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**MOUNT CARMEL GROVE CITY SITE  
TRAFFIC STUDY UPDATE**

**Mount Carmel Health Systems**

**April 21, 2015**

Engineers

Surveyors

Planners

Scientists

**Traffic Study Update**  
**For**  
**Mount Carmel Grove City**  
**Phase Two Development**

Prepared For:  
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**April 21, 2015**

The traffic engineering data, analysis, findings, and recommendations contained herein and originally produced by EMH&T have been prepared in accordance with accepted Engineering practice and represent anticipated future conditions to the best of our knowledge and belief.

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Douglas A. Bender, PE, PTOE  
For EMH&T

Date

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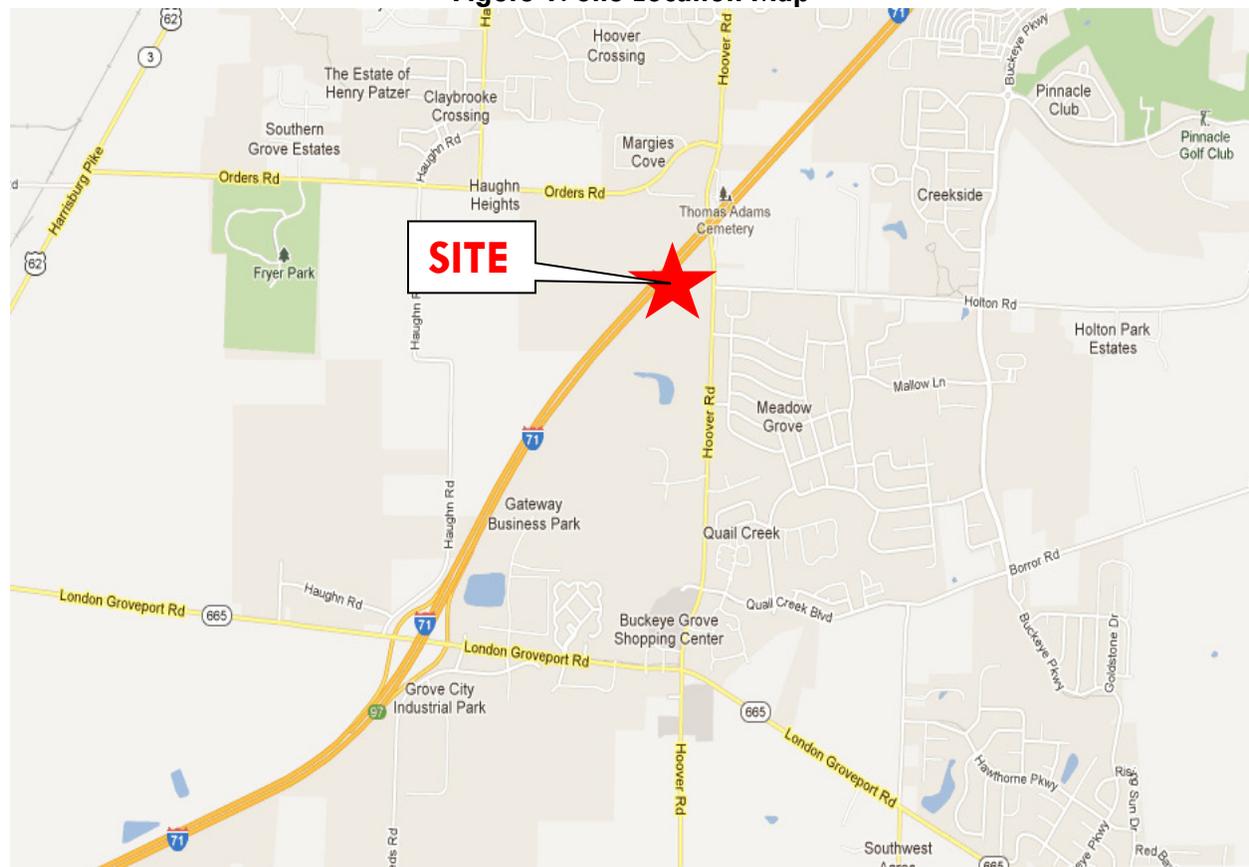
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## 1.0 INTRODUCTION – PROPOSED SITE DEVELOPMENT

This study has been completed to update our previous 2012 traffic study which focused on traffic impacts associated with the development of the Mount Carmel Health System site in Grove City, Ohio. The site is located on Meadows Drive southeast of Interstate-71 and north of State Route 665. This updated study effort includes current traffic counts and identifies the expected adjustment in traffic due to the Meadows Drive connection between SR 665 and Hoover Road, which diverted some traffic from the SR 665/Hoover Road intersection along this new connection. This analysis focuses on the timing for the provision of dual left turn lanes from SR 665 eastbound to travel north on Meadows Drive as it relates to the accelerated timeframe of the Mt. Carmel campus and the long range (2035) land use and transportation vision by the City. Grove City has expressed this vision in their recent Comprehensive Plan and Thoroughfare Plan updates.

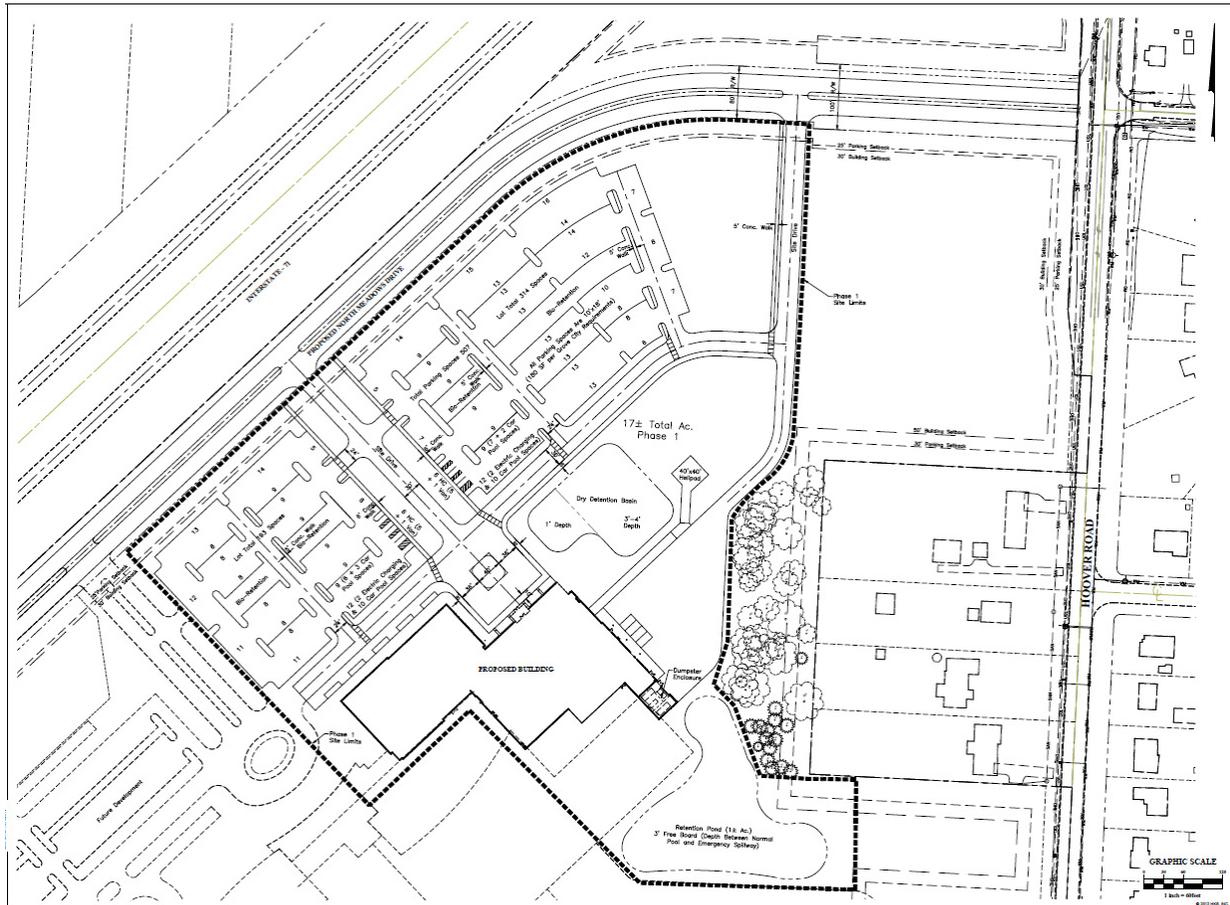
The site location and surrounding roadway network is illustrated in **Figure 1** below. The initial development of Phase 1 consisted of a 36,486 square foot ambulatory facility and approximately 55,361 square feet of medical office space. The potential full build-out of the site is expected to include a 300 bed hospital, with the ambulatory facility and up to 300,000 square feet of medical offices. However, this update is being completed to understand the effects of completing the second phase by 2018 which will result in a total of 210 hospital beds (ambulatory space included in total) and a total of 122,000 square feet of medical offices.

**Figure 1: Site Location Map**

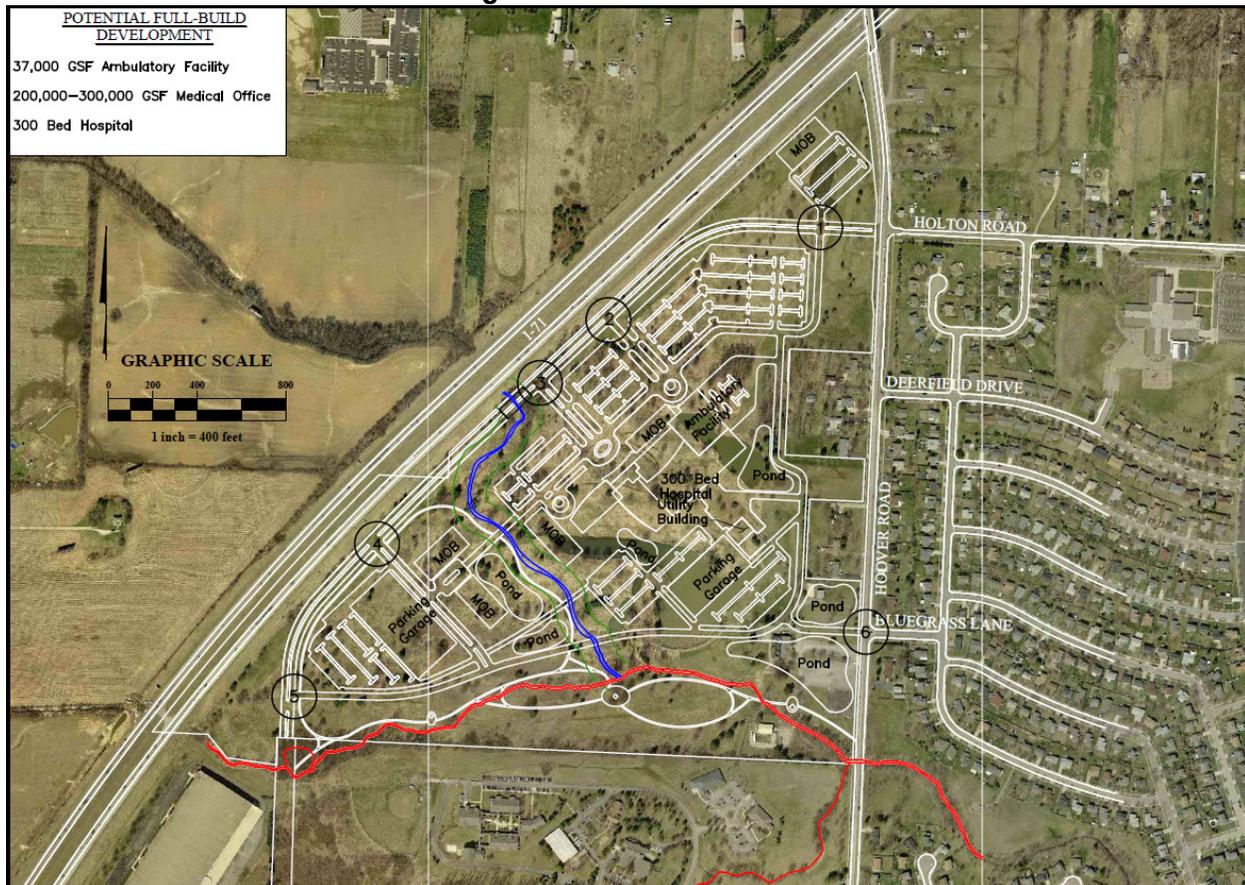


The Phase 1 development site plan that is complete and open to the public is illustrated below as **Figure 2**. The final, potential full-build site plan is provided below as **Figure 3**. Updates are ongoing and full buildout of the site may vary slightly when complete. The completion of the second phase will expand the number of hospital beds and will add site parking that connects to Hoover Road directly as well as utilize the current two connections to Meadows Drive west of Hoover Road.

**Figure 2: Phase 1 Site Plan**



**Figure 3: Site Master Plan**



The Mount Carmel development site is primarily accessed via Meadows Drive which has been constructed from State Route to Hoover Road/Holton Road intersection. Three access connections are planned along Meadows Drive site frontage in addition to the two current connections. A sixth access drive is proposed to Hoover Road opposite Blue Grass Lane, near the southern edge of the site. Access points are adequately spaced along Meadows Drive to support the provision of left turn lanes into the site since there will be no access to the west side of Meadows Drive.

**2.0 EXISTING STUDY AREA CONDITIONS**

The subject site is situated adjacent to two arterial streets in Grove City: Hoover Road and State Route 665. Access to these facilities is provided via North Meadows Drive. Hoover Road is a north-south, 3-lane roadway with a center two-way left turn lane and a posted speed limit of 35 miles per hour. State Route 665 is a multi-lane, east-west roadway connecting areas of southern Grove City east and west of I-71. State Route 665 (SR-665) also has a posted speed of 35-MPH. Traffic signals control movements at the intersections at each end of North Meadows Drive and all significant intersections along SR-665.



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The Study Area intersections analyzed as part of this traffic impact study include:

- SR-665/Meadows Drive (Signalized)
- SR-665/Hoover Road (Signalized)
- Hoover Road/Holton Road/Meadows Drive Extension (Signalized)
- Hoover Road/Blue Grass Lane (Stop sign controlled)
- Proposed site drive intersections (Stop sign controlled)

### **3.0 TRAFFIC VOLUME DEVELOPMENT**

#### **3.1 Existing Traffic Data**

Several peak hour traffic counts were completed at the study area intersections and were utilized to generate current and horizon year morning and afternoon peak hour traffic volumes for use in completing traffic analyses. Traffic count data is provided for reference in **Appendix A**.

#### **3.2 Background Traffic & Growth Rates**

Traffic information provided by the Mid-Ohio Regional Planning Commission (MORPC) was previously used to determine background traffic growth rates for the study area. Growth rates provided by MORPC to increase traffic based on a comparison of their base models included:

- SR-665: 2% per year
- Hoover Road: 2% per year
- Holton Road: 6% per year
- Buckeye Parkway: 2% per year

Traffic counts at study area intersection collected in 2015 were increased from the count year to 2018 levels for this interim condition (end of Phase 2) evaluation. Recent traffic counts revealed that traffic volumes on Meadows Drive are primarily due to the first phase of the site and that cut-through traffic is not a major factor at this point. The count at Hoover Road/SR 665 reinforced this since the drop off in eastbound left/southbound right turn traffic was minimal, indicating Meadows is not being heavily used as a cut-thru street. Additionally, the shift change traffic volumes between 3-4 PM appears to be similar in volume level to the more typical afternoon peak hour of commuter traffic on adjacent streets. Additionally, the traffic counts at the site driveways indicate traffic generated by the first phase is somewhat lower than the initial trip generation forecasts predicted for the planned uses.

Previously developed 2035 background traffic volumes were compared to 2015 count data increased to 2035 at the same rate. Background traffic volumes for Meadows Drive are now being developed from the 2015 traffic count data grown at these rates to reach 2018 interim year and the 2035 horizon year levels from the previous study effort were left as previously developed.

#### **3.3 Trip Generation**

Trip generation characteristics of the proposed site were based on trip generation data and methodology contained in Trip Generation, 9<sup>th</sup> Edition (Institute of Transportation Engineers, 2012).



Trips for the site were forecast using rates for land use codes 610 (Hospital) and 720 (Medical-Dental Office). Trip generation calculations were completed based on the new totals for completion of the second phase of development. Results of this trip generation are summarized in **Table 1** below. Peak hour trip ends in Table 1 are based on the ITE formulas for the peak hour of adjacent street. Trip generation calculations are illustrated below:

**Table 1: Site Generated Trips – Phase Two**

Land Use	Square Feet or Units	ITE Code	Time Period	ITE Formula	Total Trips	Trips		
						Entering	Exiting	
<a href="#">Hospital</a>	198 beds	610	ADT	$T=7.33(x)+2213.85$	3,666	1,833	1,833	
			AM Peak	Average Rate=1.32	261	188	73	
			PM Peak	Average Rate=1.42	281	93	188	
<a href="#">Medical-Dental Office</a>	122,659 sf	720	ADT	$T=40.89(x) - 214.97$	4,802	2,401	2,401	
			AM Peak	Average Rate = 2.39	293	231	62	
			PM Peak	$\ln(T)=0.90\ln(x)+1.53$	350	98	252	
					<b>ADT</b>	<b>8,468</b>	<b>4,234</b>	<b>4,234</b>
					<b>AM TOTAL</b>	<b>554</b>	<b>419</b>	<b>135</b>
					<b>PM TOTAL</b>	<b>631</b>	<b>191</b>	<b>440</b>

Table 1 data above represents the increase from what is currently constructed on site (first phase) to what will be there at the completion of the second phase. In essence, this is the added number of beds and square footage planned as part of Phase Two, based on the current plans/understanding of the totals at the time of preparing this update.

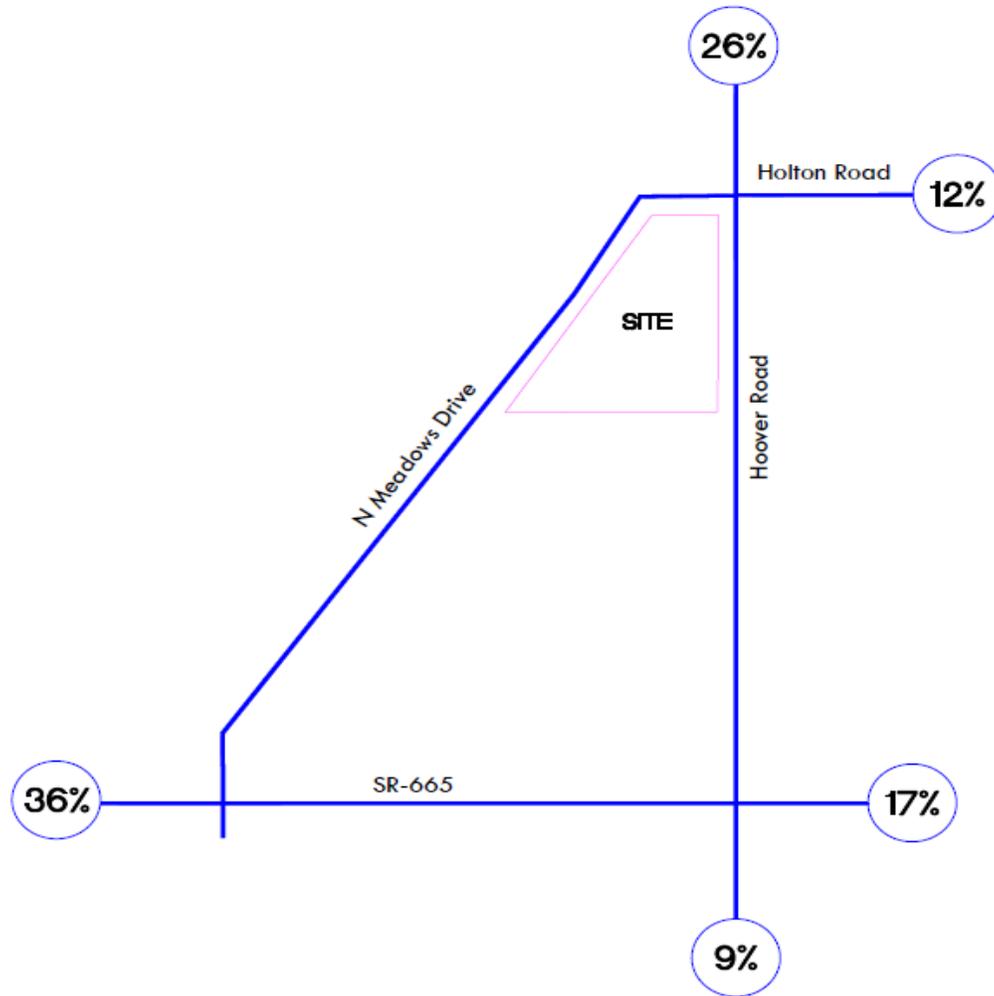
### 3.4 Trip Distribution

In this updated study, the distribution of site-generated traffic volumes up through the second phase was kept the same as the previous traffic study effort to eliminate any effect of altering the trip assignment. The site traffic was assigned to the adjacent street network according to the following distribution which was previously derived from MORPC-projected 2035 demand volumes on surrounding roadways:

- Hoover Road north of Holton Road      26%
- Holton Road east of Hoover Road      12%
- Hoover Road south of SR 665      9%
- SR 665 east of Hoover Road      17%
- SR 665 west of Meadows Drive      36%

This global trip distribution is depicted in **Figure 4** below. Recent traffic counts were reviewed to validate the trip distribution assumptions, and current counts were found to support the original trip distribution. Therefore, no changes are recommended to the trip distribution underlying our 2012 traffic study. Traffic assignment to individual intersection movements followed this global trip distribution. Detailed traffic volume calculations and assignments are included for reference in **Appendix B**.

**Figure 4: Trip Distribution**



### 3.5 Total Traffic - Opening Day and Design Year

Phase Two 2018 and design year 2035 traffic projections (morning and afternoon peak hours) were evaluated for the following scenarios:

- 2018 Build (Background+ Phase 2 Development Only)
- 2035 No Build (Background Growth Only)
- 2035 Full Build (Background+ Full Development)

Background traffic volumes in the 2018 analysis include traffic generated by the first phase of the Mount Carmel site. Background traffic was forecast to 2018 and 2035 design year conditions by applying the annual linear growth rates presented above in **Section 3.2**. In the



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2018 horizon year, the area road network was analyzed with Phase 2 generated traffic added to background traffic levels. In 2035, additional analyses were completed to assess the road network with all of the traffic generated by the full build-out of all remaining development on the Mount Carmel site. The road system was analyzed with existing geometrics and with upgrades where needed to correct deficiencies or mitigate the impact of added site traffic.

Current traffic volumes at the SR 665/N. Meadows Drive intersection indicate that the current eastbound left turn movement is 156 vehicles in the AM Peak, which was previously predicted to be 131 vehicles in 2013 at the completion of Phase 1 site development. However, the expected total of eastbound left turn site traffic there in 2013 was 54 vehicles, but actual counts indicate the site traffic total is only 31 vehicles. This indicates that background traffic at SR 665/N. Meadows Drive is continuing to grow and Phase 1 site development is not generating quite as much traffic as predicted previously. Based on this observation, the 2015 volume of 156 vehicles is only 39% of the projected 2035 level of 398 vehicles turning left from eastbound SR 665 to northbound N. Meadows Drive. Analysis of these volumes is discussed below and shows that the single left turn lane operating with protected-permissive phasing has capacity available to accommodate significantly more growth prior to any need to consider converting this movement to dual turn lanes in the future.

A similar observation shows that Meadows Drive has not attracted “cut-through” traffic even to the limited extent predicted in 2012 prior to its construction. Predicted through traffic volume in the AM Peak northbound on Meadows Drive was estimated at 112 vehicles in 2012, but 2015 traffic counts indicate this total is 37 vehicles. These findings indicate that the design of N. Meadows Drive as a boulevard limited to one lane in each direction is effective at controlling use by through traffic.

Phase Two Build (2018) and 2035 design year total traffic volumes are included for reference in Appendix B.

## **4.0 TRAFFIC ANALYSES**

Weekday morning and afternoon peak hour 2018 Build traffic volumes were used to analyze the current street network in the study area. Previous 2035 analytical results have been included but not updated for comparison purposes. Analyses and results are detailed in the following sections.

### **4.1 Intersection Capacity Analyses**

Synchro (v.8) software was used to evaluate operational characteristics of all study area intersections. At signalized intersections that are part of a coordinated signal system (SR-665 and Hoover Road signals), the ODOT method of balancing the worst of the north-south approach delay with the worst of the east-west approach delay was not previously used. Instead, previous signal timings from existing signal operation were re-used in the capacity analysis models.

Intersections are graded using a level of service designation. Levels of service (LOS) are expressed in terms of letter grades with LOS A representing the highest quality traffic flow and minimal delay, and LOS F representing poor traffic operations and significant delay. Per typical central Ohio standards, LOS D or better for each approach at a signalized intersection is desirable and considered acceptable.



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#### 4.1.1 Phase Two Development (2018 Conditions)

Capacity analysis results for the expected Phase 2 Build conditions are summarized in **Table 2** below and detailed capacity reports are included for reference in **Appendix C**.

**Table 2: Capacity Analysis Results – 2018 Phase 2 Build**

Time Period	Conditions	EBLT	EBTH	EBRT	WBTL	WBTH	WBRT	NBLT	NBTH	NBRT	SBLT	SBTH	SBRT	TOTAL
<b>SR 665/Meadows Drive</b>														
AM Peak Hour	Existing Conditions	C/25.2	A/6.2	A/6.4	B/19.1	C/21.2	C/22.7	C/31.1	C/21.8	C/21.8	D/36.1	D/45.0	D/45.0	C/21.3
PM Peak Hour	Existing Conditions	B/14.9	A/9.9	B/10.7	B/18.6	B/13.6	B/14.0	C/27.9	B/19.4	B/19.4	C/30.7	D/46.1	D/46.1	B/17.7
<b>North Meadows Drive/Bluegrass Lane</b>														
AM Peak Hour	Two-Way Stop Control	-	-	-	B/10.7	-	B/10.7	-	-	-	A/7.8	-	-	-
PM Peak Hour	Two-Way Stop Control	-	-	-	B/11.3	-	B/11.3	-	-	-	A/7.5	-	-	-
<b>North Meadows Drive/Drive 4</b>														
AM Peak Hour	Two-Way Stop Control	-	-	-	B/10.2	-	B/10.2	-	-	-	A/7.7	-	-	-
PM Peak Hour	Two-Way Stop Control	-	-	-	B/10.3	-	B/10.3	-	-	-	A/7.5	-	-	-
<b>North Meadows Drive/Drive 3</b>														
AM Peak Hour	Two-Way Stop Control	-	-	-	B/10.2	-	B/10.2	-	-	-	A/7.7	-	-	-
PM Peak Hour	Two-Way Stop Control	-	-	-	B/10.5	-	B/10.5	-	-	-	A/7.6	-	-	-
<b>North Meadows Drive/Drive 2</b>														
AM Peak Hour	Two-Way Stop Control	-	-	-	A/9.9	-	A/9.9	-	-	-	A/7.6	-	-	-
PM Peak Hour	Two-Way Stop Control	-	-	-	B/10.6	-	B/10.6	-	-	-	A/7.6	-	-	-
<b>North Meadows Drive/Drive 1</b>														
AM Peak Hour	Two-Way Stop Control	-	-	-	A/7.5	-	-	B/11.1	-	A/8.8	-	-	-	-
PM Peak Hour	Two-Way Stop Control	-	-	-	A/7.7	-	-	B/10.9	-	A/9.7	-	-	-	-
<b>Hoover Road/SR 665</b>														
AM Peak Hour	Existing Conditions	C/20.9	B/13.5	B/12.2	B/18.8	C/28.5	C/28.8	D/35.2	B/19.6	B/19.6	B/15.8	B/14.1	B/17.2	C/24.3
PM Peak Hour	Existing Conditions	B/19.2	B/14.5	B/12.5	C/21.6	C/26.7	C/27.0	D/36.9	C/29.3	C/29.3	C/20.3	B/18.3	B/18.5	C/21.0
<b>Hoover Road/Bluegrass Lane</b>														
AM Peak Hour	Existing Conditions	C/16.1	B/10.0	B/10.0	C/17.2	B/11.2	B/11.2	A/7.9	-	-	A/8.3	-	-	-
	Traffic Signal	A/8.5	A/8.5	A/8.5	A/9.0	A/9.0	A/9.0	A/3.6	A/3.5	A/3.5	A/4.2	A/2.9	A/2.9	A/4.0
PM Peak Hour	Existing Conditions	C/18.4	B/13.1	B/13.1	C/22.4	B/11.8	B/11.8	A/8.6	-	-	A/8.6	-	-	-
	Traffic Signal	B/11.7	B/11.7	B/11.7	B/11.0	B/11.0	B/11.0	A/4.5	A/3.4	A/3.4	A/4.4	A/3.4	A/3.4	A/4.3
<b>Hoover Road/North Meadows Drive/Holton Road</b>														
AM Peak Hour	Existing Conditions	C/20.2	B/17.8	B/17.5	C/23.4	C/24.5	C/29.3	A/7.8	B/12.0	A/8.0	A/7.1	A/5.3	A/5.0	B/12.7
PM Peak Hour	Existing Conditions	C/21.3	B/17.4	B/16.7	C/24.9	C/24.7	C/29.5	A/9.9	B/14.2	A/9.7	A/8.4	A/8.5	A/5.4	B/13.7

X/X = Overall LOS / Average Delay Per Vehicle

#### SR-665/N Meadows Drive

All intersection movements are expected to operate at LOS D or better and the overall intersection at LOS C or better for both the AM and PM peak hour “Build” scenario in 2018. The critical concern at this intersection in the 2018 Build scenario is the potential need to accelerate the provision of an eastbound dual left turn from SR 665 to northbound Meadows Drive. Results of these analyses indicate the dual left turn lane is not



needed to accommodate buildout of Phase Two site traffic and in fact, good level of service is expected/predicted at this intersection. No mitigation is required at this intersection. As discussed above in Section 3.5, the single, eastbound left turn lane is expected to work efficiently through the 2018 buildout of Phase Two conditions.

#### SR-665/Hoover Road

Similar to the N. Meadows Drive intersection, all intersection approaches are expected to operate at LOS D or better and the overall intersection at LOS C or better under 2018 horizon year Build conditions. The AM and PM peak hour conditions are predicted to operate well overall, therefore no mitigation is required.

#### Hoover Road/Bluegrass Lane

All intersection movements are expected to operate at LOS C or better and the overall intersection at LOS C or better for 2018 AM/PM peak Build conditions with side street stop sign control. Two-way stop-control here is expected to operate acceptably when Phase Two is built out. This location offers attractive spacing between adjacent traffic signals along Hoover Road and is therefore a candidate for signalization when warranted. Signalized capacity analysis indicated LOS A results under 2018 Build traffic levels. If the intersection is signalized in the future, Hoover Road should be re-stripped to provide dedicated left turn lanes approaching the signal. Existing two-way-left-turn-lane pavement marking should remain on Hoover Road while the intersection is under stop sign control.

#### Hoover Road/Holton Road/N Meadows Drive

All intersection movements are expected to operate at LOS C or better and the overall intersection at LOS C or better for both the AM and PM peak hour “Build” scenario in 2018. Since the second phase of development is not expected to cause poor level of service, no mitigation should be required at this intersection.

#### N Meadows Drive/Site Drives #1 and #2

All intersection movements are expected to operate at LOS C or better and the overall intersection at LOS C or better for both the AM and PM peak hour “Build” scenario in 2018. Since the second phase of development is not expected to cause poor level of service, no mitigation should be required at this intersection.

### **4.1.2 Potential Full-Build Development (Year 2035 Background + Full Build Site)**

Capacity analysis results for the potential full build-out of the property are summarized below based on previous analysis of expected 2035 conditions. **Table 3** below illustrates the previous results for 2035 Full Build conditions. Detailed capacity reports and summary tables are provided for reference in Appendix C.

#### SR-665/N Meadows Drive

All intersection approaches are expected to operate at poor levels of service in design year 2035 under the AM peak hour “Full-Build” scenario (existing background traffic



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growth plus Mount Carmel site traffic). A southbound right turn lane on N. Meadows Drive and an additional eastbound left turn lane (creating dual lefts) on SR-665 is expected to bring the intersection operations up to acceptable levels.

To accommodate the additional eastbound left turn lane, an additional receiving lane would also need to be constructed on northbound N. Meadows Drive. It is proposed that the receiving lanes for the dual left turns ultimately terminate into a single lane on N. Meadows Drive north of Meadow Pond Court. This turn lane improvement would improve the operation of the signal by facilitating more traffic through the intersection and reducing storage needs.

**Table 3: Previous 2035 Full Build Capacity Analysis Results**

Intersection	Eastbound				Westbound				Northbound				Southbound				Intersection Total
	Left	Through	Right	Approach Total	Left	Through	Right	Approach Total	Left	Through	Right	Approach Total	Left	Through	Right	Approach Total	
<b>SR-665 at N. Meadows Dr</b>	Level of Service / Delay (in seconds)																
2035 AM - Build	F/160	C/20	C/21	F/82	C/29	F/70	F/83	E/72	F/85	C/29		E/78	D/39	E/79		E/73	E/76
2035 AM - Build +EBLT +SBRT	D/51	B/17	B/18	C/33	C/25	D/43	D/51	D/44	D/44	D/50		D/45	C/27	D/45	C/34	C/33	D/40
2035 PM - Build	C/32	D/40	D/48	D/41	C/31	D/40	D/46	D/42	D/53	C/21		D/43	C/23	D/54		D/51	D/43
<b>SR-665 at Hoover Rd</b>	Level of Service / Delay (in seconds)																
2035 AM - Build	C/25	B/17	A/9	C/20	B/20	D/39	D/39	D/38	D/37	C/31		D/35	C/28	C/32	C/34	C/32	C/34
2035 PM - Build	C/22	C/25	B/12	C/21	C/25	D/36	C/34	C/34	D/39	D/52		D/46	D/52	D/45	C/26	D/43	C/34
<b>Hoover Rd at Holton Rd/N. Meadows Dr Ext.</b>	Level of Service / Delay (in seconds)																
2035 AM - Build	D/46	D/53	D/43	D/48	C/29	D/44	F/91	E/70	B/12	F/76	A/5	E/68	E/55	B/13	A/9	B/19	D/53
2035 AM - Build +WBRT	D/46	D/48	D/40	D/46	D/41	E/55	D/49	D/49	A/9	D/41	A/5	D/37	E/61	A/9	A/6	B/17	D/35
2035 PM - Build +WBRT	E/60	D/51	D/42	D/54	D/52	E/57	E/55	D/54	C/23	D/49	A/9	D/44	E/79	C/27	A/4	C/34	D/44
<b>Holton Rd at Buckeye Pkwy</b>	Level of Service / Delay (in seconds)																
2035 AM - Build	B/15			B/19				B/14	B/11	A/8		A/9		A/8	A/8	A/8	B/13
2035 PM - Build	B/19			B/18				B/16	B/15	A/8		B/12		A/9	A/9	A/9	B/14
<b>Site Dr #1 at N. Meadows Dr</b>	Level of Service / Delay (in seconds)																
2035 AM - Build				A/8				A/8				B/10					C/22
2035 PM - Build				A/8				A/9				B/13					D/32
<b>Site Dr #2 at N. Meadows Dr</b>	Level of Service / Delay (in seconds)																
2035 AM - Build								A/8				B/13					
2035 PM - Build								A/8				B/15					
<b>Site Dr #3 at N. Meadows Dr</b>	Level of Service / Delay (in seconds)																
2035 AM - Build								A/8				B/12					
2035 PM - Build								A/8				B/13					
<b>Site Dr #4 at N. Meadows Dr</b>	Level of Service / Delay (in seconds)																
2035 AM - Build								A/8				B/14					
2035 PM - Build								A/8				C/17					
<b>Site Dr #5 at N. Meadows Dr</b>	Level of Service / Delay (in seconds)																
2035 AM - Build								A/9				C/17					
2035 PM - Build								A/8				D/29					
<b>Site Dr #6 at Hoover Rd</b>	Level of Service / Delay (in seconds)																
2035 AM - Build				C/23				E/47				A/9					B/10
2035 PM - Build				F/174				F				B/11					B/10



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### SR-665/Hoover Road

All intersection approaches are expected to operate at LOS D or better and the overall intersection at LOS C or better in the 2035 AM and PM peak hour “Full-Build” scenarios (existing background traffic growth plus Mount Carmel site traffic), therefore no mitigation should be required.

### Hoover Road/Holton Road/N Meadows Drive

Westbound and northbound intersection approaches are expected to operate at poor levels of service in the design year under potential 2035 Build conditions without improvements to the existing infrastructure. With an additional westbound right turn lane on Holton Road and associated receiving lane on northbound Hoover Road, noted in section 4.2.1 above as a needed background improvement, acceptable operations are expected.

### Site Drive Intersections

These intersections will be controlled via STOP signs facing exiting traffic. For N. Meadows Drive, since traffic will not have to stop, the levels of service for the Meadows Drive approaches are LOS A for through and turning traffic in all traffic volume scenarios. Level of service for the site driveways are expected to operate at LOS D or better. For Site Drive #6/Bluegrass Lane at Hoover Road, poor operations are expected in 2035 Build conditions for traffic exiting the site under stop sign control. The Hoover Road/Bluegrass Lane intersection should be monitored beyond Phase 2 buildout to determine if/when traffic signal control is justified from a volume standpoint.

## **4.2 Turn Lane Warrants/Sizing**

The Location and Design Manual § 401 (Ohio Department of Transportation, 2010) provides guidelines for establishing turn lane storage and deceleration requirements. These guidelines were previously used to determine turn lane lengths for warranted turn lanes at the proposed site drives on N. Meadows Drive. One location that was checked includes Drive #5 on N. Meadows Drive, which indicated that a northbound right turn lane is not predicted to be warranted when Phase Two buildout is complete. However, future 2035 Build conditions are likely to require this turn lane on Meadows Drive as traffic increases in the future along this roadway.

Similarly, a turn lane warrant analysis at the Hoover Road & Bluegrass Lane/Drive #6 intersection shows that a northbound left turn lane is warranted there and should be 161 feet, including 50-foot drop, based on lane sizing calculations. Pavement is already available for this movement on Hoover Road and could be restriped to provide the needed turn lane. Turn lane warrants and lane sizing calculations are provided for reference in **Appendix D**.



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## 5.0 CONCLUSIONS AND RECOMMENDATIONS

Data collected for this study supports the analysis and conclusions reported in 2012 prior to construction of N. Meadows Drive and Phase 1 of the Mount Carmel site. Traffic distribution to and from Phase 1 was found to be consistent with assumptions made in 2012 while overall trip generation is less than expected. Use of N. Meadows Drive as a “cut-through” route between Hoover Road and SR 665 is less than expected, indicating that the design of the roadway has achieved the goal of reducing use by through traffic. Analyses show that the existing road network has sufficient reserve capacity to accept additional traffic generated by completion of Phase Two of the Mount Carmel development on Meadows Drive. No site mitigation is required to accommodate background traffic growth combined with site traffic from the second phase of the Mount Carmel site.

It appears from recently completed 2015 traffic counts that the roadway improvements completed when Meadows Drive was extended from SR 665 to Hoover Road and the I-71/SR 665 interchange was reconstructed still include reserve capacity in excess of that needed to accommodate the second phase of the Mount Carmel site. The adjacent intersections adequately serve current traffic volumes and are predicted to operate well as the second phase of the Mount Carmel site is completed. The future potential need to add dual eastbound left turn lanes on SR 665 remain a design year (2035) consideration and is not necessary to address 2018 Phase Two Build conditions.

The level of traffic expected on the Bluegrass Lane extension through the site is expected to be generally low. In order to help control vehicle speed and volume, a two-lane section is generally recommended without turn lanes at intersections with other site circulation roads. As Bluegrass Lane approaches Hoover Road from the west, a 3-lane section should be developed with a westbound left turn lane serving traffic destined for the parking garage in the southeast portion of the site. The 3-lane section should continue to Hoover Road providing two lanes (left turn and through-right turn) approaching Hoover Road with one departure lane away from the intersection. A northbound right turn lane on N. Meadows Drive at Bluegrass Lane was previously recommended in our 2012 and should be part of the project to construct the Bluegrass Lane extension through the site.

## Appendix A: Traffic Data

# EMH&T

5500 New Albany Road  
Columbus, OH 43054  
emht.com

File Name : SR 665 - Hoover  
Site Code : 00000000  
Start Date : 3/24/2015  
Page No : 1

## Groups Printed- Cars - Trucks

Start Time	HOOVER Southbound					SR665 Westbound					HOOVER Northbound					SR665 Eastbound					App. Total	Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
07:15 AM	19	9	56	0	84	4	151	28	0	183	105	15	2	0	122	22	34	7	0	63	452	
07:30 AM	13	8	61	0	82	3	141	42	0	186	77	23	2	0	102	30	44	7	0	81	451	
07:45 AM	17	14	41	0	72	2	102	25	0	129	60	14	2	0	76	35	57	17	0	109	386	
Total	49	31	158	0	238	9	394	95	0	498	242	52	6	0	300	87	135	31	0	253	1289	
08:00 AM	25	9	60	0	94	1	84	13	0	98	56	9	4	0	69	28	38	15	0	81	342	
*** BREAK ***																						
Total	25	9	60	0	94	1	84	13	0	98	56	9	4	0	69	28	38	15	0	81	342	
*** BREAK ***																						
04:30 PM	43	34	42	0	119	9	92	24	0	125	25	30	1	0	56	52	96	52	0	200	500	
04:45 PM	56	54	50	0	160	3	75	25	0	103	42	27	11	0	80	61	100	71	0	232	575	
Total	99	88	92	0	279	12	167	49	0	228	67	57	12	0	136	113	196	123	0	432	1075	
05:00 PM	39	52	44	0	135	4	83	23	0	110	41	22	3	0	66	58	93	47	0	198	509	
05:15 PM	49	47	48	0	144	8	85	25	0	118	36	22	2	0	60	57	89	43	0	189	511	
Grand Total	261	227	402	0	890	34	813	205	0	1052	442	162	27	0	631	343	551	259	0	1153	3726	
Apprch %	29.3	25.5	45.2	0		3.2	77.3	19.5	0		70	25.7	4.3	0		29.7	47.8	22.5	0			
Total %	7	6.1	10.8	0	23.9	0.9	21.8	5.5	0	28.2	11.9	4.3	0.7	0	16.9	9.2	14.8	7	0	30.9		
Cars	256	225	397	0	878	32	763	201	0	996	435	159	26	0	620	334	522	255	0	1111	3605	
% Cars	98.1	99.1	98.8	0	98.7	94.1	93.8	98	0	94.7	98.4	98.1	96.3	0	98.3	97.4	94.7	98.5	0	96.4	96.8	
Trucks	5	2	5	0	12	2	50	4	0	56	7	3	1	0	11	9	29	4	0	42	121	
% Trucks	1.9	0.9	1.2	0	1.3	5.9	6.2	2	0	5.3	1.6	1.9	3.7	0	1.7	2.6	5.3	1.5	0	3.6	3.2	

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File Name : SR 665 - Hoover

Site Code : 00000000

Start Date : 3/24/2015

Page No : 2

Start Time	HOOVER Southbound					SR665 Westbound					HOOVER Northbound					SR665 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:15 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	19	9	56	0	84	4	151	28	0	183	105	15	2	0	122	22	34	7	0	63	452
07:30 AM	13	8	61	0	82	3	141	42	0	186	77	23	2	0	102	30	44	7	0	81	451
07:45 AM	17	14	41	0	72	2	102	25	0	129	60	14	2	0	76	35	57	17	0	109	386
08:00 AM	25	9	60	0	94	1	84	13	0	98	56	9	4	0	69	28	38	15	0	81	342
Total Volume	74	40	218	0	332	10	478	108	0	596	298	61	10	0	369	115	173	46	0	334	1631
% App. Total	22.3	12	65.7	0		1.7	80.2	18.1	0		80.8	16.5	2.7	0		34.4	51.8	13.8	0		
PHF	.740	.714	.893	.000	.883	.625	.791	.643	.000	.801	.710	.663	.625	.000	.756	.821	.759	.676	.000	.766	.902

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File Name : SR 665 - Hoover  
Site Code : 00000000  
Start Date : 3/24/2015  
Page No : 3

Start Time	HOOVER Southbound					SR665 Westbound					HOOVER Northbound					SR665 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 12:00 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	43	34	42	0	119	9	92	24	0	125	25	30	1	0	56	52	96	52	0	200	500
04:45 PM	56	54	50	0	160	3	75	25	0	103	42	27	11	0	80	61	100	71	0	232	575
05:00 PM	39	52	44	0	135	4	83	23	0	110	41	22	3	0	66	58	93	47	0	198	509
05:15 PM	49	47	48	0	144	8	85	25	0	118	36	22	2	0	60	57	89	43	0	189	511
Total Volume	187	187	184	0	558	24	335	97	0	456	144	101	17	0	262	228	378	213	0	819	2095
% App. Total	33.5	33.5	33	0		5.3	73.5	21.3	0		55	38.5	6.5	0		27.8	46.2	26	0		
PHF	.835	.866	.920	.000	.872	.667	.910	.970	.000	.912	.857	.842	.386	.000	.819	.934	.945	.750	.000	.883	.911

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5500 New Albany Road

Columbus, OH 43054

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File Name : SR 665 - N Meadows

Site Code : 00000000

Start Date : 3/17/2015

Page No : 1

## Groups Printed- Cars - Trucks

Start Time	N MEADOWS Southbound					SR 665 Westbound					N MEADOWS Northbound					SR 665 Eastbound					App. Total	Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
07:00 AM	0	3	9	0	12	20	270	4	0	294	51	1	3	0	55	20	76	19	0	115	476	
07:15 AM	0	3	15	0	18	28	288	8	0	324	63	3	12	0	78	40	84	21	1	146	566	
07:30 AM	0	2	21	0	23	27	257	10	1	295	93	5	16	0	114	45	130	18	0	193	625	
07:45 AM	3	3	4	0	10	31	239	10	0	280	54	5	9	0	68	41	84	10	0	135	493	
Total	3	11	49	0	63	106	1054	32	1	1193	261	14	40	0	315	146	374	68	1	589	2160	
08:00 AM	1	3	17	0	21	26	215	8	0	249	82	3	10	0	95	30	97	12	0	139	504	
08:15 AM	2	4	10	0	16	22	182	9	0	213	75	3	20	0	98	32	88	10	0	130	457	
08:30 AM	3	1	16	0	20	21	154	8	0	183	82	2	14	0	98	26	103	9	0	138	439	
08:45 AM	1	0	10	0	11	0	10	9	0	19	42	4	9	0	55	32	95	8	0	135	220	
Total	7	8	53	0	68	69	561	34	0	664	281	12	53	0	346	120	383	39	0	542	1620	
*** BREAK ***																						
03:00 PM	7	4	26	0	37	19	146	13	0	178	40	5	13	0	58	9	130	14	0	153	426	
03:15 PM	3	6	24	0	33	14	137	9	0	160	24	3	10	0	37	25	154	14	0	193	423	
03:30 PM	14	9	79	0	102	10	140	13	0	163	87	2	12	0	101	28	215	12	0	255	621	
03:45 PM	10	5	27	0	42	15	145	6	0	166	46	4	15	0	65	27	244	14	0	285	558	
Total	34	24	156	0	214	58	568	41	0	667	197	14	50	0	261	89	743	54	0	886	2028	
04:00 PM	20	2	54	0	76	19	149	7	0	175	51	1	18	0	70	9	218	14	0	241	562	
04:15 PM	9	7	23	0	39	23	154	6	0	183	34	1	15	0	50	17	230	12	0	259	531	
04:30 PM	20	5	31	0	56	18	144	9	0	171	52	6	14	0	72	19	266	14	0	299	598	
04:45 PM	11	7	22	0	40	16	154	6	0	176	42	4	12	0	58	8	251	5	0	264	538	
Total	60	21	130	0	211	76	601	28	0	705	179	12	59	0	250	53	965	45	0	1063	2229	
05:00 PM	11	2	35	0	48	18	146	11	0	175	54	4	21	0	79	13	259	15	0	287	589	
05:15 PM	8	10	20	0	38	23	142	8	0	173	43	5	14	0	62	18	257	13	0	288	561	
05:30 PM	13	5	21	0	39	26	154	10	0	190	39	3	22	0	64	7	244	14	0	265	558	
05:45 PM	7	7	27	0	41	28	152	13	0	193	39	4	14	0	57	21	218	13	0	252	543	
Total	39	24	103	0	166	95	594	42	0	731	175	16	71	0	262	59	978	55	0	1092	2251	
Grand Total	143	88	491	0	722	404	3378	177	1	3960	1093	68	273	0	1434	467	3443	261	1	4172	10288	
Apprch %	19.8	12.2	68	0		10.2	85.3	4.5	0		76.2	4.7	19	0		11.2	82.5	6.3	0			
Total %	1.4	0.9	4.8	0	7	3.9	32.8	1.7	0	38.5	10.6	0.7	2.7	0	13.9	4.5	33.5	2.5	0	40.6		
Cars	140	85	444	0	669	373	3269	170	1	3813	935	65	264	0	1264	424	3347	156	1	3928	9674	
% Cars	97.9	96.6	90.4	0	92.7	92.3	96.8	96	100	96.3	85.5	95.6	96.7	0	88.1	90.8	97.2	59.8	100	94.2	94	
Trucks	3	3	47	0	53	31	109	7	0	147	158	3	9	0	170	43	96	105	0	244	614	
% Trucks	2.1	3.4	9.6	0	7.3	7.7	3.2	4	0	3.7	14.5	4.4	3.3	0	11.9	9.2	2.8	40.2	0	5.8	6	

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File Name : SR 665 - N Meadows

Site Code : 00000000

Start Date : 3/17/2015

Page No : 3

Start Time	N MEADOWS Southbound					SR 665 Westbound					N MEADOWS Northbound					SR 665 Eastbound					
	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 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	20	5	31	0	56	18	144	9	0	171	52	6	14	0	72	19	266	14	0	299	598
04:45 PM	11	7	22	0	40	16	154	6	0	176	42	4	12	0	58	8	251	5	0	264	538
05:00 PM	11	2	35	0	48	18	146	11	0	175	54	4	21	0	79	13	259	15	0	287	589
05:15 PM	8	10	20	0	38	23	142	8	0	173	43	5	14	0	62	18	257	13	0	288	561
Total Volume	50	24	108	0	182	75	586	34	0	695	191	19	61	0	271	58	1033	47	0	1138	2286
% App. Total	27.5	13.2	59.3	0		10.8	84.3	4.9	0		70.5	7	22.5	0		5.1	90.8	4.1	0		
PHF	.625	.600	.771	.000	.813	.815	.951	.773	.000	.987	.884	.792	.726	.000	.858	.763	.971	.783	.000	.952	.956

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File Name : SR 665 - N Meadows

Site Code : 00000000

Start Date : 3/17/2015

Page No : 2

Start Time	N MEADOWS Southbound					SR 665 Westbound					N MEADOWS Northbound					SR 665 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	3	15	0	18	28	288	8	0	324	63	3	12	0	78	40	84	21	1	146	566
07:30 AM	0	2	21	0	23	27	257	10	1	295	93	5	16	0	114	45	130	18	0	193	625
07:45 AM	3	3	4	0	10	31	239	10	0	280	54	5	9	0	68	41	84	10	0	135	493
08:00 AM	1	3	17	0	21	26	215	8	0	249	82	3	10	0	95	30	97	12	0	139	504
Total Volume	4	11	57	0	72	112	999	36	1	1148	292	16	47	0	355	156	395	61	1	613	2188
% App. Total	5.6	15.3	79.2	0		9.8	87	3.1	0.1		82.3	4.5	13.2	0		25.4	64.4	10	0.2		
PHF	.333	.917	.679	.000	.783	.903	.867	.900	.250	.886	.785	.800	.734	.000	.779	.867	.760	.726	.250	.794	.875

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File Name : Hoover - Bluegrass

Site Code : 00000000

Start Date : 4/1/2015

Page No : 1

Start Time	HOOVER Southbound					BLUEGRASS Westbound					HOOVER Northbound					Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
04:30 PM	8	106	0	0	114	10	0	5	0	15	0	105	3	1	109	0	0	0	0	0	238
04:45 PM	3	103	0	0	106	10	0	2	0	12	0	115	5	1	121	0	0	0	0	0	239
Total	11	209	0	0	220	20	0	7	0	27	0	220	8	2	230	0	0	0	0	0	477
05:00 PM	4	129	0	0	133	2	0	5	0	7	0	115	9	0	124	0	0	0	0	0	264
05:15 PM	8	133	0	0	141	3	0	9	0	12	0	103	14	0	117	0	0	0	0	0	270
Grand Total	23	471	0	0	494	25	0	21	0	46	0	438	31	2	471	0	0	0	0	0	1011
Apprch %	4.7	95.3	0	0		54.3	0	45.7	0		0	93	6.6	0.4		0	0	0	0		
Total %	2.3	46.6	0	0	48.9	2.5	0	2.1	0	4.5	0	43.3	3.1	0.2	46.6	0	0	0	0	0	
% Cars	23	469	0	0	492	25	0	21	0	46	0	433	31	2	466	0	0	0	0	0	1004
% Cars	100	99.6	0	0	99.6	100	0	100	0	100	0	98.9	100	100	98.9	0	0	0	0	0	99.3
Trucks	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	7
% Trucks	0	0.4	0	0	0.4	0	0	0	0	0	0	1.1	0	0	1.1	0	0	0	0	0	0.7





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Columbus, OH 43054

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File Name : Hoover - Bluegrass AM

Site Code : 00000000

Start Date : 4/8/2015

Page No : 1

## Groups Printed- Cars - Trucks

Start Time	HOOVER ROAD Southbound					BLUEGRASS LANE Westbound					HOOVER ROAD Northbound					BLUEGRASS LANE Eastbound					Int. Total	
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
07:15 AM	0	59	0	0	59	10	0	10	0	20	0	93	2	0	95	0	0	0	0	0	0	174
07:30 AM	3	47	0	0	50	12	0	10	0	22	0	124	0	0	124	0	0	0	0	0	0	196
07:45 AM	3	55	0	0	58	8	0	6	0	14	0	98	3	0	101	0	0	0	0	0	0	173
Total	6	161	0	0	167	30	0	26	0	56	0	315	5	0	320	0	0	0	0	0	0	543
08:00 AM	2	60	0	0	62	11	0	9	0	20	0	64	3	0	67	0	0	0	0	0	0	149
Grand Total	8	221	0	0	229	41	0	35	0	76	0	379	8	0	387	0	0	0	0	0	0	692
Apprch %	3.5	96.5	0	0		53.9	0	46.1	0		0	97.9	2.1	0		0	0	0	0	0	0	
Total %	1.2	31.9	0	0	33.1	5.9	0	5.1	0	11	0	54.8	1.2	0	55.9	0	0	0	0	0	0	
Cars	7	217	0	0	224	41	0	35	0	76	0	367	7	0	374	0	0	0	0	0	0	674
% Cars	87.5	98.2	0	0	97.8	100	0	100	0	100	0	96.8	87.5	0	96.6	0	0	0	0	0	0	97.4
Trucks	1	4	0	0	5	0	0	0	0	0	0	12	1	0	13	0	0	0	0	0	0	18
% Trucks	12.5	1.8	0	0	2.2	0	0	0	0	0	0	3.2	12.5	0	3.4	0	0	0	0	0	0	2.6

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File Name : N Meadows - Holton - Hoover

Site Code : 00000000

Start Date : 3/17/2015

Page No : 1

Groups Printed- Cars - Trucks																					
Start Time	HOOVER Southbound					HOLTON Westbound					HOOVER Northbound					N MEADOWS Eastbound					
	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	14	29	6	0	49	0	4	18	0	22	4	76	3	0	83	1	0	1	0	2	156
07:15 AM	21	37	6	0	64	7	8	26	0	41	4	90	4	0	98	2	3	3	0	8	211
07:30 AM	15	45	7	0	67	6	2	37	0	45	5	130	9	0	144	5	1	2	0	8	264
07:45 AM	34	68	8	0	110	3	5	31	0	39	5	94	15	0	114	5	6	0	0	11	274
Total	84	179	27	0	290	16	19	112	0	147	18	390	31	0	439	13	10	6	0	29	905
08:00 AM	41	64	8	0	113	4	3	20	1	28	5	94	24	0	123	8	4	0	1	13	277
08:15 AM	21	46	9	1	77	2	2	23	0	27	2	85	5	0	92	8	3	4	1	16	212
08:30 AM	21	44	6	0	71	3	6	24	0	33	4	74	6	0	84	5	1	2	0	8	196
08:45 AM	52	50	12	0	114	1	3	63	0	67	3	78	9	0	90	5	0	3	0	8	279
Total	135	204	35	1	375	10	14	130	1	155	14	331	44	0	389	26	8	9	2	45	964
*** BREAK ***																					
03:00 PM	18	79	10	0	107	4	5	29	0	38	1	107	8	1	117	7	7	2	0	16	278
03:15 PM	35	100	17	0	152	5	3	25	0	33	1	76	12	0	89	9	3	2	0	14	288
03:30 PM	38	137	13	0	188	8	3	16	0	27	0	89	8	0	97	23	4	3	0	30	342
03:45 PM	37	116	8	1	162	7	8	20	0	35	1	82	5	1	89	6	6	1	0	13	299
Total	128	432	48	1	609	24	19	90	0	133	3	354	33	2	392	45	20	8	0	73	1207
04:00 PM	25	121	5	0	151	12	1	53	0	66	0	89	6	1	96	11	1	2	0	14	327
04:15 PM	22	115	10	0	147	6	4	29	0	39	2	81	10	2	95	6	6	4	0	16	297
04:30 PM	35	118	8	0	161	7	3	20	0	30	2	93	15	0	110	9	3	3	0	15	316
04:45 PM	39	115	11	0	165	10	7	25	0	42	1	91	8	0	100	9	7	5	0	21	328
Total	121	469	34	0	624	35	15	127	0	177	5	354	39	3	401	35	17	14	0	66	1268
05:00 PM	48	124	10	0	182	9	2	28	0	39	1	98	17	0	116	13	5	4	0	22	359
05:15 PM	53	122	7	2	184	11	3	25	0	39	0	97	15	0	112	14	4	2	2	22	357
05:30 PM	38	122	7	1	168	17	7	57	0	81	1	91	14	0	106	13	5	0	1	19	374
05:45 PM	48	124	2	0	174	12	2	42	0	56	1	112	8	0	121	8	6	2	0	16	367
Total	187	492	26	3	708	49	14	152	0	215	3	398	54	0	455	48	20	8	3	79	1457
Grand Total	655	1776	170	5	2606	134	81	611	1	827	43	1827	201	5	2076	167	75	45	5	292	5801
Apprch %	25.1	68.2	6.5	0.2		16.2	9.8	73.9	0.1		2.1	88	9.7	0.2		57.2	25.7	15.4	1.7		
Total	11.3	30.6	2.9	0.1	44.9	2.3	1.4	10.5	0	14.3	0.7	31.5	3.5	0.1	35.8	2.9	1.3	0.8	0.1	5	
Cars	625	1754	170	5	2554	133	79	569	0	781	43	1793	198	5	2039	166	73	45	5	289	5663
% Cars	95.4	98.8	100	100	98	99.3	97.5	93.1	0	94.4	100	98.1	98.5	100	98.2	99.4	97.3	100	100	99	97.6
Trucks	30	22	0	0	52	1	2	42	1	46	0	34	3	0	37	1	2	0	0	3	138
% Trucks	4.6	1.2	0	0	2	0.7	2.5	6.9	100	5.6	0	1.9	1.5	0	1.8	0.6	2.7	0	0	1	2.4

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5500 New Albany Road

Columbus, OH 43054

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File Name : N Meadows - Holton - Hoover

Site Code : 00000000

Start Date : 3/17/2015

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Start Time	HOOVER Southbound					HOLTON Westbound					HOOVER Northbound					N MEADOWS Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	21	37	6	0	64	7	8	26	0	41	4	90	4	0	98	2	3	3	0	8	211
07:30 AM	15	45	7	0	67	6	2	37	0	45	5	130	9	0	144	5	1	2	0	8	264
07:45 AM	34	68	8	0	110	3	5	31	0	39	5	94	15	0	114	5	6	0	0	11	274
08:00 AM	41	64	8	0	113	4	3	20	1	28	5	94	24	0	123	8	4	0	1	13	277
Total Volume	111	214	29	0	354	20	18	114	1	153	19	408	52	0	479	20	14	5	1	40	1026
% App. Total	31.4	60.5	8.2	0		13.1	11.8	74.5	0.7		4	85.2	10.9	0		50	35	12.5	2.5		
PHF	.677	.787	.906	.000	.783	.714	.563	.770	.250	.850	.950	.785	.542	.000	.832	.625	.583	.417	.250	.769	.926

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File Name : N Meadows - Holton - Hoover

Site Code : 00000000

Start Date : 3/17/2015

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Start Time	HOOVER Southbound					HOLTON Westbound					HOOVER Northbound					N MEADOWS Eastbound					App. Total	Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 07:30 AM																						
07:30 AM	15	45	7	0	67	6	2	37	0	45	5	130	9	0	144	5	1	2	0	8	264	
07:45 AM	34	68	8	0	110	3	5	31	0	39	5	94	15	0	114	5	6	0	0	11	274	
08:00 AM	41	64	8	0	113	4	3	20	1	28	5	94	24	0	123	8	4	0	1	13	277	
08:15 AM	21	46	9	1	77	2	2	23	0	27	2	85	5	0	92	8	3	4	1	16	212	
Total Volume	111	223	32	1	367	15	12	111	1	139	17	403	53	0	473	26	14	6	2	48	1027	
% App. Total	30.2	60.8	8.7	0.3		10.8	8.6	79.9	0.7		3.6	85.2	11.2	0		54.2	29.2	12.5	4.2			
PHF	.677	.820	.889	.250	.812	.625	.600	.750	.250	.772	.850	.775	.552	.000	.821	.813	.583	.375	.500	.750	.927	

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File Name : N Meadows - Holton - Hoover

Site Code : 00000000

Start Date : 3/17/2015

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Start Time	HOOVER Southbound					HOLTON Westbound					HOOVER Northbound					N MEADOWS Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	48	124	10	0	182	9	2	28	0	39	1	98	17	0	116	13	5	4	0	22	359
05:15 PM	53	122	7	2	184	11	3	25	0	39	0	97	15	0	112	14	4	2	2	22	357
05:30 PM	38	122	7	1	168	17	7	57	0	81	1	91	14	0	106	13	5	0	1	19	374
05:45 PM	48	124	2	0	174	12	2	42	0	56	1	112	8	0	121	8	6	2	0	16	367
Total Volume	187	492	26	3	708	49	14	152	0	215	3	398	54	0	455	48	20	8	3	79	1457
% App. Total	26.4	69.5	3.7	0.4		22.8	6.5	70.7	0		0.7	87.5	11.9	0		60.8	25.3	10.1	3.8		
PHF	.882	.992	.650	.375	.962	.721	.500	.667	.000	.664	.750	.888	.794	.000	.940	.857	.833	.500	.375	.898	.974

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File Name : N Meadows - Holton - Hoover

Site Code : 00000000

Start Date : 3/17/2015

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Start Time	HOOVER Southbound					HOLTON Westbound					HOOVER Northbound					N MEADOWS Eastbound					
	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 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	35	118	8	0	161	7	3	20	0	30	2	93	15	0	110	9	3	3	0	15	316
04:45 PM	39	115	11	0	165	10	7	25	0	42	1	91	8	0	100	9	7	5	0	21	328
05:00 PM	48	124	10	0	182	9	2	28	0	39	1	98	17	0	116	13	5	4	0	22	359
05:15 PM	53	122	7	2	184	11	3	25	0	39	0	97	15	0	112	14	4	2	2	22	357
Total Volume	175	479	36	2	692	37	15	98	0	150	4	379	55	0	438	45	19	14	2	80	1360
% App. Total	25.3	69.2	5.2	0.3		24.7	10	65.3	0		0.9	86.5	12.6	0		56.2	23.8	17.5	2.5		
PHF	.825	.966	.818	.250	.940	.841	.536	.875	.000	.893	.500	.967	.809	.000	.944	.804	.679	.700	.250	.909	.947

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File Name : N Meadows - Site Dr 1

Site Code : 00000000

Start Date : 3/17/2015

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Start Time	Southbound					N MEADOWS Westbound					SITE DR #1 Northbound					N MEADOWS Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	1	19	0	0	20	0	0	4	0	4	0	3	0	0	3	27
07:30 AM	0	0	0	0	0	2	12	0	0	14	0	0	1	1	2	0	7	0	0	7	23
07:45 AM	0	0	0	0	0	1	18	0	1	20	0	0	0	0	0	0	11	0	0	11	31
08:00 AM	0	0	0	0	0	4	12	0	0	16	0	0	2	1	3	0	10	0	0	10	29
Total Volume	0	0	0	0	0	8	61	0	1	70	0	0	7	2	9	0	31	0	0	31	110
% App. Total	0	0	0	0	0	11.4	87.1	0	1.4		0	0	77.8	22.2	0	100	0	0			
PHF	.000	.000	.000	.000	.000	.500	.803	.000	.250	.875	.000	.000	.438	.500	.563	.000	.705	.000	.000	.705	.887

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5500 New Albany Road

Columbus, OH 43054

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File Name : N Meadows - Site Dr 1

Site Code : 00000000

Start Date : 3/17/2015

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Start Time	Southbound					N MEADOWS Westbound					SITE DR #1 Northbound					N MEADOWS Eastbound					
	Left	Thru	Rig	Ped	App Total	Left	Thru	Rig	Ped	App Total	Left	Thru	Right	Peds	App Total	Left	Thru	Right	Peds	App Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	13	0	0	13	0	0	1	0	1	0	14	1	0	15	29
04:45 PM	0	0	0	0	0	4	15	0	0	19	0	0	7	0	7	0	15	0	0	15	41
05:00 PM	0	0	0	0	0	1	11	0	0	12	0	0	6	0	6	0	18	0	0	18	36
05:15 PM	0	0	0	0	0	1	9	0	0	10	0	0	6	0	6	0	13	0	0	13	29
Total Volume	0	0	0	0	0	6	48	0	0	54	0	0	20	0	20	0	60	1	0	61	135
% App. Total	0	0	0	0		11.1	88.9	0	0		0	0	100	0		0	98.4	1.6	0		
PHF	.000	.000	.000	.000	.000	.375	.800	.000	.000	.711	.000	.000	.714	.000	.714	.000	.833	.250	.000	.847	.823

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File Name : N Meadows - Site Dr 1  
Site Code : 00000000  
Start Date : 3/17/2015  
Page No : 1

Start Time	Groups Printed- Cars - Trucks																				Int. Total
	Southbound					N MEADOWS Westbound					SITE DR #1 Northbound					N MEADOWS Eastbound					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	0	0	0	0	0	1	12	0	0	13	1	0	1	0	2	0	1	0	0	1	16
07:15 AM	0	0	0	0	0	1	19	0	0	20	0	0	4	0	4	0	3	0	0	3	27
07:30 AM	0	0	0	0	0	2	12	0	0	14	0	0	1	1	2	0	7	0	0	7	23
07:45 AM	0	0	0	0	0	1	18	0	1	20	0	0	0	0	0	0	11	0	0	11	31
Total	0	0	0	0	0	5	61	0	1	67	1	0	6	1	8	0	22	0	0	22	97
08:00 AM	0	0	0	0	0	4	12	0	0	16	0	0	2	1	3	0	10	0	0	10	29
08:15 AM	0	0	0	0	0	3	11	0	0	14	0	0	2	0	2	0	12	0	0	12	28
08:30 AM	0	0	0	0	0	4	12	0	0	16	0	0	1	0	1	0	7	0	0	7	24
08:45 AM	0	0	0	0	0	2	15	0	0	17	0	0	1	0	1	0	7	0	0	7	25
Total	0	0	0	0	0	13	50	0	0	63	0	0	6	1	7	0	36	0	0	36	106
*** BREAK ***																					
03:00 PM	0	0	0	0	0	5	11	0	0	16	1	0	1	0	2	0	16	0	0	16	34
03:15 PM	0	0	0	0	0	2	17	0	0	19	0	0	6	0	6	0	7	0	0	7	32
03:30 PM	0	0	0	0	0	6	11	0	0	17	0	0	3	0	3	0	28	0	0	28	48
03:45 PM	0	0	0	0	0	3	14	0	0	17	0	0	3	0	3	0	12	0	0	12	32
Total	0	0	0	0	0	16	53	0	0	69	1	0	13	0	14	0	63	0	0	63	146
04:00 PM	0	0	0	0	0	1	6	0	0	7	1	0	2	0	3	0	12	0	0	12	22
04:15 PM	0	0	0	0	0	1	14	0	0	15	0	0	2	0	2	0	14	0	0	14	31
04:30 PM	0	0	0	0	0	0	13	0	0	13	0	0	1	0	1	0	14	1	0	15	29
04:45 PM	0	0	0	0	0	4	15	0	0	19	0	0	7	0	7	0	15	0	0	15	41
Total	0	0	0	0	0	6	48	0	0	54	1	0	12	0	13	0	55	1	0	56	123
05:00 PM	0	0	0	0	0	1	11	0	0	12	0	0	6	0	6	0	18	0	0	18	36
05:15 PM	0	0	0	0	0	1	9	0	0	10	0	0	6	0	6	0	13	0	0	13	29
05:30 PM	0	0	0	0	0	3	13	0	0	16	0	0	2	0	2	0	14	1	0	15	33
05:45 PM	0	0	0	0	0	1	3	0	0	4	1	0	3	0	4	0	14	0	0	14	22
Total	0	0	0	0	0	6	36	0	0	42	1	0	17	0	18	0	59	1	0	60	120
Grand Total	0	0	0	0	0	46	248	0	1	295	4	0	54	2	60	0	235	2	0	237	592
Apprch %	0	0	0	0	0	15.6	84.1	0	0.3		6.7	0	90	3.3		0	99.2	0.8	0		
Total %	0	0	0	0	0	7.8	41.9	0	0.2	49.8	0.7	0	9.1	0.3	10.1	0	39.7	0.3	0	40	
Cars	0	0	0	0	0	46	246	0	1	293	4	0	54	2	60	0	232	2	0	234	587
% Cars	0	0	0	0	0	100	99.2	0	100	99.3	100	0	100	100	100	0	98.7	100	0	98.7	99.2
Trucks	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	5
% Trucks	0	0	0	0	0	0	0.8	0	0	0.7	0	0	0	0	0	0	1.3	0	0	1.3	0.8

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5500 New Albany Road

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File Name : N Meadows - Site Dr 1

Site Code : 00000000

Start Date : 3/17/2015

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Start Time	Southbound					N MEADOWS Westbound					SITE DR #1 Northbound					N MEADOWS Eastbound					App. Total	Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total		
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 07:45 AM																						
07:45 AM	0	0	0	0	0	1	18	0	1	20	0	0	0	0	0	0	11	0	0	11	31	
08:00 AM	0	0	0	0	0	4	12	0	0	16	0	0	2	1	3	0	10	0	0	10	29	
08:15 AM	0	0	0	0	0	3	11	0	0	14	0	0	2	0	2	0	12	0	0	12	28	
08:30 AM	0	0	0	0	0	4	12	0	0	16	0	0	1	0	1	0	7	0	0	7	24	
Total Volume	0	0	0	0	0	12	53	0	1	66	0	0	5	1	6	0	40	0	0	40	112	
% App. Total	0	0	0	0	0	18.2	80.3	0	1.5		0	0	83.3	16.7		0	100	0	0			
PHF	.000	.000	.000	.000	.000	.750	.736	.000	.250	.825	.000	.000	.625	.250	.500	.000	.833	.000	.000	.833	.903	

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File Name : N Meadows - Site Dr 1  
Site Code : 00000000  
Start Date : 3/17/2015  
Page No : 3

Start Time	Southbound					N MEADOWS Westbound					SITE DR #1 Northbound					N MEADOWS Eastbound					
	Left	Thru	Rig	Ped	App Total	Left	Thru	Rig	Ped	App Total	Left	Thru	Right	Peds	App Total	Left	Thru	Right	Peds	App Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	0	0	0	0	0	5	11	0	0	16	1	0	1	0	2	0	16	0	0	16	34
03:15 PM	0	0	0	0	0	2	17	0	0	19	0	0	6	0	6	0	7	0	0	7	32
03:30 PM	0	0	0	0	0	6	11	0	0	17	0	0	3	0	3	0	28	0	0	28	48
03:45 PM	0	0	0	0	0	3	14	0	0	17	0	0	3	0	3	0	12	0	0	12	32
Total Volume	0	0	0	0	0	16	53	0	0	69	1	0	13	0	14	0	63	0	0	63	146
% App. Total	0	0	0	0		23.2	76.8	0	0		7.1	0	92.9	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.667	.779	.000	.000	.908	.250	.000	.542	.000	.583	.000	.563	.000	.000	.563	.760





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File Name : N Meadows - Site Dr 2  
Site Code : 00000000  
Start Date : 3/17/2015  
Page No : 1

Groups Printed- Cars - Trucks																					
Start Time	N MEADOWS Southbound					SITE DR 2 Westbound					N MEADOWS Northbound					Eastbound					
	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	1	10	0	0	11	1	0	0	1	2	0	3	5	0	8	0	0	0	0	0	21
07:15 AM	3	10	0	0	13	0	0	1	0	1	0	8	11	0	19	0	0	0	0	0	33
07:30 AM	6	12	0	0	18	1	0	1	0	2	0	9	7	0	16	0	0	0	0	0	36
07:45 AM	0	12	0	0	12	1	0	0	1	2	0	9	9	0	18	0	0	0	0	0	32
Total	10	44	0	0	54	3	0	2	2	7	0	29	32	0	61	0	0	0	0	0	122
08:00 AM	2	8	0	0	10	1	0	2	0	3	0	11	4	0	15	0	0	0	0	0	28
08:15 AM	4	8	0	0	12	2	0	3	0	5	0	5	8	0	13	0	0	0	0	0	30
08:30 AM	5	11	0	0	16	4	0	1	0	5	0	5	7	0	12	0	0	0	0	0	33
08:45 AM	4	1	0	0	5	5	3	2	0	10	0	4	4	1	9	0	0	0	0	0	24
Total	15	28	0	0	43	12	3	8	0	23	0	25	23	1	49	0	0	0	0	0	115
*** BREAK ***																					
03:00 PM	5	5	0	0	10	2	0	3	0	5	0	13	0	0	13	0	0	0	0	0	28
03:15 PM	2	15	0	0	17	7	0	1	0	8	0	6	3	0	9	0	0	0	0	0	34
03:30 PM	0	11	0	0	11	2	0	6	0	8	0	20	4	0	24	0	0	0	0	0	43
03:45 PM	2	12	0	0	14	7	0	2	0	9	0	10	5	0	15	0	0	0	0	0	38
Total	9	43	0	0	52	18	0	12	0	30	0	49	12	0	61	0	0	0	0	0	143
04:00 PM	0	6	0	0	6	3	0	4	0	7	0	7	2	0	9	0	0	0	0	0	22
04:15 PM	3	12	0	0	15	9	0	7	0	16	0	7	3	0	10	0	0	0	0	0	41
04:30 PM	4	8	0	0	12	9	0	1	0	10	0	12	3	0	15	0	0	0	0	0	37
04:45 PM	1	14	0	0	15	6	0	4	0	10	0	11	1	0	12	0	0	0	0	0	37
Total	8	40	0	0	48	27	0	16	0	43	0	37	9	0	46	0	0	0	0	0	137
05:00 PM	0	11	0	0	11	5	0	2	0	7	0	16	0	0	16	0	0	0	0	0	34
05:15 PM	2	7	0	0	9	1	0	2	0	3	0	12	0	0	12	0	0	0	0	0	24
05:30 PM	0	13	0	0	13	1	0	2	0	3	0	13	1	0	14	0	0	0	0	0	30
05:45 PM	0	4	0	0	4	2	0	1	0	3	0	13	1	0	14	0	0	0	0	0	21
Total	2	35	0	0	37	9	0	7	0	16	0	54	2	0	56	0	0	0	0	0	109
Grand Total	44	190	0	0	234	69	3	45	2	119	0	194	78	1	273	0	0	0	0	0	626
Apprch %	18.8	81.2	0	0		58	2.5	37.8	1.7		0	71.1	28.6	0.4		0	0	0	0		
Total %	7	30.4	0	0	37.4	11	0.5	7.2	0.3	19	0	31	12.5	0.2	43.6	0	0	0	0	0	
Cars	44	185	0	0	229	68	3	45	2	118	0	189	77	1	267	0	0	0	0	0	614
% Cars	100	97.4	0	0	97.9	98.6	100	100	100	99.2	0	97.4	98.7	100	97.8	0	0	0	0	0	98.1
Trucks	0	5	0	0	5	1	0	0	0	1	0	5	1	0	6	0	0	0	0	0	12
% Trucks	0	2.6	0	0	2.1	1.4	0	0	0	0.8	0	2.6	1.3	0	2.2	0	0	0	0	0	1.9



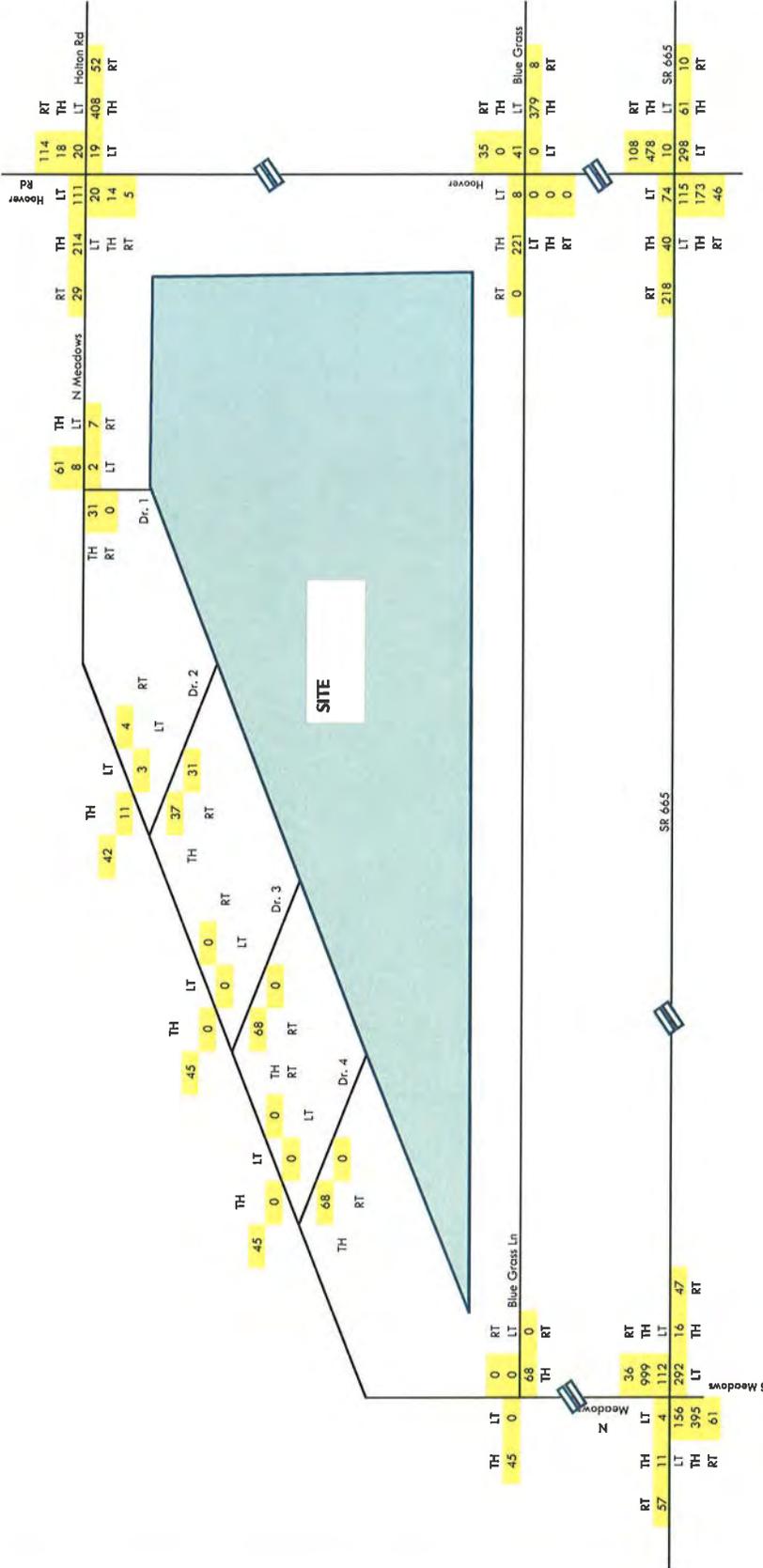


## Appendix B: Traffic Volume Calculations/Trip Assignment

Mt. Carmel Grove City  
 Traffic Impact Study  
 Traffic Volume Calculations

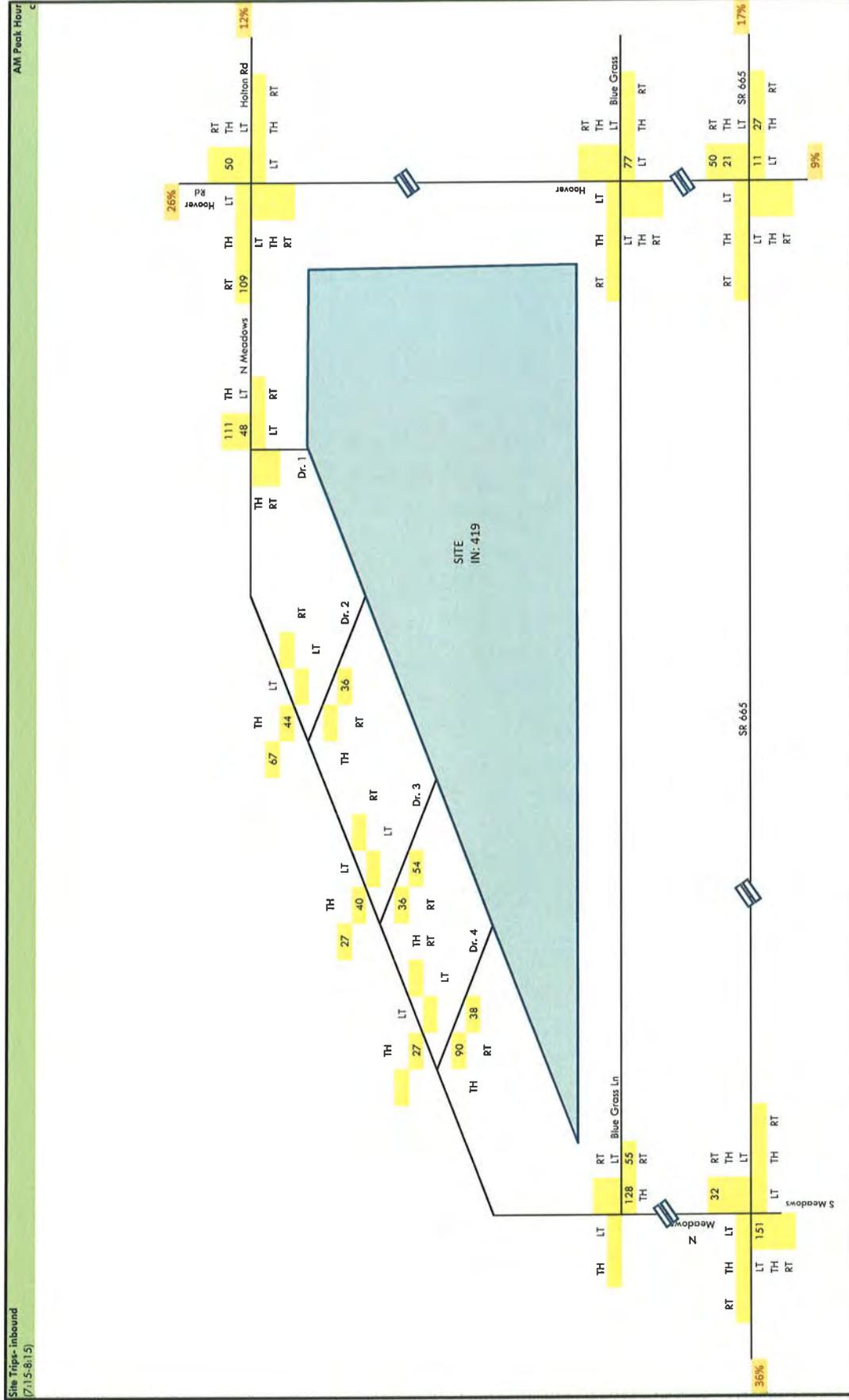
2015 Counted Traffic Volumes  
 (7:15-8:15)

AM Peak Hour



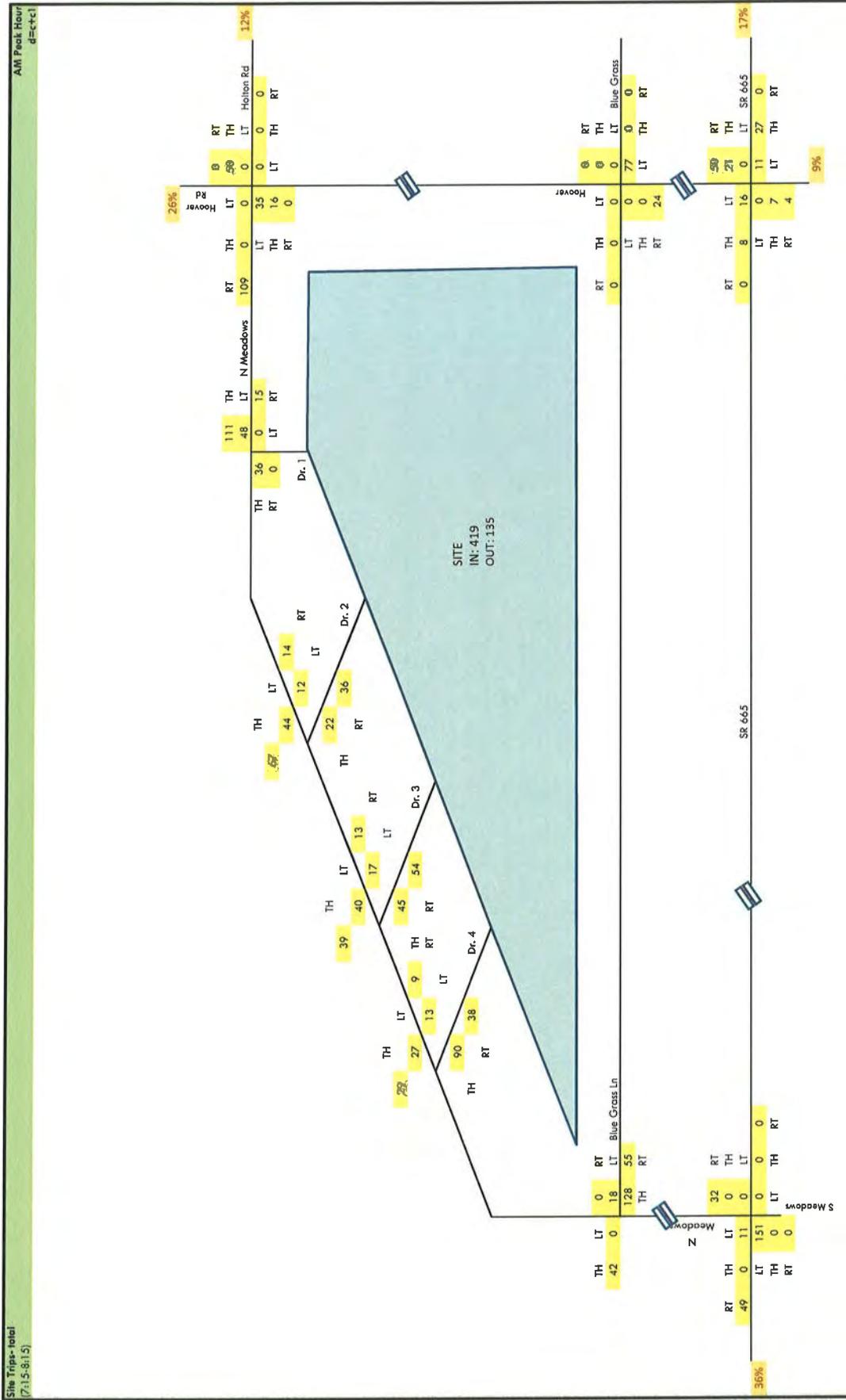


Mt. Carmel Grove City  
 Traffic Impact Study  
 Traffic Volume Calculations





Mt. Carmel Grove City  
 Traffic Impact Study  
 Traffic Volume Calculations



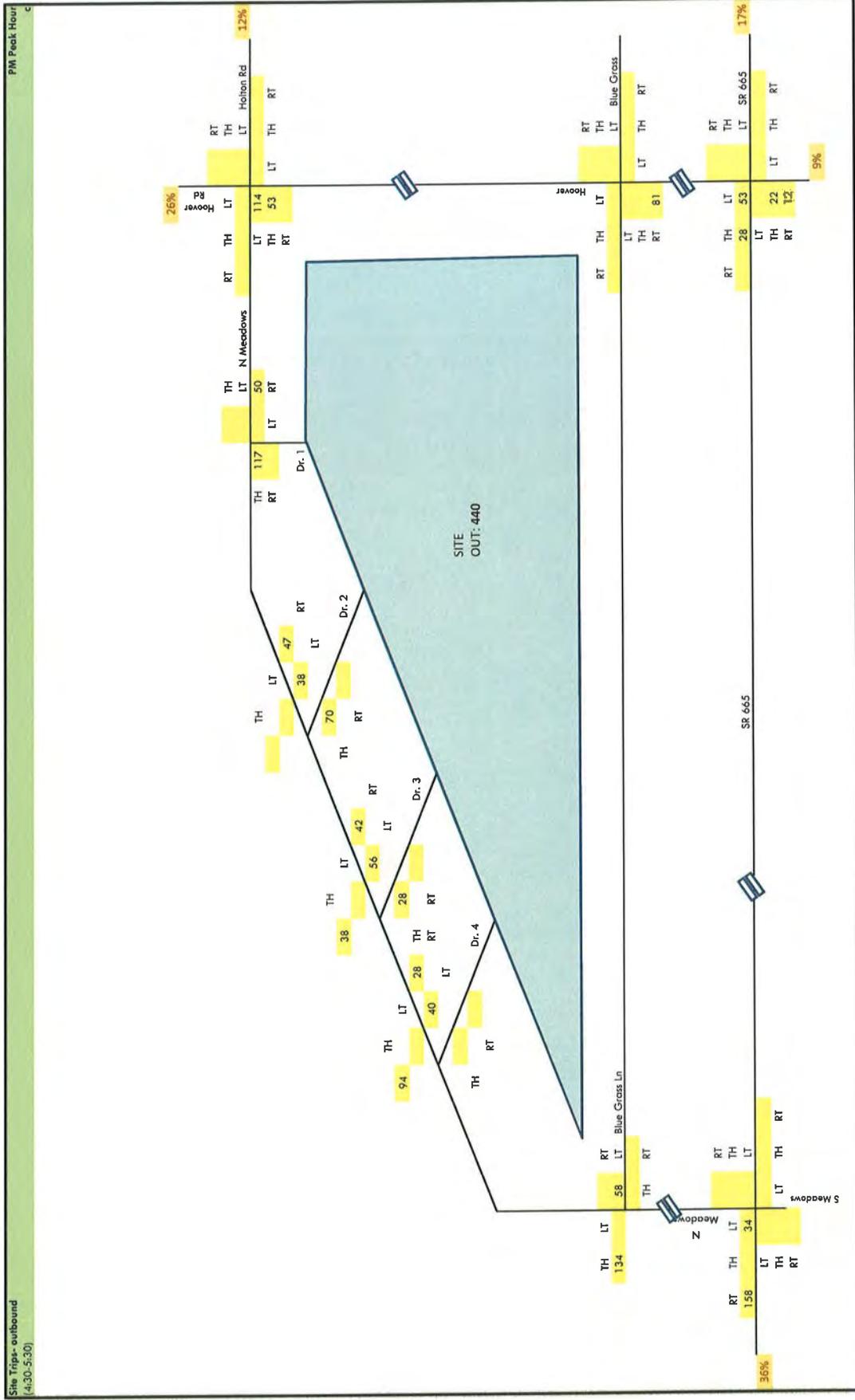








Mt. Carmel Grove City  
 Traffic Impact Study  
 Traffic Volume Calculations







## Appendix C: Capacity Analysis Reports

HCM 2010 Signalized Intersection Summary  
 1: S Meadows Dr/N Meadows Dr & SR 665

4/8/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	316	419	65	119	1059	70	292	16	47	15	11	106
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	343	455	71	129	1151	76	317	17	51	16	12	115
Adj No. of Lanes	1	3	0	1	3	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	415	2493	381	404	1853	122	466	148	444	284	24	233
Arrive On Green	0.19	0.74	0.74	0.51	0.51	0.51	0.16	0.36	0.36	0.16	0.16	0.16
Sat Flow, veh/h	1774	4452	681	873	4874	322	1774	411	1234	1328	152	1454
Grp Volume(v), veh/h	343	344	182	129	800	427	317	0	68	16	0	127
Grp Sat Flow(s),veh/h/ln	1774	1695	1743	873	1695	1806	1774	0	1645	1328	0	1606
Q Serve(g_s), s	11.3	3.0	3.1	9.1	17.0	17.0	14.4	0.0	2.8	1.0	0.0	7.2
Cycle Q Clear(g_c), s	11.3	3.0	3.1	9.1	17.0	17.0	14.4	0.0	2.8	1.0	0.0	7.2
Prop In Lane	1.00		0.39	1.00		0.18	1.00		0.75	1.00		0.91
Lane Grp Cap(c), veh/h	415	1899	976	404	1289	687	466	0	592	284	0	257
V/C Ratio(X)	0.83	0.18	0.19	0.32	0.62	0.62	0.68	0.00	0.11	0.06	0.00	0.49
Avail Cap(c_a), veh/h	540	1899	976	404	1289	687	466	0	592	284	0	257
HCM Platoon Ratio	1.33	1.33	1.33	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.75	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.2	6.0	6.0	17.6	19.5	19.5	27.1	0.0	21.4	35.7	0.0	38.3
Incr Delay (d2), s/veh	8.0	0.2	0.4	1.6	1.7	3.2	4.0	0.0	0.4	0.4	0.0	6.6
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	6.4	1.4	1.5	2.3	8.2	9.0	7.5	0.0	1.3	0.4	0.0	3.7
LnGrp Delay(d),s/veh	25.2	6.2	6.4	19.1	21.2	22.7	31.1	0.0	21.8	36.1	0.0	45.0
LnGrp LOS	C	A	A	B	C	C	C		C	D		D
Approach Vol, veh/h		869			1356			385				143
Approach Delay, s/veh		13.7			21.5			29.4				44.0
Approach LOS		B			C			C				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s		40.0		60.0	20.0	20.0	18.0	42.0				
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s		36.0		56.0	16.0	16.0	21.0	31.0				
Max Q Clear Time (g_c+I1), s		4.8		5.1	16.4	9.2	13.3	19.0				
Green Ext Time (p_c), s		1.3		19.6	0.0	0.6	0.7	8.5				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				21.3								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary  
 1: S Meadows Dr/N Meadows Dr & SR 665

4/8/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	130	1095	50	80	621	50	191	19	61	84	24	266
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	141	1190	54	87	675	54	208	21	66	91	26	289
Adj No. of Lanes	1	3	0	1	3	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	409	2593	118	256	2114	168	333	159	499	411	34	382
Arrive On Green	0.05	0.69	0.69	0.59	0.59	0.59	0.10	0.40	0.40	0.26	0.26	0.26
Sat Flow, veh/h	1774	4987	226	445	4804	382	1774	397	1246	1305	132	1471
Grp Volume(v), veh/h	141	809	435	87	475	254	208	0	87	91	0	315
Grp Sat Flow(s),veh/h/ln	1774	1695	1823	445	1695	1795	1774	0	1643	1305	0	1603
Q Serve(g_s), s	4.0	10.8	10.8	11.9	7.1	7.2	8.2	0.0	3.4	5.5	0.0	18.1
Cycle Q Clear(g_c), s	4.0	10.8	10.8	14.7	7.1	7.2	8.2	0.0	3.4	5.5	0.0	18.1
Prop In Lane	1.00		0.12	1.00		0.21	1.00		0.76	1.00		0.92
Lane Grp Cap(c), veh/h	409	1763	948	256	1492	790	333	0	657	411	0	417
V/C Ratio(X)	0.34	0.46	0.46	0.34	0.32	0.32	0.62	0.00	0.13	0.22	0.00	0.76
Avail Cap(c_a), veh/h	409	1763	948	256	1492	790	333	0	657	411	0	417
HCM Platoon Ratio	1.33	1.33	1.33	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.86	0.86	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.4	9.1	9.1	15.5	13.1	13.1	24.3	0.0	19.0	29.4	0.0	34.1
Incr Delay (d2), s/veh	0.5	0.9	1.6	3.1	0.5	0.9	3.6	0.0	0.4	1.2	0.0	12.0
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	2.1	5.2	5.8	1.7	3.4	3.7	4.3	0.0	1.6	2.1	0.0	9.4
LnGrp Delay(d),s/veh	14.9	9.9	10.7	18.6	13.6	14.0	27.9	0.0	19.4	30.7	0.0	46.1
LnGrp LOS	B	A	B	B	B	B	C		B	C		D
Approach Vol, veh/h		1385			816			295				406
Approach Delay, s/veh		10.7			14.3			25.4				42.7
Approach LOS		B			B			C				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s		44.0		56.0	14.0	30.0	8.0	48.0				
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s		40.0		52.0	10.0	26.0	4.0	44.0				
Max Q Clear Time (g_c+I1), s		5.4		12.8	10.2	20.1	6.0	16.7				
Green Ext Time (p_c), s		3.1		21.2	0.0	1.4	0.0	17.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			17.7									
HCM 2010 LOS			B									

Intersection

Int Delay, s/veh 0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	18	1	195	55	1	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	1	212	60	1	103

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	347	242	0	0	272	0
Stage 1	242	-	-	-	-	-
Stage 2	105	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	650	797	-	-	1291	-
Stage 1	798	-	-	-	-	-
Stage 2	919	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	649	797	-	-	1291	-
Mov Cap-2 Maneuver	649	-	-	-	-	-
Stage 1	798	-	-	-	-	-
Stage 2	918	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	10.7		0		0.1
HCM LOS	B				

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	655	1291	-
HCM Lane V/C Ratio	-	-	0.032	0.001	-
HCM Control Delay (s)	-	-	10.7	7.8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	58	1	126	25	1	200
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	1	137	27	1	217

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	371	151	0	0	164	0
Stage 1	151	-	-	-	-	-
Stage 2	220	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	630	895	-	-	1414	-
Stage 1	877	-	-	-	-	-
Stage 2	817	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	630	895	-	-	1414	-
Mov Cap-2 Maneuver	630	-	-	-	-	-
Stage 1	877	-	-	-	-	-
Stage 2	816	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	11.3		0		0
HCM LOS	B				

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	633	1414	-
HCM Lane V/C Ratio	-	-	0.101	0.001	-
HCM Control Delay (s)	-	-	11.3	7.5	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

**Intersection**

Int Delay, s/veh 1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	13	9	157	38	27	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	10	171	41	29	89

Major/Minor	Minor1	Minor2	Major1	Major2	Major3	Major4
Conflicting Flow All	339	191	0	0	212	0
Stage 1	191	-	-	-	-	-
Stage 2	148	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	657	851	-	-	1358	-
Stage 1	841	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	643	851	-	-	1358	-
Mov Cap-2 Maneuver	643	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	861	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	1.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	714	1358	-
HCM Lane V/C Ratio	-	-	0.033	0.022	-
HCM Control Delay (s)	-	-	10.2	7.7	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection

Int Delay, s/veh 2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	40	28	109	17	12	160
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	30	118	18	13	174

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	328	128	0	0	137	0
Stage 1	128	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	666	922	-	-	1447	-
Stage 1	898	-	-	-	-	-
Stage 2	834	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	660	922	-	-	1447	-
Mov Cap-2 Maneuver	660	-	-	-	-	-
Stage 1	898	-	-	-	-	-
Stage 2	827	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	10.3		0		0.5
HCM LOS	B				

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 747	1447	-
HCM Lane V/C Ratio	-	- 0.099	0.009	-
HCM Control Delay (s)	-	- 10.3	7.5	-
HCM Lane LOS	-	- B	A	-
HCM 95th %tile Q(veh)	-	- 0.3	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	17	13	112	54	40	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	14	122	59	43	100

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	338	151	0	0	180	0
Stage 1	151	-	-	-	-	-
Stage 2	187	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	658	895	-	-	1396	-
Stage 1	877	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	638	895	-	-	1396	-
Mov Cap-2 Maneuver	638	-	-	-	-	-
Stage 1	877	-	-	-	-	-
Stage 2	819	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	2.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 729	1396	-
HCM Lane V/C Ratio	-	- 0.045	0.031	-
HCM Control Delay (s)	-	- 10.2	7.7	-
HCM Lane LOS	-	- B	A	-
HCM 95th %tile Q(veh)	-	- 0.1	0.1	-

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	56	42	112	25	19	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	61	46	122	27	21	126

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	302	135	0	0	149	0
Stage 1	135	-	-	-	-	-
Stage 2	167	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	690	914	-	-	1432	-
Stage 1	891	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	680	914	-	-	1432	-
Mov Cap-2 Maneuver	680	-	-	-	-	-
Stage 1	891	-	-	-	-	-
Stage 2	850	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	764	1432	-
HCM Lane V/C Ratio	-	-	0.139	0.014	-
HCM Control Delay (s)	-	-	10.5	7.6	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection

Int Delay, s/veh 2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	15	18	58	67	55	117
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	20	63	73	60	127

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	346	99	0	0	136	0
Stage 1	99	-	-	-	-	-
Stage 2	247	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	651	957	-	-	1448	-
Stage 1	925	-	-	-	-	-
Stage 2	794	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	624	957	-	-	1448	-
Mov Cap-2 Maneuver	624	-	-	-	-	-
Stage 1	925	-	-	-	-	-
Stage 2	761	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	9.9		0		2.4
HCM LOS	A				

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT	
Capacity (veh/h)	-	-	770	1448	-
HCM Lane V/C Ratio	-	-	0.047	0.041	-
HCM Control Delay (s)	-	-	9.9	7.6	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	59	56	134	20	27	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	64	61	146	22	29	83

Major/Minor	Minor1	Minor2	Major1	Major2	Major3	Major4
Conflicting Flow All	298	157	0	0	167	0
Stage 1	157	-	-	-	-	-
Stage 2	141	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	693	889	-	-	1411	-
Stage 1	871	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	679	889	-	-	1411	-
Mov Cap-2 Maneuver	679	-	-	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	868	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	767	1411	-
HCM Lane V/C Ratio	-	-	0.163	0.021	-
HCM Control Delay (s)	-	-	10.6	7.6	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Intersection

Int Delay, s/veh 1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	76	1	56	172	1	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	60	-	160	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	83	1	61	187	1	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	84	0	392	83
Stage 1	-	-	-	-	83	-
Stage 2	-	-	-	-	309	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1513	-	612	976
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	745	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1513	-	587	976
Mov Cap-2 Maneuver	-	-	-	-	587	-
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	715	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	587	976	-	-	1513	-
HCM Lane V/C Ratio	0.002	0.025	-	-	0.04	-
HCM Control Delay (s)	11.1	8.8	-	-	7.5	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0	0.1	-	-	0.1	-

**Intersection**

Int Delay, s/veh 2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	189	1	28	103	1	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	60	-	160	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	205	1	30	112	1	76

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	207
Stage 1	-	-	206
Stage 2	-	-	173
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1364
Stage 1	-	-	829
Stage 2	-	-	857
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1364
Mov Cap-2 Maneuver	-	-	609
Stage 1	-	-	829
Stage 2	-	-	838

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	609	835	-	-	1364	-
HCM Lane V/C Ratio	0.002	0.091	-	-	0.022	-
HCM Control Delay (s)	10.9	9.7	-	-	7.7	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0	0.3	-	-	0.1	-

HCM 2010 Signalized Intersection Summary

7: Hoover Rd & SR 665

4/8/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	122	190	53	11	528	164	327	92	11	94	50	231
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	133	207	58	12	574	178	355	100	12	102	54	251
Adj No. of Lanes	1	1	1	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	306	820	697	443	889	275	500	653	78	603	894	760
Arrive On Green	0.09	0.59	0.59	0.44	0.44	0.44	0.40	0.40	0.40	0.04	0.48	0.48
Sat Flow, veh/h	1774	1863	1583	1110	2663	824	1070	1632	196	1774	1863	1583
Grp Volume(v), veh/h	133	207	58	12	381	371	355	0	112	102	54	251
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1110	1770	1717	1070	0	1828	1774	1863	1583
Q Serve(g_s), s	4.7	5.4	1.6	0.6	16.8	16.9	29.8	0.0	3.9	3.3	1.6	9.8
Cycle Q Clear(g_c), s	4.7	5.4	1.6	0.6	16.8	16.9	29.8	0.0	3.9	3.3	1.6	9.8
Prop In Lane	1.00		1.00	1.00		0.48	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	306	820	697	443	591	573	500	0	731	603	894	760
V/C Ratio(X)	0.43	0.25	0.08	0.03	0.64	0.65	0.71	0.00	0.15	0.17	0.06	0.33
Avail Cap(c_a), veh/h	349	820	697	443	591	573	500	0	731	603	894	760
HCM Platoon Ratio	1.33	1.33	1.33	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	0.99	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	12.7	11.9	18.7	23.2	23.2	26.9	0.0	19.2	15.7	13.9	16.1
Incr Delay (d2), s/veh	1.0	0.7	0.2	0.1	5.3	5.6	8.3	0.0	0.4	0.1	0.1	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	2.3	2.9	0.7	0.2	9.1	8.9	9.9	0.0	2.1	1.6	0.8	4.5
LnGrp Delay(d),s/veh	20.9	13.5	12.2	18.8	28.5	28.8	35.2	0.0	19.6	15.8	14.1	17.2
LnGrp LOS	C	B	B	B	C	C	D		B	B	B	B
Approach Vol, veh/h		398			764			467			407	
Approach Delay, s/veh		15.7			28.5			31.5			16.4	
Approach LOS		B			C			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	8.0	44.0		48.0		52.0	10.6	37.4				
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	40.0		44.0		48.0	9.0	31.0				
Max Q Clear Time (g_c+I1), s	5.3	31.8		7.4		11.8	6.7	18.9				
Green Ext Time (p_c), s	0.0	2.3		7.2		3.7	0.1	4.8				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			24.3									
HCM 2010 LOS			C									

# HCM 2010 Signalized Intersection Summary

## 7: Hoover Rd & SR 665

4/8/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	242	423	238	25	364	126	158	119	18	251	226	195
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	263	460	259	27	396	137	172	129	20	273	246	212
Adj No. of Lanes	1	1	1	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	455	875	744	298	802	274	336	448	69	567	838	712
Arrive On Green	0.16	0.63	0.63	0.41	0.41	0.41	0.28	0.28	0.28	0.13	0.45	0.45
Sat Flow, veh/h	1774	1863	1583	730	2590	886	930	1575	244	1774	1863	1583
Grp Volume(v), veh/h	263	460	259	27	269	264	172	0	149	273	246	212
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	730	1770	1706	930	0	1820	1774	1863	1583
Q Serve(g_s), s	9.7	13.8	7.8	2.3	11.2	11.5	16.2	0.0	6.4	10.4	8.4	8.5
Cycle Q Clear(g_c), s	9.7	13.8	7.8	2.3	11.2	11.5	16.2	0.0	6.4	10.4	8.4	8.5
Prop In Lane	1.00		1.00	1.00		0.52	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	455	875	744	298	548	528	336	0	517	567	838	712
V/C Ratio(X)	0.58	0.53	0.35	0.09	0.49	0.50	0.51	0.00	0.29	0.48	0.29	0.30
Avail Cap(c_a), veh/h	543	875	744	298	548	528	336	0	517	610	838	712
HCM Platoon Ratio	1.33	1.33	1.33	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.2	12.5	11.4	21.0	23.6	23.7	31.4	0.0	27.9	19.7	17.4	17.5
Incr Delay (d2), s/veh	1.0	2.0	1.1	0.6	3.1	3.4	5.5	0.0	1.4	0.6	0.9	1.1
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	4.8	7.5	3.6	0.5	6.0	5.9	4.7	0.0	3.4	5.1	4.5	3.9
LnGrp Delay(d),s/veh	19.2	14.5	12.5	21.6	26.7	27.0	36.9	0.0	29.3	20.3	18.3	18.5
LnGrp LOS	B	B	B	C	C	C	D		C	C	B	B
Approach Vol, veh/h		982			560			321			731	
Approach Delay, s/veh		15.3			26.6			33.4			19.1	
Approach LOS		B			C			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	16.6	32.4		51.0		49.0	16.0	35.0				
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s	15.0	26.0		47.0		45.0	17.0	26.0				
Max Q Clear Time (g_c+I1), s	12.4	18.2		15.8		10.5	11.7	13.5				
Green Ext Time (p_c), s	0.2	2.5		8.5		4.3	0.4	5.8				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			21.0									
HCM 2010 LOS			C									

Intersection												
Int Delay, s/veh	2.5											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	1	24	41	0	35	77	402	8	8	234	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	100	-	-	100	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	26	45	0	38	84	437	9	9	254	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	900	885	255	895	882	441	255	0	0	446	0	0
Stage 1	272	272	-	609	609	-	-	-	-	-	-	-
Stage 2	628	613	-	286	273	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	259	284	784	261	285	616	1310	-	-	1114	-	-
Stage 1	734	685	-	482	485	-	-	-	-	-	-	-
Stage 2	471	483	-	721	684	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	230	264	784	238	265	616	1310	-	-	1114	-	-
Mov Cap-2 Maneuver	325	355	-	340	351	-	-	-	-	-	-	-
Stage 1	687	679	-	451	454	-	-	-	-	-	-	-
Stage 2	414	452	-	690	678	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	14.4	1.3	0.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1310	-	-	325	748	340	616	1114	-	-
HCM Lane V/C Ratio	0.064	-	-	0.003	0.036	0.131	0.062	0.008	-	-
HCM Control Delay (s)	7.9	-	-	16.1	10	17.2	11.2	8.3	-	-
HCM Lane LOS	A	-	-	C	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0	0.1	0.4	0.2	0	-	-

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	1	81	25	0	21	35	464	31	23	499	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	100	-	-	100	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	88	27	0	23	38	504	34	25	542	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1202	1207	543	1235	1190	521	543	0	0	538	0	0
Stage 1	593	593	-	597	597	-	-	-	-	-	-	-
Stage 2	609	614	-	638	593	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	161	183	540	153	188	555	1026	-	-	1030	-	-
Stage 1	492	493	-	490	491	-	-	-	-	-	-	-
Stage 2	482	483	-	465	493	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	147	172	540	122	177	555	1026	-	-	1030	-	-
Mov Cap-2 Maneuver	270	288	-	234	289	-	-	-	-	-	-	-
Stage 1	474	481	-	472	473	-	-	-	-	-	-	-
Stage 2	445	465	-	379	481	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	17.6	0.6	0.4
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1026	-	-	270	534	234	555	1030	-	-
HCM Lane V/C Ratio	0.037	-	-	0.004	0.167	0.116	0.041	0.024	-	-
HCM Control Delay (s)	8.6	-	-	18.4	13.1	22.4	11.8	8.6	-	-
HCM Lane LOS	A	-	-	C	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0	0.6	0.4	0.1	0.1	-	-

HCM 2010 Signalized Intersection Summary  
 8: Hoover Rd & Bluegrass Ln

4/15/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Volume (veh/h)	1	1	24	41	0	35	77	402	8	8	234	1
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	1	1	26	45	0	38	84	437	9	9	254	1
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	191	6	148	352	0	64	842	927	19	692	945	4
Arrive On Green	0.09	0.09	0.09	0.09	0.00	0.09	0.51	0.51	0.51	0.51	0.51	0.51
Sat Flow, veh/h	62	62	1612	823	0	695	1120	1819	37	940	1854	7
Grp Volume(v), veh/h	28	0	0	83	0	0	84	0	446	9	0	255
Grp Sat Flow(s),veh/h/ln	1736	0	0	1517	0	0	1120	0	1856	940	0	1861
Q Serve(g_s), s	0.0	0.0	0.0	0.7	0.0	0.0	0.9	0.0	3.1	0.1	0.0	1.6
Cycle Q Clear(g_c), s	0.3	0.0	0.0	1.0	0.0	0.0	2.5	0.0	3.1	3.2	0.0	1.6
Prop In Lane	0.04		0.93	0.54		0.46	1.00		0.02	1.00		0.00
Lane Grp Cap(c), veh/h	345	0	0	416	0	0	842	0	946	692	0	949
V/C Ratio(X)	0.08	0.00	0.00	0.20	0.00	0.00	0.10	0.00	0.47	0.01	0.00	0.27
Avail Cap(c_a), veh/h	1618	0	0	1594	0	0	2167	0	3142	1804	0	3151
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	8.4	0.0	0.0	8.7	0.0	0.0	3.5	0.0	3.2	4.2	0.0	2.8
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.4	0.0	0.0	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	0.1	0.0	0.0	0.5	0.0	0.0	0.3	0.0	1.6	0.0	0.0	0.8
LnGrp Delay(d),s/veh	8.5	0.0	0.0	9.0	0.0	0.0	3.6	0.0	3.5	4.2	0.0	2.9
LnGrp LOS	A			A			A		A	A		A
Approach Vol, veh/h		28			83			530				264
Approach Delay, s/veh		8.5			9.0			3.5				3.0
Approach LOS		A			A			A				A
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.2		5.8		14.2		5.8				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		34.0		18.0		34.0		18.0				
Max Q Clear Time (g_c+I1), s		5.1		2.3		5.2		3.0				
Green Ext Time (p_c), s		5.0		0.5		5.0		0.5				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			4.0									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary  
 8: Hoover Rd & Bluegrass Ln

4/15/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	1	81	25	0	21	35	464	31	23	499	1
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	1	1	88	27	0	23	38	504	34	25	542	1
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	142	2	154	301	0	74	644	1023	69	645	1102	2
Arrive On Green	0.10	0.10	0.10	0.10	0.00	0.10	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	15	21	1572	881	0	750	860	1726	116	864	1859	3
Grp Volume(v), veh/h	90	0	0	50	0	0	38	0	538	25	0	543
Grp Sat Flow(s),veh/h/ln	1608	0	0	1631	0	0	860	0	1842	864	0	1862
Q Serve(g_s), s	0.7	0.0	0.0	0.0	0.0	0.0	0.7	0.0	4.3	0.4	0.0	4.3
Cycle Q Clear(g_c), s	1.4	0.0	0.0	0.7	0.0	0.0	5.0	0.0	4.3	4.8	0.0	4.3
Prop In Lane	0.01		0.98	0.54		0.46	1.00		0.06	1.00		0.00
Lane Grp Cap(c), veh/h	299	0	0	374	0	0	644	0	1092	645	0	1104
V/C Ratio(X)	0.30	0.00	0.00	0.13	0.00	0.00	0.06	0.00	0.49	0.04	0.00	0.49
Avail Cap(c_a), veh/h	1244	0	0	1221	0	0	1263	0	2420	1268	0	2446
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	11.1	0.0	0.0	10.8	0.0	0.0	4.5	0.0	3.0	4.4	0.0	3.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.3	0.0	0.0	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	0.6	0.0	0.0	0.3	0.0	0.0	0.2	0.0	2.2	0.1	0.0	2.2
LnGrp Delay(d),s/veh	11.7	0.0	0.0	11.0	0.0	0.0	4.5	0.0	3.4	4.4	0.0	3.4
LnGrp LOS	B			B			A		A	A		A
Approach Vol, veh/h		90			50			576			568	
Approach Delay, s/veh		11.7			11.0			3.5			3.4	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		19.3		6.5		19.3		6.5				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		34.0		18.0		34.0		18.0				
Max Q Clear Time (g_c+1), s		7.0		3.4		6.8		2.7				
Green Ext Time (p_c), s		8.3		0.6		8.3		0.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			4.3									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary  
 9: Hoover Rd & N Meadows Dr/Holton Rd

4/8/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	59	33	6	24	71	135	19	432	52	111	227	138
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	64	36	7	26	77	147	21	470	57	121	247	150
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	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	306	451	384	299	248	210	613	936	796	512	1166	991
Arrive On Green	0.04	0.24	0.24	0.13	0.13	0.13	0.50	0.50	0.50	0.06	0.63	0.63
Sat Flow, veh/h	1774	1863	1583	1358	1863	1583	983	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	64	36	7	26	77	147	21	470	57	121	247	150
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1358	1863	1583	983	1863	1583	1774	1863	1583
Q Serve(g_s), s	1.8	0.9	0.2	1.0	2.3	5.4	0.7	10.2	1.1	1.8	3.5	2.4
Cycle Q Clear(g_c), s	1.8	0.9	0.2	1.0	2.3	5.4	0.7	10.2	1.1	1.8	3.5	2.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	306	451	384	299	248	210	613	936	796	512	1166	991
V/C Ratio(X)	0.21	0.08	0.02	0.09	0.31	0.70	0.03	0.50	0.07	0.24	0.21	0.15
Avail Cap(c_a), veh/h	346	736	626	477	491	417	613	936	796	586	1166	991
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	19.8	17.8	17.5	23.3	23.8	25.2	7.7	10.0	7.8	6.8	4.9	4.7
Incr Delay (d2), s/veh	0.3	0.1	0.0	0.1	0.7	4.2	0.1	1.9	0.2	0.2	0.4	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	0.9	0.5	0.1	0.4	1.2	2.6	0.2	5.7	0.5	0.9	1.9	1.1
LnGrp Delay(d),s/veh	20.2	17.8	17.5	23.4	24.5	29.3	7.8	12.0	8.0	7.1	5.3	5.0
LnGrp LOS	C	B	B	C	C	C	A	B	A	A	A	A
Approach Vol, veh/h		107			250			548			518	
Approach Delay, s/veh		19.2			27.2			11.4			5.6	
Approach LOS		B			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	7.5	34.5		18.7		42.0	6.6	12.1				
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s	6.0	28.0		24.0		38.0	4.0	16.0				
Max Q Clear Time (g_c+1), s	3.8	12.2		2.9		5.5	3.8	7.4				
Green Ext Time (p_c), s	0.1	4.7		1.1		5.7	0.0	0.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			12.7									
HCM 2010 LOS			B									

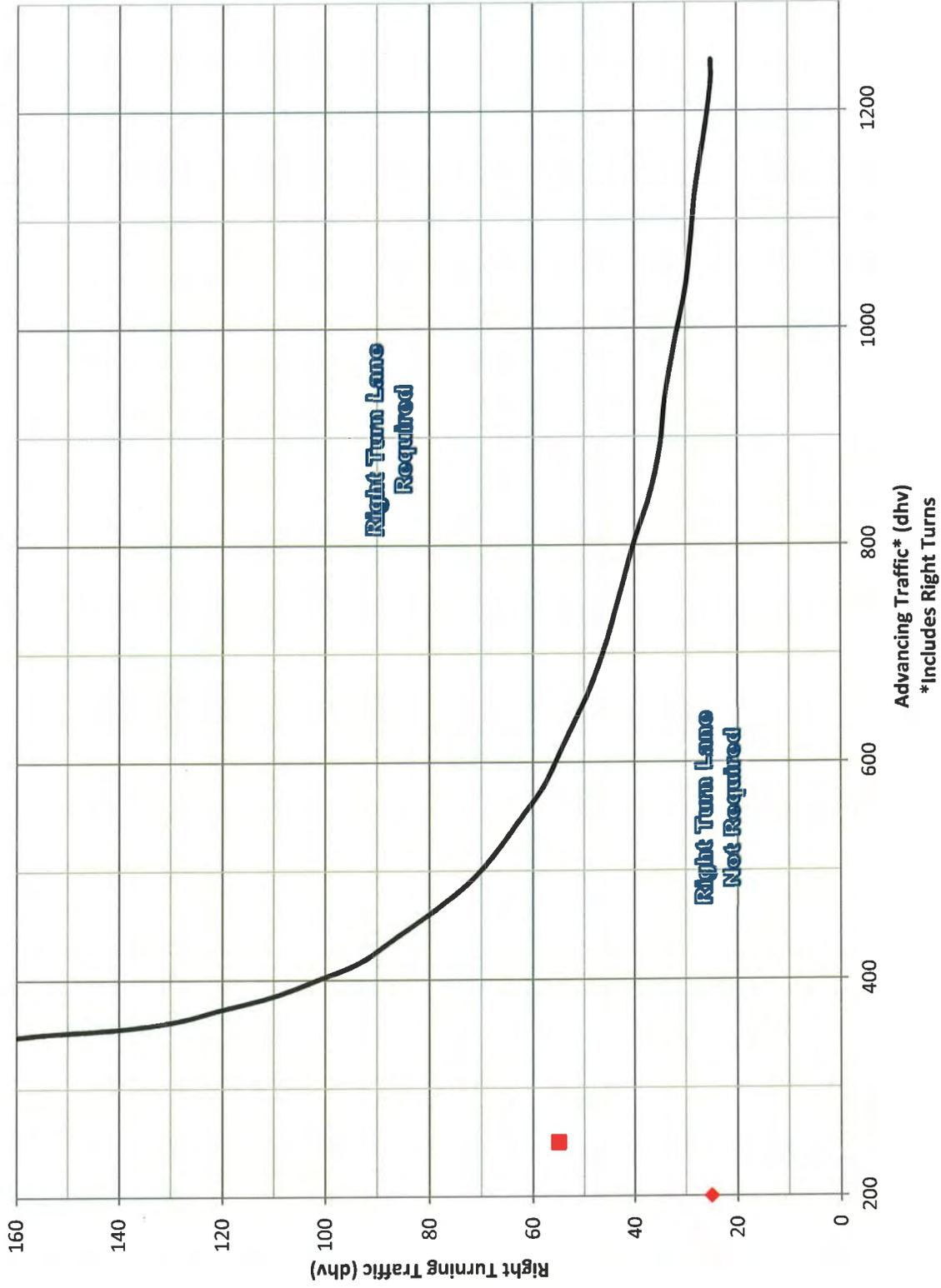
HCM 2010 Signalized Intersection Summary  
 9: Hoover Rd & N Meadows Dr/Holton Rd

4/8/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	167	75	17	44	41	116	4	402	55	175	508	86
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	182	82	18	48	45	126	4	437	60	190	552	93
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	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	382	500	425	274	227	193	456	846	719	521	1121	953
Arrive On Green	0.08	0.27	0.27	0.12	0.12	0.12	0.45	0.45	0.45	0.08	0.60	0.60
Sat Flow, veh/h	1774	1863	1583	1290	1863	1583	782	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	182	82	18	48	45	126	4	437	60	190	552	93
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1290	1863	1583	782	1863	1583	1774	1863	1583
Q Serve(g_s), s	5.0	2.1	0.5	2.1	1.3	4.7	0.2	10.3	1.3	3.2	10.3	1.5
Cycle Q Clear(g_c), s	5.0	2.1	0.5	2.1	1.3	4.7	1.4	10.3	1.3	3.2	10.3	1.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	382	500	425	274	227	193	456	846	719	521	1121	953
V/C Ratio(X)	0.48	0.16	0.04	0.17	0.20	0.65	0.01	0.52	0.08	0.37	0.49	0.10
Avail Cap(c_a), veh/h	382	757	644	453	485	412	456	846	719	576	1121	953
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	17.2	16.7	24.6	24.3	25.8	9.9	12.0	9.5	8.0	6.9	5.2
Incr Delay (d2), s/veh	0.9	0.2	0.0	0.3	0.4	3.7	0.0	2.2	0.2	0.4	1.5	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	0.5	1.1	0.2	0.8	0.7	2.2	0.0	5.7	0.6	1.5	5.7	0.7
LnGrp Delay(d),s/veh	21.3	17.4	16.7	24.9	24.7	29.5	9.9	14.2	9.7	8.4	8.5	5.4
LnGrp LOS	C	B	B	C	C	C	A	B	A	A	A	A
Approach Vol, veh/h		282			219			501			835	
Approach Delay, s/veh		19.8			27.5			13.6			8.1	
Approach LOS		B			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6	7	8				
Phs Duration (G+Y+Rc), s	9.1	31.9		20.5		41.0	9.0	11.5				
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s	7.0	26.0		25.0		37.0	5.0	16.0				
Max Q Clear Time (g_c+I1), s	5.2	12.3		4.1		12.3	7.0	6.7				
Green Ext Time (p_c), s	0.1	5.7		1.2		7.4	0.0	0.9				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			13.7									
HCM 2010 LOS			B									

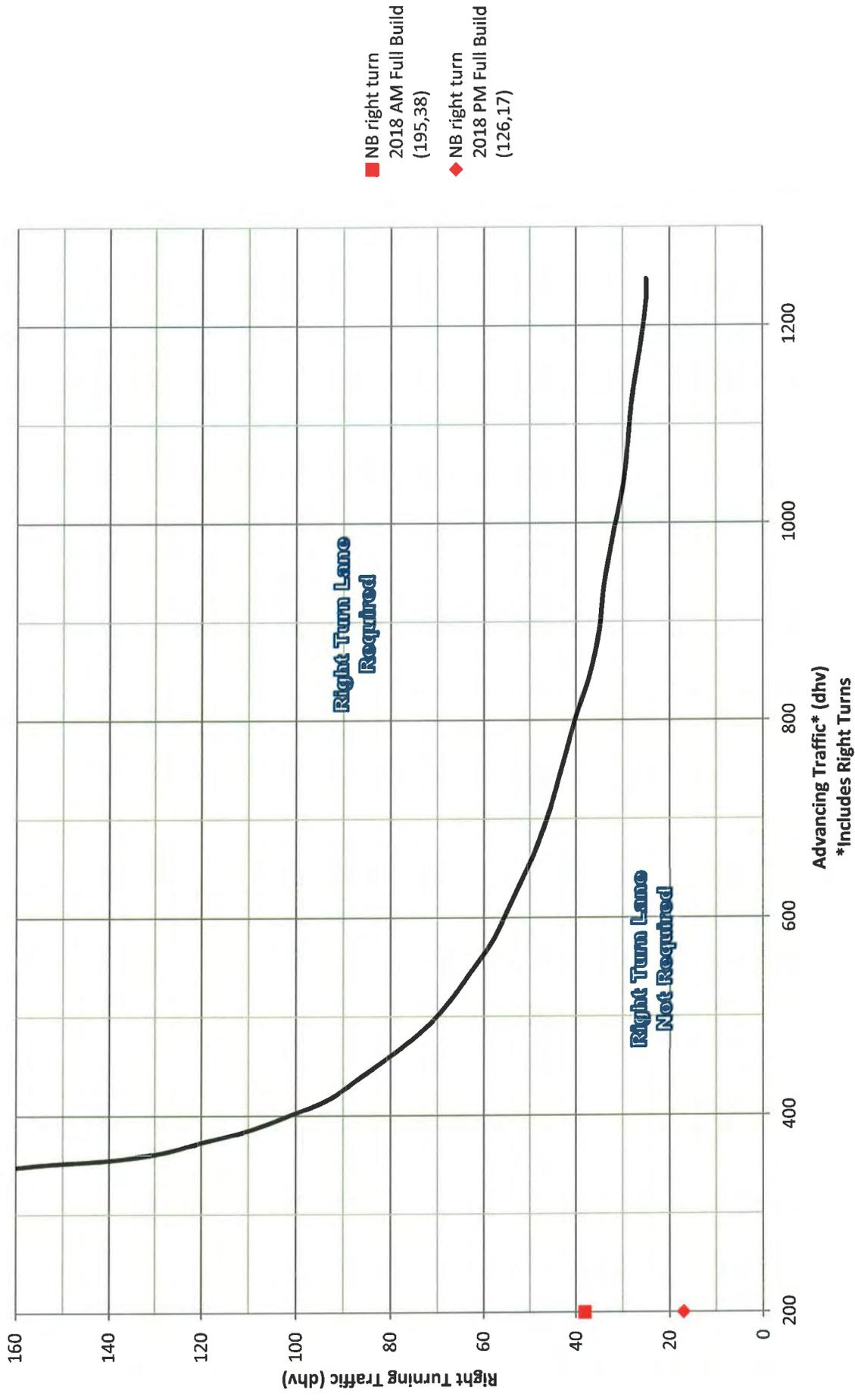
## Appendix D: Turn Lane Warrants/Lane Sizing Calculations

**N Meadows Dr @ Blue Grass Ln**  
**2-Lane Highway Right Turn Lane Warrant**  
 =<40 mph or 70 kph Posted Speed

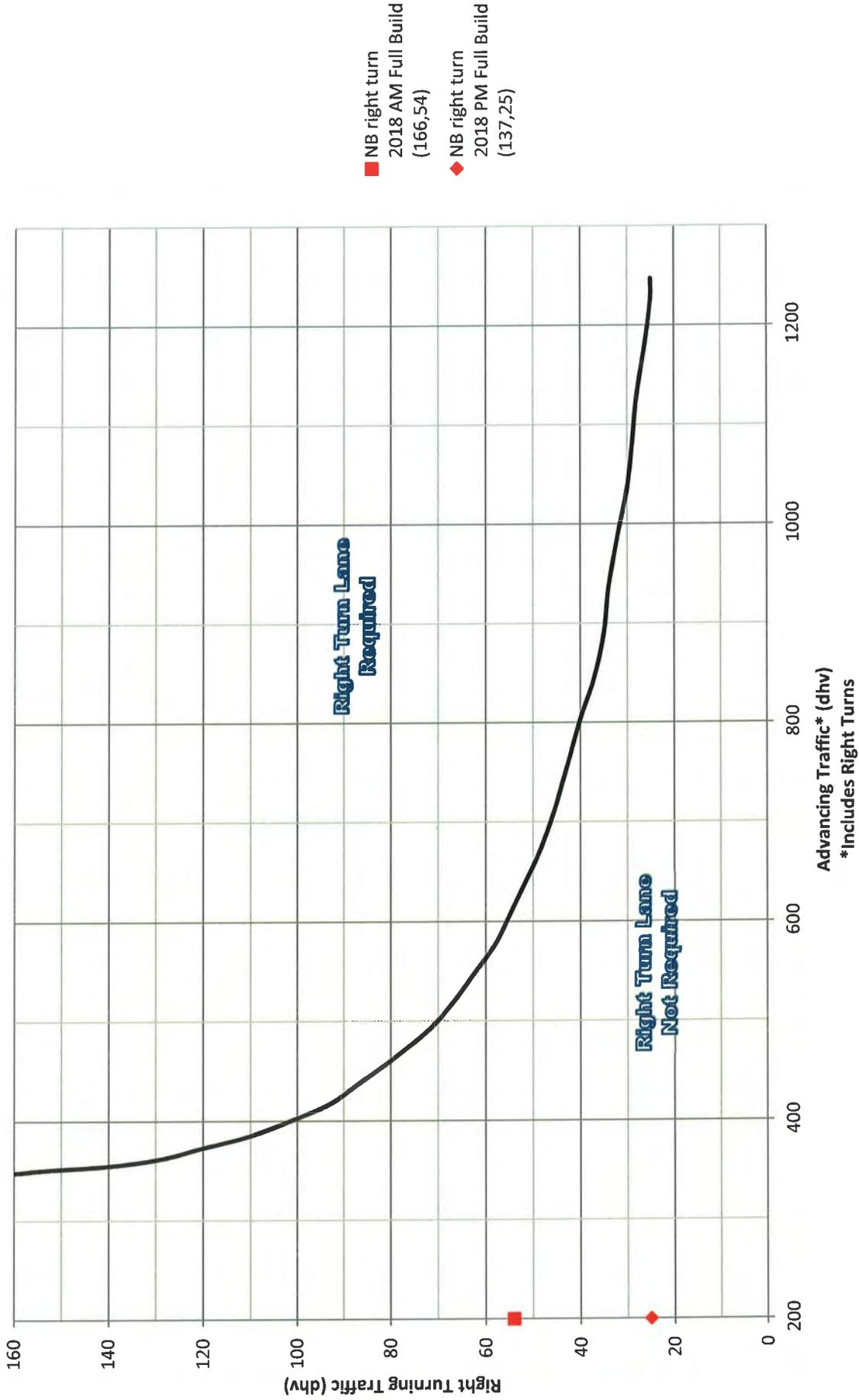


- NB right turn  
2018 AM Full Build  
(250,55)
- ◆ NB right turn  
2018 PM Full Build  
(151,25)

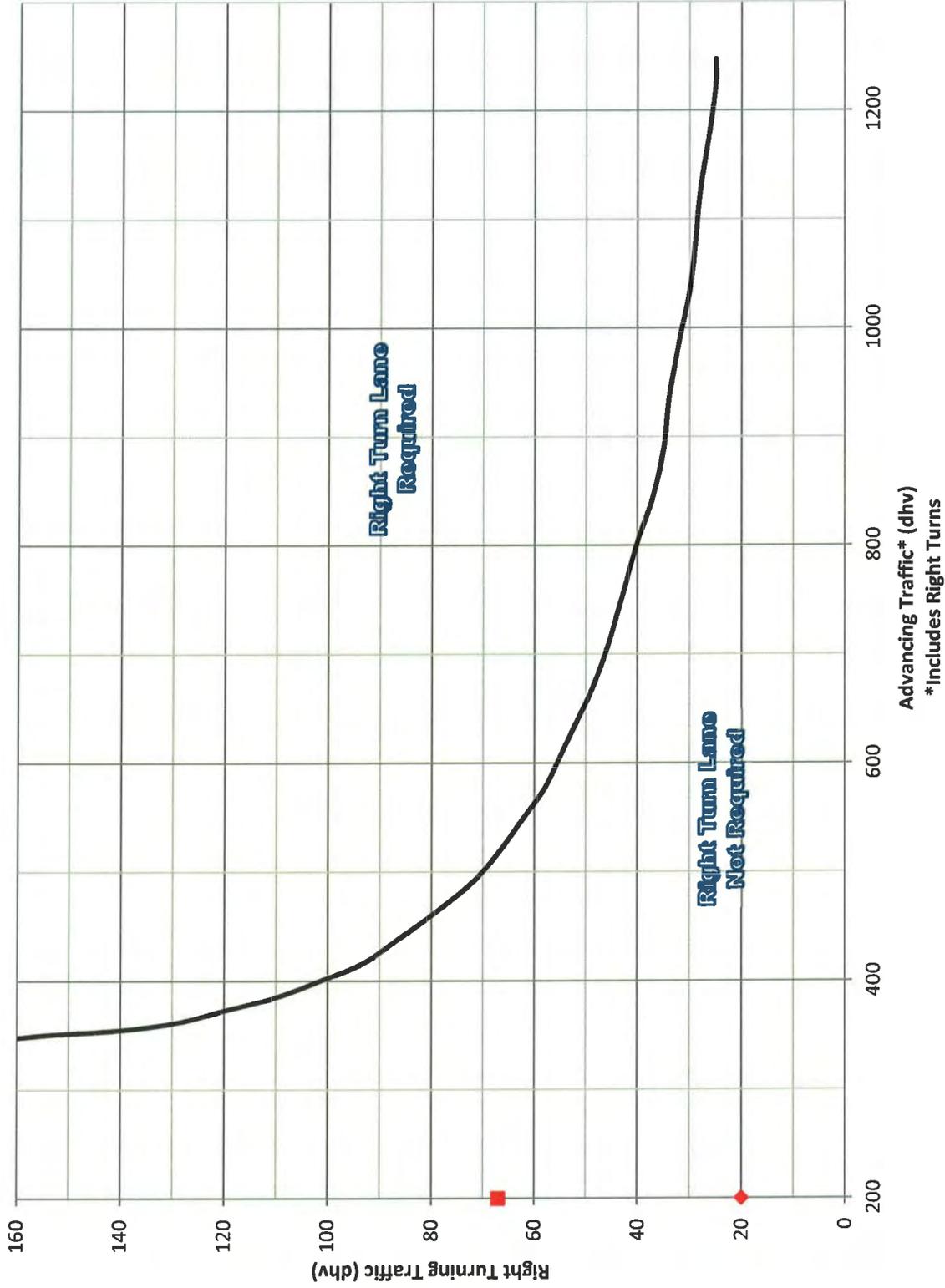
**N Meadows Dr @ Drive 4**  
**2-Lane Highway Right Turn Lane Warrant**  
 =<40 mph or 70 kph Posted Speed



**N Meadows Dr @ Drive 3**  
**2-Lane Highway Right Turn Lane Warrant**  
 =<40 mph or 70 kph Posted Speed

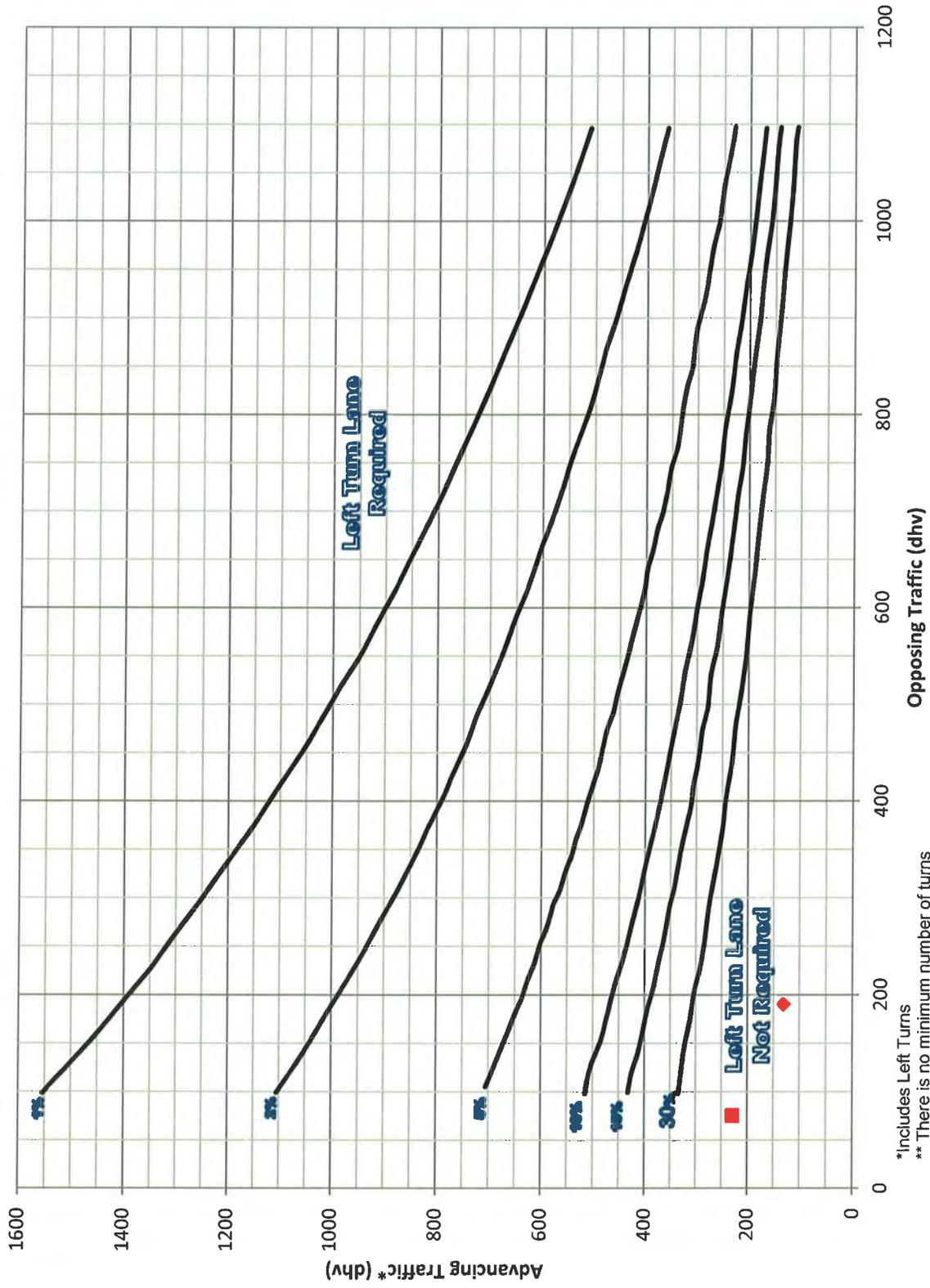


**N Meadows Dr @ Drive 2**  
**2-Lane Highway Right Turn Lane Warrant**  
 =<40 mph or 70 kph Posted Speed



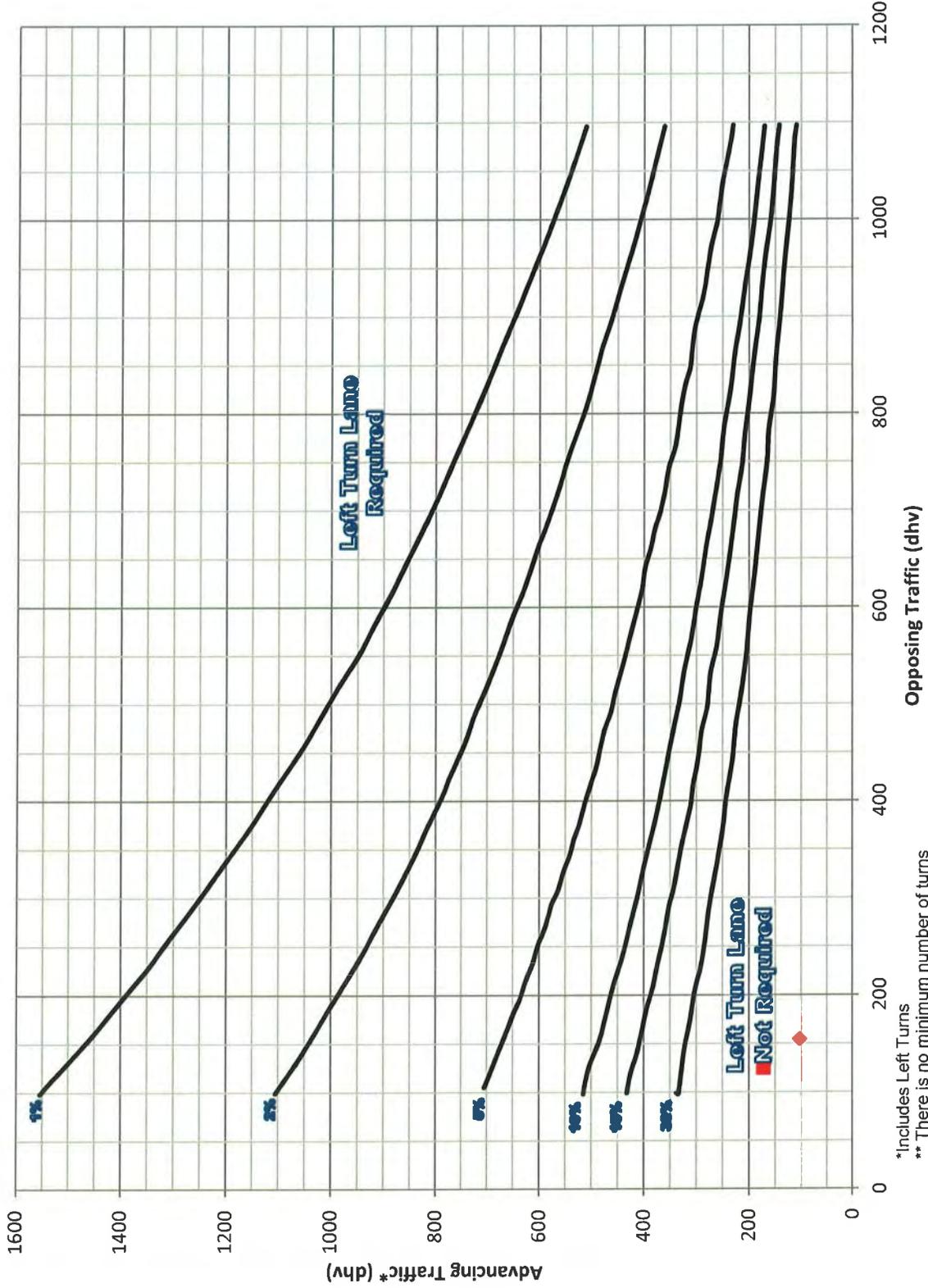
- NB right turn 2018 AM Full Build (125,67)
- ◆ NB right turn 2018 PM Full Build (154,20)

**N Meadows Dr @ Drive 1**  
**2-Lane Highway Left Turn Lane Warrant**  
 =<40 mph or 70 kph Posted Speed



\*Includes Left Turns  
 \*\* There is no minimum number of turns

**N Meadows Dr @ Drive 2**  
**2-Lane Highway Left Turn Lane Warrant**  
 =<40 mph or 70 kph Posted Speed

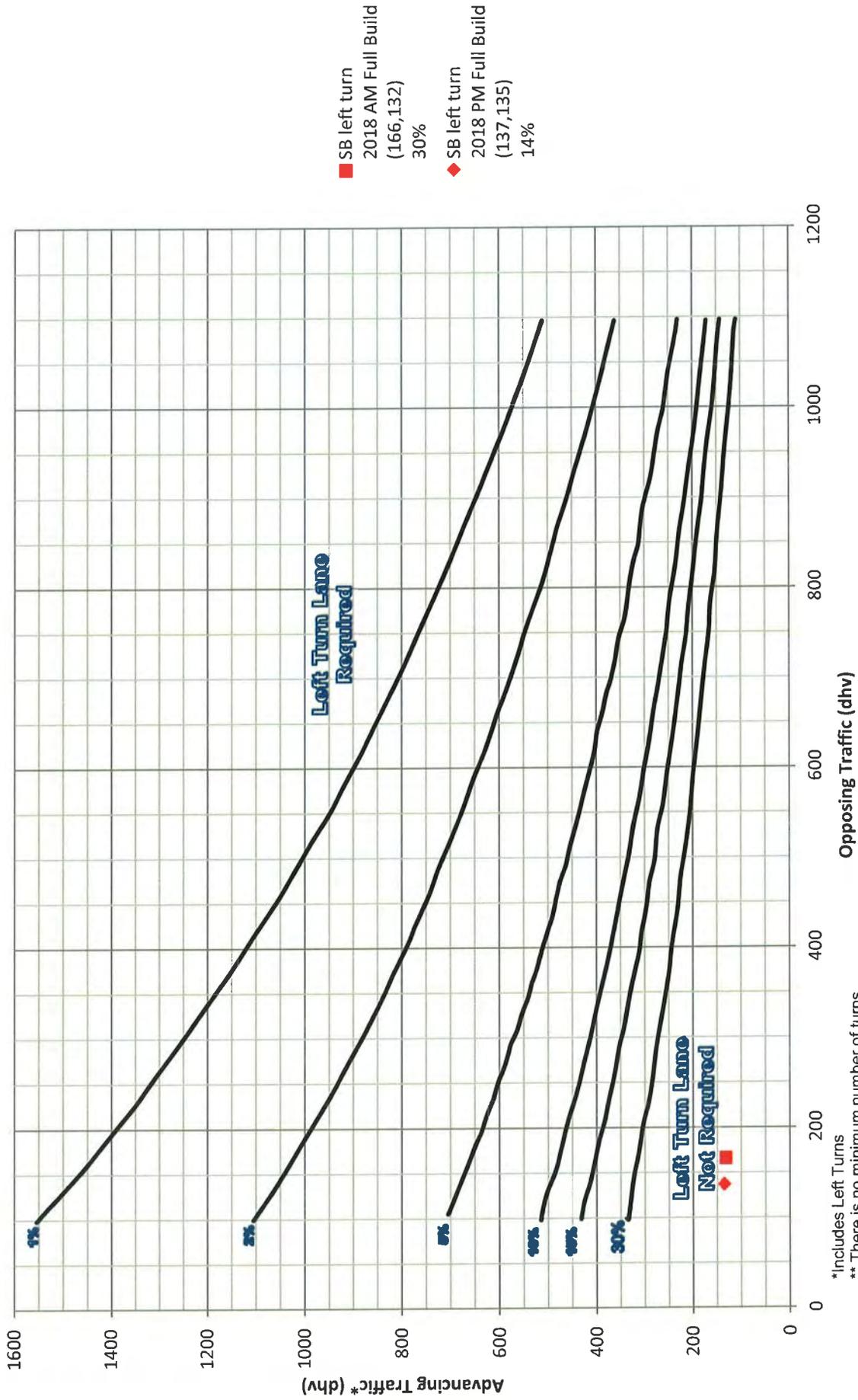


■ SB left turn  
 2018 AM Full Build  
 (125,172)  
 32%

◆ SB left turn  
 2018 PM Full Build  
 (154,103)  
 26%

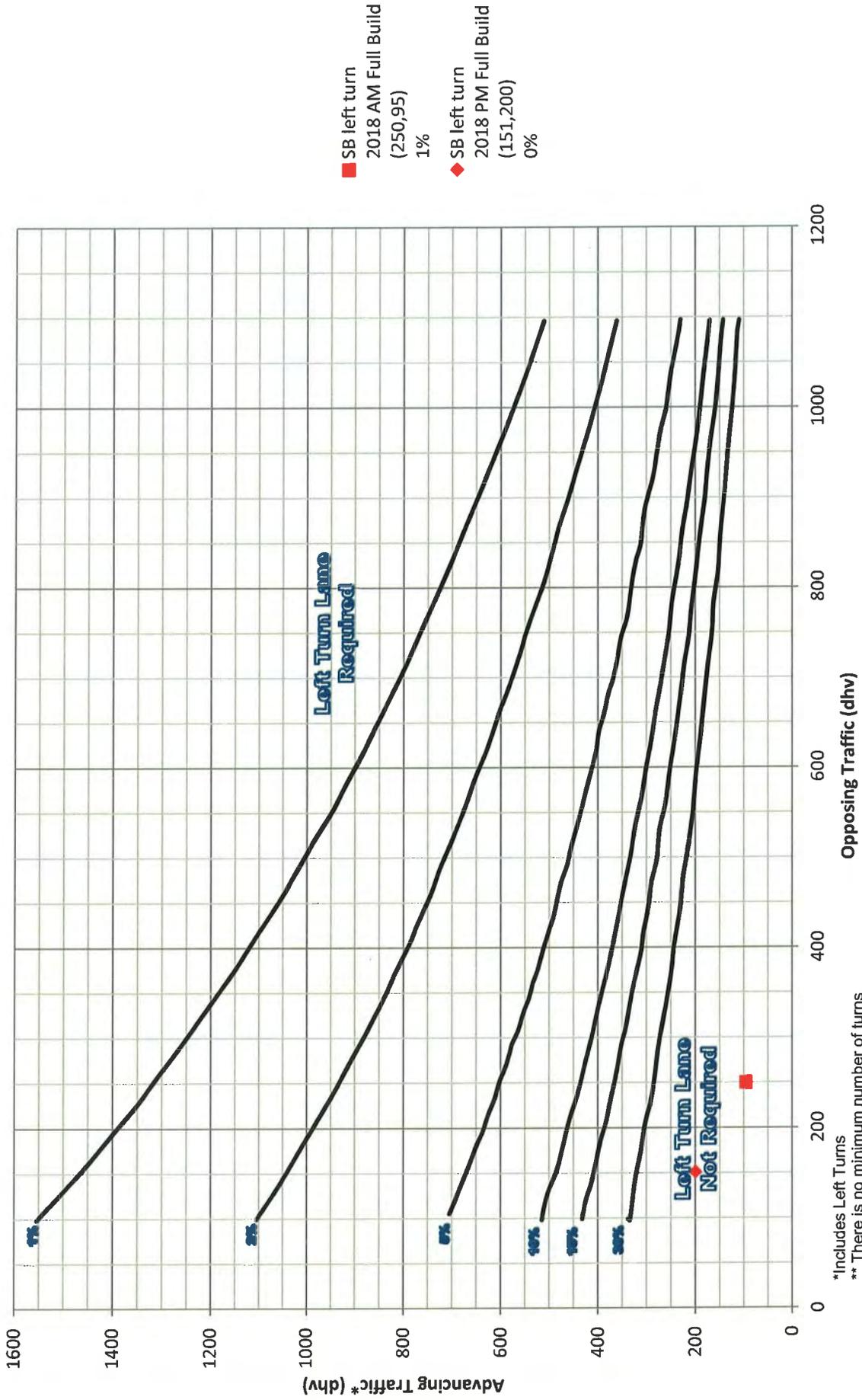
\*Includes Left Turns  
 \*\* There is no minimum number of turns

**N Meadows Dr @ Drive 3**  
**2-Lane Highway Left Turn Lane Warrant**  
 =<40 mph or 70 kph Posted Speed

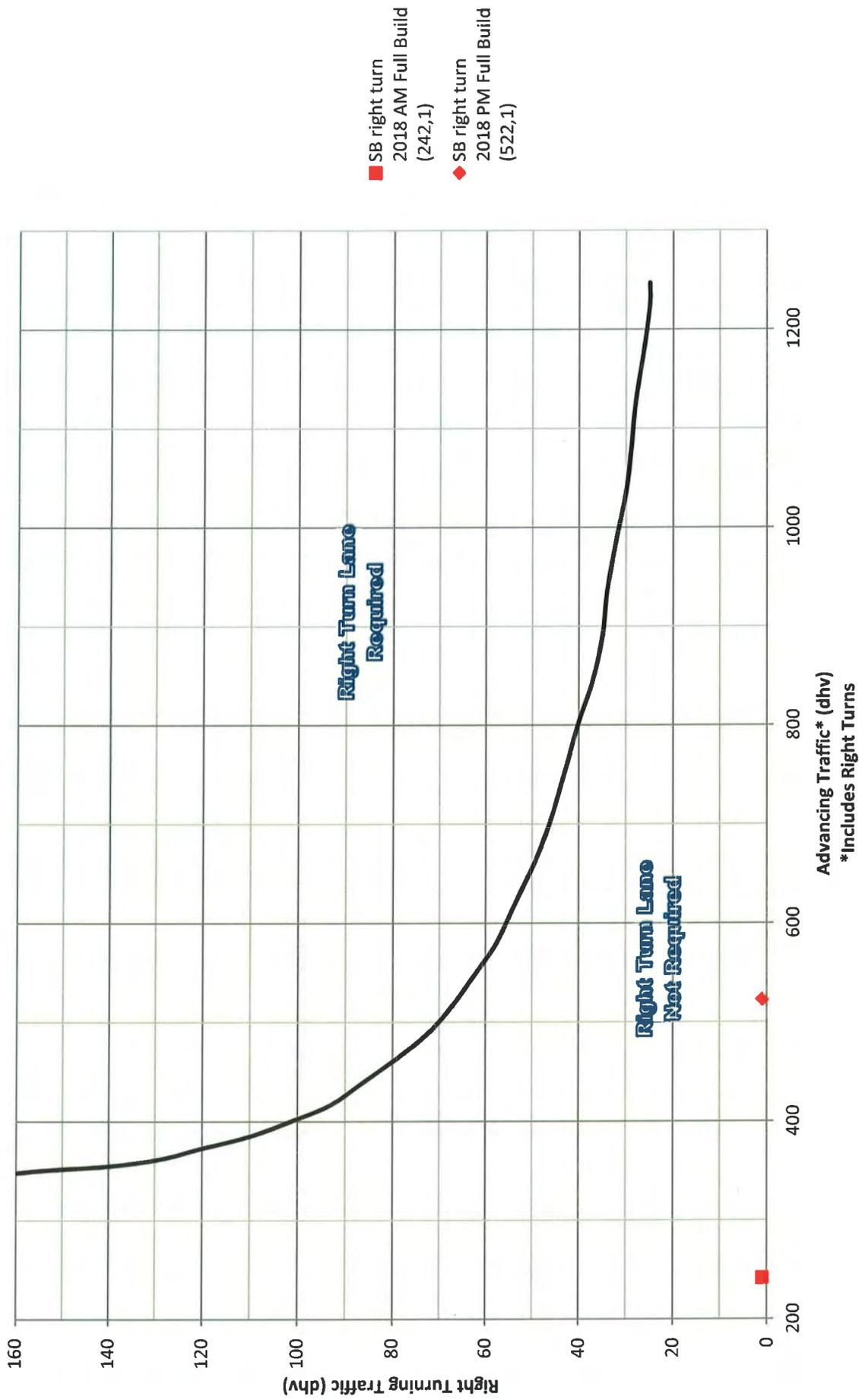


\*Includes Left Turns  
 \*\* There is no minimum number of turns

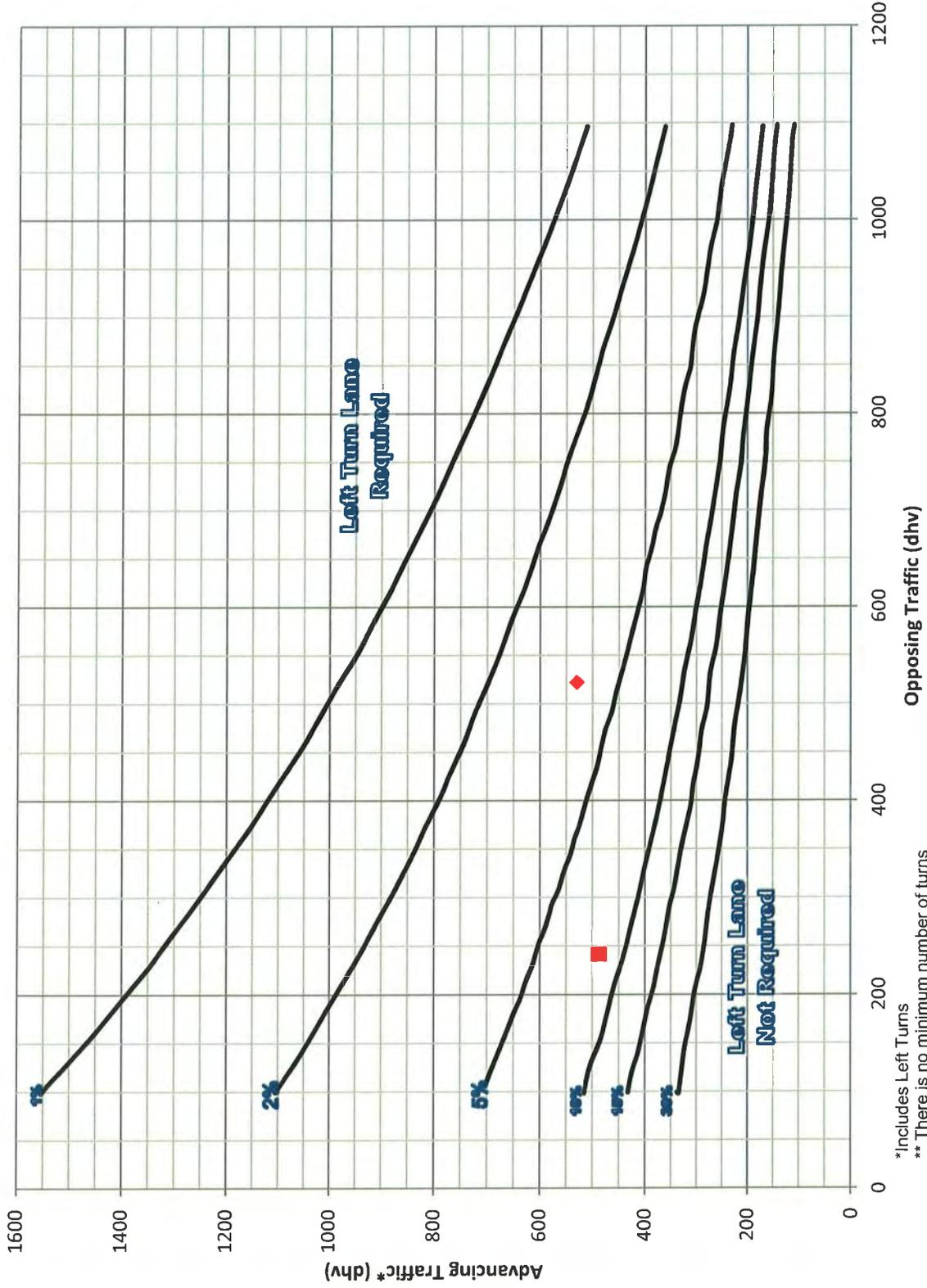
**N Meadows Dr @ Blue Grass Ln**  
**2-Lane Highway Left Turn Lane Warrant**  
 =<40 mph or 70 kph Posted Speed



**Hoover Road @ Bluegrass Ln**  
**2-Lane Highway Right Turn Lane Warrant**  
 =<40 mph or 70 kph Posted Speed



**Hoover Road @ Bluegrass Ln**  
**2-Lane Highway Left Turn Lane Warrant**  
 =<40 mph or 70 kph Posted Speed



\*Includes Left Turns  
 \*\* There is no minimum number of turns