FEASIBILITY STUDY

Market Street (State Route 7)
MAH-7-3.58 (PID 98408)

Boardman Township, Mahoning County, Ohio

GPD GROUP®
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

Prepared For:

Boardman Township
8299 Market Street
Boardman, OH 44512

Prepared By:

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June 2019

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Engineer's Seal

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GPD GROUP®
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

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I. Study Purpose:

At the request of Boardman Township, GPD Group was tasked with preparing a Feasibility Study for the Market Street (State Route 7) corridor between Midlothian Boulevard and Meadowbrook Avenue. This study is intended to evaluate the feasibility of performing a road diet along the Market Street corridor in order to make the roadway more accessible from a multi-modal perspective and potentially provide additional on-street parking for businesses. An additional option of making the Market Street corridor more pedestrian-friendly by adding high-visibility crosswalks and median refuge islands is also being considered in case the road diet is not feasible from a capacity perspective.

II. Existing Conditions:

The Market Street (State Route 7) corridor is a major north-south connector through Boardman Township and serves as the primary link between downtown Youngstown and I-680 to the north to US 224 and Boardman's primary commercial district to the south. Development along the Market Street corridor is primarily commercial whereas single family residential neighborhoods comprise of the areas to the east and west. Additionally, the Market Street Elementary School is located on the east side of Market Street at the south end of the corridor.

Market Street (State Route 7) is currently a five (5) lane asphalt roadway within the study area with two (2) lanes of travel in each direction with a center two-way left turn lane. The current posted speed limit on Market Street is 40 miles per hour (mph). According to data obtained from the Ohio Department of Transportation's (ODOT) website, Market Street is classified as an Urban Principal Arterial and has an average daily traffic (ADT) volume that varies between 13,910 and 20,290, with the highest traffic volumes being located on the south end of the corridor and consistently decreasing when moving north. Within the study area, Market Street is a relatively level roadway, with two vertical curves located along the project with minimal grades. Additionally, there is a horizontal curve within the northern section of the study area, located between Overhill Road and Midlothian Boulevard. Enclosed drainage, street lighting, sidewalks and concrete curbs are present on both sides of the roadway. No pedestrian crosswalks for crossing Market Street current exist outside of the signalized intersections.

The existing roadway geometries for the study intersections are detailed below. See **Figure 1** for an aerial photograph of the study area.

Market Street / Midlothian Boulevard Intersection:

> This intersection is currently signalized using a box span wire configuration with signal poles located on all four (4) corners of the intersection. The intersection consists of four (4) approaches with the following lane configurations: NB & SB Market Street and EB & WB Midlothian Boulevard – three (3) lanes (left, thru, thru-right). Protected/permissive left turn phasing exists on the northbound, eastbound and westbound approaches to the intersection, while the southbound approach uses protected-only phasing.

Market Street / Indianola Road / Shields Road / Brookwood Road Intersection:

This intersection is currently signalized using a box span wire configuration with signal poles located on all four (4) corners of the intersection. The intersection consistent of five (5) approaches with the following lane configurations: NB & SB Market Street – three (3) lanes (left, thru, thru-right), EB Shields Road – two (2) lanes (left, thru-right), WB Indianola Road – two (2) lanes (left, thru-right) and SEB Brookwood Road – one (1) lane (left-right). Protected/permissive left turn phasing exists for the northbound, eastbound and westbound approaches to this intersection. Right turn on red movements are prohibited for the southbound, eastbound, westbound and southeast bound approaches to the intersection.

Market Street / Meadowbrook Avenue / Key Bank Drive Intersection:

This intersection is currently signalized using a diagonal span wire configuration with signal poles located on the northwest and southeast corners of the intersection. The intersection consists of four (4) approaches with the following lane configurations: NB & SB Market Street – three (3) lanes (left, thru, thru-right), EB Key Bank Drive – one (1) lane (left-thru-right) and WB Meadowbrook Avenue – one (1) lane (left-thru-right). Right turn on red movements are prohibited for all four (4) approaches to the intersection.

III. Traffic Volumes:

Existing Traffic Volumes

Intersection turning movement traffic counts were previously performed by ODOT at the Market Street / Midlothian Boulevard and Market Street / Indianola Road / Shields Road / Brookwood Road intersections. These counts were taken on Wednesday, September 13th, 2017 and were performed for twelve (12) hours from 7:00 AM – 7:00 PM. Additionally, an intersection turning movement count was performed at the Market Street / Meadowbrook Avenue intersection by Cummins Consulting Services on Wednesday, September 5th, 2018 for eleven (11) hours from 7:00 AM – 6:00 PM. The 'raw' traffic count data is contained in **Appendix A**.

Planning Level Traffic Forecast

Planning level traffic volumes were created from the Existing Year 2019 traffic counts that were collected within the study area. The Average Daily Traffic (ADT) volumes were seasonally adjusted, while the peak hour data had design hour factors applied to them to create the design hourly volumes (DHV) for each peak hour. These volumes were then smoothed to create a balanced network throughout the study area. See **Figure 2** for the Existing Year 2018 planning level peak hour traffic volumes.

Historic Growth Trends

Developing future traffic volumes involves calculating a proposed growth rate based on historic traffic counts collected along roadways in the vicinity of the project. ODOT has been collecting traffic volumes along Market Street (State Route 7) since 1995 and the ADT volumes on these roads during this time frame are available on the ODOT website. According to these counts, traffic volumes along the study corridor have been decreasing steadily from 1985 to present day. Based on these historic traffic volumes, GPD Group developed a growth trend-line equation for Market Street. As shown in **Appendix B**, the traffic counts on Market Street show a negative annual growth rate of 2.89%. Based upon these historical growth trends, no future traffic growth is expected to occur with respect to the existing traffic volumes. Therefore the volumes shown in **Figure 2**, will also serve as the volumes for the Opening Year 2021 and Design Year 2041 traffic conditions.

Corridor Improvement Options

Two (2) improvement options are being considered along the Market Street corridor as part of this feasibility study. The first option would be to implement a road diet between Clifton Drive and Midlothian Boulevard. This option would reduce Market Street to a three (3) lane roadway with a single northbound and southbound travel lane while maintaining the existing two-way left turn lane. The excess pavement would be reallocated as dedicated, on-street bike lanes with a transverse-striped buffer area to further separate bicyclists from vehicles. In addition to these modifications, high-visibility ladder-style crosswalks along with ADA-compliant curb ramps would be installed at the Clifton Drive, Jennette Drive and Fairlawn Avenue intersections as well as at new mid-block crossings between Newport Drive and Maple Drive and between Overhill Road and Hillman Street. See **Figure 3** for a proposed improvement rendering of the road diet option.

The second option for the Market Street corridor would be to maintain the existing roadway geometry (5-lane section) but still incorporate the various pedestrian enhancements identified above under the first option (high-visibility ladder-style crosswalks at strategic intersections and mid-block crossing locations). See **Figure 4** for a proposed improvement rendering of this second (non-road diet) option.

Intersection Capacity Analysis

Intersection capacity analyses were performed for the Design Year 2041 traffic conditions as these results will also represent the Existing Year 2018 and Opening Year 2021 conditions as no future traffic growth is expected. This capacity analysis was performed in order to determine the operating conditions experienced along the Market Street corridor. The quality of the operating conditions experienced by an intersection is measured in terms of Level-of-Service (LOS). Levels-of-Service can range from LOS A to LOS F. Level-of-Service ratings of A, B, and C are considered to be in the acceptable range. Level-of-Service D is typically considered acceptable in urban areas (which the study area utilized for this project has been determined to be within). Levels-of-Service E and F are considered below average with significant levels of delay experienced by vehicles. The Level-of-Service thresholds vary for signalized and unsignalized intersections. The thresholds related to average control delay for both signalized and unsignalized intersections are as follows:

Level-of-Service	Delay Threshold – Signalized (Sec)	Delay Threshold – Unsignalized (Sec)
A	< 10	< 10
B	> 10 - 20	> 10 – 15
C	> 20 - 35	> 15 – 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

The capacity analyses was performed for the AM and PM peak hours utilizing the computer program Synchro (Version 9) which was developed by Trafficware. Synchro can provide a macroscopic analysis of a roadway system and take into account the interactions and impact of traffic which travels from one intersection to the next. Analysis results reported in the following tables are based on the Highway Capacity Manual (HCM) 2010 calculation outputs from the Synchro software which are comparable to Highway Capacity Software (HCS) outputs. It should be noted that the HCM 2010 methodology is currently unable to analyze signalized intersections with more than 4 approach legs, intersections with non-standard signal phasing and intersections with non-standard traffic control. As such, the Market Street / Indianola Road / Shields Road / Brookwood Road intersection results will be reported based on the Synchro HCM 2000 outputs as it has five (5) approaches legs.

Design Year 2041 'No-Build' Conditions

Table 1 summarizes the HCM Intersection Capacity Analysis and details the Levels-of-Service and delay experienced under the Design Year 2041 'No-Build' conditions for the study intersections. See **Appendix C** for the HCM Intersection Capacity Analysis printouts.

Table 1: HCM Intersection Capacity Analysis Summary
Design Year 2041 'No-Build' Conditions

Approach / Movement	AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)
Market Street / Midlothian Boulevard				
Eastbound Left	C	21.9	C	21.2
Eastbound Thru-Right	C	26.7	C	28.6
Eastbound Approach	*C*	*25.2*	*C*	*28.7*
Westbound Left	C	22.2	C	25.2
Westbound Thru-Right	C	27.4	C	29.5
Westbound Approach	*C*	*25.8*	*C*	*28.2*
Northbound Left	B	15.2	B	16.8
Northbound Thru-Right	C	26.0	C	27.3
Northbound Approach	*C*	*25.8*	*C*	*26.6*
Southbound Left	D	43.1	D	50.8
Southbound Thru-Right	C	23.3	C	25.8
Southbound Approach	*C*	*24.6*	*C*	*28.2*
Intersection Total	***C***	***25.4***	***C***	***27.6***

Table 1: HCM Intersection Capacity Analysis Summary Design Year 2041 'No-Build' Conditions				
Approach / Movement	**AM Peak**		**PM Peak**	
	LOS	**Delay** (sec)	**LOS**	**Delay** (sec)
Market Street / Shields Road / Indianola Road / Brookwood Road*				
Eastbound Left	C	25.3	D	35.2
Eastbound Thru-Right	D	44.0	E	69.3
Eastbound Approach	*D*	*39.6*	*E*	*63.2*
Westbound Left	C	25.3	D	41.6
Westbound Thru- Right	D	36.5	D	49.5
Westbound Approach	*C*	*33.9*	*D*	*47.8*
Northbound Left	C	28.0	E	66.4
Northbound Thru-Right	C	24.4	C	28.0
Northbound Approach	*C*	*25.0*	*D*	*38.5*
Southbound Left	C	30.4	D	40.1
Southbound Thru-Right	D	39.7	E	64.7
Southbound Approach	*D*	*39.3*	*E*	*63.7*
Southeastbound Left-Right	D	39.2	E	63.0
Southeastbound Approach	*D*	*39.2*	*E*	*63.0*
Intersection Total	***D***	***33.6***	***D***	***52.3***
Market Street / Meadowbrook Avenue / Key Bank Drive				
Eastbound Left-Thru-Right	B	15.5	B	16.9
Eastbound Approach	*B*	*15.5*	*B*	*16.9*
Westbound Left-Thru-Right	B	17.5	C	20.4
Westbound Approach	*B*	*17.5*	*C*	*20.4*
Northbound Left	B	19.1	C	21.4
Northbound Thru-Right	B	17.5	C	20.2
Northbound Approach	*B*	*17.5*	*C*	*20.3*
Southbound Left	C	21.4	C	27.7
Southbound Thru-Right	B	16.7	B	17.6
Southbound Approach	*B*	*16.9*	*B*	*17.9*
Intersection Total	***B***	***17.2***	***B***	***19.3***

Note: Orange highlighted cells indicate a Level of Service E.
Red highlighted cells indicate a Level of Service F.
*Results reported with HCM 2000 outputs

As shown in **Table 1**, the intersections of Market Street / Midlothian Boulevard and Market Street / Meadowbrook Avenue / Key Bank Drive will operate at acceptable Levels-of-Service for all movements and approaches during the AM and PM peak hours under the Design Year 2041 'No-Build' conditions. The Market Street / Shields Road / Indianola Road / Brookwood Road intersection operates at an acceptable overall LOS D, but has four (4) approaches that experience an unacceptable LOS E during the PM peak hour currently under the 'No-Build'.

Design Year 2041 'Build' Conditions

The 'Build' scenario represents the implementation of a road diet and the elimination of a northbound and southbound travel lane in each intersection. This analysis was performed under the assumption that the northbound travel lane would be eliminated using a lane merge that would occur south of the Market Street / Meadowbrook Avenue intersection whereas the southbound travel lane would be eliminated by converting it to a drop right turn lane at the Market Street / Midlothian Boulevard intersection.

Table 2 summarizes the HCM Intersection Capacity Analysis and details the Levels-of-Service and delay experienced under the Design Year 2041 'Build' conditions for the study intersections. See **Appendix D** for the HCM Intersection Capacity Analysis printouts.

Table 2: HCM Intersection Capacity Analysis Summary
Design Year 2041 'Build' Conditions

Approach / Movement	AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)
Market Street / Midlothian Boulevard				
Eastbound Left	C	27.5	C	27.0
Eastbound Thru-Right	C	33.3	D	37.7
Eastbound Approach	*C*	*31.4*	*D*	*36.1*
Westbound Left	C	28.0	C	34.9
Westbound Thru-Right	C	34.5	D	39.8
Westbound Approach	*C*	*32.5*	*D*	*38.4*
Northbound Left	B	12.5	B	14.9
Northbound Thru-Right	C	32.9	D	40.4
Northbound Approach	*C*	*32.5*	*D*	*38.6*
Southbound Left	D	43.1	D	50.8
Southbound Thru	C	21.6	C	25.7
Southbound Right	B	15.5	B	15.7
Southbound Approach	*C*	*22.5*	*C*	*26.9*
Intersection Total	***C***	***29.7***	***C***	***34.8***

Table 2: HCM Intersection Capacity Analysis Summary Design Year 2041 'Build' Conditions				
Approach / Movement	**AM Peak**		**PM Peak**	
	LOS	**Delay** (sec)	**LOS**	**Delay** (sec)
Market Street / Shields Road / Indianola Road / Brookwood Road*				
Eastbound Left	C	33.2	D	45.1
Eastbound Thru-Right	D	53.9	F	139.1
Eastbound Approach	*D*	*49.0*	*F*	*122.4*
Westbound Left	C	33.3	D	48.0
Westbound Thru- Right	D	44.8	E	70.6
Westbound Approach	*D*	*42.2*	*E*	*65.7*
Northbound Left	D	35.9	F	136.8
Northbound Thru-Right	C	30.3	C	32.3
Northbound Approach	*C*	*31.2*	*E*	*60.7*
Southbound Left	C	27.3	C	30.9
Southbound Thru-Right	D	54.1	F	123.9
Southbound Approach	*D*	*53.0*	*F*	*120.0*
Southeastbound Left-Right	D	53.7	F	117.4
Southeastbound Approach	*D*	*53.7*	*F*	*117.4*
Intersection Total	***D***	***43.2***	***F***	***91.3***
Market Street / Meadowbrook Avenue / Key Bank Drive				
Eastbound Left-Thru-Right	B	18.9	C	26.1
Eastbound Approach	*B*	*18.9*	*C*	*26.1*
Westbound Left-Thru-Right	C	21.4	C	32.9
Westbound Approach	*C*	*21.4*	*C*	*32.9*
Northbound Left	C	23.6	C	24.0
Northbound Thru-Right	C	21.2	C	33.2
Northbound Approach	*C*	*21.3*	*C*	*33.1*
Southbound Left	C	29.0	D	47.8
Southbound Thru-Right	B	18.5	B	16.7
Southbound Approach	*B*	*19.0*	*B*	*17.8*
Intersection Total	***C***	***20.3***	***C***	***26.7***

Note: Orange highlighted cells indicate a Level of Service E.
Red highlighted cells indicate a Level of Service F.
*Results reported with HCM 2000 outputs

As shown in **Table 2**, the intersections of Market Street / Midlothian Boulevard and Market Street / Meadowbrook Avenue / Key Bank Drive would be expected to continue operating at acceptable Levels-of-Service for all movements and approaches during the AM and PM peak hours under the Design Year 2041 'Build' conditions following the implementation of a road diet. These results confirm that the intersections have excess lane capacity and

would still function properly even after the elimination of a northbound and southbound travel lane. While the Market Street / Shields Road / Indianola Road / Brookwood Road intersection could also still operate with acceptable Levels-of-Service during the AM peak hour under the Design Year 2041 'Build' conditions, the reduction in lane capacity will only worsen the deficiencies previously identified in the 'No-Build' analysis. The loss of a northbound and southbound lane would result in a degradation to LOS F for several approaches as well as the overall intersection. Beyond the LOS degradation, implementing the road diet at that location would be expected to increase the overall intersection delay by nearly 30% during the AM peak hour and by nearly 75% during the PM peak hour. Based on these findings, implementing a road diet along Market Street for the entirety of the study limits would be impractical and not recommended. Instead, it should only be considered within the northern section of the study area between Clifton Drive and Midlothian Boulevard as previously depicted in **Figure 3**.

IV. Safety Analysis:

Crash data was previously obtained from the Ohio Department of Public Safety for the calendar years of 2015 to 2017. A total of 145 crashes had been found to have occurred along the Market Street corridor. These crashes include 59 rear-end, 26 sideswipe – passing, 26 angle, 25 left turn, 5 fixed object, 1 overturning, 1 pedestrian, 1 sideswipe – meeting and 1 head-on. 79% of all crashes occurred in daylight and 77% occurred on dry pavement. 66% of the crashes were property damage only and 34% of the crashes were injury crashes. No fatal crashes were reported in the study area over the study period. See **Appendix E** for a collision diagram of the study area and **Appendix F** for crash data summary and charts.

The largest concentration of crashes occurring along the study corridor is occurring at the Market Street / Indianola Road / Shields Road / Brookwood Road intersection. Numerous rear-end crashes occurred on the four (4) major legs of the intersection, which is typically a sign of congestion at an intersection and confirmed by the capacity analysis results. The majority of the rear-end crashes are occurring during the afternoon hours which is consistent with the previously discussed Level-of-Service deficiencies during the PM peak hour. In addition to the numerous rea-rend crashes occurring at the intersection, there is also a concentration of left turn crashes on the northbound approach. Again, most of these crashes are also occurring during the afternoon hours while the capacity analysis results show the northbound left turn movement to be operating at LOS F during that timeframe. The traffic counts show a heavy northbound left turning movement coupled with a heavy southbound thru movement during the afternoon hours. These conflicting movements appear to be causing driver impatience, which typically increase the number of crashes that occur. As a northbound left turning vehicle is waiting for a gap in traffic to make a left turn movement, the driver becomes less patient and is willing to accept a smaller gap in traffic than they typically would, leading to left turn crashes. There does not appear to be any sight distance concerns or negative offset left turn lanes at this intersection that would be contributing to the left turn crashes, thus the conclusion that the crashes are congestion related.

The other two (2) signalized intersections along the corridor also have rear-end crashes occurring on all approaches, however, no more crashes than would be anticipated at an urban, signalized intersection. These two (2) intersections, along with the roadway segments, do not have any identifiable or correctible crash patterns occurring.

V. Crash Reduction Analysis:

The reduction of crashes within the State of Ohio is the top priority of ODOT's Highway Safety Program (HSP). In order to maximize the impacts of their limited funding allocations, a complex spreadsheet was developed which calculates the anticipated Benefit / Cost ratio for all safety improvement projects. This spreadsheet compares the anticipated construction cost of an improvement to the anticipated reduction in crashes of this improvement. The Benefit / Cost ratio for a safety improvement can then be compared to the anticipated Benefit / Cost ratio for all other safety improvement projects throughout the State. The benefit / cost ratio spreadsheet and all necessary rates and typical crash cost were obtained from the ODOT Highway Safety Program's website.

Table 3 provides a summary of the predicted annual average crash frequency utilizing the existing roadway geometry versus the road diet roadway geometry. This comparison was created to estimate the crash performance of Market Street under both scenarios in order to determine if the proposed road diet will be a detriment to the safety of the motorists using the Market Street corridor.

Table 3: Crash Reduction Comparison

	Existing Geometry	Road Diet Geometry	Percent Change
Fatal or Incapacitating Injury	0.80	0.96	**+19.7%**
Non-Incapacitating Injury	3.75	3.72	**-0.8%**
Possibly Injury	4.66	4.88	**+4.8%**
Property Damage Only	23.52	24.37	**+3.6%**
Total	32.73	33.93	**+3.7%**

As is shown on **Table 3**, the proposed road diet is expected to increase crashes along the corridor by 1.2 crashes per year, which would be an approximate 4% increase. This slight increase of crashes is expected due to the characteristics of the two roadway types. By decreasing the number of lanes on Market Street from five (5) to three (3) lanes, the number of sideswipe – passing crashes occurring along the corridor would typically decrease due to removing the potential for this type of crash to occur. However, decreasing the capacity along Market Street is anticipated to increase the number of rear-end crashes due to the increased congestion. Additionally, when a motorist begins to slow in traffic to make a right turn, the potential for a rear-end crash also increases since there is no longer a second lane available for a trailing motorist to bypass the slowing vehicle in front of them.

VI. Pedestrian Crossing Evaluation:

Within the study limits, there are only four (4) marked crosswalks for pedestrians who need to cross Market Street, each of which being located at an existing signalized intersection. One (1) is located along the south side of the Market Street / Midlothian Boulevard intersection, one (1) is located along the south side of the Market Street / Indianola Road / Shields Road / Brookwood Road intersection, and the remaining two (2) are located at the Market Street / Meadowbrook Avenue / Key Bank Drive intersection. Despite the dense

residential neighborhoods in this area and the extensive commercial development located along Market Street, this results in a one (1) mile section of the corridor without any designated crossing locations whatsoever. Per the Ohio Revised Code, legal crosswalks exist it every intersection of two public roadways regardless of whether they are marked or not. However, despite the fact the pedestrians have a legal right to cross at numerous locations within that section, the overall lack of crosswalk pavement markings and associated signage fails to adequately convey the pedestrian demand of this area to the drivers on the roadway.

As previously discussed in Section IV, there was only one (1) pedestrian crash within the study area from 2015-2017. This pedestrian crash occurred at the intersection of Market Street and Melrose Avenue, whereas the pedestrian involved was attempting to cross Melrose Avenue, not Market Street. Despite the lack of pedestrian crashes involving pedestrians crossing Market Street, it remains a difficult crossing due to the width of the five-lane roadway and the traffic volumes utilizing this corridor.

Boardman Township conducted bike and pedestrian counts at various locations throughout the summer months of 2018. Two of the count locations were within the study area and the observed number of pedestrians is shown in **Table 4**.

Table 4: 2018 Pedestrian Counts

Timeframe	Market Street & Overhill Road	Market Street & Newport Drive
8:00 AM – 10:00 AM	13	2
11:00 AM – 1:00 PM	26	5
1:00 PM – 3:00 PM	15	4

As shown in **Table 4**, there was a significantly higher number of pedestrians observed at the Market Street / Overhill Road intersection than there was at the Market Street / Newport Drive intersection. This would be expected considering the higher density of commercial development located at the north end of the corridor as compared to that in the vicinity of Newport Drive. The data also found that there was far more pedestrian activity around the lunch hour as opposed to the morning hours or afternoon hours, which again isn't surprising given the fast-food restaurants, banks and other retail establishments in that area.

While there was a high concentration of pedestrians crossing in the vicinity of the Market Street / Overhill Road intersection, the specific location of such crossings was found to vary considerably due to the absence of a marked crosswalk. Photos on the following page depict the current conditions for pedestrians crossing Market Street in the vicinity of the Overhill Road intersection.

Pedestrian crossing north leg of Market Street / Overhill Road intersection

Pedestrians crossing south leg of Market Street / Overhill Road intersection

Based on a review of the Market Street corridor within the study limits, connections to residential neighborhoods, location of potential pedestrian destinations, and a desire to provide enhanced pedestrian crossings at regular intervals along the corridor, the following improvements are recommended:

- Provide high-visibility crosswalks on both the north leg and south leg of the Market Street / Clifton Drive intersection.
- Provide a high-visibility mid-block crosswalk and pedestrian refuge island between the northern and southern connections of Newport Drive.

- Provide a high-visibility crosswalk in the middle of the Market Street / Pinehurst Avenue / Jennette Drive intersection.
- Provide high-visibility crosswalks on both the north leg and south leg of the Market Street / Fairlawn Avenue intersection.
- Provide a high-visibility mid-block crosswalk and pedestrian refuge island between the Overhill Road and Hillman Street.

In addition to the recommended pavement markings, pedestrian warning signs should be installed at all crosswalk locations with advance warning signs also being provided for the two (2) mid-block locations. It should be noted that these recommendations are independent of the road diet evaluation and should be pursued regardless of whether travel lanes are eliminated or not. The recommended pedestrian crossing enhancements are depicted in both **Figure 3** and **Figure 4** as they can be incorporated within either option.

VII. Conclusions and Recommendations:

At the request of Boardman Township, GPD Group was tasked with preparing a Feasibility Study for the Market Street (State Route 7) corridor between Midlothian Boulevard and Meadowbrook Avenue. This study is intended to evaluate the feasibility of performing a road diet along the Market Street corridor in order to make the roadway more accessible from a multi-modal perspective and potentially provide additional on-street parking for businesses. An additional option of making the Market Street corridor more pedestrian-friendly by adding high-visibility crosswalks and median refuge islands is also being considered in case the road diet is not feasible from a capacity perspective.

The following conclusions and recommendations have resulted from this study.

1. Intersection turning movement traffic counts were obtained by ODOT at two (2) of the study intersection on Wednesday, September 13th, 2017. The traffic counts at the Midlothian Boulevard and Indianola Road / Shields Road / Brookwood Road intersections were performed for twelve (12) hours from 7:00 AM – 7:00 PM. Additionally, an intersection turning movement count was performed by Cummins Consulting Services on Wednesday, September 5th, 2018 for eleven (11) hours from 7:00 AM – 6:00 PM.

2. Two (2) improvement options are being considered along the Market Street corridor as part of this feasibility study. The first option would be to implement a road diet between Clifton Drive and Midlothian Boulevard. This option would reduce Market Street to a three (3) lane roadway with a single northbound and southbound travel lane while maintaining the existing two-way left turn lane. The excess pavement would be reallocated as dedicated, on-street bike lanes with a transverse-striped buffer area to further separate bicyclists from vehicles. In addition to these modifications, high-visibility ladder-style crosswalks along with ADA-compliant curb ramps would be installed at the Clifton Drive, Jennette Drive and Fairlawn Avenue intersections as well as at new mid-block crossings between Newport Drive and Maple Drive and between Overhill Road and Hillman Street.

3. The second option for the Market Street corridor would be to maintain the existing roadway geometry (5-lane section) but still incorporate the various pedestrian enhancements identified above under the first option (high-visibility ladder-style crosswalks at strategic intersections and mid-block crossing locations).

4. The intersections of Market Street / Midlothian Boulevard and Market Street / Meadowbrook Avenue / Key Bank Drive will operate at acceptable Levels-of-Service for all movements and approaches during the AM and PM peak hours under the Design Year 2041 'No-Build' conditions. The Market Street / Shields Road / Indianola Road / Brookwood Road intersection operates at an acceptable overall LOS D, but has four (4) approaches that experience an unacceptable LOS E during the PM peak hour currently under the 'No-Build'.

5. The intersections of Market Street / Midlothian Boulevard and Market Street / Meadowbrook Avenue / Key Bank Drive would be expected to continue operating at acceptable Levels-of-Service for all movements and approaches during the AM and PM peak hours under the Design Year 2041 'Build' conditions following the implementation of a road diet. These results confirm that the intersections have excess lane capacity and would still function properly even after the elimination of a northbound and southbound travel lane.

6. While the Market Street / Shields Road / Indianola Road / Brookwood Road intersection could also still operate with acceptable Levels-of-Service during the AM peak hour under the Design Year 2041 'Build' conditions, the reduction in lane capacity will only worsen the deficiencies previously identified in the 'No-Build' analysis. The loss of a northbound and southbound lane would result in a degradation to LOS F for several approaches as well as the overall intersection. Beyond the LOS degradation, implementing the road diet at that location would be expected to increase the overall intersection delay by nearly 30% during the AM peak hour and by nearly 75% during the PM peak hour.

7. Crash data was previously obtained from the Ohio Department of Public Safety for the calendar years of 2015 to 2017. A total of 145 crashes had been found to have occurred along the Market Street corridor. These crashes include 59 rear-end, 26 sideswipe – passing, 26 angle, 25 left turn, 5 fixed object, 1 overturning, 1 pedestrian, 1 sideswipe – meeting and 1 head-on. 79% of all crashes occurred in daylight and 77% occurred on dry pavement. 66% of the crashes were property damage only and 34% of the crashes were injury crashes.

8. The largest concentration of crashes occurring along the study corridor is occurring at the Market Street / Indianola Road / Shields Road / Brookwood Road intersection. Numerous rear-end crashes occurred on the four (4) major legs of the intersection, which is typically a sign of congestion at an intersection and confirmed by the capacity analysis results. The majority of the rear-end crashes are occurring during the afternoon hours which is consistent with the previously discussed Level-of-Service deficiencies during the PM peak hour. In addition to the numerous rea-rend crashes occurring at the intersection, there is also a concentration of left turn crashes on the northbound approach. Again, most of these crashes are also occurring during the afternoon hours while the capacity analysis results show the northbound left turn movement to be operating at LOS F during that timeframe.

9. The other two (2) signalized intersections along the corridor also have rear-end crashes occurring on all approaches, however, no more crashes than would be anticipated at an urban, signalized intersection. These two (2) intersections, along with the roadway segments, do not have any identifiable or correctible crash patterns occurring.

10. The proposed road diet is expected to increase crashes along the corridor by 1.2 crashes per year, which would be an approximate 4% increase. This slight increase of crashes is expected due to the characteristics of the two roadway types. By decreasing the number of lanes on Market Street from five (5) to three

(3) lanes, the number of sideswipe – passing crashes occurring along the corridor would typically decrease due to removing the potential for this type of crash to occur. However, decreasing the capacity along Market Street is anticipated to increase the number of rear-end crashes due to the increased congestion. Additionally, when a motorist begins to slow in traffic to make a right turn, the potential for a rear-end crash also increases since there is no longer a second lane available for a trailing motorist to bypass the slowing vehicle in front of them.

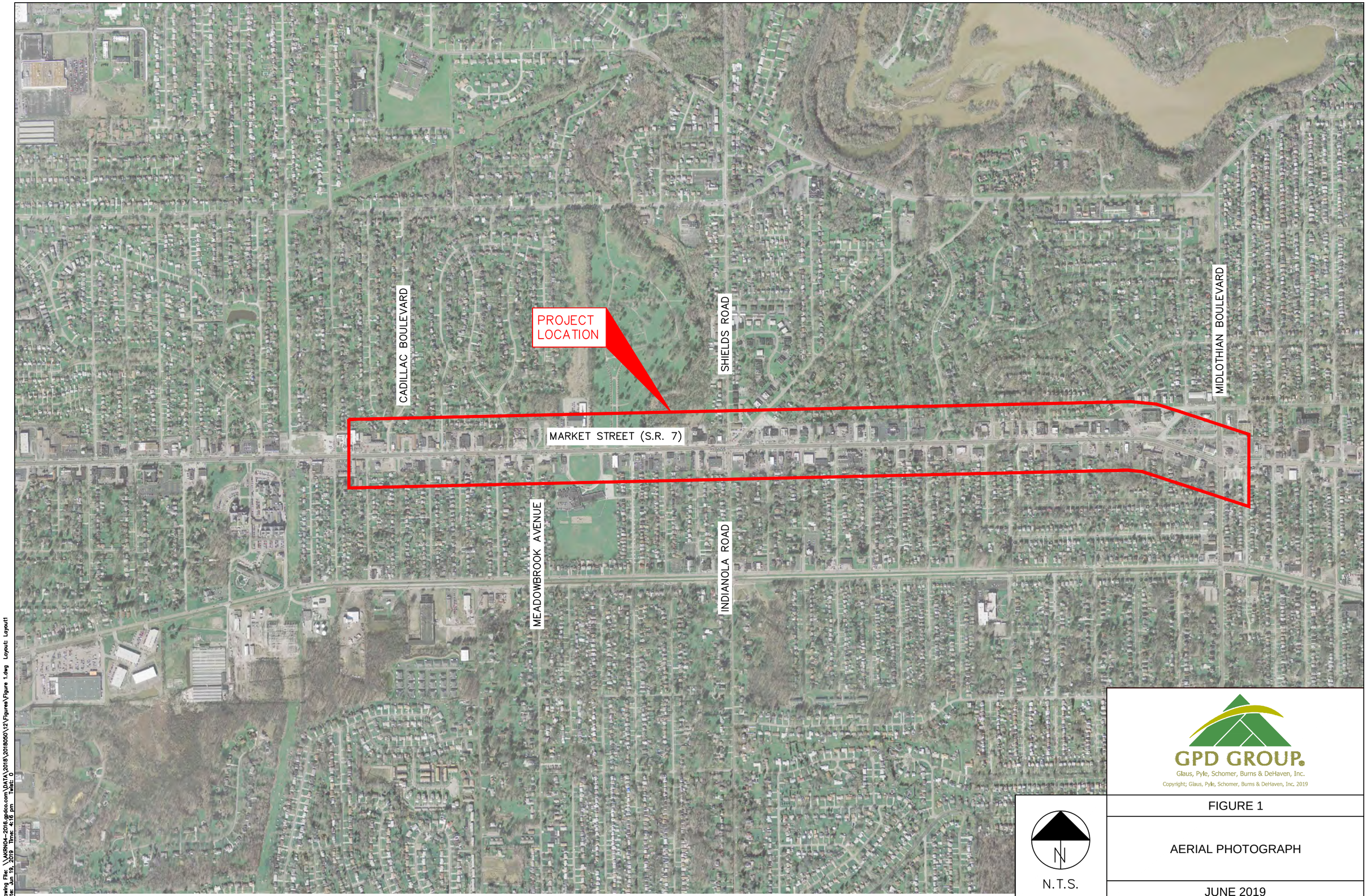
11. There are only four (4) marked crosswalks within the study area for pedestrians who need to cross Market Street, each of which being located at an existing signalized intersection. One (1) is located along the south side of the Market Street / Midlothian Boulevard intersection, one (1) is located along the south side of the Market Street / Indianola Road / Shields Road / Brookwood Road intersection, and the remaining two (2) are located at the Market Street / Meadowbrook Avenue / Key Bank Drive intersection. Despite the dense residential neighborhoods in this area and the extensive commercial development located along Market Street, there exists a one (1) mile section of the corridor without any designated crossing locations whatsoever.

12. Pedestrian counts performed by Boardman Township found that there was a significantly higher number of pedestrians observed at the Market Street / Overhill Road intersection than there was at the Market Street / Newport Drive intersection. This would be expected considering the higher density of commercial development located at the north end of the corridor as compared to that in the vicinity of Newport Drive. The data also found that there was far more pedestrian activity around the lunch hour as opposed to the morning hours or afternoon hours, which again isn't surprising given the fast-food restaurants, banks and other retail establishments in that area.

Based on the findings of this study, a road diet was found to be feasible north of the Market Street / Indianola Road / Shields Road / Brookwood Road intersection where excess roadway capacity was found to be available. However, while acceptable traffic operations could be maintained despite the elimination of a northbound and southbound travel lane, the safety analysis found that this modification would result in a slight increase in crashes.

Regardless of whether a road diet is pursued, the Market Street corridor was found to have a general lack of pedestrian accommodations for crossing Market Street despite exhibiting the residential and commercial characteristics that promote walkability. As such, it is recommended that high-visibility crosswalks and proper pedestrian warning signage be implemented at the locations identified within this study along with the construction of two (2) mid-block pedestrian refuge islands in the vicinity of Newport Road and Overhill Road.

FIGURES



GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

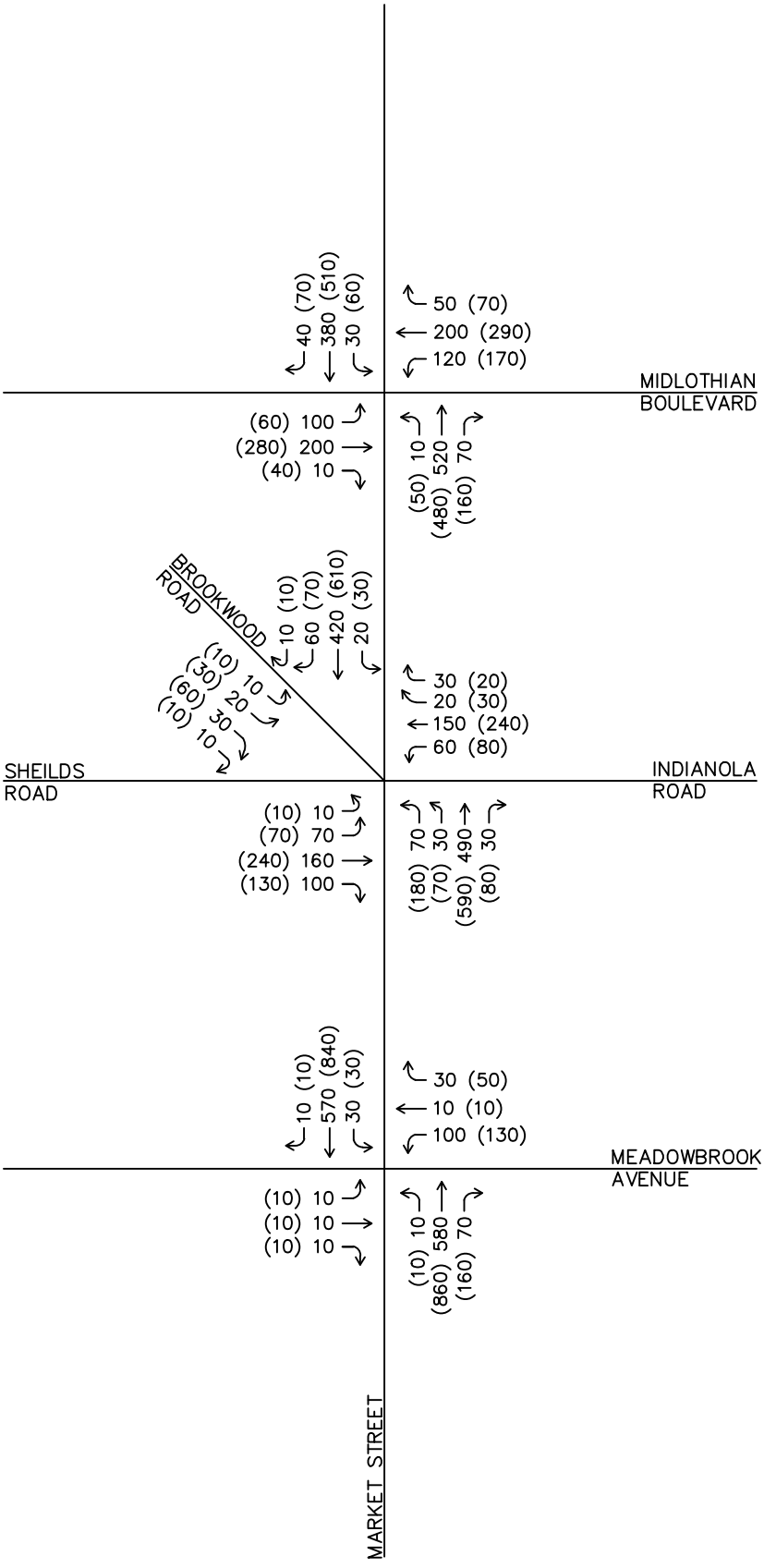
N.T.S.

FIGURE 1

AERIAL PHOTOGRAPH

JUNE 2019

Drawing File: \\AKRNO4-2016.gpdco.com\DATA\2018\20180560\12\Figures\Figure 1.dwg Layout: Layout1
Date: Jun 19, 2019 Time: 4:16 pm Twist: 0
Technician: bbowen



LEGEND
– AM PEAK
(##) – PM PEAK

N.T.S.

FIGURE 2

EXISTING YEAR 2018
PEAK HOUR TRAFFIC VOLUMES

JUNE 2019

GPD GROUP
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CAD FILE: \\AKRNO4-2016.GPDCO.COM\DATA\2018\2018050\12\FIGURES\FIGURE 2.DWG
DATE: 6/19/2019 TIME: 4:17:37 PM
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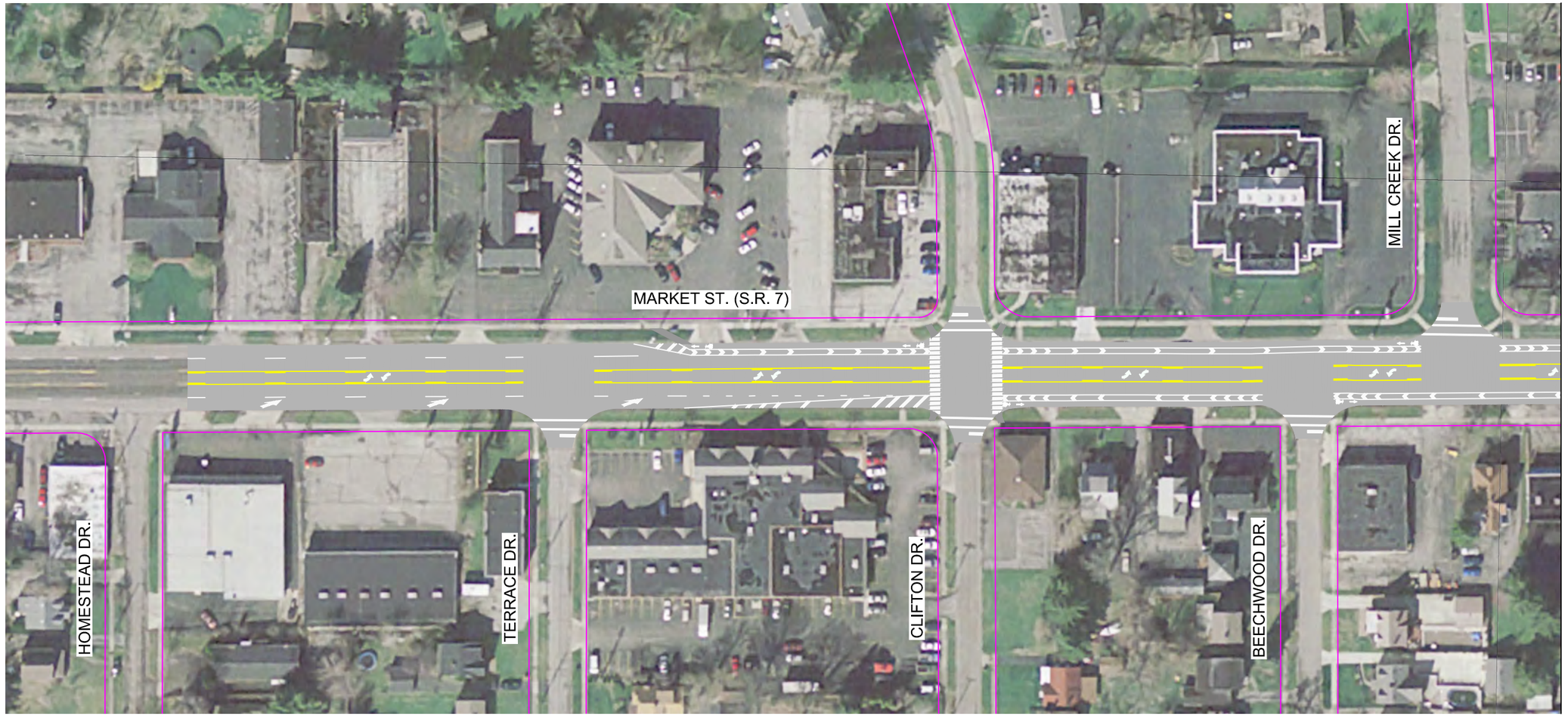

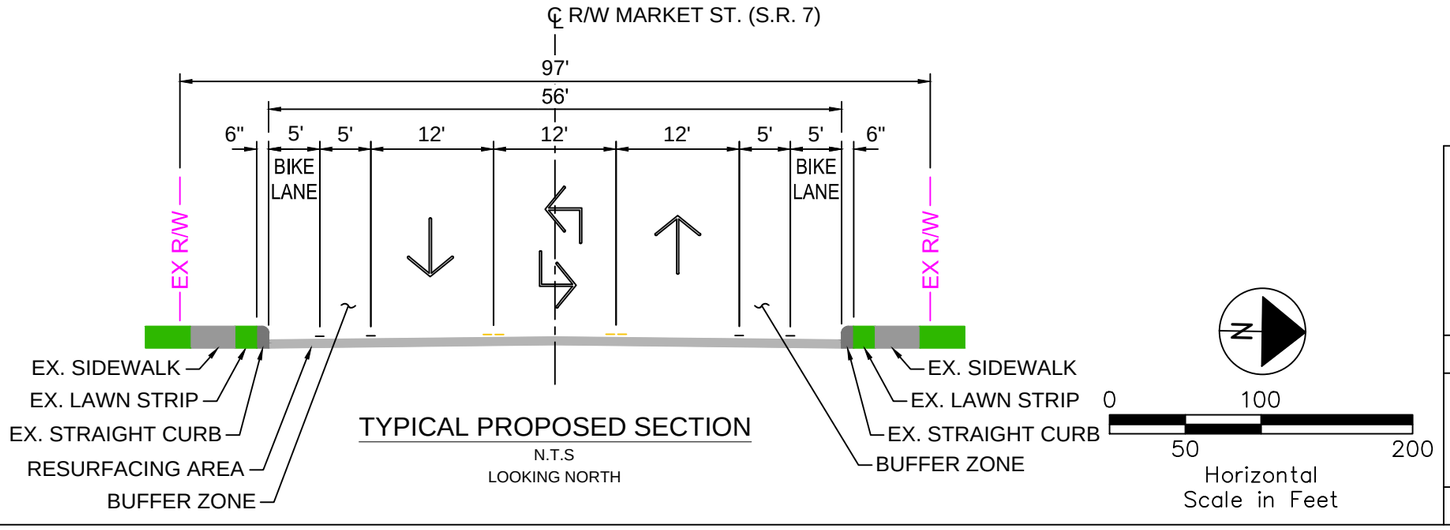

TYPICAL PROPOSED SECTION

N.T.S

LOOKING NORTH

LEGEND

- RESURFACING AREA
- PROPOSED RAMP
- EXISTING RIGHT OF WAY
- SIGNALIZED INTERSECTION

N

0 100

50 200

Horizontal Scale in Feet

GPD GROUP

Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

FIGURE 3

PROPOSED IMPROVEMENT RENDERING
SHEET 1 OF 4

JUNE 2019

Drawing File: \\AKRN04-2016.gpdco.com\DATA\2018\2180050\12\Figures\Market St Rendering.dwg Layout: 1 of 4
Date: Jun 19, 2019 Time: 4:18 pm Twist: 0
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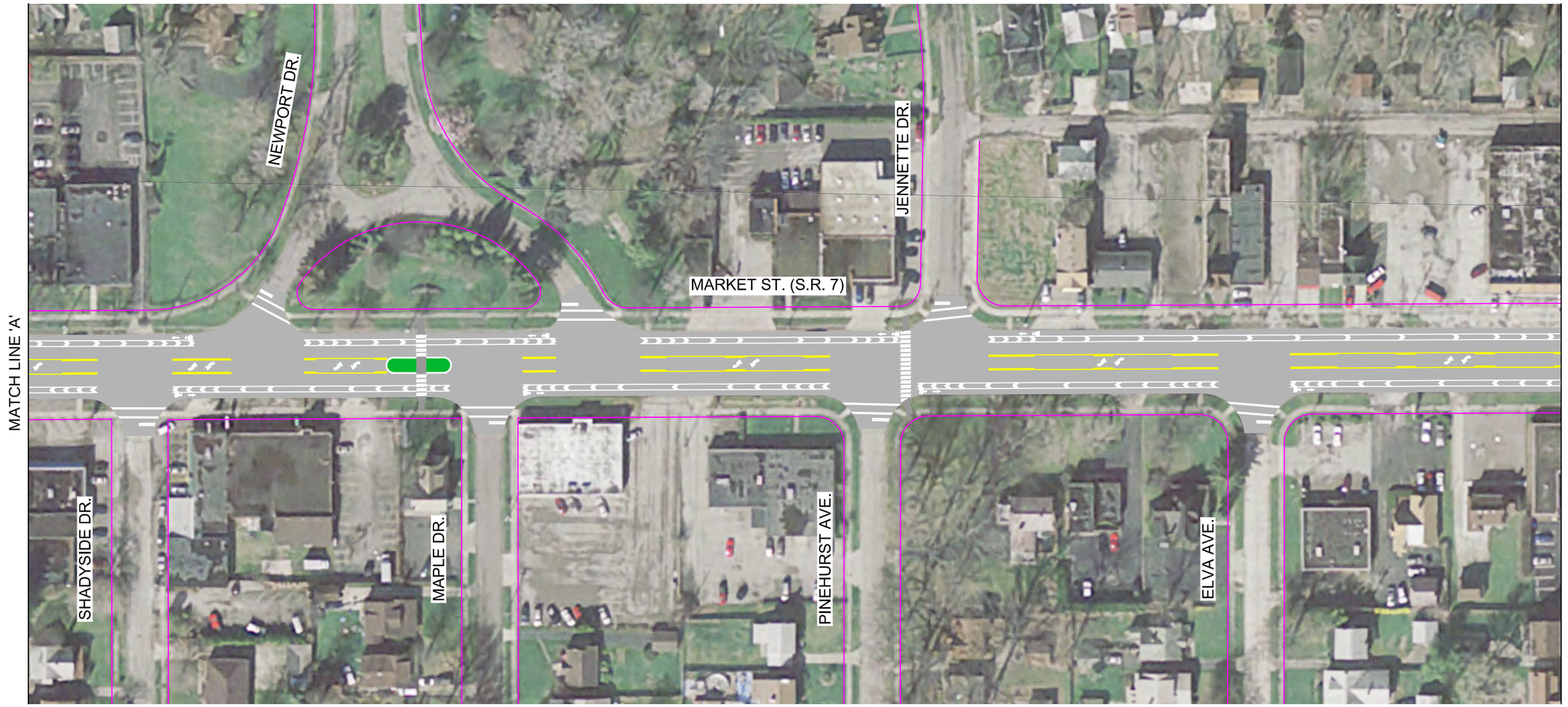

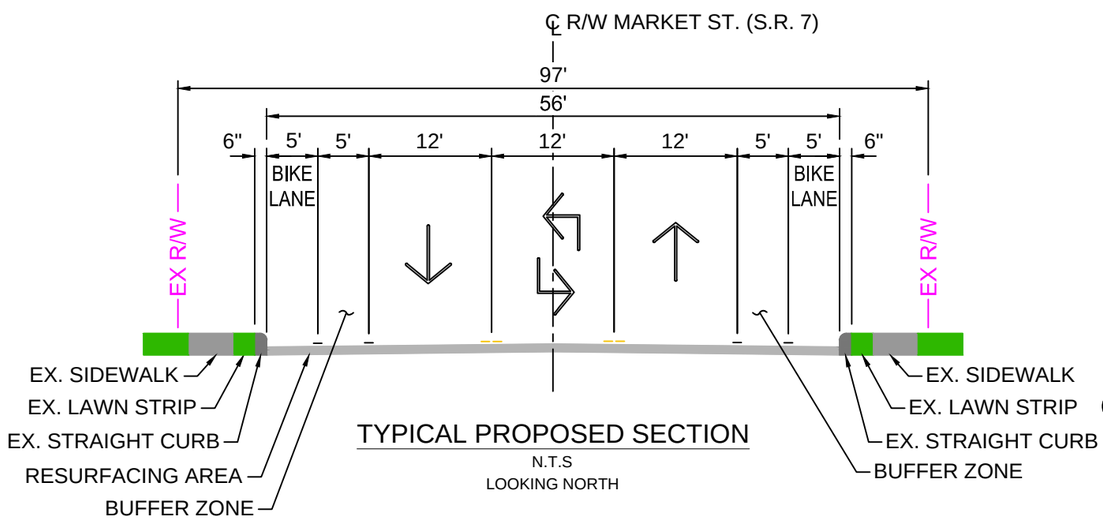

TYPICAL PROPOSED SECTION
N.T.S
LOOKING NORTH

LEGEND

- RESURFACING AREA
- PROPOSED RAMP
- EXISTING RIGHT OF WAY
- SIGNALIZED INTERSECTION

N

0 50 100 200
Horizontal Scale in Feet

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

FIGURE 3

PROPOSED IMPROVEMENT RENDERING
SHEET 2 OF 4

JUNE 2019

Drawing File: \\AKRNO4-2016.gpdco.com\DATA\2018\2018050\12\Figures\Market St Rendering.dwg Layout: 2 of 4
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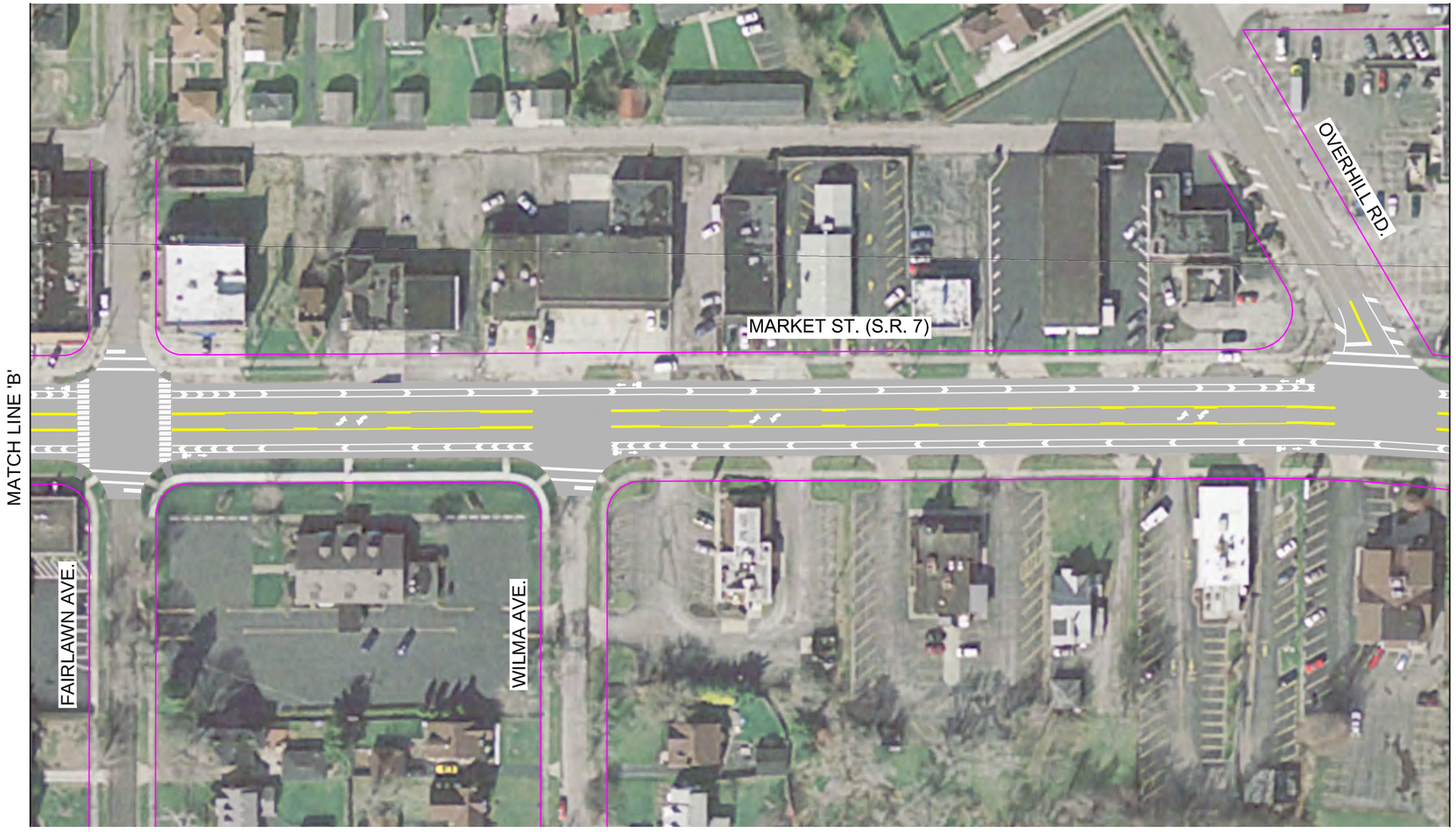
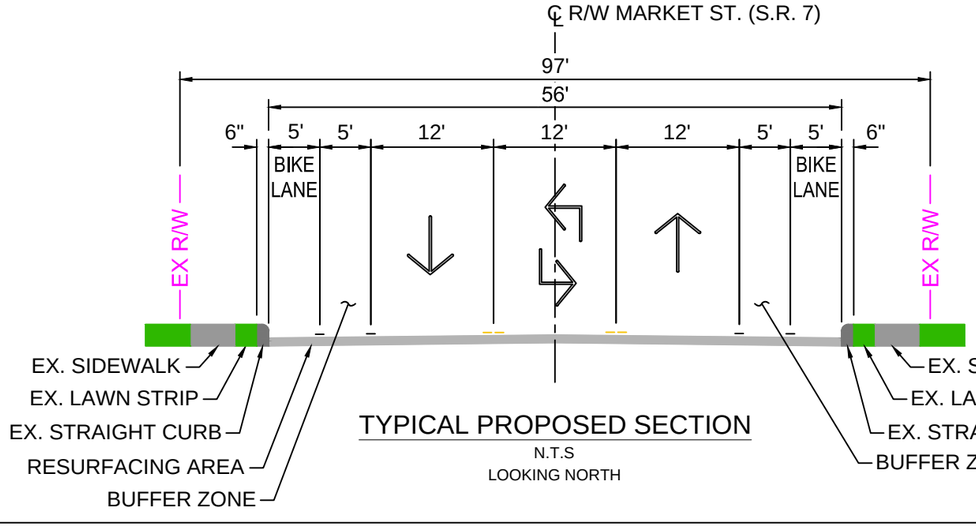
Technician: bbowen





TYPICAL PROPOSED SECTION
N.T.S
LOOKING NORTH

LEGEND

- RESURFACING AREA
- PROPOSED RAMP
- EXISTING RIGHT OF WAY
- SIGNALIZED INTERSECTION

N

0 100
50 200
Horizontal Scale in Feet

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

FIGURE 3

PROPOSED IMPROVEMENT RENDERING
SHEET 3 OF 4

JUNE 2019

Drawing File: \\AKRN04-2016.gpdco.com\DATA\2018\2180050\12\Figures\Market St Rendering.dwg Layout: 3 of 4
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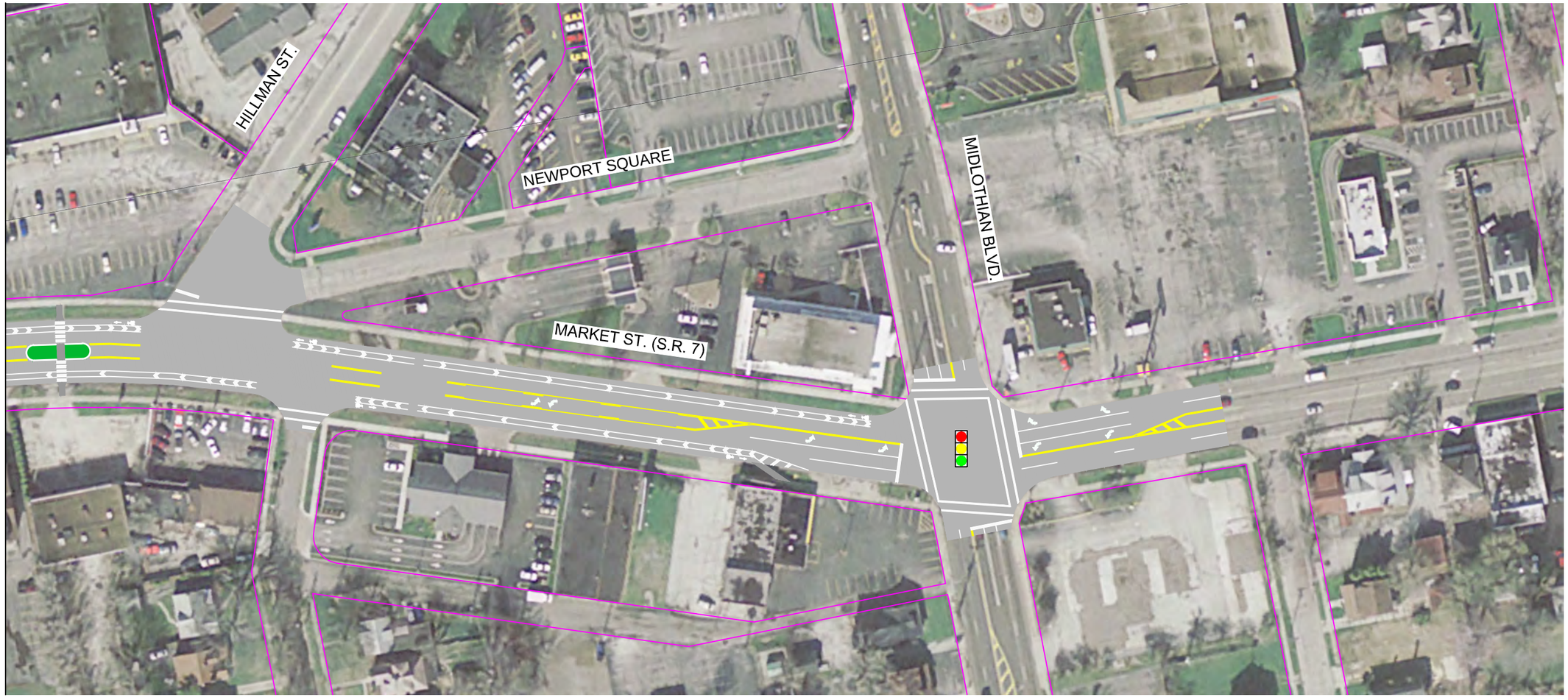

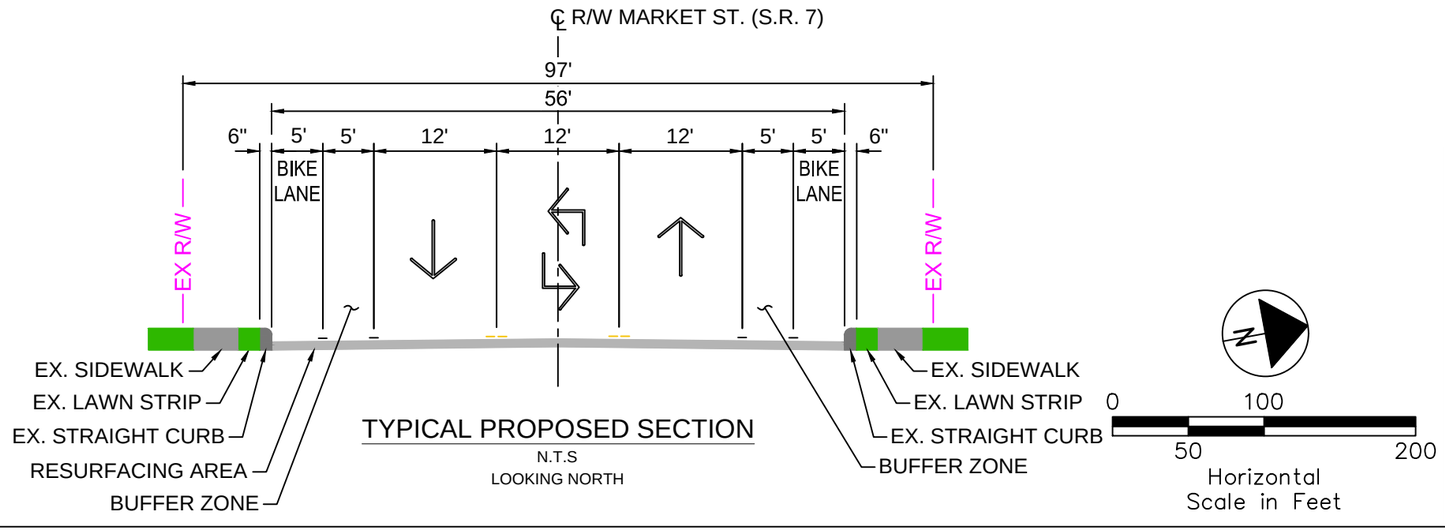

TYPICAL PROPOSED SECTION

N.T.S

LOOKING NORTH

LEGEND

- RESURFACING AREA
- PROPOSED RAMP
- EXISTING RIGHT OF WAY
- SIGNALIZED INTERSECTION

N

0 100

50 200

Horizontal Scale in Feet

GPD GROUP

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FIGURE 3

PROPOSED IMPROVEMENT RENDERING
SHEET 4 OF 4

JUNE 2019

Drawing File: \\AKRN04-2016.gpdco.com\DATA\2018\2018050\12\Figures\Market St. Rendering.dwg Layout: 4 of 4
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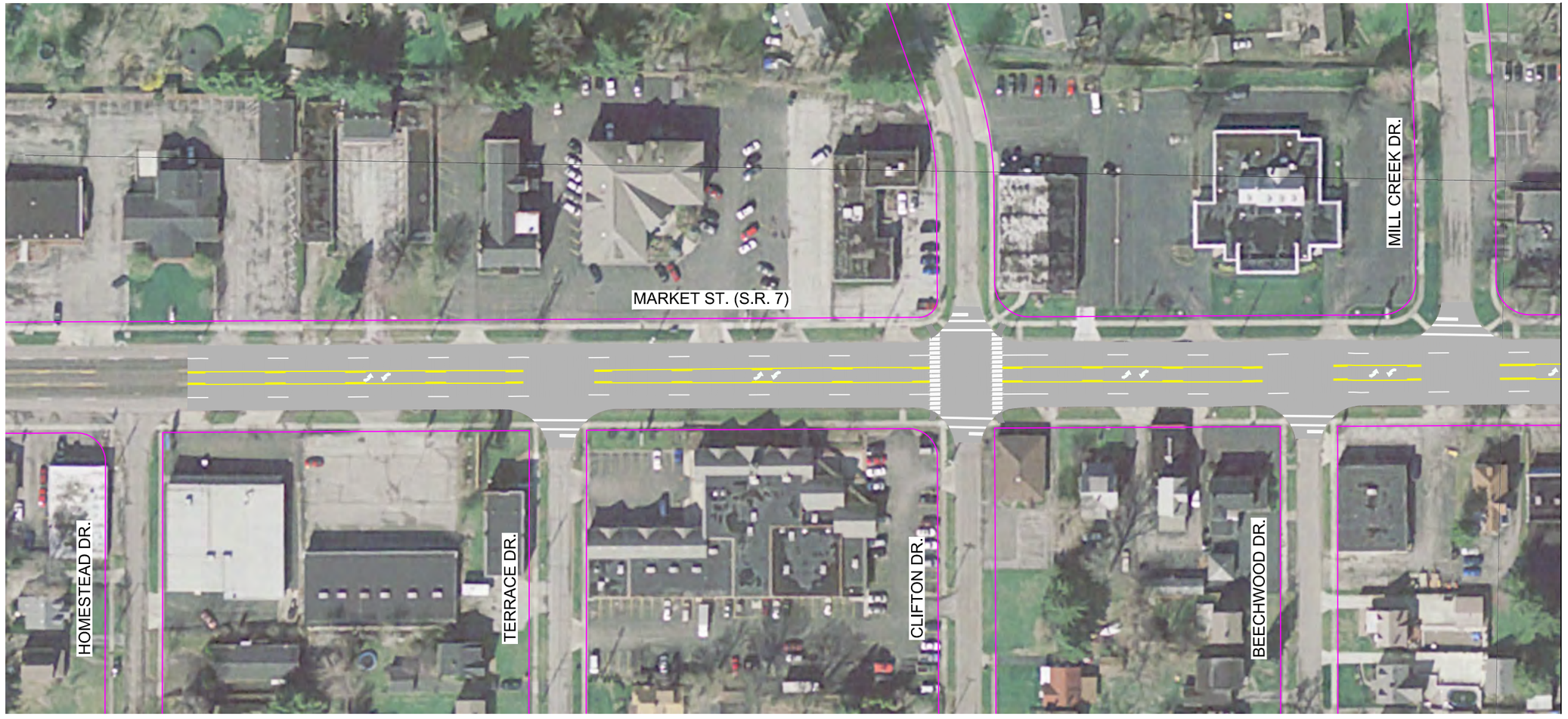

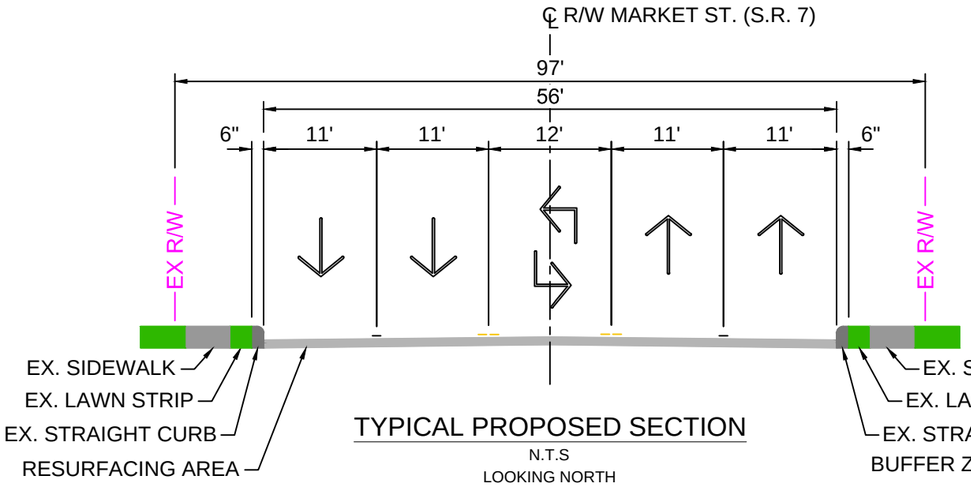

TYPICAL PROPOSED SECTION

N.T.S

LOOKING NORTH

LEGEND

- RESURFACING AREA
- PROPOSED RAMP
- EXISTING RIGHT OF WAY
- SIGNALIZED INTERSECTION

N

0 100

50 200

Horizontal Scale in Feet

GPD GROUP

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FIGURE 4

PROPOSED IMPROVEMENT RENDERING
SHEET 1 OF 4

JUNE 2019

Drawing File: \\AKRN04-2016.gpdco.com\DATA\2018\2180050\12\Figures\Market St Rendering-2.dwg Layout: 1 of 4
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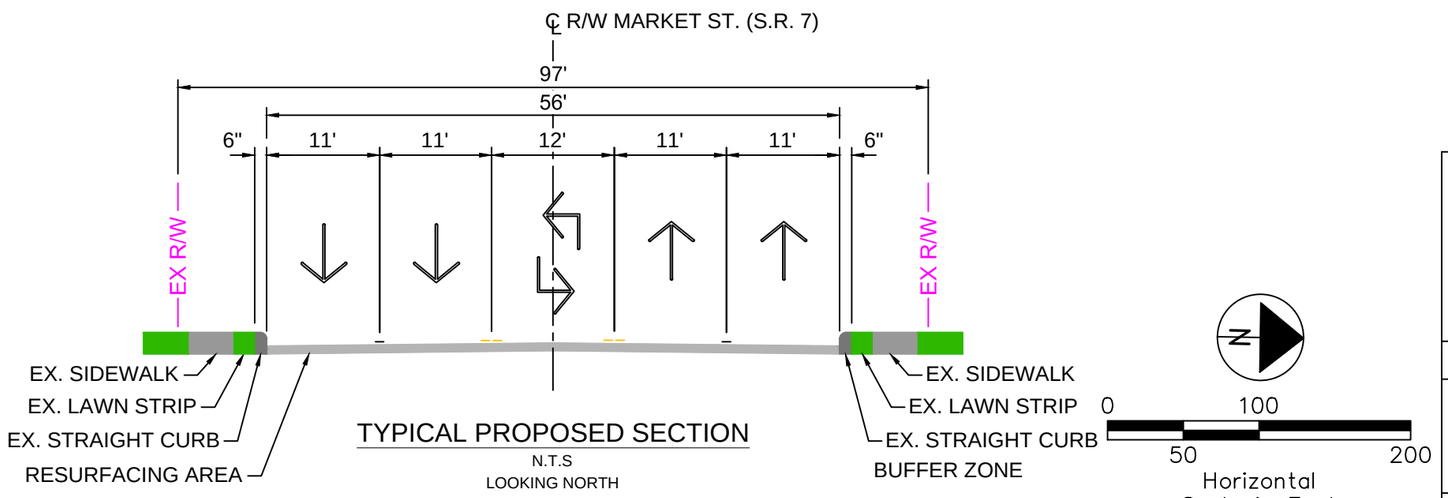

TYPICAL PROPOSED SECTION
N.T.S
LOOKING NORTH

LEGEND

- RESURFACING AREA
- PROPOSED RAMP
- EXISTING RIGHT OF WAY
- SIGNALIZED INTERSECTION

N

0 100
50 200
Horizontal
Scale in Feet

GPD GROUP
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FIGURE 4

PROPOSED IMPROVEMENT RENDERING
SHEET 2 OF 4

JUNE 2019

Drawing File: \\AKRNO4-2016.gpdco.com\DATA\2018\2018050\12\Figures\Market St Rendering-2.dwg Layout: 2 of 4
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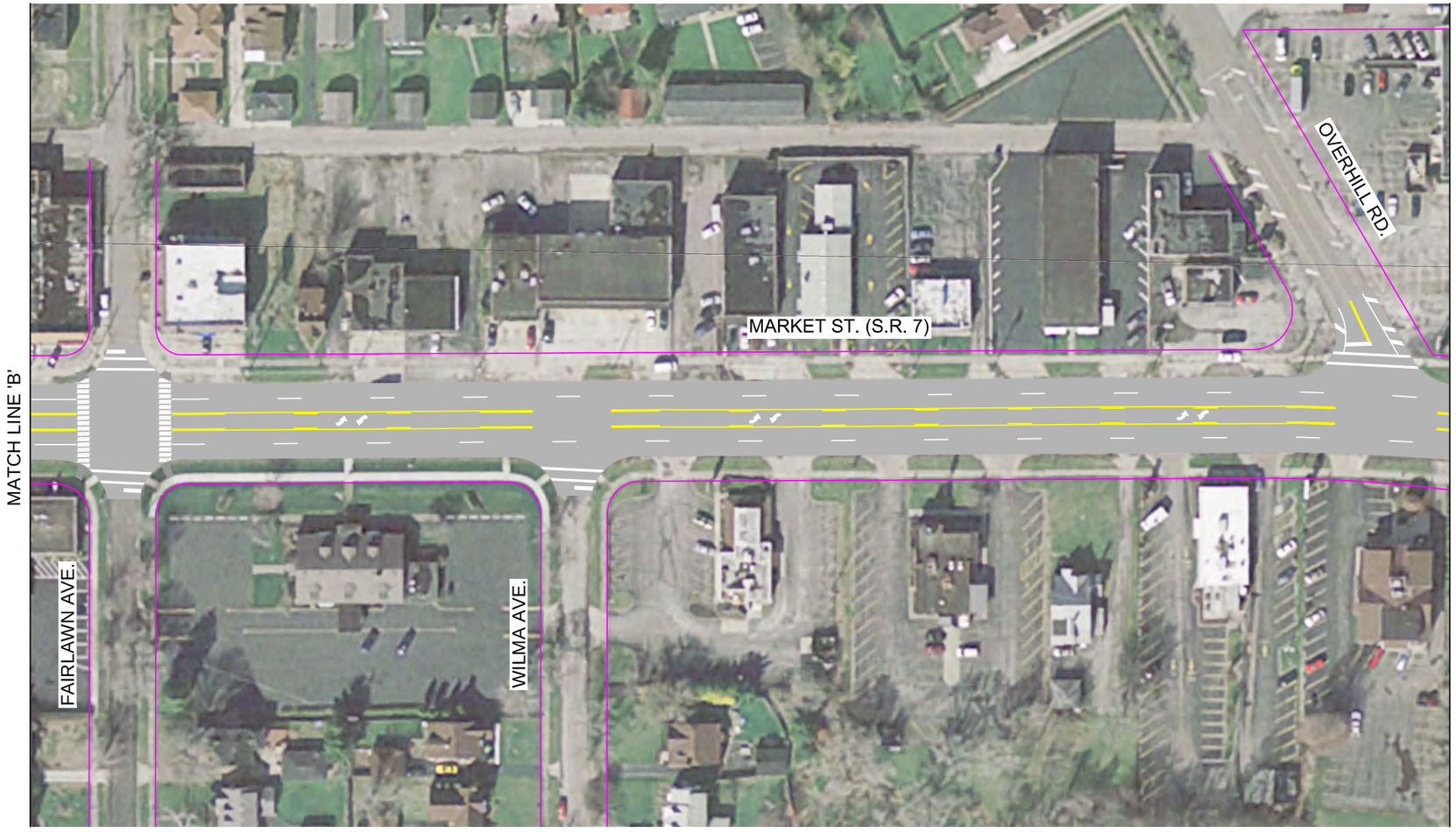

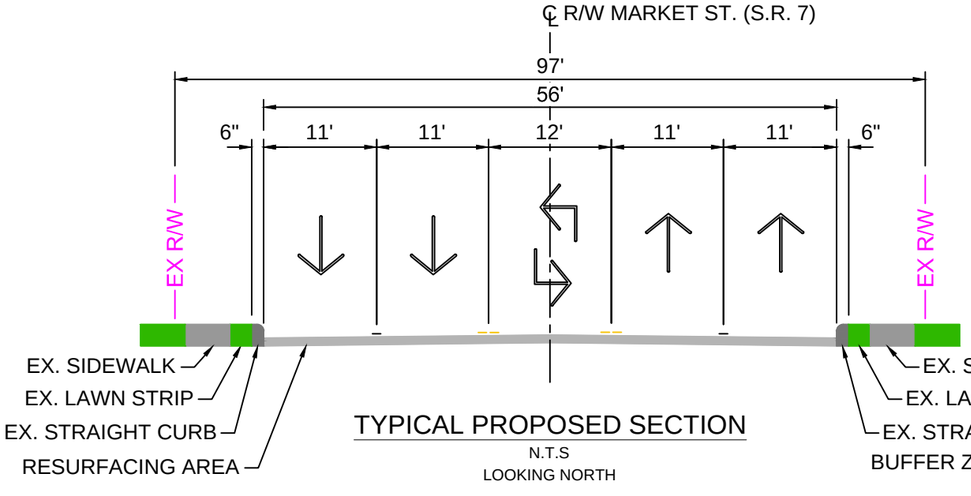

TYPICAL PROPOSED SECTION
N.T.S
LOOKING NORTH

LEGEND

- RESURFACING AREA
- PROPOSED RAMP
- EXISTING RIGHT OF WAY
- SIGNALIZED INTERSECTION

N

0 100
50 200
Horizontal Scale in Feet

GPD GROUP
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FIGURE 4

PROPOSED IMPROVEMENT RENDERING
SHEET 3 OF 4

JUNE 2019

Drawing File: \\AKRN04-2016.gpdco.com\DATA\2018\2180050\12\Figures\Market St Rendering-2.dwg Layout: 3 of 4
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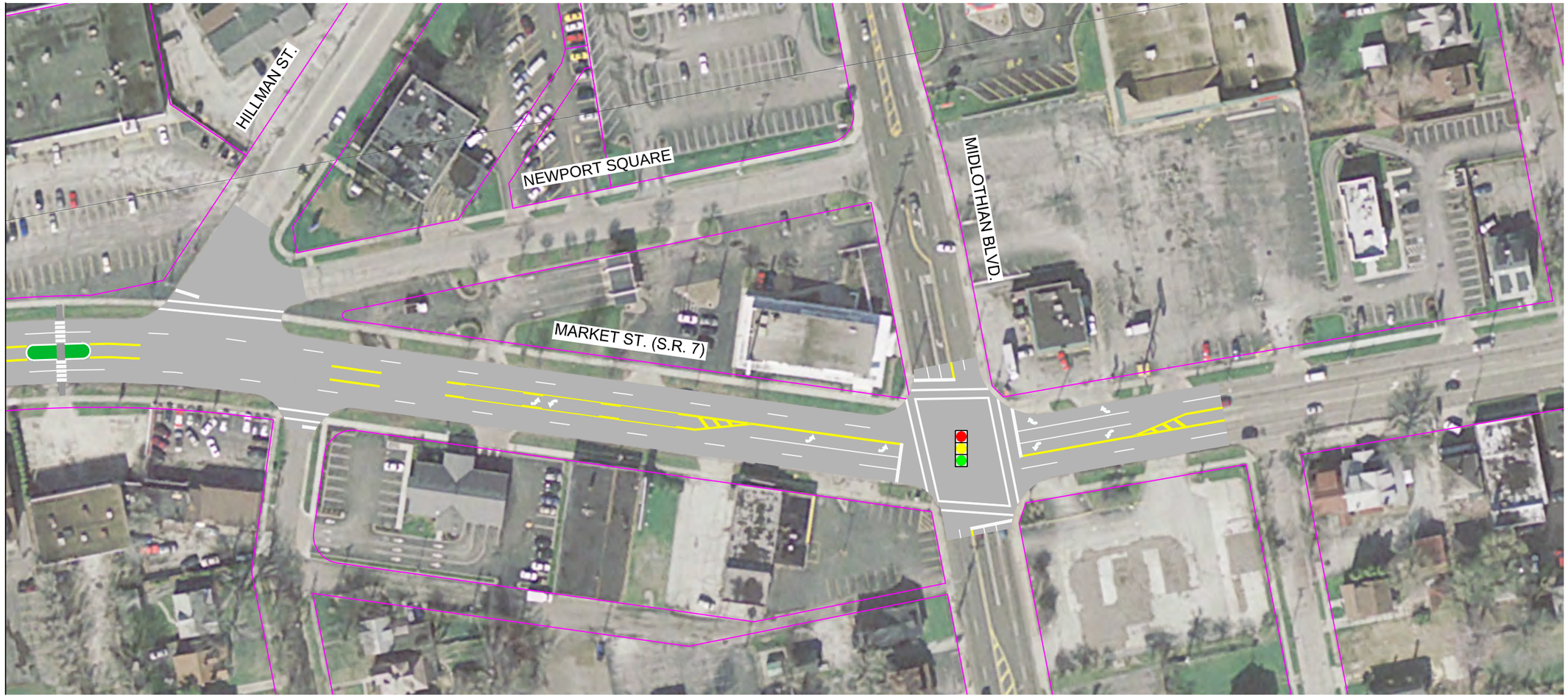

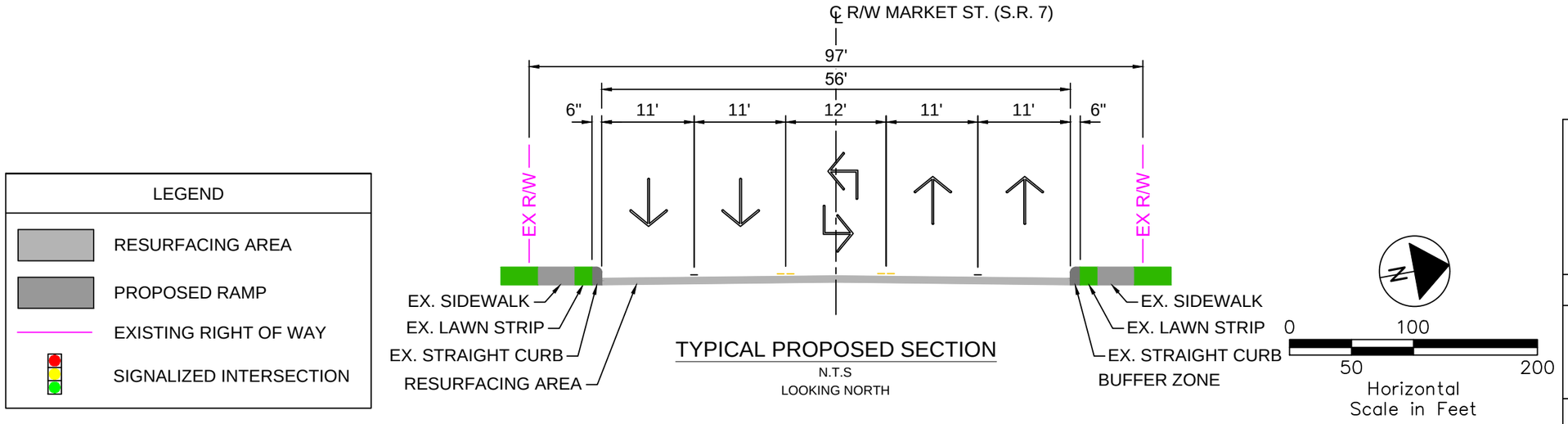

LEGEND

- RESURFACING AREA
- PROPOSED RAMP
- EXISTING RIGHT OF WAY
- SIGNALIZED INTERSECTION

N

0 100

50 200

Horizontal Scale in Feet

GPD GROUP

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FIGURE 4

PROPOSED IMPROVEMENT RENDERING
SHEET 4 OF 4

JUNE 2019

Drawing File: \\AKRN04-2016.gpdco.com\DATA\2018\2018050\12\Figures\Market St. Rendering-2.dwg Layout: 4 of 4
Date: Jun 19, 2019 Time: 4:26 pm Tetet: 0
Technician: bbowen

APPENDIX A
TURNING MOVEMENT COUNT DATA

Cummins Consulting Services

4661 Marlberry Place, Lexington, KY 40509

swcummins@windstream.net 859.361.2589

"simplifying Data Collection since 2004"

Sunny - 85 Degrees
Schools in Session

File Name : Meadowbrook_at_Market_559091_09-05-2018
Site Code : Site 1 - Wednesday
Start Date : 9/5/2018

Groups Printed- Cars - Buses - Trucks - Bicycles on Crosswalk - Pedestrians

	Market Street From North					Meadowbrook Avenue From East					Market Street From South					Private Drive From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	3	75	0	0	78	17	0	3	0	20	0	93	14	0	107	0	0	0	1	1	206
07:15 AM	8	101	0	0	109	12	0	6	0	18	0	82	11	0	93	0	0	0	0	0	220
07:30 AM	3	97	0	0	100	20	0	13	0	33	1	134	22	0	157	1	0	0	0	1	291
07:45 AM	7	139	0	0	146	22	0	15	0	37	0	132	28	0	160	0	0	0	0	0	343
Total	21	412	0	0	433	71	0	37	0	108	1	441	75	0	517	1	0	0	1	2	1060
08:00 AM	3	104	0	0	107	24	0	7	0	31	1	117	15	0	133	0	0	0	0	0	271
08:15 AM	6	137	1	0	144	20	0	8	0	28	1	115	11	0	127	1	0	0	0	1	300
08:30 AM	7	146	0	0	153	20	0	8	0	28	2	118	17	0	137	0	0	0	0	0	318
08:45 AM	6	130	1	0	137	25	1	8	1	35	1	107	20	0	128	1	0	1	1	3	303
Total	22	517	2	0	541	89	1	31	1	122	5	457	63	0	525	2	0	1	1	4	1192
09:00 AM	3	88	5	0	96	23	1	5	0	29	1	134	17	0	152	1	1	2	1	5	282
09:15 AM	4	141	0	0	145	22	1	8	1	32	2	121	15	0	138	3	0	3	0	6	321
09:30 AM	11	118	1	0	130	26	1	7	0	34	2	132	12	0	146	3	1	1	0	5	315
09:45 AM	7	159	3	0	169	22	0	7	1	30	1	116	16	0	133	3	1	1	0	5	337
Total	25	506	9	0	540	93	3	27	2	125	6	503	60	0	569	10	3	7	1	21	1255
10:00 AM	1	128	0	0	129	16	1	5	1	23	1	110	17	0	128	0	0	1	2	3	283
10:15 AM	4	143	0	0	147	19	1	7	0	27	1	126	14	0	141	1	1	1	1	4	319
10:30 AM	8	109	3	0	120	22	0	3	0	25	2	110	27	0	139	3	1	2	0	6	290
10:45 AM	10	131	1	0	142	17	1	7	0	25	1	120	19	0	140	0	1	1	0	2	309
Total	23	511	4	0	538	74	3	22	1	100	5	466	77	0	548	4	3	5	3	15	1201
11:00 AM	3	131	1	0	135	26	1	10	0	37	4	135	22	0	161	1	1	1	0	3	336
11:15 AM	4	140	2	0	146	26	2	7	1	36	2	139	26	0	167	1	1	3	0	5	354
11:30 AM	9	124	2	0	135	15	0	11	0	26	0	145	23	0	168	0	0	1	0	1	330
11:45 AM	3	167	1	0	171	30	1	15	0	46	5	132	28	0	165	1	0	7	0	8	390
Total	19	562	6	0	587	97	4	43	1	145	11	551	99	0	661	3	2	12	0	17	1410
12:00 PM	5	146	2	0	153	27	0	8	1	36	5	164	27	0	196	3	3	3	1	10	395
12:15 PM	8	143	4	0	155	32	1	9	0	42	2	184	34	0	220	2	0	0	0	2	419
12:30 PM	9	159	1	0	169	25	1	11	1	38	2	147	28	0	177	2	2	1	0	5	389
12:45 PM	10	196	5	0	211	30	2	10	1	43	2	127	28	0	157	4	0	4	0	8	419
Total	32	644	12	0	688	114	4	38	3	159	11	622	117	0	750	11	5	8	1	25	1622
01:00 PM	10	166	3	0	179	34	2	9	0	45	1	141	13	0	155	3	2	5	0	10	389
01:15 PM	8	151	0	0	159	24	0	9	0	33	0	160	24	0	184	2	0	2	0	4	380
01:30 PM	8	177	2	0	187	29	1	10	4	44	3	160	17	0	180	2	1	0	0	3	414
01:45 PM	9	169	2	0	180	21	2	7	2	32	2	171	23	0	196	2	1	3	0	6	414
Total	35	663	7	0	705	108	5	35	6	154	6	632	77	0	715	9	4	10	0	23	1597
02:00 PM	5	155	0	0	160	27	0	16	3	46	2	195	41	0	238	0	0	2	1	3	447
02:15 PM	5	185	2	0	192	24	2	17	0	43	0	164	27	1	192	3	0	1	1	5	432
02:30 PM	7	166	1	1	175	23	1	12	2	38	2	175	26	1	204	1	1	2	2	6	423
02:45 PM	9	151	1	3	164	27	0	13	1	41	1	143	26	0	170	2	0	1	3	6	381
Total	26	657	4	4	691	101	3	58	6	168	5	677	120	2	804	6	1	6	7	20	1683
03:00 PM	3	144	5	1	153	34	0	8	0	42	2	185	36	0	223	1	1	2	2	6	424
03:15 PM	8	174	2	0	184	35	1	17	2	55	1	164	33	0	198	1	2	1	0	4	441
03:30 PM	8	180	2	2	192	32	1	8	1	42	3	175	34	0	212	2	1	5	0	8	454
03:45 PM	11	174	2	0	187	33	0	8	2	43	0	191	27	0	218	2	0	1	3	6	454
Total	30	672	11	3	716	134	2	41	5	182	6	715	130	0	851	6	4	9	5	24	1773
04:00 PM	9	202	1	0	212	34	0	9	1	44	1	170	33	0	204	1	0	1	0	2	462
04:15 PM	9	190	0	0	199	30	0	14	0	44	0	184	37	0	221	1	0	0	0	1	465
04:30 PM	6	199	0	0	205	19	0	4	0	23	2	199	29	0	230	1	1	1	1	4	462
04:45 PM	3	185	1	0	189	46	0	11	0	57	0	188	38	0	226	1	0	2	0	3	475
Total	27	776	2	0	805	129	0	38	1	168	3	741	137	0	881	4	1	4	1	10	1864

Cummins Consulting Services

4661 Marlberry Place, Lexington, KY 40509

swcummins@windstream.net 859.361.2589

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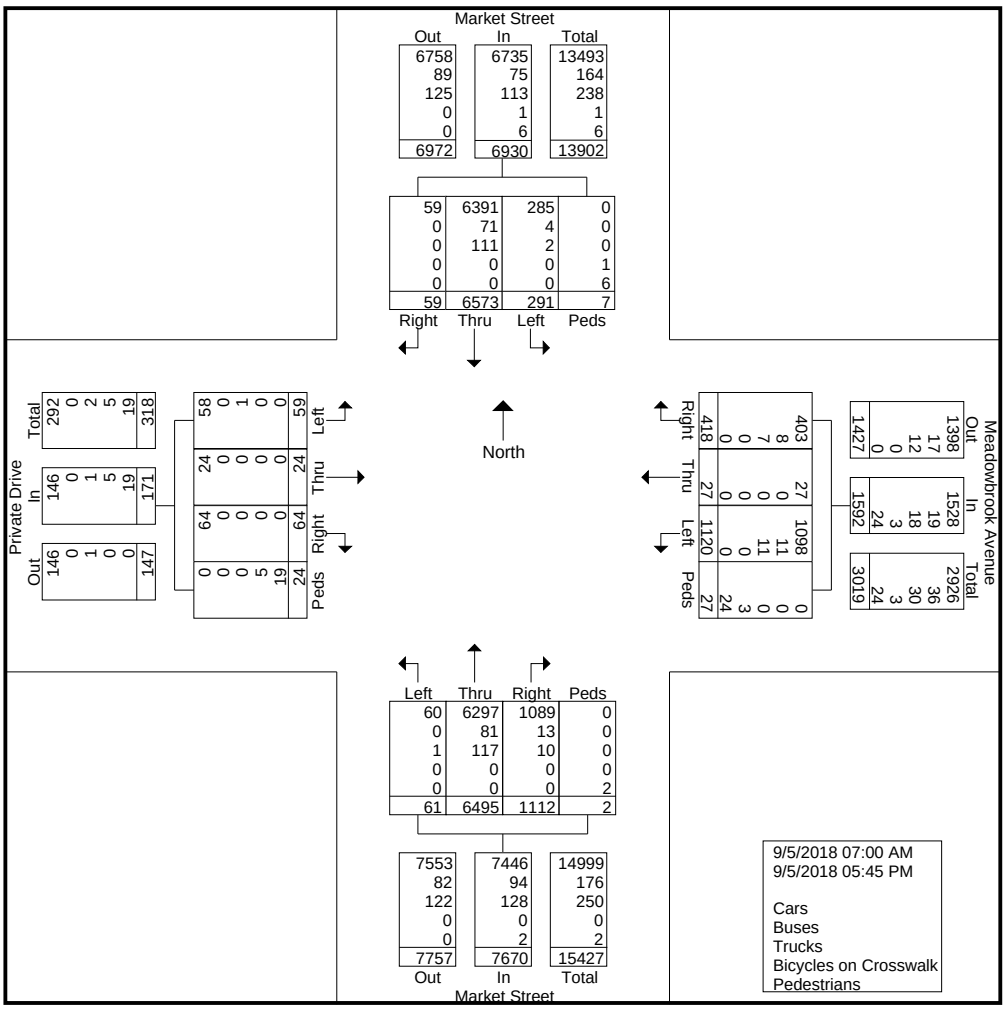
File Name : Meadowbrook_at_Market_559091_09-05-2018
Site Code : Site 1 - Wednesday
Start Date : 9/5/2018
Page No : 2

Groups Printed- Cars - Buses - Trucks - Bicycles on Crosswalk - Pedestrians

	Market Street From North					Meadowbrook Avenue From East					Market Street From South					Private Drive From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
05:00 PM	6	182	0	0	188	33	0	11	0	44	1	207	39	0	247	1	0	1	1	3	482
05:15 PM	13	179	0	0	192	28	0	19	1	48	1	184	43	0	228	1	0	0	0	1	469
05:30 PM	8	155	1	0	164	24	1	13	0	38	0	168	34	0	202	1	0	1	2	4	408
05:45 PM	4	137	1	0	142	25	1	5	0	31	0	131	41	0	172	0	1	0	1	2	347
Total	31	653	2	0	686	110	2	48	1	161	2	690	157	0	849	3	1	2	4	10	1706
Grand Total	291	6573	59	7	6930	1120	27	418	27	1592	61	6495	1112	2	7670	59	24	64	24	171	16363
Apprch %	4.2	94.8	0.9	0.1		70.4	1.7	26.3	1.7		0.8	84.7	14.5	0		34.5	14	37.4	14		
Total %	1.8	40.2	0.4	0	42.4	6.8	0.2	2.6	0.2	9.7	0.4	39.7	6.8	0	46.9	0.4	0.1	0.4	0.1	1	
Cars	285	6391	59	0	6735	1098	27	403	0	1528	60	6297	1089	0	7446	58	24	64	0	146	15855
% Cars	97.9	97.2	100	0	97.2	98	100	96.4	0	96	98.4	97	97.9	0	97.1	98.3	100	100	0	85.4	96.9
Buses	4	71	0	0	75	11	0	8	0	19	0	81	13	0	94	0	0	0	0	0	188
% Buses	1.4	1.1	0	0	1.1	1	0	1.9	0	1.2	0	1.2	1.2	0	1.2	0	0	0	0	0	1.1
Trucks	2	111	0	0	113	11	0	7	0	18	1	117	10	0	128	1	0	0	0	1	260
% Trucks	0.7	1.7	0	0	1.6	1	0	1.7	0	1.1	1.6	1.8	0.9	0	1.7	1.7	0	0	0	0.6	1.6
Bicycles on Crosswalk	0	0	0	1	1	0	0	0	3	3	0	0	0	0	0	0	0	0	5	5	9
% Bicycles on Crosswalk	0	0	0	14.3	0	0	0	0	11.1	0.2	0	0	0	0	0	0	0	0	20.8	2.9	0.1
Pedestrians	0	0	0	6	6	0	0	0	24	24	0	0	0	2	2	0	0	0	19	19	51
% Pedestrians	0	0	0	85.7	0.1	0	0	0	88.9	1.5	0	0	0	100	0	0	0	0	79.2	11.1	0.3



Cummins Consulting Services

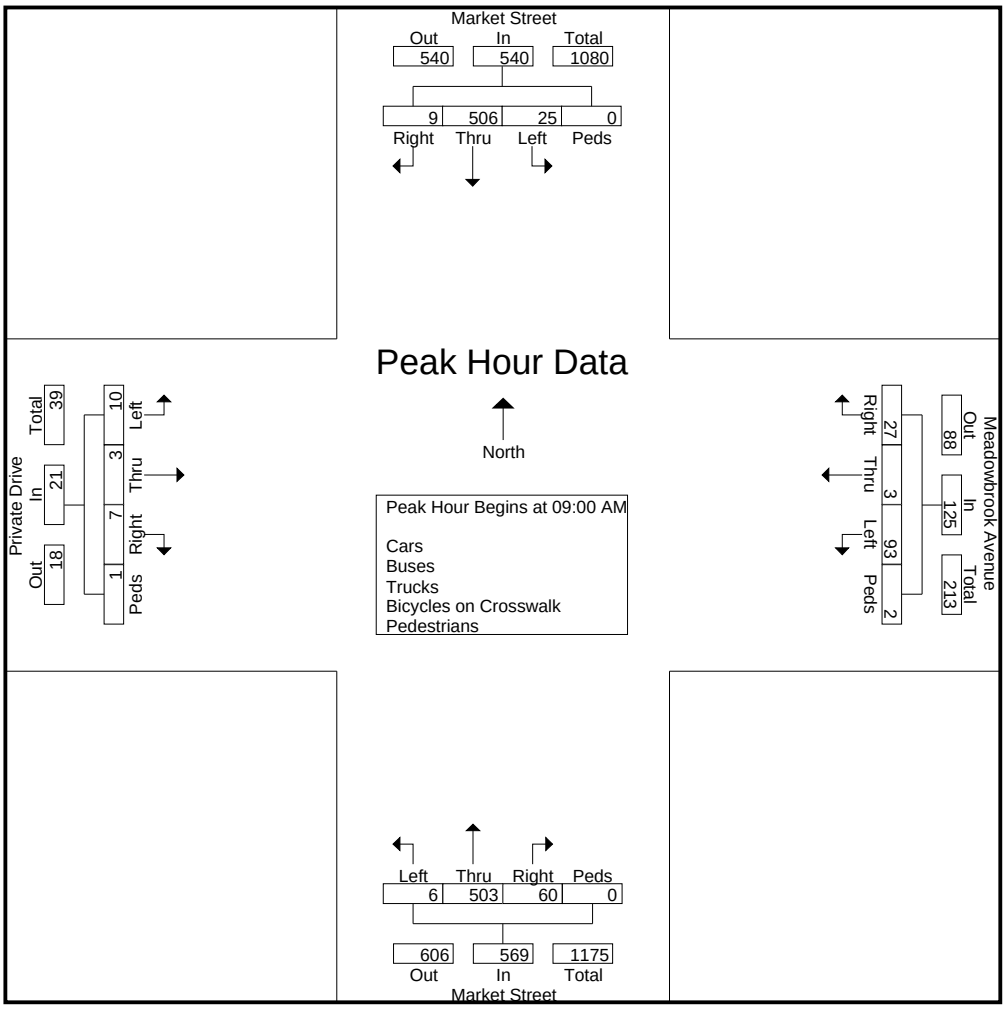
4661 Marlberry Place, Lexington, KY 40509

swcummins@windstream.net 859.361.2589

"simplifying Data Collection since 2004"

File Name : Meadowbrook_at_Market_559091_09-05-2018
Site Code : Site 1 - Wednesday
Start Date : 9/5/2018

	Market Street From North					Meadowbrook Avenue From East					Market Street From South					Private Drive From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 09:00 AM																					
09:00 AM	3	88	**5**	0	96	23	**1**	5	0	29	1	**134**	**17**	0	**152**	1	**1**	2	**1**	5	282
09:15 AM	4	141	0	0	145	22	1	**8**	**1**	32	**2**	121	15	0	138	**3**	0	**3**	0	**6**	321
09:30 AM	**11**	118	1	0	130	**26**	1	7	0	**34**	2	132	12	0	146	3	1	1	0	5	315
09:45 AM	7	**159**	3	0	**169**	22	0	7	1	30	1	116	16	0	133	3	1	1	0	5	**337**
Total Volume	25	506	9	0	540	93	3	27	2	125	6	503	60	0	569	10	3	7	1	21	1255
% App. Total	4.6	93.7	1.7	0		74.4	2.4	21.6	1.6		1.1	88.4	10.5	0		47.6	14.3	33.3	4.8		
PHF	.568	.796	.450	.000	.799	.894	.750	.844	.500	.919	.750	.938	.882	.000	.936	.833	.750	.583	.250	.875	.931



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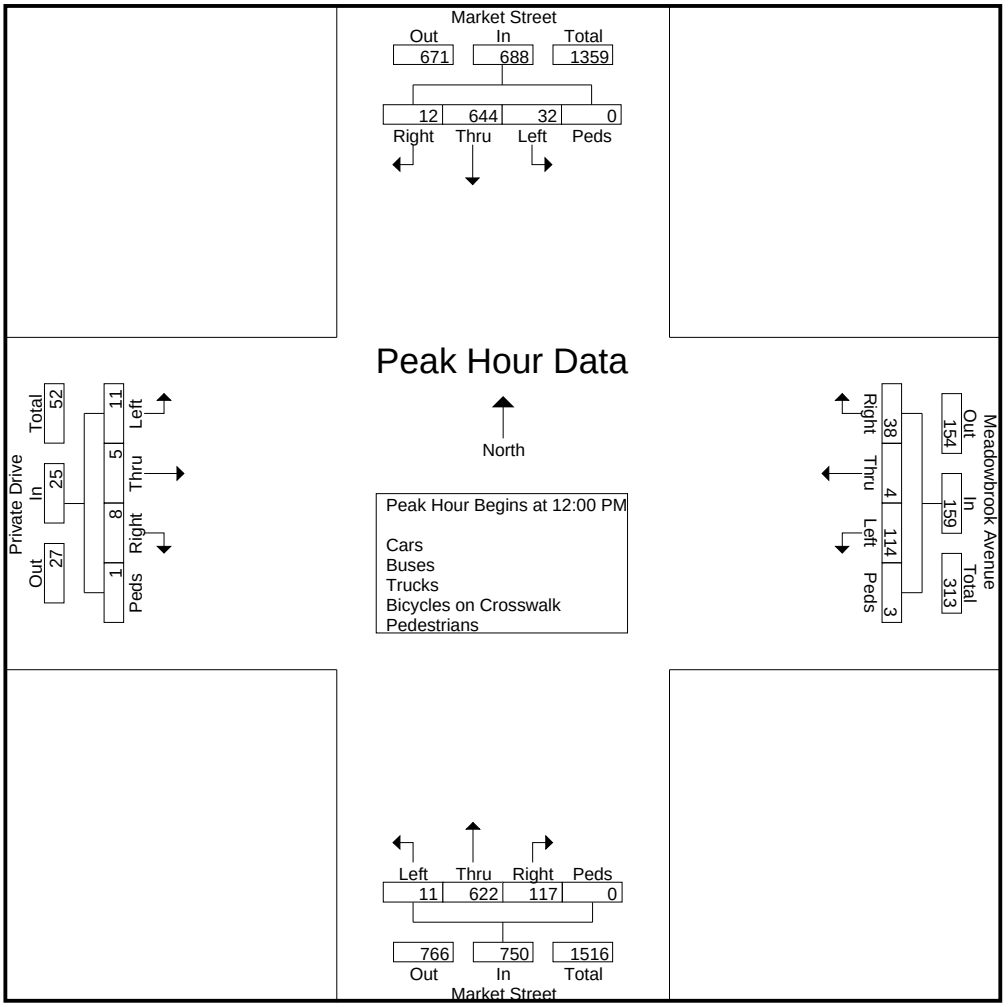
File Name : Meadowbrook_at_Market_559091_09-05-2018
Site Code : Site 1 - Wednesday
Start Date : 9/5/2018

	Market Street From North					Meadowbrook Avenue From East					Market Street From South					Private Drive From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. 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	5	146	2	0	153	27	0	8	**1**	36	**5**	164	27	0	196	3	**3**	3	**1**	**10**	395
12:15 PM	8	143	4	0	155	**32**	1	9	0	42	2	**184**	**34**	0	**220**	2	0	0	0	2	**419**
12:30 PM	9	159	1	0	169	25	1	**11**	1	38	2	147	28	0	177	2	2	1	0	5	389
12:45 PM	**10**	**196**	**5**	0	**211**	30	**2**	10	1	**43**	2	127	28	0	157	**4**	0	**4**	0	8	419
Total Volume	32	644	12	0	688	114	4	38	3	159	11	622	117	0	750	11	5	8	1	25	1622
% App. Total	4.7	93.6	1.7	0		71.7	2.5	23.9	1.9		1.5	82.9	15.6	0		44	20	32	4		
PHF	.800	.821	.600	.000	.815	.891	.500	.864	.750	.924	.550	.845	.860	.000	.852	.688	.417	.500	.250	.625	.968



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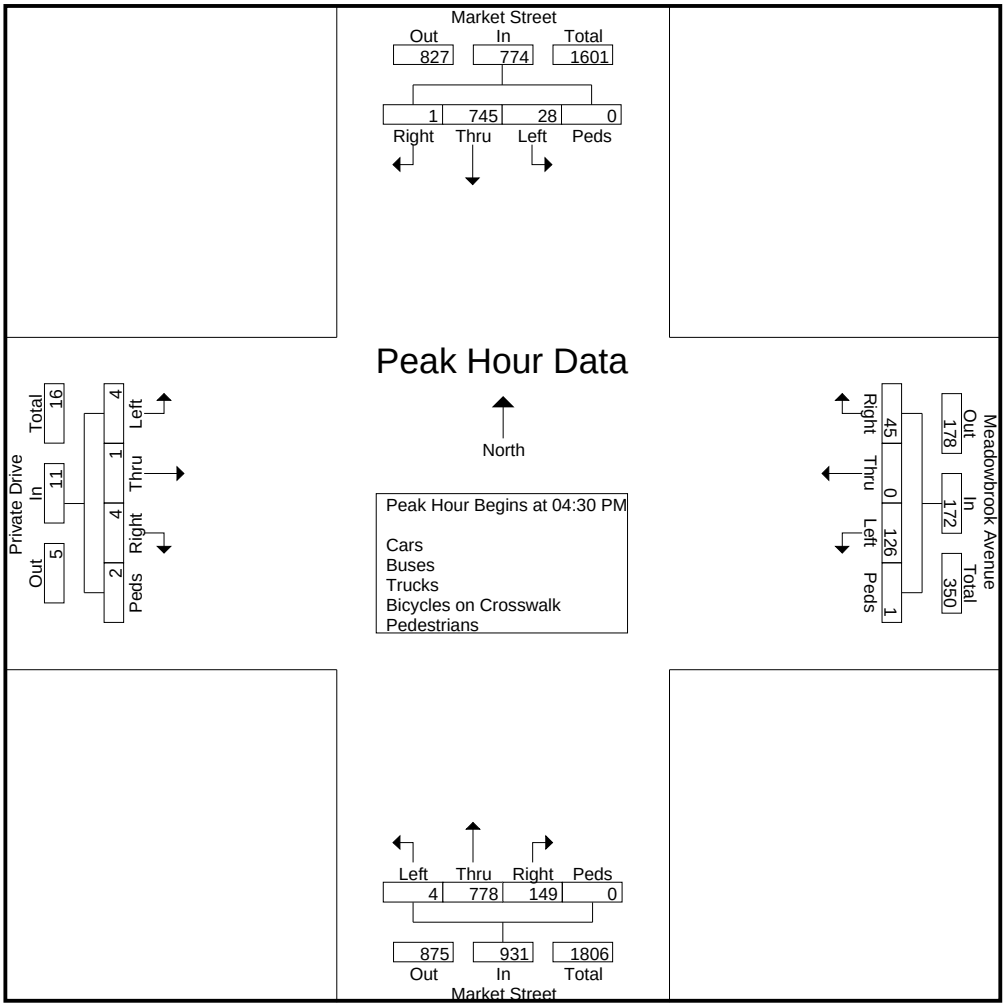
"simplifying Data Collection since 2004"

File Name : Meadowbrook_at_Market_559091_09-05-2018
Site Code : Site 1 - Wednesday
Start Date : 9/5/2018
Page No : 5

	Market Street From North					Meadowbrook Avenue From East					Market Street From South					Private Drive From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. 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	6	**199**	0	0	**205**	19	0	4	0	23	**2**	199	29	0	230	**1**	**1**	1	**1**	**4**	462
04:45 PM	3	185	**1**	0	189	**46**	0	11	0	**57**	0	188	38	0	226	1	0	**2**	0	3	475
05:00 PM	6	182	0	0	188	33	0	11	0	44	1	**207**	39	0	**247**	1	0	1	1	3	**482**
05:15 PM	**13**	179	0	0	192	28	0	**19**	**1**	48	1	184	**43**	0	228	1	0	0	0	1	469
Total Volume	28	745	1	0	774	126	0	45	1	172	4	778	149	0	931	4	1	4	2	11	1888
% App. Total	3.6	96.3	0.1	0		73.3	0	26.2	0.6		0.4	83.6	16	0		36.4	9.1	36.4	18.2		
PHF	.538	.936	.250	.000	.944	.685	.000	.592	.250	.754	.500	.940	.866	.000	.942	1.00	.250	.500	.500	.688	.979



OHIO DEPARTMENT OF TRANSPORTATION – DIVISION OF PLANNING -
OFFICE OF TECHNICAL SERVICES

INTERSECTION TRAFFIC COUNT SHOWING TURNING MOVEMENTS

Co.	Station No.	Route	Log	Location	City/Town	FC	Year
MAH	6550	SR 7	10.23	SR 7 AT SHIELDS RD. (CR 100)/ BROOKWOOD RD.	YOUNGSTOWN	U 03	2017

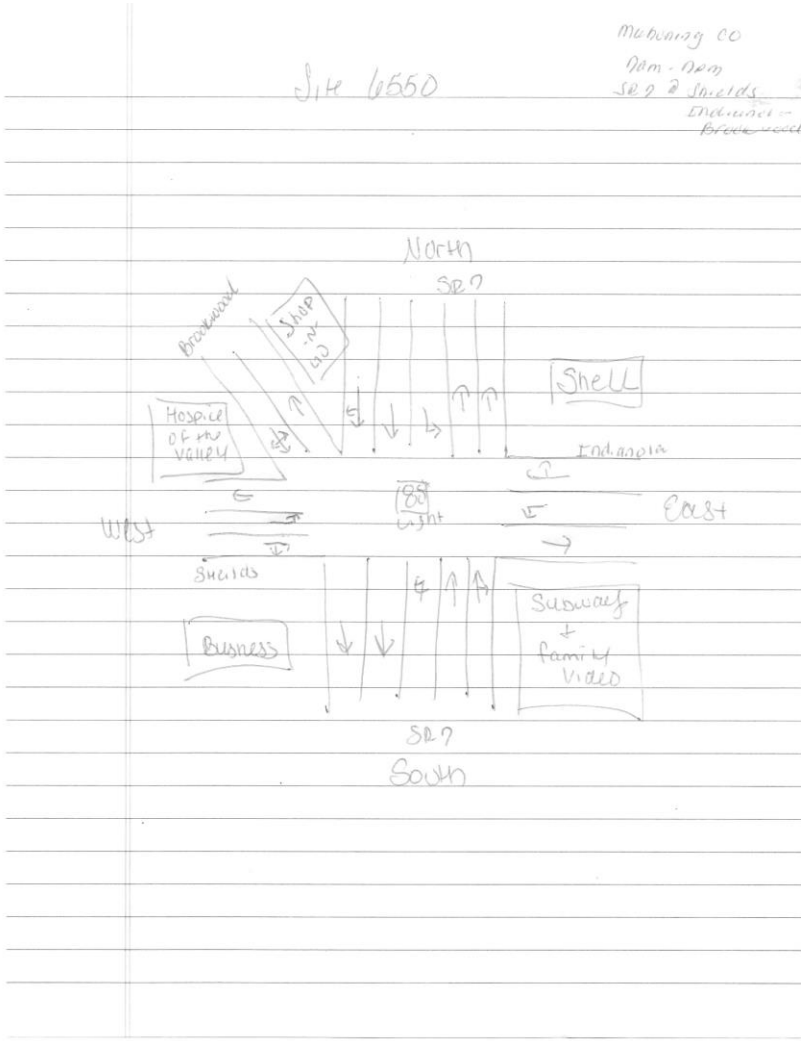
Recorder	Hour	Period	Day	Date	Weather	Road Condition
COUNT ELEC	7:00 AM	7:00 PM	WED	09/13/2017	CLOUDY	DRY

Leg Names:
N – SR 7 (MARKET ST.)
S – SR 7 (MARKET ST.)
E – INDIANOLA RD.
W– SHIELDS RD.
NW—BROOKWOOD RD.

Expansion Factor P&A:	1.29
Expansion Factor B&C:	1.33
Seasonal Factor P&A:	0.96
Seasonal Factor B&C:	0.91
Combined Factor P&A:	1.24
Combined Factor B&C:	1.21

***Note:** Expansion factor used – 2016 Hour Of Day FC03 (URBAN)

SITE 6550 MAHONING COUNTY
7AM – 7PM
SR 7 @ SHIELDS/INDIANOLA/BROOKWOOD

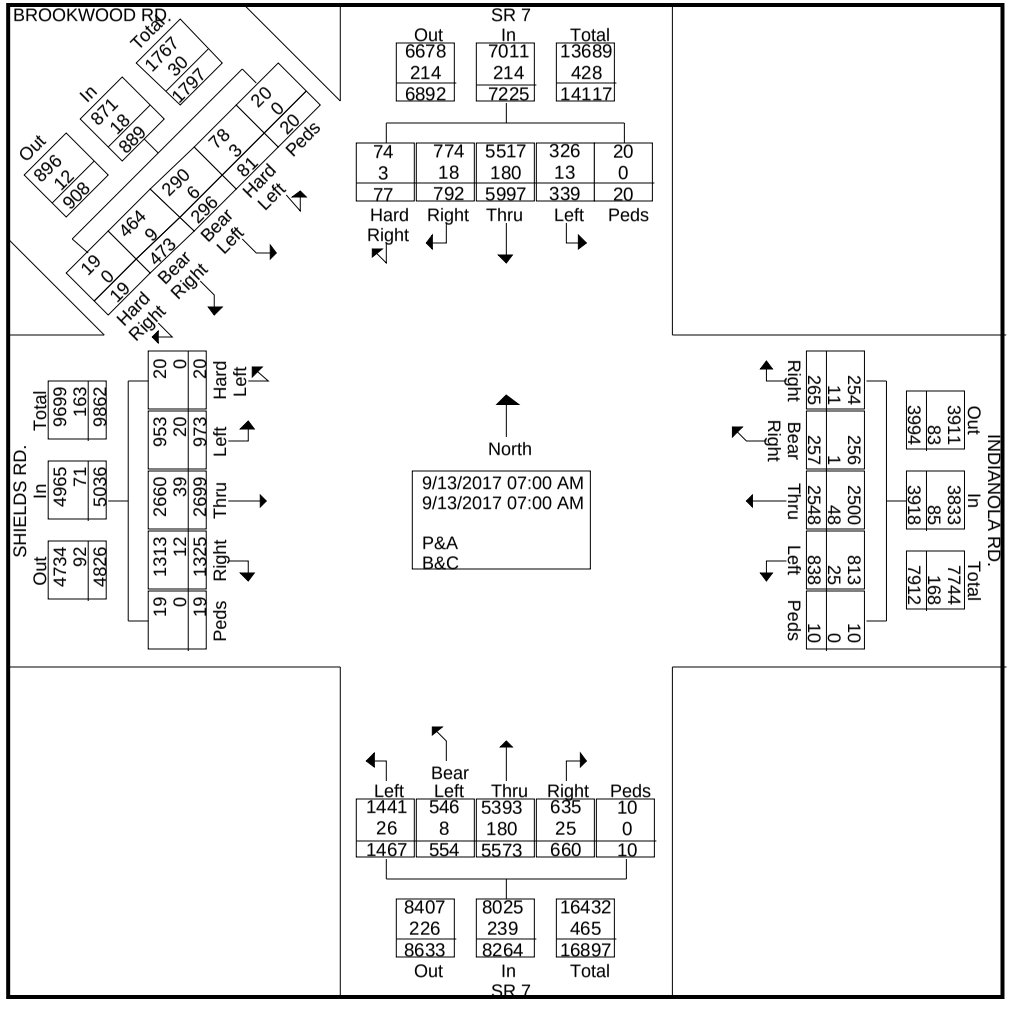


OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SHIELDS RD./BROOKWOOD
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: ADT

Site Code : 6550
Start Date : 9/13/2017
Page No : 1



OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SHIELDS RD./BROOKWOOD
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: RAW DATA

Site Code : 6550
Start Date : 9/13/2017
Page No : 1

Groups Printed- P&A

	SHIELDS RD. Eastbound						BROOKWOOD RD. Southeast Bound						INDIANOLA RD. Westbound						SR 7 Northbound						SR 7 Southbound						
Start Time	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	16	18	20	0	0	54	0	1	4	0	0	5	3	2	26	10	0	41	9	63	4	8	0	84	3	10	33	1	0	47	231
07:15 AM	16	40	16	0	0	72	0	9	4	3	0	16	1	2	35	16	0	54	6	64	5	12	0	87	2	7	53	1	0	63	292
07:30 AM	25	42	16	0	1	84	1	4	8	1	0	14	1	2	31	15	1	50	3	111	5	16	1	136	1	9	63	2	0	75	359
07:45 AM	23	45	26	0	0	94	0	5	6	1	0	12	4	10	53	19	0	86	11	74	12	12	0	109	4	6	80	3	0	93	394
Total	80	145	78	0	1	304	1	19	22	5	0	47	9	16	145	60	1	231	29	312	26	48	1	416	10	32	229	7	0	278	1276
08:00 AM	23	49	19	0	2	93	2	7	7	1	0	17	1	0	27	18	0	46	7	70	4	15	0	96	0	12	48	1	0	61	313
08:15 AM	20	41	22	0	0	83	0	11	7	0	0	18	2	3	32	17	0	54	12	80	2	19	0	113	0	7	68	3	0	78	346
08:30 AM	26	40	16	1	0	83	0	7	2	2	1	12	1	4	54	15	0	74	6	75	3	9	1	94	2	13	85	1	1	102	365
08:45 AM	30	35	22	1	2	90	2	15	5	0	1	23	3	4	27	18	0	52	5	78	4	16	1	104	0	15	112	7	1	135	404
Total	99	165	79	2	4	349	4	40	21	3	2	70	7	11	140	68	0	226	30	303	13	59	2	407	2	47	313	12	2	376	1428
09:00 AM	16	37	11	1	1	66	1	6	2	1	1	11	6	6	37	11	0	60	5	75	6	19	0	105	0	11	62	5	1	79	321
09:15 AM	18	42	17	0	0	77	0	5	5	0	0	10	4	3	30	11	0	48	9	83	10	17	0	119	2	11	92	2	0	107	361
09:30 AM	21	35	19	0	0	75	0	10	3	5	0	18	5	1	30	10	0	46	3	75	10	11	0	99	0	7	80	6	0	93	331
09:45 AM	25	48	9	0	0	82	0	5	2	0	0	7	3	1	43	11	0	58	6	92	8	16	0	122	2	9	116	4	0	131	400
Total	80	162	56	1	1	300	1	26	12	6	1	46	18	11	140	43	0	212	23	325	34	63	0	445	4	38	350	17	1	410	1413
10:00 AM	15	35	15	0	0	65	0	5	7	3	0	15	3	4	30	11	0	48	7	72	4	17	0	100	0	5	76	17	0	98	326
10:15 AM	22	46	13	0	0	81	0	9	10	2	0	21	1	1	25	10	0	37	8	77	5	19	0	109	1	5	102	2	0	110	358
10:30 AM	21	42	22	1	0	86	0	8	4	0	1	13	2	5	33	8	0	48	4	78	7	15	0	104	1	11	93	4	1	110	361
10:45 AM	19	55	11	1	0	86	0	6	2	3	1	12	2	6	40	13	0	61	6	67	6	19	1	99	2	21	97	7	1	128	386
Total	77	178	61	2	0	318	0	28	23	8	2	61	8	16	128	42	0	194	25	294	22	70	1	412	4	42	368	30	2	446	1431
11:00 AM	20	47	17	0	0	84	0	9	4	0	0	13	3	1	27	12	0	43	5	78	4	22	0	109	3	14	77	7	0	101	350
11:15 AM	24	48	12	1	0	85	0	12	3	0	1	16	2	1	34	12	1	50	14	81	8	23	0	126	1	17	94	3	1	116	393
11:30 AM	23	49	14	0	0	86	0	12	5	2	0	19	1	6	37	11	1	56	17	108	13	25	0	163	1	10	88	3	0	102	426
11:45 AM	24	39	14	2	0	79	0	6	3	0	2	11	6	9	47	13	0	75	10	75	8	20	0	113	1	7	102	7	2	119	397
Total	91	183	57	3	0	334	0	39	15	2	3	59	12	17	145	48	2	224	46	342	33	90	0	511	6	48	361	20	3	438	1566
12:00 PM	19	39	13	0	1	72	1	9	5	2	0	17	4	1	46	12	0	63	4	78	12	30	0	124	2	9	120	5	0	136	412
12:15 PM	23	45	14	0	0	82	0	4	2	4	0	10	4	0	27	8	0	39	14	106	5	29	0	154	0	11	109	8	0	128	413
12:30 PM	26	36	14	1	0	77	0	9	6	4	1	20	7	12	34	21	1	75	12	101	11	23	2	149	4	9	109	8	1	131	452
12:45 PM	16	39	20	0	0	75	0	12	3	1	0	16	5	4	41	12	0	62	11	101	9	19	0	140	1	12	86	6	0	105	398
Total	84	159	61	1	1	306	1	34	16	11	1	63	20	17	148	53	1	239	41	386	37	101	2	567	7	41	424	27	1	500	1675
01:00 PM	13	50	14	0	0	77	0	6	5	3	0	14	6	3	40	13	0	62	9	83	13	18	0	123	0	12	104	10	0	126	402

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SHIELDS RD./BROOKWOOD
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: RAW DATA

Site Code : 6550
Start Date : 9/13/2017

Groups Printed- P&A

	SHIELDS RD. Eastbound						BROOKWOOD RD. Southeast Bound						INDIANOLA RD. Westbound						SR 7 Northbound						SR 7 Southbound						
Start Time	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Int. Total
01:15 PM	15	42	21	0	0	78	0	8	4	1	0	13	6	7	29	5	0	47	9	97	13	18	0	137	1	16	126	8	0	151	426
01:30 PM	16	42	14	0	1	73	1	9	6	2	0	18	5	5	57	19	1	87	10	91	11	22	1	135	2	10	113	8	0	133	446
01:45 PM	15	35	14	0	0	64	0	9	5	0	0	14	4	3	39	11	0	57	11	91	11	24	0	137	2	15	105	5	0	127	399
Total	59	169	63	0	1	292	1	32	20	6	0	59	21	18	165	48	1	253	39	362	48	82	1	532	5	53	448	31	0	537	1673
02:00 PM	24	43	21	1	0	89	0	7	5	0	1	13	12	3	52	15	0	82	12	71	11	31	0	125	1	14	118	3	1	137	446
02:15 PM	24	41	15	1	0	81	0	10	5	1	1	17	7	3	35	12	1	58	9	113	10	35	1	168	3	21	103	8	1	136	460
02:30 PM	24	62	19	0	0	105	0	2	4	1	0	7	8	2	48	18	2	78	19	98	12	23	0	152	2	13	97	4	0	116	458
02:45 PM	17	43	7	0	0	67	0	4	5	0	0	9	7	4	47	13	0	71	5	103	16	22	0	146	1	14	96	6	0	117	410
Total	89	189	62	2	0	342	0	23	19	2	2	46	34	12	182	58	3	289	45	385	49	111	1	591	7	62	414	21	2	506	1774
03:00 PM	35	44	13	2	0	94	0	4	7	0	2	13	5	3	62	11	0	81	13	86	6	30	0	135	1	17	103	2	2	125	448
03:15 PM	17	45	14	0	0	76	0	7	4	1	0	12	4	7	56	21	0	88	13	120	17	42	1	193	1	21	109	6	0	137	506
03:30 PM	25	39	18	0	0	82	0	10	6	6	0	22	4	8	65	18	0	95	14	99	13	32	0	158	0	16	126	5	0	147	504
03:45 PM	35	54	17	0	0	106	0	9	2	1	0	12	5	1	47	17	0	70	22	112	5	26	1	166	1	15	133	3	0	152	506
Total	112	182	62	2	0	358	0	30	19	8	2	59	18	19	230	67	0	334	62	417	41	130	2	652	3	69	471	16	2	561	1964
04:00 PM	24	45	13	2	2	86	2	4	4	1	2	13	4	4	46	14	0	68	14	108	17	37	0	176	5	15	131	9	2	162	505
04:15 PM	23	41	14	0	1	79	1	5	7	1	0	14	7	4	47	12	0	70	15	102	3	29	0	149	3	21	128	6	0	158	470
04:30 PM	19	51	8	0	1	79	1	18	5	1	0	25	6	8	72	19	0	105	19	109	12	41	0	181	2	16	121	9	0	148	538
04:45 PM	23	52	19	0	0	94	0	12	7	2	0	21	5	6	50	20	0	81	13	113	10	30	0	166	0	14	128	4	0	146	508
Total	89	189	54	2	4	338	4	39	23	5	2	73	22	22	215	65	0	324	61	432	42	137	0	672	10	66	508	28	2	614	2021
05:00 PM	21	62	15	2	2	102	2	10	9	1	2	24	5	6	57	14	0	82	15	126	14	35	0	190	1	18	132	10	2	163	561
05:15 PM	43	62	23	0	1	129	1	11	7	4	0	23	5	9	57	15	0	86	13	102	15	31	0	161	2	16	114	7	0	139	538
05:30 PM	23	47	20	0	0	90	0	6	4	2	0	12	4	8	47	16	1	76	15	112	15	49	0	191	1	17	114	8	0	140	509
05:45 PM	27	58	12	1	0	98	0	3	5	0	1	9	9	5	46	17	0	77	21	95	11	32	0	159	1	18	112	6	1	138	481
Total	114	229	70	3	3	419	3	30	25	7	3	68	23	28	207	62	1	321	64	435	55	147	0	701	5	69	472	31	3	580	2089
06:00 PM	20	63	22	0	0	105	0	10	4	0	0	14	5	9	61	17	0	92	12	98	12	37	0	159	0	10	77	7	0	94	464
06:15 PM	25	46	13	0	2	86	2	5	8	3	0	18	3	7	41	10	1	62	12	103	12	34	0	161	3	12	97	6	0	118	445
06:30 PM	20	53	15	2	1	91	1	14	6	1	2	24	4	3	45	4	0	56	13	76	10	26	0	125	0	19	88	8	2	117	413
06:45 PM	15	34	15	0	1	65	1	9	4	1	0	15	4	3	27	9	0	43	11	79	7	25	0	122	0	16	74	5	0	95	340
Total	80	196	65	2	4	347	4	38	22	5	2	71	16	22	174	40	1	253	48	356	41	122	0	567	3	57	336	26	2	424	1662
Grand Total	1054	2146	768	20	19	4007	19	378	237	68	20	722	208	209	2019	654	10	3100	513	4349	441	1160	10	6473	66	624	4694	266	20	5670	19972
Apprch %	26.3	53.6	19.2	0.5	0.5		2.6	52.4	32.8	9.4	2.8		6.7	6.7	65.1	21.1	0.3		7.9	67.2	6.8	17.9	0.2		1.2	11	82.8	4.7	0.4		
Total %	5.3	10.7	3.8	0.1	0.1	20.1	0.1	1.9	1.2	0.3	0.1	3.6	1	1	10.1	3.3	0.1	15.5	2.6	21.8	2.2	5.8	0.1	32.4	0.3	3.1	23.5	1.3	0.1	28.4	

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SHIELDS RD./BROOKWOOD
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: RAW DATA

Site Code : 6550
Start Date : 9/13/2017

Groups Printed- B&C

	SHIELDS RD. Eastbound						BROOKWOOD RD. Southeast Bound						INDIANOLA RD. Westbound						SR 7 Northbound						SR 7 Southbound						
Start Time	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	2	0	3	2	6	0	0	0	8	0	0	3	0	0	3	15
07:15 AM	2	0	1	0	0	3	0	0	1	0	0	1	0	0	2	0	0	2	1	2	1	0	0	4	0	0	2	0	0	2	12
07:30 AM	0	0	1	0	0	1	0	2	0	0	0	2	1	0	0	1	0	2	2	4	0	0	0	6	0	0	4	1	0	5	16
07:45 AM	1	1	1	0	0	3	0	0	0	0	0	0	0	0	1	2	0	3	0	4	1	0	0	5	1	0	3	0	0	4	15
Total	3	1	3	0	0	7	0	3	1	0	0	4	1	0	4	5	0	10	5	16	2	0	0	23	1	0	12	1	0	14	58
08:00 AM	0	2	1	0	0	3	0	0	0	0	0	0	0	0	2	1	0	3	0	9	1	2	0	12	0	1	3	2	0	6	24
08:15 AM	1	0	0	0	0	1	0	1	0	0	0	1	0	0	2	4	0	6	2	4	0	0	0	6	0	0	4	0	0	4	18
08:30 AM	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2	0	5	0	1	6	0	0	7	14
08:45 AM	0	1	1	0	0	2	0	0	1	0	0	1	0	0	0	0	0	0	0	3	0	0	0	3	0	0	5	0	0	5	11
Total	1	4	3	0	0	8	0	1	1	0	0	2	0	0	4	5	0	9	3	18	1	4	0	26	0	2	18	2	0	22	67
09:00 AM	1	0	0	0	0	1	0	0	0	1	0	1	0	0	3	0	0	3	1	3	0	0	0	4	0	0	3	1	0	4	13
09:15 AM	0	0	1	0	0	1	0	0	0	0	0	0	1	1	1	0	0	3	0	1	0	1	0	2	0	1	4	0	0	5	11
09:30 AM	0	2	0	0	0	2	0	1	0	0	0	1	0	0	0	0	0	0	0	5	0	0	0	5	1	1	3	1	0	6	14
09:45 AM	0	2	1	0	0	3	0	0	0	0	0	0	0	0	1	1	0	2	0	2	0	1	0	3	0	0	4	0	0	4	12
Total	1	4	2	0	0	7	0	1	0	1	0	2	1	1	5	1	0	8	1	11	0	2	0	14	1	2	14	2	0	19	50
10:00 AM	0	4	1	0	0	5	0	0	1	0	0	1	0	0	2	1	0	3	0	3	0	1	0	4	0	1	1	3	0	5	18
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	3	0	0	3	1	0	4	7
10:30 AM	0	0	3	0	0	3	0	1	0	1	0	2	1	0	1	0	0	2	0	3	0	0	0	3	0	1	0	0	0	1	11
10:45 AM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	3	0	4	1	2	1	2	0	6	0	0	3	0	0	3	14
Total	1	4	4	0	0	9	0	1	1	1	0	3	1	0	4	4	0	9	2	10	1	3	0	16	0	2	7	4	0	13	50
11:00 AM	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	1	0	9	0	1	1	1	0	3	15
11:15 AM	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	3	0	0	3	10
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	3	0	1	0	4	0	0	2	0	0	2	9
11:45 AM	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	0	1	1	0	2	6
Total	0	7	1	0	0	8	0	0	0	0	0	0	0	0	3	0	0	3	0	15	1	3	0	19	0	1	7	2	0	10	40
12:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	4	0	0	0	5	1	0	1	0	0	2	8
12:15 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	3
12:30 PM	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	4	0	1	5	0	0	6	12
12:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	1	0	3	0	1	0	4	0	0	5	0	0	5	11
Total	0	1	2	0	0	3	0	1	1	0	0	2	0	0	1	0	0	1	1	10	0	2	0	13	1	1	13	0	0	15	34
01:00 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	5	0	0	0	5	0	0	4	0	0	4	11

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SHIELDS RD./BROOKWOOD
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: RAW DATA

Site Code : 6550
Start Date : 9/13/2017

Groups Printed- B&C

	SHIELDS RD. Eastbound						BROOKWOOD RD. Southeast Bound						INDIANOLA RD. Westbound						SR 7 Northbound						SR 7 Southbound						
Start Time	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Int. Total
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	3	0	0	0	3	0	0	2	0	0	2	7
01:30 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	1	5	0	0	0	6	0	0	4	0	0	4	13
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	5	0	0	0	6	0	0	8	0	0	8	15
Total	1	1	0	0	0	2	0	0	0	0	0	0	2	0	4	0	0	6	2	18	0	0	0	20	0	0	18	0	0	18	46
02:00 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	2	2	4	0	1	0	7	0	0	5	0	0	5	15
02:15 PM	0	2	0	0	0	2	0	0	0	1	0	1	2	0	4	1	0	7	3	8	0	3	0	14	0	0	7	0	0	7	31
02:30 PM	0	1	1	0	0	2	0	1	1	0	0	2	0	0	3	0	0	3	0	3	1	2	0	6	0	1	4	0	0	5	18
02:45 PM	1	0	0	0	0	1	0	0	0	0	0	0	1	0	2	1	0	4	0	2	0	1	0	3	0	3	5	0	0	8	16
Total	2	3	1	0	0	6	0	1	1	1	0	3	3	0	10	3	0	16	5	17	1	7	0	30	0	4	21	0	0	25	80
03:00 PM	1	2	0	0	0	3	0	0	0	0	0	0	0	0	2	1	0	3	2	4	0	0	0	6	0	0	3	0	0	3	15
03:15 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	0	2	0	1	2	1	0	4	0	0	6	0	0	6	13
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	3	0	4	0	0	0	4	0	1	4	1	0	6	13
03:45 PM	0	2	0	0	0	2	0	0	1	0	0	1	0	0	1	0	0	1	2	2	0	0	0	4	0	0	4	0	0	4	12
Total	1	4	1	0	0	6	0	0	1	0	0	1	0	0	5	4	0	9	4	11	2	1	0	18	0	1	17	1	0	19	53
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	6	0	1	0	7	0	0	1	0	0	1	9
04:15 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2	1	0	3	0	3	0	1	0	4	0	2	7	0	0	9	17
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	2	0	1	0	3	0	0	4	0	0	4	9
04:45 PM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	2	0	1	0	0	0	1	0	0	2	0	0	2	7
Total	1	2	0	0	0	3	0	1	0	0	0	1	2	0	4	1	0	7	0	12	0	3	0	15	0	2	14	0	0	16	42
05:00 PM	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	4
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	1	0	0	1	3
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	2	0	0	2	6
05:45 PM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	5
Total	0	3	1	0	0	4	0	0	0	0	0	0	1	0	0	0	0	1	0	7	0	0	0	7	0	1	5	0	0	6	18
06:00 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	4
06:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	3
06:30 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2
06:45 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	2	0	0	3	5
Total	1	2	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	5	0	1	4	0	0	5	14
Grand Total	12	36	19	0	0	67	0	9	6	3	0	18	11	1	44	23	0	79	24	149	8	25	0	206	3	17	150	12	0	182	552
Apprch %	17.9	53.7	28.4	0	0		0	50	33.3	16.7	0		13.9	1.3	55.7	29.1	0		11.7	72.3	3.9	12.1	0		1.6	9.3	82.4	6.6	0		
Total %	2.2	6.5	3.4	0	0	12.1	0	1.6	1.1	0.5	0	3.3	2	0.2	8	4.2	0	14.3	4.3	27	1.4	4.5	0	37.3	0.5	3.1	27.2	2.2	0	33	

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SHIELDS RD./BROOKWOOD
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: RAW DATA

Site Code : 6550
Start Date : 9/13/2017
Page No : 1

Groups Printed- P&A - B&C

	SHIELDS RD. Eastbound						BROOKWOOD RD. Southeast Bound						INDIANOLA RD. Westbound						SR 7 Northbound						SR 7 Southbound						
Start Time	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	16	18	20	0	0	54	0	2	4	0	0	6	3	2	27	12	0	44	11	69	4	8	0	92	3	10	36	1	0	50	246
07:15 AM	18	40	17	0	0	75	0	9	5	3	0	17	1	2	37	16	0	56	7	66	6	12	0	91	2	7	55	1	0	65	304
07:30 AM	25	42	17	0	1	85	1	6	8	1	0	16	2	2	31	16	1	52	5	115	5	16	1	142	1	9	67	3	0	80	375
07:45 AM	24	46	27	0	0	97	0	5	6	1	0	12	4	10	54	21	0	89	11	78	13	12	0	114	5	6	83	3	0	97	409
Total	83	146	81	0	1	311	1	22	23	5	0	51	10	16	149	65	1	241	34	328	28	48	1	439	11	32	241	8	0	292	1334
08:00 AM	23	51	20	0	2	96	2	7	7	1	0	17	1	0	29	19	0	49	7	79	5	17	0	108	0	13	51	3	0	67	337
08:15 AM	21	41	22	0	0	84	0	12	7	0	0	19	2	3	34	21	0	60	14	84	2	19	0	119	0	7	72	3	0	82	364
08:30 AM	26	41	17	1	0	85	0	7	2	2	1	12	1	4	54	15	0	74	7	77	3	11	1	99	2	14	91	1	1	109	379
08:45 AM	30	36	23	1	2	92	2	15	6	0	1	24	3	4	27	18	0	52	5	81	4	16	1	107	0	15	117	7	1	140	415
Total	100	169	82	2	4	357	4	41	22	3	2	72	7	11	144	73	0	235	33	321	14	63	2	433	2	49	331	14	2	398	1495
09:00 AM	17	37	11	1	1	67	1	6	2	2	1	12	6	6	40	11	0	63	6	78	6	19	0	109	0	11	65	6	1	83	334
09:15 AM	18	42	18	0	0	78	0	5	5	0	0	10	5	4	31	11	0	51	9	84	10	18	0	121	2	12	96	2	0	112	372
09:30 AM	21	37	19	0	0	77	0	11	3	5	0	19	5	1	30	10	0	46	3	80	10	11	0	104	1	8	83	7	0	99	345
09:45 AM	25	50	10	0	0	85	0	5	2	0	0	7	3	1	44	12	0	60	6	94	8	17	0	125	2	9	120	4	0	135	412
Total	81	166	58	1	1	307	1	27	12	7	1	48	19	12	145	44	0	220	24	336	34	65	0	459	5	40	364	19	1	429	1463
10:00 AM	15	39	16	0	0	70	0	5	8	3	0	16	3	4	32	12	0	51	7	75	4	18	0	104	0	6	77	20	0	103	344
10:15 AM	22	46	13	0	0	81	0	9	10	2	0	21	1	1	25	10	0	37	9	79	5	19	0	112	1	5	105	3	0	114	365
10:30 AM	21	42	25	1	0	89	0	9	4	1	1	15	3	5	34	8	0	50	4	81	7	15	0	107	1	12	93	4	1	111	372
10:45 AM	20	55	11	1	0	87	0	6	2	3	1	12	2	6	41	16	0	65	7	69	7	21	1	105	2	21	100	7	1	131	400
Total	78	182	65	2	0	327	0	29	24	9	2	64	9	16	132	46	0	203	27	304	23	73	1	428	4	44	375	34	2	459	1481
11:00 AM	20	50	17	0	0	87	0	9	4	0	0	13	3	1	27	12	0	43	5	85	5	23	0	118	3	15	78	8	0	104	365
11:15 AM	24	51	12	1	0	88	0	12	3	0	1	16	2	1	34	12	1	50	14	85	8	23	0	130	1	17	97	3	1	119	403
11:30 AM	23	49	14	0	0	86	0	12	5	2	0	19	1	6	40	11	1	59	17	111	13	26	0	167	1	10	90	3	0	104	435
11:45 AM	24	40	15	2	0	81	0	6	3	0	2	11	6	9	47	13	0	75	10	76	8	21	0	115	1	7	103	8	2	121	403
Total	91	190	58	3	0	342	0	39	15	2	3	59	12	17	148	48	2	227	46	357	34	93	0	530	6	49	368	22	3	448	1606
12:00 PM	19	39	13	0	1	72	1	10	5	2	0	18	4	1	46	12	0	63	5	82	12	30	0	129	3	9	121	5	0	138	420
12:15 PM	23	45	15	0	0	83	0	4	2	4	0	10	4	0	27	8	0	39	14	106	5	29	0	154	0	11	111	8	0	130	416
12:30 PM	26	37	15	1	0	79	0	9	6	4	1	20	7	12	34	21	1	75	12	104	11	24	2	153	4	10	114	8	1	137	464
12:45 PM	16	39	20	0	0	75	0	12	4	1	0	17	5	4	42	12	0	63	11	104	9	20	0	144	1	12	91	6	0	110	409
Total	84	160	63	1	1	309	1	35	17	11	1	65	20	17	149	53	1	240	42	396	37	103	2	580	8	42	437	27	1	515	1709
01:00 PM	14	50	14	0	0	78	0	6	5	3	0	14	6	3	41	13	0	63	9	88	13	18	0	128	0	12	108	10	0	130	413

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SHIELDS RD./BROOKWOOD
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: RAW DATA

Site Code : 6550
Start Date : 9/13/2017

Groups Printed- P&A - B&C

	SHIELDS RD. Eastbound						BROOKWOOD RD. Southeast Bound						INDIANOLA RD. Westbound						SR 7 Northbound						SR 7 Southbound						
Start Time	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Int. Total
01:15 PM	15	42	21	0	0	78	0	8	4	1	0	13	8	7	29	5	0	49	9	100	13	18	0	140	1	16	128	8	0	153	433
01:30 PM	16	43	14	0	1	74	1	9	6	2	0	18	5	5	59	19	1	89	11	96	11	22	1	141	2	10	117	8	0	137	459
01:45 PM	15	35	14	0	0	64	0	9	5	0	0	14	4	3	40	11	0	58	12	96	11	24	0	143	2	15	113	5	0	135	414
Total	60	170	63	0	1	294	1	32	20	6	0	59	23	18	169	48	1	259	41	380	48	82	1	552	5	53	466	31	0	555	1719
02:00 PM	25	43	21	1	0	90	0	7	5	0	1	13	12	3	53	16	0	84	14	75	11	32	0	132	1	14	123	3	1	142	461
02:15 PM	24	43	15	1	0	83	0	10	5	2	1	18	9	3	39	13	1	65	12	121	10	38	1	182	3	21	110	8	1	143	491
02:30 PM	24	63	20	0	0	107	0	3	5	1	0	9	8	2	51	18	2	81	19	101	13	25	0	158	2	14	101	4	0	121	476
02:45 PM	18	43	7	0	0	68	0	4	5	0	0	9	8	4	49	14	0	75	5	105	16	23	0	149	1	17	101	6	0	125	426
Total	91	192	63	2	0	348	0	24	20	3	2	49	37	12	192	61	3	305	50	402	50	118	1	621	7	66	435	21	2	531	1854
03:00 PM	36	46	13	2	0	97	0	4	7	0	2	13	5	3	64	12	0	84	15	90	6	30	0	141	1	17	106	2	2	128	463
03:15 PM	17	45	15	0	0	77	0	7	4	1	0	12	4	7	56	23	0	90	13	121	19	43	1	197	1	21	115	6	0	143	519
03:30 PM	25	39	18	0	0	82	0	10	6	6	0	22	4	8	67	19	0	98	14	103	13	32	0	162	0	17	130	6	0	153	517
03:45 PM	35	56	17	0	0	108	0	9	3	1	0	13	5	1	48	17	0	71	24	114	5	26	1	170	1	15	137	3	0	156	518
Total	113	186	63	2	0	364	0	30	20	8	2	60	18	19	235	71	0	343	66	428	43	131	2	670	3	70	488	17	2	580	2017
04:00 PM	24	45	13	2	2	86	2	4	4	1	2	13	5	4	46	14	0	69	14	114	17	38	0	183	5	15	132	9	2	163	514
04:15 PM	24	41	14	0	1	80	1	5	7	1	0	14	7	4	49	13	0	73	15	105	3	30	0	153	3	23	135	6	0	167	487
04:30 PM	19	51	8	0	1	79	1	19	5	1	0	26	7	8	72	19	0	106	19	111	12	42	0	184	2	16	125	9	0	152	547
04:45 PM	23	54	19	0	0	96	0	12	7	2	0	21	5	6	52	20	0	83	13	114	10	30	0	167	0	14	130	4	0	148	515
Total	90	191	54	2	4	341	4	40	23	5	2	74	24	22	219	66	0	331	61	444	42	140	0	687	10	68	522	28	2	630	2063
05:00 PM	21	63	16	2	2	104	2	10	9	1	2	24	5	6	57	14	0	82	15	128	14	35	0	192	1	18	132	10	2	163	565
05:15 PM	43	62	23	0	1	129	1	11	7	4	0	23	6	9	57	15	0	87	13	103	15	31	0	162	2	16	115	7	0	140	541
05:30 PM	23	47	20	0	0	90	0	6	4	2	0	12	4	8	47	16	1	76	15	116	15	49	0	195	1	17	116	8	0	142	515
05:45 PM	27	60	12	1	0	100	0	3	5	0	1	9	9	5	46	17	0	77	21	95	11	32	0	159	1	19	114	6	1	141	486
Total	114	232	71	3	3	423	3	30	25	7	3	68	24	28	207	62	1	322	64	442	55	147	0	708	5	70	477	31	3	586	2107
06:00 PM	20	64	22	0	0	106	0	10	4	0	0	14	5	9	61	17	0	92	12	101	12	37	0	162	0	10	77	7	0	94	468
06:15 PM	25	47	13	0	2	87	2	5	8	3	0	18	3	7	41	10	1	62	12	103	12	34	0	161	3	12	99	6	0	120	448
06:30 PM	21	53	15	2	1	92	1	14	6	1	2	24	4	3	45	4	0	56	13	77	10	26	0	126	0	19	88	8	2	117	415
06:45 PM	15	34	16	0	1	66	1	9	4	1	0	15	4	3	27	9	0	43	12	79	7	25	0	123	0	17	76	5	0	98	345
Total	81	198	66	2	4	351	4	38	22	5	2	71	16	22	174	40	1	253	49	360	41	122	0	572	3	58	340	26	2	429	1676
Grand Total	1066	2182	787	20	19	4074	19	387	243	71	20	740	219	210	2063	677	10	3179	5378	4491	1185	449	10	6679	69	641	4844	278	20	5852	20524
Apprch %	26.2	53.6	19.3	0.5	0.5		2.6	52.3	32.8	9.6	2.7		6.9	6.6	64.9	21.3	0.3		80.3	67.3	17.7	6.7	0.1		1.2	11	82.8	4.8	0.3		
Total %	5.2	10.6	3.8	0.1	0.1	19.8	0.1	1.9	1.2	0.3	0.1	3.6	1.1	1	10.1	3.3	0	15.5	26.2	21.9	5.8	2.2	0	32.5	0.3	3.1	23.6	1.4	0.1	28.5	

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SHIELDS RD./BROOKWOOD
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: RAW DATA

Site Code : 6550
Start Date : 9/13/2017
Page No : 3

Groups Printed- P&A - B&C

	SHIELDS RD. Eastbound						BROOKWOOD RD. Southeast Bound						INDIANOLA RD. Westbound						SR 7 Northbound						SR 7 Southbound						
	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Int. Total
P&A	1054	2146	768	20	19	4007	19	378	237	68	20	722	208	209	2019	654	10	3100	513	4349	441	1160	10	6473	66	624	4469	266	20	5670	19972
% P&A	98.9	98.4	97.6	100	100	98.4	100	97.7	97.5	95.8	100	97.6	95	99.5	97.9	96.6	100	97.5	95.5	96.7	98.2	97.9	100	96.9	95.7	97.3	96.9	95.7	100	96.9	97.3
B&C	12	36	19	0	0	67	0	9	6	3	0	18	11	1	44	23	0	79	24	149	8	25	0	206	3	17	150	12	0	182	552
% B&C	1.1	1.6	2.4	0	0	1.6	0	2.3	2.5	4.2	0	2.4	5	0.5	2.1	3.4	0	2.5	4.5	3.3	1.8	2.1	0	3.1	4.3	2.7	3.1	4.3	0	3.1	2.7

OHIO DEPARTMENT OF TRANSPORTATION – DIVISION OF PLANNING -
OFFICE OF TECHNICAL SERVICES

INTERSECTION TRAFFIC COUNT SHOWING TURNING MOVEMENTS

Co.	Station No.	Route	Log	Location	City/Town	FC	Year
MAH	507647	SR 7	14.96	SR 7 AT SR 170 (MIDLOTHIAN BLVD.)	YOUNGSTOWN	U 03	2017

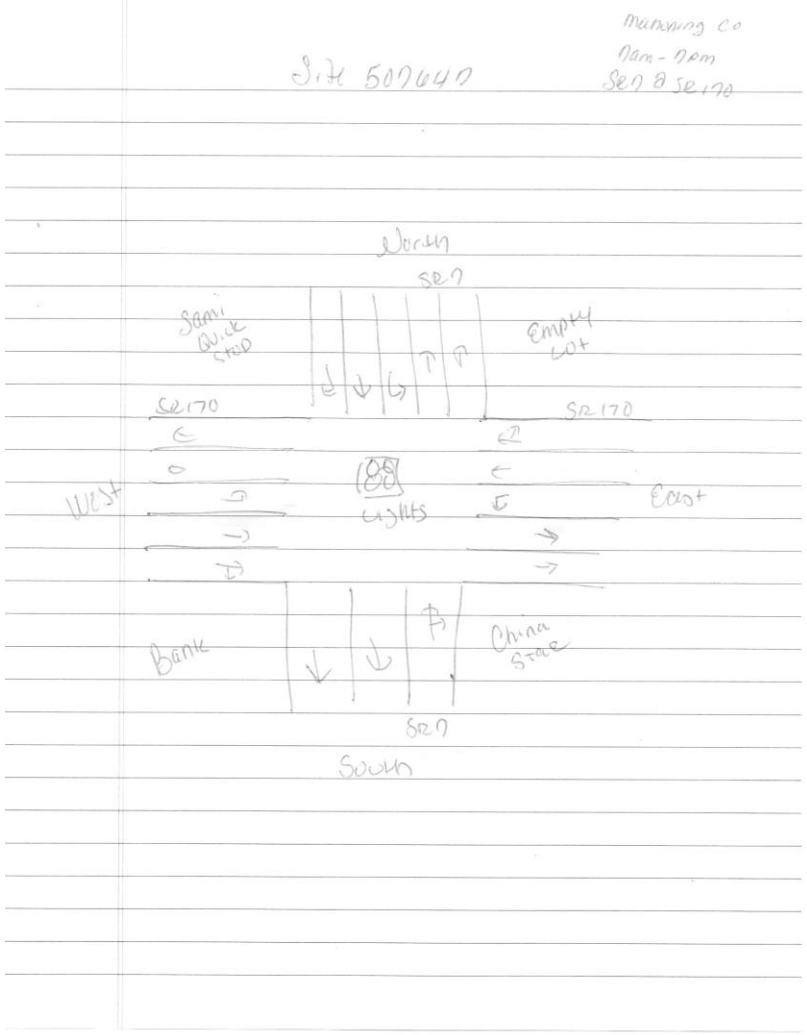
Recorder	Hour	Period	Day	Date	Weather	Road Condition
COUNT ELEC	7:00 AM	7:00 PM	WED	09/13/2017	CLOUDY	DRY

Leg Names:
N – SR 7 (MARKET ST.)
S – SR 7 (MARKET ST.)
E – SR 170 (MIDLOTHIAN BLVD.)
W– SR 170 (MIDLOTHIAN BLVD.)

Expansion Factor P&A:	1.29
Expansion Factor B&C:	1.33
Seasonal Factor P&A:	0.96
Seasonal Factor B&C:	0.91
Combined Factor P&A:	1.24
Combined Factor B&C:	1.21

***Note:** Expansion factor used – 2016 Hour Of Day FC03 (URBAN)

SITE 507647 MAHONING COUNTY
7AM – 7PM
SR 7 @ SR 170

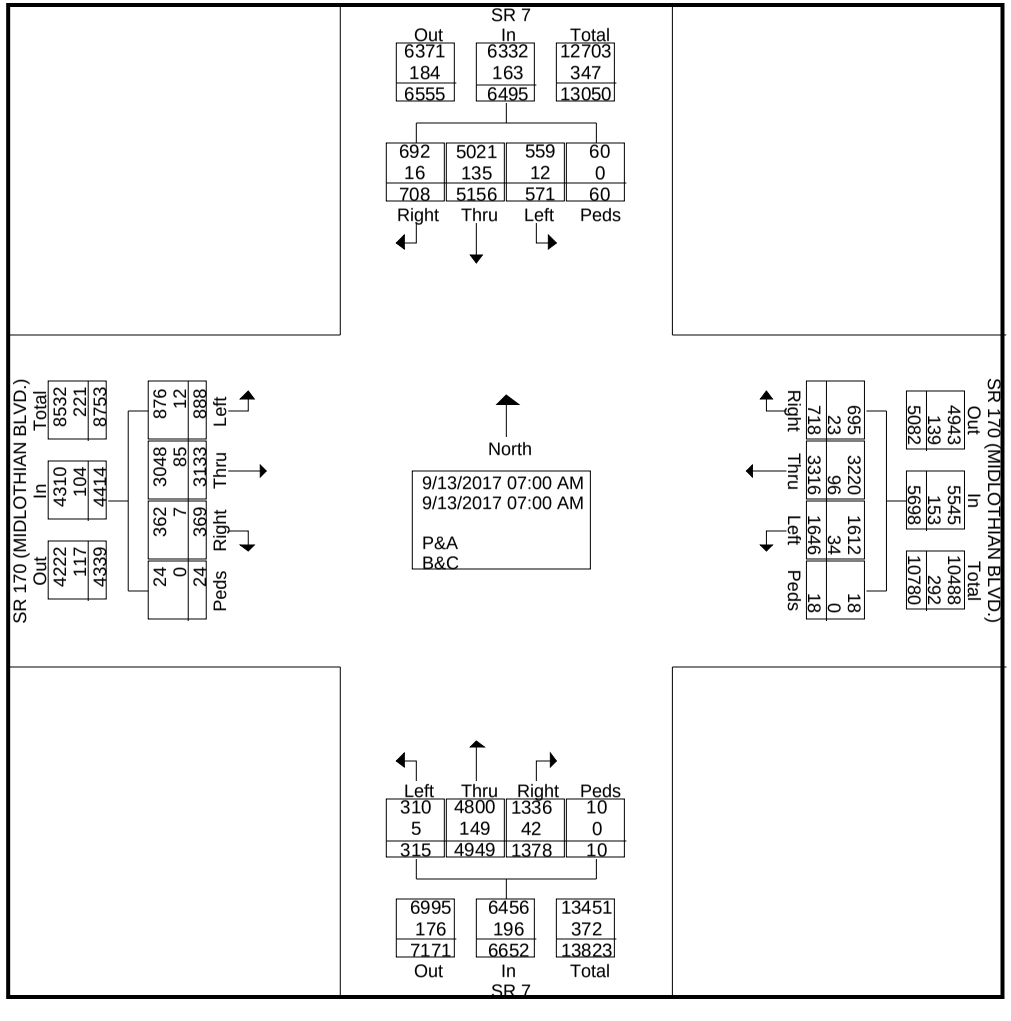


OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SR 170
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: ADT

Site Code : 507647
Start Date : 9/13/2017



OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SR 170
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: RAW DATA

Site Code : 507647
Start Date : 9/13/2017
Page No : 1

Groups Printed- P&A

	SR 170 (MIDLOTHIAN BLVD.) Eastbound					SR 170 (MIDLOTHIAN BLVD.) Westbound					SR 7 Northbound					SR 7 Southbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	22	12	0	35	4	34	13	0	51	22	78	0	0	100	2	26	1	0	29	215
07:15 AM	0	37	17	0	54	6	31	10	0	47	20	86	2	0	108	6	29	3	0	38	247
07:30 AM	2	54	33	0	89	15	48	22	0	85	22	157	2	0	181	7	53	7	0	67	422
07:45 AM	3	63	37	0	103	10	49	19	0	78	15	114	4	0	133	10	71	5	0	86	400
Total	6	176	99	0	281	35	162	64	0	261	79	435	8	0	522	25	179	16	0	220	1284
08:00 AM	0	34	14	0	48	12	51	18	0	81	7	90	0	0	97	7	54	4	0	65	291
08:15 AM	2	34	17	0	53	10	43	21	0	74	18	88	1	0	107	12	55	4	0	71	305
08:30 AM	4	42	13	1	60	8	41	27	0	76	14	95	3	0	112	7	69	8	0	84	332
08:45 AM	5	43	15	0	63	8	37	23	0	68	19	93	2	0	114	13	73	7	0	93	338
Total	11	153	59	1	224	38	172	89	0	299	58	366	6	0	430	39	251	23	0	313	1266
09:00 AM	7	32	8	1	48	6	36	20	0	62	12	84	1	0	97	11	58	5	0	74	281
09:15 AM	3	40	18	0	61	11	45	21	0	77	17	81	3	0	101	6	65	5	0	76	315
09:30 AM	2	37	18	0	57	11	41	14	2	68	16	95	1	0	112	17	66	6	0	89	326
09:45 AM	1	42	16	0	59	9	42	34	0	85	19	67	4	0	90	10	79	4	1	94	328
Total	13	151	60	1	225	37	164	89	2	292	64	327	9	0	400	44	268	20	1	333	1250
10:00 AM	6	43	8	0	57	8	36	9	0	53	12	72	3	0	87	7	71	4	4	86	283
10:15 AM	4	34	8	2	48	11	40	22	2	75	20	68	1	1	90	6	89	9	2	106	319
10:30 AM	13	39	15	0	67	10	42	24	0	76	18	67	11	0	96	7	83	7	2	99	338
10:45 AM	9	40	11	0	60	10	57	24	1	92	23	55	7	0	85	7	81	10	2	100	337
Total	32	156	42	2	232	39	175	79	3	296	73	262	22	1	358	27	324	30	10	391	1277
11:00 AM	6	44	11	0	61	7	43	17	0	67	23	74	3	0	100	12	69	9	0	90	318
11:15 AM	10	35	8	0	53	7	40	27	0	74	20	80	4	0	104	18	98	6	1	123	354
11:30 AM	10	49	14	0	73	6	44	29	1	80	21	96	4	0	121	5	85	9	0	99	373
11:45 AM	5	45	15	0	65	10	63	22	0	95	23	74	2	0	99	11	83	4	2	100	359
Total	31	173	48	0	252	30	190	95	1	316	87	324	13	0	424	46	335	28	3	412	1404
12:00 PM	6	43	19	1	69	24	51	19	0	94	19	79	8	0	106	14	99	9	0	122	391
12:15 PM	6	39	22	1	68	10	51	22	0	83	24	84	5	0	113	7	91	13	0	111	375
12:30 PM	4	43	14	0	61	16	56	19	1	92	16	79	5	0	100	13	90	6	2	111	364
12:45 PM	1	59	12	5	77	16	59	34	1	110	14	89	8	1	112	7	88	11	2	108	407
Total	17	184	67	7	275	66	217	94	2	379	73	331	26	1	431	41	368	39	4	452	1537
01:00 PM	9	63	16	0	88	10	56	26	0	92	21	60	10	0	91	11	100	9	2	122	393
01:15 PM	11	61	11	0	83	6	58	31	1	96	21	73	10	0	104	10	92	13	0	115	398

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SR 170
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: RAW DATA

Site Code : 507647
Start Date : 9/13/2017

Groups Printed- P&A

	SR 170 (MIDLOTHIAN BLVD.) Eastbound					SR 170 (MIDLOTHIAN BLVD.) Westbound					SR 7 Northbound					SR 7 Southbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:30 PM	10	51	15	2	78	11	46	35	1	93	19	88	8	2	117	21	95	13	1	130	418
01:45 PM	8	41	7	0	56	17	49	28	1	95	22	78	4	0	104	9	91	12	2	114	369
Total	38	216	49	2	305	44	209	120	3	376	83	299	32	2	416	51	378	47	5	481	1578
02:00 PM	6	59	14	0	79	8	52	26	0	86	18	70	4	1	93	19	103	6	2	130	388
02:15 PM	11	63	12	2	88	15	74	31	0	120	27	96	5	0	128	16	87	19	1	123	459
02:30 PM	7	65	13	1	86	18	67	29	0	114	26	93	4	0	123	7	89	12	2	110	433
02:45 PM	8	84	17	0	109	18	70	23	0	111	25	61	6	1	93	16	74	15	0	105	418
Total	32	271	56	3	362	59	263	109	0	431	96	320	19	2	437	58	353	52	5	468	1698
03:00 PM	2	57	13	0	72	14	93	38	0	145	32	78	3	0	113	12	117	17	0	146	476
03:15 PM	4	62	15	1	82	12	67	38	1	118	30	98	9	0	137	14	107	16	1	138	475
03:30 PM	6	67	11	0	84	18	60	29	0	107	30	73	6	0	109	17	126	20	4	167	467
03:45 PM	8	58	14	0	80	6	75	43	1	125	26	75	5	0	106	18	104	8	2	132	443
Total	20	244	53	1	318	50	295	148	2	495	118	324	23	0	465	61	454	61	7	583	1861
04:00 PM	10	62	14	1	87	11	64	36	0	111	19	81	9	0	109	20	126	6	0	152	459
04:15 PM	6	59	10	0	75	19	73	37	0	129	29	81	11	0	121	20	113	11	1	145	470
04:30 PM	11	82	23	0	116	15	70	49	0	134	29	98	11	1	139	11	115	13	1	140	529
04:45 PM	12	72	17	1	102	16	73	39	0	128	37	75	8	1	121	18	106	14	0	138	489
Total	39	275	64	2	380	61	280	161	0	502	114	335	39	2	490	69	460	44	2	575	1947
05:00 PM	8	53	13	0	74	14	74	40	0	128	27	93	7	1	128	13	117	17	2	149	479
05:15 PM	8	63	15	0	86	13	67	44	0	124	30	72	7	0	109	13	94	11	3	121	440
05:30 PM	7	68	18	0	93	13	64	33	0	110	27	64	8	0	99	17	90	14	4	125	427
05:45 PM	7	61	12	0	80	16	57	34	0	107	27	67	6	0	100	9	81	10	1	101	388
Total	30	245	58	0	333	56	262	151	0	469	111	296	28	1	436	52	382	52	10	496	1734
06:00 PM	5	57	20	0	82	13	60	30	1	104	23	75	9	0	107	13	75	15	1	104	397
06:15 PM	8	57	11	3	79	12	49	35	0	96	39	68	10	1	118	10	77	5	4	96	389
06:30 PM	9	43	10	0	62	13	54	17	3	87	34	67	5	0	106	11	74	5	2	92	347
06:45 PM	5	57	9	0	71	9	44	21	0	74	25	43	3	0	71	11	69	15	1	96	312
Total	27	214	50	3	294	47	207	103	4	361	121	253	27	1	402	45	295	40	8	388	1445
Grand Total	296	2458	705	22	3481	562	2596	1302	17	4477	1077	3872	252	10	5211	558	4047	452	55	5112	18281
Apprch %	8.5	70.6	20.3	0.6		12.6	58	29.1	0.4		20.7	74.3	4.8	0.2		10.9	79.2	8.8	1.1		
Total %	1.6	13.4	3.9	0.1	19	3.1	14.2	7.1	0.1	24.5	5.9	21.2	1.4	0.1	28.5	3.1	22.1	2.5	0.3	28	

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SR 170
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: RAW DATA

Site Code : 507647
Start Date : 9/13/2017

Groups Printed- B&C

	SR 170 (MIDLOTHIAN BLVD.) Eastbound					SR 170 (MIDLOTHIAN BLVD.) Westbound					SR 7 Northbound					SR 7 Southbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	0	0	0	1	3	4	1	0	8	1	4	0	0	5	0	0	0	0	0	14
07:15 AM	0	2	0	0	2	0	3	0	0	3	1	2	0	0	3	0	3	1	0	4	12
07:30 AM	0	4	0	0	4	1	0	0	0	1	3	3	0	0	6	1	1	2	0	4	15
07:45 AM	1	3	1	0	5	3	3	1	0	7	0	5	0	0	5	1	3	0	0	4	21
Total	2	9	1	0	12	7	10	2	0	19	5	14	0	0	19	2	7	3	0	12	62
08:00 AM	0	0	0	0	0	0	4	3	0	7	1	3	0	0	4	0	4	0	0	4	15
08:15 AM	0	2	0	0	2	2	2	0	0	4	0	5	0	0	5	0	4	0	0	4	15
08:30 AM	0	2	0	0	2	0	0	1	0	1	0	2	0	0	2	0	2	1	0	3	8
08:45 AM	0	2	0	0	2	0	3	1	0	4	2	3	0	0	5	1	2	0	0	3	14
Total	0	6	0	0	6	2	9	5	0	16	3	13	0	0	16	1	12	1	0	14	52
09:00 AM	0	0	0	0	0	0	1	0	0	1	1	1	1	0	3	0	3	0	0	3	7
09:15 AM	0	0	0	0	0	0	3	3	0	6	2	3	0	0	5	2	3	0	0	5	16
09:30 AM	0	3	0	0	3	0	4	0	0	4	0	4	1	0	5	0	3	2	0	5	17
09:45 AM	0	1	0	0	1	0	1	1	0	2	2	2	0	0	4	1	3	0	0	4	11
Total	0	4	0	0	4	0	9	4	0	13	5	10	2	0	17	3	12	2	0	17	51
10:00 AM	0	1	0	0	1	0	1	2	0	3	0	4	0	0	4	0	2	0	0	2	10
10:15 AM	1	3	0	0	4	1	2	1	0	4	1	0	1	0	2	0	4	0	0	4	14
10:30 AM	0	3	0	0	3	1	3	1	0	5	2	5	0	0	7	0	1	0	0	1	16
10:45 AM	1	2	0	0	3	0	2	0	0	2	0	2	0	0	2	0	2	0	0	2	9
Total	2	9	0	0	11	2	8	4	0	14	3	11	1	0	15	0	9	0	0	9	49
11:00 AM	0	1	2	0	3	0	2	0	0	2	3	3	0	0	6	0	2	1	0	3	14
11:15 AM	0	2	0	0	2	0	0	0	0	0	0	2	1	0	3	0	4	0	0	4	9
11:30 AM	0	2	0	0	2	0	2	0	0	2	1	1	0	0	2	0	1	0	0	1	7
11:45 AM	0	0	0	0	0	1	4	0	0	5	4	2	0	0	6	1	3	0	0	4	15
Total	0	5	2	0	7	1	8	0	0	9	8	8	1	0	17	1	10	1	0	12	45
12:00 PM	0	0	0	0	0	1	2	0	0	3	0	1	0	0	1	0	3	0	0	3	7
12:15 PM	0	3	0	0	3	0	1	1	0	2	2	1	0	0	3	0	3	0	0	3	11
12:30 PM	0	1	0	0	1	1	2	0	0	3	1	2	0	0	3	2	2	0	0	4	11
12:45 PM	1	1	1	0	3	0	0	1	0	1	0	3	0	0	3	1	3	1	0	5	12
Total	1	5	1	0	7	2	5	2	0	9	3	7	0	0	10	3	11	1	0	15	41
01:00 PM	1	2	1	0	4	0	2	1	0	3	1	4	0	0	5	0	3	1	0	4	16
01:15 PM	0	0	0	0	0	0	3	1	0	4	0	4	0	0	4	0	1	0	0	1	9

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SR 170
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: RAW DATA

Site Code : 507647
Start Date : 9/13/2017

Groups Printed- B&C

	SR 170 (MIDLOTHIAN BLVD.) Eastbound					SR 170 (MIDLOTHIAN BLVD.) Westbound					SR 7 Northbound					SR 7 Southbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:30 PM	0	1	0	0	1	1	4	0	0	5	1	4	0	0	5	0	3	0	0	3	14
01:45 PM	0	2	1	0	3	0	1	2	0	3	0	6	0	0	6	0	8	0	0	8	20
Total	1	5	2	0	8	1	10	4	0	15	2	18	0	0	20	0	15	1	0	16	59
02:00 PM	0	3	1	0	4	1	1	1	0	3	0	4	0	0	4	0	4	0	0	4	15
02:15 PM	0	0	1	0	1	1	2	1	0	4	2	6	0	0	8	0	3	1	0	4	17
02:30 PM	0	2	1	0	3	1	3	1	0	5	0	2	0	0	2	0	2	0	0	2	12
02:45 PM	0	6	1	0	7	0	2	0	0	2	1	3	0	0	4	2	3	0	0	5	18
Total	0	11	4	0	15	3	8	3	0	14	3	15	0	0	18	2	12	1	0	15	62
03:00 PM	0	7	2	0	9	0	0	1	0	1	0	3	0	0	3	1	3	0	0	4	17
03:15 PM	0	3	0	0	3	1	5	0	0	6	0	1	0	0	1	1	5	0	0	6	16
03:30 PM	0	1	0	0	1	0	3	2	0	5	1	3	0	0	4	1	2	1	0	4	14
03:45 PM	1	1	0	0	2	1	1	0	0	2	1	3	1	0	5	1	1	1	0	3	12
Total	1	12	2	0	15	2	9	3	0	14	2	10	1	0	13	4	11	2	0	17	59
04:00 PM	0	2	0	0	2	0	1	1	0	2	1	4	0	0	5	0	2	0	0	2	11
04:15 PM	0	2	0	0	2	0	2	2	0	4	0	3	0	0	3	0	2	0	0	2	11
04:30 PM	0	1	0	0	1	0	1	0	0	1	0	3	0	0	3	0	1	0	0	1	6
04:45 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3
Total	0	7	0	0	7	0	4	3	0	7	1	10	0	0	11	0	6	0	0	6	31
05:00 PM	0	0	0	0	0	1	1	0	0	2	2	1	0	0	3	0	0	0	0	0	5
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	3
05:30 PM	0	1	0	0	1	0	1	1	0	2	1	2	0	0	3	0	1	0	0	1	7
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	1	0	0	1	1	2	1	0	4	3	5	0	0	8	0	3	0	0	3	16
06:00 PM	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	3
06:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	3
06:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2
06:45 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	2
Total	0	1	0	0	1	0	0	1	0	1	1	3	0	0	4	0	4	0	0	4	10
Grand Total	7	75	12	0	94	21	82	32	0	135	39	124	5	0	168	16	112	12	0	140	537
Apprch %	7.4	79.8	12.8	0		15.6	60.7	23.7	0		23.2	73.8	3	0		11.4	80	8.6	0		
Total %	1.3	14	2.2	0	17.5	3.9	15.3	6	0	25.1	7.3	23.1	0.9	0	31.3	3	20.9	2.2	0	26.1	

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SR 170
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: RAW DATA

Site Code : 507647
Start Date : 9/13/2017

Groups Printed- P&A - B&C

	SR 170 (MIDLOTHIAN BLVD.) Eastbound					SR 170 (MIDLOTHIAN BLVD.) Westbound					SR 7 Northbound					SR 7 Southbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	2	22	12	0	36	7	38	14	0	59	23	82	0	0	105	2	26	1	0	29	229
07:15 AM	0	39	17	0	56	6	34	10	0	50	21	88	2	0	111	6	32	4	0	42	259
07:30 AM	2	58	33	0	93	16	48	22	0	86	25	160	2	0	187	8	54	9	0	71	437
07:45 AM	4	66	38	0	108	13	52	20	0	85	15	119	4	0	138	11	74	5	0	90	421
Total	8	185	100	0	293	42	172	66	0	280	84	449	8	0	541	27	186	19	0	232	1346
08:00 AM	0	34	14	0	48	12	55	21	0	88	8	93	0	0	101	7	58	4	0	69	306
08:15 AM	2	36	17	0	55	12	45	21	0	78	18	93	1	0	112	12	59	4	0	75	320
08:30 AM	4	44	13	1	62	8	41	28	0	77	14	97	3	0	114	7	71	9	0	87	340
08:45 AM	5	45	15	0	65	8	40	24	0	72	21	96	2	0	119	14	75	7	0	96	352
Total	11	159	59	1	230	40	181	94	0	315	61	379	6	0	446	40	263	24	0	327	1318
09:00 AM	7	32	8	1	48	6	37	20	0	63	13	85	2	0	100	11	61	5	0	77	288
09:15 AM	3	40	18	0	61	11	48	24	0	83	19	84	3	0	106	8	68	5	0	81	331
09:30 AM	2	40	18	0	60	11	45	14	2	72	16	99	2	0	117	17	69	8	0	94	343
09:45 AM	1	43	16	0	60	9	43	35	0	87	21	69	4	0	94	11	82	4	1	98	339
Total	13	155	60	1	229	37	173	93	2	305	69	337	11	0	417	47	280	22	1	350	1301
10:00 AM	6	44	8	0	58	8	37	11	0	56	12	76	3	0	91	7	73	4	4	88	293
10:15 AM	5	37	8	2	52	12	42	23	2	79	21	68	2	1	92	6	93	9	2	110	333
10:30 AM	13	42	15	0	70	11	45	25	0	81	20	72	11	0	103	7	84	7	2	100	354
10:45 AM	10	42	11	0	63	10	59	24	1	94	23	57	7	0	87	7	83	10	2	102	346
Total	34	165	42	2	243	41	183	83	3	310	76	273	23	1	373	27	333	30	10	400	1326
11:00 AM	6	45	13	0	64	7	45	17	0	69	26	77	3	0	106	12	71	10	0	93	332
11:15 AM	10	37	8	0	55	7	40	27	0	74	20	82	5	0	107	18	102	6	1	127	363
11:30 AM	10	51	14	0	75	6	46	29	1	82	22	97	4	0	123	5	86	9	0	100	380
11:45 AM	5	45	15	0	65	11	67	22	0	100	27	76	2	0	105	12	86	4	2	104	374
Total	31	178	50	0	259	31	198	95	1	325	95	332	14	0	441	47	345	29	3	424	1449
12:00 PM	6	43	19	1	69	25	53	19	0	97	19	80	8	0	107	14	102	9	0	125	398
12:15 PM	6	42	22	1	71	10	52	23	0	85	26	85	5	0	116	7	94	13	0	114	386
12:30 PM	4	44	14	0	62	17	58	19	1	95	17	81	5	0	103	15	92	6	2	115	375
12:45 PM	2	60	13	5	80	16	59	35	1	111	14	92	8	1	115	8	91	12	2	113	419
Total	18	189	68	7	282	68	222	96	2	388	76	338	26	1	441	44	379	40	4	467	1578
01:00 PM	10	65	17	0	92	10	58	27	0	95	22	64	10	0	96	11	103	10	2	126	409
01:15 PM	11	61	11	0	83	6	61	32	1	100	21	77	10	0	108	10	93	13	0	116	407

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF TECHNICAL SERVICES
1980 WEST BROAD STREET, 2ND FLOOR N.E.
COLUMBUS, OHIO 43223
(614) 466-3728

LOCATION: SR 7 AT SR 170
COUNTED BY: COUNT ELECTRONICS
WEATHER: CLOUDY
NOTES: RAW DATA

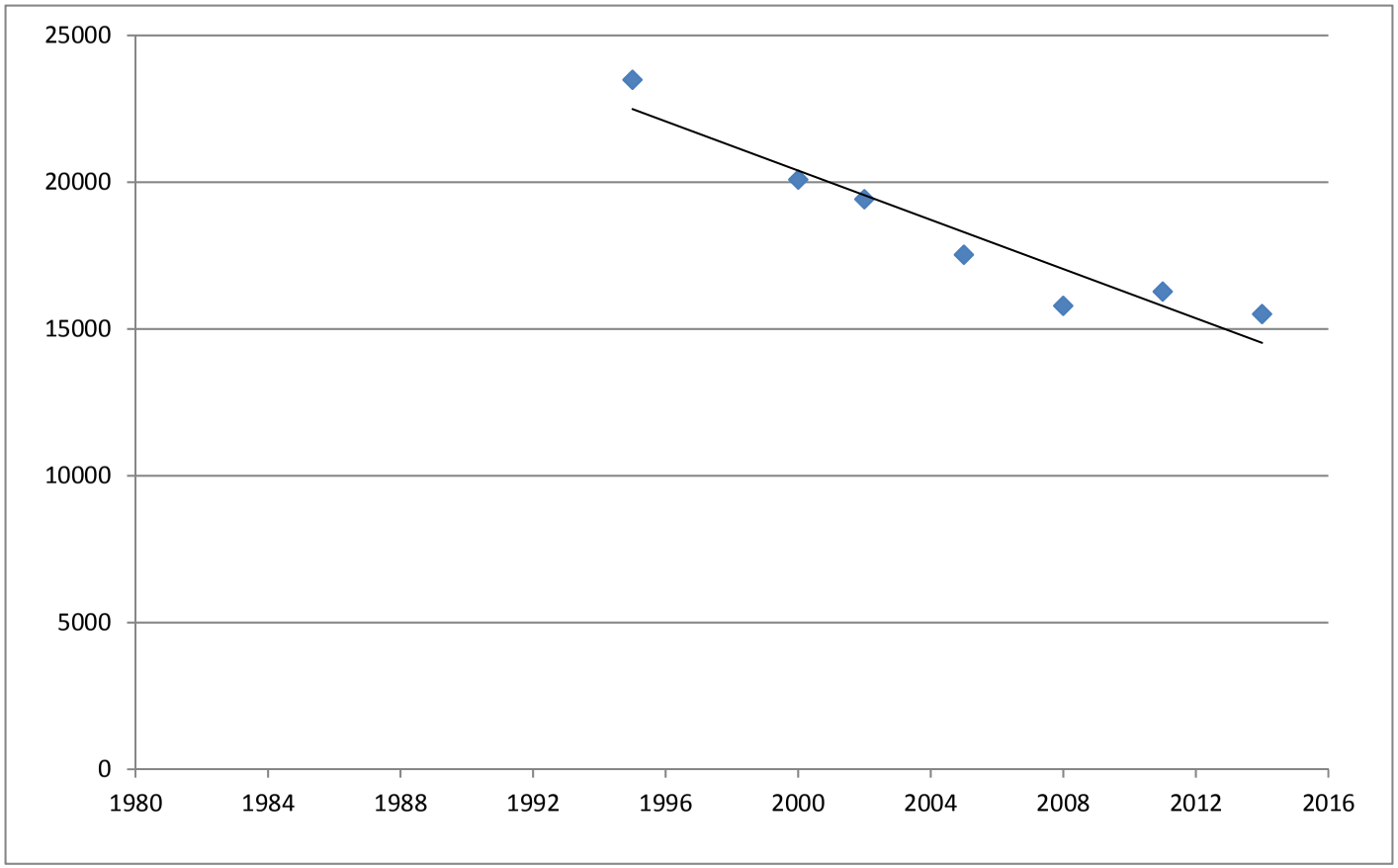
Site Code : 507647
Start Date : 9/13/2017

Groups Printed- P&A - B&C

	SR 170 (MIDLOTHIAN BLVD.) Eastbound					SR 170 (MIDLOTHIAN BLVD.) Westbound					SR 7 Northbound					SR 7 Southbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:30 PM	10	52	15	2	79	12	50	35	1	98	20	92	8	2	122	21	98	13	1	133	432
01:45 PM	8	43	8	0	59	17	50	30	1	98	22	84	4	0	110	9	99	12	2	122	389
Total	39	221	51	2	313	45	219	124	3	391	85	317	32	2	436	51	393	48	5	497	1637
02:00 PM	6	62	15	0	83	9	53	27	0	89	18	74	4	1	97	19	107	6	2	134	403
02:15 PM	11	63	13	2	89	16	76	32	0	124	29	102	5	0	136	16	90	20	1	127	476
02:30 PM	7	67	14	1	89	19	70	30	0	119	26	95	4	0	125	7	91	12	2	112	445
02:45 PM	8	90	18	0	116	18	72	23	0	113	26	64	6	1	97	18	77	15	0	110	436
Total	32	282	60	3	377	62	271	112	0	445	99	335	19	2	455	60	365	53	5	483	1760
03:00 PM	2	64	15	0	81	14	93	39	0	146	32	81	3	0	116	13	120	17	0	150	493
03:15 PM	4	65	15	1	85	13	72	38	1	124	30	99	9	0	138	15	112	16	1	144	491
03:30 PM	6	68	11	0	85	18	63	31	0	112	31	76	6	0	113	18	128	21	4	171	481
03:45 PM	9	59	14	0	82	7	76	43	1	127	27	78	6	0	111	19	105	9	2	135	455
Total	21	256	55	1	333	52	304	151	2	509	120	334	24	0	478	65	465	63	7	600	1920
04:00 PM	10	64	14	1	89	11	65	37	0	113	20	85	9	0	114	20	128	6	0	154	470
04:15 PM	6	61	10	0	77	19	75	39	0	133	29	84	11	0	124	20	115	11	1	147	481
04:30 PM	11	83	23	0	117	15	71	49	0	135	29	101	11	1	142	11	116	13	1	141	535
04:45 PM	12	74	17	1	104	16	73	39	0	128	37	75	8	1	121	18	107	14	0	139	492
Total	39	282	64	2	387	61	284	164	0	509	115	345	39	2	501	69	466	44	2	581	1978
05:00 PM	8	53	13	0	74	15	75	40	0	130	29	94	7	1	131	13	117	17	2	149	484
05:15 PM	8	63	15	0	86	13	67	44	0	124	30	74	7	0	111	13	95	11	3	122	443
05:30 PM	7	69	18	0	94	13	65	34	0	112	28	66	8	0	102	17	91	14	4	126	434
05:45 PM	7	61	12	0	80	16	57	34	0	107	27	67	6	0	100	9	82	10	1	102	389
Total	30	246	58	0	334	57	264	152	0	473	114	301	28	1	444	52	385	52	10	499	1750
06:00 PM	5	58	20	0	83	13	60	30	1	104	24	76	9	0	109	13	75	15	1	104	400
06:15 PM	8	57	11	3	79	12	49	35	0	96	39	69	10	1	119	10	79	5	4	98	392
06:30 PM	9	43	10	0	62	13	54	17	3	87	34	68	5	0	107	11	75	5	2	93	349
06:45 PM	5	57	9	0	71	9	44	22	0	75	25	43	3	0	71	11	70	15	1	97	314
Total	27	215	50	3	295	47	207	104	4	362	122	256	27	1	406	45	299	40	8	392	1455
Grand Total	303	2533	717	22	3575	583	2678	1334	17	4612	1116	3996	257	10	5379	574	4159	464	55	5252	18818
Apprch %	8.5	70.9	20.1	0.6		12.6	58.1	28.9	0.4		20.7	74.3	4.8	0.2		10.9	79.2	8.8	1		
Total %	1.6	13.5	3.8	0.1	19	3.1	14.2	7.1	0.1	24.5	5.9	21.2	1.4	0.1	28.6	3.1	22.1	2.5	0.3	27.9	
P&A	296	2458	705	22	3481	562	2596	1302	17	4477	1077	3872	252	10	5211	558	4047	452	55	5112	18281
% P&A	97.7	97	98.3	100	97.4	96.4	96.9	97.6	100	97.1	96.5	96.9	98.1	100	96.9	97.2	97.3	97.4	100	97.3	97.1
B&C	7	75	12	0	94	21	82	32	0	135	39	124	5	0	168	16	112	12	0	140	537
% B&C	2.3	3	1.7	0	2.6	3.6	3.1	2.4	0	2.9	3.5	3.1	1.9	0	3.1	2.8	2.7	2.6	0	2.7	2.9

APPENDIX B
GROWTH RATE CALCULATIONS

Roadway Section	State Route 7 North of Meadowbrook - Historical Traffic Volumes							Growth Rate
	1995	2000	2002	2005	2008	2011	2014	
State Route 7	23490	20090	19420	17530	15790	16276	15511	
Trendline	*22493*	*20397*	*19559*	*18301*	*17043*	*15786*	*14528*	*-2.89%*



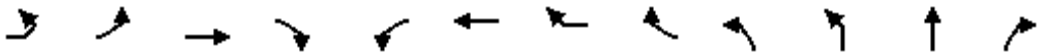
APPENDIX C
HCM INTERSECTION CAPACITY ANALYSIS - 'NO-BUILD'

DESIGN YEAR 2041 'NO-BUILD

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	200	10	120	200	50	10	520	70	30	380	40
Future Volume (veh/h)	100	200	10	120	200	50	10	520	70	30	380	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	109	217	11	130	217	54	11	565	76	33	413	43
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	447	926	47	471	762	186	457	1105	148	138	1140	118
Arrive On Green	0.08	0.27	0.27	0.08	0.27	0.27	0.08	0.35	0.35	0.08	0.35	0.35
Sat Flow, veh/h	1774	3429	173	1774	2823	688	1774	3137	421	1774	3238	335
Grp Volume(v), veh/h	109	111	117	130	134	137	11	318	323	33	225	231
Grp Sat Flow(s),veh/h/ln	1774	1770	1832	1774	1770	1741	1774	1770	1788	1774	1770	1804
Q Serve(g_s), s	3.8	4.4	4.5	4.6	5.4	5.6	0.3	12.8	12.8	1.6	8.5	8.6
Cycle Q Clear(g_c), s	3.8	4.4	4.5	4.6	5.4	5.6	0.3	12.8	12.8	1.6	8.5	8.6
Prop In Lane	1.00		0.09	1.00		0.39	1.00		0.24	1.00		0.19
Lane Grp Cap(c), veh/h	447	478	495	471	478	470	457	623	630	138	623	635
V/C Ratio(X)	0.24	0.23	0.24	0.28	0.28	0.29	0.02	0.51	0.51	0.24	0.36	0.36
Avail Cap(c_a), veh/h	447	478	495	471	478	470	457	623	630	138	623	635
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	25.6	25.6	20.8	25.9	26.0	15.1	23.0	23.0	39.0	21.6	21.7
Incr Delay (d2), s/veh	1.3	1.1	1.1	1.5	1.5	1.6	0.1	3.0	3.0	4.1	1.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	2.3	2.4	2.4	2.8	2.9	0.2	6.7	6.8	0.9	4.4	4.5
LnGrp Delay(d),s/veh	21.9	26.7	26.7	22.2	27.4	27.6	15.2	26.0	26.0	43.1	23.3	23.3
LnGrp LOS	C	C	C	C	C	C	B	C	C	D	C	C
Approach Vol, veh/h		337			401			652			489	
Approach Delay, s/veh		25.2			25.8			25.8			24.6	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	36.7	12.0	29.3	12.0	36.7	12.0	29.3
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	31.7	7.0	24.3	7.0	31.7	7.0	24.3
Max Q Clear Time (g_c+I1), s	3.6	14.8	6.6	6.5	2.3	10.6	5.8	7.6
Green Ext Time (p_c), s	0.0	3.1	0.0	1.3	0.0	3.3	0.0	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	25.4
HCM 2010 LOS	C



Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	10	70	160	100	60	150	20	30	70	30	490	30
Future Volume (vph)	10	70	160	100	60	150	20	30	70	30	490	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0				5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00				1.00	0.95	
Frt		1.00	0.94		1.00	0.96				1.00	0.99	
Flt Protected		0.95	1.00		0.95	1.00				0.95	1.00	
Satd. Flow (prot)		1770	1755		1770	1792				1770	3508	
Flt Permitted		0.48	1.00		0.35	1.00				0.20	1.00	
Satd. Flow (perm)		887	1755		649	1792				381	3508	
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	76	174	109	65	163	22	33	76	33	533	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	87	283	0	65	218	0	0	0	109	561	0
Turn Type	pm+pt	pm+pt	NA		pm+pt	NA			pm+pt	pm+pt	NA	
Protected Phases	7	7	4		3	8			5	5	2	
Permitted Phases	4	4			8				2	2		
Actuated Green, G (s)		26.9	19.9		26.9	19.9				30.9	30.9	
Effective Green, g (s)		26.9	19.9		26.9	19.9				30.9	30.9	
Actuated g/C Ratio		0.30	0.22		0.30	0.22				0.34	0.34	
Clearance Time (s)		5.0	5.0		5.0	5.0				5.0	5.0	
Lane Grp Cap (vph)		333	388		281	396				238	1204	
v/s Ratio Prot		c0.02	c0.16		0.02	0.12				0.04	c0.16	
v/s Ratio Perm		0.06			0.05					0.12		
v/c Ratio		0.26	0.73		0.23	0.55				0.46	0.47	
Uniform Delay, d1		23.4	32.5		23.3	31.1				21.8	23.1	
Progression Factor		1.00	1.00		1.00	1.00				1.00	1.00	
Incremental Delay, d2		1.9	11.4		1.9	5.4				6.2	1.3	
Delay (s)		25.3	44.0		25.3	36.5				28.0	24.4	
Level of Service		C	D		C	D				C	C	
Approach Delay (s)			39.6			33.9					25.0	
Approach LOS			D			C					C	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2	SEL2	SEL	SER	SER2
Lane Configurations								
Traffic Volume (vph)	20	420	60	10	10	20	30	10
Future Volume (vph)	20	420	60	10	10	20	30	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0				5.0		
Lane Util. Factor	1.00	0.95				1.00		
Frt	1.00	0.98				0.92		
Flt Protected	0.95	1.00				0.98		
Satd. Flow (prot)	1770	3464				1683		
Flt Permitted	0.44	1.00				0.98		
Satd. Flow (perm)	819	3464				1683		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	457	65	11	11	22	33	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	22	533	0	0	0	77	0	0
Turn Type	Perm	NA			Perm	Prot		
Protected Phases		6				9		
Permitted Phases	6				9			
Actuated Green, G (s)	18.9	18.9				12.2		
Effective Green, g (s)	18.9	18.9				12.2		
Actuated g/C Ratio	0.21	0.21				0.14		
Clearance Time (s)	5.0	5.0				5.0		
Lane Grp Cap (vph)	171	727				228		
v/s Ratio Prot		c0.15						
v/s Ratio Perm	0.03					0.05		
v/c Ratio	0.13	0.73				0.34		
Uniform Delay, d1	28.9	33.2				35.2		
Progression Factor	1.00	1.00				1.00		
Incremental Delay, d2	1.5	6.5				4.0		
Delay (s)	30.4	39.7				39.2		
Level of Service	C	D				D		
Approach Delay (s)		39.3				39.2		
Approach LOS		D				D		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	10	100	10	30	10	580	70	30	570	10
Future Volume (veh/h)	10	10	10	100	10	30	10	580	70	30	570	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	11	11	11	109	11	33	11	630	76	33	620	11
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	253	252	226	495	56	133	362	1488	179	328	1664	30
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.47	0.47	0.47	0.47	0.47	0.47
Sat Flow, veh/h	474	597	536	1012	132	315	792	3182	383	739	3558	63
Grp Volume(v), veh/h	33	0	0	153	0	0	11	350	356	33	308	323
Grp Sat Flow(s),veh/h/ln	1607	0	0	1459	0	0	792	1770	1795	739	1770	1852
Q Serve(g_s), s	0.0	0.0	0.0	4.9	0.0	0.0	0.8	11.8	11.8	2.8	10.1	10.1
Cycle Q Clear(g_c), s	1.0	0.0	0.0	5.9	0.0	0.0	10.9	11.8	11.8	14.6	10.1	10.1
Prop In Lane	0.33		0.33	0.71		0.22	1.00		0.21	1.00		0.03
Lane Grp Cap(c), veh/h	730	0	0	683	0	0	362	828	840	328	828	866
V/C Ratio(X)	0.05	0.00	0.00	0.22	0.00	0.00	0.03	0.42	0.42	0.10	0.37	0.37
Avail Cap(c_a), veh/h	730	0	0	683	0	0	362	828	840	328	828	866
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.4	0.0	0.0	16.7	0.0	0.0	19.0	15.9	15.9	20.8	15.4	15.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.8	0.0	0.0	0.2	1.6	1.6	0.6	1.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	2.6	0.0	0.0	0.2	6.1	6.2	0.6	5.2	5.4
LnGrp Delay(d),s/veh	15.5	0.0	0.0	17.5	0.0	0.0	19.1	17.5	17.5	21.4	16.7	16.7
LnGrp LOS	B			B			B	B	B	C	B	B
Approach Vol, veh/h		33			153			717			664	
Approach Delay, s/veh		15.5			17.5			17.5			16.9	
Approach LOS		B			B			B			B	

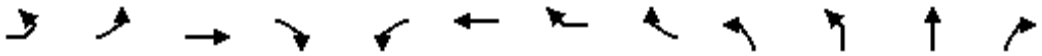
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		47.1		42.9		47.1		42.9
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		42.1		37.9		42.1		37.9
Max Q Clear Time (g_c+I1), s		13.8		3.0		16.6		7.9
Green Ext Time (p_c), s		4.6		0.6		4.5		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	17.2
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	280	40	170	290	70	50	480	160	60	510	70
Future Volume (veh/h)	60	280	40	170	290	70	50	480	160	60	510	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	65	304	43	185	315	76	54	522	174	65	554	76
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	393	842	118	414	766	182	386	920	305	138	1102	151
Arrive On Green	0.08	0.27	0.27	0.08	0.27	0.27	0.08	0.35	0.35	0.08	0.35	0.35
Sat Flow, veh/h	1774	3118	437	1774	2838	675	1774	2612	867	1774	3129	428
Grp Volume(v), veh/h	65	171	176	185	195	196	54	353	343	65	313	317
Grp Sat Flow(s),veh/h/ln	1774	1770	1786	1774	1770	1744	1774	1770	1710	1774	1770	1787
Q Serve(g_s), s	2.2	7.0	7.2	6.8	8.1	8.3	1.6	14.5	14.6	3.2	12.5	12.6
Cycle Q Clear(g_c), s	2.2	7.0	7.2	6.8	8.1	8.3	1.6	14.5	14.6	3.2	12.5	12.6
Prop In Lane	1.00		0.24	1.00		0.39	1.00		0.51	1.00		0.24
Lane Grp Cap(c), veh/h	393	478	482	414	478	471	386	623	602	138	623	629
V/C Ratio(X)	0.17	0.36	0.36	0.45	0.41	0.42	0.14	0.57	0.57	0.47	0.50	0.50
Avail Cap(c_a), veh/h	393	478	482	414	478	471	386	623	602	138	623	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	26.5	26.6	21.7	26.9	27.0	16.0	23.6	23.6	39.7	22.9	23.0
Incr Delay (d2), s/veh	0.9	2.1	2.1	3.5	2.6	2.7	0.8	3.7	3.9	11.1	2.9	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	3.7	3.8	3.7	4.3	4.3	0.9	7.7	7.5	2.0	6.6	6.7
LnGrp Delay(d),s/veh	21.2	28.6	28.7	25.2	29.5	29.7	16.8	27.3	27.5	50.8	25.8	25.8
LnGrp LOS	C	C	C	C	C	C	B	C	C	D	C	C
Approach Vol, veh/h		412			576			750			695	
Approach Delay, s/veh		27.5			28.2			26.6			28.2	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	36.7	12.0	29.3	12.0	36.7	12.0	29.3
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	31.7	7.0	24.3	7.0	31.7	7.0	24.3
Max Q Clear Time (g_c+I1), s	5.2	16.6	8.8	9.2	3.6	14.6	4.2	10.3
Green Ext Time (p_c), s	0.0	3.9	0.0	2.0	0.0	4.0	0.0	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	27.6
HCM 2010 LOS	C



Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	10	70	240	130	80	240	30	20	180	70	590	80
Future Volume (vph)	10	70	240	130	80	240	30	20	180	70	590	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0				5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00				1.00	0.95	
Frt		1.00	0.95		1.00	0.97				1.00	0.98	
Flt Protected		0.95	1.00		0.95	1.00				0.95	1.00	
Satd. Flow (prot)		1770	1765		1770	1814				1770	3476	
Flt Permitted		0.30	1.00		0.16	1.00				0.12	1.00	
Satd. Flow (perm)		559	1765		298	1814				228	3476	
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	76	261	141	87	261	33	22	196	76	641	87
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	87	402	0	87	316	0	0	0	272	719	0
Turn Type	pm+pt	pm+pt	NA		pm+pt	NA			pm+pt	pm+pt	NA	
Protected Phases	7	7	4		3	8			5	5	2	
Permitted Phases	4	4			8				2	2		
Actuated Green, G (s)		37.0	30.0		37.0	30.0				48.7	48.7	
Effective Green, g (s)		37.0	30.0		37.0	30.0				48.7	48.7	
Actuated g/C Ratio		0.31	0.25		0.31	0.25				0.41	0.41	
Clearance Time (s)		5.0	5.0		5.0	5.0				5.0	5.0	
Lane Grp Cap (vph)		243	441		177	453				298	1410	
v/s Ratio Prot		0.02	c0.23		c0.03	0.17				c0.12	0.21	
v/s Ratio Perm		0.09			0.12					c0.25		
v/c Ratio		0.36	0.91		0.49	0.70				0.91	0.51	
Uniform Delay, d1		31.1	43.7		32.2	40.9				32.5	26.7	
Progression Factor		1.00	1.00		1.00	1.00				1.00	1.00	
Incremental Delay, d2		4.1	25.6		9.4	8.6				33.9	1.3	
Delay (s)		35.2	69.3		41.6	49.5				66.4	28.0	
Level of Service		D	E		D	D				E	C	
Approach Delay (s)			63.2			47.8					38.5	
Approach LOS			E			D					D	

Intersection Summary			
HCM 2000 Control Delay	52.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2	SEL2	SEL	SER	SER2
Lane Configurations								
Traffic Volume (vph)	30	610	70	10	10	30	60	10
Future Volume (vph)	30	610	70	10	10	30	60	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0				5.0		
Lane Util. Factor	1.00	0.95				1.00		
Frt	1.00	0.98				0.91		
Flt Protected	0.95	1.00				0.98		
Satd. Flow (prot)	1770	3478				1673		
Flt Permitted	0.38	1.00				0.98		
Satd. Flow (perm)	699	3478				1673		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	663	76	11	11	33	65	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	33	750	0	0	0	120	0	0
Turn Type	Perm	NA			Perm	Prot		
Protected Phases		6				9		
Permitted Phases	6				9			
Actuated Green, G (s)	27.7	27.7				14.3		
Effective Green, g (s)	27.7	27.7				14.3		
Actuated g/C Ratio	0.23	0.23				0.12		
Clearance Time (s)	5.0	5.0				5.0		
Lane Grp Cap (vph)	161	802				199		
v/s Ratio Prot		0.22						
v/s Ratio Perm	0.05					0.07		
v/c Ratio	0.20	0.94				0.60		
Uniform Delay, d1	37.3	45.3				50.2		
Progression Factor	1.00	1.00				1.00		
Incremental Delay, d2	2.9	19.4				12.8		
Delay (s)	40.1	64.7				63.0		
Level of Service	D	E				E		
Approach Delay (s)		63.7				63.0		
Approach LOS		E				E		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	10	130	10	50	10	860	160	30	840	10
Future Volume (veh/h)	10	10	10	130	10	50	10	860	160	30	840	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	11	11	11	141	11	54	11	935	174	33	913	11
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	239	238	212	449	43	151	274	1474	274	213	1771	21
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.49	0.49	0.49	0.49	0.49	0.49
Sat Flow, veh/h	472	604	538	969	110	383	603	2980	554	506	3582	43
Grp Volume(v), veh/h	33	0	0	206	0	0	11	555	554	33	451	473
Grp Sat Flow(s),veh/h/ln	1614	0	0	1462	0	0	603	1770	1765	506	1770	1855
Q Serve(g_s), s	0.0	0.0	0.0	7.7	0.0	0.0	1.1	20.8	20.8	4.6	15.6	15.6
Cycle Q Clear(g_c), s	1.0	0.0	0.0	8.7	0.0	0.0	16.7	20.8	20.8	25.4	15.6	15.6
Prop In Lane	0.33		0.33	0.68		0.26	1.00		0.31	1.00		0.02
Lane Grp Cap(c), veh/h	690	0	0	644	0	0	274	875	873	213	875	917
V/C Ratio(X)	0.05	0.00	0.00	0.32	0.00	0.00	0.04	0.63	0.63	0.15	0.52	0.52
Avail Cap(c_a), veh/h	690	0	0	644	0	0	274	875	873	213	875	917
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	0.0	0.0	19.1	0.0	0.0	21.1	16.8	16.8	26.1	15.4	15.4
Incr Delay (d2), s/veh	0.1	0.0	0.0	1.3	0.0	0.0	0.3	3.5	3.5	1.5	2.2	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	3.8	0.0	0.0	0.2	10.9	10.9	0.7	8.0	8.4
LnGrp Delay(d),s/veh	16.9	0.0	0.0	20.4	0.0	0.0	21.4	20.2	20.3	27.7	17.6	17.5
LnGrp LOS	B			C			C	C	C	C	B	B
Approach Vol, veh/h		33			206			1120			957	
Approach Delay, s/veh		16.9			20.4			20.3			17.9	
Approach LOS		B			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		49.5		40.5		49.5		40.5
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		44.5		35.5		44.5		35.5
Max Q Clear Time (g_c+I1), s		22.8		3.0		27.4		10.7
Green Ext Time (p_c), s		7.8		0.7		7.1		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

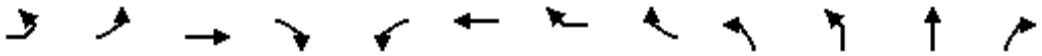
APPENDIX D
HCM INTERSECTION CAPACITY ANALYSIS - 'BUILD'

DESIGN YEAR 2041 'BUILD'

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	200	10	120	200	50	10	520	70	30	380	40
Future Volume (veh/h)	100	200	10	120	200	50	10	520	70	30	380	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	109	217	11	130	217	54	11	565	76	33	413	43
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	361	678	34	382	558	136	461	683	92	138	791	672
Arrive On Green	0.08	0.20	0.20	0.08	0.20	0.20	0.08	0.42	0.42	0.08	0.42	0.42
Sat Flow, veh/h	1774	3429	173	1774	2823	688	1774	1608	216	1774	1863	1583
Grp Volume(v), veh/h	109	111	117	130	134	137	11	0	641	33	413	43
Grp Sat Flow(s),veh/h/ln	1774	1770	1832	1774	1770	1741	1774	0	1825	1774	1863	1583
Q Serve(g_s), s	4.3	4.9	4.9	5.2	5.9	6.2	0.3	0.0	28.1	1.6	14.8	1.4
Cycle Q Clear(g_c), s	4.3	4.9	4.9	5.2	5.9	6.2	0.3	0.0	28.1	1.6	14.8	1.4
Prop In Lane	1.00		0.09	1.00		0.39	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	361	350	362	382	350	344	461	0	774	138	791	672
V/C Ratio(X)	0.30	0.32	0.32	0.34	0.38	0.40	0.02	0.00	0.83	0.24	0.52	0.06
Avail Cap(c_a), veh/h	361	350	362	382	350	344	461	0	774	138	791	672
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.4	30.9	30.9	25.6	31.3	31.4	12.4	0.0	23.0	39.0	19.2	15.3
Incr Delay (d2), s/veh	2.1	2.4	2.3	2.4	3.2	3.4	0.1	0.0	9.9	4.1	2.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	2.6	2.7	2.8	3.2	3.3	0.1	0.0	16.2	0.9	8.1	0.7
LnGrp Delay(d),s/veh	27.5	33.3	33.3	28.0	34.5	34.8	12.5	0.0	32.9	43.1	21.6	15.5
LnGrp LOS	C	C	C	C	C	C	B		C	D	C	B
Approach Vol, veh/h		337			401			652			489	
Approach Delay, s/veh		31.4			32.5			32.5			22.5	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	43.2	12.0	22.8	12.0	43.2	12.0	22.8
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	38.2	7.0	17.8	7.0	38.2	7.0	17.8
Max Q Clear Time (g_c+I1), s	3.6	30.1	7.2	6.9	2.3	16.8	6.3	8.2
Green Ext Time (p_c), s	0.0	2.5	0.0	1.1	0.0	3.6	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	29.7
HCM 2010 LOS	C



Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	10	70	160	100	60	150	20	30	70	30	490	30
Future Volume (vph)	10	70	160	100	60	150	20	30	70	30	490	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0				5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00				1.00	1.00	
Frt		1.00	0.94		1.00	0.96				1.00	0.99	
Flt Protected		0.95	1.00		0.95	1.00				0.95	1.00	
Satd. Flow (prot)		1770	1755		1770	1792				1770	1846	
Flt Permitted		0.44	1.00		0.31	1.00				0.11	1.00	
Satd. Flow (perm)		817	1755		574	1792				206	1846	
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	76	174	109	65	163	22	33	76	33	533	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	87	283	0	65	218	0	0	0	109	564	0
Turn Type	pm+pt	pm+pt	NA		pm+pt	NA			pm+pt	pm+pt	NA	
Protected Phases	7	7	4		3	8			5	5	2	
Permitted Phases	4	4			8				2	2		
Actuated Green, G (s)		30.5	23.5		30.5	23.5				47.9	47.9	
Effective Green, g (s)		30.5	23.5		30.5	23.5				47.9	47.9	
Actuated g/C Ratio		0.28	0.21		0.28	0.21				0.44	0.44	
Clearance Time (s)		5.0	5.0		5.0	5.0				5.0	5.0	
Lane Grp Cap (vph)		287	374		235	382				189	803	
v/s Ratio Prot		c0.02	c0.16		0.02	0.12				0.04	c0.31	
v/s Ratio Perm		0.06			0.06					0.21		
v/c Ratio		0.30	0.76		0.28	0.57				0.58	0.70	
Uniform Delay, d1		30.4	40.6		30.4	38.7				23.7	25.2	
Progression Factor		1.00	1.00		1.00	1.00				1.00	1.00	
Incremental Delay, d2		2.7	13.3		2.9	6.1				12.2	5.1	
Delay (s)		33.2	53.9		33.3	44.8				35.9	30.3	
Level of Service		C	D		C	D				D	C	
Approach Delay (s)			49.0			42.2					31.2	
Approach LOS			D			D					C	

Intersection Summary			
HCM 2000 Control Delay	43.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2	SEL2	SEL	SER	SER2
Lane Configurations								
Traffic Volume (vph)	20	420	60	10	10	20	30	10
Future Volume (vph)	20	420	60	10	10	20	30	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0				5.0		
Lane Util. Factor	1.00	1.00				1.00		
Frt	1.00	0.98				0.92		
Flt Protected	0.95	1.00				0.98		
Satd. Flow (prot)	1770	1823				1683		
Flt Permitted	0.31	1.00				0.98		
Satd. Flow (perm)	572	1823				1683		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	457	65	11	11	22	33	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	22	533	0	0	0	77	0	0
Turn Type	Perm	NA			Perm	Prot		
Protected Phases		6				9		
Permitted Phases	6				9			
Actuated Green, G (s)	35.9	35.9				11.6		
Effective Green, g (s)	35.9	35.9				11.6		
Actuated g/C Ratio	0.33	0.33				0.11		
Clearance Time (s)	5.0	5.0				5.0		
Lane Grp Cap (vph)	186	594				177		
v/s Ratio Prot		c0.29						
v/s Ratio Perm	0.04					0.05		
v/c Ratio	0.12	0.90				0.44		
Uniform Delay, d1	26.0	35.3				46.1		
Progression Factor	1.00	1.00				1.00		
Incremental Delay, d2	1.3	18.8				7.6		
Delay (s)	27.3	54.1				53.7		
Level of Service	C	D				D		
Approach Delay (s)		53.0				53.7		
Approach LOS		D				D		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	10	100	10	30	10	580	70	30	570	10
Future Volume (veh/h)	10	10	10	100	10	30	10	580	70	30	570	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	11	11	11	109	11	33	11	630	76	33	620	11
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	222	221	195	433	49	114	306	861	104	250	963	17
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	467	611	539	1010	137	315	792	1631	197	739	1825	32
Grp Volume(v), veh/h	33	0	0	153	0	0	11	0	706	33	0	631
Grp Sat Flow(s),veh/h/ln	1617	0	0	1462	0	0	792	0	1828	739	0	1857
Q Serve(g_s), s	0.0	0.0	0.0	5.4	0.0	0.0	0.9	0.0	26.7	3.2	0.0	21.9
Cycle Q Clear(g_c), s	1.1	0.0	0.0	6.5	0.0	0.0	22.8	0.0	26.7	30.0	0.0	21.9
Prop In Lane	0.33		0.33	0.71		0.22	1.00		0.11	1.00		0.02
Lane Grp Cap(c), veh/h	637	0	0	596	0	0	306	0	965	250	0	980
V/C Ratio(X)	0.05	0.00	0.00	0.26	0.00	0.00	0.04	0.00	0.73	0.13	0.00	0.64
Avail Cap(c_a), veh/h	637	0	0	596	0	0	306	0	965	250	0	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.7	0.0	0.0	20.4	0.0	0.0	23.3	0.0	16.3	27.9	0.0	15.2
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.0	0.0	0.0	0.2	0.0	4.9	1.1	0.0	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	2.8	0.0	0.0	0.2	0.0	14.6	0.7	0.0	11.9
LnGrp Delay(d),s/veh	18.9	0.0	0.0	21.4	0.0	0.0	23.6	0.0	21.2	29.0	0.0	18.5
LnGrp LOS	B			C			C		C	C		B
Approach Vol, veh/h		33			153			717			664	
Approach Delay, s/veh		18.9			21.4			21.3			19.0	
Approach LOS		B			C			C			B	

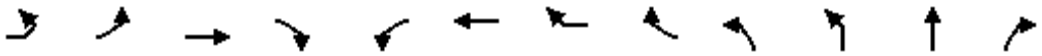
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		52.5		37.5		52.5		37.5
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		47.5		32.5		47.5		32.5
Max Q Clear Time (g_c+I1), s		28.7		3.1		32.0		8.5
Green Ext Time (p_c), s		4.8		0.5		4.5		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	20.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	280	40	170	290	70	50	480	160	60	510	70
Future Volume (veh/h)	60	280	40	170	290	70	50	480	160	60	510	70
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	65	304	43	185	315	76	54	522	174	65	554	76
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	307	599	84	325	546	130	368	575	192	138	801	681
Arrive On Green	0.08	0.19	0.19	0.08	0.19	0.19	0.08	0.43	0.43	0.08	0.43	0.43
Sat Flow, veh/h	1774	3118	437	1774	2838	675	1774	1338	446	1774	1863	1583
Grp Volume(v), veh/h	65	171	176	185	195	196	54	0	696	65	554	76
Grp Sat Flow(s),veh/h/ln	1774	1770	1786	1774	1770	1744	1774	0	1784	1774	1863	1583
Q Serve(g_s), s	2.5	7.8	7.9	7.0	9.0	9.2	1.4	0.0	32.8	3.2	21.7	2.6
Cycle Q Clear(g_c), s	2.5	7.8	7.9	7.0	9.0	9.2	1.4	0.0	32.8	3.2	21.7	2.6
Prop In Lane	1.00		0.24	1.00		0.39	1.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	307	340	343	325	340	335	368	0	767	138	801	681
V/C Ratio(X)	0.21	0.50	0.51	0.57	0.57	0.59	0.15	0.00	0.91	0.47	0.69	0.11
Avail Cap(c_a), veh/h	307	340	343	325	340	335	368	0	767	138	801	681
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.4	32.5	32.6	27.8	33.0	33.1	14.1	0.0	24.0	39.7	20.8	15.4
Incr Delay (d2), s/veh	1.6	5.2	5.4	7.1	6.8	7.3	0.8	0.0	16.5	11.1	4.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	4.3	4.4	1.4	5.0	5.1	0.8	0.0	19.6	2.0	12.2	1.2
LnGrp Delay(d),s/veh	27.0	37.7	37.9	34.9	39.8	40.4	14.9	0.0	40.4	50.8	25.7	15.7
LnGrp LOS	C	D	D	C	D	D	B		D	D	C	B
Approach Vol, veh/h		412			576			750			695	
Approach Delay, s/veh		36.1			38.4			38.6			26.9	
Approach LOS		D			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	43.7	12.0	22.3	12.0	43.7	12.0	22.3
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	7.0	38.7	7.0	17.3	7.0	38.7	7.0	17.3
Max Q Clear Time (g_c+I1), s	5.2	34.8	9.0	9.9	3.4	23.7	4.5	11.2
Green Ext Time (p_c), s	0.0	1.9	0.0	1.5	0.0	4.2	0.0	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	34.8
HCM 2010 LOS	C



Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	10	70	240	130	80	240	30	20	180	70	590	80
Future Volume (vph)	10	70	240	130	80	240	30	20	180	70	590	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0				5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00				1.00	1.00	
Frt		1.00	0.95		1.00	0.97				1.00	0.98	
Flt Protected		0.95	1.00		0.95	1.00				0.95	1.00	
Satd. Flow (prot)		1770	1765		1770	1814				1770	1829	
Flt Permitted		0.20	1.00		0.17	1.00				0.08	1.00	
Satd. Flow (perm)		378	1765		310	1814				156	1829	
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	76	261	141	87	261	33	22	196	76	641	87
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	87	402	0	87	316	0	0	0	272	724	0
Turn Type	pm+pt	pm+pt	NA		pm+pt	NA			pm+pt	pm+pt	NA	
Protected Phases	7	7	4		3	8			5	5	2	
Permitted Phases	4	4			8				2	2		
Actuated Green, G (s)		31.0	24.0		31.0	24.0				59.7	59.7	
Effective Green, g (s)		31.0	24.0		31.0	24.0				59.7	59.7	
Actuated g/C Ratio		0.26	0.20		0.26	0.20				0.50	0.50	
Clearance Time (s)		5.0	5.0		5.0	5.0				5.0	5.0	
Lane Grp Cap (vph)		178	353		165	362				239	909	
v/s Ratio Prot		0.03	c0.23		c0.03	0.17				c0.11	0.40	
v/s Ratio Perm		0.10			0.11					c0.45		
v/c Ratio		0.49	1.14		0.53	0.87				1.14	0.80	
Uniform Delay, d1		35.8	48.0		36.5	46.5				36.3	25.1	
Progression Factor		1.00	1.00		1.00	1.00				1.00	1.00	
Incremental Delay, d2		9.3	91.1		11.5	24.0				100.5	7.2	
Delay (s)		45.1	139.1		48.0	70.6				136.8	32.3	
Level of Service		D	F		D	E				F	C	
Approach Delay (s)			122.4			65.7					60.7	
Approach LOS			F			E					E	

Intersection Summary			
HCM 2000 Control Delay	91.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	104.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2	SEL2	SEL	SER	SER2
Lane Configurations								
Traffic Volume (vph)	30	610	70	10	10	30	60	10
Future Volume (vph)	30	610	70	10	10	30	60	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0				5.0		
Lane Util. Factor	1.00	1.00				1.00		
Frt	1.00	0.98				0.91		
Flt Protected	0.95	1.00				0.98		
Satd. Flow (prot)	1770	1830				1673		
Flt Permitted	0.22	1.00				0.98		
Satd. Flow (perm)	403	1830				1673		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	663	76	11	11	33	65	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	33	750	0	0	0	120	0	0
Turn Type	Perm	NA			Perm	Prot		
Protected Phases		6				9		
Permitted Phases	6				9			
Actuated Green, G (s)	42.7	42.7				9.3		
Effective Green, g (s)	42.7	42.7				9.3		
Actuated g/C Ratio	0.36	0.36				0.08		
Clearance Time (s)	5.0	5.0				5.0		
Lane Grp Cap (vph)	143	651				129		
v/s Ratio Prot		0.41						
v/s Ratio Perm	0.08					0.07		
v/c Ratio	0.23	1.15				0.93		
Uniform Delay, d1	27.1	38.6				55.0		
Progression Factor	1.00	1.00				1.00		
Incremental Delay, d2	3.7	85.2				62.3		
Delay (s)	30.9	123.9				117.4		
Level of Service	C	F				F		
Approach Delay (s)		120.0				117.4		
Approach LOS		F				F		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	10	130	10	50	10	860	160	30	840	10
Future Volume (veh/h)	10	10	10	130	10	50	10	860	160	30	840	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	11	11	11	141	11	54	11	935	174	33	913	11
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	164	162	136	307	32	96	250	976	182	115	1173	14
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.64	0.64	0.64	0.64	0.64	0.64
Sat Flow, veh/h	443	649	546	957	128	386	603	1528	284	506	1837	22
Grp Volume(v), veh/h	33	0	0	206	0	0	11	0	1109	33	0	924
Grp Sat Flow(s),veh/h/ln	1637	0	0	1471	0	0	603	0	1813	506	0	1859
Q Serve(g_s), s	0.0	0.0	0.0	9.5	0.0	0.0	1.2	0.0	51.2	5.8	0.0	32.1
Cycle Q Clear(g_c), s	1.3	0.0	0.0	10.8	0.0	0.0	33.3	0.0	51.2	57.1	0.0	32.1
Prop In Lane	0.33		0.33	0.68		0.26	1.00		0.16	1.00		0.01
Lane Grp Cap(c), veh/h	463	0	0	435	0	0	250	0	1158	115	0	1188
V/C Ratio(X)	0.07	0.00	0.00	0.47	0.00	0.00	0.04	0.00	0.96	0.29	0.00	0.78
Avail Cap(c_a), veh/h	463	0	0	435	0	0	250	0	1158	115	0	1188
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.8	0.0	0.0	29.3	0.0	0.0	23.6	0.0	15.1	41.7	0.0	11.7
Incr Delay (d2), s/veh	0.3	0.0	0.0	3.7	0.0	0.0	0.3	0.0	18.1	6.1	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	4.9	0.0	0.0	0.2	0.0	31.1	1.0	0.0	17.8
LnGrp Delay(d),s/veh	26.1	0.0	0.0	32.9	0.0	0.0	24.0	0.0	33.2	47.8	0.0	16.7
LnGrp LOS	C			C			C		C	D		B
Approach Vol, veh/h		33			206			1120			957	
Approach Delay, s/veh		26.1			32.9			33.1			17.8	
Approach LOS		C			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		62.5		27.5		62.5		27.5
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		57.5		22.5		57.5		22.5
Max Q Clear Time (g_c+I1), s		53.2		3.3		59.1		12.8
Green Ext Time (p_c), s		3.2		0.7		0.0		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	26.7
HCM 2010 LOS	C

APPENDIX E
COLLISION DIAGRAMS

N

0 100

50 200

Horizontal
Scale in Feet

LEGEND

- MOVING VEHICLE
- BACKING VEHICLE
- NON CONTACT VEHICLE
- PEDESTRIANS
- PARKED VEHICLE
- FIXED OBJECT
- FATAL CRASH
- INJURY CRASH
- REAR END
- HEAD ON
- OUT OF CONTROL
- LEFT TURN
- SIDESWIPE
- ANGLE
- NO FAULT CRASHES

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

APPENDIX E

CRASH DIAGRAMS
SHEET 1 OF 8

JUNE 2019

Drawing File: \\AKRN04-2016.gpdco.com\DATA\2018\2018050\12\Figures\Crash Diagrams.dwg Layout: 1 of 8
Date: Jun 19, 2019 Time: 4:03 pm Twist: 0
Technician: bbowen

N

0 100

50 200

Horizontal
Scale in Feet

LEGEND

- MOVING VEHICLE
- BACKING VEHICLE
- NON CONTACT VEHICLE
- PEDESTRIANS
- PARKED VEHICLE
- FIXED OBJECT
- FATAL CRASH
- INJURY CRASH
- REAR END
- HEAD ON
- OUT OF CONTROL
- LEFT TURN
- SIDESWIPE
- ANGLE
- NO FAULT CRASHES

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

APPENDIX E

CRASH DIAGRAMS
SHEET 2 OF 8

JUNE 2019

Drawing File: \\AKRN04-2016.gpdco.com\DATA\2018\2018050\12\Figures\Crash Diagrams.dwg Layout: 2 of 8
Date: Jun 19, 2019 Time: 4:04 pm Twist: 0
Technician: bbowen

N

0 100

50 200

Horizontal
Scale in Feet

LEGEND

- MOVING VEHICLE
- BACKING VEHICLE
- NON CONTACT VEHICLE
- PEDESTRIANS
- PARKED VEHICLE
- FIXED OBJECT
- FATAL CRASH
- INJURY CRASH
- REAR END
- HEAD ON
- OUT OF CONTROL
- LEFT TURN
- SIDESWIPE
- ANGLE
- NO FAULT CRASHES

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

APPENDIX E

CRASH DIAGRAMS
SHEET 3 OF 8

JUNE 2019

Drawing File: \\AKRN04-2016.gpdco.com\DATA\2018\2018050\12\Figures\Crash Diagrams.dwg Layout: 3 of 8
Date: Jun 19, 2019 Time: 4:04 pm Twist: 0
Technician: bbowen

MATCH LINE 'C'

MATCH LINE 'D'

N

0 100

50 200

Horizontal
Scale in Feet

LEGEND

- MOVING VEHICLE
- BACKING VEHICLE
- NON CONTACT VEHICLE
- PEDESTRIANS
- PARKED VEHICLE
- FIXED OBJECT
- FATAL CRASH
- INJURY CRASH
- REAR END
- HEAD ON
- OUT OF CONTROL
- LEFT TURN
- SIDESWIPE
- ANGLE
- NO FAULT CRASHES

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

APPENDIX E

CRASH DIAGRAMS
SHEET 4 OF 8

JUNE 2019

Drawing File: \\AKRN04-2016.gpdco.com\DATA\2018\20180050\12\Figures\Crash Diagrams.dwg Layout: 4 of 8
Date: Jun 19, 2019 Time: 4:05 pm Twist: 0
Technician: bbowen

N

0 100

50 200

Horizontal
Scale in Feet

LEGEND

- MOVING VEHICLE
- BACKING VEHICLE
- NON CONTACT VEHICLE
- PEDESTRIANS
- PARKED VEHICLE
- FIXED OBJECT
- FATAL CRASH
- INJURY CRASH
- REAR END
- HEAD ON
- OUT OF CONTROL
- LEFT TURN
- SIDESWIPE
- ANGLE
- NO FAULT CRASHES

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

APPENDIX E

CRASH DIAGRAMS
SHEET 5 OF 8

JUNE 2019

Drawing File: \\AKRNO4-2016.gpdco.com\DATA\2018\2018050\12\Figures\Crash Diagrams.dwg Layout: 5 of 8
Date: Jun 19, 2019 Time: 4:05 pm Twist: 0
Technician: bbowen

N

0 100

50 200

Horizontal Scale in Feet

LEGEND

- MOVING VEHICLE
- BACKING VEHICLE
- NON CONTACT VEHICLE
- PEDESTRIANS
- PARKED VEHICLE
- FIXED OBJECT
- FATAL CRASH
- INJURY CRASH
- REAR END
- HEAD ON
- OUT OF CONTROL
- LEFT TURN
- SIDESWIPE
- ANGLE
- NO FAULT CRASHES

GPD GROUP

Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

APPENDIX E

CRASH DIAGRAMS
SHEET 6 OF 8

JUNE 2019

Drawing File: \\AKRNO4-2016.gpdco.com\DATA\2018\2018050\12\Figures\Crash Diagrams.dwg Layout: 6 of 8
Date: Jun 19, 2019 Time: 4:06 pm Twist: 0
Technician: bbowen

N

0 100

50 200

Horizontal
Scale in Feet

LEGEND

- MOVING VEHICLE
- BACKING VEHICLE
- NON CONTACT VEHICLE
- PEDESTRIANS
- PARKED VEHICLE
- FIXED OBJECT
- FATAL CRASH
- INJURY CRASH
- REAR END
- HEAD ON
- OUT OF CONTROL
- LEFT TURN
- SIDESWIPE
- ANGLE
- NO FAULT CRASHES

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

APPENDIX E

CRASH DIAGRAMS
SHEET 7 OF 8

JUNE 2019

Drawing File: \\AKRN04-2016.gpdco.com\DATA\2018\2018050\12\Figures\Crash Diagrams.dwg Layout: 7 of 8
Date: Jun 19, 2019 Time: 4:13 pm Twist: 0
Technician: bbowen

N

0 100

50 200

Horizontal
Scale in Feet

LEGEND

- MOVING VEHICLE
- BACKING VEHICLE
- NON CONTACT VEHICLE
- PEDESTRIANS
- PARKED VEHICLE
- FIXED OBJECT
- FATAL CRASH
- INJURY CRASH
- REAR END
- HEAD ON
- OUT OF CONTROL
- LEFT TURN
- SIDESWIPE
- ANGLE
- NO FAULT CRASHES

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

APPENDIX E

CRASH DIAGRAMS
SHEET 8 OF 8

JUNE 2019

Drawing File: \\AKRN04-2016.gpdco.com\DATA\2018\2018050\12\Figures\Crash Diagrams.dwg Layout: 8 of 8
Date: Jun 19, 2019 Time: 4:13 pm Twist: 0
Technician: bbowen

APPENDIX F
COLLISION DATA SUMMARY & CHARTS

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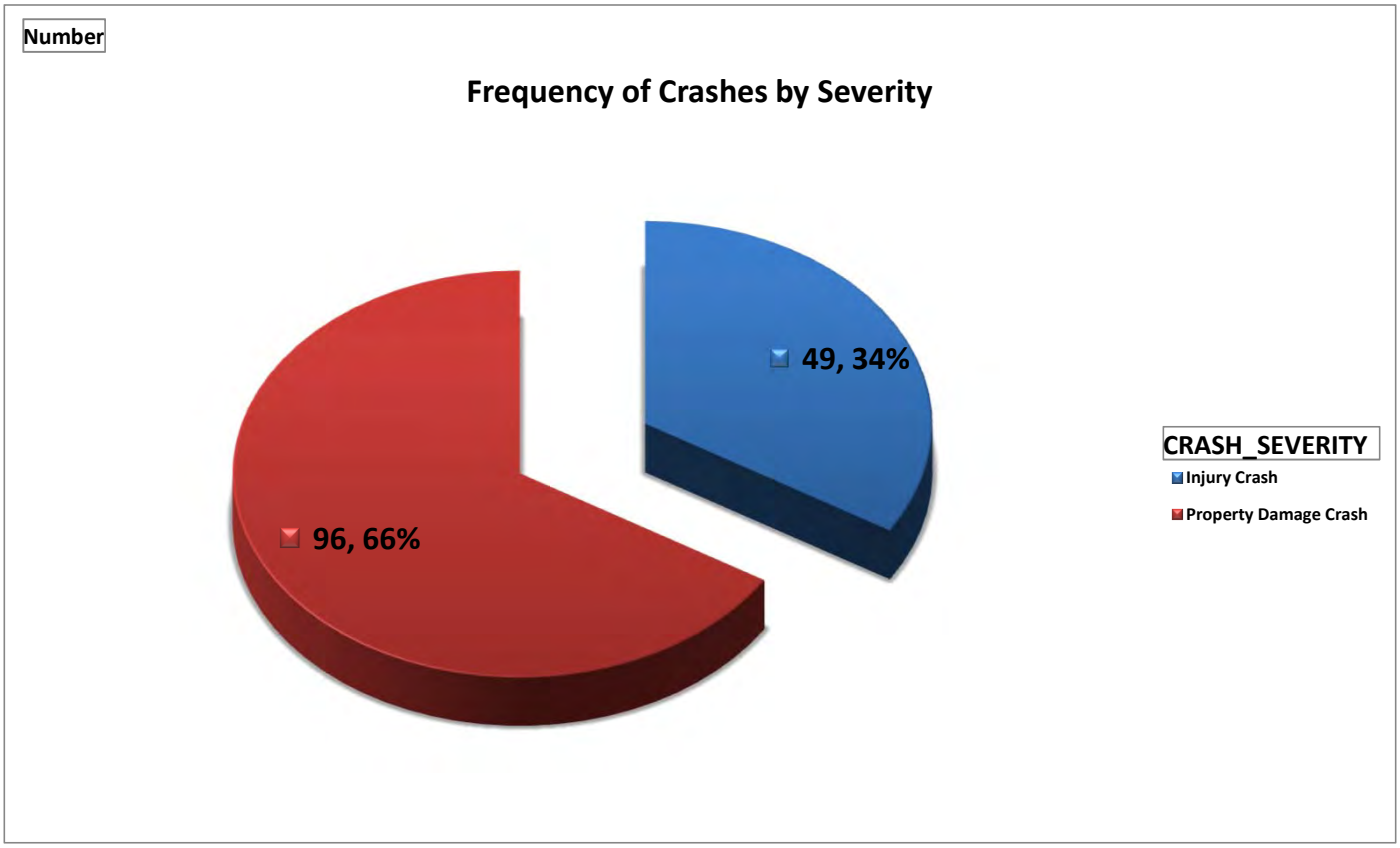

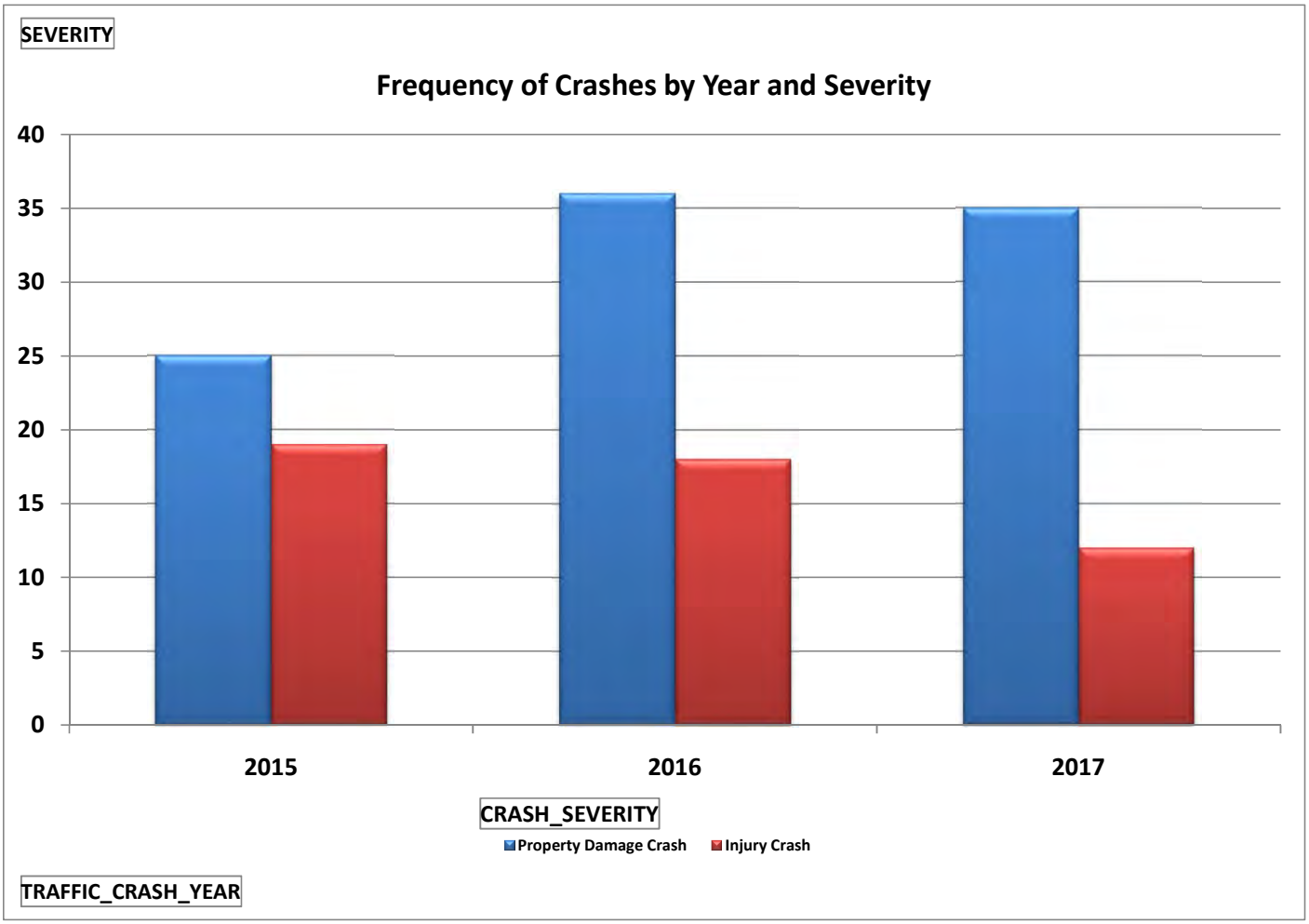

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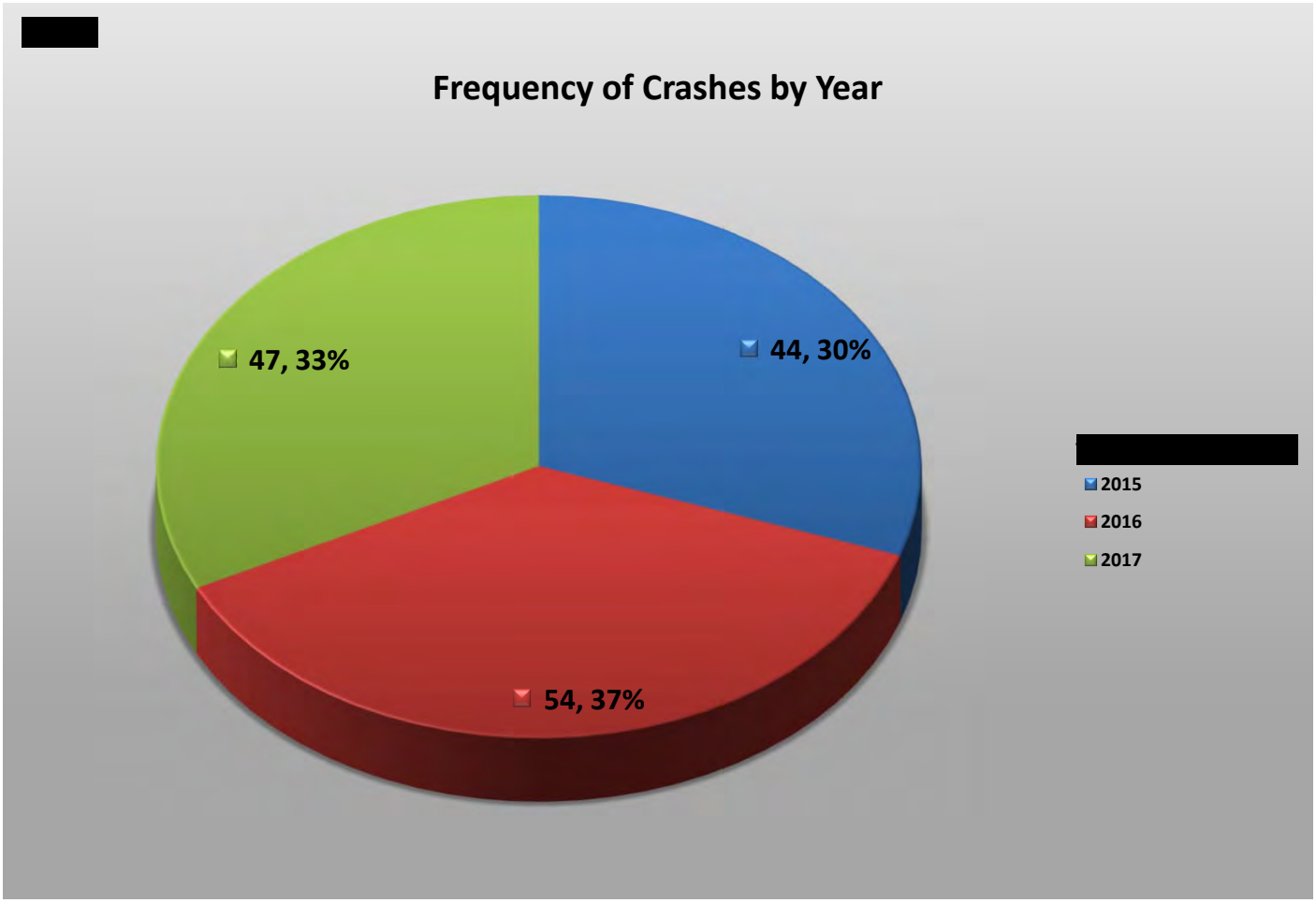

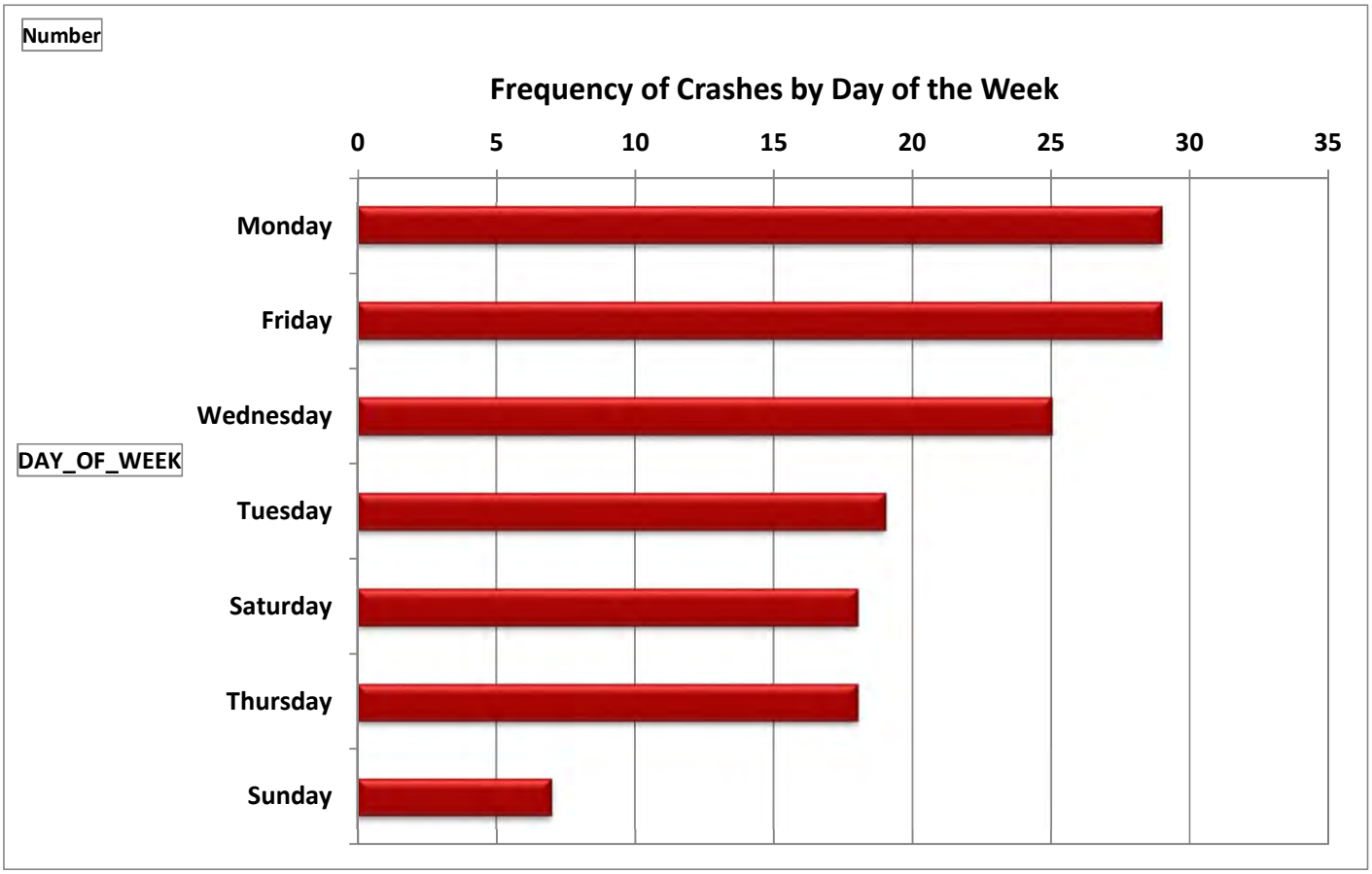

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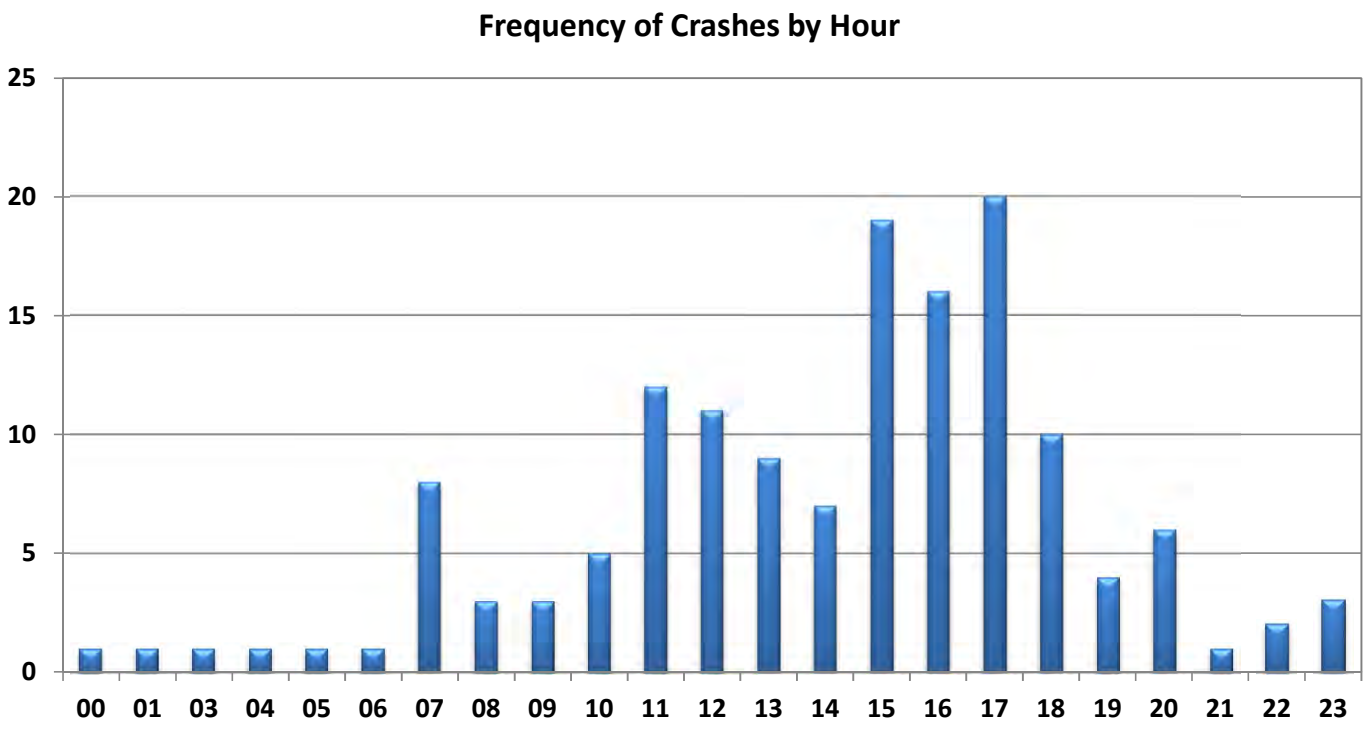

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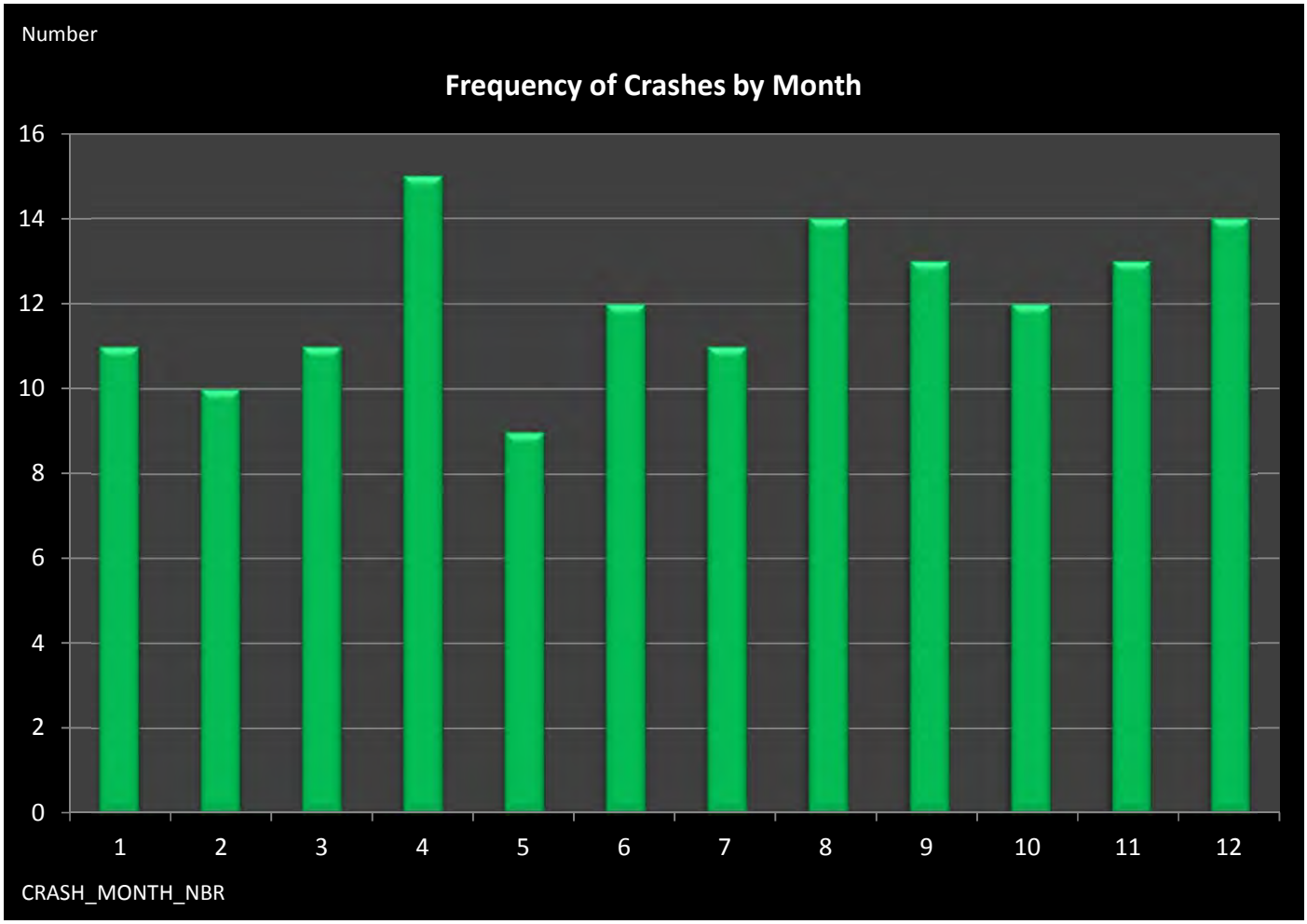

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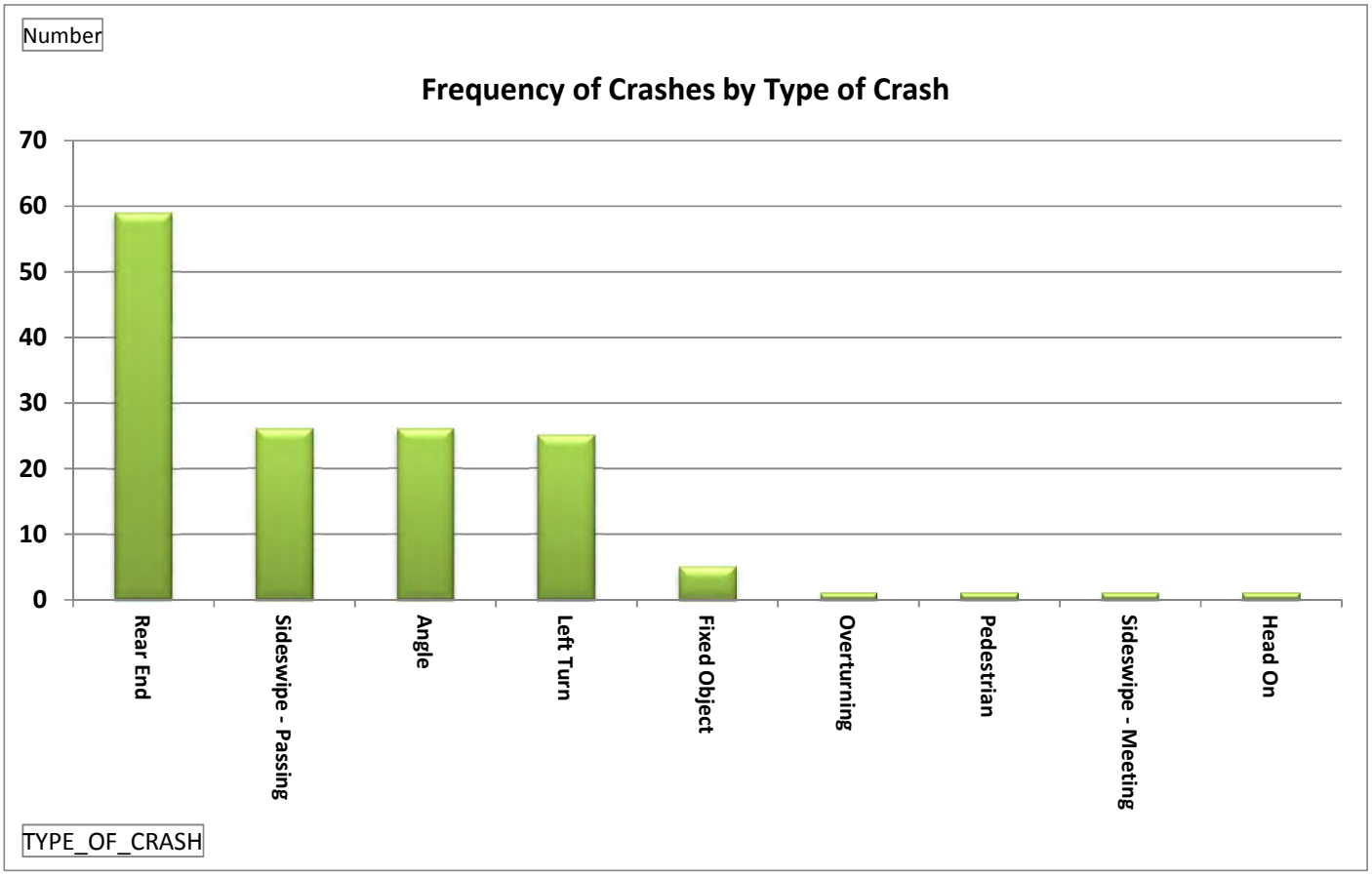

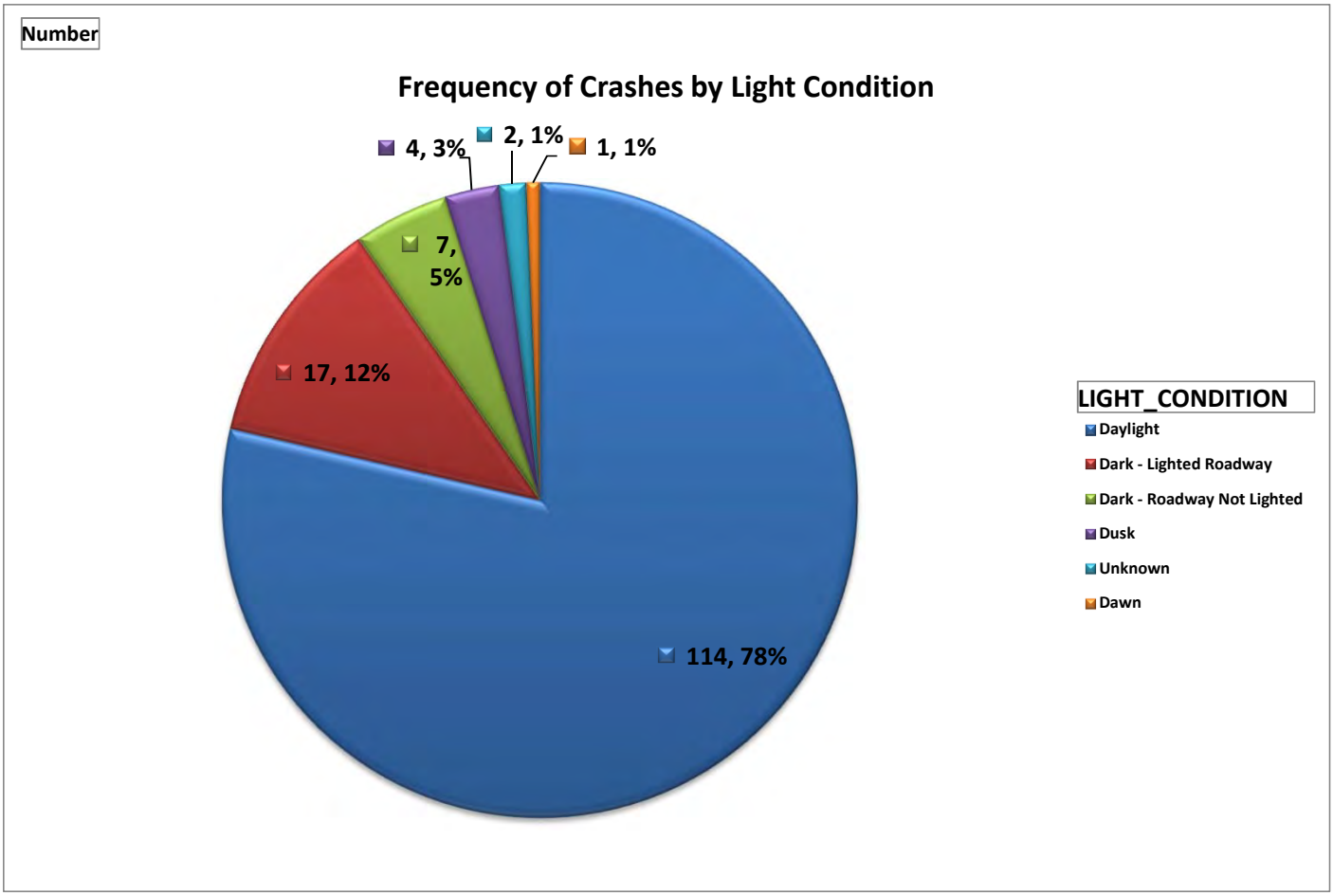

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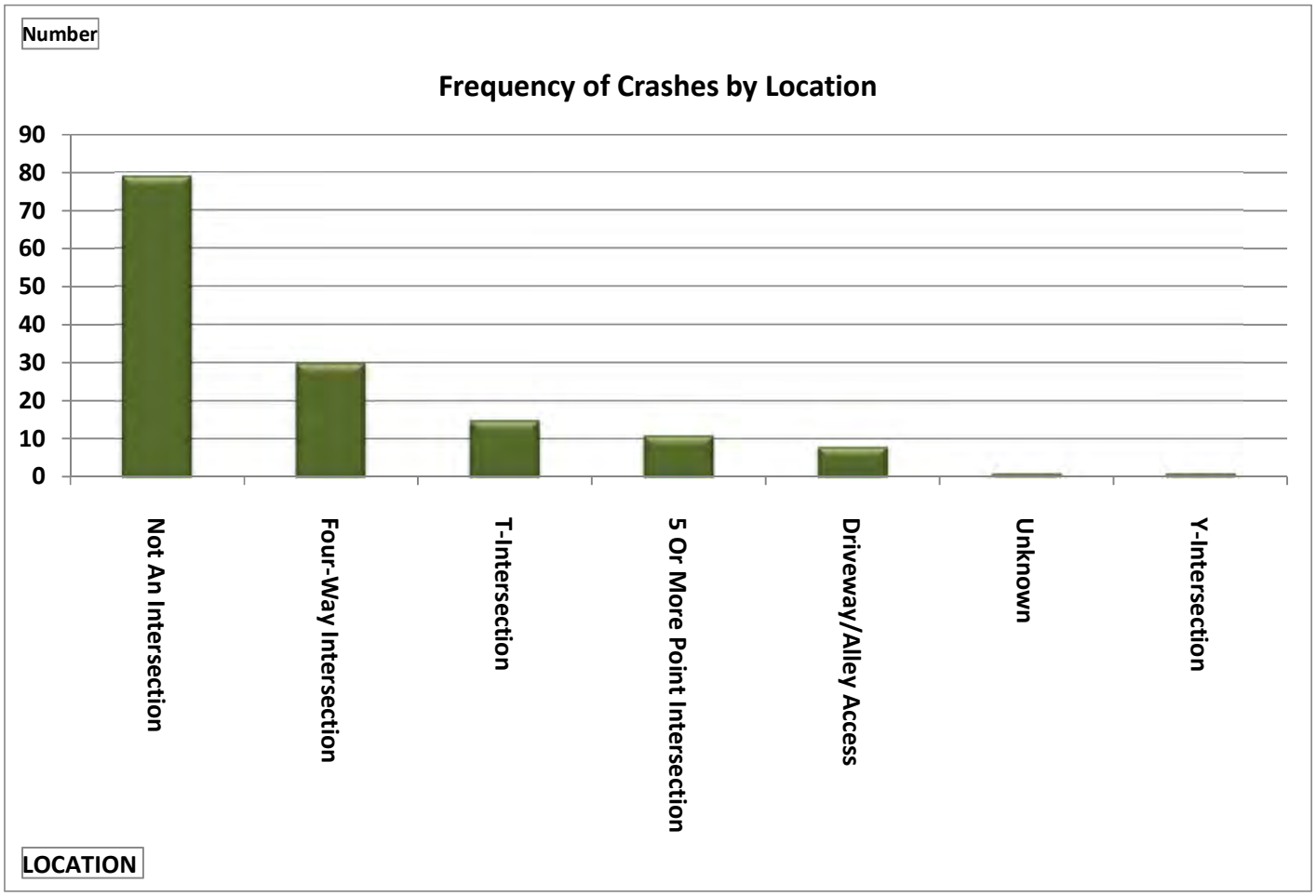

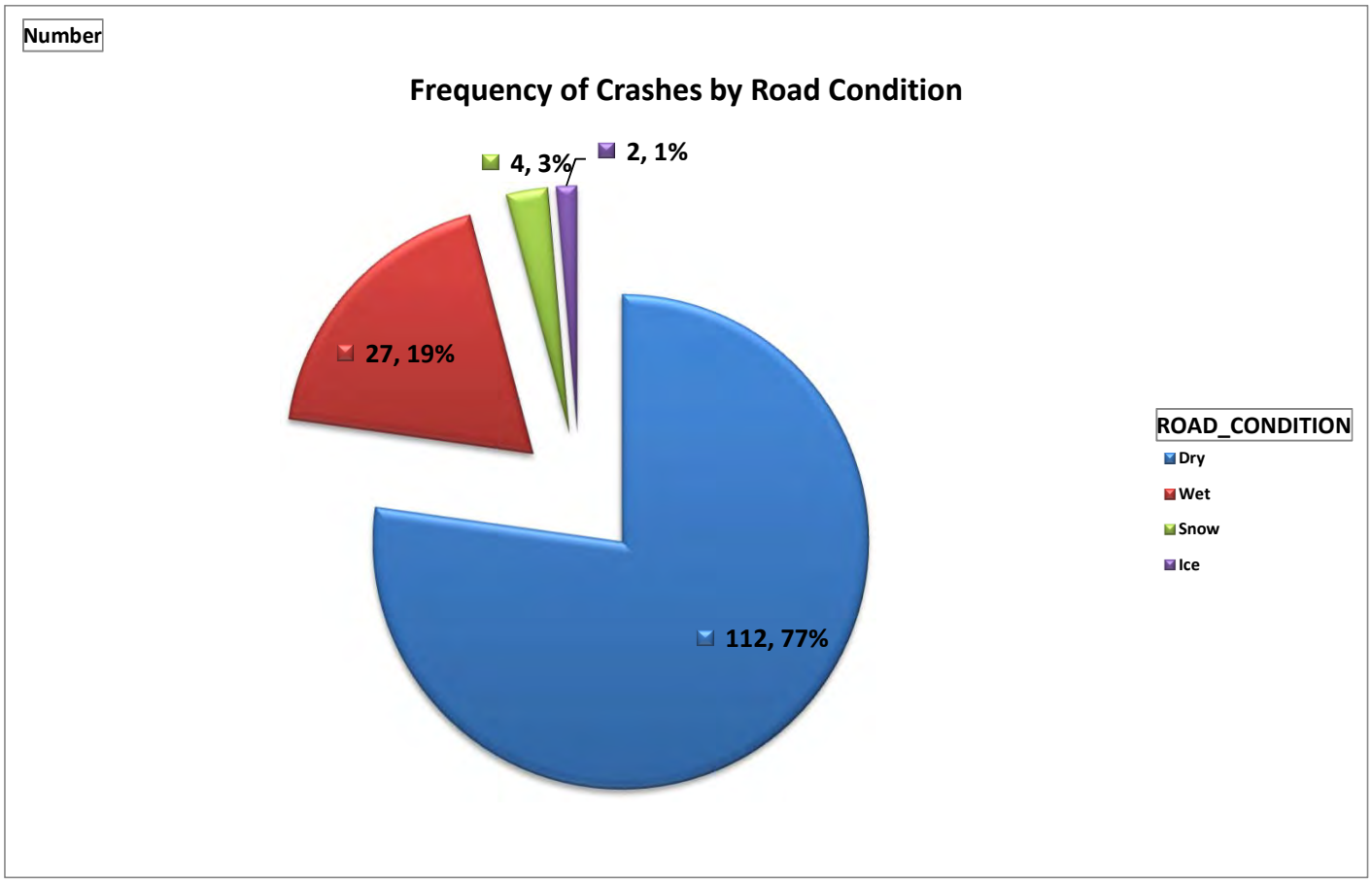

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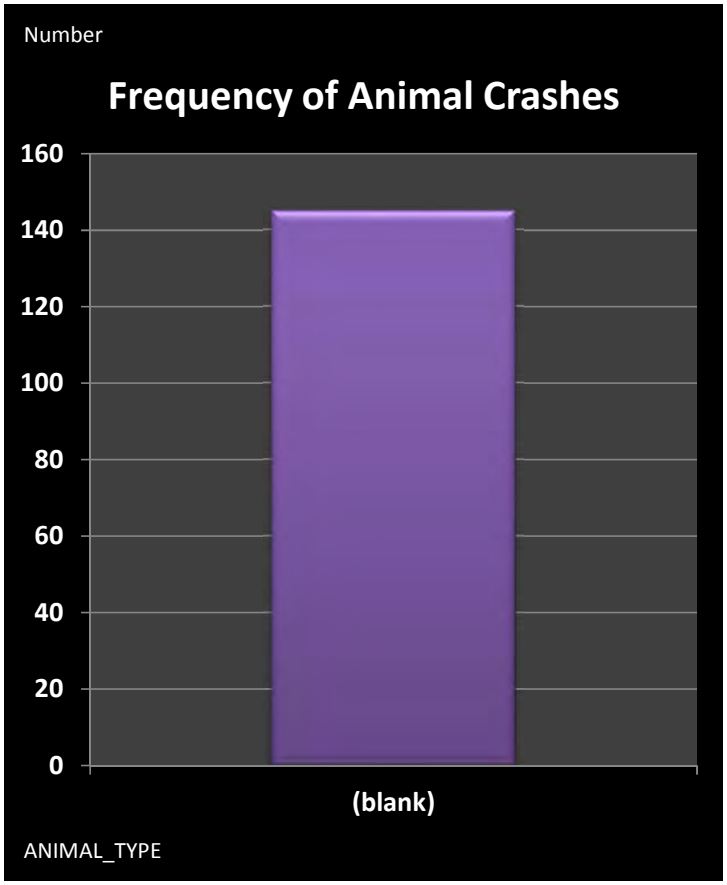

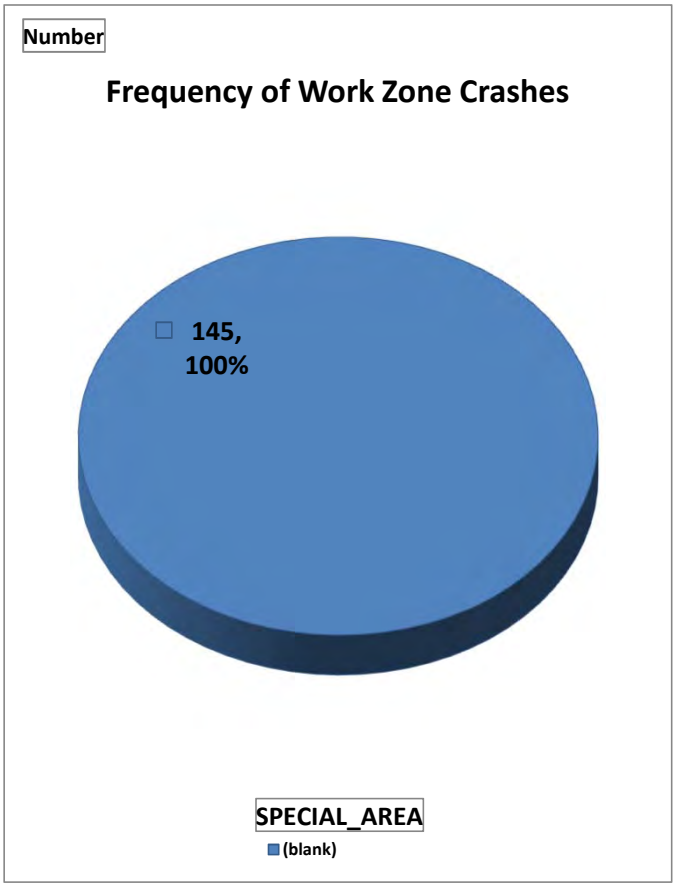

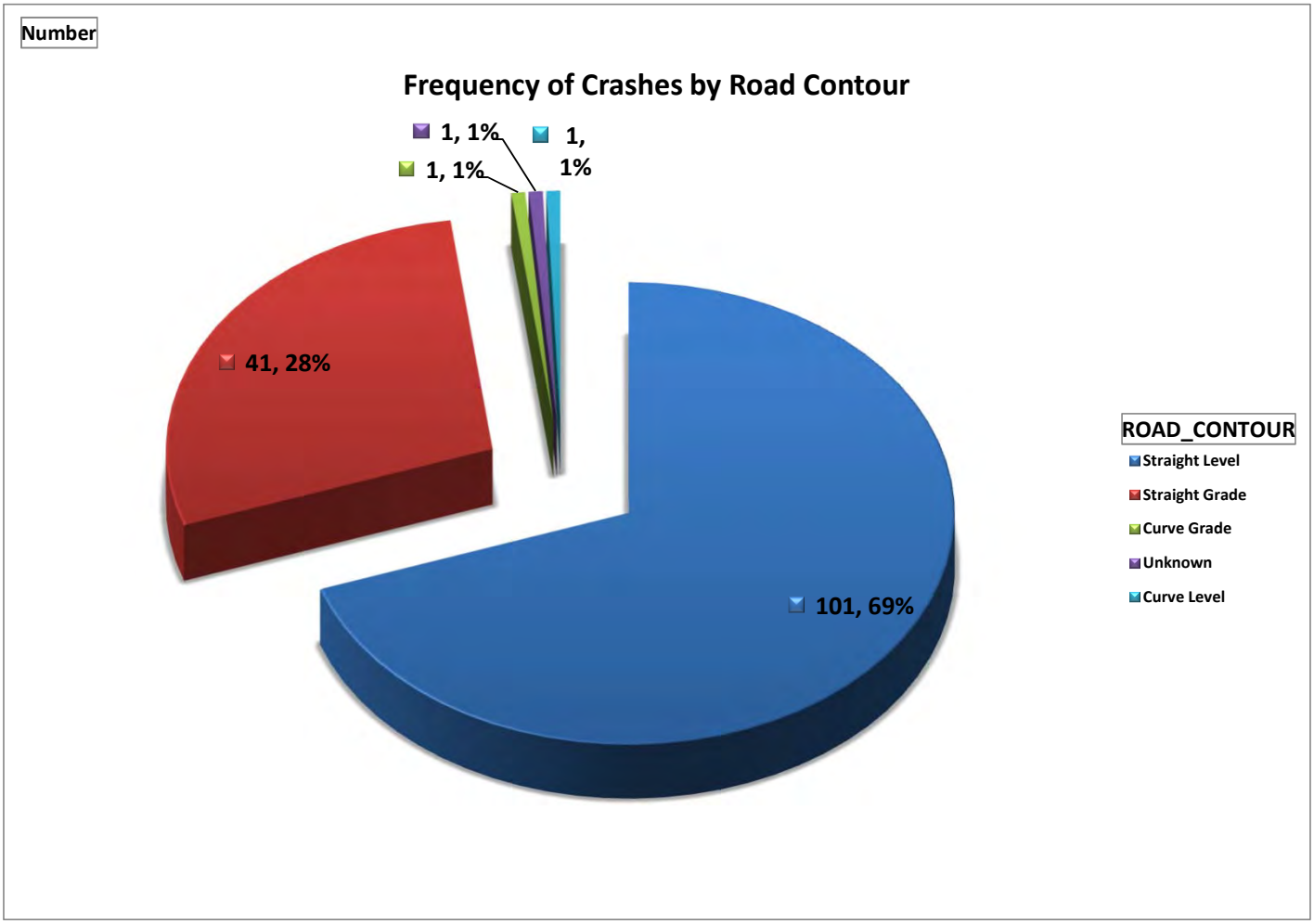

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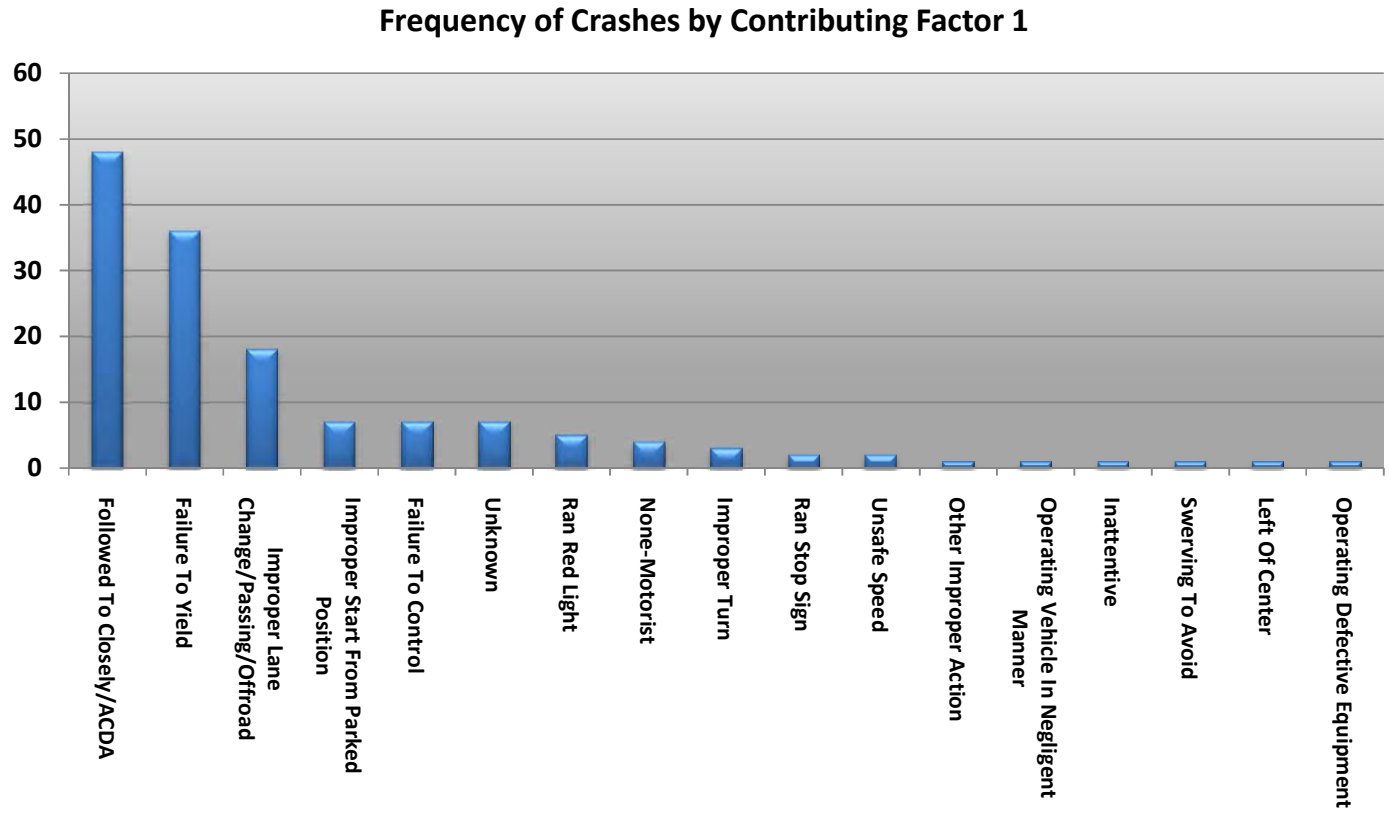

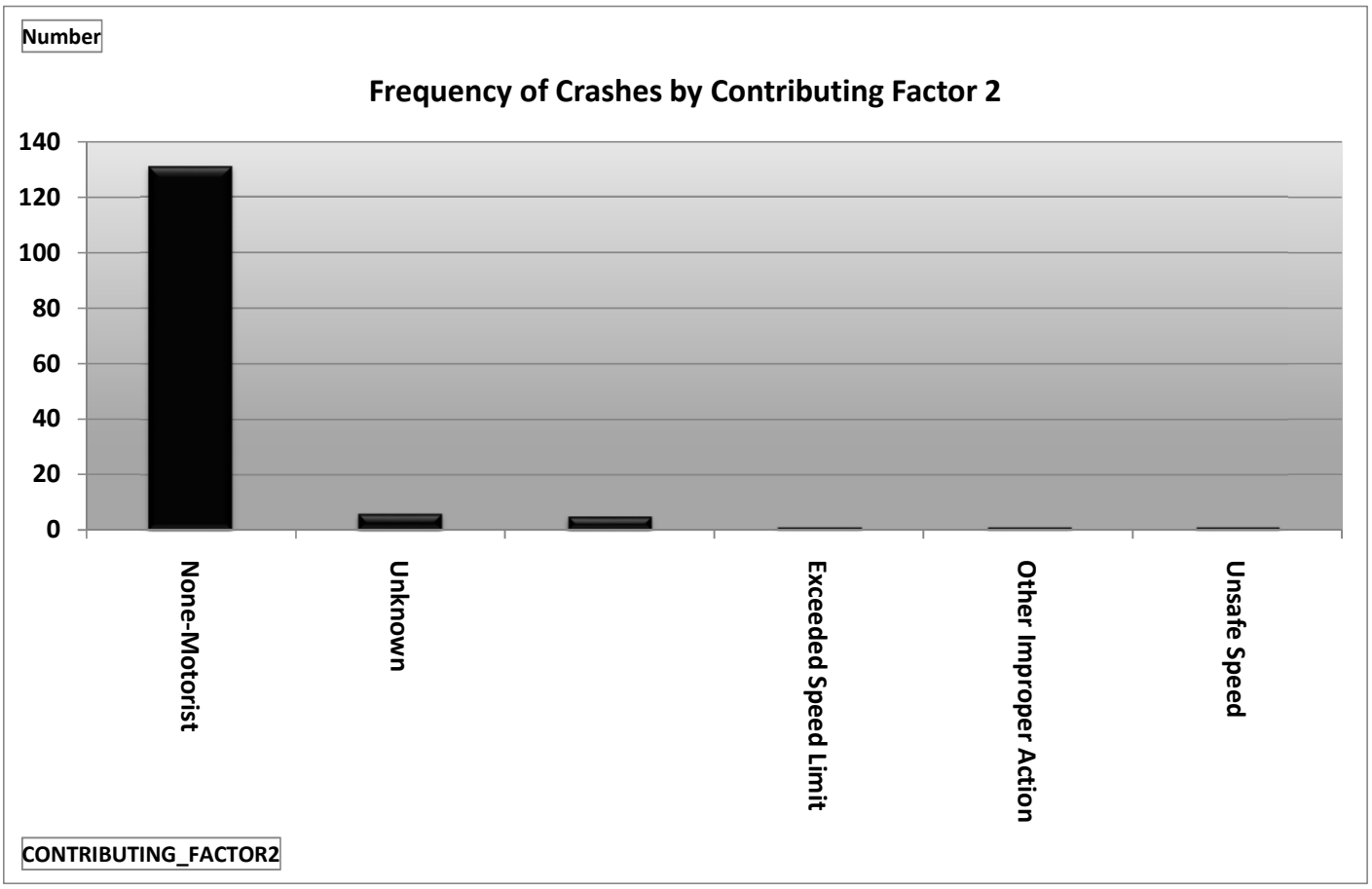

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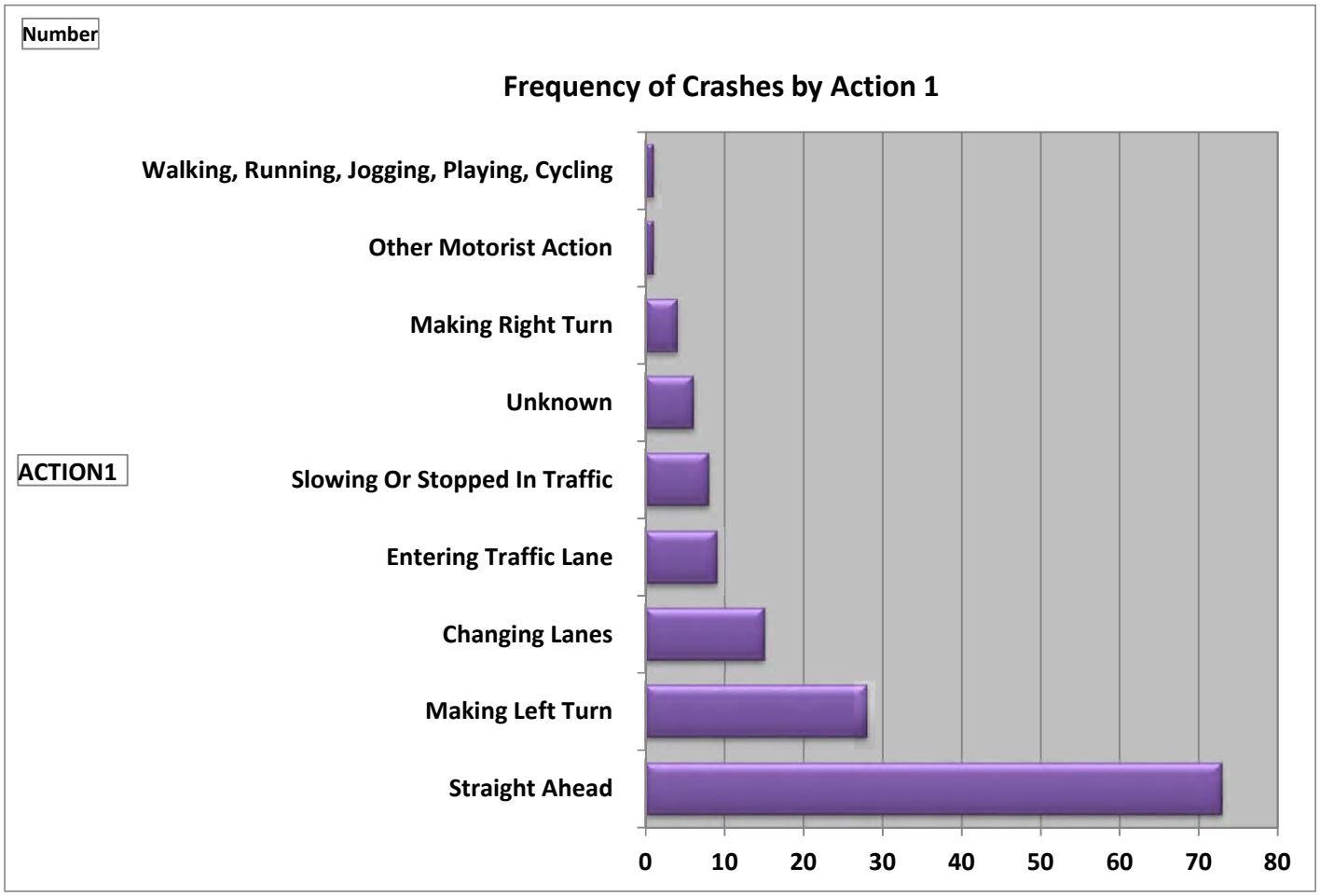

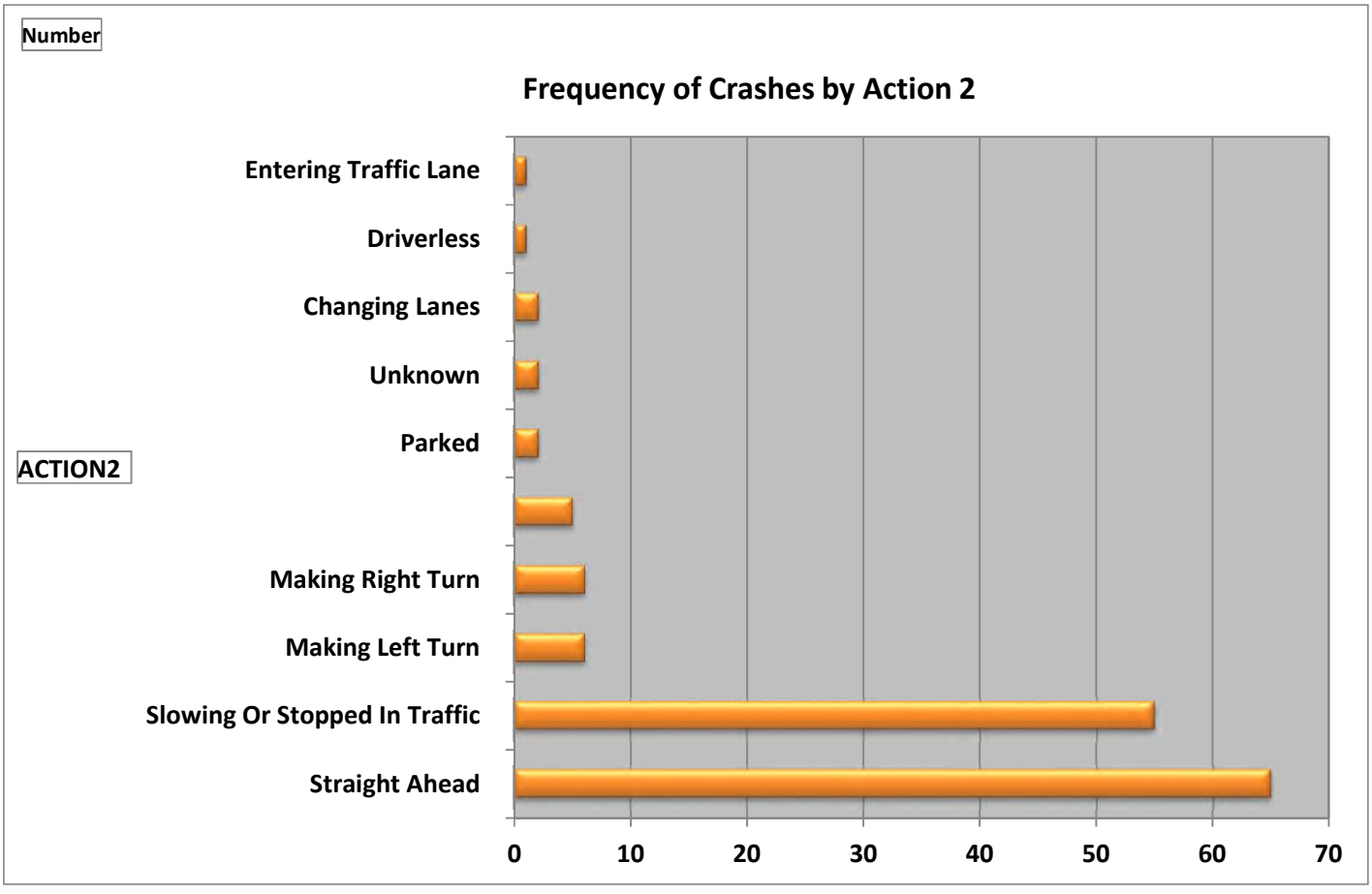

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