0		4.0	7.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	5.0	5.0		3.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	131	1386		269	1960		435	550		309	608	
v/s Ratio Prot		c0.35		0.08	c0.37			0.08			0.04	
v/s Ratio Perm	0.03			0.32			c0.29			0.02		
v/c Ratio	0.08	0.86		0.73	0.68		0.87	0.26		0.07	0.11	
Uniform Delay, d1	16.8	24.8		17.4	14.6		28.5	22.2		20.8	21.1	
Progression Factor	1.91	1.86		1.62	0.33		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	4.1		7.7	1.6		18.6	0.5		0.2	0.2	
Delay (s)	32.7	50.0		35.9	6.4		47.1	22.7		21.0	21.3	
Level of Service	C	D		D	A		D	C		C	C	
Approach Delay (s)		49.8			10.1			38.2			21.2	
Approach LOS		D			B			D			C	

Intersection Summary

HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Bellflower & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↑		↙	↑↑			↕				↕
Traffic Volume (vph)	10	1250	30	30	1510	10	90	20	20	10	10	10
Future Volume (vph)	10	1250	30	30	1510	10	90	20	20	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.98			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	
Satd. Flow (prot)	1805	3558		1800	3570			1795			1784	
Flt Permitted	0.11	1.00		0.16	1.00			0.77			0.91	
Satd. Flow (perm)	207	3558		301	3570			1436			1653	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1359	33	33	1641	11	98	22	22	11	11	11
RTOR Reduction (vph)	0	1	0	0	0	0	0	9	0	0	9	0
Lane Group Flow (vph)	11	1391	0	33	1652	0	0	133	0	0	24	0
Confl. Peds. (#/hr)	2		11	11		2			1	1		
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	66.7	66.7		66.7	66.7			15.3			15.3	
Effective Green, g (s)	66.7	66.7		66.7	66.7			15.3			15.3	
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.17			0.17	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Grp Cap (vph)	153	2636		223	2645			244			281	
v/s Ratio Prot		0.39			c0.46							
v/s Ratio Perm	0.05			0.11				c0.09			0.01	
v/c Ratio	0.07	0.53		0.15	0.62			0.54			0.08	
Uniform Delay, d1	3.2	5.0		3.4	5.6			34.2			31.5	
Progression Factor	2.36	2.56		0.28	0.22			1.00			1.00	
Incremental Delay, d2	0.7	0.6		1.2	1.0			4.3			0.3	
Delay (s)	8.2	13.3		2.2	2.2			38.5			31.7	
Level of Service	A	B		A	A			D			C	
Approach Delay (s)		13.2			2.2			38.5			31.7	
Approach LOS		B			A			D			C	

Intersection Summary

HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

5: Maryland/Gas Station & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	30	1060	60	90	1260	50	120	30	110	30	20	10
Future Volume (vph)	30	1060	60	90	1260	50	120	30	110	30	20	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.94			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1805	3534		1770	3552			1693			1770	
Flt Permitted	0.13	1.00		0.18	1.00			0.84			0.79	
Satd. Flow (perm)	249	3534		336	3552			1453			1437	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	1152	65	98	1370	54	130	33	120	33	22	11
RTOR Reduction (vph)	0	3	0	0	2	0	0	34	0	0	8	0
Lane Group Flow (vph)	33	1214	0	98	1422	0	0	249	0	0	58	0
Confl. Peds. (#/hr)	4		8	8		4	3		3	3		3
Heavy Vehicles (%)	0%	1%	2%	2%	1%	0%	0%	0%	6%	4%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	59.4	59.4		59.4	59.4			22.6			22.6	
Effective Green, g (s)	59.4	59.4		59.4	59.4			22.6			22.6	
Actuated g/C Ratio	0.66	0.66		0.66	0.66			0.25			0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Grp Cap (vph)	164	2332		221	2344			364			360	
v/s Ratio Prot		0.34			c0.40							
v/s Ratio Perm	0.13			0.29				c0.17			0.04	
v/c Ratio	0.20	0.52		0.44	0.61			0.68			0.16	
Uniform Delay, d1	6.0	7.9		7.4	8.7			30.5			26.3	
Progression Factor	0.68	0.53		1.64	1.83			1.00			1.00	
Incremental Delay, d2	2.4	0.7		4.3	0.8			6.7			0.4	
Delay (s)	6.5	4.9		16.4	16.6			37.1			26.7	
Level of Service	A	A		B	B			D			C	
Approach Delay (s)		5.0			16.6			37.1			26.7	
Approach LOS		A			B			D			C	

Intersection Summary

HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

6: Tuscarawas & Wertz

03/26/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	220	1210	1350	150	110	220
Future Volume (vph)	220	1210	1350	150	110	220
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3513		1787	1589
Flt Permitted	0.07	1.00	1.00		0.95	1.00
Satd. Flow (perm)	135	3574	3513		1787	1589
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	1315	1467	163	120	239
RTOR Reduction (vph)	0	0	7	0	0	203
Lane Group Flow (vph)	239	1315	1623	0	120	36
Confl. Peds. (#/hr)	4			4		3
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	68.4	68.4	53.2		13.6	13.6
Effective Green, g (s)	68.4	68.4	53.2		13.6	13.6
Actuated g/C Ratio	0.76	0.76	0.59		0.15	0.15
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	328	2716	2076		270	240
v/s Ratio Prot	c0.10	0.37	c0.46		c0.07	
v/s Ratio Perm	0.45					0.02
v/c Ratio	0.73	0.48	0.78		0.44	0.15
Uniform Delay, d1	23.6	4.1	14.0		34.8	33.2
Progression Factor	1.43	1.11	0.11		1.00	1.00
Incremental Delay, d2	7.3	0.6	0.9		2.4	0.6
Delay (s)	41.0	5.1	2.5		37.2	33.8
Level of Service	D	A	A		D	C
Approach Delay (s)		10.7	2.5		34.9	
Approach LOS		B	A		C	

Intersection Summary

HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

7: Tuscarawas & Broad

03/26/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↑↑		↖	↖
Traffic Volume (vph)	160	1080	1480	120	80	150
Future Volume (vph)	160	1080	1480	120	80	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	3574	3528		1805	1615
Flt Permitted	0.09	1.00	1.00		0.95	1.00
Satd. Flow (perm)	164	3574	3528		1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	1174	1609	130	87	163
RTOR Reduction (vph)	0	0	6	0	0	115
Lane Group Flow (vph)	174	1174	1733	0	87	48
Confl. Peds. (#/hr)	4			4		
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	55.4	55.4	43.0		26.6	26.6
Effective Green, g (s)	55.4	55.4	43.0		26.6	26.6
Actuated g/C Ratio	0.62	0.62	0.48		0.30	0.30
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	270	2199	1685		533	477
v/s Ratio Prot	c0.07	0.33	c0.49		c0.05	
v/s Ratio Perm	0.33					0.03
v/c Ratio	0.64	0.53	1.03		0.16	0.10
Uniform Delay, d1	19.3	9.9	23.5		23.5	23.0
Progression Factor	2.06	0.41	0.67		1.00	1.00
Incremental Delay, d2	4.7	0.8	28.1		0.7	0.4
Delay (s)	44.5	4.9	43.8		24.1	23.4
Level of Service	D	A	D		C	C
Approach Delay (s)		10.0	43.8		23.7	
Approach LOS		A	D		C	

Intersection Summary

HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

8: Dartmouth & Tuscarawas

03/26/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Traffic Volume (veh/h)	1140	70	100	1710	50	220
Future Volume (Veh/h)	1140	70	100	1710	50	220
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1239	76	109	1859	54	239
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL		TWLTL			
Median storage (veh)	2		2			
Upstream signal (ft)	233		709			
pX, platoon unblocked			0.81		0.84	0.81
vC, conflicting volume			1315		2424	658
vC1, stage 1 conf vol					1277	
vC2, stage 2 conf vol					1148	
vCu, unblocked vol			913		1289	99
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			82		78	69
cM capacity (veh/h)			609		246	762
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	826	489	109	930	930	293
Volume Left	0	0	109	0	0	54
Volume Right	0	76	0	0	0	239
cSH	1700	1700	609	1700	1700	550
Volume to Capacity	0.49	0.29	0.18	0.55	0.55	0.53
Queue Length 95th (ft)	0	0	16	0	0	78
Control Delay (s)	0.0	0.0	12.2	0.0	0.0	18.8
Lane LOS			B			C
Approach Delay (s)	0.0		0.7			18.8
Approach LOS						C
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			70.3%	ICU Level of Service	C	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Bedford & Tuscarawas

03/26/2018



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (vph)	1200	110	150	1180	260	170
Future Volume (vph)	1200	110	150	1180	260	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		3.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00		1.00	1.00	0.99	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.95	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3524		1787	3574	1737	
Flt Permitted	1.00		0.10	1.00	0.97	
Satd. Flow (perm)	3524		183	3574	1737	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1304	120	163	1283	283	185
RTOR Reduction (vph)	7	0	0	0	0	0
Lane Group Flow (vph)	1417	0	163	1283	468	0
Confl. Peds. (#/hr)		2	2			1
Heavy Vehicles (%)	1%	0%	1%	1%	0%	0%
Turn Type	NA		pm+pt	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases			6			
Actuated Green, G (s)	38.2		50.0	50.0	32.0	
Effective Green, g (s)	38.2		50.0	50.0	32.0	
Actuated g/C Ratio	0.42		0.56	0.56	0.36	
Clearance Time (s)	4.0		3.0	4.0	4.0	
Vehicle Extension (s)	5.0		2.0	5.0	5.0	
Lane Grp Cap (vph)	1495		258	1985	617	
v/s Ratio Prot	c0.40		0.06	c0.36	c0.27	
v/s Ratio Perm			0.29			
v/c Ratio	0.95		0.63	0.65	0.76	
Uniform Delay, d1	24.9		17.9	13.9	25.6	
Progression Factor	0.65		1.00	1.00	1.00	
Incremental Delay, d2	13.1		3.7	1.6	8.5	
Delay (s)	29.4		21.6	15.5	34.1	
Level of Service	C		C	B	C	
Approach Delay (s)	29.4			16.2	34.1	
Approach LOS	C			B	C	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

10: Harrison & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↕		↖	↕			↕			↖	↗
Traffic Volume (vph)	30	1020	30	20	1540	160	10	10	20	270	10	130
Future Volume (vph)	30	1020	30	20	1540	160	10	10	20	270	10	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1		3.0	5.1			5.1			5.1	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99			0.99			1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	1.00
Frt	1.00	1.00		1.00	0.99			0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1805	3523		1805	3466			1731			1688	1570
Flt Permitted	0.07	1.00		0.18	1.00			0.85			0.70	1.00
Satd. Flow (perm)	135	3523		335	3466			1490			1241	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	1109	33	22	1674	174	11	11	22	293	11	141
RTOR Reduction (vph)	0	2	0	0	9	0	0	17	0	0	0	97
Lane Group Flow (vph)	33	1140	0	22	1839	0	0	27	0	0	304	44
Confl. Peds. (#/hr)	17		3	3		17	10		4	4		10
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	0%	0%	7%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2 8		1	6 8			3			3	
Permitted Phases	2 8			6 8			3			3		3
Actuated Green, G (s)	56.2	56.2		61.7	61.7			19.9			19.9	19.9
Effective Green, g (s)	56.2	56.2		56.6	61.7			19.9			19.9	19.9
Actuated g/C Ratio	0.61	0.61		0.62	0.67			0.22			0.22	0.22
Clearance Time (s)				3.0				5.1			5.1	5.1
Vehicle Extension (s)				3.0				3.0			3.0	3.0
Lane Grp Cap (vph)	82	2156		246	2329			322			269	340
v/s Ratio Prot		0.32		0.00	c0.53							
v/s Ratio Perm	0.24			0.05				0.02			c0.24	0.03
v/c Ratio	0.40	0.53		0.09	0.79			0.08			1.13	0.13
Uniform Delay, d1	9.2	10.2		8.2	10.5			28.7			36.0	29.0
Progression Factor	1.00	1.00		0.52	0.60			1.00			1.00	1.00
Incremental Delay, d2	3.2	0.2		0.0	0.5			0.1			94.5	0.2
Delay (s)	12.4	10.4		4.4	6.8			28.8			130.5	29.1
Level of Service	B	B		A	A			C			F	C
Approach Delay (s)		10.5			6.8			28.8			98.4	
Approach LOS		B			A			C			F	

Intersection Summary

HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	91.8	Sum of lost time (s)	18.3
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

11: SB I-77 Off Ramp/Harrison & Tuscarawas

03/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑		↖		↖	↖	↖	↖
Traffic Volume (vph)	0	1360	80	60	980	0	180	0	190	230	220	590
Future Volume (vph)	0	1360	80	60	980	0	180	0	190	230	220	590
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00	0.95	0.95	1.00
Frt		0.99		1.00	1.00		1.00		0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95		1.00	0.95	1.00	1.00
Satd. Flow (prot)		3546		1805	3574		1805		1615	1715	1765	1599
Flt Permitted		1.00		0.13	1.00		0.59		1.00	0.95	1.00	1.00
Satd. Flow (perm)		3546		240	3574		1119		1615	1715	1765	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1478	87	65	1065	0	196	0	207	250	239	641
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	162	0	0	113
Lane Group Flow (vph)	0	1561	0	65	1065	0	196	0	45	225	264	528
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	2%	1%
Turn Type		NA		Perm	NA		Perm		Perm	Split	NA	Perm
Protected Phases		2			6					8	8	
Permitted Phases				6			7		7			8
Actuated Green, G (s)		26.2		31.7	31.7		19.9		19.9	24.9	24.9	24.9
Effective Green, g (s)		26.2		31.7	31.7		19.9		19.9	24.9	24.9	24.9
Actuated g/C Ratio		0.29		0.35	0.35		0.22		0.22	0.27	0.27	0.27
Clearance Time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Vehicle Extension (s)		5.0		5.0	5.0		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1012		82	1234		242		350	465	478	433
v/s Ratio Prot		c0.44			c0.30					0.13	0.15	
v/s Ratio Perm				0.27			c0.18		0.03			c0.33
v/c Ratio		1.54		0.79	0.86		0.81		0.13	0.48	0.55	1.22
Uniform Delay, d1		32.8		27.1	28.0		34.2		29.0	28.1	28.7	33.5
Progression Factor		0.87		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		248.1		53.4	8.1		17.8		0.2	0.8	1.4	118.1
Delay (s)		276.5		80.5	36.1		52.0		29.1	28.9	30.1	151.5
Level of Service		F		F	D		D		C	C	C	F
Approach Delay (s)		276.5			38.7			40.2			98.7	
Approach LOS		F			D			D			F	

Intersection Summary

HCM 2000 Control Delay	142.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	91.8	Sum of lost time (s)	18.3
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

SimTraffic Simulation Summary
No Build PM 2042

04/12/2018

Summary of All Intervals

Run Number	1	2	3	Avg
Start Time	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	8880	9176	9145	9066
Vehs Exited	8847	9062	9151	9023
Starting Vehs	548	484	566	533
Ending Vehs	581	598	560	575
Travel Distance (mi)	7495	7623	7670	7596
Travel Time (hr)	947.4	855.5	895.5	899.5
Total Delay (hr)	699.1	603.9	642.0	648.3
Total Stops	17590	19006	18446	18343
Fuel Used (gal)	418.8	401.0	412.4	410.8

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00
End Time	5:15
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	2196	2298	2318	2270
Vehs Exited	2178	2220	2303	2233
Starting Vehs	548	484	566	533
Ending Vehs	566	562	581	566
Travel Distance (mi)	1875	1854	1939	1889
Travel Time (hr)	151.9	142.0	152.4	148.8
Total Delay (hr)	89.7	80.6	88.4	86.2
Total Stops	4388	4544	5005	4648
Fuel Used (gal)	85.0	82.6	87.3	85.0

SimTraffic Simulation Summary
No Build PM 2042

04/12/2018

Interval #2 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	2	3	Avg
Vehs Entered	2501	2396	2431	2442
Vehs Exited	2353	2295	2339	2329
Starting Vehs	566	562	581	566
Ending Vehs	714	663	673	675
Travel Distance (mi)	2034	1980	1995	2003
Travel Time (hr)	215.7	197.1	198.5	203.8
Total Delay (hr)	148.5	131.9	132.4	137.6
Total Stops	5169	5054	5045	5085
Fuel Used (gal)	104.3	98.1	99.0	100.5

Interval #3 Information

Start Time	5:30
End Time	5:45
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	2105	2240	2244	2196
Vehs Exited	2264	2322	2346	2312
Starting Vehs	714	663	673	675
Ending Vehs	555	581	571	564
Travel Distance (mi)	1870	1953	1904	1909
Travel Time (hr)	262.8	246.9	251.2	253.6
Total Delay (hr)	200.9	182.7	188.4	190.7
Total Stops	4317	5048	4325	4565
Fuel Used (gal)	111.2	109.3	109.8	110.1

Interval #4 Information

Start Time	5:45
End Time	6:00
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	2078	2242	2152	2159
Vehs Exited	2052	2225	2163	2145
Starting Vehs	555	581	571	564
Ending Vehs	581	598	560	575
Travel Distance (mi)	1716	1837	1834	1795
Travel Time (hr)	317.0	269.5	293.4	293.3
Total Delay (hr)	260.0	208.6	232.8	233.8
Total Stops	3716	4360	4071	4049
Fuel Used (gal)	118.4	111.0	116.3	115.3

Queuing and Blocking Report
No Build PM 2042

04/12/2018

Intersection: 1: Whipple & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	245	281	304	154	290	322	175	115	487	448	215	349
Average Queue (ft)	119	151	184	29	125	137	76	110	226	168	173	164
95th Queue (ft)	197	234	271	88	222	250	177	133	408	323	241	316
Link Distance (ft)		2943	2943		1127	1127			832	832		1246
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	235			130			150	90			190	
Storage Blk Time (%)	0	1			5	5	0	46	30		13	1
Queuing Penalty (veh)	0	2			3	14	0	62	77		21	3

Intersection: 1: Whipple & Tuscarawas

Movement	SB
Directions Served	TR
Maximum Queue (ft)	320
Average Queue (ft)	184
95th Queue (ft)	285
Link Distance (ft)	1246
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Valleyview & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	TR
Maximum Queue (ft)	125	408	407	115	563	581	75	151	94	93	109	152
Average Queue (ft)	64	265	281	95	284	310	40	69	38	40	49	51
95th Queue (ft)	131	386	405	138	477	501	96	119	80	73	94	107
Link Distance (ft)		1127	1127		1307	1307		277	277	277		326
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	100			90			50				180	
Storage Blk Time (%)	0	39		16	40	52	0					0
Queuing Penalty (veh)	0	23		99	69	67	2					0

Queuing and Blocking Report
No Build PM 2042

04/12/2018

Intersection: 3: Raff & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	75	410	441	100	234	241	339	166	47	86
Average Queue (ft)	17	302	319	70	89	98	189	68	13	30
95th Queue (ft)	57	387	404	112	189	190	290	131	38	64
Link Distance (ft)		1307	1307		949	949	522	522		1313
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	50			75					90	
Storage Blk Time (%)	1	45		8	8					1
Queuing Penalty (veh)	3	5		51	14					0

Intersection: 4: Bellflower & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	58	295	326	53	266	176	144	70
Average Queue (ft)	7	177	192	14	50	49	73	24
95th Queue (ft)	34	300	322	38	141	116	122	56
Link Distance (ft)		949	949		828	828	738	1106
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	50			50				
Storage Blk Time (%)	0	19		1	4			
Queuing Penalty (veh)	2	2		6	1			

Intersection: 5: Maryland/Gas Station & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	64	232	256	75	310	365	257	96
Average Queue (ft)	19	101	98	40	154	167	127	30
95th Queue (ft)	51	196	198	78	280	307	215	67
Link Distance (ft)		828	828		611	611	913	928
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	50			50				
Storage Blk Time (%)	0	15		13	17			
Queuing Penalty (veh)	3	4		82	15			

Queuing and Blocking Report
No Build PM 2042

04/12/2018

Intersection: 6: Tuscarawas & Wertz

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	74	362	350	197	241	99	213
Average Queue (ft)	68	173	152	69	82	64	73
95th Queue (ft)	83	328	295	153	179	108	152
Link Distance (ft)		611	611	504	504		1346
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	50					75	
Storage Blk Time (%)	46	9				10	5
Queuing Penalty (veh)	279	19				21	6

Intersection: 7: Tuscarawas & Broad

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	74	243	246	181	170	109	172
Average Queue (ft)	64	118	113	146	144	45	56
95th Queue (ft)	84	232	209	182	181	91	117
Link Distance (ft)		504	504	144	144		1280
Upstream Blk Time (%)				18	19		
Queuing Penalty (veh)				164	170		
Storage Bay Dist (ft)	50					85	
Storage Blk Time (%)	44	11				2	3
Queuing Penalty (veh)	237	18				3	2

Intersection: 8: Dartmouth & Tuscarawas

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	20	36	192	290	320	695
Average Queue (ft)	1	3	53	87	96	659
95th Queue (ft)	8	18	132	244	259	822
Link Distance (ft)	144	144		650	650	680
Upstream Blk Time (%)						89
Queuing Penalty (veh)						0
Storage Bay Dist (ft)			250			
Storage Blk Time (%)				1		
Queuing Penalty (veh)				1		

Queuing and Blocking Report
No Build PM 2042

04/12/2018

Intersection: 9: Bedford & Tuscarawas

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	L	T	LR
Maximum Queue (ft)	275	280	74	312	294
Average Queue (ft)	166	178	56	132	122
95th Queue (ft)	249	264	88	281	264
Link Distance (ft)	650	650		948	948
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			50		
Storage Blk Time (%)			24	15	
Queuing Penalty (veh)			140	22	

Intersection: 10: Harrison & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LT	R
Maximum Queue (ft)	74	436	434	96	194	185	328	1005	205
Average Queue (ft)	25	236	242	14	121	137	179	949	37
95th Queue (ft)	64	429	435	59	184	189	463	1066	166
Link Distance (ft)		948	948		170	170	1016	953	
Upstream Blk Time (%)					1	1		93	
Queuing Penalty (veh)					5	11		0	
Storage Bay Dist (ft)	50			100					180
Storage Blk Time (%)	3	44		0	8			99	0
Queuing Penalty (veh)	14	13		0	2			128	0

Intersection: 11: SB I-77 Off Ramp/Harrison & Tuscarawas

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	TR	L	T	T	L	R	L	LT	R
Maximum Queue (ft)	225	213	125	1023	1002	278	175	260	475	1154
Average Queue (ft)	187	193	109	743	722	101	73	107	294	517
95th Queue (ft)	209	210	155	1266	1273	182	148	216	547	1151
Link Distance (ft)	170	170		979	979	1073				1256
Upstream Blk Time (%)	45	49		54	49					7
Queuing Penalty (veh)	295	320		0	0					0
Storage Bay Dist (ft)			100				150	450	450	
Storage Blk Time (%)			80	32		2	0		0	16
Queuing Penalty (veh)			392	19		5	0		0	75

Network Summary

Network wide Queuing Penalty: 2993

1: Whipple & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

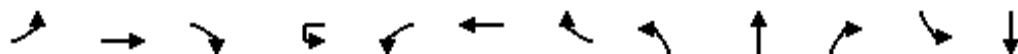


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗	↖	↖	↖↗		↖	↖↗	
Traffic Volume (vph)	180	560	70	20	360	110	80	130	20	210	120	160
Future Volume (vph)	180	560	70	20	360	110	80	130	20	210	120	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	3464		1569	3505	1482	1768	3416		1752	3172	
Flt Permitted	0.43	1.00		0.39	1.00	1.00	0.57	1.00		0.44	1.00	
Satd. Flow (perm)	779	3464		646	3505	1482	1054	3416		807	3172	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	609	76	22	391	120	87	141	22	228	130	174
RTOR Reduction (vph)	0	9	0	0	0	54	0	12	0	0	138	0
Lane Group Flow (vph)	196	676	0	22	391	66	87	151	0	228	166	0
Confl. Peds. (#/hr)	2		3	3		2	2					2
Heavy Vehicles (%)	4%	2%	5%	15%	3%	8%	2%	3%	7%	3%	2%	4%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	55.2	46.7		41.2	38.3	54.7	19.1	11.6		33.6	20.5	
Effective Green, g (s)	55.2	46.7		41.2	38.3	54.7	19.1	11.6		33.6	20.5	
Actuated g/C Ratio	0.55	0.47		0.41	0.38	0.55	0.19	0.12		0.34	0.20	
Clearance Time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	538	1617		292	1342	893	254	396		426	650	
v/s Ratio Prot	c0.04	c0.20		0.00	0.11	0.01	0.03	0.04		c0.09	0.05	
v/s Ratio Perm	0.16			0.03		0.03	0.04			c0.09		
v/c Ratio	0.36	0.42		0.08	0.29	0.07	0.34	0.38		0.54	0.25	
Uniform Delay, d1	11.7	17.7		17.5	21.4	10.7	34.4	40.9		25.5	33.3	
Progression Factor	1.00	1.00		0.58	0.60	0.13	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.8		0.1	0.5	0.0	0.8	0.6		1.3	0.2	
Delay (s)	12.1	18.5		10.2	13.4	1.5	35.2	41.5		26.8	33.6	
Level of Service	B	B		B	B	A	D	D		C	C	
Approach Delay (s)		17.0			10.6			39.3			30.7	
Approach LOS		B			B			D			C	

Intersection Summary		
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.50	C
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	65.3%	22.4
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	740	30	10	50	520	40	50	20	20	70	10
Future Volume (vph)	10	740	30	10	50	520	40	50	20	20	70	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1804	3505	1520		1727	3505	1578	1805	1900	1350	1803	1643
Flt Permitted	0.44	1.00	1.00		0.95	1.00	1.00	0.64	1.00	1.00	0.74	1.00
Satd. Flow (perm)	835	3505	1520		1727	3505	1578	1211	1900	1350	1410	1643
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	804	33	11	54	565	43	54	22	22	76	11
RTOR Reduction (vph)	0	0	19	0	0	0	22	0	0	0	0	9
Lane Group Flow (vph)	11	804	14	0	65	565	21	54	22	22	76	13
Confl. Peds. (#/hr)	1		1		1		1			1	1	
Heavy Vehicles (%)	0%	3%	4%	2%	5%	3%	0%	0%	0%	18%	0%	0%
Turn Type	pm+pt	NA	Perm	Prot	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases	2		2				6	8		8	4	
Actuated Green, G (s)	43.9	42.6	42.6		7.7	49.0	49.0	34.8	24.6	24.6	27.8	21.1
Effective Green, g (s)	43.9	42.6	42.6		7.7	49.0	49.0	34.8	24.6	24.6	27.8	21.1
Actuated g/C Ratio	0.44	0.43	0.43		0.08	0.49	0.49	0.35	0.25	0.25	0.28	0.21
Clearance Time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	379	1493	647		132	1717	773	482	467	332	418	346
v/s Ratio Prot	0.00	c0.23			c0.04	0.16		c0.01	0.01		c0.01	0.01
v/s Ratio Perm	0.01		0.01				0.01	0.03		0.02	c0.04	
v/c Ratio	0.03	0.54	0.02		0.49	0.33	0.03	0.11	0.05	0.07	0.18	0.04
Uniform Delay, d1	15.8	21.4	16.6		44.3	15.5	13.2	22.0	28.8	28.9	27.2	31.4
Progression Factor	0.86	0.79	1.00		0.85	1.21	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	1.3	0.1		2.8	0.5	0.1	0.1	0.2	0.4	0.2	0.1
Delay (s)	13.6	18.1	16.7		40.3	19.2	13.2	22.1	28.9	29.3	27.4	31.5
Level of Service	B	B	B		D	B	B	C	C	C	C	C
Approach Delay (s)		18.0				20.9			25.2			28.3
Approach LOS		B				C			C			C

Intersection Summary

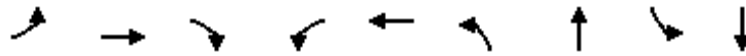
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	10
Future Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	11
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	14%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

3: Raff & Tuscarawas
Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↗	↗	↗
Traffic Volume (vph)	10	830	60	120	580	130	50	30	40
Future Volume (vph)	10	830	60	120	580	130	50	30	40
Turn Type	Prot	NA	Perm	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2		1	6		8		4
Permitted Phases			2			8		4	
Detector Phase	5	2	2	1	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	4.0	10.0	10.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	8.0	24.0	24.0	10.0	24.0	25.0	25.0	14.0	14.0
Total Split (s)	9.0	49.0	49.0	24.0	64.0	27.0	27.0	27.0	27.0
Total Split (%)	9.0%	49.0%	49.0%	24.0%	64.0%	27.0%	27.0%	27.0%	27.0%
Yellow Time (s)	3.5	4.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	0.5	3.0	3.0	1.0	3.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	6.0	52.6	52.6	14.8	67.5	17.5	17.5	17.5	17.5
Actuated g/C Ratio	0.06	0.53	0.53	0.15	0.68	0.18	0.18	0.18	0.18
v/c Ratio	0.21	0.48	0.07	0.66	0.27	0.61	0.52	0.21	0.18
Control Delay	58.2	6.1	0.2	47.3	5.9	48.4	43.0	36.5	34.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	6.1	0.2	47.3	5.9	48.4	43.0	36.5	34.4
LOS	E	A	A	D	A	D	D	D	C
Approach Delay		6.9			14.7		45.6		35.2
Approach LOS		A			B		D		D

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 64 (64%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 16.1
 Intersection LOS: B
 Intersection Capacity Utilization 64.3%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 3: Raff & Tuscarawas



3: Raff & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↔	↕	↗		↔	↕		↖	↗		↖
Traffic Volume (vph)	10	10	830	60	40	120	580	10	130	50	90	30
Future Volume (vph)	10	10	830	60	40	120	580	10	130	50	90	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	7.0	7.0		4.0	7.0		4.0	4.0		4.0
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	1.00		1.00
Frbp, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.85		1.00	1.00		1.00	0.90		1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95
Satd. Flow (prot)		1787	3574	1615		1783	3496		1750	1666		1626
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.72	1.00		0.52
Satd. Flow (perm)		1787	3574	1615		1783	3496		1330	1666		897
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	902	65	43	130	630	11	141	54	98	33
RTOR Reduction (vph)	0	0	0	31	0	0	1	0	0	0	0	0
Lane Group Flow (vph)	0	22	902	34	0	173	640	0	141	152	0	33
Confl. Peds. (#/hr)		1						1	1			
Heavy Vehicles (%)	2%	0%	1%	0%	2%	1%	3%	0%	3%	3%	3%	11%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2					8			4
Actuated Green, G (s)		2.4	52.7	52.7		14.8	65.1		17.5	17.5		17.5
Effective Green, g (s)		2.4	52.7	52.7		14.8	65.1		17.5	17.5		17.5
Actuated g/C Ratio		0.02	0.53	0.53		0.15	0.65		0.18	0.18		0.18
Clearance Time (s)		4.0	7.0	7.0		4.0	7.0		4.0	4.0		4.0
Vehicle Extension (s)		3.0	5.0	5.0		3.0	5.0		5.0	5.0		5.0
Lane Grp Cap (vph)		42	1883	851		263	2275		232	291		156
v/s Ratio Prot		0.01	c0.25			c0.10	0.18			0.09		
v/s Ratio Perm				0.02					c0.11			0.04
v/c Ratio		0.52	0.48	0.04		0.66	0.28		0.61	0.52		0.21
Uniform Delay, d1		48.2	15.0	11.4		40.2	7.5		38.1	37.5		35.3
Progression Factor		1.19	0.31	0.03		0.90	0.72		1.00	1.00		1.00
Incremental Delay, d2		10.4	0.8	0.1		5.7	0.3		6.5	3.2		1.4
Delay (s)		68.1	5.5	0.5		41.8	5.6		44.6	40.7		36.8
Level of Service		E	A	A		D	A		D	D		D
Approach Delay (s)			6.6				13.3			42.5		
Approach LOS			A				B			D		

Intersection Summary

HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

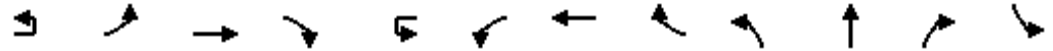
c Critical Lane Group

3: Raff & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations	1P	
Traffic Volume (vph)	40	10
Future Volume (vph)	40	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frbp, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	1.00	
Satd. Flow (prot)	1753	
Flt Permitted	1.00	
Satd. Flow (perm)	1753	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	43	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	54	0
Confl. Peds. (#/hr)		1
Heavy Vehicles (%)	6%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	17.5	
Effective Green, g (s)	17.5	
Actuated g/C Ratio	0.18	
Clearance Time (s)	4.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	306	
v/s Ratio Prot	0.03	
v/s Ratio Perm		
v/c Ratio	0.18	
Uniform Delay, d1	35.1	
Progression Factor	1.00	
Incremental Delay, d2	0.6	
Delay (s)	35.7	
Level of Service	D	
Approach Delay (s)	36.1	
Approach LOS	D	
Intersection Summary		

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	10	10	950	40	10	20	710	10	0	0	20	0
Future Volume (Veh/h)	10	10	950	40	10	20	710	10	0	0	20	0
Sign Control			Free				Free			Stop		
Grade			0%				0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	1033	43	0	22	772	11	0	0	22	0
Pedestrians							2			4		
Lane Width (ft)							12.0			12.0		
Walking Speed (ft/s)							4.0			4.0		
Percent Blockage							0			0		
Right turn flare (veh)												
Median type			None				None					
Median storage (veh)												
Upstream signal (ft)			1030				904					
pX, platoon unblocked	0.00	0.96			0.00	0.85			0.87	0.87	0.85	0.87
vC, conflicting volume	0	785			0	1080			1510	1910	544	1364
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	681			0	736			1058	1516	104	889
tC, single (s)	0.0	4.1			0.0	4.1			7.5	6.5	7.0	7.5
tC, 2 stage (s)												
tF (s)	0.0	2.2			0.0	2.2			3.5	4.0	3.4	3.5
p0 queue free %	0	99			0	97			100	100	97	100
cM capacity (veh/h)	0	878			0	743			150	100	772	196
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	11	689	387	22	515	268	22	11				
Volume Left	11	0	0	22	0	0	0	0				
Volume Right	0	0	43	0	0	11	22	11				
cSH	878	1700	1700	743	1700	1700	772	698				
Volume to Capacity	0.01	0.41	0.23	0.03	0.30	0.16	0.03	0.02				
Queue Length 95th (ft)	1	0	0	2	0	0	2	1				
Control Delay (s)	9.2	0.0	0.0	10.0	0.0	0.0	9.8	10.2				
Lane LOS	A			A			A	B				
Approach Delay (s)	0.1			0.3			9.8	10.2				
Approach LOS							A	B				
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			38.2%	ICU Level of Service	A							
Analysis Period (min)			15									

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations		↗
Traffic Volume (veh/h)	0	10
Future Volume (Veh/h)	0	10
Sign Control	Stop	
Grade	0%	
Peak Hour Factor	0.92	0.92
Hourly flow rate (vph)	0	11
Pedestrians	2	
Lane Width (ft)	12.0	
Walking Speed (ft/s)	4.0	
Percent Blockage	0	
Right turn flare (veh)		
Median type		
Median storage (veh)		
Upstream signal (ft)		
pX, platoon unblocked	0.87	0.96
vC, conflicting volume	1926	394
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol	1535	272
tC, single (s)	6.5	6.9
tC, 2 stage (s)		
tF (s)	4.0	3.3
p0 queue free %	100	98
cM capacity (veh/h)	97	698
Direction, Lane #		

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↔	↕			↔	↕			↕		
Traffic Volume (vph)	10	10	890	20	10	40	580	50	50	40	70	30
Future Volume (vph)	10	10	890	20	10	40	580	50	50	40	70	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0			4.0		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frbp, ped/bikes		1.00	1.00			1.00	1.00			0.99		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	0.99			0.94		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1195	3561			1756	3497			1693		
Flt Permitted		0.95	1.00			0.95	1.00			0.89		
Satd. Flow (perm)		1195	3561			1756	3497			1528		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	967	22	11	43	630	54	54	43	76	33
RTOR Reduction (vph)	0	0	1	0	0	0	5	0	0	0	0	0
Lane Group Flow (vph)	0	22	988	0	0	54	679	0	0	173	0	0
Confl. Peds. (#/hr)				2		2			5		1	1
Heavy Vehicles (%)	2%	100%	1%	0%	2%	3%	2%	2%	10%	0%	0%	0%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		3.6	62.4			7.4	66.2			18.2		
Effective Green, g (s)		3.6	62.4			7.4	66.2			18.2		
Actuated g/C Ratio		0.04	0.62			0.07	0.66			0.18		
Clearance Time (s)		4.0	4.0			4.0	4.0			4.0		
Vehicle Extension (s)		3.0	5.0			3.0	5.0			5.0		
Lane Grp Cap (vph)		43	2222			129	2315			278		
v/s Ratio Prot		0.02	c0.28			c0.03	c0.19					
v/s Ratio Perm										c0.11		
v/c Ratio		0.51	0.44			0.42	0.29			0.62		
Uniform Delay, d1		47.3	9.8			44.2	7.1			37.7		
Progression Factor		1.45	0.41			0.86	0.69			1.00		
Incremental Delay, d2		9.1	0.6			2.1	0.3			6.0		
Delay (s)		77.9	4.6			40.1	5.2			43.7		
Level of Service		E	A			D	A			D		
Approach Delay (s)			6.2				7.8			43.7		
Approach LOS			A				A			D		
Intersection Summary												
HCM 2000 Control Delay			10.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			48.3%				ICU Level of Service			A		
Analysis Period (min)			15									
c	Critical Lane Group											

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations	↕	
Traffic Volume (vph)	10	10
Future Volume (vph)	10	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frbp, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	0.97	
Satd. Flow (prot)	1787	
Flt Permitted	0.76	
Satd. Flow (perm)	1392	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	11	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	55	0
Confl. Peds. (#/hr)		5
Heavy Vehicles (%)	0%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	18.2	
Effective Green, g (s)	18.2	
Actuated g/C Ratio	0.18	
Clearance Time (s)	4.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	253	
v/s Ratio Prot		
v/s Ratio Perm	0.04	
v/c Ratio	0.22	
Uniform Delay, d1	34.8	
Progression Factor	1.00	
Incremental Delay, d2	0.9	
Delay (s)	35.7	
Level of Service	D	
Approach Delay (s)	35.7	
Approach LOS	D	
Intersection Summary		

6: Tuscarawas & Wertz
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↗		↖	↗
Traffic Volume (vph)	100	810	740	70	130	110
Future Volume (vph)	100	810	740	70	130	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3531		1805	1591
Flt Permitted	0.27	1.00	1.00		0.95	1.00
Satd. Flow (perm)	522	3574	3531		1805	1591
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	880	804	76	141	120
RTOR Reduction (vph)	0	0	5	0	0	102
Lane Group Flow (vph)	109	880	875	0	141	18
Confl. Peds. (#/hr)					1	2
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	77.1	77.1	67.0		14.9	14.9
Effective Green, g (s)	77.1	77.1	67.0		14.9	14.9
Actuated g/C Ratio	0.77	0.77	0.67		0.15	0.15
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	493	2755	2365		268	237
v/s Ratio Prot	0.02	c0.25	c0.25		c0.08	
v/s Ratio Perm	0.15					0.01
v/c Ratio	0.22	0.32	0.37		0.53	0.08
Uniform Delay, d1	3.5	3.5	7.2		39.3	36.6
Progression Factor	0.24	0.28	0.38		1.00	1.00
Incremental Delay, d2	0.2	0.3	0.4		3.5	0.3
Delay (s)	1.0	1.3	3.2		42.8	36.9
Level of Service	A	A	A		D	D
Approach Delay (s)		1.2	3.2		40.1	
Approach LOS		A	A		D	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

7: Dartmouth/Broad & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	820	150	320	660	30	20	10	130	110	10	120
Future Volume (vph)	70	820	150	320	660	30	20	10	130	110	10	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.86		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1734	3539	1583	1770	3514		1770	1604		1770	1620	
Flt Permitted	0.37	1.00	1.00	0.22	1.00		0.59	1.00		0.57	1.00	
Satd. Flow (perm)	670	3539	1583	411	3514		1105	1604		1064	1620	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	891	163	348	717	33	22	11	141	120	11	130
RTOR Reduction (vph)	0	0	81	0	3	0	0	109	0	0	100	0
Lane Group Flow (vph)	76	891	82	348	747	0	22	43	0	120	41	0
Confl. Peds. (#/hr)	3					3						
Heavy Vehicles (%)	4%	2%	2%	2%	2%	0%	2%	2%	2%	2%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	55.2	50.4	50.4	69.0	61.2		23.0	23.0		23.0	23.0	
Effective Green, g (s)	55.2	50.4	50.4	69.0	61.2		23.0	23.0		23.0	23.0	
Actuated g/C Ratio	0.55	0.50	0.50	0.69	0.61		0.23	0.23		0.23	0.23	
Clearance Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0		3.0	3.0		5.0	5.0	
Lane Grp Cap (vph)	420	1783	797	495	2150		254	368		244	372	
v/s Ratio Prot	0.01	0.25		c0.11	0.21			0.03			0.03	
v/s Ratio Perm	0.09		0.05	c0.37			0.02			c0.11		
v/c Ratio	0.18	0.50	0.10	0.70	0.35		0.09	0.12		0.49	0.11	
Uniform Delay, d1	10.5	16.4	13.0	9.3	9.6		30.2	30.5		33.4	30.4	
Progression Factor	0.52	0.51	0.19	1.07	0.49		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	1.0	0.3	4.3	0.4		0.1	0.1		6.9	0.6	
Delay (s)	5.7	9.3	2.7	14.2	5.1		30.4	30.6		40.4	31.0	
Level of Service	A	A	A	B	A		C	C		D	C	
Approach Delay (s)		8.1			8.0			30.6			35.3	
Approach LOS		A			A			C			D	

Intersection Summary		
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.67	B
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	70.6%	11.0
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

9: Arlington & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	840	180	230	820	50	60	10	30	50	10	50
Future Volume (vph)	50	840	180	230	820	50	60	10	30	50	10	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.89		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1555	1805	3542		1700	1629		1770	1631	
Flt Permitted	0.30	1.00	1.00	0.25	1.00		0.71	1.00		0.73	1.00	
Satd. Flow (perm)	564	3539	1555	466	3542		1279	1629		1357	1631	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	913	196	250	891	54	65	11	33	54	11	54
RTOR Reduction (vph)	0	0	78	0	4	0	0	0	0	0	43	0
Lane Group Flow (vph)	54	913	118	250	941	0	65	44	0	54	22	0
Confl. Peds. (#/hr)			2	2			1					
Heavy Vehicles (%)	2%	2%	1%	0%	1%	2%	6%	2%	4%	2%	2%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	60.1	60.1	60.1	72.0	72.0		20.0	20.0		20.0	20.0	
Effective Green, g (s)	60.1	60.1	60.1	72.0	72.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.60	0.60	0.60	0.72	0.72		0.20	0.20		0.20	0.20	
Clearance Time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	5.0	5.0	5.0	2.0	5.0		5.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	338	2126	934	454	2550		255	325		271	326	
v/s Ratio Prot		0.26		c0.05	0.27			0.03			0.01	
v/s Ratio Perm	0.10		0.08	c0.35			c0.05			0.04		
v/c Ratio	0.16	0.43	0.13	0.55	0.37		0.25	0.14		0.20	0.07	
Uniform Delay, d1	8.8	10.7	8.6	6.1	5.3		33.7	32.9		33.3	32.4	
Progression Factor	0.42	0.36	0.07	2.34	0.56		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.6	0.2	0.7	0.4		2.4	0.9		0.4	0.1	
Delay (s)	4.6	4.4	0.9	15.1	3.4		36.1	33.8		33.7	32.5	
Level of Service	A	A	A	B	A		D	C		C	C	
Approach Delay (s)		3.8			5.8			35.2			33.1	
Approach LOS		A			A			D			C	

Intersection Summary

HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

10: Harrison & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	710	10	10	1070	50	10	10	10	130	10	30
Future Volume (vph)	10	710	10	10	1070	50	10	10	10	130	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1		3.0	5.1			5.1			5.1	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.96	1.00
Satd. Flow (prot)	1801	3483		1805	3475			1784			1783	1532
Flt Permitted	0.21	1.00		0.32	1.00			0.89			0.72	1.00
Satd. Flow (perm)	402	3483		603	3475			1616			1338	1532
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	772	11	11	1163	54	11	11	11	141	11	33
RTOR Reduction (vph)	0	1	0	0	2	0	0	9	0	0	0	27
Lane Group Flow (vph)	11	782	0	11	1215	0	0	24	0	0	152	6
Confl. Peds. (#/hr)	4					4	1					1
Heavy Vehicles (%)	0%	3%	33%	0%	3%	4%	0%	0%	0%	2%	0%	4%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2 8		1	6 8			3			3	
Permitted Phases	2 8			6 8			3			3		3
Actuated Green, G (s)	68.9	68.9		73.1	73.1			16.7			16.7	16.7
Effective Green, g (s)	68.9	68.9		68.0	73.1			16.7			16.7	16.7
Actuated g/C Ratio	0.69	0.69		0.68	0.73			0.17			0.17	0.17
Clearance Time (s)				3.0				5.1			5.1	5.1
Vehicle Extension (s)				3.0				3.0			3.0	3.0
Lane Grp Cap (vph)	276	2399		424	2540			269			223	255
v/s Ratio Prot		0.22		0.00	c0.35							
v/s Ratio Perm	0.03			0.02				0.01			c0.11	0.00
v/c Ratio	0.04	0.33		0.03	0.48			0.09			0.68	0.02
Uniform Delay, d1	5.0	6.2		5.4	5.6			35.2			39.2	34.8
Progression Factor	0.22	0.25		1.17	1.03			1.00			1.00	1.00
Incremental Delay, d2	0.1	0.1		0.0	0.0			0.1			8.3	0.0
Delay (s)	1.1	1.6		6.3	5.8			35.4			47.4	34.9
Level of Service	A	A		A	A			D			D	C
Approach Delay (s)		1.6			5.8			35.4			45.2	
Approach LOS		A			A			D			D	

Intersection Summary		
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.57	A
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	54.1%	18.3
Analysis Period (min)	15	ICU Level of Service
		A

c Critical Lane Group

11: SB I-77 Off Ramp/Harrison & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑		↖		↗	↖	↗	↖
Traffic Volume (vph)	0	960	70	40	580	0	120	0	90	730	230	790
Future Volume (vph)	0	960	70	40	580	0	120	0	90	730	230	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00		1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00		1.00		0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95		1.00	0.95	0.97	1.00
Satd. Flow (prot)		3526		1671	3574		1641		1568	1715	1742	1579
Flt Permitted		1.00		0.13	1.00		0.46		1.00	0.95	0.97	1.00
Satd. Flow (perm)		3526		221	3574		788		1568	1715	1742	1579
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1043	76	43	630	0	130	0	98	793	250	859
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	69	0	0	84
Lane Group Flow (vph)	0	1114	0	43	630	0	130	0	29	515	528	775
Confl. Peds. (#/hr)	1					1						1
Heavy Vehicles (%)	0%	1%	6%	8%	1%	0%	10%	0%	3%	0%	2%	1%
Turn Type		NA		Perm	NA		Perm		Perm	Split	NA	Perm
Protected Phases		2			6					8		8
Permitted Phases				6			7			7		
Actuated Green, G (s)		31.9		31.9	31.9		12.9		12.9	39.9	39.9	39.9
Effective Green, g (s)		31.9		31.9	31.9		12.9		12.9	39.9	39.9	39.9
Actuated g/C Ratio		0.32		0.32	0.32		0.13		0.13	0.40	0.40	0.40
Clearance Time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Vehicle Extension (s)		5.0		5.0	5.0		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1124		70	1140		101		202	684	695	630
v/s Ratio Prot		c0.32			0.18					0.30	0.30	
v/s Ratio Perm				0.19			c0.17		0.02			c0.49
v/c Ratio		0.99		0.61	0.55		1.29		0.14	0.75	0.76	1.23
Uniform Delay, d1		33.9		28.8	28.2		43.5		38.7	25.8	25.9	30.1
Progression Factor		0.77		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		24.4		34.2	1.9		185.0		0.3	4.7	4.8	117.0
Delay (s)		50.6		63.0	30.1		228.6		39.0	30.5	30.7	147.0
Level of Service		D		E	C		F		D	C	C	F
Approach Delay (s)		50.6			32.2			147.1				83.2
Approach LOS		D			C			F				F

Intersection Summary		
HCM 2000 Control Delay	68.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.15	E
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	83.5%	15.3
Analysis Period (min)	15	ICU Level of Service
		E

c Critical Lane Group

SimTraffic Simulation Summary
AM 2022 Alternative 1

04/12/2018

Summary of All Intervals

Run Number	1	2	3	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	6417	6519	6666	6535
Vehs Exited	6458	6498	6662	6537
Starting Vehs	243	211	222	219
Ending Vehs	202	232	226	219
Travel Distance (mi)	3591	3634	3693	3639
Travel Time (hr)	259.7	272.0	275.1	268.9
Total Delay (hr)	138.5	149.8	150.9	146.4
Total Stops	8640	8807	9024	8819
Fuel Used (gal)	163.1	167.2	170.3	166.9

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1584	1632	1632	1615
Vehs Exited	1617	1647	1630	1632
Starting Vehs	243	211	222	219
Ending Vehs	210	196	224	202
Travel Distance (mi)	885	940	908	911
Travel Time (hr)	58.3	56.1	56.5	57.0
Total Delay (hr)	28.3	24.6	26.0	26.3
Total Stops	2171	2191	2209	2187
Fuel Used (gal)	39.1	40.2	39.2	39.5

SimTraffic Simulation Summary
AM 2022 Alternative 1

04/12/2018

Interval #2 Information

Start Time	7:15
End Time	7:30
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	2	3	Avg
Vehs Entered	1710	1750	1726	1729
Vehs Exited	1669	1710	1707	1695
Starting Vehs	210	196	224	202
Ending Vehs	251	236	243	237
Travel Distance (mi)	952	949	968	956
Travel Time (hr)	65.5	66.1	70.5	67.4
Total Delay (hr)	33.5	34.2	37.9	35.2
Total Stops	2258	2340	2315	2304
Fuel Used (gal)	42.4	42.5	44.0	43.0

Interval #3 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1561	1531	1664	1583
Vehs Exited	1622	1510	1681	1605
Starting Vehs	251	236	243	237
Ending Vehs	190	257	226	222
Travel Distance (mi)	895	820	907	874
Travel Time (hr)	69.7	73.1	74.1	72.3
Total Delay (hr)	39.5	45.3	43.6	42.8
Total Stops	2102	2031	2243	2122
Fuel Used (gal)	41.7	40.3	43.7	41.9

Interval #4 Information

Start Time	7:45
End Time	8:00
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1562	1606	1644	1602
Vehs Exited	1550	1631	1644	1606
Starting Vehs	190	257	226	222
Ending Vehs	202	232	226	219
Travel Distance (mi)	860	925	909	898
Travel Time (hr)	66.2	76.7	74.0	72.3
Total Delay (hr)	37.2	45.7	43.4	42.1
Total Stops	2109	2245	2257	2201
Fuel Used (gal)	40.0	44.2	43.3	42.5

Queuing and Blocking Report
AM 2022 Alternative 1

04/12/2018

Intersection: 1: Whipple & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	142	192	190	52	113	105	68	115	136	123	193	132
Average Queue (ft)	63	98	87	10	45	49	19	46	64	24	99	44
95th Queue (ft)	117	163	161	37	86	90	51	99	123	71	174	98
Link Distance (ft)		636	636		1127	1127			339	339		1018
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	235			130				150	90			190
Storage Blk Time (%)		0			0			3	6			0
Queuing Penalty (veh)		0			0			2	5			0

Intersection: 1: Whipple & Tuscarawas

Movement	SB
Directions Served	TR
Maximum Queue (ft)	175
Average Queue (ft)	62
95th Queue (ft)	132
Link Distance (ft)	1018
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
AM 2022 Alternative 1

04/12/2018

Intersection: 2: Valleyview & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	UL	T	T	R	L	T	R	L
Maximum Queue (ft)	30	184	203	68	139	169	197	75	70	53	59	103
Average Queue (ft)	4	98	112	12	52	78	103	20	27	12	12	40
95th Queue (ft)	21	158	183	48	106	154	180	66	59	35	41	82
Link Distance (ft)		1127	1127			1305	1305		267	267	267	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	600				100	600			50			180
Storage Blk Time (%)			9	0				21	0			
Queuing Penalty (veh)			3	0				8	0			

Intersection: 2: Valleyview & Tuscarawas

Movement	SB
Directions Served	TR
Maximum Queue (ft)	52
Average Queue (ft)	13
95th Queue (ft)	38
Link Distance (ft)	326
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Raff & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	UL	T	T	R	UL	T	TR	L	TR	L	TR	
Maximum Queue (ft)	49	158	162	30	191	130	141	169	150	75	99	
Average Queue (ft)	15	64	58	6	97	53	60	88	81	21	28	
95th Queue (ft)	41	125	121	26	168	106	118	158	146	60	69	
Link Distance (ft)		1305	1305			946	946	303	303		421	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	600				600	600				90		
Storage Blk Time (%)										1	0	
Queuing Penalty (veh)										0	0	

Queuing and Blocking Report
AM 2022 Alternative 1

04/12/2018

Intersection: 4: Bellflower & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB
Directions Served	UL	T	TR	UL	T	TR
Maximum Queue (ft)	24	8	18	31	14	9
Average Queue (ft)	5	0	1	6	0	0
95th Queue (ft)	18	4	9	22	8	5
Link Distance (ft)		946	946		827	827
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200			200		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Maryland/Gas Station & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	100	136	144	92	119	125	197	62
Average Queue (ft)	23	45	58	31	47	53	92	29
95th Queue (ft)	68	106	113	66	97	102	158	62
Link Distance (ft)		827	827		611	611	368	47
Upstream Blk Time (%)								10
Queuing Penalty (veh)								0
Storage Bay Dist (ft)	150			160				
Storage Blk Time (%)		0						
Queuing Penalty (veh)		0						

Intersection: 6: Tuscarawas & Wertz

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	105	74	112	126	104	98	171
Average Queue (ft)	49	19	33	27	35	61	37
95th Queue (ft)	86	57	83	74	82	104	86
Link Distance (ft)		611	611	486	486		575
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	375					75	
Storage Blk Time (%)						13	0
Queuing Penalty (veh)						14	0

Queuing and Blocking Report
AM 2022 Alternative 1

04/12/2018

Intersection: 7: Dartmouth/Broad & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	49	170	186	71	290	148	166	53	107	108	199
Average Queue (ft)	20	85	99	27	125	64	80	12	46	65	49
95th Queue (ft)	45	151	161	60	224	127	145	37	82	115	121
Link Distance (ft)		486	486			1266	1266		269		455
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	400			400	600			160		85	
Storage Blk Time (%)										10	1
Queuing Penalty (veh)										13	1

Intersection: 9: Arlington & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	61	136	133	65	167	158	130	113	65	83	83
Average Queue (ft)	21	46	65	26	86	78	66	34	25	32	26
95th Queue (ft)	49	95	113	56	153	135	116	83	56	66	61
Link Distance (ft)		1266	1266			506	506		466		435
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	600			600	250			100		100	
Storage Blk Time (%)								1		0	0
Queuing Penalty (veh)								1		0	0

Intersection: 10: Harrison & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LT	R
Maximum Queue (ft)	38	112	141	44	164	188	68	192	98
Average Queue (ft)	7	24	46	7	82	80	20	91	19
95th Queue (ft)	27	77	107	26	149	153	51	164	60
Link Distance (ft)		506	506		172	172	126	574	
Upstream Blk Time (%)					0	0			
Queuing Penalty (veh)					0	1			
Storage Bay Dist (ft)	200			100				180	
Storage Blk Time (%)					3		1	0	
Queuing Penalty (veh)					0		0	0	

Queuing and Blocking Report
 AM 2022 Alternative 1

04/12/2018

Intersection: 11: SB I-77 Off Ramp/Harrison & Tuscarawas

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	TR	L	T	T	L	R	L	LT	R
Maximum Queue (ft)	204	211	125	385	308	223	131	392	475	528
Average Queue (ft)	162	171	74	225	147	101	43	300	440	446
95th Queue (ft)	206	216	141	373	324	184	99	393	534	607
Link Distance (ft)	172	172		386	386	297				496
Upstream Blk Time (%)	8	10		11	5					6
Queuing Penalty (veh)	33	42		0	0					0
Storage Bay Dist (ft)			100				150	450	450	
Storage Blk Time (%)			20	36		4			5	5
Queuing Penalty (veh)			58	14		4			38	49

Network Summary

Network wide Queuing Penalty: 289

1: Whipple & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

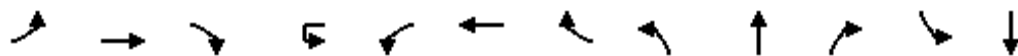


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	
Traffic Volume (vph)	230	700	110	60	770	260	250	240	40	360	280	230
Future Volume (vph)	230	700	110	60	770	260	250	240	40	360	280	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3499		1805	3574	1601	1804	3474		1805	3292	
Flt Permitted	0.14	1.00		0.23	1.00	1.00	0.40	1.00		0.28	1.00	
Satd. Flow (perm)	265	3499		431	3574	1601	760	3474		538	3292	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	761	120	65	837	283	272	261	43	391	304	250
RTOR Reduction (vph)	0	14	0	0	0	48	0	15	0	0	167	0
Lane Group Flow (vph)	250	867	0	65	837	235	272	289	0	391	387	0
Confl. Peds. (#/hr)	3		3	3		3	3					3
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	0%	2%	0%	0%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	44.9	33.9		34.1	28.5	46.6	22.2	10.0		33.7	15.9	
Effective Green, g (s)	44.9	33.9		34.1	28.5	46.6	22.2	10.0		33.7	15.9	
Actuated g/C Ratio	0.50	0.38		0.38	0.32	0.52	0.25	0.11		0.37	0.18	
Clearance Time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	318	1317		248	1131	928	328	386		456	581	
v/s Ratio Prot	c0.10	0.25		0.02	0.23	0.05	0.11	0.08		c0.17	0.12	
v/s Ratio Perm	c0.30			0.08		0.10	0.09			c0.15		
v/c Ratio	0.79	0.66		0.26	0.74	0.25	0.83	0.75		0.86	0.67	
Uniform Delay, d1	16.7	23.3		18.5	27.4	12.0	30.1	38.8		23.0	34.6	
Progression Factor	1.00	1.00		1.70	1.21	0.30	1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.1	2.6		0.4	3.0	0.1	15.7	7.7		14.7	2.9	
Delay (s)	28.8	25.8		31.8	36.3	3.7	45.9	46.5		37.7	37.5	
Level of Service	C	C		C	D	A	D	D		D	D	
Approach Delay (s)		26.5			28.3			46.2			37.6	
Approach LOS		C			C			D			D	

Intersection Summary		
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.89	
Actuated Cycle Length (s)	90.0	Sum of lost time (s) 22.4
Intersection Capacity Utilization	81.8%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	60	810	120	40	170	1090	120	150	50	90	110	60
Future Volume (vph)	60	810	120	40	170	1090	120	150	50	90	110	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3574	1578		1798	3574	1578	1804	1900	1593	1803	1777
Flt Permitted	0.14	1.00	1.00		0.95	1.00	1.00	0.56	1.00	1.00	0.72	1.00
Satd. Flow (perm)	263	3574	1578		1798	3574	1578	1065	1900	1593	1370	1777
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	880	130	43	185	1185	130	163	54	98	120	65
RTOR Reduction (vph)	0	0	88	0	0	0	71	0	0	0	0	28
Lane Group Flow (vph)	65	880	42	0	228	1185	59	163	54	98	120	80
Confl. Peds. (#/hr)	1		2		2		1	1		1	1	
Heavy Vehicles (%)	0%	1%	0%	2%	0%	1%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	Prot	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases	2		2				6	8		8	4	
Actuated Green, G (s)	34.8	28.9	28.9		13.2	36.2	36.2	33.1	21.4	21.4	24.1	16.0
Effective Green, g (s)	34.8	28.9	28.9		13.2	36.2	36.2	33.1	21.4	21.4	24.1	16.0
Actuated g/C Ratio	0.39	0.32	0.32		0.15	0.40	0.40	0.37	0.24	0.24	0.27	0.18
Clearance Time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	202	1147	506		263	1437	634	502	451	378	405	315
v/s Ratio Prot	0.02	0.25			c0.13	c0.33		c0.05	0.03		0.03	0.05
v/s Ratio Perm	0.10		0.03				0.04	c0.07		0.06	0.05	
v/c Ratio	0.32	0.77	0.08		0.87	0.82	0.09	0.32	0.12	0.26	0.30	0.25
Uniform Delay, d1	19.1	27.5	21.3		37.5	24.1	16.7	19.9	26.9	27.9	25.8	31.9
Progression Factor	1.35	1.16	3.42		0.83	1.00	1.08	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	3.4	0.2		19.0	4.1	0.2	0.4	0.5	1.7	0.4	0.9
Delay (s)	26.5	35.4	73.2		50.3	28.2	18.2	20.2	27.5	29.5	26.3	32.8
Level of Service	C	D	E		D	C	B	C	C	C	C	C
Approach Delay (s)		39.4				30.6			24.4			29.3
Approach LOS		D				C			C			C

Intersection Summary		
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.67	C
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	72.8%	18.4
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	40
Future Volume (vph)	40
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	43
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

3: Raff & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



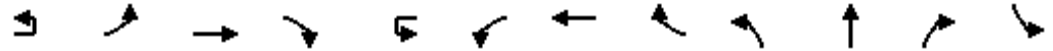
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↔	↕	↗		↔	↕		↖	↗		↖
Traffic Volume (vph)	10	10	820	180	50	170	1050	20	360	80	130	30
Future Volume (vph)	10	10	820	180	50	170	1050	20	360	80	130	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	7.0	7.0		4.0	7.0		4.0	4.0		4.0
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	1.00		1.00
Frbp, ped/bikes		1.00	1.00	0.98		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.85		1.00	1.00		1.00	0.91		1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95
Satd. Flow (prot)		1787	3574	1570		1770	3563		1783	1690		1687
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.71	1.00		0.52
Satd. Flow (perm)		1787	3574	1570		1770	3563		1341	1690		919
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	891	196	54	185	1141	22	391	87	141	33
RTOR Reduction (vph)	0	0	0	130	0	0	2	0	0	0	0	0
Lane Group Flow (vph)	0	22	891	66	0	239	1161	0	391	228	0	33
Confl. Peds. (#/hr)		5		4		4		5	2			
Heavy Vehicles (%)	2%	0%	1%	1%	2%	2%	1%	0%	1%	2%	2%	7%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2					8			4
Actuated Green, G (s)		1.6	30.3	30.3		15.0	43.7		29.7	29.7		29.7
Effective Green, g (s)		1.6	30.3	30.3		15.0	43.7		29.7	29.7		29.7
Actuated g/C Ratio		0.02	0.34	0.34		0.17	0.49		0.33	0.33		0.33
Clearance Time (s)		4.0	7.0	7.0		4.0	7.0		4.0	4.0		4.0
Vehicle Extension (s)		3.0	5.0	5.0		3.0	5.0		5.0	5.0		5.0
Lane Grp Cap (vph)		31	1203	528		295	1730		442	557		303
v/s Ratio Prot		0.01	c0.25			c0.14	0.33			0.13		
v/s Ratio Perm				0.04					c0.29			0.04
v/c Ratio		0.71	0.74	0.12		0.81	0.67		0.88	0.41		0.11
Uniform Delay, d1		44.0	26.4	20.7		36.1	17.7		28.5	23.4		21.0
Progression Factor		1.49	0.58	0.72		1.16	0.41		1.00	1.00		1.00
Incremental Delay, d2		43.2	3.1	0.4		12.9	1.7		19.8	1.0		0.3
Delay (s)		108.6	18.4	15.3		54.9	9.0		48.3	24.4		21.3
Level of Service		F	B	B		D	A		D	C		C
Approach Delay (s)			19.7			16.8			39.5			
Approach LOS			B			B			D			
Intersection Summary												
HCM 2000 Control Delay			22.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)				15.0		
Intersection Capacity Utilization			74.0%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

3: Raff & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations	1P	
Traffic Volume (vph)	50	10
Future Volume (vph)	50	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frbp, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	1.00	
Satd. Flow (prot)	1847	
Flt Permitted	1.00	
Satd. Flow (perm)	1847	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	54	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	65	0
Confl. Peds. (#/hr)		2
Heavy Vehicles (%)	0%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	29.7	
Effective Green, g (s)	29.7	
Actuated g/C Ratio	0.33	
Clearance Time (s)	4.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	609	
v/s Ratio Prot	0.04	
v/s Ratio Perm		
v/c Ratio	0.11	
Uniform Delay, d1	20.9	
Progression Factor	1.00	
Incremental Delay, d2	0.2	
Delay (s)	21.1	
Level of Service	C	
Approach Delay (s)	21.2	
Approach LOS	C	
Intersection Summary		

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↔	↕↔			↔	↕↔				↕	
Traffic Volume (veh/h)	10	10	1120	30	10	30	1360	10	0	0	20	0
Future Volume (Veh/h)	10	10	1120	30	10	30	1360	10	0	0	20	0
Sign Control			Free				Free			Stop		
Grade			0%				0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	1217	33	0	33	1478	11	0	0	22	0
Pedestrians							1			11		
Lane Width (ft)							12.0			12.0		
Walking Speed (ft/s)							4.0			4.0		
Percent Blockage							0			1		
Right turn flare (veh)												
Median type			None				None					
Median storage (veh)												
Upstream signal (ft)			1030				904					
pX, platoon unblocked	0.00	0.74			0.00	0.78			0.85	0.85	0.78	0.85
vC, conflicting volume	0	1491			0	1261			2072	2824	637	2183
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	969			0	782			767	1650	0	898
tC, single (s)	0.0	4.1			0.0	4.1			7.5	6.5	6.9	7.5
tC, 2 stage (s)												
tF (s)	0.0	2.2			0.0	2.2			3.5	4.0	3.3	3.5
p0 queue free %	0	98			0	95			100	100	97	100
cM capacity (veh/h)	0	533			0	656			231	78	847	184
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	11	811	439	33	985	504	22	11				
Volume Left	11	0	0	33	0	0	0	0				
Volume Right	0	0	33	0	0	11	22	11				
cSH	533	1700	1700	656	1700	1700	847	809				
Volume to Capacity	0.02	0.48	0.26	0.05	0.58	0.30	0.03	0.01				
Queue Length 95th (ft)	2	0	0	4	0	0	2	1				
Control Delay (s)	11.9	0.0	0.0	10.8	0.0	0.0	9.4	9.5				
Lane LOS	B			B			A	A				
Approach Delay (s)	0.1			0.2			9.4	9.5				
Approach LOS							A	A				
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			48.2%	ICU Level of Service	A							
Analysis Period (min)			15									

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations		↗
Traffic Volume (veh/h)	0	10
Future Volume (Veh/h)	0	10
Sign Control	Stop	
Grade	0%	
Peak Hour Factor	0.92	0.92
Hourly flow rate (vph)	0	11
Pedestrians	2	
Lane Width (ft)	12.0	
Walking Speed (ft/s)	4.0	
Percent Blockage	0	
Right turn flare (veh)		
Median type		
Median storage (veh)		
Upstream signal (ft)		
pX, platoon unblocked	0.85	0.74
vC, conflicting volume	2834	746
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol	1663	0
tC, single (s)	6.5	6.9
tC, 2 stage (s)		
tF (s)	4.0	3.3
p0 queue free %	100	99
cM capacity (veh/h)	77	809
Direction, Lane #		

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↔	↕			↔	↕			↕		
Traffic Volume (vph)	30	30	950	50	20	80	1110	50	140	30	90	30
Future Volume (vph)	30	30	950	50	20	80	1110	50	140	30	90	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0			4.0		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frbp, ped/bikes		1.00	1.00			1.00	1.00			0.99		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	0.99			1.00	0.99			0.95		
Flt Protected		0.95	1.00			0.95	1.00			0.97		
Satd. Flow (prot)		1787	3537			1770	3549			1715		
Flt Permitted		0.95	1.00			0.95	1.00			0.82		
Satd. Flow (perm)		1787	3537			1770	3549			1439		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	33	1033	54	22	87	1207	54	152	33	98	33
RTOR Reduction (vph)	0	0	3	0	0	0	3	0	0	0	0	0
Lane Group Flow (vph)	0	66	1084	0	0	109	1258	0	0	283	0	0
Confl. Peds. (#/hr)		4		8		8		4	3		3	3
Heavy Vehicles (%)	2%	0%	1%	2%	2%	2%	1%	0%	0%	0%	6%	4%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		6.1	46.0			8.1	48.0			23.9		
Effective Green, g (s)		6.1	46.0			8.1	48.0			23.9		
Actuated g/C Ratio		0.07	0.51			0.09	0.53			0.27		
Clearance Time (s)		4.0	4.0			4.0	4.0			4.0		
Vehicle Extension (s)		3.0	5.0			3.0	5.0			5.0		
Lane Grp Cap (vph)		121	1807			159	1892			382		
v/s Ratio Prot		0.04	0.31			c0.06	c0.35					
v/s Ratio Perm										c0.20		
v/c Ratio		0.55	0.60			0.69	0.66			0.74		
Uniform Delay, d1		40.6	15.5			39.7	15.2			30.2		
Progression Factor		1.38	0.43			1.18	0.76			1.00		
Incremental Delay, d2		4.1	1.2			9.0	1.4			9.0		
Delay (s)		60.2	7.9			56.0	12.9			39.2		
Level of Service		E	A			E	B			D		
Approach Delay (s)			10.9				16.4			39.2		
Approach LOS			B				B			D		
Intersection Summary												
HCM 2000 Control Delay			16.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			64.8%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations	↕	
Traffic Volume (vph)	20	10
Future Volume (vph)	20	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frbp, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.98	
Flt Protected	0.98	
Satd. Flow (prot)	1770	
Flt Permitted	0.81	
Satd. Flow (perm)	1464	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	22	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	66	0
Confl. Peds. (#/hr)		3
Heavy Vehicles (%)	0%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	23.9	
Effective Green, g (s)	23.9	
Actuated g/C Ratio	0.27	
Clearance Time (s)	4.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	388	
v/s Ratio Prot		
v/s Ratio Perm	0.05	
v/c Ratio	0.17	
Uniform Delay, d1	25.4	
Progression Factor	1.00	
Incremental Delay, d2	0.4	
Delay (s)	25.9	
Level of Service	C	
Approach Delay (s)	25.9	
Approach LOS	C	
Intersection Summary		

6: Tuscarawas & Wertz
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	210	1070	1210	130	110	200
Future Volume (vph)	210	1070	1210	130	110	200
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3515		1787	1589
Flt Permitted	0.10	1.00	1.00		0.95	1.00
Satd. Flow (perm)	193	3574	3515		1787	1589
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	1163	1315	141	120	217
RTOR Reduction (vph)	0	0	7	0	0	184
Lane Group Flow (vph)	228	1163	1449	0	120	33
Confl. Peds. (#/hr)	4			4		3
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	68.4	68.4	54.5		13.6	13.6
Effective Green, g (s)	68.4	68.4	54.5		13.6	13.6
Actuated g/C Ratio	0.76	0.76	0.61		0.15	0.15
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	341	2716	2128		270	240
v/s Ratio Prot	c0.08	0.33	0.41		c0.07	
v/s Ratio Perm	c0.43					0.02
v/c Ratio	0.67	0.43	0.68		0.44	0.14
Uniform Delay, d1	15.1	3.8	11.9		34.8	33.1
Progression Factor	1.90	0.58	0.50		1.00	1.00
Incremental Delay, d2	4.4	0.4	1.2		2.4	0.5
Delay (s)	33.1	2.7	7.2		37.2	33.7
Level of Service	C	A	A		D	C
Approach Delay (s)		7.7	7.2		34.9	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

7: Dartmouth/Broad & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗↗	↖	↖	↗↗		↖	↗		↖	↗	
Traffic Volume (vph)	140	910	60	90	1410	100	30	10	210	80	10	120
Future Volume (vph)	140	910	60	90	1410	100	30	10	210	80	10	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.86		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3574	1583	1770	3534		1770	1596		1805	1635	
Flt Permitted	0.07	1.00	1.00	0.25	1.00		0.57	1.00		0.33	1.00	
Satd. Flow (perm)	133	3574	1583	465	3534		1065	1596		628	1635	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	989	65	98	1533	109	33	11	228	87	11	130
RTOR Reduction (vph)	0	0	24	0	5	0	0	182	0	0	107	0
Lane Group Flow (vph)	152	989	41	98	1637	0	33	57	0	87	34	0
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	1%	1%	2%	2%	1%	0%	2%	2%	2%	0%	2%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	64.8	56.9	56.9	60.2	55.1		16.0	16.0		16.0	16.0	
Effective Green, g (s)	64.8	56.9	56.9	60.2	55.1		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.72	0.63	0.63	0.67	0.61		0.18	0.18		0.18	0.18	
Clearance Time (s)	3.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0		3.0	3.0		5.0	5.0	
Lane Grp Cap (vph)	240	2259	1000	384	2163		189	283		111	290	
v/s Ratio Prot	c0.06	0.28		0.01	c0.46			0.04			0.02	
v/s Ratio Perm	0.40		0.03	0.16			0.03			c0.14		
v/c Ratio	0.63	0.44	0.04	0.26	0.76		0.17	0.20		0.78	0.12	
Uniform Delay, d1	16.6	8.4	6.2	5.6	12.6		31.4	31.6		35.3	31.1	
Progression Factor	1.35	0.83	1.14	0.76	0.91		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.0	0.6	0.1	0.3	2.0		0.4	0.4		33.3	0.4	
Delay (s)	27.4	7.5	7.2	4.5	13.4		31.8	31.9		68.6	31.5	
Level of Service	C	A	A	A	B		C	C		E	C	
Approach Delay (s)		10.0			12.9			31.9			45.6	
Approach LOS		B			B			C			D	

Intersection Summary

HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

9: Arlington & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	1170	120	140	1320	50	230	10	150	50	10	50
Future Volume (vph)	50	1170	120	140	1320	50	230	10	150	50	10	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.86		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3574	1572	1787	3554		1805	1610		1770	1631	
Flt Permitted	0.14	1.00	1.00	0.12	1.00		0.71	1.00		0.56	1.00	
Satd. Flow (perm)	261	3574	1572	226	3554		1358	1610		1040	1631	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1272	130	152	1435	54	250	11	163	54	11	54
RTOR Reduction (vph)	0	0	59	0	3	0	0	0	0	0	40	0
Lane Group Flow (vph)	54	1272	71	152	1486	0	250	174	0	54	25	0
Confl. Peds. (#/hr)			2	2					1			
Heavy Vehicles (%)	2%	1%	0%	1%	1%	2%	0%	2%	0%	2%	2%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	48.9	48.9	48.9	59.0	59.0		23.0	23.0		23.0	23.0	
Effective Green, g (s)	48.9	48.9	48.9	59.0	59.0		23.0	23.0		23.0	23.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.66	0.66		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	5.0	5.0	5.0	2.0	5.0		5.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	141	1941	854	271	2329		347	411		265	416	
v/s Ratio Prot		0.36		0.04	c0.42			0.11			0.02	
v/s Ratio Perm	0.21		0.04	0.32			c0.18			0.05		
v/c Ratio	0.38	0.66	0.08	0.56	0.64		0.72	0.42		0.20	0.06	
Uniform Delay, d1	11.9	14.6	9.8	10.6	9.2		30.6	28.0		26.3	25.3	
Progression Factor	0.77	0.80	1.32	2.39	0.46		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.2	1.6	0.2	1.1	0.9		12.2	3.2		0.4	0.1	
Delay (s)	16.4	13.2	13.1	26.6	5.2		42.8	31.1		26.7	25.4	
Level of Service	B	B	B	C	A		D	C		C	C	
Approach Delay (s)		13.3			7.2			38.0			26.0	
Approach LOS		B			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

10: Harrison & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	920	20	20	1380	140	10	10	10	240	10	120
Future Volume (vph)	20	920	20	20	1380	140	10	10	10	240	10	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1		3.0	5.1			5.1			5.1	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99			0.99			1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	1.00
Frt	1.00	1.00		1.00	0.99			0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (prot)	1805	3527		1805	3468			1769			1689	1570
Flt Permitted	0.09	1.00		0.20	1.00			0.88			0.71	1.00
Satd. Flow (perm)	169	3527		381	3468			1588			1258	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	1000	22	22	1500	152	11	11	11	261	11	130
RTOR Reduction (vph)	0	1	0	0	8	0	0	8	0	0	0	92
Lane Group Flow (vph)	22	1021	0	22	1644	0	0	25	0	0	272	38
Confl. Peds. (#/hr)	17		3	3		17	10		4	4		10
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	0%	0%	7%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2 8		1	6 8			3			3	
Permitted Phases	2 8			6 8			3			3		3
Actuated Green, G (s)	51.9	51.9		56.9	56.9			22.9			22.9	22.9
Effective Green, g (s)	51.9	51.9		51.8	56.9			22.9			22.9	22.9
Actuated g/C Ratio	0.58	0.58		0.58	0.63			0.25			0.25	0.25
Clearance Time (s)				3.0				5.1			5.1	5.1
Vehicle Extension (s)				3.0				3.0			3.0	3.0
Lane Grp Cap (vph)	97	2033		250	2192			404			320	399
v/s Ratio Prot		0.29		0.00	c0.47							
v/s Ratio Perm	0.13			0.05				0.02			c0.22	0.02
v/c Ratio	0.23	0.50		0.09	0.75			0.06			0.85	0.09
Uniform Delay, d1	9.3	11.4		9.4	11.6			25.4			31.9	25.6
Progression Factor	0.45	0.44		1.03	0.83			1.00			1.00	1.00
Incremental Delay, d2	0.9	0.2		0.0	0.4			0.1			18.6	0.1
Delay (s)	5.1	5.1		9.6	10.1			25.5			50.5	25.7
Level of Service	A	A		A	B			C			D	C
Approach Delay (s)		5.1			10.1			25.5			42.5	
Approach LOS		A			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

11: SB I-77 Off Ramp/Harrison & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑		↖		↖	↖	↖	↖
Traffic Volume (vph)	0	1360	80	80	960	0	200	0	190	230	220	590
Future Volume (vph)	0	1360	80	80	960	0	200	0	190	230	220	590
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00	0.95	0.95	1.00
Frt		0.99		1.00	1.00		1.00		0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95		1.00	0.95	1.00	1.00
Satd. Flow (prot)		3546		1805	3574		1805		1615	1715	1765	1599
Flt Permitted		1.00		0.11	1.00		0.59		1.00	0.95	1.00	1.00
Satd. Flow (perm)		3546		218	3574		1119		1615	1715	1765	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1478	87	87	1043	0	217	0	207	250	239	641
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	120	0	0	63
Lane Group Flow (vph)	0	1560	0	87	1043	0	217	0	87	225	264	578
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	2%	1%
Turn Type		NA		Perm	NA		Perm		Perm	Split	NA	Perm
Protected Phases		2			6					8	8	
Permitted Phases				6			7		7			8
Actuated Green, G (s)		34.9		34.9	34.9		14.9		14.9	24.9	24.9	24.9
Effective Green, g (s)		34.9		34.9	34.9		14.9		14.9	24.9	24.9	24.9
Actuated g/C Ratio		0.39		0.39	0.39		0.17		0.17	0.28	0.28	0.28
Clearance Time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Vehicle Extension (s)		5.0		5.0	5.0		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1375		84	1385		185		267	474	488	442
v/s Ratio Prot		c0.44			0.29					0.13	0.15	
v/s Ratio Perm				0.40			c0.19		0.05			c0.36
v/c Ratio		1.13		1.04	0.75		1.17		0.33	0.47	0.54	1.31
Uniform Delay, d1		27.6		27.6	23.8		37.5		33.1	27.1	27.7	32.5
Progression Factor		0.71		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		69.4		108.3	3.8		120.5		0.7	0.8	1.2	154.1
Delay (s)		89.0		135.8	27.7		158.0		33.8	27.9	28.9	186.6
Level of Service		F		F	C		F		C	C	C	F
Approach Delay (s)		89.0			36.0			97.4			118.2	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	83.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

SimTraffic Simulation Summary
PM 2022 Alternative 1

04/12/2018

Summary of All Intervals

Run Number	1	2	3	Avg
Start Time	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	8071	8097	8179	8118
Vehs Exited	8153	8181	8189	8172
Starting Vehs	373	403	334	370
Ending Vehs	291	319	324	309
Travel Distance (mi)	4736	4704	4769	4736
Travel Time (hr)	727.5	805.9	574.1	702.5
Total Delay (hr)	569.0	648.4	414.7	544.0
Total Stops	13241	13064	13100	13139
Fuel Used (gal)	304.8	322.3	272.4	299.8

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00
End Time	5:15
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1990	1987	2093	2029
Vehs Exited	2065	2091	2114	2091
Starting Vehs	373	403	334	370
Ending Vehs	298	299	313	299
Travel Distance (mi)	1199	1184	1242	1208
Travel Time (hr)	98.4	120.5	80.6	99.8
Total Delay (hr)	58.4	80.8	39.4	59.5
Total Stops	3257	3359	3397	3340
Fuel Used (gal)	57.5	62.4	55.6	58.5

SimTraffic Simulation Summary
PM 2022 Alternative 1

04/12/2018

Interval #2 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	2	3	Avg
Vehs Entered	2192	2121	2197	2169
Vehs Exited	2102	2038	2184	2107
Starting Vehs	298	299	313	299
Ending Vehs	388	382	326	357
Travel Distance (mi)	1250	1173	1251	1225
Travel Time (hr)	161.1	174.6	110.8	148.9
Total Delay (hr)	119.3	135.1	68.7	107.7
Total Stops	3567	3375	3649	3527
Fuel Used (gal)	73.2	74.3	62.6	70.0

Interval #3 Information

Start Time	5:30
End Time	5:45
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1929	1938	1926	1932
Vehs Exited	2021	1989	1969	1992
Starting Vehs	388	382	326	357
Ending Vehs	296	331	283	298
Travel Distance (mi)	1171	1133	1116	1140
Travel Time (hr)	213.9	232.6	161.4	202.6
Total Delay (hr)	174.6	194.8	124.0	164.5
Total Stops	3280	3126	2967	3125
Fuel Used (gal)	83.4	86.9	69.5	79.9

Interval #4 Information

Start Time	5:45
End Time	6:00
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1960	2051	1963	1993
Vehs Exited	1965	2063	1922	1985
Starting Vehs	296	331	283	298
Ending Vehs	291	319	324	309
Travel Distance (mi)	1117	1215	1159	1164
Travel Time (hr)	254.1	278.1	221.3	251.2
Total Delay (hr)	216.7	237.7	182.5	212.3
Total Stops	3137	3204	3087	3141
Fuel Used (gal)	90.7	98.7	84.7	91.4

Queuing and Blocking Report
PM 2022 Alternative 1

04/12/2018

Intersection: 1: Whipple & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	179	237	280	85	262	276	175	115	354	325	214	378
Average Queue (ft)	90	129	144	27	136	139	58	110	184	129	162	126
95th Queue (ft)	157	206	240	63	229	243	144	127	342	268	232	277
Link Distance (ft)		636	636		1127	1127			339	339		1018
Upstream Blk Time (%)									5	0		
Queuing Penalty (veh)									0	0		
Storage Bay Dist (ft)	235			500			150	90			190	
Storage Blk Time (%)	0	0			9	0	38	20			8	0
Queuing Penalty (veh)	0	1			25	0	45	50			11	1

Intersection: 1: Whipple & Tuscarawas

Movement	SB
Directions Served	TR
Maximum Queue (ft)	353
Average Queue (ft)	150
95th Queue (ft)	275
Link Distance (ft)	1018
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
PM 2022 Alternative 1

04/12/2018

Intersection: 2: Valleyview & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	UL	T	T	R	L	T	R	L
Maximum Queue (ft)	89	283	282	125	219	296	312	75	141	68	106	133
Average Queue (ft)	33	161	184	77	106	165	199	39	71	22	41	63
95th Queue (ft)	70	243	268	156	181	272	296	91	122	56	88	113
Link Distance (ft)		1127	1127			1305	1305		267	267	267	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	600			100	600			50				180
Storage Blk Time (%)			31	0			32	0				
Queuing Penalty (veh)			37	1			39	2				

Intersection: 2: Valleyview & Tuscarawas

Movement	SB
Directions Served	TR
Maximum Queue (ft)	121
Average Queue (ft)	52
95th Queue (ft)	101
Link Distance (ft)	326
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Raff & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	UL	T	T	R	UL	T	TR	L	TR	L	TR
Maximum Queue (ft)	56	236	225	87	204	198	196	298	258	70	71
Average Queue (ft)	15	109	111	32	99	79	90	173	89	21	25
95th Queue (ft)	40	197	189	70	170	142	150	276	167	53	56
Link Distance (ft)		1305	1305			946	946	303	303		421
Upstream Blk Time (%)								1	0		
Queuing Penalty (veh)								0	0		
Storage Bay Dist (ft)	600			600	600					90	
Storage Blk Time (%)										0	0
Queuing Penalty (veh)										0	0

Queuing and Blocking Report
PM 2022 Alternative 1

04/12/2018

Intersection: 4: Bellflower & Tuscarawas

Movement	EB	EB	EB	WB	WB	NB
Directions Served	UL	T	TR	UL	TR	R
Maximum Queue (ft)	18	7	16	32	16	12
Average Queue (ft)	7	0	0	9	1	0
95th Queue (ft)	20	0	0	25	9	7
Link Distance (ft)		946	946		827	189
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200			200		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Maryland/Gas Station & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	124	158	152	164	197	188	263	63
Average Queue (ft)	42	69	69	52	86	98	124	35
95th Queue (ft)	85	132	122	107	159	155	208	67
Link Distance (ft)		827	827		611	611	368	47
Upstream Blk Time (%)							0	11
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)	150			160				
Storage Blk Time (%)		0		0	1			
Queuing Penalty (veh)		0		1	1			

Intersection: 6: Tuscarawas & Wertz

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	191	151	156	126	141	98	180
Average Queue (ft)	88	55	60	70	77	61	63
95th Queue (ft)	158	118	124	118	128	103	138
Link Distance (ft)		611	611	486	486		575
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	375					75	
Storage Blk Time (%)						10	3
Queuing Penalty (veh)						20	4

Queuing and Blocking Report
PM 2022 Alternative 1

04/12/2018

Intersection: 7: Dartmouth/Broad & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	101	111	129	49	67	182	202	41	142	100	162
Average Queue (ft)	41	56	67	12	23	71	88	16	69	49	50
95th Queue (ft)	77	105	120	37	53	151	170	43	128	92	107
Link Distance (ft)		486	486			1264	1264		268		455
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	400			400	600			160		85	
Storage Blk Time (%)									0	3	3
Queuing Penalty (veh)									0	4	2

Intersection: 9: Arlington & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	80	223	245	60	110	120	124	124	326	67	66
Average Queue (ft)	23	115	130	25	43	38	47	108	131	30	24
95th Queue (ft)	57	197	211	53	85	97	104	141	259	60	52
Link Distance (ft)		1264	1264			508	508		466		507
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	600			600	250			100		100	
Storage Blk Time (%)									17	7	0
Queuing Penalty (veh)									27	15	0

Intersection: 10: Harrison & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LT	R
Maximum Queue (ft)	52	276	293	72	191	186	47	618	205
Average Queue (ft)	16	128	140	9	129	147	15	450	127
95th Queue (ft)	45	230	239	37	210	213	37	759	276
Link Distance (ft)		508	508		172	172	127	574	
Upstream Blk Time (%)					1	3		40	
Queuing Penalty (veh)					12	25		0	
Storage Bay Dist (ft)	200			100					180
Storage Blk Time (%)		1			8			66	0
Queuing Penalty (veh)		0			2			79	0

Queuing and Blocking Report
 PM 2022 Alternative 1

04/12/2018

Intersection: 11: SB I-77 Off Ramp/Harrison & Tuscarawas

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	TR	L	T	T	L	R	L	LT	R
Maximum Queue (ft)	221	210	125	408	401	312	175	287	453	503
Average Queue (ft)	191	194	117	384	231	153	101	113	229	223
95th Queue (ft)	209	211	130	443	531	280	191	266	406	454
Link Distance (ft)	172	172		386	386	297				496
Upstream Blk Time (%)	37	35		91	26	6				3
Queuing Penalty (veh)	218	204		0	0	0				0
Storage Bay Dist (ft)			100				150	450	450	
Storage Blk Time (%)			99	4		15	1		0	4
Queuing Penalty (veh)			475	3		29	2		0	17

Network Summary

Network wide Queuing Penalty: 1352

1: Whipple & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

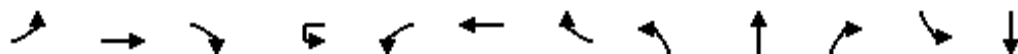


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	
Traffic Volume (vph)	200	630	80	20	410	120	90	140	20	230	130	180
Future Volume (vph)	200	630	80	20	410	120	90	140	20	230	130	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	3462		1569	3505	1482	1768	3422		1752	3167	
Flt Permitted	0.38	1.00		0.35	1.00	1.00	0.55	1.00		0.43	1.00	
Satd. Flow (perm)	700	3462		574	3505	1482	1021	3422		799	3167	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	685	87	22	446	130	98	152	22	250	141	196
RTOR Reduction (vph)	0	9	0	0	0	60	0	11	0	0	154	0
Lane Group Flow (vph)	217	763	0	22	446	70	98	163	0	250	183	0
Confl. Peds. (#/hr)	2		3	3		2	2					2
Heavy Vehicles (%)	4%	2%	5%	15%	3%	8%	2%	3%	7%	3%	2%	4%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	54.3	45.8		39.7	36.8	54.1	19.3	11.6		34.5	21.2	
Effective Green, g (s)	54.3	45.8		39.7	36.8	54.1	19.3	11.6		34.5	21.2	
Actuated g/C Ratio	0.54	0.46		0.40	0.37	0.54	0.19	0.12		0.34	0.21	
Clearance Time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	503	1585		256	1289	884	254	396		440	671	
v/s Ratio Prot	c0.05	c0.22		0.00	0.13	0.01	0.03	0.05		c0.10	0.06	
v/s Ratio Perm	0.18			0.03		0.03	0.04			c0.10		
v/c Ratio	0.43	0.48		0.09	0.35	0.08	0.39	0.41		0.57	0.27	
Uniform Delay, d1	12.5	18.8		18.4	22.9	11.0	34.5	41.0		25.2	32.9	
Progression Factor	1.00	1.00		0.57	0.60	0.12	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	1.1		0.1	0.7	0.0	1.0	0.7		1.7	0.2	
Delay (s)	13.1	19.9		10.7	14.5	1.3	35.4	41.7		26.9	33.2	
Level of Service	B	B		B	B	A	D	D		C	C	
Approach Delay (s)		18.4			11.5			39.5			30.5	
Approach LOS		B			B			D			C	

Intersection Summary		
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.56	C
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	67.5%	22.4
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	820	40	10	60	580	40	60	20	20	80	10
Future Volume (vph)	10	820	40	10	60	580	40	60	20	20	80	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1804	3505	1520		1726	3505	1578	1805	1900	1350	1803	1643
Flt Permitted	0.41	1.00	1.00		0.95	1.00	1.00	0.60	1.00	1.00	0.74	1.00
Satd. Flow (perm)	784	3505	1520		1726	3505	1578	1132	1900	1350	1410	1643
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	891	43	11	65	630	43	65	22	22	87	11
RTOR Reduction (vph)	0	0	25	0	0	0	22	0	0	0	0	9
Lane Group Flow (vph)	11	891	18	0	76	630	21	65	22	22	87	13
Confl. Peds. (#/hr)	1		1		1		1			1	1	
Heavy Vehicles (%)	0%	3%	4%	2%	5%	3%	0%	0%	0%	18%	0%	0%
Turn Type	pm+pt	NA	Perm	Prot	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases	2		2				6	8		8	4	
Actuated Green, G (s)	43.1	41.8	41.8		8.1	48.6	48.6	35.3	25.0	25.0	21.3	14.6
Effective Green, g (s)	43.1	41.8	41.8		8.1	48.6	48.6	35.3	25.0	25.0	21.3	14.6
Actuated g/C Ratio	0.43	0.42	0.42		0.08	0.49	0.49	0.35	0.25	0.25	0.21	0.15
Clearance Time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	351	1465	635		139	1703	766	514	475	337	326	239
v/s Ratio Prot	0.00	c0.25			c0.04	0.18		c0.02	0.01		c0.02	0.01
v/s Ratio Perm	0.01		0.01				0.01	0.02		0.02	c0.04	
v/c Ratio	0.03	0.61	0.03		0.55	0.37	0.03	0.13	0.05	0.07	0.27	0.05
Uniform Delay, d1	16.3	22.7	17.1		44.2	16.1	13.4	21.8	28.5	28.6	32.5	36.7
Progression Factor	1.00	0.84	1.00		0.84	1.19	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	1.7	0.1		4.2	0.6	0.1	0.1	0.2	0.4	0.4	0.2
Delay (s)	16.3	20.8	17.2		41.5	19.7	13.5	21.9	28.6	29.0	33.0	36.9
Level of Service	B	C	B		D	B	B	C	C	C	C	D
Approach Delay (s)		20.6			21.5			24.7				33.8
Approach LOS		C			C			C				C

Intersection Summary

HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	10
Future Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	11
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	14%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

3: Raff & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↔	↕	↗		↔	↕		↖	↗		↖
Traffic Volume (vph)	10	10	930	70	40	130	640	10	140	60	100	40
Future Volume (vph)	10	10	930	70	40	130	640	10	140	60	100	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	7.0	7.0		4.0	7.0		4.0	4.0		4.0
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	1.00		1.00
Frbp, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.85		1.00	1.00		1.00	0.91		1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95
Satd. Flow (prot)		1787	3574	1615		1783	3497		1750	1671		1626
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.71	1.00		0.48
Satd. Flow (perm)		1787	3574	1615		1783	3497		1317	1671		819
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	1011	76	43	141	696	11	152	65	109	43
RTOR Reduction (vph)	0	0	0	37	0	0	1	0	0	0	0	0
Lane Group Flow (vph)	0	22	1011	39	0	184	706	0	152	174	0	43
Confl. Peds. (#/hr)		1						1	1			
Heavy Vehicles (%)	2%	0%	1%	0%	2%	1%	3%	0%	3%	3%	3%	11%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2					8			4
Actuated Green, G (s)		2.2	51.5	51.5		15.3	64.6		18.2	18.2		18.2
Effective Green, g (s)		2.2	51.5	51.5		15.3	64.6		18.2	18.2		18.2
Actuated g/C Ratio		0.02	0.52	0.52		0.15	0.65		0.18	0.18		0.18
Clearance Time (s)		4.0	7.0	7.0		4.0	7.0		4.0	4.0		4.0
Vehicle Extension (s)		3.0	5.0	5.0		3.0	5.0		5.0	5.0		5.0
Lane Grp Cap (vph)		39	1840	831		272	2259		239	304		149
v/s Ratio Prot		0.01	c0.28			c0.10	0.20			0.10		
v/s Ratio Perm				0.02					c0.12			0.05
v/c Ratio		0.56	0.55	0.05		0.68	0.31		0.64	0.57		0.29
Uniform Delay, d1		48.4	16.4	12.1		40.0	7.9		37.8	37.3		35.3
Progression Factor		1.18	0.32	0.03		0.89	0.66		1.00	1.00		1.00
Incremental Delay, d2		15.7	1.1	0.1		6.4	0.4		7.5	4.1		2.2
Delay (s)		72.9	6.4	0.5		42.0	5.6		45.3	41.5		37.5
Level of Service		E	A	A		D	A		D	D		D
Approach Delay (s)			7.3				13.1			43.3		
Approach LOS			A				B			D		
Intersection Summary												
HCM 2000 Control Delay			15.5				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			68.6%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

3: Raff & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations	P	
Traffic Volume (vph)	50	10
Future Volume (vph)	50	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frbp, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	1.00	
Satd. Flow (prot)	1760	
Flt Permitted	1.00	
Satd. Flow (perm)	1760	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	54	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	65	0
Confl. Peds. (#/hr)		1
Heavy Vehicles (%)	6%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	18.2	
Effective Green, g (s)	18.2	
Actuated g/C Ratio	0.18	
Clearance Time (s)	4.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	320	
v/s Ratio Prot	0.04	
v/s Ratio Perm		
v/c Ratio	0.20	
Uniform Delay, d1	34.7	
Progression Factor	1.00	
Incremental Delay, d2	0.7	
Delay (s)	35.4	
Level of Service	D	
Approach Delay (s)	36.3	
Approach LOS	D	
Intersection Summary		

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	10	10	1060	40	10	20	790	10	0	0	20	0
Future Volume (Veh/h)	10	10	1060	40	10	20	790	10	0	0	20	0
Sign Control			Free				Free			Stop		
Grade			0%				0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	1152	43	0	22	859	11	0	0	22	0
Pedestrians							2			4		
Lane Width (ft)							12.0			12.0		
Walking Speed (ft/s)							4.0			4.0		
Percent Blockage							0			0		
Right turn flare (veh)												
Median type			None				None					
Median storage (veh)												
Upstream signal (ft)			1030				904					
pX, platoon unblocked	0.00	0.94			0.00	0.81			0.84	0.84	0.81	0.84
vC, conflicting volume	0	872			0	1199			1673	2116	604	1510
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	727			0	774			1080	1606	38	887
tC, single (s)	0.0	4.1			0.0	4.1			7.5	6.5	7.0	7.5
tC, 2 stage (s)												
tF (s)	0.0	2.2			0.0	2.2			3.5	4.0	3.4	3.5
p0 queue free %	0	99			0	97			100	100	97	100
cM capacity (veh/h)	0	828			0	686			139	85	813	190
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	11	768	427	22	573	297	22	11				
Volume Left	11	0	0	22	0	0	0	0				
Volume Right	0	0	43	0	0	11	22	11				
cSH	828	1700	1700	686	1700	1700	813	694				
Volume to Capacity	0.01	0.45	0.25	0.03	0.34	0.17	0.03	0.02				
Queue Length 95th (ft)	1	0	0	2	0	0	2	1				
Control Delay (s)	9.4	0.0	0.0	10.4	0.0	0.0	9.6	10.3				
Lane LOS	A			B			A	B				
Approach Delay (s)	0.1			0.3			9.6	10.3				
Approach LOS							A	B				
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			41.2%	ICU Level of Service	A							
Analysis Period (min)			15									

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations		↗
Traffic Volume (veh/h)	0	10
Future Volume (Veh/h)	0	10
Sign Control	Stop	
Grade	0%	
Peak Hour Factor	0.92	0.92
Hourly flow rate (vph)	0	11
Pedestrians	2	
Lane Width (ft)	12.0	
Walking Speed (ft/s)	4.0	
Percent Blockage	0	
Right turn flare (veh)		
Median type		
Median storage (veh)		
Upstream signal (ft)		
pX, platoon unblocked	0.84	0.94
vC, conflicting volume	2132	437
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol	1625	262
tC, single (s)	6.5	6.9
tC, 2 stage (s)		
tF (s)	4.0	3.3
p0 queue free %	100	98
cM capacity (veh/h)	83	694
Direction, Lane #		

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	10	10	990	30	10	50	650	60	50	50	70	30
Future Volume (vph)	10	10	990	30	10	50	650	60	50	50	70	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0			4.0		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frbp, ped/bikes		1.00	1.00			1.00	1.00			0.99		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	0.99			0.94		
Flt Protected		0.95	1.00			0.95	1.00			0.99		
Satd. Flow (prot)		1195	3556			1755	3495			1705		
Flt Permitted		0.95	1.00			0.95	1.00			0.90		
Satd. Flow (perm)		1195	3556			1755	3495			1548		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	1076	33	11	54	707	65	54	54	76	33
RTOR Reduction (vph)	0	0	2	0	0	0	5	0	0	0	0	0
Lane Group Flow (vph)	0	22	1107	0	0	65	767	0	0	184	0	0
Confl. Peds. (#/hr)				2		2			5		1	1
Heavy Vehicles (%)	2%	100%	1%	0%	2%	3%	2%	2%	10%	0%	0%	0%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		3.5	61.7			7.6	65.8			18.7		
Effective Green, g (s)		3.5	61.7			7.6	65.8			18.7		
Actuated g/C Ratio		0.04	0.62			0.08	0.66			0.19		
Clearance Time (s)		4.0	4.0			4.0	4.0			4.0		
Vehicle Extension (s)		3.0	5.0			3.0	5.0			5.0		
Lane Grp Cap (vph)		41	2194			133	2299			289		
v/s Ratio Prot		0.02	c0.31			c0.04	0.22					
v/s Ratio Perm										c0.12		
v/c Ratio		0.54	0.50			0.49	0.33			0.64		
Uniform Delay, d1		47.5	10.7			44.3	7.5			37.5		
Progression Factor		1.50	0.42			0.85	0.75			1.00		
Incremental Delay, d2		11.3	0.7			2.6	0.4			6.3		
Delay (s)		82.3	5.2			40.3	6.0			43.8		
Level of Service		F	A			D	A			D		
Approach Delay (s)			6.7				8.6			43.8		
Approach LOS			A				A			D		

Intersection Summary

HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations	↕	
Traffic Volume (vph)	10	10
Future Volume (vph)	10	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frbp, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	0.97	
Satd. Flow (prot)	1787	
Flt Permitted	0.75	
Satd. Flow (perm)	1375	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	11	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	55	0
Confl. Peds. (#/hr)		5
Heavy Vehicles (%)	0%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	18.7	
Effective Green, g (s)	18.7	
Actuated g/C Ratio	0.19	
Clearance Time (s)	4.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	257	
v/s Ratio Prot		
v/s Ratio Perm	0.04	
v/c Ratio	0.21	
Uniform Delay, d1	34.4	
Progression Factor	1.00	
Incremental Delay, d2	0.9	
Delay (s)	35.3	
Level of Service	D	
Approach Delay (s)	35.3	
Approach LOS	D	
Intersection Summary		

6: Tuscarawas & Wertz
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↶↶	↶↶		↶	↶
Traffic Volume (vph)	110	910	830	80	140	120
Future Volume (vph)	110	910	830	80	140	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3530		1805	1591
Flt Permitted	0.24	1.00	1.00		0.95	1.00
Satd. Flow (perm)	448	3574	3530		1805	1591
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	989	902	87	152	130
RTOR Reduction (vph)	0	0	5	0	0	110
Lane Group Flow (vph)	120	989	984	0	152	20
Confl. Peds. (#/hr)					1	2
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	76.3	76.3	66.0		15.7	15.7
Effective Green, g (s)	76.3	76.3	66.0		15.7	15.7
Actuated g/C Ratio	0.76	0.76	0.66		0.16	0.16
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	440	2726	2329		283	249
v/s Ratio Prot	0.02	c0.28	c0.28		c0.08	
v/s Ratio Perm	0.19					0.01
v/c Ratio	0.27	0.36	0.42		0.54	0.08
Uniform Delay, d1	4.1	3.9	8.0		38.8	36.0
Progression Factor	0.32	0.25	0.43		1.00	1.00
Incremental Delay, d2	0.3	0.3	0.5		3.6	0.3
Delay (s)	1.6	1.3	3.9		42.4	36.3
Level of Service	A	A	A		D	D
Approach Delay (s)		1.3	3.9		39.6	
Approach LOS		A	A		D	

Intersection Summary

HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

7: Dartmouth/Broad & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑	↗	↖	↑↑		↖	↗		↖	↗	
Traffic Volume (vph)	80	920	170	360	740	30	20	10	150	120	10	130
Future Volume (vph)	80	920	170	360	740	30	20	10	150	120	10	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.86		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1734	3539	1583	1770	3517		1770	1601		1770	1618	
Flt Permitted	0.34	1.00	1.00	0.16	1.00		0.57	1.00		0.53	1.00	
Satd. Flow (perm)	615	3539	1583	304	3517		1064	1601		984	1618	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	1000	185	391	804	33	22	11	163	130	11	141
RTOR Reduction (vph)	0	0	99	0	3	0	0	126	0	0	109	0
Lane Group Flow (vph)	87	1000	86	391	834	0	22	48	0	130	43	0
Confl. Peds. (#/hr)	3					3						
Heavy Vehicles (%)	4%	2%	2%	2%	2%	0%	2%	2%	2%	2%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	51.1	46.3	46.3	69.0	61.2		23.0	23.0		23.0	23.0	
Effective Green, g (s)	51.1	46.3	46.3	69.0	61.2		23.0	23.0		23.0	23.0	
Actuated g/C Ratio	0.51	0.46	0.46	0.69	0.61		0.23	0.23		0.23	0.23	
Clearance Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0		3.0	3.0		5.0	5.0	
Lane Grp Cap (vph)	367	1638	732	498	2152		244	368		226	372	
v/s Ratio Prot	0.01	0.28		c0.15	0.24			0.03			0.03	
v/s Ratio Perm	0.11		0.05	c0.39			0.02			c0.13		
v/c Ratio	0.24	0.61	0.12	0.79	0.39		0.09	0.13		0.58	0.12	
Uniform Delay, d1	12.6	20.1	15.2	17.4	9.9		30.3	30.6		34.2	30.5	
Progression Factor	0.50	0.54	0.13	0.85	0.49		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.6	0.3	7.6	0.5		0.2	0.2		10.2	0.6	
Delay (s)	6.7	12.4	2.3	22.4	5.3		30.4	30.7		44.4	31.1	
Level of Service	A	B	A	C	A		C	C		D	C	
Approach Delay (s)		10.6			10.8			30.7			37.2	
Approach LOS		B			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

9: Arlington & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗↗	↖	↖	↗↗		↖	↗		↖	↗	
Traffic Volume (vph)	60	940	200	260	920	60	70	10	30	60	10	60
Future Volume (vph)	60	940	200	260	920	60	70	10	30	60	10	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.89		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1555	1805	3539		1700	1629		1770	1624	
Flt Permitted	0.27	1.00	1.00	0.20	1.00		0.71	1.00		0.73	1.00	
Satd. Flow (perm)	500	3539	1555	387	3539		1266	1629		1357	1624	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	1022	217	283	1000	65	76	11	33	65	11	65
RTOR Reduction (vph)	0	0	90	0	5	0	0	0	0	0	52	0
Lane Group Flow (vph)	65	1022	127	283	1060	0	76	44	0	65	24	0
Confl. Peds. (#/hr)			2	2			1					
Heavy Vehicles (%)	2%	2%	1%	0%	1%	2%	6%	2%	4%	2%	2%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	58.3	58.3	58.3	72.0	72.0		20.0	20.0		20.0	20.0	
Effective Green, g (s)	58.3	58.3	58.3	72.0	72.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.58	0.58	0.58	0.72	0.72		0.20	0.20		0.20	0.20	
Clearance Time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	5.0	5.0	5.0	2.0	5.0		5.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	291	2063	906	430	2548		253	325		271	324	
v/s Ratio Prot		0.29		c0.07	0.30			0.03			0.01	
v/s Ratio Perm	0.13		0.08	c0.40			c0.06			0.05		
v/c Ratio	0.22	0.50	0.14	0.66	0.42		0.30	0.14		0.24	0.07	
Uniform Delay, d1	10.0	12.2	9.5	7.6	5.6		34.0	32.9		33.6	32.5	
Progression Factor	0.38	0.31	0.03	3.09	0.75		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.7	0.3	2.4	0.4		3.0	0.9		0.5	0.1	
Delay (s)	5.2	4.5	0.6	26.0	4.7		37.1	33.8		34.1	32.6	
Level of Service	A	A	A	C	A		D	C		C	C	
Approach Delay (s)		3.9			9.1			35.9			33.3	
Approach LOS		A			A			D			C	

Intersection Summary

HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

10: Harrison & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↗	↖
Traffic Volume (vph)	10	800	10	10	1190	60	10	10	10	150	10	30
Future Volume (vph)	10	800	10	10	1190	60	10	10	10	150	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1		3.0	5.1			5.1			5.1	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.96	1.00
Satd. Flow (prot)	1803	3486		1805	3473			1784			1782	1532
Flt Permitted	0.17	1.00		0.28	1.00			0.89			0.72	1.00
Satd. Flow (perm)	326	3486		526	3473			1615			1334	1532
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	870	11	11	1293	65	11	11	11	163	11	33
RTOR Reduction (vph)	0	1	0	0	3	0	0	9	0	0	0	27
Lane Group Flow (vph)	11	880	0	11	1355	0	0	24	0	0	174	6
Confl. Peds. (#/hr)	4					4	1					1
Heavy Vehicles (%)	0%	3%	33%	0%	3%	4%	0%	0%	0%	2%	0%	4%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2 8		1	6 8			3			3	
Permitted Phases	2 8			6 8			3			3		3
Actuated Green, G (s)	67.3	67.3		71.5	71.5			18.3			18.3	18.3
Effective Green, g (s)	67.3	67.3		66.4	71.5			18.3			18.3	18.3
Actuated g/C Ratio	0.67	0.67		0.66	0.72			0.18			0.18	0.18
Clearance Time (s)				3.0				5.1			5.1	5.1
Vehicle Extension (s)				3.0				3.0			3.0	3.0
Lane Grp Cap (vph)	219	2346		364	2483			295			244	280
v/s Ratio Prot		0.25		0.00	c0.39							
v/s Ratio Perm	0.03			0.02				0.01			c0.13	0.00
v/c Ratio	0.05	0.38		0.03	0.55			0.08			0.71	0.02
Uniform Delay, d1	5.5	7.2		6.1	6.7			33.9			38.4	33.5
Progression Factor	0.16	0.20		1.14	0.95			1.00			1.00	1.00
Incremental Delay, d2	0.1	0.1		0.0	0.1			0.1			9.5	0.0
Delay (s)	1.0	1.5		7.0	6.5			34.0			47.8	33.5
Level of Service	A	A		A	A			C			D	C
Approach Delay (s)		1.5			6.5			34.0			45.6	
Approach LOS		A			A			C			D	

Intersection Summary		
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.64	A
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	58.8%	18.3
Analysis Period (min)	15	ICU Level of Service
		B

c Critical Lane Group

11: SB I-77 Off Ramp/Harrison & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑		↖		↗	↖	↕	↗
Traffic Volume (vph)	0	1010	70	40	580	0	100	0	90	730	230	790
Future Volume (vph)	0	1010	70	40	580	0	100	0	90	730	230	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00	0.95	0.91	0.95
Frbp, ped/bikes		1.00		1.00	1.00		1.00		1.00	1.00	0.99	0.99
Flpb, ped/bikes		1.00		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00		1.00		0.85	1.00	0.94	0.85
Flt Protected		1.00		0.95	1.00		0.95		1.00	0.95	0.99	1.00
Satd. Flow (prot)		3528		1671	3574		1641		1568	1715	1579	1500
Flt Permitted		1.00		0.13	1.00		0.39		1.00	0.95	0.99	1.00
Satd. Flow (perm)		3528		221	3574		679		1568	1715	1579	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1098	76	43	630	0	109	0	98	793	250	859
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	69	0	25	96
Lane Group Flow (vph)	0	1169	0	43	630	0	109	0	29	658	626	497
Confl. Peds. (#/hr)	1					1						1
Heavy Vehicles (%)	0%	1%	6%	8%	1%	0%	10%	0%	3%	0%	2%	1%
Turn Type		NA		Perm	NA		Perm		Perm	Split	NA	Perm
Protected Phases		2			6					8		8
Permitted Phases				6			7		7			8
Actuated Green, G (s)		31.9		31.9	31.9		12.9		12.9	39.9	39.9	39.9
Effective Green, g (s)		31.9		31.9	31.9		12.9		12.9	39.9	39.9	39.9
Actuated g/C Ratio		0.32		0.32	0.32		0.13		0.13	0.40	0.40	0.40
Clearance Time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Vehicle Extension (s)		5.0		5.0	5.0		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1125		70	1140		87		202	684	630	598
v/s Ratio Prot		c0.33			0.18					0.38	c0.40	
v/s Ratio Perm				0.19			c0.16		0.02			0.33
v/c Ratio		1.04		0.61	0.55		1.25		0.14	0.96	0.99	0.83
Uniform Delay, d1		34.0		28.8	28.2		43.5		38.7	29.3	29.9	27.0
Progression Factor		0.73		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		37.1		34.2	1.9		179.0		0.3	25.2	34.2	9.6
Delay (s)		61.9		63.0	30.1		222.5		39.0	54.5	64.1	36.6
Level of Service		E		E	C		F		D	D	E	D
Approach Delay (s)		61.9			32.2			135.6			52.2	
Approach LOS		E			C			F			D	
Intersection Summary												
HCM 2000 Control Delay			56.0			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.05									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			15.3			
Intersection Capacity Utilization			84.9%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

SimTraffic Simulation Summary
AM 2042 Alternative 1

04/12/2018

Summary of All Intervals

Run Number	1	2	3	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	6957	6865	6869	6894
Vehs Exited	6927	6890	6847	6886
Starting Vehs	321	320	293	306
Ending Vehs	351	295	315	318
Travel Distance (mi)	5856	5845	5838	5847
Travel Time (hr)	389.9	337.6	363.5	363.6
Total Delay (hr)	192.4	140.6	166.7	166.6
Total Stops	10156	9535	9520	9737
Fuel Used (gal)	243.1	231.3	236.5	237.0

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	7:15
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1725	1668	1702	1700
Vehs Exited	1743	1674	1695	1704
Starting Vehs	321	320	293	306
Ending Vehs	303	314	300	305
Travel Distance (mi)	1472	1438	1421	1443
Travel Time (hr)	81.7	73.1	79.6	78.1
Total Delay (hr)	32.1	24.8	31.9	29.6
Total Stops	2444	2208	2299	2318
Fuel Used (gal)	57.5	54.5	55.3	55.8

SimTraffic Simulation Summary
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Interval #2 Information

Start Time	7:15
End Time	7:30
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	2	3	Avg
Vehs Entered	1928	1810	1772	1837
Vehs Exited	1815	1771	1718	1768
Starting Vehs	303	314	300	305
Ending Vehs	416	353	354	374
Travel Distance (mi)	1594	1520	1508	1541
Travel Time (hr)	101.7	83.5	96.3	93.9
Total Delay (hr)	48.4	32.4	45.4	42.1
Total Stops	2710	2540	2463	2573
Fuel Used (gal)	65.3	59.4	61.4	62.0

Interval #3 Information

Start Time	7:30
End Time	7:45
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1704	1651	1723	1690
Vehs Exited	1735	1717	1764	1740
Starting Vehs	416	353	354	374
Ending Vehs	385	287	313	327
Travel Distance (mi)	1449	1416	1496	1454
Travel Time (hr)	107.0	88.0	99.4	98.1
Total Delay (hr)	57.9	40.3	49.0	49.1
Total Stops	2620	2283	2423	2439
Fuel Used (gal)	62.9	57.2	62.0	60.7

Interval #4 Information

Start Time	7:45
End Time	8:00
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	1600	1736	1672	1673
Vehs Exited	1634	1728	1670	1680
Starting Vehs	385	287	313	327
Ending Vehs	351	295	315	318
Travel Distance (mi)	1342	1472	1413	1409
Travel Time (hr)	99.5	93.0	88.1	93.5
Total Delay (hr)	54.0	43.2	40.4	45.9
Total Stops	2382	2504	2335	2409
Fuel Used (gal)	57.4	60.1	57.8	58.4

Queuing and Blocking Report
AM 2042 Alternative 1

04/12/2018

Intersection: 1: Whipple & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	178	201	221	54	104	119	55	130	113	99	220	141
Average Queue (ft)	76	103	137	12	52	53	21	47	53	33	113	52
95th Queue (ft)	139	182	209	39	94	98	49	96	101	77	193	106
Link Distance (ft)		2826	2826		1126	1126			846	846		1245
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500			130			150	500			500	
Storage Blk Time (%)						0						
Queuing Penalty (veh)						0						

Intersection: 1: Whipple & Tuscarawas

Movement	SB
Directions Served	TR
Maximum Queue (ft)	189
Average Queue (ft)	70
95th Queue (ft)	148
Link Distance (ft)	1245
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
AM 2042 Alternative 1

04/12/2018

Intersection: 2: Valleyview & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	UL	T	T	R	L	T	R	L
Maximum Queue (ft)	30	209	248	125	103	204	226	75	77	39	45	118
Average Queue (ft)	4	116	132	30	47	83	112	19	34	12	9	44
95th Queue (ft)	21	181	211	96	89	159	190	67	67	37	32	92
Link Distance (ft)		1126	1126			1303	1303		267	267	267	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	600			100	600			50				180
Storage Blk Time (%)			15	0			21	0				
Queuing Penalty (veh)			6	0			8	0				

Intersection: 2: Valleyview & Tuscarawas

Movement	SB
Directions Served	TR
Maximum Queue (ft)	52
Average Queue (ft)	9
95th Queue (ft)	32
Link Distance (ft)	326
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Raff & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	UL	T	T	R	UL	T	TR	L	TR	L	TR	
Maximum Queue (ft)	48	164	178	29	205	115	128	171	197	87	100	
Average Queue (ft)	14	66	62	9	104	46	60	82	91	28	30	
95th Queue (ft)	36	128	133	30	177	96	109	145	175	66	73	
Link Distance (ft)		1303	1303			946	946	530	530		1305	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	600			600	600					90		
Storage Blk Time (%)										0	1	
Queuing Penalty (veh)										0	0	

Queuing and Blocking Report
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Intersection: 4: Bellflower & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB
Directions Served	UL	T	TR	UL	T	TR
Maximum Queue (ft)	18	61	34	39	8	28
Average Queue (ft)	5	4	2	9	0	1
95th Queue (ft)	17	29	16	27	5	8
Link Distance (ft)		946	946		827	827
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200			200		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Maryland/Gas Station & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	72	135	135	80	158	155	248	97
Average Queue (ft)	19	48	61	33	60	62	102	31
95th Queue (ft)	56	101	118	71	128	131	186	69
Link Distance (ft)		827	827		611	611	923	928
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	150			160				
Storage Blk Time (%)		0		0				
Queuing Penalty (veh)		0		0				

Intersection: 6: Tuscarawas & Wertz

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	102	60	88	153	145	99	167
Average Queue (ft)	50	16	36	40	46	69	49
95th Queue (ft)	91	50	78	105	108	108	121
Link Distance (ft)		611	611	486	486		1507
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	375					75	
Storage Blk Time (%)						16	1
Queuing Penalty (veh)						19	1

Queuing and Blocking Report
AM 2042 Alternative 1

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Intersection: 7: Dartmouth/Broad & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	64	210	227	79	268	188	186	46	147	110	208
Average Queue (ft)	26	110	125	35	136	67	81	14	66	74	66
95th Queue (ft)	58	190	203	67	225	139	154	37	122	120	154
Link Distance (ft)		486	486			1268	1268		616		1394
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	400			400	600			160		85	
Storage Blk Time (%)									0	13	2
Queuing Penalty (veh)									0	18	2

Intersection: 9: Arlington & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	64	153	165	53	226	254	235	101	79	102	78
Average Queue (ft)	23	62	80	27	115	90	92	46	25	39	28
95th Queue (ft)	51	117	132	52	204	180	172	91	58	80	59
Link Distance (ft)		1268	1268			506	506		875		1127
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	600			600	250			100		100	
Storage Blk Time (%)					1	0		0	0	0	0
Queuing Penalty (veh)					4	0		0	0	0	0

Intersection: 10: Harrison & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LT	R
Maximum Queue (ft)	38	167	169	64	190	188	61	534	205
Average Queue (ft)	9	55	71	7	126	108	19	197	30
95th Queue (ft)	33	136	157	35	209	202	49	554	126
Link Distance (ft)		506	506		171	171	1017	1027	
Upstream Blk Time (%)					4	2		0	
Queuing Penalty (veh)					26	16		0	
Storage Bay Dist (ft)	200			100				180	
Storage Blk Time (%)		0			11			20	0
Queuing Penalty (veh)		0			1			6	0

Queuing and Blocking Report
 AM 2042 Alternative 1

04/12/2018

Intersection: 11: SB I-77 Off Ramp/Harrison & Tuscarawas

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	TR	L	T	T	L	R	L	LTR	R
Maximum Queue (ft)	214	213	320	524	499	209	144	437	458	548
Average Queue (ft)	167	176	181	305	244	90	41	322	366	194
95th Queue (ft)	220	225	470	806	750	178	101	432	454	394
Link Distance (ft)	171	171		1000	1000	1078				1357
Upstream Blk Time (%)	18	21		10	3					
Queuing Penalty (veh)	85	102		0	0					
Storage Bay Dist (ft)			500				150	450	450	
Storage Blk Time (%)			17	3		5	0	0	0	0
Queuing Penalty (veh)			47	1		5	0	0	1	2

Network Summary

Network wide Queuing Penalty: 354

1: Whipple & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

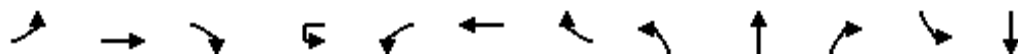


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	
Traffic Volume (vph)	260	780	130	70	860	300	280	270	50	400	310	250
Future Volume (vph)	260	780	130	70	860	300	280	270	50	400	310	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3496		1805	3574	1602	1804	3467		1805	3295	
Flt Permitted	0.12	1.00		0.17	1.00	1.00	0.40	1.00		0.26	1.00	
Satd. Flow (perm)	227	3496		319	3574	1602	760	3467		487	3295	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	283	848	141	76	935	326	304	293	54	435	337	272
RTOR Reduction (vph)	0	14	0	0	0	48	0	17	0	0	162	0
Lane Group Flow (vph)	283	975	0	76	935	278	304	330	0	435	447	0
Confl. Peds. (#/hr)	3		3	3		3	3					3
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	0%	2%	0%	0%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	44.6	33.4		33.2	27.6	46.2	22.4	10.0		34.2	16.2	
Effective Green, g (s)	44.6	33.4		33.2	27.6	46.2	22.4	10.0		34.2	16.2	
Actuated g/C Ratio	0.50	0.37		0.37	0.31	0.51	0.25	0.11		0.38	0.18	
Clearance Time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	310	1297		210	1096	922	332	385		457	593	
v/s Ratio Prot	c0.12	0.28		0.02	0.26	0.06	0.13	0.10		c0.20	0.14	
v/s Ratio Perm	c0.34			0.11		0.11	0.10			c0.16		
v/c Ratio	0.91	0.75		0.36	0.85	0.30	0.92	0.86		0.95	0.75	
Uniform Delay, d1	22.3	24.7		19.6	29.3	12.6	31.1	39.3		23.5	35.0	
Progression Factor	1.00	1.00		1.72	1.21	0.30	1.00	1.00		1.00	1.00	
Incremental Delay, d2	29.7	4.0		0.6	5.0	0.1	28.7	16.9		30.0	5.4	
Delay (s)	52.0	28.7		34.3	40.6	3.9	59.8	56.2		53.5	40.4	
Level of Service	D	C		C	D	A	E	E		D	D	
Approach Delay (s)		33.9			31.3			57.9			45.9	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.4
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	70	900	140	40	190	1220	130	170	60	100	120	60
Future Volume (vph)	70	900	140	40	190	1220	130	170	60	100	120	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3574	1578		1799	3574	1578	1804	1900	1593	1803	1777
Flt Permitted	0.14	1.00	1.00		0.95	1.00	1.00	0.56	1.00	1.00	0.71	1.00
Satd. Flow (perm)	266	3574	1578		1799	3574	1578	1065	1900	1593	1357	1777
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	978	152	43	207	1326	141	185	65	109	130	65
RTOR Reduction (vph)	0	0	104	0	0	0	72	0	0	0	0	28
Lane Group Flow (vph)	76	978	48	0	250	1326	69	185	65	109	130	80
Confl. Peds. (#/hr)	1		2		2		1	1		1	1	
Heavy Vehicles (%)	0%	1%	0%	2%	0%	1%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	Prot	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases	2		2				6	8		8	4	
Actuated Green, G (s)	34.8	28.6	28.6		13.5	35.9	35.9	33.1	21.3	21.3	24.2	16.0
Effective Green, g (s)	34.8	28.6	28.6		13.5	35.9	35.9	33.1	21.3	21.3	24.2	16.0
Actuated g/C Ratio	0.39	0.32	0.32		0.15	0.40	0.40	0.37	0.24	0.24	0.27	0.18
Clearance Time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	208	1135	501		269	1425	629	502	449	377	405	315
v/s Ratio Prot	0.03	0.27			c0.14	c0.37		c0.06	0.03		0.03	0.05
v/s Ratio Perm	0.12		0.03				0.04	c0.08		0.07	0.06	
v/c Ratio	0.37	0.86	0.10		0.93	0.93	0.11	0.37	0.14	0.29	0.32	0.25
Uniform Delay, d1	20.4	28.8	21.6		37.8	25.9	17.0	20.1	27.2	28.1	25.9	31.9
Progression Factor	1.40	1.18	2.85		0.85	0.99	0.96	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	5.1	0.2		26.2	8.3	0.2	0.5	0.7	1.9	0.5	0.9
Delay (s)	29.2	39.1	61.7		58.4	34.0	16.5	20.6	27.8	30.1	26.4	32.8
Level of Service	C	D	E		E	C	B	C	C	C	C	C
Approach Delay (s)		41.3				36.1			24.8			29.3
Approach LOS		D				D			C			C

Intersection Summary

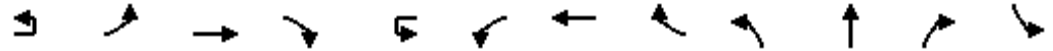
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	40
Future Volume (vph)	40
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	43
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

3: Raff & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↔	↕	↗		↔	↕		↖	↗		↖
Traffic Volume (vph)	10	10	920	200	50	190	1170	20	390	70	130	30
Future Volume (vph)	10	10	920	200	50	190	1170	20	390	70	130	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	7.0	7.0		4.0	7.0		4.0	4.0		4.0
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	1.00		1.00
Frbp, ped/bikes		1.00	1.00	0.98		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.85		1.00	1.00		1.00	0.90		1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95
Satd. Flow (prot)		1787	3574	1570		1770	3564		1783	1681		1687
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.71	1.00		0.54
Satd. Flow (perm)		1787	3574	1570		1770	3564		1328	1681		955
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	1000	217	54	207	1272	22	424	76	141	33
RTOR Reduction (vph)	0	0	0	145	0	0	1	0	0	0	0	0
Lane Group Flow (vph)	0	22	1000	72	0	261	1293	0	424	217	0	33
Confl. Peds. (#/hr)		5		4		4		5	2			
Heavy Vehicles (%)	2%	0%	1%	1%	2%	2%	1%	0%	1%	2%	2%	7%
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2					8			4
Actuated Green, G (s)		1.6	29.7	29.7		14.8	42.9		30.5	30.5		30.5
Effective Green, g (s)		1.6	29.7	29.7		14.8	42.9		30.5	30.5		30.5
Actuated g/C Ratio		0.02	0.33	0.33		0.16	0.48		0.34	0.34		0.34
Clearance Time (s)		4.0	7.0	7.0		4.0	7.0		4.0	4.0		4.0
Vehicle Extension (s)		3.0	5.0	5.0		3.0	5.0		5.0	5.0		5.0
Lane Grp Cap (vph)		31	1179	518		291	1698		450	569		323
v/s Ratio Prot		0.01	c0.28			c0.15	0.36			0.13		
v/s Ratio Perm				0.05					c0.32			0.03
v/c Ratio		0.71	0.85	0.14		0.90	0.76		0.94	0.38		0.10
Uniform Delay, d1		44.0	28.1	21.2		36.9	19.3		28.9	22.6		20.4
Progression Factor		1.45	0.56	0.53		1.23	0.43		1.00	1.00		1.00
Incremental Delay, d2		39.1	5.2	0.4		22.3	2.5		29.0	0.9		0.3
Delay (s)		102.7	21.0	11.5		67.7	10.7		57.9	23.5		20.7
Level of Service		F	C	B		E	B		E	C		C
Approach Delay (s)			20.8			20.3			46.2			
Approach LOS			C			C			D			
Intersection Summary												
HCM 2000 Control Delay			25.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			79.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

3: Raff & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations	1P	
Traffic Volume (vph)	60	10
Future Volume (vph)	60	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frbp, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.98	
Flt Protected	1.00	
Satd. Flow (prot)	1855	
Flt Permitted	1.00	
Satd. Flow (perm)	1855	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	65	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	76	0
Confl. Peds. (#/hr)		2
Heavy Vehicles (%)	0%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	30.5	
Effective Green, g (s)	30.5	
Actuated g/C Ratio	0.34	
Clearance Time (s)	4.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	628	
v/s Ratio Prot	0.04	
v/s Ratio Perm		
v/c Ratio	0.12	
Uniform Delay, d1	20.5	
Progression Factor	1.00	
Incremental Delay, d2	0.2	
Delay (s)	20.7	
Level of Service	C	
Approach Delay (s)	20.7	
Approach LOS	C	
Intersection Summary		

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	10	10	1250	30	10	30	1510	10	0	0	20	0
Future Volume (Veh/h)	10	10	1250	30	10	30	1510	10	0	0	20	0
Sign Control			Free				Free			Stop		
Grade			0%				0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	1359	33	0	33	1641	11	0	0	22	0
Pedestrians							1			11		
Lane Width (ft)							12.0			12.0		
Walking Speed (ft/s)							4.0			4.0		
Percent Blockage							0			1		
Right turn flare (veh)												
Median type			None				None					
Median storage (veh)												
Upstream signal (ft)			1030				904					
pX, platoon unblocked	0.00	0.68			0.00	0.74			0.81	0.81	0.74	0.81
vC, conflicting volume	0	1654			0	1403			2295	3128	708	2417
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	1021			0	834			675	1701	0	825
tC, single (s)	0.0	4.1			0.0	4.1			7.5	6.5	6.9	7.5
tC, 2 stage (s)												
tF (s)	0.0	2.2			0.0	2.2			3.5	4.0	3.3	3.5
p0 queue free %	0	98			0	94			100	100	97	100
cM capacity (veh/h)	0	467			0	590			254	69	796	197

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	11	906	486	33	1094	558	22	11
Volume Left	11	0	0	33	0	0	0	0
Volume Right	0	0	33	0	0	11	22	11
cSH	467	1700	1700	590	1700	1700	796	741
Volume to Capacity	0.02	0.53	0.29	0.06	0.64	0.33	0.03	0.01
Queue Length 95th (ft)	2	0	0	4	0	0	2	1
Control Delay (s)	12.9	0.0	0.0	11.5	0.0	0.0	9.6	9.9
Lane LOS	B			B			A	A
Approach Delay (s)	0.1			0.2			9.6	9.9
Approach LOS							A	A

Intersection Summary		
Average Delay		0.3
Intersection Capacity Utilization	52.4%	ICU Level of Service
Analysis Period (min)	15	A

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations		↗
Traffic Volume (veh/h)	0	10
Future Volume (Veh/h)	0	10
Sign Control	Stop	
Grade	0%	
Peak Hour Factor	0.92	0.92
Hourly flow rate (vph)	0	11
Pedestrians	2	
Lane Width (ft)	12.0	
Walking Speed (ft/s)	4.0	
Percent Blockage	0	
Right turn flare (veh)		
Median type		
Median storage (veh)		
Upstream signal (ft)		
pX, platoon unblocked	0.81	0.68
vC, conflicting volume	3140	828
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol	1715	0
tC, single (s)	6.5	6.9
tC, 2 stage (s)		
tF (s)	4.0	3.3
p0 queue free %	100	99
cM capacity (veh/h)	67	741
Direction, Lane #		

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	
Lane Configurations		↔	↕			↔	↕			↕			
Traffic Volume (vph)	30	30	1060	60	20	90	1230	50	160	30	110	30	
Future Volume (vph)	30	30	1060	60	20	90	1230	50	160	30	110	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0			4.0	4.0			4.0			
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00			
Frbp, ped/bikes		1.00	1.00			1.00	1.00			0.99			
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00			
Frt		1.00	0.99			1.00	0.99			0.95			
Flt Protected		0.95	1.00			0.95	1.00			0.97			
Satd. Flow (prot)		1787	3534			1770	3552			1708			
Flt Permitted		0.95	1.00			0.95	1.00			0.82			
Satd. Flow (perm)		1787	3534			1770	3552			1432			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	33	33	1152	65	22	98	1337	54	174	33	120	33	
RTOR Reduction (vph)	0	0	4	0	0	0	3	0	0	0	0	0	
Lane Group Flow (vph)	0	66	1213	0	0	120	1388	0	0	327	0	0	
Confl. Peds. (#/hr)		4		8		8		4	3		3	3	
Heavy Vehicles (%)	2%	0%	1%	2%	2%	2%	1%	0%	0%	0%	6%	4%	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	
Protected Phases	5	5	2		1	1	6			8			
Permitted Phases									8			4	
Actuated Green, G (s)		5.9	42.7			9.6	46.4			25.7			
Effective Green, g (s)		5.9	42.7			9.6	46.4			25.7			
Actuated g/C Ratio		0.07	0.47			0.11	0.52			0.29			
Clearance Time (s)		4.0	4.0			4.0	4.0			4.0			
Vehicle Extension (s)		3.0	5.0			3.0	5.0			5.0			
Lane Grp Cap (vph)		117	1676			188	1831			408			
v/s Ratio Prot		0.04	0.34			c0.07	c0.39						
v/s Ratio Perm										c0.23			
v/c Ratio		0.56	0.72			0.64	0.76			0.80			
Uniform Delay, d1		40.8	18.9			38.5	17.3			29.8			
Progression Factor		1.42	0.45			1.19	0.79			1.00			
Incremental Delay, d2		4.6	2.1			4.6	2.0			12.2			
Delay (s)		62.4	10.7			50.3	15.7			42.0			
Level of Service		E	B			D	B			D			
Approach Delay (s)			13.3				18.4			42.0			
Approach LOS			B				B			D			
Intersection Summary													
HCM 2000 Control Delay			18.9									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.77										
Actuated Cycle Length (s)			90.0									Sum of lost time (s)	12.0
Intersection Capacity Utilization			71.0%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations	↕	
Traffic Volume (vph)	20	10
Future Volume (vph)	20	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frbp, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.98	
Flt Protected	0.98	
Satd. Flow (prot)	1770	
Flt Permitted	0.80	
Satd. Flow (perm)	1447	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	22	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	66	0
Confl. Peds. (#/hr)		3
Heavy Vehicles (%)	0%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	25.7	
Effective Green, g (s)	25.7	
Actuated g/C Ratio	0.29	
Clearance Time (s)	4.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	413	
v/s Ratio Prot		
v/s Ratio Perm	0.05	
v/c Ratio	0.16	
Uniform Delay, d1	24.1	
Progression Factor	1.00	
Incremental Delay, d2	0.4	
Delay (s)	24.4	
Level of Service	C	
Approach Delay (s)	24.4	
Approach LOS	C	
Intersection Summary		

6: Tuscarawas & Wertz
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑↑	↑↑		↙	↗
Traffic Volume (vph)	240	1190	1350	150	120	220
Future Volume (vph)	240	1190	1350	150	120	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3513		1787	1589
Flt Permitted	0.07	1.00	1.00		0.95	1.00
Satd. Flow (perm)	136	3574	3513		1787	1589
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	1293	1467	163	130	239
RTOR Reduction (vph)	0	0	8	0	0	201
Lane Group Flow (vph)	261	1293	1622	0	130	38
Confl. Peds. (#/hr)	4			4		3
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	67.8	67.8	52.7		14.2	14.2
Effective Green, g (s)	67.8	67.8	52.7		14.2	14.2
Actuated g/C Ratio	0.75	0.75	0.59		0.16	0.16
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	326	2692	2057		281	250
v/s Ratio Prot	c0.11	0.36	0.46		c0.07	
v/s Ratio Perm	c0.49					0.02
v/c Ratio	0.80	0.48	0.79		0.46	0.15
Uniform Delay, d1	25.1	4.3	14.4		34.4	32.7
Progression Factor	1.39	0.73	0.59		1.00	1.00
Incremental Delay, d2	10.8	0.5	1.7		2.5	0.6
Delay (s)	45.6	3.6	10.2		36.9	33.3
Level of Service	D	A	B		D	C
Approach Delay (s)		10.7	10.2		34.6	
Approach LOS		B	B		C	

Intersection Summary

HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

7: Dartmouth/Broad & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↕	↘	↙	↕		↙	↘		↙	↘	
Traffic Volume (vph)	160	1020	70	100	1580	110	30	10	240	90	10	130
Future Volume (vph)	160	1020	70	100	1580	110	30	10	240	90	10	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.86		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3574	1583	1770	3534		1770	1595		1805	1633	
Flt Permitted	0.07	1.00	1.00	0.21	1.00		0.56	1.00		0.30	1.00	
Satd. Flow (perm)	136	3574	1583	387	3534		1045	1595		561	1633	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	1109	76	109	1717	120	33	11	261	98	11	141
RTOR Reduction (vph)	0	0	29	0	5	0	0	157	0	0	104	0
Lane Group Flow (vph)	174	1109	47	109	1832	0	33	115	0	98	48	0
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	1%	1%	2%	2%	1%	0%	2%	2%	2%	0%	2%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	63.7	55.5	55.5	57.9	53.1		17.7	17.7		17.7	17.7	
Effective Green, g (s)	63.7	55.5	55.5	57.9	53.1		17.7	17.7		17.7	17.7	
Actuated g/C Ratio	0.71	0.62	0.62	0.64	0.59		0.20	0.20		0.20	0.20	
Clearance Time (s)	3.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0		3.0	3.0		5.0	5.0	
Lane Grp Cap (vph)	246	2203	976	322	2085		205	313		110	321	
v/s Ratio Prot	c0.06	0.31		0.02	c0.52			0.07			0.03	
v/s Ratio Perm	0.44		0.03	0.20			0.03			c0.17		
v/c Ratio	0.71	0.50	0.05	0.34	0.88		0.16	0.37		0.89	0.15	
Uniform Delay, d1	22.0	9.6	6.8	6.8	15.7		30.0	31.3		35.2	29.9	
Progression Factor	1.34	0.89	1.06	0.85	0.99		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.1	0.7	0.1	0.4	4.0		0.4	0.7		55.6	0.4	
Delay (s)	37.6	9.2	7.3	6.3	19.5		30.4	32.0		90.8	30.4	
Level of Service	D	A	A	A	B		C	C		F	C	
Approach Delay (s)		12.8			18.7			31.9			54.1	
Approach LOS		B			B			C			D	

Intersection Summary		
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.87	B
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	93.1%	12.0
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

9: Arlington & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑	↗	↖	↑↑		↖	↗		↖	↗	
Traffic Volume (vph)	60	1310	130	160	1480	60	260	10	170	60	10	60
Future Volume (vph)	60	1310	130	160	1480	60	260	10	170	60	10	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.86		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3574	1572	1787	3552		1805	1609		1770	1624	
Flt Permitted	0.10	1.00	1.00	0.08	1.00		0.71	1.00		0.52	1.00	
Satd. Flow (perm)	186	3574	1572	157	3552		1344	1609		967	1624	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	1424	141	174	1609	65	283	11	185	65	11	65
RTOR Reduction (vph)	0	0	65	0	3	0	0	0	0	0	30	0
Lane Group Flow (vph)	65	1424	76	174	1671	0	283	196	0	65	46	0
Confl. Peds. (#/hr)			2	2					1			
Heavy Vehicles (%)	2%	1%	0%	1%	1%	2%	0%	2%	0%	2%	2%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	48.5	48.5	48.5	59.0	59.0		23.0	23.0		23.0	23.0	
Effective Green, g (s)	48.5	48.5	48.5	59.0	59.0		23.0	23.0		23.0	23.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.66	0.66		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	5.0	5.0	5.0	2.0	5.0		5.0	5.0		3.0	3.0	
Lane Grp Cap (vph)	100	1925	847	238	2328		343	411		247	415	
v/s Ratio Prot		0.40		0.06	c0.47			0.12			0.03	
v/s Ratio Perm	0.35		0.05	c0.42			c0.21			0.07		
v/c Ratio	0.65	0.74	0.09	0.73	0.72		0.83	0.48		0.26	0.11	
Uniform Delay, d1	14.7	15.9	10.1	16.7	10.1		31.6	28.4		26.7	25.7	
Progression Factor	0.82	0.81	1.37	1.93	0.59		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.7	2.3	0.2	5.6	1.1		19.8	3.9		0.6	0.1	
Delay (s)	37.8	15.1	14.0	37.9	7.1		51.4	32.3		27.3	25.8	
Level of Service	D	B	B	D	A		D	C		C	C	
Approach Delay (s)		15.9			10.0			43.6			26.5	
Approach LOS		B			A			D			C	

Intersection Summary

HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

10: Harrison & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1020	30	20	1540	160	10	10	20	270	10	130
Future Volume (vph)	30	1020	30	20	1540	160	10	10	20	270	10	130
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1		3.0	5.1			5.1			5.1	5.1
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99			0.99			1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	1.00
Frt	1.00	1.00		1.00	0.99			0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1805	3523		1805	3466			1731			1688	1570
Flt Permitted	0.08	1.00		0.16	1.00			0.90			0.70	1.00
Satd. Flow (perm)	151	3523		299	3466			1584			1241	1570
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	1109	33	22	1674	174	11	11	22	293	11	141
RTOR Reduction (vph)	0	2	0	0	8	0	0	16	0	0	0	90
Lane Group Flow (vph)	33	1140	0	22	1840	0	0	28	0	0	304	51
Confl. Peds. (#/hr)	17		3	3		17	10		4	4		10
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	0%	0%	7%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2 8		1	6 8			3			3	
Permitted Phases	2 8			6 8			3			3		3
Actuated Green, G (s)	50.4	50.4		55.4	55.4			24.4			24.4	24.4
Effective Green, g (s)	50.4	50.4		50.3	55.4			24.4			24.4	24.4
Actuated g/C Ratio	0.56	0.56		0.56	0.62			0.27			0.27	0.27
Clearance Time (s)				3.0				5.1			5.1	5.1
Vehicle Extension (s)				3.0				3.0			3.0	3.0
Lane Grp Cap (vph)	84	1972		200	2133			429			336	425
v/s Ratio Prot		0.32		0.00	c0.53							
v/s Ratio Perm	0.22			0.06				0.02			c0.24	0.03
v/c Ratio	0.39	0.58		0.11	0.86			0.07			0.90	0.12
Uniform Delay, d1	11.2	12.9		10.7	14.2			24.3			31.7	24.7
Progression Factor	0.46	0.44		1.12	0.88			1.00			1.00	1.00
Incremental Delay, d2	2.2	0.3		0.1	1.7			0.1			26.4	0.1
Delay (s)	7.3	6.0		12.1	14.2			24.4			58.1	24.8
Level of Service	A	A		B	B			C			E	C
Approach Delay (s)		6.0			14.2			24.4			47.6	
Approach LOS		A			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

11: SB I-77 Off Ramp/Harrison & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑		↖		↗	↖	↕	↗
Traffic Volume (vph)	0	1360	80	60	960	0	200	0	190	230	220	590
Future Volume (vph)	0	1360	80	60	960	0	200	0	190	230	220	590
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00	0.95	0.91	0.95
Frt		0.99		1.00	1.00		1.00		0.85	1.00	0.93	0.85
Flt Protected		1.00		0.95	1.00		0.95		1.00	0.95	1.00	1.00
Satd. Flow (prot)		3546		1805	3574		1805		1615	1715	1588	1519
Flt Permitted		1.00		0.11	1.00		0.47		1.00	0.95	1.00	1.00
Satd. Flow (perm)		3546		212	3574		899		1615	1715	1588	1519
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1478	87	65	1043	0	217	0	207	250	239	641
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	73	0	31	92
Lane Group Flow (vph)	0	1560	0	65	1043	0	217	0	134	225	438	344
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	2%	1%
Turn Type		NA		Perm	NA		Perm		Perm	Split	NA	Perm
Protected Phases		2			6					8	8	
Permitted Phases				6			7		7			8
Actuated Green, G (s)		35.9		35.9	35.9		18.9		18.9	19.9	19.9	19.9
Effective Green, g (s)		35.9		35.9	35.9		18.9		18.9	19.9	19.9	19.9
Actuated g/C Ratio		0.40		0.40	0.40		0.21		0.21	0.22	0.22	0.22
Clearance Time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Vehicle Extension (s)		5.0		5.0	5.0		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1414		84	1425		188		339	379	351	335
v/s Ratio Prot		c0.44			0.29					0.13	c0.28	
v/s Ratio Perm				0.31			c0.24		0.08			0.23
v/c Ratio		1.10		0.77	0.73		1.15		0.39	0.59	1.25	1.03
Uniform Delay, d1		27.1		23.5	23.0		35.5		30.6	31.4	35.0	35.0
Progression Factor		0.71		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		56.0		49.4	3.4		113.3		0.8	2.5	133.0	56.3
Delay (s)		75.3		72.9	26.3		148.9		31.4	33.9	168.0	91.4
Level of Service		E		E	C		F		C	C	F	F
Approach Delay (s)		75.3			29.1			91.5			111.7	
Approach LOS		E			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	74.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

SimTraffic Simulation Summary
PM 2042 Alternative 1

04/12/2018

Summary of All Intervals

Run Number	1	2	3	Avg
Start Time	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Vehs Entered	9576	9653	9361	9532
Vehs Exited	9542	9569	9195	9433
Starting Vehs	499	457	487	480
Ending Vehs	533	541	653	565
Travel Distance (mi)	8464	8503	8320	8429
Travel Time (hr)	654.1	590.5	688.7	644.4
Total Delay (hr)	372.7	308.3	413.8	364.9
Total Stops	18739	18111	18296	18384
Fuel Used (gal)	373.1	359.8	378.7	370.5

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00
End Time	5:15
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	2374	2308	2333	2334
Vehs Exited	2372	2306	2283	2321
Starting Vehs	499	457	487	480
Ending Vehs	501	459	537	496
Travel Distance (mi)	2132	2067	2067	2089
Travel Time (hr)	132.1	121.4	137.4	130.3
Total Delay (hr)	61.3	52.7	69.1	61.1
Total Stops	4635	4242	4412	4431
Fuel Used (gal)	86.7	82.6	86.3	85.2

SimTraffic Simulation Summary
PM 2042 Alternative 1

04/12/2018

Interval #2 Information

Start Time	5:15
End Time	5:30
Total Time (min)	15
Volumes adjusted by PHF, Growth Factors.	

Run Number	1	2	3	Avg
Vehs Entered	2619	2641	2444	2563
Vehs Exited	2459	2471	2310	2413
Starting Vehs	501	459	537	496
Ending Vehs	661	629	671	648
Travel Distance (mi)	2192	2226	2106	2175
Travel Time (hr)	161.2	140.8	174.1	158.7
Total Delay (hr)	88.4	66.9	104.5	86.6
Total Stops	5055	4836	4874	4919
Fuel Used (gal)	94.3	91.6	94.7	93.5

Interval #3 Information

Start Time	5:30
End Time	5:45
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	2270	2362	2193	2275
Vehs Exited	2331	2439	2311	2360
Starting Vehs	661	629	671	648
Ending Vehs	600	552	553	562
Travel Distance (mi)	2050	2133	2092	2091
Travel Time (hr)	180.9	161.1	190.9	177.6
Total Delay (hr)	112.6	90.2	121.9	108.3
Total Stops	4608	4533	4601	4579
Fuel Used (gal)	96.1	92.2	100.1	96.2

Interval #4 Information

Start Time	5:45
End Time	6:00
Total Time (min)	15
Volumes adjusted by Growth Factors, Anti PHF.	

Run Number	1	2	3	Avg
Vehs Entered	2313	2342	2391	2348
Vehs Exited	2380	2353	2291	2342
Starting Vehs	600	552	553	562
Ending Vehs	533	541	653	565
Travel Distance (mi)	2090	2077	2056	2074
Travel Time (hr)	179.9	167.2	186.3	177.8
Total Delay (hr)	110.4	98.4	118.2	109.0
Total Stops	4441	4500	4409	4447
Fuel Used (gal)	96.1	93.3	97.5	95.6

Queuing and Blocking Report
PM 2042 Alternative 1

04/12/2018

Intersection: 1: Whipple & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T	
Maximum Queue (ft)	334	260	280	232	497	516	175	440	485	461	459	256	
Average Queue (ft)	130	159	195	44	237	256	143	238	221	209	238	131	
95th Queue (ft)	238	252	278	142	395	418	233	448	480	455	387	223	
Link Distance (ft)		2711	2711		1127	1127			859	859		1819	
Upstream Blk Time (%)													
Queuing Penalty (veh)													
Storage Bay Dist (ft)	500			500			150	500			500		
Storage Blk Time (%)					0	41	0	4	0				0
Queuing Penalty (veh)					0	121	1	6	1				0

Intersection: 1: Whipple & Tuscarawas

Movement	SB
Directions Served	TR
Maximum Queue (ft)	314
Average Queue (ft)	173
95th Queue (ft)	280
Link Distance (ft)	1819
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
PM 2042 Alternative 1

04/12/2018

Intersection: 2: Valleyview & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	
Directions Served	L	T	T	R	UL	T	T	R	L	T	R	L	
Maximum Queue (ft)	95	316	343	125	336	479	477	75	163	87	109	135	
Average Queue (ft)	42	204	227	87	149	245	292	40	78	32	48	68	
95th Queue (ft)	78	293	320	162	263	407	429	95	135	71	90	121	
Link Distance (ft)		1127	1127			1304	1304		267	267	267		
Upstream Blk Time (%)													
Queuing Penalty (veh)													
Storage Bay Dist (ft)	600				100	600			50				180
Storage Blk Time (%)					43	0		41	0				
Queuing Penalty (veh)					60	1		53	2				

Intersection: 2: Valleyview & Tuscarawas

Movement	SB
Directions Served	TR
Maximum Queue (ft)	101
Average Queue (ft)	49
95th Queue (ft)	90
Link Distance (ft)	326
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Raff & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	UL	T	T	R	UL	T	TR	L	TR	L	TR	
Maximum Queue (ft)	42	218	238	80	265	214	214	443	200	68	94	
Average Queue (ft)	12	112	117	34	137	107	118	235	88	18	27	
95th Queue (ft)	34	195	202	68	236	177	190	372	156	48	66	
Link Distance (ft)		1304	1304			945	945	518	518		1304	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	600				600	600				90		
Storage Blk Time (%)											0	1
Queuing Penalty (veh)											0	0

Queuing and Blocking Report
PM 2042 Alternative 1

04/12/2018

Intersection: 4: Bellflower & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	UL	T	TR	UL	T	TR	R
Maximum Queue (ft)	32	22	30	38	15	18	31
Average Queue (ft)	8	1	1	9	1	1	1
95th Queue (ft)	22	17	17	26	9	10	13
Link Distance (ft)		945	945		826	826	750
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	200			200			
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Maryland/Gas Station & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	91	153	153	185	242	249	306	87
Average Queue (ft)	40	81	83	73	159	160	155	31
95th Queue (ft)	80	138	140	147	224	222	261	70
Link Distance (ft)		826	826		611	611	916	932
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	150			160				
Storage Blk Time (%)		0		0	10			
Queuing Penalty (veh)		0		0	11			

Intersection: 6: Tuscarawas & Wertz

Movement	EB	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	T	TR	L	R
Maximum Queue (ft)	236	172	176	266	289	99	232
Average Queue (ft)	132	78	81	137	148	73	97
95th Queue (ft)	214	150	150	224	239	114	184
Link Distance (ft)		611	611	487	487		1492
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	375					75	
Storage Blk Time (%)						11	10
Queuing Penalty (veh)						25	12

Queuing and Blocking Report
PM 2042 Alternative 1

04/12/2018

Intersection: 7: Dartmouth/Broad & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	196	128	153	53	88	328	335	67	187	109	147
Average Queue (ft)	76	72	78	15	36	174	188	23	89	56	65
95th Queue (ft)	149	114	124	43	71	283	299	54	163	103	124
Link Distance (ft)		487	487			1265	1265		619		1366
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	400			400	600			160			85
Storage Blk Time (%)									1	3	4
Queuing Penalty (veh)									0	4	4

Intersection: 9: Arlington & Tuscarawas

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	131	270	264	68	168	206	228	124	369	110	113
Average Queue (ft)	50	169	179	29	74	125	131	111	145	43	33
95th Queue (ft)	109	243	246	60	143	190	204	139	300	90	76
Link Distance (ft)		1265	1265			506	506		910		1112
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	600			600	250			100			100
Storage Blk Time (%)								22	9	1	1
Queuing Penalty (veh)								41	22	0	0

Intersection: 10: Harrison & Tuscarawas

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LT	R
Maximum Queue (ft)	94	224	223	122	206	210	69	1075	205
Average Queue (ft)	32	111	119	16	173	179	23	899	154
95th Queue (ft)	75	185	195	68	206	217	54	1388	291
Link Distance (ft)		506	506		170	170	1013	1023	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200			100					180
Storage Blk Time (%)		0		0	22			80	0
Queuing Penalty (veh)		0		0	4			104	1

Queuing and Blocking Report
 PM 2042 Alternative 1

04/12/2018

Intersection: 11: SB I-77 Off Ramp/Harrison & Tuscarawas

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	TR	L	T	T	L	R	L	LTR	R
Maximum Queue (ft)	218	220	519	746	719	1101	175	462	475	1074
Average Queue (ft)	192	193	272	317	279	650	131	341	399	656
95th Queue (ft)	211	214	540	672	623	1341	238	547	550	1435
Link Distance (ft)	170	170		1006	1006	1086				1347
Upstream Blk Time (%)	34	35		3	2	35				9
Queuing Penalty (veh)	221	232		0	0	0				0
Storage Bay Dist (ft)			500				150	450	450	
Storage Blk Time (%)			14	5		66	3	0	14	12
Queuing Penalty (veh)			65	3		124	6	1	43	90

Network Summary

Network wide Queuing Penalty: 1450

1: Whipple & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

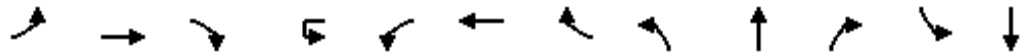


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	
Traffic Volume (vph)	180	560	70	20	360	110	80	130	20	210	120	160
Future Volume (vph)	180	560	70	20	360	110	80	130	20	210	120	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	3464		1569	3505	1482	1768	3416		1752	3172	
Flt Permitted	0.43	1.00		0.39	1.00	1.00	0.57	1.00		0.44	1.00	
Satd. Flow (perm)	779	3464		646	3505	1482	1054	3416		807	3172	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	609	76	22	391	120	87	141	22	228	130	174
RTOR Reduction (vph)	0	9	0	0	0	54	0	12	0	0	138	0
Lane Group Flow (vph)	196	676	0	22	391	66	87	151	0	228	166	0
Confl. Peds. (#/hr)	2		3	3		2	2					2
Heavy Vehicles (%)	4%	2%	5%	15%	3%	8%	2%	3%	7%	3%	2%	4%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	55.2	46.7		41.2	38.3	54.7	19.1	11.6		33.6	20.5	
Effective Green, g (s)	55.2	46.7		41.2	38.3	54.7	19.1	11.6		33.6	20.5	
Actuated g/C Ratio	0.55	0.47		0.41	0.38	0.55	0.19	0.12		0.34	0.20	
Clearance Time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	538	1617		292	1342	893	254	396		426	650	
v/s Ratio Prot	c0.04	c0.20		0.00	0.11	0.01	0.03	0.04		c0.09	0.05	
v/s Ratio Perm	0.16			0.03		0.03	0.04			c0.09		
v/c Ratio	0.36	0.42		0.08	0.29	0.07	0.34	0.38		0.54	0.25	
Uniform Delay, d1	11.7	17.7		17.5	21.4	10.7	34.4	40.9		25.5	33.3	
Progression Factor	1.00	1.00		0.77	0.65	0.11	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.8		0.1	0.5	0.0	0.8	0.6		1.3	0.2	
Delay (s)	12.1	18.5		13.5	14.4	1.2	35.2	41.5		26.8	33.6	
Level of Service	B	B		B	B	A	D	D		C	C	
Approach Delay (s)		17.0			11.4			39.3			30.7	
Approach LOS		B			B			D			C	

Intersection Summary		
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.50	C
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	65.3%	22.4
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	740	30	10	50	520	40	50	20	20	70	10
Future Volume (vph)	10	740	30	10	50	520	40	50	20	20	70	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1804	3505	1520		1727	3505	1578	1805	1900	1350	1803	1643
Flt Permitted	0.44	1.00	1.00		0.95	1.00	1.00	0.64	1.00	1.00	0.74	1.00
Satd. Flow (perm)	835	3505	1520		1727	3505	1578	1211	1900	1350	1410	1643
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	804	33	11	54	565	43	54	22	22	76	11
RTOR Reduction (vph)	0	0	19	0	0	0	22	0	0	0	0	9
Lane Group Flow (vph)	11	804	14	0	65	565	21	54	22	22	76	13
Confl. Peds. (#/hr)	1		1		1		1			1	1	
Heavy Vehicles (%)	0%	3%	4%	2%	5%	3%	0%	0%	0%	18%	0%	0%
Turn Type	pm+pt	NA	Perm	Prot	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases	2		2				6	8		8	4	
Actuated Green, G (s)	43.9	42.6	42.6		7.7	49.0	49.0	34.8	24.6	24.6	27.8	21.1
Effective Green, g (s)	43.9	42.6	42.6		7.7	49.0	49.0	34.8	24.6	24.6	27.8	21.1
Actuated g/C Ratio	0.44	0.43	0.43		0.08	0.49	0.49	0.35	0.25	0.25	0.28	0.21
Clearance Time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	379	1493	647		132	1717	773	482	467	332	418	346
v/s Ratio Prot	0.00	c0.23			c0.04	0.16		c0.01	0.01		c0.01	0.01
v/s Ratio Perm	0.01		0.01				0.01	0.03		0.02	c0.04	
v/c Ratio	0.03	0.54	0.02		0.49	0.33	0.03	0.11	0.05	0.07	0.18	0.04
Uniform Delay, d1	15.8	21.4	16.6		44.3	15.5	13.2	22.0	28.8	28.9	27.2	31.4
Progression Factor	0.86	0.79	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	1.3	0.1		2.9	0.5	0.1	0.1	0.2	0.4	0.2	0.1
Delay (s)	13.6	18.1	16.7		47.1	16.0	13.2	22.1	28.9	29.3	27.4	31.5
Level of Service	B	B	B		D	B	B	C	C	C	C	C
Approach Delay (s)		18.0				18.8			25.2			28.3
Approach LOS		B				B			C			C

Intersection Summary		
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.39	B
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	63.1%	18.4
Analysis Period (min)	15	ICU Level of Service
		B

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	10
Future Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	11
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	14%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	10	10	950	40	10	20	710	10	0	0	20	0
Future Volume (Veh/h)	10	10	950	40	10	20	710	10	0	0	20	0
Sign Control			Free				Free			Stop		
Grade			0%				0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	1033	43	0	22	772	11	0	0	22	0
Pedestrians							2			4		
Lane Width (ft)							12.0			12.0		
Walking Speed (ft/s)							4.0			4.0		
Percent Blockage							0			0		
Right turn flare (veh)												
Median type			None				None					
Median storage (veh)												
Upstream signal (ft)							904					
pX, platoon unblocked	0.00	0.96			0.00				0.96	0.96		0.96
vC, conflicting volume	0	785			0	1080			1510	1910	544	1364
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	681			0	1080			1441	1859	544	1288
tC, single (s)	0.0	4.1			0.0	4.1			7.5	6.5	7.0	7.5
tC, 2 stage (s)												
tF (s)	0.0	2.2			0.0	2.2			3.5	4.0	3.4	3.5
p0 queue free %	0	99			0	97			100	100	95	100
cM capacity (veh/h)	0	878			0	651			86	67	468	108
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	11	689	387	22	515	268	22	11				
Volume Left	11	0	0	22	0	0	0	0				
Volume Right	0	0	43	0	0	11	22	11				
cSH	878	1700	1700	651	1700	1700	468	698				
Volume to Capacity	0.01	0.41	0.23	0.03	0.30	0.16	0.05	0.02				
Queue Length 95th (ft)	1	0	0	3	0	0	4	1				
Control Delay (s)	9.2	0.0	0.0	10.7	0.0	0.0	13.1	10.2				
Lane LOS	A			B			B	B				
Approach Delay (s)	0.1			0.3			13.1	10.2				
Approach LOS							B	B				
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			38.2%	ICU Level of Service	A							
Analysis Period (min)			15									

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations		↗
Traffic Volume (veh/h)	0	10
Future Volume (Veh/h)	0	10
Sign Control	Stop	
Grade	0%	
Peak Hour Factor	0.92	0.92
Hourly flow rate (vph)	0	11
Pedestrians	2	
Lane Width (ft)	12.0	
Walking Speed (ft/s)	4.0	
Percent Blockage	0	
Right turn flare (veh)		
Median type		
Median storage (veh)		
Upstream signal (ft)		
pX, platoon unblocked	0.96	0.96
vC, conflicting volume	1926	394
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol	1875	272
tC, single (s)	6.5	6.9
tC, 2 stage (s)		
tF (s)	4.0	3.3
p0 queue free %	100	98
cM capacity (veh/h)	66	698
Direction, Lane #		

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	
Lane Configurations													
Traffic Volume (vph)	10	10	890	20	10	40	580	50	50	40	70	30	
Future Volume (vph)	10	10	890	20	10	40	580	50	50	40	70	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0			4.0	4.0			4.0			
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00			
Frbp, ped/bikes		1.00	1.00			1.00	1.00			0.99			
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00			
Frt		1.00	1.00			1.00	0.99			0.94			
Flt Protected		0.95	1.00			0.95	1.00			0.98			
Satd. Flow (prot)		1195	3561			1756	3497			1693			
Flt Permitted		0.95	1.00			0.95	1.00			0.89			
Satd. Flow (perm)		1195	3561			1756	3497			1528			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	11	11	967	22	11	43	630	54	54	43	76	33	
RTOR Reduction (vph)	0	0	1	0	0	0	5	0	0	0	0	0	
Lane Group Flow (vph)	0	22	988	0	0	54	679	0	0	173	0	0	
Confl. Peds. (#/hr)				2		2			5		1	1	
Heavy Vehicles (%)	2%	100%	1%	0%	2%	3%	2%	2%	10%	0%	0%	0%	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	
Protected Phases	5	5	2		1	1	6			8			
Permitted Phases									8			4	
Actuated Green, G (s)		3.6	62.4			7.4	66.2			18.2			
Effective Green, g (s)		3.6	62.4			7.4	66.2			18.2			
Actuated g/C Ratio		0.04	0.62			0.07	0.66			0.18			
Clearance Time (s)		4.0	4.0			4.0	4.0			4.0			
Vehicle Extension (s)		3.0	5.0			3.0	5.0			5.0			
Lane Grp Cap (vph)		43	2222			129	2315			278			
v/s Ratio Prot		0.02	c0.28			c0.03	c0.19						
v/s Ratio Perm										c0.11			
v/c Ratio		0.51	0.44			0.42	0.29			0.62			
Uniform Delay, d1		47.3	9.8			44.2	7.1			37.7			
Progression Factor		1.00	1.00			0.89	0.90			1.00			
Incremental Delay, d2		9.9	0.6			2.1	0.3			6.0			
Delay (s)		57.2	10.4			41.6	6.7			43.7			
Level of Service		E	B			D	A			D			
Approach Delay (s)			11.4				9.2			43.7			
Approach LOS			B				A			D			
Intersection Summary													
HCM 2000 Control Delay			14.1									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.47										
Actuated Cycle Length (s)			100.0									Sum of lost time (s)	12.0
Intersection Capacity Utilization			48.3%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations	↕	
Traffic Volume (vph)	10	10
Future Volume (vph)	10	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frbp, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	0.97	
Satd. Flow (prot)	1787	
Flt Permitted	0.76	
Satd. Flow (perm)	1392	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	11	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	55	0
Confl. Peds. (#/hr)		5
Heavy Vehicles (%)	0%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	18.2	
Effective Green, g (s)	18.2	
Actuated g/C Ratio	0.18	
Clearance Time (s)	4.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	253	
v/s Ratio Prot		
v/s Ratio Perm	0.04	
v/c Ratio	0.22	
Uniform Delay, d1	34.8	
Progression Factor	1.00	
Incremental Delay, d2	0.9	
Delay (s)	35.7	
Level of Service	D	
Approach Delay (s)	35.7	
Approach LOS	D	
Intersection Summary		

6: Tuscarawas & Wertz
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	810	740	70	130	110
Future Volume (vph)	100	810	740	70	130	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3531		1805	1591
Flt Permitted	0.27	1.00	1.00		0.95	1.00
Satd. Flow (perm)	522	3574	3531		1805	1591
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	880	804	76	141	120
RTOR Reduction (vph)	0	0	5	0	0	102
Lane Group Flow (vph)	109	880	875	0	141	18
Confl. Peds. (#/hr)					1	2
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	77.1	77.1	67.0		14.9	14.9
Effective Green, g (s)	77.1	77.1	67.0		14.9	14.9
Actuated g/C Ratio	0.77	0.77	0.67		0.15	0.15
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	493	2755	2365		268	237
v/s Ratio Prot	0.02	c0.25	c0.25		c0.08	
v/s Ratio Perm	0.15					0.01
v/c Ratio	0.22	0.32	0.37		0.53	0.08
Uniform Delay, d1	3.5	3.5	7.2		39.3	36.6
Progression Factor	0.25	0.27	1.00		1.00	1.00
Incremental Delay, d2	0.2	0.3	0.4		3.5	0.3
Delay (s)	1.1	1.2	7.7		42.8	36.9
Level of Service	A	A	A		D	D
Approach Delay (s)		1.2	7.7		40.1	
Approach LOS		A	A		D	

Intersection Summary

HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

10: Harrison & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Traffic Volume (veh/h)	0	750	10	0	1070	50	0	0	10	0	0	30
Future Volume (Veh/h)	0	750	10	0	1070	50	0	0	10	0	0	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	815	11	0	1163	54	0	0	11	0	0	33
Pedestrians		1										4
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					255							
pX, platoon unblocked	0.87						0.87	0.87		0.87	0.87	0.87
vC, conflicting volume	1221			826			1436	2042	413	1612	2020	614
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	959			826			1206	1900	413	1408	1876	262
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	100	100	95
cM capacity (veh/h)	630			813			117	61	594	84	63	634
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	543	283	775	442	11	33						
Volume Left	0	0	0	0	0	0						
Volume Right	0	11	0	54	11	33						
cSH	1700	1700	1700	1700	594	634						
Volume to Capacity	0.32	0.17	0.46	0.26	0.02	0.05						
Queue Length 95th (ft)	0	0	0	0	1	4						
Control Delay (s)	0.0	0.0	0.0	0.0	11.2	11.0						
Lane LOS					B	B						
Approach Delay (s)	0.0		0.0		11.2	11.0						
Approach LOS					B	B						
Intersection Summary												
Average Delay			0.2									
Intersection Capacity Utilization			41.5%	ICU Level of Service	A							
Analysis Period (min)			15									

11: SB I-77 Off Ramp/Harrison & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑		↖		↗	↖	↗	↖
Traffic Volume (vph)	0	870	70	40	580	0	120	0	90	730	230	790
Future Volume (vph)	0	870	70	40	580	0	120	0	90	730	230	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00		1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00		1.00		0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95		1.00	0.95	0.97	1.00
Satd. Flow (prot)		3521		1671	3574		1641		1568	1715	1742	1579
Flt Permitted		1.00		0.13	1.00		0.46		1.00	0.95	0.97	1.00
Satd. Flow (perm)		3521		221	3574		788		1568	1715	1742	1579
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	946	76	43	630	0	130	0	98	793	250	859
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	69	0	0	84
Lane Group Flow (vph)	0	1016	0	43	630	0	130	0	29	515	528	775
Confl. Peds. (#/hr)	1					1						1
Heavy Vehicles (%)	0%	1%	6%	8%	1%	0%	10%	0%	3%	0%	2%	1%
Turn Type		NA		Perm	NA		Perm		Perm	Split	NA	Perm
Protected Phases		2			6					8		8
Permitted Phases				6			7			7		8
Actuated Green, G (s)		31.9		31.9	31.9		12.9		12.9	39.9	39.9	39.9
Effective Green, g (s)		31.9		31.9	31.9		12.9		12.9	39.9	39.9	39.9
Actuated g/C Ratio		0.32		0.32	0.32		0.13		0.13	0.40	0.40	0.40
Clearance Time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Vehicle Extension (s)		5.0		5.0	5.0		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1123		70	1140		101		202	684	695	630
v/s Ratio Prot		c0.29			0.18					0.30	0.30	
v/s Ratio Perm				0.19			c0.17		0.02			c0.49
v/c Ratio		0.90		0.61	0.55		1.29		0.14	0.75	0.76	1.23
Uniform Delay, d1		32.6		28.8	28.2		43.5		38.7	25.8	25.9	30.1
Progression Factor		1.00		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		11.9		34.2	1.9		185.0		0.3	4.7	4.8	117.0
Delay (s)		44.5		63.0	30.1		228.6		39.0	30.5	30.7	147.0
Level of Service		D		E	C		F		D	C	C	F
Approach Delay (s)		44.5			32.2			147.1				83.2
Approach LOS		D			C			F				F

Intersection Summary			
HCM 2000 Control Delay	67.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

1: Whipple & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

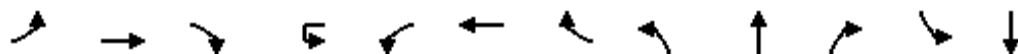


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	
Traffic Volume (vph)	230	700	110	60	770	260	250	240	40	360	280	230
Future Volume (vph)	230	700	110	60	770	260	250	240	40	360	280	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3499		1805	3574	1601	1804	3474		1805	3291	
Flt Permitted	0.15	1.00		0.23	1.00	1.00	0.39	1.00		0.31	1.00	
Satd. Flow (perm)	273	3499		437	3574	1601	737	3474		595	3291	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	761	120	65	837	283	272	261	43	391	304	250
RTOR Reduction (vph)	0	14	0	0	0	50	0	15	0	0	166	0
Lane Group Flow (vph)	250	867	0	65	837	233	272	289	0	391	388	0
Confl. Peds. (#/hr)	3		3	3		3	3					3
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	0%	2%	0%	0%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	45.4	34.4		34.6	29.0	46.3	23.2	10.3		32.0	14.7	
Effective Green, g (s)	45.4	34.4		34.6	29.0	46.3	23.2	10.3		32.0	14.7	
Actuated g/C Ratio	0.50	0.38		0.38	0.32	0.51	0.26	0.11		0.36	0.16	
Clearance Time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	322	1337		253	1151	923	342	397		444	537	
v/s Ratio Prot	c0.09	0.25		0.02	0.23	0.05	0.11	0.08		c0.17	0.12	
v/s Ratio Perm	c0.30			0.08		0.10	0.09			c0.14		
v/c Ratio	0.78	0.65		0.26	0.73	0.25	0.80	0.73		0.88	0.72	
Uniform Delay, d1	16.4	22.8		18.1	27.0	12.2	29.3	38.5		24.2	35.7	
Progression Factor	1.00	1.00		0.56	0.48	0.67	1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.1	2.4		0.3	2.4	0.1	12.0	6.5		18.1	4.8	
Delay (s)	27.5	25.3		10.5	15.4	8.3	41.4	45.0		42.3	40.5	
Level of Service	C	C		B	B	A	D	D		D	D	
Approach Delay (s)		25.8			13.4			43.3			41.3	
Approach LOS		C			B			D			D	

Intersection Summary		
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.89	
Actuated Cycle Length (s)	90.0	Sum of lost time (s) 22.4
Intersection Capacity Utilization	81.8%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	60	810	120	40	170	1090	120	150	50	90	110	60
Future Volume (vph)	60	810	120	40	170	1090	120	150	50	90	110	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3574	1578		1798	3574	1578	1804	1900	1593	1803	1777
Flt Permitted	0.15	1.00	1.00		0.95	1.00	1.00	0.57	1.00	1.00	0.72	1.00
Satd. Flow (perm)	276	3574	1578		1798	3574	1578	1082	1900	1593	1370	1777
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	880	130	43	185	1185	130	163	54	98	120	65
RTOR Reduction (vph)	0	0	83	0	0	0	76	0	0	72	0	28
Lane Group Flow (vph)	65	880	47	0	228	1185	54	163	54	26	120	80
Confl. Peds. (#/hr)	1		2		2		1	1		1	1	
Heavy Vehicles (%)	0%	1%	0%	2%	0%	1%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	Prot	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases	2		2				6	8		8	4	
Actuated Green, G (s)	33.6	27.5	27.5		10.8	32.2	32.2	36.9	23.9	23.9	26.9	17.5
Effective Green, g (s)	33.6	27.5	27.5		10.8	32.2	32.2	36.9	23.9	23.9	26.9	17.5
Actuated g/C Ratio	0.37	0.31	0.31		0.12	0.36	0.36	0.41	0.27	0.27	0.30	0.19
Clearance Time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	206	1092	482		215	1278	564	570	504	423	454	345
v/s Ratio Prot	0.02	0.25			c0.13	c0.33		c0.05	0.03		0.03	0.04
v/s Ratio Perm	0.10		0.03				0.03	c0.07		0.02	0.05	
v/c Ratio	0.32	0.81	0.10		1.06	0.93	0.09	0.29	0.11	0.06	0.26	0.23
Uniform Delay, d1	20.8	28.8	22.4		39.6	27.8	19.2	17.3	25.0	24.7	23.7	30.6
Progression Factor	0.72	0.95	1.71		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	4.4	0.3		78.3	12.9	0.3	0.3	0.4	0.3	0.3	0.7
Delay (s)	15.6	31.8	38.5		117.9	40.7	19.5	17.6	25.4	25.0	24.0	31.3
Level of Service	B	C	D		F	D	B	B	C	C	C	C
Approach Delay (s)		31.7				50.3			21.2			27.5
Approach LOS		C				D			C			C

Intersection Summary

HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	40
Future Volume (vph)	40
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	43
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↔	↕↔			↔	↕↔				↔	
Traffic Volume (veh/h)	10	10	1120	30	10	30	1360	10	0	0	20	0
Future Volume (Veh/h)	10	10	1120	30	10	30	1360	10	0	0	20	0
Sign Control			Free				Free			Stop		
Grade			0%				0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	1217	33	0	33	1478	11	0	0	22	0
Pedestrians							1			11		
Lane Width (ft)							12.0			12.0		
Walking Speed (ft/s)							4.0			4.0		
Percent Blockage							0			1		
Right turn flare (veh)												
Median type			None				None					
Median storage (veh)												
Upstream signal (ft)							904					
pX, platoon unblocked	0.00	0.75			0.00				0.75	0.75		0.75
vC, conflicting volume	0	1491			0	1261			2072	2824	637	2183
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	992			0	1261			1765	2765	637	1913
tC, single (s)	0.0	4.1			0.0	4.1			7.5	6.5	6.9	7.5
tC, 2 stage (s)												
tF (s)	0.0	2.2			0.0	2.2			3.5	4.0	3.3	3.5
p0 queue free %	0	98			0	94			100	100	95	100
cM capacity (veh/h)	0	529			0	553			37	13	421	28
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	11	811	439	33	985	504	22	11				
Volume Left	11	0	0	33	0	0	0	0				
Volume Right	0	0	33	0	0	11	22	11				
cSH	529	1700	1700	553	1700	1700	421	817				
Volume to Capacity	0.02	0.48	0.26	0.06	0.58	0.30	0.05	0.01				
Queue Length 95th (ft)	2	0	0	5	0	0	4	1				
Control Delay (s)	12.0	0.0	0.0	11.9	0.0	0.0	14.0	9.5				
Lane LOS	B			B			B	A				
Approach Delay (s)	0.1			0.3			14.0	9.5				
Approach LOS							B	A				
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			48.2%	ICU Level of Service	A							
Analysis Period (min)			15									

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations		↗
Traffic Volume (veh/h)	0	10
Future Volume (Veh/h)	0	10
Sign Control	Stop	
Grade	0%	
Peak Hour Factor	0.92	0.92
Hourly flow rate (vph)	0	11
Pedestrians	2	
Lane Width (ft)	12.0	
Walking Speed (ft/s)	4.0	
Percent Blockage	0	
Right turn flare (veh)		
Median type		
Median storage (veh)		
Upstream signal (ft)		
pX, platoon unblocked	0.75	0.75
vC, conflicting volume	2834	746
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol	2780	2
tC, single (s)	6.5	6.9
tC, 2 stage (s)		
tF (s)	4.0	3.3
p0 queue free %	100	99
cM capacity (veh/h)	13	817
Direction, Lane #		

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↔	↕			↔	↕			↕		
Traffic Volume (vph)	30	30	950	50	20	80	1110	50	140	30	90	30
Future Volume (vph)	30	30	950	50	20	80	1110	50	140	30	90	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0			4.0		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frbp, ped/bikes		1.00	1.00			1.00	1.00			0.99		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	0.99			1.00	0.99			0.95		
Flt Protected		0.95	1.00			0.95	1.00			0.97		
Satd. Flow (prot)		1787	3537			1770	3549			1714		
Flt Permitted		0.95	1.00			0.95	1.00			0.81		
Satd. Flow (perm)		1787	3537			1770	3549			1435		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	33	1033	54	22	87	1207	54	152	33	98	33
RTOR Reduction (vph)	0	0	4	0	0	0	3	0	0	22	0	0
Lane Group Flow (vph)	0	66	1083	0	0	109	1258	0	0	261	0	0
Confl. Peds. (#/hr)		4		8		8		4	3		3	3
Heavy Vehicles (%)	2%	0%	1%	2%	2%	2%	1%	0%	0%	0%	6%	4%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		7.7	50.1			11.4	53.8			24.5		
Effective Green, g (s)		7.7	50.1			11.4	53.8			24.5		
Actuated g/C Ratio		0.08	0.51			0.12	0.55			0.25		
Clearance Time (s)		4.0	4.0			4.0	4.0			4.0		
Vehicle Extension (s)		3.0	5.0			3.0	5.0			5.0		
Lane Grp Cap (vph)		140	1808			205	1948			358		
v/s Ratio Prot		0.04	0.31			c0.06	c0.35					
v/s Ratio Perm										c0.18		
v/c Ratio		0.47	0.60			0.53	0.65			0.73		
Uniform Delay, d1		43.2	16.9			40.8	15.4			33.7		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		2.5	1.5			2.6	1.7			8.9		
Delay (s)		45.7	18.3			43.4	17.1			42.6		
Level of Service		D	B			D	B			D		
Approach Delay (s)			19.9				19.2			42.6		
Approach LOS			B				B			D		
Intersection Summary												
HCM 2000 Control Delay			22.0				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			98.0				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			64.8%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations	↕	
Traffic Volume (vph)	20	10
Future Volume (vph)	20	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frbp, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.98	
Flt Protected	0.98	
Satd. Flow (prot)	1770	
Flt Permitted	0.80	
Satd. Flow (perm)	1445	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	22	11
RTOR Reduction (vph)	8	0
Lane Group Flow (vph)	58	0
Confl. Peds. (#/hr)		3
Heavy Vehicles (%)	0%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	24.5	
Effective Green, g (s)	24.5	
Actuated g/C Ratio	0.25	
Clearance Time (s)	4.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	361	
v/s Ratio Prot		
v/s Ratio Perm	0.04	
v/c Ratio	0.16	
Uniform Delay, d1	28.7	
Progression Factor	1.00	
Incremental Delay, d2	0.4	
Delay (s)	29.1	
Level of Service	C	
Approach Delay (s)	29.1	
Approach LOS	C	
Intersection Summary		

6: Tuscarawas & Wertz
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑↑	↑↑		↙	↗
Traffic Volume (vph)	210	1070	1210	130	110	200
Future Volume (vph)	210	1070	1210	130	110	200
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3515		1787	1589
Flt Permitted	0.10	1.00	1.00		0.95	1.00
Satd. Flow (perm)	189	3574	3515		1787	1589
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	1163	1315	141	120	217
RTOR Reduction (vph)	0	0	7	0	0	184
Lane Group Flow (vph)	228	1163	1449	0	120	33
Confl. Peds. (#/hr)	4			4		3
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	68.4	68.4	53.9		13.6	13.6
Effective Green, g (s)	68.4	68.4	53.9		13.6	13.6
Actuated g/C Ratio	0.76	0.76	0.60		0.15	0.15
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	350	2716	2105		270	240
v/s Ratio Prot	c0.08	0.33	c0.41		c0.07	
v/s Ratio Perm	0.41					0.02
v/c Ratio	0.65	0.43	0.69		0.44	0.14
Uniform Delay, d1	15.6	3.8	12.3		34.8	33.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.3	0.5	1.9		2.4	0.5
Delay (s)	19.9	4.3	14.2		37.2	33.7
Level of Service	B	A	B		D	C
Approach Delay (s)		6.9	14.2		34.9	
Approach LOS		A	B		C	

Intersection Summary

HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

10: Harrison & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Traffic Volume (veh/h)	0	1020	20	0	1380	140	0	0	10	0	0	120
Future Volume (Veh/h)	0	1020	20	0	1380	140	0	0	10	0	0	120
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1109	22	0	1500	152	0	0	11	0	0	130
Pedestrians		10			4			3			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					255							
pX, platoon unblocked	0.73						0.73	0.73		0.73	0.73	0.73
vC, conflicting volume	1669			1134			2013	2792	572	2162	2727	853
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1183			1134			1653	2716	572	1857	2627	69
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	100			100			100	100	98	100	100	82
cM capacity (veh/h)	431			622			39	15	465	30	17	706
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	739	392	1000	652	11	130						
Volume Left	0	0	0	0	0	0						
Volume Right	0	22	0	152	11	130						
cSH	1700	1700	1700	1700	465	706						
Volume to Capacity	0.43	0.23	0.59	0.38	0.02	0.18						
Queue Length 95th (ft)	0	0	0	0	2	17						
Control Delay (s)	0.0	0.0	0.0	0.0	12.9	11.2						
Lane LOS					B	B						
Approach Delay (s)	0.0		0.0		12.9	11.2						
Approach LOS					B	B						
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			59.3%	ICU Level of Service	B							
Analysis Period (min)			15									

11: SB I-77 Off Ramp/Harrison & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑		↖		↗	↖	↗	↖
Traffic Volume (vph)	0	1220	80	80	960	0	200	0	190	230	220	590
Future Volume (vph)	0	1220	80	80	960	0	200	0	190	230	220	590
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00	0.95	0.95	1.00
Frt		0.99		1.00	1.00		1.00		0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95		1.00	0.95	1.00	1.00
Satd. Flow (prot)		3543		1805	3574		1805		1615	1715	1765	1599
Flt Permitted		1.00		0.13	1.00		0.59		1.00	0.95	1.00	1.00
Satd. Flow (perm)		3543		254	3574		1119		1615	1715	1765	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1326	87	87	1043	0	217	0	207	250	239	641
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	123	0	0	94
Lane Group Flow (vph)	0	1408	0	87	1043	0	217	0	84	225	264	547
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	2%	1%
Turn Type		NA		Perm	NA		Perm		Perm	Split	NA	Perm
Protected Phases		2			6					8	8	
Permitted Phases				6			7		7			8
Actuated Green, G (s)		29.9		29.9	29.9		19.1		19.1	24.9	24.9	24.9
Effective Green, g (s)		29.9		29.9	29.9		19.1		19.1	24.9	24.9	24.9
Actuated g/C Ratio		0.34		0.34	0.34		0.21		0.21	0.28	0.28	0.28
Clearance Time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Vehicle Extension (s)		5.0		5.0	5.0		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1187		85	1198		239		345	478	492	446
v/s Ratio Prot		c0.40			0.29					0.13	0.15	
v/s Ratio Perm				0.34			c0.19		0.05			c0.34
v/c Ratio		1.19		1.02	0.87		0.91		0.24	0.47	0.54	1.23
Uniform Delay, d1		29.7		29.7	27.8		34.2		29.1	26.7	27.3	32.2
Progression Factor		1.00		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		92.4		104.2	8.8		34.2		0.4	0.7	1.1	120.0
Delay (s)		122.1		133.8	36.6		68.4		29.4	27.4	28.4	152.2
Level of Service		F		F	D		E		C	C	C	F
Approach Delay (s)		122.1			44.1			49.4			98.4	
Approach LOS		F			D			D			F	

Intersection Summary			
HCM 2000 Control Delay	86.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	15.3
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

1: Whipple & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

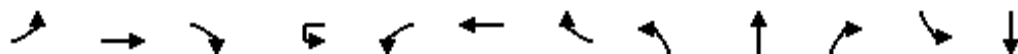


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	
Traffic Volume (vph)	200	630	80	20	410	120	90	140	20	230	130	180
Future Volume (vph)	200	630	80	20	410	120	90	140	20	230	130	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	3462		1569	3505	1482	1768	3422		1752	3167	
Flt Permitted	0.38	1.00		0.35	1.00	1.00	0.55	1.00		0.43	1.00	
Satd. Flow (perm)	700	3462		574	3505	1482	1021	3422		799	3167	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	685	87	22	446	130	98	152	22	250	141	196
RTOR Reduction (vph)	0	9	0	0	0	60	0	11	0	0	154	0
Lane Group Flow (vph)	217	763	0	22	446	70	98	163	0	250	183	0
Confl. Peds. (#/hr)	2		3	3		2	2					2
Heavy Vehicles (%)	4%	2%	5%	15%	3%	8%	2%	3%	7%	3%	2%	4%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	54.3	45.8		39.7	36.8	54.1	19.3	11.6		34.5	21.2	
Effective Green, g (s)	54.3	45.8		39.7	36.8	54.1	19.3	11.6		34.5	21.2	
Actuated g/C Ratio	0.54	0.46		0.40	0.37	0.54	0.19	0.12		0.34	0.21	
Clearance Time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	503	1585		256	1289	884	254	396		440	671	
v/s Ratio Prot	c0.05	c0.22		0.00	0.13	0.01	0.03	0.05		c0.10	0.06	
v/s Ratio Perm	0.18			0.03		0.03	0.04			c0.10		
v/c Ratio	0.43	0.48		0.09	0.35	0.08	0.39	0.41		0.57	0.27	
Uniform Delay, d1	12.5	18.8		18.4	22.9	11.0	34.5	41.0		25.2	32.9	
Progression Factor	1.00	1.00		0.76	0.65	0.11	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	1.1		0.1	0.7	0.0	1.0	0.7		1.7	0.2	
Delay (s)	13.1	19.9		14.1	15.5	1.2	35.4	41.7		26.9	33.2	
Level of Service	B	B		B	B	A	D	D		C	C	
Approach Delay (s)		18.4			12.3			39.5			30.5	
Approach LOS		B			B			D			C	

Intersection Summary		
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.56	C
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	67.5%	22.4
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	820	40	10	60	580	40	60	20	20	80	10
Future Volume (vph)	10	820	40	10	60	580	40	60	20	20	80	10
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1804	3505	1520		1726	3505	1578	1805	1900	1350	1803	1643
Flt Permitted	0.41	1.00	1.00		0.95	1.00	1.00	0.60	1.00	1.00	0.74	1.00
Satd. Flow (perm)	784	3505	1520		1726	3505	1578	1132	1900	1350	1410	1643
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	891	43	11	65	630	43	65	22	22	87	11
RTOR Reduction (vph)	0	0	25	0	0	0	22	0	0	0	0	9
Lane Group Flow (vph)	11	891	18	0	76	630	21	65	22	22	87	13
Confl. Peds. (#/hr)	1		1		1		1			1	1	
Heavy Vehicles (%)	0%	3%	4%	2%	5%	3%	0%	0%	0%	18%	0%	0%
Turn Type	pm+pt	NA	Perm	Prot	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases	2		2				6	8		8	4	
Actuated Green, G (s)	43.1	41.8	41.8		8.1	48.6	48.6	35.3	25.0	25.0	21.3	14.6
Effective Green, g (s)	43.1	41.8	41.8		8.1	48.6	48.6	35.3	25.0	25.0	21.3	14.6
Actuated g/C Ratio	0.43	0.42	0.42		0.08	0.49	0.49	0.35	0.25	0.25	0.21	0.15
Clearance Time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	351	1465	635		139	1703	766	514	475	337	326	239
v/s Ratio Prot	0.00	c0.25			c0.04	0.18		c0.02	0.01		c0.02	0.01
v/s Ratio Perm	0.01		0.01				0.01	0.02		0.02	c0.04	
v/c Ratio	0.03	0.61	0.03		0.55	0.37	0.03	0.13	0.05	0.07	0.27	0.05
Uniform Delay, d1	16.3	22.7	17.1		44.2	16.1	13.4	21.8	28.5	28.6	32.5	36.7
Progression Factor	1.00	0.84	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	1.7	0.1		4.3	0.6	0.1	0.1	0.2	0.4	0.4	0.2
Delay (s)	16.3	20.8	17.2		48.5	16.7	13.5	21.9	28.6	29.0	33.0	36.9
Level of Service	B	C	B		D	B	B	C	C	C	C	D
Approach Delay (s)		20.6				19.8			24.7			33.8
Approach LOS		C				B			C			C

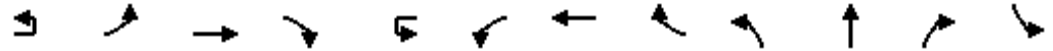
Intersection Summary		
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.45	C
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	65.3%	18.4
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	10
Future Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	11
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	14%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	10	10	1060	40	10	20	790	10	0	0	20	0
Future Volume (Veh/h)	10	10	1060	40	10	20	790	10	0	0	20	0
Sign Control			Free				Free			Stop		
Grade			0%				0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	1152	43	0	22	859	11	0	0	22	0
Pedestrians							2			4		
Lane Width (ft)							12.0			12.0		
Walking Speed (ft/s)							4.0			4.0		
Percent Blockage							0			0		
Right turn flare (veh)												
Median type			None				None					
Median storage (veh)												
Upstream signal (ft)							904					
pX, platoon unblocked	0.00	0.94			0.00				0.94	0.94		0.94
vC, conflicting volume	0	872			0	1199			1673	2116	604	1510
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	727			0	1199			1582	2055	604	1409
tC, single (s)	0.0	4.1			0.0	4.1			7.5	6.5	7.0	7.5
tC, 2 stage (s)												
tF (s)	0.0	2.2			0.0	2.2			3.5	4.0	3.4	3.5
p0 queue free %	0	99			0	96			100	100	95	100
cM capacity (veh/h)	0	828			0	587			66	50	427	85
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	11	768	427	22	573	297	22	11				
Volume Left	11	0	0	22	0	0	0	0				
Volume Right	0	0	43	0	0	11	22	11				
cSH	828	1700	1700	587	1700	1700	427	694				
Volume to Capacity	0.01	0.45	0.25	0.04	0.34	0.17	0.05	0.02				
Queue Length 95th (ft)	1	0	0	3	0	0	4	1				
Control Delay (s)	9.4	0.0	0.0	11.4	0.0	0.0	13.9	10.3				
Lane LOS	A			B			B	B				
Approach Delay (s)	0.1			0.3			13.9	10.3				
Approach LOS							B	B				
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			41.2%	ICU Level of Service	A							
Analysis Period (min)			15									

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations		↗
Traffic Volume (veh/h)	0	10
Future Volume (Veh/h)	0	10
Sign Control	Stop	
Grade	0%	
Peak Hour Factor	0.92	0.92
Hourly flow rate (vph)	0	11
Pedestrians	2	
Lane Width (ft)	12.0	
Walking Speed (ft/s)	4.0	
Percent Blockage	0	
Right turn flare (veh)		
Median type		
Median storage (veh)		
Upstream signal (ft)		
pX, platoon unblocked	0.94	0.94
vC, conflicting volume	2132	437
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol	2072	262
tC, single (s)	6.5	6.9
tC, 2 stage (s)		
tF (s)	4.0	3.3
p0 queue free %	100	98
cM capacity (veh/h)	48	694
Direction, Lane #		

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	10	10	990	30	10	50	650	60	50	50	70	30
Future Volume (vph)	10	10	990	30	10	50	650	60	50	50	70	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0			4.0		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frbp, ped/bikes		1.00	1.00			1.00	1.00			0.99		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	0.99			0.94		
Flt Protected		0.95	1.00			0.95	1.00			0.99		
Satd. Flow (prot)		1195	3556			1755	3495			1705		
Flt Permitted		0.95	1.00			0.95	1.00			0.90		
Satd. Flow (perm)		1195	3556			1755	3495			1548		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	11	1076	33	11	54	707	65	54	54	76	33
RTOR Reduction (vph)	0	0	2	0	0	0	5	0	0	0	0	0
Lane Group Flow (vph)	0	22	1107	0	0	65	767	0	0	184	0	0
Confl. Peds. (#/hr)				2		2			5		1	1
Heavy Vehicles (%)	2%	100%	1%	0%	2%	3%	2%	2%	10%	0%	0%	0%
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases									8			4
Actuated Green, G (s)		3.5	61.7			7.6	65.8			18.7		
Effective Green, g (s)		3.5	61.7			7.6	65.8			18.7		
Actuated g/C Ratio		0.04	0.62			0.08	0.66			0.19		
Clearance Time (s)		4.0	4.0			4.0	4.0			4.0		
Vehicle Extension (s)		3.0	5.0			3.0	5.0			5.0		
Lane Grp Cap (vph)		41	2194			133	2299			289		
v/s Ratio Prot		0.02	c0.31			c0.04	0.22					
v/s Ratio Perm										c0.12		
v/c Ratio		0.54	0.50			0.49	0.33			0.64		
Uniform Delay, d1		47.5	10.7			44.3	7.5			37.5		
Progression Factor		1.00	1.00			0.88	0.91			1.00		
Incremental Delay, d2		12.8	0.8			2.6	0.4			6.3		
Delay (s)		60.3	11.5			41.4	7.2			43.8		
Level of Service		E	B			D	A			D		
Approach Delay (s)			12.4				9.8			43.8		
Approach LOS			B				A			D		

Intersection Summary		
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.53	B
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	51.9%	12.0
Analysis Period (min)	15	ICU Level of Service
		A

c Critical Lane Group

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations	↕	
Traffic Volume (vph)	10	10
Future Volume (vph)	10	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frbp, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	0.97	
Satd. Flow (prot)	1787	
Flt Permitted	0.75	
Satd. Flow (perm)	1375	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	11	11
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	55	0
Confl. Peds. (#/hr)		5
Heavy Vehicles (%)	0%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	18.7	
Effective Green, g (s)	18.7	
Actuated g/C Ratio	0.19	
Clearance Time (s)	4.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	257	
v/s Ratio Prot		
v/s Ratio Perm	0.04	
v/c Ratio	0.21	
Uniform Delay, d1	34.4	
Progression Factor	1.00	
Incremental Delay, d2	0.9	
Delay (s)	35.3	
Level of Service	D	
Approach Delay (s)	35.3	
Approach LOS	D	
Intersection Summary		

6: Tuscarawas & Wertz
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↶↶	↶↶		↶	↶
Traffic Volume (vph)	110	910	830	80	140	120
Future Volume (vph)	110	910	830	80	140	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3530		1805	1591
Flt Permitted	0.24	1.00	1.00		0.95	1.00
Satd. Flow (perm)	448	3574	3530		1805	1591
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	989	902	87	152	130
RTOR Reduction (vph)	0	0	5	0	0	110
Lane Group Flow (vph)	120	989	984	0	152	20
Confl. Peds. (#/hr)					1	2
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	76.3	76.3	66.0		15.7	15.7
Effective Green, g (s)	76.3	76.3	66.0		15.7	15.7
Actuated g/C Ratio	0.76	0.76	0.66		0.16	0.16
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	440	2726	2329		283	249
v/s Ratio Prot	0.02	c0.28	c0.28		c0.08	
v/s Ratio Perm	0.19					0.01
v/c Ratio	0.27	0.36	0.42		0.54	0.08
Uniform Delay, d1	4.1	3.9	8.0		38.8	36.0
Progression Factor	0.30	0.24	1.00		1.00	1.00
Incremental Delay, d2	0.3	0.3	0.6		3.6	0.3
Delay (s)	1.5	1.3	8.6		42.4	36.3
Level of Service	A	A	A		D	D
Approach Delay (s)		1.3	8.6		39.6	
Approach LOS		A	A		D	

Intersection Summary

HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

10: Harrison & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Traffic Volume (veh/h)	0	850	10	0	1200	70	0	0	10	0	0	30
Future Volume (Veh/h)	0	850	10	0	1200	70	0	0	10	0	0	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	924	11	0	1304	76	0	0	11	0	0	33
Pedestrians		1										4
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					255							
pX, platoon unblocked	0.86						0.86	0.86		0.86	0.86	0.86
vC, conflicting volume	1384			935			1616	2314	468	1819	2281	695
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1116			935			1386	2200	468	1623	2162	312
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	100	100	94
cM capacity (veh/h)	541			741			84	39	547	57	41	579
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	616	319	869	511	11	33						
Volume Left	0	0	0	0	0	0						
Volume Right	0	11	0	76	11	33						
cSH	1700	1700	1700	1700	547	579						
Volume to Capacity	0.36	0.19	0.51	0.30	0.02	0.06						
Queue Length 95th (ft)	0	0	0	0	2	5						
Control Delay (s)	0.0	0.0	0.0	0.0	11.7	11.6						
Lane LOS					B	B						
Approach Delay (s)	0.0		0.0		11.7	11.6						
Approach LOS					B	B						
Intersection Summary												
Average Delay			0.2									
Intersection Capacity Utilization			45.8%	ICU Level of Service	A							
Analysis Period (min)			15									

11: SB I-77 Off Ramp/Harrison & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑		↖		↗	↖	↕	↗
Traffic Volume (vph)	0	910	70	40	580	0	100	0	90	730	230	790
Future Volume (vph)	0	910	70	40	580	0	100	0	90	730	230	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00	0.95	0.91	0.95
Frbp, ped/bikes		1.00		1.00	1.00		1.00		1.00	1.00	0.99	0.99
Flpb, ped/bikes		1.00		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00		1.00		0.85	1.00	0.94	0.85
Flt Protected		1.00		0.95	1.00		0.95		1.00	0.95	0.99	1.00
Satd. Flow (prot)		3524		1671	3574		1641		1568	1715	1579	1500
Flt Permitted		1.00		0.14	1.00		0.39		1.00	0.95	0.99	1.00
Satd. Flow (perm)		3524		239	3574		679		1568	1715	1579	1500
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	989	76	43	630	0	109	0	98	793	250	859
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	66	0	25	122
Lane Group Flow (vph)	0	1059	0	43	630	0	109	0	32	658	626	471
Confl. Peds. (#/hr)	1					1						1
Heavy Vehicles (%)	0%	1%	6%	8%	1%	0%	10%	0%	3%	0%	2%	1%
Turn Type		NA		Perm	NA		Perm		Perm	Split	NA	Perm
Protected Phases		2			6					8		8
Permitted Phases				6			7		7			8
Actuated Green, G (s)		29.5		29.5	29.5		16.1		16.1	39.1	39.1	39.1
Effective Green, g (s)		29.5		29.5	29.5		16.1		16.1	39.1	39.1	39.1
Actuated g/C Ratio		0.29		0.29	0.29		0.16		0.16	0.39	0.39	0.39
Clearance Time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Vehicle Extension (s)		5.0		5.0	5.0		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1039		70	1054		109		252	670	617	586
v/s Ratio Prot		c0.30			0.18					0.38	c0.40	
v/s Ratio Perm				0.18			c0.16		0.02			0.31
v/c Ratio		1.02		0.61	0.60		1.00		0.13	0.98	1.01	0.80
Uniform Delay, d1		35.2		30.4	30.2		42.0		35.9	30.1	30.4	27.0
Progression Factor		1.00		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		32.9		34.2	2.5		86.2		0.2	30.1	39.9	7.8
Delay (s)		68.2		64.6	32.7		128.2		36.2	60.2	70.4	34.9
Level of Service		E		E	C		F		D	E	E	C
Approach Delay (s)		68.2			34.7			84.6			55.8	
Approach LOS		E			C			F			E	
Intersection Summary												
HCM 2000 Control Delay			57.1			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.01									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			15.3			
Intersection Capacity Utilization			84.9%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

1: Whipple & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

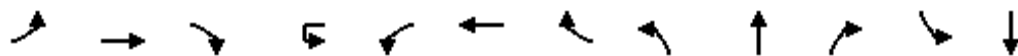


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	
Traffic Volume (vph)	260	780	130	70	860	300	280	270	50	400	310	250
Future Volume (vph)	260	780	130	70	860	300	280	270	50	400	310	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3496		1805	3574	1601	1804	3467		1805	3294	
Flt Permitted	0.12	1.00		0.17	1.00	1.00	0.38	1.00		0.28	1.00	
Satd. Flow (perm)	221	3496		331	3574	1601	730	3467		524	3294	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	283	848	141	76	935	326	304	293	54	435	337	272
RTOR Reduction (vph)	0	14	0	0	0	49	0	17	0	0	162	0
Lane Group Flow (vph)	283	975	0	76	935	277	304	330	0	435	447	0
Confl. Peds. (#/hr)	3		3	3		3	3					3
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	0%	2%	0%	0%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	45.4	34.2		34.0	28.4	45.8	23.7	10.4		31.9	14.5	
Effective Green, g (s)	45.4	34.2		34.0	28.4	45.8	23.7	10.4		31.9	14.5	
Actuated g/C Ratio	0.50	0.38		0.38	0.32	0.51	0.26	0.12		0.35	0.16	
Clearance Time (s)	5.6	5.6		5.6	5.6	5.6	5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	309	1328		216	1127	914	350	400		433	530	
v/s Ratio Prot	c0.12	0.28		0.02	0.26	0.06	0.13	0.10		c0.19	0.14	
v/s Ratio Perm	c0.34			0.11		0.11	0.10			c0.16		
v/c Ratio	0.92	0.73		0.35	0.83	0.30	0.87	0.83		1.00	0.84	
Uniform Delay, d1	22.4	24.0		19.0	28.6	12.8	29.7	38.9		25.6	36.6	
Progression Factor	1.00	1.00		1.00	0.49	0.67	1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.2	3.6		0.4	3.2	0.1	19.8	13.0		44.4	11.7	
Delay (s)	52.6	27.6		19.5	17.3	8.6	49.5	51.9		70.0	48.3	
Level of Service	D	C		B	B	A	D	D		E	D	
Approach Delay (s)		33.2			15.3			50.8			57.4	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.4
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	70	900	140	40	190	1220	130	170	60	100	120	60
Future Volume (vph)	70	900	140	40	190	1220	130	170	60	100	120	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.98		1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3574	1578		1799	3574	1578	1804	1900	1593	1803	1777
Flt Permitted	0.15	1.00	1.00		0.95	1.00	1.00	0.57	1.00	1.00	0.71	1.00
Satd. Flow (perm)	276	3574	1578		1799	3574	1578	1080	1900	1593	1357	1777
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	978	152	43	207	1326	141	185	65	109	130	65
RTOR Reduction (vph)	0	0	83	0	0	0	77	0	0	80	0	28
Lane Group Flow (vph)	76	978	69	0	250	1326	64	185	65	29	130	80
Confl. Peds. (#/hr)	1		2		2		1	1		1	1	
Heavy Vehicles (%)	0%	1%	0%	2%	0%	1%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	Prot	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases	2		2				6	8		8	4	
Actuated Green, G (s)	33.8	27.5	27.5		10.8	32.0	32.0	36.9	23.7	23.7	26.9	17.3
Effective Green, g (s)	33.8	27.5	27.5		10.8	32.0	32.0	36.9	23.7	23.7	26.9	17.3
Actuated g/C Ratio	0.38	0.31	0.31		0.12	0.36	0.36	0.41	0.26	0.26	0.30	0.19
Clearance Time (s)	3.6	5.6	5.6		3.6	5.6	5.6	3.6	5.6	5.6	3.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0
Lane Grp Cap (vph)	210	1092	482		215	1270	561	571	500	419	453	341
v/s Ratio Prot	0.03	0.27			c0.14	c0.37		c0.06	0.03		0.03	0.04
v/s Ratio Perm	0.11		0.04				0.04	c0.08		0.02	0.06	
v/c Ratio	0.36	0.90	0.14		1.16	1.04	0.11	0.32	0.13	0.07	0.29	0.23
Uniform Delay, d1	21.5	29.9	22.7		39.6	29.0	19.5	17.5	25.3	24.9	23.8	30.7
Progression Factor	0.68	0.94	1.37		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	6.8	0.3		112.3	37.6	0.4	0.3	0.5	0.3	0.4	0.7
Delay (s)	15.2	34.8	31.5		151.9	66.6	19.9	17.9	25.8	25.2	24.2	31.5
Level of Service	B	C	C		F	E	B	B	C	C	C	C
Approach Delay (s)		33.1				75.2			21.5			27.5
Approach LOS		C				E			C			C

Intersection Summary

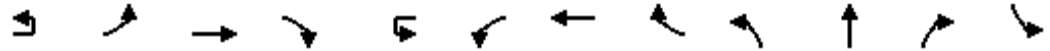
HCM 2000 Control Delay	52.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2: Valleyview & Tuscarawas
 HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	40
Future Volume (vph)	40
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	43
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	10	10	1250	30	10	30	1510	10	0	0	20	0
Future Volume (Veh/h)	10	10	1250	30	10	30	1510	10	0	0	20	0
Sign Control			Free				Free			Stop		
Grade			0%				0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	1359	33	0	33	1641	11	0	0	22	0
Pedestrians							1			11		
Lane Width (ft)							12.0			12.0		
Walking Speed (ft/s)							4.0			4.0		
Percent Blockage							0			1		
Right turn flare (veh)												
Median type			None				None					
Median storage (veh)												
Upstream signal (ft)							904					
pX, platoon unblocked	0.00	0.70			0.00				0.70	0.70		0.70
vC, conflicting volume	0	1654			0	1403			2295	3128	708	2417
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	1064			0	1403			1986	3185	708	2161
tC, single (s)	0.0	4.1			0.0	4.1			7.5	6.5	6.9	7.5
tC, 2 stage (s)												
tF (s)	0.0	2.2			0.0	2.2			3.5	4.0	3.3	3.5
p0 queue free %	0	98			0	93			100	100	94	100
cM capacity (veh/h)	0	460			0	489			23	7	378	16

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	11	906	486	33	1094	558	22	11
Volume Left	11	0	0	33	0	0	0	0
Volume Right	0	0	33	0	0	11	22	11
cSH	460	1700	1700	489	1700	1700	378	757
Volume to Capacity	0.02	0.53	0.29	0.07	0.64	0.33	0.06	0.01
Queue Length 95th (ft)	2	0	0	5	0	0	5	1
Control Delay (s)	13.0	0.0	0.0	12.9	0.0	0.0	15.1	9.8
Lane LOS	B			B			C	A
Approach Delay (s)	0.1			0.3			15.1	9.8
Approach LOS							C	A

Intersection Summary		
Average Delay		0.3
Intersection Capacity Utilization	52.4%	ICU Level of Service
Analysis Period (min)	15	A

4: Bellflower & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations		↗
Traffic Volume (veh/h)	0	10
Future Volume (Veh/h)	0	10
Sign Control	Stop	
Grade	0%	
Peak Hour Factor	0.92	0.92
Hourly flow rate (vph)	0	11
Pedestrians	2	
Lane Width (ft)	12.0	
Walking Speed (ft/s)	4.0	
Percent Blockage	0	
Right turn flare (veh)		
Median type		
Median storage (veh)		
Upstream signal (ft)		
pX, platoon unblocked	0.70	0.70
vC, conflicting volume	3140	828
vC1, stage 1 conf vol		
vC2, stage 2 conf vol		
vCu, unblocked vol	3201	0
tC, single (s)	6.5	6.9
tC, 2 stage (s)		
tF (s)	4.0	3.3
p0 queue free %	100	99
cM capacity (veh/h)	6	757
Direction, Lane #		

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	
Lane Configurations		↔	↕			↔	↕			↕			
Traffic Volume (vph)	30	30	1060	60	20	90	1230	50	160	30	110	30	
Future Volume (vph)	30	30	1060	60	20	90	1230	50	160	30	110	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0			4.0	4.0			4.0			
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00			
Frbp, ped/bikes		1.00	1.00			1.00	1.00			0.99			
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00			
Frt		1.00	0.99			1.00	0.99			0.95			
Flt Protected		0.95	1.00			0.95	1.00			0.97			
Satd. Flow (prot)		1787	3534			1770	3552			1707			
Flt Permitted		0.95	1.00			0.95	1.00			0.82			
Satd. Flow (perm)		1787	3534			1770	3552			1429			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	33	33	1152	65	22	98	1337	54	174	33	120	33	
RTOR Reduction (vph)	0	0	4	0	0	0	3	0	0	23	0	0	
Lane Group Flow (vph)	0	66	1213	0	0	120	1388	0	0	304	0	0	
Confl. Peds. (#/hr)		4		8		8		4	3		3	3	
Heavy Vehicles (%)	2%	0%	1%	2%	2%	2%	1%	0%	0%	0%	6%	4%	
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Perm	NA		Perm	
Protected Phases	5	5	2		1	1	6			8			
Permitted Phases									8			4	
Actuated Green, G (s)		6.6	50.0			9.3	52.7			26.7			
Effective Green, g (s)		6.6	50.0			9.3	52.7			26.7			
Actuated g/C Ratio		0.07	0.51			0.09	0.54			0.27			
Clearance Time (s)		4.0	4.0			4.0	4.0			4.0			
Vehicle Extension (s)		3.0	5.0			3.0	5.0			5.0			
Lane Grp Cap (vph)		120	1803			167	1910			389			
v/s Ratio Prot		0.04	0.34			c0.07	c0.39						
v/s Ratio Perm										c0.21			
v/c Ratio		0.55	0.67			0.72	0.73			0.78			
Uniform Delay, d1		44.3	17.9			43.1	17.2			32.9			
Progression Factor		1.00	1.00			1.00	1.00			1.00			
Incremental Delay, d2		5.4	2.0			13.8	2.5			11.2			
Delay (s)		49.6	19.9			56.8	19.6			44.2			
Level of Service		D	B			E	B			D			
Approach Delay (s)			21.5				22.6			44.2			
Approach LOS			C				C			D			
Intersection Summary													
HCM 2000 Control Delay			24.5									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.75										
Actuated Cycle Length (s)			98.0									Sum of lost time (s)	12.0
Intersection Capacity Utilization			71.0%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

5: Maryland/Gas Station & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	SBT	SBR
Lane Configurations	↕	
Traffic Volume (vph)	20	10
Future Volume (vph)	20	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frbp, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.98	
Flt Protected	0.98	
Satd. Flow (prot)	1770	
Flt Permitted	0.79	
Satd. Flow (perm)	1432	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	22	11
RTOR Reduction (vph)	8	0
Lane Group Flow (vph)	58	0
Confl. Peds. (#/hr)		3
Heavy Vehicles (%)	0%	0%
Turn Type	NA	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	26.7	
Effective Green, g (s)	26.7	
Actuated g/C Ratio	0.27	
Clearance Time (s)	4.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	390	
v/s Ratio Prot		
v/s Ratio Perm	0.04	
v/c Ratio	0.15	
Uniform Delay, d1	27.0	
Progression Factor	1.00	
Incremental Delay, d2	0.4	
Delay (s)	27.4	
Level of Service	C	
Approach Delay (s)	27.4	
Approach LOS	C	
Intersection Summary		

6: Tuscarawas & Wertz
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑↑	↑↑		↙	↗
Traffic Volume (vph)	240	1190	1350	150	120	220
Future Volume (vph)	240	1190	1350	150	120	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3513		1787	1589
Flt Permitted	0.07	1.00	1.00		0.95	1.00
Satd. Flow (perm)	140	3574	3513		1787	1589
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	1293	1467	163	130	239
RTOR Reduction (vph)	0	0	7	0	0	201
Lane Group Flow (vph)	261	1293	1623	0	130	38
Confl. Peds. (#/hr)	4			4		3
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	67.8	67.8	51.2		14.2	14.2
Effective Green, g (s)	67.8	67.8	51.2		14.2	14.2
Actuated g/C Ratio	0.75	0.75	0.57		0.16	0.16
Clearance Time (s)	3.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	357	2692	1998		281	250
v/s Ratio Prot	c0.11	0.36	c0.46		c0.07	
v/s Ratio Perm	0.44					0.02
v/c Ratio	0.73	0.48	0.81		0.46	0.15
Uniform Delay, d1	24.1	4.3	15.5		34.4	32.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	7.5	0.6	3.7		2.5	0.6
Delay (s)	31.6	4.9	19.3		36.9	33.3
Level of Service	C	A	B		D	C
Approach Delay (s)		9.4	19.3		34.6	
Approach LOS		A	B		C	

Intersection Summary

HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

10: Harrison & Tuscarawas
 HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Traffic Volume (veh/h)	0	1150	40	0	1550	170	0	0	20	0	0	130
Future Volume (Veh/h)	0	1150	40	0	1550	170	0	0	20	0	0	130
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1250	43	0	1685	185	0	0	22	0	0	141
Pedestrians		10			4			3			17	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			0			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					255							
pX, platoon unblocked	0.75						0.75	0.75		0.75	0.75	0.75
vC, conflicting volume	1887			1296			2268	3162	654	2446	3090	962
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1508			1296			2019	3217	654	2257	3121	267
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	100			100			100	100	95	100	100	74
cM capacity (veh/h)	331			540			19	7	412	14	8	537
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	833	460	1123	747	22	141						
Volume Left	0	0	0	0	0	0						
Volume Right	0	43	0	185	22	141						
cSH	1700	1700	1700	1700	412	537						
Volume to Capacity	0.49	0.27	0.66	0.44	0.05	0.26						
Queue Length 95th (ft)	0	0	0	0	4	26						
Control Delay (s)	0.0	0.0	0.0	0.0	14.2	14.1						
Lane LOS					B	B						
Approach Delay (s)	0.0		0.0		14.2	14.1						
Approach LOS					B	B						
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			65.4%	ICU Level of Service	C							
Analysis Period (min)			15									

11: SB I-77 Off Ramp/Harrison & Tuscarawas
 HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑		↖		↖	↖	↕	↖
Traffic Volume (vph)	0	1200	80	80	960	0	200	0	190	230	220	590
Future Volume (vph)	0	1200	80	80	960	0	200	0	190	230	220	590
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00	0.95	0.91	0.95
Frt		0.99		1.00	1.00		1.00		0.85	1.00	0.93	0.85
Flt Protected		1.00		0.95	1.00		0.95		1.00	0.95	1.00	1.00
Satd. Flow (prot)		3543		1805	3574		1805		1615	1715	1588	1519
Flt Permitted		1.00		0.11	1.00		0.47		1.00	0.95	1.00	1.00
Satd. Flow (perm)		3543		218	3574		899		1615	1715	1588	1519
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1304	87	87	1043	0	217	0	207	250	239	641
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	85	0	31	91
Lane Group Flow (vph)	0	1385	0	87	1043	0	217	0	122	225	438	345
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	2%	1%
Turn Type		NA		Perm	NA		Perm		Perm	Split	NA	Perm
Protected Phases		2			6					8	8	
Permitted Phases				6			7		7			8
Actuated Green, G (s)		34.9		34.9	34.9		18.9		18.9	20.9	20.9	20.9
Effective Green, g (s)		34.9		34.9	34.9		18.9		18.9	20.9	20.9	20.9
Actuated g/C Ratio		0.39		0.39	0.39		0.21		0.21	0.23	0.23	0.23
Clearance Time (s)		5.1		5.1	5.1		5.1		5.1	5.1	5.1	5.1
Vehicle Extension (s)		5.0		5.0	5.0		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1373		84	1385		188		339	398	368	352
v/s Ratio Prot		0.39			0.29					0.13	c0.28	
v/s Ratio Perm				c0.40			c0.24		0.08			0.23
v/c Ratio		1.01		1.04	0.75		1.15		0.36	0.57	1.19	0.98
Uniform Delay, d1		27.6		27.6	23.8		35.5		30.4	30.5	34.5	34.4
Progression Factor		1.00		1.00	1.00		1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		26.5		108.3	3.8		113.3		0.7	1.8	109.8	42.7
Delay (s)		54.1		135.8	27.7		148.9		31.0	32.4	144.4	77.1
Level of Service		D		F	C		F		C	C	F	E
Approach Delay (s)		54.1			36.0			91.3			96.1	
Approach LOS		D			D			F			F	

Intersection Summary		
HCM 2000 Control Delay	64.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.10	E
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	85.5%	15.3
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		E

LANE SUMMARY

 Site: 1 [Arlington AM 2022]

Arlington & Tuscarawas
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Bedford													
Lane 1 ^d	76	5.1	501	0.152	100	9.2	LOS A	0.4	9.9	Full	1600	0.0	0.0
Lane 2	33	3.7	481	0.068	100	8.4	LOS A	0.2	4.4	Short	100	0.0	NA
Approach	109	4.7		0.152		9.0	LOS A	0.4	9.9				
East: Tuscarawas													
Lane 1 ^d	583	0.6	992	0.588	100	11.6	LOS B	4.0	101.4	Full	1600	0.0	0.0
Lane 2	580	1.2	987	0.588	100	11.7	LOS B	4.0	100.7	Full	1600	0.0	0.0
Lane 3	54	0.0	1094	0.050	100	3.7	LOS A	0.2	4.4	Short	200	0.0	NA
Approach	1217	0.9		0.588		11.3	LOS B	4.0	101.4				
North: Arlington													
Lane 1	79	1.0	433	0.182	100	11.1	LOS B	0.5	12.4	Full	1600	0.0	0.0
Lane 2 ^d	84	0.9	462	0.182	100	10.4	LOS B	0.5	12.0	Short	150	0.0	NA
Approach	163	0.9		0.182		10.7	LOS B	0.5	12.4				
West: Tuscarawas													
Lane 1	570	1.4	837	0.681	100	16.4	LOS C	7.4	186.5	Full	1600	0.0	0.0
Lane 2 ^d	582	1.3	854	0.681	100	16.1	LOS C	7.3	183.9	Full	1600	0.0	0.0
Approach	1152	1.3		0.681		16.2	LOS C	7.4	186.5				
Intersection	2641	1.2		0.681		13.3	LOS B	7.4	186.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Sieglösch M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 Site: 1 [Arlington PM 2022]

Arlington & Tuscarawas
Roundabout

Lane Use and Performance													
	Demand	Flows		Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	Cap.	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
South: Bedford													
Lane 1 ^d	261	0.0	392	0.665	100	28.9	LOS D	3.1	77.7	Full	1600	0.0	0.0
Lane 2	163	0.0	364	0.448	100	19.9	LOS C	1.6	39.9	Short	100	0.0	NA
Approach	424	0.0		0.665		25.5	LOS D	3.1	77.7				
East: Tuscarawas													
Lane 1	805	1.0	825	0.976	100	47.9	LOS E	38.3	965.9	Full	1600	0.0	0.0
Lane 2 ^d	804	1.1	824	0.976	100	47.9	LOS E	38.3	965.5	Full	1600	0.0	0.0
Lane 3	22	1.0	1083	0.020	100	3.5	LOS A	0.1	1.7	Short	200	0.0	NA
Approach	1630	1.1		0.976		47.3	LOS E	38.3	965.9				
North: Arlington													
Lane 1 ^d	163	1.0	296	0.550	100	28.8	LOS D	1.9	48.9	Full	1600	0.0	0.0
Lane 2	65	1.0	270	0.242	100	18.8	LOS C	0.7	16.5	Short	150	0.0	NA
Approach	228	1.0		0.550		25.9	LOS D	1.9	48.9				
West: Tuscarawas													
Lane 1	716	0.7	863	0.830	100	25.1	LOS D	16.6	416.1	Full	1600	0.0	0.0
Lane 2 ^d	730	0.6	879	0.830	100	24.7	LOS C	16.5	414.5	Full	1600	0.0	0.0
Approach	1446	0.6		0.830		24.9	LOS C	16.6	416.1				
Intersection	3728	0.8		0.976		34.8	LOS D	38.3	965.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Sieglöch M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 Site: 1 [Arlington AM 2042]

Arlington & Tuscarawas
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Bedford													
Lane 1 ^d	87	5.2	456	0.191	100	10.7	LOS B	0.5	12.5	Full	1600	0.0	0.0
Lane 2	33	3.7	435	0.075	100	9.3	LOS A	0.2	4.9	Short	100	0.0	NA
Approach	120	4.8		0.191		10.3	LOS B	0.5	12.5				
East: Tuscarawas													
Lane 1 ^d	654	0.6	981	0.667	100	14.0	LOS B	5.3	132.7	Full	1600	0.0	0.0
Lane 2	650	1.2	975	0.667	100	14.1	LOS B	5.2	131.6	Full	1600	0.0	0.0
Lane 3	22	0.0	1094	0.020	100	3.5	LOS A	0.1	1.7	Short	200	0.0	NA
Approach	1326	0.9		0.667		13.9	LOS B	5.3	132.7				
North: Arlington													
Lane 1	94	1.0	386	0.244	100	13.5	LOS B	0.7	17.4	Full	1600	0.0	0.0
Lane 2 ^d	101	0.9	415	0.244	100	12.7	LOS B	0.7	16.9	Short	150	0.0	NA
Approach	196	0.9		0.244		13.1	LOS B	0.7	17.4				
West: Tuscarawas													
Lane 1	634	1.4	803	0.789	100	23.0	LOS C	11.5	291.4	Full	1600	0.0	0.0
Lane 2 ^d	649	1.3	822	0.789	100	22.6	LOS C	11.5	289.9	Full	1600	0.0	0.0
Approach	1283	1.3		0.789		22.8	LOS C	11.5	291.4				
Intersection	2924	1.3		0.789		17.6	LOS C	11.5	291.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Siegloch M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 Site: 1 [Arlington PM 2042]

Arlington & Tuscarawas
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Bedford													
Lane 1 ^d	304	0.1	348	0.876	100	56.5	LOS F	6.1	153.1	Full	1600	0.0	0.0
Lane 2	163	0.0	320	0.510	100	25.0	LOS C	1.9	46.4	Short	100	0.0	NA
Approach	467	0.0		0.876		45.5	LOS E	6.1	153.1				
East: Tuscarawas													
Lane 1	897	1.0	789	1.136	100	97.4	LOS F	65.6	1654.1	Full	1600	0.0	6.0
Lane 2 ^d	896	1.1	789	1.136	100	97.4	LOS F	65.6	1654.0	Full	1600	0.0	6.0
Lane 3	22	1.0	1071	0.020	100	3.5	LOS A	0.1	1.7	Short	200	0.0	NA
Approach	1815	1.1		1.136		96.3	LOS F	65.6	1654.1				
North: Arlington													
Lane 1	109	1.0	269	0.404	100	24.2	LOS C	1.3	31.6	Full	1600	0.0	0.0
Lane 2 ^d	120	1.0	296	0.404	100	22.2	LOS C	1.2	31.2	Short	150	0.0	NA
Approach	228	1.0		0.404		23.1	LOS C	1.3	31.6				
West: Tuscarawas													
Lane 1	786	0.7	849	0.926	100	37.4	LOS E	26.5	666.5	Full	1600	0.0	0.0
Lane 2 ^d	801	0.6	865	0.926	100	36.9	LOS E	26.6	669.0	Full	1600	0.0	0.0
Approach	1587	0.6		0.926		37.2	LOS E	26.6	669.0				
Intersection	4098	0.8		1.136		63.5	LOS F	65.6	1654.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Sieglösch M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 Site: 1 [Broad AM 2022]

Broad & Tuscarawas
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Dartmouth													
Lane 1	33	0.0	477	0.068	100	8.4	LOS A	0.2	4.5	Full	1600	0.0	0.0
Lane 2 ^d	141	2.6	492	0.287	100	11.7	LOS B	0.8	21.5	Short	150	0.0	NA
Approach	174	2.1		0.287		11.1	LOS B	0.8	21.5				
East: Tuscarawas													
Lane 1 ^d	544	1.2	978	0.557	100	11.0	LOS B	3.5	89.5	Full	1600	0.0	0.0
Lane 2	543	1.5	974	0.557	100	11.0	LOS B	3.5	89.2	Full	1600	0.0	0.0
Lane 3	33	0.0	1033	0.032	100	3.8	LOS A	0.1	2.7	Short	250	0.0	NA
Approach	1120	1.3		0.557		10.8	LOS B	3.5	89.5				
North: Broad													
Lane 1	130	2.0	469	0.278	100	12.0	LOS B	0.8	21.3	Full	1600	0.0	0.0
Lane 2 ^d	130	1.1	501	0.260	100	11.0	LOS B	0.7	18.7	Short	150	0.0	NA
Approach	261	1.6		0.278		11.5	LOS B	0.8	21.3				
West: Tuscarawas													
Lane 1	575	1.8	669	0.859	100	33.6	LOS D	14.5	368.0	Full	1600	0.0	0.0
Lane 2 ^d	577	1.4	672	0.859	100	33.5	LOS D	14.6	368.4	Full	1600	0.0	0.0
Approach	1152	1.6		0.859		33.5	LOS D	14.6	368.4				
Intersection	2707	1.5		0.859		20.5	LOS C	14.6	368.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Sieglösch M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 Site: 1 [Broad PM 2022]

Broad & Tuscarawas
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Dartmouth													
Lane 1	43	0.0	431	0.101	100	9.8	LOS A	0.3	6.7	Full	1600	0.0	0.0
Lane 2 ^d	228	0.0	460	0.496	100	17.8	LOS C	2.0	49.2	Short	150	0.0	NA
Approach	272	0.0		0.496		16.5	LOS C	2.0	49.2				
East: Tuscarawas													
Lane 1	826	0.9	899	0.919	100	34.9	LOS D	35.5	893.3	Full	1600	0.0	0.0
Lane 2 ^d	826	1.0	899	0.919	100	34.9	LOS D	35.4	892.9	Full	1600	0.0	0.0
Lane 3	109	0.0	959	0.113	100	9.2	LOS A	0.4	10.5	Short	150	0.0	NA
Approach	1761	0.9		0.919		33.3	LOS D	35.5	893.3				
North: Broad													
Lane 1	98	0.0	310	0.315	100	18.4	LOS C	0.9	23.5	Full	1600	0.0	0.0
Lane 2 ^d	130	0.0	338	0.385	100	19.1	LOS C	1.2	30.3	Short	150	0.0	NA
Approach	228	0.0		0.385		18.8	LOS C	1.2	30.3				
West: Tuscarawas													
Lane 1	614	1.0	900	0.682	100	15.5	LOS C	9.5	238.5	Full	1600	0.0	0.0
Lane 2 ^d	614	0.9	901	0.682	100	15.5	LOS C	9.5	238.6	Full	1600	0.0	0.0
Approach	1228	0.9		0.682		15.5	LOS C	9.5	238.6				
Intersection	3489	0.8		0.919		24.8	LOS C	35.5	893.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Sieglösch M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 Site: 1 [Broad AM 2042]

Broad & Tuscarawas
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Dartmouth													
Lane 1	22	0.0	443	0.049	100	8.8	LOS A	0.1	3.2	Full	1600	0.0	0.0
Lane 2 ^d	43	2.6	459	0.095	100	9.1	LOS A	0.2	6.0	Short	150	0.0	NA
Approach	65	1.7		0.095		9.0	LOS A	0.2	6.0				
East: Tuscarawas													
Lane 1 ^d	610	1.2	988	0.617	100	12.4	LOS B	4.4	111.7	Full	1600	0.0	0.0
Lane 2	608	1.5	985	0.617	100	12.4	LOS B	4.4	111.3	Full	1600	0.0	0.0
Lane 3	33	0.0	1033	0.032	100	3.8	LOS A	0.1	2.7	Short	250	0.0	NA
Approach	1250	1.3		0.617		12.2	LOS B	4.4	111.7				
North: Broad													
Lane 1	141	2.0	428	0.330	100	14.1	LOS B	1.1	26.8	Full	1600	0.0	0.0
Lane 2 ^d	141	1.1	461	0.307	100	12.8	LOS B	0.9	23.5	Short	150	0.0	NA
Approach	283	1.6		0.330		13.5	LOS B	1.1	26.8				
West: Tuscarawas													
Lane 1	629	1.8	633	0.994	100	59.7	LOS F	26.0	660.1	Full	1600	0.0	0.0
Lane 2 ^d	632	1.4	636	0.994	100	59.5	LOS F	26.2	660.9	Full	1600	0.0	0.0
Approach	1261	1.6		0.994		59.6	LOS F	26.2	660.9				
Intersection	2859	1.5		0.994		33.2	LOS D	26.2	660.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Sieglösch M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 Site: 1 [Broad PM 2042]

Broad & Tuscarawas
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Dartmouth													
Lane 1	43	0.0	394	0.110	100	10.8	LOS B	0.3	7.3	Full	1600	0.0	0.0
Lane 2 ^d	239	0.0	423	0.565	100	21.8	LOS C	2.4	59.3	Short	150	0.0	NA
Approach	283	0.0		0.565		20.1	LOS C	2.4	59.3				
East: Tuscarawas													
Lane 1	924	0.9	880	1.050	100	65.8	LOS F	61.4	1545.8	Full	1600	0.0	4.0
Lane 2 ^d	924	1.0	879	1.050	100	65.8	LOS F	61.3	1545.8	Full	1600	0.0	4.0
Lane 3	120	0.0	938	0.128	100	9.4	LOS A	0.5	11.9	Short	150	0.0	NA
Approach	1967	0.9		1.050		62.4	LOS F	61.4	1545.8				
North: Broad													
Lane 1	98	0.0	286	0.342	100	20.7	LOS C	1.0	25.7	Full	1600	0.0	0.0
Lane 2 ^d	152	0.0	314	0.485	100	24.2	LOS C	1.6	41.1	Short	150	0.0	NA
Approach	250	0.0		0.485		22.8	LOS C	1.6	41.1				
West: Tuscarawas													
Lane 1	685	1.0	896	0.764	100	19.6	LOS C	15.1	381.1	Full	1600	0.0	0.0
Lane 2 ^d	685	0.9	896	0.764	100	19.6	LOS C	15.1	381.2	Full	1600	0.0	0.0
Approach	1370	0.9		0.764		19.6	LOS C	15.1	381.2				
Intersection	3870	0.8		1.050		41.6	LOS E	61.4	1545.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Sieglach M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 Site: 1 [Raff AM 2022]

Broad & Tuscarawas
Roundabout

Lane Use and Performance													
	Demand Flows			Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV	Cap.	Satn	Util.	Delay	Service	Veh	Dist		ft	%	%
	veh/h	%	veh/h	v/c	%	sec			ft				
South: Raff													
Lane 1	141	3.3	510	0.277	98 ⁵	11.1	LOS B	0.8	21.3	Full	1600	0.0	0.0
Lane 2 ^d	152	2.8	539	0.282	100	10.7	LOS B	0.8	21.2	Full	1600	0.0	0.0
Approach	293	3.1		0.282		10.9	LOS B	0.8	21.3				
East: Tuscarawas													
Lane 1	406	2.3	934	0.435	100	9.0	LOS A	1.7	43.2	Full	1600	0.0	0.0
Lane 2 ^d	409	2.8	940	0.435	100	8.9	LOS A	1.6	40.7	Full	1600	0.0	0.0
Approach	815	2.6		0.435		8.9	LOS A	1.7	43.2				
North: Raff													
Lane 1 ^d	76	7.8	527	0.144	100	8.7	LOS A	0.4	9.3	Full	1600	0.0	0.0
Lane 2	11	0.0	541	0.020	100	6.9	LOS A	0.1	1.3	Full	1600	0.0	0.0
Approach	87	6.8		0.144		8.5	LOS A	0.4	9.3				
West: Tuscarawas													
Lane 1	494	1.3	861	0.574	100	12.5	LOS B	5.0	125.6	Full	1600	0.0	0.0
Lane 2 ^d	495	1.1	863	0.574	100	12.5	LOS B	5.0	125.8	Full	1600	0.0	0.0
Approach	989	1.2		0.574		12.5	LOS B	5.0	125.8				
Intersection	2185	2.2		0.574		10.8	LOS B	5.0	125.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Siegloch M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

⁵ Lane under-utilisation found by the program

^d Dominant lane on roundabout approach

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LANE SUMMARY

 Site: 1 [Raff PM 2022]

Broad & Tuscarawas
Roundabout

Lane Use and Performance													
	Demand	Flows		Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	Cap.	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
South: Raff													
Lane 1	303	0.8	525	0.577	100	18.7	LOS C	2.9	73.3	Full	1600	0.0	0.0
Lane 2 ^d	316	1.7	548	0.577	100	18.0	LOS C	2.9	72.2	Full	1600	0.0	0.0
Approach	620	1.2		0.577		18.3	LOS C	2.9	73.3				
East: Tuscarawas													
Lane 1	691	1.2	765	0.904	100	36.4	LOS E	18.7	472.5	Full	1600	0.0	0.0
Lane 2 ^d	711	0.9	787	0.904	100	35.7	LOS E	18.9	475.3	Full	1600	0.0	0.0
Approach	1402	1.0		0.904		36.0	LOS E	18.9	475.3				
North: Raff													
Lane 1 ^d	87	2.5	313	0.278	100	17.3	LOS C	0.8	19.3	Full	1600	0.0	0.0
Lane 2	11	0.0	293	0.037	100	13.0	LOS B	0.1	2.3	Full	1600	0.0	0.0
Approach	98	2.2		0.278		16.8	LOS C	0.8	19.3				
West: Tuscarawas													
Lane 1 ^d	555	0.9	803	0.691	100	17.3	LOS C	8.8	221.2	Full	1600	0.0	0.0
Lane 2	554	1.1	802	0.691	100	17.3	LOS C	8.8	221.0	Full	1600	0.0	0.0
Approach	1109	1.0		0.691		17.3	LOS C	8.8	221.2				
Intersection	3228	1.1		0.904		25.6	LOS D	18.9	475.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Siegloch M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 Site: 1 [Raff AM 2042]

Broad & Tuscarawas
Roundabout

Lane Use and Performance													
	Demand Flows			Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV	Cap.	v/c	%	sec		Veh	Dist		ft	%	%
	veh/h	%	veh/h						ft				
South: Raff													
Lane 1	152	3.3	466	0.327	93 ⁵	13.1	LOS B	1.0	26.9	Full	1600	0.0	0.0
Lane 2 ^d	174	2.8	495	0.351	100	12.9	LOS B	1.1	29.2	Full	1600	0.0	0.0
Approach	326	3.0		0.351		13.0	LOS B	1.1	29.2				
East: Tuscarawas													
Lane 1	444	2.3	918	0.484	100	10.0	LOS A	2.1	52.6	Full	1600	0.0	0.0
Lane 2 ^d	447	2.8	925	0.484	100	9.9	LOS A	1.9	49.7	Full	1600	0.0	0.0
Approach	891	2.6		0.484		9.9	LOS A	2.1	52.6				
North: Raff													
Lane 1 ^d	98	7.8	495	0.198	100	10.0	LOS B	0.5	13.0	Full	1600	0.0	0.0
Lane 2	11	0.0	506	0.021	100	7.4	LOS A	0.1	1.4	Full	1600	0.0	0.0
Approach	109	7.1		0.198		9.8	LOS A	0.5	13.0				
West: Tuscarawas													
Lane 1	554	1.3	832	0.666	100	15.8	LOS C	8.1	205.2	Full	1600	0.0	0.0
Lane 2 ^d	555	1.1	834	0.666	100	15.8	LOS C	8.1	205.3	Full	1600	0.0	0.0
Approach	1109	1.2		0.666		15.8	LOS C	8.1	205.3				
Intersection	2435	2.2		0.666		13.0	LOS B	8.1	205.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Siegloch M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

⁵ Lane under-utilisation found by the program

^d Dominant lane on roundabout approach

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LANE SUMMARY

 Site: 1 [Raff PM 2042]

Broad & Tuscarawas
Roundabout

Lane Use and Performance													
	Demand Total	Flows HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Raff													
Lane 1	313	0.8	500	0.626	100	21.6	LOS C	3.3	83.9	Full	1600	0.0	0.0
Lane 2 ^d	328	1.6	524	0.626	100	20.8	LOS C	3.3	83.0	Full	1600	0.0	0.0
Approach	641	1.2		0.626		21.2	LOS C	3.3	83.9				
East: Tuscarawas													
Lane 1	744	1.3	752	0.990	100	53.7	LOS F	28.8	727.6	Full	1600	0.0	0.0
Lane 2 ^d	767	0.9	775	0.990	100	52.8	LOS F	29.3	738.2	Full	1600	0.0	0.0
Approach	1511	1.1		0.990		53.2	LOS F	29.3	738.2				
North: Raff													
Lane 1 ^d	98	2.2	284	0.345	100	21.0	LOS C	1.0	25.1	Full	1600	0.0	0.0
Lane 2	11	0.0	263	0.041	100	14.5	LOS B	0.1	2.6	Full	1600	0.0	0.0
Approach	109	2.0		0.345		20.3	LOS C	1.0	25.1				
West: Tuscarawas													
Lane 1 ^d	620	0.9	812	0.764	100	21.1	LOS C	12.8	321.0	Full	1600	0.0	0.0
Lane 2	619	1.1	810	0.764	100	21.1	LOS C	12.7	320.7	Full	1600	0.0	0.0
Approach	1239	1.0		0.764		21.1	LOS C	12.8	321.0				
Intersection	3500	1.1		0.990		35.0	LOS D	29.3	738.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Siegloch M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

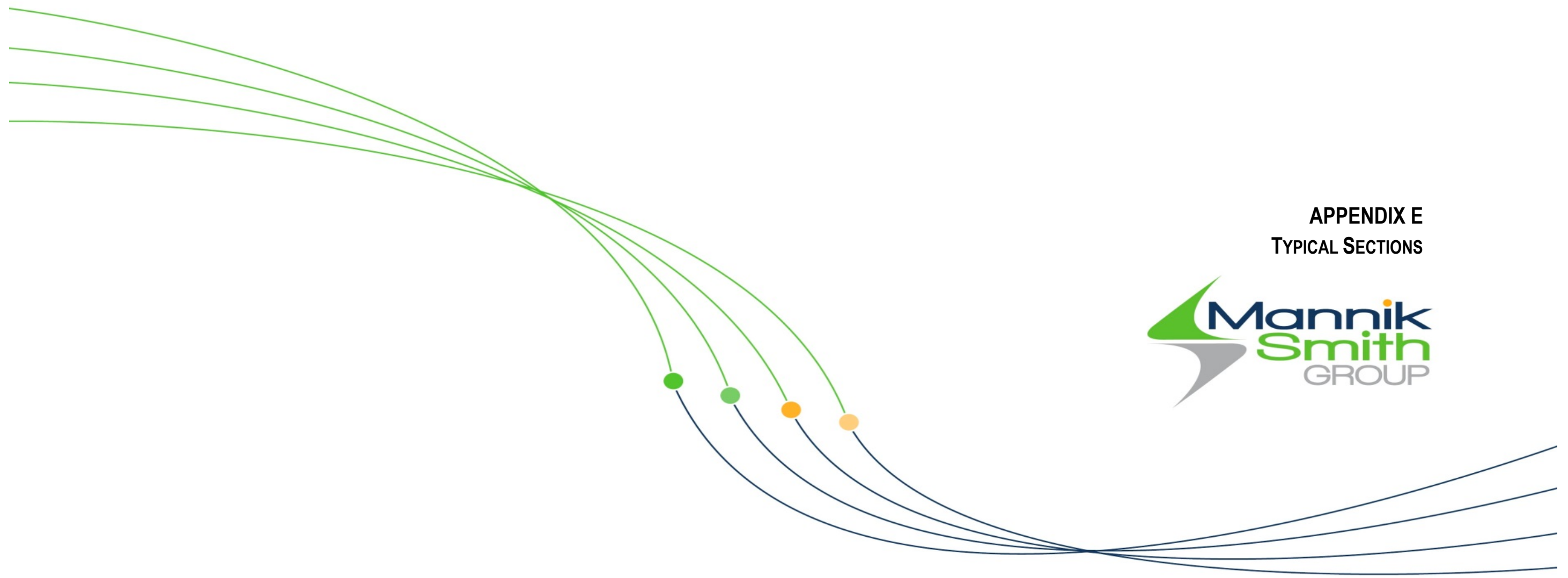
^d Dominant lane on roundabout approach

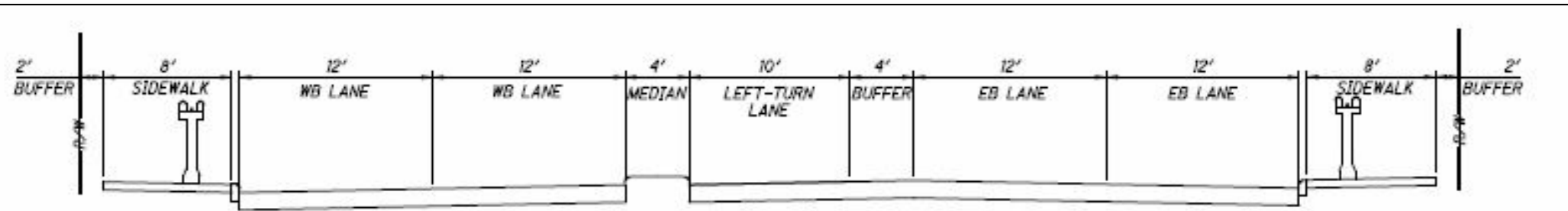
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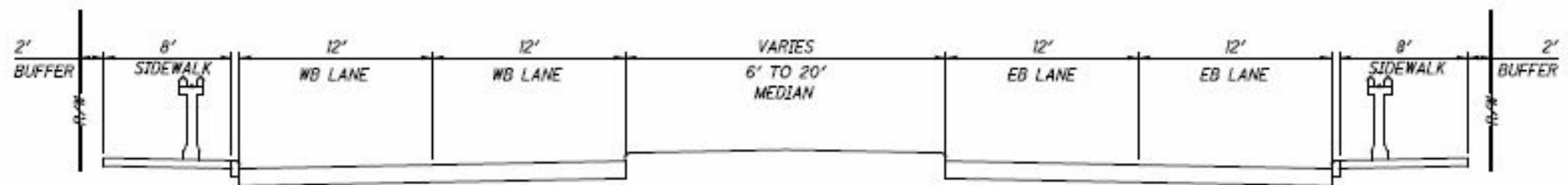
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APPENDIX E
TYPICAL SECTIONS

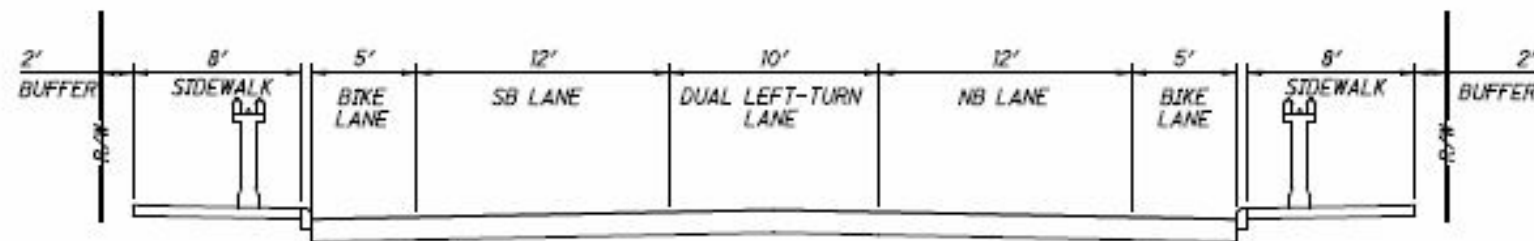




TYPICAL SECTION - WITH LEFT TURN LANE AND MEDIAN

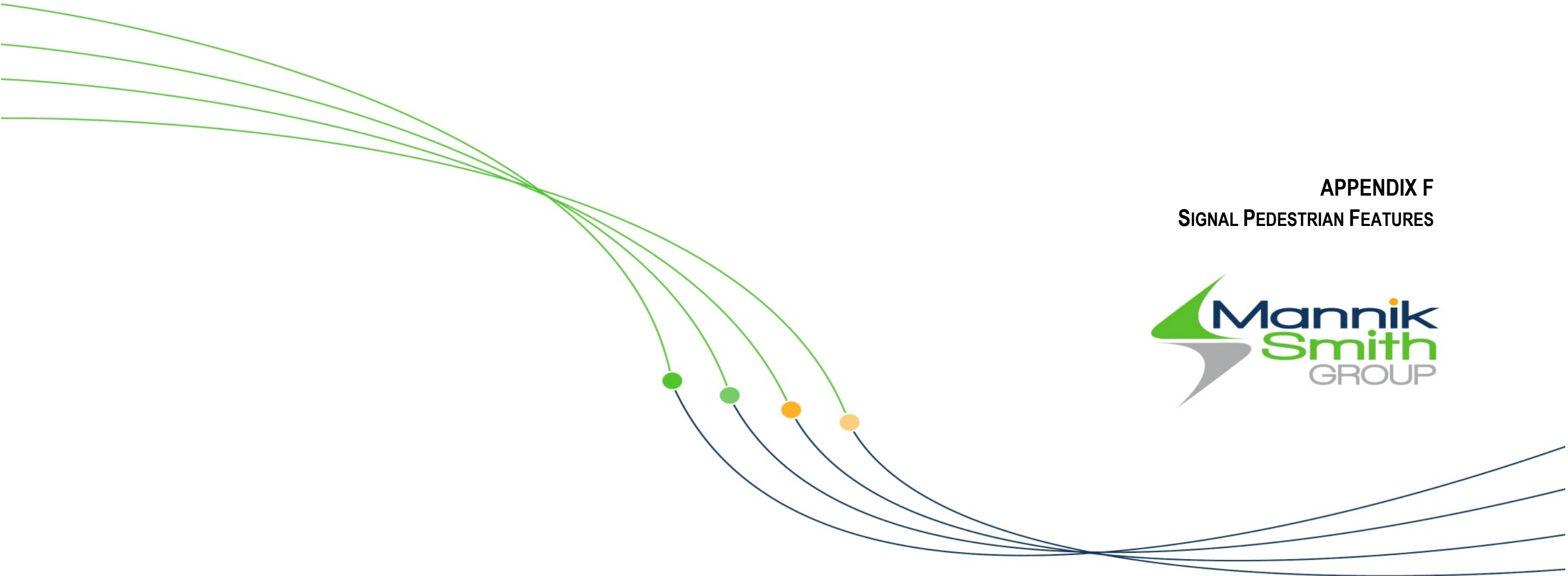


TYPICAL SECTION - WITH MEDIAN (NO LEFT-TURN LANE)



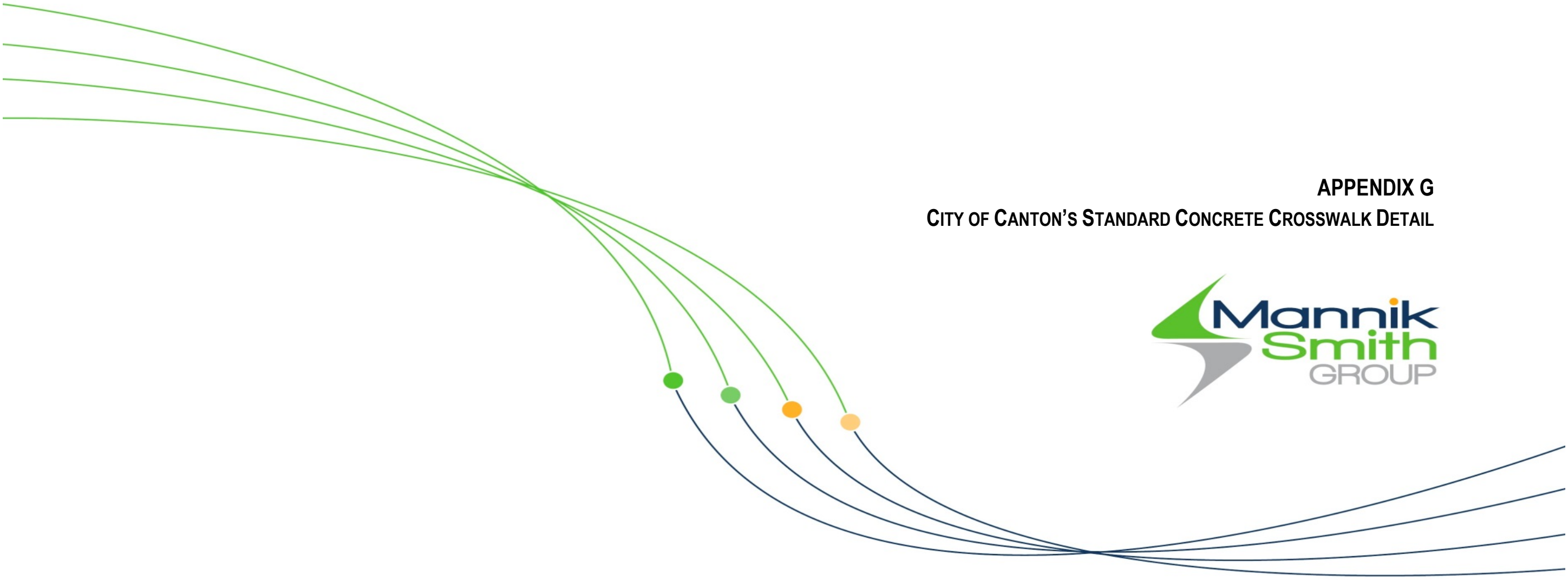
TYPICAL SECTION - RAFF ROAD WITH BIKE LANE

APPENDIX F
SIGNAL PEDESTRIAN FEATURES

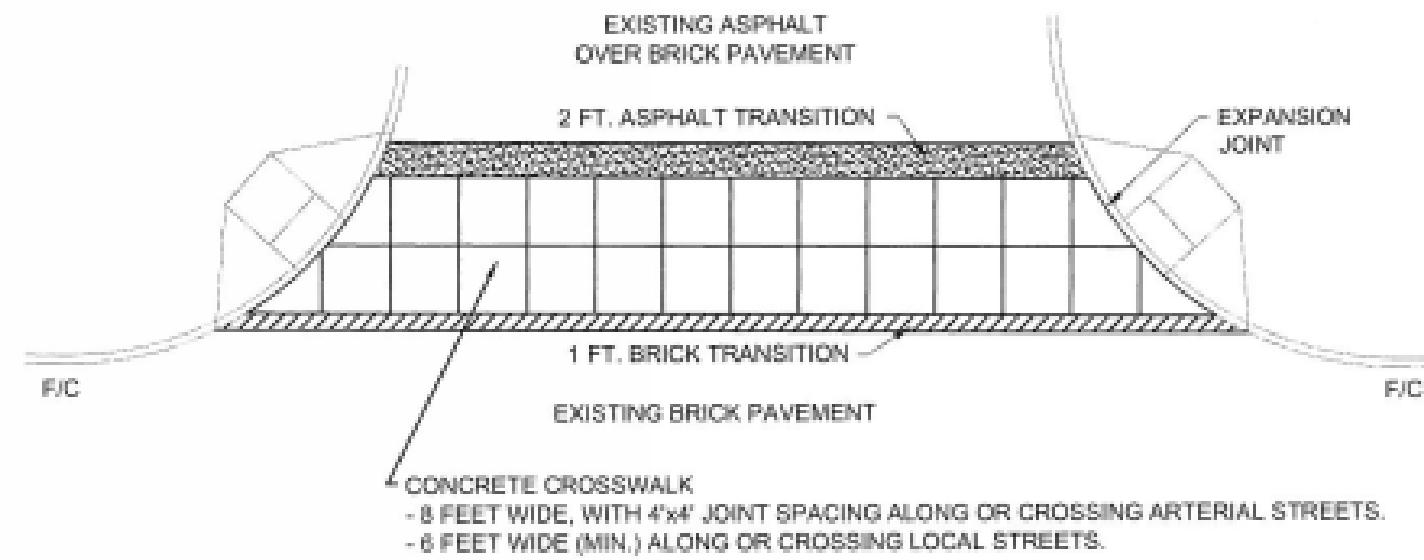


		Ped Volumes		
Intersection	Crosswalks	E/W/N/S	Ped Heads	Compliant ?
I-77 SB Ramps/Harrison Ave SW	North, South, East	30/14/9/7	Yes	No
Harrison Avenue NW	West, North	54/23/32/23	Yes	No
Bedford Avenue SW	East, West	0/23/7/15	Yes	No
Broad Avenue NW	East, West	20/0/3/3	Yes	No
Wertz Avenue NW	East, West, North	38/13/25/20	Yes	No
Maryland Avenue SW	East, West, South	25/40/26/31	Yes	No
Bellflower Avenue NW	East, South	35/51/6/20	Yes	No
Raff Road	East, South, North	32/20/9/18	Yes	No
Valleyview Avenue	East, North	11/11/5/5	Yes	No
Whipple Avenue	East, West, North	22/14/8/0	Yes - countdwn	Yes
* Ped Volumes are total observed from 7-9A, 11A-1P and 2-6P in 2015				

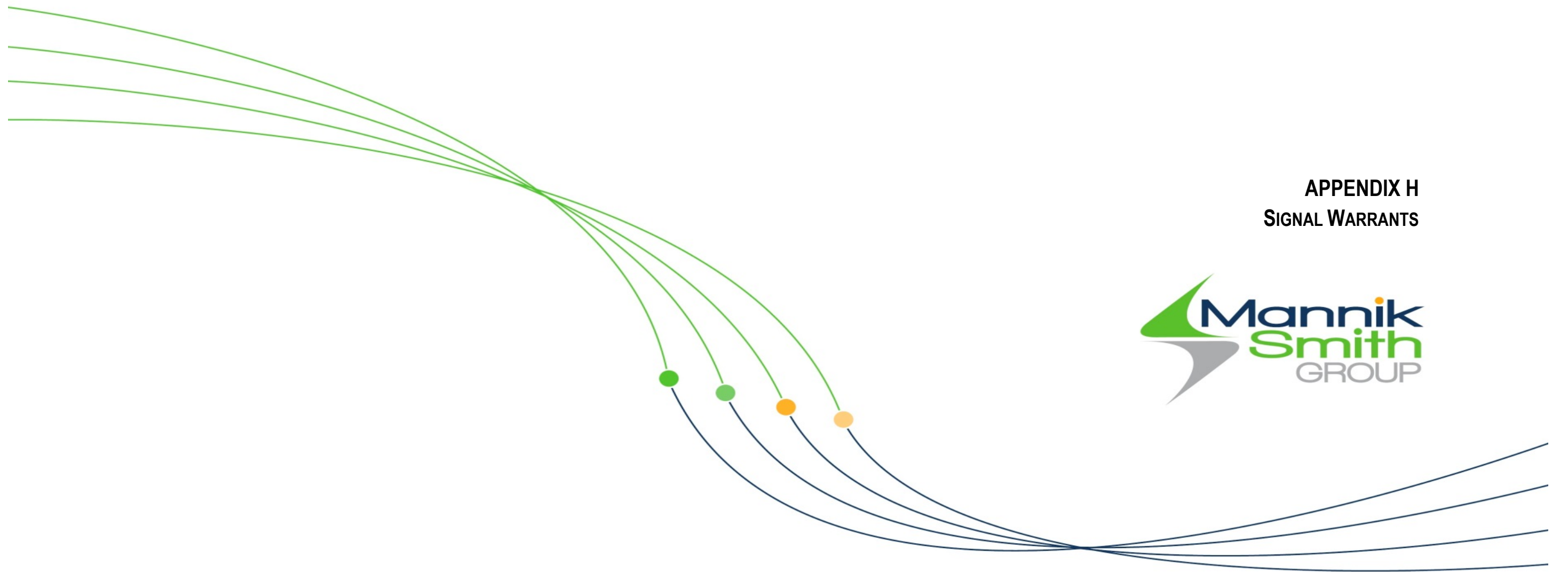
APPENDIX G
CITY OF CANTON'S STANDARD CONCRETE CROSSWALK DETAIL



PLAN VIEW



APPENDIX H
SIGNAL WARRANTS



SIGNAL WARRANT REPORT

TUSCARAWAS ST. (SR 172) CANTON, OH
PID 92562



JUNE 2017

PREPARED FOR:
THE CITY OF CANTON
218 CLEVELAND AVENUE S.W.
CANTON, OH 44702



SUMMARY

The City of Canton is evaluating potential improvements to Tuscarawas Street (SR 172) between Whipple Avenue and Harrison Avenue. The corridor includes the following nine (9) existing signalized intersections: Whipple Avenue, Valleyview Avenue, Raff Road, Bellflower Avenue, Maryland Avenue, Wertz Avenue, Broad Avenue, Bedford Avenue, and Harrison Avenue. The project will likely involve reconstruction of the roadway, intersection improvements and realignments, curb, sidewalk, drive approaches, as well as traffic signal upgrades. To implement the traffic signal upgrades using state or federal funding, signal warrants are required to be met. This memo documents the signal warrant analysis performed for the nine (9) existing signalized intersections and one (1) existing stop controlled intersection, Dartmouth Avenue, which is expected to be realigned and converted to a signal as a potential improvement. The following signal warrants as described in the Ohio Manual of Uniform Traffic Control Devices (OMUTCD) were evaluated for this study:

- Warrant #1 – Eight-Hour Vehicular Volume (Conditions A, B, or C are necessary for warrant)
- Warrant #2 – Four-Hour Vehicular Volume (Condition must met for 4 hours)
- Warrant #3 – Peak Hour Vehicular Volume (Condition A or B as necessary, 100% volumes)

All other OMUTCD signal warrants were not evaluated or deemed not applicable. PC Warrants, a signal warrant analysis software package, was used to perform the analysis per Ohio Department of Transportation (ODOT) requirements. The 100 percent volume criteria were used for these analyses, as Tuscarawas Street was used as the major street for all analyses and has a posted speed limit of 35 mph. To be conservative, minor streets were assumed to have two lanes if an exclusive left turn lane was present. Right turn on red reductions following the ODOT Traffic Engineering Manual Section 402-5 were applied to the Whipple Avenue intersection, as this intersection is ODOT maintained. The warrant analyses were conducted based on traffic counts performed on Tuesday, September 22nd 2015 thru Thursday, September 24th 2015 and Tuesday, September 29th 2015 thru Wednesday, September 30th 2015 during an AM peak period (7:00 AM – 9:00 AM), a Midday peak period (11:00 AM - 1:00 PM) and a PM peak period (2:00 PM – 6:00 PM). The analysis yielded the following conclusions by intersection:

Cross Street Name		Warrant 1 Eight Hour Volume	Warrant 2 Four Hour Volume	Warrant 3 Peak Hour Volume
1	Whipple Avenue	SATISFIED	SATISFIED	SATISFIED
2	Valleyview Avenue	NOT SATISFIED	SATISFIED	SATISFIED
3	Raff Road	SATISFIED	SATISFIED	SATISFIED
4	Bellflower Avenue	NOT SATISFIED	SATISFIED	SATISFIED
5	Maryland Avenue	SATISFIED	SATISFIED	SATISFIED
6	Wertz Avenue	SATISFIED	SATISFIED	SATISFIED
7	Broad Avenue	SATISFIED	SATISFIED	SATISFIED
8	Dartmouth Avenue	NOT SATISFIED	SATISFIED	SATISFIED
9	Bedford Avenue	SATISFIED	SATISFIED	SATISFIED
10	Harrison Avenue	SATISFIED	SATISFIED	SATISFIED

As shown in the table above, all intersections evaluated on the corridor meet at least two warrants under the existing (2015) traffic volumes.

1.0 **SIGNAL WARRANTS**

1.1 **Tuscarawas Street & Whipple Avenue**

The intersection of Tuscarawas Street and Whipple Avenue is the western limit of the project area. This intersection has a total of four (4) approaches, with main road Tuscarawas Street providing two (2) lanes on each approach, and Whipple Avenue being analyzed as a two (2) lane approach in PC Warrants. Table 2.1 provides a summary of signal warrant analyses for the intersection. The table indicates that the intersection meets Warrant 1, 2, and 3. Further information regarding the warrant analyses can be found in Appendix D.

Table 2 - Tuscarawas Street & Whipple Avenue Signal Warrant Summary		
Warrant		Summary of Criteria Evaluation
		Existing Conditions (2015)
1	Eight-Hour Vehicular Volume	SATISFIED 1A (8 Hours needed, 8 Hours achieved) 1B (8 Hours needed, 8 Hours achieved) 1C (8 Hours needed, 8 Hours achieved)
2	Four-Hour Vehicular Volume	SATISFIED 2 (4 Hours needed, 8 Hours achieved)
3	Peak Hour	SATISFIED 3A (Satisfied) 3B (Satisfied)
4	Pedestrian Volume	NOT EVALUATED
5	School Crossing	NOT EVALUATED
6	Coordinated Signal System	NOT APPLICABLE
7	Crash Experience	NOT EVALUATED
8	Roadway Network	NOT EVALUATED
9	Intersection Near a Grade Crossing	NOT APPLICABLE



Figure 1 - Tuscarawas Street & Whipple Avenue

1.2 Tuscarawas Street & Valleyview Avenue

The intersection of Tuscarawas Street and Valleyview Avenue is located east of Whipple Avenue. This intersection has a total of four (4) approaches; all approaches were analyzed as two (2) lanes in PC Warrants. Table 2.1 provides a summary of the signal warrant analyses. The table indicates that this intersection does not meet Warrant 1, but does meet Warrant 2 and 3. Further information regarding the warrant analyses can be found in Appendix D.

Table 3 - Tuscarawas Street & Valleyview Avenue Signal Warrant Summary		
Warrant		Summary of Criteria Evaluation
		Existing Conditions (2015)
1	Eight-Hour Vehicular Volume	NOT SATISFIED 1A (8 Hours needed, 6 Hours achieved) 1B (8 Hours needed, 6 Hours achieved) 1C (8 Hours needed, 6 Hours achieved)
2	Four-Hour Vehicular Volume	SATISFIED 2 (4 Hours needed, 6 Hours achieved)
3	Peak Hour	SATISFIED 3A (Satisfied) 3B (Satisfied)
4	Pedestrian Volume	NOT EVALUATED
5	School Crossing	NOT EVALUATED
6	Coordinated Signal System	NOT APPLICABLE
7	Crash Experience	NOT EVALUATED
8	Roadway Network	NOT EVALUATED
9	Intersection Near a Grade Crossing	NOT APPLICABLE



Figure 2 - Tuscarawas Street & Valleyview Avenue

1.3 Tuscarawas Street & Raff Road

The intersection Tuscarawas Street and Raff Road is located east of Valleyview Avenue. This intersection has a total of four (4) approaches; three approaches were analyzed as two lanes and the remaining one approach, Raff Road south bound, was analyzed as one lane in PC Warrants. Table 2.1 provides a summary of the signal warrant analyses. The table indicates that this intersection did meet Warrant 1, 2, and 3. Further information regarding the warrant analyses can be found in Appendix D.

Table 3 - Tuscarawas Street & Raff Road Signal Warrant Summary		
Warrant		Summary of Criteria Evaluation
		Existing Conditions (2015)
1	Eight-Hour Vehicular Volume	SATISFIED 1A (8 Hours needed, 10 Hours achieved) 1B (8 Hours needed, 8 Hours achieved) 1C (8 Hours needed, 8 Hours achieved)
2	Four-Hour Vehicular Volume	SATISFIED 2 (4 Hours needed, 9 Hours achieved)
3	Peak Hour	SATISFIED 3A (Satisfied) 3B (Satisfied)
4	Pedestrian Volume	NOT EVALUATED
5	School Crossing	NOT EVALUATED
6	Coordinated Signal System	NOT APPLICABLE
7	Crash Experience	NOT EVALUATED
8	Roadway Network	NOT EVALUATED
9	Intersection Near a Grade Crossing	NOT APPLICABLE

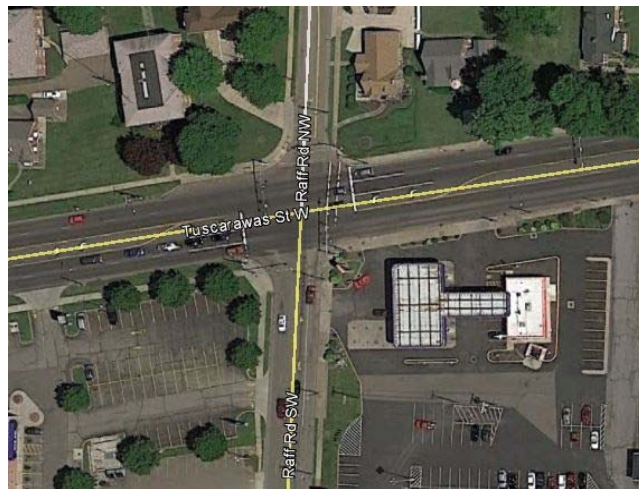


Figure 3 - Tuscarawas Street & Raff Road

1.4 Tuscarawas Street & Bellflower Avenue

The intersection Tuscarawas Street and Bellflower Avenue is located east of Raff Road. This intersection has a total of four (4) approaches; two Tuscarawas Street approaches were analyzed as two (2) lanes and two Bellflower Avenue approaches were analyzed as one (1) lane in PC Warrants. Table 2.1 provides a summary of the signal warrant analyses. The table indicates that this intersection meets Warrants 2 and 3. Further information regarding the warrant analyses can be found in Appendix D.

Table 4 - Tuscarawas Street & Bellflower Signal Warrant Summary		
Warrant		Summary of Criteria Evaluation
		Existing Conditions (2015)
1	Eight-Hour Vehicular Volume	NOT SATISFIED 1A (8 Hours needed, 0 Hours achieved) 1B (8 Hours needed, 5 Hours achieved) 1C (8 Hours needed, 5 Hours achieved)
2	Four-Hour Vehicular Volume	SATISFIED 2 (4 Hours needed, 5 Hours achieved)
3	Peak Hour	SATISFIED 3A (Satisfied) 3B (Satisfied)
4	Pedestrian Volume	NOT EVALUATED
5	School Crossing	NOT EVALUATED
6	Coordinated Signal System	NOT APPLICABLE
7	Crash Experience	NOT EVALUATED
8	Roadway Network	NOT EVALUATED
9	Intersection Near a Grade Crossing	NOT APPLICABLE



Figure 4 - Tuscarawas Street & Bellflower Avenue

1.5 Tuscarawas Street & Maryland Avenue

The intersection Tuscarawas Street and Maryland Avenue is located east of Wertz Avenue. This intersection has a total of three (3) approaches; two Tuscarawas Street approaches were analyzed as two (2) lanes and one Maryland Avenue approach was analyzed as one (1) lane in PC Warrants. Table 2.1 provides a summary of the signal warrant analyses. The table indicates that this intersection meets Warrants 1, 2, and 3. Further information regarding the warrant analyses can be found in Appendix D.

Table 5 - Tuscarawas Street & Maryland Avenue Signal Warrant Summary		
Warrant		Summary of Criteria Evaluation
		Existing Conditions (2015)
1	Eight-Hour Vehicular Volume	SATISFIED 1A (8 Hours needed, 5 Hours achieved) 1B (8 Hours needed, 8 Hours achieved) 1C (8 Hours needed, 7 Hours achieved)
2	Four-Hour Vehicular Volume	SATISFIED 2 (4 Hours needed, 7 Hours achieved)
3	Peak Hour	SATISFIED 3A (Satisfied) 3B (Satisfied)
4	Pedestrian Volume	NOT EVALUATED
5	School Crossing	NOT EVALUATED
6	Coordinated Signal System	NOT APPLICABLE
7	Crash Experience	NOT EVALUATED
8	Roadway Network	NOT EVALUATED
9	Intersection Near a Grade Crossing	NOT APPLICABLE



Figure 5 - Tuscarawas Street & Maryland Avenue

1.6 Tuscarawas Street & Wertz Avenue

The intersection Tuscarawas Street and Wertz Avenue is located east of Maryland Avenue. This intersection has a total of three (3) approaches; all three approaches were analyzed as three (3) lanes in PC Warrants. Table 2.1 provides a summary of the signal warrant analyses. The table indicates that this intersection meets Warrants 1, 2, and 3. Further information regarding the warrant analyses can be found in Appendix D.

Table 6 - Tuscarawas Street & Wertz Avenue Signal Warrant Summary		
Warrant		Summary of Criteria Evaluation
		Existing Conditions (2015)
1	Eight-Hour Vehicular Volume	SATISFIED 1A (8 Hours needed, 5 Hours achieved) 1B (8 Hours needed, 8 Hours achieved) 1C (8 Hours needed, 8 Hours achieved)
2	Four-Hour Vehicular Volume	SATISFIED 2 (4 Hours needed, 8 Hours achieved)
3	Peak Hour	SATISFIED 3A (Satisfied) 3B (Satisfied)
4	Pedestrian Volume	NOT EVALUATED
5	School Crossing	NOT EVALUATED
6	Coordinated Signal System	NOT APPLICABLE
7	Crash Experience	NOT EVALUATED
8	Roadway Network	NOT EVALUATED
9	Intersection Near a Grade Crossing	NOT APPLICABLE



Figure 6 - Tuscarawas Street and Wertz Avenue

1.7 Tuscarawas Street & Broad Avenue

The intersection Tuscarawas Street and Broad Avenue is located east of Wertz Avenue. This intersection has a total of three (3) approaches; all three approaches were analyzed as three (3) lanes in PC Warrants. Table 2.1 provides a summary of the signal warrant analyses. The table indicates that this intersection meets Warrants 1, 2, and 3. Further information regarding the warrant analyses can be found in Appendix D.

Table 7 - Tuscarawas Street & Broad Avenue Signal Warrant Summary		
Warrant		Summary of Criteria Evaluation
		Existing Conditions (2015)
1	Eight-Hour Vehicular Volume	SATISFIED 1A (8 Hours needed, 0 Hours achieved) 1B (8 Hours needed, 8 Hours achieved) 1C (4 Hours needed, 8 Hours achieved)
2	Four-Hour Vehicular Volume	SATISFIED 2 (4 Hours needed, 8 Hours achieved)
3	Peak Hour	SATISFIED 3A (Satisfied) 3B (Satisfied)
4	Pedestrian Volume	NOT EVALUATED
5	School Crossing	NOT EVALUATED
6	Coordinated Signal System	NOT APPLICABLE
7	Crash Experience	NOT EVALUATED
8	Roadway Network	NOT EVALUATED
9	Intersection Near a Grade Crossing	NOT APPLICABLE

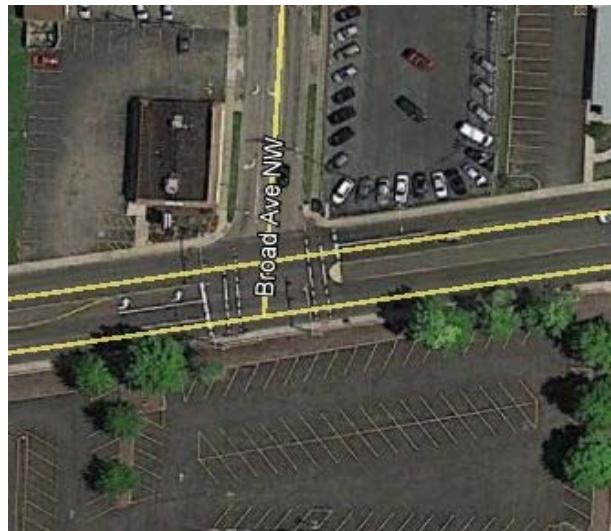


Figure 7 - Tuscarawas Street and Broad Avenue

1.8 Tuscarawas Street & Dartmouth Avenue

The intersection Tuscarawas Street and Dartmouth Avenue is located east of Broad Avenue. This intersection has a total of three (3) approaches; two Tuscarawas Street approaches were analyzed as two (2) lanes and one Dartmouth Avenue approach was analyzed as one (1) lane in PC Warrants. Table 2.1 provides a summary of the signal warrant analyses. The table indicates that this intersection meets Warrants 2 and 3. Further information regarding the warrant analyses can be found in Appendix D.

Table 8 - Tuscarawas Street & Dartmouth Avenue Signal Warrant Summary		
Warrant		Summary of Criteria Evaluation
		Existing Conditions (2015)
1	Eight-Hour Vehicular Volume	NOT SATISFIED 1A (8 Hours needed, 3 Hours achieved) 1B (8 Hours needed, 6 Hours achieved) 1C (8 Hours needed, 7 Hours achieved)
2	Four-Hour Vehicular Volume	SATISFIED 2 (4 Hours needed, 6 Hours achieved)
3	Peak Hour	SATISFIED 3A (Satisfied) 3B (Satisfied)
4	Pedestrian Volume	NOT EVALUATED
5	School Crossing	NOT EVALUATED
6	Coordinated Signal System	NOT APPLICABLE
7	Crash Experience	NOT EVALUATED
8	Roadway Network	NOT EVALUATED
9	Intersection Near a Grade Crossing	NOT APPLICABLE



Figure 8 - Tuscarawas Street & Dartmouth Avenue

1.9 Tuscarawas Street & Bedford Avenue

The intersection Tuscarawas Street and Bedford Avenue is located east of Dartmouth Avenue. This intersection has a total of three (3) approaches; two Tuscarawas Street approaches were analyzed as two (2) lanes and one Bedford Avenue approach was analyzed as one (1) lane in PC Warrants. Table 2.2 provides a summary of the signal warrant analyses. The table indicates that this intersection meets Warrants 1, 2, and 3. Further information regarding the warrant analyses can be found in Appendix D.

Table 9 - Tuscarawas Street & Bedford Avenue Signal Warrant Summary		
Warrant		Summary of Criteria Evaluation
		Existing Conditions (2015)
1	Eight-Hour Vehicular Volume	SATISFIED 1A (8 Hours needed, 6 Hours achieved) 1B (8 Hours needed, 8 Hours achieved) 1C (8 Hours needed, 6 Hours achieved)
2	Four-Hour Vehicular Volume	SATISFIED 2 (4 Hours needed, 7 Hours achieved)
3	Peak Hour	SATISFIED 3A (Satisfied) 3B (Satisfied)
4	Pedestrian Volume	NOT EVALUATED
5	School Crossing	NOT EVALUATED
6	Coordinated Signal System	NOT APPLICABLE
7	Crash Experience	NOT EVALUATED
8	Roadway Network	NOT EVALUATED
9	Intersection Near a Grade Crossing	NOT APPLICABLE



Figure 9 - Tuscarawas Street & Bedford Avenue

1.10 Tuscarawas Street & Harrison Avenue NW

The intersection Tuscarawas Street and Harrison Avenue NW is located east of Bedford Avenue. This intersection has a total of four (4) approaches; two Tuscarawas Street approaches were analyzed as two (2) lanes and two approaches on Harrison Avenue were analyzed as one (1) lane in PC Warrants. Table 2.1 provides a summary of the signal warrant analyses. The table indicates that this intersection meets Warrants 1, 2 and 3. Further information regarding the warrant analyses can be found in Appendix D.

Table 10 - Tuscarawas Street & Harrison Avenue NW Signal Warrant Summary		
Warrant		Summary of Criteria Evaluation
		Existing Conditions (2015)
1	Eight-Hour Vehicular Volume	SATISFIED 1A (8 Hours needed, 4 Hours achieved) 1B (8 Hours needed, 8 Hours achieved) 1C (8 Hours needed, 8 Hours achieved)
2	Four-Hour Vehicular Volume	SATISFIED 2 (8 Hours needed, 10 Hours achieved)
3	Peak Hour	SATISFIED 3A (Satisfied) 3B (Satisfied)
4	Pedestrian Volume	NOT EVALUATED
5	School Crossing	NOT EVALUATED
6	Coordinated Signal System	NOT APPLICABLE
7	Crash Experience	NOT EVALUATED
8	Roadway Network	NOT EVALUATED
9	Intersection Near a Grade Crossing	NOT APPLICABLE



Figure 10 - Tuscarawas Street & Harrison Avenue

2.0 CONCLUSIONS AND RECOMMENDATIONS

A summary of the traffic signal warrant analyses conducted at the project intersections is provided in Table 2.1. The warrant analyses were conducted based on traffic counts performed on Tuesday, September 22nd 2015 thru Thursday, September 24th 2015 and Tuesday, September 29th 2015 thru Wednesday, September 30th 2015 during an AM peak period (7:00 AM – 9:00 AM), a Midday peak period (11:00 AM - 1:00 PM), and a PM peak period (2:00 PM – 6:00 PM). Based on this analysis, the existing traffic signals on Whipple Avenue, Valleyview Avenue, Raff Road, Bellflower Avenue, Maryland Avenue, Wertz Avenue, Broad Avenue, Dartmouth Avenue, Bedford Avenue, and Harrison Avenue intersect with Tuscarawas Street meet warrants for traffic signal upgrades. Dartmouth Avenue meets warrants for the installation of a traffic signal.

Table 2.1 Signal Warrant Summary				
Street Name		Warrant 1 Eight Hour Volume	Warrant 2 Four Hour Volume	Warrant 3 Peak Hour Volume
1	Whipple Avenue	SATISFIED	SATISFIED	SATISFIED
2	Valleyview Avenue	NOT SATISFIED	SATISFIED	SATISFIED
3	Raff Road	SATISFIED	SATISFIED	SATISFIED
4	Bellflower Avenue	NOT SATISFIED	SATISFIED	SATISFIED
5	Maryland Avenue	SATISFIED	SATISFIED	SATISFIED
6	Wertz Avenue	SATISFIED	SATISFIED	SATISFIED
7	Broad Avenue	SATISFIED	SATISFIED	SATISFIED
8	Dartmouth Avenue	NOT SATISFIED	SATISFIED	SATISFIED
9	Bedford Avenue	SATISFIED	SATISFIED	SATISFIED
10	Harrison Avenue	SATISFIED	SATISFIED	SATISFIED

The proposed project should accommodate this demand with proper crossings, pedestrian signals, and signage at intersections to ensure the safety of both pedestrians and vehicles. A full upgrade of the signals, detection zones and LED signal heads are recommended to efficiently accommodate vehicles and pedestrians. These upgrades would improve both the safety and efficiency of motorized and non-motorized travel along the Tuscarawas Street corridor.



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Int. : Tuscarawas and Whipple
 Counted By: MJL
 Day: Tuesday
 Weather: Sunny

File Name : Tuscarawas st and Whipple Right Turn Reduction
 Site Code : 00000000
 Start Date : 9/22/2015
 Page No : 1

Groups Printed- Car - Truck -

Start Time	WHIPPLE From North					TUSCARAWAS From East					WHIPPLE From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	3	10	10	0	23	10	48	0	1	59	1	7	3	0	11	7	65	15	0	87	180
07:15 AM	2	28	30	0	60	15	64	0	0	79	2	15	10	0	27	12	109	40	0	161	327
07:30 AM	7	18	32	0	57	22	91	1	0	114	2	28	17	0	47	18	111	34	0	163	381
07:45 AM	4	23	54	0	81	15	70	7	1	93	5	39	16	0	60	15	157	49	1	222	456
Total	16	79	126	0	221	62	273	8	2	345	10	89	46	0	145	52	442	138	1	633	1344
08:00 AM	3	36	32	2	73	23	73	3	1	100	1	23	14	0	38	9	115	30	0	154	365
08:15 AM	5	23	39	0	67	29	74	2	0	105	2	19	12	0	33	15	103	25	2	145	350
08:30 AM	3	12	35	0	50	19	76	4	2	101	0	23	26	0	49	16	126	38	0	180	380
08:45 AM	3	23	37	0	63	16	90	2	0	108	3	26	15	0	44	17	116	42	0	175	390
Total	14	94	143	2	253	87	313	11	3	414	6	91	67	0	164	57	460	135	2	654	1485
*** BREAK ***																					
11:00 AM	9	33	57	0	99	20	107	1	1	129	7	20	32	0	59	18	138	29	0	185	472
11:15 AM	9	36	46	1	92	25	132	4	1	162	9	33	40	0	82	23	120	35	0	178	514
11:30 AM	7	41	35	0	83	33	138	9	1	181	6	30	24	0	60	16	156	46	0	218	542
11:45 AM	7	29	52	0	88	29	135	5	0	169	3	39	30	0	72	22	141	44	0	207	536
Total	32	139	190	1	362	107	512	19	3	641	25	122	126	0	273	79	555	154	0	788	2064
12:00 PM	8	35	45	0	88	41	148	3	0	192	3	25	46	0	74	19	150	62	0	231	585
12:15 PM	15	36	55	0	106	37	136	4	2	179	6	37	37	0	80	21	170	32	0	223	588
12:30 PM	8	48	57	0	113	36	128	6	1	171	9	40	31	0	80	21	181	39	1	242	606
12:45 PM	16	43	54	0	113	31	118	16	1	166	9	37	30	0	76	26	163	34	0	223	578
Total	47	162	211	0	420	145	530	29	4	708	27	139	144	0	310	87	664	167	1	919	2357
*** BREAK ***																					
02:00 PM	7	30	48	0	85	37	144	7	0	188	15	31	30	0	76	16	150	32	1	199	548
02:15 PM	14	44	50	0	108	37	145	8	0	190	4	36	24	0	64	27	135	40	1	203	565
02:30 PM	12	37	40	1	90	46	155	5	0	206	4	29	42	0	75	16	119	38	0	173	544
02:45 PM	11	41	66	0	118	52	140	14	2	208	6	37	36	0	79	22	139	60	1	222	627
Total	44	152	204	1	401	172	584	34	2	792	29	133	132	0	294	81	543	170	3	797	2284
03:00 PM	13	35	47	0	95	46	127	5	0	178	4	35	27	0	66	25	152	49	0	226	565
03:15 PM	13	48	46	0	107	41	121	10	1	173	4	45	40	0	89	36	139	48	0	223	592
03:30 PM	4	32	47	0	83	38	129	8	1	176	7	36	35	0	78	13	145	40	0	198	535
03:45 PM	4	43	46	0	93	52	181	9	1	243	8	43	46	0	97	35	139	51	0	225	658
Total	34	158	186	0	378	177	558	32	3	770	23	159	148	0	330	109	575	188	0	872	2350
04:00 PM	1	13	35	0	49	31	105	3	0	139	8	24	31	0	63	18	119	30	1	168	419
04:15 PM	3	36	41	1	81	57	136	11	2	206	9	37	39	0	85	23	134	42	0	199	571
04:30 PM	14	42	63	0	119	35	112	9	1	157	8	32	44	0	84	22	126	48	2	198	558
04:45 PM	16	65	66	0	147	61	188	11	0	260	4	48	53	0	105	28	168	54	2	252	764
Total	34	156	205	1	396	184	541	34	3	762	29	141	167	0	337	91	547	174	5	817	2312
05:00 PM	35	68	67	3	173	47	175	21	2	245	10	57	46	0	113	25	155	56	0	236	767
05:15 PM	11	56	82	0	149	65	162	9	0	236	6	52	64	0	122	22	144	42	1	209	716
05:30 PM	13	48	61	0	122	50	129	5	1	185	11	45	30	0	86	20	141	27	0	188	581
05:45 PM	30	33	62	0	125	33	130	6	0	169	6	23	45	0	74	22	133	51	1	207	575
Total	89	205	272	3	569	195	596	41	3	835	33	177	185	0	395	89	573	176	2	840	2639



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File Name : Tuscarawas st and Whipple Right Turn Reduction

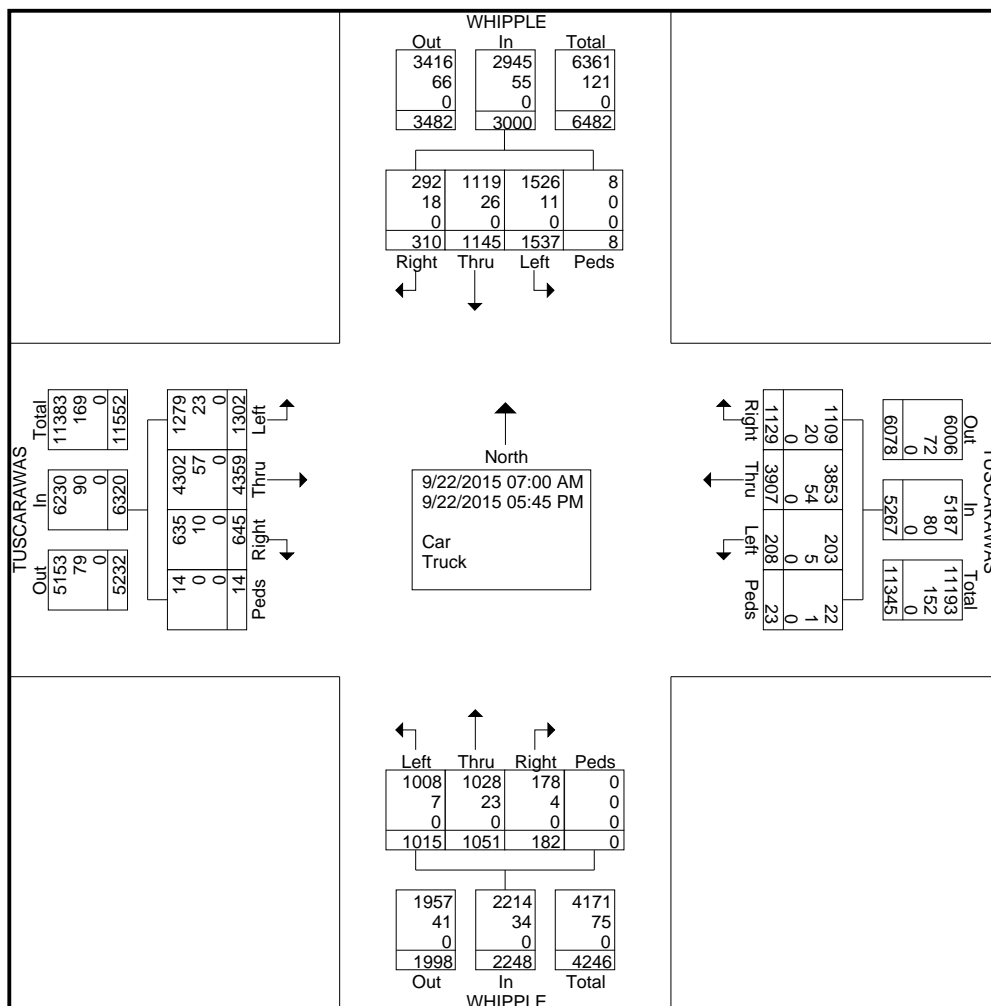
Site Code : 00000000

Start Date : 9/22/2015

Page No : 2

Groups Printed- Car - Truck -

	WHIPPLE From North					TUSCARAWAS From East					WHIPPLE From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	310	1145	1537	8	3000	1129	3907	208	23	5267	182	1051	1015	0	2248	645	4359	1302	14	6320	16835
Apprch %	10.3	38.2	51.2	0.3		21.4	74.2	3.9	0.4		8.1	46.8	45.2	0		10.2	69	20.6	0.2		
Total %	1.8	6.8	9.1	0	17.8	6.7	23.2	1.2	0.1	31.3	1.1	6.2	6	0	13.4	3.8	25.9	7.7	0.1	37.5	
Car	292	1119	1526	8	2945	1109	3853	203	22	5187	178	1028	1008	0	2214	635	4302	1279	14	6230	16576
% Car	94.2	97.7	99.3	100	98.2	98.2	98.6	97.6	95.7	98.5	97.8	97.8	99.3	0	98.5	98.4	98.7	98.2	100	98.6	98.5
Truck	18	26	11	0	55	20	54	5	1	80	4	23	7	0	34	10	57	23	0	90	259
% Truck	5.8	2.3	0.7	0	1.8	1.8	1.4	2.4	4.3	1.5	2.2	2.2	0.7	0	1.5	1.6	1.3	1.8	0	1.4	1.5
%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





Int. : Tuscarawas St
 Counted By: KH
 Day: Tuesday
 Weather: Sunny

File Name : Tuscarawas st and Valleyview
 Site Code : 00000000
 Start Date : 9/22/2015
 Page No : 1

Groups Printed- Cars - Trucks

Start Time	VALLEYVIEW From North					TUSCARAWAS From East					VALLEYVIEW From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	7	3	12	0	22	14	69	7	0	90	3	3	7	0	13	7	126	3	0	136	261
07:15 AM	1	5	9	0	15	7	101	8	0	116	7	0	6	0	13	4	138	0	0	142	286
07:30 AM	3	4	12	0	19	10	121	11	0	142	5	8	8	0	21	7	191	1	0	199	381
07:45 AM	1	4	16	0	21	12	100	7	0	119	4	1	12	0	17	6	169	2	0	177	334
Total	12	16	49	0	77	43	391	33	0	467	19	12	33	0	64	24	624	6	0	654	1262
08:00 AM	3	1	13	0	17	6	114	8	1	129	3	3	8	1	15	7	122	3	1	133	294
08:15 AM	0	2	14	0	16	3	106	13	0	122	5	1	10	0	16	7	144	4	0	155	309
08:30 AM	6	1	21	0	28	12	119	13	0	144	8	2	12	0	22	6	154	5	0	165	359
08:45 AM	5	6	17	0	28	12	113	20	0	145	5	8	15	0	28	14	127	7	0	148	349
Total	14	10	65	0	89	33	452	54	1	540	21	14	45	1	81	34	547	19	1	601	1311
*** BREAK ***																					
11:00 AM	5	11	19	0	35	26	148	22	0	196	11	15	25	0	51	13	175	10	0	198	480
11:15 AM	4	15	18	0	37	26	154	27	0	207	14	9	34	0	57	15	129	10	0	154	455
11:30 AM	9	16	29	0	54	22	191	24	0	237	11	10	29	0	50	23	153	19	0	195	536
11:45 AM	7	9	24	0	40	16	175	37	0	228	16	7	28	0	51	23	164	11	0	198	517
Total	25	51	90	0	166	90	668	110	0	868	52	41	116	0	209	74	621	50	0	745	1988
12:00 PM	11	9	17	1	38	18	185	27	0	230	21	13	33	0	67	11	183	7	0	201	536
12:15 PM	8	21	36	0	65	20	188	27	0	235	17	10	26	0	53	18	172	4	0	194	547
12:30 PM	8	15	30	0	53	25	175	23	0	223	12	13	30	0	55	14	197	11	0	222	553
12:45 PM	5	15	32	0	52	20	189	42	0	251	16	12	33	0	61	15	178	6	0	199	563
Total	32	60	115	1	208	83	737	119	0	939	66	48	122	0	236	58	730	28	0	816	2199
*** BREAK ***																					
02:00 PM	5	14	15	0	34	28	179	37	0	244	13	7	37	0	57	18	145	6	0	169	504
02:15 PM	7	17	17	0	41	37	185	23	1	246	19	10	32	1	62	20	155	7	0	182	531
02:30 PM	13	11	21	0	45	23	186	32	1	242	22	11	27	0	60	23	153	2	0	178	525
02:45 PM	3	2	22	0	27	33	176	30	1	240	16	13	36	0	65	20	164	6	0	190	522
Total	28	44	75	0	147	121	726	122	3	972	70	41	132	1	244	81	617	21	0	719	2082
03:00 PM	11	9	17	0	37	28	177	28	0	233	20	11	25	0	56	21	160	9	0	190	516
03:15 PM	6	5	18	1	30	25	253	27	1	306	18	11	19	0	48	18	153	10	0	181	565
03:30 PM	13	15	27	0	55	24	199	29	0	252	15	12	33	0	60	33	150	9	0	192	559
03:45 PM	12	14	28	0	54	31	224	21	3	279	19	15	26	1	61	25	154	6	1	186	580
Total	42	43	90	1	176	108	853	105	4	1070	72	49	103	1	225	97	617	34	1	749	2220
04:00 PM	7	9	18	1	35	23	206	29	0	258	18	10	23	0	51	28	139	3	1	171	515
04:15 PM	7	14	20	0	41	29	194	26	1	250	22	20	33	1	76	18	151	7	3	179	546
04:30 PM	8	12	20	0	40	28	254	27	0	309	18	6	29	1	54	20	184	16	0	220	623
04:45 PM	7	14	24	0	45	25	247	37	0	309	15	16	24	0	55	33	165	12	0	210	619
Total	29	49	82	1	161	105	901	119	1	1126	73	52	109	2	236	99	639	38	4	780	2303
05:00 PM	12	14	24	1	51	24	219	32	0	275	19	14	34	0	67	15	152	9	0	176	569
05:15 PM	5	9	16	0	30	21	211	33	1	266	21	7	27	0	55	35	186	12	2	235	586
05:30 PM	6	12	26	1	45	20	193	33	0	246	15	16	35	0	66	14	167	7	2	190	547
05:45 PM	4	8	23	0	35	18	189	30	1	238	13	12	30	0	55	12	160	6	1	179	507
Total	27	43	89	2	161	83	812	128	2	1025	68	49	126	0	243	76	665	34	5	780	2209

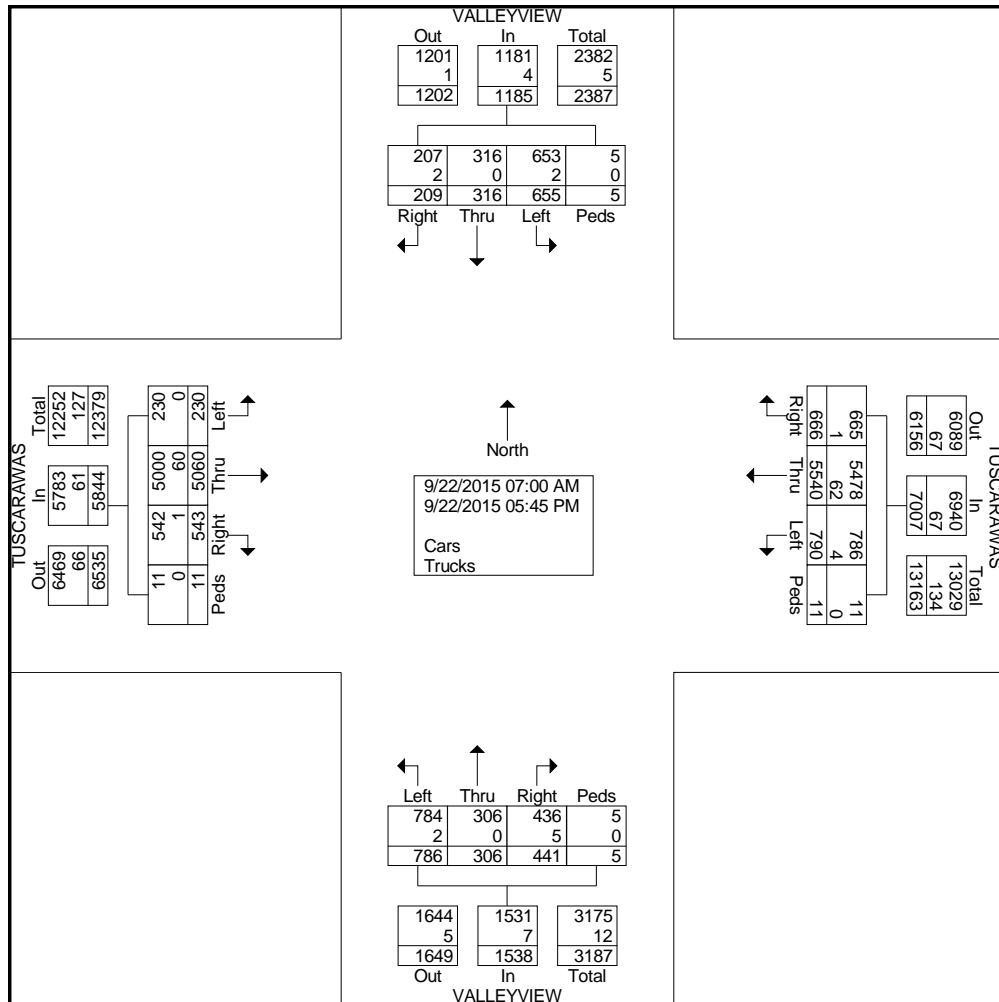


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File Name : Tuscarawas st and Valleyview
 Site Code : 00000000
 Start Date : 9/22/2015
 Page No : 2

Groups Printed- Cars - Trucks

	VALLEYVIEW From North					TUSCARAWAS From East					VALLEYVIEW From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	209	316	655	5	1185	666	5540	790	11	7007	441	306	786	5	1538	543	5060	230	11	5844	15574
Apprch %	17.6	26.7	55.3	0.4		9.5	79.1	11.3	0.2		28.7	19.9	51.1	0.3		9.3	86.6	3.9	0.2		
Total %	1.3	2	4.2	0	7.6	4.3	35.6	5.1	0.1	45	2.8	2	5	0	9.9	3.5	32.5	1.5	0.1	37.5	
Cars	207	316	653	5	1181	665	5478	786	11	6940	436	306	784	5	1531	542	5000	230	11	5783	15435
% Cars	99	100	99.7	100	99.7	99.8	98.9	99.5	100	99	98.9	100	99.7	100	99.5	99.8	98.8	100	100	99	99.1
Trucks	2	0	2	0	4	1	62	4	0	67	5	0	2	0	7	1	60	0	0	61	139
% Trucks	1	0	0.3	0	0.3	0.2	1.1	0.5	0	1	1.1	0	0.3	0	0.5	0.2	1.2	0	0	1	0.9





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Int. : Tuscarawas and Raff
Counted By: MJL
Day: Wednesday
Weather: Sunny

File Name : Tuscarawas st and Raff
Site Code : 00000000
Start Date : 9/23/2015
Page No : 1

Groups Printed- Car - Truck -

Start Time	RAFF From North					TUSCARAWAS From East					RAFF From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	2	5	3	0	10	7	67	17	2	93	11	2	16	2	31	8	113	2	0	123	257
07:15 AM	1	3	3	0	7	1	73	17	1	92	21	5	16	0	42	19	145	1	0	165	306
07:30 AM	0	9	4	0	13	3	107	20	0	130	20	8	22	0	50	16	157	1	0	174	367
07:45 AM	5	15	9	0	29	4	125	28	0	157	18	18	31	0	67	12	196	2	0	210	463
Total	8	32	19	0	59	15	372	82	3	472	70	33	85	2	190	55	611	6	0	672	1393
08:00 AM	1	15	7	1	24	1	115	24	1	141	11	16	16	0	43	16	157	3	0	176	384
08:15 AM	2	2	1	0	5	0	113	22	0	135	21	4	25	0	50	13	166	0	0	179	369
08:30 AM	1	3	2	0	6	4	130	16	0	150	17	2	20	0	39	9	168	0	0	177	372
08:45 AM	2	4	7	0	13	3	128	17	0	148	17	6	23	0	46	14	134	0	0	148	355
Total	6	24	17	1	48	8	486	79	1	574	66	28	84	0	178	52	625	3	0	680	1480
*** BREAK ***																					
11:00 AM	0	8	3	1	12	3	168	23	1	195	27	9	47	0	83	17	134	0	2	153	443
11:15 AM	0	8	1	1	10	0	173	26	1	200	24	6	48	2	80	19	150	0	1	170	460
11:30 AM	4	5	1	0	10	3	189	21	0	213	9	1	39	1	50	31	161	0	0	192	465
11:45 AM	2	7	1	0	10	1	208	26	1	236	30	13	53	3	99	26	153	0	2	181	526
Total	6	28	6	2	42	7	738	96	3	844	90	29	187	6	312	93	598	0	5	696	1894
12:00 PM	2	7	0	0	9	1	220	19	0	240	17	7	61	1	86	28	139	3	0	170	505
12:15 PM	1	5	4	0	10	1	223	30	1	255	17	8	71	0	96	30	214	3	1	248	609
12:30 PM	2	6	0	2	10	1	201	27	3	232	18	8	55	0	81	33	223	0	1	257	580
12:45 PM	2	7	3	0	12	2	205	26	2	235	16	5	48	0	69	36	196	2	0	234	550
Total	7	25	7	2	41	5	849	102	6	962	68	28	235	1	332	127	772	8	2	909	2244
*** BREAK ***																					
02:00 PM	3	8	5	0	16	5	213	33	3	254	26	18	43	0	87	28	176	2	0	206	563
02:15 PM	2	15	8	0	25	5	187	29	0	221	26	10	50	0	86	35	186	0	0	221	553
02:30 PM	3	7	3	0	13	5	236	26	1	268	14	11	48	0	73	27	196	3	1	227	581
02:45 PM	2	13	2	0	17	3	200	23	0	226	21	10	53	1	85	26	195	2	1	224	552
Total	10	43	18	0	71	18	836	111	4	969	87	49	194	1	331	116	753	7	2	878	2249
03:00 PM	1	10	4	1	16	0	167	15	1	183	32	6	44	1	83	25	158	1	1	185	467
03:15 PM	3	10	2	0	15	2	233	25	3	263	23	12	64	1	100	26	231	3	0	260	638
03:30 PM	0	7	4	1	12	5	223	20	1	249	28	11	51	1	91	28	199	0	0	227	579
03:45 PM	2	5	2	0	9	3	221	31	1	256	18	11	54	0	83	36	165	4	2	207	555
Total	6	32	12	2	52	10	844	91	6	951	101	40	213	3	357	115	753	8	3	879	2239
04:00 PM	3	4	4	0	11	0	209	24	0	233	17	21	49	0	87	42	180	3	2	227	558
04:15 PM	1	3	3	0	7	2	204	35	2	243	25	19	57	0	101	33	154	2	1	190	541
04:30 PM	1	15	1	0	17	3	229	26	0	258	28	14	64	0	106	49	137	0	3	189	570
04:45 PM	3	9	2	2	16	4	228	32	1	265	24	13	59	0	96	33	174	2	0	209	586
Total	8	31	10	2	51	9	870	117	3	999	94	67	229	0	390	157	645	7	6	815	2255
05:00 PM	2	9	7	0	18	3	225	30	1	259	24	12	61	0	97	38	193	0	0	231	605
05:15 PM	1	10	5	0	16	5	207	42	3	257	18	16	71	0	105	26	176	0	1	203	581
05:30 PM	4	7	3	0	14	0	177	43	1	221	35	13	55	4	107	47	160	2	1	210	552
05:45 PM	3	9	0	0	12	0	189	28	1	218	34	14	46	1	95	22	189	0	0	211	536
Total	10	35	15	0	60	8	798	143	6	955	111	55	233	5	404	133	718	2	2	855	2274



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File Name : Tuscarawas st and Raff

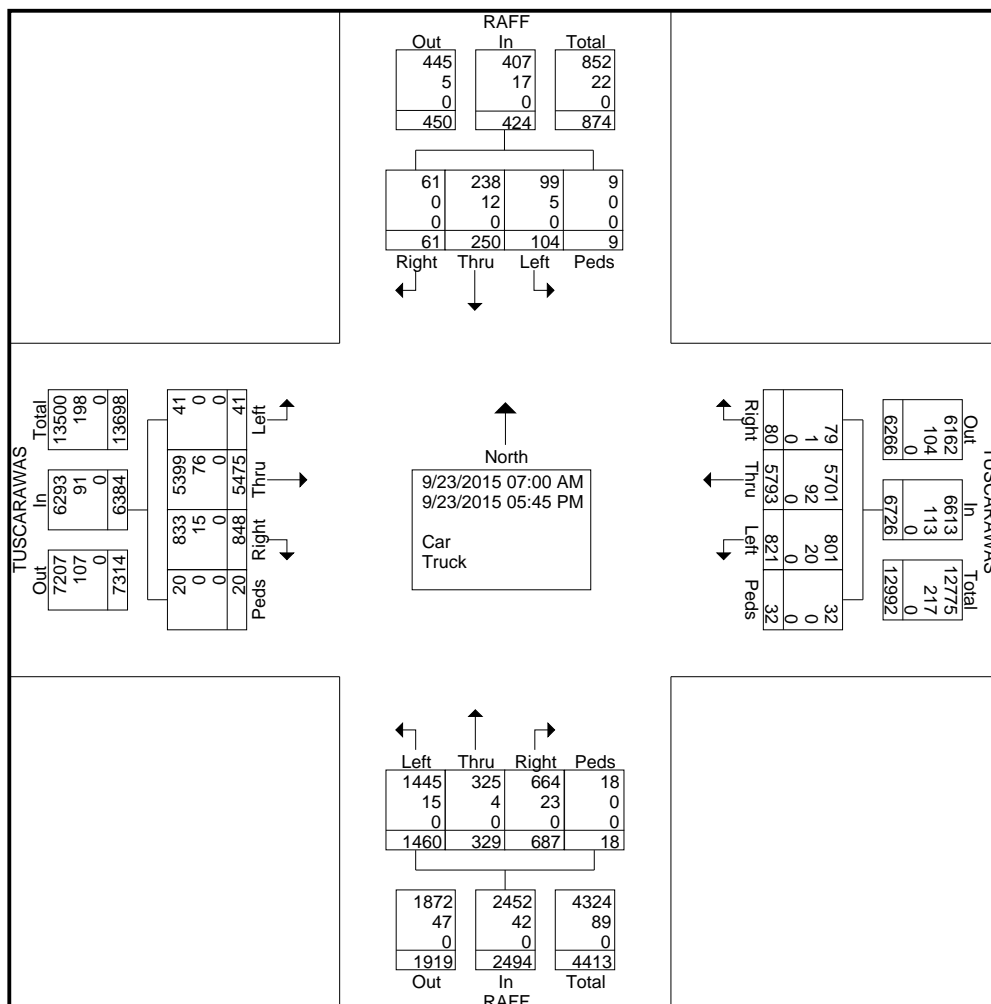
Site Code : 00000000

Start Date : 9/23/2015

Page No : 2

Groups Printed- Car - Truck -

	RAFF From North					TUSCARAWAS From East					RAFF From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	61	250	104	9	424	80	5793	821	32	6726	687	329	1460	18	2494	848	5475	41	20	6384	16028
Apprch %	14.4	59	24.5	2.1		1.2	86.1	12.2	0.5		27.5	13.2	58.5	0.7		13.3	85.8	0.6	0.3		
Total %	0.4	1.6	0.6	0.1	2.6	0.5	36.1	5.1	0.2	42	4.3	2.1	9.1	0.1	15.6	5.3	34.2	0.3	0.1	39.8	
Car	61	238	99	9	407	79	5701	801	32	6613	664	325	1445	18	2452	833	5399	41	20	6293	15765
% Car	100	95.2	95.2	100	96	98.8	98.4	97.6	100	98.3	96.7	98.8	99	100	98.3	98.2	98.6	100	100	98.6	98.4
Truck	0	12	5	0	17	1	92	20	0	113	23	4	15	0	42	15	76	0	0	91	263
% Truck	0	4.8	4.8	0	4	1.2	1.6	2.4	0	1.7	3.3	1.2	1	1.7	1.8	1.4	0	0	0	1.4	1.6
%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





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Int. : Tuscarawas St & Bellflower Ave
 Counted By: AK
 Day: Wednesday
 Weather: Sunny

File Name : tuscarawas st and bellflower
 Site Code : 00000000
 Start Date : 9/23/2015
 Page No : 1

Groups Printed- Cars - Trucks

Start Time	BELLFLOWER From North					TUSCARAWAS From East					BELLFLOWER From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	3	0	1	0	4	0	80	2	0	82	4	1	4	0	9	7	133	0	0	140	235
07:15 AM	1	1	7	0	9	0	91	2	1	94	4	4	6	0	14	8	159	2	1	170	287
07:30 AM	1	1	3	0	5	0	138	3	0	141	3	0	7	0	10	2	184	0	0	186	342
07:45 AM	1	3	4	0	8	2	145	1	0	148	4	4	6	0	14	7	222	1	0	230	400
Total	6	5	15	0	26	2	454	8	1	465	15	9	23	0	47	24	698	3	1	726	1264
08:00 AM	1	1	0	0	2	0	145	8	2	155	2	0	3	0	5	13	173	0	3	189	351
08:15 AM	3	2	1	0	6	0	149	0	0	149	2	1	5	1	9	7	199	1	0	207	371
08:30 AM	0	0	3	0	3	0	141	5	0	146	6	2	3	1	12	2	189	0	1	192	353
08:45 AM	4	1	2	1	8	0	146	1	0	147	2	2	1	0	5	11	159	4	1	175	335
Total	8	4	6	1	19	0	581	14	2	597	12	5	12	2	31	33	720	5	5	763	1410
*** BREAK ***																					
11:00 AM	4	1	1	0	6	0	186	6	0	192	0	2	7	0	9	4	182	1	1	188	395
11:15 AM	3	2	2	0	7	0	231	5	0	236	2	1	3	0	6	15	162	1	2	180	429
11:30 AM	2	2	4	0	8	2	249	3	1	255	7	2	16	2	27	1	184	1	2	188	478
11:45 AM	3	2	1	0	6	3	252	3	3	261	1	1	9	1	12	1	183	2	3	189	468
Total	12	7	8	0	27	5	918	17	4	944	10	6	35	3	54	21	711	5	8	745	1770
12:00 PM	1	1	3	0	5	4	249	5	0	258	3	2	17	1	23	5	190	2	1	198	484
12:15 PM	3	4	0	0	7	0	286	3	2	291	5	4	13	0	22	14	231	1	3	249	569
12:30 PM	0	1	1	0	2	3	217	4	1	225	6	3	14	0	23	7	229	3	2	241	491
12:45 PM	3	2	1	0	6	1	259	8	4	272	0	2	10	4	16	5	212	1	2	220	514
Total	7	8	5	0	20	8	1011	20	7	1046	14	11	54	5	84	31	862	7	8	908	2058
*** BREAK ***																					
02:00 PM	2	1	1	0	4	3	245	3	3	254	2	4	18	1	25	4	214	1	1	220	503
02:15 PM	5	0	1	0	6	1	250	11	1	263	8	4	10	0	22	8	238	3	1	250	541
02:30 PM	3	1	3	0	7	0	260	4	1	265	3	3	15	2	23	4	241	1	2	248	543
02:45 PM	1	0	0	0	1	2	194	4	0	200	0	3	13	0	16	6	226	3	2	237	454
Total	11	2	5	0	18	6	949	22	5	982	13	14	56	3	86	22	919	8	6	955	2041
03:00 PM	3	1	2	0	6	1	219	7	1	228	6	3	10	2	21	7	237	1	0	245	500
03:15 PM	1	1	1	0	3	3	280	5	0	288	4	2	15	0	21	5	254	1	3	263	575
03:30 PM	1	1	1	0	3	1	300	6	1	308	7	1	22	0	30	7	218	2	1	228	569
03:45 PM	2	4	1	0	7	0	263	6	1	270	4	7	10	0	21	7	222	3	2	234	532
Total	7	7	5	0	19	5	1062	24	3	1094	21	13	57	2	93	26	931	7	6	970	2176
04:00 PM	1	0	1	0	2	1	271	6	0	278	1	2	19	1	23	6	223	0	5	234	537
04:15 PM	1	2	3	0	6	3	283	3	2	291	4	4	13	1	22	5	191	3	1	200	519
04:30 PM	4	0	2	1	7	6	261	4	0	271	2	5	22	0	29	5	199	2	1	207	514
04:45 PM	0	1	3	0	4	1	293	3	2	299	6	4	18	1	29	9	200	3	3	215	547
Total	6	3	9	1	19	11	1108	16	4	1139	13	15	72	3	103	25	813	8	10	856	2117
05:00 PM	2	0	4	0	6	3	262	8	0	273	4	2	30	0	36	5	233	1	1	240	555
05:15 PM	1	0	0	4	5	1	266	10	8	285	4	4	11	1	20	4	199	2	2	207	517
05:30 PM	2	0	1	0	3	2	275	7	1	285	4	1	7	0	12	3	195	3	3	204	504
05:45 PM	1	2	4	0	7	3	261	7	0	271	5	7	4	1	17	7	224	4	1	236	531
Total	6	2	9	4	21	9	1064	32	9	1114	17	14	52	2	85	19	851	10	7	887	2107

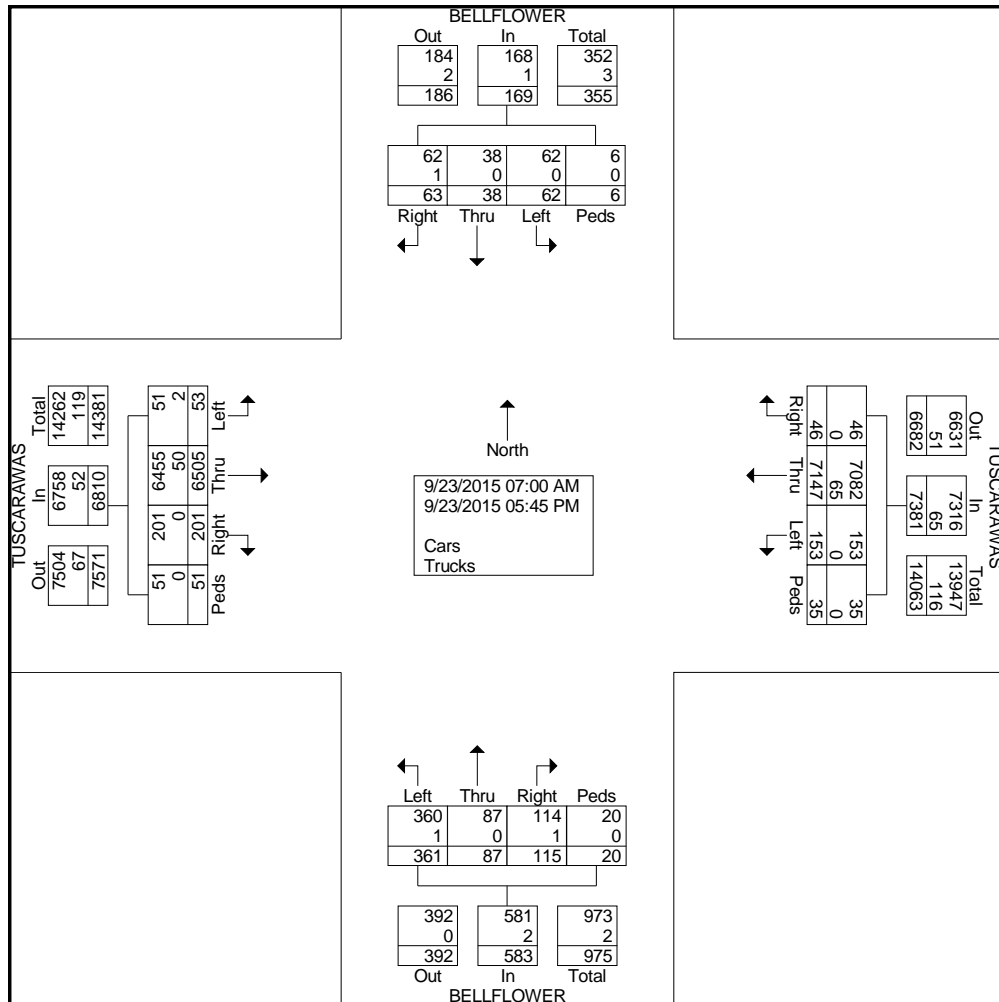


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File Name : tuscarawas st and bellflower
 Site Code : 00000000
 Start Date : 9/23/2015
 Page No : 2

Groups Printed- Cars - Trucks

	BELLFLOWER From North					TUSCARAWAS From East					BELLFLOWER From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	63	38	62	6	169	46	7147	153	35	7381	115	87	361	20	583	201	6505	53	51	6810	14943
Apprch %	37.3	22.5	36.7	3.6		0.6	96.8	2.1	0.5		19.7	14.9	61.9	3.4		3	95.5	0.8	0.7		
Total %	0.4	0.3	0.4	0	1.1	0.3	47.8	1	0.2	49.4	0.8	0.6	2.4	0.1	3.9	1.3	43.5	0.4	0.3	45.6	
Cars	62	38	62	6	168	46	7082	153	35	7316	114	87	360	20	581	201	6455	51	51	6758	14823
% Cars	98.4	100	100	100	99.4	100	99.1	100	100	99.1	99.1	100	99.7	100	99.7	100	99.2	96.2	100	99.2	99.2
Trucks	1	0	0	0	1	0	65	0	0	65	1	0	1	0	2	0	50	2	0	52	120
% Trucks	1.6	0	0	0	0.6	0	0.9	0	0	0.9	0.9	0	0.3	0.3	0	0	0.8	3.8	0	0.8	0.8





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Int. : Tuscarawas and Maryland
 Counted By: MJL
 Day: Thursday
 Weather: Sunny

File Name : Tuscarawas st and Maryland
 Site Code : 00000000
 Start Date : 9/24/2015
 Page No : 1

Groups Printed- Car - Truck -

Start Time	MARYLAND From North					TUSCARAWAS From East					MARYLAND From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	3	0	3	6	85	4	0	95	18	2	5	0	25	6	109	0	0	115	238
07:15 AM	0	1	4	1	6	8	103	7	0	118	9	4	4	2	19	16	155	0	0	171	314
07:30 AM	0	1	9	1	11	9	110	7	0	126	5	3	8	0	16	4	144	1	0	149	302
07:45 AM	1	2	5	0	8	10	119	4	0	133	18	6	8	0	32	6	217	0	0	223	396
Total	1	4	21	2	28	33	417	22	0	472	50	15	25	2	92	32	625	1	0	658	1250
08:00 AM	0	2	4	0	6	10	114	8	0	132	11	11	10	1	33	4	194	1	0	199	370
08:15 AM	0	4	4	1	9	13	122	10	0	145	14	10	5	0	29	8	172	0	1	181	364
08:30 AM	3	1	9	4	17	12	151	10	0	173	14	8	8	0	30	3	178	0	1	182	402
08:45 AM	0	4	3	0	7	11	122	10	1	144	32	6	5	2	45	7	144	6	0	157	353
Total	3	11	20	5	39	46	509	38	1	594	71	35	28	3	137	22	688	7	2	719	1489
*** BREAK ***																					
11:00 AM	3	6	8	0	17	3	185	8	0	196	17	10	8	3	38	13	138	4	2	157	408
11:15 AM	1	3	5	0	9	16	178	5	1	200	11	4	12	0	27	8	151	1	2	162	398
11:30 AM	1	1	5	0	7	12	185	8	0	205	12	8	12	0	32	9	183	1	2	195	439
11:45 AM	1	5	6	0	12	12	204	16	1	233	14	10	10	2	36	7	173	0	1	181	462
Total	6	15	24	0	45	43	752	37	2	834	54	32	42	5	133	37	645	6	7	695	1707
12:00 PM	0	5	10	1	16	9	172	7	1	189	9	4	17	1	31	9	174	1	2	186	422
12:15 PM	0	3	4	0	7	7	232	15	1	255	17	1	29	1	48	7	189	9	2	207	517
12:30 PM	0	0	9	0	9	10	188	12	2	212	20	3	16	1	40	10	208	1	2	221	482
12:45 PM	0	2	1	0	3	3	181	20	1	205	16	5	20	2	43	7	231	4	1	243	494
Total	0	10	24	1	35	29	773	54	5	861	62	13	82	5	162	33	802	15	7	857	1915
*** BREAK ***																					
02:00 PM	3	1	5	0	9	6	177	10	0	193	12	3	26	3	44	5	176	1	0	182	428
02:15 PM	1	1	5	0	7	9	216	23	2	250	17	13	18	0	48	7	193	2	1	203	508
02:30 PM	0	4	2	1	7	6	200	13	1	220	20	4	15	0	39	9	191	0	1	201	467
02:45 PM	1	2	4	0	7	8	214	13	1	236	21	8	17	1	47	5	181	0	0	186	476
Total	5	8	16	1	30	29	807	59	4	899	70	28	76	4	178	26	741	3	2	772	1879
03:00 PM	0	5	6	0	11	10	197	13	0	220	27	4	31	2	64	8	216	1	3	228	523
03:15 PM	0	4	5	3	12	10	202	13	1	226	15	1	29	0	45	11	244	13	7	275	558
03:30 PM	1	0	8	1	10	16	228	21	1	266	10	6	14	4	34	7	198	2	1	208	518
03:45 PM	1	0	12	0	13	16	213	27	1	257	15	6	16	1	38	4	175	0	2	181	489
Total	2	9	31	4	46	52	840	74	3	969	67	17	90	7	181	30	833	16	13	892	2088
04:00 PM	0	5	5	1	11	9	248	21	4	282	20	12	22	0	54	13	205	2	0	220	567
04:15 PM	0	6	8	0	14	11	239	12	0	262	16	5	21	3	45	11	218	12	0	241	562
04:30 PM	0	3	6	1	10	12	214	15	0	241	23	4	23	0	50	12	177	4	5	198	499
04:45 PM	1	5	4	1	11	9	265	18	0	292	22	5	27	0	54	10	213	2	3	228	585
Total	1	19	23	3	46	41	966	66	4	1077	81	26	93	3	203	46	813	20	8	887	2213
05:00 PM	1	5	7	4	17	10	235	23	0	268	24	4	17	2	47	7	179	11	0	197	529
05:15 PM	1	2	6	2	11	7	229	17	2	255	20	4	24	0	48	18	192	1	0	211	525
05:30 PM	0	0	5	3	8	6	218	22	0	246	22	5	12	0	39	10	200	0	1	211	504
05:45 PM	2	3	3	1	9	6	206	16	4	232	26	6	12	0	44	7	179	6	0	192	477
Total	4	10	21	10	45	29	888	78	6	1001	92	19	65	2	178	42	750	18	1	811	2035

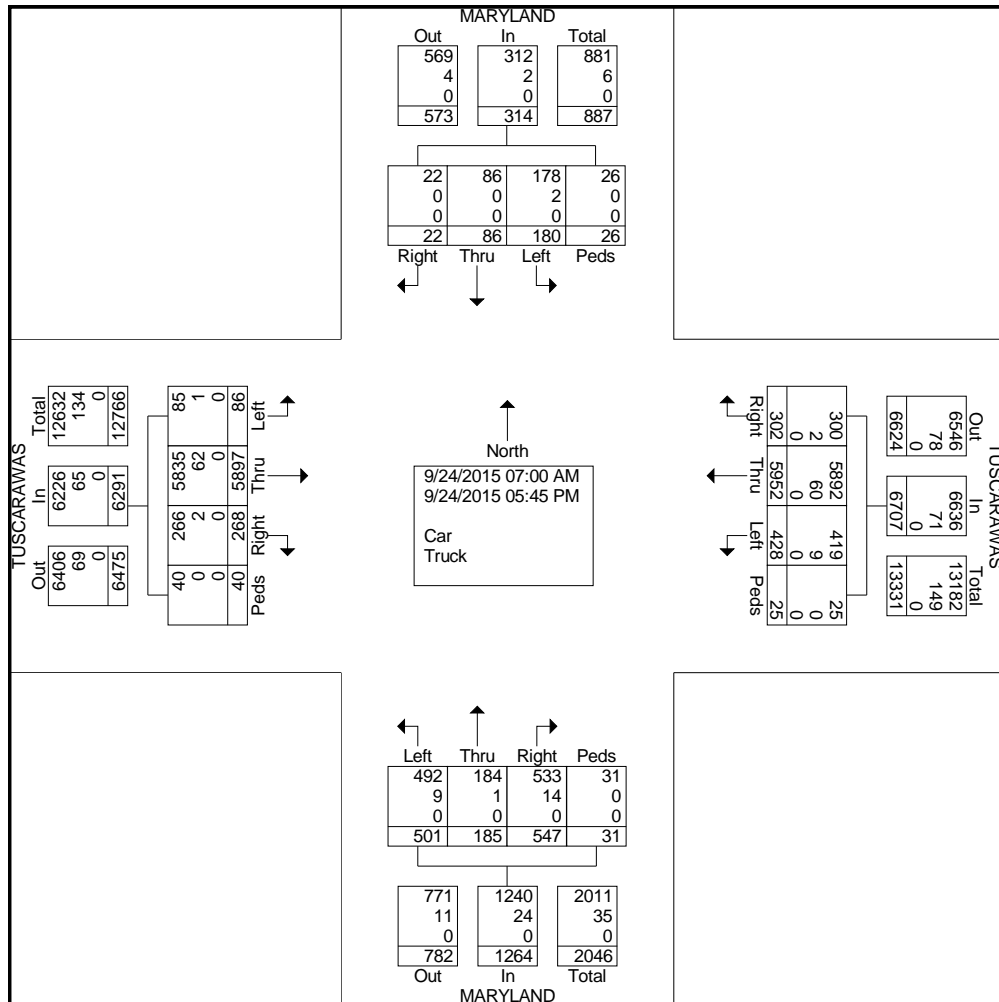


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File Name : Tuscarawas st and Maryland
 Site Code : 00000000
 Start Date : 9/24/2015
 Page No : 2

Groups Printed- Car - Truck -

	MARYLAND From North					TUSCARAWAS From East					MARYLAND From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	22	86	180	26	314	302	5952	428	25	6707	547	185	501	31	1264	268	5897	86	40	6291	14576
Apprch %	7	27.4	57.3	8.3		4.5	88.7	6.4	0.4		43.3	14.6	39.6	2.5		4.3	93.7	1.4	0.6		
Total %	0.2	0.6	1.2	0.2	2.2	2.1	40.8	2.9	0.2	46	3.8	1.3	3.4	0.2	8.7	1.8	40.5	0.6	0.3	43.2	
Car	22	86	178	26	312	300	5892	419	25	6636	533	184	492	31	1240	266	5835	85	40	6226	14414
% Car	100	100	98.9	100	99.4	99.3	99	97.9	100	98.9	97.4	99.5	98.2	100	98.1	99.3	98.9	98.8	100	99	98.9
Truck	0	0	2	0	2	2	60	9	0	71	14	1	9	0	24	2	62	1	0	65	162
% Truck	0	0	1.1	0	0.6	0.7	1	2.1	0	1.1	2.6	0.5	1.8	0	1.9	0.7	1.1	1.2	0	1	1.1
%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





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Int. :Tuscarawas and Wertz
 Counted By: AK
 Day: Thursday
 Weather: Sunny

File Name : Tuscarawas st and Wertz
 Site Code : 00000000
 Start Date : 9/24/2015
 Page No : 1

Groups Printed- Cars - Trucks -

Start Time	WERTZ From North					TUSCARAWAS From East					WERTZ From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	14	0	13	0	27	13	104	0	0	117	0	0	0	0	0	0	132	20	0	152	296
07:15 AM	18	0	27	0	45	8	95	0	0	103	0	0	0	0	0	0	163	13	0	176	324
07:30 AM	24	0	27	0	51	9	138	0	0	147	0	0	0	0	0	0	202	13	0	215	413
07:45 AM	17	0	34	0	51	13	149	0	0	162	0	0	0	0	0	0	233	22	0	255	468
Total	73	0	101	0	174	43	486	0	0	529	0	0	0	0	0	0	730	68	0	798	1501
08:00 AM	23	0	20	0	43	10	135	0	0	145	0	0	0	1	1	0	181	16	0	197	386
08:15 AM	12	0	23	0	35	27	148	0	0	175	0	0	0	0	0	0	176	14	0	190	400
08:30 AM	30	0	26	0	56	11	163	0	0	174	0	0	0	0	0	0	168	17	0	185	415
08:45 AM	26	0	30	2	58	13	192	0	0	205	0	0	0	0	0	0	181	33	0	214	477
Total	91	0	99	2	192	61	638	0	0	699	0	0	0	1	1	0	706	80	0	786	1678
*** BREAK ***																					
11:00 AM	30	0	22	1	53	10	201	0	3	214	0	0	0	0	0	0	149	21	0	170	437
11:15 AM	32	0	15	1	48	21	196	0	3	220	0	0	0	4	4	0	169	30	0	199	471
11:30 AM	26	0	21	1	48	20	211	0	0	231	0	0	0	1	1	0	196	23	0	219	499
11:45 AM	25	0	26	1	52	16	226	0	1	243	0	0	0	0	0	0	188	25	0	213	508
Total	113	0	84	4	201	67	834	0	7	908	0	0	0	5	5	0	702	99	0	801	1915
12:00 PM	47	0	26	0	73	13	208	0	2	223	0	0	0	0	0	0	214	35	0	249	545
12:15 PM	28	0	22	0	50	13	221	0	0	234	0	0	0	6	6	0	234	27	0	261	551
12:30 PM	31	0	19	1	51	21	205	0	0	226	0	0	0	1	1	0	221	32	0	253	531
12:45 PM	29	0	16	2	47	20	205	0	2	227	0	0	0	0	0	0	242	29	0	271	545
Total	135	0	83	3	221	67	839	0	4	910	0	0	0	7	7	0	911	123	0	1034	2172
*** BREAK ***																					
02:00 PM	34	0	19	1	54	21	186	0	1	208	0	0	0	1	1	0	179	25	0	204	467
02:15 PM	30	0	27	0	57	48	194	0	2	244	0	0	0	0	0	0	202	30	0	232	533
02:30 PM	39	0	25	4	68	28	238	0	2	268	0	0	0	0	0	0	193	40	0	233	569
02:45 PM	47	0	30	0	77	12	230	0	0	242	0	0	0	0	0	0	226	37	0	263	582
Total	150	0	101	5	256	109	848	0	5	962	0	0	0	1	1	0	800	132	0	932	2151
03:00 PM	54	0	23	1	78	26	256	0	3	285	0	0	0	2	2	0	256	35	0	291	656
03:15 PM	54	0	26	4	84	34	225	0	3	262	0	0	0	0	0	1	225	35	2	263	609
03:30 PM	48	0	13	0	61	22	250	0	1	273	0	0	0	0	0	0	209	34	0	243	577
03:45 PM	38	0	20	0	58	24	256	0	3	283	0	0	0	0	0	0	223	39	1	263	604
Total	194	0	82	5	281	106	987	0	10	1103	0	0	0	2	2	1	913	143	3	1060	2446
04:00 PM	40	1	28	0	69	16	254	0	3	273	0	0	0	3	3	0	163	39	0	202	547
04:15 PM	33	0	24	0	57	26	235	0	2	263	0	0	0	0	0	0	226	32	1	259	579
04:30 PM	44	0	11	3	58	26	219	0	2	247	0	0	0	1	1	0	204	33	1	238	544
04:45 PM	36	0	25	0	61	37	271	0	1	309	0	0	0	0	0	0	227	45	4	276	646
Total	153	1	88	3	245	105	979	0	8	1092	0	0	0	4	4	0	820	149	6	975	2316
05:00 PM	53	0	22	1	76	27	260	0	2	289	0	0	0	0	0	0	257	35	0	292	657
05:15 PM	34	0	20	1	55	23	265	0	1	289	0	0	0	0	0	0	218	48	2	268	612
05:30 PM	48	0	19	1	68	28	241	0	0	269	0	0	0	0	0	0	227	39	1	267	604
05:45 PM	49	0	20	0	69	10	233	0	1	244	0	0	0	0	0	0	195	31	1	227	540
Total	184	0	81	3	268	88	999	0	4	1091	0	0	0	0	0	0	897	153	4	1054	2413

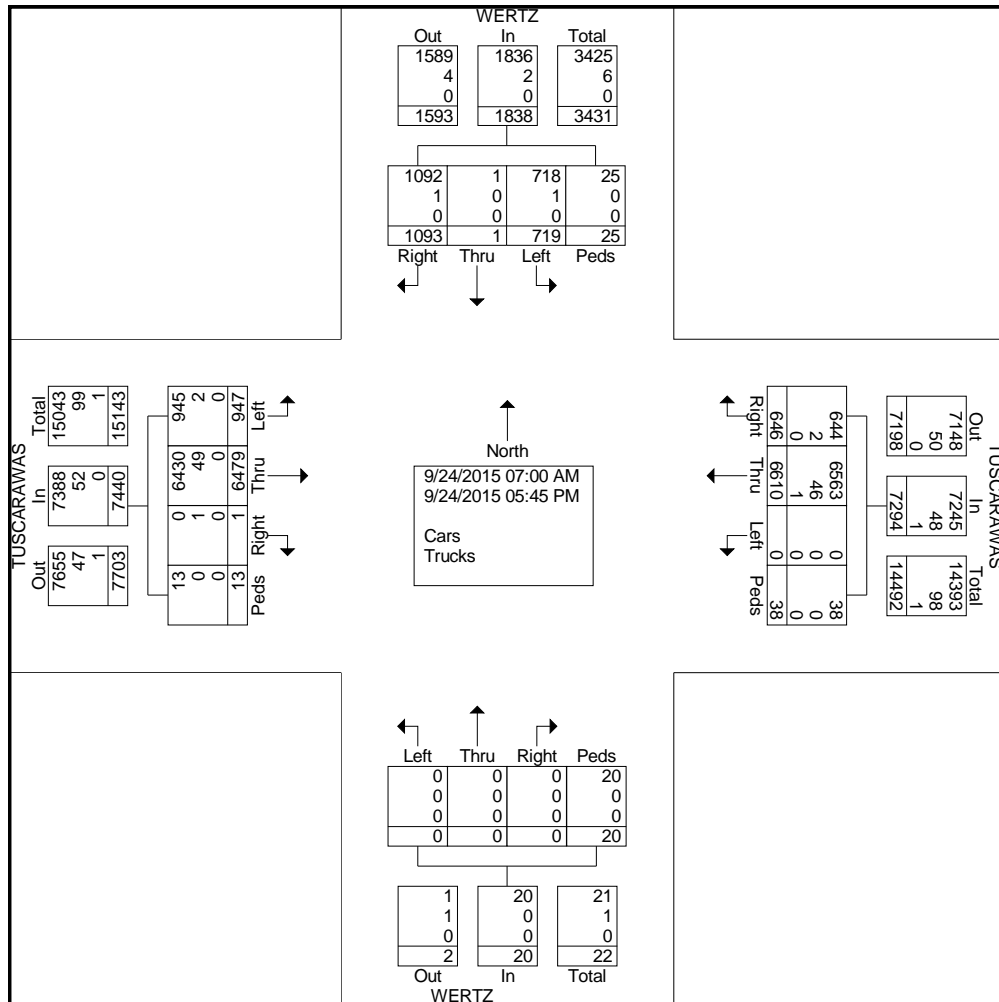


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File Name : Tuscarawas st and Wertz
 Site Code : 00000000
 Start Date : 9/24/2015
 Page No : 2

Groups Printed- Cars - Trucks -

	WERTZ From North					TUSCARAWAS From East					WERTZ From South					TUSCARAWAS From West					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
Grand Total	1093	1	719	25	1838	646	6610	0	38	7294	0	0	0	20	20	1	6479	947	13	7440	16592	
Apprch %	59.5	0.1	39.1	1.4		8.9	90.6	0	0.5		0	0	0	100		0	87.1	12.7	0.2			
Total %	6.6	0	4.3	0.2	11.1	3.9	39.8	0	0.2	44	0	0	0	0.1	0.1	0	39	5.7	0.1	44.8		
Cars	1092	1	718	25	1836	644	6563	0	38	7245	0	0	0	20	20	0	6430	945	13	7388	16489	
% Cars	99.9	100	99.9	100	99.9	99.7	99.3	0	100	99.3	0	0	0	100	100	0	99.2	99.8	100	99.3	99.4	
Trucks	1	0	1	0	2	2	46	0	0	48	0	0	0	0	0	1	49	2	0	52	102	
% Trucks	0.1	0	0.1	0	0.1	0.3	0.7	0	0	0.7	0	0	0	0	0	100	0.8	0.2	0	0.7	0.6	
%	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





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Int. :Tuscarawas St Broad Ave NW
 Counted By: KH
 Day: Tuesday
 Weather: Overcast & Rain

File Name : Tuscarawas st and Broad Ave
 Site Code : 00000000
 Start Date : 9/29/2015
 Page No : 1

Groups Printed- Cars - Trucks -

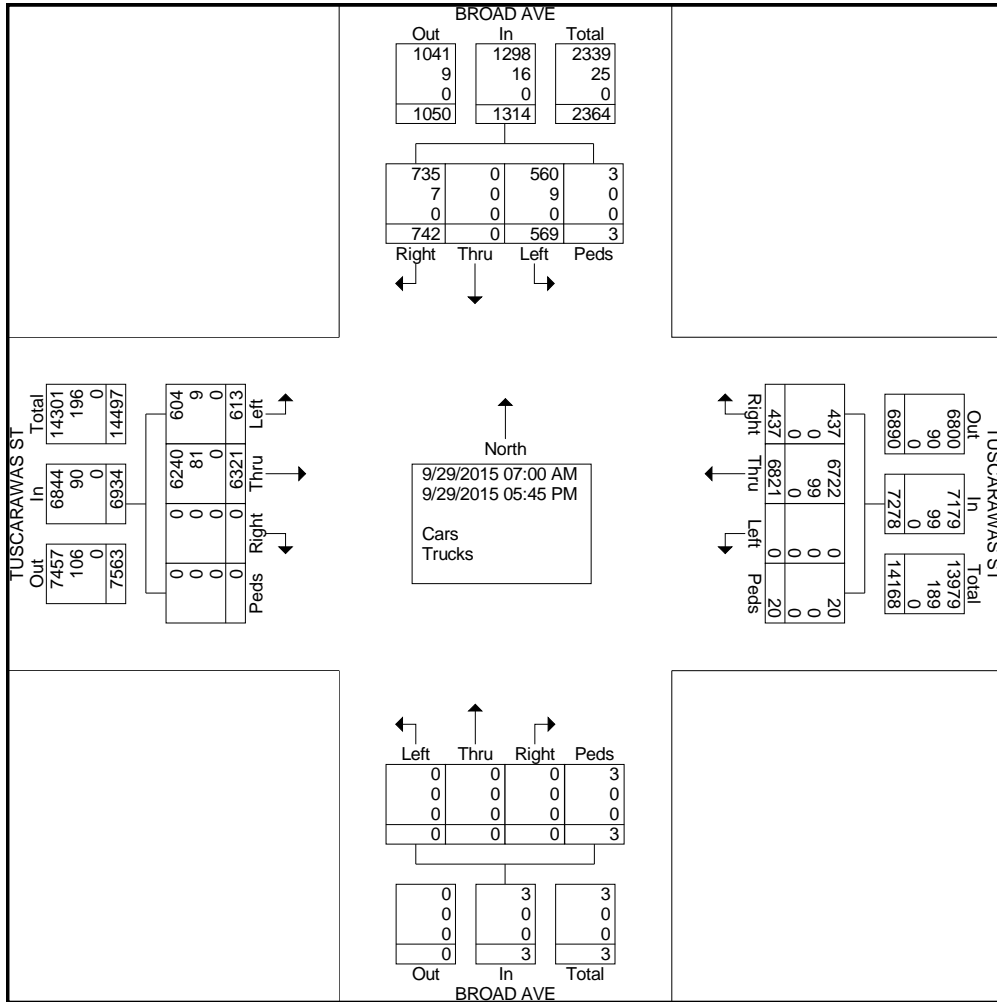
Start Time	BROAD AVE From North					TUSCARAWAS ST From East					BROAD AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	20	0	17	0	37	7	103	0	0	110	0	0	0	0	0	0	162	5	0	167	314
07:15 AM	12	0	18	0	30	5	152	0	1	158	0	0	0	0	0	0	178	15	0	193	381
07:30 AM	27	0	26	0	53	7	145	0	1	153	0	0	0	0	0	0	246	9	0	255	461
07:45 AM	28	0	26	0	54	4	176	0	1	181	0	0	0	0	0	0	194	16	0	210	445
Total	87	0	87	0	174	23	576	0	3	602	0	0	0	0	0	0	780	45	0	825	1601
08:00 AM	20	0	19	0	39	5	115	0	1	121	0	0	0	0	0	0	188	11	0	199	359
08:15 AM	12	0	20	0	32	9	153	0	0	162	0	0	0	0	0	0	177	20	0	197	391
08:30 AM	15	0	27	0	42	13	162	0	0	175	0	0	0	1	1	0	179	12	0	191	409
08:45 AM	13	0	19	1	33	9	181	0	0	190	0	0	0	1	1	0	149	9	0	158	382
Total	60	0	85	1	146	36	611	0	1	648	0	0	0	2	2	0	693	52	0	745	1541
*** BREAK ***																					
11:00 AM	17	0	18	0	35	8	184	0	3	195	0	0	0	0	0	0	199	18	0	217	447
11:15 AM	30	0	19	0	49	20	212	0	0	232	0	0	0	0	0	0	161	15	0	176	457
11:30 AM	13	0	15	0	28	13	236	0	1	250	0	0	0	0	0	0	199	13	0	212	490
11:45 AM	18	0	29	0	47	15	219	0	0	234	0	0	0	0	0	0	178	14	0	192	473
Total	78	0	81	0	159	56	851	0	4	911	0	0	0	0	0	0	737	60	0	797	1867
12:00 PM	28	0	12	0	40	12	227	0	0	239	0	0	0	0	0	0	196	12	0	208	487
12:15 PM	25	0	19	0	44	11	222	0	0	233	0	0	0	0	0	0	207	17	0	224	501
12:30 PM	23	0	13	0	36	13	236	0	0	249	0	0	0	0	0	0	206	14	0	220	505
12:45 PM	24	0	13	0	37	14	223	0	3	240	0	0	0	0	0	0	215	16	0	231	508
Total	100	0	57	0	157	50	908	0	3	961	0	0	0	0	0	0	824	59	0	883	2001
*** BREAK ***																					
02:00 PM	18	0	23	0	41	16	219	0	0	235	0	0	0	0	0	0	219	11	0	230	506
02:15 PM	21	0	12	1	34	12	240	0	1	253	0	0	0	0	0	0	241	21	0	262	549
02:30 PM	27	0	22	0	49	16	227	0	1	244	0	0	0	0	0	0	200	26	0	226	519
02:45 PM	20	0	19	0	39	12	219	0	0	231	0	0	0	0	0	0	218	17	0	235	505
Total	86	0	76	1	163	56	905	0	2	963	0	0	0	0	0	0	878	75	0	953	2079
03:00 PM	27	0	21	0	48	19	216	0	0	235	0	0	0	0	0	0	221	21	0	242	525
03:15 PM	27	0	13	0	40	11	241	0	1	253	0	0	0	0	0	0	196	24	0	220	513
03:30 PM	29	0	19	0	48	20	259	0	0	279	0	0	0	0	0	0	181	25	0	206	533
03:45 PM	31	0	20	0	51	21	262	0	0	283	0	0	0	0	0	0	200	28	0	228	562
Total	114	0	73	0	187	71	978	0	1	1050	0	0	0	0	0	0	798	98	0	896	2133
04:00 PM	31	0	15	0	46	17	234	0	0	251	0	0	0	0	0	0	198	26	0	224	521
04:15 PM	16	0	13	0	29	15	244	0	1	260	0	0	0	0	0	0	204	29	0	233	522
04:30 PM	23	0	19	0	42	20	265	0	0	285	0	0	0	0	0	0	188	30	0	218	545
04:45 PM	34	0	19	0	53	27	306	0	0	333	0	0	0	0	0	0	214	33	0	247	633
Total	104	0	66	0	170	79	1049	0	1	1129	0	0	0	0	0	0	804	118	0	922	2221
05:00 PM	22	0	13	0	35	15	302	0	3	320	0	0	0	0	0	0	195	25	0	220	575
05:15 PM	34	0	11	0	45	25	243	0	1	269	0	0	0	0	0	0	218	31	0	249	563
05:30 PM	30	0	9	1	40	14	210	0	1	225	0	0	0	0	0	0	218	29	0	247	512
05:45 PM	27	0	11	0	38	12	188	0	0	200	0	0	0	1	1	0	176	21	0	197	436
Total	113	0	44	1	158	66	943	0	5	1014	0	0	0	1	1	0	807	106	0	913	2086



File Name : Tuscarawas st and Broad Ave
 Site Code : 00000000
 Start Date : 9/29/2015
 Page No : 2

Groups Printed- Cars - Trucks -

	BROAD AVE From North					TUSCARAWAS ST From East					BROAD AVE From South					TUSCARAWAS ST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	742	0	569	3	1314	437	6821	0	20	7278	0	0	0	3	3	0	6321	613	0	6934	15529
Apprch %	56.5	0	43.3	0.2		6	93.7	0	0.3		0	0	0	100		0	91.2	8.8	0		
Total %	4.8	0	3.7	0	8.5	2.8	43.9	0	0.1	46.9	0	0	0	0	0	0	40.7	3.9	0	44.7	
Cars	735	0	560	3	1298	437	6722	0	20	7179	0	0	0	3	3	0	6240	604	0	6844	15324
% Cars	99.1	0	98.4	100	98.8	100	98.5	0	100	98.6	0	0	0	100	100	0	98.7	98.5	0	98.7	98.7
Trucks	7	0	9	0	16	0	99	0	0	99	0	0	0	0	0	0	81	9	0	90	205
% Trucks	0.9	0	1.6	0	1.2	0	1.5	0	0	1.4	0	0	0	0	0	0	1.3	1.5	0	1.3	1.3
%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





Mannik & Smith Group Inc.
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Int. : Tuscarawas & Dartmouth
Counted By: MJL
Day: Wednesday
Weather: Overcast

File Name : Tuscarawas st and Dartmouth
Site Code : 00000000
Start Date : 9/30/2015
Page No : 1

Groups Printed- Cars - Trucks -

Start Time	DARTMOUTH From North					TUSCARAWAS From East					DARTMOUTH From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	86	44	0	130	9	0	3	0	12	20	123	0	0	143	285
07:15 AM	0	0	0	0	0	0	115	69	0	184	13	0	0	0	13	33	159	0	1	193	390
07:30 AM	0	0	0	0	0	0	139	70	0	209	9	0	3	0	12	32	206	0	0	238	459
07:45 AM	0	0	0	0	0	0	137	78	0	215	7	0	0	0	7	35	203	0	1	239	461
Total	0	0	0	0	0	0	477	261	0	738	38	0	6	0	44	120	691	0	2	813	1595
08:00 AM	0	0	0	0	0	0	123	71	0	194	19	0	2	0	21	27	165	0	2	194	409
08:15 AM	0	0	0	0	0	0	136	46	0	182	4	0	3	0	7	29	178	0	0	207	396
08:30 AM	0	0	0	0	0	0	173	44	2	219	22	0	3	0	25	20	186	0	0	206	450
08:45 AM	0	0	0	1	1	0	187	37	5	229	10	0	6	0	16	20	179	0	0	199	445
Total	0	0	0	1	1	0	619	198	7	824	55	0	14	0	69	96	708	0	2	806	1700
*** BREAK ***																					
11:00 AM	0	0	0	0	0	0	217	21	1	239	21	0	7	0	28	9	157	0	0	166	433
11:15 AM	0	0	0	1	1	0	200	10	4	214	28	0	7	0	35	15	172	0	2	189	439
11:30 AM	0	0	0	0	0	0	227	20	3	250	22	0	6	0	28	15	178	0	2	195	473
11:45 AM	0	0	0	0	0	0	196	24	2	222	18	0	15	0	33	18	162	0	1	181	436
Total	0	0	0	1	1	0	840	75	10	925	89	0	35	0	124	57	669	0	5	731	1781
12:00 PM	0	0	0	0	0	0	188	26	1	215	31	0	5	0	36	16	166	0	0	182	433
12:15 PM	0	0	0	0	0	0	257	24	0	281	26	1	3	2	32	11	206	0	1	218	531
12:30 PM	0	0	0	0	0	0	261	22	1	284	25	0	4	0	29	17	201	0	2	220	533
12:45 PM	0	0	0	0	0	0	259	49	0	308	38	0	0	0	38	18	209	0	0	227	573
Total	0	0	0	0	0	0	965	121	2	1088	120	1	12	2	135	62	782	0	3	847	2070
*** BREAK ***																					
02:00 PM	0	0	0	0	0	0	221	29	2	252	23	0	9	1	33	28	193	0	0	221	506
02:15 PM	0	0	0	0	0	0	215	26	2	243	36	0	6	0	42	11	189	0	0	200	485
02:30 PM	0	0	0	0	0	0	248	41	0	289	41	0	4	0	45	12	152	0	2	166	500
02:45 PM	0	0	0	0	0	0	231	51	1	283	25	0	6	0	31	22	224	0	0	246	560
Total	0	0	0	0	0	0	915	147	5	1067	125	0	25	1	151	73	758	0	2	833	2051
03:00 PM	0	0	0	0	0	0	242	25	3	270	35	0	7	0	42	11	205	0	1	217	529
03:15 PM	0	0	0	0	0	0	246	22	5	273	30	0	10	0	40	10	201	0	1	212	525
03:30 PM	0	0	0	0	0	0	257	40	2	299	34	0	4	0	38	18	218	0	0	236	573
03:45 PM	0	0	0	0	0	1	277	25	0	303	41	0	11	0	52	12	184	0	2	198	553
Total	0	0	0	0	0	1	1022	112	10	1145	140	0	32	0	172	51	808	0	4	863	2180
04:00 PM	0	0	0	0	0	1	280	21	2	304	41	0	13	0	54	19	185	0	0	204	562
04:15 PM	0	0	0	0	0	0	264	26	6	296	46	0	6	1	53	13	197	0	1	211	560
04:30 PM	0	0	0	0	0	0	290	22	1	313	60	0	7	0	67	18	214	0	0	232	612
04:45 PM	0	0	0	0	0	0	381	17	1	399	36	0	8	0	44	15	206	0	0	221	664
Total	0	0	0	0	0	1	1215	86	10	1312	183	0	34	1	218	65	802	0	1	868	2398
05:00 PM	0	0	0	0	0	0	298	16	1	315	29	0	10	0	39	9	215	0	1	225	579
05:15 PM	0	0	0	0	0	0	291	15	0	306	37	0	9	0	46	11	205	0	2	218	570
05:30 PM	0	0	0	0	0	0	282	7	0	289	20	0	9	0	29	3	190	0	0	193	511
05:45 PM	0	0	0	0	0	0	239	11	0	250	26	0	4	1	31	6	194	0	1	201	482
Total	0	0	0	0	0	0	1110	49	1	1160	112	0	32	1	145	29	804	0	4	837	2142

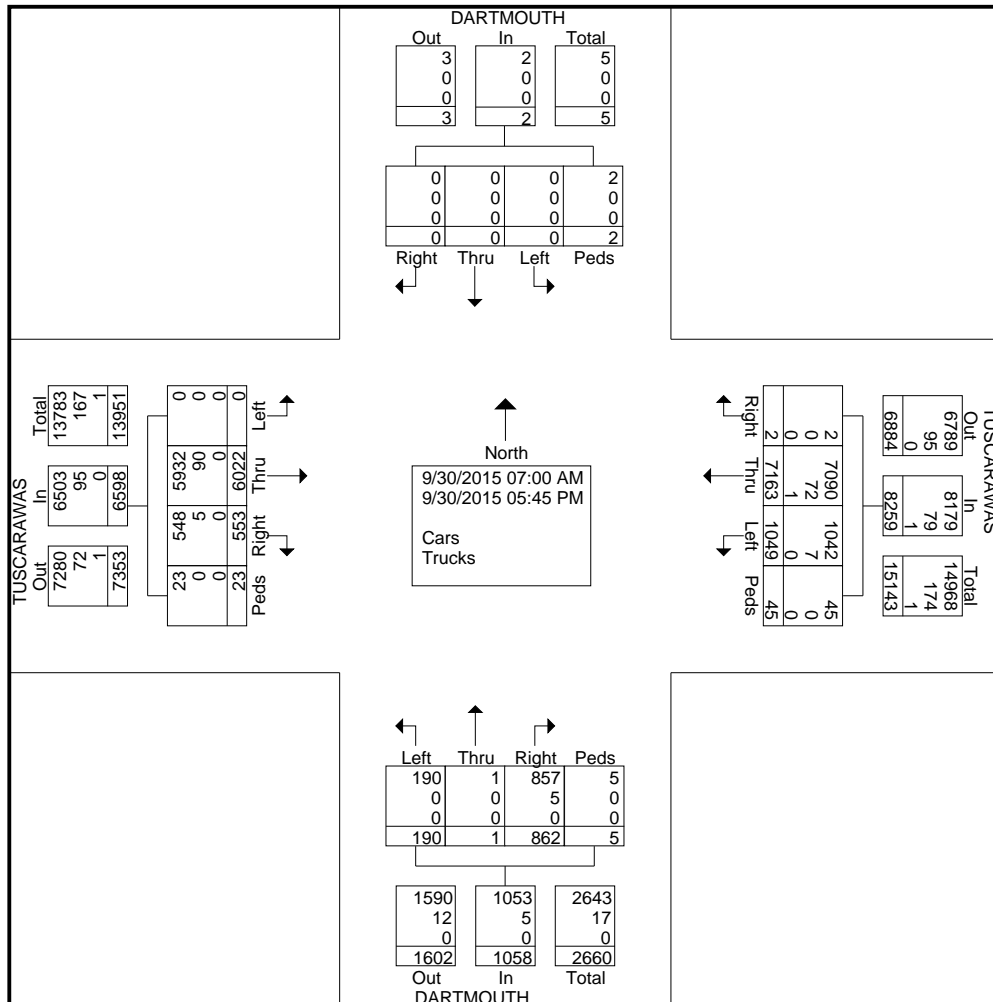


Mannik & Smith Group Inc.
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File Name : Tuscarawas st and Dartmouth
Site Code : 00000000
Start Date : 9/30/2015
Page No : 2

Groups Printed- Cars - Trucks -

	DARTMOUTH From North					TUSCARAWAS From East					DARTMOUTH From South					TUSCARAWAS From West					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
Grand Total	0	0	0	2	2	2	7163	1049	45	8259	862	1	190	5	1058	553	6022	0	23	6598	15917	
Apprch %	0	0	0	100		0	86.7	12.7	0.5		81.5	0.1	18	0.5		8.4	91.3	0	0.3			
Total %	0	0	0	0	0	0	45	6.6	0.3	51.9	5.4	0	1.2	0	6.6	3.5	37.8	0	0.1	41.5		
Cars	0	0	0	2	2	2	7090	1042	45	8179	857	1	190	5	1053	548	5932	0	23	6503	15737	
% Cars	0	0	0	100	100	100	99	99.3	100	99	99.4	100	100	100	99.5	99.1	98.5	0	100	98.6	98.9	
Trucks	0	0	0	0	0	0	72	7	0	79	5	0	0	0	5	5	90	0	0	95	179	
% Trucks	0	0	0	0	0	0	1	0.7	0	1	0.6	0	0	0	0.5	0.9	1.5	0	0	1.4	1.1	
%	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





Mannik & Smith Group Inc.

www.manniksmithgroup.com

Int. : Tuscarawas & Bedford

Counted By: MJL

Day: Tuesday

Weather: Overcast & Rain

File Name : Tuscarawas st and Bedford

Site Code : 00000000

Start Date : 9/29/2015

Page No : 1

Groups Printed- Cars - Trucks -

Start Time	BEDFORD From North					TUSCARAWAS From East					BEDFORD From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	131	38	0	169	3	1	8	0	12	21	133	0	0	154	335
07:15 AM	0	0	0	0	0	0	179	39	0	218	7	0	12	0	19	28	165	0	0	193	430
07:30 AM	0	0	0	0	0	0	200	61	0	261	10	0	12	0	22	47	208	0	0	255	538
07:45 AM	0	0	0	1	1	0	209	55	0	264	7	0	17	0	24	32	170	0	0	202	491
Total	0	0	0	1	1	0	719	193	0	912	27	1	49	0	77	128	676	0	0	804	1794
08:00 AM	0	0	0	0	0	0	141	40	0	181	3	0	9	0	12	25	169	0	2	196	389
08:15 AM	0	0	0	0	0	0	165	38	0	203	8	0	17	0	25	26	167	0	0	193	421
08:30 AM	0	0	0	0	0	0	173	52	0	225	7	0	29	0	36	27	158	0	0	185	446
08:45 AM	0	0	0	1	1	0	183	25	0	208	13	0	27	1	41	23	135	0	0	158	408
Total	0	0	0	1	1	0	662	155	0	817	31	0	82	1	114	101	629	0	2	732	1664
*** BREAK ***																					
11:00 AM	0	0	0	0	0	0	145	39	0	184	19	0	26	3	48	21	185	0	1	207	439
11:15 AM	0	0	0	0	0	0	185	26	0	211	17	0	28	0	45	17	191	0	0	208	464
11:30 AM	0	0	0	0	0	0	194	22	0	216	23	0	40	0	63	24	171	0	0	195	474
11:45 AM	0	0	0	1	1	0	220	38	0	258	24	0	34	1	59	25	209	0	0	234	552
Total	0	0	0	1	1	0	744	125	0	869	83	0	128	4	215	87	756	0	1	844	1929
12:00 PM	0	0	0	0	0	0	214	18	0	232	20	0	26	0	46	17	196	0	1	214	492
12:15 PM	0	0	0	1	1	0	220	37	0	257	16	0	37	0	53	22	231	0	1	254	565
12:30 PM	0	0	0	0	0	0	239	32	0	271	19	0	19	1	39	19	191	0	1	211	521
12:45 PM	0	0	0	0	0	0	211	26	0	237	18	0	29	1	48	25	234	0	0	259	544
Total	0	0	0	1	1	0	884	113	0	997	73	0	111	2	186	83	852	0	3	938	2122
*** BREAK ***																					
02:00 PM	0	0	0	0	0	0	195	41	0	236	40	0	42	3	85	25	203	0	4	232	553
02:15 PM	0	0	0	0	0	0	208	33	0	241	31	0	28	0	59	25	221	0	1	247	547
02:30 PM	0	0	0	1	1	0	234	35	0	269	31	0	33	1	65	35	210	0	6	251	586
02:45 PM	1	0	0	0	1	0	203	38	0	241	28	0	39	0	67	24	205	0	0	229	538
Total	1	0	0	1	2	0	840	147	0	987	130	0	142	4	276	109	839	0	11	959	2224
03:00 PM	0	0	0	0	0	0	210	36	0	246	29	0	49	0	78	26	231	0	0	257	581
03:15 PM	0	0	0	0	0	0	221	31	0	252	31	0	37	0	68	18	213	0	0	231	551
03:30 PM	0	0	0	0	0	0	214	18	0	232	35	0	57	0	92	19	220	0	2	241	565
03:45 PM	0	0	0	0	0	0	248	29	0	277	30	0	50	1	81	21	239	0	0	260	618
Total	0	0	0	0	0	0	893	114	0	1007	125	0	193	1	319	84	903	0	2	989	2315
04:00 PM	0	0	0	0	0	0	222	18	0	240	26	0	45	1	72	16	234	0	0	250	562
04:15 PM	0	0	0	0	0	0	240	20	0	260	37	0	24	0	61	17	218	0	0	235	556
04:30 PM	0	0	0	0	0	0	221	15	0	236	25	0	37	0	62	8	197	0	1	206	504
04:45 PM	0	0	0	0	0	0	256	22	0	278	27	0	58	0	85	21	227	0	1	249	612
Total	0	0	0	0	0	0	939	75	0	1014	115	0	164	1	280	62	876	0	2	940	2234
05:00 PM	0	0	0	0	0	0	262	15	0	277	23	0	41	0	64	20	232	0	0	252	593
05:15 PM	0	0	0	0	0	0	224	20	0	244	26	1	54	0	81	19	254	0	0	273	598
05:30 PM	0	0	0	2	2	0	181	16	0	197	15	0	34	2	51	24	224	0	2	250	500
05:45 PM	0	0	0	0	0	0	174	10	0	184	16	0	33	0	49	10	228	0	0	238	471
Total	0	0	0	2	2	0	841	61	0	902	80	1	162	2	245	73	938	0	2	1013	2162

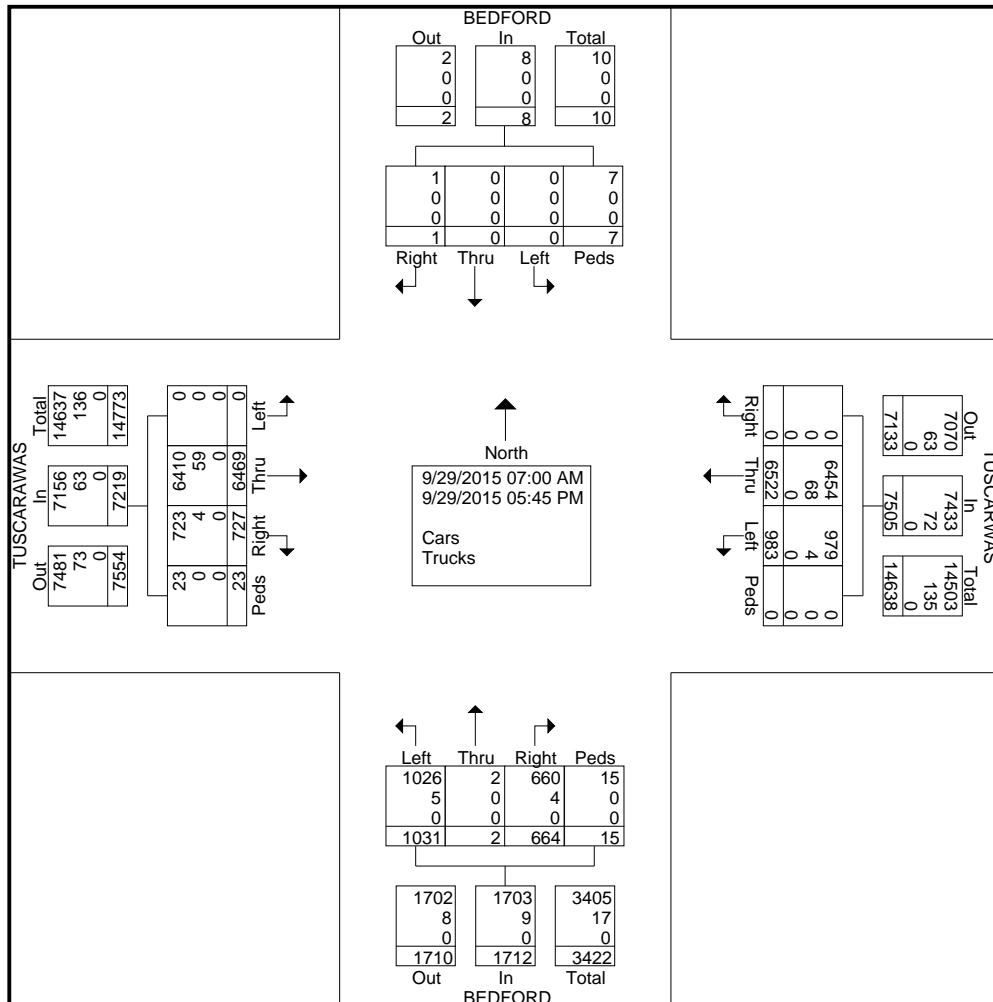


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File Name : Tuscarawas st and Bedford
Site Code : 00000000
Start Date : 9/29/2015
Page No : 2

Groups Printed- Cars - Trucks -

	BEDFORD From North					TUSCARAWAS From East					BEDFORD From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	1	0	0	7	8	0	6522	983	0	7505	664	2	1031	15	1712	727	6469	0	23	7219	16444
Apprch %	12.5	0	0	87.5		0	86.9	13.1	0		38.8	0.1	60.2	0.9		10.1	89.6	0	0.3		
Total %	0	0	0	0	0	0	39.7	6	0	45.6	4	0	6.3	0.1	10.4	4.4	39.3	0	0.1	43.9	
Cars	1	0	0	7	8	0	6454	979	0	7433	660	2	1026	15	1703	723	6410	0	23	7156	16300
% Cars	100	0	0	100	100	0	99	99.6	0	99	99.4	100	99.5	100	99.5	99.4	99.1	0	100	99.1	99.1
Trucks	0	0	0	0	0	0	68	4	0	72	4	0	5	0	9	4	59	0	0	63	144
% Trucks	0	0	0	0	0	0	1	0.4	0	1	0.6	0	0.5	0	0.5	0.6	0.9	0	0	0.9	0.9
%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





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Int. : Tuscarawas St and Harrison NW
 Counted By: MJL
 Day: 10 15 2015
 Weather: Sunny

File Name : Tuscarawas st and Harrison NW
 Site Code : 00000000
 Start Date : 10/15/2015
 Page No : 1

Groups Printed- Car - Truck -

Start Time	HARRISON NW From North					TUSCARAWAS From East					HARRISON NW From South					TUSCARAWAS From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	1	0	14	0	15	5	159	2	0	166	1	0	0	0	1	1	114	0	0	115	297
07:15 AM	5	0	20	0	25	10	224	1	0	235	0	0	0	0	0	1	172	1	0	174	434
07:30 AM	7	1	21	0	29	10	236	2	0	248	0	0	0	0	0	2	170	1	0	173	450
07:45 AM	11	1	52	1	65	14	262	1	3	280	0	0	2	0	2	2	143	3	0	148	495
Total	24	2	107	1	134	39	881	6	3	929	1	0	2	0	3	6	599	5	0	610	1676
08:00 AM	3	0	24	0	27	11	210	0	1	222	0	1	4	0	5	1	138	1	0	140	394
08:15 AM	6	0	35	0	41	13	212	1	4	230	0	0	2	0	2	3	146	1	0	150	423
08:30 AM	6	1	22	0	29	16	215	1	0	232	2	0	0	0	2	0	147	3	0	150	413
08:45 AM	9	0	16	1	26	14	208	1	1	224	1	1	0	0	2	3	160	2	1	166	418
Total	24	1	97	1	123	54	845	3	6	908	3	2	6	0	11	7	591	7	1	606	1648
*** BREAK ***																					
11:00 AM	12	0	19	0	31	11	216	0	1	228	1	0	0	2	3	4	192	3	0	199	461
11:15 AM	9	1	19	0	29	7	180	2	0	189	1	1	1	4	7	2	166	3	0	171	396
11:30 AM	10	2	29	2	43	13	226	2	0	241	0	1	4	1	6	1	196	6	0	203	493
11:45 AM	12	4	19	0	35	15	225	5	3	248	0	0	1	0	1	7	203	5	0	215	499
Total	43	7	86	2	138	46	847	9	4	906	2	2	6	7	17	14	757	17	0	788	1849
12:00 PM	11	2	22	0	35	16	235	3	4	258	2	0	0	0	2	4	171	2	0	177	472
12:15 PM	5	3	27	2	37	17	225	2	1	245	0	0	2	3	5	4	224	3	0	231	518
12:30 PM	7	0	25	1	33	13	214	0	3	230	3	2	3	3	11	3	220	5	0	228	502
12:45 PM	11	1	32	0	44	13	231	4	0	248	2	2	1	3	8	1	214	3	2	220	520
Total	34	6	106	3	149	59	905	9	8	981	7	4	6	9	26	12	829	13	2	856	2012
*** BREAK ***																					
02:00 PM	12	1	22	3	38	18	267	2	0	287	2	1	2	0	5	1	217	5	0	223	553
02:15 PM	4	1	27	2	34	22	287	1	2	312	1	0	1	0	2	2	219	6	2	229	577
02:30 PM	5	0	18	2	25	12	243	4	4	263	1	0	1	0	2	1	211	7	1	220	510
02:45 PM	12	2	32	0	46	21	292	3	2	318	0	1	1	0	2	0	225	1	0	226	592
Total	33	4	99	7	143	73	1089	10	8	1180	4	2	5	0	11	4	872	19	3	898	2232
03:00 PM	13	5	33	3	54	31	243	3	1	278	0	2	2	0	4	2	228	5	3	238	574
03:15 PM	18	1	27	0	46	25	312	2	1	340	3	0	0	0	3	0	244	4	1	249	638
03:30 PM	6	2	19	3	30	28	269	2	2	301	4	1	0	0	5	2	229	5	1	237	573
03:45 PM	18	4	32	1	55	33	316	2	9	360	2	2	2	2	8	6	200	4	2	212	635
Total	55	12	111	7	185	117	1140	9	13	1279	9	5	4	2	20	10	901	18	7	936	2420
04:00 PM	19	1	51	6	77	33	275	8	5	321	6	1	1	0	8	2	201	11	1	215	621
04:15 PM	28	2	57	2	89	22	313	3	1	339	0	0	1	0	1	9	184	2	0	195	624
04:30 PM	39	3	70	1	113	36	303	2	2	343	4	1	2	2	9	3	216	3	0	222	687
04:45 PM	20	2	29	0	51	28	296	2	1	327	0	3	1	0	4	3	196	3	4	206	588
Total	106	8	207	9	330	119	1187	15	9	1330	10	5	5	2	22	17	797	19	5	838	2520
05:00 PM	15	2	27	1	45	36	288	2	0	326	2	1	4	0	7	2	237	1	3	243	621
05:15 PM	13	1	27	1	42	27	276	5	0	308	3	2	0	0	5	2	176	4	0	182	537
05:30 PM	16	1	38	0	55	20	238	1	1	260	4	2	2	1	9	5	217	7	2	231	555
05:45 PM	12	0	28	0	40	14	226	9	2	251	3	0	0	2	5	1	200	5	0	206	502
Total	56	4	120	2	182	97	1028	17	3	1145	12	5	6	3	26	10	830	17	5	862	2215

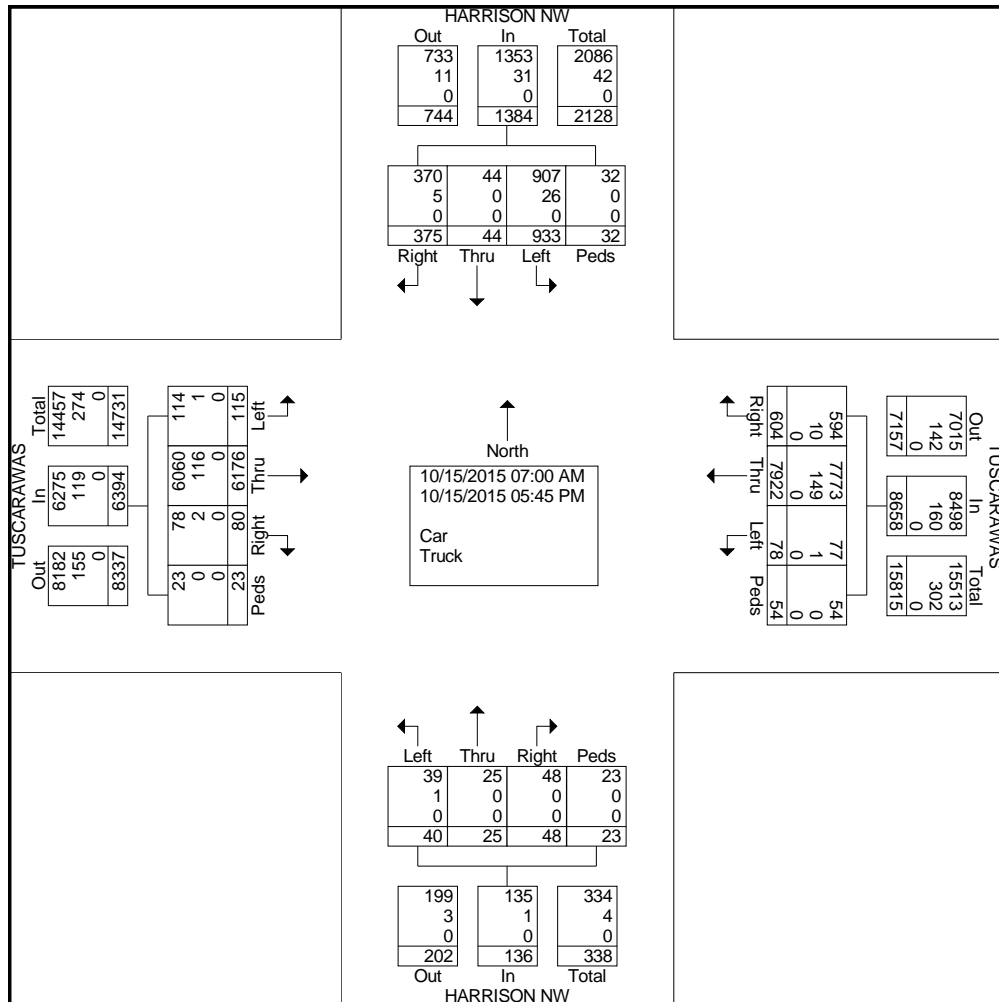


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File Name : Tuscarawas st and Harrison NW
 Site Code : 00000000
 Start Date : 10/15/2015
 Page No : 2

Groups Printed- Car - Truck -

	HARRISON NW From North					TUSCARAWAS From East					HARRISON NW From South					TUSCARAWAS From West					Int. Total	
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total		
Grand Total	375	44	933	32	1384	604	7922	78	54	8658	48	25	40	23	136	80	6176	115	23	6394	16572	
Apprch %	27.1	3.2	67.4	2.3		7	91.5	0.9	0.6		35.3	18.4	29.4	16.9		1.3	96.6	1.8	0.4			
Total %	2.3	0.3	5.6	0.2	8.4	3.6	47.8	0.5	0.3	52.2	0.3	0.2	0.2	0.1	0.8	0.5	37.3	0.7	0.1	38.6		
Car	370	44	907	32	1353	594	7773	77	54	8498	48	25	39	23	135	78	6060	114	23	6275	16261	
% Car	98.7	100	97.2	100	97.8	98.3	98.1	98.7	100	98.2	100	100	97.5	100	99.3	97.5	98.1	99.1	100	98.1	98.1	
Truck	5	0	26	0	31	10	149	1	0	160	0	0	1	0	1	2	116	1	0	119	311	
% Truck	1.3	0	2.8	0	2.2	1.7	1.9	1.3	0	1.8	0	0	2.5	0	0.7	2.5	1.9	0.9	0	1.9	1.9	
%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



APPENDIX C
PC-WARRANTS REPORTS



Signal Warrants - Summary

Major Street Approaches

Eastbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: **6,306**

Westbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: **5,244**

Minor Street Approaches

Northbound: WHIPPLE

Number of Lanes: 2

Total Approach Volume: **2,248**

Southbound: WHIPPLE

Number of Lanes: 2

Total Approach Volume: **2,992**

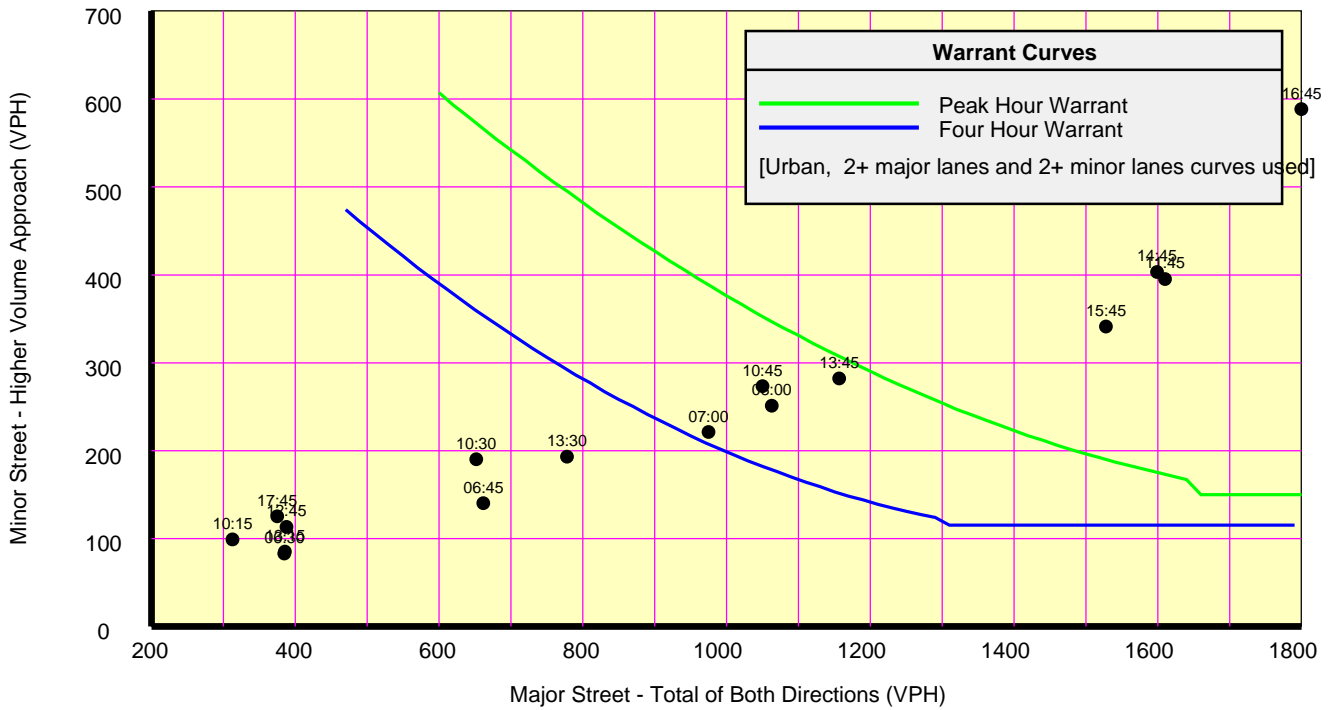
Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes	Satisfied
Warrant 1A - Minimum Vehicular Volume Satisfied	
Required volumes reached for 8 hours, 8 are needed	
Warrant 1B - Interruption of Continuous Traffic Satisfied	
Required volumes reached for 8 hours, 8 are needed	
Warrant 1C - Combination of Warrants Satisfied	
Required 1A volumes reached for 8 hours, 8 are needed	
Required 1B volumes reached for 8 hours, 8 are needed	
Warrant 2 - Four Hour Volumes	Satisfied
Number of hours (8) volumes exceed minimum >= minimum required (4).	
Warrant 3 - Peak Hour	Satisfied
Warrant 3A - Peak Hour Delay Satisfied	
Number of hours (32) volumes exceed minimum >= required (1). Delay data not evaluated.	
Warrant 3B - Peak Hour Volumes Satisfied	
Volumes exceed minimums for at least one hour.	
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated Signal System	Not Evaluated
Warrant 7 - Crash Experience	Not Evaluated
Warrant 8 - Roadway Network	Not Evaluated
Warrant 9 - Intersection Near a Grade Crossing	Not Evaluated

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Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

War 1A-Minimum Volume

War 1B-Interruption of Traffic

War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol Dir	Maj 600	Min 200	Hour Begin	Major Total	Minor Vol Dir	Maj 900	Min 100	Hour Begin	Major Total	Minor Vol Dir	1A Met	1B Met
16:45	1,805	588 SB	Yes	Yes	16:45	1,805	588 SB	Yes	Yes	16:30	1,785	585 SB	Yes	Yes
11:45	1,610	395 SB	Yes	Yes	11:45	1,610	395 SB	Yes	Yes	11:45	1,610	395 SB	-	Yes
14:45	1,599	403 SB	Yes	Yes	14:45	1,599	403 SB	Yes	Yes	14:30	1,605	409 SB	Yes	Yes
15:45	1,528	341 SB	Yes	Yes	15:45	1,528	341 SB	Yes	Yes	11:30	1,597	365 SB	Yes	-
13:45	1,157	282 SB	Yes	Yes	13:45	1,157	282 SB	Yes	Yes	15:30	1,549	323 NB	Yes	Yes
08:00	1,063	251 SB	Yes	Yes	08:00	1,063	251 SB	Yes	Yes	08:00	1,063	251 SB	Yes	Yes
10:45	1,050	273 SB	Yes	Yes	10:45	1,050	273 SB	Yes	Yes	10:45	1,050	273 SB	-	Yes
07:00	975	221 SB	Yes	Yes	07:00	975	221 SB	Yes	Yes	07:00	975	221 SB	Yes	Yes
13:30	778	193 SB	Yes	No	13:30	778	193 SB	No	Yes	12:30	799	226 SB	Yes	-
06:45	662	140 SB	Yes	No	06:45	662	140 SB	No	Yes	13:30	778	193 SB	Yes	Yes
10:30	652	190 SB	Yes	No	10:30	652	190 SB	No	Yes	17:30	747	247 SB	Yes	Yes
12:45	388	113 SB	No	No	12:45	388	113 SB	No	Yes	10:30	652	190 SB	Yes	No
13:15	386	85 SB	No	No	13:15	386	85 SB	No	No	06:45	662	140 SB	No	No
06:30	385	83 SB	No	No	06:30	385	83 SB	No	No	12:45	388	113 SB	-	No
17:45	375	125 SB	No	No	17:45	375	125 SB	No	Yes	13:15	386	85 SB	-	No
10:15	313	99 SB	No	No	10:15	313	99 SB	No	No	06:30	385	83 SB	No	No
06:15	145	23 SB	No	No	06:15	145	23 SB	No	No	10:15	313	99 SB	No	No
22:45	0	0 SB	No	No	22:45	0	0 SB	No	No	06:15	145	23 SB	No	No
22:30	0	0 SB	No	No	22:30	0	0 SB	No	No	22:30	0	0 SB	No	No
22:15	0	0 SB	No	No	22:15	0	0 SB	No	No	22:15	0	0 SB	No	No
22:00	0	0 SB	No	No	22:00	0	0 SB	No	No	22:00	0	0 SB	No	No
21:45	0	0 SB	No	No	21:45	0	0 SB	No	No	21:45	0	0 SB	No	No
21:30	0	0 SB	No	No	21:30	0	0 SB	No	No	21:30	0	0 SB	No	No
21:15	0	0 SB	No	No	21:15	0	0 SB	No	No	21:15	0	0 SB	No	No

Signal Warrants - Summary

Major Street Approaches

Eastbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: **5,833**

Westbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: **6,996**

Minor Street Approaches

Northbound: VALLEYVIEW

Number of Lanes: 2

Total Approach Volume: **1,533**

Southbound: VALLEYVIEW

Number of Lanes: 2

Total Approach Volume: **1,180**

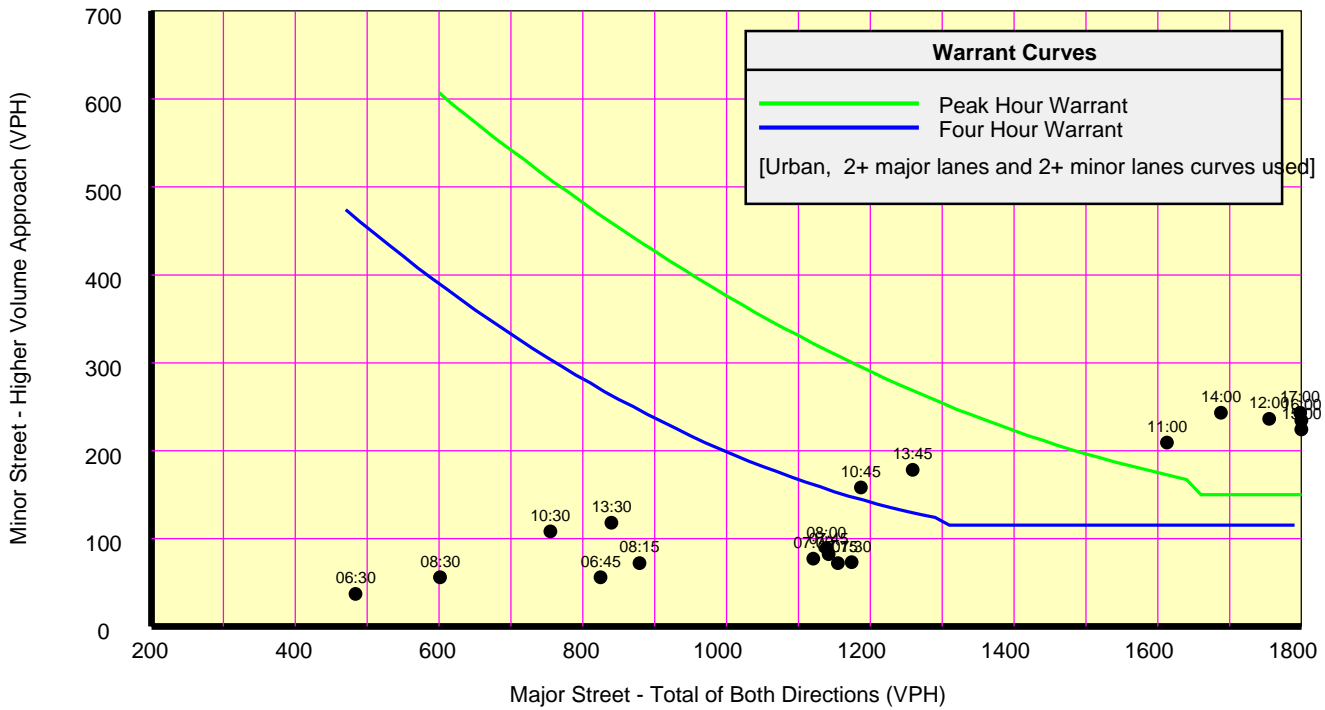
Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes	Not Satisfied
Warrant 1A - Minimum Vehicular Volume Not Satisfied	
Required volumes reached for 6 hours, 8 are needed	
Warrant 1B - Interruption of Continuous Traffic Not Satisfied	
Required volumes reached for 6 hours, 8 are needed	
Warrant 1C - Combination of Warrants Not Satisfied	
Required 1A volumes reached for 6 hours, 8 are needed	
Required 1B volumes reached for 7 hours, 8 are needed	
Warrant 2 - Four Hour Volumes	Satisfied
Number of hours (6) volumes exceed minimum >= minimum required (4).	
Warrant 3 - Peak Hour	Satisfied
Warrant 3A - Peak Hour Delay Satisfied	
Number of hours (22) volumes exceed minimum >= required (1). Delay data not evaluated.	
Warrant 3B - Peak Hour Volumes Satisfied	
Volumes exceed minimums for at least one hour.	
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated Signal System	Not Evaluated
Warrant 7 - Crash Experience	Not Evaluated
Warrant 8 - Roadway Network	Not Evaluated
Warrant 9 - Intersection Near a Grade Crossing	Not Evaluated

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Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

War 1A-Minimum Volume

War 1B-Interruption of Traffic

War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol Dir	Maj 600	Min 200	Hour Begin	Major Total	Minor Vol Dir	Maj 900	Min 100	Hour Begin	Major Total	Minor Vol Dir	1A Met	1B Met
16:00	1,901	234 NB	Yes	Yes	16:45	1,902	243 NB	Yes	Yes	16:30	1,997	230 NB	-	Yes
15:00	1,814	224 NB	Yes	Yes	15:45	1,843	239 NB	Yes	Yes	16:45	1,902	243 NB	Yes	-
17:00	1,798	243 NB	Yes	Yes	14:45	1,782	229 NB	Yes	Yes	15:45	1,843	239 NB	Yes	-
12:00	1,755	236 NB	Yes	Yes	11:45	1,731	226 NB	Yes	Yes	14:45	1,782	229 NB	Yes	-
14:00	1,688	243 NB	Yes	Yes	13:45	1,259	178 NB	Yes	Yes	15:30	1,758	246 NB	-	Yes
11:00	1,613	209 NB	Yes	Yes	10:45	1,187	158 NB	Yes	Yes	14:30	1,757	229 NB	-	Yes
13:45	1,259	178 NB	Yes	No	07:30	1,174	73 SB	Yes	No	12:00	1,755	236 NB	Yes	-
10:45	1,187	158 NB	Yes	No	07:15	1,155	72 SB	Yes	No	11:30	1,718	221 NB	-	Yes
07:30	1,174	73 SB	Yes	No	07:45	1,142	82 SB	Yes	No	11:00	1,613	209 NB	Yes	-
07:15	1,155	72 SB	Yes	No	08:00	1,139	89 SB	Yes	No	13:45	1,259	178 NB	Yes	-
07:45	1,142	82 SB	Yes	No	07:00	1,121	77 SB	Yes	No	07:45	1,142	82 SB	No	Yes
08:00	1,139	89 SB	Yes	No	08:15	879	72 SB	No	No	12:30	895	116 NB	-	Yes
07:00	1,121	77 SB	Yes	No	13:30	840	118 NB	No	Yes	17:30	849	121 NB	-	Yes
08:15	879	72 SB	Yes	No	06:45	825	56 SB	No	No	13:30	840	118 NB	No	Yes
13:30	840	118 NB	Yes	No	10:30	755	108 NB	No	Yes	10:30	755	108 NB	No	Yes
06:45	825	56 SB	Yes	No	08:30	602	56 SB	No	No	10:45	1,187	158 NB	No	-
10:30	755	108 NB	Yes	No	06:30	484	37 SB	No	No	07:30	1,174	73 SB	No	No
08:30	602	56 SB	Yes	No	12:45	450	61 NB	No	No	07:15	1,155	72 SB	No	No
06:30	484	37 SB	No	No	17:45	415	55 NB	No	No	08:00	1,139	89 SB	No	-
13:15	413	57 NB	No	No	13:15	413	57 NB	No	No	07:00	1,121	77 SB	No	No
10:15	394	51 NB	No	No	10:15	394	51 NB	No	No	08:15	879	72 SB	No	-
08:45	293	28 SB	No	No	08:45	293	28 SB	No	No	06:45	825	56 SB	No	No
06:15	226	22 SB	No	No	06:15	226	22 SB	No	No	08:30	602	56 SB	No	-
22:45	0	0 SB	No	No	22:45	0	0 SB	No	No	06:30	484	37 SB	No	No

Signal Warrants - Summary

Major Street Approaches

Eastbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: **6,364**

Westbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: **6,694**

Minor Street Approaches

Northbound: RAFF

Number of Lanes: 2

Total Approach Volume: **2,476**

Southbound: RAFF

Number of Lanes: 1

Total Approach Volume: **415**

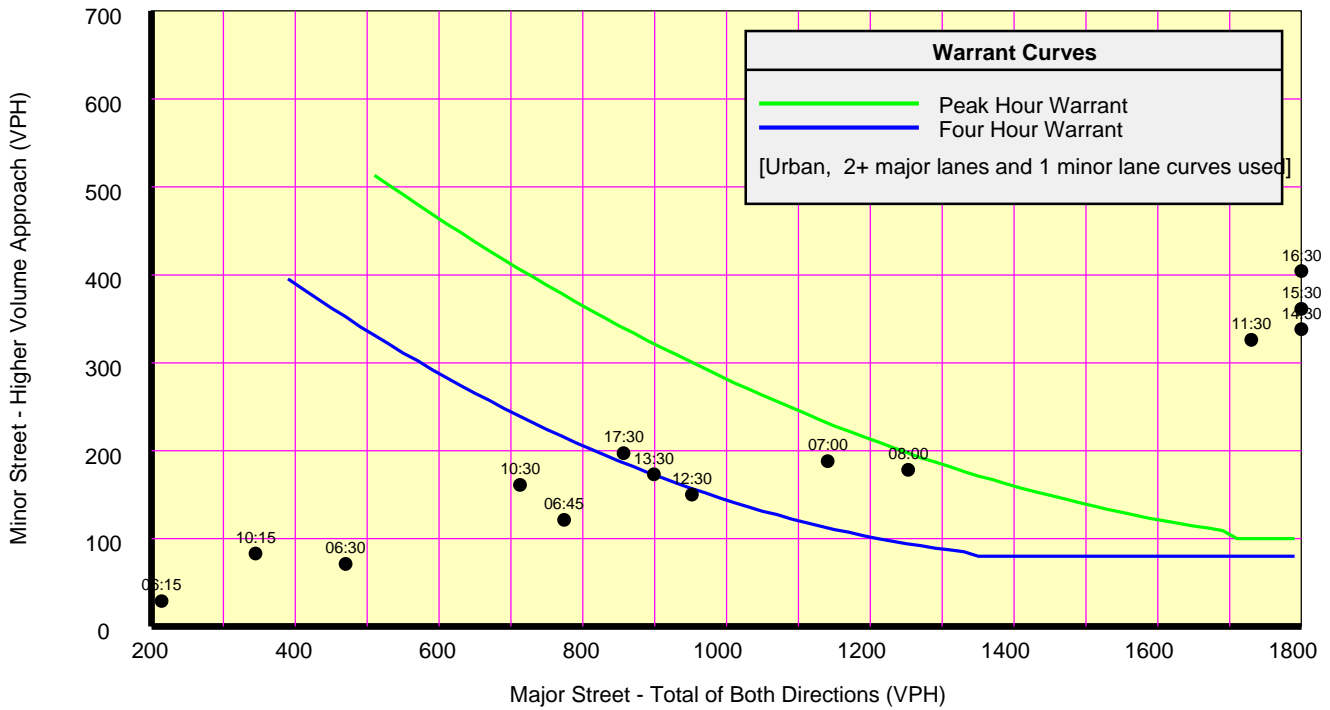
Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes	Satisfied
Warrant 1A - Minimum Vehicular Volume Satisfied	
Required volumes reached for 10 hours, 8 are needed	
Warrant 1B - Interruption of Continuous Traffic Satisfied	
Required volumes reached for 8 hours, 8 are needed	
Warrant 1C - Combination of Warrants Satisfied	
Required 1A volumes reached for 8 hours, 8 are needed	
Required 1B volumes reached for 8 hours, 8 are needed	
Warrant 2 - Four Hour Volumes	Satisfied
Number of hours (9) volumes exceed minimum >= minimum required (4).	
Warrant 3 - Peak Hour	Satisfied
Warrant 3A - Peak Hour Delay Satisfied	
Number of hours (33) volumes exceed minimum >= required (1). Delay data not evaluated.	
Warrant 3B - Peak Hour Volumes Satisfied	
Volumes exceed minimums for at least one hour.	
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated Signal System	Not Evaluated
Warrant 7 - Crash Experience	Not Evaluated
Warrant 8 - Roadway Network	Not Evaluated
Warrant 9 - Intersection Near a Grade Crossing	Not Evaluated

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Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

War 1A-Minimum Volume

War 1B-Interruption of Traffic

War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol Dir	Maj 600	Min 150	Hour Begin	Major Total	Minor Vol Dir	Maj 900	Min 75	Hour Begin	Major Total	Minor Vol Dir	1A Met	1B Met
16:30	1,862	404 NB	Yes	Yes	16:45	1,847	401 NB	Yes	Yes	16:30	1,862	404 NB	Yes	Yes
14:30	1,828	338 NB	Yes	Yes	14:45	1,810	355 NB	Yes	Yes	14:30	1,828	338 NB	Yes	Yes
15:30	1,823	361 NB	Yes	Yes	11:45	1,810	358 NB	Yes	Yes	15:30	1,823	361 NB	Yes	Yes
11:30	1,730	326 NB	Yes	Yes	15:45	1,792	377 NB	Yes	Yes	11:45	1,810	358 NB	-	Yes
08:00	1,253	178 NB	Yes	Yes	13:45	1,392	246 NB	Yes	Yes	11:30	1,730	326 NB	Yes	-
07:00	1,141	188 NB	Yes	Yes	08:00	1,253	178 NB	Yes	Yes	07:45	1,324	199 NB	Yes	Yes
12:30	952	150 NB	Yes	Yes	07:00	1,141	188 NB	Yes	Yes	10:45	1,118	210 NB	-	Yes
13:30	899	173 NB	Yes	Yes	10:45	1,118	210 NB	Yes	Yes	12:30	952	150 NB	Yes	-
17:30	857	197 NB	Yes	Yes	13:30	899	173 NB	No	Yes	13:30	899	173 NB	Yes	Yes
10:30	713	161 NB	Yes	Yes	06:45	774	121 NB	No	Yes	17:30	857	197 NB	Yes	Yes
06:45	774	121 NB	Yes	No	10:30	713	161 NB	No	Yes	06:45	774	121 NB	Yes	Yes
06:30	470	71 NB	No	No	06:30	470	71 NB	No	No	10:30	713	161 NB	Yes	No
10:15	345	83 NB	No	No	12:45	467	69 NB	No	No	06:30	470	71 NB	No	No
06:15	214	29 NB	No	No	13:15	457	87 NB	No	Yes	12:45	467	69 NB	-	No
22:45	0	0 SB	No	No	17:45	428	94 NB	No	Yes	13:15	457	87 NB	-	No
22:30	0	0 SB	No	No	10:15	345	83 NB	No	Yes	10:15	345	83 NB	No	No
22:15	0	0 SB	No	No	06:15	214	29 NB	No	No	08:45	296	46 NB	No	No
22:00	0	0 SB	No	No	22:45	0	0 SB	No	No	06:15	214	29 NB	No	No
21:45	0	0 SB	No	No	22:30	0	0 SB	No	No	22:30	0	0 SB	No	No
21:30	0	0 SB	No	No	22:15	0	0 SB	No	No	22:15	0	0 SB	No	No
21:15	0	0 SB	No	No	22:00	0	0 SB	No	No	22:00	0	0 SB	No	No
21:00	0	0 SB	No	No	21:45	0	0 SB	No	No	21:45	0	0 SB	No	No
20:45	0	0 SB	No	No	21:30	0	0 SB	No	No	21:30	0	0 SB	No	No
20:30	0	0 SB	No	No	21:15	0	0 SB	No	No	21:15	0	0 SB	No	No

Signal Warrants - Summary

Major Street Approaches

Eastbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: 6,759

Westbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: 7,346

Minor Street Approaches

Northbound: BELLFLOWER

Number of Lanes: 1

Total Approach Volume: 563

Southbound: BELLFLOWER

Number of Lanes: 1

Total Approach Volume: 163

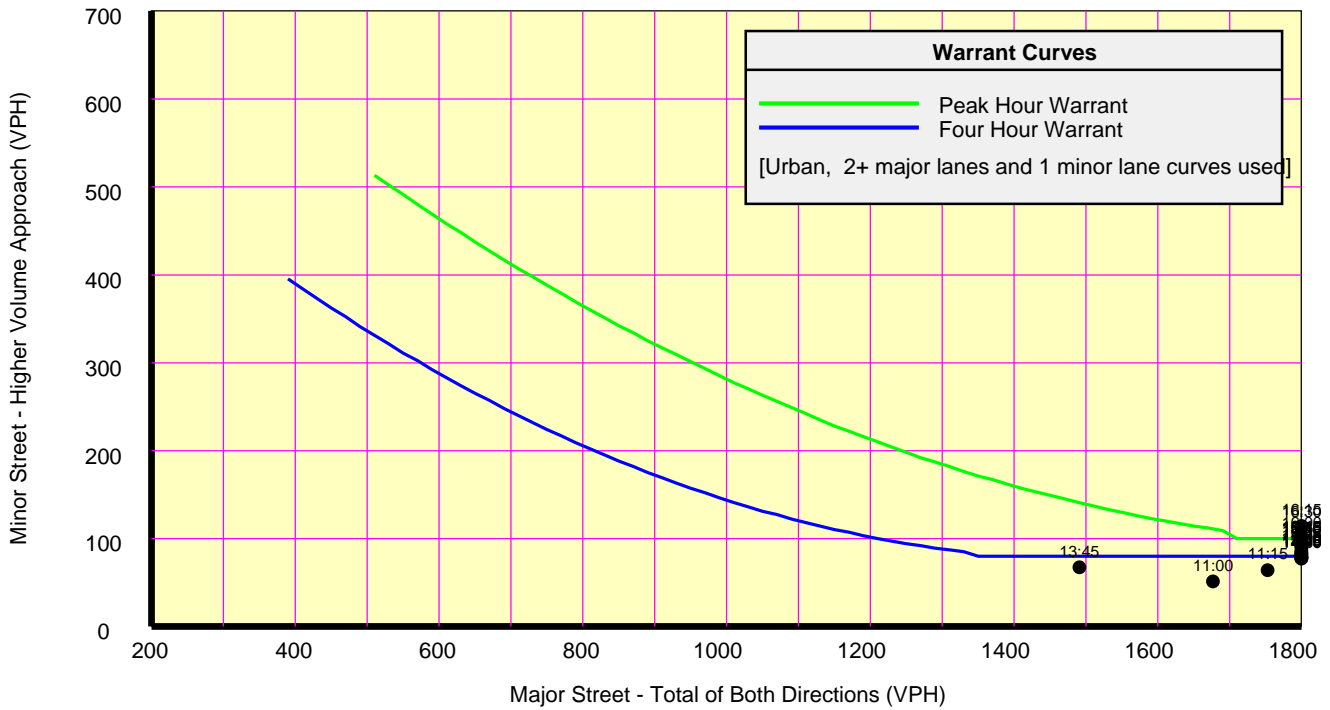
Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes	Not Satisfied
Warrant 1A - Minimum Vehicular Volume Not Satisfied	
Required volumes reached for 0 hours, 8 are needed	
Warrant 1B - Interruption of Continuous Traffic Not Satisfied	
Required volumes reached for 5 hours, 8 are needed	
Warrant 1C - Combination of Warrants Not Satisfied	
Required 1A volumes reached for 0 hours, 8 are needed	
Required 1B volumes reached for 5 hours, 8 are needed	
Warrant 2 - Four Hour Volumes	Satisfied
Number of hours (5) volumes exceed minimum >= minimum required (4).	
Warrant 3 - Peak Hour	Satisfied
Warrant 3A - Peak Hour Delay Satisfied	
Number of hours (3) volumes exceed minimum >= required (1). Delay data not evaluated.	
Warrant 3B - Peak Hour Volumes Satisfied	
Volumes exceed minimums for at least one hour.	
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated Signal System	Not Evaluated
Warrant 7 - Crash Experience	Not Evaluated
Warrant 8 - Roadway Network	Not Evaluated
Warrant 9 - Intersection Near a Grade Crossing	Not Evaluated

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Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

War 1A-Minimum Volume

War 1B-Interruption of Traffic

War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol	Dir	Maj 600	Min 150	Hour Begin	Major Total	Minor Vol	Dir	Maj 900	Min 75	Hour Begin	Major Total	Minor Vol	Dir	1A Met	1B Met
15:15	2,090	94	NB	Yes	No	15:00	2,055	91	NB	Yes	Yes	14:45	1,989	86	NB	No	Yes
15:00	2,055	91	NB	Yes	No	17:00	1,985	83	NB	Yes	Yes	16:45	1,988	95	NB	No	Yes
15:30	2,030	94	NB	Yes	No	16:00	1,981	100	NB	Yes	Yes	15:45	1,973	93	NB	No	Yes
14:45	1,989	86	NB	Yes	No	14:00	1,926	83	NB	Yes	Yes	11:15	1,753	64	NB	No	Yes
16:45	1,988	95	NB	Yes	No	11:30	1,874	80	NB	Yes	Yes	13:45	1,491	67	NB	No	Yes
16:15	1,986	114	NB	Yes	No	11:15	1,753	64	NB	Yes	No	15:15	2,090	94	NB	No	-
17:00	1,985	83	NB	Yes	No	11:00	1,677	51	NB	Yes	No	15:00	2,055	91	NB	No	-
16:00	1,981	100	NB	Yes	No	13:45	1,491	67	NB	Yes	No	15:30	2,030	94	NB	No	-
16:30	1,980	112	NB	Yes	No	07:45	1,410	38	NB	Yes	No	16:15	1,986	114	NB	No	-
15:45	1,973	93	NB	Yes	No	07:30	1,400	37	NB	Yes	No	17:00	1,985	83	NB	No	-
14:30	1,965	77	NB	Yes	No	08:00	1,353	29	NB	Yes	No	16:00	1,981	100	NB	No	-
12:00	1,939	79	NB	Yes	No	07:15	1,306	43	NB	Yes	No	16:30	1,980	112	NB	No	-
14:15	1,928	78	NB	Yes	No	10:45	1,233	40	NB	Yes	No	14:30	1,965	77	NB	No	-
14:00	1,926	83	NB	Yes	No	07:00	1,189	47	NB	Yes	No	12:00	1,939	79	NB	No	-
11:45	1,897	78	NB	Yes	No	08:15	1,014	24	NB	Yes	No	14:15	1,928	78	NB	No	-
11:30	1,874	80	NB	Yes	No	13:30	981	46	NB	Yes	No	14:00	1,926	83	NB	No	-
11:15	1,753	64	NB	Yes	No	12:30	949	35	NB	Yes	No	11:45	1,897	78	NB	No	-
11:00	1,677	51	NB	Yes	No	06:45	811	33	NB	No	No	11:30	1,874	80	NB	No	-
13:45	1,491	67	NB	Yes	No	10:30	793	15	NB	No	No	11:00	1,677	51	NB	No	No
12:15	1,484	57	NB	Yes	No	08:30	658	16	NB	No	No	12:15	1,484	57	NB	No	No
17:15	1,473	47	NB	Yes	No	12:45	486	12	NB	No	No	17:15	1,473	47	NB	No	-
07:45	1,410	38	NB	Yes	No	06:30	484	23	NB	No	No	07:45	1,410	38	NB	No	No
07:30	1,400	37	NB	Yes	No	13:15	470	24	NB	No	No	07:30	1,400	37	NB	No	No
08:00	1,353	29	NB	Yes	No	10:15	379	9	NB	No	No	08:00	1,353	29	NB	No	No

Signal Warrants - Summary

Major Street Approaches

Eastbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: 6,251

Westbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: 6,682

Minor Street Approaches

Northbound: MARYLAND

Number of Lanes: 1
Total Approach Volume: 1,233

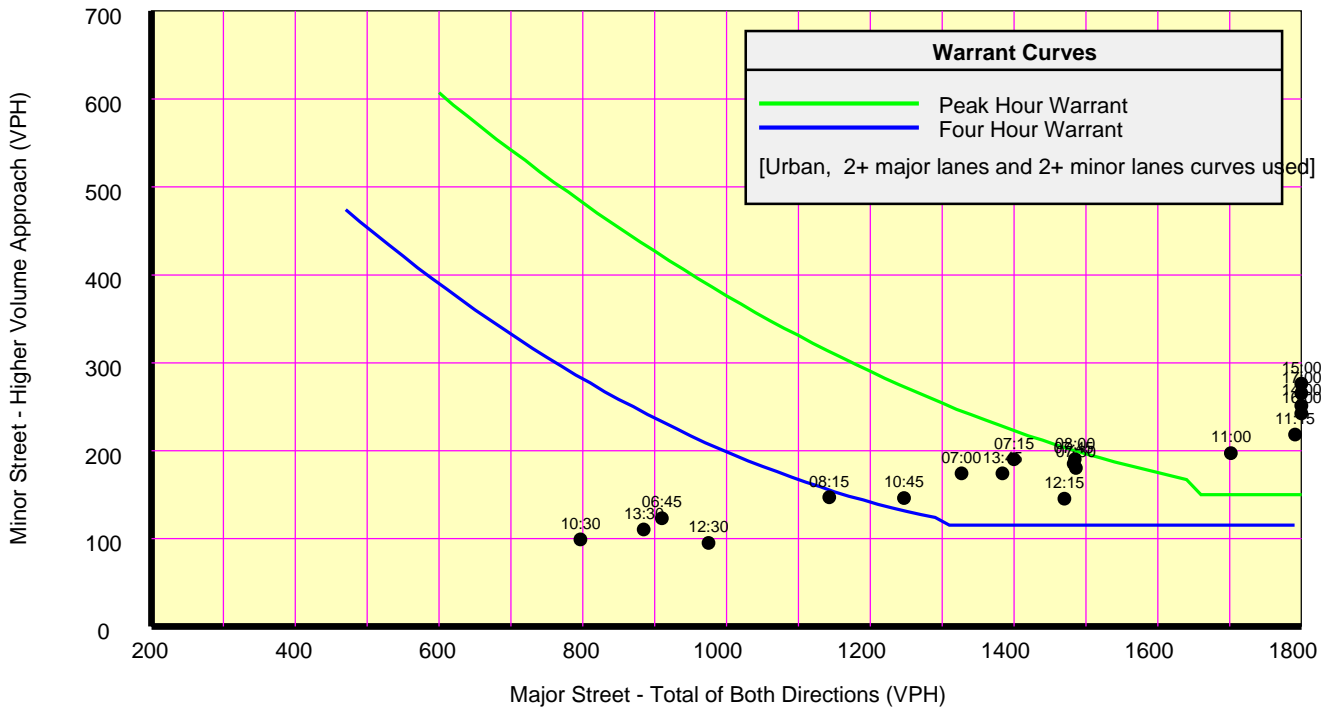
Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes	Satisfied
Warrant 1A - Minimum Vehicular Volume Not Satisfied	
Required volumes reached for 5 hours, 8 are needed	
Warrant 1B - Interruption of Continuous Traffic Satisfied	
Required volumes reached for 8 hours, 8 are needed	
Warrant 1C - Combination of Warrants Not Satisfied	
Required 1A volumes reached for 7 hours, 8 are needed	
Required 1B volumes reached for 8 hours, 8 are needed	
Warrant 2 - Four Hour Volumes	Satisfied
Number of hours (7) volumes exceed minimum >= minimum required (4).	
Warrant 3 - Peak Hour	Satisfied
Warrant 3A - Peak Hour Delay Satisfied	
Number of hours (25) volumes exceed minimum >= required (1). Delay data not evaluated.	
Warrant 3B - Peak Hour Volumes Satisfied	
Volumes exceed minimums for at least one hour.	
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated Signal System	Not Evaluated
Warrant 7 - Crash Experience	Not Evaluated
Warrant 8 - Roadway Network	Not Evaluated
Warrant 9 - Intersection Near a Grade Crossing	Not Evaluated

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Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

War 1A-Minimum Volume

War 1B-Interruption of Traffic

War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol	Dir	Maj 600	Min 200	Hour Begin	Major Total	Minor Vol	Dir	Maj 900	Min 100	Hour Begin	Major Total	Minor Vol	Dir	1A Met	1B Met
15:00	2,150	276	SB	Yes	Yes	16:45	2,248	257	SB	Yes	Yes	16:45	2,248	257	SB	Yes	-
17:00	2,137	265	SB	Yes	Yes	14:45	2,113	295	SB	Yes	Yes	16:30	2,195	245	SB	-	Yes
16:00	2,053	242	SB	Yes	Yes	15:45	2,015	239	SB	Yes	Yes	14:45	2,113	295	SB	Yes	-
14:00	1,889	251	SB	Yes	Yes	11:45	1,899	224	SB	Yes	Yes	14:30	2,097	298	SB	-	Yes
11:15	1,791	218	SB	Yes	Yes	07:45	1,483	185	SB	Yes	Yes	15:30	2,048	245	SB	-	Yes
11:00	1,702	197	SB	Yes	No	13:45	1,384	174	SB	Yes	Yes	15:45	2,015	239	SB	Yes	-
07:30	1,486	180	SB	Yes	No	10:45	1,247	146	SB	Yes	Yes	12:00	1,940	218	SB	Yes	-
08:00	1,485	190	SB	Yes	No	06:45	910	123	SB	Yes	Yes	11:30	1,870	221	SB	-	Yes
07:45	1,483	185	SB	Yes	No	13:30	885	110	SB	No	Yes	11:00	1,702	197	SB	Yes	-
12:15	1,470	145	SB	Yes	No	10:30	797	99	SB	No	No	08:00	1,485	190	SB	Yes	-
07:15	1,400	190	SB	Yes	No	06:30	548	72	SB	No	No	07:45	1,483	185	SB	-	Yes
13:45	1,384	174	SB	Yes	No	12:45	496	45	SB	No	No	13:45	1,384	174	SB	Yes	-
07:00	1,327	174	SB	Yes	No	17:45	469	69	SB	No	No	07:00	1,327	174	SB	Yes	-
10:45	1,247	146	SB	Yes	No	08:45	419	56	SB	No	No	17:30	1,004	136	SB	-	Yes
08:15	1,143	147	SB	Yes	No	13:15	411	53	SB	No	No	12:30	975	95	SB	-	Yes
12:30	975	95	SB	Yes	No	10:15	381	52	SB	No	No	06:45	910	123	SB	No	Yes
06:45	910	123	SB	Yes	No	06:15	269	27	SB	No	No	13:30	885	110	SB	No	Yes
13:30	885	110	SB	Yes	No	22:45	0	0	SB	No	No	10:30	797	99	SB	No	Yes
10:30	797	99	SB	Yes	No	22:30	0	0	SB	No	No	10:45	1,247	146	SB	No	-
08:30	778	112	SB	Yes	No	22:15	0	0	SB	No	No	06:30	548	72	SB	No	No
06:30	548	72	SB	No	No	22:00	0	0	SB	No	No	17:45	469	69	SB	No	-
12:45	496	45	SB	No	No	21:45	0	0	SB	No	No	08:45	419	56	SB	-	No
08:45	419	56	SB	No	No	21:30	0	0	SB	No	No	13:15	411	53	SB	No	-
13:15	411	53	SB	No	No	21:15	0	0	SB	No	No	10:15	381	52	SB	No	No

Signal Warrants - Summary

Major Street Approaches

Eastbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: 7,427

Westbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: 7,256

Minor Street Approaches

Southbound: WERTZ

Number of Lanes: 2
Total Approach Volume: 1,813

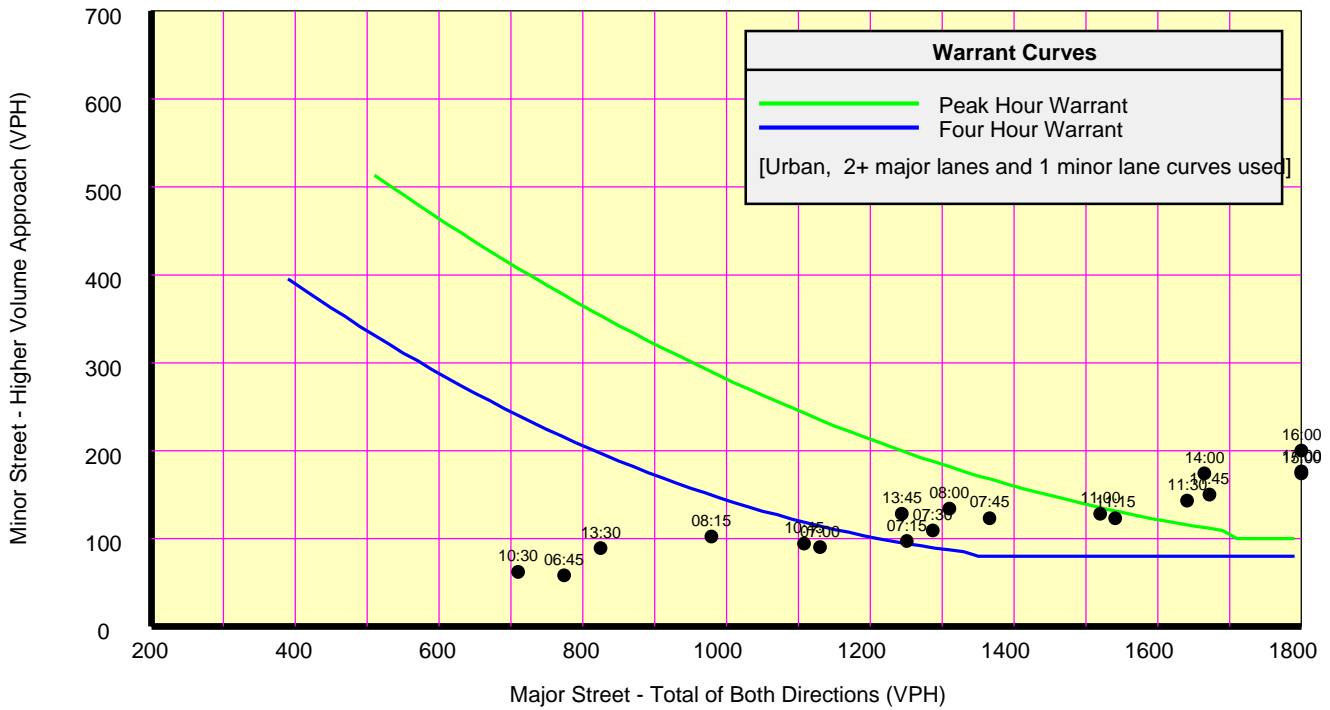
Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes	Satisfied
Warrant 1A - Minimum Vehicular Volume Not Satisfied	
Required volumes reached for 5 hours, 8 are needed	
Warrant 1B - Interruption of Continuous Traffic Satisfied	
Required volumes reached for 8 hours, 8 are needed	
Warrant 1C - Combination of Warrants Satisfied	
Required 1A volumes reached for 8 hours, 8 are needed	
Required 1B volumes reached for 8 hours, 8 are needed	
Warrant 2 - Four Hour Volumes	Satisfied
Number of hours (8) volumes exceed minimum >= minimum required (4).	
Warrant 3 - Peak Hour	Satisfied
Warrant 3A - Peak Hour Delay Satisfied	
Number of hours (25) volumes exceed minimum >= required (1). Delay data not evaluated.	
Warrant 3B - Peak Hour Volumes Satisfied	
Volumes exceed minimums for at least one hour.	
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated Signal System	Not Evaluated
Warrant 7 - Crash Experience	Not Evaluated
Warrant 8 - Roadway Network	Not Evaluated
Warrant 9 - Intersection Near a Grade Crossing	Not Evaluated

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Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

War 1A-Minimum Volume

War 1B-Interruption of Traffic

War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol Dir	Maj 600	Min 150	Hour Begin	Major Total	Minor Vol Dir	Maj 900	Min 75	Hour Begin	Major Total	Minor Vol Dir	1A Met	1B Met
16:00	1,952	200 NB	Yes	Yes	16:45	1,902	186 NB	Yes	Yes	15:30	1,908	163 NB	-	Yes
15:00	1,845	174 NB	Yes	Yes	15:45	1,870	183 NB	Yes	Yes	16:45	1,902	186 NB	Yes	-
17:00	1,805	176 NB	Yes	Yes	14:45	1,831	183 NB	Yes	Yes	16:30	1,880	197 NB	-	Yes
11:45	1,672	150 NB	Yes	Yes	11:45	1,672	150 NB	Yes	Yes	15:45	1,870	183 NB	Yes	-
14:00	1,665	174 NB	Yes	Yes	08:00	1,310	134 NB	Yes	Yes	14:45	1,831	183 NB	Yes	-
11:30	1,641	143 NB	Yes	No	13:45	1,244	128 NB	Yes	Yes	14:30	1,778	192 NB	-	Yes
11:15	1,541	123 NB	Yes	No	07:00	1,130	90 NB	Yes	Yes	12:00	1,706	157 NB	Yes	-
11:00	1,520	128 NB	Yes	No	10:45	1,108	94 NB	Yes	Yes	11:45	1,672	150 NB	-	Yes
07:45	1,366	123 NB	Yes	No	13:30	825	89 NB	No	Yes	11:00	1,520	128 NB	Yes	-
08:00	1,310	134 NB	Yes	No	06:45	774	58 NB	No	No	07:45	1,366	123 NB	Yes	-
07:30	1,287	109 NB	Yes	No	10:30	710	62 NB	No	No	08:00	1,310	134 NB	-	Yes
07:15	1,251	97 NB	Yes	No	06:30	499	42 NB	No	No	13:45	1,244	128 NB	Yes	-
13:45	1,244	128 NB	Yes	No	12:45	446	41 NB	No	No	07:00	1,130	90 NB	No	Yes
07:00	1,130	90 NB	Yes	No	17:45	420	44 NB	No	No	10:45	1,108	94 NB	No	Yes
10:45	1,108	94 NB	Yes	No	13:15	375	41 NB	No	No	17:30	876	83 NB	-	Yes
08:15	979	102 NB	Yes	No	10:15	351	35 NB	No	No	13:30	825	89 NB	No	Yes
13:30	825	89 NB	Yes	No	06:15	210	25 NB	No	No	07:30	1,287	109 NB	No	-
06:45	774	58 NB	Yes	No	22:45	0	0 SB	No	No	07:15	1,251	97 NB	No	-
10:30	710	62 NB	Yes	No	22:30	0	0 SB	No	No	06:45	774	58 NB	No	No
08:30	654	73 NB	Yes	No	22:15	0	0 SB	No	No	10:30	710	62 NB	No	No
06:30	499	42 NB	No	No	22:00	0	0 SB	No	No	06:30	499	42 NB	No	No
12:45	446	41 NB	No	No	21:45	0	0 SB	No	No	12:45	446	41 NB	-	No
13:15	375	41 NB	No	No	21:30	0	0 SB	No	No	17:45	420	44 NB	No	-
10:15	351	35 NB	No	No	21:15	0	0 SB	No	No	13:15	375	41 NB	No	No

Signal Warrants - Summary

Major Street Approaches

Eastbound: TUSCARAWAS ST

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: **6,934**

Westbound: TUSCARAWAS ST

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: **7,258**

Minor Street Approaches

Southbound: BROAD AVE

Number of Lanes: 2

Total Approach Volume: **1,311**

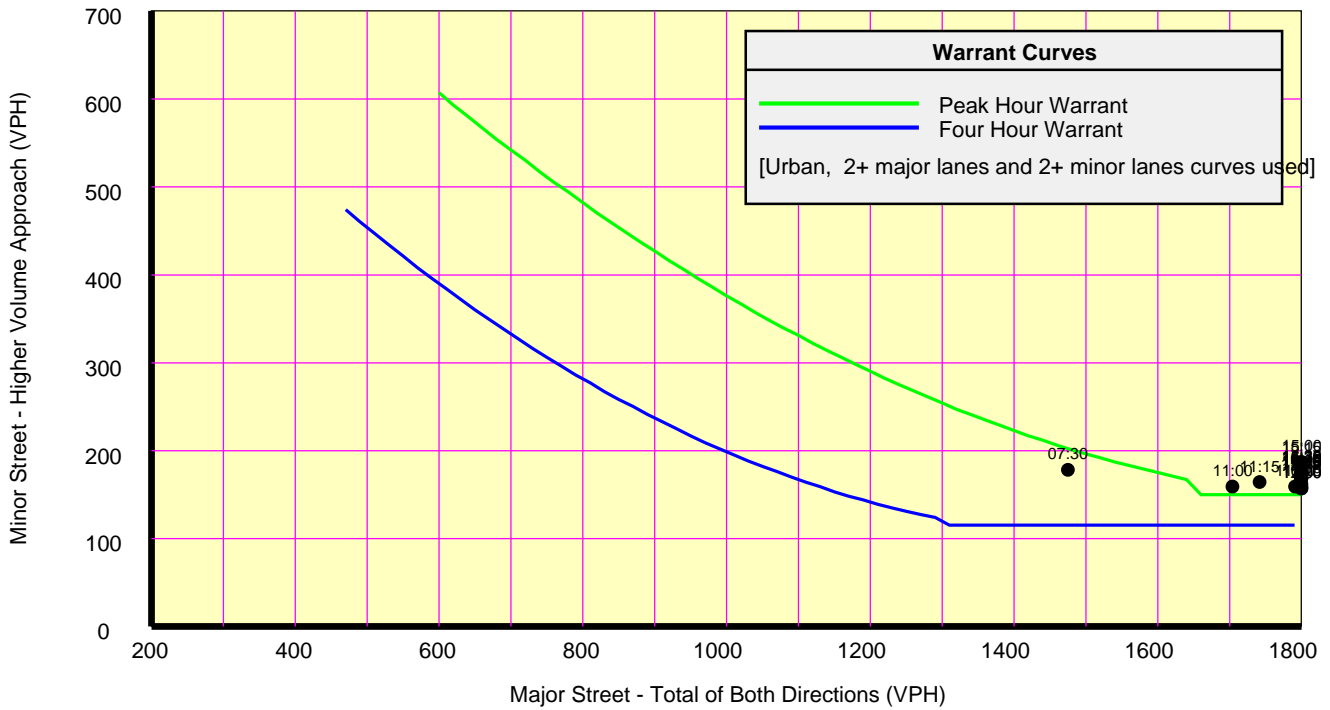
Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes	Satisfied
Warrant 1A - Minimum Vehicular Volume Not Satisfied	
Required volumes reached for 0 hours, 8 are needed	
Warrant 1B - Interruption of Continuous Traffic Satisfied	
Required volumes reached for 8 hours, 8 are needed	
Warrant 1C - Combination of Warrants Not Satisfied	
Required 1A volumes reached for 4 hours, 8 are needed Required 1B volumes reached for 8 hours, 8 are needed	
Warrant 2 - Four Hour Volumes	Satisfied
Number of hours (8) volumes exceed minimum >= minimum required (4).	
Warrant 3 - Peak Hour	Satisfied
Warrant 3A - Peak Hour Delay Satisfied	
Number of hours (22) volumes exceed minimum >= required (1). Delay data not evaluated.	
Warrant 3B - Peak Hour Volumes Satisfied	
Volumes exceed minimums for at least one hour.	
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated Signal System	Not Evaluated
Warrant 7 - Crash Experience	Not Evaluated
Warrant 8 - Roadway Network	Not Evaluated
Warrant 9 - Intersection Near a Grade Crossing	Not Evaluated

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Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

War 1A-Minimum Volume

War 1B-Interruption of Traffic

War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol Dir	Maj 600	Min 200	Hour Begin	Major Total	Minor Vol Dir	Maj 900	Min 100	Hour Begin	Major Total	Minor Vol Dir	1A Met	1B Met
16:30	2,137	175 SB	Yes	No	16:45	2,105	172 SB	Yes	Yes	16:45	2,105	172 SB	-	Yes
16:15	2,112	159 SB	Yes	No	15:45	1,981	168 SB	Yes	Yes	16:00	2,050	170 SB	Yes	-
16:45	2,105	172 SB	Yes	No	14:45	1,900	175 SB	Yes	Yes	15:45	1,981	168 SB	-	Yes
16:00	2,050	170 SB	Yes	No	11:45	1,799	167 SB	Yes	Yes	15:00	1,945	187 SB	Yes	-
15:45	1,981	168 SB	Yes	No	13:45	1,448	123 SB	Yes	Yes	14:00	1,914	162 SB	Yes	-
15:30	1,963	174 SB	Yes	No	07:45	1,434	167 SB	Yes	Yes	14:45	1,900	175 SB	-	Yes
15:00	1,945	187 SB	Yes	No	10:45	1,278	112 SB	Yes	Yes	11:30	1,791	159 SB	-	Yes
15:15	1,943	185 SB	Yes	No	06:45	1,034	120 SB	Yes	Yes	11:15	1,742	164 SB	Yes	-
14:15	1,926	169 SB	Yes	No	13:30	979	74 SB	Yes	No	13:45	1,448	123 SB	No	Yes
17:00	1,922	157 SB	Yes	No	10:30	817	84 SB	No	No	07:45	1,434	167 SB	-	Yes
14:00	1,914	162 SB	Yes	No	06:30	627	67 SB	No	No	07:00	1,424	174 SB	Yes	-
14:45	1,900	175 SB	Yes	No	12:45	468	37 SB	No	No	06:45	1,034	120 SB	No	Yes
14:30	1,884	176 SB	Yes	No	13:15	465	41 SB	No	No	10:30	817	84 SB	No	Yes
12:00	1,841	157 SB	Yes	No	10:15	409	35 SB	No	No	17:00	1,922	157 SB	No	-
11:45	1,799	167 SB	Yes	No	17:45	397	38 SB	No	No	11:00	1,704	159 SB	No	-
11:30	1,791	159 SB	Yes	No	08:45	348	32 SB	No	No	12:15	1,394	117 SB	No	-
11:15	1,742	164 SB	Yes	No	06:15	277	37 SB	No	No	08:00	1,392	145 SB	No	-
11:00	1,704	159 SB	Yes	No	22:45	0	0 SB	No	No	17:15	1,385	122 SB	No	-
07:30	1,475	178 SB	Yes	No	22:30	0	0 SB	No	No	10:45	1,278	112 SB	No	-
07:15	1,466	176 SB	Yes	No	22:15	0	0 SB	No	No	08:15	1,073	106 SB	No	-
13:45	1,448	123 SB	Yes	No	22:00	0	0 SB	No	No	13:30	979	74 SB	No	No
07:45	1,434	167 SB	Yes	No	21:45	0	0 SB	No	No	12:30	937	73 SB	No	No
07:00	1,424	174 SB	Yes	No	21:30	0	0 SB	No	No	17:30	868	77 SB	No	-
12:15	1,394	117 SB	Yes	No	21:15	0	0 SB	No	No	08:30	714	74 SB	No	-

Signal Warrants - Summary

Major Street Approaches

Eastbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: 6,575

Westbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: 8,214

Minor Street Approaches

Northbound: DARTMOUTH

Number of Lanes: 1
Total Approach Volume: 1,053

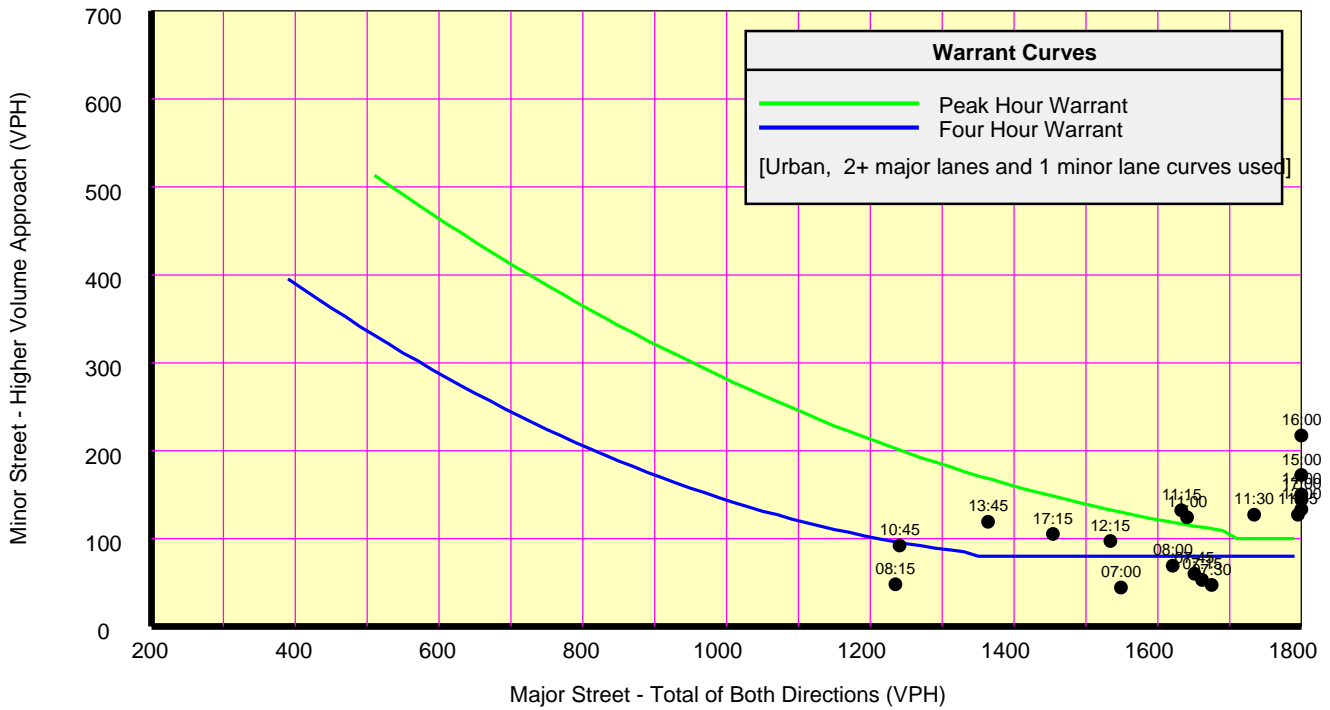
Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes	Not Satisfied
Warrant 1A - Minimum Vehicular Volume Not Satisfied	
Required volumes reached for 3 hours, 8 are needed	
Warrant 1B - Interruption of Continuous Traffic Not Satisfied	
Required volumes reached for 6 hours, 8 are needed	
Warrant 1C - Combination of Warrants Not Satisfied	
Required 1A volumes reached for 6 hours, 8 are needed	
Required 1B volumes reached for 7 hours, 8 are needed	
Warrant 2 - Four Hour Volumes	Satisfied
Number of hours (6) volumes exceed minimum >= minimum required (4).	
Warrant 3 - Peak Hour	Satisfied
Warrant 3A - Peak Hour Delay Satisfied	
Number of hours (20) volumes exceed minimum >= required (1). Delay data not evaluated.	
Warrant 3B - Peak Hour Volumes Satisfied	
Volumes exceed minimums for at least one hour.	
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated Signal System	Not Evaluated
Warrant 7 - Crash Experience	Not Evaluated
Warrant 8 - Roadway Network	Not Evaluated
Warrant 9 - Intersection Near a Grade Crossing	Not Evaluated

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Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

War 1A-Minimum Volume

War 1B-Interruption of Traffic

War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol	Dir	Maj 600	Min 150	Hour Begin	Major Total	Minor Vol	Dir	Maj 900	Min 75	Hour Begin	Major Total	Minor Vol	Dir	1A Met	1B Met
16:00	2,169	217	NB	Yes	Yes	16:45	2,161	158	NB	Yes	Yes	16:30	2,223	196	NB	-	Yes
15:00	1,994	172	NB	Yes	Yes	15:45	2,049	225	NB	Yes	Yes	16:00	2,169	217	NB	Yes	-
14:00	1,893	150	NB	Yes	Yes	14:45	2,024	151	NB	Yes	Yes	15:30	2,038	196	NB	-	Yes
17:00	1,992	144	NB	Yes	No	11:45	1,795	127	NB	Yes	Yes	15:00	1,994	172	NB	Yes	-
12:00	1,930	133	NB	Yes	No	13:45	1,364	119	NB	Yes	Yes	17:00	1,992	144	NB	Yes	-
11:45	1,795	127	NB	Yes	No	10:45	1,241	92	NB	Yes	Yes	14:30	1,944	158	NB	-	Yes
11:30	1,734	127	NB	Yes	No	07:30	1,675	47	NB	Yes	No	12:00	1,930	133	NB	Yes	-
07:30	1,675	47	NB	Yes	No	07:15	1,662	53	NB	Yes	No	14:00	1,893	150	NB	Yes	-
07:15	1,662	53	NB	Yes	No	07:45	1,651	60	NB	Yes	No	11:30	1,734	127	NB	-	Yes
07:45	1,651	60	NB	Yes	No	08:00	1,621	69	NB	Yes	No	07:45	1,651	60	NB	No	Yes
11:00	1,641	124	NB	Yes	No	07:00	1,549	44	NB	Yes	No	11:00	1,641	124	NB	Yes	-
11:15	1,633	132	NB	Yes	No	08:15	1,235	48	NB	Yes	No	12:30	1,036	67	NB	-	Yes
08:00	1,621	69	NB	Yes	No	06:45	1,096	37	NB	Yes	No	13:30	911	74	NB	No	Yes
07:00	1,549	44	NB	Yes	No	13:30	911	74	NB	Yes	No	10:30	801	63	NB	No	Yes
12:15	1,534	97	NB	Yes	No	08:30	846	41	NB	No	No	07:30	1,675	47	NB	No	No
17:15	1,454	105	NB	Yes	No	10:30	801	63	NB	No	No	07:15	1,662	53	NB	No	No
13:45	1,364	119	NB	Yes	No	06:30	649	25	NB	No	No	08:00	1,621	69	NB	No	-
10:45	1,241	92	NB	Yes	No	12:45	535	38	NB	No	No	07:00	1,549	44	NB	No	No
08:15	1,235	48	NB	Yes	No	13:15	469	32	NB	No	No	13:45	1,364	119	NB	No	-
06:45	1,096	37	NB	Yes	No	17:45	450	30	NB	No	No	10:45	1,241	92	NB	No	-
12:30	1,036	67	NB	Yes	No	08:45	423	16	NB	No	No	08:15	1,235	48	NB	No	-
17:30	932	59	NB	Yes	No	10:15	404	28	NB	No	No	06:45	1,096	37	NB	No	No
13:30	911	74	NB	Yes	No	06:15	273	12	NB	No	No	17:30	932	59	NB	-	No
08:30	846	41	NB	Yes	No	22:45	0	0	SB	No	No	08:30	846	41	NB	No	-

Signal Warrants - Summary

Major Street Approaches

Eastbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: 7,196

Westbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: 7,505

Minor Street Approaches

Northbound: BEDFORD

Number of Lanes: 1
Total Approach Volume: 1,697

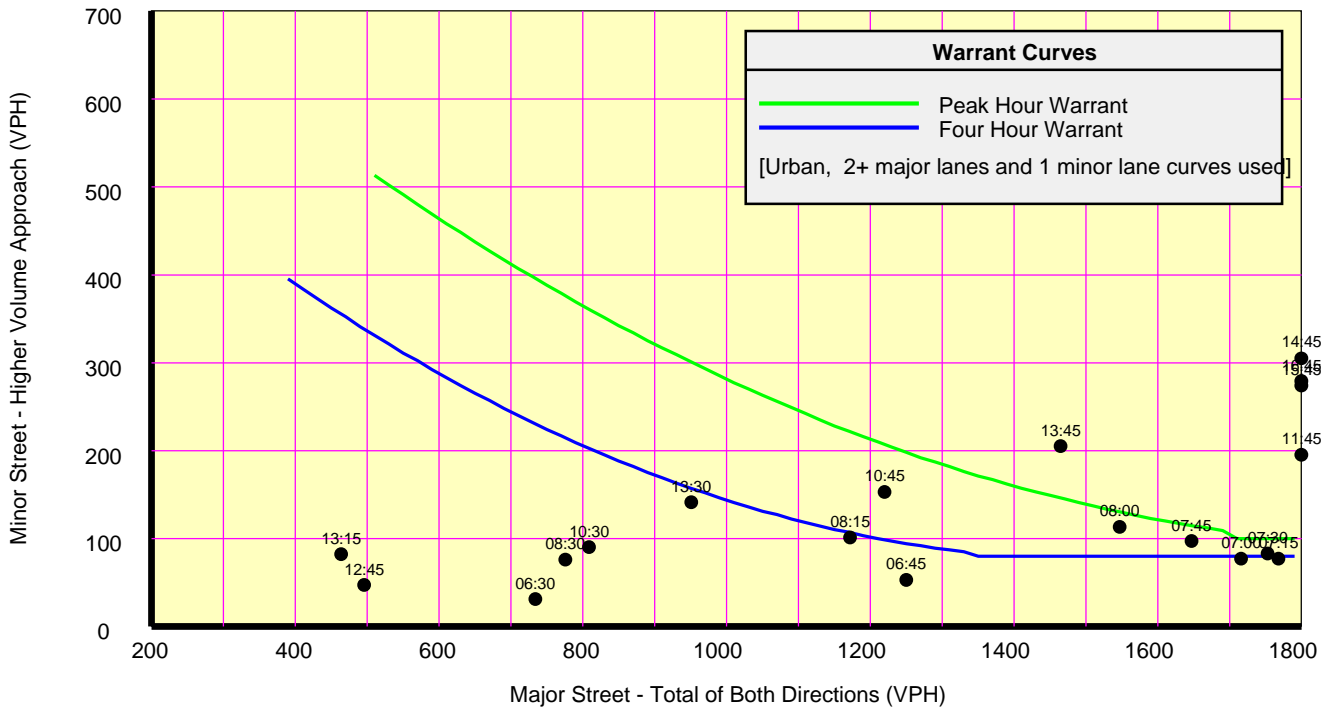
Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes	Satisfied
Warrant 1A - Minimum Vehicular Volume Not Satisfied	
Required volumes reached for 6 hours, 8 are needed	
Warrant 1B - Interruption of Continuous Traffic Satisfied	
Required volumes reached for 8 hours, 8 are needed	
Warrant 1C - Combination of Warrants Not Satisfied	
Required 1A volumes reached for 6 hours, 8 are needed	
Required 1B volumes reached for 8 hours, 8 are needed	
Warrant 2 - Four Hour Volumes	Satisfied
Number of hours (7) volumes exceed minimum >= minimum required (4).	
Warrant 3 - Peak Hour	Satisfied
Warrant 3A - Peak Hour Delay Satisfied	
Number of hours (25) volumes exceed minimum >= required (1). Delay data not evaluated.	
Warrant 3B - Peak Hour Volumes Satisfied	
Volumes exceed minimums for at least one hour.	
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated Signal System	Not Evaluated
Warrant 7 - Crash Experience	Not Evaluated
Warrant 8 - Roadway Network	Not Evaluated
Warrant 9 - Intersection Near a Grade Crossing	Not Evaluated

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Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

War 1A-Minimum Volume

War 1B-Interruption of Traffic

War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol	Dir	Maj 600	Min 150	Hour Begin	Major Total	Minor Vol	Dir	Maj 900	Min 75	Hour Begin	Major Total	Minor Vol	Dir	1A Met	1B Met
16:45	2,017	279	NB	Yes	Yes	16:30	2,013	292	NB	Yes	Yes	16:30	2,013	292	NB	Yes	Yes
15:45	1,963	274	NB	Yes	Yes	15:30	1,993	304	NB	Yes	Yes	15:30	1,993	304	NB	Yes	Yes
11:45	1,928	195	NB	Yes	Yes	14:30	1,970	277	NB	Yes	Yes	14:30	1,970	277	NB	Yes	Yes
14:45	1,927	305	NB	Yes	Yes	11:45	1,928	195	NB	Yes	Yes	11:45	1,928	195	NB	Yes	-
13:45	1,465	205	NB	Yes	Yes	07:00	1,716	77	NB	Yes	Yes	11:30	1,858	220	NB	-	Yes
10:45	1,220	153	NB	Yes	Yes	08:00	1,547	113	NB	Yes	Yes	07:00	1,716	77	NB	No	Yes
07:15	1,768	77	NB	Yes	No	10:45	1,220	153	NB	Yes	Yes	08:00	1,547	113	NB	No	Yes
07:30	1,753	83	NB	Yes	No	13:30	951	141	NB	Yes	Yes	10:45	1,220	153	NB	Yes	-
07:00	1,716	77	NB	Yes	No	06:45	1,250	53	NB	Yes	No	12:30	977	85	NB	-	Yes
07:45	1,647	97	NB	Yes	No	17:30	867	98	NB	No	Yes	13:30	951	141	NB	Yes	Yes
08:00	1,547	113	NB	Yes	No	10:30	809	90	NB	No	Yes	17:30	867	98	NB	No	Yes
06:45	1,250	53	NB	Yes	No	06:30	734	31	NB	No	No	10:30	809	90	NB	No	Yes
08:15	1,172	101	NB	Yes	No	12:45	496	47	NB	No	No	07:15	1,768	77	NB	No	-
13:30	951	141	NB	Yes	No	13:15	464	82	NB	No	Yes	07:30	1,753	83	NB	No	-
10:30	809	90	NB	Yes	No	17:45	422	49	NB	No	No	07:45	1,647	97	NB	No	-
08:30	776	76	NB	Yes	No	10:15	390	45	NB	No	No	06:45	1,250	53	NB	No	No
06:30	734	31	NB	Yes	No	06:15	323	12	NB	No	No	08:15	1,172	101	NB	No	-
12:45	496	47	NB	No	No	22:45	0	0	SB	No	No	08:30	776	76	NB	No	-
13:15	464	82	NB	No	No	22:30	0	0	SB	No	No	06:30	734	31	NB	No	No
17:45	422	49	NB	No	No	22:15	0	0	SB	No	No	12:45	496	47	NB	No	-
10:15	390	45	NB	No	No	22:00	0	0	SB	No	No	13:15	464	82	NB	No	-
08:45	366	40	NB	No	No	21:45	0	0	SB	No	No	17:45	422	49	NB	No	-
06:15	323	12	NB	No	No	21:30	0	0	SB	No	No	10:15	390	45	NB	No	No
22:45	0	0	SB	No	No	21:15	0	0	SB	No	No	08:45	366	40	NB	No	-

Signal Warrants - Summary

Major Street Approaches

Eastbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: 6,371

Westbound: TUSCARAWAS

Number of Lanes: 2
85% Speed < 40 MPH.
Total Approach Volume: 8,604

Minor Street Approaches

Northbound: HARRISON NW

Number of Lanes: 1

Total Approach Volume: 113

Southbound: HARRISON NW

Number of Lanes: 1

Total Approach Volume: 1,352

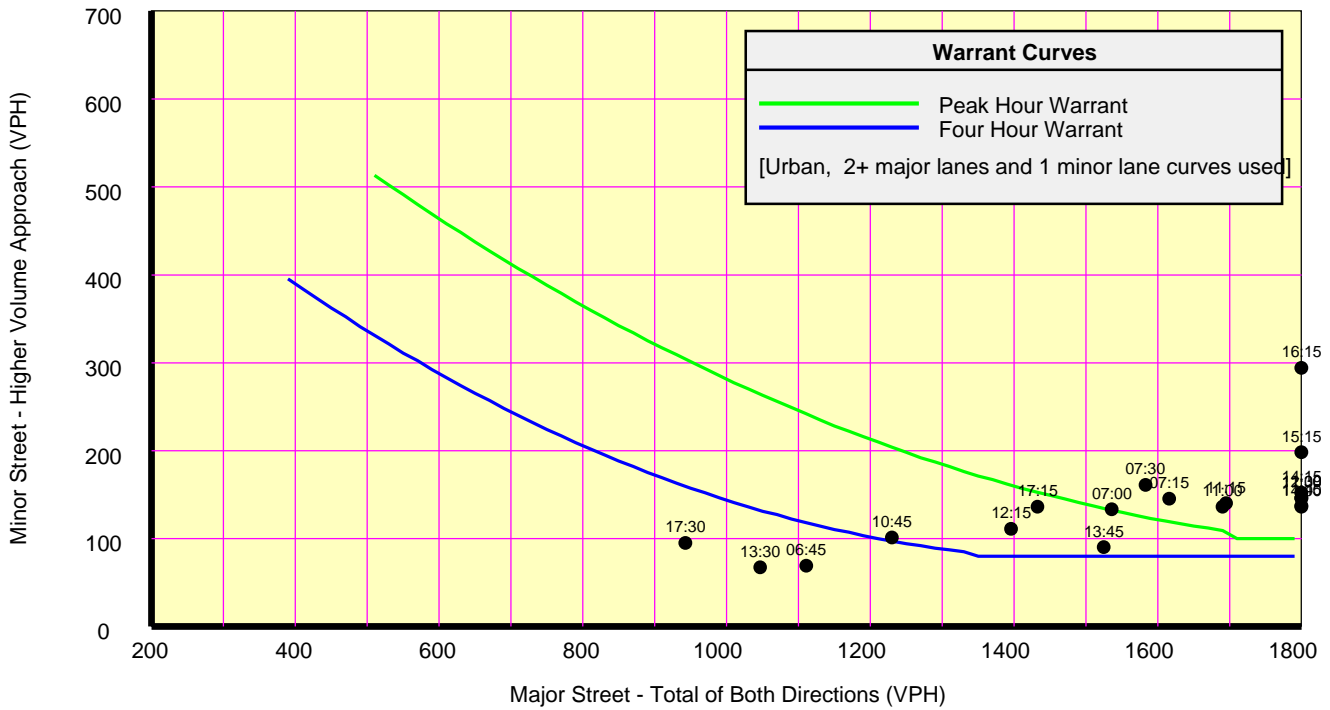
Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes	Satisfied
Warrant 1A - Minimum Vehicular Volume Not Satisfied	
Required volumes reached for 4 hours, 8 are needed	
Warrant 1B - Interruption of Continuous Traffic Satisfied	
Required volumes reached for 8 hours, 8 are needed	
Warrant 1C - Combination of Warrants Satisfied	
Required 1A volumes reached for 8 hours, 8 are needed	
Required 1B volumes reached for 8 hours, 8 are needed	
Warrant 2 - Four Hour Volumes	Satisfied
Number of hours (8) volumes exceed minimum >= minimum required (4).	
Warrant 3 - Peak Hour	Satisfied
Warrant 3A - Peak Hour Delay Satisfied	
Number of hours (26) volumes exceed minimum >= required (1). Delay data not evaluated.	
Warrant 3B - Peak Hour Volumes Satisfied	
Volumes exceed minimums for at least one hour.	
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated Signal System	Not Evaluated
Warrant 7 - Crash Experience	Not Evaluated
Warrant 8 - Roadway Network	Not Evaluated
Warrant 9 - Intersection Near a Grade Crossing	Not Evaluated

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Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

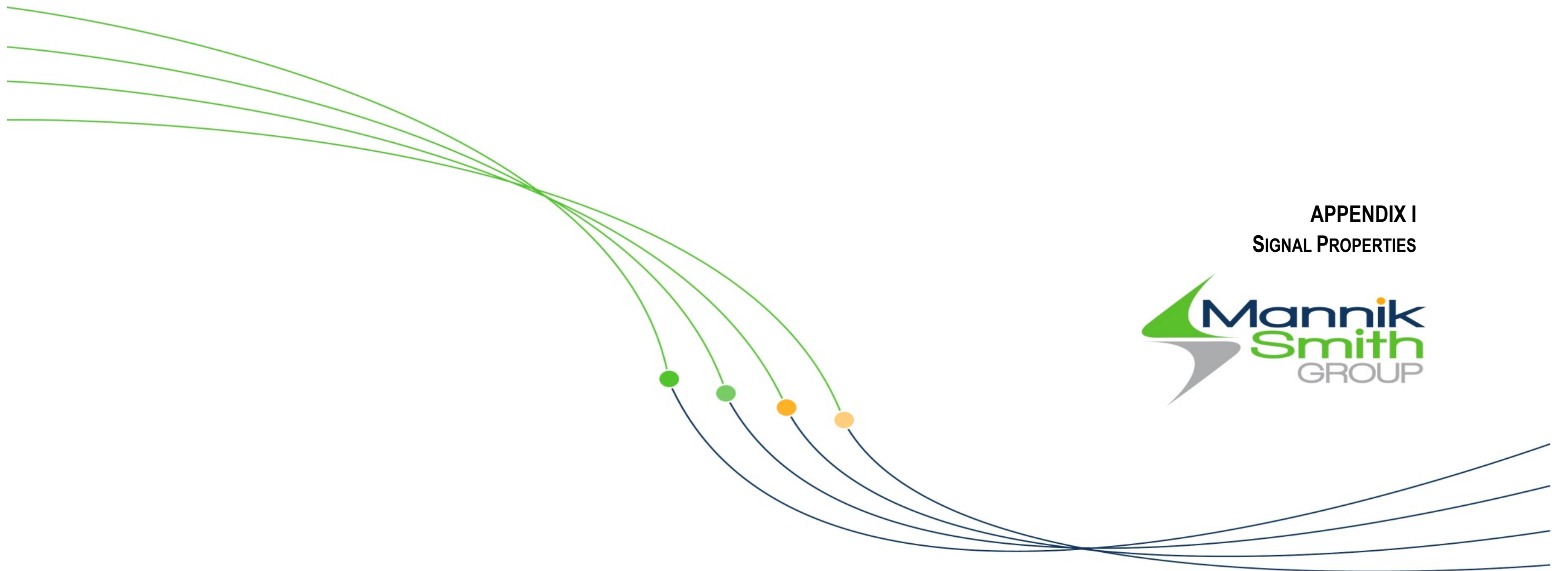
War 1A-Minimum Volume

War 1B-Interruption of Traffic

War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol Dir	Maj 600	Min 150	Hour Begin	Major Total	Minor Vol Dir	Maj 900	Min 75	Hour Begin	Major Total	Minor Vol Dir	1A Met	1B Met
15:15	2,213	198 SB	Yes	Yes	15:45	2,187	324 SB	Yes	Yes	15:00	2,195	178 SB	Yes	-
16:15	2,190	294 SB	Yes	Yes	14:45	2,176	170 SB	Yes	Yes	15:30	2,159	239 SB	-	Yes
14:15	2,069	152 SB	Yes	Yes	16:45	2,072	191 SB	Yes	Yes	16:00	2,154	321 SB	Yes	-
07:30	1,583	161 SB	Yes	Yes	11:45	1,821	137 SB	Yes	Yes	16:30	2,147	248 SB	-	Yes
14:00	2,067	136 SB	Yes	No	07:00	1,536	133 SB	Yes	Yes	14:30	2,119	166 SB	-	Yes
12:00	1,827	146 SB	Yes	No	13:45	1,525	90 SB	Yes	Yes	14:00	2,067	136 SB	Yes	-
11:45	1,821	137 SB	Yes	No	08:00	1,507	122 SB	Yes	Yes	17:00	1,999	180 SB	Yes	-
11:30	1,810	146 SB	Yes	No	10:45	1,230	101 SB	Yes	Yes	12:00	1,827	146 SB	Yes	-
11:15	1,695	140 SB	Yes	No	06:45	1,111	69 SB	Yes	No	11:30	1,810	146 SB	-	Yes
11:00	1,690	136 SB	Yes	No	13:30	1,047	67 SB	Yes	No	11:00	1,690	136 SB	Yes	-
07:15	1,616	145 SB	Yes	No	10:30	786	60 SB	No	No	07:45	1,544	161 SB	-	Yes
07:00	1,536	133 SB	Yes	No	06:30	690	40 SB	No	No	07:00	1,536	133 SB	Yes	-
13:45	1,525	90 SB	Yes	No	13:15	510	35 SB	No	No	08:00	1,507	122 SB	Yes	-
17:15	1,433	136 SB	Yes	No	12:45	466	44 SB	No	No	06:45	1,111	69 SB	No	Yes
12:15	1,396	111 SB	Yes	No	17:45	455	40 SB	No	No	13:30	1,047	67 SB	No	Yes
10:45	1,230	101 SB	Yes	No	10:15	426	31 SB	No	No	17:30	943	95 SB	-	Yes
06:45	1,111	69 SB	Yes	No	06:15	281	15 SB	No	No	12:30	921	76 SB	-	Yes
13:30	1,047	67 SB	Yes	No	22:45	0	0 SB	No	No	10:30	786	60 SB	No	Yes
17:30	943	95 SB	Yes	No	22:30	0	0 SB	No	No	13:45	1,525	90 SB	No	-
12:30	921	76 SB	Yes	No	22:15	0	0 SB	No	No	10:45	1,230	101 SB	No	-
10:30	786	60 SB	Yes	No	22:00	0	0 SB	No	No	06:30	690	40 SB	No	No
08:30	770	54 SB	Yes	No	21:45	0	0 SB	No	No	13:15	510	35 SB	No	-
06:30	690	40 SB	Yes	No	21:30	0	0 SB	No	No	10:15	426	31 SB	No	No
13:15	510	35 SB	No	No	21:15	0	0 SB	No	No	08:45	388	25 SB	-	No

APPENDIX I
SIGNAL PROPERTIES



Signal Properties					
Intersection	Existing Phasing	Log Point / Spacing	Lane Needs	Timing/Phasing Needs	Comments
Whipple Ave.	8 phase, lefts PT&PM	11.91	<ul style="list-style-type: none"> No Changes 	<ul style="list-style-type: none"> Optimize timing 	<ul style="list-style-type: none"> ODOT Maintained
Valleyview Ave.	8 phase, lefts PT&PM	12.14 (1,230')	<ul style="list-style-type: none"> Add eastbound right turn lane 	<ul style="list-style-type: none"> Optimize timing, add westbound protected left/U-turn 	<ul style="list-style-type: none"> Only 8-phase signal along corridor limits coordination potential
Raff Rd.	5 phases, WBL PT&PM	12.41 (1,410')	<ul style="list-style-type: none"> Alt 1 – Add eastbound right turn lane for safety improvement Alt 2A and 2B - Roundabout 	<ul style="list-style-type: none"> Alt 1 – Optimize timing and SR 172 left turns protected only for U-turns Alt 2- Roundabout 	<ul style="list-style-type: none"> Heavy northbound left turn Light eastbound left turn
Bellflower Ave.	4 phases	12.60 (1,040')	<ul style="list-style-type: none"> Convert to superstreet* intersection 	<ul style="list-style-type: none"> Remove signal 	<ul style="list-style-type: none"> South access via 6th and 7th Streets North access via 2nd Street
Maryland Ave. SW	4 phases	12.77 (900')	<ul style="list-style-type: none"> Eliminate southbound gas station approach 	<ul style="list-style-type: none"> Optimize timing and SR 172 left turns protected only for U-turns 	<ul style="list-style-type: none"> Recommend realignment of Floral Recommend removal of gas station approach

Signal Properties					
Intersection	Existing Phasing	Log Point / Spacing	Lane Needs	Timing/Phasing Needs	Comments
Wertz Ave. NW	4 phases, EBL PT&PM	12.90 (690')	<ul style="list-style-type: none"> Alt 1 – Add south leg Alt 2A and 2B - Eliminate southbound left turn movement 	<ul style="list-style-type: none"> Permitted phasing for Wertz and optimize timing 	<ul style="list-style-type: none"> Westbound right turn lane would be beneficial South leg serves Dartmouth/Exeter for Alt 1 North access via Broad under Alt 2A and 2B Retain eastbound left turn (uncontrolled) for Alt 2A and 2B
Broad Ave. NW	4 phases, EBL PT&PM	13.01 (580')	<ul style="list-style-type: none"> South leg added Alt 1 – Signal, add eastbound right turn lane Alt 2A and 2B - Roundabout 	<ul style="list-style-type: none"> Alt 1 – PT & PM left turn phasing SR 172 Alt 2A and 2B – Roundabout 	<ul style="list-style-type: none"> Westbound right turn lane would be beneficial Access to and from Wertz Ave. and Bedford Ave. via 3rd Street under Alt 1 South leg of roundabout serves Dartmouth/Exeter under Alt 2A and 2B
Bedford Ave. SW / Arlington Ave. NW	4 phases, WBL PT&PM	13.18 (930')	<ul style="list-style-type: none"> Alts 2A and 2B – Bedford Ave. SW Roundabout instead of signal, Arlington Ave. SW leg relocated to align with Arlington Ave. NW Alt 1 – Add eastbound right turn lane 	<ul style="list-style-type: none"> Alt 1 – PT & PM left turn phasing for SR 172 Alt 2– Roundabout 	<ul style="list-style-type: none"> Arlington Ave. SW aligned with Arlington Ave. NW North leg of Arlington Ave. is narrow (22')
Harrison Ave. NW	5 phases, clustered with ramp	13.37 (1,000')	<ul style="list-style-type: none"> Add raised median to eliminate left turns 	<ul style="list-style-type: none"> Remove signal 	<ul style="list-style-type: none"> North access via Bedford NW and 4th Street South access via Harrison SW and 2nd Street

Summary of Improvements and Safety Features			
Intersection or Segment	Existing – No Build	Alternative 1 – Signals and Raised Medians	Alternative 2A and 2B – Roundabouts and Raised Medians
Whipple Avenue Intersection	Signal	<ul style="list-style-type: none"> No physical roadway changes Partial traffic signal upgrade and timing optimization Increased left turns from access management / median Addresses existing congestion related rear end crashes 	<ul style="list-style-type: none"> No physical roadway changes Partial traffic signal upgrade Increased left turns from access management / median Addresses existing congestion related crashes
Whipple Avenue to Valleyview Avenue Segment	Five lane cross section	<ul style="list-style-type: none"> Access management with raised median Better define and size bus storage Sidewalk connections on north side Addresses existing midblock angle and rear end crashes Improves non-motorized mobility 	<ul style="list-style-type: none"> Access management with raised median Better define and size bus storage Sidewalk connections on north side Addresses existing midblock angle and rear end crashes Improves non-motorized mobility
Valleyview Avenue Intersection	Signal	<ul style="list-style-type: none"> Add eastbound right turn lane Full traffic signal upgrade and timing optimization Displaced left turns from access management replaced with U-turns (westbound only) Protected only left turn phasing Addresses existing congestion related rear end crashes 	<ul style="list-style-type: none"> Add eastbound right turn lane Full traffic signal upgrade and timing optimization Displaced left turns from access management replaced with U-turns (westbound only) Protected only left turn phasing Addresses existing congestion related rear end crashes
Valleyview Avenue to Raff Road Segment	Five lane cross section	<ul style="list-style-type: none"> Access management with raised median Complete sidewalk on south side Extend bus bay on NW corner at Raff Road Addresses existing midblock angle, rear end, and sideswipe crashes Improves non-motorized mobility 	<ul style="list-style-type: none"> Access management with raised median Complete sidewalk on south side Extend bus bay on NW corner at Raff Road Addresses existing midblock angle, rear end, and sideswipe crashes
Raff Road Intersection	Signal	<ul style="list-style-type: none"> Full traffic signal upgrade and timing optimization Displaced left turns from access management replaced with U-turns Protected left turn / u-turn phasing Add eastbound right turn lane Addresses existing congestion related rear end crashes 	<ul style="list-style-type: none"> Construct multilane roundabout Roundabout shifted slightly south from existing alignment Displaced left turns from access management replaced with U-turns Addresses existing congestion related rear end crashes and angle crashes
Raff Road south of SR 172 West	Four lane cross section	<ul style="list-style-type: none"> No Changes 	<ul style="list-style-type: none"> Revise pavement markings to provide three lane section with bike lanes Addresses driveway crashes and improves non-motorized mobility
Raff Road to Bellflower Avenue	Five lane cross section	<ul style="list-style-type: none"> Access management with raised median Addresses existing midblock angle and left turn crashes 	<ul style="list-style-type: none"> Access management with raised median Addresses existing midblock angle and left turn crashes
Bellflower Avenue Intersection	Signal	<ul style="list-style-type: none"> Remove borderline unwarranted traffic signal Construct superstreet* intersection 	<ul style="list-style-type: none"> Remove borderline unwarranted traffic signal Construct superstreet* intersection

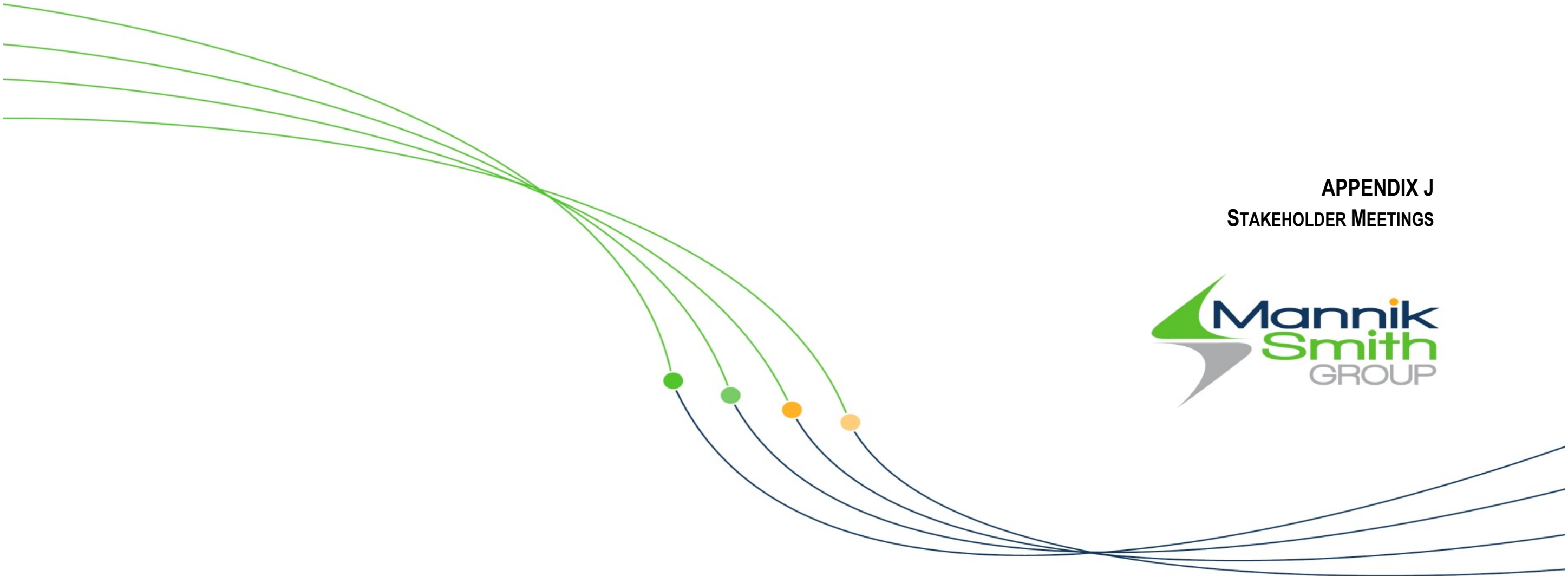
Summary of Improvements and Safety Features			
Intersection or Segment	Existing – No Build	Alternative 1 – Signals and Raised Medians	Alternative 2A and 2B – Roundabouts and Raised Medians
		<ul style="list-style-type: none"> control configuration Improves corridor progression and reduces conflict points 	<ul style="list-style-type: none"> control configuration Improves corridor progression and reduces conflict points
Bellflower Avenue to Maryland Avenue	Five lane cross section	<ul style="list-style-type: none"> Access management with raised median Addresses existing midblock rear end crashes 	<ul style="list-style-type: none"> Access management with raised median Addresses existing midblock rear end crashes

Summary of Improvements and Safety Features			
Intersection or Segment	Existing – No Build	Alternative 1 – Signals and Raised Medians	Alternative 2A and 2B – Roundabouts and Raised Medians
Maryland Avenue Intersection	Signal	<ul style="list-style-type: none"> Reconfigure southbound approach to reduce conflict points Full traffic signal upgrade and timing optimization Displaced left turns from access management replaced with U-turns Protected left turn / u-turn phasing Addresses existing left turn crashes and unusual configuration for north leg 	<ul style="list-style-type: none"> Reconfigure southbound approach to reduce conflict points Full traffic signal upgrade and timing optimization Displaced left turns from access management replaced with U-turns Protected left turn / u-turn phasing Addresses existing left turn crashes and unusual configuration for north leg
Maryland Avenue to Wertz Avenue	Five lane cross section	<ul style="list-style-type: none"> Access management with raised median Addresses existing midblock rear end crashes 	<ul style="list-style-type: none"> Access management with raised median Addresses existing midblock rear end crashes
Wertz Avenue Intersection	Signal	<ul style="list-style-type: none"> South leg added to connect to existing surface streets Full traffic signal upgrade and timing optimization Keep existing phasing, no u-turns Addresses existing congestion related rear end crashes 	<ul style="list-style-type: none"> Remove traffic signal Access management with raised median, southbound approach stop controlled Break in median provided for eastbound left turns Improves corridor progression and reduces conflict points
Wertz Avenue to Broad Avenue	Five lane cross section	<ul style="list-style-type: none"> Access management with raised median Addresses existing midblock rear end crashes 	<ul style="list-style-type: none"> Access management with raised median Addresses existing midblock rear end crashes
Broad Avenue Intersection	Signal	<ul style="list-style-type: none"> Full traffic signal upgrade South leg added to connect to existing surface streets Access management with raised median (west of Broad only) Improves corridor progression and reduces conflict points 	<ul style="list-style-type: none"> Construct multilane roundabout Roundabout shifted south of existing alignment South leg added to connect to existing surface streets Displaced left turns from access management / raised medians replaced with U-turns at roundabouts Addresses existing left turn crashes and congestion related rear end

Summary of Improvements and Safety Features			
Intersection or Segment	Existing – No Build	Alternative 1 – Signals and Raised Medians	Alternative 2A and 2B – Roundabouts and Raised Medians
			crashes
Bedford / Arlington Avenue Intersection	Signal	<ul style="list-style-type: none"> • Signal relocated to Arlington Ave. NW • Arlington Ave. SW aligned as south leg of intersection • Addresses existing left turn crashes and aligns intersection 	<ul style="list-style-type: none"> • Construct multilane roundabout at Arlington Ave. NW • Arlington Ave. SW aligned as south leg of intersection • Roundabout shifted south of existing alignment • Displaced left turns from access management replaced with U-turns • Addresses existing left turn crashes and aligns intersection
Arlington Avenue to Harrison Avenue	Five lane cross section	<ul style="list-style-type: none"> • No Changes • 1.0 	<ul style="list-style-type: none"> • Access management with raised median • Addresses existing midblock left turn and angle crashes
Harrison Avenue Intersection	Signal	<ul style="list-style-type: none"> • No Changes 	<ul style="list-style-type: none"> • Remove traffic signal at Harrison Ave. NW • Access management with raised median • Improves corridor progression and reduces conflict points

*A superstreet is designed to reduce conflict points where traffic on the minor road is not permitted to proceed straight across the major road or highway. Instead, drivers wishing to turn left must turn right then make a U-turn.

APPENDIX J
STAKEHOLDER MEETINGS





KICKOFF MEETING MINUTES

TUSC WEST

Date: Friday, August 21, 2015
Project #: C3100002 PID 92562
Location: City of Canton 2436 30th street

- City of Canton: Dan Moeglin, Eduardo Molina, Nick Loukas (part of meeting), Chris Brown (part of meeting)
- MSG : Jean Hartline, Raymond Luk

Discussion

1. Invoices need to be submitted on ODOT IPS format. Subsequent to the meeting ODOT indicated.
2. Communication Plan
 - Submittals and Reviews - City and ODOT
 - Progress reports – Excel format with a tab for each month
 - Meetings or Conference Calls as needed
3. Scope
 - Preliminary Engineering only thru Environmental Screening, Alternative Engineering Report (AER), Public Meeting and pre-stage 1 plans.
 - Survey scope is limited to Centerline and back of curb for initial effort
4. Most Important Project goals
 - Preliminary engineering needs to result in project phasing. These should include logical limits, priorities and funding opportunities. The resulting funding list should have “bit size” projects, not a single mega project.
 - Stakeholder Satisfaction
 - Create a corridor with visual and functional transformation
 - Keep ODOT happy
5. Stakeholder Involvement Meeting with the hospital in September or October
6. Schedule
 - Ellis indicates only: Estimated End Construction 10/21/19 and Federal Reimbursement End Date 4/21/2022
7. Work in Progress
 - Survey Research
 - Schedule Counts for September (School in session)
 - Develop project concept for Sept/Oct hospital meeting
8. Record Plans – Have City plans, need to check with ODOT District 4 for plans (Whipple is a state route)
9. Drainage – Chris Brown - Drainage problem at Fawcett Street on the north side of Tusc West. Recent storm had 3’ deep water with the water spilling over to Tusc West. There is a 18” that goes to 24” storm, might be a possible capacity issue.
10. BMP – on the 12th Street project City did an “in lieu of”.

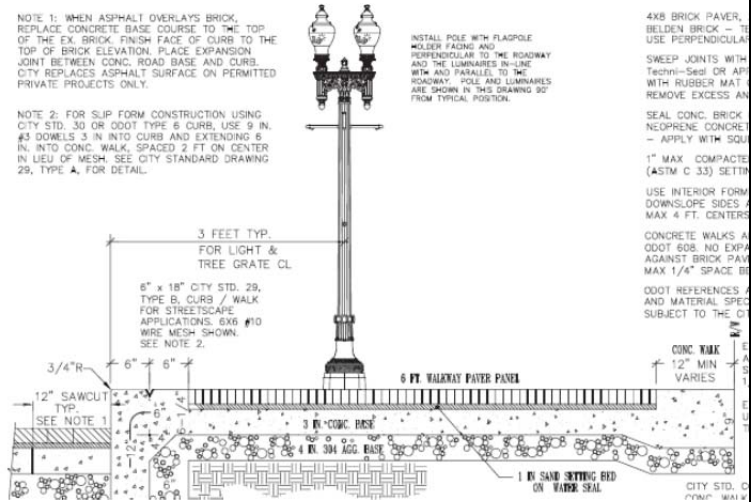
KICKOFF MEETING MINUTES

TUSC WEST

Date: Friday, August 21, 2015

Project #: C3100002 PID 92562

11. Sanitary – no known sanitary issues.
12. Lighting is 1' back of curb now. City desires 3' back of curb (need to get ODOT concurrence as current standards is 4' back of curb).
13. Curb – City wants straight curb not curb and gutter.
14. Private utilities – AT&T, gas - Dominion, Time Warner, Electric AP
15. ADA – sidewalk at 8.5' face curb to back of walk. Follow City standards. (see adjacent standard) Tree grate is considered traversable per City.
16. Transit – “Major” stop has a shelter. “Minor” stop does not have a shelter. City as a standard.
17. Signal – unwarranted signal – City is open to removing unwarranted signals.
18. Roundabout – city has 3 in progress.
19. Hospital – need to coordinate with Aultman. Possible two roundabout scheme to be considered.
20. Bikeway – Routes on Raffe, Maryland 6th. Walnut may have bike lanes.
21. AER – should present fundable phases.
22. Funding – CMAQ is an option for signal improvements. We can also apply (or reapply) for safety funds. TAP can also be considered.



Action Items	Status	Responsible Party
1. Schedule Hospital meeting – Sept/Oct	OPEN	JMH/City
2. Get IPS	OPEN	City/ODOT
3. Concept Plan	OPEN	MSG
4.		
5.		

Next Meeting Date: TBD Time: _____

MEETING MINUTES

Date: Wednesday, November 18, 2015 Time: 2:00
Project #: PID 92562 (C3100002)
Subject: Tusc West Stakeholder Meeting

Invitees:

- City: Dan Meglin, dan.moeglin@cantonohio.org (330) 438 6903
Eduardo Molina, eduardo.molina@cantonohio.org (330) 438 6928
Nick Loukas, nick.loukas@cantonohio.org (330) 438 6920
- MSG: Jean Hartline, jhartline@manniksmithgroup.com (419) 891-2222 Cell (419) 279-5174
Ray Luk, rluk@manniksmithgroup.com (419) 891-2222
- Aultman: James Miller james.miller@aultman.com (330) 363-3458
Chris Feller, chris.feller@aultman.com (330) 363-6858
David Dougherty david.dougherty@aultman.com (330) 499-8153
- Dehoff: Bob Dehoff bdehoff@dehoff.com (330) 499-8153
Beth Borda bborda@dehoff.com (330) 499-8153

Agenda

Project Overview

- Federal Safety Funds administered through ODOT – funding results in some restrictions in project area and scope (improvements must address safety issues/crash patterns). Road improvements using safety funds must prove crash reduction potential.
- Funded for Preliminary Engineering (~\$250,000 in federal safety funds with 10% local match)
- Phased projects to be constructed over 10 years (priorities and funding) – area near the hospital may be one of the first phases
- Project Public Involvement including stakeholder coordination – public meeting expected for late winter with location expected to be Cedar School (which was the public meeting location for the recent comprehensive plan)
- Project involves the Tusc West corridor from Whipple to Smith (west of I-77). Any of the road realignments from Tusc West to 9th that are being considered are to assure that the Tusc West corridor project is adequately addressing hospital planning with the Tusc West corridor safety project. The extensions/realignments of roadways to 6th or 9th will not likely be part of the initial safety project unless such has a direct result on safety improvements (Crash reduction) on Tusc West. These “off the Tusc West Corridor” street improvements can be a separate project.
- The Tusc West Corridor Project will involve: Roundabouts (see discussion below for two at hospital with others potential on the corridor), signal improvements, possible medians, sidewalk improvements, road sign improvements. Drainage improvements (such as the flooding problem at Fawcett Street) can be addressed as road improvements occur.
- Future funding scenarios may involve ODOT’s Jobs and Commerce and Jobs Ohio. These funding sources may have more application to road realignments/extension south of Tusc West to 7th or 9th. If these funds are pursued, information on job creation/retention will be required.

Complete streets and roundabout discussion

- Roundabouts Pros: create a traffic calming affect (slower traffic), provides aesthetics/gateway addresses, are fundable in several transportation funding arenas including safety and CMAQ (Congestion Mitigation Air Quality). Roundabouts involving pairs (two roundabouts separated by 500-1000’) allow for left turns displaced

MEETING MINUTES

Date: Wednesday, November 18, 2015 Time: 2:00

Project #: PID 92562 (C3100002)

by a median to occur via U-Turns at the roundabouts.

- Roundabout Cons: Sometimes more expensive from initial construction cost than a convention intersection improvement (signal upgrade and lane additions), larger "foot print" at the intersection, but less lanes on the roadway approaching the roundabout.
- Complete Streets – is a design concept in which streets are designed for all users (cars, transit, pedestrian and bicycles). The Tusc West corridor will have emphasis on cars, transit and pedestrians however, bicycles do not fit well on this corridor and the City is looking to 6th Street as a better bicycle route coming from the east, then heading south to go around the hospital, and eventually connecting to Maryland Avenue.

Revitalization Area

- Revitalization area is bounded by Tusc West (north) , Harrison (east), Bellflower (west) and 9th (south)
- Harrison is considered the major route to the neighborhood with this leg of Harrison aligned with the I-77 off ramp. Neighborhood planning would like to have this Harrison corridor to have more presence as a neighborhood main route. The Harrison neighborhood connection keeps some separation of hospital traffic from neighborhood traffic.

Hospital plans, needs, objectives, priorities, transportation needs

- Primary hospital foot print involves: Tusc W to the north, with some support facilities possible on the north side of the road, Exeter to the west, Arlington to the east and 9th to the south
- Hospital would like to keep a ring road concepts involving Tusc West (north), Arlington (east), 9th (south) and Exeter (west).
- ER is on the north side of the building. Hospital would like ambulance only entrance off of Tusc west as this would separate drive in public from ambulances and also keep ambulances away from residential areas. This would require a median opening for left in.
- Hospital planning suggests that Bedford may be closed and vacated from Tusc West to 7th/9th
- ER access for public should be kept "streamline (not circuitous) from Arlington
- Hospital prefers east roundabout to be moved from Bedford to Arlington with a slight southern alignment if this reduces impacts to the commercial businesses to the north. The houses to the south have been identified as "blighted". MSG needs to investigate what "blighted" means in regards to environmental justice as defined by FHWA. This moves the roundabout away from St Joseph's and reduces potential for impact to the church/school and also eliminates the need to push the roundabout hard to the south.
- Hospital prefers to have the west roundabout remain at Broad (although Exeter Avenue was also discussed as a possible site. The hospital day care is located at the SE corner of Tusc and Dartmouth. Another Aultman building (outpatient dialysis) is located across Exeter from the day care.
- Roadway realignments and extensions from Tusc West to 7th or 9th should avoid bisecting major parking fields.
- The Aultman school on the southeast park of the hospital campus creates a lot of pedestrian traffic from the parking to the school across Bedford. Bedford needs to remain pedestrian friendly. Hospital may add student housing to the school.

Next Steps

- MSG to revise roundabout concepts (2-3 weeks)
- City to provide record plans for signals and signal timing



MEETING MINUTES

Date: Wednesday, November 18, 2015 Time: 2:00
 Project #: PID 92562 (C3100002)

Action Items	Status	Responsible Party
1. MSG to investigate effect of formally classified "blighted" homes on the environmental justice part of the environmental clearance	Open	MSG
2. MSG to revise roundabout concept	Open	MSG
3. City to provide record plans for signals and signal timing	Open	City
4.	Status	
5.	Status	

Next Meeting Date: TBD Time: _____



MEETING MINUTES

Date: April 4, 2017
Project Title: Tusc West Safety Project
Project #: C3100002
Owner: City of Canton
Prepared By: JMH

Attendees:
Aultman: Kevin Pete, Aultman Foundation, Chris Parrish, Aultman Foundation, Joel Owen, Community Building Partnership NBBJ: Alan Mountjoy Mannik & Smith: Jean Hartline, Raymond Luk
CC (Not In Attendance):
•

This Document sets forth the understanding of the parties. The parties rely upon the contents unless the writer receives notice of specific discrepancies with proposed revised wording within two weeks of the date of transmission of this document. Parties responsible for action items are listed in BOLD font in the right column.

The following items were discussed:
Aultman Hospital identified the following: <ul style="list-style-type: none">• Pedestrian access to the neighborhood to the north is desired and part of the reason for the Clarendon Ave signal.• The roundabouts had footprints that bit too heavily into their property and resulted in restriction to their development plan• Their plan added a secondary east-west road north of the buildings (and south and parallel to Tusc West) to aid in internal site circulation• The day care will be relocated.• The hospital is teaming with a development partner to look at a holistic plan• Only hospital dock is off Dartmouth and it is not a very good dock as truck maneuverability is constrained.
City offered: <ul style="list-style-type: none">• Roundabouts are easier to fund with the federal safety funds but understand the hospital development needs.• The "fix: (alignment) of the offset intersection (at Broad and at Arlington) is a safety improvement that should be fundable• The ODOT Safety project will only permit work on the side roads that support the safety improvements on Tusc West. Thus, side road improvements will likely only extend 100-400 feet down the side roads.• Medians will be considered for access management and safety improvements but could be limited in the area of the hospital due to closely spaced intersections. Medians can be used for pedestrian refuge if they are wide enough (8'). If mid blocks crossings are used, medians would be beneficial for pedestrians.• The project is currently only funded for preliminary engineering.
Other discussions included: <ol style="list-style-type: none">1. Signal warrants were discussed. Signals on Tusc West at Broad and Arlington have passed signal warrant screening. Clarendon Avenue was not evaluated in screening as it was not previously identified as a signal location. The signal may not warrant. Aultman indicated that the lack of this signal could be worked around.2. Signal spacing with the Clarendon signal is tight (500 feet to Broadway and 860 feet to Arlington)3. Possible on-street parking was discussed. The City indicated Tusc West is not a good candidate for on-street



MEETING MINUTES

Date: April 4, 2017

Project Title: Tusc West Safety Project

Project #: C3100002

parking.

4. The only hospital dock is off Dartmouth and it is not a very good dock as truck maneuverability is constrained. With Dartmouth becoming a main circulatory route around the hospital, truck docking may get more complex.
5. For the ODOT required engineering report, options for both the Forest Avenue and Dartmouth Avenue alignments will be presented to keep options open.
6. A public meeting is required for the safety project and this will likely occur in late summer.
7. The City has a persistent problem with drainage on Fawcett Court for which they will look for solutions with the safety project.
8. The City indicated that the Tusc West improvements will proceed in phases over several years. The first phase will likely be in the vicinity of the hospital. With the need to apply for safety funds for design plans and construction, any work would not likely occur for four to five years. The safety funds can be used for safety improvements but cannot be used for aesthetics.
9. The hospital indicated that they do not have a firm schedule for their improvements.

Action Items	Status	Responsible Party
1. Revised Concept Plan	Open	MSG
2. Revised Tusc West Project schedule	Open	MSG
3.	Status	
4.	Status	
5.	Status	

Aultman Hospital Site Plan Road Improvements

Legend

- - - Existing Road
- Buildings to be Demolished
- 1 Office Building
- 2 AultCare
- 3 Physicians Office Building
- 4 Existing Church
- 5 Bedford Building
- 6 Aultman Hospital
- 7 Generator Building
- 8 Ambulatory Care Building
- 9 Education Center
- 10 Parking Garage





MEETING MINUTES

TUSC WEST

Date: Friday, August 18, 2017
 Project #: C3100002 PID 92562 TUSC WEST
 Location: City of Canton 2436 30th Street

- City of Canton: Dan Moeglin, Nick Loukas
- MSG : Jean Hartline, Jason Watson

Discussion

1. Aultman Hospital is back to considering roundabouts at Broad and at Arlington. Broad roundabout should attempt to miss pharmacy on NW corner. MSG may have this design concept already. Arlington roundabout should also keep the southern shift to minimize business impacts.
2. The AER should include both non-roundabout and roundabout alts for Raff, Broad and Arlington.
3. Broad roundabout should move south leg due south to 6th street (not the Dartmouth alignment as previously shown in the hospital plan). This is based on City's recent discussion with hospital. This helps as Dartmouth separates the hospital (and school of nursing) from parking (higher pedestrian conflicts with Dartmouth alignment) and the somewhat difficult truck dock for the hospital is on Dartmouth. Thus, minimizing traffic on Dartmouth is desired.
4. Roundabouts have better safety funding opportunities.
5. City desires to hit April submittal for safety funding on Phase 1.
6. Provide medians between Broad and Arlington roundabouts with opening at Clarendon for ambulances only.
7. Harrison revision to right in/right out is more feasible with the Arlington roundabout to replace restricted SB left turns. City has some concerns that this change may not go well with the public.
8. Keep Wertz/Broad re-alignment in the AER but this might not be part of phase 1.
9. Winter Public Meeting is expected. City would like exhibits and simulation for both alternatives (with and without roundabouts). We believe that SimTraffic will work for both although SimTraffic is not the tool to use for roundabout analyses (aaSidra is).
10. City is reviewing signal warrants and certified traffic request. We would like to get these to ODOT fairly quickly.
11. MSG will revise project schedule and identify dates for AER submittal and public meeting
12. Monthly meetings with the City are proposed. MSG will solicit dates from City to get these on our calendars.
13. A meeting with ODOT D4 is desired as the ODOT project entries (in Ellis) indicate that this is a low level environmental with No R/W. MSG to solicit dates from City for this meeting and then contact ODOT. Late September expected.

Action Items	Status	Responsible Party
1. ODOT Meeting – Coordinate Dates with City and ODOT	Open	Jean
2. Schedule Monthly Meetings with City	Open	Jean/Dan
3. Review Cert Traffic Request and Signal Warrants	Open	Nick

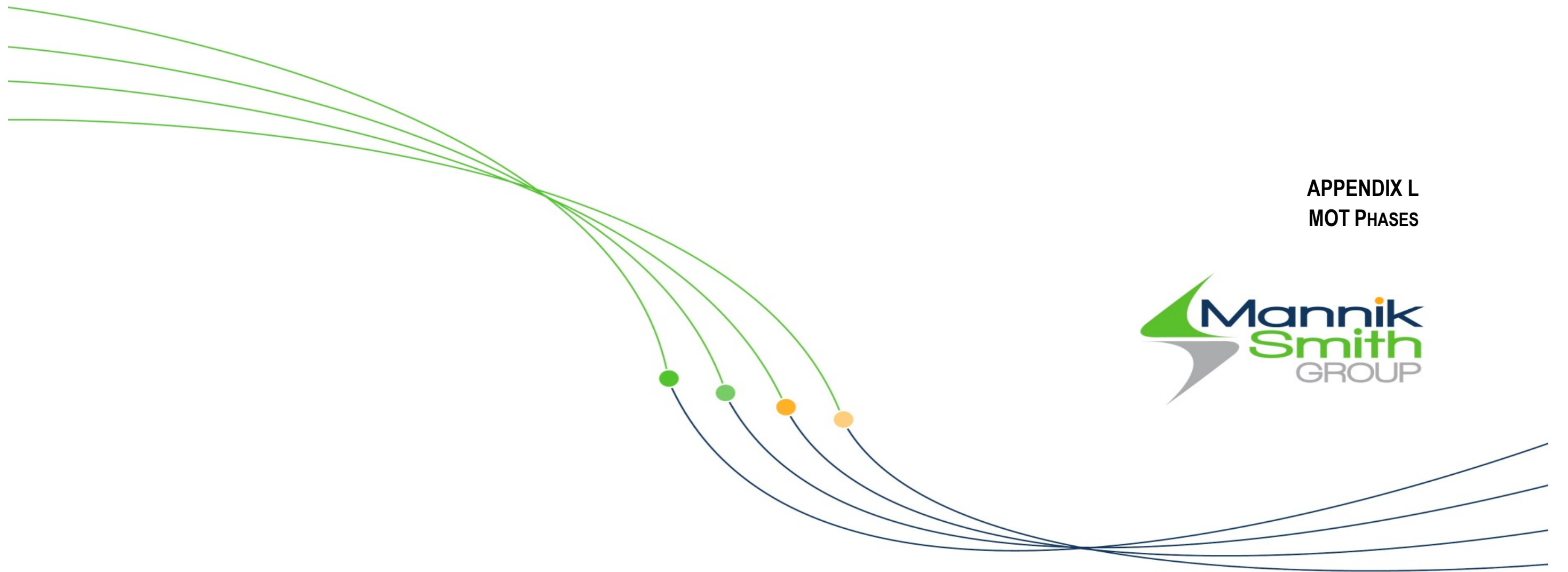
Next Meeting Date: TBD Time: TBD

APPENDIX K
PRELIMINARY AULTMAN HOSPITAL MASTER PLAN





APPENDIX L
MOT PHASES



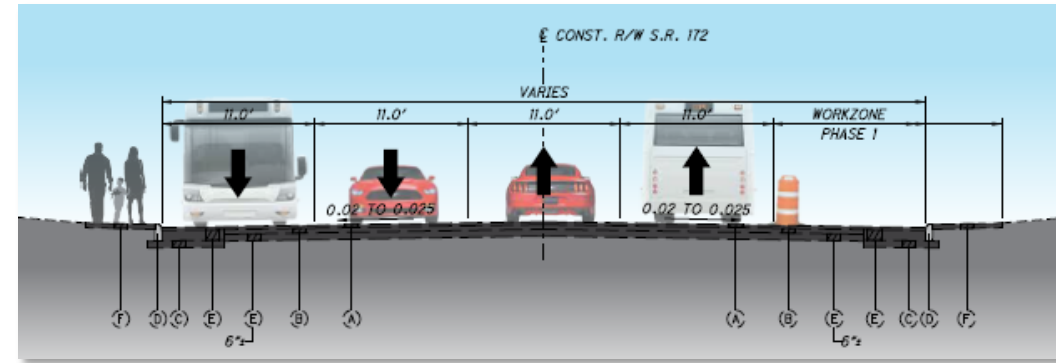


Figure 17 - Phase 1 MOT

Phase II

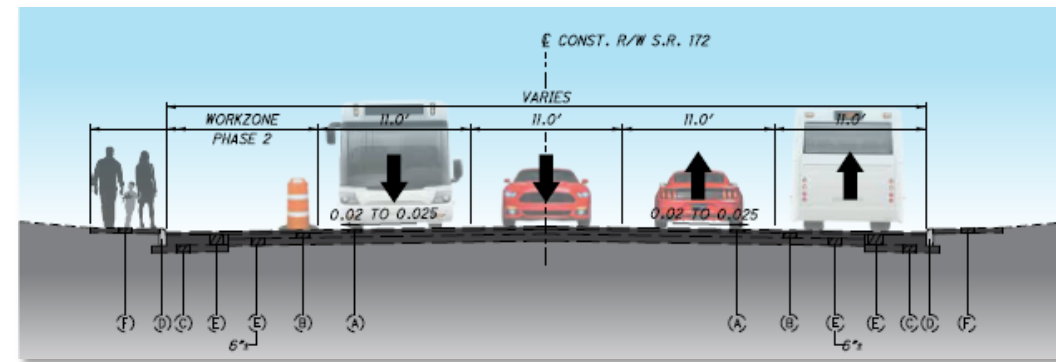


Figure 18 - Phase 2 MOT

Phase III

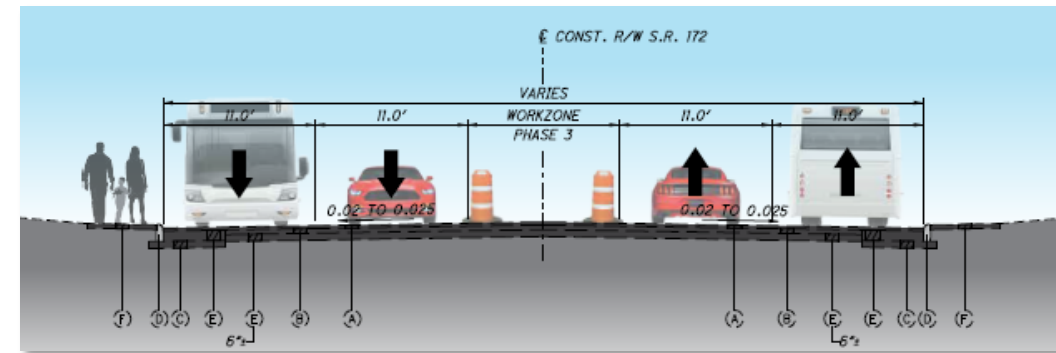
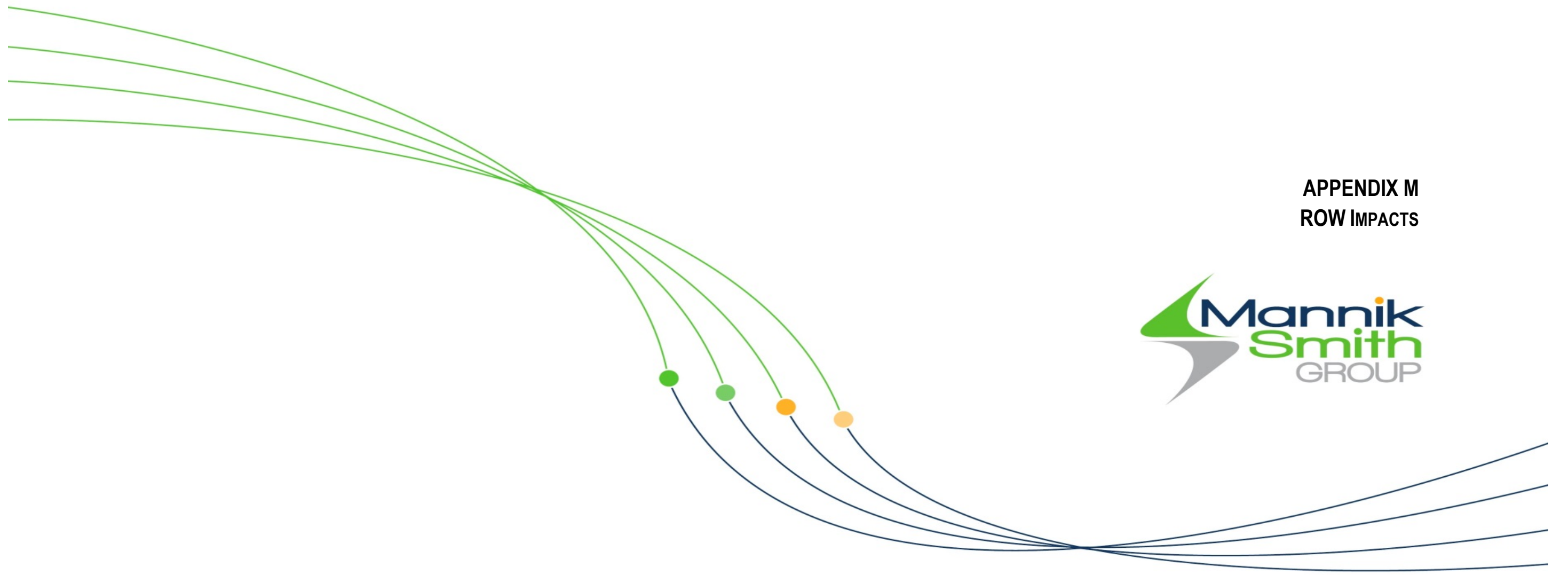


Figure 19 - Phase 3 MOT

APPENDIX M
ROW IMPACTS





STA-172-11.91

TUSCARAWAS STREET PARCEL IMPACTS
ALTERNATIVE 1





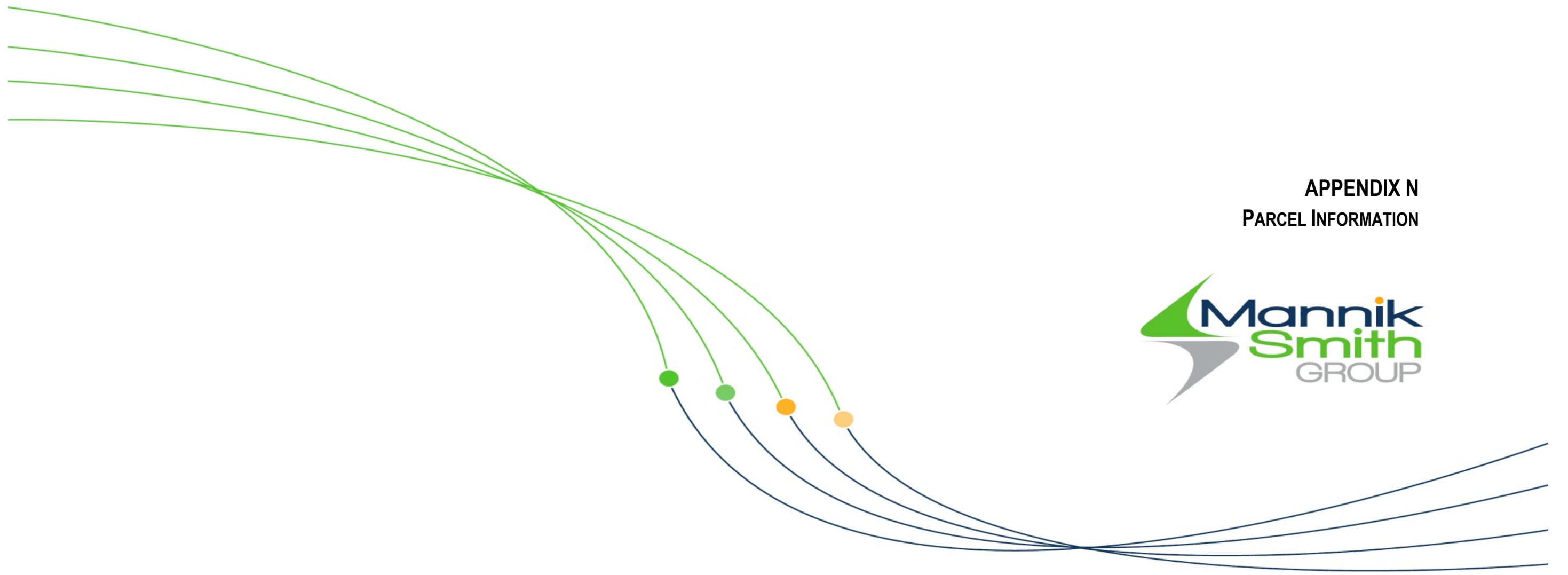
TUSCARAWAS STREET PARCEL IMPACTS
ALTERNATIVE 2

STA-172-11.91



TOTAL # OF PARCELS IMPACTED = 77

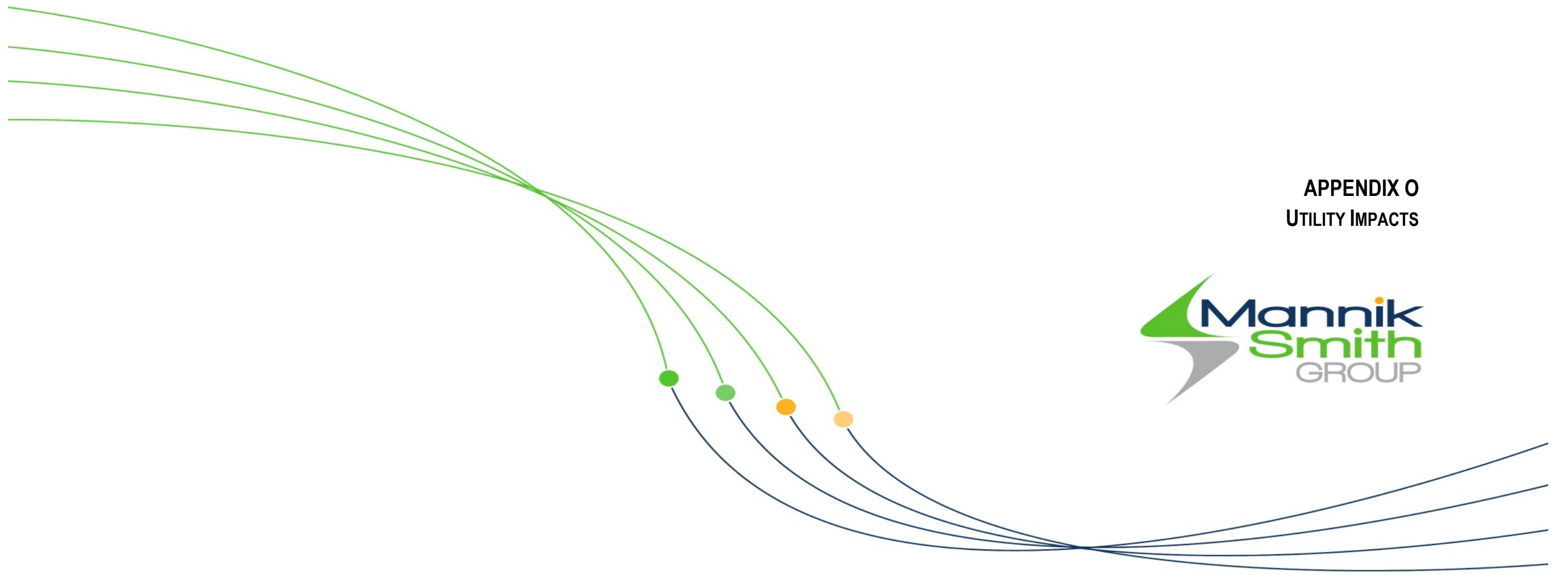
APPENDIX N
PARCEL INFORMATION



SR 172 PARCEL INFORMATION						
Alternate 1	Alternate 2	Parcel #	Owner	Street Address	Description	Appraised Total Value
1	1	247089	Nassimi Realty Corp & Canton Zar LLC & Canton Mall Realty LLC	4300 SR 172 OH	Regional Shopping Center	\$4,251,900.00
2	2	244155	Country Fair Partnership	4357 SR 172 Canton OH 44708-5426	Community Shopping Center	\$3,535,900.00
	3	284727	United States Postal Service	4025 SR 172 Canton OH 44708-5500	Exempt, USA	\$338,300.00
3	4	248049	Wal-Mart Stores East Lp	4030 SR 172 OH	Discount/JR. Department Store	\$142,700.00
4		243265	WEC 98G-28 LLC	3720 SR 172 Canton OH 44708-5619	Small Retail Store	\$796,600.00
5	5	243584	Wec 98G-28 LLC	SR 172 OH	Parking Garage/Structure/Lot	\$72,300.00
	6	208722	Antonini-Diblasio Apartments LLC	3709 SR 172 Canton OH 44708-5660	Apartments, 4-19 Units	\$255,100.00
	7	281593	Canton City	3701 SR 172 Canton OH 44708	Exempt, Municipality	\$301,000.00
7	8	246349	Altman Buckeye Company li Partnership	3510 SR 172 Canton OH 44708-5641	Community Shopping Center	\$3,333,900.00
6	9	246350	Buckeye Plaza Land Company LLC	3600 SR 172 Canton OH 44708-5643	Community Shopping Center	\$164,100.00
8		247983	Buckeye Plaza Land Company LLC	3504 SR 172 OH	Community Shopping Center	\$665,000.00
	10	226749	Krupar Thomas M	3625 SR 172 Canton OH 44708-5642	1-Family Dwelling	\$109,900.00
	11	214404	Younus Asif	SR 172 OH	Residential Vacant Land	\$12,000.00
	12	215873	Younus Asif	SR 172 OH	Residential Vacant Land	\$11,900.00
	13	215872	Shubert Ronald A & Karen	3501 SR 172 Canton OH 44708-5640	Office Bld'g, 1-2 Story, Walk-Up	\$106,700.00
9	14	200041	Poling Carly L	3447 SR 172 Canton OH 44708-5638	1-Family Dwelling	\$128,000.00
10	15	238975	Rauls Rhonda R	3411 SR 172 Canton OH 44708-5638	1-Family Dwelling	\$155,700.00
11	16	222926	Mills Daniel M & Douglas V	Bellflower Ave Sw OH	Residential Vacant Land	\$8,600.00
12	17	203941	National Driver Training School Inc	3319 SR 172 Canton OH 44708-5615	Small Retail Store	\$98,400.00
13	18	205894	Dimarzio Ardean	3316 SR 172 Canton OH 44708-5654	1-Family Dwelling	\$62,800.00
14	19	207945	Reale Therese L & Owen Michelle K Co Trustees Of The Richard J & Wilma J Guarendi Family Irrevocable Trust	3306 SR 172 Canton OH 44708-5654	3-Family Dwelling	\$67,900.00
15	20	246167	Chiarelli John P	3309 SR 172 Canton OH 44708-5615	1-Family Dwelling	\$86,400.00
16	21	246166	Chiarelli John P	SR 172 OH	Residential Vacant Land	\$10,500.00
17	22	245714	Jaime Carlos & Soccoro O	3300 SR 172 Canton OH 44708-5654	2-Family Dwelling	\$72,800.00
18	23	245443	Jaime Carlos & Soccoro O	SR 172 OH	Residential Vacant Land	\$1,100.00
19	24	245762	Cje Enterprises LLC	3212 SR 172 Canton OH 44708-4142	Restaurant/Cafeteria Bar	\$261,600.00
20	25	227215	H & H Co	3217 SR 172 Canton OH 44708-4141	Small Retail Store	\$134,400.00
21	26	246470	Heggy William A & Virginia C Co-Trustees	3200 SR 172 Canton OH 44708-4142	Restaurant/Cafeteria Bar	\$189,000.00
22	27	227216	H & H Co	3215 SR 172 Canton OH 44708-4141	Neighborhood Shopping Center	\$85,400.00
23	28	237579	Orso Enterprises, LTD	3211 SR 172 Canton OH 44708	Restaurant/Cafeteria Bar	\$345,400.00
24	29	208996	Dipietro Enterprises No 1 LTD	3201 SR 172 Canton OH 44708-4141	Parking Garage/Structure/Lot	\$38,100.00
25	30	244635	Adams James	3130 SR 172 Canton OH 44708-4140	Dry Cleaning Plant/Laundry	\$171,000.00
26	31	245731	Jones Properties LTD	3124 SR 172 Canton OH 44708-4140	Auto Sales/Service	\$134,800.00
27	32	245687	Benak Properties LLC	3102 SR 172 Canton OH 44708-4140	Drive-In/Food Service	\$56,900.00
28	33	245793	Speedway Superamerica LLC	3131 SR 172 Canton OH 44708-4160	Auto Service Station	\$364,200.00
29	34	245758	Cig Enterprises LLC	SR 172 OH	Parking Garage/Structure/Lot	\$15,900.00
30	35	237547	Cig Enterprises LLC	3060 SR 172 Canton OH 44708-4167	Other Retail Structures	\$62,400.00
31	36	245182	Ripich Robert J Trustee/ Robert J Ripich Revocable Trust	3054 SR 172 Canton OH 44708-4167	Office Bld'g, 1-2 Story, Walk-Up	\$81,900.00
32	37	241783	Castillo Rigoberto	3040 SR 172 Canton OH 44708-4167	Small Retail Store	\$196,400.00
33	38	299293	3030 W. Tusc Office Condominium (Master Record)	SR 172 OH 44708	Office Condominium	\$0.00
34	39	217346	Kafalides Louis & Geraldine	3024 SR 172 Canton OH 44708-4167	1-Family Dwelling	\$62,800.00
35	40	285718	Chiarelli John	3016 SR 172 OH	1-Family Dwelling	\$50,500.00
36/37		246108	Lewis Roy M	3000 SR 172 Canton OH 44708-4138	Auto Sales/Service	\$331,700.00
38		285107	Aultman Health Foundation	2904 SR 172 Canton OH 44708-4643	Exempt, Charitable	\$984,400.00
39	41	285106	Aultman Health Foundation	SR 172 W OH	Exempt, Charitable	\$68,400.00

SR 172 PARCEL INFORMATION						
Alternate 1	Alternate 2	Parcel #	Owner	Street Address	Description	Appraised Total Value
40	42	245718	Aultman Health Foundation	2820 SR 172 Canton OH 44708-4641	Small Retail Store	\$288,900.00
41	43	246783	Aultman Health Foundation	2810 SR 172 Canton OH 44708-4641	Exempt, Charitable	\$99,200.00
	44	245791	Amato David L & Christina M Trustee / Amato Trust	2801 SR 172Canton OH 44708-4640	Other Retail Structures	\$119,300.00
42	45	284810	Aultman Hospital Association	SR 172	Exempt, Charitable	\$78,000.00
43	46	247466	Aultman Health Foundation	Grove Ave Sw OH	Exempt, Charitable	\$5,300.00
44	47	247469	Aultman Health Foundation	Dartmouth Ave Sw OH	Exempt, Charitable	\$200,500.00
45	48	218268	Aultman Health Foundation	2721 Maywood Pl Sw Canton OH 44710-1731	Exempt, Charitable	\$9,000.00
46		247467	Aultman Health Foundation	Grove Ave SW OH	Exempt, Charitable	\$3,700.00
47	49	284808	Aultman Hospital Association	SR 172	Exempt, Charitable	\$64,300.00
	50	245723	Randazzo Michael C Jr	SR 172	Parking Garage/Structure/Lot	\$16,700.00
	51	284812	Aultman Hospital Association	SR 172	Exempt, Charitable	\$64,400.00
	52	246667	West Tuscarawas Property Management LLC	2600 W Tuscarawas St Canton OH 44708	Medical Clinic/Office	\$9,006,500.00
48	53	245725	Aultman Health Foundation	SR 172	Exempt, Charitable	\$10,600.00
49	54	203102	Aultman Health Foundation	SR 172 Canton OH 44708-4728	Exempt, Charitable	\$15,600.00
50	55	220360	Aultman Health Foundation	SR 172 Canton OH 44708-4728	Other Commercial Structure	\$11,700.00
	56	247057	2401 W Tusc LLC	2401 Tuscarawas St W OH	Neighborhood Shopping Center	\$581,800.00
51	57	245818	Aultman Health Foundation	SR 172 W Canton OH 44708-4728	Exempt, Charitable	\$20,200.00
52	58	227275	Aultman Health Foundation	2406 SR 172 Canton OH 44708-4728	Exempt, Charitable	\$21,700.00
53	59	245846	Aultman Health Foundation	2402 SR 172 Canton OH 44708-4728	Exempt, Charitable	\$9,100.00
	60	221458	Aultman Health Foundation	Arlington Ave Sw OH	Exempt, Charitable	\$4,700.00
	61	220656	Aultman Health Foundation	Arlington Ave Sw Canton OH 44706-1134	Exempt, Charitable	\$4,300.00
	62	233211	Aultman Health Foundation	119 Arlington Ave Sw Canton OH 44706-1134	Exempt, Charitable	\$4,500.00
54	63	236498	Quinn Mark O	2330 SR 172 Canton OH 44708-4747	Other Commercial Structure	\$37,900.00
55	64	221459	Welcome Home Properties LLC	110 Arlington Ave Sw Canton OH 44706-1135	1-Family Dwelling	\$28,200.00
56	65	203743	Lukens David B	116 Arlington Ave Sw Canton OH 44706-1135	2-Family Dwelling	\$20,100.00
58	66	224769	Copeland Dennis R &Carolyn J	2326 SR 172 W Canton OH 44708-4747	Other Commercial Structure	\$46,200.00
57	67	211858	Sinclair Thomas A &Helen B	118 Arlington Ave Sw Canton OH 44706-1160	2-Family Dwelling	\$30,600.00
	68	213802	Huntsman Sharon K	129 Raymont Crt Sw Canton OH 44706-1157	1-Family Dwelling	\$23,000.00
	69	245752	Tct Investments LLC	2315 SR 172 W Canton OH 44708-4751	Neighborhood Shopping Center	\$277,300.00
	70	203027	Blair William P Iii	SR 172 OH	Commercial Vacant Land	\$10,000.00
	71	219361	Frank Christine M	117 Raymont Crt Sw Canton OH 44706-1141	2-Family Dwelling	\$22,500.00
	72	234979	Vogelgesang Charlesa	2316 SR 172 Canton OH 44708-4752	1-Family Dwelling	\$37,900.00
	73	234972	Vogelgesang Charlesa	2310 SR 172 Canton OH 44708-4752	Other Residential Structures	\$6,600.00
	74	245789	A R M Properties LLC	2306 SR 172 Canton OH 44708-4752	Office Bld'g, 1-2 Story, Walk-Up	\$105,100.00
	75	10005341	Cths LLC	2234 SR 172 Canton OH 44708	Neighborhood Shopping Center	\$542,300.00
	76	245838	Shaheen Norman M	2241 SR 172 Canton OH 44708-4740	Other Retail Structures	\$64,700.00
	77	246002	Rfy Fairlawn LLC	2237 SR 172 Canton OH 44708-4755	Apartments, 4-19 Units	\$101,000.00

APPENDIX O
UTILITY IMPACTS



- **Electrical Infrastructure** - The existing utility poles on each side of SR 172 are being used for power distribution as well as supports for lights and signals. Corridor upgrades will conflict with existing utility poles throughout the corridor, especially in areas where widening and roundabouts are proposed. It is anticipated that temporary signals will be installed before existing poles can be removed where designated in the plans.
- **Gas Infrastructure** - There is a 6"/8" gas line that runs along the north side of Tuscarawas Street and a 6"/8" gas line that runs along the south side of SR 172 east of Raff Road. Both lines are located under the existing pavement with branches stemming off into side streets along the corridor. Depending on the depth of the gas lines, there are potential impacts to the line at the proposed roundabouts or areas of proposed widening.
- **Water Infrastructure** - There is an 8"/12" water line that runs along the north side of SR 172 and a 6"/8" water line that runs along the south side of SR 172 east of Raff Road. There are water valves and fire hydrants located within the proposed roundabout and widening areas. The proposed upgrades would require the relocation of water valves and the fire hydrants at locations with conflicts. The fire hydrants will be relocated to meet the required offset standards consistent with City of Canton and ODOT standards.
- **Telephone Infrastructure** –AT&T has telecommunications facilities within the project limits. Based on site visits, there are aerial telecommunications lines within the project area. There are some lines that use the electrical poles and some that have separate poles. Further investigation will be made to verify the existence of communication lines in the area and any impacts from the proposed upgrades. Relocation of these facilities are anticipated
- **Cable Infrastructure** – Spectrum has cable infrastructure within the project limits. Based on site visits and photos, there are aerial lines within the project area. Further investigation will be made to verify the existence of cable lines in the area and any impacts from the proposed upgrades.
- **Sewer/Sanitary Infrastructure** – The City of Canton has facilities running along both sides of the road throughout the corridor. Catch basins and manholes are spread out throughout the project area. It is anticipated that existing inlets will need to be relocated and retrofitted with the existing drainage system.