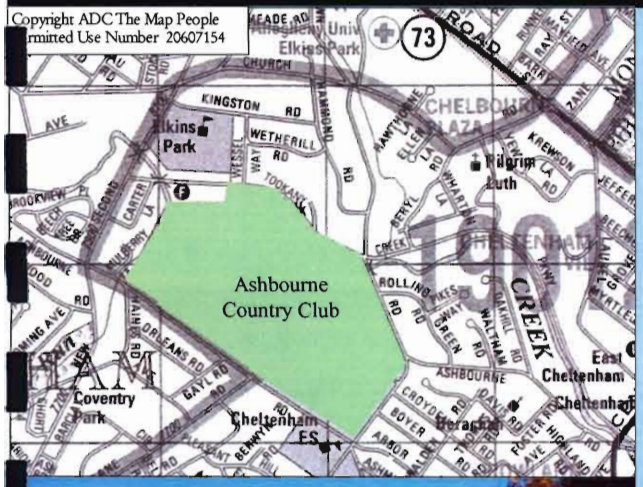
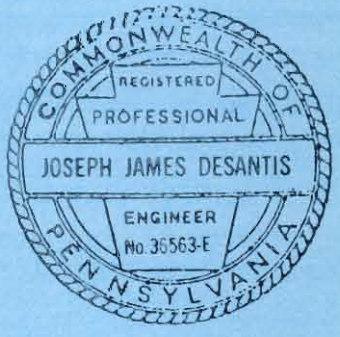
Traffic Impact Study for the Ashbourne Country Club

Cheltenham Township, Montgomery County, PA





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Executive Summary

The Matrix Development Group proposes to redevelop a portion of the Ashbourne Country Club to provide a 246 unit age-restricted residential community. The existing country club facility has recently closed, which formerly provided an 18-hole golf course with a clubhouse for member golfers. The Ashbourne Country Club is bordered by Ashbourne Road (S.R. 2025) to the south and east, and Tookany Creek Parkway and Jenkintown Road to the north in Cheltenham Township, Montgomery County, Pennsylvania. Access to the age-restricted community will be provided via the existing signalized access located along the south leg of Ashbourne Road (S.R. 2025) opposite Oak Lane Road, and a new unsignalized access also located along the south leg of Ashbourne Road (S.R. 2025), but opposite Haines Road.

The scope of this traffic impact study includes an evaluation of the existing (2009) and future build-out (2013) conditions both without and with the proposed development for the weekday morning and weekday afternoon peak hour at the following study intersections:

- Ashbourne Road (S.R. 2025)/New Second Street (S.R. 2060),
- Ashbourne Road (S.R. 2025)/Haines Road,
- Ashbourne Road (S.R. 2025)/Oak Lane Road (S.R. 2062)/Ashbourne Country Club Access,
- Ashbourne Road (S.R. 2025)/Front Street/Ashmead Road/Arbor Road,
- Ashbourne Road (S.R. 2025)/Croyden Road,
- Ashbourne Road (S.R. 2025)/Jenkintown Road,
- Jenkintown Road/Tookany Creek Parkway, and
- New Second Street (S.R. 2060/Tookany Creek Parkway.

The trip generation characteristics for the age-restricted dwelling units are based on data from the Institute of Transportation Engineers' publication entitled *Trip Generation, 8th Edition*, the industry standard for estimating trip values. The ITE data indicates that the age-restricted community can be expected to generate approximately 72 total (inbound and outbound) trips during the weekday morning peak hour and approximately 88 total (inbound and outbound) trips during the weekday afternoon peak hour within the surrounding area.

To mitigate the traffic impacts associated with the redevelopment of the Ashbourne Country Club, the following roadway/intersection improvements are proposed by the developer:

- **Ashbourne Road (S.R. 2025) and Oak Lane Road (S.R. 2062)/Site Access** – Widen the existing access to provide one 16-foot-wide egress lane and one 16-foot-wide ingress lane separated by a 12-foot-wide median. In addition, construct a separate westbound right-turn lane, 75 feet in length with a 75-foot bay taper, and modify the existing traffic signal timing to provide an advance westbound phase to better accommodate the existing left-turn movement from Ashbourne Road to Oak Lane Road.

- **Ashbourne Road (S.R. 2025)/Front Street/Ashmead Road/Arbor Road** – Construct a separate southbound right-turn lane along Ashbourne Road, 150 feet in length with a 75-foot bay taper, and modify the existing traffic signal timings.

- **Ashbourne Road (S.R. 2025) and Haines Road/Site Access** – Provide one 14-foot-wide ingress lane and one 14-foot-wide egress lane for the access, with stop control provided along the access approach, and a 10-foot-wide median.

The traffic analysis, which is described in further detail herein, demonstrates that safe and efficient access can be provided for the proposed age-restricted residential development and that the recommended improvements will mitigate the development's impact.

Introduction

The Matrix Development Group proposes to redevelop a portion of the existing Ashbourne Country Club, which provided an 18-hole golf course with clubhouse for member golfers, by proposing to construct a 246 unit age-restricted community. Access to the age-restricted community will be provided via the existing signalized access located along the south leg of Ashbourne Road (S.R. 2025) opposite Oak Lane Road, and a new unsignalized access also located along the south leg of Ashbourne Road (S.R. 2025), but opposite Haines Road. The conceptual site plan of the proposed residential development is shown in **Figure 1**. The Ashbourne Country Club is bordered by Ashbourne Road (S.R. 2025) to the south and east, and Tookany Creek Parkway and Jenkintown Road to the north in Cheltenham Township, Montgomery County, Pennsylvania.

The purpose of this traffic study is to present an evaluation of the incremental traffic impacts of the proposed development within the study area in Cheltenham Township, as well as provide recommendations regarding the site access design in order to provide efficient access to the site for the anticipated increase in traffic volumes associated with the development.

Manual turning movement traffic counts were completed at eight intersections during the weekday morning peak period (7:00 AM to 9:00 AM) and the weekday afternoon peak period (4:00 PM to 6:00 PM). In order to assess the existing traffic conditions, these existing traffic volumes were subjected to detailed capacity/level-of-service analysis, in accordance with accepted methodologies, for the highest peak hour during each peak period, which serves as the basis for this evaluation.

Next, future traffic volumes without the redevelopment of the Ashbourne Country Club were projected utilizing an annual traffic growth rate to account for regional traffic growth. Based on conversations with the Township, it was determined that there are no other area developments in the vicinity of the site that would impact the study area intersections or roadways. The future traffic volumes were projected to the build-out (2013) at each of the study intersections. The future traffic volumes without development were then subjected to detailed capacity/level-of-service analysis.

Finally, the traffic generated by the redevelopment of the Ashbourne Country Club to include the 246 age-restricted units a was established based on accepted methodologies published by the Institute of Transportation Engineers (ITE), and assigned to the roadway network and site accesses. The site-generated traffic volumes were added to future without-development traffic volumes, and subjected to detailed capacity/level-of-service analysis to assess the future traffic conditions with the development.

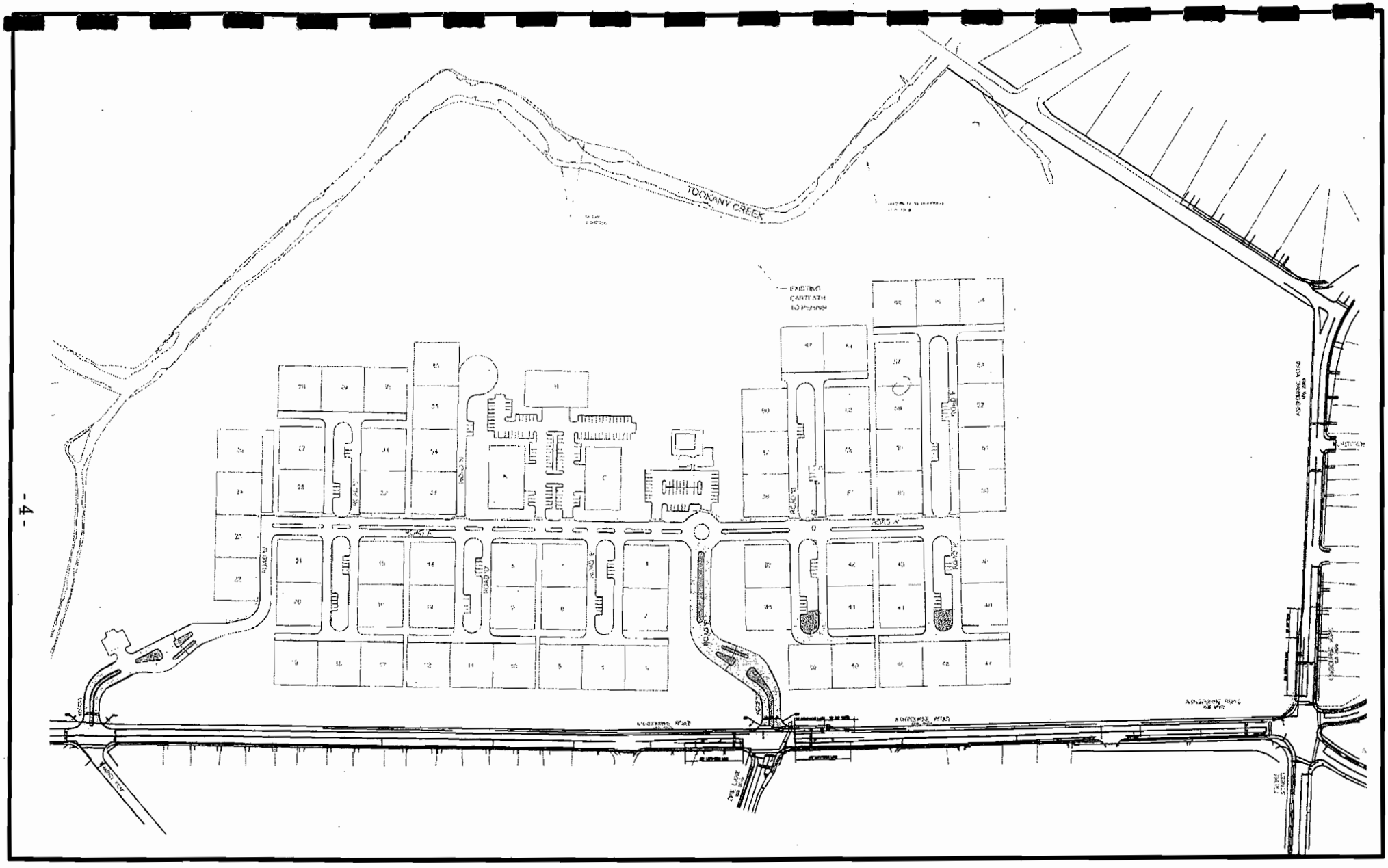

FIGURE 1
Site Plan

ASHBOURNE COUNTRY CLUB - Age Restricted Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

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Existing Transportation Setting

The Ashbourne Country Club is bordered by Ashbourne Road (S.R. 2025) to the south and east, Tookany Creek Parkway and Jenkintown Road to the north in Cheltenham Township, Montgomery County, Pennsylvania **(Figure 2)**. The existing roadways and intersections in the vicinity of the site, which comprise the study area roadway network, are described in this section.

Roadway Characteristics

The study area roadway network and characteristics are summarized below in **Table 1**.

Table 1. Existing Roadway Characteristics

Roadway	Roadway Jurisdiction	Approximate Cartway Width	Travel Lanes (per direction)	Speed Limit
Ashbourne Road (S.R. 2025)	State	22 to 34 feet	One	35 to 40 mph
Oak Lane Road (S.R. 2062)	State	36 to 40 feet	One	35 mph
New Second Street (S.R. 2060)	State	32 to 36 feet	One	35 mph
Front Street	Township	32 to 34 feet	One	15 mph
Ashmead Road	Township	34 feet	One	25 mph
Arbor Road	Township	24 feet	One	25 mph
Haines Road	Township	22 feet	One	25 mph
Croyden Road	Township	23 feet	One	Not Posted
Tookany Creek Parkway	Township	26 to 28 feet	One	35 mph
Jenkintown Road	Township	18 to 28 feet	One	25 mph

The following key intersections in the vicinity of the site comprise the study area:

- Ashbourne Road (S.R. 2025)/New Second Street (S.R. 2060)
- Ashbourne Road (S.R. 2025) and Haines Road
- Ashbourne Road (S.R. 2025)/Oak Lane Road (S.R. 2062)/Ashbourne Country Club Access
- Ashbourne Road (S.R. 2025)/Front Street/Ashmead Road/Arbor Road
- Ashbourne Road (S.R. 2025) and Croyden Road
- Ashbourne Road (S.R. 2025) and Jenkintown Road

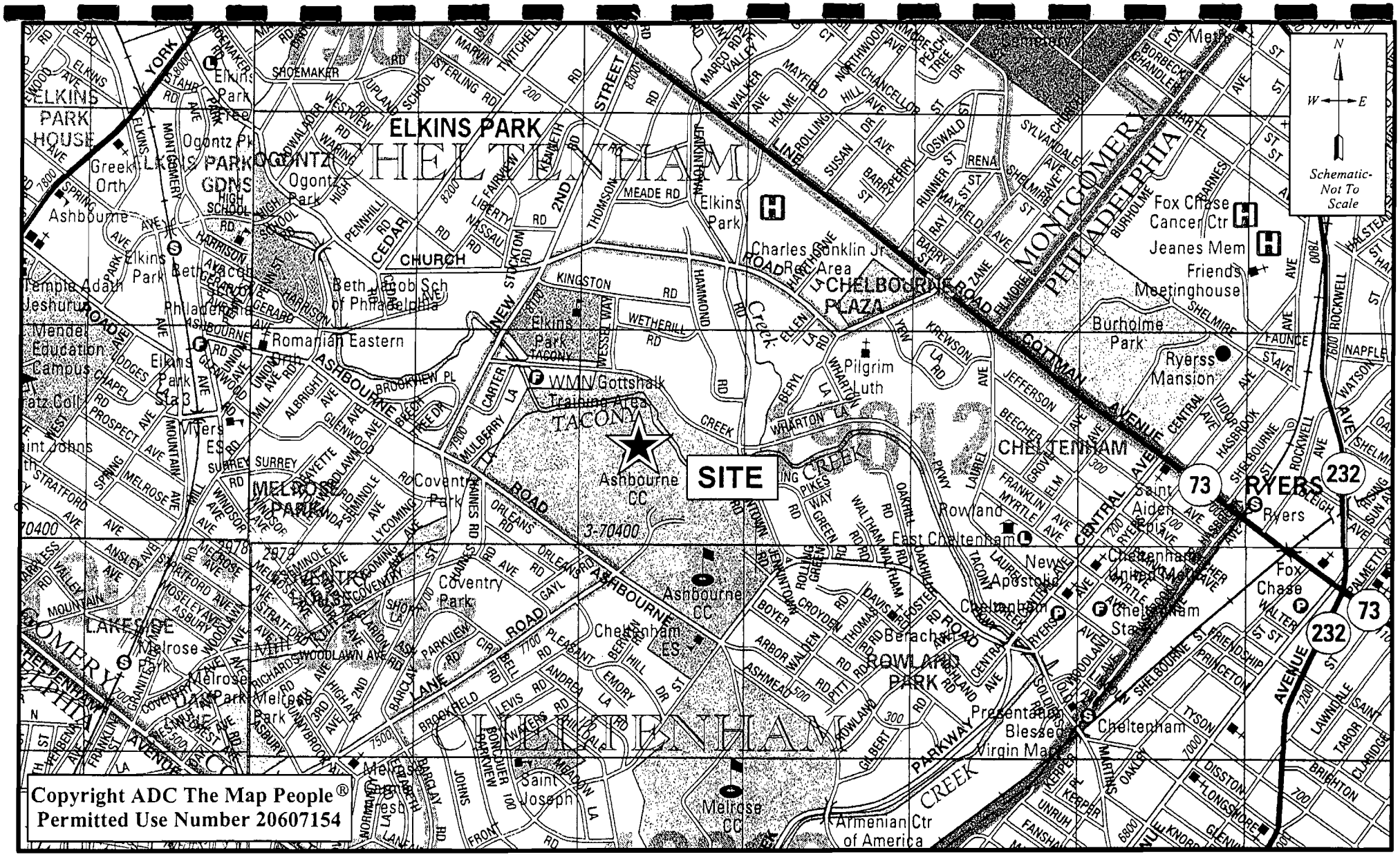

FIGURE 2

Site Location Map

ASHBOURNE COUNTRY CLUB - Age Restricted Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

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Existing Traffic Volumes

Daily traffic counts were conducted along Ashbourne Road (S.R. 2025) in the vicinity of the site, near its intersection with Oak Lane, in March 2009 and are provided in **Appendix B**. Based on the counts, the two-way daily traffic volume along Ashbourne Road (S.R. 2025) is approximately 8,350 vehicles per day (vpd) on a typical weekday.

Manual turning movement traffic counts, which are the basis of this study, were conducted at various periods in 2009 during the weekday morning peak period (7:00 AM to 9:00 AM) and the weekday afternoon peak period (4:00 PM to 6:00 PM) at each of the study intersections. Copies of the 2009 traffic count data, tabulated by 15-minute intervals, are provided in **Appendix C.** The four highest consecutive 15-minute peak intervals during these traffic count periods constitute the peak hours.

To establish base condition traffic volumes, the 2009 peak hour traffic volumes were compared to each other and prior year traffic counts. For some movements, traffic volumes were slightly lower than in prior years. Therefore, to be conservative, the higher turning movement volume from either prior year counts or from the 2009 counts were utilized at the study area intersections. The resultant peak hour traffic volumes are depicted in **Figures 3 and 4** for the weekday morning and weekday afternoon peak hours, respectively.

Planned Roadway Improvements

Through discussions with the Township and review of PennDOT's *Twelve Year Transportation Program*, there are no planned or proposed improvements on the study area roadways by the Township, PennDOT, or other area developers that would have a significant effect on area traffic operations.

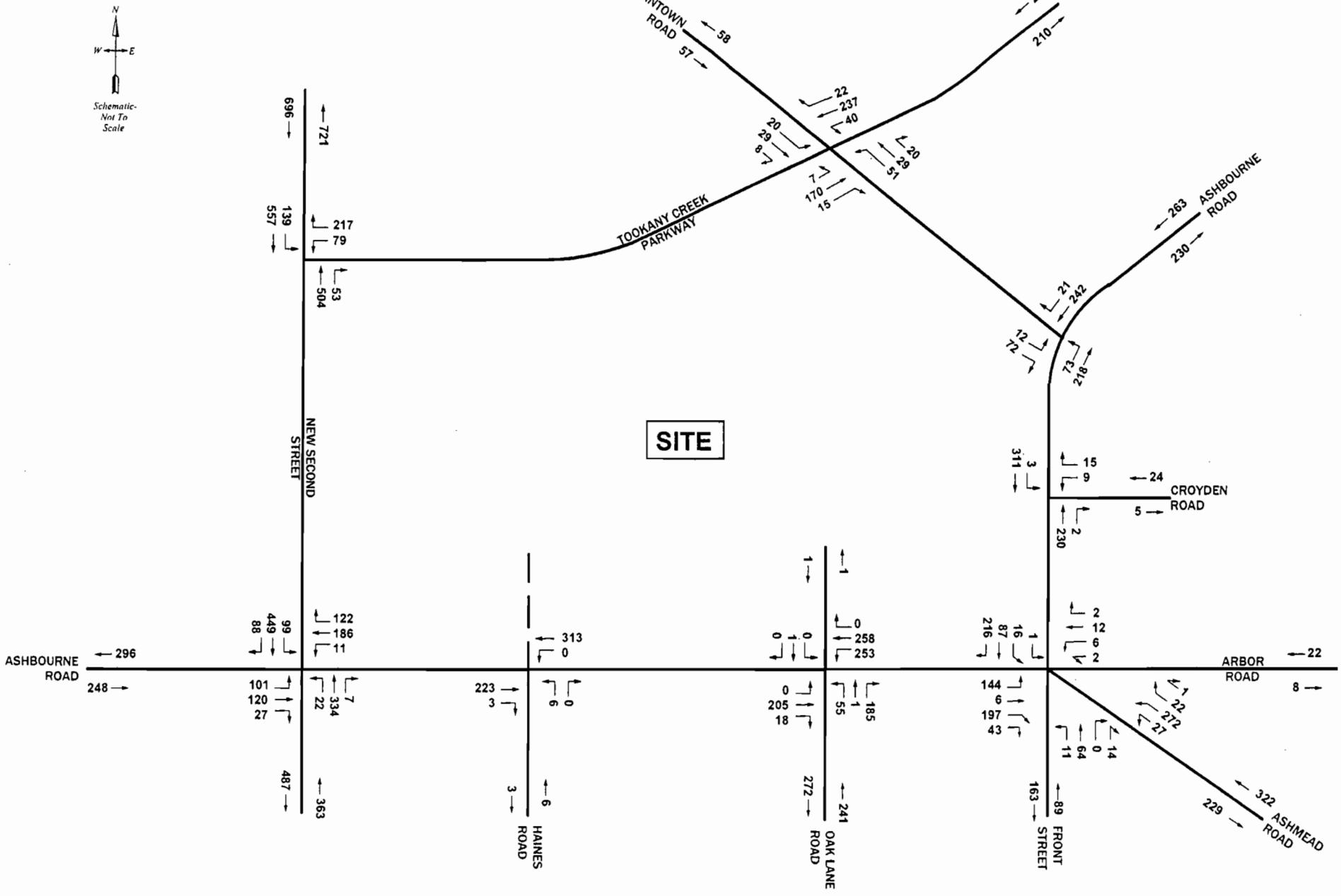

FIGURE 3

2009 Existing Weekday Morning Peak Hour Traffic Volumes

ASHBOURNE COUNTRY CLUB - Age Restricted Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

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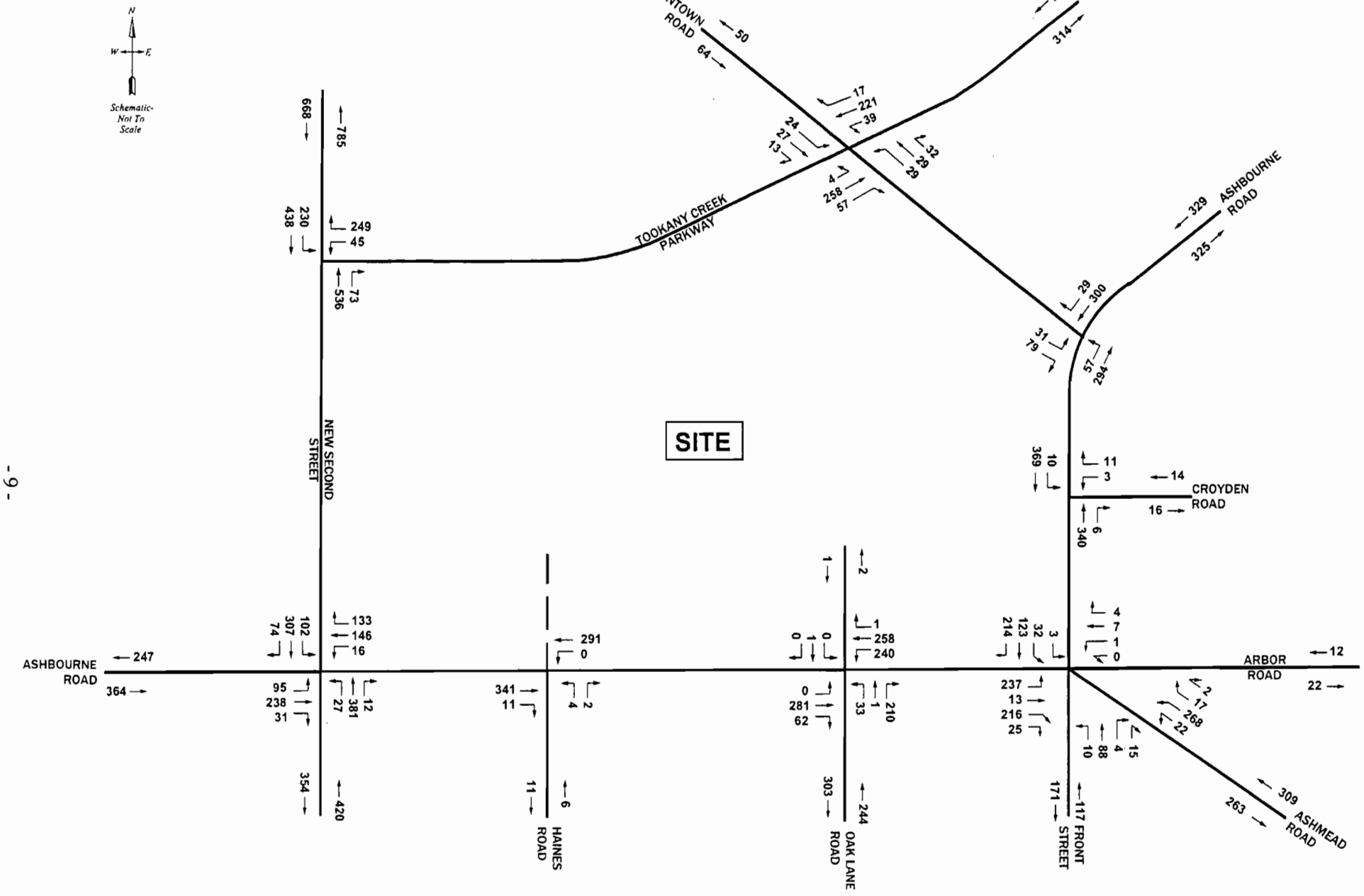

FIGURE 4

2009 Existing Weekday Afternoon Peak Hour Traffic Volumes

ASHBOURNE COUNTRY CLUB - Age Restricted Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

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Future Traffic Volumes without Development

This section presents projected traffic volumes without the redevelopment of the Ashbourne Country Club for the future build-out (2013). The future year 2013 without-development traffic volumes were estimated by increasing the existing 2009 peak hour traffic volumes to account for regional and local traffic growth, as described below. The future year 2013 without-development traffic volumes for the weekday morning and weekday afternoon peak hours are illustrated in **Figures 5 and 6**, respectively.

Regional and Local Traffic Growth

To account for background traffic growth, the existing traffic volumes were increased by a compounded annual traffic growth rate of 0.89 percent. This regional traffic growth rate is consistent with the recommendations by PennDOT's Bureau of Planning and Research for similar urban roadways in Montgomery County. According to the Township, there are no other area developments within the study area that will impact traffic conditions. Therefore, the existing 2009 peak hour traffic volumes were increased by a total of 3.61 percent to obtain the base build-out (2013) peak hour traffic volumes.

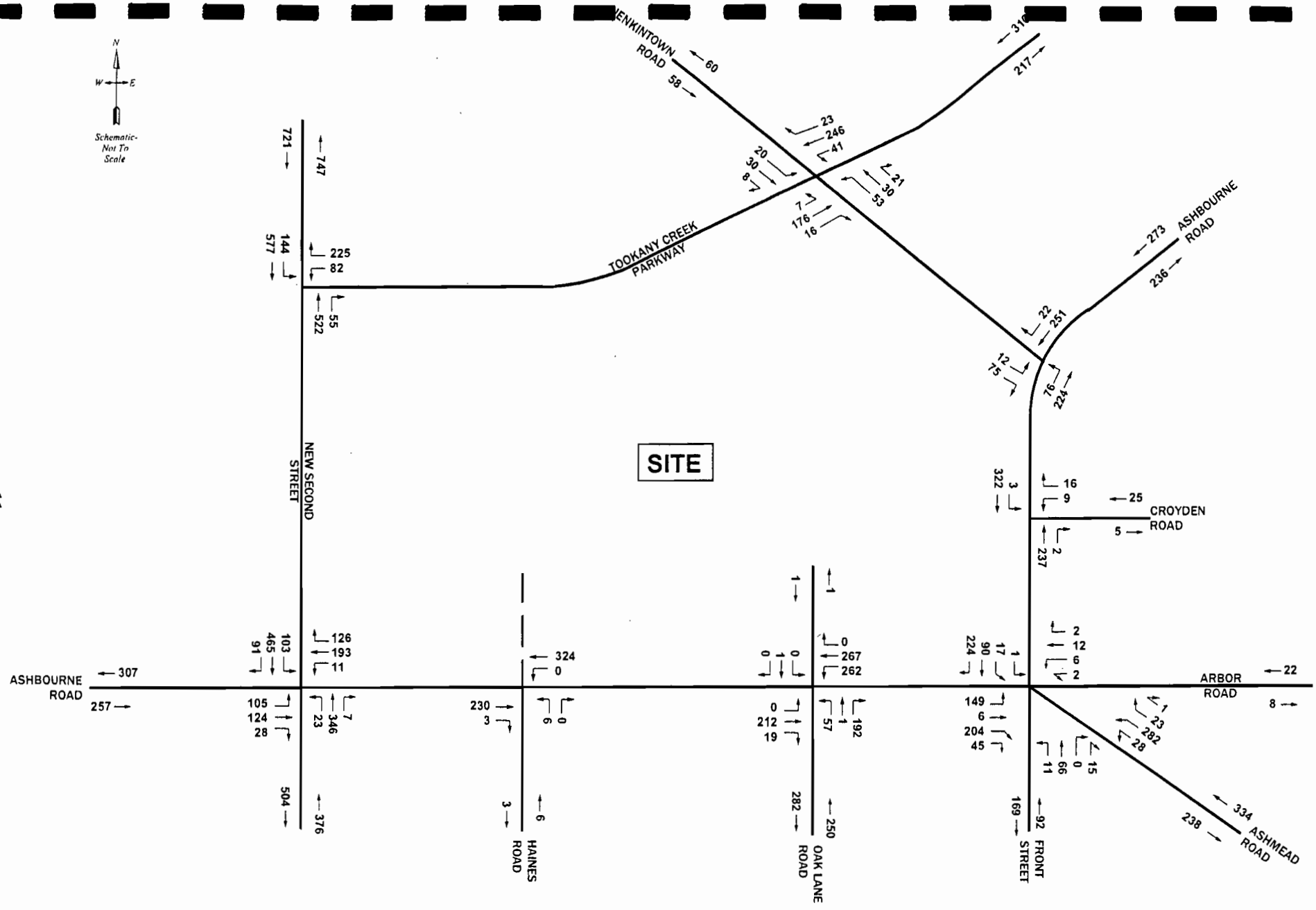

FIGURE 5

2013 Future Weekday Morning Peak Hour Traffic Volumes without Development

ASHBOURNE COUNTRY CLUB - Age Restricted Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

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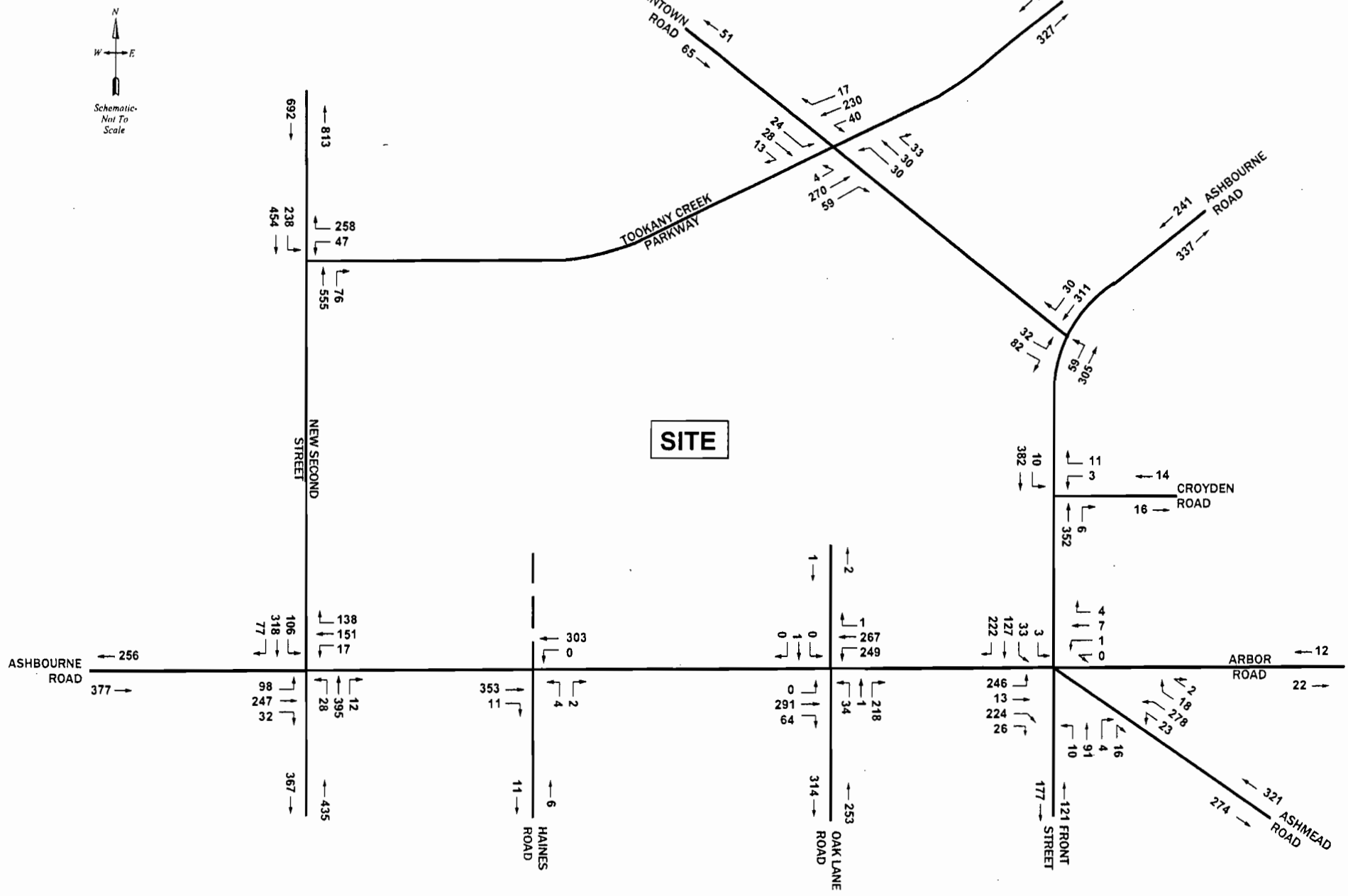

FIGURE 6

2013 Future Weekday Afternoon Peak Hour Traffic Volumes without Development

ASHBOURNE COUNTRY CLUB - Age Restricted Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

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Future Traffic Volumes with Development

Evaluation of the redevelopment of the existing Ashbourne Country Club for the age-restricted residential development is based upon the incremental increase in traffic volumes generated by the development during the peak hours, as described below.

Trip Generation

Traffic volumes generated by the existing land use and proposed development was prepared based on data compiled in the Institute of Transportation Engineers' publication, *Trip Generation, 8th Edition*. The Institute of Transportation Engineers is an international educational and scientific association of transportation professionals that facilitates the application of technology and scientific principals related to the research, planning, design, implementation, operation, and management of any mode of transportation. The *Trip Generation* is a multi-volume report that provides a summary of the trip generation data that has been collected and then presents rates and/or equations that can then be utilized for a particular land use code to estimate its trip generation characteristics.

The existing trip generation characteristics for the golf course, which is now closed, are based upon the rates for ITE Land Use 430 – Golf Course. The anticipated trip generation characteristics for the age-restricted residential development are based upon Land Use Code 251 – Senior Adult Housing. This land use code consists of detached independent living developments that includes gated age-restricted housing developments with residents who are generally active and includes residents who may or may not be retired. **Table 2** presents the anticipated vehicular trip generation characteristics for the existing site and the proposed development.

Table 2. Vehicular Trip Generation for Age-Restricted Homes

Land Use	Size (units)	Daily	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Existing: Golf Course	18-hole	643	32	8	40	23	28	51
Proposed: Age-restricted Homes	246	1,164	25	47	72	54	34	88

As shown, the ITE data indicates the proposed age-restricted community would, on average, generate about 32 greater trips during the morning peak hour and 37 greater trips during the afternoon peak hour compared to the previously existing golf course.

Trip Distribution and Assignment

Site-generated traffic will approach and depart the site via different routes depending on factors such as the existing traffic patterns, location of major roadways, and the location of the development's site access. The detailed distribution percentages for the anticipated directions of approach and departure are illustrated in **Figure 7** for the age-restricted homes. Application of the percentages, illustrated in Figure 7 to the peak hour trips contained in Table 2 for the age-restricted homes, provides an estimate of site traffic to be added to the study area. The trip assignment has been illustrated in **Figure 8** for the age-restricted homes.

The site-generated traffic volumes were then added to the future without-development traffic volumes to result in total future peak hour traffic volumes with development for each peak hour. The 2013 future traffic volumes with development are illustrated in **Figures 9 and 10** for the weekday morning and weekday afternoon peak hours, respectively.

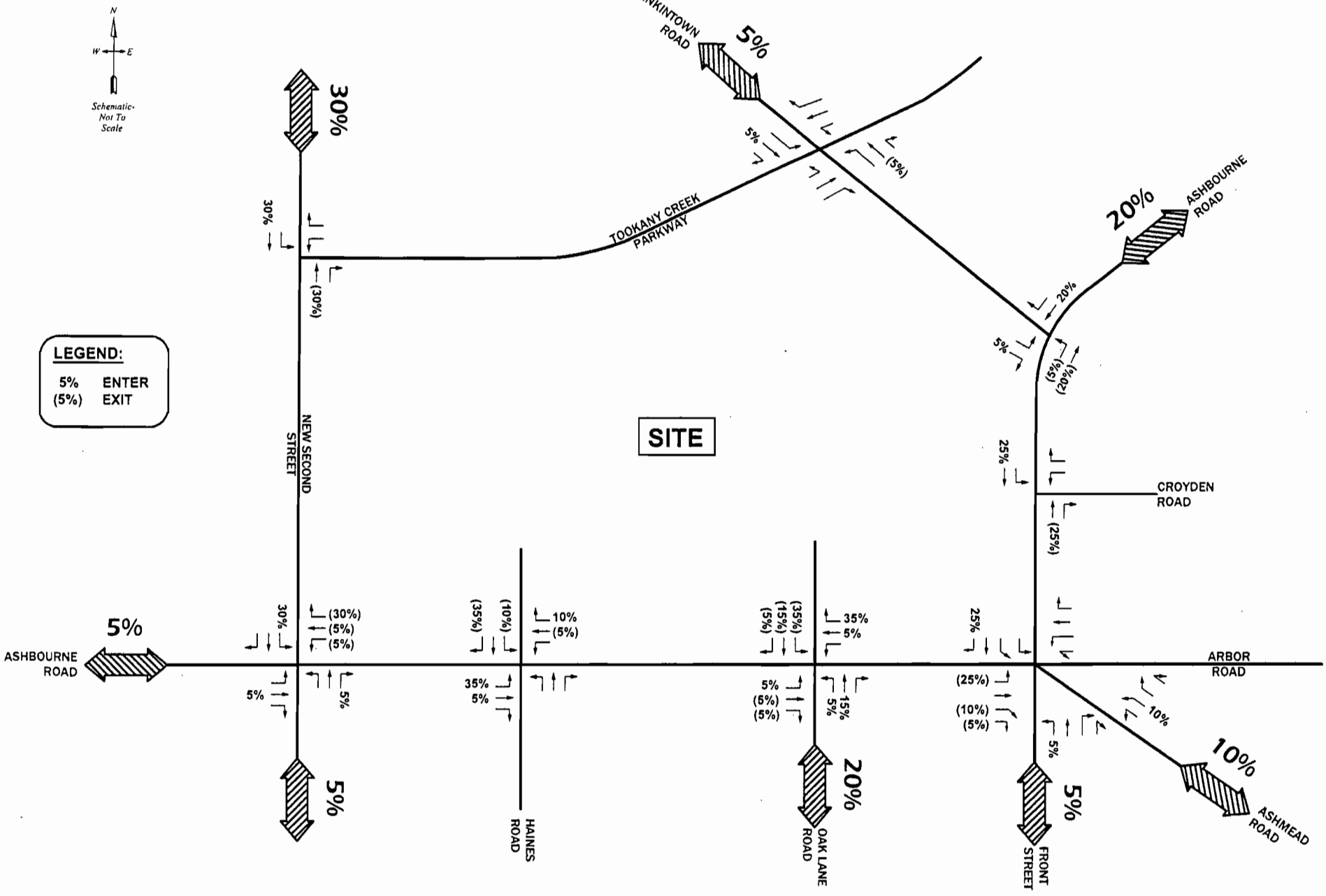

FIGURE 7

Directions of Approach and Departure

ASHBOURNE COUNTRY CLUB - Age Restricted Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

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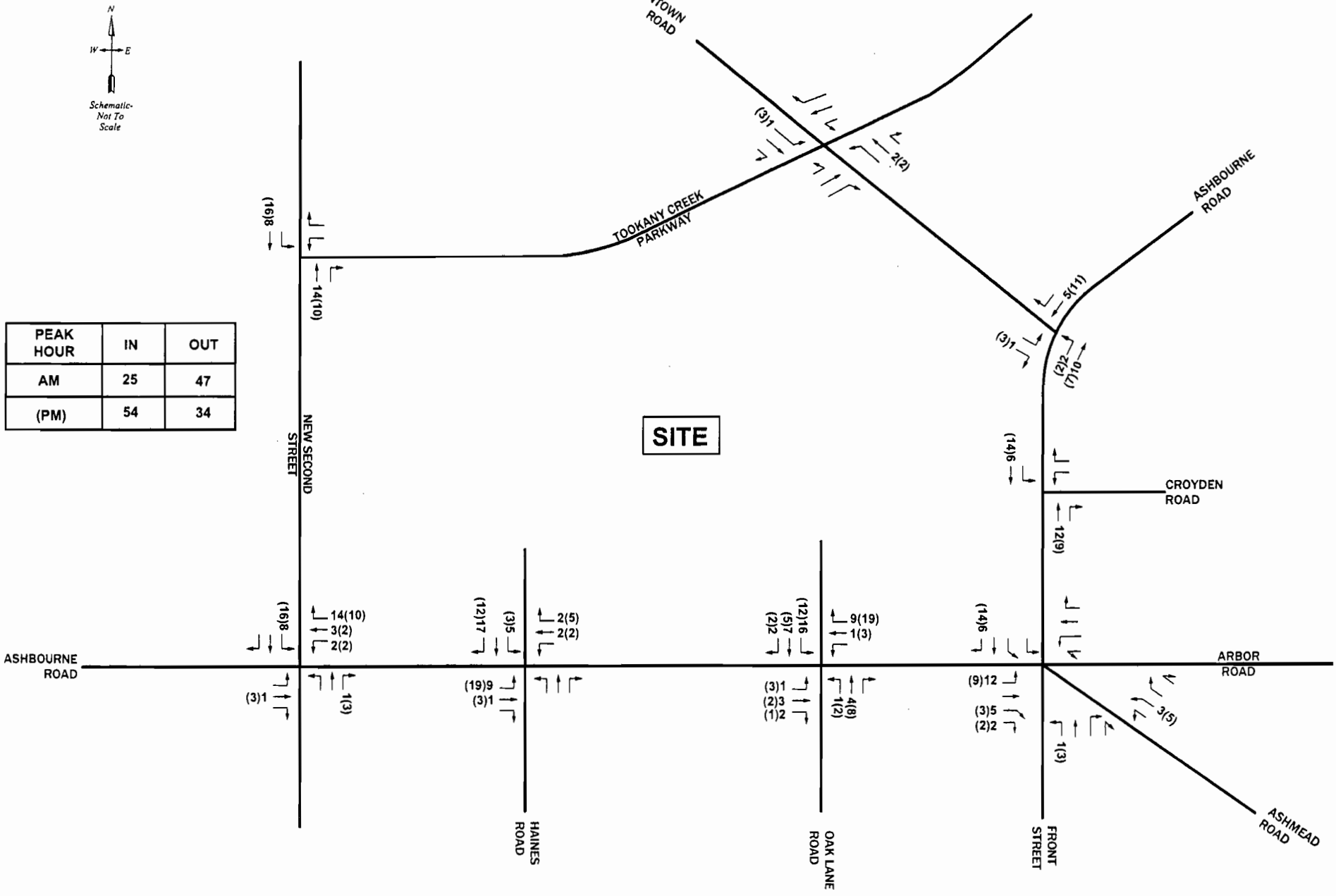

PEAK HOUR	IN	OUT
AM	25	47
(PM)	54	34

FIGURE 8

New Trip Assignment

ASHBOURNE COUNTRY CLUB - Age Restricted Community

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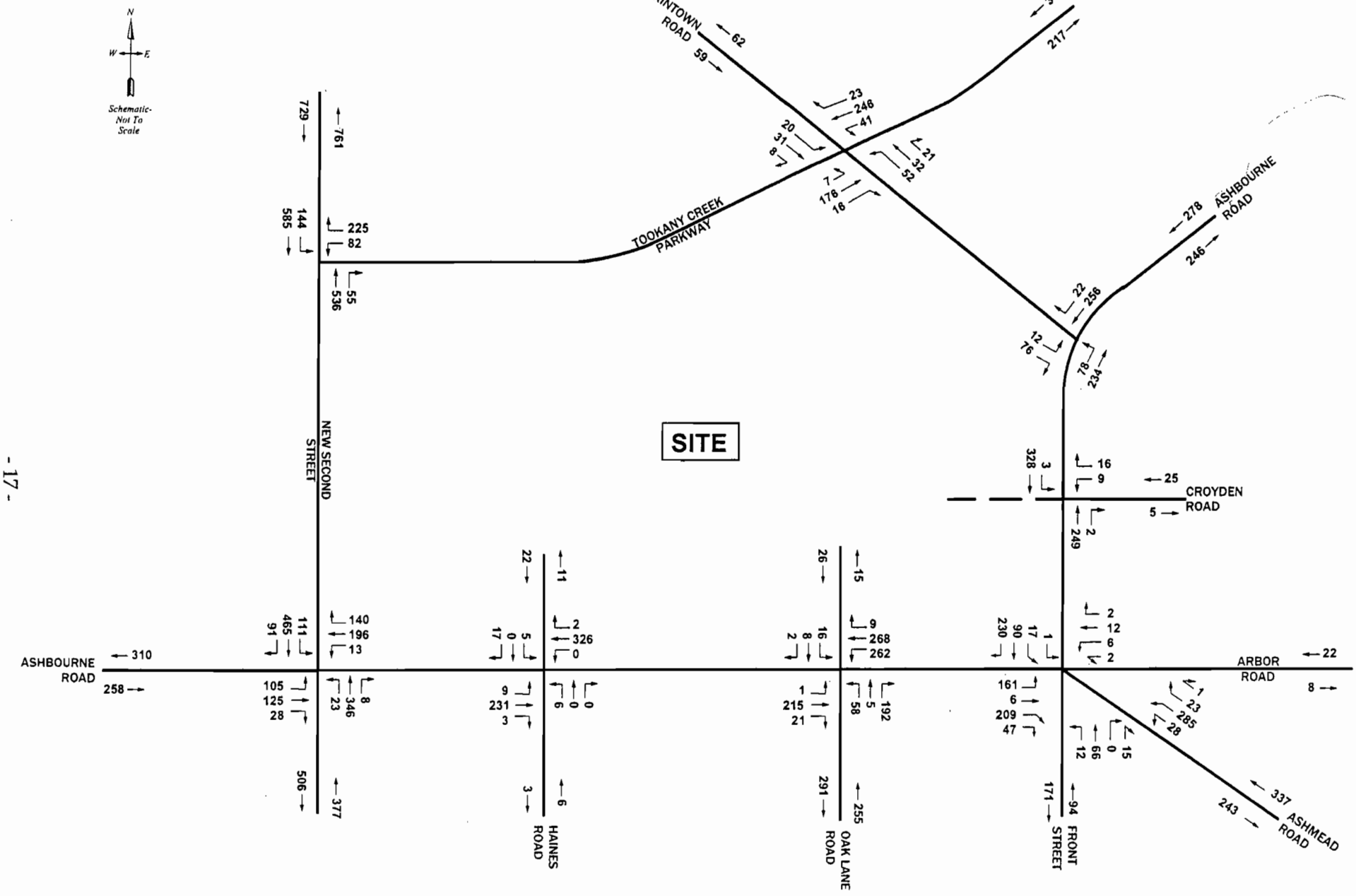

FIGURE 9

2013 Future Weekday Morning Peak Hour Traffic Volumes with Development

ASHBOURNE COUNTRY CLUB - Age Restricted Community

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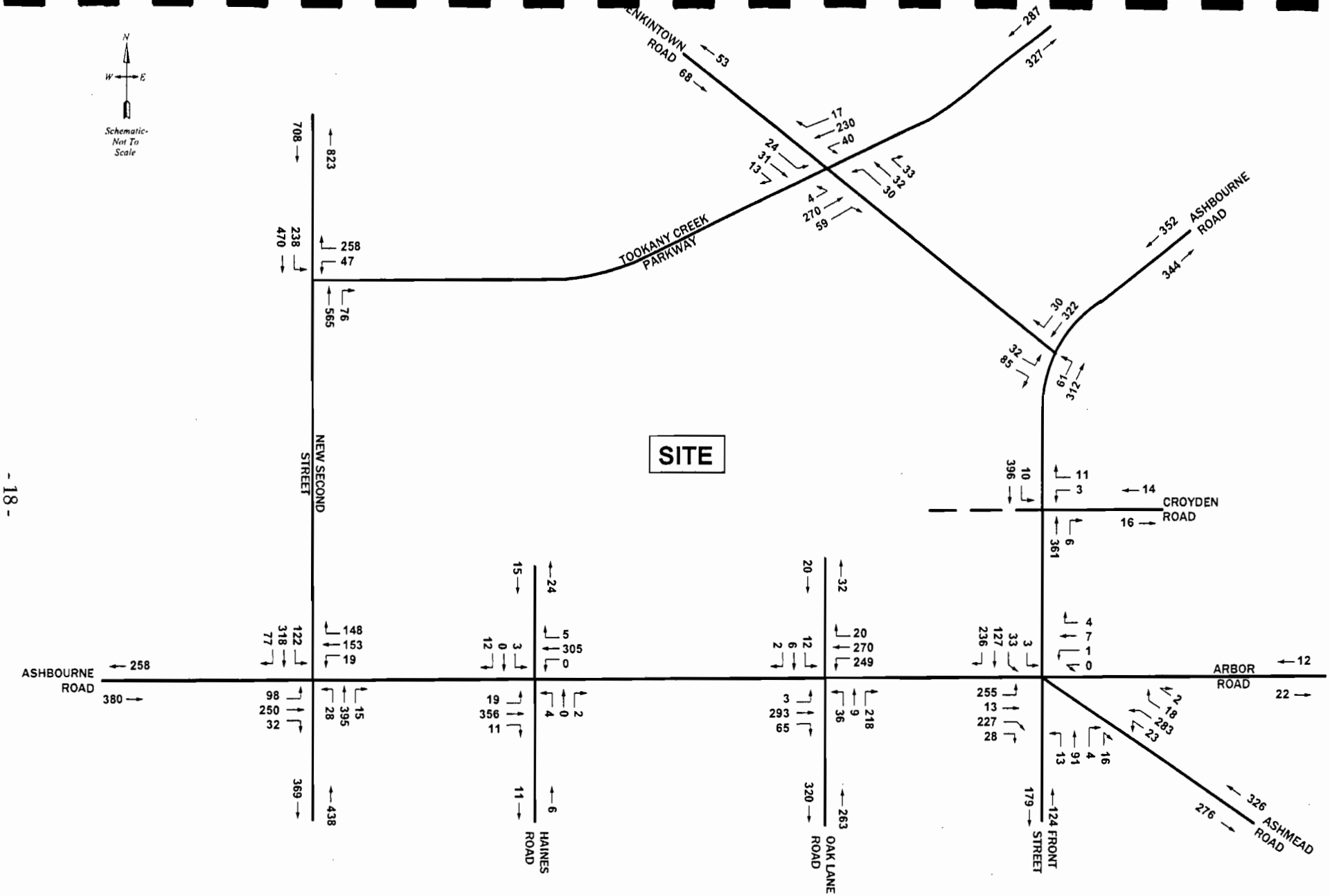

FIGURE 10

2013 Future Weekday Afternoon Peak Hour Traffic Volumes with Development

ASHBOURNE COUNTRY CLUB - Age Restricted Community

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Site Access

Access to the age-restricted homes will be provided via the existing signalized intersection at Ashbourne Road (S.R. 2025) and Oak Lane Road (S.R. 2062) and a new unsignalized access along Ashbourne Road opposite Haines Road. This section summarizes the recommended design for these two accesses associated with the redevelopment of the Ashbourne Country Club.

Design Criteria

The proposed recommendations for the proposed access designs, including the traffic control and geometric design, are based on criteria and guidelines accepted by PennDOT contained in the *Pennsylvania Code, Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads*, PennDOT's *Publication 282 Highway Occupancy Permit Handbook*, as well as local PennDOT District policies. Since both accesses are on a State highway, Ashbourne Road (S.R. 2025), any modifications to the existing access servicing the Ashbourne Country Club, as well as the design of the new unsignalized access, will require the review and approval of PennDOT.

Based on Section 441.8 of PennDOT access code, both access driveways would be classified as low-volume driveways, since there will be less than 750 trips per day utilizing each driveway. The design criteria for a two-way, low-volume driveway is based upon the roadway speed (Ashbourne Road is posted 35 miles per hour), and the anticipated design vehicle that will be using the site. Since, the residential development will need to accommodate moving vehicles, it is recommended that the driveways be designed to accommodate combination trucks. The design criteria, as documented in *Chapter 441* for the low-volume driveway conditions for these two accesses; are to provide a minimum cartway width of 22 feet with a minimum curb radius of 35 feet.

Although an approach for the Ashbourne Country Club is currently provided at the intersection ofAshbourne Road (S.R. 2025)/Oak Lane Road (S.R. 2062), it will be realigned and widened in conjunction with the redevelopment. The following improvements, which meet or exceed the minimum design guidelines for a low-volume driveway, are planned by the applicant for this access that will be gated:

- Provide a single 16-foot-wide ingress lane and a single 16-foot-wide egress lane that will be separated by a 12-foot wide landscaped median.
- Provide 35-foot curb radii (at a minimum).
- Provide a separate 14-foot-wide right-turn lane along Ashbourne Road (S.R. 2025), 75 feet in length and a 75-foot bay taper.
- Modify the traffic control signal permit to include the proposed right-turn lane and provide an advance westbound phase to better accommodate the left-turn movement to Oak Lane.

The unsignalized access for the age-restricted development will be located along Ashbourne Road (S.R. 2025) directly opposite Haines Road. This access will also be gated; however, prior to the gatehouse, a public parking lot will be provided that will allow non-residents to utilize the

proposed trail system surrounding the development. Since the daily trips will be split between this access and the signalized access, it too will be classified as a low-volume driveway by PennDOT and would be subject to the same design criteria. The following improvements are planned by the applicant for this driveway, which meet or exceed the design criteria for a low-volume driveway:

- Provide a single 14-foot-wide ingress lane and a single 14-foot-wide egress lane that will be separated by a 10-foot wide landscaped median.
- Provide 35-foot curb radii (at a minimum).
- Provide stop-control along the access approach.

Copies of the auxiliary lane warrant worksheets for the proposed unsignalized access are provided in **Appendix D**, which show that auxiliary turn lanes are not warranted at this access based upon the anticipated peak hour traffic volumes.

Sight Distance

Sight distance field measurements were performed at the proposed new, unsignalized full-movement access on Ashbourne Road (S.R. 2025) for the age-restricted homes. Generally, the posted speed limit, roadway grades and profiles, and the number of travel lanes play a role in determining the required safe sight distances for egress and ingress movements. The sight distances were measured in the field and compared to PennDOT's desirable and minimum safe stopping sight distance (SSSD) requirements for two-lane roads, which are contained in *Tables 1 and 5* of the *Pennsylvania Code, Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads, and Pub 282, Highway Occupancy Permit Handbook.*

Table 3 provides a summary of the field measured distances, along with the minimum and desirable distances, per current PennDOT policy. As can be seen, the desirable required safe sight distance can be provided for all of the ingress and egress movements at the new, unsignalized access driveway for the age-restricted development.

Table 3. Sight Distance Criteria for Age-Restricted Access opposite Haines Road

Movement	Direction	Approach Grade	Sight Distance (feet)		
			Desirable (1)	Minimum (2)	Available
Exiting	Looking Left	-4%	440	338	661
	Looking Right	-4%	350	338	537
Left turn Entering	Looking Ahead	-4%	300	338	611
	From the Rear	-4%	300	338	531

(1) Based on the posted speed of 35 miles per hour.
(2) Based on the 85th percentile speed of 40 miles per hour (see ATR count data).

Capacity/Level-of-Service Analyses

The peak hour traffic volumes were analyzed to determine the existing operating conditions and future operating conditions, both without and with redevelopment of the Ashbourne Country Club, in accordance with the standard techniques contained in the current *Highway Capacity Manual (2000)*. These standard capacity/level-of-service analysis techniques, which calculate total control delay, are more thoroughly described in **Appendix E** for both signalized and unsignalized intersections, as well as the correlation between average total control delay and the respective level-of-service criteria for each intersection type.

In the surrounding area, PennDOT District 6-0, as well as many local municipalities, considers LOS A through D acceptable operating conditions, while LOS E represents conditions approaching capacity and LOS F indicates that traffic volumes have exceeded available capacity. PennDOT's *Policies and Procedures for Transportation Impact Studies Related to Highway Occupancy Permit*, dated January 28, 2009, does allow for a 10 second variance for any drop in the overall level-of-service at an intersection prior to requiring mitigation; however, PennDOT still reserved the right to require mitigation for individual movements on a case-by-case basis. For example, if the overall level-of-service under without-development conditions is LOS D with 52.4 seconds of delay per vehicle, the overall with-development level-of-service can drop to LOS E, and not require any mitigation measures, as long as the overall delay does not exceed 62.4 seconds. If the overall increase in the delay exceeds the 10 second variance, then improvements are required to mitigate the delay back to the without-development condition.

The results of the capacity/level-of-service analyses are illustrated in **Figures 11 through 13** for the existing, future build-out (2013) without development and with development, respectively. Additionally, detailed capacity/level-of-service analysis worksheets are contained in **Appendix F, G, and H** for the existing and future build-out (2013) without and with development, respectively. The analysis results are summarized below for each study intersection.

Ashbourne Road (S.R. 2025) and New Second Street (S.R. 2060)

Under existing and 2013 future without-development conditions, this intersection operates at overall LOS C during the weekday morning and weekday afternoon peak hours, with all movements operating at LOS D or better during both peak hours. Under 2013 future with-development conditions, this intersection will continue to operate at the same overall levels of service as without-development conditions and the movements will operate at LOS D or better during both peak hours.

Ashbourne Road (S.R. 2025) and Haines Road/Site Access

Under existing and 2013 future without-development conditions, this intersection operates at LOS B or better for all movements during the weekday morning and weekday afternoon peak

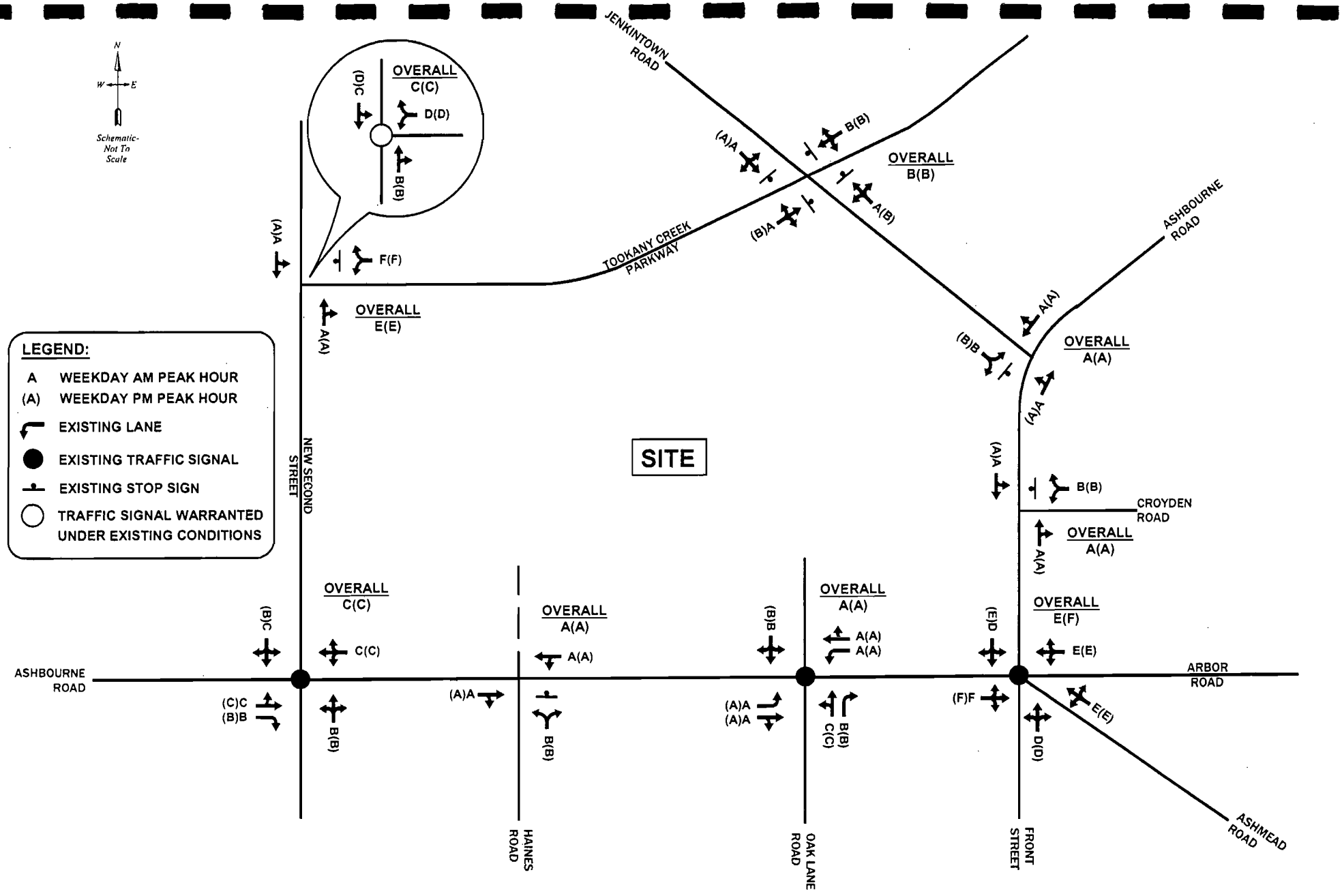

FIGURE 11

2009 Existing Levels of Service

ASHBOURNE COUNTRY CLUB - Age Restricted Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(9/24/09-LBK) i:\Eng\809015\Dwg\Figures\09-2009\Figure11.dwg

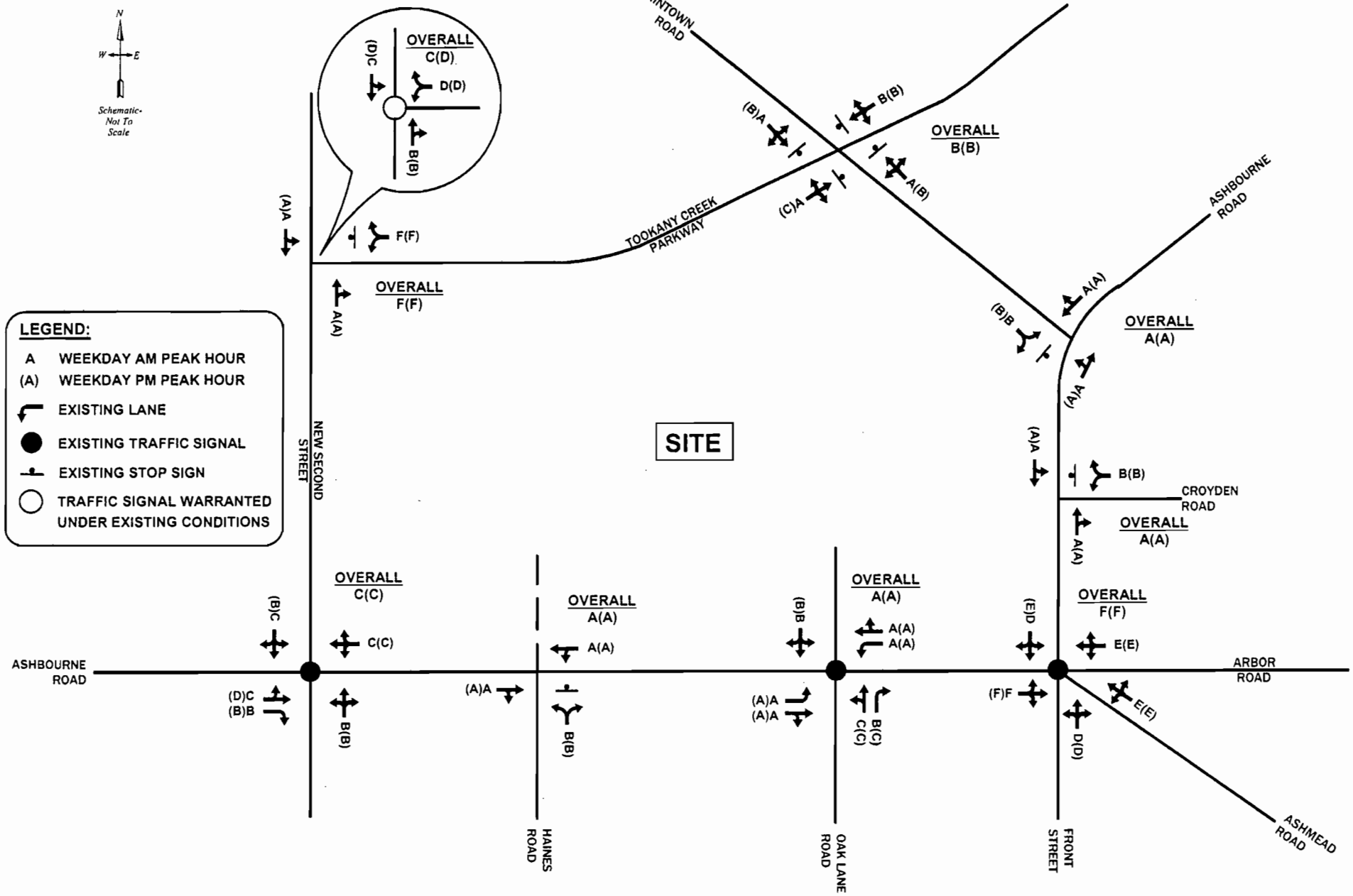

FIGURE 12

2013 Future Levels of Service Without Development

ASHBOURNE COUNTRY CLUB - Age Restricted Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(9/24/09-LBK) i:\Eng\809015\Dwg\Figures\09-2009\Figure12.dwg

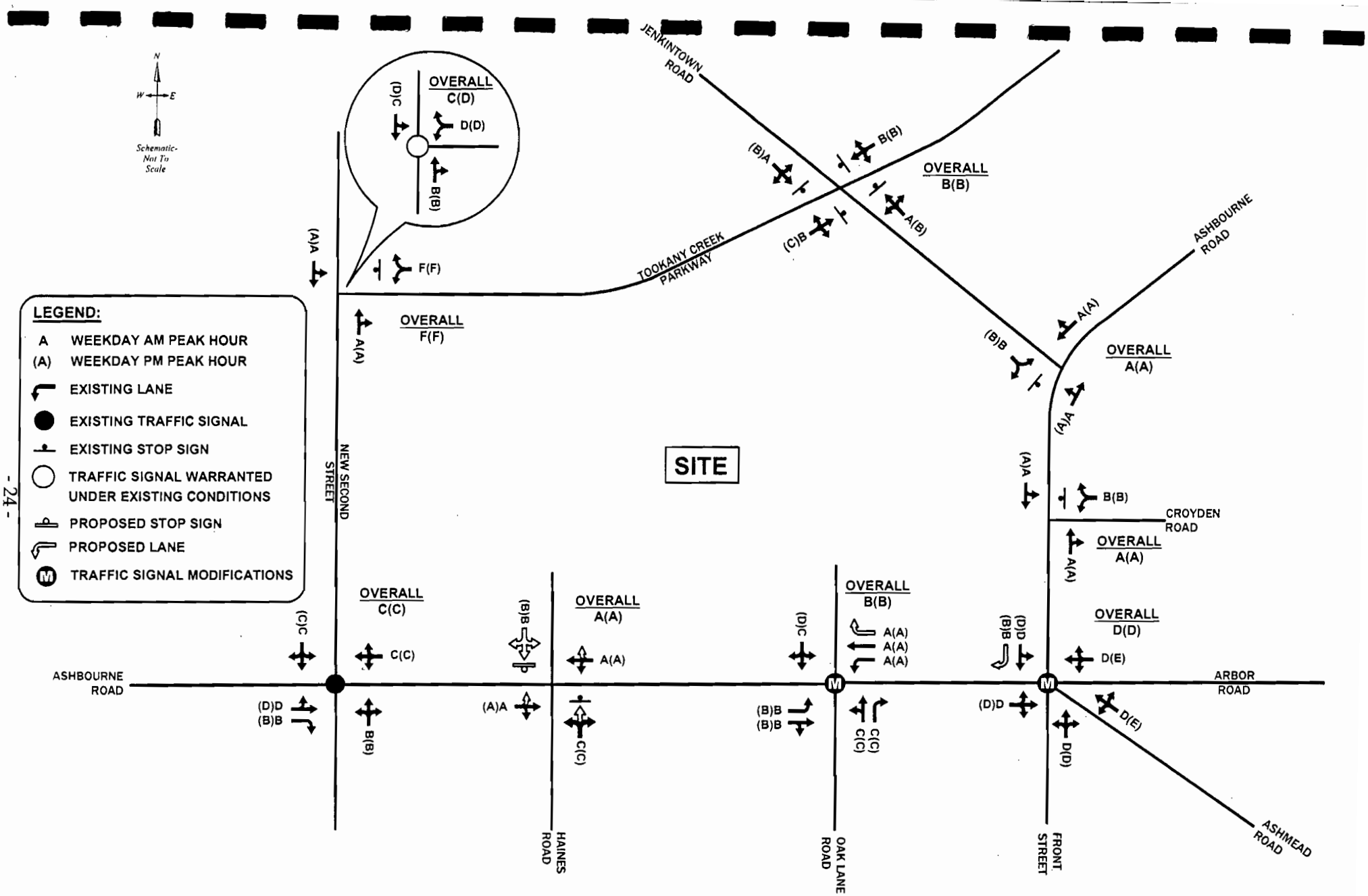

FIGURE 13

2013 Future Levels of Service With Development

ASHBOURNE COUNTRY CLUB - Age Restricted Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(9/24/09-LBK) i:\Eng\809015\Dwg\Figures\09-2009\Figure13.dwg

hours. With development of the site, the northbound approach of Haines Road will operate at LOS C during the weekday morning and weekday afternoon peak hours, while the southbound approach for the access will operate at LOS B during the weekday morning and weekday afternoon peak hours.

Ashbourne Road (S.R. 2025) and Oak Lane Road (S.R. 2062)/Site Access

Under existing and 2013 future without-development conditions, this intersection operates at overall LOS A during both the weekday morning and weekday afternoon peak hours, with all movements operating at LOS C or better during both peak hours. With development of the site, it is recommended that the existing access driveway to the Ashbourne Country Club be realigned and widened to provide one ingress lane and one egress lane, which is consistent with PennDOT's design standards for a low-volume driveway. Additionally, a separate right-turn lane along the westbound approach of Ashbourne Road (S.R. 2025) is also proposed, along with traffic signal timing modifications that includes the provision of an advance westbound phase to better accommodate the heavy left-turn movement from Ashbourne Road (S.R. 2025) to Oak Lane Road (S.R. 2062).

With these improvements, the intersection will operate at overall LOS B during the weekday morning and weekday afternoon peak hours with all movements operating at LOS D or better during both peak hours. It should be noted that if the signal permit timings were to remain unchanged from without-development conditions and the separate right-turn lane was not provided along the westbound approach of Ashbourne Road (S.R. 2025), the overall delay would be LOS B during both the weekday morning and weekday afternoon peak hours; however, the incremental increase in the overall delay from without-to with-development conditions would be less than 10 seconds per vehicle, which would not require the applicant to provide any mitigation improvements. It can be concluded that the applicant does comply with PennDOT's requirements, since the applicant is proposing improvements to the intersection, and the resultant level-of-service will result in an increase in the overall delay that is less than 6 seconds per vehicle compared to without-development conditions.

Ashbourne Road (S.R. 2025) and Front Street/Ashmead Road/Arbor Road

Under existing conditions, this intersection operates at overall LOS E during the weekday morning peak hour and at overall LOS F during the weekday afternoon peak hour, with several movements operating with delay (LOS E and F) during both peak hours. Under 2013 future without-development conditions, this intersection will operate at overall LOS F during both the weekday morning and weekday afternoon peak hours, only with several movements continuing to operate with delay (LOS E and F) during both peak hours.

With development of the site, the installation of a southbound right-turn lane along Ashbourne Road (S.R. 2025) is recommended along with traffic signal timing modifications to mitigate the impact of the development. With these improvements, the intersection will operate at overall LOS D during the weekday morning and weekday afternoon peak hours, with some movements continuing to operate with delay (LOS E) during the weekday afternoon peak hour only. All movements at the intersection will function with reduced delay compared to without-development conditions.

Ashbourne Road (S.R. 2025) and Croyden Road

Under existing and 2013 future conditions both without- and with-development of the age-restricted homes, this intersection will operate at LOS B or better for all movements during the weekday morning and weekday afternoon peak hours. Therefore, no improvements are recommended.

Ashbourne Road (S.R. 2025) and Jenkintown Road

Under existing and 2013 future without- and with-development conditions, this intersection operates at LOS B or better for all movements during the weekday morning and weekday afternoon peak hours. Therefore, no improvements are recommended.

Jenkintown Road and Tookany Creek Parkway

Under existing and 2013 future without- and with-development conditions, this all-way stop-controlled intersection operates at LOS B overall with all movements also operating at LOS B or better conditions during the weekday morning and weekday afternoon peak hours. Therefore, no improvements are recommended.

New Second Street (S.R. 2060) and Tookany Creek Parkway

Under existing and 2013 future without- and with-development conditions, this intersection operates with delay (LOS F) on the minor street approach during the weekday morning and weekday afternoon peak hours. A comparison of the overall increase in delay at the intersection from without- to with-development conditions shows that the increase in delay is less than 10 seconds per vehicle, which is permitted under PennDOT's current policy prior to requiring mitigation measures. It should also be noted that the proposed development will increase traffic at this intersection by less than 1.6 percent during both peak hours, which is less than 26 vehicles per hour, i.e. one additional vehicle every two minutes.

A traffic signal warrant was conducted based upon the 2002 and 2009 existing volumes from the manual turning movement counts, which is provided in **Appendix I.** According to the warrants, the installation of a traffic signal is warranted based on the peak hour and four-hour warrants for the 2002 traffic volumes, but only for the 2009 peak hour traffic volumes, since there has been a reduction in area traffic volumes as a result of the recession. With signalization, this intersection would operate at overall LOS D or better during the weekday morning and weekday afternoon peak hours, with all movements operating at LOS D or better during both peak hours under existing and 2013 future without- and with-development conditions.

Supplemental Analysis

At the direction of the Township Engineer, a supplemental analysis has been completed assuming the trip volumes for the age-restricted community were more similar to market-value carriage homes. This alternative methodology was completed to address concerns regarding the retired versus non-retired residents living in the age-restricted section of the development, due to current economic conditions. Therefore, for this analysis, the trip generation for the 246 units was established based on data from the Institute of Transportation Engineers' publication entitled *Trip Generation, 8th Edition* for Land Use Code 230 – Residential Condominium/Townhouse.

Trip Generation

Table 4 provides a comparison of the trip generation characteristics for the two different methodologies. As can be seen, the alternative trip generation methodology will result in an additional 34 (total inbound and outbound) trips during the weekday morning peak hour and an additional 22 (total inbound and outbound) trips during the weekday afternoon peak hour.

Table 4. Vehicular Trip Generation Comparison

Land Use	Size (units)	Daily	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Method 1: Age-restricted Homes	246	1,164	25	47	72	54	34	88
Method 2: Residential Condominium/ Townhouse	246	1,408	18	88	106	84	42	126
Difference		**244**	**-7**	**41**	**34**	**30**	**8**	**38**

Capacity/Level-of-Service Analyses

The site-generated traffic volumes, utilizing Residential Condominium/Townhouse trip generation characteristics for the entire site were then added to the 2013 future without-development traffic volumes to result in total future peak hour traffic volumes with development for each peak hour. These peak hour traffic volumes were then analyzed to determine the future operating conditions for the build-out year 2013, with redevelopment of the Ashbourne Country Club, in accordance with the standard techniques contained in the current *Highway Capacity Manual (2000)*. The resultant level-of-service figure is provided in **Appendix J** along with the detailed capacity/level-of-service analysis worksheets.

Despite the increase in traffic associated with this alternative trip generation methodology, no additional roadway or intersection improvements would be required over those that were already recommended in conjunction with this development. Therefore, it can be concluded, based upon the traffic analysis, which is described in further detail herein, that safe and efficient access can be provided for the proposed development with both the age-restricted and carriage home components and that the previously recommended improvements will mitigate the development's impact.

Conclusions and Recommendations

In conjunction with the redevelopment of the Ashbourne Country Club that will result in 246 age-restricted homes, the following roadway/intersection improvements are proposed by the developer, which will mitigate the traffic impacts and provide safe and efficient flow in the area:

- **Ashbourne Road (S.R. 2025) and Oak Lane Road (S.R. 2062)/Access** – Widen the existing access to provide one 16-foot-wide egress lane and one 16-foot-wide ingress lane separated by a 12-foot-wide median. In addition, construct a separate westbound right-turn lane, 75 feet in length with a 75-foot bay taper, and modify the existing traffic signal timings to provide an advance westbound phase for traffic turning left from Ashbourne Road to Oak Lane Road.

- **Ashbourne Road (S.R. 2025)/Front Street/Ashmead Road/Arbor Road** – Construct a separate southbound right-turn lane along Ashbourne Road, 150 feet in length with a 75-foot bay taper, and modify the existing traffic signal timings.

- **Ashbourne Road (S.R. 2025) and Haines Road/Access** – Provide one 14-foot-wide ingress lane and one 14-foot-wide egress lane for the access, with stop control provided along the access approach, and a 10-foot-wide median separating the travel lanes.

Preliminary Concept Plans 1 through 3 detailing these intersection improvements follow. The traffic analysis, which is described in further detail herein, reveals that safe and efficient access can be provided for the proposed age-restricted homes and that the recommended improvements will mitigate the development's impact.

LEGEND

- EXISTING FEATURES
- PROPOSED PAVEMENT MARKINGS
- LEGAL RIGHT-OF-WAY
- ULTIMATE RIGHT-OF-WAY
- NEW PAVEMENT/CURBING AREA
- LANDSCAPED AREAS

SCALE

25' 0 25' 50'

DATE	DESCRIPTION	NO.
	REVISIONS	

PRELIMINARY CONCEPT #1

McMAHON

INTERSECTION IMPROVEMENTS
ASHBOURNE ROAD (S.R. 2025) AND
ACCESS OPPOSITE HAINES ROAD

CHELTENHAM TOWNSHIP MONTGOMERY COUNTY

DRWN BY: SAL
CHKD BY: SAE
APPRD BY: SAE

DATE OF PLAN: SEPTEMBER 1999

SCALE: 1" = 25'
JOB #: [illegible]
DWG #: 1 OF 1

LEGEND

- EXISTING FEATURES
- PROPOSED PAVEMENT MARKINGS
- LEGAL RIGHT-OF-WAY
- ULTIMATE RIGHT-OF-WAY
- NEW PAVEMENT/CURBING AREA
- LANDSCAPED AREAS

SCALE

25' 0 25' 50'

DATE	DESCRIPTION	NO.
	REVISIONS	

PRELIMINARY CONCEPT #2

McMAHON

INTERSECTION IMPROVEMENTS
ASHBOURNE ROAD (S.R. 2025) AND
OAK LANE (S.R. 2062)/ACCESS

CHELTENHAM TOWNSHIP MONTGOMERY COUNTY

DRWN. BY SAK
CHKD. BY SAK
APPRD. BY SAK

DATE OF PLAN
SEPTEMBER 1,2000

SCALE: 1" = 25'
JOB #
DWG # 1 OF 1

ASHBOURNE ROAD
(S.R. 2025)
ASHBOURNE ROAD
(S.R. 2025)
ARBOR
ROAD
ASHMEAD
ROAD
FRONT
STREET
LEGEND
EXISTING FEATURES
PROPOSED PAVEMENT MARKINGS
LEGAL RIGHT-OF-WAY
ULTIMATE RIGHT-OF-WAY
NEW PAVEMENT/CURBING AREA
LANDSCAPED AREAS
SCALE
25' 0 25' 50'
DATE
DESCRIPTION
NO.
REVISIONS
PRELIMINARY CONCEPT #3
McMAHON
INTERSECTION IMPROVEMENTS
ASHBOURNE ROAD (S.R. 2025) AND
FRONT STREET/ASHMEAD ROAD/ARBOR ROAD
CHELTENHAM TOWNSHIP
MONTGOMERY COUNTY
DRWN BY SAK
CHKD BY SAK
APPRD BY SAK
DATE OF PLAN
SEPTEMBER 1,2009
-33-

Executive Summary

While the Matrix Development Group proposes to redevelop a portion of the Ashbourne Country Club to provide a 246 unit age-restricted residential community, the applicant is also considering to construct an additional 96-unit carriage home community with access to the carriage home parcel provided separately from the age-restricted parcel. The foregoing traffic analysis builds upon the results for the prior study completed for the age-restricted community. A new full-movement, unsignalized access is proposed for the carriage homes that will be located opposite the northern leg of Ashbourne Road (S.R. 2025) opposite Croyden Road.

The trip generation characteristics for the carriage homes are again based on data from the Institute of Transportation Engineers' publication entitled *Trip Generation, 8th Edition*. Based on ITE data, the carriage homes can be expected to generate an additional 50 total (inbound and outbound) trips during the morning peak hour and 58 total (inbound and outbound) trips during the afternoon peak hour within the surrounding area.

To mitigate the traffic impacts associated with the redevelopment of the Ashbourne Country Club, the following roadway/intersection improvements are proposed by the developer, in addition to those proposed in conjunction with the age-restricted component of the development:

- **Ashbourne Road (S.R. 2025)/Front Street/Ashmead Road/Arbor** – Construct a separate eastbound left-turn lane on Ashbourne Road, 220 feet in length with a 75-foot bay taper, and modify the traffic signal timings.

- **Ashbourne Road (S.R. 2025) and Croyden Road/Access** – Provide one 14-foot-wide egress lane and one 14-foot-wide ingress lane, with stop control provided along the access approach, and the travel lanes separated by a 4-foot wide median.

The traffic analysis, which is described in further detail herein, reveals that safe and efficient access can be provided for the proposed development with either trip generation methodology for both the age-restricted and carriage home components and that the recommended improvements will mitigate the development's impact.

Introduction

The Matrix Development Group proposes to redevelop a portion of the existing Ashbourne Country Club, which provided an 18-hole golf course with clubhouse for member golfers, by proposing to initially construct a 246 unit age-restricted community, but is also considering adding a separate 96-unit carriage home community. Access to the carriage home community will be provided via a new unsignalized, full-movement driveway that will be located opposite Croyden Road along the northern leg of Ashbourne Road (S.R. 2025). The conceptual site plan of the proposed residential development is shown in **Figure 14**. The Ashbourne Country Club is bordered by Ashbourne Road (S.R. 2025) to the south and east, and Tookany Creek Parkway and Jenkintown Road to the north in Cheltenham Township, Montgomery County, Pennsylvania.

The purpose of this section of the traffic study is to present an evaluation of the incremental traffic impacts of the proposed development within the study area in Cheltenham Township, as well as provide recommendations regarding the site access design in order to provide efficient access to the site for the anticipated increase in traffic volumes associated with the development.

Future traffic volumes without the development of the carriage home community were projected utilizing an annual traffic growth rate to account for regional traffic growth. Based on conversations with the Township, it was determined that there are no other area developments in the vicinity of the site that would impact the study area intersections or roadways. The future traffic volumes were projected to the build-out (2015) at each of the study intersections. The future traffic volumes without the carriage home development were then subjected to detailed capacity/ level-of-service analysis.

Finally, the traffic generated by the proposed 96-unit carriage home community was established based on accepted methodologies published by ITE, and assigned to the roadway network and site accesses. For purposes of this analysis, Land Use Code 230 – Residential Condominium/ Townhouse was utilized for the carriage homes. The site-generated traffic volumes were added to future without-development traffic volumes, and subjected to detailed capacity/level-of-service analysis to assess the future traffic conditions with the development.

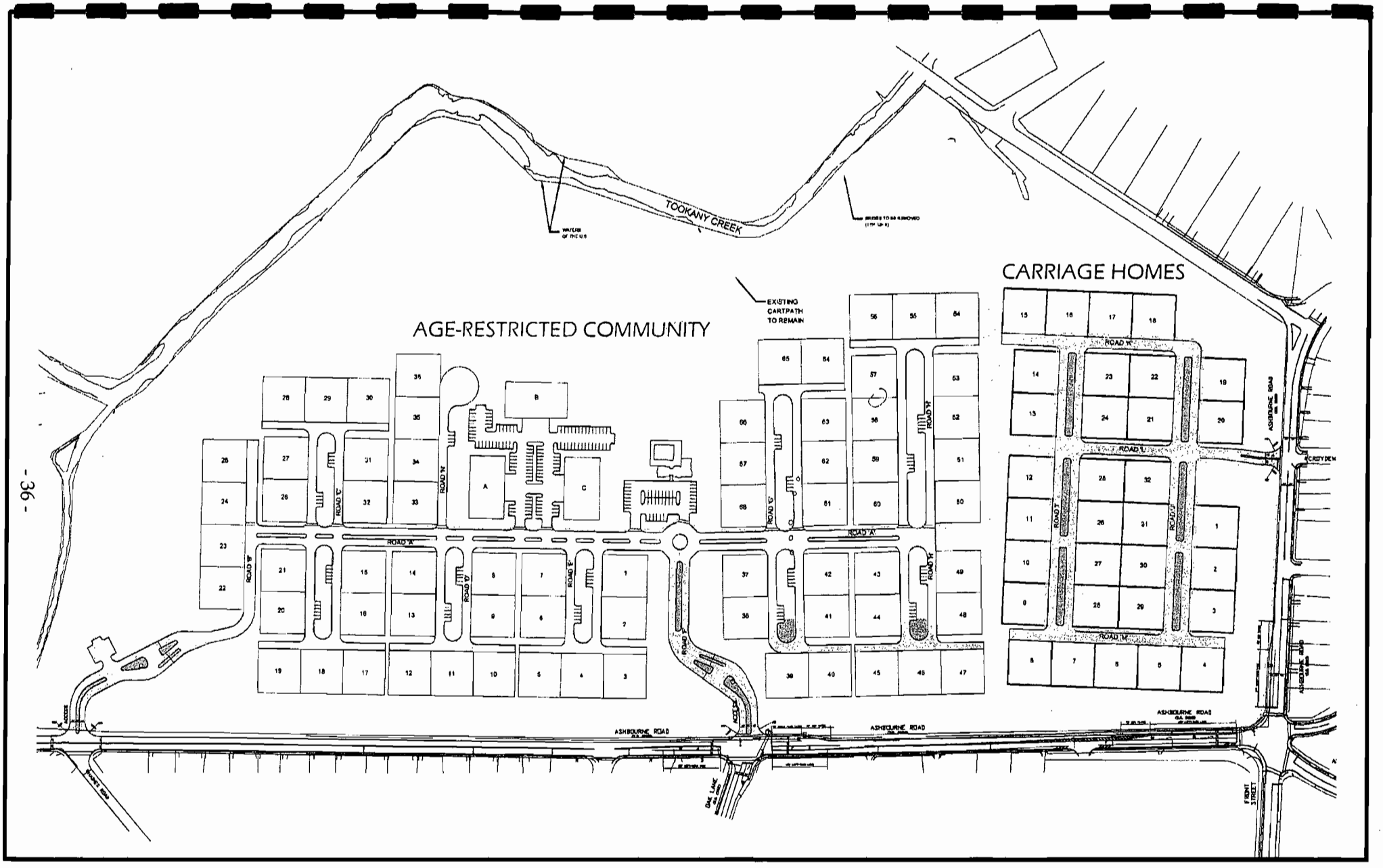

FIGURE 14
Site Plan

ASHBOURNE COUNTRY CLUB - Carriage Home Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

(9/22/09-LBK) i:\Eng\809015\Dwg\Figures\09-2009\Figure14.dwg

Future Traffic Volumes without Development

This section presents projected traffic volumes without the development of the carriage home community for the future build-out (2015). The future year 2015 without-development traffic volumes were estimated by increasing the existing 2009 peak hour traffic volumes to account for regional and local traffic growth, as described below. The future year 2015 without-development traffic volumes for the weekday morning and weekday afternoon peak hours are illustrated in **Figures 15 and 16**, respectively.

Regional and Local Traffic Growth

To account for background traffic growth, the existing traffic volumes were increased by a compounded annual traffic growth rate of 0.89 percent. This regional traffic growth rate is consistent with the recommendations by PennDOT's Bureau of Planning and Research for similar urban roadways in Montgomery County. Therefore, the existing 2009 peak hour traffic volumes were increased by a total of 5.46 percent to obtain the base build-out (2015) peak hour traffic volumes. Additionally, traffic generated from the proposed 246-unit age-restricted community was assumed in the without-development conditions, along with the proposed improvements.

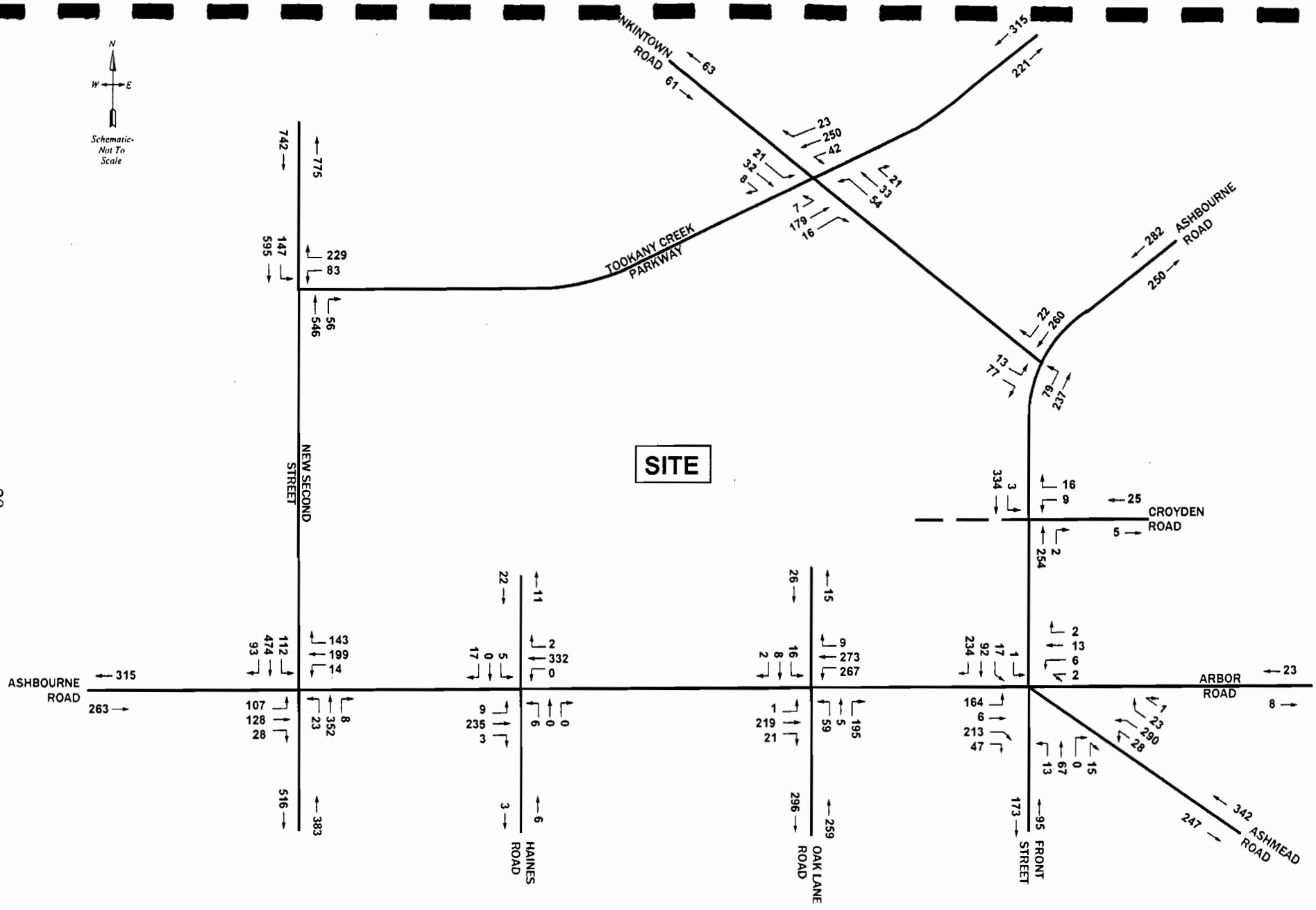

FIGURE 15

2015 Future Weekday Morning Peak Hour Traffic Volumes without Development

ASHBOURNE COUNTRY CLUB - Carriage Home Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

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(9/24/09-LBK) i:\Eng\809015\Dwg\Figures\09-2009\Figure15.dwg

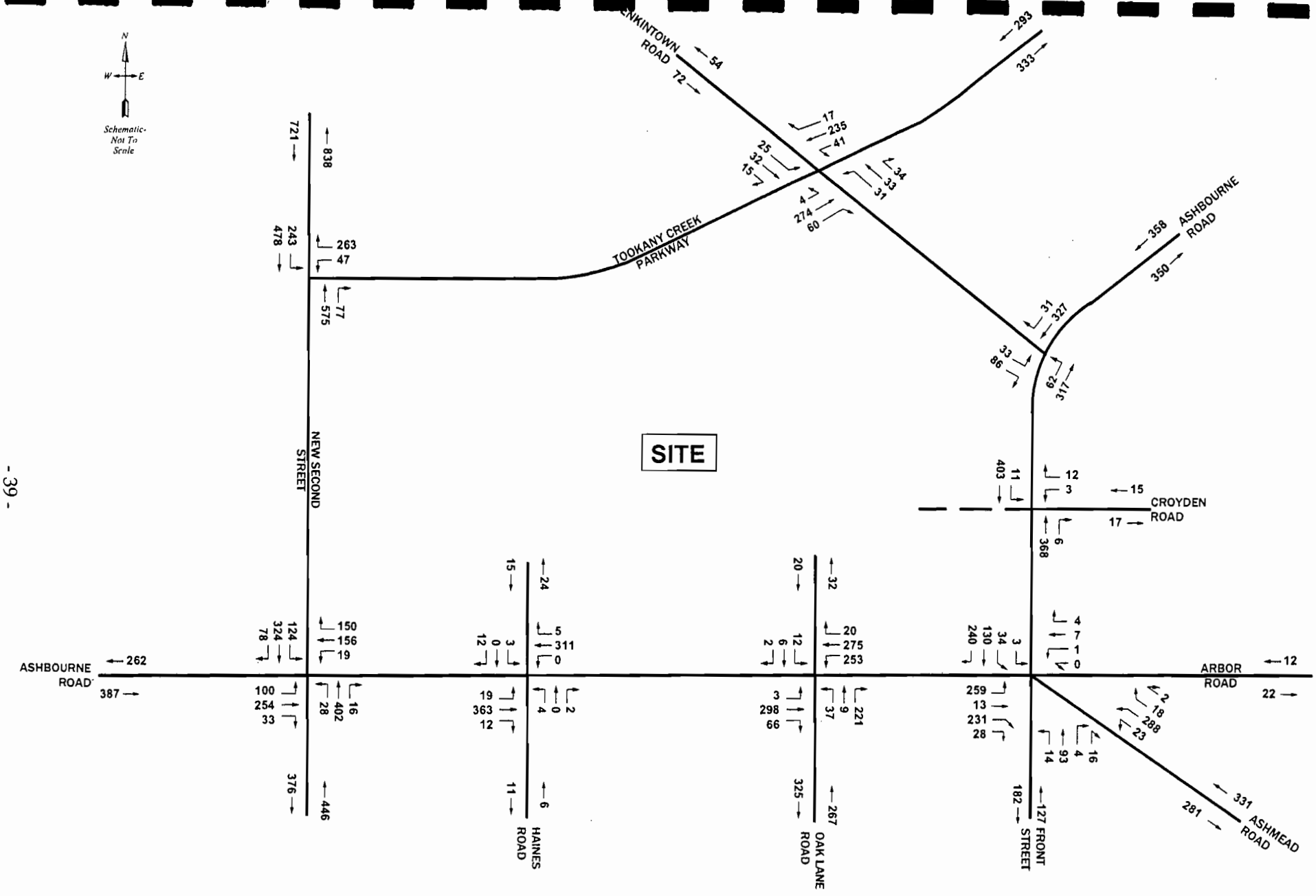

FIGURE 16

2015 Future Weekday Afternoon Peak Hour Traffic Volumes without Development

ASHBOURNE COUNTRY CLUB - Carriage Home Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

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(9/24/09-LBK) i:\Eng\809015\Dwg\Figures\09-2009\Figure16.dwg

Future Traffic Volumes with Development

Evaluation of the development of the proposed carriage home community is based upon the incremental increase in traffic volumes generated by the development during the peak hours, as described below.

Trip Generation

The anticipated trip generation characteristics for the carriage home community are based upon ITE Land Use Code 230 – Residential Condominium/Townhouse, which is representative of the type of homes and the residents.

Table 5 presents the anticipated vehicular trip generation characteristics for the proposed development. As can be seen, with the additional 96 carriage homes, the site will generate approximately 50 (total inbound and outbound) trips during the weekday morning peak hour and approximately 58 (total inbound and outbound) trips during the weekday afternoon peak hour.

Table 5. Vehicular Trip Generation for Carriage Homes

Land Use	Size (units)	Daily	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Carriage Homes	96	621	9	41	50	39	9	58

Trip Distribution and Assignment

Site-generated traffic will approach and depart the site via different routes depending on factors such as the existing traffic patterns, location of major roadways, and the location of the development's site access. The detailed distribution percentages for the anticipated directions of approach and departure, as well as the trip assignment details for the carriage homes is provide in **Figures 17 and 18**, respectively.

The site-generated traffic volumes were then added to the future without-development traffic volumes to result in total future peak hour traffic volumes with development for each peak hour. The 2015 future traffic volumes with development are illustrated in **Figures 19 and 20** for the weekday morning and weekday afternoon peak hours, respectively.

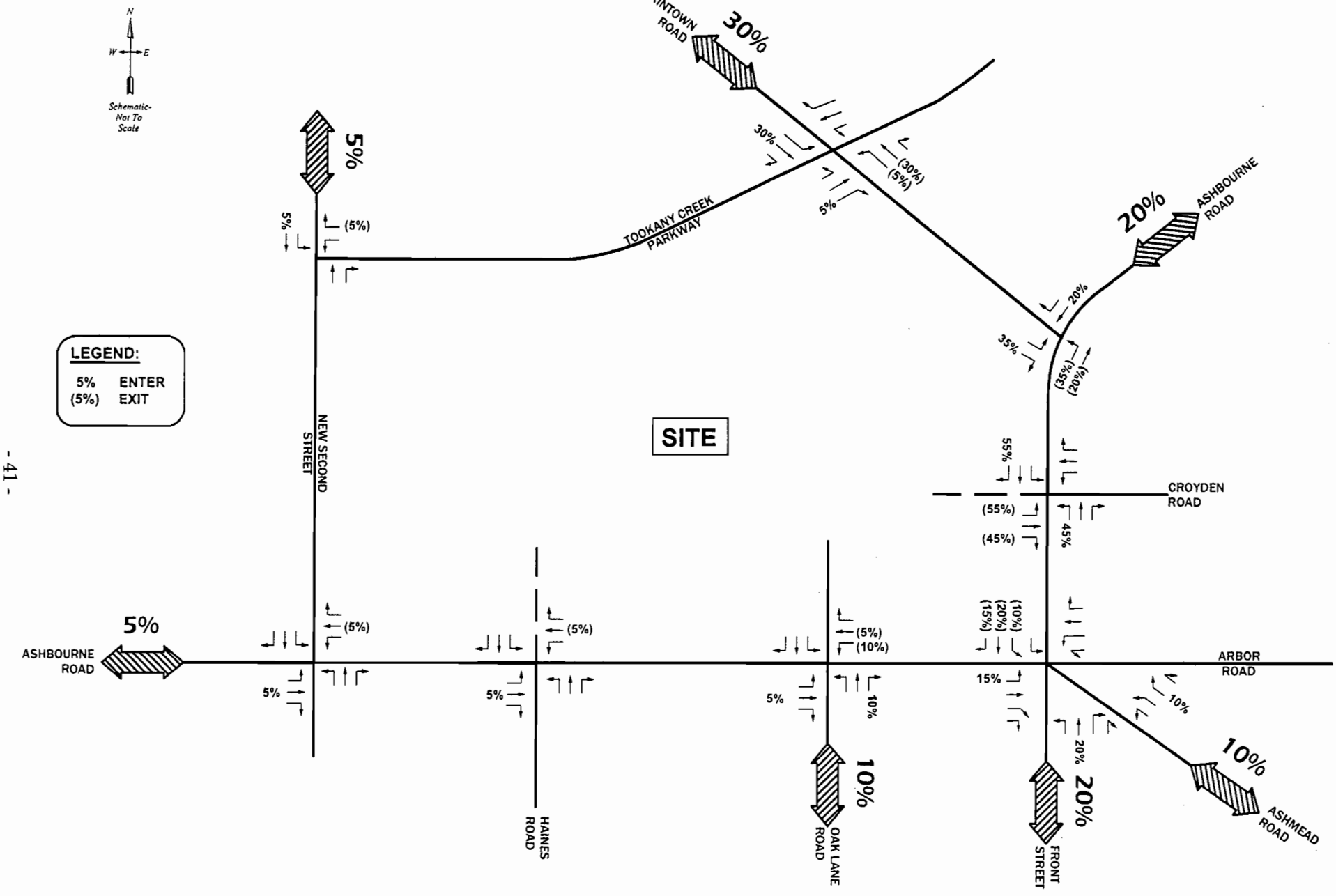

FIGURE 17

Directions of Approach and Departure

ASHBOURNE COUNTRY CLUB - Carriage Home Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

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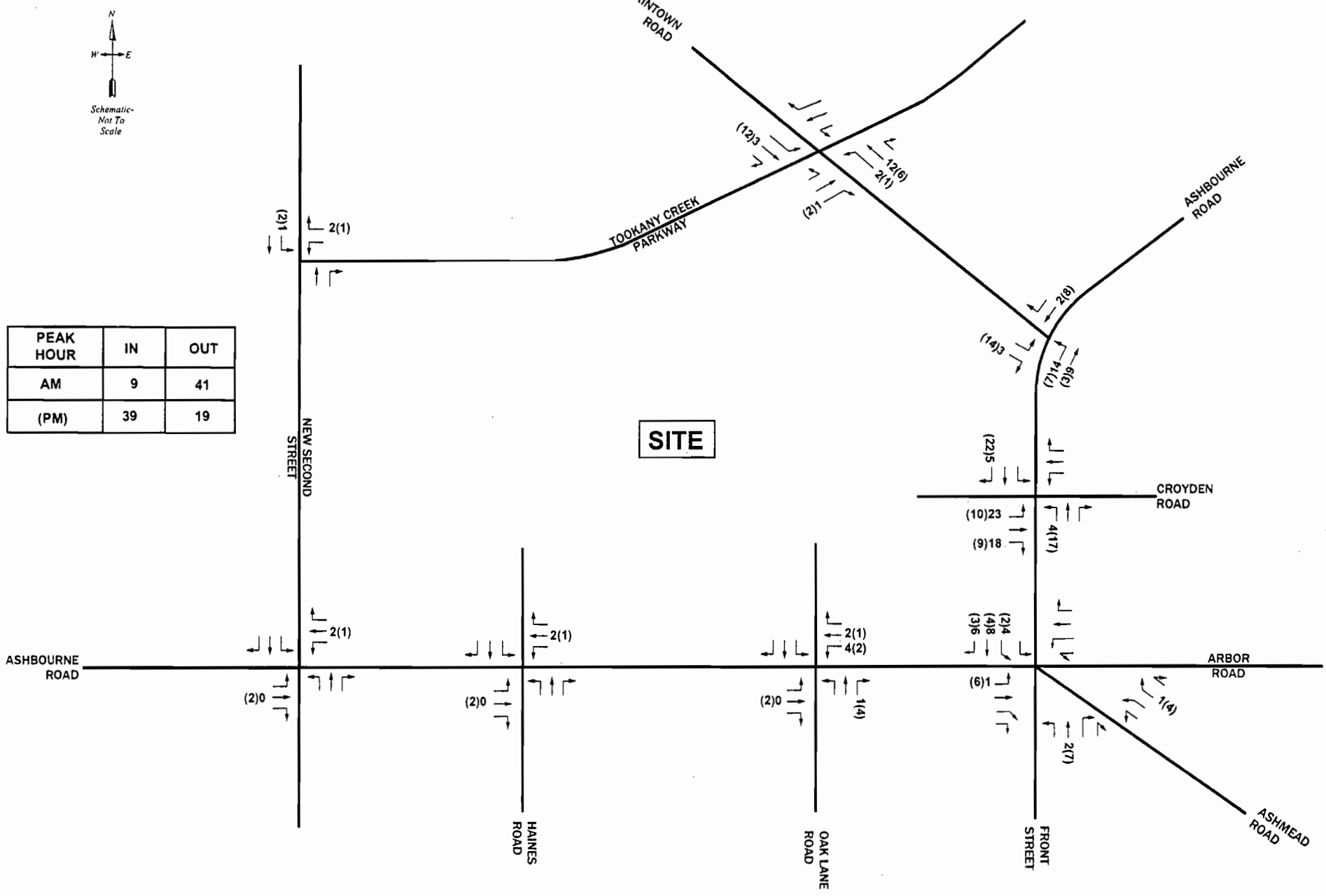

PEAK HOUR	IN	OUT
AM	9	41
(PM)	39	19

FIGURE 18

New Trip Assignment

ASHBOURNE COUNTRY CLUB - Carriage Home Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

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(9/22/09-LBK) i:\Eng\809015\Dwg\Figures\09-2009\Figure18.dwg

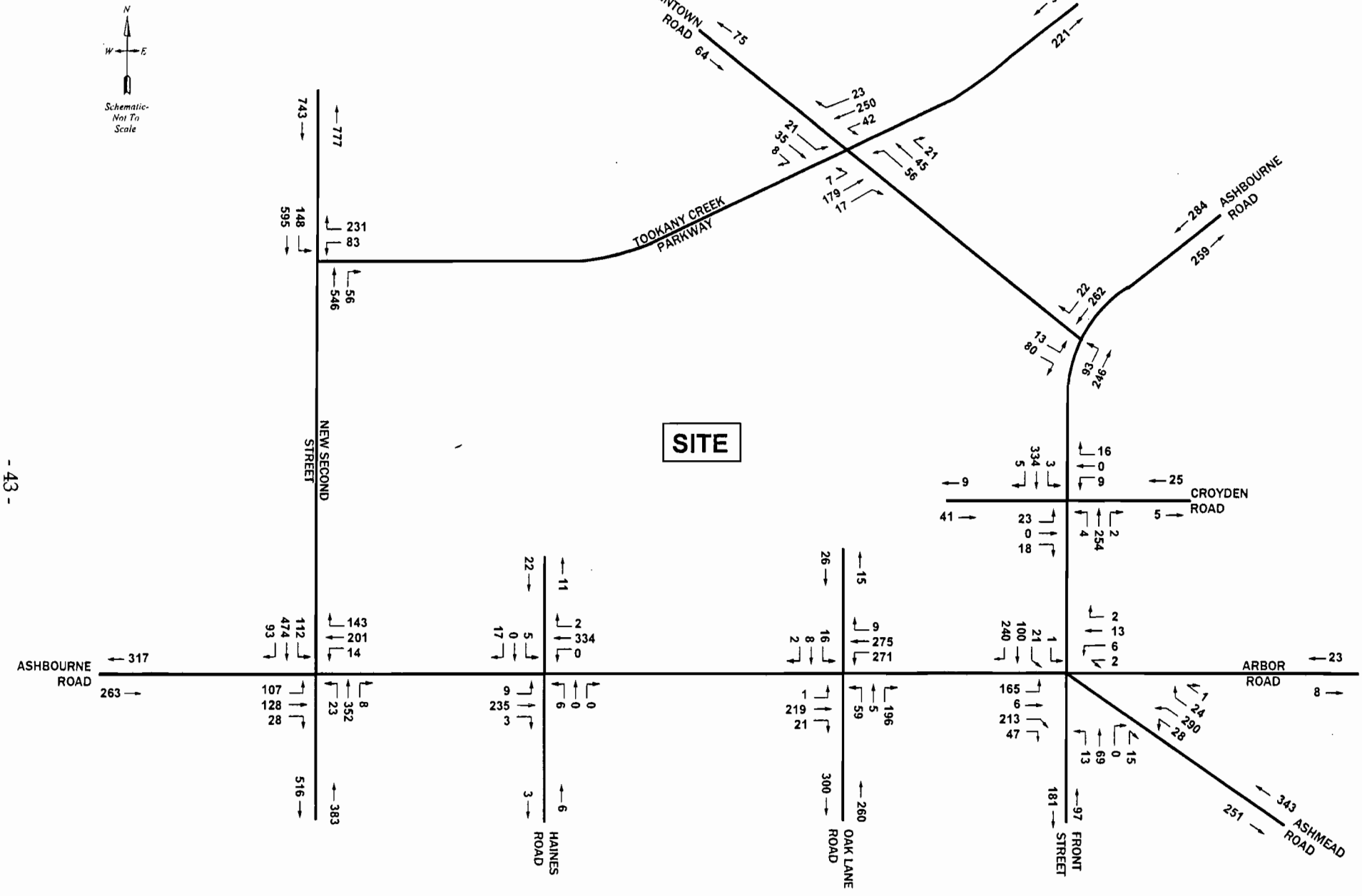

FIGURE 19

2015 Future Weekday Morning Peak Hour Traffic Volumes with Development

ASHBOURNE COUNTRY CLUB - Carriage Home Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

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(9/24/09-LBK) i:\Eng\809015\Dwg\Figures\09-2009\Figure19.dwg

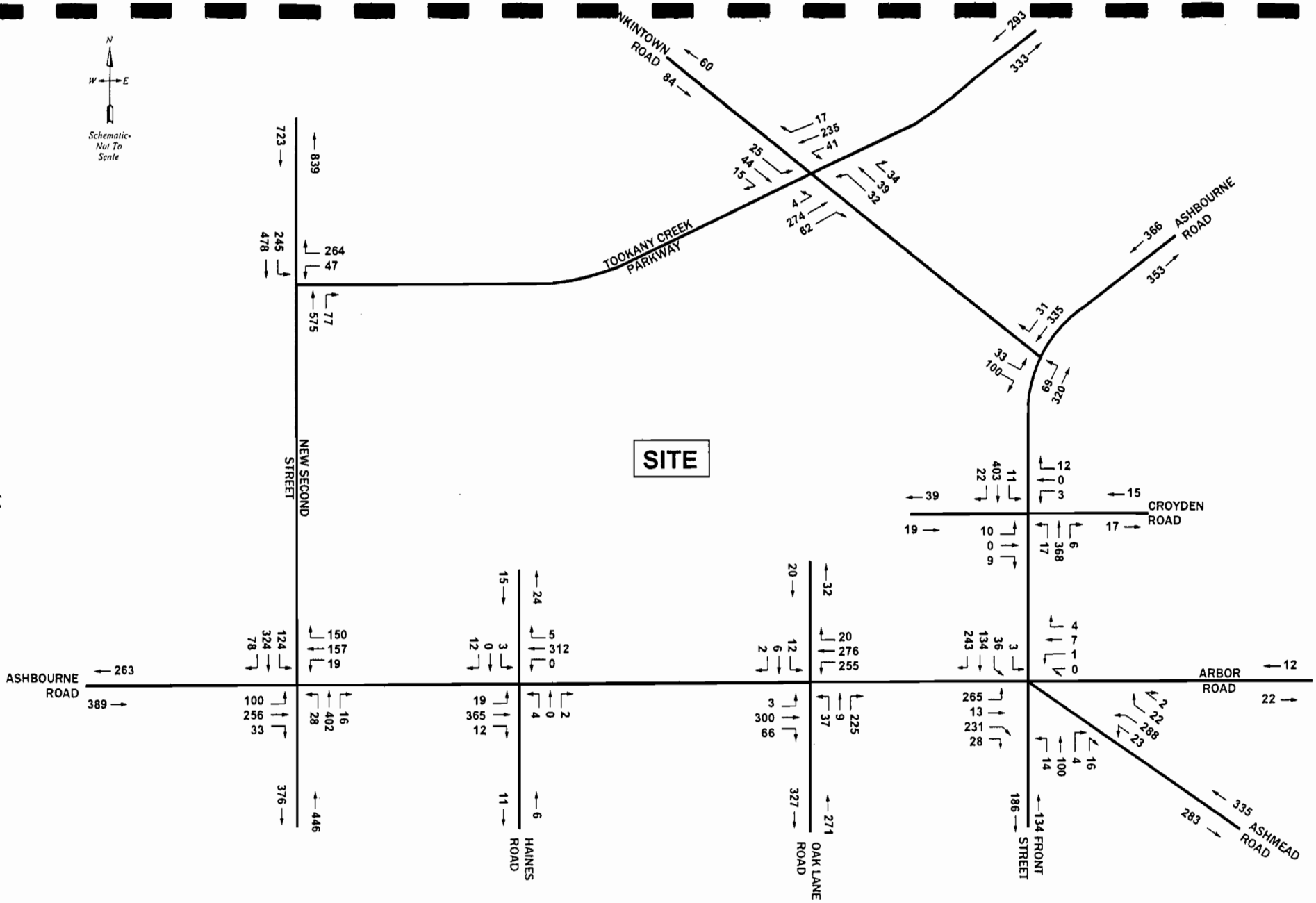

FIGURE 20

2015 Future Weekday Afternoon Peak Hour Traffic Volumes with Development

ASHBOURNE COUNTRY CLUB - Carriage Home Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

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(9/24/09-LBK) i:\Eng\809015\Dwg\Figures\09-2009\Figure20.dwg

Site Access

As previously documented in the first section of the study, access to the age-restricted homes will be provided via the existing signalized intersection at Ashbourne Road (S.R. 2025) and Oak Lane Road (S.R. 2062) and a new unsignalized access along Ashbourne Road opposite Haines Road. This section summarizes the recommended design for the new unsignalized, full-movement access that will be utilized by the carriage home component of the development project, which will be located along the northern leg of Ashbourne Road (S.R. 2025) directly opposite Croyden Road.

Design Criteria

The proposed recommendations for the proposed access design, including the traffic control and geometric design, are based on criteria and guidelines accepted by PennDOT contained in the *Pennsylvania Code, Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads,* PennDOT's *Publication 282 Highway Occupancy Permit Handbook,* as well as local PennDOT District policies. Since Ashbourne Road (S.R. 2025) is a state highway, the design of the new unsignalized access, will require the review and approval of PennDOT.

Based on the anticipated daily trips that will be generated by the carriage home component of the development (621), the access driveway serving the carriage homes would be classified as low-volume driveways, since there will be less than 750 trips per day using the site driveway. The design criteria for a two-way, low-volume driveway is based upon the roadway speed (Ashbourne Road is posted 35 miles per hour), and the anticipated design vehicle that will be using the site. Since, the residential development will need to accommodate moving vehicles; it is recommended that the driveways be designed to accommodate combination trucks. The design criteria, as documented in *Chapter 441* for the low-volume driveway conditions for this access are to provide a minimum cartway width of 22 feet with a minimum curb radius of 35 feet.

With the development of the carriage home component, the applicant is proposing the following improvements, which meet or exceed the minimum design guidelines for a low-volume driveway:

- Provide a single 14-foot-wide ingress lane and a single 14-foot-wide egress lane that will be separated by a 4-foot wide landscaped median.
- Provide 35-foot curb radii (at a minimum).
- Provide stop-control along the access approach.

Copies of the auxiliary lane warrant worksheets for the proposed unsignalized access are provided in **Appendix K**, which show that auxiliary turn lanes are not warranted at this access based upon the anticipated peak hour traffic volumes.

Sight Distance

Sight distance field measurements were performed at the proposed new, unsignalized full-movement access on Ashbourne Road (S.R. 2025) for the carriage homes. Generally, the posted speed limit, roadway grades and profiles, and the number of travel lanes play a role in determining the required safe sight distances for egress and ingress movements. The sight distances were measured in the field and compared to PennDOT's desirable and minimum safe stopping sight distance (SSSD) requirements for two-lane roads, which are contained in *Tables 1 and 5* of the *Pennsylvania Code, Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads, and Pub 282, Highway Occupancy Permit Handbook.*

Table 6 provides a summary of the field measured distances, along with the minimum and desirable distances, per current PennDOT policy. As can be seen, the desirable required safe sight distance can be provided for all of the ingress and egress movements at the new, unsignalized access driveway for the carriage homes.

Table 6. Sight Distance Criteria for Carriage Homes' Access along Ashbourne Road

Movement	Direction	Approach Grade	Sight Distance (feet)		
			Desirable (1)	Minimum (1)	Available
Exiting	Looking Left	+3%	440	239	431
	Looking Right	-4%	350	265	707
Left turn Entering	Looking Ahead	+3%	300	239	345
	From the Rear	-4%	300	265	680

(1) Based on the posted speed of 35 miles per hour.

Capacity/Level-of-Service Analyses

The peak hour traffic volumes were analyzed to determine the future operating conditions for the build-out year 2015, both without and with redevelopment of the Ashbourne Country Club, in accordance with the standard techniques contained in the current *Highway Capacity Manual (2000)* as described in the first section of the study.

The results of the capacity/level-of-service analyses are illustrated in **Figures 21 and 22** for the future build-out (2015) without development and with development, respectively. Additionally, detailed capacity/level-of-service analysis worksheets are contained in **Appendix L and M** for the future build-out (2015) without and with development, respectively. The analysis results are summarized below for each study intersection.

Ashbourne Road (S.R. 2025) and New Second Street (S.R. 2060)

Under 2015 future without-development conditions, this intersection operates at overall LOS C during the weekday morning and weekday afternoon peak hours, with all movements operating at LOS D or better during both peak hours. Under 2015 future with- development conditions, this intersection will continue to operate at the same overall levels of service as without-development conditions with all of the movements also operating at the same LOS D or better during both peak hours.

Ashbourne Road (S.R. 2025) and Haines Road/Site Access

Under 2015 future without- and with-development conditions, the northbound approach of Haines Road will operate at LOS C during the weekday morning and weekday afternoon peak hours, while the southbound approach for the access will operate at LOS B during the weekday morning and weekday afternoon peak hours.

Ashbourne Road (S.R. 2025) and Oak Lane Road (S.R. 2062)/Site Access

Under 2015 future without-development conditions, this intersection operates at overall LOS B during both the weekday morning and weekday afternoon peak hours, with all movements operating at LOS D or better during both peak hours. With development of the carriage homes, the intersection will continue to operate at overall LOS B during the weekday morning and weekday afternoon peak hours with all movements also operating at the same LOS D or better conditions during both peak hours.

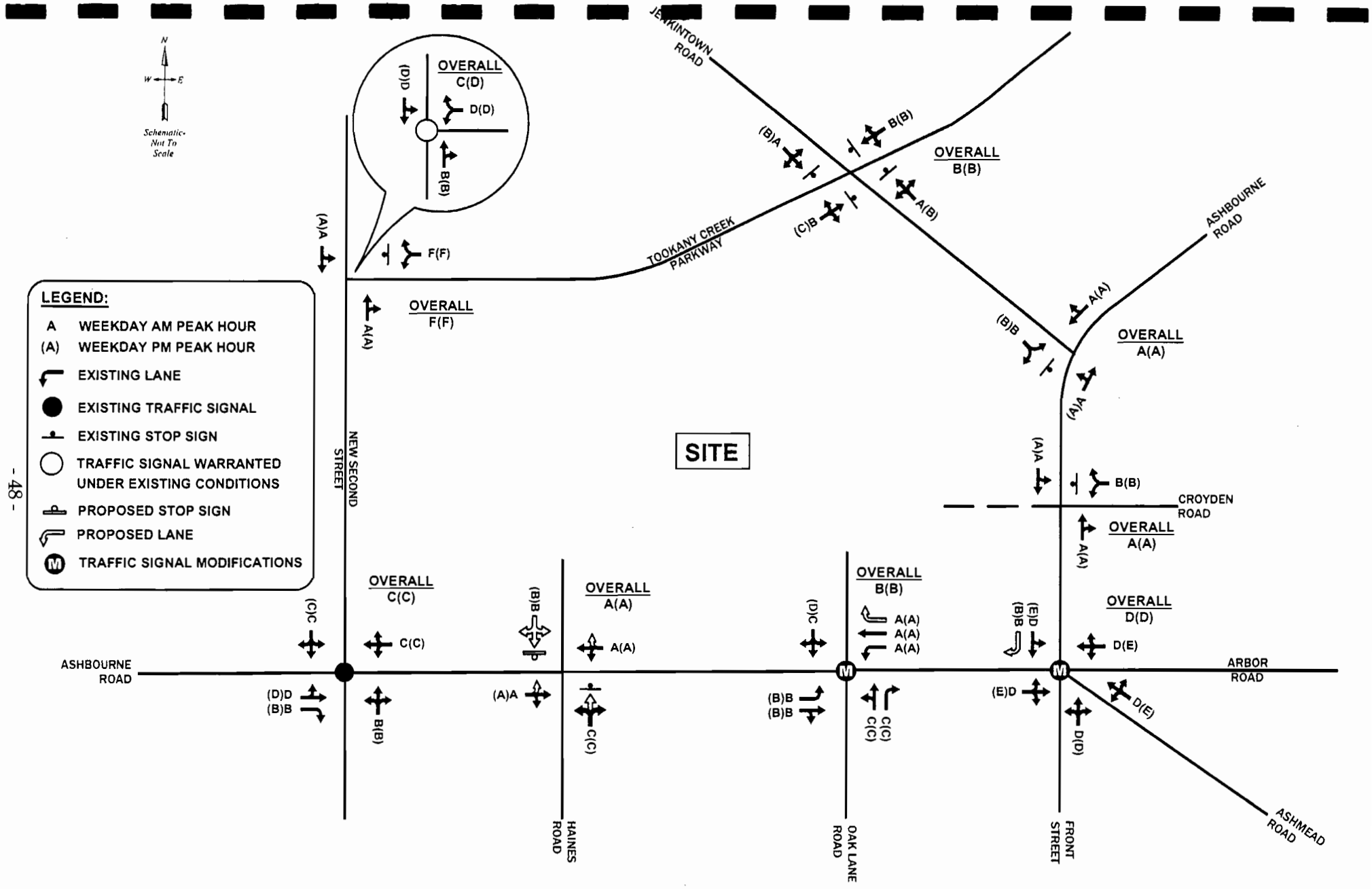


FIGURE 21

2015 Future Levels of Service Without Development

ASHBOURNE COUNTRY CLUB - Carriage Home Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(9/24/09-LBK) i:\Eng\809015\Dwg\Figures\09-2009\Figure21.dwg

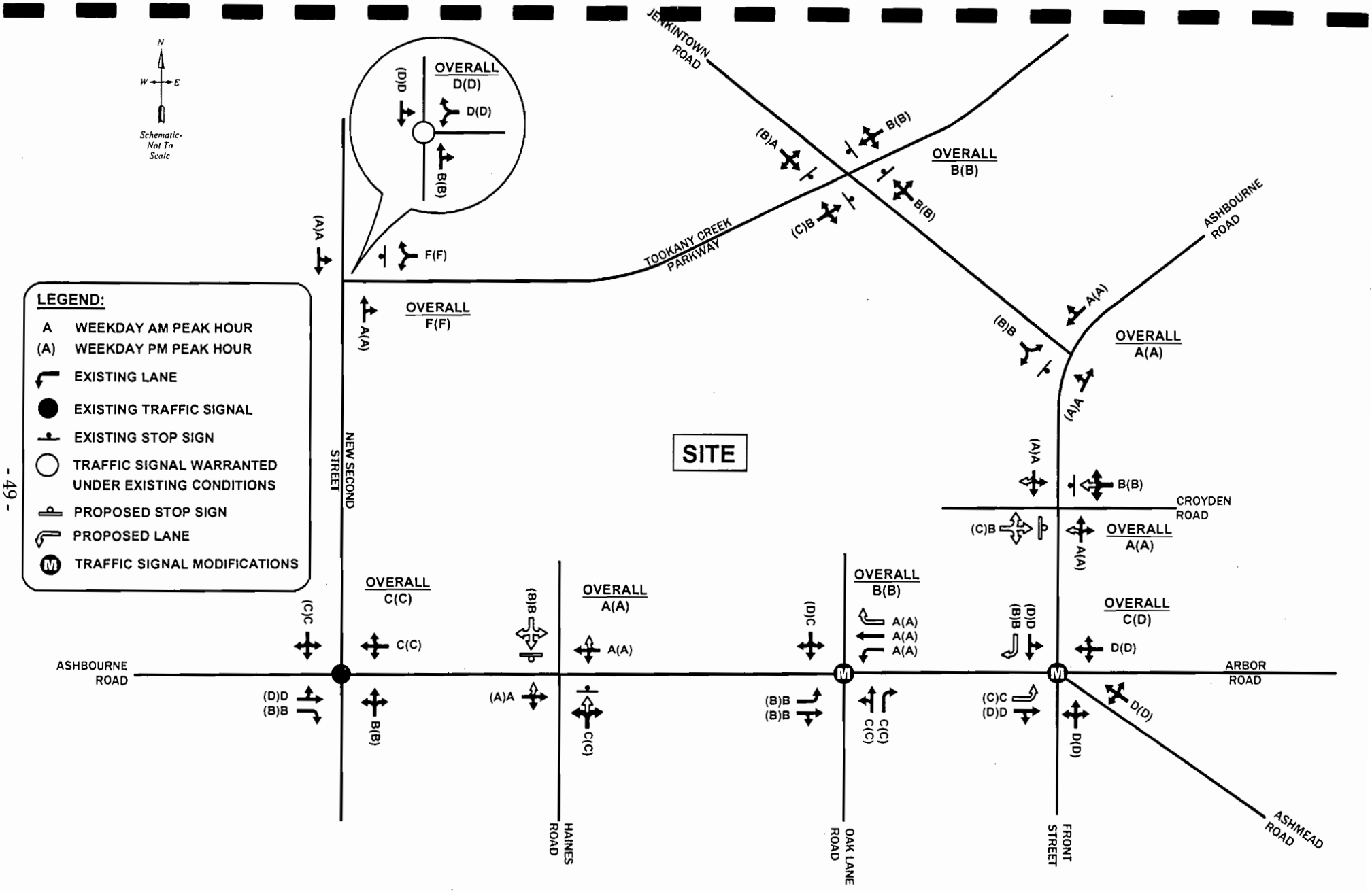


FIGURE 22

2015 Future Levels of Service with Development

ASHBOURNE COUNTRY CLUB - Carriage Home Community

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(9/24/09-LBK) i:\Eng\809015\Dwg\Figures\09-2009\Figure22.dwg

Ashbourne Road (S.R. 2025) and Front Street/Ashmead Road/Arbor Road

Under 2015 future without-development conditions with optimization of the traffic signal timings and the separate southbound right-turn lane along Ashbourne Road (S.R. 2025), this intersection will operate at overall LOS D during both the weekday morning and weekday afternoon peak hours; however, some movements will operate with delay (LOS E) during the weekday afternoon peak hour.

With development of the site, the installation of an eastbound left-turn lane along Ashbourne Road (S.R. 2025) is recommended along with traffic signal timing modifications to mitigate the impact of the development. With these improvements, the intersection will operate at overall LOS D or better during the weekday morning and weekday afternoon peak hours, with all movements operating at acceptable LOS D or better during both peak hours.

Ashbourne Road (S.R. 2025) and Croyden Road/Site Access

Under 2015 future conditions without-development, this intersection will operate at LOS B or better for all movements during the weekday morning and weekday afternoon peak hours. With development of the carriage homes, which will have access opposite Croyden Road, this intersection will operate at LOS C or better for all movements during the weekday morning and weekday afternoon peak hours.

Ashbourne Road (S.R. 2025) and Jenkintown Road

Under 2015 future without- and with-development conditions, this intersection operates at LOS B or better for all movements during the weekday morning and weekday afternoon peak hours. Therefore, no improvements are recommended.

Jenkintown Road and Tookany Creek Parkway

Under 2015 future without- and with-development conditions, this all-way stop-controlled intersection operates at LOS B overall with all movements also operating at LOS B or better conditions during the weekday morning and weekday afternoon peak hours. Therefore, no improvements are recommended.

New Second Street (S.R. 2060) and Tookany Creek Parkway

Under 2015 future without- and with-development conditions, this intersection operates with delay (LOS F) on the minor street approach during the weekday morning and weekday afternoon peak hours. A comparison of the overall increase in delay at the intersection from without- to

with-development conditions shows that the increase in delay is less than 10 seconds per vehicle, which is permitted under PennDOT's current policy prior to requiring mitigation measures. With the development of the carriage homes, traffic is expected to increase at this intersection by less than 0.20 percent during both peak hours, which is less than three vehicles per hour, i.e., one additional vehicle every twenty minutes.

As documented in the first section of this study, the installation of a traffic signal is warranted based on the peak hour and four-hour warrants for the 2002 traffic volumes, but only for the 2009 peak hour traffic volumes, since there has been a reduction in area traffic volumes as a result of the recession. With signalization, this intersection would operate at overall LOS D or better during the weekday morning and weekday afternoon peak hours, with all movements operating at LOS D or better during both peak hours during 2015 future without- and with-development conditions.

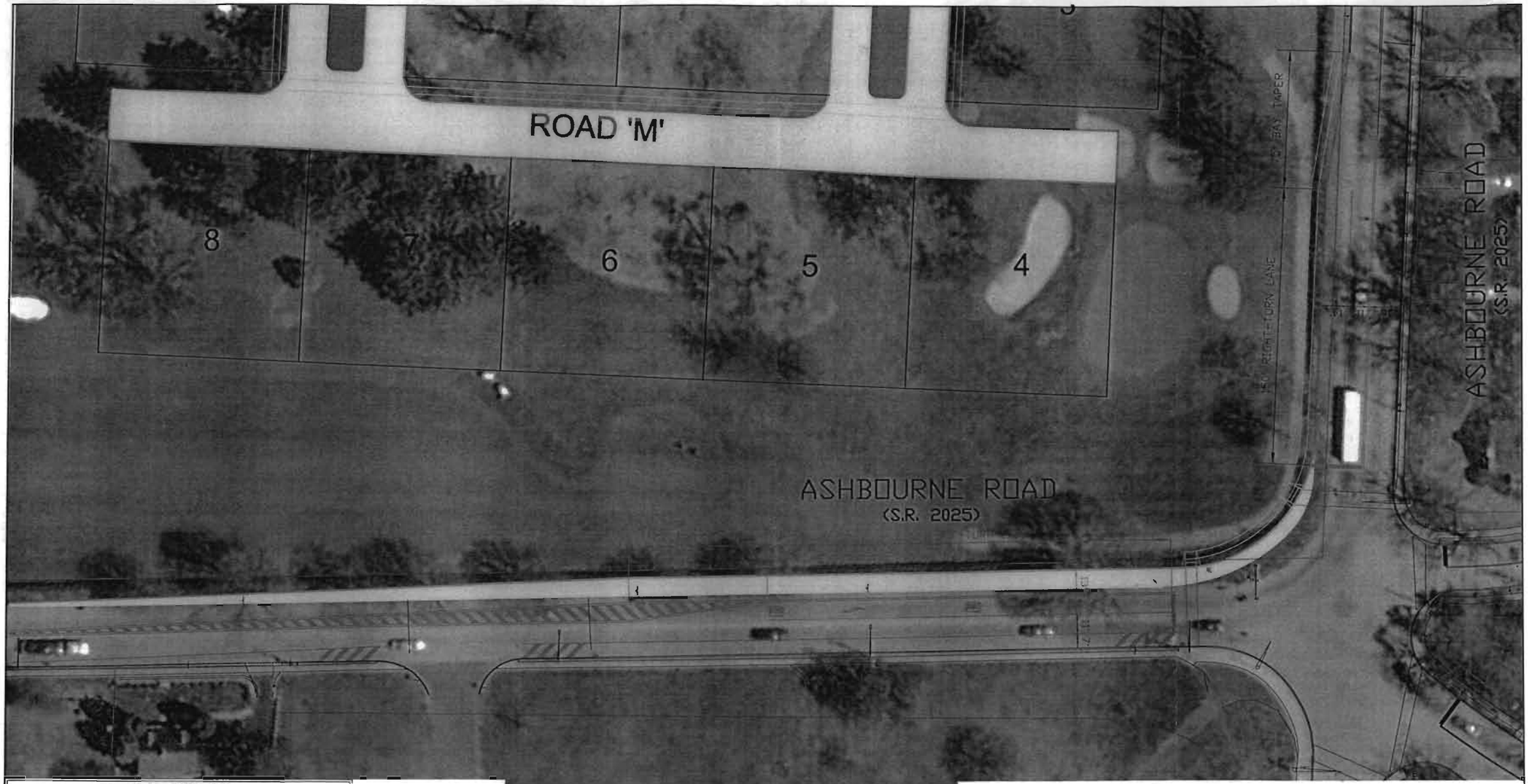
Conclusions and Recommendations

In conjunction with the redevelopment of the Ashbourne Country Club that will result in 246 age-restricted homes and 96 carriage homes, the following roadway/intersection improvements are proposed by the developer, which will mitigate the traffic impacts and provide safe and efficient flow in the area:

- **Ashbourne Road (S.R. 2025)/Front Street/Ashmead Road/Arbor Road** – Construct a separate eastbound left-turn lane along Ashbourne Road, 220 feet in length with a 75-foot bay taper, and modify the existing traffic signal timings. An illustration of this improvement is provided in **Concept Plan #4**.

- **Ashbourne Road (S.R. 2025) and Croyden Road/Site Access** – Provide one 14-foot-wide egress lane and one 14-foot-wide ingress lane, with stop control provided along the access approach, and the travel lanes separated by a 4-foot wide median. An illustration of this access configuration is provided in **Concept Plan #5**.

The traffic analysis, which is described in further detail herein, reveals that safe and efficient access can be provided for the proposed project with development of both the age-restricted and carriage homes and that the recommended improvements will mitigate the development's impact.



LEGEND

- EXISTING FEATURES
- PROPOSED PAVEMENT MARKINGS
- LEGAL RIGHT-OF-WAY
- ULTIMATE RIGHT-OF-WAY
- NEW PAVEMENT/CURBING AREA
- LANDSCAPED AREAS

SCALE

25' 0 25' 50'

DATE	DESCRIPTION	NO.
	REVISIONS	

PRELIMINARY CONCEPT #4

McMAHON

INTERSECTION IMPROVEMENTS
ASHBOURNE ROAD (S.R. 2025) AND
FRONT STREET/ASHMEAD ROAD/ARBOR ROAD

CHELTENHAM TOWNSHIP MONTGOMERY COUNTY

DRWN. BY SAK
CHKD. BY SAK
APPRD. BY SAK

DATE OF PLAN
NOVEMBER 1, 2009

SCALE 1" = 25'
JOB # 000013.11
DWG # 4 OF 5

LEGEND

- EXISTING FEATURES
- PROPOSED PAVEMENT MARKINGS
- LEGAL RIGHT-OF-WAY
- ULTIMATE RIGHT-OF-WAY
- NEW PAVEMENT/CURBING AREA
- LANDSCAPED AREAS

SCALE

25' 0 25 50'

DATE	DESCRIPTION	NO.
	REVISIONS	

PRELIMINARY CONCEPT #5

McMAHON

INTERSECTION IMPROVEMENTS
ASHBOURNE ROAD (S.R. 2025) AND
ACCESS OPPOSITE CROYDEN ROAD

CHELTENHAM TOWNSHIP MONTGOMERY COUNTY

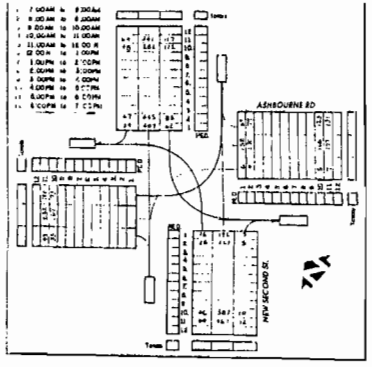
DRWN BY SAK
CHKD BY SAK
APPRD BY SAK

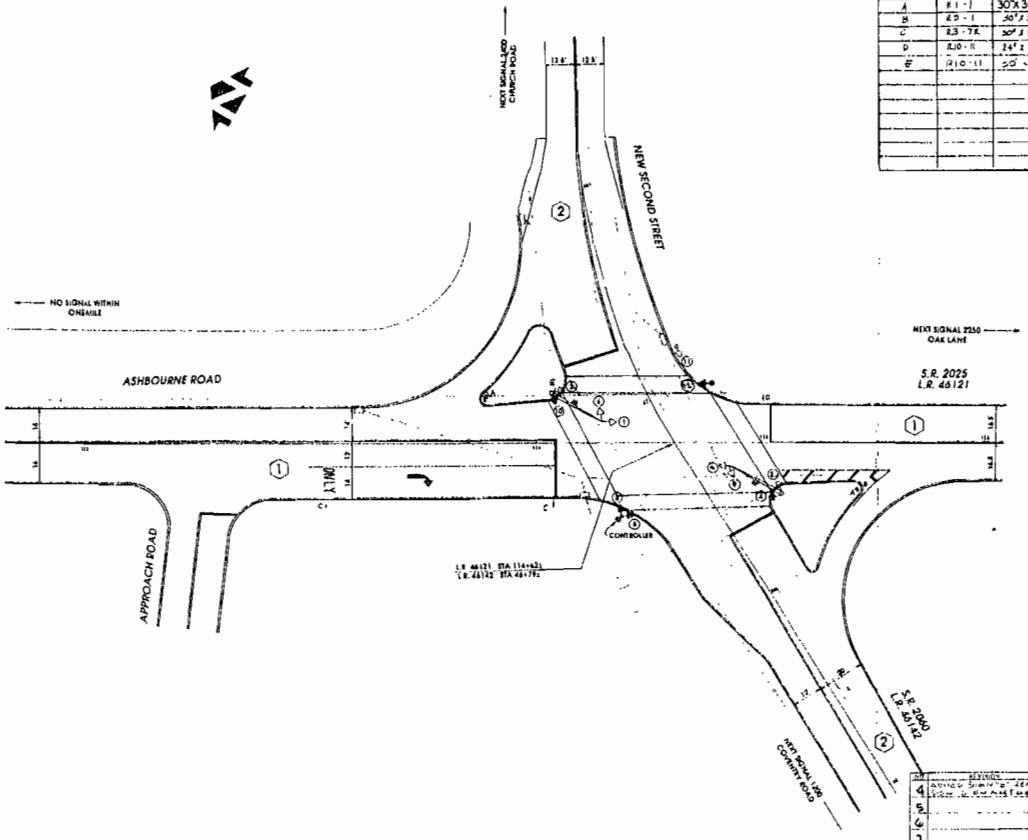
DATE OF PLAN
SEPTEMBER 1,2009

SCALE: 1" = 25'
JOB # 400015.H
DWG # 5 OF 5

APPENDIX A

Study Area Intersection Sketches and Photographs





SIGN TABULATION

PLAN SYMBOL	SERIES NUMBER	SIZE	REMARKS
A	R1-1	30"x30"	STOP SIGN
B	R3-1	30"x30"	DO NOT ENTER
C	R3-7R	30"x30"	RIGHT LANE MUST TURN RIGHT
D	R10-11	24"x30"	NO TURN ON RED
E	R10-11	30"x36"	NO TURN ON RED

MOVEMENT, SEQUENCE, AND TIMING DIAGRAM

PHASE	1			2									CONCURRENT FLASH
INTERVAL / SIGNALS	1	2	3	4	5	6							
1, 3, 4, 5	G	Y	R	R	R	R							Y
6, 7, 8	R	R	R	G	Y	R							R
9, 10, 11	R	R	R	G	Y	R							R
2, 12	G	Y	R	R	R	R							F

FIXED TIME	22	3	4		23	3	2						
PERCENT	24	3	3		30	5	3						
DIAL PATTERN		7A	7P			7A	7P						

SIGNAL INDICATIONS

12" LENS — 1, 3, 4, 5; 9, 10

8" LENS — 2, 7, 11, 12

LEGEND

- 22' Mast Arm with Identifying Length
- Loop Detector Presence & Directional
- Sign with Identifying Letter
- Pedestrian Pushbutton
- Signal Head with Identifying Number
- Signal Head with Arrow Section & Identifying Number
- PHASE INDICATION

25' 0 25' SCALE IN FEET

	REVISIONS	DRN	CHK	DATE	CHK	DATE	CHK	DATE
4	ADDED SIGN "E" REMOVED SIGN "D" ON MAST ARM							
5								
6								
7								
8								
9								
10								
11								

DATE ISSUED 6/18/80 DATE REVISED

GENERAL NOTES

NO MODIFICATIONS OF THIS INSTALLATION ARE PERMITTED UNLESS PRIOR APPROVAL IS GRANTED IN WRITING BY A REPRESENTATIVE OF THE DEPARTMENT OF TRANSPORTATION.

ALL MAINTENANCE WORK INCLUDING TRIMMING OF TREES, NECESSARY FOR PROPER VISIBILITY OF THE SIGNALS IS THE RESPONSIBILITY OF THE PERMITTEE.

ALL SIGNS AND PAVEMENT MARKINGS INDICATED ON THIS DRAWING ARE CONSIDERED PART OF THE PERMIT AND SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH PUBLICATION N° 68.

POST MOUNTED SIGNALS SHALL BE INSTALLED WITH THE SIGNAL HEADS A MINIMUM OF 2 FEET BEHIND THE FACE OF CURB OR THE EDGE OF THE SHOULDER. SUPPORT POLES FOR OVERHEAD SIGNALS SHALL ALSO HAVE A MINIMUM CLEARANCE HORIZONTALLY OF 2 FEET.

SIGNALS ERECTED OVER THE ROADWAY SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 16 FT ABOVE THE ROADWAY. POST MOUNTED SIGNALS SHALL BE A MINIMUM OF 8 FT. ABOVE THE SIDEWALK OR PAVEMENT GRADE.

ALL OVERHEAD SIGNALS MUST BE RIGIDLY MOUNTED, TOP AND BOTTOM, AND EQUIPPED WITH BACKPLATES.

THE MINIMUM HORIZONTAL DISTANCE BETWEEN SIGNALS MEASURED AT RIGHT ANGLES TO THE APPROACH SHALL BE 8 FEET.

EXACT LOCATION OF DETECTORS SHALL BE DETERMINED PRIOR TO INSTALLATION BY A REPRESENTATIVE OF PENNDOT.

CURBING TO BE INSTALLED BY MUNICIPALITY AND WHERE NOTED, SHALL BE PLAIN CEMENT CONCRETE CURB OR GRANITE CURB, INSTALLED IN ACCORDANCE WITH DEPARTMENT SPECIFICATIONS FORM 408.

PRIOR TO INSTALLATION THE CONTRACTOR SHALL CONSULT WITH THE LOCAL OFFICIALS AND UTILITY COMPANIES TO RESOLVE ANY PROBLEMS WHICH MAY BE CREATED DUE TO THE LOCATION OF UTILITIES.

IN ADDITION TO THIS SIGNAL PERMIT THE PERMITTEE SHALL OBTAIN A HIGHWAY OCCUPANCY PERMIT PRIOR TO ANY OPENINGS BEING MADE IN OR UNDER ANY PORTION OF A STATE HIGHWAY.

THIS DRAWING CANNOT BE USED AS A CONSTRUCTION DRAWING UNLESS THE PERMITTEE COMPLIES WITH THE PROVISIONS OF ACT 172, PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES, EFFECTIVE DATE DECEMBER 12, 1986.

WHEN LIQUID FUELS MONEY IS USED, SIGNAL INSTALLATION MUST CONFORM TO FORM 408 AND A COPY OF THE PROPOSED SPECIFICATIONS MUST BE SUBMITTED TO THE DISTRICT TRAFFIC UNIT, FOR REVIEW, PRIOR TO BIDDING.

ENGINEERING DISTRICT 8-0

INTERSECTION Ashbourne Road (S.R. 2025) & New Second Street (S.R. 2040)

COUNTY Montgomery MUNICIPALITY Conshohocken

Drawn by Pennsylvania Engineering Co. Date 3/4/87

Checked by [illegible] Date [illegible]

Approved by Douglas [illegible] Date 12/16/87
DISTRICT TRAFFIC ENGR

FILE 0350

REVISED [illegible]

REVISED [illegible]

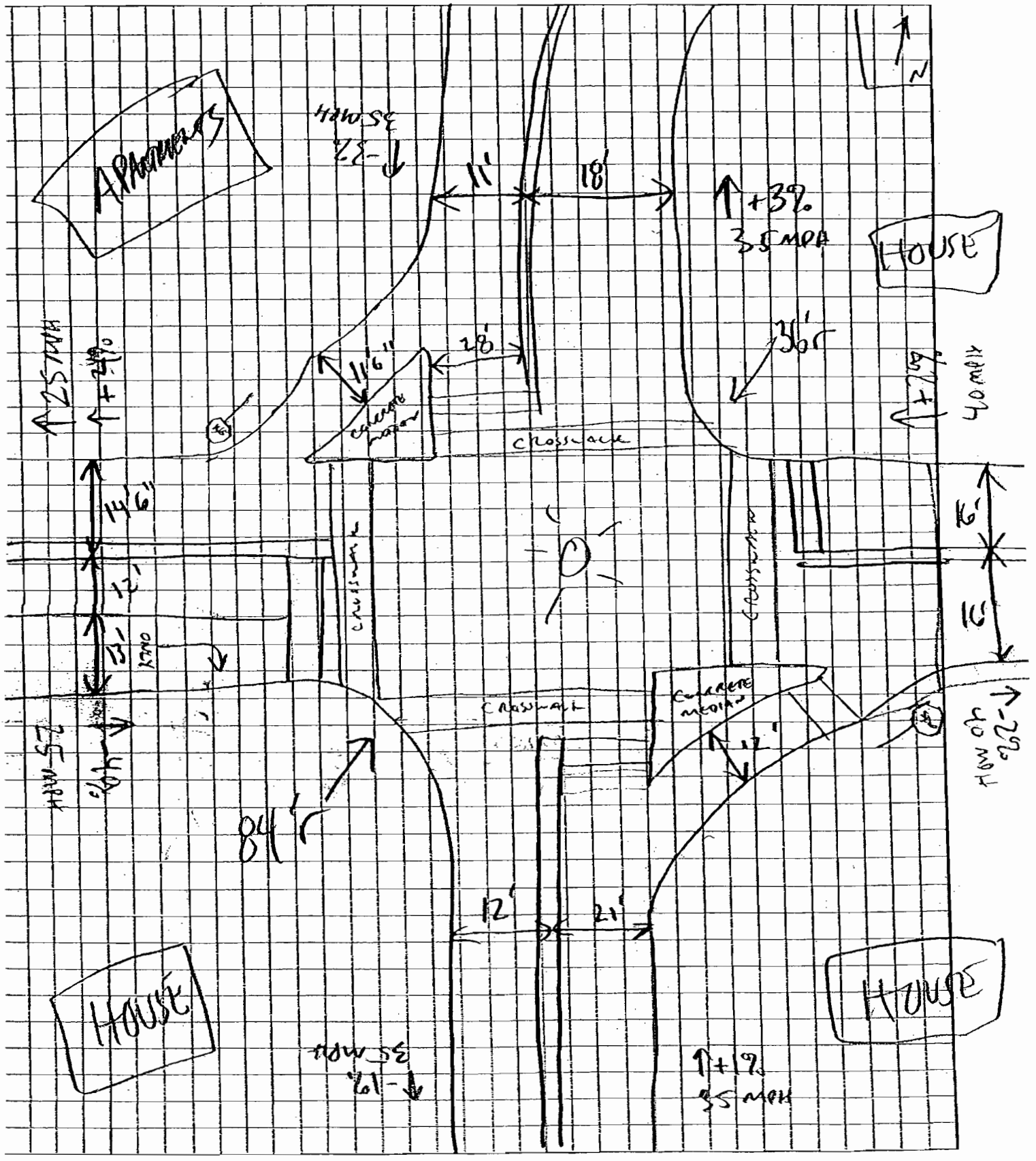
REVISED [illegible]

#0350

McM McMAHON ASSOCIATES, INC.
TRANSPORTATION ENGINEERS & PLANNERS

RESPONSIVE
TRANSPORTATION
SOLUTIONS

	McM Project No. 802454	Sheet	of
scription ASHBORNE RD +	Designed By MDB	Date 12/12/02	
Second St pike	Checked By	Date	



Ashbourne Country Club

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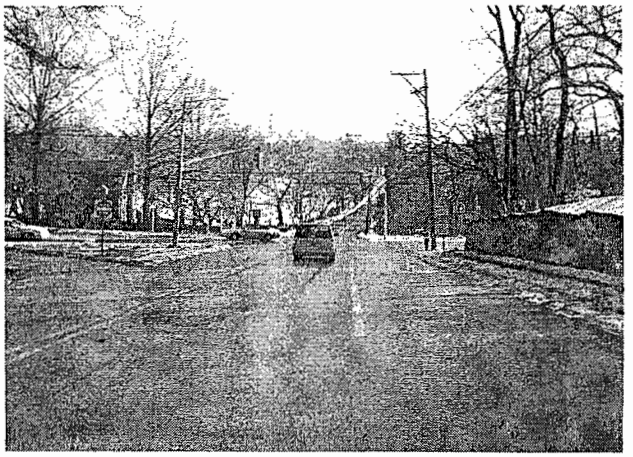
New Second St & Ashbourne Rd - Ashbourne Rd Eastbound Departure



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New Second St & Ashbourne Rd - Ashbourne Road Eastbound Approach

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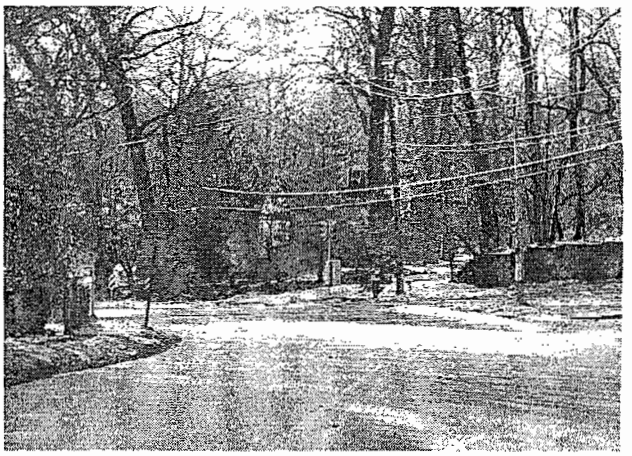
New Second St & Ashbourne Rd - New Second Street Southbound Approach



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New Second St & Ashbourne Rd - New Second Street Southbound Approach

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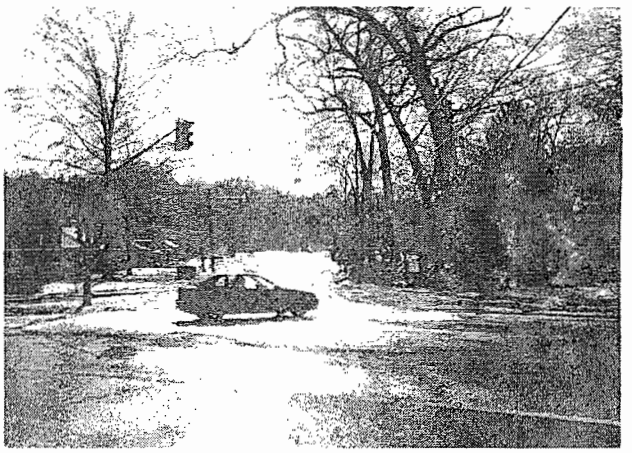
New Second St & Ashbourne Rd - Ashbourne Rd Westbound Approach



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New Second St & Ashbourne Rd - New Second St Southbound Departure

Ashbourne Country Club

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New Second St & Ashbourne Rd - New Second St Northbound Approach

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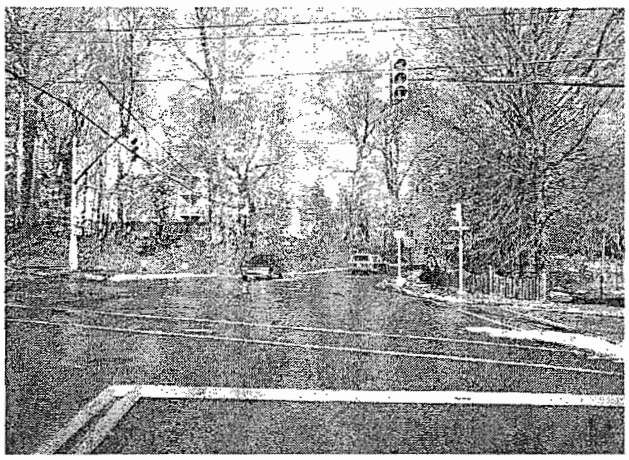
New Second St & Ashbourne Rd - Ashbourne Rd Westbound Departure



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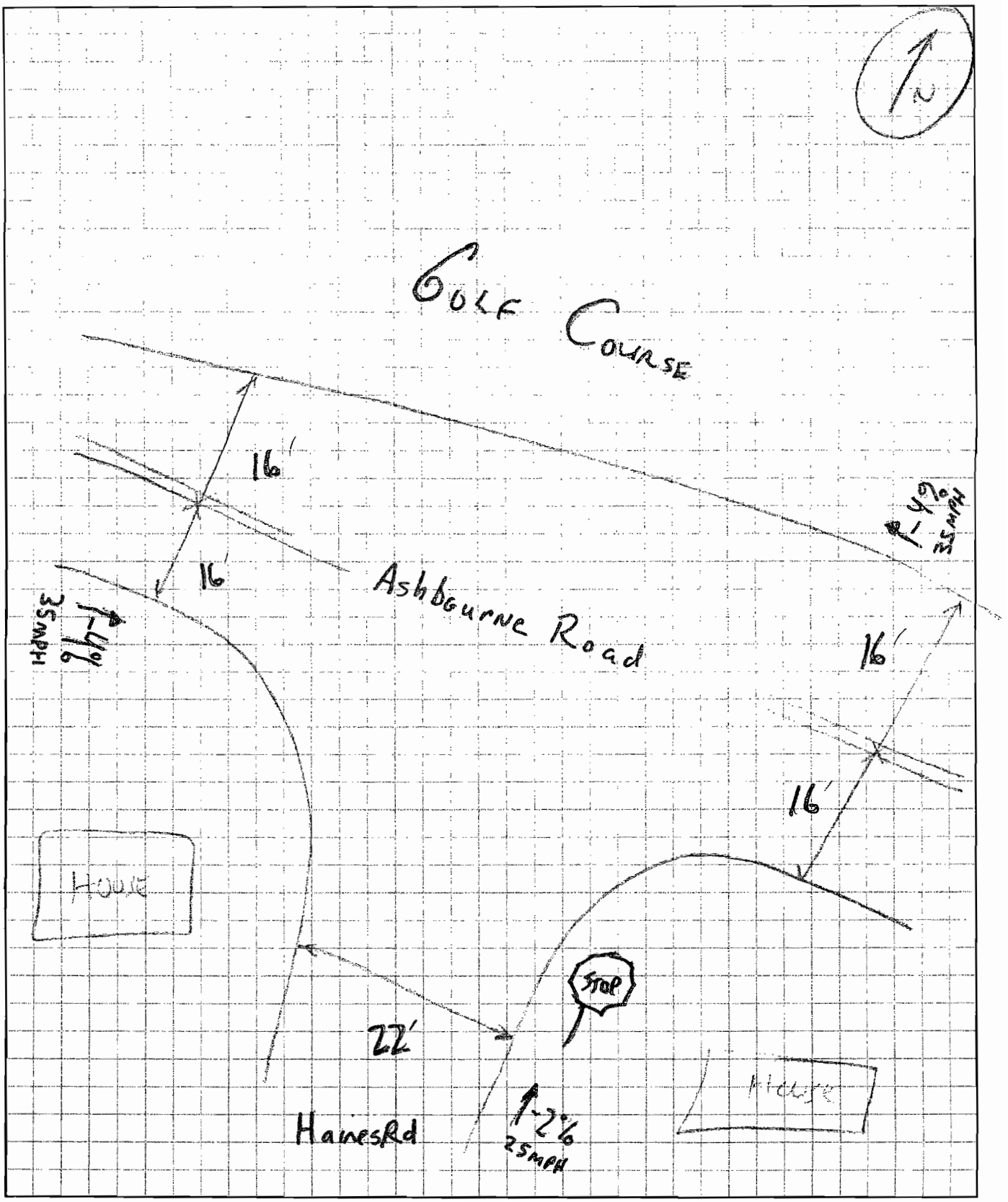
New Second St & Ashbourne Rd - New Second St Northbound Departure

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Job _____ McMahon Project No. _____ Sheet _____ of _____

Description Ashburne Rd _____ Designed By _____ Date _____

Haines Rd _____ Checked By _____ Date _____



I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3095.JPG
Figure 21: Ashbourne-Haines: WB Approach

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Figure 22: Ashbourne-Haines: WB Approach

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Figure 23: Ashbourne-Haines: Looking south on Haines Road

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Figure 24: Ashbourne-Haines: WB Departure

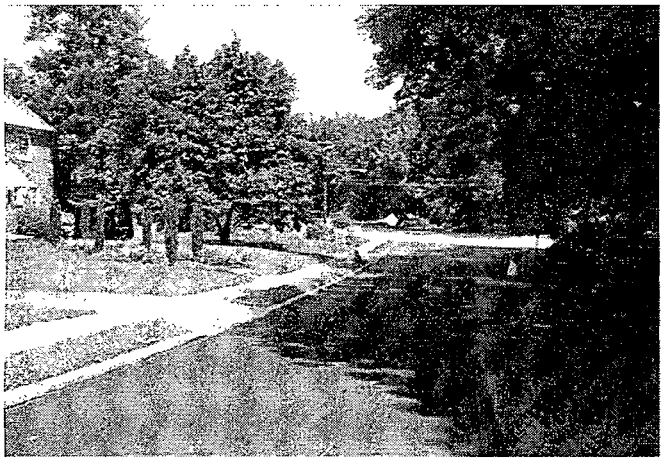

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Figure 25: Ashbourne-Haines: NB Approach

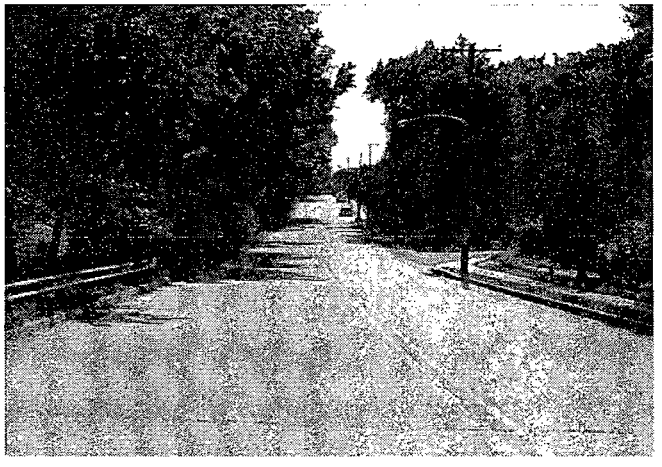

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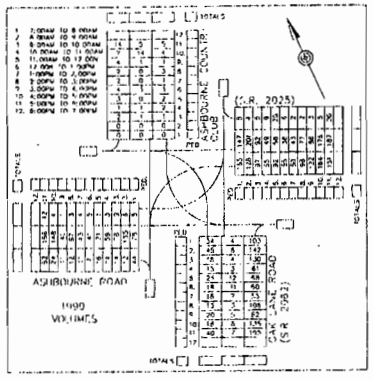
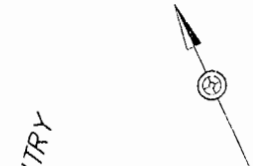
Figure 26: Ashbourne-Haines: EB Approach

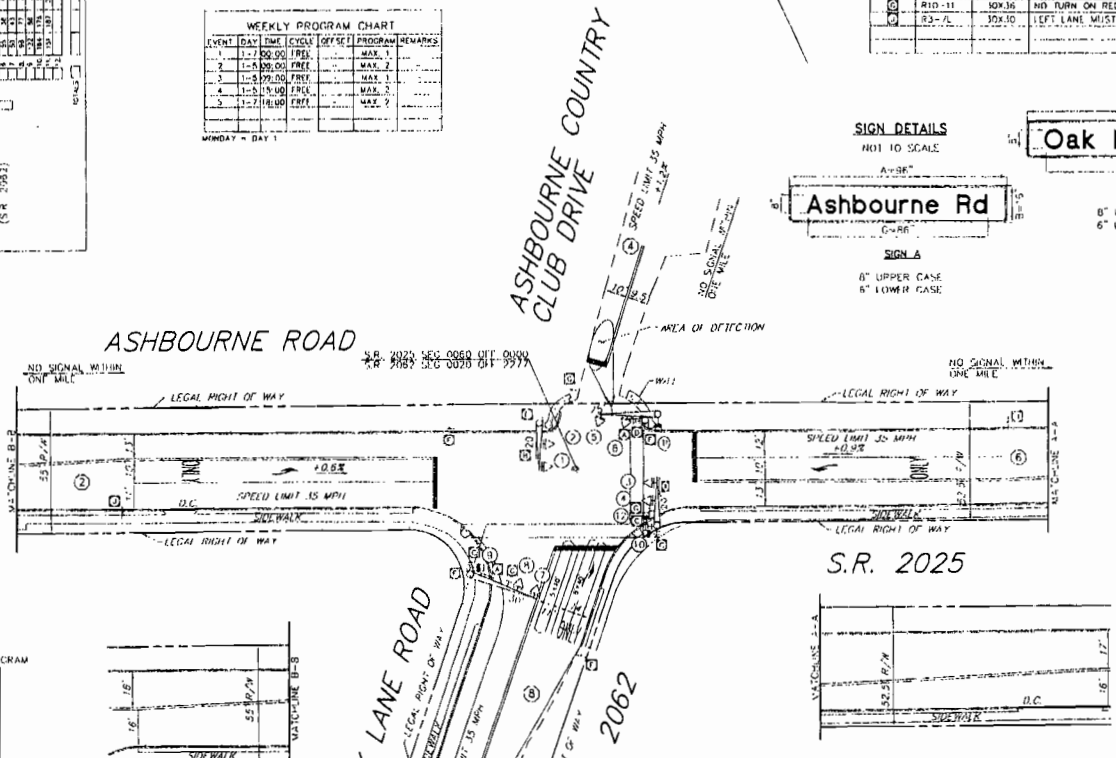


WEEKLY PROGRAM CHART						
EVENT	DAY	TIME	CYCLE	OFFSET	PROGRAM	REMARKS
1	1-7	00:00	FREE		MAX. 1	
2	1-5	09:00	FREE		MAX. 2	
3	1-5	09:00	FREE		MAX. 1	
4	1-5	15:00	FREE		MAX. 2	
5	1-7	18:00	FREE		MAX. 2	

MONDAY = DAY 1

SIGN TABULATION			
PLAN SYMBOL	SERIES NUMBER	SIZE	REMARKS
	D3-4	96X18	OVERHEAD STREET NAME SIGN (SEE DETAIL)
	D3-4	96X18	OVERHEAD STREET NAME SIGN (SEE DETAIL)
	R10-3B(I)	9X12	EDUCATIONAL PUSH BUTTON FOR WALKING PERSON
	R10-3B(P)	9X12	EDUCATIONAL PUSH BUTTON FOR WALKING PERSON
	R3-7R	30X30	RIGHT LANE MUST TURN RIGHT
	R9-1	18X18	NO PEDESTRIAN CROSSING
	R10-11	30X36	NO TURN ON RED
	R3-7L	30X30	LEFT LANE MUST TURN LEFT





SIGN DETAILS

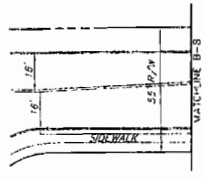
NOT TO SCALE

SIGN A

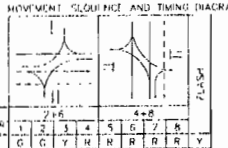
8" UPPER CASE
6" LOWER CASE

SIGN B

8" UPPER CASE
6" LOWER CASE



MOVEMENT SEQUENCE AND TIMING DIAGRAM



PHASE	2+6				4+8				FLASH
SIGNAL INTERVAL	1	2	3	4	5	6	7	8	
1,2,3,4	G	G	Y	R	R	R	R	R	Y
5,6,7,8	R	R	R	R	G	G	Y	R	R
9,10*	M	FD	H	H	H	H	H	H	OFF
11,12*	H	H	H	H	FD	H	H	H	OFF

FIXED			4	2			4	2
MINIMUM	33				3			
PASSAGE					3			
MAX. 1					12			
MAX. 2					20			
PEDESTRIAN	15	17	4	2	8	8	4	2
MEMORY	MN				NL			

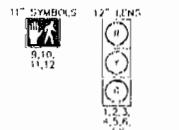
PROGRAM 1	38	4	2	12	4	2	60 SEC.
PROGRAM 2	33	4	2	15	4	2	60 SEC.
PROGRAM 3	35	4	2	13	4	2	60 SEC.

*UPON PEDESTRIAN ACTUATION ONLY.
OTHERWISE HAND SYMBOL AT ALL TIMES

* CONTROLLER TO DWELL IN PHASE 2+6 UNTIL ACTUATED BY PHASE 4+8

* MICROWAVE DETECTION FOR PHASE 4 TO BE IN LOCKING MODE, WITH A 5-SECOND DETECTOR DELAY.

SIGNAL INDICATIONS



SCALE

LEGEND

- MAST ARM/ IDENTIFYING LENGTH
- VEHICULAR SIGNAL HEAD/ BACKPLATE/VISORS/ DIRECTIONAL ARROW/ IDENTIFYING NUMBER
- PEDESTRIAN SIGNAL HEAD/ IDENTIFYING NUMBER
- PEDESTRIAN PUSHBUTTON/ SIGN
- SIGN IDENTIFYING LETTER
- LOOP SENSOR/WIRE
- MICROWAVE PRESENCE DETECTOR
- EMERGENCY PRE-EMPTION FLASHING BEACON
- EMERGENCY PRE-EMPTION DEVICE
- CURB RAMP
- UTILITY POLE
- PHASE NUMBER
- INLET

GENERAL NOTES

NO MODIFICATIONS OF THIS INSTALLATION ARE PERMITTED UNLESS PRIOR APPROVAL IS GRANTED IN WRITING BY A REPRESENTATIVE OF THE DEPARTMENT OF TRANSPORTATION.

ALL MAINTENANCE WORK INCLUDING TRIMMING OF TREES, NECESSARY FOR PROPER VISIBILITY OF THE SIGNALS IS THE RESPONSIBILITY OF THE PERMITTEE.

ALL SIGNS AND PAVEMENT MARKINGS INDICATED ON THIS DRAWING ARE CONSIDERED PART OF THE PERMIT AND SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH PUBLICATION NO. 68.

POST MOUNTED SIGNALS SHALL BE INSTALLED WITH THE SIGNAL HEADS A MINIMUM OF 2 FEET BEHIND THE FACE OF CURB OR THE EDGE OF THE SHOULDER. SUPPORT POLES FOR OVERHEAD SIGNALS SHALL ALSO HAVE A MINIMUM CLEARANCE HORIZONTALLY OF 2 FEET.

SIGNALS ERECTED OVER THE ROADWAY SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 16 FT. ABOVE THE ROADWAY. POST MOUNTED SIGNALS SHALL BE A MINIMUM OF 8 FT. ABOVE THE SIDEWALK OR PAVEMENT.

ALL OVERHEAD SIGNALS MUST BE RIGIDLY MOUNTED, TOP AND BOTTOM, AND EQUIPPED WITH BACKPLATES.

THE MINIMUM HORIZONTAL DISTANCE BETWEEN SIGNALS MEASURED AT RIGHT ANGLES TO THE APPROACH SHALL BE 8 FEET.

EXACT LOCATION OF DETECTORS SHALL BE DETERMINED PRIOR TO INSTALLATION BY A REPRESENTATIVE OF PENNDOT.

CURBING TO BE INSTALLED BY MUNICIPALITY AND WHERE NOTED, SHALL BE PLAIN CEMENT CONCRETE CURB OR GRANITE CURB, INSTALLED IN ACCORDANCE WITH DEPARTMENT SPECIFICATIONS FORM 408.

PRIOR TO INSTALLATION THE CONTRACTOR SHALL CONSULT WITH THE LOCAL OFFICIALS AND UTILITY COMPANIES TO RESOLVE ANY PROBLEMS WHICH MAY BE CREATED DUE TO THE LOCATION OF UTILITIES.

THIS DRAWING CANNOT BE USED AS A CONSTRUCTION DRAWING UNLESS THE PERMITTEE COMPLIES WITH THE PROVISIONS OF ACT 187, PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES, EFFECTIVE DATE DECEMBER 19, 1986.

WHEN LIQUID FUELS MONEY IS USED, SIGNAL INSTALLATION MUST CONFORM TO FORM 408 AND A COPY OF THE PROPOSED SPECIFICATIONS MUST BE SUBMITTED TO THE DISTRICT TRAFFIC UNIT, FOR REVIEW, PRIOR TO BIDDING.

PERMITTEE SHALL OBTAIN A HIGHWAY OCCUPANCY PERMIT FOR ANY CHANGES IN INTERSECTION GEOMETRY REGARDING EXCAVATION.

CONDUIT INSTALLED IN BITUMINOUS ROADWAY LESS THAN 5 YEARS OLD, OR CONCRETE ROADWAY REGARDLESS OF AGE, MUST BE BORED OR JACKED UNDER THE ROADWAY. INSTALL IN ACCORDANCE WITH TRAFFIC SIGNAL STANDARDS TC 7800 SERIES.

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY
MUNICIPALITY: CHELTENHAM TOWNSHIP
INTERSECTION: ASHBOURNE ROAD (S.R. 2025) AND OAK LANE ROAD (S.R. 2062)/ASHBOURNE COUNTRY CLUB DRIVE

REVIEWED:
DISTRICT TRAFFIC ENGINEER — DATE

RECOMMENDED:
MARK L. KRAY — 3-19-91
DOUGLAS MAY — 3-19-91
DISTRICT TRAFFIC ENGINEER — DATE

NO.	REVISION	DRAWN	DATE	REVIEW	DATE	APPROVE	DATE
1	NEW DRAWING	MCM	8/30/93	ALC	10/8/93	JRS	10/14/93
2							
3							
4							
5							
6							
7							
8							

SHEET 2 OF 2 | PERMIT # 64-0991 | FILE # 0991

McMAHON ASSOCIATES, INC.
TRANSPORTATION ENGINEERS & PLANNERS

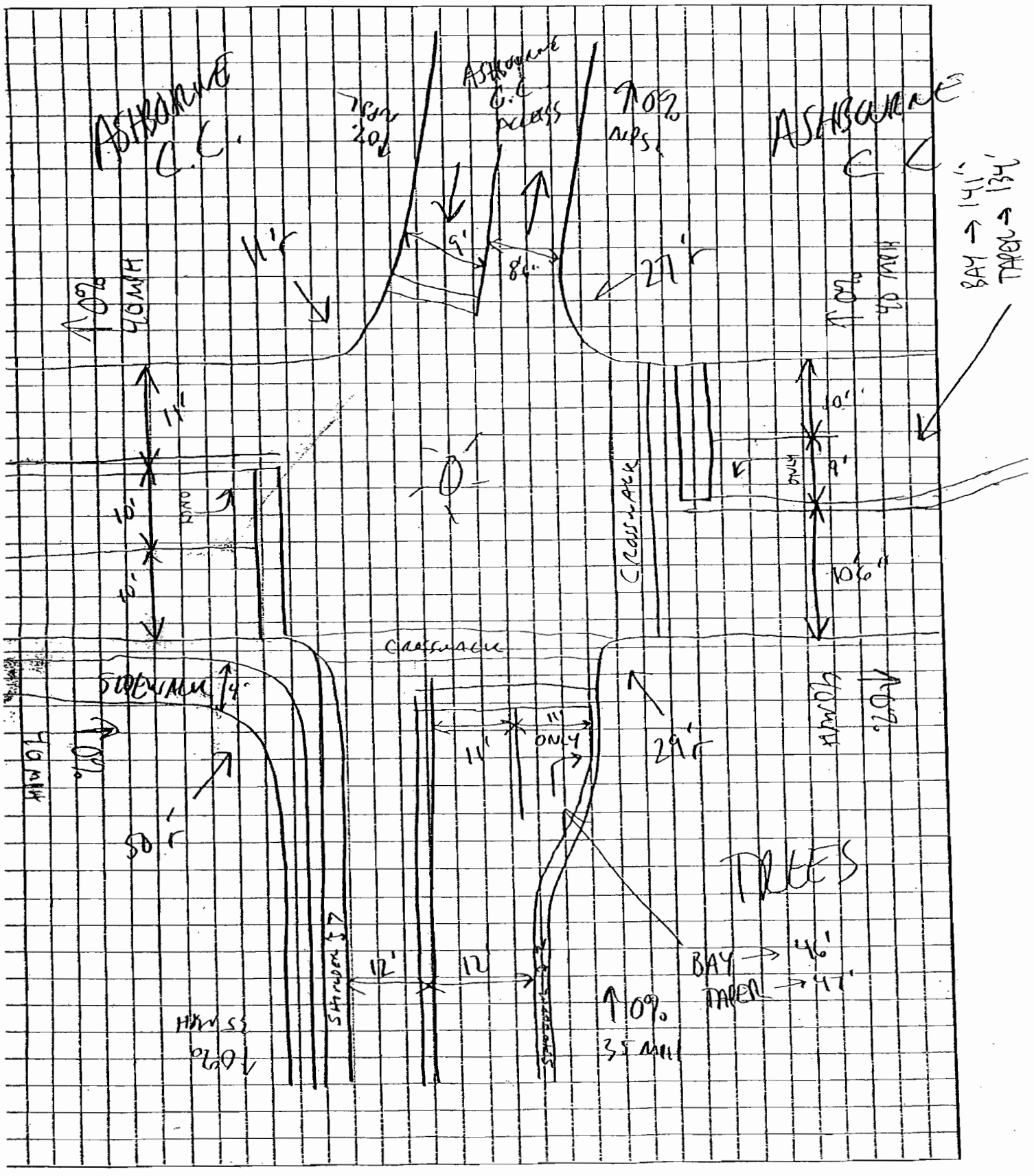
RESPONSIVE
RANSPORTATION
SOLUTIONS

McM Project No. 802454 Sheet ____ of ____

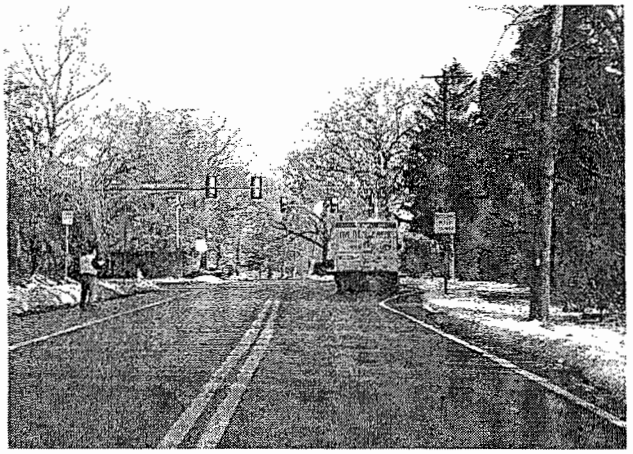
scription ASHBOURNE RD & OAK LAKE RD

Designed By NDB Date 12/12/02

Checked By ____ Date ____



Ashbourne Country Club



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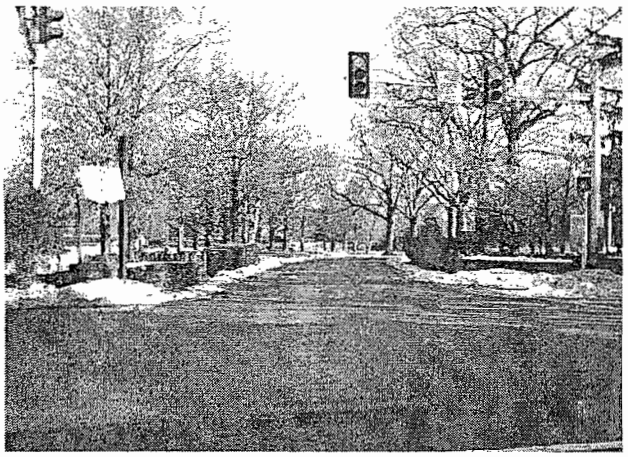
Ashboune Rd & Oak Lane Rd/C.C.- Oak Lane Rd Approach

C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120022.JPG
Ashboune Rd & Oak Lane Rd/C.C.- Oak Lane Rd Approach



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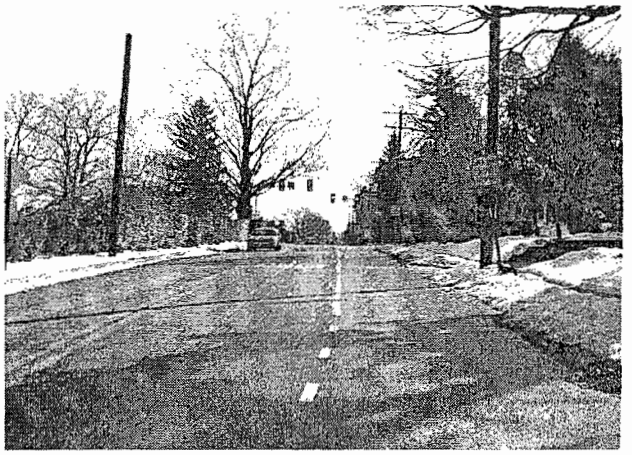
Ashboune Rd & Oak Lane Rd/C.C. - Oak Lane Rd Departure



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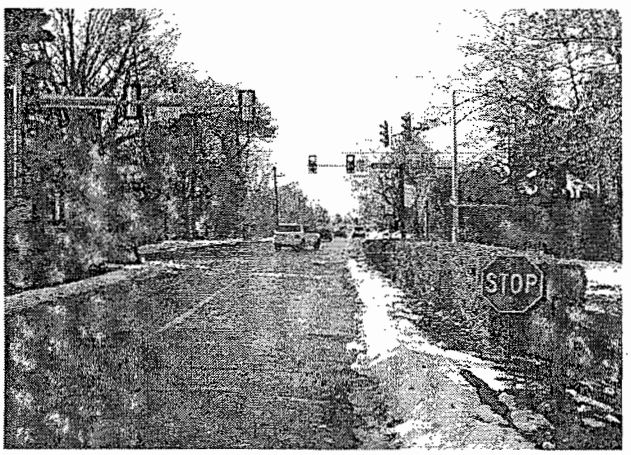
Ashboune Rd & Oak Lane Rd/C.C. - Ashbourne Rd Eastbound Approach



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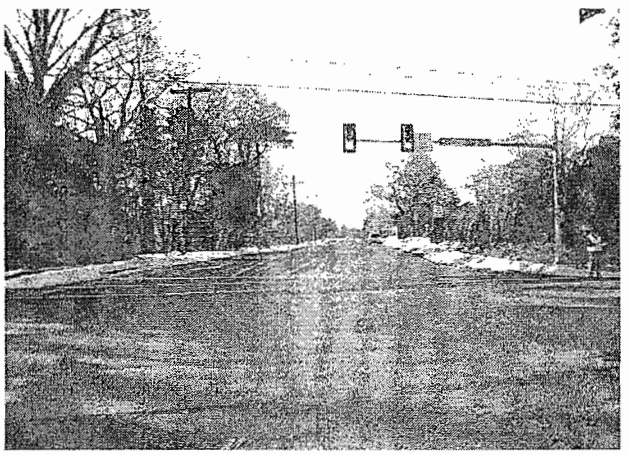
Ashboune Rd & Oak Lane Rd/C.C. - Ashbourne C.C. Approach



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Ashboune Rd & Oak Lane Rd/C.C. - Ashbourne C.C. Departure

Ashbourne Country Club

C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120027.JPG
Ashboune Rd & Oak Lane Rd/C.C. - Ashbourne Rd Westbound Approach

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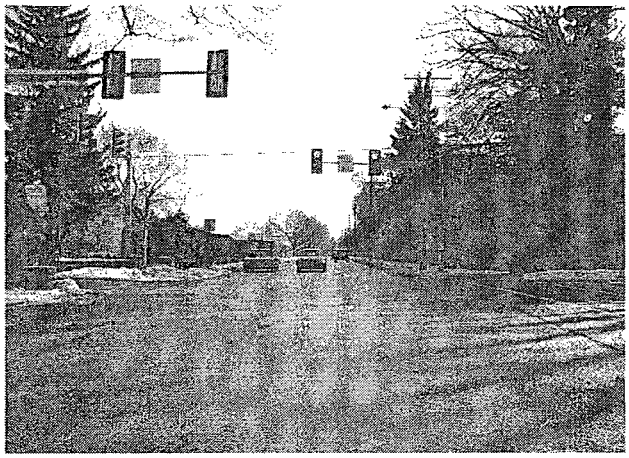
Ashboune Rd & Oak Lane Rd/C.C. - Ashbourne Rd Westbound Departure



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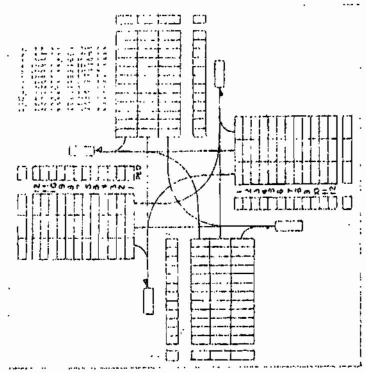
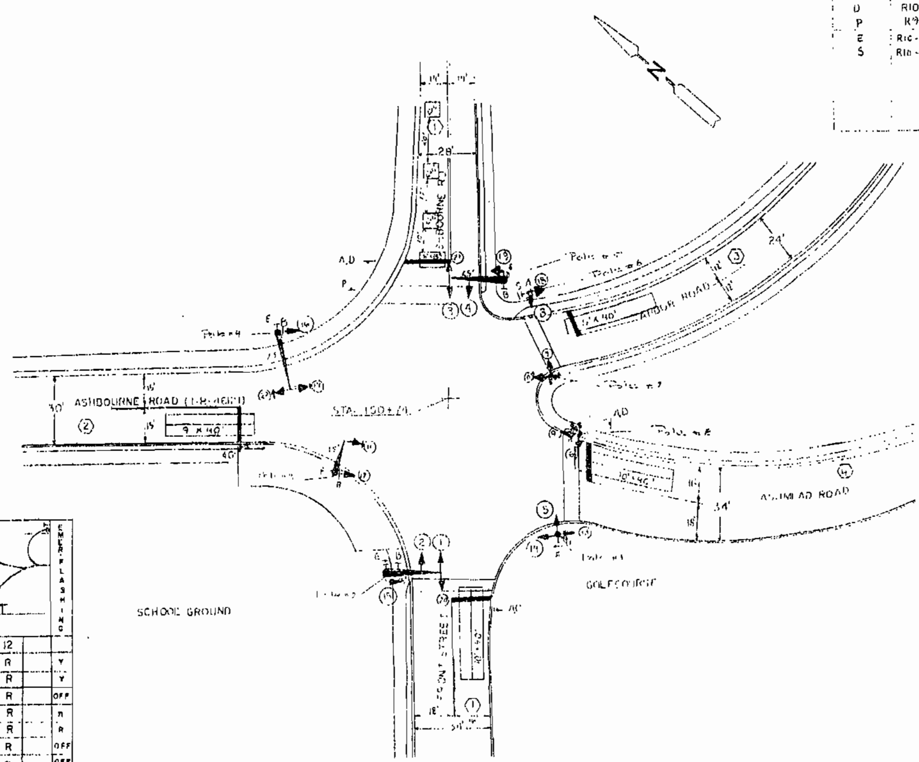
Ashboune Rd & Oak Lane Rd/C.C.- Ashbourne Rd Eastbound Departure





SIGN	[illegible]	SIZE	MESSAGE
A	R10-11	24 X 30	NO TURN ON RED
B	R10-11	30 X 36	NO TURN ON RED
C	R10-6L	24 X 30	STOP HERE ON RED
D	R10-6R	24 X 30	STOP HERE ON RED
P	R9-3	18" X 18"	NO PEDESTRIAN [illegible] KING
E	R10-3	9" X 12"	PUSH BUTTON FOR GREEN LIGHT
S	R10-3	9" X 12"	PUSH BUTTON FOR GREEN LIGHT

PERMIT NO. 4339 | SHEET 2 OF 2
DATE ISSUED 9-19-55 | FILE 726

GENERAL NOTES

NO MODIFICATIONS OF THIS INSTALLATION ARE PERMITTED UNLESS PRIOR APPROVAL IS GRANTED IN WRITING BY A REPRESENTATIVE OF THE DEPARTMENT OF TRANSPORTATION.

ALL MAINTENANCE WORK INCLUDING TRIMMING OF [illegible] NECESSARY FOR PROPER VISIBILITY OF THE [illegible] RESPONSIBILITY OF THE PERMITTEE.

ALL SIGNS AND PAVEMENT MARKINGS INDICATED [illegible] DRAWING ARE CONSIDERED PART OF THE PERMIT AND SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH PUBLICATION NO. [illegible]

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PRIOR TO INSTALLATION THE CONTRACTOR SHALL CONSULT WITH THE LOCAL OFFICIALS AND UTILITY COMPANIES TO RESOLVE ANY PROBLEMS WHICH MAY BE CREATED DUE TO THE LOCATION OF UTILITIES.

IN ADDITION TO THIS SIGNAL PERMIT THE PERMITTEE SHALL OBTAIN A HIGHWAY OCCUPANCY PERMIT PRIOR TO ANY OPENINGS BEING MADE IN OR UNDER ANY PORTION OF A STATE HIGHWAY.

THIS DRAWING CANNOT BE USED AS A CONSTRUCTION DRAWING UNLESS THE PERMITTEE COMPLIES WITH THE PROVISIONS OF ACT 172, PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES, EFFECTIVE DATE DECEMBER 12, 1986.

WHEN LIQUID FUELS MONEY IS USED, SIGNAL INSTALLATION MUST CONFORM TO FORM 408 AND A COPY OF THE PROPOSED SPECIFICATIONS MUST BE SUBMITTED TO THE DISTRICT TRAFFIC UNIT FOR REVIEW, PRIOR TO BIDDING.

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

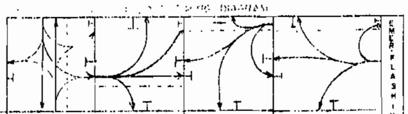
COUNTY: MONTGOMERY
MUNICIPALITY: CHELTENHAM TWP
INTERSECTION: ASHBOURNE RD LR 46121
ASHMEAD RD, FRONT AND ARBOR ROADS

REVIEWED:

MUNICIPAL OFFICIAL	DATE
RECOMMENDED [illegible]	
DISTRICT TRAFFIC ENGINEER	DATE 9-19

Revised [illegible]
Revised 4/89 ADDED MAST ARMS-UPDATING C.A. [illegible]
Revised [illegible]
Revised [illegible]
Revised ADD SPLIT PHASE BLT TURN SIGNAL 1-22-90

SEQUENCE DIAGRAM

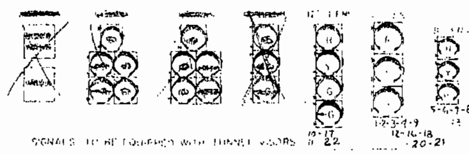


PHASE	1				2				3				4				EMER-FLASHING
	1	2	3		4	5	6		7	8	9		10	11	12		
1-2-3-4	G	Y	R		R	R	R		R	R	R		R	R	R		Y
20-21	G	Y	R		R	R	R		R	R	R		R	R	R		Y
5-6-7-8	G	Y	R		R	R	R		R	R	R		R	R	R		OFF
9	R	R	R		G	Y	R		R	R	R		R	R	R		R
10-22	R	R	R		G/←G	Y	R		R	R	R		R	R	R		R
14-15	R	R	R		G	Y	R		R	R	R		R	R	R		OFF
17	R	R	R		R	R	R		G/←G	Y	R		R	R	R		OFF
18	R	R	R		R	R	R		G	Y	R		R	R	R		OFF
16-18	R	R	R		R	R	R		G	Y	R		R	R	R		OFF
11	R	R	R		R	R	R		P	R	R		G/←G	Y	R		R
12-13	R	R	R		R	R	R		P	R	R		G	Y	R		R

EXTENSION UNIT		4	2			4	2			4	2			4	2
MINIMUM	8				8				8				8		
PASSAGE	5				5				5				5		
MAX I	30				25				12				25		
MAX II	85				40				15				40		
PED TIME △	20				15				12				20		
MEMORY	MR				NL				NL				NL		

MAX II SHOULD OPERATE FROM 6:00-10:00 AM & 3:00-6:00 PM.
MAX I SHOULD OPERATE AT ALL OTHER TIMES
△ UPON PEDESTRIAN ACTUATION ONLY.

SIGNAL INDICATIONS



SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS [illegible] 22
SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS and LOUVERS 11-12-15-16-17 19

SCALE IN FEET 0 [illegible] 25

LEGEND
25' Mast Arm with Identify Length
Loop Detector Presence and Directional
A Sign with Identifying Letter
Pedestrian Pushbutton
Signal Head with Identifying Number
Signal Head with Arrow Sector & Identifying Number
(2) PHASE NUMBER

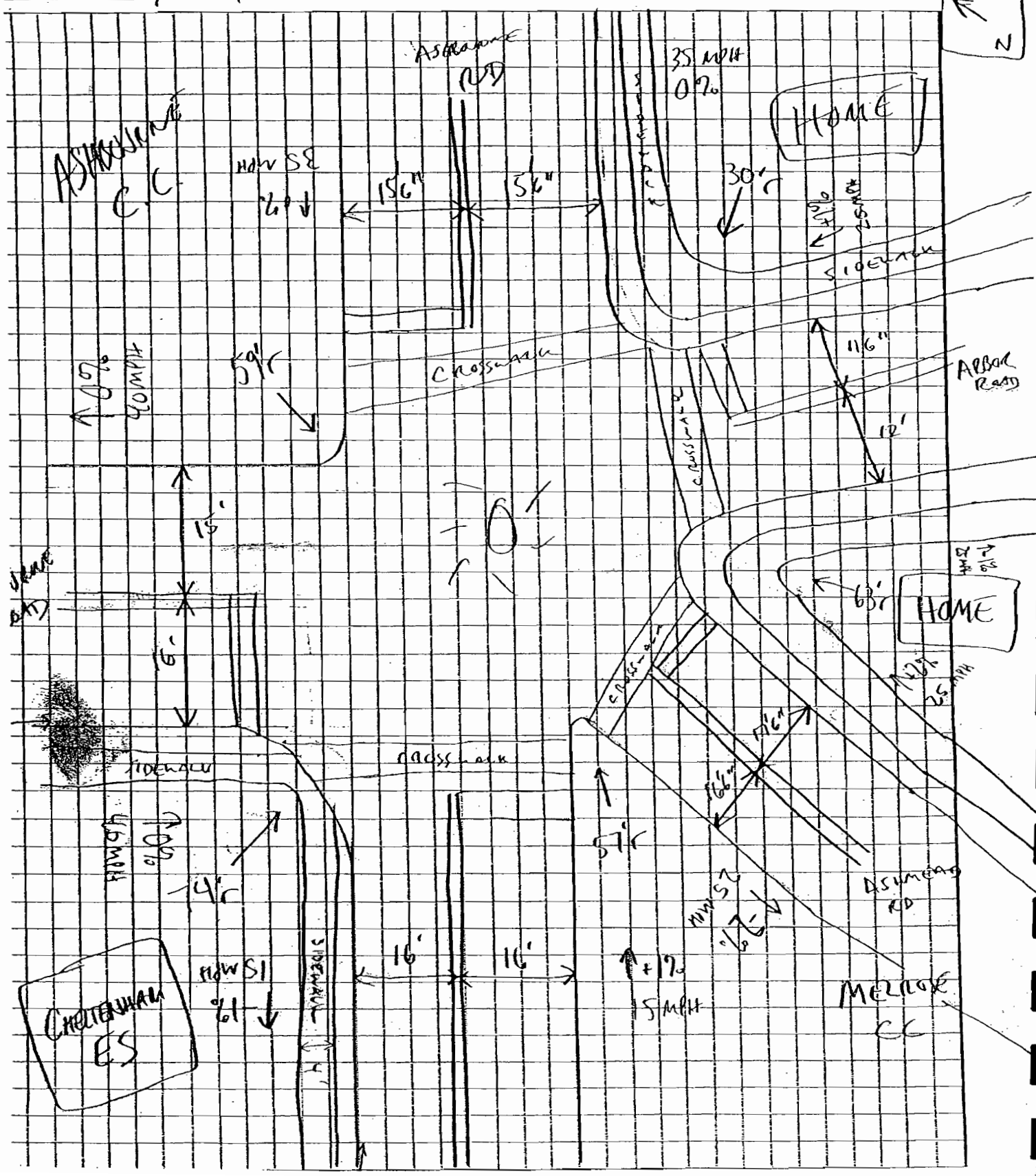
McM McMAHON ASSOCIATES, INC.
TRANSPORTATION ENGINEERS & PLANNERS

RESPONSIVE
TRANSPORTATION
SOLUTIONS

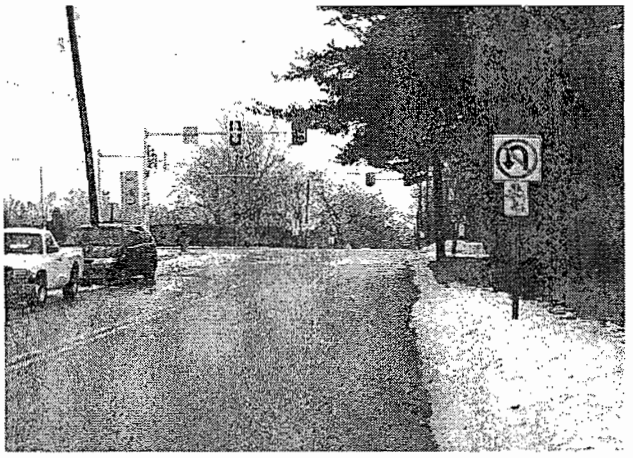
Job _____ McM Project No. 802454 Sheet ____ of ____

Description ASHBOURNE RD Designed By NDB Date 12/12/02

ARBOR ROAD / FRONT ST / MELROSE CC Checked By _____ Date _____



Ashbourne Country Club



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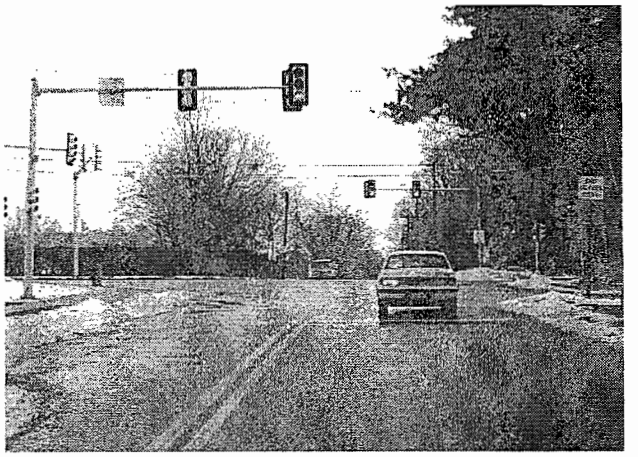
Front/Ashbourne/Ashmead/Arbor/Jenkintown - Front Road NB Approach



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Front/Ashbourne/Ashmead/Arbor/Jenkintown - Front Road Approach

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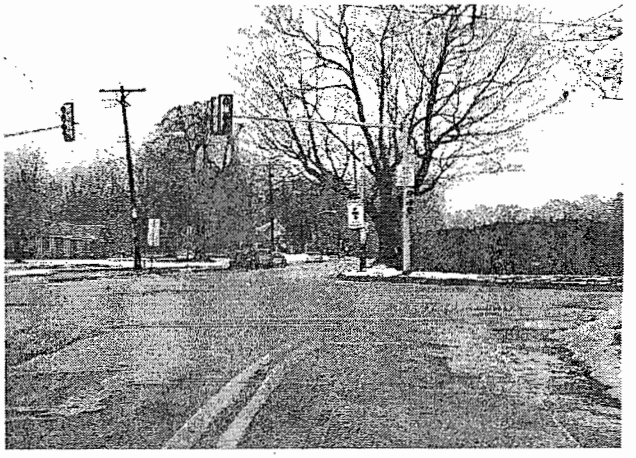
Front/Ashbourne/Ashmead/Arbor/Jenkintown - Ashbourne Approach



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Front/Ashbourne/Ashmead/Arbor/Jenkintown - Arbor Road Approach

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Front/Ashbourne/Ashmead/Arbor/Jenkintown - Jenkintown Road Approach

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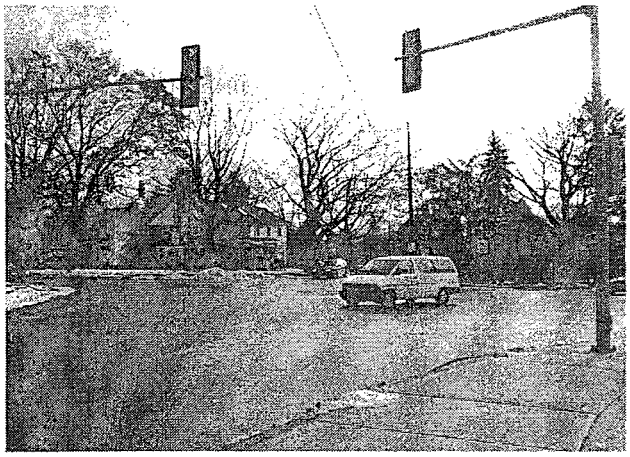
Front/Ashbourne/Ashmead/Arbor/Jenkintown - Ashbourne Rd Approach

Ashbourne Country Club



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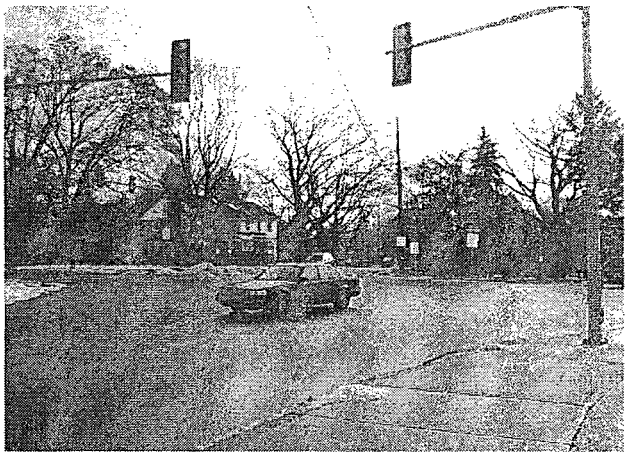
From Ashbourne looking towards Arbor Road



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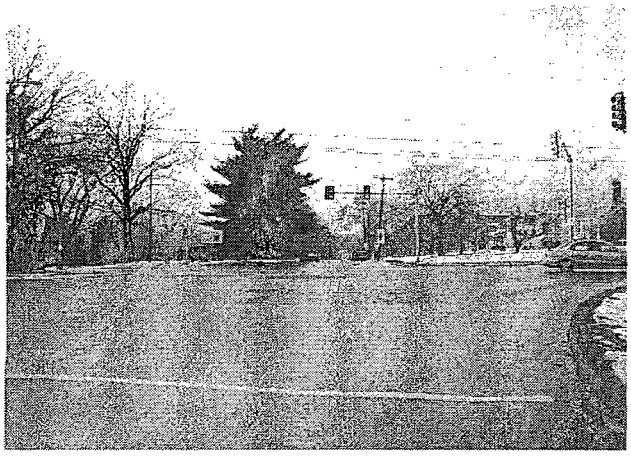
From Ashbourne looking towards Arbor Road



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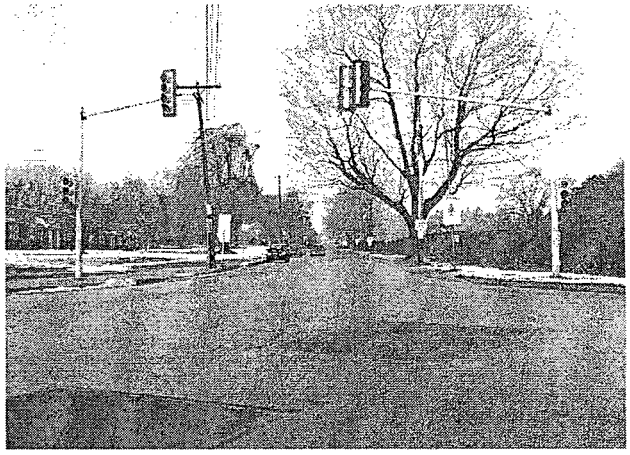
Front/Ashbourne/Ashmead/Arbor/Jenkintown - Jenkintown Rd Departure



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Front/Ashbourne/Ashmead/Arbor/Jenkintown - Arbor Rd Departure

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Front/Ashbourne/Ashmead/Arbor/Jenkintown - Front Rd Departure

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Front/Ashbourne/Ashmead/Arbor/Jenkintown - Ashmead Rd Departure

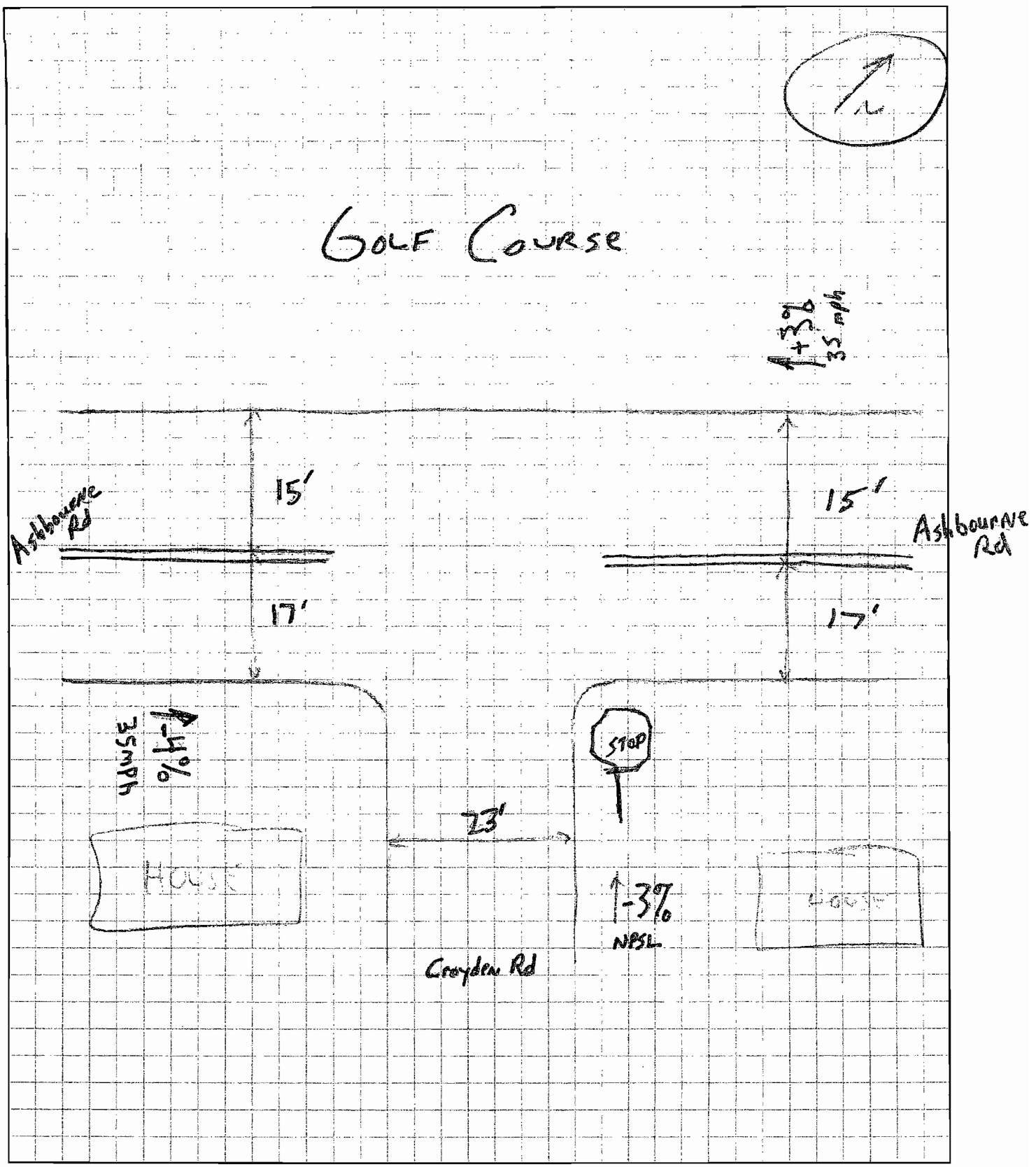
McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Job _____ McMahon Project No. _____ Sheet ____ of ____

Description Ashbourne Rd + Croyden Rd

Designed By _____ Date _____

Checked By _____ Date _____



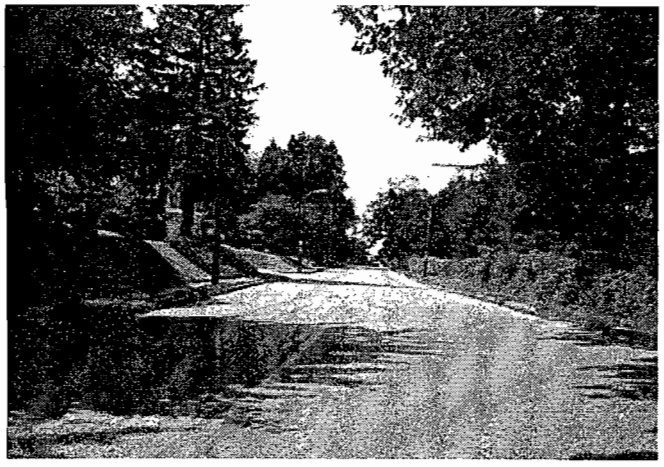


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Figure 13: Ashbourne-Croyden: SB Approach

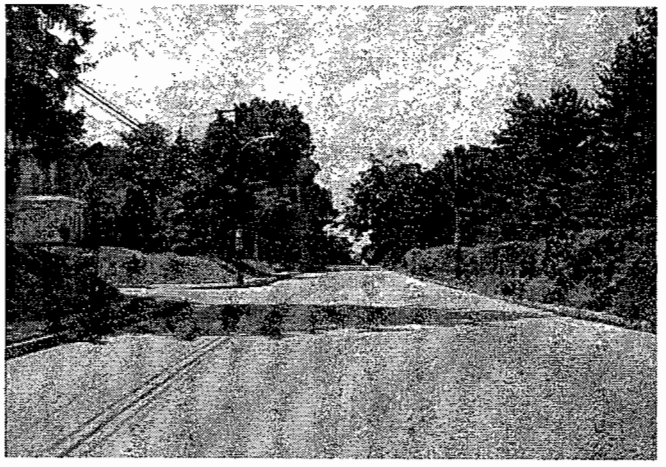

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Figure 14: Ashbourne-Croyden: SB Approach

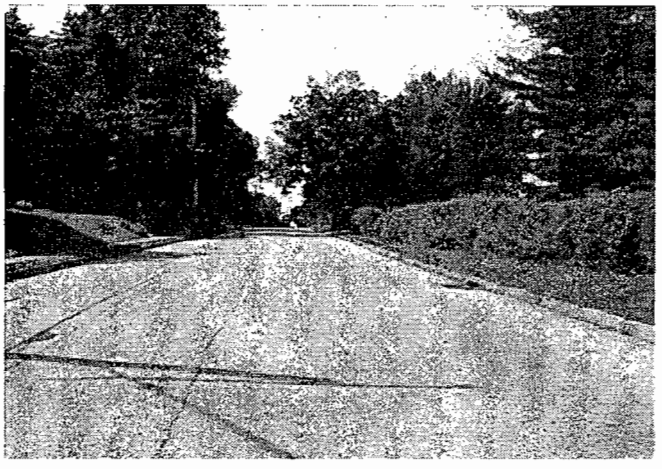

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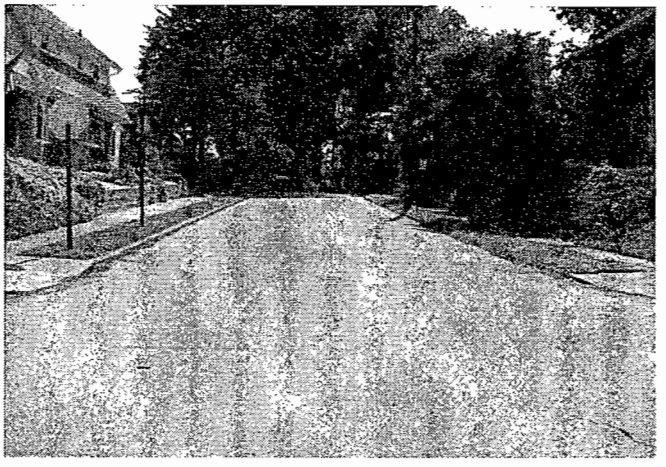
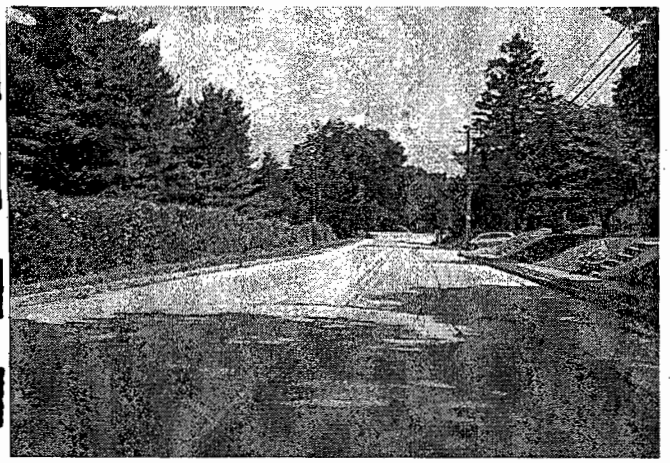
Figure 15: Ashbourne-Croyden: SB Departure



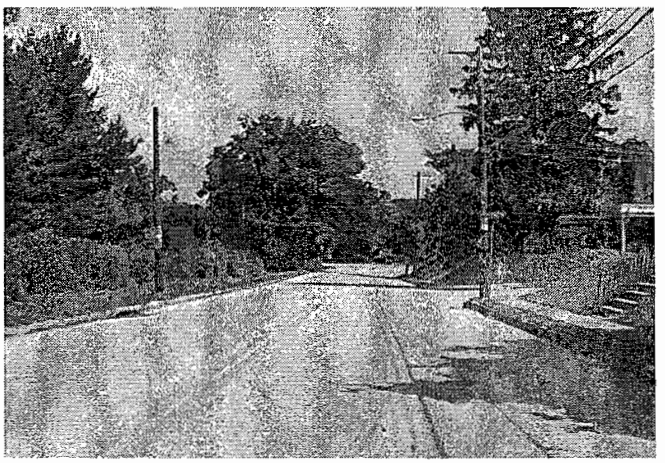
I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3090.JPG
Figure 16: Ashbourne-Croyden: Looking east on Croyden

I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3091.JPG
Figure 17: Ashbourne-Croyden: WB Approach

I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3092.JPG
Figure 18: Ashbourne-Croyden: WB Approach



I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3093.JPG
Figure 19: Ashbourne-Croyden: NB Departure



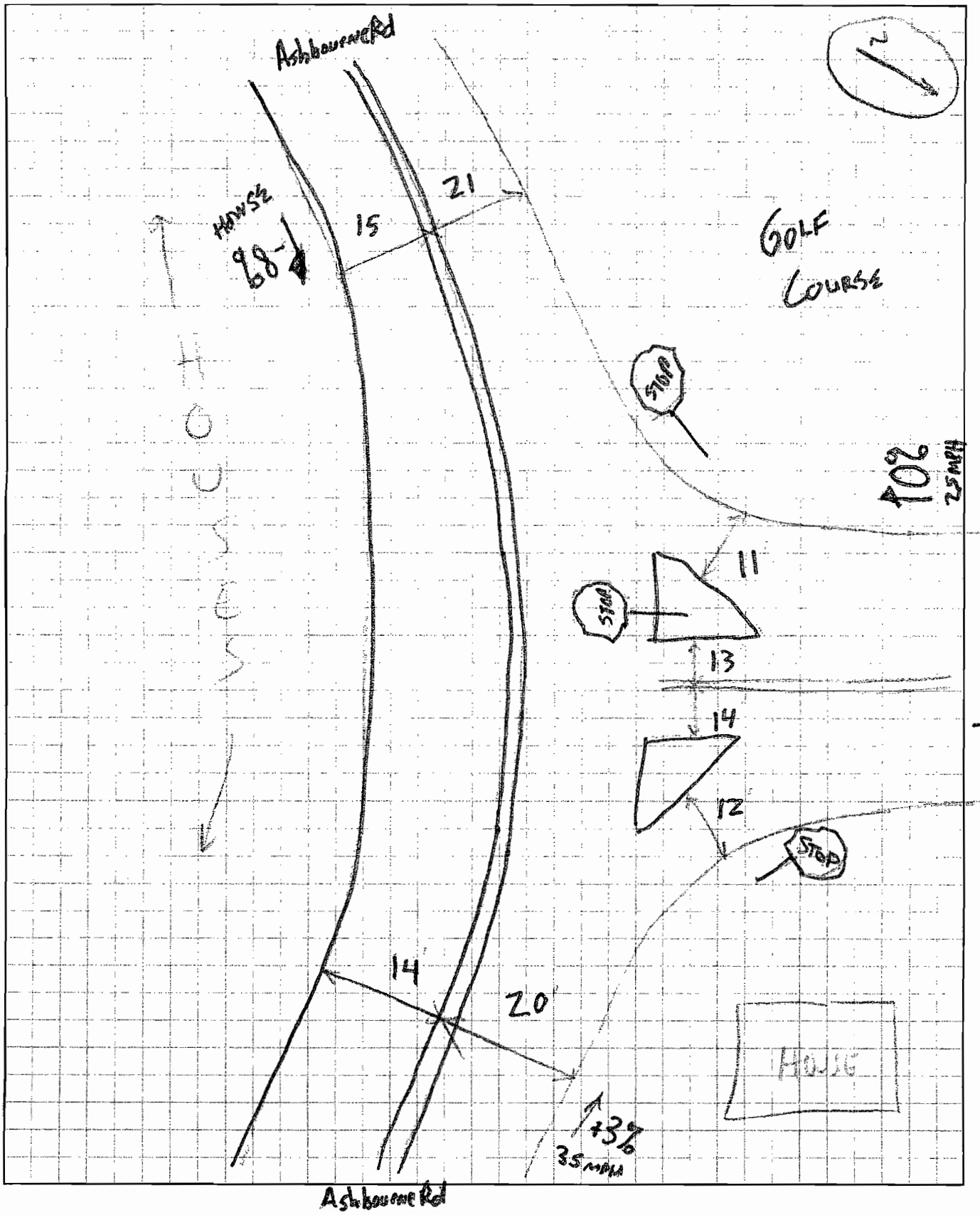
I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3094.JPG
Figure 20: Ashbourne-Croyden: NB Approach

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

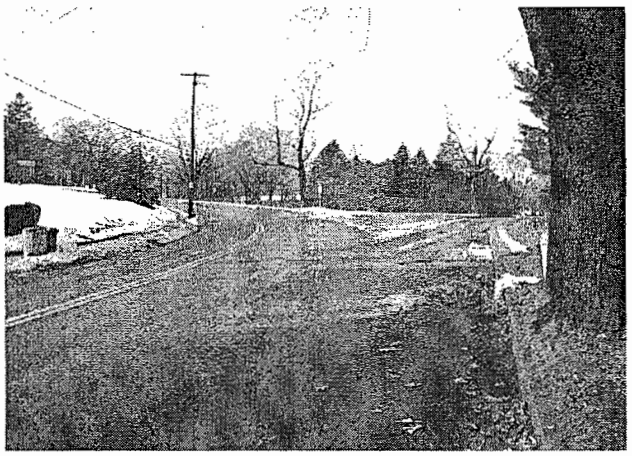
Job _____ McMahon Project No. _____ Sheet ____ of ____

Description _____ Designed By _____ Date _____

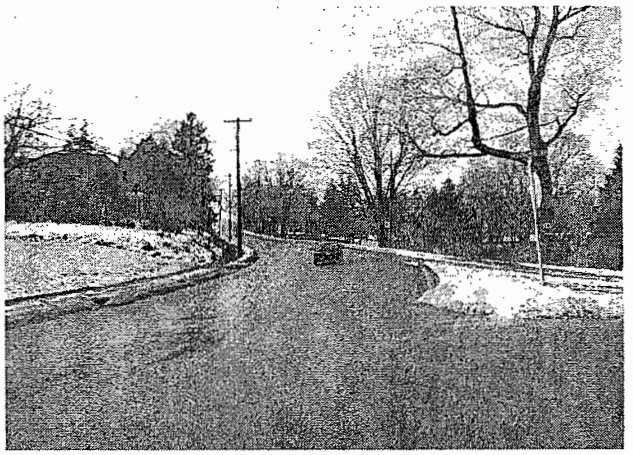
Ashbourne Rd Checked By _____ Date _____



Ashbourne Country Club



C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120013.JPG
Ashbourne Rd & Jenkintown Rd - Ashbourne Road Westbound Approach



C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120014.JPG
Ashbourne Rd & Jenkintown Rd - Ashbourne Road Westbound Departure

C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120015.JPG
Ashbourne Rd & Jenkintown Rd - Ashbourne Road Eastbound Approach

C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120016.JPG
Ashbourne Rd & Jenkintown Rd - Ashbourne Road Eastbound Departure

C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120017.JPG
Ashbourne Rd & Jenkintown Rd - Jenkintown Rd Approach (Back)

C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120018.JPG
Ashbourne Rd & Jenkintown Rd - Jenkintown Rd Approach

Ashbourne Country Club

C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120019.JPG
Looking east on Ashbourne Rd From Jenkintown Rd

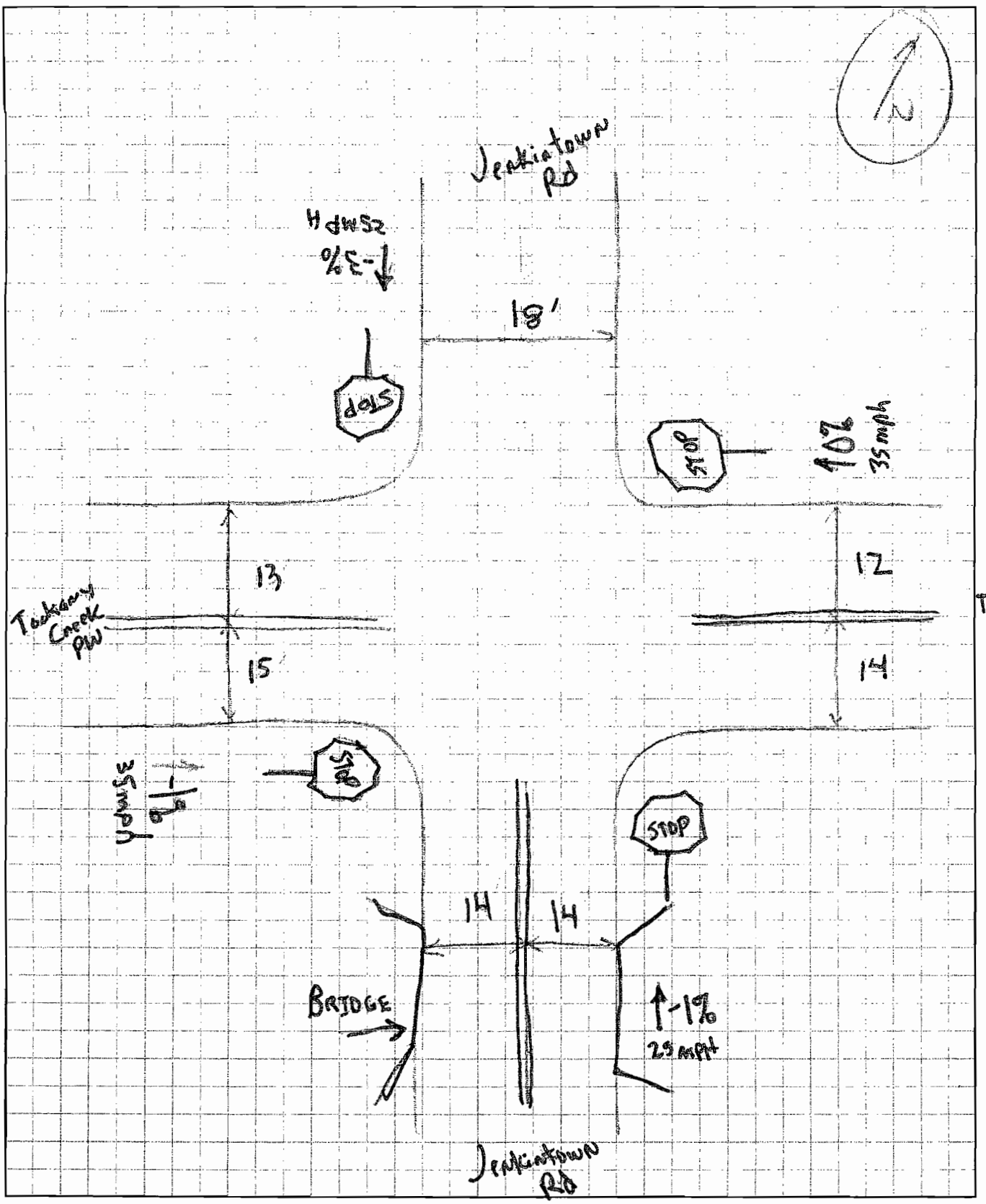
C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120020.JPG
Looking west on Ashbourne from Jenkintown Rd

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Job _____ McMahon Project No. _____ Sheet ____ of ____

Description [illegible] Designed By [illegible] Date _____

Tookany Creek [illegible] Checked By _____ Date _____



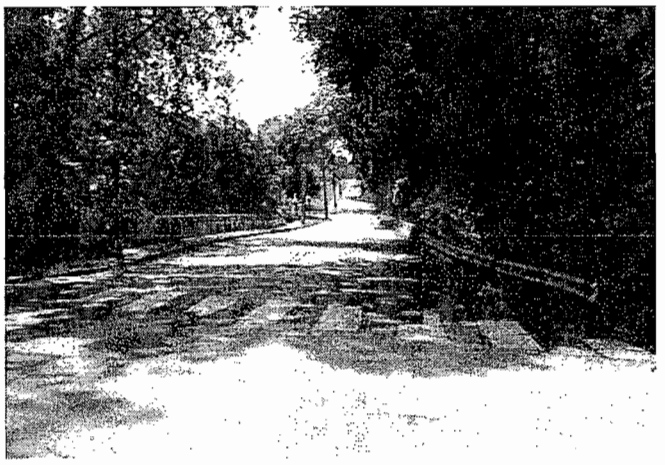
I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3066.JPG
Figure 1: Tookany-Jenkintown: EB Approach

I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3067.JPG
Figure 2: Tookany-Jenkintown: EB Approach

I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3068.JPG
Figure 3: Tookany-Jenkintown: WB Departure

I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3069.JPG
Figure 4: Tookany-Jenkintown: EB Departure

I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3070.JPG
Figure 5: Tookany-Jenkintown: NB Departure



I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3071.JPG
Figure 6: Tookany-Jenkintown: SB Departure

I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3072.JPG
Figure 7: Tookany-Jenkintown: NB Approach

I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3073.JPG
Figure 8: Tookany-Jenkintown: NB Approach

I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3074.JPG
Figure 9: Tookany-Jenkintown: WB Approach

I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3075.JPG
Figure 10: Tookany-Jenkintown: WB Approach

I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3076.JPG
Figure 11: Tookany-Jenkintown: SB Approach

I:\eng\809015\Traffic\Pictures\8-19-09\IMG_3077.JPG
Figure 12: Tookany-Jenkintown: SB Approach

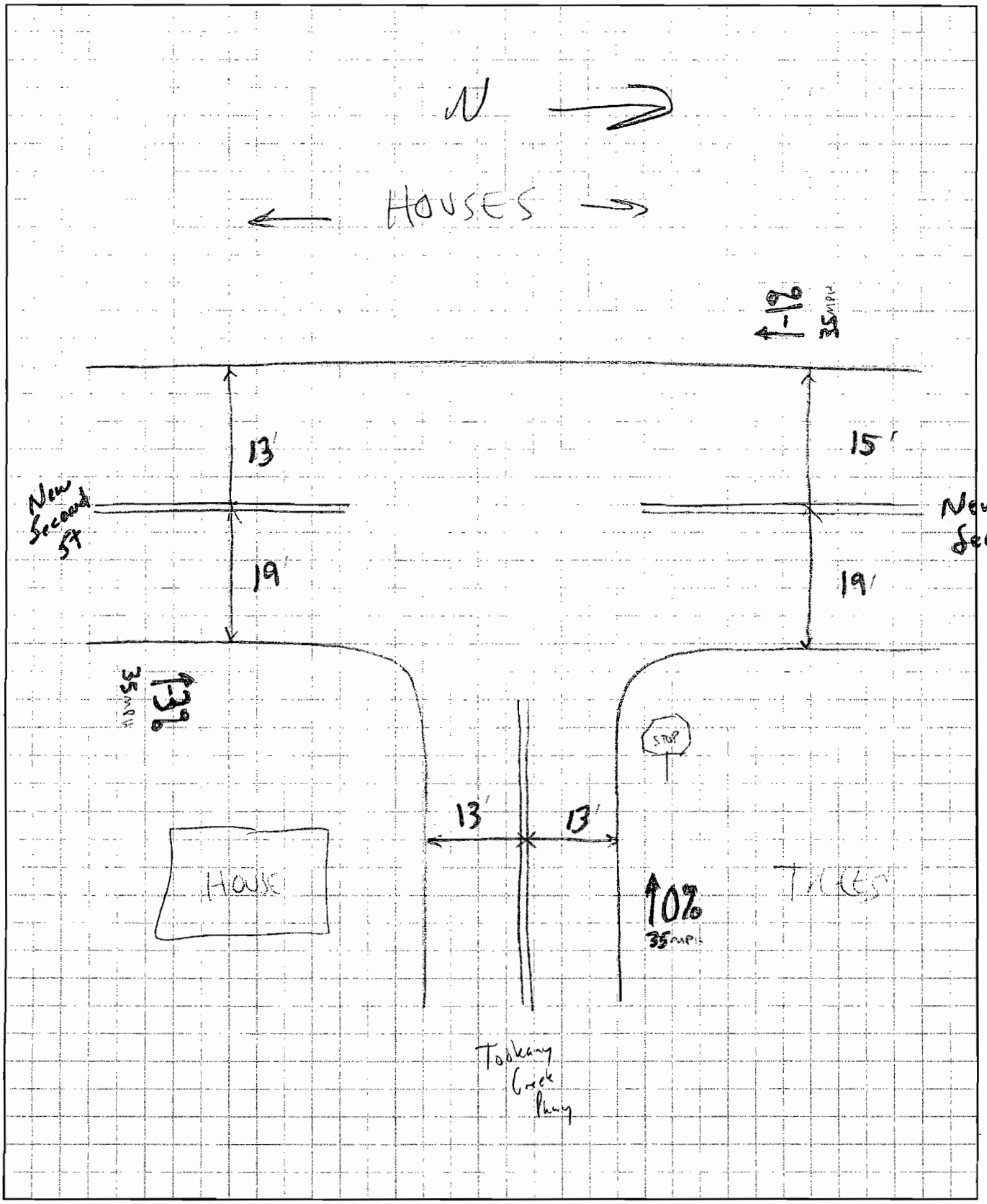
McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Job _____ McMahon Project No. _____ Sheet _____ of _____

Description New Second St + Tookany Creek Parkway

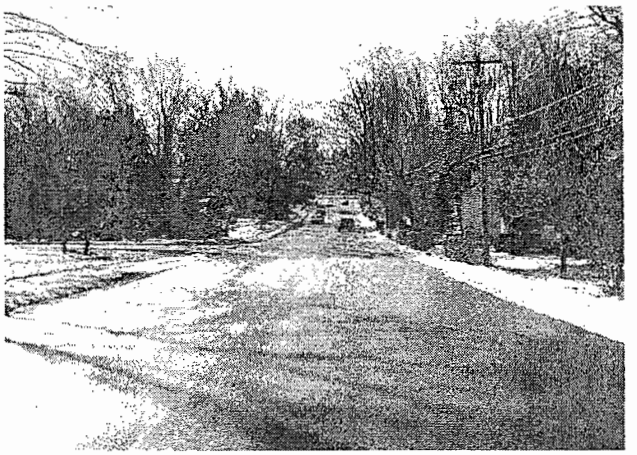
Designed By 8/13/09 Date _____

Checked By _____ Date _____



Ashbourne Country Club

C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120039.JPG
New Second St & Tookany Creek Pkwy - Tookany Creek Approach

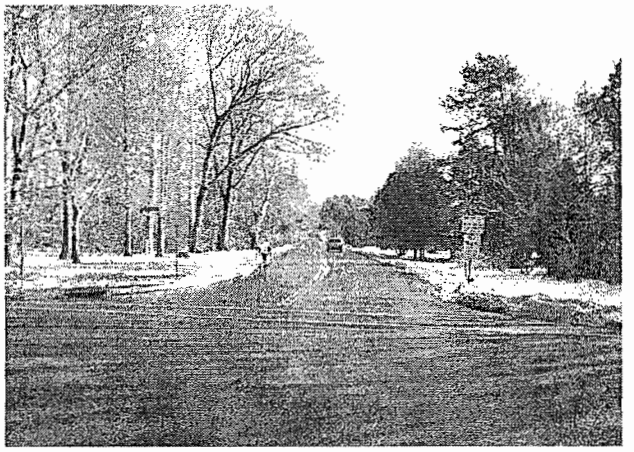


C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120040.JPG
New Second St & Tookany Creek Pkwy - New Second St Southbound Appro

C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120041.JPG
New Second St & Tookany Creek Pkwy - New Second St Southbound Departure

C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120042.JPG
New Second St & Tookany Creek Pkwy - New Second St Northbound Approa

C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120043.JPG
New Second St & Tookany Creek Pkwy - New Second St Northbound Departure



C:\WINDOWS\DESKTOP\NDB\Temporary\Pics\PC120044.JPG
New Second St & Tookany Creek Pkwy - Tookany Creek Approach (Back)

APPENDIX B

Automatic Traffic Recorder (ATR) Counts

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
03/26/09	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	0	0	**6**	**35**	65	**36**	15	0	0	0	**1**	0	**1**	159	39	43
11:00	**2**	0	5	33	**72**	36	**18**	**3**	0	0	0	0	0	**169**	40	44
12 PM	1	0	6	36	94	40	12	2	0	0	0	0	0	191	39	42
13:00	4	1	7	28	67	45	8	2	0	0	0	0	**1**	163	39	42
14:00	**17**	**12**	**36**	**74**	86	28	2	3	0	0	0	0	0	258	35	39
15:00	9	2	10	65	113	54	16	4	0	0	1	**1**	0	275	39	43
16:00	11	1	12	55	**146**	**83**	17	**5**	0	0	0	1	0	**331**	39	42
17:00	9	0	16	65	128	57	**21**	2	0	0	**3**	0	0	301	39	43
18:00	5	1	14	48	82	42	9	2	1	0	0	0	0	204	38	41
19:00	3	0	5	47	66	38	10	0	0	0	0	0	0	169	38	41
20:00	2	0	10	39	57	26	11	1	0	0	1	0	0	147	39	43
21:00	2	**1**	5	22	55	23	9	0	0	0	0	0	0	117	38	42
22:00	0	0	4	17	30	16	2	1	0	0	0	0	0	70	38	40
23:00	0	1	1	7	23	13	3	1	**3**	**1**	0	0	0	53	40	51
Total	65	19	137	571	1084	537	153	26	4	1	6	2	2	2607		
Percent	2.5%	0.7%	5.3%	21.9%	41.6%	20.6%	5.9%	1.0%	0.2%	0.0%	0.2%	0.1%	0.1%			
AM Peak	11:00		10:00	10:00	11:00	10:00	11:00	11:00			10:00		10:00	11:00		
Vol.	2		6	35	72	36	18	3			1		1	169		
PM Peak	14:00	14:00	14:00	14:00	16:00	16:00	17:00	16:00	23:00	23:00	17:00	15:00	13:00	16:00		
Vol.	17	12	36	74	146	83	21	5	3	1	3	1	1	331		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
03/27/09	0	0	3	2	8	6	0	2	1	0	0	0	0	22	40	47
01:00	0	0	1	1	5	2	2	0	0	0	0	0	0	11	40	41
02:00	0	0	1	1	1	4	1	0	0	0	0	0	0	8	39	41
03:00	0	0	0	2	4	4	1	0	1	0	0	0	0	12	39	41
04:00	0	1	1	9	14	9	3	2	0	1	0	0	0	40	40	46
05:00	2	0	1	18	53	46	24	3	1	0	1	0	0	149	42	45
06:00	7	0	5	50	101	68	18	1	2	0	2	0	0	254	39	43
07:00	13	8	47	85	82	46	9	1	0	0	0	0	0	291	37	40
08:00	2	0	9	36	91	54	10	1	1	0	1	0	0	205	39	42
09:00	3	0	3	17	71	43	16	2	1	0	0	0	0	156	40	44
10:00	4	1	3	24	86	35	17	5	2	0	0	0	0	177	40	45
11:00	4	0	5	31	82	51	20	8	2	0	0	0	0	203	40	45
12 PM	2	0	2	35	96	57	15	5	2	0	0	1	0	215	40	44
13:00	3	0	3	34	90	70	15	5	0	0	0	0	0	220	40	43
14:00	7	6	29	92	95	38	6	1	0	1	1	0	0	276	36	40
15:00	17	5	8	41	122	81	25	6	2	0	0	1	0	308	40	44
16:00	16	0	6	58	147	113	27	6	0	0	1	0	0	374	39	43
17:00	5	1	2	51	126	75	27	3	0	1	1	0	0	292	40	43
18:00	8	0	1	44	117	61	29	3	0	2	1	0	0	266	40	44
19:00	5	0	4	38	87	48	18	2	1	0	0	0	0	203	39	43
20:00	1	0	4	27	68	29	14	3	2	1	1	0	1	151	40	45
21:00	1	0	7	22	66	45	11	1	0	0	1	0	0	154	39	42
22:00	0	0	2	19	51	41	9	0	0	0	0	0	0	122	39	42
23:00	0	1	0	20	25	23	10	1	3	0	0	0	0	83	41	45
Total	100	23	147	757	1688	1049	327	61	21	6	10	2	1	4192		
Percent	2.4%	0.5%	3.5%	18.1%	40.3%	25.0%	7.8%	1.5%	0.5%	0.1%	0.2%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	07:00	06:00	06:00	05:00	11:00	06:00	04:00	06:00			07:00		
Vol.	13	8	47	85	101	68	24	8	2	1	2			291		
PM Peak	15:00	14:00	14:00	14:00	16:00	16:00	18:00	15:00	23:00	18:00	14:00	12:00	20:00	16:00		
Vol.	17	6	29	92	147	113	29	6	3	2	1	1	1	374		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
03/28/09	0	0	2	2	25	6	1	0	0	0	0	0	0	36	36	39
01:00	0	0	2	7	15	3	0	0	0	0	0	0	0	27	35	37
02:00	0	0	1	4	4	8	2	0	0	0	0	0	0	19	39	41
03:00	0	0	0	6	8	2	1	1	0	0	0	0	0	18	36	45
04:00	0	1	0	6	8	5	4	0	0	0	0	0	0	24	40	43
05:00	0	0	1	6	27	13	7	1	0	0	0	0	0	55	40	43
06:00	1	0	1	13	27	22	4	0	0	0	0	0	0	68	39	41
07:00	0	0	2	19	62	24	11	0	0	0	0	0	0	118	39	42
08:00	0	0	2	27	73	41	10	3	1	0	0	0	0	157	39	43
09:00	1	0	**5**	24	76	32	16	5	0	0	0	0	0	159	40	44
10:00	2	0	4	**34**	76	42	20	7	1	0	0	0	0	186	40	45
11:00	**4**	**4**	3	31	**95**	**56**	**23**	3	0	0	0	0	0	**219**	40	43
12 PM	**4**	0	**4**	29	88	**70**	18	6	0	0	0	0	0	219	40	44
13:00	**6**	0	1	27	95	55	23	2	1	0	**2**	**1**	0	213	40	44
14:00	1	0	2	37	**101**	57	25	6	1	0	0	0	0	**230**	40	44
15:00	2	**2**	3	29	93	53	17	3	0	**1**	0	0	0	203	40	43
16:00	1	1	4	28	91	49	**27**	**7**	0	0	0	0	0	208	41	45
17:00	3	0	2	33	100	44	21	**7**	**2**	0	0	0	0	212	40	45
18:00	1	0	0	**55**	81	50	15	5	0	0	0	0	0	207	39	44
19:00	3	0	0	31	78	36	16	2	0	0	0	0	**1**	167	40	44
20:00	0	0	2	22	73	38	8	1	0	0	0	0	0	144	39	41
21:00	1	0	0	28	60	27	15	5	1	0	0	0	0	137	40	45
22:00	2	0	2	19	52	23	3	0	0	0	0	0	0	101	38	40
23:00	0	0	4	24	42	13	12	1	0	0	0	0	0	96	40	43
Total	32	8	47	541	1450	769	299	65	7	1	2	1	1	3223		
Percent	1.0%	0.2%	1.5%	16.8%	45.0%	23.9%	9.3%	2.0%	0.2%	0.0%	0.1%	0.0%	0.0%			
AM Peak	11:00	11:00	09:00	10:00	11:00	11:00	11:00	10:00	08:00					11:00		
Vol.	4	4	5	34	95	56	23	7	1					219		
PM Peak	13:00	15:00	12:00	18:00	14:00	12:00	16:00	16:00	17:00	15:00	13:00	13:00	19:00	14:00		
Vol.	6	2	4	55	101	70	27	7	2	1	2	1	1	230		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
03/29/09	0	0	1	8	19	8	2	0	0	0	0	0	0	38	37	40
01:00	0	0	1	4	15	6	2	2	0	0	0	0	0	30	39	45
02:00	0	0	1	4	10	4	2	1	0	0	0	0	0	22	39	42
03:00	0	0	0	3	2	3	4	0	0	0	0	0	0	12	42	43
04:00	0	0	1	4	7	3	0	1	0	0	0	0	0	16	37	38
05:00	0	0	0	6	13	17	3	0	0	0	0	0	0	39	39	41
06:00	1	0	1	5	13	6	8	2	0	0	0	0	0	36	43	45
07:00	1	0	0	19	22	11	0	1	0	0	0	0	0	54	37	39
08:00	1	0	4	20	46	26	**13**	2	0	0	0	0	0	112	40	43
09:00	**3**	0	4	**49**	80	37	12	1	0	0	1	0	0	187	38	42
10:00	1	**2**	**9**	40	54	**38**	3	**3**	0	0	0	0	0	150	38	40
11:00	0	0	1	48	**94**	28	13	2	0	**1**	1	**1**	0	**189**	38	43
12 PM	2	0	1	40	**107**	44	16	2	0	0	0	0	0	212	39	42
13:00	**13**	0	4	30	102	52	10	4	**4**	0	0	0	0	**219**	39	44
14:00	2	0	6	**69**	86	33	8	2	0	0	0	0	0	206	37	40
15:00	3	**2**	**11**	45	64	28	16	2	0	0	0	0	1	172	39	43
16:00	7	1	3	26	85	**58**	**25**	**7**	2	0	**1**	0	0	215	41	45
17:00	3	**1**	0	30	81	36	22	2	2	0	0	0	0	177	40	44
18:00	4	2	11	40	65	32	10	2	0	0	0	0	0	166	38	42
19:00	2	0	0	45	86	30	12	3	0	0	0	0	0	178	38	42
20:00	3	0	1	21	67	16	10	0	0	0	0	0	0	118	38	42
21:00	0	0	6	29	45	11	7	2	0	0	0	0	0	100	37	42
22:00	2	1	1	14	31	12	4	0	0	0	0	0	0	65	37	41
23:00	0	0	3	11	20	9	0	1	0	0	0	0	0	44	37	39
Total	48	9	70	610	1214	548	202	42	8	1	3	1	1	2757		
Percent	1.7%	0.3%	2.5%	22.1%	44.0%	19.9%	7.3%	1.5%	0.3%	0.0%	0.1%	0.0%	0.0%			
AM Peak	09:00	10:00	10:00	09:00	11:00	10:00	08:00	10:00		11:00	09:00	11:00		11:00		
Vol.	3	2	9	49	94	38	13	3		1	1	1		189		
PM Peak	13:00	15:00	15:00	14:00	12:00	16:00	16:00	16:00	13:00		16:00		15:00	13:00		
Vol.	13	2	11	69	107	58	25	7	4		1		1	219		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
03/30/09	0	0	1	3	5	8	2	1	0	0	0	0	0	20	40	42
01:00	0	0	2	1	2	3	1	1	0	0	0	0	0	10	38	45
02:00	0	0	0	1	3	1	0	0	0	0	0	0	0	5	33	36
03:00	0	0	0	3	6	5	2	1	0	0	0	0	0	17	40	42
04:00	0	0	2	4	15	12	6	1	1	**1**	0	0	0	42	42	50
05:00	0	0	0	24	43	63	**22**	4	1	0	**1**	0	**1**	159	41	45
06:00	**9**	0	3	40	90	**69**	19	3	**3**	0	0	**1**	0	237	40	44
07:00	9	**7**	**26**	**107**	**97**	46	13	6	0	1	0	1	0	**313**	38	42
08:00	5	0	16	38	70	39	20	0	2	1	1	0	0	192	40	44
09:00	3	0	4	36	66	41	16	6	1	0	0	1	0	174	40	45
10:00	2	1	5	32	60	48	11	3	0	0	0	0	0	162	39	43
11:00	1	0	5	21	57	40	19	**9**	2	1	0	0	0	155	42	47
12 PM	4	0	1	19	70	45	16	4	0	0	0	0	0	159	40	44
13:00	3	1	3	41	110	40	19	2	1	0	0	0	0	220	39	43
14:00	**14**	**5**	**29**	**68**	100	33	11	0	1	0	1	**1**	0	263	37	41
15:00	12	3	4	44	90	77	17	3	1	0	1	1	0	253	39	43
16:00	5	0	5	52	**149**	**100**	**32**	4	**2**	**2**	0	0	0	**351**	40	44
17:00	6	0	6	46	119	72	30	5	1	0	0	0	0	285	40	44
18:00	3	1	6	47	86	43	18	**6**	0	0	1	0	0	211	40	44
19:00	2	0	4	35	50	36	11	4	2	0	**2**	0	0	146	40	46
20:00	0	0	1	31	52	31	12	2	0	0	0	0	0	129	40	43
21:00	1	0	1	15	43	37	11	5	1	0	0	0	0	114	40	45
22:00	0	0	0	12	31	19	12	2	1	0	0	0	0	77	41	45
23:00	0	0	3	4	12	9	5	2	0	0	0	0	0	35	42	45
Total	79	18	127	724	1426	917	325	74	20	6	7	5	1	3729		
Percent	2.1%	0.5%	3.4%	19.4%	38.2%	24.6%	8.7%	2.0%	0.5%	0.2%	0.2%	0.1%	0.0%			
AM Peak	06:00	07:00	07:00	07:00	07:00	06:00	05:00	11:00	06:00	04:00	05:00	06:00	05:00	07:00		
Vol.	9	7	26	107	97	69	22	9	3	1	1	1	1	313		
PM Peak	14:00	14:00	14:00	14:00	16:00	16:00	16:00	18:00	16:00	16:00	19:00	14:00		16:00		
Vol.	14	5	29	68	149	100	32	6	2	2	2	1		351		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
03/31/09	0	0	1	3	2	5	2	0	1	0	0	0	0	14	41	42
01:00	0	0	1	3	5	4	4	0	1	**1**	0	0	0	19	43	55
02:00	0	0	0	3	2	2	0	0	0	0	0	0	0	7	36	37
03:00	0	0	1	3	4	5	2	3	1	0	0	0	0	19	46	48
04:00	1	0	1	9	16	16	7	3	0	0	0	0	0	53	41	45
05:00	0	0	0	19	60	57	15	6	**2**	0	0	0	0	159	40	45
06:00	**11**	1	5	43	**108**	**73**	**31**	7	0	0	0	0	0	279	40	44
07:00	10	**5**	**26**	**105**	106	45	7	0	0	0	0	0	0	**304**	36	40
08:00	2	1	3	43	68	56	14	2	0	0	0	**1**	0	190	39	43
09:00	4	0	1	22	80	38	11	5	0	0	0	0	0	161	39	44
10:00	0	0	0	27	65	47	18	3	0	1	0	0	0	161	40	44
11:00	1	1	0	30	80	51	22	1	0	0	0	0	0	186	40	43
12 PM	6	0	0	35	69	**43**	11	3	1	0	0	0	0	168	39	43
13:00	1	1	**4**	35	82	36	18	3	0	0	0	0	**1**	181	40	44
14:00	**21**	**10**	**25**	**65**	99	41	11	0	0	0	1	**1**	0	274	37	40
15:00	9	2	3	48	109	67	21	4	0	**1**	0	0	0	264	39	43
16:00	9	3	15	46	**162**	85	**29**	2	1	1	2	1	0	**356**	39	43
17:00	6	0	5	55	114	**102**	19	**6**	0	0	**3**	0	0	310	40	43
18:00	3	2	2	40	96	54	13	2	1	0	0	0	1	214	39	42
19:00	4	0	4	31	70	40	18	1	**2**	0	1	0	0	171	40	44
20:00	1	0	5	32	62	39	12	0	0	0	0	0	0	151	39	42
21:00	2	0	7	16	50	25	14	2	2	0	0	0	0	118	40	44
22:00	1	0	2	10	41	21	4	3	0	0	0	0	0	82	39	43
23:00	0	0	3	7	16	10	5	2	0	0	0	0	0	43	41	45
Total	92	26	114	730	1566	962	308	58	12	4	7	3	2	3884		
Percent	2.4%	0.7%	2.9%	18.8%	40.3%	24.8%	7.9%	1.5%	0.3%	0.1%	0.2%	0.1%	0.1%			
AM Peak	06:00	07:00	07:00	07:00	06:00	06:00	06:00	06:00	05:00	01:00		08:00		07:00		
Vol.	11	5	26	105	108	73	31	7	2	1		1		304		
PM Peak	14:00	14:00	14:00	14:00	16:00	17:00	16:00	17:00	19:00	15:00	17:00	14:00	13:00	16:00		
Vol.	21	10	25	65	162	102	29	6	2	1	3	1	1	356		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
04/01/09	0	0	1	9	10	5	2	0	0	0	0	0	0	27	38	41
01:00	0	0	1	1	9	5	3	0	0	0	0	0	0	19	40	42
02:00	0	0	0	3	3	4	1	0	0	0	0	0	0	11	38	39
03:00	0	0	1	3	4	1	2	1	0	0	0	0	0	12	41	42
04:00	0	0	0	7	14	17	6	2	0	0	0	0	0	46	41	45
05:00	3	0	4	10	63	54	**21**	2	1	0	0	0	0	158	40	44
06:00	9	0	6	49	**122**	**56**	21	**5**	4	0	**1**	0	**2**	**275**	40	45
07:00	**10**	0	**34**	**81**	102	36	7	1	0	0	0	**1**	0	272	36	40
08:00	0	4	25	50	68	27	4	2	0	**1**	0	0	1	182	37	40
09:00	1	0	3	39	59	43	13	3	0	1	0	1	0	163	40	44
10:00	1	0	7	35	53	34	13	3	0	0	0	0	0	146	39	43
11:00	1	1	3	25	74	44	8	0	0	0	0	0	0	156	39	40
12 PM	3	0	3	58	81	47	11	1	0	0	**1**	0	0	205	38	41
13:00	3	0	0	62	67	37	13	2	1	1	1	**1**	0	188	39	44
14:00	16	**7**	**33**	**105**	97	30	4	2	0	0	1	0	0	295	35	39
15:00	**17**	5	11	61	120	54	17	4	1	0	1	0	**1**	292	39	43
16:00	9	0	13	79	**137**	**62**	12	4	**3**	0	1	0	0	**320**	38	42
17:00	2	0	13	51	128	60	15	2	1	0	1	0	0	273	39	42
18:00	2	0	7	49	71	47	**20**	1	1	**2**	0	1	0	201	40	44
19:00	1	0	8	35	85	31	12	1	0	0	0	0	0	173	38	42
20:00	2	0	5	64	48	36	10	1	1	0	0	0	0	167	39	42
21:00	2	1	4	34	48	26	18	1	0	0	0	0	0	134	40	43
22:00	1	0	3	9	42	18	4	1	0	0	0	0	0	78	38	41
23:00	0	1	2	8	12	8	4	0	1	0	0	0	0	36	40	43
Total	83	19	187	927	1517	782	241	39	14	5	7	4	4	3829		
Percent	2.2%	0.5%	4.9%	24.2%	39.6%	20.4%	6.3%	1.0%	0.4%	0.1%	0.2%	0.1%	0.1%			
AM Peak	07:00	08:00	07:00	07:00	06:00	06:00	05:00	06:00	06:00	08:00	06:00	07:00	06:00	06:00		
Vol.	10	4	34	81	122	56	21	5	4	1	1	1	2	275		
PM Peak	15:00	14:00	14:00	14:00	16:00	16:00	18:00	15:00	16:00	18:00	12:00	13:00	15:00	16:00		
Vol.	17	7	33	105	137	62	20	4	3	2	1	1	1	320		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
04/02/09	0	0	1	4	3	6	1	0	0	0	0	0	0	15	39	40
01:00	0	0	1	2	1	3	3	0	0	0	0	0	0	10	41	42
02:00	0	0	1	0	3	7	2	0	0	0	0	0	0	13	40	41
03:00	0	0	0	5	5	3	1	1	1	0	0	0	0	16	45	50
04:00	1	0	1	11	15	21	4	2	1	0	0	0	0	56	40	44
05:00	4	1	2	18	63	41	18	1	0	0	1	0	0	149	40	44
06:00	**9**	3	7	65	**99**	44	**21**	**7**	**2**	0	**2**	0	0	259	40	45
07:00	7	3	**40**	**125**	74	35	7	2	0	0	0	0	0	**293**	35	40
08:00	4	**12**	20	58	71	**49**	13	5	2	**1**	0	0	0	235	39	43
09:00	1	0	1	34	67	37	7	3	0	0	1	0	0	151	39	42
10:00	3	0	5	35	70	39	14	1	1	0	0	0	0	168	39	43
11:00	4	0	0	27	94	39	16	4	1	0	0	**1**	0	186	40	44
12 PM	5	2	4	54	79	49	**25**	1	0	0	0	0	0	219	40	43
13:00	5	1	1	40	84	46	10	4	0	0	**1**	**1**	0	193	39	43
14:00	14	**10**	**35**	**95**	93	24	10	3	1	**1**	1	1	0	288	35	42
15:00	**19**	6	12	54	114	61	24	3	**2**	0	1	0	0	296	39	43
16:00	16	0	6	76	**166**	**86**	11	3	2	0	0	0	0	**366**	38	40
17:00	1	0	6	68	106	75	25	**8**	1	0	0	0	0	290	40	44
18:00	4	0	5	42	72	63	19	3	1	0	0	0	0	209	40	44
19:00	2	0	5	47	73	46	11	1	0	0	0	0	0	185	39	41
20:00	1	0	1	31	74	30	7	2	0	0	0	0	0	146	38	41
21:00	1	2	5	16	56	32	9	3	2	0	0	0	0	126	40	44
22:00	1	0	0	12	44	25	8	2	0	0	0	0	0	92	40	43
23:00	0	0	5	6	14	12	4	1	0	0	0	0	0	42	40	43
Total	102	40	164	925	1540	873	270	60	17	2	7	3	0	4003		
Percent	2.5%	1.0%	4.1%	23.1%	38.5%	21.8%	6.7%	1.5%	0.4%	0.0%	0.2%	0.1%	0.0%			
AM Peak	06:00	08:00	07:00	07:00	06:00	08:00	06:00	06:00	06:00	08:00	06:00	11:00		07:00		
Vol.	9	12	40	125	99	49	21	7	2	1	2	1		293		
PM Peak	15:00	14:00	14:00	14:00	16:00	16:00	12:00	17:00	15:00	14:00	13:00	13:00		16:00		
Vol.	19	10	35	95	166	86	25	8	2	1	1	1		366		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
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ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
04/03/09	0	0	0	5	14	7	2	2	0	0	0	0	0	30	39	45
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	0	0	0	5	14	7	2	2	0	0	0	0	0	30		
Percent	0.0%	0.0%	0.0%	16.7%	46.7%	23.3%	6.7%	6.7%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak				00:00	00:00	00:00	00:00	00:00						00:00		
Vol.				5	14	7	2	2						30		
PM Peak Vol.																
Grand Total	601	162	993	5790	11499	6444	2127	427	103	26	49	21	12	28254		
Percent	2.1%	0.6%	3.5%	20.5%	40.7%	22.8%	7.5%	1.5%	0.4%	0.1%	0.2%	0.1%	0.0%			

	15th Percentile :	28 MPH
	50th Percentile :	33 MPH
	85th Percentile :	39 MPH
	95th Percentile :	44 MPH
Stats	10 MPH Pace Speed :	31-40 MPH
	Number in Pace :	17943
	Percent in Pace :	63.5%
	Number of Vehicles > 55 MPH :	108
	Percent of Vehicles > 55 MPH :	0.4%
	Mean Speed(Average) :	33 MPH

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
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Municipality: Cheltenham Township
Comments: None`
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ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
03/26/09	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	0	**1**	**8**	**35**	53	**49**	**16**	0	0	0	0	0	0	162	40	43
11:00	0	0	**4**	33	**74**	44	16	0	**1**	0	0	0	0	**172**	39	43
12 PM	0	0	6	39	90	52	**18**	2	1	0	0	1	0	209	40	43
13:00	3	2	8	39	108	60	15	**4**	0	**1**	1	0	0	241	39	43
14:00	12	**5**	26	76	105	56	14	1	**2**	0	0	1	0	298	38	41
15:00	11	2	26	**96**	104	**75**	6	1	2	0	2	0	**1**	**326**	38	40
16:00	**14**	5	**29**	75	111	66	17	1	2	1	**3**	1	0	325	39	43
17:00	13	3	13	58	**125**	60	12	3	0	0	0	0	0	287	38	41
18:00	6	0	13	59	99	46	9	1	0	0	0	**2**	0	235	38	40
19:00	3	0	10	43	55	36	7	1	0	0	0	0	0	155	38	40
20:00	0	1	6	26	53	29	9	0	0	0	0	0	0	124	39	42
21:00	4	0	4	24	54	23	14	3	0	0	0	1	0	127	40	44
22:00	0	0	2	12	27	28	8	4	0	0	0	0	0	81	40	45
23:00	0	0	3	8	13	12	1	2	0	0	0	0	0	39	39	45
Total	66	19	158	623	1071	636	162	23	8	2	6	6	1	2781		
Percent	2.4%	0.7%	5.7%	22.4%	38.5%	22.9%	5.8%	0.8%	0.3%	0.1%	0.2%	0.2%	0.0%			
AM Peak		10:00	10:00	10:00	11:00	10:00	10:00		11:00					11:00		
Vol.		1	8	35	74	49	16		1					172		
PM Peak	16:00	14:00	16:00	15:00	17:00	15:00	12:00	13:00	14:00	13:00	16:00	18:00	15:00	15:00		
Vol.	14	5	29	96	125	75	18	4	2	1	3	2	1	326		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
03/27/09	0	0	0	4	11	8	4	0	0	0	0	0	0	27	40	43
01:00	0	0	3	0	7	6	0	0	0	0	0	0	0	16	38	39
02:00	0	0	0	1	4	4	1	1	0	0	0	0	0	11	39	45
03:00	1	0	0	1	6	6	2	0	0	0	0	0	0	16	40	41
04:00	0	0	3	4	15	20	7	4	1	0	0	0	0	54	42	47
05:00	3	0	4	28	48	44	14	5	2	0	0	0	0	148	40	45
06:00	7	**9**	34	93	114	**81**	**37**	1	2	**1**	**1**	0	1	**381**	40	44
07:00	**10**	1	**43**	**100**	**124**	48	4	0	1	1	1	0	0	333	36	39
08:00	3	3	17	58	75	59	19	2	0	0	0	0	**2**	238	39	43
09:00	0	1	5	17	59	64	19	3	**3**	0	0	0	0	171	40	44
10:00	2	0	2	23	52	62	26	**6**	0	1	0	0	0	174	42	45
11:00	5	1	5	24	73	52	22	2	0	0	0	0	0	184	40	44
12 PM	0	0	8	38	89	68	10	4	0	0	0	0	0	217	39	42
13:00	6	0	10	30	92	94	17	3	0	0	0	0	0	252	39	42
14:00	10	**8**	22	**85**	109	59	16	2	0	0	0	**2**	0	313	38	41
15:00	9	8	24	75	100	74	17	4	0	0	0	2	**1**	314	39	42
16:00	**12**	3	**25**	85	106	**105**	**22**	2	**2**	**2**	**1**	0	0	**365**	39	43
17:00	6	3	16	67	**125**	70	20	2	1	2	0	0	0	312	39	43
18:00	1	1	10	**45**	74	82	17	4	1	1	0	0	0	236	40	43
19:00	2	0	13	**49**	74	46	12	0	1	0	1	0	0	198	39	42
20:00	0	0	7	44	78	41	14	**5**	0	0	0	0	0	189	39	44
21:00	0	5	9	29	57	41	10	1	0	0	0	0	0	152	39	42
22:00	0	1	1	17	42	37	9	4	2	0	0	0	0	113	40	45
23:00	0	1	4	12	24	33	8	3	0	0	0	0	0	85	40	44
Total	77	45	265	929	1558	1204	327	58	16	8	4	4	4	4499		
Percent	1.7%	1.0%	5.9%	20.6%	34.6%	26.8%	7.3%	1.3%	0.4%	0.2%	0.1%	0.1%	0.1%			
AM Peak	07:00	06:00	07:00	07:00	07:00	06:00	06:00	10:00	09:00	06:00	06:00		08:00	06:00		
Vol.	10	9	43	100	124	81	37	6	3	1	1		2	381		
PM Peak	16:00	14:00	16:00	14:00	17:00	16:00	16:00	20:00	16:00	16:00	16:00	14:00	15:00	16:00		
Vol.	12	8	25	85	125	105	22	5	2	2	1	2	1	365		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
03/28/09	0	0	1	9	15	8	7	2	0	0	0	0	0	42	42	45
01:00	0	0	1	8	10	10	4	1	0	0	0	0	0	34	40	43
02:00	1	0	0	5	12	9	3	0	0	0	0	0	0	30	39	41
03:00	0	0	1	5	9	5	1	0	0	0	0	0	0	21	38	40
04:00	0	0	0	5	4	7	5	0	0	0	0	0	0	21	42	44
05:00	0	0	2	7	21	26	8	3	0	0	0	0	0	67	41	45
06:00	0	0	0	5	33	43	**24**	**6**	**3**	0	0	0	0	114	44	47
07:00	1	0	2	26	43	50	16	2	0	**1**	0	0	0	141	40	44
08:00	4	0	7	22	70	53	21	2	0	0	0	**1**	0	180	40	44
09:00	2	1	**10**	32	59	59	21	5	2	1	0	0	0	192	40	45
10:00	3	**7**	6	**42**	**79**	**73**	13	5	0	0	**1**	0	0	**229**	39	43
11:00	**5**	0	3	28	76	51	14	4	2	0	0	1	0	184	40	44
12 PM	0	0	2	33	86	66	26	3	**2**	0	0	0	0	218	40	44
13:00	1	0	7	42	65	**89**	21	7	0	0	**1**	0	**1**	234	40	45
14:00	**4**	2	4	25	**99**	70	27	4	1	0	0	**2**	0	238	40	44
15:00	2	2	**11**	**52**	84	64	12	4	0	**2**	1	0	0	234	39	43
16:00	1	**3**	5	50	95	64	20	3	0	0	1	0	0	**242**	39	43
17:00	2	0	3	22	69	72	15	3	0	0	0	1	0	187	40	44
18:00	2	0	7	33	57	56	21	**8**	0	1	0	0	0	185	41	45
19:00	1	0	4	38	66	38	13	2	1	0	0	1	0	164	39	43
20:00	1	2	6	22	59	42	**30**	4	0	0	0	0	0	166	42	45
21:00	4	2	6	32	51	36	16	1	1	0	0	0	0	149	40	44
22:00	1	0	3	15	42	51	14	4	1	0	0	0	0	131	40	44
23:00	0	0	4	8	35	29	7	2	0	0	0	0	0	85	40	43
Total	35	19	95	566	1239	1071	359	75	13	5	4	6	1	3488		
Percent	1.0%	0.5%	2.7%	16.2%	35.5%	30.7%	10.3%	2.2%	0.4%	0.1%	0.1%	0.2%	0.0%			
AM Peak	11:00	10:00	09:00	10:00	10:00	10:00	06:00	06:00	06:00	07:00	10:00	08:00		10:00		
Vol.	5	7	10	42	79	73	24	6	3	1	1	1		229		
PM Peak	14:00	16:00	15:00	15:00	14:00	13:00	20:00	18:00	12:00	15:00	13:00	14:00	13:00	16:00		
Vol.	4	3	11	52	99	89	30	8	2	2	1	2	1	242		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
03/29/09	1	0	0	6	12	22	7	1	0	0	0	0	0	49	41	44
01:00	0	0	2	4	8	12	5	0	0	0	0	0	0	31	40	43
02:00	0	0	0	6	11	8	4	0	0	1	0	0	0	30	40	43
03:00	0	0	0	2	3	3	3	0	0	0	0	0	0	11	41	42
04:00	0	0	2	2	3	2	1	1	0	0	0	0	0	11	37	45
05:00	0	0	0	4	11	8	2	1	0	0	0	0	0	26	39	42
06:00	0	0	1	10	25	34	14	3	0	0	0	0	0	87	42	45
07:00	0	0	0	12	49	42	15	6	0	0	0	0	0	124	41	45
08:00	0	1	1	20	45	54	20	5	2	0	0	1	1	150	42	46
09:00	2	1	3	29	98	54	16	4	2	0	0	1	0	210	40	44
10:00	2	2	5	23	61	53	8	3	1	0	0	0	0	158	39	42
11:00	0	1	2	27	79	68	16	3	0	0	0	0	0	196	40	43
12 PM	3	0	1	45	78	58	15	6	0	0	0	0	0	206	40	44
13:00	4	1	6	31	73	72	24	4	0	1	0	0	0	216	40	44
14:00	7	0	6	31	78	62	20	4	2	0	0	0	0	210	40	44
15:00	5	2	1	32	76	79	27	4	0	0	1	0	0	227	40	44
16:00	7	2	4	25	69	72	30	2	0	0	0	0	0	211	40	44
17:00	0	0	4	44	68	81	16	2	2	0	0	0	0	217	40	43
18:00	2	4	15	39	66	30	5	3	0	0	0	0	0	164	38	40
19:00	1	1	7	35	52	44	13	1	0	0	1	0	0	155	39	43
20:00	2	0	0	24	47	34	20	2	0	0	1	0	0	130	41	44
21:00	1	0	5	20	39	34	9	2	0	1	0	0	0	111	40	43
22:00	0	0	3	14	27	30	8	1	0	0	0	0	0	83	40	43
23:00	1	0	1	3	10	10	4	2	0	0	0	0	0	31	41	44
Total	38	15	69	488	1088	966	302	60	9	3	3	2	1	3044		
Percent	1.2%	0.5%	2.3%	16.0%	35.7%	31.7%	9.9%	2.0%	0.3%	0.1%	0.1%	0.1%	0.0%			
AM Peak	09:00	10:00	10:00	09:00	09:00	11:00	08:00	07:00	08:00	02:00		08:00	08:00	09:00		
Vol.	2	2	5	29	98	68	20	6	2	1		1	1	210		
PM Peak	14:00	18:00	18:00	12:00	12:00	17:00	16:00	12:00	14:00	13:00	15:00			15:00		
Vol.	7	4	15	45	78	81	30	6	2	1	1			227		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
03/30/09	0	0	1	3	2	5	6	1	0	0	0	0	0	18	43	45
01:00	0	0	1	6	2	6	2	0	0	0	0	0	0	17	39	41
02:00	0	0	0	0	1	3	0	0	0	0	0	0	0	4	37	38
03:00	0	0	0	2	2	4	5	1	0	0	0	0	0	14	44	45
04:00	0	0	0	5	21	20	4	2	1	0	0	0	0	53	40	44
05:00	0	1	3	14	37	63	19	**7**	**3**	0	0	0	0	147	42	47
06:00	8	4	23	46	**134**	**112**	**37**	7	0	0	**1**	**2**	0	**374**	40	44
07:00	**19**	**12**	**32**	**94**	133	65	8	3	0	**1**	0	0	0	367	37	40
08:00	1	4	21	52	83	38	16	3	0	0	1	0	0	219	39	43
09:00	3	0	5	21	67	34	12	2	0	1	0	0	0	145	39	43
10:00	0	0	1	30	59	48	19	5	0	1	0	0	0	163	41	45
11:00	4	1	7	32	76	52	14	4	2	0	0	0	0	192	40	44
12 PM	5	0	2	33	58	50	20	1	**1**	0	0	0	0	170	40	44
13:00	1	2	5	47	91	58	24	**7**	1	0	**1**	0	0	237	40	45
14:00	8	**5**	25	50	95	60	12	1	0	1	0	0	0	257	38	41
15:00	**14**	4	**38**	**74**	123	71	11	3	1	**2**	1	1	0	343	38	41
16:00	3	4	20	72	**125**	**93**	35	1	0	1	1	**2**	0	**357**	40	44
17:00	7	3	17	58	96	74	**36**	2	0	0	1	2	0	296	40	44
18:00	3	0	5	37	80	79	21	2	1	0	0	1	0	229	40	44
19:00	2	0	12	41	59	33	14	4	0	0	0	0	0	165	39	44
20:00	2	0	2	24	47	40	10	3	1	0	0	0	0	129	40	44
21:00	1	4	3	15	50	24	13	1	1	0	0	0	0	112	40	43
22:00	0	3	3	9	25	24	11	4	0	0	0	0	0	79	41	45
23:00	0	0	4	2	7	13	6	1	1	0	0	0	0	34	42	45
Total	81	47	230	767	1473	1069	355	65	13	7	6	8	0	4121		
Percent	2.0%	1.1%	5.6%	18.6%	35.7%	25.9%	8.6%	1.6%	0.3%	0.2%	0.1%	0.2%	0.0%			
AM Peak	07:00	07:00	07:00	07:00	06:00	06:00	06:00	05:00	05:00	07:00	06:00	06:00		06:00		
Vol.	19	12	32	94	134	112	37	7	3	1	1	2		374		
PM Peak	15:00	14:00	15:00	15:00	16:00	16:00	17:00	13:00	12:00	15:00	13:00	16:00		16:00		
Vol.	14	5	38	74	125	93	36	7	1	2	1	2		357		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
03/31/09	0	0	1	1	5	5	7	1	0	0	0	0	0	20	43	45
01:00	0	0	1	1	3	3	0	0	0	0	0	0	0	8	37	38
02:00	0	0	0	1	1	0	2	2	0	0	0	0	0	6	46	47
03:00	0	0	0	1	7	8	5	1	0	0	0	0	0	22	43	45
04:00	0	0	1	9	15	21	7	3	0	1	0	0	0	57	41	46
05:00	0	2	3	22	39	51	29	3	0	0	0	0	0	149	42	45
06:00	12	8	34	73	115	97	26	4	2	0	0	1	0	372	39	43
07:00	12	9	45	104	111	46	4	3	0	1	1	1	0	337	36	40
08:00	4	4	13	61	83	55	15	2	1	0	0	0	0	238	39	42
09:00	2	0	5	25	53	39	22	1	0	0	1	0	0	148	41	44
10:00	1	0	4	18	75	56	18	5	0	0	1	0	0	178	40	44
11:00	5	0	7	27	55	55	22	3	0	1	0	0	0	175	40	44
12 PM	2	1	4	29	56	67	17	4	0	0	1	0	0	181	40	44
13:00	9	2	11	25	82	75	20	8	2	0	0	0	0	234	40	45
14:00	8	3	18	81	102	41	22	1	0	0	1	1	0	278	38	43
15:00	6	5	29	70	128	87	15	2	2	0	1	0	1	346	39	42
16:00	12	9	26	108	113	77	26	6	0	1	0	1	0	379	39	43
17:00	13	1	13	49	105	78	30	5	2	0	0	2	0	298	40	44
18:00	3	1	11	42	95	55	29	2	0	0	0	0	1	239	40	44
19:00	0	1	6	33	61	39	17	2	1	0	0	0	0	160	40	44
20:00	1	0	11	32	51	43	14	1	0	0	0	0	0	153	39	43
21:00	3	1	5	11	55	37	10	3	2	1	1	0	0	129	40	46
22:00	1	1	2	10	26	21	10	1	0	0	0	0	0	72	40	44
23:00	0	0	0	5	7	13	9	1	0	0	0	0	0	35	43	44
Total	94	48	250	838	1443	1069	376	64	12	5	7	6	2	4214		
Percent	2.2%	1.1%	5.9%	19.9%	34.2%	25.4%	8.9%	1.5%	0.3%	0.1%	0.2%	0.1%	0.0%			
AM Peak	06:00	07:00	07:00	07:00	06:00	06:00	05:00	10:00	06:00	04:00	07:00	06:00		06:00		
Vol.	12	9	45	104	115	97	29	5	2	1	1	1		372		
PM Peak	17:00	16:00	15:00	16:00	15:00	15:00	17:00	13:00	13:00	16:00	12:00	17:00	15:00	16:00		
Vol.	13	9	29	108	128	87	30	8	2	1	1	2	1	379		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
04/01/09	0	0	0	3	11	3	4	0	**2**	0	0	0	0	23	43	51
01:00	0	0	0	5	6	6	1	0	0	0	0	0	0	18	38	40
02:00	0	0	1	3	2	8	2	2	0	0	0	0	0	18	44	46
03:00	0	0	0	1	4	6	3	1	0	0	0	0	0	15	42	43
04:00	0	0	1	3	11	30	9	2	0	0	0	0	0	56	42	44
05:00	3	0	9	26	47	61	21	4	2	0	0	0	0	173	41	45
06:00	11	2	30	79	**124**	74	20	4	0	1	1	0	0	**346**	39	43
07:00	**14**	**14**	**40**	**87**	119	47	12	1	1	0	0	0	0	335	37	40
08:00	1	1	26	67	81	39	13	3	0	1	1	0	0	233	38	42
09:00	0	0	12	42	61	36	11	0	0	0	0	0	0	162	39	41
10:00	5	1	4	21	58	46	23	5	1	0	1	0	0	165	41	45
11:00	4	0	5	35	56	55	27	7	1	0	0	0	0	190	41	45
12 PM	2	1	2	37	66	66	16	2	0	0	0	0	0	192	40	43
13:00	0	1	13	30	97	52	21	1	1	0	0	0	0	216	40	43
14:00	5	5	21	78	86	47	10	1	0	0	0	1	0	254	38	40
15:00	**13**	**12**	**36**	**96**	117	**73**	**24**	0	1	0	**2**	0	0	**374**	38	42
16:00	**11**	7	27	76	**125**	60	15	1	0	**2**	0	1	1	326	38	42
17:00	10	2	15	80	114	57	14	3	1	0	1	1	0	298	38	42
18:00	2	3	10	37	74	47	17	2	0	0	0	0	0	192	39	43
19:00	1	0	10	39	63	22	12	4	0	0	0	0	0	151	39	43
20:00	1	0	8	31	53	34	8	2	**2**	1	2	0	0	142	39	45
21:00	0	0	5	18	30	31	8	1	0	1	1	0	0	95	40	43
22:00	0	0	3	15	40	20	9	3	0	0	0	0	0	90	40	44
23:00	0	1	1	7	17	10	1	1	0	0	0	0	0	38	38	40
Total	83	50	279	916	1462	930	301	50	12	6	9	3	1	4102		
Percent	2.0%	1.2%	6.8%	22.3%	35.6%	22.7%	7.3%	1.2%	0.3%	0.1%	0.2%	0.1%	0.0%			
AM Peak	07:00	07:00	07:00	07:00	06:00	06:00	11:00	11:00	00:00	06:00	06:00			06:00		
Vol.	14	14	40	87	124	74	27	7	2	1	1			346		
PM Peak	15:00	15:00	15:00	15:00	16:00	15:00	15:00	19:00	20:00	16:00	15:00	14:00	16:00	15:00		
Vol.	13	12	36	96	125	73	24	4	2	2	2	1	1	374		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
04/02/09	0	0	1	1	10	12	4	0	1	0	0	0	0	29	41	44
01:00	0	0	0	2	5	5	3	0	0	0	0	0	0	15	41	42
02:00	0	0	1	0	4	1	1	0	0	0	0	0	0	7	40	41
03:00	0	0	0	1	3	7	3	0	0	0	0	0	0	14	41	42
04:00	0	0	1	5	16	15	9	3	1	0	0	0	0	50	43	46
05:00	3	1	3	20	42	65	14	2	1	1	0	0	0	152	40	44
06:00	11	8	43	75	128	71	28	4	0	0	0	0	0	368	39	43
07:00	11	11	64	120	110	29	5	4	0	1	2	0	0	357	35	39
08:00	3	4	10	59	88	62	12	2	0	0	0	1	1	242	39	42
09:00	1	2	6	38	64	39	17	1	0	0	1	0	0	169	40	43
10:00	3	0	1	18	52	52	18	9	1	0	0	0	0	154	42	46
11:00	2	1	2	19	68	65	19	1	0	0	1	0	0	178	40	43
12 PM	2	2	5	26	71	56	17	4	2	0	0	0	0	185	40	44
13:00	2	1	8	42	74	65	20	5	0	0	0	0	0	217	40	44
14:00	7	4	25	83	87	69	15	2	1	0	0	1	0	294	39	42
15:00	7	6	28	101	128	91	18	2	0	1	0	0	0	382	38	41
16:00	12	4	42	74	131	82	10	2	2	0	0	1	1	361	38	40
17:00	13	2	16	69	123	74	15	2	0	1	0	0	0	315	38	41
18:00	3	3	5	45	82	70	18	2	1	0	0	0	0	229	40	43
19:00	3	3	13	34	68	40	16	4	0	1	0	0	0	182	40	44
20:00	2	0	6	32	65	37	11	3	1	0	0	1	0	158	39	44
21:00	1	0	5	24	35	52	14	5	2	0	0	0	0	138	40	45
22:00	1	0	3	14	29	26	13	2	0	0	0	0	0	88	41	44
23:00	0	0	0	7	18	20	6	0	0	0	0	0	0	51	40	42
Total	87	52	288	909	1501	1105	306	59	13	5	4	4	2	4335		
Percent	2.0%	1.2%	6.6%	21.0%	34.6%	25.5%	7.1%	1.4%	0.3%	0.1%	0.1%	0.1%	0.0%			
AM Peak	06:00	07:00	07:00	07:00	06:00	06:00	06:00	10:00	00:00	05:00	07:00	08:00	08:00	06:00		
Vol.	11	11	64	120	128	71	28	9	1	1	2	1	1	368		
PM Peak	17:00	15:00	16:00	15:00	16:00	15:00	13:00	13:00	12:00	15:00		14:00	16:00	15:00		
Vol.	13	6	42	101	131	91	20	5	2	1		1	1	382		

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None`
Weather: Variable
ATR#/Operator: JC

ashbourne01s
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total	85th Percent	95th Percent
04/03/09	0	0	1	3	7	5	4	0	0	0	0	0	0	20	41	43
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	0	0	1	3	7	5	4	0	0	0	0	0	0	20		
Percent	0.0%	0.0%	5.0%	15.0%	35.0%	25.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak			00:00	00:00	00:00	00:00	00:00							00:00		
Vol.			1	3	7	5	4							20		
PM Peak																
Vol.																
Grand Total	561	295	1635	6039	10842	8055	2492	454	96	41	43	39	12	30604		
Percent	1.8%	1.0%	5.3%	19.7%	35.4%	26.3%	8.1%	1.5%	0.3%	0.1%	0.1%	0.1%	0.0%			

	15th Percentile :	27 MPH
	50th Percentile :	34 MPH
	85th Percentile :	40 MPH
	95th Percentile :	44 MPH
Stats	10 MPH Pace Speed :	31-40 MPH
	Number in Pace :	18897
	Percent in Pace :	61.7%
	Number of Vehicles > 55 MPH :	135
	Percent of Vehicles > 55 MPH :	0.4%
	Mean Speed(Average) :	33 MPH

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/26/09	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	0	118	23	4	4	**3**	0	**5**	**1**	**1**	0	0	0	159
11:00	**1**	**122**	**33**	**5**	**5**	1	0	3	0	0	0	0	0	**170**
12 PM	1	144	30	7	**7**	1	0	0	0	0	0	0	1	191
13:00	1	109	35	7	2	2	0	3	0	1	0	**1**	1	162
14:00	**11**	167	46	6	3	**8**	0	**10**	**1**	1	0	0	2	255
15:00	3	194	42	8	3	8	1	7	0	**4**	0	1	**4**	275
16:00	7	**242**	**49**	5	3	6	1	9	1	4	0	0	4	**331**
17:00	9	218	38	**9**	3	6	**2**	8	1	3	0	0	3	300
18:00	3	162	25	2	0	4	1	4	0	0	**1**	0	1	203
19:00	1	140	20	3	1	3	0	1	0	0	0	0	2	171
20:00	1	118	23	2	0	0	0	2	0	0	0	0	0	146
21:00	1	98	13	4	0	0	1	0	0	0	0	0	0	117
22:00	2	62	3	2	0	0	0	0	0	0	0	0	0	69
23:00	0	46	5	1	0	1	0	0	0	0	0	0	0	53
Day Total	41	1940	385	65	31	43	6	52	4	14	1	2	18	2602
Percent	1.6%	74.6%	14.8%	2.5%	1.2%	1.7%	0.2%	2.0%	0.2%	0.5%	0.0%	0.1%	0.7%	
AM Peak	11:00	11:00	11:00	11:00	11:00	10:00		10:00	10:00	10:00				11:00
Vol.	1	122	33	5	5	3		5	1	1				170
PM Peak	14:00	16:00	16:00	17:00	12:00	14:00	17:00	14:00	14:00	15:00	18:00	13:00	15:00	16:00
Vol.	11	242	49	9	7	8	2	10	1	4	1	1	4	331

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/27/09	0	17	3	0	0	1	0	0	0	0	0	0	0	21
01:00	0	11	0	0	0	0	0	0	0	0	0	0	0	11
02:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
03:00	0	9	3	0	0	0	0	0	0	0	0	0	0	12
04:00	0	34	3	1	1	0	0	1	0	0	0	0	0	40
05:00	0	116	22	3	1	0	0	5	0	0	0	0	1	148
06:00	4	178	31	**13**	6	4	**2**	**11**	**1**	**4**	0	0	0	254
07:00	**11**	**190**	**48**	13	5	**5**	2	8	1	0	0	**3**	**4**	**290**
08:00	1	158	25	6	**8**	2	0	3	0	0	0	0	1	204
09:00	0	110	33	4	6	0	0	2	0	0	0	0	2	157
10:00	2	139	26	3	4	1	0	2	0	0	0	0	0	177
11:00	3	153	31	6	7	1	0	3	0	0	0	0	0	204
12 PM	3	158	35	7	**5**	2	0	6	0	0	0	**1**	0	217
13:00	1	175	24	8	3	**5**	0	4	0	1	0	0	1	222
14:00	2	183	**55**	**9**	5	1	0	**15**	**2**	**3**	0	1	2	278
15:00	4	230	40	9	4	3	0	6	0	2	0	0	**10**	308
16:00	5	**290**	44	7	5	5	**1**	7	1	3	0	1	3	**372**
17:00	**8**	224	39	6	3	1	1	10	0	1	0	0	3	296
18:00	4	209	29	6	3	2	0	9	0	3	0	0	2	267
19:00	1	161	31	3	1	1	0	5	0	0	0	0	1	204
20:00	3	119	16	4	0	4	1	3	0	0	0	1	0	151
21:00	4	125	22	1	0	1	0	1	0	0	0	1	0	155
22:00	1	100	17	3	0	0	1	0	0	0	0	0	0	122
23:00	1	70	6	1	3	1	0	0	0	0	0	0	0	82
Day Total	58	3167	583	113	70	40	8	101	5	17	0	8	30	4200
Percent	1.4%	75.4%	13.9%	2.7%	1.7%	1.0%	0.2%	2.4%	0.1%	0.4%	0.0%	0.2%	0.7%	
AM Peak	07:00	07:00	07:00	06:00	08:00	07:00	06:00	06:00	06:00	06:00		07:00	07:00	07:00
Vol.	11	190	48	13	8	5	2	11	1	4		3	4	290
PM Peak	17:00	16:00	14:00	14:00	12:00	13:00	16:00	14:00	14:00	14:00		12:00	15:00	16:00
Vol.	8	290	55	9	5	5	1	15	2	3		1	10	372

McMahon Associates Inc.

Transportation Engineers & Planners
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Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
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ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/28/09	0	28	5	2	0	1	0	0	0	0	0	0	0	36
01:00	0	22	2	1	1	1	0	0	0	0	0	0	0	27
02:00	0	16	2	0	1	0	0	0	0	0	0	0	0	19
03:00	0	16	1	0	1	0	0	0	0	0	0	0	0	18
04:00	0	20	4	0	0	0	0	0	0	0	0	0	0	24
05:00	0	44	10	0	1	0	0	0	0	0	0	0	0	55
06:00	0	54	8	2	1	0	0	2	0	0	0	**1**	0	68
07:00	0	87	16	2	3	**4**	0	4	0	0	0	0	0	116
08:00	0	122	23	1	**4**	1	0	4	0	**1**	0	0	0	156
09:00	1	131	16	2	2	1	**1**	2	0	1	0	0	0	157
10:00	0	145	**28**	1	2	1	0	**5**	0	1	0	0	2	185
11:00	**2**	**181**	25	**4**	1	**1**	0	2	0	0	0	1	**3**	**220**
12 PM	1	174	**31**	2	2	**5**	0	1	**1**	**1**	0	0	1	219
13:00	1	172	31	**6**	1	1	0	2	0	0	0	0	1	215
14:00	0	**187**	28	5	**4**	2	0	4	0	1	0	0	1	**232**
15:00	1	160	28	5	1	0	**1**	3	0	1	**1**	0	**2**	203
16:00	2	173	20	1	2	1	0	**6**	0	0	1	0	0	206
17:00	2	173	20	5	3	2	0	5	1	0	0	0	1	212
18:00	**3**	175	22	3	1	0	0	2	0	0	0	0	0	206
19:00	0	139	20	3	1	0	0	3	0	0	0	0	0	166
20:00	0	126	14	3	0	0	0	1	0	0	0	0	0	144
21:00	1	117	14	3	2	0	0	1	0	0	0	0	0	138
22:00	0	84	10	4	1	1	0	2	0	0	0	0	0	102
23:00	0	75	16	2	1	0	0	2	0	0	0	0	0	96
Day Total	14	2621	394	57	36	22	2	51	2	6	2	2	11	3220
Percent	0.4%	81.4%	12.2%	1.8%	1.1%	0.7%	0.1%	1.6%	0.1%	0.2%	0.1%	0.1%	0.3%	
AM Peak	11:00	11:00	10:00	11:00	08:00	07:00	09:00	10:00		08:00		06:00	11:00	11:00
Vol.	2	181	28	4	4	4	1	5		1		1	3	220
PM Peak	18:00	14:00	12:00	13:00	14:00	12:00	15:00	16:00	12:00	12:00	15:00		15:00	14:00
Vol.	3	187	31	6	4	5	1	6	1	1	1		2	232

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
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ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/29/09	0	34	3	1	0	0	0	0	0	0	0	0	0	38
01:00	0	23	4	2	1	0	0	0	0	0	0	0	0	30
02:00	0	22	0	0	0	0	0	0	0	0	0	0	0	22
03:00	0	9	3	0	0	0	0	0	0	0	0	0	0	12
04:00	0	14	2	0	0	0	0	0	0	0	0	0	0	16
05:00	0	35	3	1	0	0	0	0	0	0	0	0	0	39
06:00	1	29	3	2	**2**	0	0	0	0	0	0	0	0	37
07:00	0	48	3	2	0	0	0	1	0	0	0	0	0	54
08:00	0	95	11	2	0	0	0	2	0	**2**	0	0	0	112
09:00	0	148	**30**	3	0	0	**1**	3	0	0	0	**1**	**1**	187
10:00	1	120	19	1	1	**1**	0	**5**	0	2	0	0	0	150
11:00	**2**	**157**	21	**5**	0	1	0	1	**1**	0	0	0	0	**188**
12 PM	1	178	16	4	2	2	0	4	0	**1**	0	**1**	**1**	210
13:00	**5**	**184**	20	3	1	2	0	1	0	1	0	1	1	**219**
14:00	1	162	**31**	4	2	1	0	2	0	0	**1**	0	0	204
15:00	2	141	22	4	1	0	**1**	1	0	0	0	1	0	173
16:00	3	180	20	3	**3**	**3**	0	4	0	1	0	0	1	218
17:00	1	146	21	2	1	0	1	4	0	1	0	1	0	178
18:00	1	136	22	2	0	2	0	3	0	0	0	0	1	167
19:00	3	152	18	3	0	1	0	1	0	0	0	0	0	178
20:00	1	100	12	3	1	0	0	0	0	0	0	0	0	117
21:00	1	86	8	3	1	0	0	1	0	0	0	0	0	100
22:00	0	57	4	1	1	0	1	0	0	0	0	0	1	65
23:00	1	35	6	1	0	0	0	0	0	0	0	0	0	43
Day Total	24	2291	302	52	17	13	4	33	1	8	1	5	6	2757
Percent	0.9%	83.1%	11.0%	1.9%	0.6%	0.5%	0.1%	1.2%	0.0%	0.3%	0.0%	0.2%	0.2%	
AM Peak	11:00	11:00	09:00	11:00	06:00	10:00	09:00	10:00	11:00	08:00		09:00	09:00	11:00
Vol.	2	157	30	5	2	1	1	5	1	2		1	1	188
PM Peak	13:00	13:00	14:00	12:00	16:00	16:00	15:00	12:00		12:00	14:00	12:00	12:00	13:00
Vol.	5	184	31	4	3	3	1	4		1	1	1	1	219

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/30/09	0	15	4	1	0	0	0	0	0	0	0	0	0	20
01:00	0	7	0	2	1	0	0	0	0	0	0	0	0	10
02:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
03:00	0	15	2	0	0	0	0	0	0	0	0	0	0	17
04:00	0	34	6	1	1	0	0	0	0	0	0	0	0	42
05:00	0	131	16	7	0	0	0	4	0	0	0	0	0	158
06:00	2	177	25	**19**	5	2	**2**	6	0	0	0	0	2	240
07:00	**4**	**228**	**40**	13	5	2	1	**12**	**2**	**1**	0	**2**	**3**	**313**
08:00	3	130	30	7	**6**	3	1	6	0	1	0	1	3	191
09:00	2	127	32	5	3	3	0	1	0	0	0	0	0	173
10:00	2	125	18	3	3	**5**	0	7	0	0	0	0	0	163
11:00	2	117	21	3	5	2	2	2	0	0	0	0	0	154
12 PM	2	118	25	5	3	**4**	0	3	0	0	0	0	0	160
13:00	3	160	33	9	3	2	**3**	4	0	**2**	0	0	1	220
14:00	4	180	37	**11**	3	3	2	**13**	0	0	0	1	**8**	262
15:00	1	183	40	6	**5**	1	0	10	0	2	0	1	4	253
16:00	**7**	**269**	**49**	4	3	3	1	10	0	1	0	**2**	2	**351**
17:00	6	223	34	3	3	1	1	8	**1**	2	0	0	2	284
18:00	3	166	25	4	3	3	0	5	1	0	0	0	0	210
19:00	2	124	15	3	0	0	0	0	0	0	0	0	1	145
20:00	1	105	18	3	1	0	0	0	0	0	0	0	1	129
21:00	0	98	12	2	0	0	0	0	0	0	0	0	1	113
22:00	0	69	5	3	0	0	0	0	0	0	0	0	0	77
23:00	0	26	5	2	1	0	0	1	0	0	0	0	0	35
Day Total	44	2832	492	116	54	34	13	92	4	9	0	7	28	3725
Percent	1.2%	76.0%	13.2%	3.1%	1.4%	0.9%	0.3%	2.5%	0.1%	0.2%	0.0%	0.2%	0.8%	
AM Peak	07:00	07:00	07:00	06:00	08:00	10:00	06:00	07:00	07:00	07:00		07:00	07:00	07:00
Vol.	4	228	40	19	6	5	2	12	2	1		2	3	313
PM Peak	16:00	16:00	16:00	14:00	15:00	12:00	13:00	14:00	17:00	13:00		16:00	14:00	16:00
Vol.	7	269	49	11	5	4	3	13	1	2		2	8	351

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/31/09	1	9	2	2	0	0	0	0	0	0	0	0	0	14
01:00	0	16	2	1	0	0	0	0	0	0	0	0	0	19
02:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
03:00	0	15	4	0	0	0	0	0	0	0	0	0	0	19
04:00	0	44	8	1	0	0	0	0	0	0	0	0	0	53
05:00	1	127	19	5	0	1	0	2	0	1	0	0	1	157
06:00	**5**	198	38	**14**	5	**5**	0	5	**1**	**3**	0	0	**6**	280
07:00	4	**221**	**42**	7	4	4	0	**10**	1	1	0	**1**	6	**301**
08:00	1	140	28	5	5	4	0	4	1	0	**1**	1	0	190
09:00	2	126	20	4	1	2	0	3	0	1	0	1	0	160
10:00	0	118	33	3	3	0	0	2	0	0	0	1	0	160
11:00	0	132	38	5	**8**	1	**1**	1	0	0	0	0	1	187
12 PM	1	127	28	4	3	4	0	1	0	0	0	0	0	168
13:00	1	133	27	6	2	5	0	4	1	1	0	0	1	181
14:00	**7**	197	35	7	**5**	3	**1**	8	1	0	0	1	7	272
15:00	3	173	**45**	**10**	4	3	1	**17**	1	**2**	0	**2**	4	265
16:00	4	**266**	42	9	5	**8**	0	12	1	1	0	1	4	**353**
17:00	5	231	42	9	5	2	0	9	**2**	0	0	2	2	309
18:00	3	170	32	3	1	1	0	2	0	0	0	2	1	215
19:00	1	145	22	3	1	0	0	1	0	0	0	1	0	174
20:00	2	121	19	5	0	2	0	2	0	1	0	0	0	152
21:00	1	99	12	3	1	0	0	1	0	0	0	0	1	118
22:00	1	70	6	2	0	0	0	0	0	1	0	0	1	81
23:00	0	36	5	2	0	0	0	0	0	0	0	0	0	43
Day Total	43	2919	551	110	53	45	3	84	9	12	1	13	35	3878
Percent	1.1%	75.3%	14.2%	2.8%	1.4%	1.2%	0.1%	2.2%	0.2%	0.3%	0.0%	0.3%	0.9%	
AM Peak	06:00	07:00	07:00	06:00	11:00	06:00	11:00	07:00	06:00	06:00	08:00	07:00	06:00	07:00
Vol.	5	221	42	14	8	5	1	10	1	3	1	1	6	301
PM Peak	14:00	16:00	15:00	15:00	14:00	16:00	14:00	15:00	17:00	15:00		15:00	14:00	16:00
Vol.	7	266	45	10	5	8	1	17	2	2		2	7	353

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/01/09	0	19	4	2	0	2	0	0	0	0	0	0	0	27
01:00	0	17	1	1	0	0	0	0	0	0	0	0	0	19
02:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
03:00	1	8	3	0	0	0	0	0	0	0	0	0	0	12
04:00	0	36	8	1	1	0	0	0	0	0	0	0	0	46
05:00	1	132	18	5	1	0	0	1	0	0	0	0	0	158
06:00	4	**202**	33	**15**	**7**	1	0	**8**	0	**3**	0	1	3	**277**
07:00	**6**	196	**35**	9	6	3	0	6	**1**	3	0	**2**	**5**	272
08:00	3	124	32	6	6	3	0	7	0	1	0	0	0	182
09:00	2	117	24	8	5	1	0	4	1	0	0	0	0	162
10:00	3	105	26	2	5	2	**1**	1	0	0	0	1	0	146
11:00	2	128	19	3	3	1	0	0	0	0	0	0	0	156
12 PM	1	147	38	5	5	2	0	2	**2**	0	**1**	0	0	203
13:00	1	146	21	7	3	4	0	5	0	0	0	0	2	189
14:00	5	192	**53**	**12**	**7**	8	**4**	8	0	**4**	0	0	**3**	296
15:00	**6**	211	44	8	5	4	1	7	0	2	0	0	3	291
16:00	5	**238**	36	9	3	**9**	2	**9**	1	4	0	**1**	3	**320**
17:00	1	213	31	7	3	5	0	8	0	2	0	0	2	272
18:00	1	152	33	4	2	1	0	5	0	0	0	1	2	201
19:00	0	142	24	2	1	1	0	2	1	0	0	0	0	173
20:00	0	140	20	3	0	1	1	0	0	0	0	0	0	165
21:00	0	111	11	4	0	2	1	3	0	2	0	0	0	134
22:00	1	64	10	2	0	0	0	1	0	0	0	0	0	78
23:00	1	31	2	2	0	0	0	0	0	0	0	0	0	36
Day Total	44	2880	528	117	63	50	10	77	6	21	1	6	23	3826
Percent	1.2%	75.3%	13.8%	3.1%	1.6%	1.3%	0.3%	2.0%	0.2%	0.5%	0.0%	0.2%	0.6%	
AM Peak	07:00	06:00	07:00	06:00	06:00	07:00	10:00	06:00	07:00	06:00		07:00	07:00	06:00
Vol.	6	202	35	15	7	3	1	8	1	3		2	5	277
PM Peak	15:00	16:00	14:00	14:00	14:00	16:00	14:00	16:00	12:00	14:00	12:00	16:00	14:00	16:00
Vol.	6	238	53	12	7	9	4	9	2	4	1	1	3	320

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/02/09	0	13	0	2	0	0	0	0	0	0	0	0	0	15
01:00	1	7	1	1	0	0	0	0	0	0	0	0	0	10
02:00	0	10	1	0	1	1	0	0	0	0	0	0	0	13
03:00	0	14	2	0	0	0	0	0	0	0	0	0	0	16
04:00	1	43	9	2	2	0	0	0	0	0	0	0	0	57
05:00	1	125	14	4	1	1	0	2	0	0	0	0	1	149
06:00	**5**	185	31	**14**	5	3	0	**7**	0	**2**	0	1	**5**	258
07:00	4	**218**	**38**	13	4	**6**	**2**	4	0	2	0	**2**	4	**297**
08:00	2	174	38	6	**6**	3	0	6	0	1	0	1	0	237
09:00	2	102	31	5	1	4	0	5	0	0	0	0	0	150
10:00	2	127	27	3	5	2	0	1	0	0	0	0	1	168
11:00	0	146	27	5	3	1	0	4	0	0	0	0	0	186
12 PM	2	158	33	5	**9**	2	0	8	**2**	0	0	**1**	0	220
13:00	3	139	27	6	4	**4**	1	4	1	2	0	1	1	193
14:00	2	203	43	10	5	4	**3**	**16**	0	0	0	0	3	289
15:00	2	215	37	**11**	2	2	0	15	0	**4**	0	1	6	295
16:00	**5**	**280**	**49**	3	5	1	0	13	0	0	0	1	**9**	**366**
17:00	3	230	35	8	3	2	0	5	0	3	0	1	0	290
18:00	2	170	22	3	3	0	0	5	0	2	0	1	0	208
19:00	1	151	27	1	1	1	0	2	0	0	0	0	1	185
20:00	2	123	14	3	0	1	0	2	0	0	0	0	0	145
21:00	1	106	13	3	0	0	0	3	0	0	0	0	0	126
22:00	1	79	9	3	0	0	0	0	0	0	0	0	0	92
23:00	0	31	9	2	0	0	0	0	0	0	0	0	0	42
Day Total	42	3049	537	113	60	38	6	102	3	16	0	10	31	4007
Percent	1.0%	76.1%	13.4%	2.8%	1.5%	0.9%	0.1%	2.5%	0.1%	0.4%	0.0%	0.2%	0.8%	
AM Peak	06:00	07:00	07:00	06:00	08:00	07:00	07:00	06:00		06:00		07:00	06:00	07:00
Vol.	5	218	38	14	6	6	2	7		2		2	5	297
PM Peak	16:00	16:00	16:00	15:00	12:00	13:00	14:00	14:00	12:00	15:00		12:00	16:00	16:00
Vol.	5	280	49	11	9	4	3	16	2	4		1	9	366

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/03/09	0	**25**	**3**	**2**	0	0	0	0	0	0	0	0	0	**30**
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Day Total	0	25	3	2	0	0	0	0	0	0	0	0	0	30
Percent	0.0%	83.3%	10.0%	6.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		00:00	00:00	00:00										00:00
Vol.		25	3	2										30
PM Peak														
Vol.														
Grand Total	310	21724	3775	745	384	285	52	592	34	103	6	53	182	28245
Percent	1.1%	76.9%	13.4%	2.6%	1.4%	1.0%	0.2%	2.1%	0.1%	0.4%	0.0%	0.2%	0.6%	

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/26/09	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	0	**119**	32	3	**5**	0	**1**	1	**1**	0	0	0	0	162
11:00	0	117	**41**	**7**	4	0	0	**4**	0	0	0	0	0	**173**
12 PM	0	143	40	7	**9**	1	0	7	**1**	0	0	0	0	208
13:00	0	170	46	10	7	1	0	4	0	0	0	0	2	240
14:00	0	209	**53**	**16**	6	0	0	8	0	2	0	**1**	4	299
15:00	**2**	**241**	52	11	5	0	0	11	1	1	0	1	2	**327**
16:00	2	233	44	11	3	**2**	**1**	**15**	0	**5**	0	1	**8**	325
17:00	1	233	36	3	2	0	0	7	0	0	0	1	1	284
18:00	1	178	37	5	3	1	0	7	0	2	0	1	0	235
19:00	0	128	18	4	2	0	0	2	0	0	0	0	1	155
20:00	0	101	17	3	1	0	0	1	0	1	0	0	0	124
21:00	0	99	21	4	1	0	0	2	0	0	0	0	1	128
22:00	0	59	17	3	1	0	0	1	0	0	0	0	0	81
23:00	0	30	7	2	0	0	0	0	0	0	0	0	0	39
Day Total	6	2060	461	89	49	5	2	70	3	11	0	5	19	2780
Percent	0.2%	74.1%	16.6%	3.2%	1.8%	0.2%	0.1%	2.5%	0.1%	0.4%	0.0%	0.2%	0.7%	
AM Peak		10:00	11:00	11:00	10:00		10:00	11:00	10:00					11:00
Vol.		119	41	7	5		1	4	1					173
PM Peak	15:00	15:00	14:00	14:00	12:00	16:00	16:00	16:00	12:00	16:00		14:00	16:00	15:00
Vol.	2	241	53	16	9	2	1	15	1	5		1	8	327

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/27/09	0	23	3	1	0	0	0	0	0	0	0	0	0	27
01:00	0	13	2	1	0	0	0	0	0	0	0	0	0	16
02:00	0	5	4	0	2	0	0	0	0	0	0	0	0	11
03:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
04:00	0	40	12	1	0	0	0	1	0	0	0	0	0	54
05:00	0	96	35	6	3	0	0	7	**1**	0	0	**1**	0	149
06:00	**3**	**275**	**56**	**13**	**14**	0	1	13	0	1	0	0	4	**380**
07:00	3	232	47	13	12	0	**2**	**15**	1	1	0	0	**6**	332
08:00	3	163	44	11	6	0	1	9	0	**2**	0	0	0	239
09:00	0	127	28	4	4	0	0	8	0	0	0	0	0	171
10:00	0	130	35	3	3	0	0	4	0	0	0	0	0	175
11:00	1	132	34	9	3	0	0	2	0	1	0	1	0	183
12 PM	1	165	32	5	5	**1**	0	8	0	0	0	0	0	217
13:00	1	178	38	**17**	**8**	0	1	8	**1**	0	0	0	2	254
14:00	3	242	37	11	3	0	2	8	0	2	0	**2**	**5**	315
15:00	**5**	219	**64**	7	5	1	1	7	0	1	0	0	3	313
16:00	3	**275**	49	11	4	0	0	17	0	**3**	0	1	3	**366**
17:00	0	237	35	11	2	0	0	**21**	0	2	**1**	1	2	312
18:00	1	176	40	3	2	0	**3**	7	0	0	0	1	0	233
19:00	1	157	32	3	2	0	0	2	0	0	0	1	0	198
20:00	1	160	25	1	2	0	0	0	0	0	0	0	0	189
21:00	0	117	25	2	1	0	0	3	1	1	0	0	0	150
22:00	0	90	19	3	0	0	0	1	0	0	0	0	0	113
23:00	0	71	12	2	0	0	0	0	0	0	0	0	0	85
Day Total	26	3336	711	138	81	2	11	141	4	14	1	8	25	4498
Percent	0.6%	74.2%	15.8%	3.1%	1.8%	0.0%	0.2%	3.1%	0.1%	0.3%	0.0%	0.2%	0.6%	
AM Peak	06:00	06:00	06:00	06:00	06:00		07:00	07:00	05:00	08:00		05:00	07:00	06:00
Vol.	3	275	56	13	14		2	15	1	2		1	6	380
PM Peak	15:00	16:00	15:00	13:00	13:00	12:00	18:00	17:00	13:00	16:00	17:00	14:00	14:00	16:00
Vol.	5	275	64	17	8	1	3	21	1	3	1	2	5	366

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/28/09	0	33	8	1	0	0	0	0	0	0	0	0	0	42
01:00	0	26	7	1	0	0	0	0	0	0	0	0	0	34
02:00	0	23	4	0	1	0	0	1	0	0	0	0	0	29
03:00	0	15	6	0	0	0	0	0	0	0	0	0	0	21
04:00	0	15	2	0	3	0	0	1	0	0	0	0	0	21
05:00	0	50	13	2	2	0	0	0	0	0	0	0	0	67
06:00	0	88	21	2	2	0	1	0	0	0	0	0	0	114
07:00	0	110	25	4	1	0	0	1	**1**	0	0	0	0	142
08:00	0	140	31	2	1	0	**2**	4	0	0	0	0	0	180
09:00	0	146	31	**5**	**6**	0	0	3	0	0	0	0	0	191
10:00	**2**	**168**	**36**	4	5	0	0	**13**	0	0	**1**	0	**1**	**230**
11:00	0	140	30	4	5	0	0	4	1	0	1	0	1	186
12 PM	0	176	28	4	4	0	**1**	4	0	0	0	0	0	217
13:00	0	173	**41**	3	**5**	**1**	1	7	0	0	0	**1**	**1**	233
14:00	**2**	**194**	26	3	4	0	0	8	0	0	0	0	1	238
15:00	0	181	33	3	4	0	1	**10**	0	**1**	0	1	1	235
16:00	0	193	38	5	2	0	0	5	0	0	0	0	0	**243**
17:00	1	145	27	**6**	0	1	1	5	0	1	0	0	0	187
18:00	1	149	19	4	2	0	1	8	0	0	0	0	0	184
19:00	0	140	14	3	2	0	0	3	0	0	0	0	0	162
20:00	0	135	20	4	2	0	0	6	**1**	0	0	0	0	168
21:00	0	117	20	4	1	0	0	5	0	0	0	1	1	149
22:00	0	106	20	2	0	0	0	3	0	0	0	0	0	131
23:00	0	70	11	3	0	0	0	1	0	0	0	0	0	85
Day Total	6	2733	511	69	52	2	8	92	3	2	2	3	6	3489
Percent	0.2%	78.3%	14.6%	2.0%	1.5%	0.1%	0.2%	2.6%	0.1%	0.1%	0.1%	0.1%	0.2%	
AM Peak	10:00	10:00	10:00	09:00	09:00		08:00	10:00	07:00		10:00		10:00	10:00
Vol.	2	168	36	5	6		2	13	1		1		1	230
PM Peak	14:00	14:00	13:00	17:00	13:00	13:00	12:00	15:00	20:00	15:00		13:00	13:00	16:00
Vol.	2	194	41	6	5	1	1	10	1	1		1	1	243

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/29/09	0	37	10	1	1	0	0	0	0	0	0	0	0	49
01:00	0	28	2	1	0	0	0	0	0	0	0	0	0	31
02:00	0	27	2	0	0	0	0	1	0	0	0	0	0	30
03:00	0	8	3	0	0	0	0	0	0	0	0	0	0	11
04:00	0	8	3	0	0	0	0	0	0	0	0	0	0	11
05:00	0	17	7	1	0	0	0	1	0	0	0	0	0	26
06:00	**1**	69	14	2	1	0	0	1	0	0	0	0	0	88
07:00	0	99	21	2	1	0	0	0	0	0	0	0	0	123
08:00	0	124	19	3	1	0	0	1	**1**	0	0	0	0	149
09:00	0	**166**	34	2	1	0	0	4	0	0	0	0	**1**	**208**
10:00	0	121	23	3	**3**	0	0	**7**	0	0	0	0	1	158
11:00	0	146	**42**	**5**	0	0	0	4	0	**1**	0	0	0	198
12 PM	0	167	25	**5**	**3**	0	0	5	0	0	0	0	0	205
13:00	0	173	31	2	2	0	0	**9**	0	0	0	0	0	217
14:00	0	172	27	3	1	0	**2**	4	0	**2**	0	0	**2**	213
15:00	**3**	167	**43**	4	3	0	0	7	0	1	0	**1**	0	**229**
16:00	1	**174**	29	1	1	0	0	4	0	0	0	1	0	211
17:00	0	167	38	3	0	0	0	9	0	0	0	0	0	217
18:00	0	141	16	2	1	0	0	2	0	2	0	1	0	165
19:00	0	127	19	4	2	0	1	2	0	0	0	0	0	155
20:00	0	104	23	3	0	0	0	0	0	0	0	0	0	130
21:00	1	87	16	4	1	0	0	1	0	0	0	0	0	110
22:00	0	67	12	3	0	**1**	0	0	0	0	0	0	0	83
23:00	0	25	6	0	0	0	0	0	0	0	0	0	0	31
Day Total	6	2421	465	54	22	1	3	62	1	6	0	3	4	3048
Percent	0.2%	79.4%	15.3%	1.8%	0.7%	0.0%	0.1%	2.0%	0.0%	0.2%	0.0%	0.1%	0.1%	
AM Peak	06:00	09:00	11:00	11:00	10:00			10:00	08:00	11:00			09:00	09:00
Vol.	1	166	42	5	3			7	1	1			1	208
PM Peak	15:00	16:00	15:00	12:00	12:00	22:00	14:00	13:00		14:00		15:00	14:00	15:00
Vol.	3	174	43	5	3	1	2	9		2		1	2	229

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/30/09	0	15	2	1	0	0	0	0	0	0	0	0	0	18
01:00	0	9	6	2	0	0	0	0	0	0	0	0	0	17
02:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
03:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
04:00	0	42	9	1	1	0	0	0	0	0	0	0	0	53
05:00	0	105	33	5	3	0	0	1	0	0	0	0	0	147
06:00	2	**280**	**52**	10	**11**	0	0	14	**1**	0	0	**1**	2	**373**
07:00	**4**	261	49	**15**	11	0	**1**	**16**	1	0	0	1	**5**	364
08:00	1	161	28	8	11	0	0	6	0	**1**	0	1	2	219
09:00	0	94	37	6	6	**1**	0	3	0	0	0	0	0	147
10:00	0	115	31	3	4	1	1	6	0	1	0	0	0	162
11:00	0	155	21	4	4	0	1	7	0	0	0	0	1	193
12 PM	0	129	24	5	6	0	0	4	0	1	0	0	1	170
13:00	0	169	37	9	**11**	0	**2**	6	0	2	0	0	1	237
14:00	0	187	41	11	3	**1**	0	10	0	0	0	0	3	256
15:00	1	241	**54**	**12**	8	0	2	11	**2**	**3**	0	1	**6**	341
16:00	1	**282**	48	6	3	0	0	**12**	0	0	0	1	5	**358**
17:00	**2**	229	40	4	2	0	2	12	0	1	**1**	1	1	295
18:00	1	177	35	3	2	0	0	7	0	1	0	0	1	227
19:00	0	136	19	4	2	0	0	3	0	0	0	0	0	164
20:00	0	108	17	2	0	0	0	2	0	0	0	0	0	129
21:00	0	86	17	4	0	0	0	4	0	0	0	**2**	0	113
22:00	0	64	11	3	0	0	0	1	0	0	0	0	0	79
23:00	0	26	6	2	0	0	0	0	0	0	0	0	0	34
Day Total	12	3086	620	120	88	3	9	125	4	10	1	8	28	4114
Percent	0.3%	75.0%	15.1%	2.9%	2.1%	0.1%	0.2%	3.0%	0.1%	0.2%	0.0%	0.2%	0.7%	
AM Peak	07:00	06:00	06:00	07:00	06:00	09:00	07:00	07:00	06:00	08:00		06:00	07:00	06:00
Vol.	4	280	52	15	11	1	1	16	1	1		1	5	373
PM Peak	17:00	16:00	15:00	15:00	13:00	14:00	13:00	16:00	15:00	15:00	17:00	21:00	15:00	16:00
Vol.	2	282	54	12	11	1	2	12	2	3	1	2	6	358

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/31/09	0	14	5	1	0	0	0	0	0	0	0	0	0	20
01:00	0	6	1	1	0	0	0	0	0	0	0	0	0	8
02:00	0	3	2	0	1	0	0	0	0	0	0	0	0	6
03:00	0	14	8	0	0	0	0	0	0	0	0	0	0	22
04:00	0	46	10	1	1	0	0	0	0	0	0	0	0	58
05:00	0	97	37	4	7	0	1	3	0	0	0	0	0	149
06:00	1	**274**	**52**	**12**	9	0	1	14	**1**	**3**	0	**1**	2	**370**
07:00	**2**	245	42	12	**13**	0	0	**18**	1	1	0	0	**4**	338
08:00	1	168	39	7	11	0	1	8	0	2	0	0	0	237
09:00	0	106	31	5	1	1	0	1	1	1	0	0	0	147
10:00	0	131	37	3	3	0	0	3	0	1	0	0	0	178
11:00	0	125	33	5	3	**2**	0	7	0	0	0	0	0	175
12 PM	0	118	43	6	8	0	1	3	1	0	0	1	0	181
13:00	1	167	48	8	5	0	1	3	0	0	0	0	1	234
14:00	3	191	47	**15**	6	**1**	0	10	**2**	2	0	0	4	281
15:00	1	251	55	6	**9**	0	**2**	16	0	2	0	1	**5**	348
16:00	**4**	**265**	**58**	7	8	1	2	**23**	1	3	0	**2**	5	**379**
17:00	3	233	31	6	3	0	0	12	0	**5**	0	2	2	297
18:00	0	176	44	5	2	0	0	10	0	2	0	0	2	241
19:00	0	124	27	4	2	0	1	3	0	0	0	1	0	162
20:00	0	126	22	3	1	0	0	1	0	0	0	0	0	153
21:00	0	98	25	3	2	0	0	0	0	0	0	0	1	129
22:00	0	55	12	3	0	0	0	2	0	0	0	0	0	72
23:00	0	27	6	2	0	0	0	0	0	0	0	0	0	35
Day Total	16	3060	715	119	95	5	10	137	7	22	0	8	26	4220
Percent	0.4%	72.5%	16.9%	2.8%	2.3%	0.1%	0.2%	3.2%	0.2%	0.5%	0.0%	0.2%	0.6%	
AM Peak	07:00	06:00	06:00	06:00	07:00	11:00	05:00	07:00	06:00	06:00		06:00	07:00	06:00
Vol.	2	274	52	12	13	2	1	18	1	3		1	4	370
PM Peak	16:00	16:00	16:00	14:00	15:00	14:00	15:00	16:00	14:00	17:00		16:00	15:00	16:00
Vol.	4	265	58	15	9	1	2	23	2	5		2	5	379

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/01/09	0	16	5	1	1	0	0	0	0	0	0	0	0	23
01:00	0	14	3	1	0	0	0	0	0	0	0	0	0	18
02:00	0	13	5	0	0	0	0	0	0	0	0	0	0	18
03:00	0	11	4	0	0	0	0	0	0	0	0	0	0	15
04:00	0	44	9	1	2	0	0	0	0	0	0	0	0	56
05:00	1	117	45	4	4	0	0	2	0	0	0	0	1	174
06:00	**5**	**239**	**50**	**15**	9	1	**1**	**15**	**1**	**7**	0	0	3	**346**
07:00	1	239	45	10	**11**	**2**	1	13	1	2	0	0	**9**	334
08:00	0	163	44	9	6	0	0	7	0	3	0	**1**	1	234
09:00	0	109	37	6	8	0	0	2	0	0	0	0	0	162
10:00	0	122	31	3	5	0	0	4	0	1	0	0	1	167
11:00	1	135	40	5	10	0	0	1	0	0	0	0	0	192
12 PM	0	138	28	7	**13**	0	1	4	0	0	0	1	0	192
13:00	0	154	34	10	8	0	0	11	0	0	0	0	0	217
14:00	2	175	43	**17**	5	**1**	2	7	0	1	0	0	2	255
15:00	**3**	**274**	**59**	6	5	1	**3**	**16**	**1**	0	0	2	5	**375**
16:00	2	251	36	10	4	0	1	11	0	**2**	0	**4**	4	325
17:00	1	230	47	3	4	0	0	7	1	0	0	0	**6**	299
18:00	0	141	38	3	1	0	0	8	0	0	0	1	0	192
19:00	0	123	20	4	0	0	0	4	0	0	0	0	0	151
20:00	0	110	25	3	1	0	1	1	0	0	0	0	0	141
21:00	0	76	16	2	0	0	0	1	0	0	0	0	0	95
22:00	0	75	12	3	0	0	0	0	0	0	0	0	0	90
23:00	0	33	3	2	0	0	0	1	0	0	0	0	0	39
Day Total	16	3002	679	125	97	5	10	115	4	16	0	9	32	4110
Percent	0.4%	73.0%	16.5%	3.0%	2.4%	0.1%	0.2%	2.8%	0.1%	0.4%	0.0%	0.2%	0.8%	
AM Peak	06:00	06:00	06:00	06:00	07:00	07:00	06:00	06:00	06:00	06:00		08:00	07:00	06:00
Vol.	5	239	50	15	11	2	1	15	1	7		1	9	346
PM Peak	15:00	15:00	15:00	14:00	12:00	14:00	15:00	15:00	15:00	16:00		16:00	17:00	15:00
Vol.	3	274	59	17	13	1	3	16	1	2		4	6	375

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/02/09	0	25	3	1	0	0	0	0	0	0	0	0	0	29
01:00	0	11	2	1	0	0	0	1	0	0	0	0	0	15
02:00	0	4	3	0	0	0	0	0	0	0	0	0	0	7
03:00	0	9	5	0	0	0	0	0	0	0	0	0	0	14
04:00	0	39	8	1	3	0	0	0	0	0	0	0	0	51
05:00	0	105	34	5	3	0	0	5	0	0	0	0	0	152
06:00	**3**	**260**	55	**12**	**14**	0	2	**9**	**2**	1	0	**1**	**9**	**368**
07:00	2	255	**57**	9	13	**1**	**3**	9	0	**2**	0	0	5	356
08:00	1	160	52	12	11	1	0	5	0	2	0	0	1	245
09:00	1	119	35	5	1	0	2	4	0	0	0	0	1	168
10:00	0	105	36	3	7	0	0	2	0	0	0	0	0	153
11:00	1	134	28	3	6	1	0	2	0	2	0	0	0	177
12 PM	1	121	40	7	**10**	0	0	4	0	0	0	0	1	184
13:00	0	155	42	8	3	0	1	6	0	0	0	0	3	218
14:00	0	211	39	**17**	8	**1**	0	**18**	0	0	0	1	0	295
15:00	2	**280**	**65**	8	7	0	**3**	14	0	0	0	0	3	**382**
16:00	**4**	261	55	13	8	0	2	11	0	1	**1**	**3**	2	361
17:00	0	247	39	7	3	0	1	7	0	**2**	0	1	**7**	314
18:00	1	170	45	2	4	0	0	6	0	1	0	1	0	230
19:00	0	142	28	3	3	0	0	5	0	0	0	1	0	182
20:00	0	125	24	4	0	0	0	4	0	0	0	0	0	157
21:00	0	106	24	3	2	0	1	2	0	0	0	0	0	138
22:00	0	70	14	3	0	0	0	1	0	0	0	0	0	88
23:00	0	40	9	1	0	0	0	1	0	0	0	0	0	51
Day Total	16	3154	742	128	106	4	15	116	2	11	1	8	32	4335
Percent	0.4%	72.8%	17.1%	3.0%	2.4%	0.1%	0.3%	2.7%	0.0%	0.3%	0.0%	0.2%	0.7%	
AM Peak	06:00	06:00	07:00	06:00	06:00	07:00	07:00	06:00	06:00	07:00		06:00	06:00	06:00
Vol.	3	260	57	12	14	1	3	9	2	2		1	9	368
PM Peak	16:00	15:00	15:00	14:00	12:00	14:00	15:00	14:00		17:00	16:00	16:00	17:00	15:00
Vol.	4	280	65	17	10	1	3	18		2	1	3	7	382

McMahon Associates Inc.

Transportation Engineers & Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Comments: None
Weather: Variable
ATR#/Operator: JC

ashbourne01c
Site Code: 00000000000000000002
Station ID: 00000000000000000000
Ashbourne Road south of
Oak Lane
Date Start: 26-Mar-09

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
04/03/09	0	**17**	**2**	**1**	0	0	0	0	0	0	0	0	0	**20**
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Day Total	0	17	2	1	0	0	0	0	0	0	0	0	0	20
Percent	0.0%	85.0%	10.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		00:00	00:00	00:00										00:00
Vol.		17	2	1										20
PM Peak														
Vol.														
Grand Total	104	22869	4906	843	590	27	68	858	28	92	5	52	172	30614
Percent	0.3%	74.7%	16.0%	2.8%	1.9%	0.1%	0.2%	2.8%	0.1%	0.3%	0.0%	0.2%	0.6%	

APPENDIX C

Manual Turning Movement (MTM) Counts

McMahon Associates Inc.
Transportation Engineers & Planners

425 Commerce Drive, Suite 200
Ft. Washington, PA 19034

Municipality: Cheltenham Township
Location: New Second Street & Ashbourne Road
Counter/ Board #: TD

File Name : ashbourne01w
Site Code : 80901501
Start Date : 2/24/2009
Page No : 1

Groups Printed- Unshifted

	New Second St Southbound				Ashbourne Rd Westbound				New Second St Northbound				Ashbourne Rd Eastbound						
Start Time	Left	Thru	Right	HV	Left	Thru	Right	HV	Left	Thru	Right	HV	Left	Thru	Right	HV	Exclu. Total	Inclu. Total	Int. Total
07:00	19	107	8	8	3	32	24	5	1	44	2	1	11	17	6	2	16	274	290
07:15	13	111	11	8	0	35	22	4	3	69	2	5	22	28	9	3	20	325	345
07:30	17	133	12	9	0	39	18	8	4	81	1	0	19	31	12	3	20	367	387
07:45	21	99	14	6	0	46	21	2	7	101	4	4	24	23	5	2	14	365	379
Total	70	450	45	31	3	152	85	19	15	295	9	10	76	99	32	10	70	1331	1401
08:00	15	109	26	1	2	32	30	3	3	76	0	4	45	27	3	1	9	368	377
08:15	23	108	17	5	4	34	25	2	0	76	1	1	13	25	3	1	9	329	338
08:30	15	99	9	5	1	21	20	1	3	69	1	4	21	19	6	2	12	284	296
08:45	14	79	17	5	1	25	32	5	4	71	0	3	34	22	7	5	18	306	324
Total	67	395	69	16	8	112	107	11	10	292	2	12	113	93	19	9	48	1287	1335
16:00	12	82	15	2	3	30	27	5	2	70	1	2	17	26	3	3	12	288	300
16:15	14	73	12	1	3	30	17	5	4	76	2	2	21	29	6	0	8	287	295
16:30	20	82	6	2	1	36	30	2	8	93	1	5	22	46	4	1	10	349	359
16:45	23	63	18	3	2	35	19	1	5	103	6	1	25	35	6	1	6	340	346
Total	69	300	51	8	9	131	93	13	19	342	10	10	85	136	19	5	36	1264	1300
17:00	31	87	17	3	2	33	22	2	2	86	4	0	17	28	5	2	7	334	341
17:15	28	75	15	1	2	30	51	2	3	99	1	0	22	43	8	1	4	377	381
17:30	26	68	17	1	4	30	23	1	1	63	2	0	19	32	8	1	3	293	296
17:45	24	67	16	1	4	36	26	0	5	82	3	1	14	33	3	1	3	313	316
Total	109	297	65	6	12	129	122	5	11	330	10	1	72	136	24	5	17	1317	1334
Grand Total	315	1442	230	61	32	524	407	48	55	1259	31	33	346	464	94	29	171	5199	5370
Apprch %	15.9	72.6	11.6		3.3	54.4	42.3		4.1	93.6	2.3		38.3	51.3	10.4				
Total %	6.1	27.7	4.4		0.6	10.1	7.8		1.1	24.2	0.6		6.7	8.9	1.8		3.2	96.8	

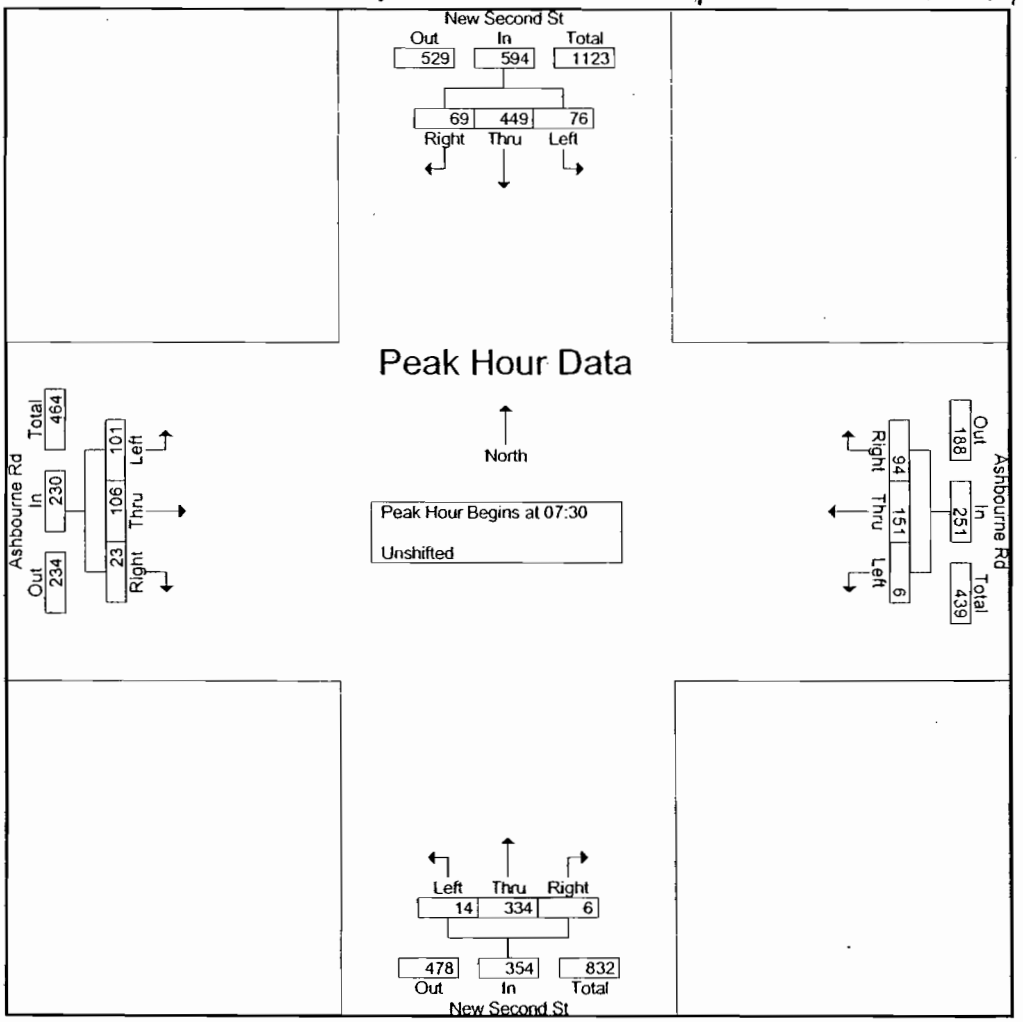
McMahon Associates Inc.
Transportation Engineers & Planners

425 Commerce Drive, Suite 200
Ft. Washington, PA 19034

Municipality: Cheltenham Township
Location: New Second Street & Ashbourne Road
Counter/ Board #: TD

File Name : ashbourne01w
Site Code : 80901501
Start Date : 2/24/2009
Page No : 2

	New Second St Southbound				Ashbourne Rd Westbound				New Second St Northbound				Ashbourne Rd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	17	**133**	12	**162**	0	39	18	57	4	81	1	86	19	**31**	**12**	62	367
07:45	21	99	14	134	0	**46**	21	**67**	**7**	**101**	4	**112**	24	23	5	52	365
08:00	15	109	**26**	150	2	32	**30**	64	3	76	0	79	**45**	27	3	**75**	**368**
08:15	**23**	108	17	148	**4**	34	25	63	0	76	1	77	13	25	3	41	329
Total Volume	76	449	69	594	6	151	94	251	14	334	6	354	101	106	23	230	1429
% App. Total	12.8	75.6	11.6		2.4	60.2	37.5		4	94.4	1.7		43.9	46.1	10		
PHF	.826	.844	.663	.917	.375	.821	.783	.937	.500	.827	.375	.790	.561	.855	.479	.767	.971
	21	4%				15	6%			9	3%		7	3%			



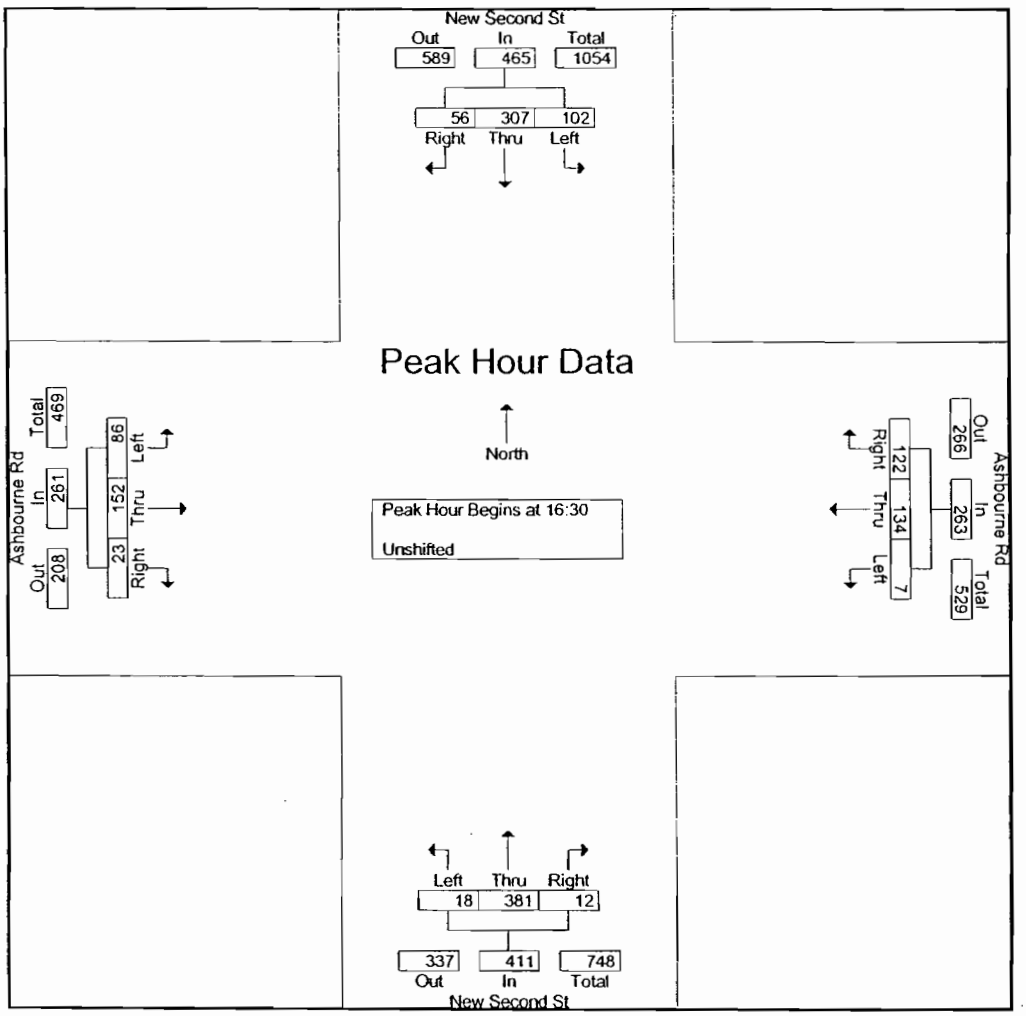
McMahon Associates Inc.
Transportation Engineers & Planners

425 Commerce Drive, Suite 200
Ft. Washington, PA 19034

Municipality: Cheltenham Township
Location: New Second Street &
Ashbourne Road
Counter/ Board #: TD

File Name : ashbourne01w
Site Code : 80901501
Start Date : 2/24/2009
Page No : 3

	New Second St Southbound				Ashbourne Rd Westbound				New Second St Northbound				Ashbourne Rd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	20	82	6	108	1	**36**	30	67	**8**	93	1	102	22	**46**	4	72	349
16:45	23	63	**18**	104	**2**	35	19	56	5	**103**	**6**	**114**	**25**	35	6	66	340
17:00	**31**	**87**	17	**135**	2	33	22	57	2	86	4	92	17	28	5	50	334
17:15	28	75	15	118	2	30	**51**	**83**	3	99	1	103	22	43	**8**	**73**	**377**
Total Volume	102	307	56	465	7	134	122	263	18	381	12	411	86	152	23	261	1400
% App. Total	21.9	66	12		2.7	51	46.4		4.4	92.7	2.9		33	58.2	8.8		
PHF	.823	.882	.778	.861	.875	.931	.598	.792	.563	.925	.500	.901	.860	.826	.719	.894	.928
			9	2%			7	3%			6	1%			5	2%	



McMahon Associates Inc.
Transportation Engineers & Planners

425 Commerce Drive, Suite 200
Ft. Washington, PA 19034

Municipality: Cheltenham Township
Location: New Second Street &
Ashbourne Road
Counter/ Board #: TD

File Name : ashbourne01w
Site Code : 80901501
Start Date : 2/24/2009
Page No : 1

Groups Printed- Pedestrians

	New Second St Southbound				Ashbourne Rd Westbound				New Second St Northbound				Ashbourne Rd Eastbound						
Start Time	Left	Thru	Right	E/W Peds	Left	Thru	Right	N/S Peds	Left	Thru	Right	E/W Peds	Left	Thru	Right	N/S Peds	Exclu Total	Inclu Total	Int. Total
07:15	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2	0	2
07:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
Total	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	4	0	4
08:15	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
08:30	0	0	0	3	0	0	0	2	0	0	0	1	0	0	0	0	6	0	6
08:45	0	0	0	1	0	0	0	2	0	0	0	2	0	0	0	0	5	0	5
Total	0	0	0	4	0	0	0	5	0	0	0	3	0	0	0	0	12	0	12
16:00	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	2
16:30	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	3	0	3
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
Total	0	0	0	1	0	0	0	1	0	0	0	3	0	0	0	1	6	0	6
17:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
17:15	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	2	5	0	5
Total	0	0	0	1	0	0	0	2	0	0	0	1	0	0	0	2	6	0	6
Grand Total	0	0	0	7	0	0	0	9	0	0	0	8	0	0	0	4	28	0	28
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashbourne Road &
Haines Road
Counter/Countboard No.: GH

File Name : tookany03w
Site Code : 00000000
Start Date : 8/13/2009
Page No : 1

Groups Printed- Unshifted

	Ashbourne Rd Westbound			Haines Rd Northbound			Ashbourne Rd Eastbound					
Start Time	Left	Thru	HV	Left	Right	HV	Thru	Right	HV	Exclu. Total	Inclu. Total	Int. Total
07:00	0	40	0	2	0	0	32	1	0	0	75	75
07:15	0	40	0	1	0	0	34	2	0	0	77	77
07:30	0	56	0	2	0	0	21	0	0	0	79	79
07:45	0	28	0	1	0	0	26	0	0	0	55	55
Total	0	164	0	6	0	0	113	3	0	0	286	286
08:00	0	40	0	0	1	0	18	1	0	0	60	60
08:15	0	20	0	2	1	0	28	0	0	0	51	51
08:30	0	31	0	2	0	0	16	1	0	0	50	50
08:45	0	22	0	2	0	0	24	1	0	0	49	49
Total	0	113	0	6	2	0	86	3	0	0	210	210
*** BREAK ***												
16:00	0	34	0	1	0	0	26	3	0	0	64	64
16:15	1	43	0	0	1	0	42	3	0	0	90	90
16:30	0	50	0	1	0	0	37	1	0	0	89	89
16:45	0	52	0	1	0	0	50	1	0	0	104	104
Total	1	179	0	3	1	0	155	8	0	0	347	347
17:00	0	62	0	2	2	0	66	5	0	0	137	137
17:15	0	45	0	0	0	0	47	4	0	0	96	96
17:30	1	40	0	1	0	0	44	2	0	0	88	88
17:45	0	53	0	0	0	0	45	3	0	0	101	101
Total	1	200	0	3	2	0	202	14	0	0	422	422
Grand Total	2	656	0	18	5	0	556	28	0	0	1265	1265
Apprch %	0.3	99.7		78.3	21.7		95.2	4.8				
Total %	0.2	51.9		1.4	0.4		44	2.2		0	100	

McMahon Associates, Inc.

Transportation Engineers and Planners

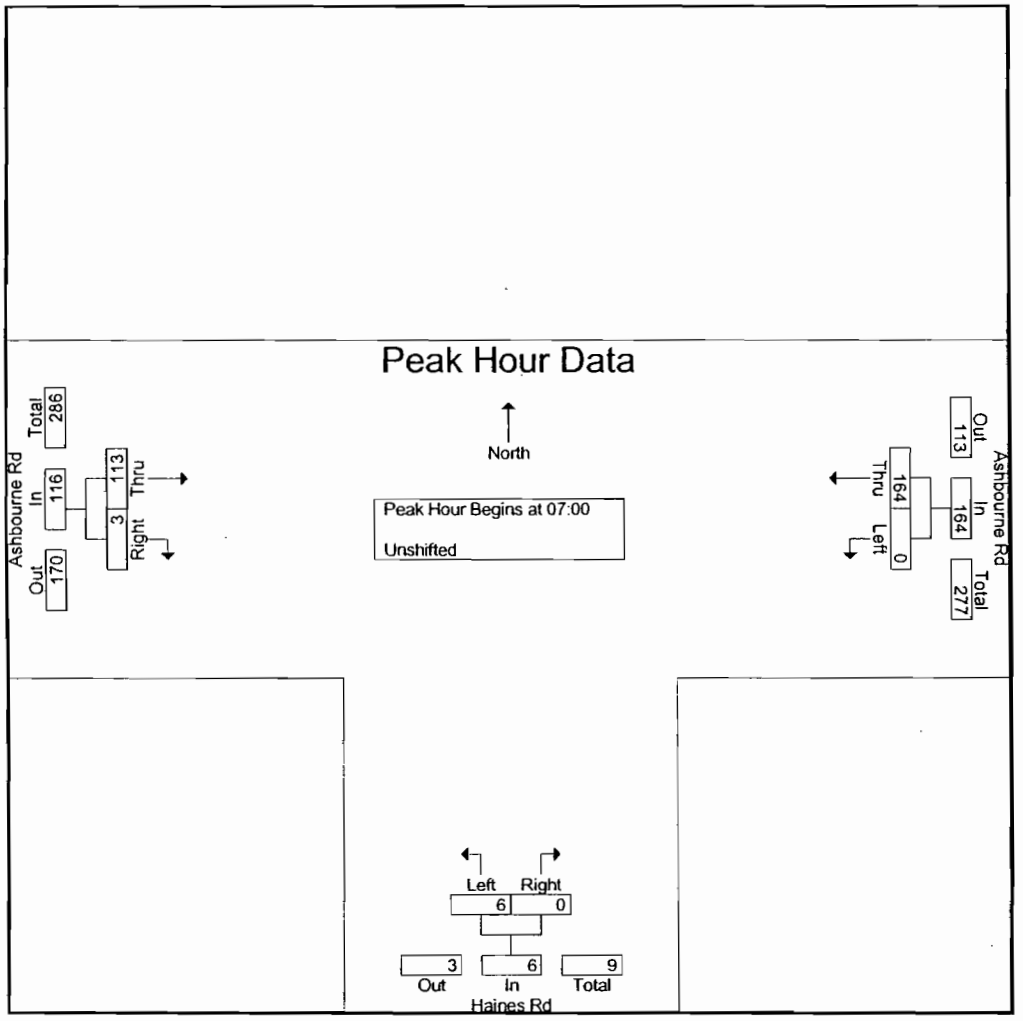
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashbourne Road &
Haines Road
Counter/Countboard No.: GH

File Name : tookany03w
Site Code : 00000000
Start Date : 8/13/2009
Page No : 2

	Ashbourne Rd Westbound			Haines Rd Northbound			Ashbourne Rd Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00										
07:00	0	40	40	**2**	0	**2**	32	1	33	75
07:15	0	40	40	1	0	1	**34**	**2**	**36**	77
07:30	0	**56**	**56**	2	0	2	21	0	21	**79**
07:45	0	28	28	1	0	1	26	0	26	55
Total Volume	0	164	164	6	0	6	113	3	116	286
% App. Total	0	100		100	0		97.4	2.6		
PHF	.000	.732	.732	.750	.000	.750	.831	.375	.806	.905

0 -1. 0 -1. 0 -1.



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

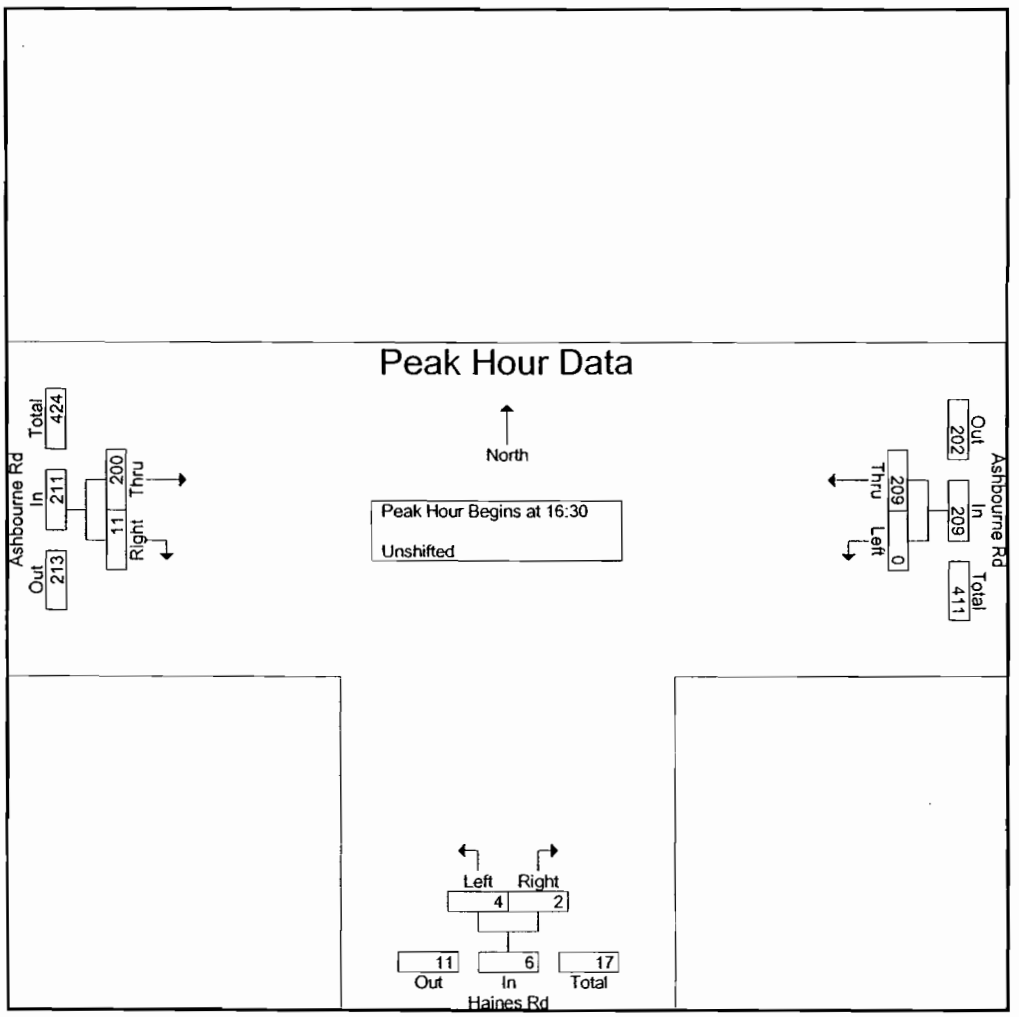
Municipality: Cheltenham Township
Location: Ashbourne Road &
Haines Road
Counter/Countboard No.: GH

File Name : tookany03w
Site Code : 00000000
Start Date : 8/13/2009
Page No : 3

	Ashbourne Rd Westbound			Haines Rd Northbound			Ashbourne Rd Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 16:30										
16:30	0	50	50	1	0	1	37	1	38	89
16:45	0	52	52	1	0	1	50	1	51	104
17:00	0	**62**	**62**	**2**	**2**	**4**	**66**	**5**	**71**	**137**
17:15	0	45	45	0	0	0	47	4	51	96
Total Volume	0	209	209	4	2	6	200	11	211	426
% App. Total	0	100		66.7	33.3		94.8	5.2		
PHF	.000	.843	.843	.500	.250	.375	.758	.550	.743	.777

0 % 0 % 0 %

Peak Hour Data



McMahon Associates Inc.
Transportation Engineers & Planners

425 Commerce Drive, Suite 200
Ft. Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashbourne Road &
Oak Lane Road / Country Club Access
Counter/ Board #: JB

File Name : ashbourne02w
Site Code : 80901502
Start Date : 2/24/2009
Page No : 1

Groups Printed- Unshifted

	C.C. Access Southbound				Ashbourne Rd Westbound				Oak Lane Rd Northbound				Ashbourne Rd Eastbound						
Start Time	Left	Thru	Right	HV	Left	Thru	Right	HV	Left	Thru	Right	HV	Left	Thru	Right	HV	Exclu. Total	Inclu. Total	Int. Total
07:00	0	0	1	1	58	42	0	5	8	0	48	7	0	35	3	2	15	195	210
07:15	0	0	0	0	59	44	0	7	7	0	39	7	0	37	4	3	17	190	207
07:30	0	0	0	0	66	50	0	8	9	0	52	5	0	55	2	4	17	234	251
07:45	0	1	0	0	71	51	0	6	14	1	34	5	0	41	2	1	12	215	227
Total	0	1	1	1	254	187	0	26	38	1	173	24	0	168	11	10	61	834	895
08:00	0	0	0	0	58	48	0	8	6	0	35	4	0	40	3	0	12	190	202
08:15	0	0	0	0	58	60	0	6	8	0	37	4	0	41	2	0	10	206	216
08:30	0	0	0	0	51	31	0	3	9	0	58	3	0	41	4	1	7	194	201
08:45	0	0	0	0	45	48	0	6	14	0	56	3	0	29	4	3	12	196	208
Total	0	0	0	0	212	187	0	23	37	0	186	14	0	151	13	4	41	786	827
16:00	0	1	0	0	49	41	0	5	7	0	58	1	0	37	6	2	8	199	207
16:15	0	0	0	0	49	54	0	5	7	0	40	2	0	34	7	1	8	191	199
16:30	1	0	1	0	63	51	0	2	4	1	50	3	0	53	11	1	6	235	241
16:45	0	0	0	0	43	57	0	5	2	0	44	2	0	47	11	1	8	204	212
Total	1	1	1	0	204	203	0	17	20	1	192	8	0	171	35	5	30	829	859
17:00	0	1	0	1	54	51	0	3	11	1	56	4	0	53	15	0	8	242	250
17:15	0	0	0	0	52	75	0	4	10	0	46	3	0	48	10	0	7	241	248
17:30	0	0	0	0	55	42	0	4	5	0	67	1	0	53	8	0	5	230	235
17:45	0	0	0	0	52	61	1	1	7	0	41	1	0	42	15	0	2	219	221
Total	0	1	0	1	213	229	1	12	33	1	210	9	0	196	48	0	22	932	954
Grand Total	1	3	2	2	883	806	1	78	128	3	761	55	0	686	107	19	154	3381	3535
Apprch %	16.7	50	33.3		52.2	47.7	0.1		14.3	0.3	85.3		0	86.5	13.5				
Total %	0	0.1	0.1		26.1	23.8	0		3.8	0.1	22.5		0	20.3	3.2		4.4	95.6	

McMahon Associates Inc.
Transportation Engineers & Planners

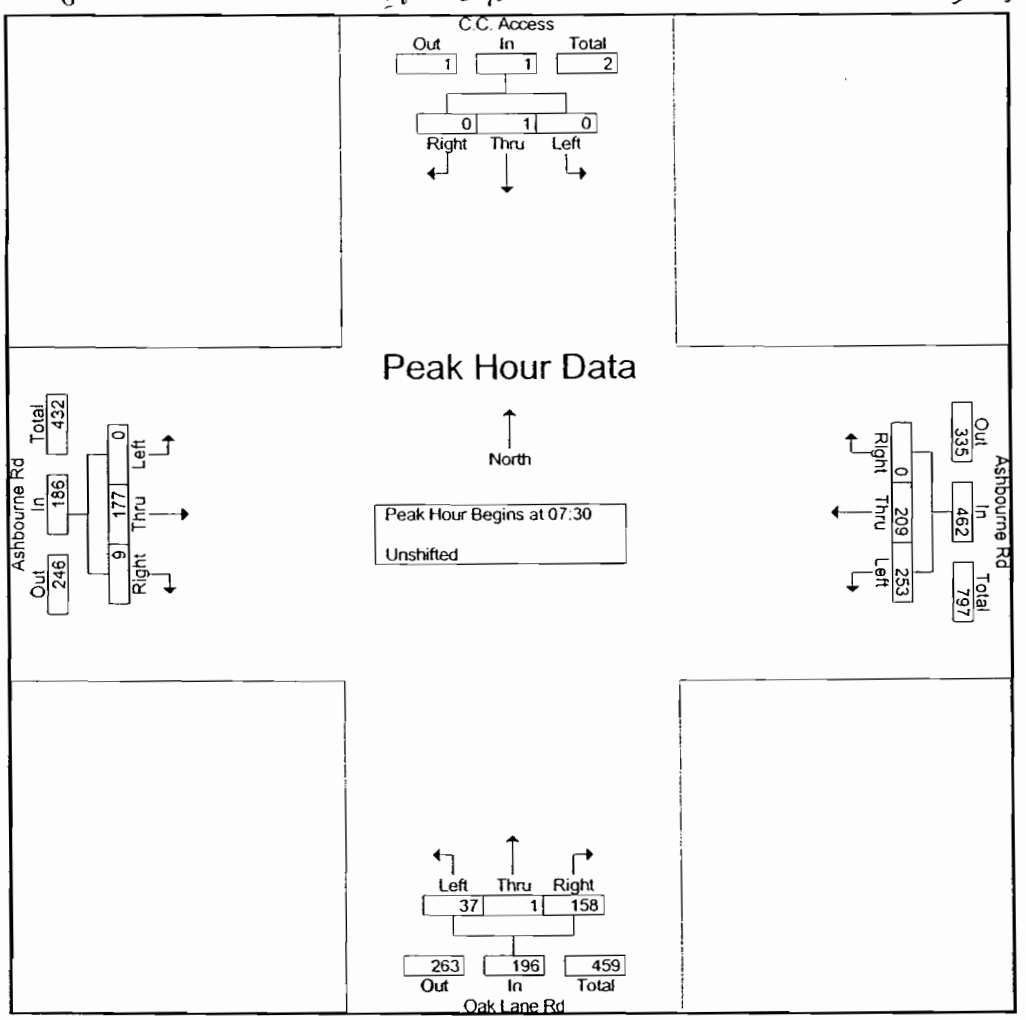
425 Commerce Drive, Suite 200
Ft. Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashbourne Road &
Oak Lane Road / Country Club Access
Counter/ Board #: JB

File Name : ashbourne02w
Site Code : 80901502
Start Date : 2/24/2009
Page No : 2

	C.C. Access Southbound				Ashbourne Rd Westbound				Oak Lane Rd Northbound				Ashbourne Rd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	0	0	0	0	66	50	0	116	9	0	**52**	**61**	0	**55**	2	**57**	**234**
07:45	0	**1**	0	**1**	**71**	51	0	**122**	**14**	**1**	34	49	0	41	2	43	215
08:00	0	0	0	0	58	48	0	106	6	0	35	41	0	40	**3**	43	190
08:15	0	0	0	0	58	**60**	0	118	8	0	37	45	0	41	2	43	206
Total Volume	0	1	0	1	253	209	0	462	37	1	158	196	0	177	9	186	845
% App. Total	0	100	0		54.8	45.2	0		18.9	0.5	80.6		0	95.2	4.8		
PHF	.000	.250	.000	.250	.891	.871	.000	.947	.661	.250	.760	.803	.000	.805	.750	.816	.903

0 28 6% 18 9% 5 3%



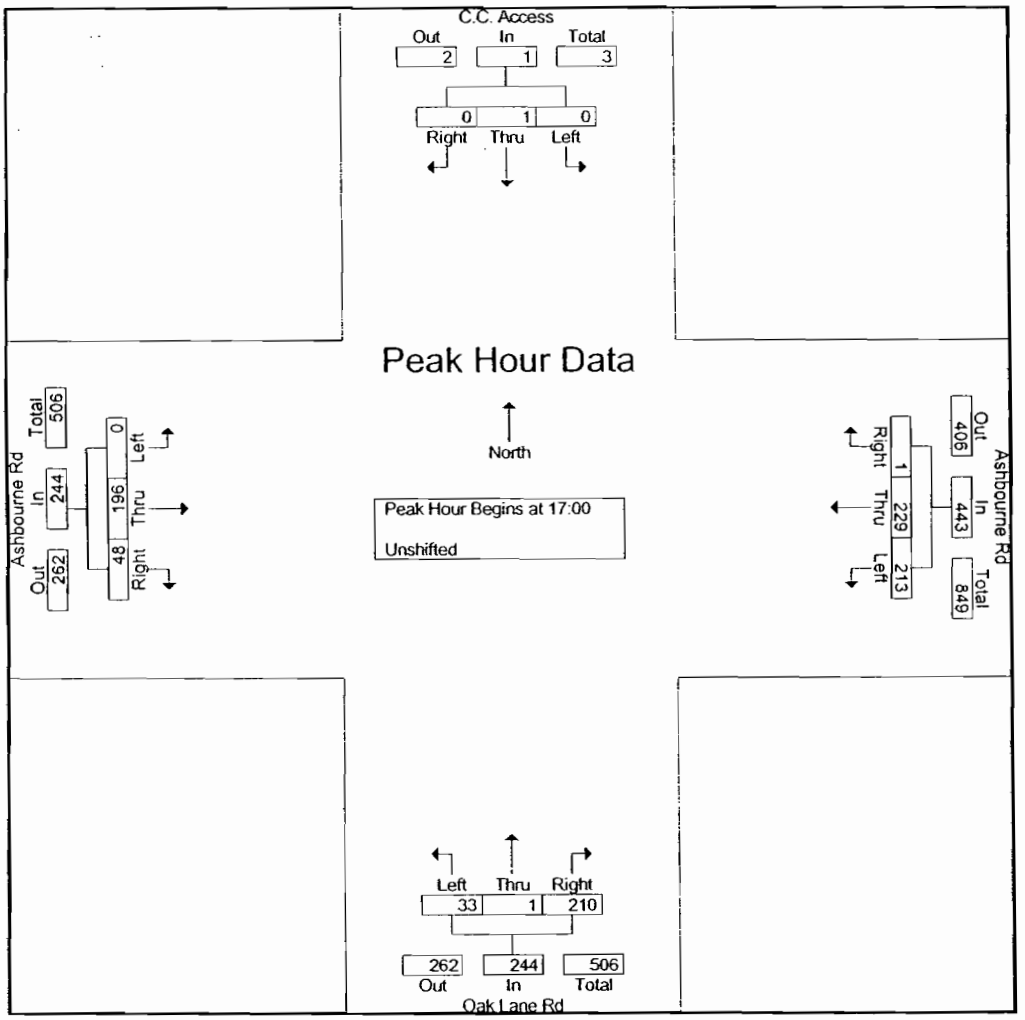
McMahon Associates Inc.
Transportation Engineers & Planners

425 Commerce Drive, Suite 200
Ft. Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashbourne Road &
Oak Lane Road / Country Club Access
Counter/ Board #: JB

File Name : ashbourne02w
Site Code : 80901502
Start Date : 2/24/2009
Page No : 3

	C.C. Access Southbound				Ashbourne Rd Westbound				Oak Lane Rd Northbound				Ashbourne Rd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	0	**1**	0	1	54	51	0	105	**11**	**1**	56	68	0	**53**	**15**	**68**	**242**
17:15	0	0	0	0	52	**75**	0	**127**	10	0	46	56	0	48	10	58	241
17:30	0	0	0	0	**55**	42	0	97	5	0	**67**	**72**	0	53	8	61	230
17:45	0	0	0	0	52	61	**1**	114	7	0	41	48	0	42	15	57	219
Total Volume	0	1	0	1	213	229	1	443	33	1	210	244	0	196	48	244	932
% App. Total	0	100	0		48.1	51.7	0.2		13.5	0.4	86.1		0	80.3	19.7		
PHF	.000	.250	.000	.250	.968	.763	.250	.872	.750	.250	.784	.847	.000	.925	.800	.897	.963
		1	100%			12	3%			9	4%			0			



McMahon Associates Inc.
Transportation Engineers & Planners

425 Commerce Drive, Suite 200
Ft. Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashbourne Road &
Oak Lane Road / Country Club Access
Counter/ Board #: JB

File Name : ashbourne02w
Site Code : 80901502
Start Date : 2/24/2009
Page No : 1

Groups Printed- Pedestrians

	C.C. Access Southbound				Ashbourne Rd Westbound				Oak Lane Rd Northbound				Ashbourne Rd Eastbound						
Start Time	Left	Thru	Right	E/W Peds	Left	Thru	Right	N/S Peds	Left	Thru	Right	E/W Peds	Left	Thru	Right	N/S Peds	Exclu. Total	Inclu. Total	Int. Total
07:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
07:15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
07:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
Total	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	3	0	3
08:30	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	5	0	5
08:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	6	0	6
16:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
16:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
16:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0	3
17:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Grand Total	0	0	0	2	0	0	0	0	0	0	0	11	0	0	0	0	13	0	13
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

McMahon Associates Inc.
Transportation Engineers & Planners

425 Commerce Drive, Suite 200
Ft. Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashbourne Road &
Ashmead Rd & Front St & Arbour Rd
Counter/ Board #:EW

File Name : ashbourne03w
Site Code : 80901503
Start Date : 2/24/2009
Page No : 1

Groups Printed- Unshifted

	Front St Southbound					Arbor Rd Southwestbound					Ashmead Rd Westbound					Front St Northbound					Ashbourne Rd Eastbound							
Start Time	Hard Left	Left	Thru	Right	HV	Hard Left	Bear Left	Bear Right	Hard Right	HV	Left	Thru	Right	Hard Right	HV	Left	Thru	Bear Right	Right	HV	Left	Bear Left	Thru	Right	HV	Exclu. Total	Inclu. Total	Int. Total
07:00	0	1	24	27	6	0	1	1	0	1	0	27	2	0	0	8	19	0	2	1	34	0	29	3	4	12	178	190
07:15	0	4	24	54	3	0	2	2	1	0	4	62	5	0	0	0	20	0	1	0	33	0	40	0	7	10	252	262
07:30	0	4	18	55	7	0	3	3	0	0	4	59	2	0	1	1	20	0	1	1	49	0	54	0	6	15	273	288
07:45	0	2	21	56	8	0	1	3	1	1	4	62	1	0	5	0	12	0	0	0	33	1	33	2	5	19	232	251
Total	0	11	87	192	24	0	7	9	2	2	12	210	10	0	6	9	71	0	4	2	149	1	156	5	22	56	935	991
08:00	1	6	24	51	4	0	0	3	0	0	3	59	5	0	0	3	12	0	0	0	29	2	37	4	2	6	239	245
08:15	1	5	16	38	4	0	3	1	0	0	3	49	6	0	2	4	15	1	1	2	27	0	25	9	4	12	204	216
08:30	2	1	29	35	5	0	3	4	3	0	10	44	6	0	0	0	31	1	1	0	22	2	30	38	4	9	262	271
08:45	2	7	22	35	2	0	0	1	0	0	2	35	2	0	1	8	19	0	0	5	33	2	26	14	4	12	208	220
Total	6	19	91	159	15	0	6	9	3	0	18	187	19	0	3	15	77	2	2	7	111	6	118	65	14	39	913	952
15:45	0	2	19	28	3	0	0	0	0	0	4	47	7	0	1	0	10	1	4	0	41	0	37	1	5	9	201	210
Total	0	2	19	28	3	0	0	0	0	0	4	47	7	0	1	0	10	1	4	0	41	0	37	1	5	9	201	210
16:00	0	3	16	32	4	0	1	1	0	0	0	54	3	0	1	1	15	1	0	1	53	1	27	2	2	8	210	218
16:15	0	1	24	36	3	0	0	1	1	0	11	68	7	0	0	1	20	2	1	1	31	3	57	4	3	7	268	275
16:30	2	9	16	42	2	0	0	0	0	0	8	65	2	0	1	2	30	1	7	1	49	2	47	2	4	8	284	292
16:45	0	5	24	30	4	0	0	0	0	0	6	69	6	0	2	2	23	0	1	1	51	0	43	7	3	10	267	277
Total	2	18	80	140	13	0	1	2	1	0	25	256	18	0	4	6	88	4	9	4	184	6	174	15	12	33	1029	1062
17:00	1	2	25	44	2	0	0	0	3	2	5	77	7	0	1	4	16	2	5	0	45	6	50	3	1	6	295	301
17:15	0	3	25	39	4	0	0	0	1	0	3	57	2	0	1	1	19	1	2	0	67	2	45	8	2	7	275	282
17:30	1	0	24	41	0	0	0	1	1	0	6	65	4	0	0	4	20	1	3	0	33	3	45	5	1	1	257	258
Grand Total			33.1	60.7			30.4	45.7	23.9			86.5				10.3	79.2				45.6		45.3					
				16.5																	16.1							

McMahon Associates Inc.
Transportation Engineers & Planners

425 Commerce Drive Suite 200
Ft. Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashbourne Road &
Ashmead Rd & Front St & Arbour Rd
Counter/ Board #:EW

File Name : ashbourne03w
Site Code : 80901503
Start Date : 2/24/2009
Page No : 2

	Front St Southbound					Arbor Rd Southwestbound					Ashmead Rd Westbound					Front St Northbound					Ashbourne Rd Eastbound					
Start Time	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App Total	Left	Thru	Bear Right	Right	App Total	Left	Bear Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:15																										
07:15	0	4	24	54	82	0	2	2	1	5	4	62	5	0	71	0	20	0	1	21	33	0	40	0	73	252
07:30	0	4	18	55	77	0	3	3	0	6	4	59	2	0	65	1	20	0	1	22	49	0	54	0	103	273
07:45	0	2	21	56	79	0	1	3	1	5	4	62	1	0	67	0	12	0	0	12	33	1	33	2	69	232
08:00	1	6	24	51	82	0	0	3	0	3	3	59	5	0	67	3	12	0	0	15	29	2	37	4	72	239
Total Volume	1	16	87	216	320	0	6	11	2	19	15	242	13	0	270	4	64	0	2	70	144	3	164	6	317	996
% App. Total	0.3		27.2	67.5			31.6	57.9	10.5		5.6	89.6	4.8			5.7	91.4		2.9		45.4	0.9	51.7	1.9		
PHF	.250	.667	.906	.964	.976	.000	.500	.917	.500	.792	.938	.976	.650	000	.951	.333	.800	.000	.500	.795	.735	.375	.759	.375	.769	.912
		22	7%				1	5%					6	2%				1	1%				20	6%		

McMahon Associates Inc.
Transportation Engineers & Planners

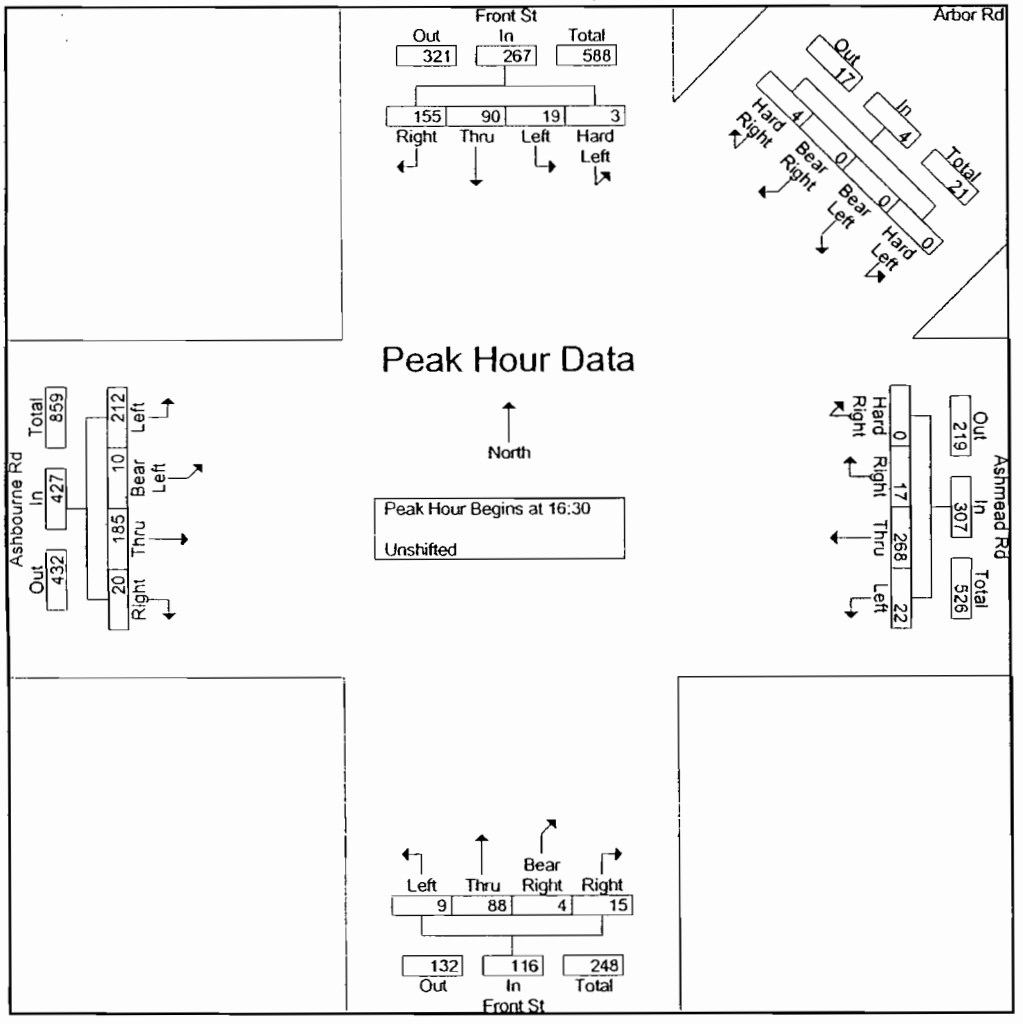
425 Commerce Drive, Suite 200
Ft. Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashbourne Road &
Ashmead Rd & Front St & Arbour Rd
Counter/ Board #:EW

File Name : ashbourne03w
Site Code : 80901503
Start Date : 2/24/2009
Page No : 3

	Front St Southbound					Arbor Rd Southwestbound					Ashmead Rd Westbound					Front St Northbound					Ashbourne Rd Eastbound					
Start Time	Hard Left	Left	Thru	Right	App Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Left	Bear Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 17:30 - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 16:30																										
16:30	2	9	16	42	69	0	0	0	0	0	8	65	2	0	75	2	30	1	7	40	49	2	47	2	100	284
16:45	0	5	24	30	59	0	0	0	0	0	6	69	6	0	81	2	23	0	1	26	51	0	43	7	101	267
17:00	1	2	25	44	72	0	0	0	3	3	5	77	7	0	89	4	16	2	5	27	45	6	50	3	104	295
17:15	0	3	25	39	67	0	0	0	1	1	3	57	2	0	62	1	19	1	2	23	67	2	45	8	122	275
Total Volume	3	19	90	155	267	0	0	0	4	4	22	268	17	0	307	9	88	4	15	116	212	10	185	20	427	1121
% App. Total	1.1	7.1	33.7	58.1					100		7.2	87.3	5.5			7.8	75.9	3.4	12.9		49.6	2.3	43.3	4.7		
PHF	.375	.528	.900	.881	.927	.000	.000	.000	.333	.333	.688	.870	.607	.000	.862	.563	.733	.500	.536	.725	.791	.417	.925	.625	.875	.950

12 4% 2 50% 5 2% 2 2% 10 2%



McMahon Associates Inc.
Transportation Engineers & Planners

425 Commerce Drive, Suite 200
Ft. Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashbourne Road &
Ashmead Rd & Front St & Arbour Rd
Counter/ Board #:EW

File Name : ashbourne03w
Site Code : 80901503
Start Date : 2/24/2009
Page No : 1

Groups Printed- Pedestrians

	Front St Southbound					Arbor Rd Southwestbound					Ashmead Rd Westbound					Front St Northbound					Ashbourne Rd Eastbound							
Start Time	Hard Left	Left	Thru	Right	E/W Peds	Hard Left	Bear Left	Bear Right	Hard Right	E/W Peds	Left	Thru	Right	Hard Right	N/S Peds	Left	Thru	Bear Right	Right	E/W Peds	Left	Bear Left	Thru	Right	N/S Peds	Exclu. Total	Inclu. Total	Int. Total
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	4	0	4
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	0	3
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	1	0	0	0	0	0	7	0	7
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1
08:15	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	6	0	6
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	0	0	29	0	0	0	0	0	48	0	48
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	5	0	0	0	0	0	6	0	6
Total	0	0	0	0	3	0	0	0	0	0	0	0	0	0	24	0	0	0	0	34	0	0	0	0	0	61	0	61
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	0	3
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	0	3
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	2
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	4	0	4
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	5	0	0	0	0	0	7	0	7
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	9	0	0	0	0	0	13	0	13
Grand Total	0	0	0	0	3	0	0	0	0	0	0	0	0	0	37	0	0	0	0	44	0	0	0	0	0	84	0	84
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0				
Total %																										100	0	

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Twp
Location: Ashbourne Road / Front St &
Ashmead Road / Arbor Road
Counter/Countboard No.: EW+JB

File Name : jenkintown01a
Site Code : 80901501
Start Date : 9/24/2009
Page No : 1

Groups Printed- Unshifted - School Vehicles

	Ashbourne Rd Southbound					Arbor Rd Southwestbound					Ashmead Rd Westbound					Front St Northbound					Ashbourne Rd Eastbound							
Start Time	Hard Left	Left	Thru	Right	HV	Hard Left	Bear Left	Bear Right	Hard Right	HV	Left	Thru	Right	Hard Right	HV	Left	Thru	Bear Right	Right	HV	Left	Bear Left	Thru	Right	HV	Exclu. Total	Inclu. Total	Int. Total
07:00	0	2	18	42	2	0	2	0	1	0	5	40	3	0	0	4	12	1	1	0	23	0	41	5	3	5	200	205
07:15	0	3	17	44	4	0	0	5	0	0	5	50	2	1	0	2	25	1	4	1	33	4	43	2	6	11	241	252
07:30	0	1	25	46	3	0	0	3	1	0	15	69	6	0	1	1	17	0	3	0	42	2	41	0	5	9	272	281
07:45	0	2	24	57	3	0	1	2	0	0	5	62	3	0	0	3	21	0	4	0	40	4	42	1	5	8	271	279
Total	0	8	84	189	12	0	3	10	2	0	30	221	14	1	1	10	75	2	12	1	138	10	167	8	19	33	984	1017
08:00	0	5	16	57	5	0	1	4	0	0	4	53	2	0	2	4	13	0	2	0	33	0	40	1	4	11	235	246
08:15	0	6	12	48	2	0	0	2	0	0	3	65	3	0	1	2	15	1	4	1	38	2	46	1	3	7	248	255
08:30	0	5	22	35	2	0	1	5	1	0	7	32	3	0	0	3	20	1	4	0	31	2	18	14	3	5	204	209
08:45	2	2	25	48	3	0	5	4	3	0	6	45	5	0	1	0	23	2	8	0	25	4	18	36	3	7	261	268
Total	2	18	75	188	12	0	7	15	4	0	20	195	13	0	4	9	71	4	18	1	127	8	122	52	13	30	948	978
Grand Total			28.2	66.8	19.5		24.4		14.6		10.1	84.2	21.5				72.6		14.9		41.9		45.7					
Unshifted	1	26	152	366		0	10	23	6		50	416	27	1		19	142	6	30		260	9	287	58		0	0	1952
% Unshifted		100	95.6	97.1	100	0	100	92	100	0	100	100	100	100	100	100	97.3	100	100	100	98.1		99.3	96.7	100	0	0	97.8
School Vehicles	1	0	7	11		0	0	2	0		0	0	0	0		0	4	0	0		5	9	2	2		0	0	43
% School Vehicles	50	0	4.4	2.9	0	0	0	8	0	0	0	0	0	0	0	0	2.7	0	0	0	1.9	50	0.7	3.3	0	0	0	2.2

McMahon Associates, Inc.

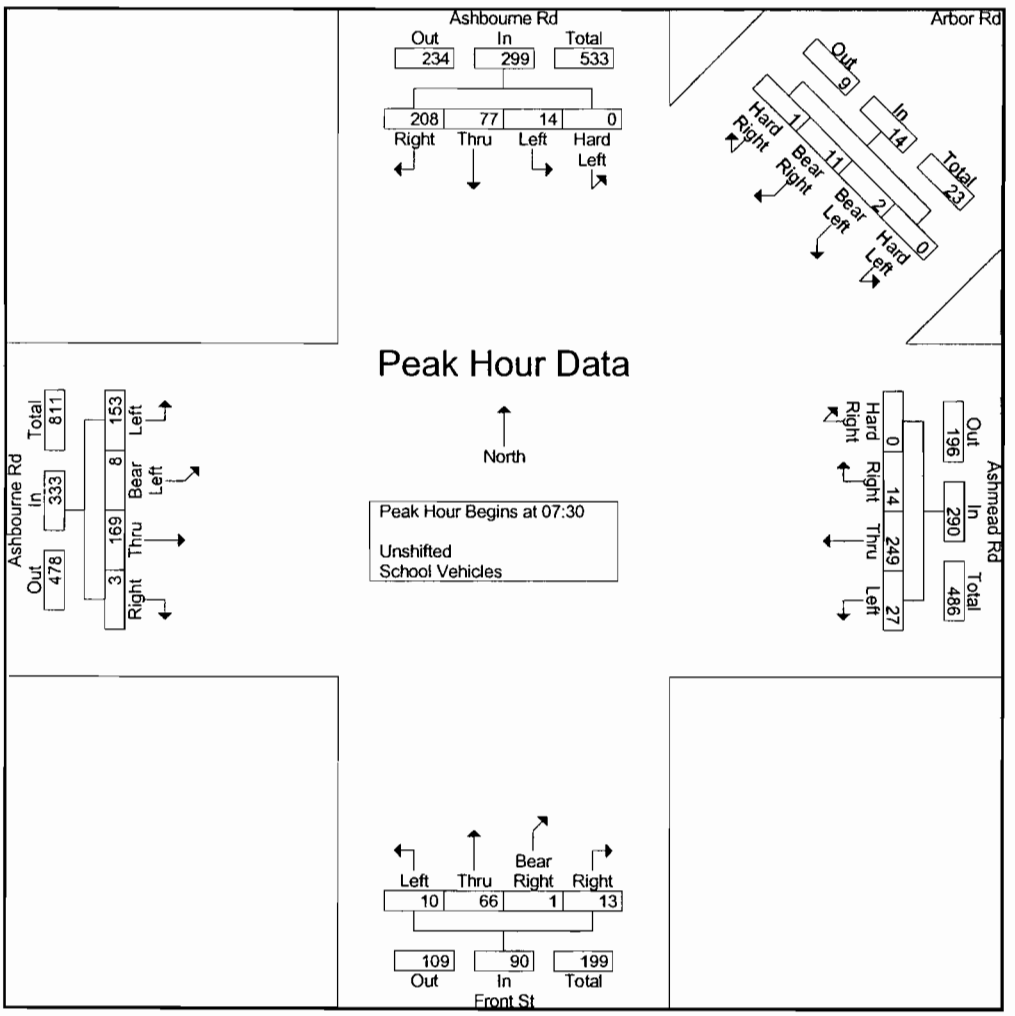
Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Twp
Location: Ashbourne Road / Front St &
Ashmead Road / Arbor Road
Counter/Countboard No.: EW+JB

File Name : jenkintown01a
Site Code : 80901501
Start Date : 9/24/2009
Page No : 2

	Ashbourne Rd Southbound					Arbor Rd Southwestbound					Ashmead Rd Westbound					Front St Northbound					Ashbourne Rd Eastbound					
Start Time	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Left	Bear Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:30																										
07:30	0	1	**25**	46	72	0	0	3	1	4	**15**	**69**	**6**	0	**90**	1	17	0	3	21	**42**	2	41	0	85	**272**
07:45	0	2	24	**57**	**83**	0	1	2	0	3	5	62	3	0	70	3	**21**	0	**4**	**28**	40	**4**	42	1	**87**	271
08:00	0	5	16	57	78	0	1	**4**	0	**5**	4	53	2	0	59	**4**	13	0	2	19	33	0	40	1	74	235
08:15	0	**6**	12	48	66	0	0	2	0	2	3	65	3	0	71	2	15	**1**	**4**	22	38	2	**46**	1	87	248
Total Volume	0	14	77	208	299	0	2	11	1	14	27	249	14	0	290	10	66	1	13	90	153	8	169	3	333	1026
% App. Total	0	4.7	25.8	69.6			14.3	78.6	7.1		9.3	85.9	4.8			11.1	73.3	1.1	14.4		45.9	2.4	50.8	0.9		
PHF	.000	.583	.770	.912	.901	.000	.500	.688	.250	.700	.450	.902	.583	.000	.806	.625	.786	.250	.813	.804	.911	.500	.918	.750	.957	.943



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Twp
Location: Ashbourne Road / Front St &
Ashmead Road / Arbor Road
Counter/Countboard No.: EW+JB

File Name : jenkintown01p
Site Code : 80901501
Start Date : 9/23/2009
Page No : 1

Groups Printed- Unshifted - School Vehicles

	Ashbourne Rd Southbound					Arbor Rd Southwestbound					Ashmead Rd Westbound					Front St Northbound					Ashbourne Rd Eastbound							
Start Time	Hard Left	Left	Thru	Right	HV	Hard Left	Bear Left	Bear Right	Hard Right	HV	Left	Thru	Right	Hard Right	HV	Left	Thru	Bear Right	Right	HV	Left	Bear Left	Thru	Right	HV	Exclu. Total	Inclu. Total	Int. Total
16:00	0	7	21	33	1	0	2	0	3	0	4	31	2	2	0	4	32	1	3	0	35	1	32	2	1	2	215	217
16:15	0	2	17	29	2	0	0	1	0	0	7	35	3	0	0	3	16	2	3	0	43	1	41	3	7	9	206	215
16:30	0	3	19	35	1	0	1	0	0	0	7	58	10	0	2	3	28	2	1	1	49	0	43	4	3	7	263	270
16:45	2	6	21	37	5	0	1	1	1	0	8	58	5	0	1	0	24	2	2	0	39	2	44	3	3	9	256	265
Total	2	18	78	134	9	0	4	2	4	0	26	182	20	2	3	10	100	7	9	1	166	4	160	12	14	27	940	967
17:00	2	3	21	40	3	0	0	1	0	0	6	54	7	0	0	2	23	2	1	1	45	5	37	3	2	6	252	258
17:15	0	6	18	46	1	0	0	2	0	0	3	66	10	2	1	6	27	4	2	1	50	6	59	3	3	6	310	316
17:30	1	3	18	38	4	0	1	0	1	0	5	80	8	1	0	2	24	4	1	0	62	8	45	1	1	5	303	308
17:45	1	7	20	35	2	0	0	0	1	0	1	53	3	1	0	2	17	7	3	0	44	4	46	4	0	2	249	251
Total	4	19	77	159	10	0	1	3	2	0	15	253	28	4	1	12	91	17	7	2	201	23	187	11	6	19	1114	1133
Grand Total			31.6	59.7	14.3		31.2	31.2	37.5			82.1	21.2				75.5				17.9		45.4	16.9				
Unshifted	6	37	154	290		0	5	4	6		41	435	48	6		21	190	23	16		366	27	345	23		0	0	2089
% Unshifted	100	100	99.4		100	0	100	80	100	0	100	100	100	100	100	95.5	99.5	95.8	100	100	99.7	100	99.4	100	100	0	0	99.5
School Vehicles	0	0	1	3		0	0	1	0		0	0	0	0		1	1	1	0		1	0	2	0		0	0	11
% School Vehicles	0	0	0.6	1	0	0	0	20	0	0	0	0	0	0	0	4.5	0.5	4.2	0	0	0.3	0	0.6	0	0	0	0	0.5

McMahon Associates, Inc.

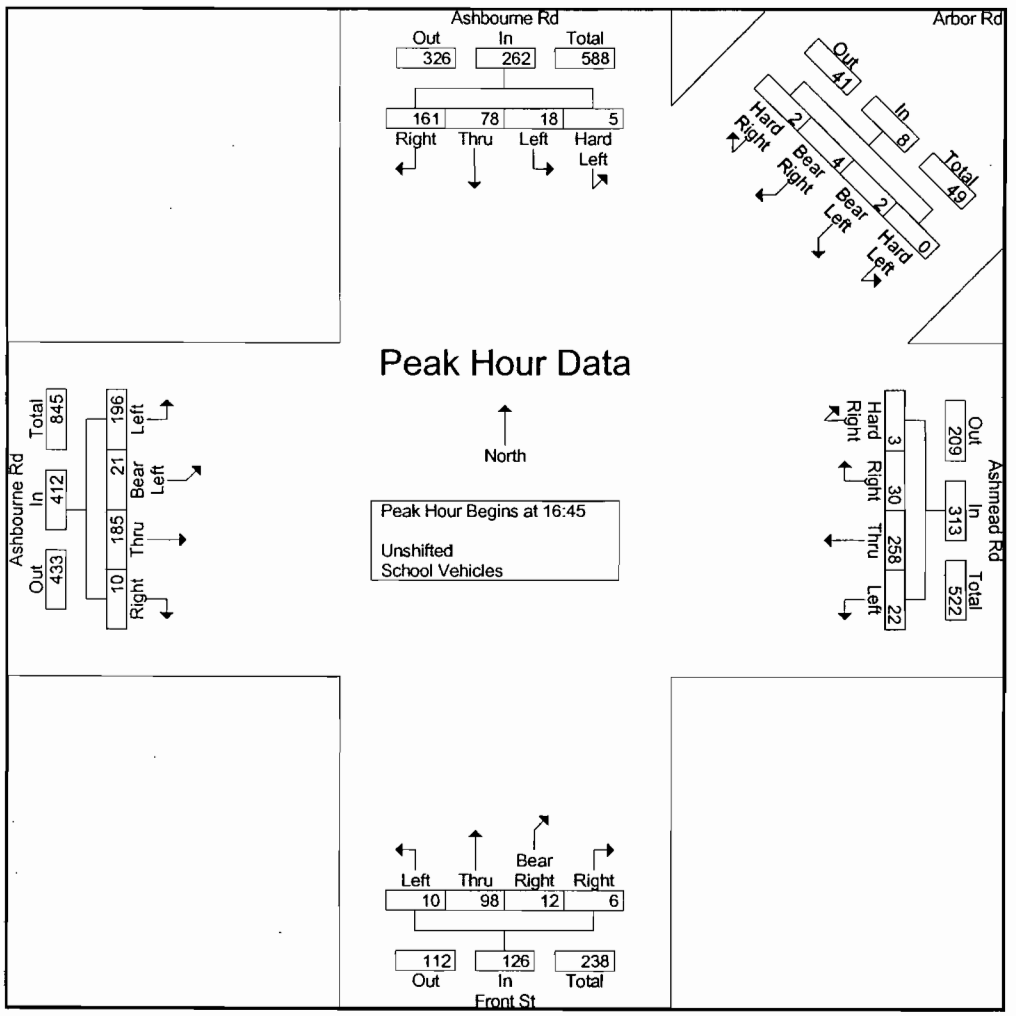
Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Twp
Location: Ashbourne Road / Front St &
Ashmead Road / Arbor Road
Counter/Countboard No.: EW+JB

File Name : jenkintown01p
Site Code : 80901501
Start Date : 9/23/2009
Page No : 2

	Ashbourne Rd Southbound					Arbor Rd Southwestbound					Ashmead Rd Westbound					Front St Northbound					Ashbourne Rd Eastbound					
Start Time	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Left	Bear Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 16:45																										
16:45	**2**	**6**	**21**	37	66	0	1	1	**1**	**3**	**8**	58	5	0	71	0	24	2	**2**	28	39	2	44	**3**	88	256
17:00	2	3	21	40	66	0	0	1	0	1	6	54	7	0	67	2	23	2	1	28	45	5	37	3	90	252
17:15	0	6	18	**46**	**70**	0	0	**2**	0	2	3	66	**10**	**2**	81	**6**	**27**	**4**	2	**39**	50	6	**59**	3	**118**	**310**
17:30	1	3	18	38	60	0	1	0	1	2	5	**80**	8	1	**94**	2	24	4	1	31	**62**	**8**	45	1	116	303
Total Volume	5	18	78	161	262	0	2	4	2	8	22	258	30	3	313	10	98	12	6	126	196	21	185	10	412	1121
% App. Total	1.9	6.9	29.8	61.5								82.4	9.6			7.9	77.8	9.5	4.8		47.6	5.1	44.9	2.4		
PHF	.625	.750	.929	.675	.936	.000	.500	.500	.500	.667	.688	.806	.750	.375	.832	.417	.907	.750	.750	.808	.790	.656	.784	.833	.873	.904



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashboune Road &
Croyden Road
Counter/Countboard No.: JG/2214

File Name : tookany02w
Site Code : 80901502
Start Date : 8/13/2009
Page No : 1

Groups Printed- Unshifted

	Ashbourne Rd Southbound			Croyden Rd Westbound			Ashbourne Rd Northbound					
Start Time	Left	Thru	HV	Left	Right	HV	Thru	Right	HV	Exclu. Total	Inclu. Total	Int. Total
07:00	0	46	2	3	0	0	30	0	2	4	79	83
07:15	1	43	1	2	2	0	32	2	4	5	82	87
07:30	0	60	2	1	3	0	37	0	1	3	101	104
07:45	1	56	4	4	4	1	51	1	1	6	117	123
Total	2	205	9	10	9	1	150	3	8	18	379	397
08:00	0	46	2	2	4	0	45	1	5	7	98	105
08:15	1	51	3	4	2	0	46	0	3	6	104	110
08:30	1	56	4	0	5	0	54	0	4	8	116	124
08:45	1	52	3	3	4	0	61	1	1	4	122	126
Total	3	205	12	9	15	0	206	2	13	25	440	465
*** BREAK ***												
16:00	1	70	1	1	0	0	57	1	3	4	130	134
16:15	5	56	3	0	4	1	53	1	1	5	119	124
16:30	3	67	2	2	1	0	65	1	1	3	139	142
16:45	1	61	1	0	3	0	83	0	2	3	148	151
Total	10	254	7	3	8	1	258	3	7	15	536	551
17:00	1	57	3	0	2	0	63	1	2	5	124	129
17:15	4	70	2	1	2	0	73	4	3	5	154	159
17:30	4	68	1	2	4	0	66	1	1	2	145	147
17:45	2	65	1	1	4	0	70	1	1	2	143	145
Total	11	260	7	4	12	0	272	7	7	14	566	580
Grand Total	26	924	35	26	44	2	886	15	35	72	1921	1993
Apprch %	2.7	97.3		37.1	62.9		98.3	1.7				
Total %	1.4	48.1		1.4	2.3		46.1	0.8		3.6	96.4	

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McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashboune Road &
Croyden Road
Counter/Countboard No.: JG/2214

File Name : tookany02w
Site Code : 80901502
Start Date : 8/13/2009
Page No : 2

	Ashbourne Rd Southbound			Croyden Rd Westbound			Ashbourne Rd Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00										
08:00	0	46	46	2	4	6	45	**1**	46	98
08:15	**1**	51	52	4	2	6	46	0	46	104
08:30	1	**56**	**57**	0	**5**	5	54	0	54	116
08:45	1	52	53	3	4	**7**	**61**	1	**62**	**122**
Total Volume	3	205	208	9	15	24	206	2	208	440
% App. Total	1.4	98.6		37.5	62.5		99	1		
PHF	.750	.915	.912	.563	.750	.857	.844	.500	.839	.902

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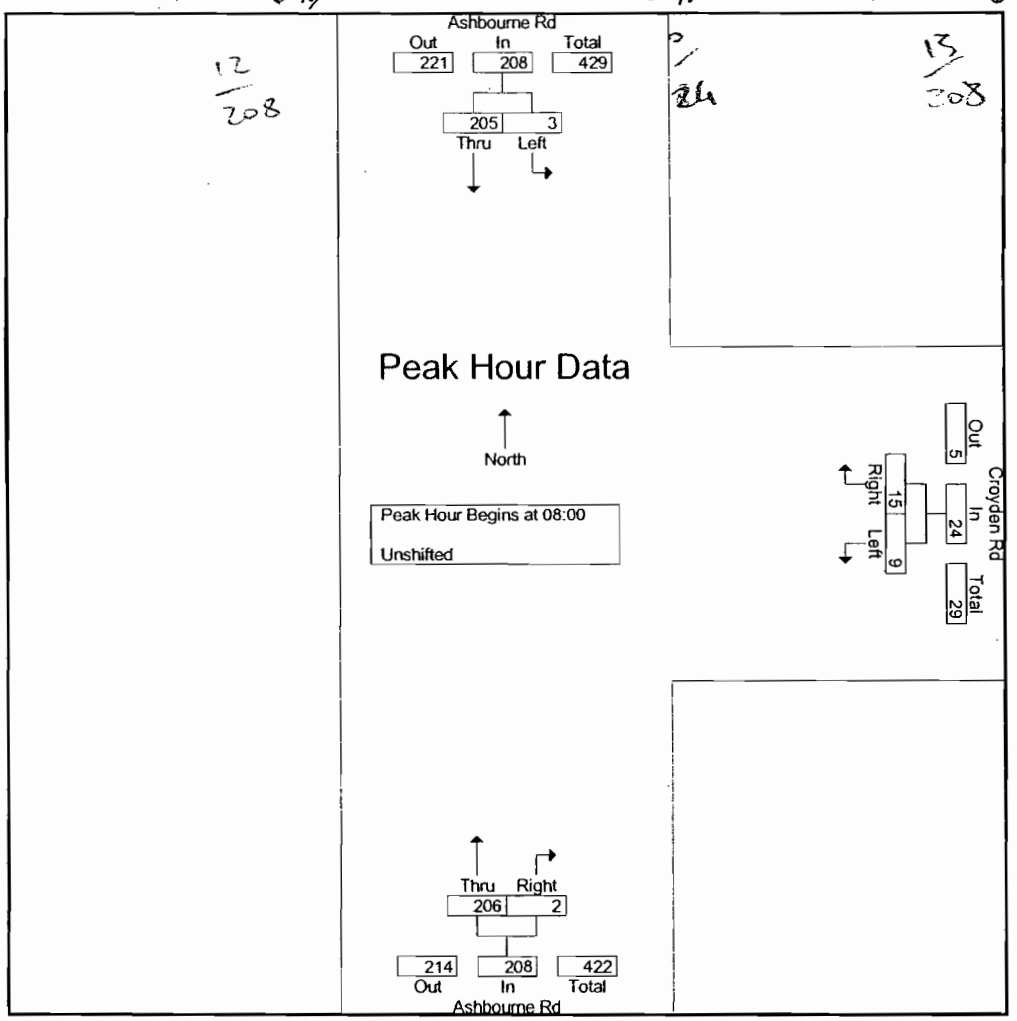

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashboune Road &
Croyden Road
Counter/Countboard No.: JG/2214

File Name : tookany02w
Site Code : 80901502
Start Date : 8/13/2009
Page No : 3

	Ashbourne Rd Southbound			Croyden Rd Westbound			Ashbourne Rd Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 16:45										
16:45	1	61	62	0	3	3	**83**	0	**83**	148
17:00	1	57	58	0	2	2	63	1	64	124
17:15	**4**	**70**	**74**	1	2	3	73	**4**	77	**154**
17:30	4	68	72	**2**	**4**	**6**	66	1	67	145
Total Volume	10	256	266	3	11	14	285	6	291	571
% App. Total	3.8	96.2		21.4	78.6		97.9	2.1		
PHF	.625	.914	.899	.375	.688	.583	.858	.375	.877	.927

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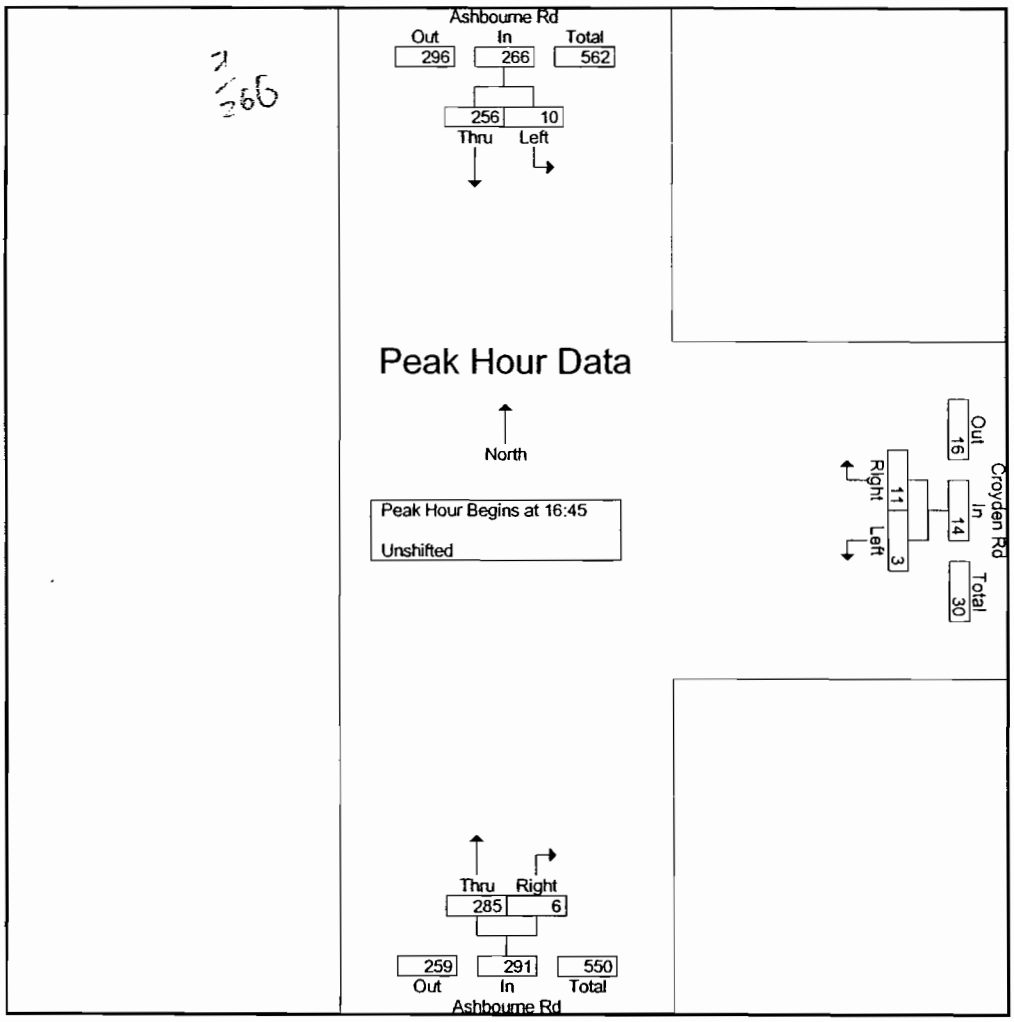


McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Location: Ashboune Road & Croyden Road
Counter/Countboard No.: JG/2214

File Name : tookany02w
Site Code : 80901502
Start Date : 8/13/2009
Page No : 1

Groups Printed- Pedestrians

	Ashbourne Rd Southbound			Croyden Rd Westbound			Ashbourne Rd Northbound					
Start Time	Left	Thru	E/W Peds	Left	Right	N/S Peds	Thru	Right	E/W Peds	Exclu. Total	Inclu. Total	Int. Total
07:00	0	0	2	0	0	0	0	0	0	2	0	2
07:15	0	0	1	0	0	0	0	0	0	1	0	1
*** BREAK ***												
07:45	0	0	1	0	0	0	0	0	0	1	0	1
Total	0	0	4	0	0	0	0	0	0	4	0	4
08:00	0	0	0	0	0	1	0	0	0	1	0	1
*** BREAK ***												
Total	0	0	0	0	0	1	0	0	0	1	0	1
*** BREAK ***												
16:15	0	0	1	0	0	0	0	0	0	1	0	1
16:30	0	0	1	0	0	0	0	0	0	1	0	1
*** BREAK ***												
Total	0	0	2	0	0	0	0	0	0	2	0	2
17:00	0	0	1	0	0	3	0	0	0	4	0	4
17:15	0	0	3	0	0	0	0	0	2	5	0	5
17:30	0	0	1	0	0	1	0	0	0	2	0	2
*** BREAK ***												
Total	0	0	5	0	0	4	0	0	2	11	0	11
Grand Total	0	0	11	0	0	5	0	0	2	18	0	18
Apprch %	0	0		0	0		0	0				
Total %										100	0	

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Twp
Location: Ashbourne Road & Jenkintown Road
Counter/Countboard No.: TD

File Name : jenkintown02a
Site Code : 80901502
Start Date : 9/24/2009
Page No : 1

Groups Printed- Unshifted - School Vehicles

	Ashbourne Rd Southbound			Ashbourne Rd Northbound			Jenkintown Rd Eastbound					
Start Time	Thru	Right	HV	Left	Thru	HV	Left	Right	HV	Exclu. Total	Inclu. Total	Int. Total
07:00	53	5	5	19	43	4	3	8	1	10	131	141
07:15	61	4	5	11	59	7	0	11	1	13	146	159
07:30	69	8	6	15	51	4	4	9	0	10	156	166
07:45	68	5	5	10	59	5	2	16	1	11	160	171
Total	251	22	21	55	212	20	9	44	3	44	593	637
08:00	56	4	6	16	52	6	3	11	0	12	142	154
08:15	52	7	3	14	49	3	2	18	0	6	142	148
08:30	68	5	6	16	58	3	3	14	3	12	164	176
08:45	57	2	4	20	46	5	3	9	0	9	137	146
Total	233	18	19	66	205	17	11	52	3	39	585	624
Grand Total	484	40	40	121	417	37	20	96	6	83	1178	1261
Apprch %	92.4	7.6		22.5	77.5		17.2	82.8				
Total %	41.1	3.4		10.3	35.4		1.7	8.1		6.6	93.4	
Unshifted	475	39		116	403		15	91		0	0	1222
% Unshifted	98.1	97.5	100	95.9	96.6	100	75	94.8	100	0	0	96.9
School Vehicles	9	1		5	14		5	5		0	0	39
% School Vehicles	1.9	2.5	0	4.1	3.4	0	25	5.2	0	0	0	3.1

McMahon Associates, Inc.

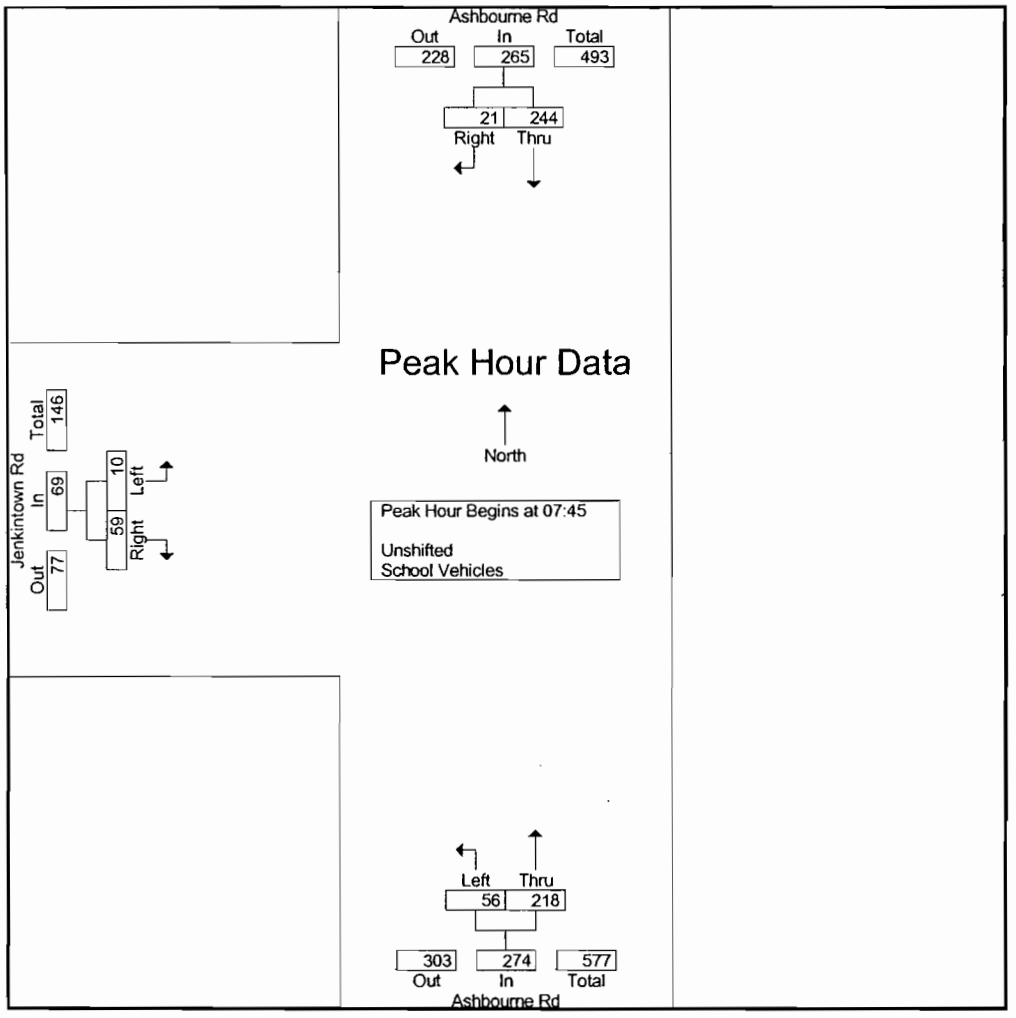
Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Twp
Location: Ashbourne Road & Jenkintown Road
Counter/Countboard No.: TD

File Name : jenkintown02a
Site Code : 80901502
Start Date : 9/24/2009
Page No : 2

	Ashbourne Rd Southbound			Ashbourne Rd Northbound			Jenkintown Rd Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45										
07:45	**68**	5	**73**	10	**59**	69	2	16	18	160
08:00	56	4	60	**16**	52	68	**3**	11	14	142
08:15	52	**7**	59	14	49	63	2	**18**	**20**	142
08:30	68	5	73	16	58	**74**	3	14	17	**164**
Total Volume	244	21	265	56	218	274	10	59	69	608
% App. Total	92.1	7.9		20.4	79.6		14.5	85.5		
PHF	.897	.750	.908	.875	.924	.926	.833	.819	.863	.927



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Twp
Location: Ashbourne Road & Jenkintown Road
Counter/Countboard No.: GH

File Name : jenkintown02p
Site Code : 80901502
Start Date : 9/23/2009
Page No : 1

Groups Printed- Unshifted - School Vehicles

	Ashbourne Rd Southbound			Ashbourne Rd Northbound			Jenkintown Rd Eastbound					
Start Time	Thru	Right	HV	Left	Thru	HV	Left	Right	HV	Exclu. Total	Inclu. Total	Int. Total
16:00	29	2	0	15	34	3	12	13	0	3	105	108
16:15	40	5	2	15	42	5	7	8	2	9	117	126
16:30	43	3	2	13	62	2	4	11	1	5	136	141
16:45	46	7	6	12	59	3	6	14	0	9	144	153
Total	158	17	10	55	197	13	29	46	3	26	502	528
17:00	45	3	5	13	40	4	8	9	1	10	118	128
17:15	50	5	2	24	60	4	9	16	0	6	164	170
17:30	37	8	2	15	48	2	6	9	1	5	123	128
17:45	40	1	2	9	53	1	14	17	0	3	134	137
Total	172	17	11	61	201	11	37	51	2	24	539	563
Grand Total	330	34	21	116	398	24	66	97	5	50	1041	1091
Apprch %	90.7	9.3		22.6	77.4		40.5	59.5				
Total %	31.7	3.3		11.1	38.2		6.3	9.3		4.6	95.4	
Unshifted	316	32		115	386		66	95		0	0	1030
% Unshifted	95.8	94.1	23.8	99.1	97	50	100	97.9	60	0	0	94.4
School Vehicles	14	2		1	12		0	2		0	0	61
% School Vehicles	4.2	5.9	76.2	0.9	3	50	0	2.1	40	0	0	5.6

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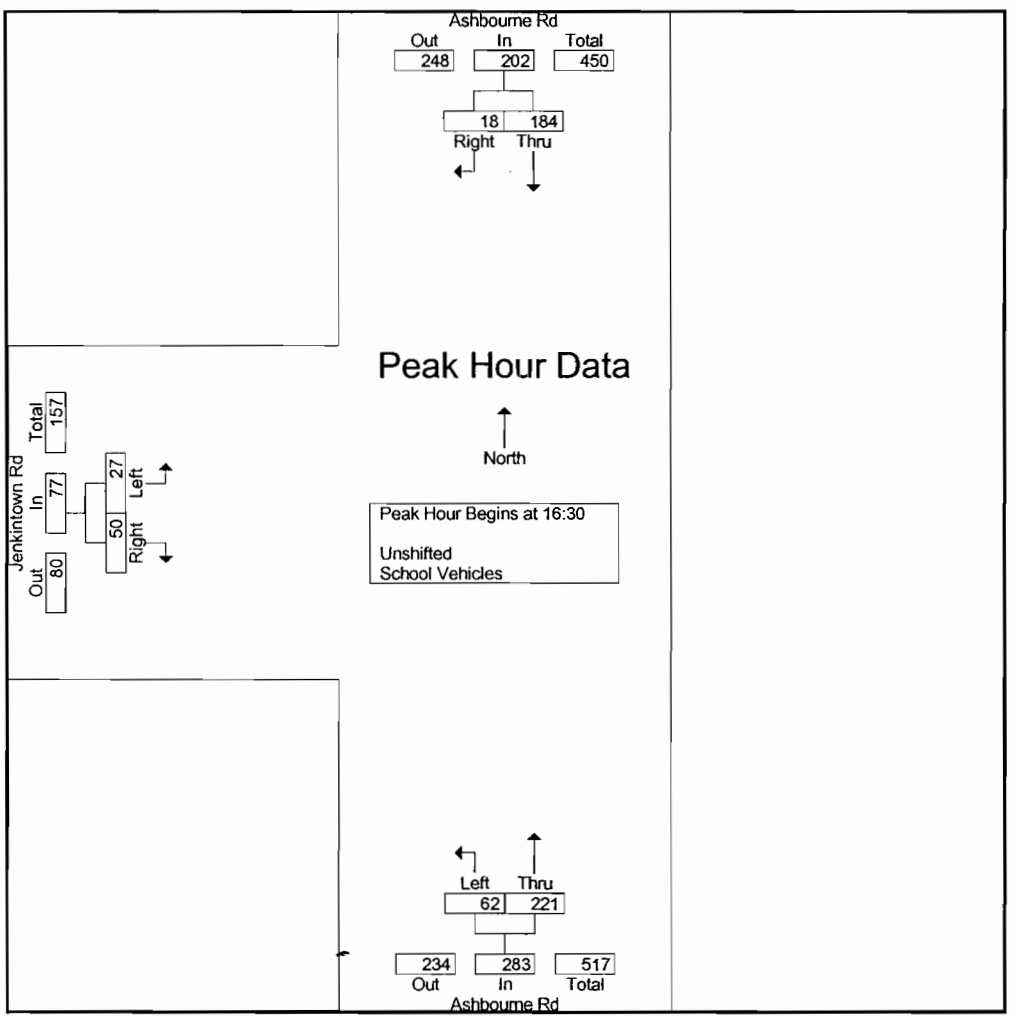
Transportation Engineers and Planners
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Twp
Location: Ashbourne Road &
Jenkintown Road
Counter/Countboard No.: GH

File Name : jenkintown02p
Site Code : 80901502
Start Date : 9/23/2009
Page No : 2

	Ashbourne Rd Southbound			Ashbourne Rd Northbound			Jenkintown Rd Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 16:30										
16:30	43	3	46	13	**62**	75	4	11	15	136
16:45	46	**7**	53	12	59	**71**	6	14	20	144
17:00	45	3	48	13	40	53	8	9	17	118
17:15	**50**	5	**55**	**24**	60	**84**	**9**	**16**	**25**	**164**
Total Volume	184	18	202	62	221	283	27	50	77	562
% App. Total	91.1	8.9		21.9	78.1		35.1	64.9		
PHF	.920	.643	.918	.646	.891	.842	.750	.781	.770	.857



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Fort Washington, PA 19034

Municipality: Cheltenham Twp
Location: Jenkintown Road &
Tookany Creek Parkway
Counter/Countboard No.: LB/4095

File Name : jenkintown03a
Site Code : 80901503
Start Date : 9/24/2009
Page No : 1

Groups Printed- Unshifted - School Vehicles

	Jenkintown Rd Southbound				Tookany Creek Pkwy Westbound				Jenkintown Rd Northbound				Tookany Creek Pkwy Eastbound						
Start Time	Left	Thru	Right	HV	Left	Thru	Right	HV	Left	Thru	Right	HV	Left	Thru	Right	HV	Exclu. Total	Inclu. Total	Int. Total
07:00	3	4	1	0	4	52	2	0	17	6	4	0	1	30	2	1	1	126	127
07:15	5	6	1	0	2	56	4	0	6	6	6	0	0	41	1	0	0	134	134
07:30	3	2	2	0	2	58	1	0	10	5	5	0	0	36	2	0	0	126	126
07:45	8	4	2	0	8	39	10	1	11	5	4	0	2	43	6	1	2	142	144
Total	19	16	6	0	16	205	17	1	44	22	19	0	3	150	11	2	3	528	531
08:00	4	8	1	0	4	55	7	0	14	3	5	0	1	34	5	0	0	141	141
08:15	1	10	1	0	5	42	3	0	9	10	7	1	3	36	6	2	3	133	136
08:30	1	5	0	0	1	43	3	0	4	10	4	0	2	34	8	1	1	115	116
08:45	4	6	0	0	2	50	4	1	9	13	8	0	1	20	2	0	1	119	120
Total	10	29	2	0	12	190	17	1	36	36	24	1	7	124	21	3	5	508	513
Grand Total	29	45	8	0	28	395	34	2	80	58	43	1	10	274	32	5	8	1036	1044
Apprch %	35.4	54.9	9.8		6.1	86.4	7.4		44.2	32	23.8		3.2	86.7	10.1				
Total %	2.8	4.3	0.8		2.7	38.1	3.3		7.7	5.6	4.2		1	26.4	3.1		0.8	99.2	
Unshifted	28	43	6		24	393	33		77	57	42		10	274	30		0	0	1025
% Unshifted	96.6	95.6	75	0	85.7	99.5	97.1	100	96.2	98.3	97.7	100	100	100	93.8	100	0	0	98.2
School Vehicles	1	2	2		4	2	1		3	1	1		0	0	2		0	0	19
% School Vehicles	3.4	4.4	25	0	14.3	0.5	2.9	0	3.8	1.7	2.3	0	0	0	6.2	0	0	0	1.8

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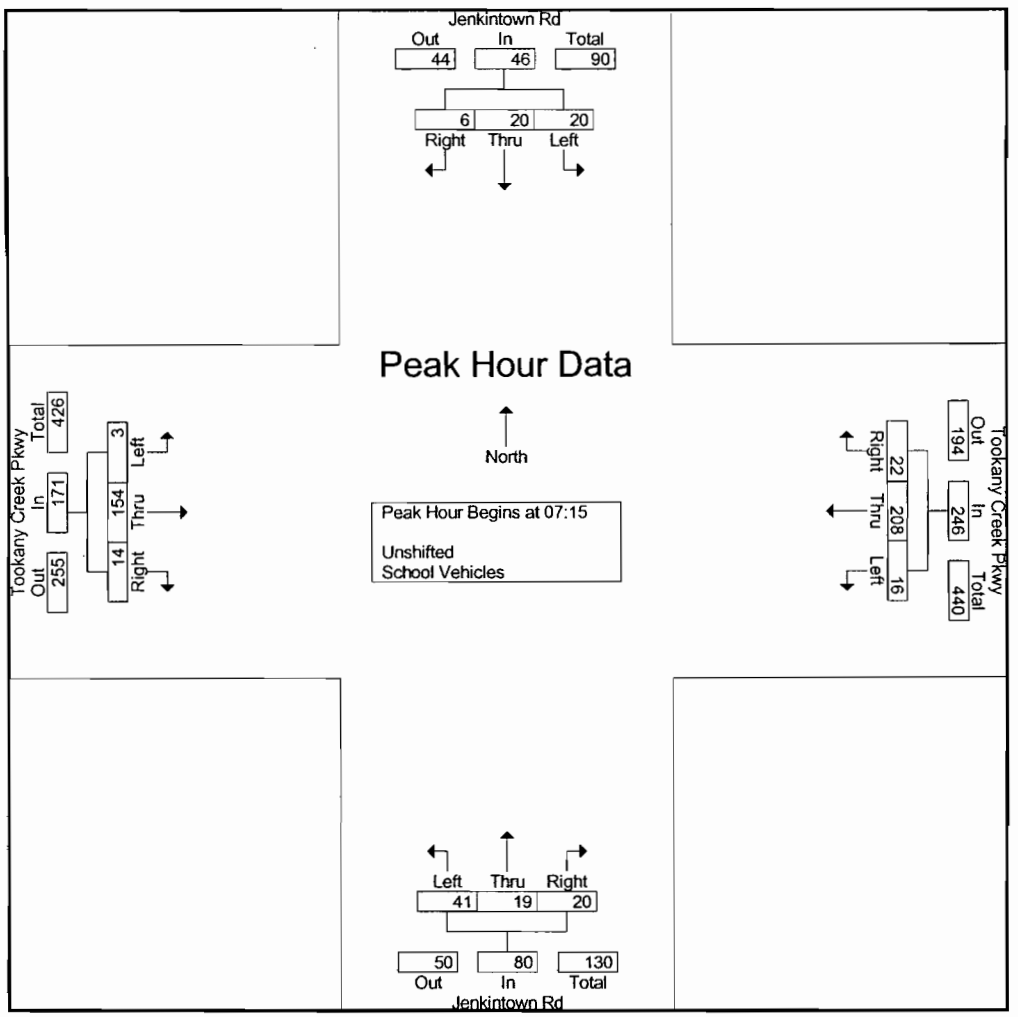
Municipality: Cheltenham Twp
Location: Jenkintown Road &
Tookany Creek Parkway
Counter/Countboard No.: LB/4095

File Name : jenkintown03a
Site Code : 80901503
Start Date : 9/24/2009
Page No : 2

	Jenkintown Rd Southbound				Tookany Creek Pkwy Westbound				Jenkintown Rd Northbound				Tookany Creek Pkwy Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	5	6	1	12	2	56	4	62	6	**6**	**6**	18	0	41	1	42	134
07:30	3	2	**2**	7	2	**58**	1	61	10	5	5	20	0	36	2	38	126
07:45	**8**	4	2	**14**	**8**	39	**10**	57	11	5	4	20	**2**	**43**	**6**	**51**	**142**
08:00	4	**8**	1	13	4	55	7	**66**	**14**	3	5	**22**	1	34	5	40	141
Total Volume	20	20	6	46	16	208	22	246	41	19	20	80	3	154	14	171	543
% App. Total	43.5	43.5	13		6.5	84.6	8.9		51.2	23.8	25		1.8	90.1	8.2		
PHF	.625	.625	.750	.821	.500	.897	.550	.932	.732	.792	.833	.909	.375	.895	.583	.838	.956



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Municipality: Cheltenham Twp
Location: Jenkintown Road &
Tookany Creek Parkway
Counter/Countboard No.: LB/4095

File Name : jenkintown03p
Site Code : 80901503
Start Date : 9/23/2009
Page No : 1

Groups Printed- Unshifted - School Vehicles

	Jenkintown Rd Southbound				Tookany Creek Pkwy Westbound				Jenkintown Rd Northbound				Tookany Creek Pkwy Eastbound						
Start Time	Left	Thru	Right	HV	Left	Thru	Right	HV	Left	Thru	Right	HV	Left	Thru	Right	HV	Exclu. Total	Inclu. Total	Int. Total
16:00	5	9	3	0	4	53	3	0	4	9	5	0	1	55	16	0	0	167	167
16:15	5	7	0	0	10	27	3	0	3	8	5	0	1	68	10	0	0	147	147
16:30	3	5	1	1	7	52	2	1	6	5	8	0	1	65	7	3	5	162	167
16:45	4	6	1	0	4	39	1	0	7	9	4	0	0	52	10	0	0	137	137
Total	17	27	5	1	25	171	9	1	20	31	22	0	3	240	43	3	5	613	618
17:00	4	7	1	0	10	50	5	0	9	7	8	1	1	80	10	0	1	192	193
17:15	8	7	0	0	9	48	6	0	5	10	11	0	3	60	7	0	0	174	174
17:30	5	8	2	0	7	40	5	0	4	7	5	0	0	63	12	0	0	158	158
17:45	7	2	1	0	13	51	1	0	8	5	8	0	0	55	22	0	0	173	173
Total	24	24	4	0	39	189	17	0	26	29	32	1	4	258	51	0	1	697	698
Grand Total	41	51	9	1	64	360	26	1	46	60	54	1	7	498	94	3	6	1310	1316
Apprch %	40.6	50.5	8.9		14.2	80	5.8		28.8	37.5	33.8		1.2	83.1	15.7				
Total %	3.1	3.9	0.7		4.9	27.5	2		3.5	4.6	4.1		0.5	38	7.2		0.5	99.5	
Unshifted	40	51	9		63	360	26		45	58	54		7	498	94		0	0	1311
% Unshifted	97.6	100	100	100	98.4	100	100	100	97.8	96.7	100	100	100	100	100	100	0	0	99.6
School Vehicles	1	0	0		1	0	0		1	2	0		0	0	0		0	0	5
% School Vehicles	2.4	0	0	0	1.6	0	0	0	2.2	3.3	0	0	0	0	0	0	0	0	0.4

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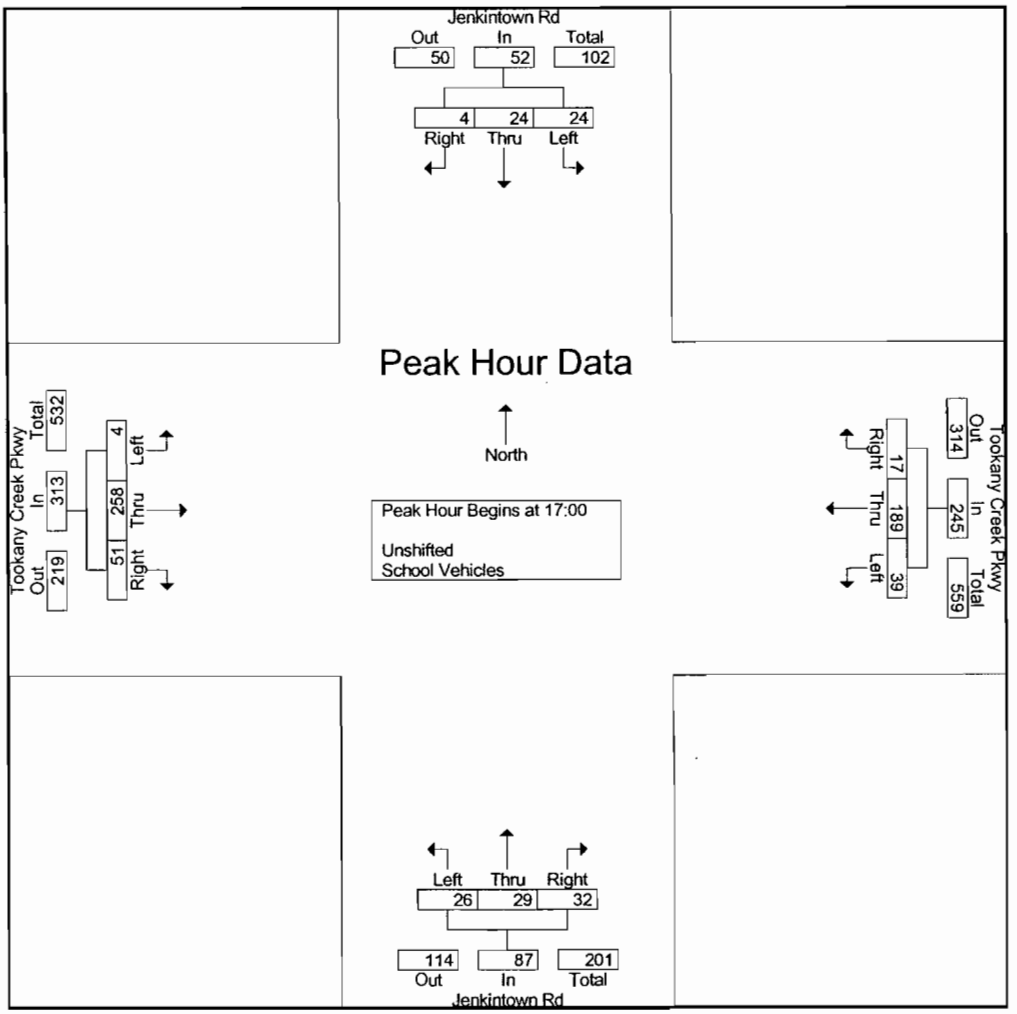
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Twp
Location: Jenkintown Road &
Tookany Creek Parkway
Counter/Countboard No.: LB/4095

File Name : jenkintown03p
Site Code : 80901503
Start Date : 9/23/2009
Page No : 2

	Jenkintown Rd Southbound				Tookany Creek Pkwy Westbound				Jenkintown Rd Northbound				Tookany Creek Pkwy Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	4	7	1	12	10	50	5	**65**	**9**	7	8	24	1	**80**	10	**91**	**192**
17:15	**8**	7	0	**15**	9	48	**6**	63	5	**10**	**11**	**26**	**3**	60	7	70	174
17:30	5	**8**	**2**	15	7	40	5	52	4	7	5	16	0	63	12	75	158
17:45	7	2	**1**	10	**13**	**51**	1	65	8	5	8	21	0	55	**22**	77	173
Total Volume	24	24	4	52	39	189	17	245	26	29	32	87	4	258	51	313	697
% App. Total	46.2	46.2	7.7		15.9	77.1	6.9		29.9	33.3	36.8		1.3	82.4	16.3		
PHF	.750	.750	.500	.867	.750	.926	.708	.942	.722	.725	.727	.837	.333	.806	.580	.860	.908



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425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Location: New Second Street &
Tookany Creek Parkway
Counter/Countboard No.: KH/4093

File Name : tookany04w
Site Code : 80901504
Start Date : 8/13/2009
Page No : 1

Groups Printed- Unshifted

	New Second St Southbound			Tookany Creek Pkwy Westbound			New Second St Northbound					
Start Time	Left	Thru	HV	Left	Right	HV	Thru	Right	HV	Exclu. Total	Inclu. Total	Int. Total
07:00	18	64	1	4	37	0	64	7	0	1	194	195
07:15	22	85	1	20	46	0	75	7	2	3	255	258
07:30	22	95	3	11	49	0	87	11	1	4	275	279
07:45	25	95	1	9	47	0	73	8	0	1	257	258
Total	87	339	6	44	179	0	299	33	3	9	981	990
08:00	18	84	0	13	32	1	67	6	0	1	220	221
08:15	26	93	0	21	33	1	83	8	1	2	264	266
08:30	12	80	1	6	37	0	75	7	0	1	217	218
08:45	31	62	1	9	25	0	79	10	1	2	216	218
Total	87	319	2	49	127	2	304	31	2	6	917	923
*** BREAK ***			4			2			2			
16:00	35	109	0	8	31	0	81	10	0	0	274	274
16:15	44	85	0	9	37	1	94	10	0	1	279	280
16:30	37	92	4	7	33	0	103	13	0	4	285	289
16:45	56	84	0	7	25	0	109	13	1	1	294	295
Total	172	370	4	31	126	1	387	46	1	6	1132	1138
17:00	52	98	2	5	40	0	111	14	1	3	320	323
17:15	70	116	0	6	29	0	107	27	3	3	355	358
17:30	51	102	0	7	26	0	104	19	0	0	309	309
17:45	48	94	1	12	36	0	100	12	1	2	302	304
Total	221	410	3	30	131	0	422	72	5	8	1286	1294
Grand Total	567	1438	15	154	563	3	1412	182	11	29	4316	4345
Apprch %	28.3	71.7		21.5	78.5		88.6	11.4				
Total %	13.1	33.3		3.6	13		32.7	4.2		0.7	99.3	

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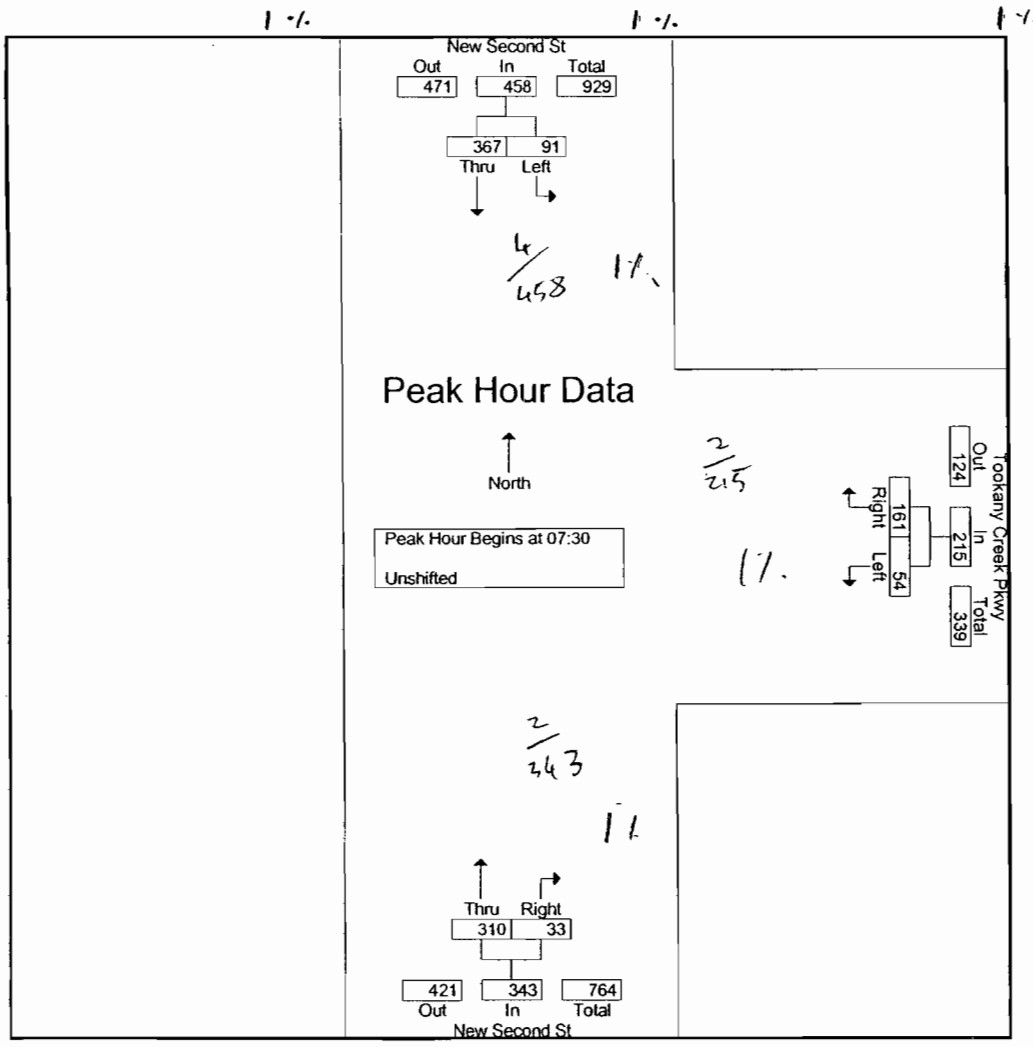
Transportation Engineers and Planners

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Location: New Second Street &
Tookany Creek Parkway
Counter/Countboard No.: KH/4093

File Name : tookany04w
Site Code : 80901504
Start Date : 8/13/2009
Page No : 2

	New Second St Southbound			Tookany Creek Pkwy Westbound			New Second St Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30										
07:30	22	**95**	117	11	**49**	**60**	**87**	**11**	**98**	**275**
07:45	25	95	**120**	9	47	56	73	8	81	257
08:00	18	84	102	13	32	45	67	6	73	220
08:15	**26**	93	119	**21**	33	54	83	8	91	264
Total Volume	91	367	458	54	161	215	310	33	343	1016
% App. Total	19.9	80.1		25.1	74.9		90.4	9.6		
PHF	.875	.966	.954	.643	.821	.896	.891	.750	.875	.924



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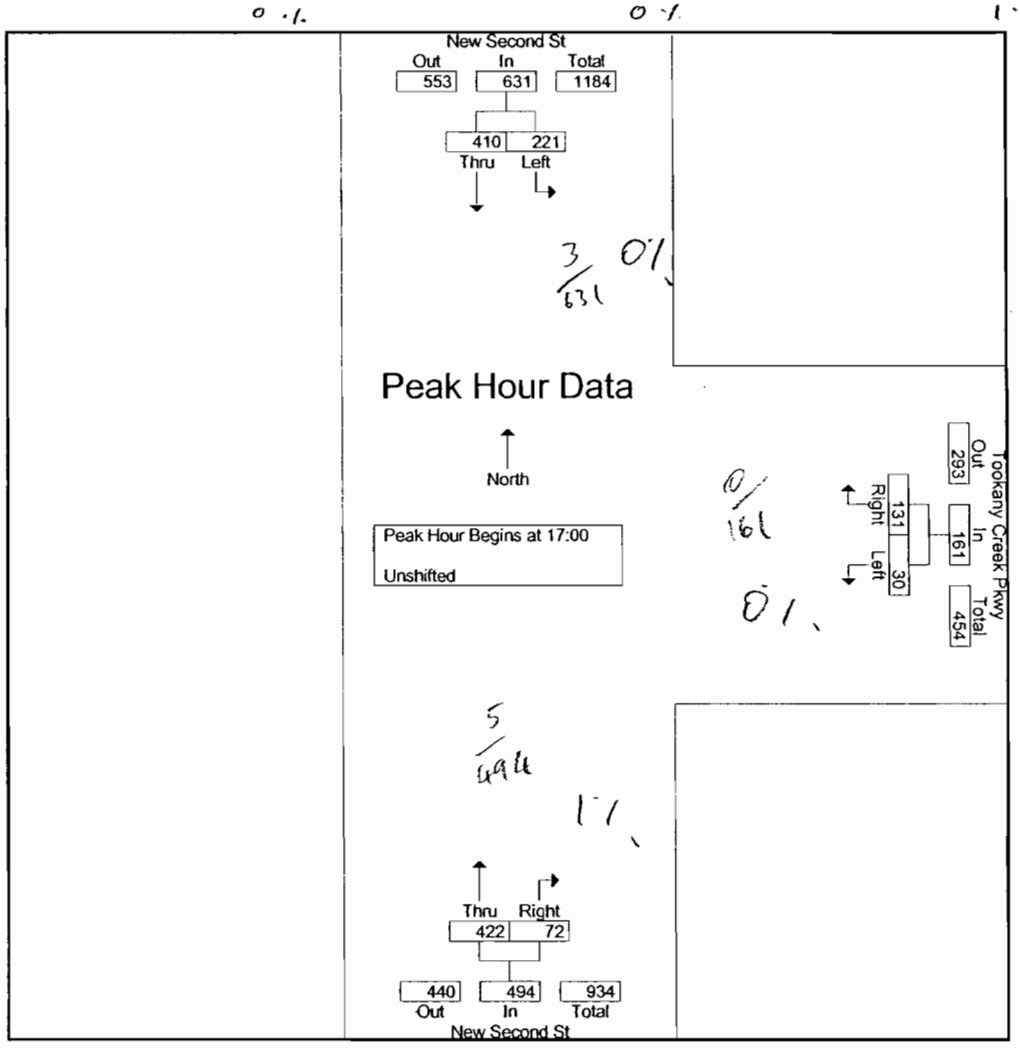
425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: Cheltenham Township
Location: New Second Street &
Tookany Creek Parkway
Counter/Countboard No.: KH/4093

File Name : tookany04w
Site Code : 80901504
Start Date : 8/13/2009
Page No : 3

	New Second St Southbound			Tookany Creek Pkwy Westbound			New Second St Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 17:00										
17:00	52	98	150	5	**40**	45	**111**	14	125	320
17:15	**70**	**116**	**186**	6	29	35	107	**27**	**134**	**355**
17:30	51	102	153	7	26	33	104	19	123	309
17:45	48	94	142	**12**	36	**48**	100	12	112	302
Total Volume	221	410	631	30	131	161	422	72	494	1286
% App. Total	35	65		18.6	81.4		85.4	14.6		
PHF	.789	.884	.848	.625	.819	.839	.950	.667	.922	.906



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425 Commerce Drive, Suite 200
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Municipality: Cheltenham Township
Location: New Second Street &
Tookany Creek Parkway
Counter/Countboard No.: KH/4093

File Name : tookany04w
Site Code : 80901504
Start Date : 8/13/2009
Page No : 1

Groups Printed- Pedestrians

	New Second St Southbound			Tookany Creek Pkwy Westbound			New Second St Northbound					
Start Time	Left	Thru	E/W Peds	Left	Right	N/S Peds	Thru	Right	E/W Peds	Exclu. Total	Inclu. Total	Int. Total
*** BREAK ***												
16:00	0	0	0	0	0	0	0	0	2	2	0	2
16:15	0	0	0	0	0	1	0	0	0	1	0	1
*** BREAK ***												
Total	0	0	0	0	0	1	0	0	2	3	0	3
*** BREAK ***												
17:30	0	0	0	0	0	1	0	0	0	1	0	1
17:45	0	0	0	0	0	0	0	0	1	1	0	1
Total	0	0	0	0	0	1	0	0	1	2	0	2
Grand Total	0	0	0	0	0	2	0	0	3	5	0	5
Apprch %	0	0		0	0		0	0				
Total %										100	0	

APPENDIX D

Auxiliary Lane Warrants
Unsignalized, Age-Restricted Access

2013 Future with Development Conditions
Ashbourne Road and Haines Road/Minor Access for Age-Restricted Homes
Left-Turn Lane Volume Adjustments

Time Period	Eastbound		Westbound	
	2011		2011	
	AM	PM	AM	PM
Advancing Volumes				
$P_{Heavy\ Vehicles}$	0.00	0.00	0.00	0.00
$E_{Terrain}$	1.5	1.5	1.5	1.5
$T_{adjustment}$	1.0	1.0	1.0	1.0
Volumes				
Initial				
Lefts	9	19	0	0
Total Advancing	243	386	328	310
Adjusted				
Lefts	9	19	0	0
Total Advancing	243	386	328	310
Percent Lefts	4%	5%	0%	0%
Opposing Volumes				
Adjustment Factors				
$P_{Heavy\ Vehicles}$	0.00	0.00	0.00	0.00
$E_{Terrain}$	1.5	1.5	1.5	1.5
$T_{adjustment}$	1.0	1.0	1.0	1.0
Volumes				
Initial	328	310	243	386
Adjusted	328	310	243	386
Lane Warranted (1)	No	No	No	No

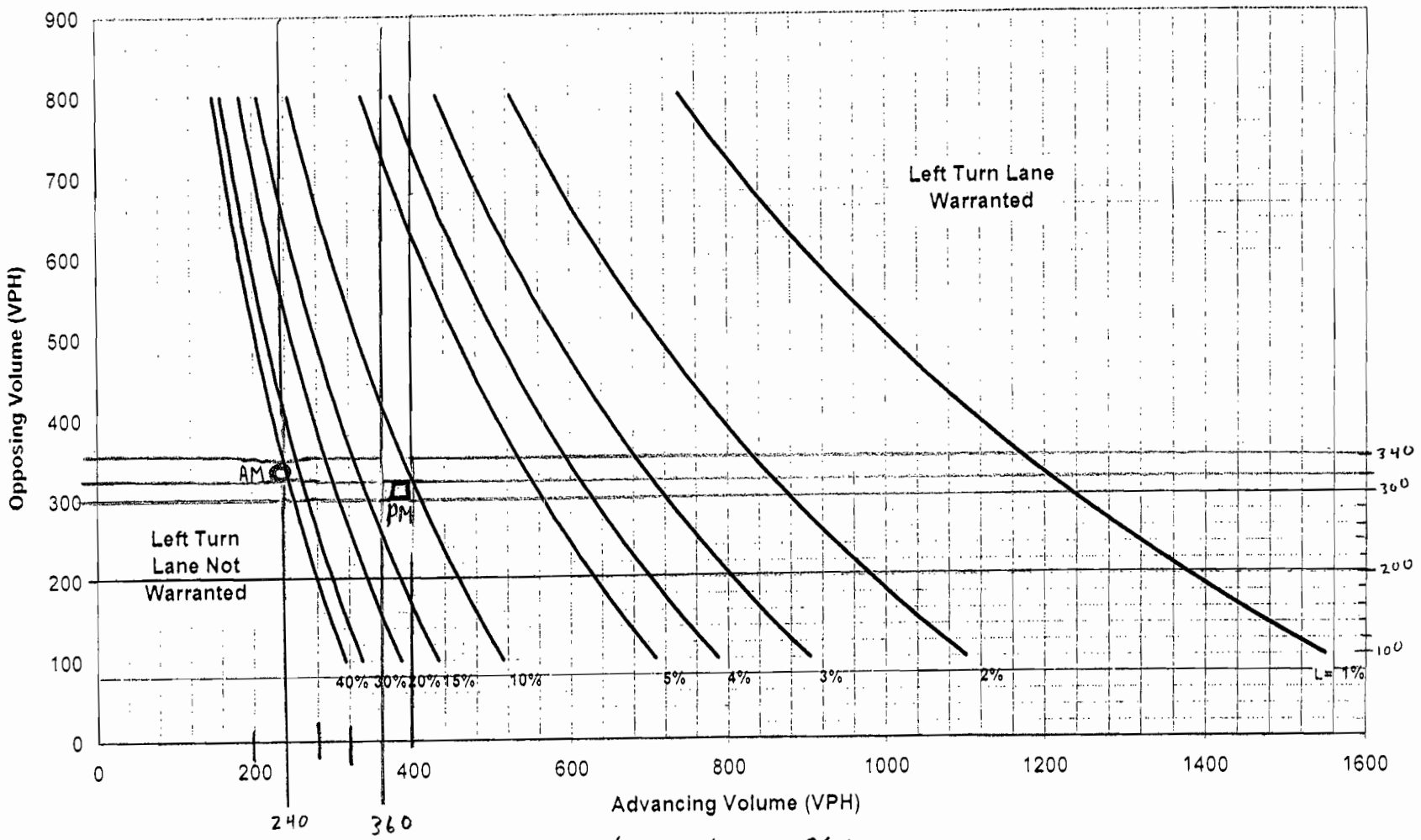
(1) Based on Pub 46 charts using speed of 40 miles per hour

Ashbourne Road and Haines Road/Minor Access for Age-Restricted Homes

Eastbound – to Haines Rd

Figure 2. Warrant for left turn lanes on two-lane highways (40 mph speed, unsignalized and signalized intersections)

(L = % Left Turns in Advancing Volume)



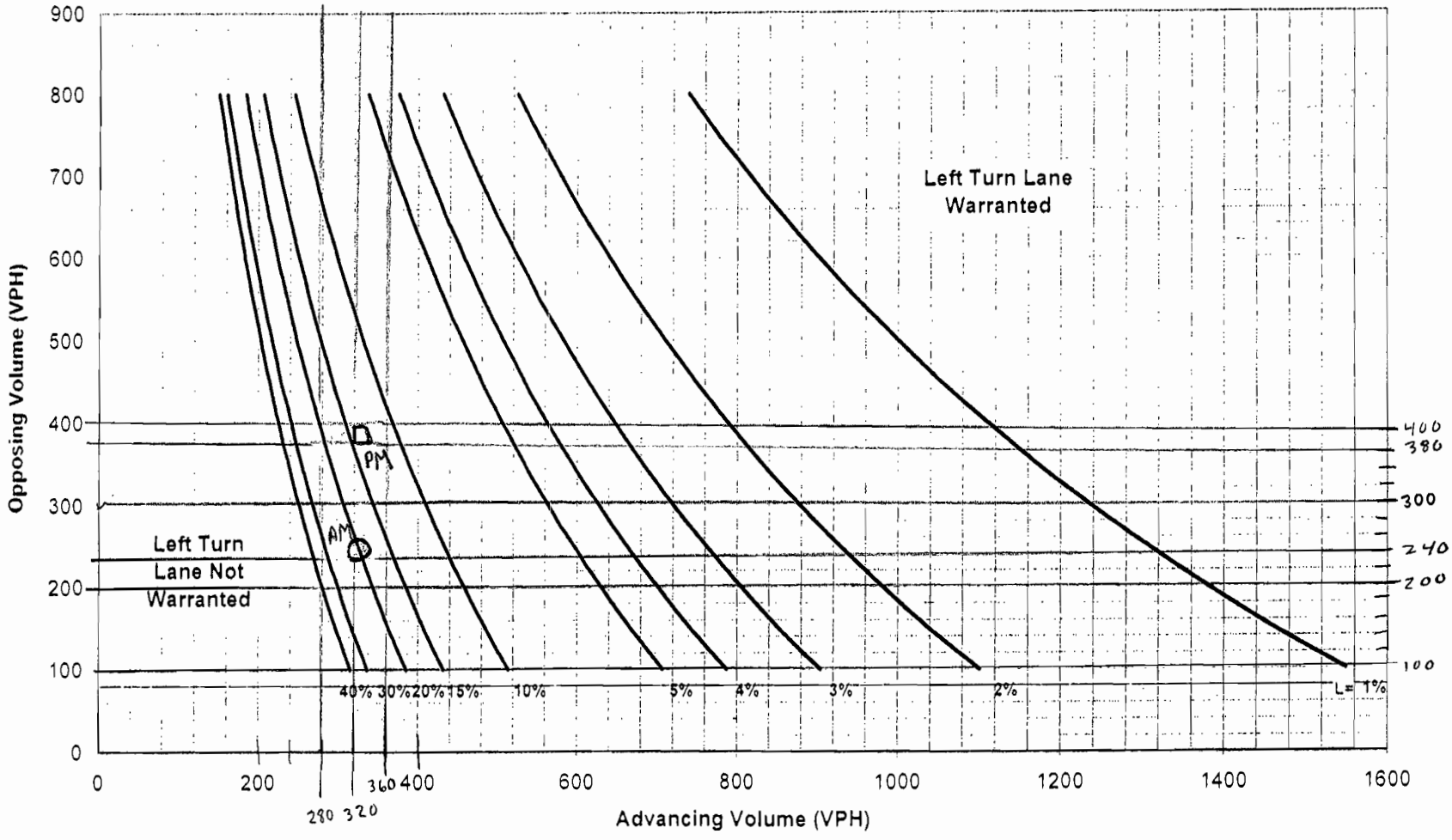
		V_{ADV}	V_{OPP}	%L	
2011	AM	243	328	4%	○
	PM	386	310	5%	□

Ashbourne Road and Haines Road/Minor Access for Age-Restricted Homes

West bound - to Access

Figure 2. Warrant for left turn lanes on two-lane highways (40 mph speed, unsignalized and signalized intersections)

(L = % Left Turns in Advancing Volume)



		V_{ADV}	V_{OPP}	%L	
2011	AM	328	243	0%	○
	PM	310	386	0%	□

2013 Future with Development Conditions
Ashbourne Road and Haines Road/Minor Access for Age-Restricted Homes
Right-Turn Lane Volume Adjustments

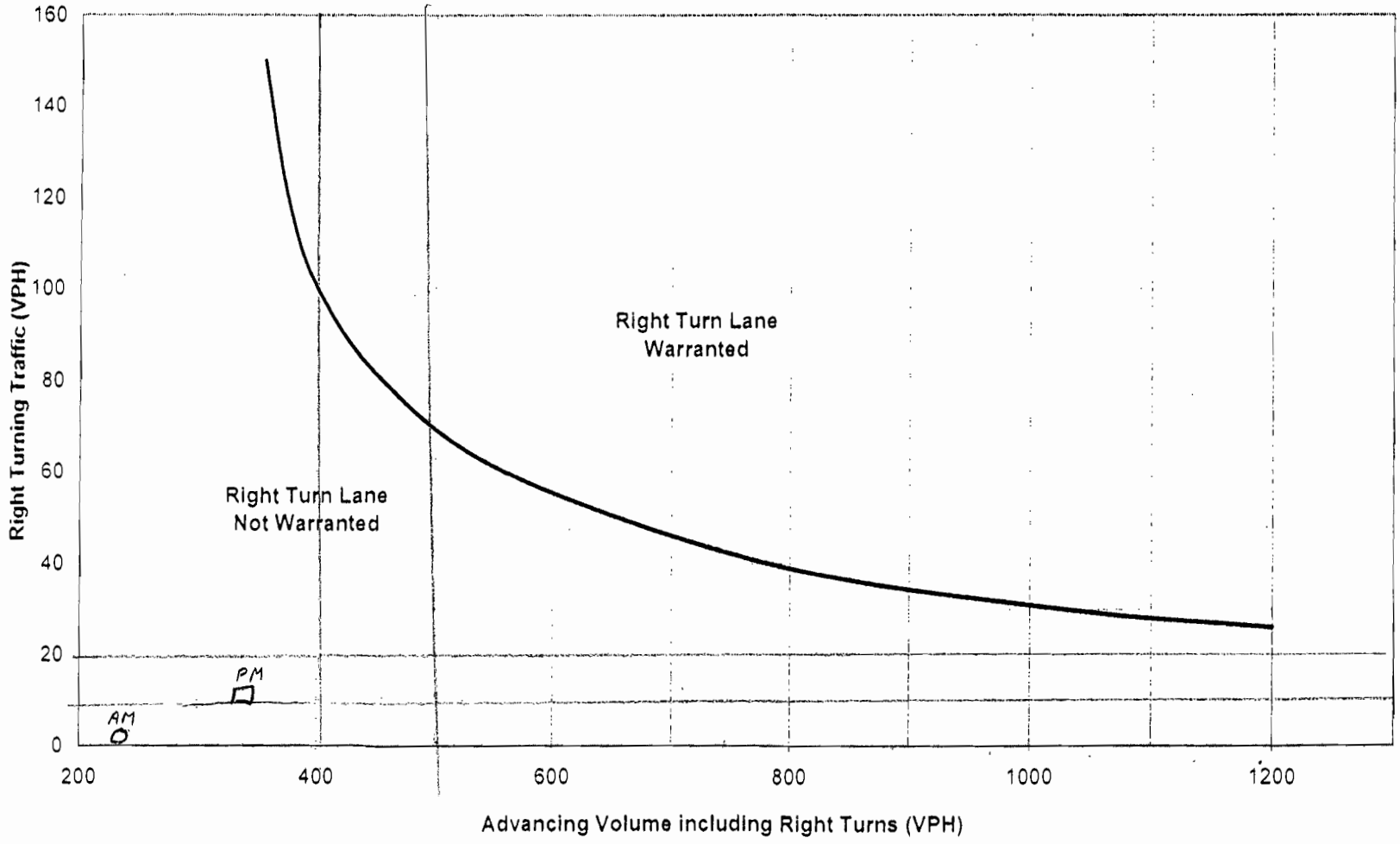
Time Period	Eastbound		Westbound	
	2011		2011	
	AM	PM	AM	PM
Adjustment Factors				
$P_{Heavy\ Vehicles}$	0.00	0.00	0.00	0.00
$E_{Terrain}$	1.5	1.5	1.5	1.5
$T_{adjustment}$	1.0	1.0	1.0	1.0
Initial Volumes				
Rights	3	11	2	5
Total Approaching	243	386	328	310
Adjusted Volumes				
Rights	3	11	2	5
Total Approaching	243	386	328	310
Percent Rights	1%	3%	1%	2%
Lane Warranted[1]	No	No	No	No

(1) Based on PUB 46 charts for speeds of 40 miles per hour or lower on two-lane roadways.

Ashbourne Road and Haines Road / Minor Access for Age-Restricted Homes

Eastbound – to Haines Rd

Figure 9. Warrant for right turn lanes on two-lane roadways (40 mph or lower speeds, unsignalized and signalized intersections)



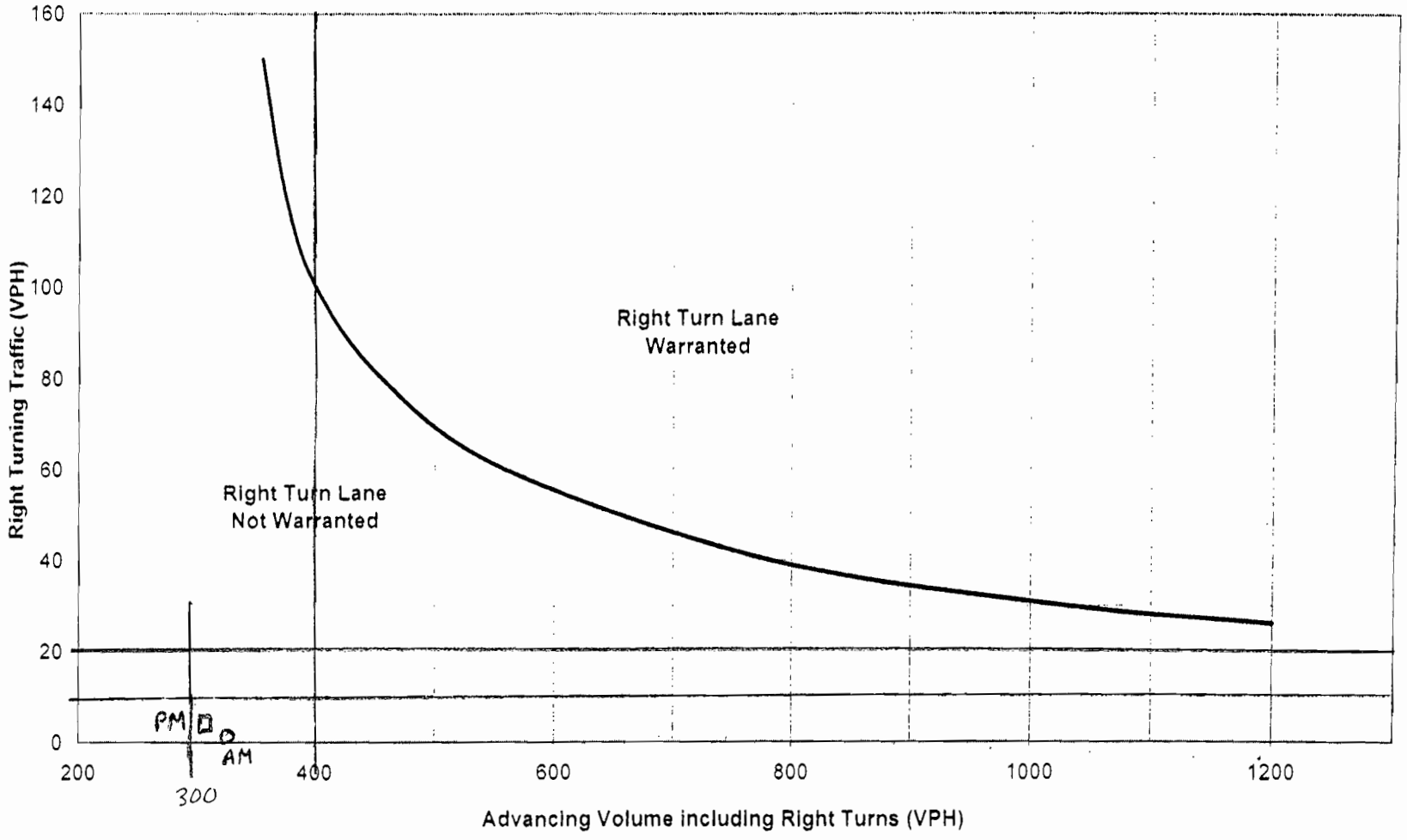
V_R — V_{ADV}

2011	AM	3	243	○
	PM	11	386	□

Ashbourne Road and Haines Road / Minor Access for Age-Restricted Homes

Westbound - to Access

Figure 9. Warrant for right turn lanes on two-lane roadways (40 mph or lower speeds, unsignalized and signalized intersections)



$V_R - V_{ADV}$

2011	AM	2	328	○
	PM	5	340	□

APPENDIX E

HCM Methodology

CAPACITY/LEVEL-OF-SERVICE ANALYSIS METHODOLOGY

The detailed capacity/level-of-service analysis contained in this traffic impact study was performed in accordance with the standard techniques contained in the "Highway Capacity Manual".(1) By definition, capacity represents "the maximum rate of flow that can reasonably be expected to pass a point on a uniform section of a lane or roadway under prevailing roadway, traffic, and control conditions." The level of functioning of an intersection or a uniform section of a lane or roadway can be expressed in terms of levels of service. Level of service (LOS) is defined as "a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers". Such measures include "speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety."

At unsignalized intersections, a methodology for evaluating the relative functioning of intersections controlled by stop or yield signs has been developed, and is based on several assumptions, including:

- Major street flows are not affected by the minor (stop-sign controlled) street movements.
- Left turns from the major street to the minor street are influenced only by opposing major street through flow.
- Minor street left turns are impeded by all major street traffic plus opposing minor street traffic.
- Minor street through traffic is impeded by all major street traffic.
- Minor street right turns are impeded only by the major street traffic coming from the left.

The concept of stop-controlled or yield-controlled intersection analysis is based on the estimate of average total delay on minor streets. The methodology of analysis relies on three elements: the size and distribution of gaps in the major traffic stream, the usefulness of these gaps to the minor stream drivers, and the relative priority of the various traffic streams at the intersection. The results of the analysis provide an estimate of average total delay for the various critical movements at the unsignalized intersections. Correlation between average total delay and the respective levels of service are provided for unsignalized intersections as follows:

(1) *Transportation Research Board, Special Report 209, Highway Capacity Manual, published by the Transportation Research Board, Washington, DC, Updated 2000.*

Unsignalized Intersections

Level of Service	Description	Control Delay Per Vehicle (seconds)
A	Little or no delay	≤10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Demand exceeds capacity of the lane or approach	> 50.0

At signalized intersections, an additional element must be considered: time allocation. Level of service is based primarily on the average control delay per vehicle for various movements within the intersection. Volume/capacity relationships also affect level of service. Thus, both volume/capacity and delay must be considered to evaluate the overall operation of a signalized intersection. Correlation between average delay per vehicle and the respective levels of service are provided for signalized intersections as follows:

Signalized Intersections

Level of Service	Description	Control Delay Per Vehicle (seconds)
A	Very low delay, high quality flow	≤10.0
B	Low delay, good traffic flow	10.1 to 20.0
C	Average delay, stable traffic flow	20.1 to 35.0
D	Longer delay, approach capacity flow	35.1 to 55.0
E	Limit of acceptable delay, capacity flow	55.1 to 80.0
F	Unacceptable delay, forced flow	> 80.0

APPENDIX F

2009 Existing Capacity/Level-of-Service Analysis Worksheets

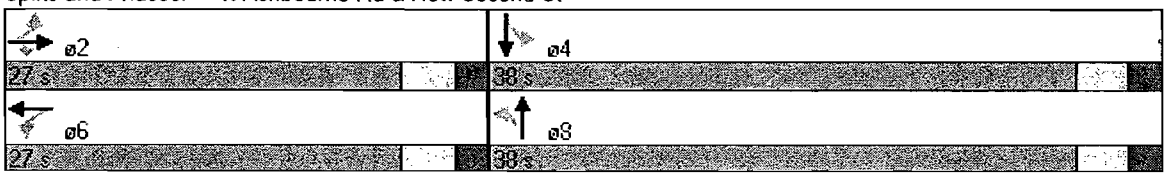
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	101	120	27	11	186	122	22	334	7	99	449	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Storage Length (ft)	0		110	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.948			0.997			0.981	
Flt Protected		0.978			0.998			0.997			0.992	
Satd. Flow (prot)	0	1840	1653	0	1903	0	0	2068	0	0	1805	0
Flt Permitted		0.611			0.985			0.943			0.869	
Satd. Flow (perm)	0	1150	1653	0	1878	0	0	1956	0	0	1581	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			35					2			18	
Link Speed (mph)		25			40			35			35	
Link Distance (ft)		500			433			500			1087	
Travel Time (s)		13.6			7.4			9.7			21.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	131	156	35	12	198	130	28	423	9	108	488	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	287	35	0	340	0	0	460	0	0	692	0
Number of Detectors	1	0	0	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	35	0	0	35	0		35	0		35	0	
Trailing Detector (ft)	-5	0	0	-5	0		-5	0		-5	0	
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase												
Switch Phase												
Minimum Initial (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		38.0	38.0		38.0	38.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	41.5%	0.0%	58.5%	58.5%	0.0%	58.5%	58.5%	0.0%
Maximum Green (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max	Max	Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.74	0.06		0.53			0.46			0.85	
Control Delay		33.1	6.1		21.1			12.2			26.5	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		33.1	6.1		21.1			12.2			26.5	
Queue Length 50th (ft)		98	0		107			108			215	
Queue Length 95th (ft)		146	12		179			145			#429	
Internal Link Dist (ft)		420			353			420			1007	
Turn Bay Length (ft)			110									
Base Capacity (vph)		389	583		636			994			812	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.74	0.06		0.53			0.46			0.85	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 65
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ashbourne Rd & New Second St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	101	120	27	11	186	122	22	334	7	99	449	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.95			1.00			0.98	
Flt Protected		0.98	1.00		1.00			1.00			0.99	
Satd. Flow (prot)		1840	1653		1904			2068			1806	
Flt Permitted		0.61	1.00		0.99			0.94			0.87	
Satd. Flow (perm)		1149	1653		1879			1957			1581	
Peak-hour factor, PHF	0.77	0.77	0.77	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.92	0.92
Adj. Flow (vph)	131	156	35	12	198	130	28	423	9	108	488	96
RTOR Reduction (vph)	0	0	23	0	0	0	0	1	0	0	9	0
Lane Group Flow (vph)	0	287	12	0	340	0	0	459	0	0	683	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	4%	4%	4%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)		22.0	22.0		22.0			33.0			33.0	
Effective Green, g (s)		22.0	22.0		22.0			33.0			33.0	
Actuated g/C Ratio		0.34	0.34		0.34			0.51			0.51	
Clearance Time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Grp Cap (vph)		389	559		636			994			803	
v/s Ratio Prot												
v/s Ratio Perm		c0.25	0.01		0.18			0.23			c0.43	
v/c Ratio		0.74	0.02		0.53			0.46			0.85	
Uniform Delay, d1		19.0	14.3		17.4			10.3			13.9	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		11.8	0.1		3.2			1.5			11.0	
Delay (s)		30.8	14.4		20.6			11.8			24.8	
Level of Service		C	B		C			B			C	
Approach Delay (s)		29.0			20.6			11.8			24.8	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	21.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	111.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	223	3	0	313	6	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	11	11
Grade (%)	-4%			-4%	-2%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.998					
Flt Protected					0.950	
Satd. Flow (prot)	2192	0	0	2196	1762	0
Flt Permitted					0.950	
Satd. Flow (perm)	2192	0	0	2196	1762	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	433			1750	486	
Travel Time (s)	8.4			34.1	13.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.81	0.81	0.73	0.73	0.75	0.75
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	275	4	0	429	8	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	279	0	0	429	8	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	223	3	0	313	6	0
Sign Control	Free			Free	Stop	
Grade	-4%			-4%	-2%	
Peak Hour Factor	0.81	0.81	0.73	0.73	0.75	0.75
Hourly flow rate (vph)	275	4	0	429	8	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	433					
pX, platoon unblocked						
vC, conflicting volume			279		706	277
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			279		706	277
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1295		406	767

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	279	429	8
Volume Left	0	0	8
Volume Right	4	0	0
cSH	1700	1295	406
Volume to Capacity	0.16	0.00	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	14.1
Lane LOS			B
Approach Delay (s)	0.0	0.0	14.1
Approach LOS			B

Intersection Summary			
Average Delay	0.2 - A		
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		

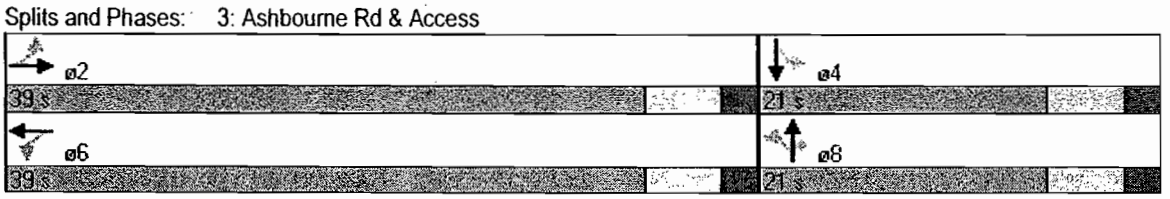
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	205	18	253	258	0	55	1	185	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	9	10	10	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Storage Length (ft)	140		0	150		0	0		45	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988							0.850			
Flt Protected				0.950				0.953				
Satd. Flow (prot)	1713	1693	0	1525	1665	0	0	1622	1596	0	1701	0
Flt Permitted				0.592				0.727				
Satd. Flow (perm)	1713	1693	0	950	1665	0	0	1237	1596	0	1701	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)									231			
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1750			1349			500			300	
Travel Time (s)		29.8			23.0			9.7			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.95	0.95	0.95	0.80	0.80	0.80	0.25	0.25	0.25
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	9%	9%	9%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	250	22	266	272	0	69	1	231	0	4	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	272	0	266	272	0	0	70	231	0	4	0
Number of Detectors	0	0		0	0		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	0	0		0	0		35	35	35	20	20	
Trailing Detector (ft)	0	0		0	0		-5	-5	-5	-5	-5	
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase							8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	33.0	33.0		33.0	33.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	39.0	39.0		39.0	39.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	39.0	39.0	0.0	39.0	39.0	0.0	21.0	21.0	21.0	21.0	21.0	0.0
Total Split (%)	65.0%	65.0%	0.0%	65.0%	65.0%	0.0%	35.0%	35.0%	35.0%	35.0%	35.0%	0.0%
Maximum Green (s)	33.0	33.0		33.0	33.0		15.0	15.0	15.0	15.0	15.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	Min	Min		Min	Min		None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.26		0.45	0.27			0.35	0.51		0.01	
Control Delay		6.0		9.3	6.1			25.1	8.0		18.0	
Queue Delay		0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay		6.0		9.3	6.1			25.1	8.0		18.0	
Queue Length 50th (ft)		33		37	33			20	0		1	
Queue Length 95th (ft)		66		100	76			44	33		2	
Internal Link Dist (ft)		1670			1269			420			220	
Turn Bay Length (ft)				150					45			
Base Capacity (vph)		1043		586	1026			347	613		477	
Starvation Cap Reductn		0		0	0			0	0		0	
Spillback Cap Reductn		0		0	0			0	0		0	
Storage Cap Reductn		0		0	0			0	0		0	
Reduced v/c Ratio		0.26		0.45	0.27			0.20	0.38		0.01	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 53.6
Natural Cycle: 50
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ashbourne Rd & Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	205	18	253	258	0	55	1	185	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	10	10	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Frt		0.99		1.00	1.00			1.00	0.85		1.00	
Flt Protected		1.00		0.95	1.00			0.95	1.00		1.00	
Satd. Flow (prot)		1692		1525	1665			1622	1596		1701	
Flt Permitted		1.00		0.59	1.00			0.73	1.00		1.00	
Satd. Flow (perm)		1692		950	1665			1237	1596		1701	
Peak-hour factor, PHF	0.82	0.82	0.82	0.95	0.95	0.95	0.80	0.80	0.80	0.25	0.25	0.25
Adj. Flow (vph)	0	250	22	266	272	0	69	1	231	0	4	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	194	0	0	0
Lane Group Flow (vph)	0	272	0	266	272	0	0	70	37	0	4	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	9%	9%	9%	0%	0%	0%
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)		33.1		33.1	33.1			8.6	8.6		8.6	
Effective Green, g (s)		33.1		33.1	33.1			8.6	8.6		8.6	
Actuated g/C Ratio		0.62		0.62	0.62			0.16	0.16		0.16	
Clearance Time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		1043		586	1026			198	256		272	
v/s Ratio Prot		0.16			0.16						0.00	
v/s Ratio Perm				c0.28				c0.06	0.02			
v/c Ratio		0.26		0.45	0.27			0.35	0.14		0.01	
Uniform Delay, d1		4.7		5.5	4.7			20.1	19.4		19.0	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.1		0.6	0.1			1.1	0.3		0.0	
Delay (s)		4.8		6.0	4.9			21.2	19.6		19.0	
Level of Service		A		A	A			C	B		B	
Approach Delay (s)		4.8			5.4			20.0			19.0	
Approach LOS		A			A			C			B	

Intersection Summary			
HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	53.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lane Configurations												
Volume (vph)	144	6	197	43	2	6	12	2	11	64	14	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	15	12	12	12	12	16	16	16	15
Grade (%)		0%					1%			1%		
Storage Length (ft)	0		0			0		0	0			
Storage Lanes	0		0			0		0	0			
Taper Length (ft)	25		25			25		25	25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.917					0.986			0.978		
Flt Protected		0.982					0.981			0.994		
Satd. Flow (prot)	0	1776	0	0	0	0	1742	0	0	2062	0	0
Flt Permitted		0.982					0.981			0.939		
Satd. Flow (perm)	0	1776	0	0	0	0	1742	0	0	1948	0	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)		40					25			15		
Link Distance (ft)		1349					528			501		
Travel Time (s)		23.0					14.4			22.8		
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.77	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	1%	1%	1%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%					0%			0%		
Adj. Flow (vph)	187	8	256	56	3	8	15	3	14	80	18	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	507	0	0	0	0	29	0	0	112	0	0
Number of Detectors	1	1			1	1	1		1	1		2
Detector Template												
Leading Detector (ft)	35	35			35	35	35		35	35		70
Trailing Detector (ft)	-5	-5			-5	-5	-5		-5	-5		-5
Turn Type	Split				Perm	Split			Perm			Perm
Protected Phases	2	2				6	6			8		
Permitted Phases		2			6				8			4
Detector Phase	2	2			6	6	6		8	8		4
Switch Phase												
Minimum Initial (s)	8.0	8.0			5.0	5.0	5.0		8.0	8.0		8.0
Minimum Split (s)	14.0	14.0			11.0	11.0	11.0		14.0	14.0		14.0
Total Split (s)	46.0	46.0	0.0	0.0	21.0	21.0	21.0	0.0	51.0	51.0	0.0	51.0
Total Split (%)	28.0%	28.0%	0.0%	0.0%	12.8%	12.8%	12.8%	0.0%	31.1%	31.1%	0.0%	31.1%
Maximum Green (s)	40.0	40.0			15.0	15.0	15.0		45.0	45.0		45.0
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	-2.0	-2.0	0.0	0.0	-2.0	0.0	0.0	2.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	16	87	216	27	272	22	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	16	16	16	16
Grade (%)		0%			2%		
Storage Length (ft)	0		0		0	0	
Storage Lanes	0		0		1	0	
Taper Length (ft)	25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							
Frt		0.909			0.990		
Flt Protected		0.997			0.956		
Satd. Flow (prot)	0	1770	0	0	1978	0	0
Flt Permitted		0.983			0.956		
Satd. Flow (perm)	0	1745	0	0	1978	0	0
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		35			25		
Link Distance (ft)		752			574		
Travel Time (s)		14.6			15.7		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.98	0.98	0.98	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%			0%		
Adj. Flow (vph)	16	89	220	28	286	23	1
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	326	0	0	338	0	0
Number of Detectors	2	2		1	1		
Detector Template							
Leading Detector (ft)	70	70		35	35		
Trailing Detector (ft)	-5	-5		-5	-5		
Turn Type	Perm			Split			
Protected Phases		4		9	9		
Permitted Phases	4						
Detector Phase	4	4		9	9		
Switch Phase							
Minimum Initial (s)	8.0	8.0		8.0	8.0		
Minimum Split (s)	14.0	14.0		14.0	14.0		
Total Split (s)	51.0	51.0	0.0	46.0	46.0	0.0	0.0
Total Split (%)	31.1%	31.1%	0.0%	28.0%	28.0%	0.0%	0.0%
Maximum Green (s)	45.0	45.0		40.0	40.0		
Yellow Time (s)	4.0	4.0		4.0	4.0		
All-Red Time (s)	2.0	2.0		2.0	2.0		
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	4.0

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0		5.0
Minimum Gap (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		3.0
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None			None	None	None		Max	Max		Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		1.02					0.24			0.18		
Control Delay		97.1					73.1			40.7		
Queue Delay		0.0					0.0			0.0		
Total Delay		97.1					73.1			40.7		
Queue Length 50th (ft)		~559					28			83		
Queue Length 95th (ft)		#671					57			130		
Internal Link Dist (ft)		1269					448			421		
Turn Bay Length (ft)												
Base Capacity (vph)		497					182			612		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		1.02					0.16			0.18		

Intersection Summary

Area Type: Other

Cycle Length: 164

Actuated Cycle Length: 144.8

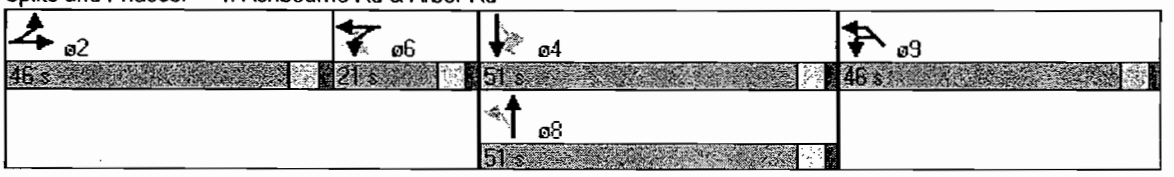
Natural Cycle: 90

Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Ashbourne Rd & Arbor Rd



Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	5.0	5.0		5.0	5.0		
Minimum Gap (s)	3.0	3.0		3.0	3.0		
Time Before Reduce (s)	0.0	0.0		0.0	0.0		
Time To Reduce (s)	0.0	0.0		0.0	0.0		
Recall Mode	Max	Max		None	None		
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
v/c Ratio		0.59			0.80		
Control Delay		50.1			69.4		
Queue Delay		0.0			0.0		
Total Delay		50.1			69.4		
Queue Length 50th (ft)		280			320		
Queue Length 95th (ft)		425			446		
Internal Link Dist (ft)		672			494		
Turn Bay Length (ft)							
Base Capacity (vph)		549			553		
Starvation Cap Reductn		0			0		
Spillback Cap Reductn		0			0		
Storage Cap Reductn		0			0		
Reduced v/c Ratio		0.59			0.61		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lane Configurations												
Volume (vph)	144	6	197	43	2	6	12	2	11	64	14	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	15	12	12	12	12	16	16	16	15
Grade (%)		0%					1%			1%		
Total Lost time (s)		6.0					6.0			6.0		
Lane Util. Factor		1.00					1.00			1.00		
Frt		0.92					0.99			0.98		
Flt Protected		0.98					0.98			0.99		
Satd. Flow (prot)		1775					1742			2062		
Flt Permitted		0.98					0.98			0.94		
Satd. Flow (perm)		1775					1742			1948		
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.98
Adj. Flow (vph)	187	8	256	56	3	8	15	3	14	80	18	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	507	0	0	0	0	29	0	0	112	0	0
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	1%	1%	1%	7%
Turn Type	Split				Perm	Split			Perm			Perm
Protected Phases	2	2				6	6			8		
Permitted Phases		2			6				8			4
Actuated Green, G (s)		40.5					6.3			45.5		
Effective Green, g (s)		40.5					6.3			45.5		
Actuated g/C Ratio		0.27					0.04			0.31		
Clearance Time (s)		6.0					6.0			6.0		
Vehicle Extension (s)		5.0					5.0			5.0		
Lane Grp Cap (vph)		488					75			602		
v/s Ratio Prot		c0.29					c0.02					
v/s Ratio Perm										0.06		
v/c Ratio		1.04					0.39			0.19		
Uniform Delay, d1		53.4					68.6			37.3		
Progression Factor		1.00					1.00			1.00		
Incremental Delay, d2		51.2					6.8			0.7		
Delay (s)		104.6					75.4			38.0		
Level of Service		F					E			D		
Approach Delay (s)		104.6					75.4			38.0		
Approach LOS		F					E			D		

Intersection Summary			
HCM Average Control Delay	74.9	HCM Level of Service	E
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	147.3	Sum of lost time (s)	24.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	16	87	216	27	272	22	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	16	16	16	16
Grade (%)		0%			2%		
Total Lost time (s)		6.0			6.0		
Lane Util. Factor		1.00			1.00		
Frt		0.91			0.99		
Flt Protected		1.00			0.96		
Satd. Flow (prot)		1771			1978		
Flt Permitted		0.98			0.96		
Satd. Flow (perm)		1744			1978		
Peak-hour factor, PHF	0.98	0.98	0.98	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	89	220	28	286	23	1
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	326	0	0	338	0	0
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	2%
Turn Type	Perm			Split			
Protected Phases		4		9	9		
Permitted Phases	4						
Actuated Green, G (s)		45.5			31.0		
Effective Green, g (s)		45.5			31.0		
Actuated g/C Ratio		0.31			0.21		
Clearance Time (s)		6.0			6.0		
Vehicle Extension (s)		5.0			5.0		
Lane Grp Cap (vph)		539			416		
v/s Ratio Prot					c0.17		
v/s Ratio Perm		c0.19					
v/c Ratio		0.60			0.81		
Uniform Delay, d1		43.3			55.4		
Progression Factor		1.00			1.00		
Incremental Delay, d2		5.0			12.9		
Delay (s)		48.2			68.3		
Level of Service		D			E		
Approach Delay (s)		48.2			68.3		
Approach LOS		D			E		

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	9	15	230	2	3	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	16	15	15
Grade (%)	-3%		-5%			3%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.915		0.999			
Flt Protected	0.982					
Satd. Flow (prot)	1733	0	2080	0	0	1942
Flt Permitted	0.982					
Satd. Flow (perm)	1733	0	2080	0	0	1942
Link Speed (mph)	25		35			35
Link Distance (ft)	484		752			350
Travel Time (s)	13.2		14.6			6.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.84	0.84	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	6%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	10	17	274	2	3	342
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	0	276	0	0	345
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	15	230	2	3	311
Sign Control	Stop		Free			Free
Grade	-3%		-5%			3%
Peak Hour Factor	0.86	0.86	0.84	0.84	0.91	0.91
Hourly flow rate (vph)	10	17	274	2	3	342
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			752			
pX, platoon unblocked						
vC, conflicting volume	623	275			276	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	623	275			276	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	98	98			100	
cM capacity (veh/h)	452	769			1264	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	28	276	345
Volume Left	10	0	3
Volume Right	17	2	0
cSH	609	1700	1264
Volume to Capacity	0.05	0.16	0.00
Queue Length 95th (ft)	4	0	0
Control Delay (s)	11.2	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	11.2	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay	0.5 - A		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	12	72	73	172	242	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	15	15	16	16
Grade (%)	0%			-8%	3%	
Storage Length (ft)	0	0	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.884				0.989	
Flt Protected	0.993			0.985		
Satd. Flow (prot)	1673	0	0	2039	1942	0
Flt Permitted	0.993			0.985		
Satd. Flow (perm)	1673	0	0	2039	1942	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	1357			350	457	
Travel Time (s)	37.0			6.8	8.9	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.89	0.89	0.82	0.82
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	5%	5%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	17	101	82	193	295	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	118	0	0	275	321	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	12	72	73	172	242	21
Sign Control	Stop			Free	Free	
Grade	0%			-8%	3%	
Peak Hour Factor	0.71	0.71	0.89	0.89	0.82	0.82
Hourly flow rate (vph)	17	101	82	193	295	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	665	308	295			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	665	308	295			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	86	93			
cM capacity (veh/h)	396	730	1249			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	118	275	321
Volume Left	17	82	0
Volume Right	101	0	26
cSH	651	1249	1700
Volume to Capacity	0.18	0.07	0.19
Queue Length 95th (ft)	16	5	0
Control Delay (s)	11.8	2.8	0.0
Lane LOS	B	A	
Approach Delay (s)	11.8	2.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.0 - A		
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	281	62	240	258	1	33	1	210	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	10	10	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Frt		0.97		1.00	1.00			1.00	0.85		1.00	
Flt Protected		1.00		0.95	1.00			0.95	1.00		1.00	
Satd. Flow (prot)		1717		1569	1712			1701	1673		851	
Flt Permitted		1.00		0.54	1.00			0.73	1.00		1.00	
Satd. Flow (perm)		1717		885	1712			1301	1673		851	
Peak-hour factor, PHF	0.90	0.90	0.90	0.87	0.87	0.87	0.85	0.85	0.85	0.25	0.25	0.25
Adj. Flow (vph)	0	312	69	276	297	1	39	1	247	0	4	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	212	0	0	0
Lane Group Flow (vph)	0	381	0	276	298	0	0	40	35	0	4	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	100%	100%	100%
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)		33.0		33.0	33.0			7.5	7.5		7.5	
Effective Green, g (s)		33.0		33.0	33.0			7.5	7.5		7.5	
Actuated g/C Ratio		0.63		0.63	0.63			0.14	0.14		0.14	
Clearance Time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		1079		556	1076			186	239		122	
v/s Ratio Prot		0.22			0.17						0.00	
v/s Ratio Perm				c0.31				c0.03	0.02			
v/c Ratio		0.35		0.50	0.28			0.22	0.15		0.03	
Uniform Delay, d1		4.7		5.3	4.4			19.9	19.7		19.4	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.2		0.7	0.1			0.6	0.3		0.1	
Delay (s)		4.9		6.0	4.5			20.5	20.0		19.5	
Level of Service		A		A	A			C	B		B	
Approach Delay (s)		4.9			5.2			20.1			19.5	
Approach LOS		A			A			C			B	

Intersection Summary			
HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	52.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Volume (vph)	237	13	216	25	1	7	4	10	88	4	15	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	12	16	16	16	16	15
Grade (%)		0%				1%			1%			
Storage Length (ft)	0		0		0		0	0		0		
Storage Lanes	0		0		0		0	0		0		
Taper Length (ft)	25		25		25		25	25		25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.934				0.955			0.978			
Flt Protected		0.976				0.996			0.996			
Satd. Flow (prot)	0	1868	0	0	0	1199	0	0	2046	0	0	0
Flt Permitted		0.976				0.996			0.947			
Satd. Flow (perm)	0	1868	0	0	0	1199	0	0	1945	0	0	0
Right Turn on Red				No			No				No	
Satd. Flow (RTOR)												
Link Speed (mph)		40				25			15			
Link Distance (ft)		1349				527			500			
Travel Time (s)		23.0				14.4			22.7			
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.90	0.33	0.33	0.33	0.73	0.73	0.73	0.73	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	50%	50%	50%	2%	2%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%			0%			
Adj. Flow (vph)	269	15	245	28	3	21	12	14	121	5	21	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	557	0	0	0	36	0	0	161	0	0	0
Number of Detectors	1	1			1	1		1	1			2
Detector Template												
Leading Detector (ft)	35	35			35	35		35	35			70
Trailing Detector (ft)	-5	-5			-5	-5		-5	-5			-5
Turn Type	Split				Split			Perm				Perm
Protected Phases	2	2			6	6			8			
Permitted Phases		2						8				4
Detector Phase	2	2			6	6		8	8			4
Switch Phase												
Minimum Initial (s)	8.0	8.0			5.0	5.0		8.0	8.0			8.0
Minimum Split (s)	14.0	14.0			11.0	11.0		14.0	14.0			14.0
Total Split (s)	46.0	46.0	0.0	0.0	21.0	21.0	0.0	51.0	51.0	0.0	0.0	51.0
Total Split (%)	28.0%	28.0%	0.0%	0.0%	12.8%	12.8%	0.0%	31.1%	31.1%	0.0%	0.0%	31.1%
Maximum Green (s)	40.0	40.0			15.0	15.0		45.0	45.0			45.0
Yellow Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			4.0
All-Red Time (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0	-2.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0	4.0

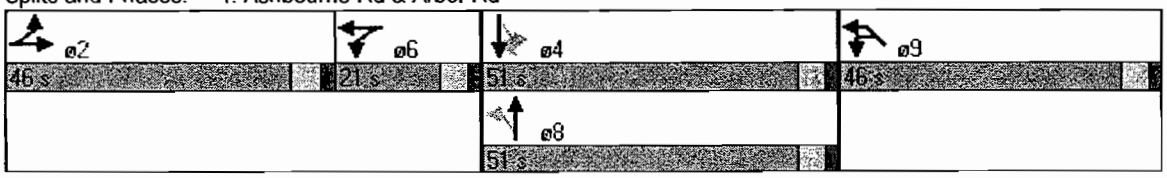
Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	32	123	214	22	268	17	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	16	16	16	16
Grade (%)		0%			2%		
Storage Length (ft)	0		0		0	0	
Storage Lanes	0		0		1	0	
Taper Length (ft)	25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							
Frt		0.922			0.992		
Flt Protected		0.995			0.955		
Satd. Flow (prot)	0	1844	0	0	1980	0	0
Flt Permitted		0.956			0.955		
Satd. Flow (perm)	0	1771	0	0	1980	0	0
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		35			25		
Link Distance (ft)		752			573		
Travel Time (s)		14.6			15.6		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%			0%		
Adj. Flow (vph)	34	132	230	26	312	20	2
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	399	0	0	360	0	0
Number of Detectors	2	2		1	1		
Detector Template							
Leading Detector (ft)	70	70		35	35		
Trailing Detector (ft)	-5	-5		-5	-5		
Turn Type	Perm			Split			
Protected Phases		4		9	9		
Permitted Phases	4						
Detector Phase	4	4		9	9		
Switch Phase							
Minimum Initial (s)	8.0	8.0		8.0	8.0		
Minimum Split (s)	14.0	14.0		14.0	14.0		
Total Split (s)	51.0	51.0	0.0	46.0	46.0	0.0	0.0
Total Split (%)	31.1%	31.1%	0.0%	28.0%	28.0%	0.0%	0.0%
Maximum Green (s)	45.0	45.0		40.0	40.0		
Yellow Time (s)	4.0	4.0		4.0	4.0		
All-Red Time (s)	2.0	2.0		2.0	2.0		
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	4.0

Lane Group	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0	5.0		5.0	5.0			5.0
Minimum Gap (s)	3.0	3.0			3.0	3.0		3.0	3.0			3.0
Time Before Reduce (s)	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Time To Reduce (s)	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Recall Mode	None	None			None	None		Max	Max			Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		1.12				0.39			0.28			
Control Delay		127.3				82.2			45.0			
Queue Delay		0.0				0.0			0.0			
Total Delay		127.3				82.2			45.0			
Queue Length 50th (ft)		~671				36			128			
Queue Length 95th (ft)		#939				27			164			
Internal Link Dist (ft)		1269				447			420			
Turn Bay Length (ft)												
Base Capacity (vph)		498				120			583			
Starvation Cap Reductn		0				0			0			
Spillback Cap Reductn		0				0			0			
Storage Cap Reductn		0				0			0			
Reduced v/c Ratio		1.12				0.30			0.28			

Intersection Summary

Area Type: Other
Cycle Length: 164
Actuated Cycle Length: 151.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Ashbourne Rd & Arbor Rd



Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	5.0	5.0		5.0	5.0		
Minimum Gap (s)	3.0	3.0		3.0	3.0		
Time Before Reduce (s)	0.0	0.0		0.0	0.0		
Time To Reduce (s)	0.0	0.0		0.0	0.0		
Recall Mode	Max	Max		None	None		
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
v/c Ratio		0.75			0.83		
Control Delay		60.4			73.9		
Queue Delay		0.0			0.0		
Total Delay		60.4			73.9		
Queue Length 50th (ft)		376			352		
Queue Length 95th (ft)		#567			457		
Internal Link Dist (ft)		672			493		
Turn Bay Length (ft)							
Base Capacity (vph)		531			527		
Starvation Cap Reductn		0			0		
Spillback Cap Reductn		0			0		
Storage Cap Reductn		0			0		
Reduced v/c Ratio		0.75			0.68		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Volume (vph)	237	13	216	25	1	7	4	10	88	4	15	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	12	12	12	12	16	16	16	16	15
Grade (%)		0%				1%			1%			
Total Lost time (s)		6.0				6.0			6.0			
Lane Util. Factor		1.00				1.00			1.00			
Frt		0.93				0.96			0.98			
Flt Protected		0.98				1.00			1.00			
Satd. Flow (prot)		1868				1199			2046			
Flt Permitted		0.98				1.00			0.95			
Satd. Flow (perm)		1868				1199			1946			
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.33	0.33	0.33	0.73	0.73	0.73	0.73	0.93
Adj. Flow (vph)	269	15	245	28	3	21	12	14	121	5	21	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	557	0	0	0	36	0	0	161	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	50%	50%	50%	2%	2%	2%	2%	4%
Turn Type	Split				Split			Perm				Perm
Protected Phases	2	2			6	6			8			
Permitted Phases		2						8				4
Actuated Green, G (s)		40.4				9.8			45.4			
Effective Green, g (s)		40.4				9.8			45.4			
Actuated g/C Ratio		0.26				0.06			0.30			
Clearance Time (s)		6.0				6.0			6.0			
Vehicle Extension (s)		5.0				5.0			5.0			
Lane Grp Cap (vph)		494				77			578			
v/s Ratio Prot		c0.30				c0.03						
v/s Ratio Perm									0.08			
v/c Ratio		1.13				0.47			0.28			
Uniform Delay, d1		56.2				69.0			41.2			
Progression Factor		1.00				1.00			1.00			
Incremental Delay, d2		80.4				9.1			1.2			
Delay (s)		136.6				78.1			42.3			
Level of Service		F				E			D			
Approach Delay (s)		136.6				78.1			42.3			
Approach LOS		F				E			D			

Intersection Summary			
HCM Average Control Delay	89.2	HCM Level of Service	F
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	152.8	Sum of lost time (s)	24.0
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	32	123	214	22	268	17	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	16	16	16	16
Grade (%)		0%			2%		
Total Lost time (s)		6.0			6.0		
Lane Util. Factor		1.00			1.00		
Frt		0.92			0.99		
Flt Protected		1.00			0.96		
Satd. Flow (prot)		1845			1980		
Flt Permitted		0.96			0.96		
Satd. Flow (perm)		1771			1980		
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.86
Adj. Flow (vph)	34	132	230	26	312	20	2
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	399	0	0	360	0	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%
Turn Type	Perm			Split			
Protected Phases		4		9	9		
Permitted Phases	4						
Actuated Green, G (s)		45.4			33.2		
Effective Green, g (s)		45.4			33.2		
Actuated g/C Ratio		0.30			0.22		
Clearance Time (s)		6.0			6.0		
Vehicle Extension (s)		5.0			5.0		
Lane Grp Cap (vph)		526			430		
v/s Ratio Prot					c0.18		
v/s Ratio Perm		c0.23					
v/c Ratio		0.76			0.84		
Uniform Delay, d1		48.7			57.2		
Progression Factor		1.00			1.00		
Incremental Delay, d2		9.9			14.6		
Delay (s)		58.6			71.9		
Level of Service		E			E		
Approach Delay (s)		58.6			71.9		
Approach LOS		E			E		

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	3	11	340	6	10	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	16	15	15
Grade (%)	-3%		-5%			3%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.893		0.998			
Flt Protected	0.990					0.999
Satd. Flow (prot)	1705	0	2139	0	0	1997
Flt Permitted	0.990					0.999
Satd. Flow (perm)	1705	0	2139	0	0	1997
Link Speed (mph)	25		35			35
Link Distance (ft)	595		752			350
Travel Time (s)	16.2		14.6			6.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.58	0.58	0.88	0.88	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	5	19	386	7	11	410
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	393	0	0	421
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	11	340	6	10	369
Sign Control	Stop		Free			Free
Grade	-3%		-5%			3%
Peak Hour Factor	0.58	0.58	0.88	0.88	0.90	0.90
Hourly flow rate (vph)	5	19	386	7	11	410
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			752			
pX, platoon unblocked	0.98	0.98			0.98	
vC, conflicting volume	822	390			393	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	807	366			369	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	97			99	
cM capacity (veh/h)	343	670			1159	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	393	421
Volume Left	5	0	11
Volume Right	19	7	0
cSH	556	1700	1159
Volume to Capacity	0.04	0.23	0.01
Queue Length 95th (ft)	3	0	1
Control Delay (s)	11.8	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	11.8	0.0	0.3
Approach LOS	B		

Intersection Summary			
Average Delay	0.5 -A		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	31	79	57	294	300	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	15	15	16	16
Grade (%)	0%			-8%	3%	
Storage Length (ft)	0	50	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.903				0.988	
Flt Protected	0.986			0.992		
Satd. Flow (prot)	1748	0	0	2093	2035	0
Flt Permitted	0.986			0.992		
Satd. Flow (perm)	1748	0	0	2093	2035	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	1339			350	562	
Travel Time (s)	36.5			6.8	10.9	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.94	0.94	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	36	92	61	313	323	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	128	0	0	374	354	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	31	79	57	294	300	29
Sign Control	Stop			Free	Free	
Grade	0%			-8%	3%	
Peak Hour Factor	0.86	0.86	0.94	0.94	0.93	0.93
Hourly flow rate (vph)	36	92	61	313	323	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	772	338	323			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	772	338	323			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	87	95			
cM capacity (veh/h)	352	709	1232			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	128	373	354
Volume Left	36	61	0
Volume Right	92	0	31
cSH	551	1232	1700
Volume to Capacity	0.23	0.05	0.21
Queue Length 95th (ft)	22	4	0
Control Delay (s)	13.5	1.7	0.0
Lane LOS	B	A	
Approach Delay (s)	13.5	1.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.8 -A		
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	4	258	57	39	221	17	29	27	13	29	29	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	9	9	9	14	14	14
Grade (%)		-1%			0%			-3%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.976			0.992			0.974			0.952	
Flt Protected		0.999			0.993			0.980			0.984	
Satd. Flow (prot)	0	2048	0	0	1872	0	0	1657	0	0	1908	0
Flt Permitted		0.999			0.993			0.980			0.984	
Satd. Flow (perm)	0	2048	0	0	1872	0	0	1657	0	0	1908	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2916			718			672			1339	
Travel Time (s)		56.8			14.0			18.3			36.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.87	0.87	0.87	0.82	0.82	0.82	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	5	349	77	45	254	20	35	33	16	36	36	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	431	0	0	319	0	0	84	0	0	112	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	258	57	39	221	17	29	27	13	29	29	32
Peak Hour Factor	0.74	0.74	0.74	0.87	0.87	0.87	0.82	0.82	0.82	0.81	0.81	0.81
Hourly flow rate (vph)	5	349	77	45	254	20	35	33	16	36	36	40

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total (vph)	431	318	84	111
Volume Left (vph)	5	45	35	36
Volume Right (vph)	77	20	16	40
Hadj (s)	-0.10	-0.01	-0.03	-0.15
Departure Headway (s)	4.8	5.1	5.9	5.8
Degree Utilization, x	0.58	0.45	0.14	0.18
Capacity (veh/h)	716	678	516	538
Control Delay (s)	14.2	12.1	9.9	10.0
Approach Delay (s)	14.2	12.1	9.9	10.0
Approach LOS	B	B	A	B

Intersection Summary			
Delay	12.6		
HCM Level of Service	B		
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	45	249	536	73	230	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Factor						
Frt	0.886		0.984			
Flt Protected	0.992					0.983
Satd. Flow (prot)	1726	0	2129	0	0	2065
Flt Permitted	0.992					0.983
Satd. Flow (perm)	1726	0	2129	0	0	2065
Link Speed (mph)	35		35			35
Link Distance (ft)	2916		1087			300
Travel Time (s)	56.8		21.2			5.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	54	296	583	79	271	515
Shared Lane Traffic (%)						
Lane Group Flow (vph)	350	0	662	0	0	786
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	45	249	536	73	230	438
Sign Control	Stop		Free			Free
Grade	0%		-3%			-1%
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Hourly flow rate (vph)	54	296	583	79	271	515
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1087			
pX, platoon unblocked	0.92	0.92			0.92	
vC, conflicting volume	1679	622			662	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1695	545			588	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	20	41			70	
cM capacity (veh/h)	67	498			916	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	350	662	786
Volume Left	54	0	271
Volume Right	296	79	0
cSH	251	1700	916
Volume to Capacity	1.40	0.39	0.30
Queue Length 95th (ft)	481	0	31
Control Delay (s)	239.0	0.0	6.6
Lane LOS	F		A
Approach Delay (s)	239.0	0.0	6.6
Approach LOS	F		

Intersection Summary			
Average Delay	49.4 – E		
Intersection Capacity Utilization	96.3%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	45	249	536	73	230	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.886		0.984			
Flt Protected	0.992					0.983
Satd. Flow (prot)	1726	0	2129	0	0	2065
Flt Permitted	0.992					*0.461
Satd. Flow (perm)	1726	0	2129	0	0	968
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	232		12			
Link Speed (mph)	35		35			35
Link Distance (ft)	2916		1087			300
Travel Time (s)	56.8		21.2			5.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	54	296	583	79	271	515
Shared Lane Traffic (%)						
Lane Group Flow (vph)	350	0	662	0	0	786
Number of Detectors	1		0		1	0
Detector Template	Left				Left	
Leading Detector (ft)	35		0		20	0
Trailing Detector (ft)	-5		0		0	0
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8					
Switch Phase						
Minimum Initial (s)	7.0		20.0		7.0	20.0
Minimum Split (s)	13.0		26.0		13.0	26.0
Total Split (s)	21.0	0.0	66.0	0.0	13.0	79.0
Total Split (%)	21.0%	0.0%	66.0%	0.0%	13.0%	79.0%
Maximum Green (s)	15.0		60.0		7.0	73.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0

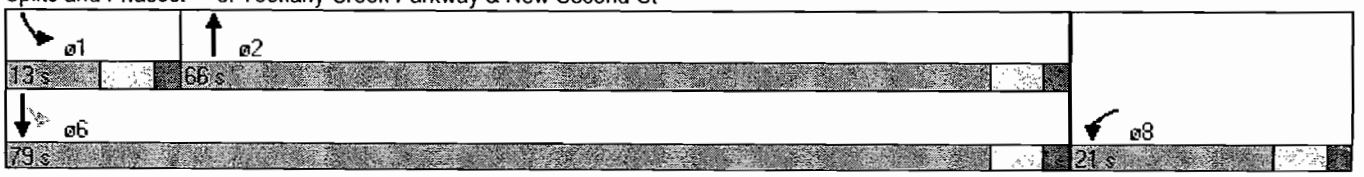
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0
Recall Mode	None		Max		Max	Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.84		0.50			0.97
Control Delay	33.1		12.1			37.7
Queue Delay	0.0		0.0			0.0
Total Delay	33.1		12.1			37.7
Queue Length 50th (ft)	70		214			174
Queue Length 95th (ft)	148		312			#351
Internal Link Dist (ft)	2836		1007			220
Turn Bay Length (ft)						
Base Capacity (vph)	463		1322			808
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.76		0.50			0.97

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 97.1
Natural Cycle: 80
Control Type: Semi Act-Uncoord

* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Tookany Creek Parkway & New Second St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	45	249	536	73	230	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	0.89		0.98			1.00
Flt Protected	0.99		1.00			0.98
Satd. Flow (prot)	1726		2129			2065
Flt Permitted	0.99		1.00			0.46
Satd. Flow (perm)	1726		2129			968
Peak-hour factor, PHF	0.84	0.84	0.92	0.92	0.85	0.85
Adj. Flow (vph)	54	296	583	79	271	515
RTOR Reduction (vph)	203	0	5	0	0	0
Lane Group Flow (vph)	147	0	657	0	0	786
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	12.0		60.1			73.1
Effective Green, g (s)	12.0		60.1			73.1
Actuated g/C Ratio	0.12		0.62			0.75
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	213		1318			808
v/s Ratio Prot	c0.08		0.31			c0.07
v/s Ratio Perm						c0.66
v/c Ratio	0.69		0.50			0.97
Uniform Delay, d1	40.8		10.2			11.1
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	8.9		1.4			25.7
Delay (s)	49.7		11.5			36.8
Level of Service	D		B			D
Approach Delay (s)	49.7		11.5			36.8
Approach LOS	D		B			D

Intersection Summary			
HCM Average Control Delay	30.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	97.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	101.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	7	170	15	40	237	22	20	29	8	51	29	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	9	9	9	14	14	14
Grade (%)		-1%			0%			-3%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.989			0.990			0.980			0.973	
Flt Protected		0.998			0.993			0.983			0.975	
Satd. Flow (prot)	0	2053	0	0	1831	0	0	1672	0	0	1876	0
Flt Permitted		0.998			0.993			0.983			0.975	
Satd. Flow (perm)	0	2053	0	0	1831	0	0	1672	0	0	1876	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2917			950			663			1357	
Travel Time (s)		56.8			18.5			18.1			37.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	8	191	17	45	266	25	24	35	10	60	34	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	216	0	0	336	0	0	69	0	0	118	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	7	170	15	40	237	22	20	29	8	51	29	20
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83	0.85	0.85	0.85
Hourly flow rate (vph)	8	191	17	45	266	25	24	35	10	60	34	24

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total (vph)	216	336	69	118
Volume Left (vph)	8	45	24	60
Volume Right (vph)	17	25	10	24
Hadj (s)	-0.02	0.02	-0.01	0.03
Departure Headway (s)	4.8	4.7	5.4	5.4
Degree Utilization, x	0.29	0.44	0.10	0.18
Capacity (veh/h)	701	731	585	594
Control Delay (s)	9.8	11.4	9.0	9.5
Approach Delay (s)	9.8	11.4	9.0	9.5
Approach LOS	A	B	A	A

Intersection Summary			
Delay	10.4		
HCM Level of Service	B		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	79	217	504	53	139	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.901		0.987			
Flt Protected	0.987					0.990
Satd. Flow (prot)	1729	0	2136	0	0	2059
Flt Permitted	0.987					0.990
Satd. Flow (perm)	1729	0	2136	0	0	2059
Link Speed (mph)	35		35			35
Link Distance (ft)	2917		1087			792
Travel Time (s)	56.8		21.2			15.4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	88	241	573	60	146	586
Shared Lane Traffic (%)						
Lane Group Flow (vph)	329	0	633	0	0	732
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	79	217	504	53	139	557
Sign Control	Stop		Free			Free
Grade	0%		-3%			-1%
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Hourly flow rate (vph)	88	241	573	60	146	586
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1087			
pX, platoon unblocked	0.93	0.93			0.93	
vC, conflicting volume	1482	603			633	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1480	533			566	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	19	53			84	
cM capacity (veh/h)	109	509			938	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	329	633	733
Volume Left	88	0	146
Volume Right	241	60	0
cSH	257	1700	938
Volume to Capacity	1.28	0.37	0.16
Queue Length 95th (ft)	412	0	14
Control Delay (s)	192.0	0.0	3.7
Lane LOS	F		A
Approach Delay (s)	192.0	0.0	3.7
Approach LOS	F		

Intersection Summary			
Average Delay	38.9 – E		
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	79	217	504	53	139	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.901		0.987			
Flt Protected	0.987					0.990
Satd. Flow (prot)	1729	0	2136	0	0	2059
Flt Permitted	0.987					0.523
Satd. Flow (perm)	1729	0	2136	0	0	1088
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	133		9			
Link Speed (mph)	35		35			35
Link Distance (ft)	2917		1087			792
Travel Time (s)	56.8		21.2			15.4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	88	241	573	60	146	586
Shared Lane Traffic (%)						
Lane Group Flow (vph)	329	0	633	0	0	732
Number of Detectors	1		0		1	1
Detector Template						
Leading Detector (ft)	35		0		35	5
Trailing Detector (ft)	-5		0		-5	0
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8					
Switch Phase						
Minimum Initial (s)	7.0		20.0		7.0	20.0
Minimum Split (s)	13.0		26.0		13.0	26.0
Total Split (s)	22.0	0.0	55.0	0.0	13.0	68.0
Total Split (%)	24.4%	0.0%	61.1%	0.0%	14.4%	75.6%
Maximum Green (s)	16.0		49.0		7.0	62.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0
Recall Mode	None		Max		Max	Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.85		0.53			0.87
Control Delay	42.4		14.5			22.2
Queue Delay	0.0		0.0			0.0
Total Delay	42.4		14.5			22.2
Queue Length 50th (ft)	108		215			174
Queue Length 95th (ft)	#241		299			#328
Internal Link Dist (ft)	2837		1007			712
Turn Bay Length (ft)						
Base Capacity (vph)	423		1194			844
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.78		0.53			0.87

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 88.1

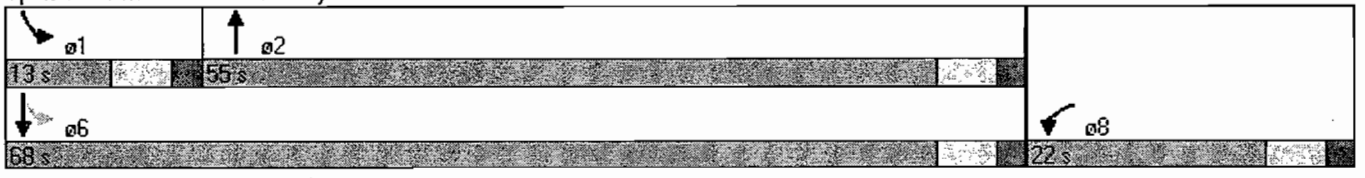
Natural Cycle: 80

Control Type: Semi Act-Uncoord

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 8: Tookany Creek Rd & New Second St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	79	217	504	53	139	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	0.90		0.99			1.00
Flt Protected	0.99		1.00			0.99
Satd. Flow (prot)	1729		2136			2059
Flt Permitted	0.99		1.00			0.52
Satd. Flow (perm)	1729		2136			1087
Peak-hour factor, PHF	0.90	0.90	0.88	0.88	0.95	0.95
Adj. Flow (vph)	88	241	573	60	146	586
RTOR Reduction (vph)	112	0	4	0	0	0
Lane Group Flow (vph)	217	0	629	0	0	732
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	14.0		49.1			62.1
Effective Green, g (s)	14.0		49.1			62.1
Actuated g/C Ratio	0.16		0.56			0.70
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	275		1190			843
v/s Ratio Prot	c0.13		0.29			c0.07
v/s Ratio Perm						c0.54
v/c Ratio	0.79		0.53			0.87
Uniform Delay, d1	35.6		12.2			9.9
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	14.0		1.7			11.8
Delay (s)	49.6		13.9			21.6
Level of Service	D		B			C
Approach Delay (s)	49.6		13.9			21.6
Approach LOS	D		B			C

Intersection Summary			
HCM Average Control Delay	24.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	88.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	238	31	16	146	133	27	381	12	102	307	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	14	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Storage Length (ft)	0		110	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.939			0.996			0.979	
Flt Protected		0.986			0.997			0.997			0.990	
Satd. Flow (prot)	0	1873	1723	0	1938	0	0	2107	0	0	1832	0
Flt Permitted		0.716			0.969			0.949			0.822	
Satd. Flow (perm)	0	1360	1723	0	1883	0	0	2005	0	0	1522	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			35					3			20	
Link Speed (mph)		25			40			35			35	
Link Distance (ft)		500			433			500			1087	
Travel Time (s)		13.6			7.4			9.7			21.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.79	0.79	0.79	0.90	0.90	0.90	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	107	267	35	20	185	168	30	423	13	119	357	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	374	35	0	373	0	0	466	0	0	562	0
Number of Detectors	1	0	0	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	35	0	0	35	0		35	0		35	0	
Trailing Detector (ft)	-5	0	0	-5	0		-5	0		-5	0	
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase												
Switch Phase												
Minimum Initial (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		38.0	38.0		38.0	38.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	41.5%	0.0%	58.5%	58.5%	0.0%	58.5%	58.5%	0.0%
Maximum Green (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max	Max	Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.81	0.06		0.59			0.46			0.72	
Control Delay		36.6	6.1		22.3			12.0			18.4	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		36.6	6.1		22.3			12.0			18.4	
Queue Length 50th (ft)		133	0		120			109			154	
Queue Length 95th (ft)		#266	16		166			176			247	
Internal Link Dist (ft)		420			353			420			1007	
Turn Bay Length (ft)			110									
Base Capacity (vph)		460	606		637			1019			783	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.81	0.06		0.59			0.46			0.72	

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 65

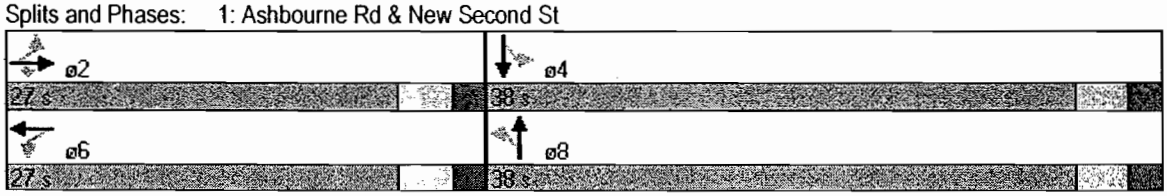
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 65

Control Type: Pretimed

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ashbourne Rd & New Second St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	238	31	16	146	133	27	381	12	102	307	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	14	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.94			1.00			0.98	
Flt Protected		0.99	1.00		1.00			1.00			0.99	
Satd. Flow (prot)		1873	1723		1939			2107			1832	
Flt Permitted		0.72	1.00		0.97			0.95			0.82	
Satd. Flow (perm)		1360	1723		1884			2007			1521	
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	107	267	35	20	185	168	30	423	13	119	357	86
RTOR Reduction (vph)	0	0	23	0	0	0	0	1	0	0	10	0
Lane Group Flow (vph)	0	374	12	0	373	0	0	465	0	0	552	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)		22.0	22.0		22.0			33.0			33.0	
Effective Green, g (s)		22.0	22.0		22.0			33.0			33.0	
Actuated g/C Ratio		0.34	0.34		0.34			0.51			0.51	
Clearance Time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Grp Cap (vph)		460	583		638			1019			772	
v/s Ratio Prot												
v/s Ratio Perm		c0.28	0.01		0.20			0.23			c0.36	
v/c Ratio		0.81	0.02		0.58			0.46			0.72	
Uniform Delay, d1		19.6	14.3		17.7			10.2			12.4	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		14.5	0.1		3.9			1.5			5.6	
Delay (s)		34.1	14.4		21.6			11.7			18.0	
Level of Service		C	B		C			B			B	
Approach Delay (s)		32.4			21.6			11.7			18.0	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	104.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	341	11	0	291	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	11	11
Grade (%)	-4%			-4%	-2%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.996				0.958	
Flt Protected					0.967	
Satd. Flow (prot)	2188	0	0	2196	1718	0
Flt Permitted					0.967	
Satd. Flow (perm)	2188	0	0	2196	1718	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	433			1750	526	
Travel Time (s)	8.4			34.1	14.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.74	0.74	0.84	0.84	0.38	0.38
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	461	15	0	346	11	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	476	0	0	346	16	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	341	11	0	291	4	2
Sign Control	Free			Free	Stop	
Grade	-4%			-4%	2%	
Peak Hour Factor	0.74	0.74	0.84	0.84	0.38	0.38
Hourly flow rate (vph)	461	15	0	346	11	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	433					
pX, platoon unblocked			0.89		0.89	0.89
vC, conflicting volume			476		815	468
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			351		731	342
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1087		349	628

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	476	346	16
Volume Left	0	0	11
Volume Right	15	0	5
cSH	1700	1087	410
Volume to Capacity	0.28	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	14.1
Lane LOS			B
Approach Delay (s)	0.0	0.0	14.1
Approach LOS			B

Intersection Summary			
Average Delay	0.3 - A		
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

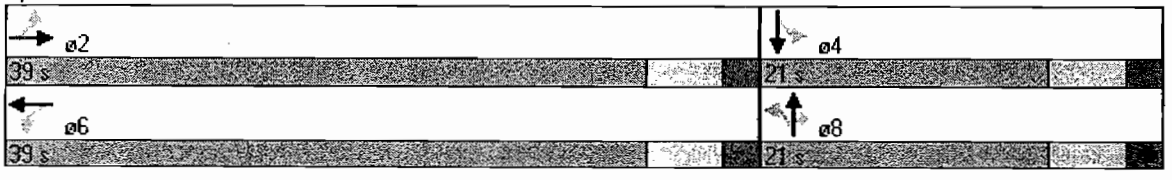
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	281	62	240	258	1	33	1	210	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	9	10	10	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Storage Length (ft)	140		0	150		0	0		45	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.973			0.999				0.850			
Flt Protected				0.950				0.954				
Satd. Flow (prot)	1764	1717	0	1569	1711	0	0	1702	1673	0	851	0
Flt Permitted				0.536				0.729				
Satd. Flow (perm)	1764	1717	0	885	1711	0	0	1300	1673	0	851	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)									247			
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1750			1349			500			300	
Travel Time (s)		29.8			23.0			9.7			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.87	0.87	0.87	0.85	0.85	0.85	0.25	0.25	0.25
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	100%	100%	100%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	312	69	276	297	1	39	1	247	0	4	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	381	0	276	298	0	0	40	247	0	4	0
Number of Detectors	0	0		0	0		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	0	0		0	0		35	35	35	20	20	
Trailing Detector (ft)	0	0		0	0		-5	-5	-5	-5	-5	
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase							8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	33.0	33.0		33.0	33.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	39.0	39.0		39.0	39.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	39.0	39.0	0.0	39.0	39.0	0.0	21.0	21.0	21.0	21.0	21.0	0.0
Total Split (%)	65.0%	65.0%	0.0%	65.0%	65.0%	0.0%	35.0%	35.0%	35.0%	35.0%	35.0%	0.0%
Maximum Green (s)	33.0	33.0		33.0	33.0		15.0	15.0	15.0	15.0	15.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	Min	Min		Min	Min		None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.35		0.50	0.28			0.22	0.55		0.03	
Control Delay		6.2		9.8	5.6			22.4	8.5		19.0	
Queue Delay		0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay		6.2		9.8	5.6			22.4	8.5		19.0	
Queue Length 50th (ft)		44		36	33			11	0		1	
Queue Length 95th (ft)		104		101	75			31	41		2	
Internal Link Dist (ft)		1670			1269			420			220	
Turn Bay Length (ft)				150					45			
Base Capacity (vph)		1079		556	1075			371	654		243	
Starvation Cap Reductn		0		0	0			0	0		0	
Spillback Cap Reductn		0		0	0			0	0		0	
Storage Cap Reductn		0		0	0			0	0		0	
Reduced v/c Ratio		0.35		0.50	0.28			0.11	0.38		0.02	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 52.6
Natural Cycle: 50
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ashbourne Rd & Access



APPENDIX G

2013 Future without Development Capacity/Level-of-Service Analysis Worksheets

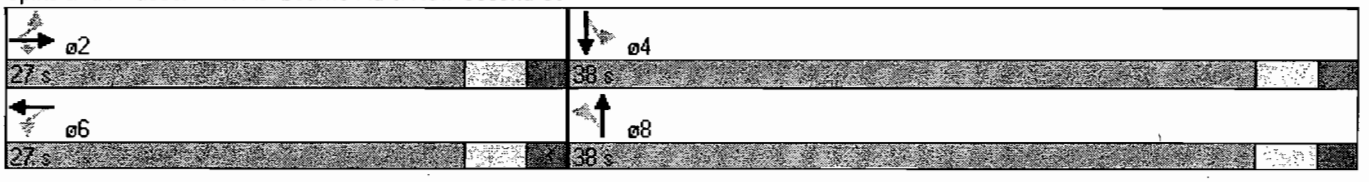
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	124	28	11	193	126	23	346	7	103	465	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Storage Length (ft)	0		110	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.948			0.997			0.981	
Flt Protected		0.978			0.998			0.997			0.992	
Satd. Flow (prot)	0	1840	1653	0	1903	0	0	2068	0	0	1805	0
Flt Permitted		0.598			0.985			0.941			0.862	
Satd. Flow (perm)	0	1125	1653	0	1878	0	0	1952	0	0	1568	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			36					2			18	
Link Speed (mph)		25			40			35			35	
Link Distance (ft)		500			433			500			1087	
Travel Time (s)		13.6			7.4			9.7			21.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	136	161	36	12	205	134	29	438	9	112	505	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	297	36	0	351	0	0	476	0	0	716	0
Number of Detectors	1	0	0	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	35	0	0	35	0		35	0		35	0	
Trailing Detector (ft)	-5	0	0	-5	0		-5	0		-5	0	
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase												
Switch Phase												
Minimum Initial (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		38.0	38.0		38.0	38.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	41.5%	0.0%	58.5%	58.5%	0.0%	58.5%	58.5%	0.0%
Maximum Green (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max	Max	Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.78	0.06		0.55			0.48			0.89	
Control Delay		36.5	6.0		21.5			12.4			30.4	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		36.5	6.0		21.5			12.4			30.4	
Queue Length 50th (ft)		104	0		111			113			231	
Queue Length 95th (ft)		#161	13		186			151			#456	
Internal Link Dist (ft)		420			353			420			1007	
Turn Bay Length (ft)			110									
Base Capacity (vph)		381	583		636			992			805	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.78	0.06		0.55			0.48			0.89	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 65
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ashbourne Rd & New Second St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	124	28	11	193	126	23	346	7	103	465	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.95			1.00			0.98	
Flt Protected		0.98	1.00		1.00			1.00			0.99	
Satd. Flow (prot)		1839	1653		1904			2069			1806	
Flt Permitted		0.60	1.00		0.99			0.94			0.86	
Satd. Flow (perm)		1125	1653		1879			1952			1569	
Peak-hour factor, PHF	0.77	0.77	0.77	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.92	0.92
Adj. Flow (vph)	136	161	36	12	205	134	29	438	9	112	505	99
RTOR Reduction (vph)	0	0	24	0	0	0	0	1	0	0	9	0
Lane Group Flow (vph)	0	297	12	0	351	0	0	475	0	0	707	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	4%	4%	4%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)		22.0	22.0		22.0			33.0			33.0	
Effective Green, g (s)		22.0	22.0		22.0			33.0			33.0	
Actuated g/C Ratio		0.34	0.34		0.34			0.51			0.51	
Clearance Time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Grp Cap (vph)		381	559		636			991			797	
v/s Ratio Prot												
v/s Ratio Perm		c0.26	0.01		0.19			0.24			c0.45	
v/c Ratio		0.78	0.02		0.55			0.48			0.89	
Uniform Delay, d1		19.3	14.3		17.5			10.4			14.3	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		14.6	0.1		3.4			1.7			13.9	
Delay (s)		33.9	14.4		20.9			12.1			28.3	
Level of Service		C	B		C			B			C	
Approach Delay (s)		31.8			20.9			12.1			28.3	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	114.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	230	3	0	324	6	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	11	11
Grade (%)	-4%			-4%	-2%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.998					
Flt Protected					0.950	
Satd. Flow (prot)	2192	0	0	2196	1762	0
Flt Permitted					0.950	
Satd. Flow (perm)	2192	0	0	2196	1762	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	433			1750	486	
Travel Time (s)	8.4			34.1	13.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.81	0.81	0.73	0.73	0.75	0.75
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	284	4	0	444	8	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	288	0	0	444	8	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	230	3	0	324	6	0
Sign Control	Free			Free	Stop	
Grade	-4%			-4%	-2%	
Peak Hour Factor	0.81	0.81	0.73	0.73	0.75	0.75
Hourly flow rate (vph)	284	4	0	444	8	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	433					
pX, platoon unblocked						
vC, conflicting volume			288		730	286
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			288		730	286
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1286		393	758

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	288	444	8
Volume Left	0	0	8
Volume Right	4	0	0
cSH	1700	1286	393
Volume to Capacity	0.17	0.00	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	14.4
Lane LOS			B
Approach Delay (s)	0.0	0.0	14.4
Approach LOS			B

Intersection Summary			
Average Delay	0.2	A	
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	212	19	262	267	0	57	1	192	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	9	10	10	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Storage Length (ft)	140		0	150		0	0		45	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988							0.850			
Flt Protected				0.950				0.953				
Satd. Flow (prot)	1713	1693	0	1525	1665	0	0	1622	1596	0	1701	0
Flt Permitted				0.587				0.727				
Satd. Flow (perm)	1713	1693	0	942	1665	0	0	1237	1596	0	1701	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)									240			
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1750			1349			500			300	
Travel Time (s)		29.8			23.0			9.7			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.95	0.95	0.95	0.80	0.80	0.80	0.25	0.25	0.25
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	9%	9%	9%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	259	23	276	281	0	71	1	240	0	4	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	282	0	276	281	0	0	72	240	0	4	0
Number of Detectors	0	0		0	0		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	0	0		0	0		35	35	35	20	20	
Trailing Detector (ft)	0	0		0	0		-5	-5	-5	-5	-5	
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase							8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	33.0	33.0		33.0	33.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	39.0	39.0		39.0	39.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	43.0	43.0	0.0	43.0	43.0	0.0	17.0	17.0	17.0	17.0	17.0	0.0
Total Split (%)	71.7%	71.7%	0.0%	71.7%	71.7%	0.0%	28.3%	28.3%	28.3%	28.3%	28.3%	0.0%
Maximum Green (s)	37.0	37.0		37.0	37.0		11.0	11.0	11.0	11.0	11.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	Min	Min		Min	Min		None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.27		0.47	0.27			0.37	0.53		0.02	
Control Delay		5.9		9.5	5.9			25.8	8.2		19.0	
Queue Delay		0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay		5.9		9.5	5.9			25.8	8.2		19.0	
Queue Length 50th (ft)		34		39	34			21	0		1	
Queue Length 95th (ft)		64		100	73			45	34		2	
Internal Link Dist (ft)		1670			1269			420			220	
Turn Bay Length (ft)				150					45			
Base Capacity (vph)		1047		583	1030			255	520		351	
Starvation Cap Reductn		0		0	0			0	0		0	
Spillback Cap Reductn		0		0	0			0	0		0	
Storage Cap Reductn		0		0	0			0	0		0	
Reduced v/c Ratio		0.27		0.47	0.27			0.28	0.46		0.01	

Intersection Summary

Area Type: Other

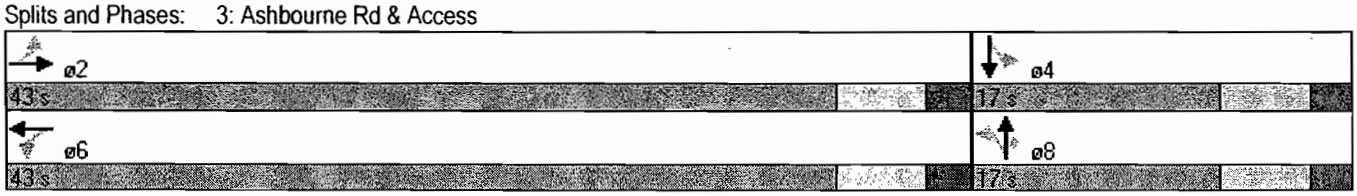
Cycle Length: 60

Actuated Cycle Length: 53.4

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ashbourne Rd & Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	212	19	262	267	0	57	1	192	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	10	10	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Frt		0.99		1.00	1.00			1.00	0.85		1.00	
Flt Protected		1.00		0.95	1.00			0.95	1.00		1.00	
Satd. Flow (prot)		1692		1525	1665			1622	1596		1701	
Flt Permitted		1.00		0.59	1.00			0.73	1.00		1.00	
Satd. Flow (perm)		1692		942	1665			1237	1596		1701	
Peak-hour factor, PHF	0.82	0.82	0.82	0.95	0.95	0.95	0.80	0.80	0.80	0.25	0.25	0.25
Adj. Flow (vph)	0	259	23	276	281	0	71	1	240	0	4	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	202	0	0	0
Lane Group Flow (vph)	0	282	0	276	281	0	0	72	38	0	4	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	9%	9%	9%	0%	0%	0%
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)		33.0		33.0	33.0			8.4	8.4		8.4	
Effective Green, g (s)		33.0		33.0	33.0			8.4	8.4		8.4	
Actuated g/C Ratio		0.62		0.62	0.62			0.16	0.16		0.16	
Clearance Time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		1046		582	1029			195	251		268	
v/s Ratio Prot		0.17			0.17						0.00	
v/s Ratio Perm				c0.29				c0.06	0.02			
v/c Ratio		0.27		0.47	0.27			0.37	0.15		0.01	
Uniform Delay, d1		4.7		5.5	4.7			20.1	19.4		19.0	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.1		0.6	0.1			1.2	0.3		0.0	
Delay (s)		4.8		6.1	4.8			21.3	19.7		19.0	
Level of Service		A		A	A			C	B		B	
Approach Delay (s)		4.8			5.5			20.1			19.0	
Approach LOS		A			A			C			B	

Intersection Summary			
HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	53.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lane Configurations												
Volume (vph)	149	6	204	45	2	6	12	2	11	66	15	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	15	12	12	12	12	16	16	16	15
Grade (%)		0%					1%			1%		
Storage Length (ft)	0		0			0		0	0			
Storage Lanes	0		0			0		0	0			
Taper Length (ft)	25		25			25		25	25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.917					0.986			0.978		
Flt Protected		0.982					0.981			0.994		
Satd. Flow (prot)	0	1776	0	0	0	0	1742	0	0	2062	0	0
Flt Permitted		0.982					0.981			0.940		
Satd. Flow (perm)	0	1776	0	0	0	0	1742	0	0	1950	0	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)		40					25			15		
Link Distance (ft)		1349					528			501		
Travel Time (s)		23.0					14.4			22.8		
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.77	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	1%	1%	1%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%					0%			0%		
Adj. Flow (vph)	194	8	265	58	3	8	15	3	14	82	19	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	525	0	0	0	0	29	0	0	115	0	0
Number of Detectors	1	1			1	1	1		1	1		2
Detector Template												
Leading Detector (ft)	35	35			35	35	35		35	35		70
Trailing Detector (ft)	-5	-5			-5	-5	-5		-5	-5		-5
Turn Type	Split				Perm	Split			Perm			Perm
Protected Phases	2	2				6	6			8		
Permitted Phases		2			6				8			4
Detector Phase	2	2			6	6	6		8	8		4
Switch Phase												
Minimum Initial (s)	8.0	8.0			5.0	5.0	5.0		8.0	8.0		8.0
Minimum Split (s)	14.0	14.0			11.0	11.0	11.0		14.0	14.0		14.0
Total Split (s)	46.0	46.0	0.0	0.0	21.0	21.0	21.0	0.0	51.0	51.0	0.0	51.0
Total Split (%)	28.0%	28.0%	0.0%	0.0%	12.8%	12.8%	12.8%	0.0%	31.1%	31.1%	0.0%	31.1%
Maximum Green (s)	40.0	40.0			15.0	15.0	15.0		45.0	45.0		45.0
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	-2.0	-2.0	0.0	0.0	-2.0	0.0	0.0	-2.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	17	90	224	28	282	23	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	16	16	16	16
Grade (%)		0%			2%		
Storage Length (ft)	0		0		0	0	
Storage Lanes	0		0		1	0	
Taper Length (ft)	25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							
Frt		0.909			0.990		
Flt Protected		0.997			0.956		
Satd. Flow (prot)	0	1770	0	0	1978	0	0
Flt Permitted		0.982			0.956		
Satd. Flow (perm)	0	1744	0	0	1978	0	0
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		35			25		
Link Distance (ft)		752			574		
Travel Time (s)		14.6			15.7		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.98	0.98	0.98	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%			0%		
Adj. Flow (vph)	17	92	229	29	297	24	1
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	339	0	0	351	0	0
Number of Detectors	2	2		1	1		
Detector Template							
Leading Detector (ft)	70	70		35	35		
Trailing Detector (ft)	-5	-5		-5	-5		
Turn Type	Perm			Split			
Protected Phases		4		9	9		
Permitted Phases	4						
Detector Phase	4	4		9	9		
Switch Phase							
Minimum Initial (s)	8.0	8.0		8.0	8.0		
Minimum Split (s)	14.0	14.0		14.0	14.0		
Total Split (s)	51.0	51.0	0.0	46.0	46.0	0.0	0.0
Total Split (%)	31.1%	31.1%	0.0%	28.0%	28.0%	0.0%	0.0%
Maximum Green (s)	45.0	45.0		40.0	40.0		
Yellow Time (s)	4.0	4.0		4.0	4.0		
All-Red Time (s)	2.0	2.0		2.0	2.0		
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	4.0

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0		5.0
Minimum Gap (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		3.0
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None			None	None	None		Max	Max		Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		1.06					0.24			0.19		
Control Delay		108.3					73.5			41.2		
Queue Delay		0.0					0.0			0.0		
Total Delay		108.3					73.5			41.2		
Queue Length 50th (ft)		~605					28			86		
Queue Length 95th (ft)		#706					57			133		
Internal Link Dist (ft)		1269					448			421		
Turn Bay Length (ft)												
Base Capacity (vph)		493					181			609		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		1.06					0.16			0.19		

Intersection Summary

Area Type: Other

Cycle Length: 164

Actuated Cycle Length: 145.7

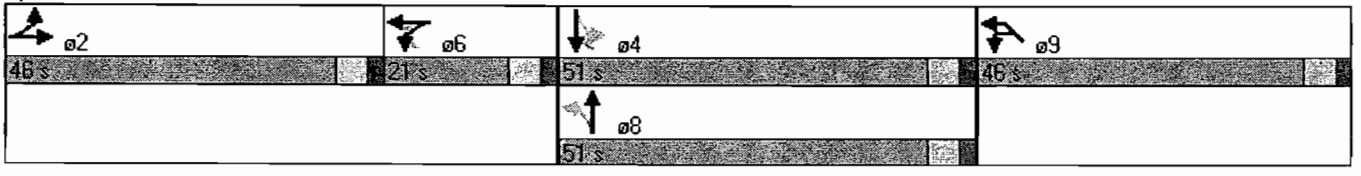
Natural Cycle: 90

Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Ashbourne Rd & Arbor Rd



Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	5.0	5.0		5.0	5.0		
Minimum Gap (s)	3.0	3.0		3.0	3.0		
Time Before Reduce (s)	0.0	0.0		0.0	0.0		
Time To Reduce (s)	0.0	0.0		0.0	0.0		
Recall Mode	Max	Max		None	None		
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
v/c Ratio		0.62			0.81		
Control Delay		51.5			70.2		
Queue Delay		0.0			0.0		
Total Delay		51.5			70.2		
Queue Length 50th (ft)		298			335		
Queue Length 95th (ft)		445			464		
Internal Link Dist (ft)		672			494		
Turn Bay Length (ft)							
Base Capacity (vph)		545			550		
Starvation Cap Reductn		0			0		
Spillback Cap Reductn		0			0		
Storage Cap Reductn		0			0		
Reduced v/c Ratio		0.62			0.64		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lane Configurations												
Volume (vph)	149	6	204	45	2	6	12	2	11	66	15	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	15	12	12	12	12	16	16	16	15
Grade (%)		0%					1%			1%		
Total Lost time (s)		6.0					6.0			6.0		
Lane Util. Factor		1.00					1.00			1.00		
Frt		0.92					0.99			0.98		
Flt Protected		0.98					0.98			0.99		
Satd. Flow (prot)		1775					1742			2061		
Flt Permitted		0.98					0.98			0.94		
Satd. Flow (perm)		1775					1742			1949		
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.98
Adj. Flow (vph)	194	8	265	58	3	8	15	3	14	82	19	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	525	0	0	0	0	29	0	0	115	0	0
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	1%	1%	1%	7%
Turn Type	Split				Perm	Split			Perm			Perm
Protected Phases	2	2				6	6			8		
Permitted Phases		2			6				8			4
Actuated Green, G (s)		40.5					6.3			45.5		
Effective Green, g (s)		40.5					6.3			45.5		
Actuated g/C Ratio		0.27					0.04			0.31		
Clearance Time (s)		6.0					6.0			6.0		
Vehicle Extension (s)		5.0					5.0			5.0		
Lane Grp Cap (vph)		485					74			599		
v/s Ratio Prot		c0.30					c0.02					
v/s Ratio Perm										0.06		
v/c Ratio		1.08					0.39			0.19		
Uniform Delay, d1		53.8					69.0			37.8		
Progression Factor		1.00					1.00			1.00		
Incremental Delay, d2		64.9					7.0			0.7		
Delay (s)		118.7					76.1			38.5		
Level of Service		F					E			D		
Approach Delay (s)		118.7					76.1			38.5		
Approach LOS		F					E			D		

Intersection Summary			
HCM Average Control Delay	81.1	HCM Level of Service	F
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	148.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	17	90	224	28	282	23	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	16	16	16	16
Grade (%)		0%			2%		
Total Lost time (s)		6.0			6.0		
Lane Util. Factor		1.00			1.00		
Frt		0.91			0.99		
Flt Protected		1.00			0.96		
Satd. Flow (prot)		1770			1978		
Flt Permitted		0.98			0.96		
Satd. Flow (perm)		1743			1978		
Peak-hour factor, PHF	0.98	0.98	0.98	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	92	229	29	297	24	1
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	339	0	0	351	0	0
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	2%
Turn Type	Perm			Split			
Protected Phases		4		9	9		
Permitted Phases	4						
Actuated Green, G (s)		45.5			31.8		
Effective Green, g (s)		45.5			31.8		
Actuated g/C Ratio		0.31			0.21		
Clearance Time (s)		6.0			6.0		
Vehicle Extension (s)		5.0			5.0		
Lane Grp Cap (vph)		535			425		
v/s Ratio Prot					c0.18		
v/s Ratio Perm		c0.19					
v/c Ratio		0.63			0.83		
Uniform Delay, d1		44.1			55.5		
Progression Factor		1.00			1.00		
Incremental Delay, d2		5.6			13.7		
Delay (s)		49.8			69.2		
Level of Service		D			E		
Approach Delay (s)		49.8			69.2		
Approach LOS		D			E		

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	9	16	237	2	3	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	16	15	15
Grade (%)	-3%		-5%			3%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.912		0.999			
Flt Protected	0.983					
Satd. Flow (prot)	1729	0	2080	0	0	1942
Flt Permitted	0.983					
Satd. Flow (perm)	1729	0	2080	0	0	1942
Link Speed (mph)	25		35			35
Link Distance (ft)	484		752			350
Travel Time (s)	13.2		14.6			6.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.84	0.84	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	6%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	10	19	282	2	3	354
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	284	0	0	357
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	16	237	2	3	322
Sign Control	Stop		Free			Free
Grade	-3%		-5%			3%
Peak Hour Factor	0.86	0.86	0.84	0.84	0.91	0.91
Hourly flow rate (vph)	10	19	282	2	3	354
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			752			
pX, platoon unblocked						
vC, conflicting volume	644	283			285	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	644	283			285	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	98	98			100	
cM capacity (veh/h)	440	761			1255	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	29	285	357
Volume Left	10	0	3
Volume Right	19	2	0
cSH	602	1700	1255
Volume to Capacity	0.05	0.17	0.00
Queue Length 95th (ft)	4	0	0
Control Delay (s)	11.3	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	11.3	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay	0.5 — A		
Intersection Capacity Utilization	29.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	12	75	76	178	251	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	15	15	16	16
Grade (%)	0%			-8%	3%	
Storage Length (ft)	0	0	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.884				0.989	
Flt Protected	0.993			0.985		
Satd. Flow (prot)	1673	0	0	2039	1942	0
Flt Permitted	0.993			0.985		
Satd. Flow (perm)	1673	0	0	2039	1942	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	1357			350	457	
Travel Time (s)	37.0			6.8	8.9	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.89	0.89	0.82	0.82
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	5%	5%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	17	106	85	200	306	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	123	0	0	285	333	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	12	75	76	178	251	22
Sign Control	Stop			Free	Free	
Grade	0%			-8%	3%	
Peak Hour Factor	0.71	0.71	0.89	0.89	0.82	0.82
Hourly flow rate (vph)	17	106	85	200	306	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	690	320	306			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	690	320	306			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	85	93			
cM capacity (veh/h)	381	719	1238			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	123	285	333
Volume Left	17	85	0
Volume Right	106	0	27
cSH	641	1238	1700
Volume to Capacity	0.19	0.07	0.20
Queue Length 95th (ft)	18	6	0
Control Delay (s)	11.9	2.9	0.0
Lane LOS	B	A	
Approach Delay (s)	11.9	2.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.1 – A		
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	7	176	16	41	246	23	21	30	8	53	30	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	9	9	9	14	14	14
Grade (%)		-1%			0%			-3%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.989			0.990			0.981			0.972	
Flt Protected		0.998			0.993			0.983			0.975	
Satd. Flow (prot)	0	2053	0	0	1831	0	0	1674	0	0	1874	0
Flt Permitted		0.998			0.993			0.983			0.975	
Satd. Flow (perm)	0	2053	0	0	1831	0	0	1674	0	0	1874	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2917			950			663			1357	
Travel Time (s)		56.8			18.5			18.1			37.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	8	198	18	46	276	26	25	36	10	62	35	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	224	0	0	348	0	0	71	0	0	122	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	7	176	16	41	246	23	21	30	8	53	30	21
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83	0.85	0.85	0.85
Hourly flow rate (vph)	8	198	18	46	276	26	25	36	10	62	35	25

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total (vph)	224	348	71	122
Volume Left (vph)	8	46	25	62
Volume Right (vph)	18	26	10	25
Hadj (s)	-0.02	0.02	-0.01	0.03
Departure Headway (s)	4.9	4.8	5.5	5.4
Degree Utilization, x	0.30	0.46	0.11	0.18
Capacity (veh/h)	694	725	573	586
Control Delay (s)	10.0	11.7	9.2	9.7
Approach Delay (s)	10.0	11.7	9.2	9.7
Approach LOS	A	B	A	A

Intersection Summary			
Delay	10.6		
HCM Level of Service	B		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	82	225	522	55	144	577
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.901		0.987			
Flt Protected	0.987					0.990
Satd. Flow (prot)	1729	0	2136	0	0	2059
Flt Permitted	0.987					0.990
Satd. Flow (perm)	1729	0	2136	0	0	2059
Link Speed (mph)	35		35			35
Link Distance (ft)	2917		1087			792
Travel Time (s)	56.8		21.2			15.4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	91	250	593	63	152	607
Shared Lane Traffic (%)						
Lane Group Flow (vph)	341	0	655	0	0	759
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	82	225	522	55	144	577
Sign Control	Stop		Free			Free
Grade	0%		-3%			-1%
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Hourly flow rate (vph)	91	250	593	62	152	607
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1087			
pX, platoon unblocked	0.92	0.92			0.92	
vC, conflicting volume	1535	624			656	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1538	545			579	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	7	50			83	
cM capacity (veh/h)	98	495			916	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	341	656	759
Volume Left	91	0	152
Volume Right	250	62	0
cSH	238	1700	916
Volume to Capacity	1.44	0.39	0.17
Queue Length 95th (ft)	487	0	15
Control Delay (s)	257.2	0.0	3.9
Lane LOS	F		A
Approach Delay (s)	257.2	0.0	3.9
Approach LOS	F		

Intersection Summary			
Average Delay	51.7 — F		
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	82	225	522	55	144	577
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.901		0.987			
Flt Protected	0.987					0.990
Satd. Flow (prot)	1729	0	2136	0	0	2059
Flt Permitted	0.987					0.492
Satd. Flow (perm)	1729	0	2136	0	0	1023
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	134		9			
Link Speed (mph)	35		35			35
Link Distance (ft)	2917		1087			792
Travel Time (s)	56.8		21.2			15.4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	91	250	593	62	152	607
Shared Lane Traffic (%)						
Lane Group Flow (vph)	341	0	655	0	0	759
Number of Detectors	1		0		1	0
Detector Ternplate						
Leading Detector (ft)	35		0		35	0
Trailing Detector (ft)	-5		0		-5	0
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8					
Switch Phase						
Minimum Initial (s)	7.0		20.0		7.0	20.0
Minimum Split (s)	13.0		26.0		13.0	26.0
Total Split (s)	22.0	0.0	55.0	0.0	13.0	68.0
Total Split (%)	24.4%	0.0%	61.1%	0.0%	14.4%	75.6%
Maximum Green (s)	16.0		49.0		7.0	62.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0
Recall Mode	None		Max		Max	Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.87		0.55			0.95
Control Delay	44.8		15.0			34.1
Queue Delay	0.0		0.0			0.0
Total Delay	44.8		15.0			34.1
Queue Length 50th (ft)	115		226			184
Queue Length 95th (ft)	#257		313			#406
Internal Link Dist (ft)	2837		1007			712
Turn Bay Length (ft)						
Base Capacity (vph)	423		1189			800
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.81		0.55			0.95

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 88.4

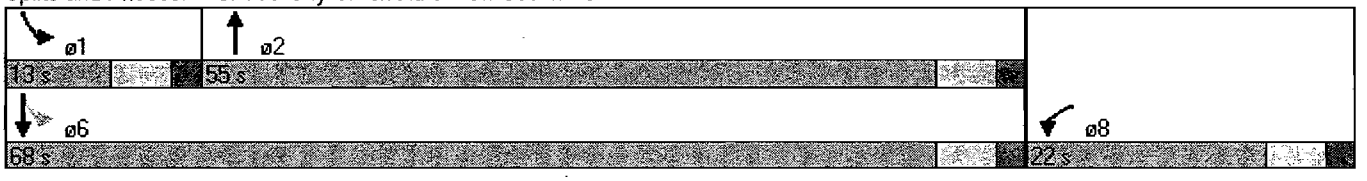
Natural Cycle: 90

Control Type: Semi Act-Uncoord

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 8: Tookany Creek Rd & New Second St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	82	225	522	55	144	577
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	0.90		0.99			1.00
Flt Protected	0.99		1.00			0.99
Satd. Flow (prot)	1728		2136			2059
Flt Permitted	0.99		1.00			0.49
Satd. Flow (perm)	1728		2136			1022
Peak-hour factor, PHF	0.90	0.90	0.88	0.88	0.95	0.95
Adj. Flow (vph)	91	250	593	62	152	607
RTOR Reduction (vph)	112	0	4	0	0	0
Lane Group Flow (vph)	229	0	651	0	0	759
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	14.3		49.1			62.1
Effective Green, g (s)	14.3		49.1			62.1
Actuated g/C Ratio	0.16		0.56			0.70
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	280		1186			800
v/s Ratio Prot	c0.13		0.30			c0.08
v/s Ratio Perm						c0.59
v/c Ratio	0.82		0.55			0.95
Uniform Delay, d1	35.8		12.6			11.7
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	16.6		1.8			21.5
Delay (s)	52.4		14.4			33.3
Level of Service	D		B			C
Approach Delay (s)	52.4		14.4			33.3
Approach LOS	D		B			C

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	102.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	247	32	17	151	138	28	395	12	106	318	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	14	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Storage Length (ft)	0		110	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.939			0.996			0.979	
Flt Protected		0.986			0.997			0.997			0.990	
Satd. Flow (prot)	0	1873	1723	0	1938	0	0	2107	0	0	1832	0
Flt Permitted		0.701			0.966			0.947			0.813	
Satd. Flow (perm)	0	1332	1723	0	1877	0	0	2001	0	0	1505	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			36					3			21	
Link Speed (mph)		25			40			35			35	
Link Distance (ft)		500			433			500			1087	
Travel Time (s)		13.6			7.4			9.7			21.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.79	0.79	0.79	0.90	0.90	0.90	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	110	278	36	22	191	175	31	439	13	123	370	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	388	36	0	388	0	0	483	0	0	583	0
Number of Detectors	1	0	0	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	35	0	0	35	0		35	0		35	0	
Trailing Detector (ft)	-5	0	0	-5	0		-5	0		-5	0	
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase												
Switch Phase												
Minimum Initial (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		38.0	38.0		38.0	38.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	41.5%	0.0%	58.5%	58.5%	0.0%	58.5%	58.5%	0.0%
Maximum Green (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max	Max	Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.86	0.06		0.61			0.47			0.75	
Control Delay		41.9	6.0		22.9			12.3			20.2	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		41.9	6.0		22.9			12.3			20.2	
Queue Length 50th (ft)		141	0		126			114			164	
Queue Length 95th (ft)		#284	16		174			184			265	
Internal Link Dist (ft)		420			353			420			1007	
Turn Bay Length (ft)			110									
Base Capacity (vph)		451	607		635			1017			774	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.86	0.06		0.61			0.47			0.75	

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 65

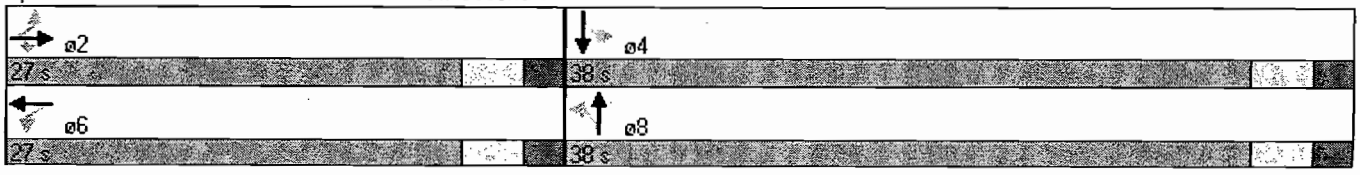
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 65

Control Type: Pretimed

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ashbourne Rd & New Second St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	247	32	17	151	138	28	395	12	106	318	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	14	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.94			1.00			0.98	
Flt Protected		0.99	1.00		1.00			1.00			0.99	
Satd. Flow (prot)		1873	1723		1938			2107			1832	
Flt Permitted		0.70	1.00		0.97			0.95			0.81	
Satd. Flow (perm)		1332	1723		1877			2002			1505	
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	110	278	36	22	191	175	31	439	13	123	370	90
RTOR Reduction (vph)	0	0	24	0	0	0	0	1	0	0	10	0
Lane Group Flow (vph)	0	388	12	0	388	0	0	482	0	0	573	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)		22.0	22.0		22.0			33.0			33.0	
Effective Green, g (s)		22.0	22.0		22.0			33.0			33.0	
Actuated g/C Ratio		0.34	0.34		0.34			0.51			0.51	
Clearance Time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Grp Cap (vph)		451	583		635			1016			764	
v/s Ratio Prot												
v/s Ratio Perm		c0.29	0.01		0.21			0.24			c0.38	
v/c Ratio		0.86	0.02		0.61			0.47			0.75	
Uniform Delay, d1		20.1	14.3		17.9			10.4			12.7	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		18.9	0.1		4.3			1.6			6.7	
Delay (s)		39.0	14.4		22.3			12.0			19.4	
Level of Service		D	B		C			B			B	
Approach Delay (s)		36.9			22.3			12.0			19.4	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM Average Control Delay	22.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	106.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	353	11	0	303	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	11	11
Grade (%)	-4%			-4%	-2%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.996				0.958	
Flt Protected					0.967	
Satd. Flow (prot)	2188	0	0	2196	1718	0
Flt Permitted					0.967	
Satd. Flow (perm)	2188	0	0	2196	1718	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	433			1750	526	
Travel Time (s)	8.4			34.1	14.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.74	0.74	0.84	0.84	0.38	0.38
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	477	15	0	361	11	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	492	0	0	361	16	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	353	11	0	303	4	2
Sign Control	Free			Free	Stop	
Grade	-4%			-4%	-2%	
Peak Hour Factor	0.74	0.74	0.84	0.84	0.38	0.38
Hourly flow rate (vph)	477	15	0	361	11	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	433					
pX, platoon unblocked			0.88		0.88	0.88
vC, conflicting volume			492		845	484
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			357		757	348
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1070		334	617

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	492	361	16
Volume Left	0	0	11
Volume Right	15	0	5
cSH	1700	1070	394
Volume to Capacity	0.29	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	14.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	14.5
Approach LOS			B

Intersection Summary			
Average Delay	0.3 – A		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	291	64	249	267	1	34	1	218	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	9	10	10	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Storage Length (ft)	140		0	150		0	0		45	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.973							0.850			
Flt Protected				0.950				0.953				
Satd. Flow (prot)	1764	1717	0	1569	1713	0	0	1700	1673	0	851	0
Flt Permitted				0.529				0.729				
Satd. Flow (perm)	1764	1717	0	874	1713	0	0	1300	1673	0	851	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)									256			
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1750			1349			500			300	
Travel Time (s)		29.8			23.0			9.7			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.87	0.87	0.87	0.85	0.85	0.85	0.25	0.25	0.25
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	100%	100%	100%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	323	71	286	307	1	40	1	256	0	4	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	394	0	286	308	0	0	41	256	0	4	0
Number of Detectors	0	0		0	0		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	0	0		0	0		35	35	35	20	20	
Trailing Detector (ft)	0	0		0	0		-5	-5	-5	-5	-5	
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase							8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	33.0	33.0		33.0	33.0		3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	39.0	39.0		39.0	39.0		9.0	9.0	9.0	9.0	9.0	
Total Split (s)	39.0	39.0	0.0	39.0	39.0	0.0	21.0	21.0	21.0	21.0	21.0	0.0
Total Split (%)	65.0%	65.0%	0.0%	65.0%	65.0%	0.0%	35.0%	35.0%	35.0%	35.0%	35.0%	0.0%
Maximum Green (s)	33.0	33.0		33.0	33.0		15.0	15.0	15.0	15.0	15.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	Min	Min		Min	Min		None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.37		0.52	0.29			0.22	0.56		0.03	
Control Delay		6.4		10.4	5.8			22.5	8.5		19.0	
Queue Delay		0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay		6.4		10.4	5.8			22.5	8.5		19.0	
Queue Length 50th (ft)		46		38	34			11	0		1	
Queue Length 95th (ft)		110		110	79			31	42		2	
Internal Link Dist (ft)		1670			1269			420			220	
Turn Bay Length (ft)				150					45			
Base Capacity (vph)		1077		548	1075			371	660		243	
Starvation Cap Reductn		0		0	0			0	0		0	
Spillback Cap Reductn		0		0	0			0	0		0	
Storage Cap Reductn		0		0	0			0	0		0	
Reduced v/c Ratio		0.37		0.52	0.29			0.11	0.39		0.02	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 52.7
Natural Cycle: 50
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ashbourne Rd & Access

ø2	ø4
39 s	21 s
ø6	ø8
39 s	21 s

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	291	64	249	267	1	34	1	218	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	10	10	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Lane Util. Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Frt		0.97		1.00	1.00			1.00	0.85		1.00	
Flt Protected		1.00		0.95	1.00			0.95	1.00		1.00	
Satd. Flow (prot)		1717		1569	1712			1701	1673		851	
Flt Permitted		1.00		0.53	1.00			0.73	1.00		1.00	
Satd. Flow (perm)		1717		875	1712			1300	1673		851	
Peak-hour factor, PHF	0.90	0.90	0.90	0.87	0.87	0.87	0.85	0.85	0.85	0.25	0.25	0.25
Adj. Flow (vph)	0	323	71	286	307	1	40	1	256	0	4	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	219	0	0	0
Lane Group Flow (vph)	0	394	0	286	308	0	0	41	37	0	4	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	100%	100%	100%
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)		33.1		33.1	33.1			7.6	7.6		7.6	
Effective Green, g (s)		33.1		33.1	33.1			7.6	7.6		7.6	
Actuated g/C Ratio		0.63		0.63	0.63			0.14	0.14		0.14	
Clearance Time (s)		6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		1078		550	1075			187	241		123	
v/s Ratio Prot		0.23			0.18						0.00	
v/s Ratio Perm				c0.33				c0.03	0.02			
v/c Ratio		0.37		0.52	0.29			0.22	0.15		0.03	
Uniform Delay, d1		4.7		5.4	4.4			19.9	19.7		19.4	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.2		0.9	0.1			0.6	0.3		0.1	
Delay (s)		4.9		6.3	4.6			20.5	20.0		19.5	
Level of Service		A		A	A			C	C		B	
Approach Delay (s)		4.9			5.4			20.1			19.5	
Approach LOS		A			A			C			B	

Intersection Summary			
HCM Average Control Delay	8.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	52.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Volume (vph)	246	13	224	26	1	7	4	10	91	4	16	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	12	16	16	16	16	15
Grade (%)		0%				1%			1%			
Storage Length (ft)	0		0		0		0	0		0		
Storage Lanes	0		0		0		0	0		0		
Taper Length (ft)	25		25		25		25	25		25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.934				0.955			0.978			
Flt Protected		0.976				0.996			0.996			
Satd. Flow (prot)	0	1868	0	0	0	1199	0	0	2046	0	0	0
Flt Permitted		0.976				0.996			0.943			
Satd. Flow (perm)	0	1868	0	0	0	1199	0	0	1937	0	0	0
Right Turn on Red				No			No				No	
Satd. Flow (RTOR)												
Link Speed (mph)		40				25			15			
Link Distance (ft)		1349				527			500			
Travel Time (s)		23.0				14.4			22.7			
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.90	0.33	0.33	0.33	0.73	0.73	0.73	0.73	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	50%	50%	50%	2%	2%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%			0%			
Adj. Flow (vph)	280	15	255	29	3	21	12	14	125	5	22	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	579	0	0	0	36	0	0	166	0	0	0
Number of Detectors	1	1			1	1		1	1			2
Detector Template												
Leading Detector (ft)	35	35			35	35		35	35			70
Trailing Detector (ft)	-5	-5			-5	-5		-5	-5			-5
Turn Type	Split				Split			Perm				Perm
Protected Phases	2	2			6	6			8			
Permitted Phases		2						8				4
Detector Phase	2	2			6	6		8	8			4
Switch Phase												
Minimum Initial (s)	8.0	8.0			5.0	5.0		8.0	8.0			8.0
Minimum Split (s)	14.0	14.0			11.0	11.0		14.0	14.0			14.0
Total Split (s)	46.0	46.0	0.0	0.0	21.0	21.0	0.0	51.0	51.0	0.0	0.0	51.0
Total Split (%)	28.0%	28.0%	0.0%	0.0%	12.8%	12.8%	0.0%	31.1%	31.1%	0.0%	0.0%	31.1%
Maximum Green (s)	40.0	40.0			15.0	15.0		45.0	45.0			45.0
Yellow Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			4.0
All-Red Time (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0	-2.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0	4.0

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	33	127	222	23	278	18	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	16	16	16	16
Grade (%)		0%			2%		
Storage Length (ft)	0		0		0	0	
Storage Lanes	0		0		1	0	
Taper Length (ft)	25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							
Frt		0.922			0.992		
Flt Protected		0.995			0.955		
Satd. Flow (prot)	0	1844	0	0	1980	0	0
Flt Permitted		0.957			0.955		
Satd. Flow (perm)	0	1773	0	0	1980	0	0
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		35			25		
Link Distance (ft)		752			573		
Travel Time (s)		14.6			15.6		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%			0%		
Adj. Flow (vph)	35	137	239	27	323	21	2
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	414	0	0	373	0	0
Number of Detectors	2	2		1	1		
Detector Template							
Leading Detector (ft)	70	70		35	35		
Trailing Detector (ft)	-5	-5		-5	-5		
Turn Type	Perm			Split			
Protected Phases		4		9	9		
Permitted Phases	4						
Detector Phase	4	4		9	9		
Switch Phase							
Minimum Initial (s)	8.0	8.0		8.0	8.0		
Minimum Split (s)	14.0	14.0		14.0	14.0		
Total Split (s)	51.0	51.0	0.0	46.0	46.0	0.0	0.0
Total Split (%)	31.1%	31.1%	0.0%	28.0%	28.0%	0.0%	0.0%
Maximum Green (s)	45.0	45.0		40.0	40.0		
Yellow Time (s)	4.0	4.0		4.0	4.0		
All-Red Time (s)	2.0	2.0		2.0	2.0		
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	4.0

Lane Group	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0	5.0		5.0	5.0			5.0
Minimum Gap (s)	3.0	3.0			3.0	3.0		3.0	3.0			3.0
Time Before Reduce (s)	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Time To Reduce (s)	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Recall Mode	None	None			None	None		Max	Max			Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		1.17				0.39			0.29			
Control Delay		144.5				82.7			45.4			
Queue Delay		0.0				0.0			0.0			
Total Delay		144.5				82.7			45.4			
Queue Length 50th (ft)		~729				36			134			
Queue Length 95th (ft)		#987				27			168			
Internal Link Dist (ft)		1269				447			420			
Turn Bay Length (ft)												
Base Capacity (vph)		495				119			577			
Starvation Cap Reductn		0				0			0			
Spillback Cap Reductn		0				0			0			
Storage Cap Reductn		0				0			0			
Reduced v/c Ratio		1.17				0.30			0.29			

Intersection Summary

Area Type: Other

Cycle Length: 164

Actuated Cycle Length: 152.4

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Ashbourne Rd & Arbor Rd

ø2	ø6	ø4	ø9
46 s	21 s	51 s	46 s
		ø8	
		51 s	

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	5.0	5.0		5.0	5.0		
Minimum Gap (s)	3.0	3.0		3.0	3.0		
Time Before Reduce (s)	0.0	0.0		0.0	0.0		
Time To Reduce (s)	0.0	0.0		0.0	0.0		
Recall Mode	Max	Max		None	None		
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
v/c Ratio		0.78			0.84		
Control Delay		62.7			75.2		
Queue Delay		0.0			0.0		
Total Delay		62.7			75.2		
Queue Length 50th (ft)		400			367		
Queue Length 95th (ft)		#602			476		
Internal Link Dist (ft)		672			493		
Turn Bay Length (ft)							
Base Capacity (vph)		528			525		
Starvation Cap Reductn		0			0		
Spillback Cap Reductn		0			0		
Storage Cap Reductn		0			0		
Reduced v/c Ratio		0.78			0.71		
Intersection Summary							

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Volume (vph)	246	13	224	26	1	7	4	10	91	4	16	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	12	12	12	12	16	16	16	16	15
Grade (%)		0%				1%			1%			
Total Lost time (s)		6.0				6.0			6.0			
Lane Util. Factor		1.00				1.00			1.00			
Frt		0.93				0.96			0.98			
Flt Protected		0.98				1.00			1.00			
Satd. Flow (prot)		1868				1199			2046			
Flt Permitted		0.98				1.00			0.94			
Satd. Flow (perm)		1868				1199			1938			
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.33	0.33	0.33	0.73	0.73	0.73	0.73	0.93
Adj. Flow (vph)	280	15	255	29	3	21	12	14	125	5	22	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	579	0	0	0	36	0	0	166	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	50%	50%	50%	2%	2%	2%	2%	4%
Turn Type	Split				Split			Perm				Perm
Protected Phases	2	2			6	6			8			
Permitted Phases		2						8				4
Actuated Green, G (s)		40.4				9.8			45.4			
Effective Green, g (s)		40.4				9.8			45.4			
Actuated g/C Ratio		0.26				0.06			0.30			
Clearance Time (s)		6.0				6.0			6.0			
Vehicle Extension (s)		5.0				5.0			5.0			
Lane Grp Cap (vph)		491				76			573			
v/s Ratio Prot		c0.31				c0.03						
v/s Ratio Perm									0.09			
v/c Ratio		1.18				0.47			0.29			
Uniform Delay, d1		56.6				69.4			41.7			
Progression Factor		1.00				1.00			1.00			
Incremental Delay, d2		100.1				9.4			1.3			
Delay (s)		156.7				78.8			43.0			
Level of Service		F				E			D			
Approach Delay (s)		156.7				78.8			43.0			
Approach LOS		F				E			D			

Intersection Summary			
HCM Average Control Delay	97.8	HCM Level of Service	F
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	153.6	Sum of lost time (s)	24.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	33	127	222	23	278	18	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	16	16	16	16
Grade (%)		0%			2%		
Total Lost time (s)		6.0			6.0		
Lane Util. Factor		1.00			1.00		
Frt		0.92			0.99		
Flt Protected		1.00			0.96		
Satd. Flow (prot)		1845			1980		
Flt Permitted		0.96			0.96		
Satd. Flow (perm)		1773			1980		
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.86
Adj. Flow (vph)	35	137	239	27	323	21	2
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	414	0	0	373	0	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%
Turn Type	Perm			Split			
Protected Phases		4		9	9		
Permitted Phases	4						
Actuated Green, G (s)		45.4			34.0		
Effective Green, g (s)		45.4			34.0		
Actuated g/C Ratio		0.30			0.22		
Clearance Time (s)		6.0			6.0		
Vehicle Extension (s)		5.0			5.0		
Lane Grp Cap (vph)		524			438		
v/s Ratio Prot					c0.19		
v/s Ratio Perm		c0.23					
v/c Ratio		0.79			0.85		
Uniform Delay, d1		49.7			57.4		
Progression Factor		1.00			1.00		
Incremental Delay, d2		11.5			16.0		
Delay (s)		61.2			73.4		
Level of Service		E			E		
Approach Delay (s)		61.2			73.4		
Approach LOS		E			E		

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	3	11	352	6	10	382
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	16	15	15
Grade (%)	-3%		-5%			3%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.893		0.998			
Flt Protected	0.990					0.999
Satd. Flow (prot)	1705	0	2139	0	0	1997
Flt Permitted	0.990					0.999
Satd. Flow (perm)	1705	0	2139	0	0	1997
Link Speed (mph)	25		35			35
Link Distance (ft)	595		752			350
Travel Time (s)	16.2		14.6			6.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.58	0.58	0.88	0.88	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	5	19	400	7	11	424
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	407	0	0	435
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	11	352	6	10	382
Sign Control	Stop		Free			Free
Grade	-3%		-5%			3%
Peak Hour Factor	0.58	0.58	0.88	0.88	0.90	0.90
Hourly flow rate (vph)	5	19	400	7	11	424
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			752			
pX, platoon unblocked	0.97	0.97			0.97	
vC, conflicting volume	850	403			407	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	832	372			376	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	97			99	
cM capacity (veh/h)	330	660			1145	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	407	436
Volume Left	5	0	11
Volume Right	19	7	0
cSH	543	1700	1145
Volume to Capacity	0.04	0.24	0.01
Queue Length 95th (ft)	3	0	1
Control Delay (s)	11.9	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	11.9	0.0	0.3
Approach LOS	B		

Intersection Summary			
Average Delay	0.5 – A		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	32	82	59	305	311	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	15	15	16	16
Grade (%)	0%			-8%	3%	
Storage Length (ft)	0	50	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.903				0.988	
Flt Protected	0.986			0.992		
Satd. Flow (prot)	1748	0	0	2093	2035	0
Flt Permitted	0.986			0.992		
Satd. Flow (perm)	1748	0	0	2093	2035	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	1339			350	562	
Travel Time (s)	36.5			6.8	10.9	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.94	0.94	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	37	95	63	324	334	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	132	0	0	387	366	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	32	82	59	305	311	30
Sign Control	Stop			Free	Free	
Grade	0%			-8%	3%	
Peak Hour Factor	0.86	0.86	0.94	0.94	0.93	0.93
Hourly flow rate (vph)	37	95	63	324	334	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	801	351	334			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	801	351	334			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	86	95			
cM capacity (veh/h)	338	697	1219			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	133	387	367
Volume Left	37	63	0
Volume Right	95	0	32
cSH	537	1219	1700
Volume to Capacity	0.25	0.05	0.22
Queue Length 95th (ft)	24	4	0
Control Delay (s)	13.9	1.7	0.0
Lane LOS	B	A	
Approach Delay (s)	13.9	1.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.8 — A		
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	4	267	59	40	229	18	30	28	13	30	30	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	9	9	9	14	14	14
Grade (%)		-1%			0%			-3%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.976			0.991			0.975			0.952	
Flt Protected		0.999			0.993			0.979			0.984	
Satd. Flow (prot)	0	2048	0	0	1870	0	0	1657	0	0	1908	0
Flt Permitted		0.999			0.993			0.979			0.984	
Satd. Flow (perm)	0	2048	0	0	1870	0	0	1657	0	0	1908	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2916			718			672			1339	
Travel Time (s)		56.8			14.0			18.3			36.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.87	0.87	0.87	0.82	0.82	0.82	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	5	361	80	46	263	21	37	34	16	37	37	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	446	0	0	330	0	0	87	0	0	115	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	267	59	40	229	18	30	28	13	30	30	33
Peak Hour Factor	0.74	0.74	0.74	0.87	0.87	0.87	0.82	0.82	0.82	0.81	0.81	0.81
Hourly flow rate (vph)	5	361	80	46	263	21	37	34	16	37	37	41

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total (vph)	446	330	87	115
Volume Left (vph)	5	46	37	37
Volume Right (vph)	80	21	16	41
Hadj (s)	-0.10	-0.01	-0.03	-0.15
Departure Headway (s)	4.9	5.1	6.0	5.9
Degree Utilization, x	0.60	0.47	0.15	0.19
Capacity (veh/h)	709	671	505	528
Control Delay (s)	15.1	12.5	10.1	10.2
Approach Delay (s)	15.1	12.5	10.1	10.2
Approach LOS	C	B	B	B

Intersection Summary			
Delay	13.2		
HCM Level of Service	B		
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	47	258	555	76	238	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.886		0.984			
Flt Protected	0.992					0.983
Satd. Flow (prot)	1726	0	2129	0	0	2065
Flt Permitted	0.992					0.983
Satd. Flow (perm)	1726	0	2129	0	0	2065
Link Speed (mph)	35		35			35
Link Distance (ft)	2916		1087			300
Travel Time (s)	56.8		21.2			5.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	56	307	603	83	280	534
Shared Lane Traffic (%)						
Lane Group Flow (vph)	363	0	686	0	0	814
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	47	258	555	76	238	454
Sign Control	Stop		Free			Free
Grade	0%		-3%			-1%
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Hourly flow rate (vph)	56	307	603	83	280	534
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1087			
pX, platoon unblocked	0.91	0.91			0.91	
vC, conflicting volume	1739	645			686	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1763	557			602	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	4	37			69	
cM capacity (veh/h)	58	484			893	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	363	686	814
Volume Left	56	0	280
Volume Right	307	83	0
cSH	228	1700	893
Volume to Capacity	1.59	0.40	0.31
Queue Length 95th (ft)	572	0	34
Control Delay (s)	325.7	0.0	7.0
Lane LOS	F		A
Approach Delay (s)	325.7	0.0	7.0
Approach LOS	F		

Intersection Summary			
Average Delay	66.5 —F		
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	47	258	555	76	238	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.886		0.984			
Flt Protected	0.992					0.983
Satd. Flow (prot)	1726	0	2129	0	0	2065
Flt Permitted	0.992					0.461
Satd. Flow (perm)	1726	0	2129	0	0	968
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	232		12			
Link Speed (mph)	35		35			35
Link Distance (ft)	2916		1087			300
Travel Time (s)	56.8		21.2			5.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	56	307	603	83	280	534
Shared Lane Traffic (%)						
Lane Group Flow (vph)	363	0	686	0	0	814
Number of Detectors	1		0		1	0
Detector Template	Left				Left	
Leading Detector (ft)	35		0		20	0
Trailing Detector (ft)	-5		0		0	0
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8					
Switch Phase						
Minimum Initial (s)	7.0		20.0		7.0	20.0
Minimum Split (s)	13.0		26.0		13.0	26.0
Total Split (s)	21.0	0.0	66.0	0.0	13.0	79.0
Total Split (%)	21.0%	0.0%	66.0%	0.0%	13.0%	79.0%
Maximum Green (s)	15.0		60.0		7.0	73.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0
Recall Mode	None		Max		Max	Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.86		0.52			1.01
Control Delay	35.4		12.6			48.1
Queue Delay	0.0		0.0			0.0
Total Delay	35.4		12.6			48.1
Queue Length 50th (ft)	79		234			~224
Queue Length 95th (ft)	#167		330			#395
Internal Link Dist (ft)	2836		1007			220
Turn Bay Length (ft)						
Base Capacity (vph)	462		1315			804
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.79		0.52			1.01

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 97.6

Natural Cycle: 75

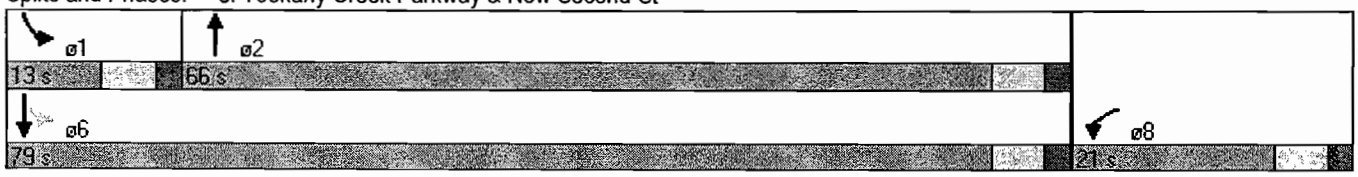
Control Type: Semi-Act-Uncoord

* User Entered Value

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Tookany Creek Parkway & New Second St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	47	258	555	76	238	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	0.89		0.98			1.00
Flt Protected	0.99		1.00			0.98
Satd. Flow (prot)	1726		2129			2065
Flt Permitted	0.99		1.00			0.46
Satd. Flow (perm)	1726		2129			968
Peak-hour factor, PHF	0.84	0.84	0.92	0.92	0.85	0.85
Adj. Flow (vph)	56	307	603	83	280	534
RTOR Reduction (vph)	202	0	5	0	0	0
Lane Group Flow (vph)	161	0	681	0	0	814
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	12.5		60.1			73.1
Effective Green, g (s)	12.5		60.1			73.1
Actuated g/C Ratio	0.13		0.62			0.75
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	221		1311			804
v/s Ratio Prot	c0.09		0.32			c0.07
v/s Ratio Perm						c0.69
v/c Ratio	0.73		0.52			1.01
Uniform Delay, d1	40.9		10.6			12.2
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	11.3		1.5			34.9
Delay (s)	52.2		12.1			47.1
Level of Service	D		B			D
Approach Delay (s)	52.2		12.1			47.1
Approach LOS	D		B			D

Intersection Summary			
HCM Average Control Delay	35.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	97.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX H

2013 Future with Development Capacity/Level-of-Service Analysis Worksheets

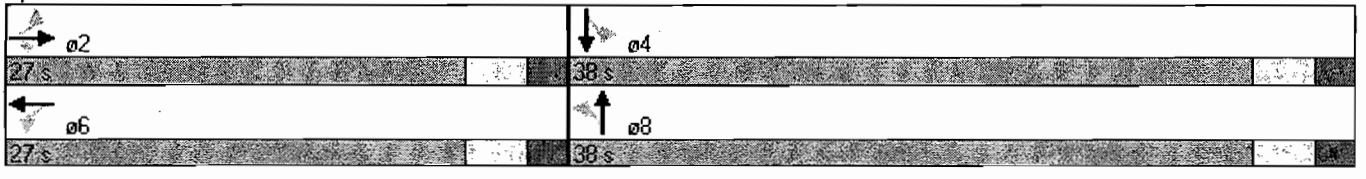
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	125	28	13	196	140	23	346	8	111	465	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Storage Length (ft)	0		110	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.946			0.997			0.982	
Flt Protected		0.978			0.998			0.997			0.992	
Satd. Flow (prot)	0	1840	1653	0	1899	0	0	2068	0	0	1806	0
Flt Permitted		0.579			0.983			0.940			0.849	
Satd. Flow (perm)	0	1089	1653	0	1870	0	0	1949	0	0	1546	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			36					2			18	
Link Speed (mph)		25			40			35			35	
Link Distance (ft)		500			433			500			1087	
Travel Time (s)		13.6			7.4			9.7			21.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	136	162	36	14	209	149	29	438	10	121	505	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	298	36	0	372	0	0	477	0	0	725	0
Number of Detectors	1	0	0	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	35	0	0	35	0		35	0		35	0	
Trailing Detector (ft)	-5	0	0	-5	0		-5	0		-5	0	
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase												
Switch Phase												
Minimum Initial (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		38.0	38.0		38.0	38.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	41.5%	0.0%	58.5%	58.5%	0.0%	58.5%	58.5%	0.0%
Maximum Green (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max	Max	Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.81	0.06		0.59			0.48			0.91	
Control Delay		39.6	6.0		22.3			12.4			33.7	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		39.6	6.0		22.3			12.4			33.7	
Queue Length 50th (ft)		105	0		119			114			239	
Queue Length 95th (ft)		#176	13		198			151			#469	
Internal Link Dist (ft)		420			353			420			1007	
Turn Bay Length (ft)			110									
Base Capacity (vph)		369	583		633			990			794	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.81	0.06		0.59			0.48			0.91	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 65
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ashbourne Rd & New Second St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	125	28	13	196	140	23	346	8	111	465	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.95			1.00			0.98	
Flt Protected		0.98	1.00		1.00			1.00			0.99	
Satd. Flow (prot)		1840	1653		1899			2068			1805	
Flt Permitted		0.58	1.00		0.98			0.94			0.85	
Satd. Flow (perm)		1089	1653		1870			1950			1545	
Peak-hour factor, PHF	0.77	0.77	0.77	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.92	0.92
Adj. Flow (vph)	136	162	36	14	209	149	29	438	10	121	505	99
RTOR Reduction (vph)	0	0	24	0	0	0	0	1	0	0	9	0
Lane Group Flow (vph)	0	298	12	0	372	0	0	476	0	0	716	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	4%	4%	4%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)		22.0	22.0		22.0			33.0			33.0	
Effective Green, g (s)		22.0	22.0		22.0			33.0			33.0	
Actuated g/C Ratio		0.34	0.34		0.34			0.51			0.51	
Clearance Time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Grp Cap (vph)		369	559		633			990			784	
v/s Ratio Prot												
v/s Ratio Perm		c0.27	0.01		0.20			0.24			c0.46	
v/c Ratio		0.81	0.02		0.59			0.48			0.91	
Uniform Delay, d1		19.6	14.3		17.8			10.4			14.7	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		17.1	0.1		4.0			1.7			16.9	
Delay (s)		36.7	14.4		21.7			12.1			31.6	
Level of Service		D	B		C			B			C	
Approach Delay (s)		34.3			21.7			12.1			31.6	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	25.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	118.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	231	3	0	326	2	6	0	0	5	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		-4%			-4%			-2%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.999						0.897	
Flt Protected		0.998						0.950			0.988	
Satd. Flow (prot)	0	1930	0	0	1936	0	0	1762	0	0	1651	0
Flt Permitted		0.998						0.950			0.988	
Satd. Flow (perm)	0	1930	0	0	1936	0	0	1762	0	0	1651	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		433			1750			486			448	
Travel Time (s)		8.4			34.1			13.3			12.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.81	0.81	0.73	0.73	0.73	0.75	0.75	0.75	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	285	4	0	447	3	8	0	0	6	0	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	300	0	0	450	0	0	8	0	0	25	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	231	3	0	326	2	6	0	0	5	0	17
Sign Control		Free			Free			Stop			Stop	
Grade		-4%			-4%			-2%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.73	0.73	0.73	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	11	285	4	0	447	3	8	0	0	6	0	19
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		433										
pX, platoon unblocked												
vC, conflicting volume	449			289			776	759	287	757	759	448
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	449			289			776	759	287	757	759	448
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	100	100	98	100	97
cM capacity (veh/h)	1122			1285			305	336	757	321	333	611

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	300	449	8	24
Volume Left	11	0	8	6
Volume Right	4	3	0	19
cSH	1122	1285	305	507
Volume to Capacity	0.01	0.00	0.03	0.05
Queue Length 95th (ft)	1	0	2	4
Control Delay (s)	0.4	0.0	17.1	12.5
Lane LOS	A		C	B
Approach Delay (s)	0.4	0.0	17.1	12.5
Approach LOS			C	B

Intersection Summary			
Average Delay	0.7 – A		
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

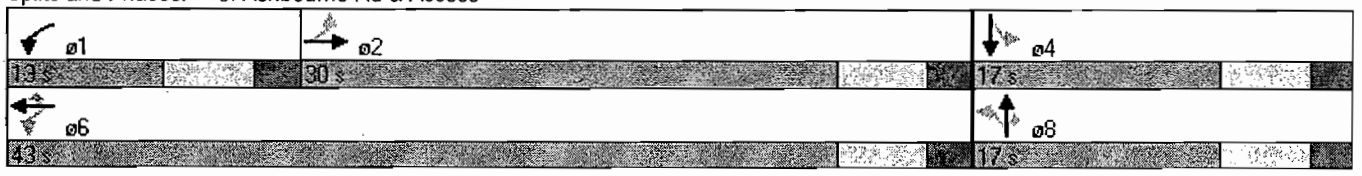
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	215	21	262	268	9	58	5	192	16	8	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Storage Length (ft)	140		0	150		75	0		45	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.986				0.850			0.850		0.990	
Flt Protected	0.950			0.950				0.956			0.970	
Satd. Flow (prot)	1627	1689	0	1525	1665	1617	0	1627	1596	0	1634	0
Flt Permitted	0.587			0.457				0.743			0.767	
Satd. Flow (perm)	1006	1689	0	734	1665	1617	0	1264	1596	0	1292	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						9			240			
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1750			1349			500			300	
Travel Time (s)		29.8			23.0			9.7			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.95	0.95	0.95	0.80	0.80	0.80	0.25	0.25	0.25
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	9%	9%	9%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1	262	26	276	282	9	72	6	240	64	32	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	288	0	276	282	9	0	78	240	0	104	0
Number of Detectors	0	0		1	0	0	1	1	1	1	1	
Detector Template												
Leading Detector (ft)	0	0		35	0	0	35	35	35	20	20	
Trailing Detector (ft)	0	0		-5	0	0	-5	-5	-5	-5	-5	
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Detector Phase				1		6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	24.0	24.0		7.0	33.0	33.0	3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	30.0	30.0		13.0	39.0	39.0	9.0	9.0	9.0	9.0	9.0	
Total Split (s)	30.0	30.0	0.0	13.0	43.0	43.0	17.0	17.0	17.0	17.0	17.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	21.7%	71.7%	71.7%	28.3%	28.3%	28.3%	28.3%	28.3%	0.0%
Maximum Green (s)	24.0	24.0		7.0	37.0	37.0	11.0	11.0	11.0	11.0	11.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	Min	Min		None	Min	Min	None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.00	0.41		0.49	0.27	0.01		0.39	0.53		0.51	
Control Delay	11.0	14.9		8.4	5.8	2.8		28.1	8.4		31.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	11.0	14.9		8.4	5.8	2.8		28.1	8.4		31.8	
Queue Length 50th (ft)	0	70		38	38	0		25	0		34	
Queue Length 95th (ft)	2	114		73	72	4		52	35		19	
Internal Link Dist (ft)		1670			1269			420			220	
Turn Bay Length (ft)	140			150		75			45			
Base Capacity (vph)	415	698		563	1060	1033		239	497		244	
Starvation Cap Reductn	0	0		0	0	0		0	0		0	
Spillback Cap Reductn	0	0		0	0	0		0	0		0	
Storage Cap Reductn	0	0		0	0	0		0	0		0	
Reduced v/c Ratio	0.00	0.41		0.49	0.27	0.01		0.33	0.48		0.43	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 58.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ashbourne Rd & Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	215	21	262	268	9	58	5	192	16	8	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		0.97	
Satd. Flow (prot)	1627	1690		1525	1665	1617		1627	1596		1634	
Flt Permitted	0.59	1.00		0.46	1.00	1.00		0.74	1.00		0.77	
Satd. Flow (perm)	1005	1690		734	1665	1617		1264	1596		1291	
Peak-hour factor, PHF	0.82	0.82	0.82	0.95	0.95	0.95	0.80	0.80	0.80	0.25	0.25	0.25
Adj. Flow (vph)	1	262	26	276	282	9	72	6	240	64	32	8
RTOR Reduction (vph)	0	0	0	0	0	3	0	0	202	0	0	0
Lane Group Flow (vph)	1	288	0	276	282	6	0	78	38	0	104	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	9%	9%	9%	0%	0%	0%
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	24.0	24.0		37.0	37.0	37.0		9.1	9.1		9.1	
Effective Green, g (s)	24.0	24.0		37.0	37.0	37.0		9.1	9.1		9.1	
Actuated g/C Ratio	0.41	0.41		0.64	0.64	0.64		0.16	0.16		0.16	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	415	698		563	1060	1030		198	250		202	
v/s Ratio Prot		0.17		c0.06	0.17							
v/s Ratio Perm	0.00			c0.25		0.00		0.06	0.02		c0.08	
v/c Ratio	0.00	0.41		0.49	0.27	0.01		0.39	0.15		0.51	
Uniform Delay, d1	10.0	12.1		5.2	4.6	3.8		22.0	21.2		22.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.4		0.7	0.1	0.0		1.3	0.3		2.2	
Delay (s)	10.0	12.5		5.9	4.7	3.8		23.3	21.4		24.7	
Level of Service	B	B		A	A	A		C	C		C	
Approach Delay (s)		12.5			5.3			21.9			24.7	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lane Configurations												
Volume (vph)	161	6	209	47	2	6	13	2	12	66	15	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	15	12	12	12	12	16	16	16	15
Grade (%)		0%					1%			1%		
Storage Length (ft)	0		0			0		0	0			
Storage Lanes	0		0			0		0	0			
Taper Length (ft)	25		25			25		25	25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.918					0.986			0.978		
Flt Protected		0.981					0.982			0.994		
Satd. Flow (prot)	0	1776	0	0	0	0	1743	0	0	2062	0	0
Flt Permitted		0.981					0.982			0.940		
Satd. Flow (perm)	0	1776	0	0	0	0	1743	0	0	1950	0	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)		40					25			15		
Link Distance (ft)		1349					528			501		
Travel Time (s)		23.0					14.4			22.8		
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.77	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	1%	1%	1%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%					0%			0%		
Adj. Flow (vph)	209	8	271	61	3	8	16	3	15	82	19	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	549	0	0	0	0	30	0	0	116	0	0
Number of Detectors	1	1			1	1	1		1	1		2
Detector Template												
Leading Detector (ft)	35	35			35	35	35		35	35		70
Trailing Detector (ft)	-5	-5			-5	-5	-5		-5	-5		-5
Turn Type	Split				Perm	Split			Perm			Perm
Protected Phases	2	2				6	6			8		
Permitted Phases		2			6				8			4
Detector Phase	2	2			6	6	6		8	8		4
Switch Phase												
Minimum Initial (s)	8.0	8.0			5.0	5.0	5.0		8.0	8.0		8.0
Minimum Split (s)	14.0	14.0			11.0	11.0	11.0		14.0	14.0		14.0
Total Split (s)	35.0	35.0	0.0	0.0	13.0	13.0	13.0	0.0	17.0	17.0	0.0	17.0
Total Split (%)	38.9%	38.9%	0.0%	0.0%	14.4%	14.4%	14.4%	0.0%	18.9%	18.9%	0.0%	18.9%
Maximum Green (s)	29.0	29.0			7.0	7.0	7.0		11.0	11.0		11.0
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	-2.0	-2.0	0.0	0.0	-2.0	0.0	0.0	-2.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	17	90	230	27	280	22	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Storage Length (ft)	0		150		0	0	
Storage Lanes	0		1		1	0	
Taper Length (ft)	25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							
Frt			0.850		0.991		
Flt Protected		0.992			0.956		
Satd. Flow (prot)	0	1938	1610	0	1980	0	0
Flt Permitted		0.931			0.956		
Satd. Flow (perm)	0	1818	1610	0	1980	0	0
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		35			25		
Link Distance (ft)		752			574		
Travel Time (s)		14.6			15.7		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.98	0.98	0.98	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%			0%		
Adj. Flow (vph)	17	92	235	28	295	23	1
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	110	235	0	347	0	0
Number of Detectors	2	2	1	1	1		
Detector Template							
Leading Detector (ft)	70	70	35	35	35		
Trailing Detector (ft)	-5	-5	-5	-5	-5		
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Detector Phase	4	4	2	9	9		
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		
Total Split (s)	17.0	17.0	35.0	25.0	25.0	0.0	0.0
Total Split (%)	18.9%	18.9%	38.9%	27.8%	27.8%	0.0%	0.0%
Maximum Green (s)	11.0	11.0	29.0	19.0	19.0		
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	4.0

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0		5.0
Minimum Gap (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		3.0
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None			None	None	None		Max	Max		Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.90					0.20			0.45		
Control Delay		47.8					42.2			41.9		
Queue Delay		0.0					0.0			0.0		
Total Delay		47.8					42.2			41.9		
Queue Length 50th (ft)		304					16			63		
Queue Length 95th (ft)		#388					38			102		
Internal Link Dist (ft)		1269					448			421		
Turn Bay Length (ft)												
Base Capacity (vph)		621					147			259		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.88					0.20			0.45		

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 83.7

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Ashbourne Rd & Arbor Rd

ø2	ø6	ø4	ø9
35 s	13 s	17 s	25 s
		ø8	
		17 s	

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0		
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Recall Mode	Max	Max	None	None	None		
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
v/c Ratio		0.46	0.29		0.80		
Control Delay		42.6	9.3		47.8		
Queue Delay		0.0	0.0		0.0		
Total Delay		42.6	9.3		47.8		
Queue Length 50th (ft)		59	48		190		
Queue Length 95th (ft)		112	79		#332		
Internal Link Dist (ft)		672			494		
Turn Bay Length (ft)			150				
Base Capacity (vph)		241	802		454		
Starvation Cap Reductn		0	0		0		
Spillback Cap Reductn		0	0		0		
Storage Cap Reductn		0	0		0		
Reduced v/c Ratio		0.46	0.29		0.76		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lane Configurations												
Volume (vph)	161	6	209	47	2	6	13	2	12	66	15	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	15	12	12	12	12	16	16	16	15
Grade (%)		0%					1%			1%		
Total Lost time (s)		6.0					6.0			6.0		
Lane Util. Factor		1.00					1.00			1.00		
Frt		0.92					0.99			0.98		
Flt Protected		0.98					0.98			0.99		
Satd. Flow (prot)		1777					1744			2061		
Flt Permitted		0.98					0.98			0.94		
Satd. Flow (perm)		1777					1744			1951		
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.98
Adj. Flow (vph)	209	8	271	61	3	8	16	3	15	82	19	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	549	0	0	0	0	30	0	0	116	0	0
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	1%	1%	1%	7%
Turn Type	Split				Perm	Split			Perm			Perm
Protected Phases	2	2				6	6			8		
Permitted Phases		2			6				8			4
Actuated Green, G (s)		28.8					3.9			11.1		
Effective Green, g (s)		28.8					3.9			11.1		
Actuated g/C Ratio		0.33					0.05			0.13		
Clearance Time (s)		6.0					6.0			6.0		
Vehicle Extension (s)		5.0					5.0			5.0		
Lane Grp Cap (vph)		594					79			252		
v/s Ratio Prot		c0.31					c0.02					
v/s Ratio Perm										0.06		
v/c Ratio		0.92					0.38			0.46		
Uniform Delay, d1		27.6					39.9			34.7		
Progression Factor		1.00					1.00			1.00		
Incremental Delay, d2		21.0					6.3			5.9		
Delay (s)		48.6					46.2			40.7		
Level of Service		D					D			D		
Approach Delay (s)		48.6					46.2			40.7		
Approach LOS		D					D			D		

Intersection Summary			
HCM Average Control Delay	41.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	17	90	230	27	280	22	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Total Lost time (s)		6.0	6.0		6.0		
Lane Util. Factor		1.00	1.00		1.00		
Frt		1.00	0.85		0.99		
Flt Protected		0.99	1.00		0.96		
Satd. Flow (prot)		1937	1610		1978		
Flt Permitted		0.93	1.00		0.96		
Satd. Flow (perm)		1819	1610		1978		
Peak-hour factor, PHF	0.98	0.98	0.98	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	92	235	28	295	23	1
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	110	235	0	347	0	0
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	2%
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Actuated Green, G (s)		11.1	39.9		18.3		
Effective Green, g (s)		11.1	39.9		18.3		
Actuated g/C Ratio		0.13	0.46		0.21		
Clearance Time (s)		6.0	6.0		6.0		
Vehicle Extension (s)		5.0	5.0		5.0		
Lane Grp Cap (vph)		235	746		420		
v/s Ratio Prot			0.11		c0.18		
v/s Ratio Perm		c0.06	0.04				
v/c Ratio		0.47	0.32		0.83		
Uniform Delay, d1		34.8	14.5		32.4		
Progression Factor		1.00	1.00		1.00		
Incremental Delay, d2		6.6	0.5		13.9		
Delay (s)		41.3	15.0		46.3		
Level of Service		D	B		D		
Approach Delay (s)		23.4			46.3		
Approach LOS		C			D		

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	9	16	249	2	3	328
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	16	15	15
Grade (%)	-3%		-5%			3%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.912		0.999			
Flt Protected	0.983					
Satd. Flow (prot)	1729	0	2080	0	0	1942
Flt Permitted	0.983					
Satd. Flow (perm)	1729	0	2080	0	0	1942
Link Speed (mph)	25		35			35
Link Distance (ft)	484		752			350
Travel Time (s)	13.2		14.6			6.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.84	0.84	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	6%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	10	19	296	2	3	360
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	298	0	0	363
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	16	249	2	3	328
Sign Control	Stop		Free			Free
Grade	-3%		-5%			3%
Peak Hour Factor	0.86	0.86	0.84	0.84	0.91	0.91
Hourly flow rate (vph)	10	19	296	2	3	360
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			752			
pX, platoon unblocked						
vC, conflicting volume	665	298			299	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	665	298			299	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	98	98			100	
cM capacity (veh/h)	428	747			1240	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	29	299	364
Volume Left	10	0	3
Volume Right	19	2	0
cSH	589	1700	1240
Volume to Capacity	0.05	0.18	0.00
Queue Length 95th (ft)	4	0	0
Control Delay (s)	11.4	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	11.4	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay	0.5 — A		
Intersection Capacity Utilization	29.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	12	76	78	188	256	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	15	15	16	16
Grade (%)	0%			-8%	3%	
Storage Length (ft)	0	50	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.884				0.989	
Flt Protected	0.993			0.985		
Satd. Flow (prot)	1673	0	0	2039	1942	0
Flt Permitted	0.993			0.985		
Satd. Flow (perm)	1673	0	0	2039	1942	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	1329			350	719	
Travel Time (s)	36.2			6.8	14.0	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.89	0.89	0.82	0.82
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	5%	5%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	17	107	88	211	312	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	124	0	0	299	339	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	12	76	78	188	256	22
Sign Control	Stop			Free	Free	
Grade	0%			-8%	3%	
Peak Hour Factor	0.71	0.71	0.89	0.89	0.82	0.82
Hourly flow rate (vph)	17	107	88	211	312	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	712	326	312			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	712	326	312			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	85	93			
cM capacity (veh/h)	369	713	1231			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	124	299	339
Volume Left	17	88	0
Volume Right	107	0	27
cSH	633	1231	1700
Volume to Capacity	0.20	0.07	0.20
Queue Length 95th (ft)	18	6	0
Control Delay (s)	12.1	2.9	0.0
Lane LOS	B	A	
Approach Delay (s)	12.1	2.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.1 — A		
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	7	176	16	41	246	23	21	31	8	53	32	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	9	9	9	14	14	14
Grade (%)		-1%			0%			-3%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.989			0.990			0.981			0.973	
Flt Protected		0.998			0.993			0.983			0.976	
Satd. Flow (prot)	0	2053	0	0	1831	0	0	1674	0	0	1878	0
Flt Permitted		0.998			0.993			0.983			0.976	
Satd. Flow (perm)	0	2053	0	0	1831	0	0	1674	0	0	1878	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2917			950			663			1329	
Travel Time (s)		56.8			18.5			18.1			36.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	8	198	18	46	276	26	25	37	10	62	38	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	224	0	0	348	0	0	72	0	0	125	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	7	176	16	41	246	23	21	31	8	53	32	21
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83	0.85	0.85	0.85
Hourly flow rate (vph)	8	198	18	46	276	26	25	37	10	62	38	25

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total (vph)	224	348	72	125
Volume Left (vph)	8	46	25	62
Volume Right (vph)	18	26	10	25
Hadj (s)	-0.02	0.02	-0.01	0.03
Departure Headway (s)	4.9	4.8	5.5	5.5
Degree Utilization, x	0.30	0.46	0.11	0.19
Capacity (veh/h)	692	723	572	585
Control Delay (s)	10.0	11.8	9.2	9.7
Approach Delay (s)	10.0	11.8	9.2	9.7
Approach LOS	B	B	A	A

Intersection Summary			
Delay	10.7		
HCM Level of Service	B		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	82	225	536	55	144	585
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.901		0.988			
Flt Protected	0.987					0.990
Satd. Flow (prot)	1729	0	2138	0	0	2059
Flt Permitted	0.987					0.990
Satd. Flow (perm)	1729	0	2138	0	0	2059
Link Speed (mph)	35		35			35
Link Distance (ft)	2917		1087			792
Travel Time (s)	56.8		21.2			15.4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	91	250	609	63	152	616
Shared Lane Traffic (%)						
Lane Group Flow (vph)	341	0	671	0	0	768
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	82	225	536	55	144	585
Sign Control	Stop		Free			Free
Grade	0%		-3%			-1%
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Hourly flow rate (vph)	91	250	609	62	152	616
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1087			
pX, platoon unblocked	0.92	0.92			0.92	
vC, conflicting volume	1559	640			672	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1565	561			595	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	3	48			83	
cM capacity (veh/h)	94	484			903	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	341	672	767
Volume Left	91	0	152
Volume Right	250	62	0
cSH	230	1700	903
Volume to Capacity	1.49	0.40	0.17
Queue Length 95th (ft)	507	0	15
Control Delay (s)	280.0	0.0	4.0
Lane LOS	F		A
Approach Delay (s)	280.0	0.0	4.0
Approach LOS	F		

Intersection Summary			
Average Delay	55.4 – F		
Intersection Capacity Utilization	98.7%	ICU Level of Service	F
Analysis Period (min)	15		

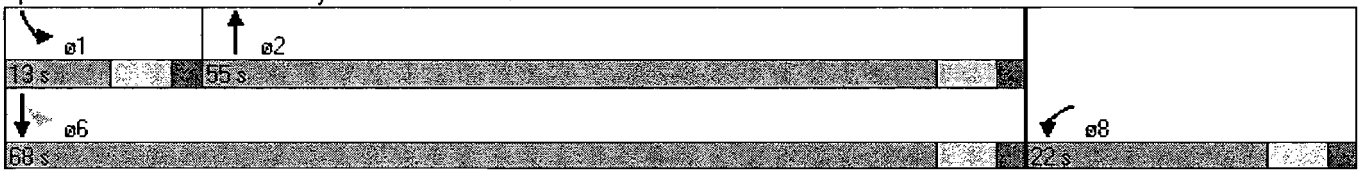
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	82	225	536	55	144	585
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.901		0.988			
Flt Protected	0.987					0.990
Satd. Flow (prot)	1729	0	2138	0	0	2059
Flt Permitted	0.987					0.478
Satd. Flow (perm)	1729	0	2138	0	0	994
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	134		9			
Link Speed (mph)	35		35			35
Link Distance (ft)	2917		1087			792
Travel Time (s)	56.8		21.2			15.4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	91	250	609	62	152	616
Shared Lane Traffic (%)						
Lane Group Flow (vph)	341	0	671	0	0	768
Number of Detectors	1		0		1	0
Detector Template						
Leading Detector (ft)	35		0		35	0
Trailing Detector (ft)	-5		0		-5	0
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8					
Switch Phase						
Minimum Initial (s)	7.0		20.0		7.0	20.0
Minimum Split (s)	13.0		26.0		13.0	26.0
Total Split (s)	22.0	0.0	55.0	0.0	13.0	68.0
Total Split (%)	24.4%	0.0%	61.1%	0.0%	14.4%	75.6%
Maximum Green (s)	16.0		49.0		7.0	62.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0
Recall Mode	None		Max		Max	Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.87		0.56			0.98
Control Delay	44.8		15.2			41.4
Queue Delay	0.0		0.0			0.0
Total Delay	44.8		15.2			41.4
Queue Length 50th (ft)	115		234			~188
Queue Length 95th (ft)	#257		324			#437
Internal Link Dist (ft)	2837		1007			712
Turn Bay Length (ft)						
Base Capacity (vph)	423		1190			782
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.81		0.56			0.98

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 88.4
Natural Cycle: 90
Control Type: Semi Act-Uncoord
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Tookany Creek Rd & New Second St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	82	225	536	55	144	585
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	0.90		0.99			1.00
Flt Protected	0.99		1.00			0.99
Satd. Flow (prot)	1728		2137			2059
Flt Permitted	0.99		1.00			0.48
Satd. Flow (perm)	1728		2137			995
Peak-hour factor, PHF	0.90	0.90	0.88	0.88	0.95	0.95
Adj. Flow (vph)	91	250	609	62	152	616
RTOR Reduction (vph)	112	0	4	0	0	0
Lane Group Flow (vph)	229	0	667	0	0	768
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	14.3		49.1			62.1
Effective Green, g (s)	14.3		49.1			62.1
Actuated g/C Ratio	0.16		0.56			0.70
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	280		1187			783
v/s Ratio Prot	c0.13		0.31			c0.08
v/s Ratio Perm						c0.61
v/c Ratio	0.82		0.56			0.98
Uniform Delay, d1	35.8		12.7			12.6
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	16.6		1.9			27.8
Delay (s)	52.4		14.6			40.4
Level of Service	D		B			D
Approach Delay (s)	52.4		14.6			40.4
Approach LOS	D		B			D

Intersection Summary			
HCM Average Control Delay	33.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	103.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	250	32	19	153	148	28	395	15	122	318	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	14	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Storage Length (ft)	0		110	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.938			0.995			0.980	
Flt Protected		0.986			0.997			0.997			0.988	
Satd. Flow (prot)	0	1873	1723	0	1936	0	0	2104	0	0	1831	0
Flt Permitted		0.689			0.963			0.946			0.779	
Satd. Flow (perm)	0	1309	1723	0	1870	0	0	1997	0	0	1443	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			36					4			20	
Link Speed (mph)		25			40			35			35	
Link Distance (ft)		500			433			500			1087	
Travel Time (s)		13.6			7.4			9.7			21.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.79	0.79	0.79	0.90	0.90	0.90	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	110	281	36	24	194	187	31	439	17	142	370	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	391	36	0	405	0	0	487	0	0	602	0
Number of Detectors	1	0	0	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	35	0	0	35	0		35	0		35	0	
Trailing Detector (ft)	-5	0	0	-5	0		-5	0		-5	0	
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase												
Switch Phase												
Minimum Initial (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		38.0	38.0		38.0	38.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	41.5%	0.0%	58.5%	58.5%	0.0%	58.5%	58.5%	0.0%
Maximum Green (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max	Max	Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.88	0.06		0.64			0.48			0.81	
Control Delay		45.2	6.0		23.7			12.3			24.2	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		45.2	6.0		23.7			12.3			24.2	
Queue Length 50th (ft)		144	0		133			115			179	
Queue Length 95th (ft)		#290	16		182			186			#340	
Internal Link Dist (ft)		420			353			420			1007	
Turn Bay Length (ft)			110									
Base Capacity (vph)		443	607		633			1016			742	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.88	0.06		0.64			0.48			0.81	

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 65

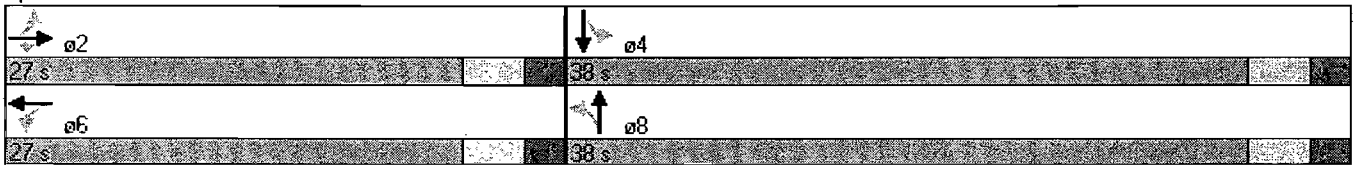
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 65

Control Type: Pretimed

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ashbourne Rd & New Second St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	250	32	19	153	148	28	395	15	122	318	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	14	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.94			1.00			0.98	
Flt Protected		0.99	1.00		1.00			1.00			0.99	
Satd. Flow (prot)		1874	1723		1935			2105			1831	
Flt Permitted		0.69	1.00		0.96			0.95			0.78	
Satd. Flow (perm)		1309	1723		1869			1998			1442	
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	110	281	36	24	194	187	31	439	17	142	370	90
RTOR Reduction (vph)	0	0	24	0	0	0	0	2	0	0	10	0
Lane Group Flow (vph)	0	391	12	0	405	0	0	485	0	0	592	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)		22.0	22.0		22.0			33.0			33.0	
Effective Green, g (s)		22.0	22.0		22.0			33.0			33.0	
Actuated g/C Ratio		0.34	0.34		0.34			0.51			0.51	
Clearance Time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Grp Cap (vph)		443	583		633			1014			732	
v/s Ratio Prot												
v/s Ratio Perm		c0.30	0.01		0.22			0.24			c0.41	
v/c Ratio		0.88	0.02		0.64			0.48			0.81	
Uniform Delay, d1		20.3	14.3		18.2			10.4			13.4	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		21.7	0.1		4.9			1.6			9.4	
Delay (s)		41.9	14.4		23.1			12.0			22.8	
Level of Service		D	B		C			B			C	
Approach Delay (s)		39.6			23.1			12.0			22.8	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM Average Control Delay	23.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	109.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	359	11	0	305	5	4	0	2	3	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		-4%			-4%			-2%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996			0.998			0.958			0.890	
Flt Protected		0.998						0.967			0.991	
Satd. Flow (prot)	0	1926	0	0	1934	0	0	1718	0	0	1643	0
Flt Permitted		0.998						0.967			0.991	
Satd. Flow (perm)	0	1926	0	0	1934	0	0	1718	0	0	1643	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		433			1750			526			356	
Travel Time (s)		8.4			34.1			14.3			9.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.84	0.84	0.84	0.38	0.38	0.38	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	26	485	15	0	363	6	11	0	5	3	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	526	0	0	369	0	0	16	0	0	16	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	359	11	0	305	5	4	0	2	3	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		-4%			-4%			-2%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.84	0.84	0.84	0.38	0.38	0.38	0.90	0.90	0.90
Hourly flow rate (vph)	26	485	15	0	363	6	11	0	5	3	0	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		433										
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	369			500			923	913	493	915	917	366
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	369			363			844	832	354	835	838	366
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			96	100	99	99	100	98
cM capacity (veh/h)	1201			1061			242	264	610	246	260	679

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	526	369	16	17
Volume Left	26	0	11	3
Volume Right	15	6	5	13
cSH	1201	1061	303	502
Volume to Capacity	0.02	0.00	0.05	0.03
Queue Length 95th (ft)	2	0	4	3
Control Delay (s)	0.6	0.0	17.5	12.4
Lane LOS	A		C	B
Approach Delay (s)	0.6	0.0	17.5	12.4
Approach LOS			C	B

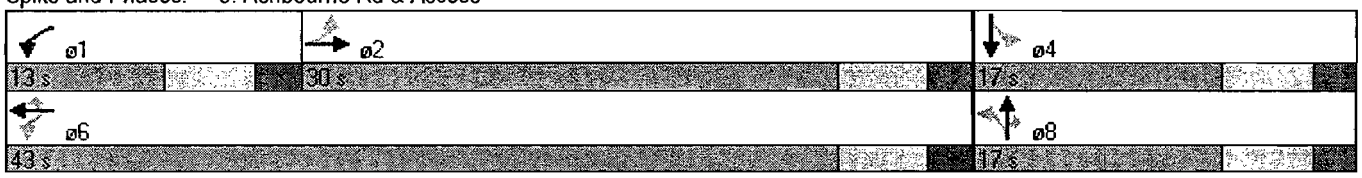
Intersection Summary			
Average Delay	0.9 — A		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	293	65	249	270	20	36	9	218	12	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Storage Length (ft)	140		0	150		75	0		45	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.973				0.850			0.850		0.986	
Flt Protected	0.950			0.950				0.962			0.971	
Satd. Flow (prot)	1676	1717	0	1569	1713	1664	0	1716	1673	0	814	0
Flt Permitted	0.572			0.352				0.717			0.785	
Satd. Flow (perm)	1009	1717	0	581	1713	1664	0	1279	1673	0	658	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						23			256			
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1750			1349			500			300	
Travel Time (s)		29.8			23.0			9.7			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.87	0.87	0.87	0.85	0.85	0.85	0.25	0.25	0.25
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	100%	100%	100%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	3	326	72	286	310	23	42	11	256	48	24	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	398	0	286	310	23	0	53	256	0	80	0
Number of Detectors	0	0		1	0	0	1	1	1	1	1	
Detector Template												
Leading Detector (ft)	0	0		35	0	0	35	35	35	20	20	
Trailing Detector (ft)	0	0		-5	0	0	-5	-5	-5	-5	-5	
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Detector Phase				1		6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	24.0	24.0		7.0	33.0	33.0	3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	30.0	30.0		13.0	39.0	39.0	9.0	9.0	9.0	9.0	9.0	
Total Split (s)	30.0	30.0	0.0	13.0	43.0	43.0	17.0	17.0	17.0	17.0	17.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	21.7%	71.7%	71.7%	28.3%	28.3%	28.3%	28.3%	28.3%	0.0%
Maximum Green (s)	24.0	24.0		7.0	37.0	37.0	11.0	11.0	11.0	11.0	11.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	Min	Min		None	Min	Min	None	None	None	None	None	
Walk Time (s)					5.0	5.0						
Flash Dont Walk (s)					11.0	11.0						
Pedestrian Calls (#/hr)					0	0						
v/c Ratio	0.01	0.57		0.59	0.29	0.02		0.24	0.52		0.71	
Control Delay	11.0	17.8		11.1	6.1	2.2		24.2	7.7		59.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	11.0	17.8		11.1	6.1	2.2		24.2	7.7		59.9	
Queue Length 50th (ft)	1	108		41	45	0		17	0		27	
Queue Length 95th (ft)	5	186		72	75	6		41	44		16	
Internal Link Dist (ft)		1670			1269			420			220	
Turn Bay Length (ft)	140			150		75			45			
Base Capacity (vph)	410	698		481	1073	1051		238	520		123	
Starvation Cap Reductn	0	0		0	0	0		0	0		0	
Spillback Cap Reductn	0	0		0	0	0		0	0		0	
Storage Cap Reductn	0	0		0	0	0		0	0		0	
Reduced v/c Ratio	0.01	0.57		0.59	0.29	0.02		0.22	0.49		0.65	

Intersection Summary
Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 59.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ashbourne Rd & Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	293	65	249	270	20	36	9	218	12	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		0.97	
Satd. Flow (prot)	1676	1717		1569	1713	1664		1716	1673		815	
Flt Permitted	0.57	1.00		0.35	1.00	1.00		0.72	1.00		0.79	
Satd. Flow (perm)	1009	1717		582	1713	1664		1279	1673		659	
Peak-hour factor, PHF	0.90	0.90	0.90	0.87	0.87	0.87	0.85	0.85	0.85	0.25	0.25	0.25
Adj. Flow (vph)	3	326	72	286	310	23	42	11	256	48	24	8
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	212	0	0	0
Lane Group Flow (vph)	3	398	0	286	310	14	0	53	44	0	80	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	100%	100%	100%
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	24.0	24.0		37.0	37.0	37.0		10.1	10.1		10.1	
Effective Green, g (s)	24.0	24.0		37.0	37.0	37.0		10.1	10.1		10.1	
Actuated g/C Ratio	0.41	0.41		0.63	0.63	0.63		0.17	0.17		0.17	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	410	697		481	1072	1042		219	286		113	
v/s Ratio Prot		0.23		c0.07	0.18							
v/s Ratio Perm	0.00			c0.30		0.01		0.04	0.03		c0.12	
v/c Ratio	0.01	0.57		0.59	0.29	0.01		0.24	0.15		0.71	
Uniform Delay, d1	10.5	13.6		6.3	5.0	4.2		21.2	20.9		23.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	1.1		2.0	0.2	0.0		0.6	0.2		18.3	
Delay (s)	10.5	14.7		8.3	5.2	4.2		21.8	21.1		41.4	
Level of Service	B	B		A	A	A		C	C		D	
Approach Delay (s)		14.7			6.6			21.2			41.4	
Approach LOS		B			A			C			D	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Volume (vph)	255	13	227	28	1	7	4	13	91	4	16	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	12	16	16	16	16	15
Grade (%)		0%				1%			1%			
Storage Length (ft)	0		0		0		0	0		0		
Storage Lanes	0		0		0		0	0		0		
Taper Length (ft)	25		25		25		25	25		25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.934				0.955			0.979			
Flt Protected		0.976				0.996			0.995			
Satd. Flow (prot)	0	1868	0	0	0	1199	0	0	2046	0	0	0
Flt Permitted		0.976				0.996			0.934			
Satd. Flow (perm)	0	1868	0	0	0	1199	0	0	1921	0	0	0
Right Turn on Red				No			No				No	
Satd. Flow (RTOR)												
Link Speed (mph)		40				25			15			
Link Distance (ft)		1349				527			500			
Travel Time (s)		23.0				14.4			22.7			
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.90	0.33	0.33	0.33	0.73	0.73	0.73	0.73	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	50%	50%	50%	2%	2%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%			0%			
Adj. Flow (vph)	290	15	258	31	3	21	12	18	125	5	22	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	594	0	0	0	36	0	0	170	0	0	0
Number of Detectors	1	1			1	1		1	1			2
Detector Template												
Leading Detector (ft)	35	35			35	35		35	35			70
Trailing Detector (ft)	-5	-5			-5	-5		-5	-5			-5
Turn Type	Split				Split			Perm				Perm
Protected Phases	2	2			6	6			8			
Permitted Phases		2						8				4
Detector Phase	2	2			6	6		8	8			4
Switch Phase												
Minimum Initial (s)	8.0	8.0			5.0	5.0		8.0	8.0			8.0
Minimum Split (s)	14.0	14.0			11.0	11.0		14.0	14.0			14.0
Total Split (s)	35.0	35.0	0.0	0.0	13.0	13.0	0.0	19.0	19.0	0.0	0.0	19.0
Total Split (%)	38.9%	38.9%	0.0%	0.0%	14.4%	14.4%	0.0%	21.1%	21.1%	0.0%	0.0%	21.1%
Maximum Green (s)	29.0	29.0			7.0	7.0		13.0	13.0			13.0
Yellow Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			4.0
All-Red Time (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0	-2.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0	4.0

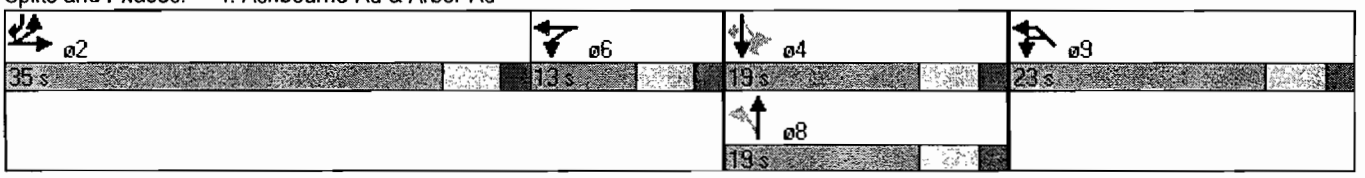
Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	33	127	236	23	283	18	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Storage Length (ft)	0		150		0	0	
Storage Lanes	0		1		1	0	
Taper Length (ft)	25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							
Frt			0.850		0.992		
Flt Protected		0.989			0.955		
Satd. Flow (prot)	0	1988	1656	0	1980	0	0
Flt Permitted		0.802			0.955		
Satd. Flow (perm)	0	1612	1656	0	1980	0	0
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		35			25		
Link Distance (ft)		752			573		
Travel Time (s)		14.6			15.6		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%			0%		
Adj. Flow (vph)	35	137	254	27	329	21	2
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	175	254	0	379	0	0
Number of Detectors	2	2	1	1	1		
Detector Template							
Leading Detector (ft)	70	70	35	35	35		
Trailing Detector (ft)	-5	-5	-5	-5	-5		
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Detector Phase	4	4	2	9	9		
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		
Total Split (s)	19.0	19.0	35.0	23.0	23.0	0.0	0.0
Total Split (%)	21.1%	21.1%	38.9%	25.6%	25.6%	0.0%	0.0%
Maximum Green (s)	13.0	13.0	29.0	17.0	17.0		
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	4.0

Lane Group	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0	5.0		5.0	5.0			5.0
Minimum Gap (s)	3.0	3.0			3.0	3.0		3.0	3.0			3.0
Time Before Reduce (s)	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Time To Reduce (s)	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Recall Mode	None	None			None	None		Max	Max			Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.92				0.36			0.57			
Control Delay		50.9				49.8			43.3			
Queue Delay		0.0				0.0			0.0			
Total Delay		50.9				49.8			43.3			
Queue Length 50th (ft)		333				20			92			
Queue Length 95th (ft)		#532				18			124			
Internal Link Dist (ft)		1269				447			420			
Turn Bay Length (ft)												
Base Capacity (vph)		643				99			296			
Starvation Cap Reductn		0				0			0			
Spillback Cap Reductn		0				0			0			
Storage Cap Reductn		0				0			0			
Reduced v/c Ratio		0.92				0.36			0.57			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 84.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Ashbourne Rd & Arbor Rd



Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0		
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Recall Mode	Max	Max	None	None	None		
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
v/c Ratio		0.70	0.29		0.95		
Control Delay		52.6	8.6		70.8		
Queue Delay		0.0	0.0		0.0		
Total Delay		52.6	8.6		70.8		
Queue Length 50th (ft)		97	48		~222		
Queue Length 95th (ft)		#198	78		#375		
Internal Link Dist (ft)		672			493		
Turn Bay Length (ft)			150				
Base Capacity (vph)		249	877		399		
Starvation Cap Reductn		0	0		0		
Spillback Cap Reductn		0	0		0		
Storage Cap Reductn		0	0		0		
Reduced v/c Ratio		0.70	0.29		0.95		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Volume (vph)	255	13	227	28	1	7	4	13	91	4	16	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	12	12	12	12	16	16	16	16	15
Grade (%)		0%				1%			1%			
Total Lost time (s)		6.0				6.0			6.0			
Lane Util. Factor		1.00				1.00			1.00			
Frt		0.93				0.96			0.98			
Flt Protected		0.98				1.00			0.99			
Satd. Flow (prot)		1869				1199			2045			
Flt Permitted		0.98				1.00			0.93			
Satd. Flow (perm)		1869				1199			1920			
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.33	0.33	0.33	0.73	0.73	0.73	0.73	0.93
Adj. Flow (vph)	290	15	258	31	3	21	12	18	125	5	22	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	594	0	0	0	36	0	0	170	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	50%	50%	50%	2%	2%	2%	2%	4%
Turn Type	Split				Split			Perm				Perm
Protected Phases	2	2			6	6			8			
Permitted Phases		2						8				4
Actuated Green, G (s)		29.2				4.0			13.1			
Effective Green, g (s)		29.2				4.0			13.1			
Actuated g/C Ratio		0.33				0.05			0.15			
Clearance Time (s)		6.0				6.0			6.0			
Vehicle Extension (s)		5.0				5.0			5.0			
Lane Grp Cap (vph)		624				55			288			
v/s Ratio Prot		c0.32				c0.03						
v/s Ratio Perm									0.09			
v/c Ratio		0.95				0.65			0.59			
Uniform Delay, d1		28.4				41.0			34.6			
Progression Factor		1.00				1.00			1.00			
Incremental Delay, d2		25.1				31.9			8.6			
Delay (s)		53.5				72.9			43.2			
Level of Service		D				E			D			
Approach Delay (s)		53.5				72.9			43.2			
Approach LOS		D				E			D			

Intersection Summary			
HCM Average Control Delay	51.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	87.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	33	127	236	23	283	18	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Total Lost time (s)		6.0	6.0		6.0		
Lane Util. Factor		1.00	1.00		1.00		
Frt		1.00	0.85		0.99		
Flt Protected		0.99	1.00		0.96		
Satd. Flow (prot)		1988	1656		1980		
Flt Permitted		0.80	1.00		0.96		
Satd. Flow (perm)		1612	1656		1980		
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.86
Adj. Flow (vph)	35	137	254	27	329	21	2
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	175	254	0	379	0	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Actuated Green, G (s)		13.1	42.3		17.1		
Effective Green, g (s)		13.1	42.3		17.1		
Actuated g/C Ratio		0.15	0.48		0.20		
Clearance Time (s)		6.0	6.0		6.0		
Vehicle Extension (s)		5.0	5.0		5.0		
Lane Grp Cap (vph)		242	801		387		
v/s Ratio Prot			0.11		c0.19		
v/s Ratio Perm		c0.11	0.05				
v/c Ratio		0.72	0.32		0.98		
Uniform Delay, d1		35.4	13.7		35.0		
Progression Factor		1.00	1.00		1.00		
Incremental Delay, d2		17.1	0.5		40.2		
Delay (s)		52.5	14.2		75.2		
Level of Service		D	B		E		
Approach Delay (s)		29.8			75.2		
Approach LOS		C			E		

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	3	11	361	6	10	396
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	16	15	15
Grade (%)	-3%		-5%			3%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.893		0.998			
Flt Protected	0.990					0.999
Satd. Flow (prot)	1705	0	2139	0	0	1997
Flt Permitted	0.990					0.999
Satd. Flow (perm)	1705	0	2139	0	0	1997
Link Speed (mph)	25		35			35
Link Distance (ft)	595		752			350
Travel Time (s)	16.2		14.6			6.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.58	0.58	0.88	0.88	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	5	19	410	7	11	440
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	417	0	0	451
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	11	361	6	10	396
Sign Control	Stop		Free			Free
Grade	-3%		-5%			3%
Peak Hour Factor	0.58	0.58	0.88	0.88	0.90	0.90
Hourly flow rate (vph)	5	19	410	7	11	440
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			752			
pX, platoon unblocked						
vC, conflicting volume	876	414			417	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	876	414			417	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	97			99	
cM capacity (veh/h)	319	643			1137	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	417	451
Volume Left	5	0	11
Volume Right	19	7	0
cSH	528	1700	1137
Volume to Capacity	0.05	0.25	0.01
Queue Length 95th (ft)	4	0	1
Control Delay (s)	12.1	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	12.1	0.0	0.3
Approach LOS	B		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	32	85	61	312	322	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	15	15	16	16
Grade (%)	0%			-8%	3%	
Storage Length (ft)	0	50	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.902				0.989	
Flt Protected	0.987			0.992		
Satd. Flow (prot)	1748	0	0	2093	2037	0
Flt Permitted	0.987			0.992		
Satd. Flow (perm)	1748	0	0	2093	2037	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	1324			350	862	
Travel Time (s)	36.1			6.8	16.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.94	0.94	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	37	99	65	332	346	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	136	0	0	397	378	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	32	85	61	312	322	30
Sign Control	Stop			Free	Free	
Grade	0%			-8%	3%	
Peak Hour Factor	0.86	0.86	0.94	0.94	0.93	0.93
Hourly flow rate (vph)	37	99	65	332	346	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	824	362	346			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	824	362	346			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	86	95			
cM capacity (veh/h)	327	687	1207			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	136	397	378
Volume Left	37	65	0
Volume Right	99	0	32
cSH	528	1207	1700
Volume to Capacity	0.26	0.05	0.22
Queue Length 95th (ft)	26	4	0
Control Delay (s)	14.2	1.8	0.0
Lane LOS	B	A	
Approach Delay (s)	14.2	1.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.9 — A		
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	4	267	59	40	229	18	30	31	13	30	32	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	9	9	9	14	14	14
Grade (%)		-1%			0%			-3%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Factor												
Frt		0.976			0.991			0.976			0.953	
Flt Protected		0.999			0.993			0.980			0.985	
Satd. Flow (prot)	0	2048	0	0	1870	0	0	1660	0	0	1912	0
Flt Permitted		0.999			0.993			0.980			0.985	
Satd. Flow (perm)	0	2048	0	0	1870	0	0	1660	0	0	1912	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2916			718			672			1324	
Travel Time (s)		56.8			14.0			18.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.87	0.87	0.87	0.82	0.82	0.82	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	5	361	80	46	263	21	37	38	16	37	40	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	446	0	0	330	0	0	91	0	0	118	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	267	59	40	229	18	30	31	13	30	32	33
Peak Hour Factor	0.74	0.74	0.74	0.87	0.87	0.87	0.82	0.82	0.82	0.81	0.81	0.81
Hourly flow rate (vph)	5	361	80	46	263	21	37	38	16	37	40	41

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total (vph)	446	330	90	117
Volume Left (vph)	5	46	37	37
Volume Right (vph)	80	21	16	41
Hadj (s)	-0.10	-0.01	-0.02	-0.15
Departure Headway (s)	4.9	5.1	6.1	5.9
Degree Utilization, x	0.61	0.47	0.15	0.19
Capacity (veh/h)	705	667	504	526
Control Delay (s)	15.2	12.6	10.2	10.3
Approach Delay (s)	15.2	12.6	10.2	10.3
Approach LOS	C	B	B	B

Intersection Summary			
Delay	13.3		
HCM Level of Service	B		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	47	258	565	76	238	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.886		0.984			
Flt Protected	0.992					0.983
Satd. Flow (prot)	1726	0	2129	0	0	2065
Flt Permitted	0.992					0.983
Satd. Flow (perm)	1726	0	2129	0	0	2065
Link Speed (mph)	35		35			35
Link Distance (ft)	2916		1087			300
Travel Time (s)	56.8		21.2			5.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	56	307	614	83	280	553
Shared Lane Traffic (%)						
Lane Group Flow (vph)	363	0	697	0	0	833
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	47	258	565	76	238	470
Sign Control	Stop		Free			Free
Grade	0%		-3%			-1%
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Hourly flow rate (vph)	56	307	614	83	280	553
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1087			
pX, platoon unblocked	0.91	0.91			0.91	
vC, conflicting volume	1768	655			697	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1796	569			614	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	36			68	
cM capacity (veh/h)	55	477			884	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	363	697	833
Volume Left	56	0	280
Volume Right	307	83	0
cSH	219	1700	884
Volume to Capacity	1.65	0.41	0.32
Queue Length 95th (ft)	593	0	34
Control Delay (s)	352.9	0.0	7.1
Lane LOS	F		A
Approach Delay (s)	352.9	0.0	7.1
Approach LOS	F		

Intersection Summary			
Average Delay	70.8 – F		
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	47	258	565	76	238	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.886		0.984			
Flt Protected	0.992					0.983
Satd. Flow (prot)	1726	0	2129	0	0	2065
Flt Permitted	0.992					*0.470
Satd. Flow (perm)	1726	0	2129	0	0	987
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	232		12			
Link Speed (mph)	35		35			35
Link Distance (ft)	2916		1087			300
Travel Time (s)	56.8		21.2			5.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	56	307	614	83	280	553
Shared Lane Traffic (%)						
Lane Group Flow (vph)	363	0	697	0	0	833
Number of Detectors	1		0		1	0
Detector Template	Left				Left	
Leading Detector (ft)	35		0		20	0
Trailing Detector (ft)	-5		0		0	0
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8					
Switch Phase						
Minimum Initial (s)	7.0		20.0		7.0	20.0
Minimum Split (s)	13.0		26.0		13.0	26.0
Total Split (s)	21.0	0.0	66.0	0.0	13.0	79.0
Total Split (%)	21.0%	0.0%	66.0%	0.0%	13.0%	79.0%
Maximum Green (s)	15.0		60.0		7.0	73.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0
Recall Mode	None		Max		Max	Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.86		0.53			1.02
Control Delay	35.4		12.7			49.9
Queue Delay	0.0		0.0			0.0
Total Delay	35.4		12.7			49.9
Queue Length 50th (ft)	79		240			~238
Queue Length 95th (ft)	#167		337			#412
Internal Link Dist (ft)	2836		1007			220
Turn Bay Length (ft)						
Base Capacity (vph)	462		1315			817
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.79		0.53			1.02

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 97.6

Natural Cycle: 75

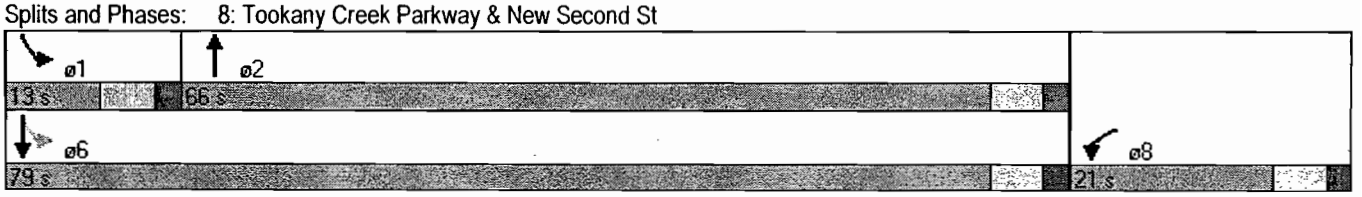
Control Type: Semi Act-Uncoord

* User Entered Value

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Tookany Creek Parkway & New Second St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	47	258	565	76	238	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	0.89		0.98			1.00
Flt Protected	0.99		1.00			0.98
Satd. Flow (prot)	1726		2129			2066
Flt Permitted	0.99		1.00			0.47
Satd. Flow (perm)	1726		2129			987
Peak-hour factor, PHF	0.84	0.84	0.92	0.92	0.85	0.85
Adj. Flow (vph)	56	307	614	83	280	553
RTOR Reduction (vph)	202	0	5	0	0	0
Lane Group Flow (vph)	161	0	692	0	0	833
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	12.5		60.1			73.1
Effective Green, g (s)	12.5		60.1			73.1
Actuated g/C Ratio	0.13		0.62			0.75
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	221		1311			817
v/s Ratio Prot	c0.09		0.33			c0.07
v/s Ratio Perm						c0.69
v/c Ratio	0.73		0.53			1.02
Uniform Delay, d1	40.9		10.7			12.2
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	11.3		1.5			36.5
Delay (s)	52.2		12.2			48.8
Level of Service	D		B			D
Approach Delay (s)	52.2		12.2			48.8
Approach LOS	D		B			D

Intersection Summary			
HCM Average Control Delay	36.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	97.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX I

Traffic Signal Warrants
New Second Street and
Tookany Creek Parkway

McMahon Associates, Inc.

New Second Street and Tookany Creek Parkway (2002 Counts)

Signal Warrants - Summary

Major Street Approaches

Northbound: **New Second Street**
Number of Lanes: **1**
Approach Speed: **35**
Total Approach Volume: **1,640**

Southbound: **New Second Street**
Number of Lanes: **1**
Approach Speed: **35**
Total Approach Volume: **1,967**

Minor Street Approaches

Eastbound:
Number of Lanes: **2**

Total Approach Volume: **0**

Westbound: **Tookany Creek Parkway**
Number of Lanes: **1**

Total Approach Volume: **924**

Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes ..... **Not Satisfied**

Warrant 1A - Minimum Vehicular Volume ..... **Not Satisfied**
Required volumes reached for 3 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic ..... **Not Satisfied**
Required volumes reached for 3 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants ..... **Not Satisfied**
Required volumes reached for 4 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... **Satisfied**
Number of hours (4) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour ..... **Satisfied**

Warrant 3A - Peak Hour Delay ..... **Not Satisfied**
Total approach volumes and delays on minor street do not exceed minimums for any hour.

Warrant 3B - Peak Hour Volumes ..... **Satisfied**
Volumes exceed minimums for at least one hour.

Warrant 4 - Pedestrian Volumes ..... **Not Satisfied**
Required 4 Hr pedestrian volume reached for 0 hour(s) and the single hour volume for 0 hour(s)

Warrant 5 - School Crossing ..... **Not Satisfied**
Number of gaps > .0 seconds (0) exceeds the number of minutes in the crossing period (0).

Warrant 6 - Coordinated Signal System ..... **Not Satisfied**
No adjacent coordinated signals are present

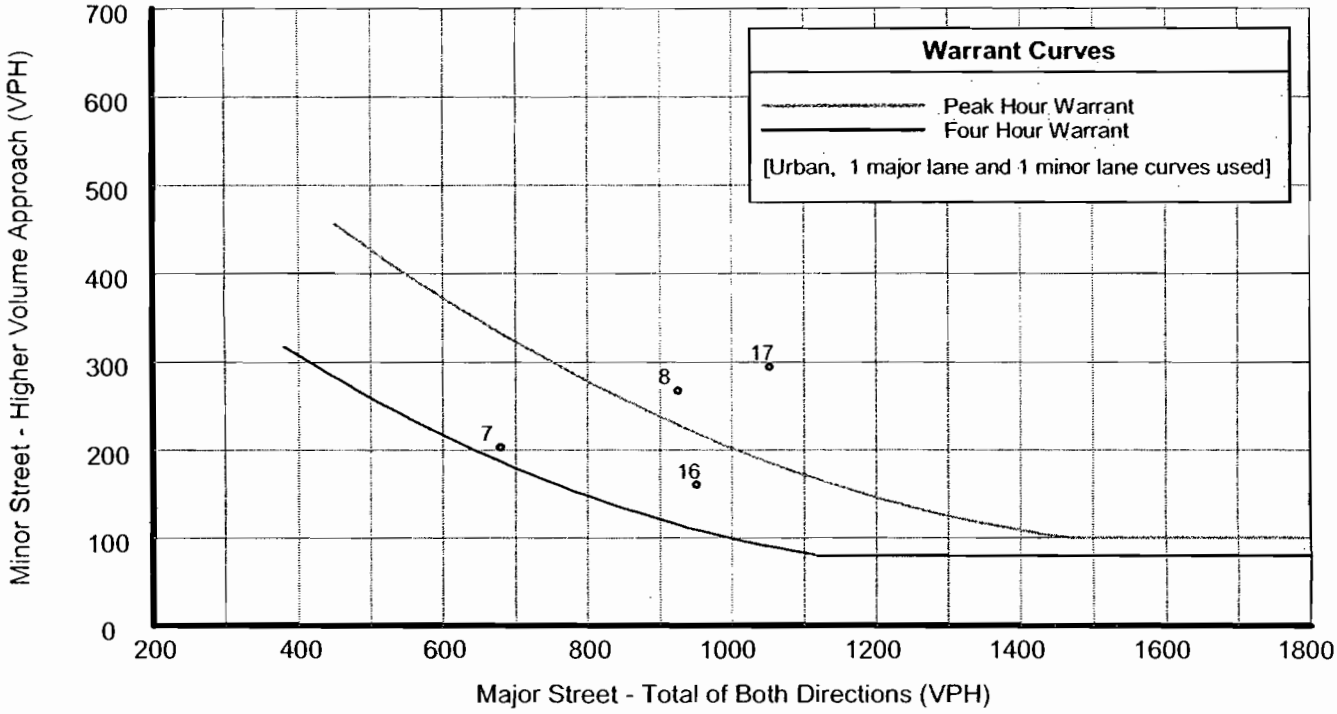
Warrant 7 - Crash Experience ..... **Not Satisfied**
Number of accidents (-1) is less than minimum (5). Volume minimums are not met.

Warrant 8 - Roadway Network ..... **Not Satisfied**
Major Route conditions not met. One or more volume requirement met.

McMahon Associates, Inc.

New Second Street and Tookany Creek Parkway (2002 Counts)

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

Hour	Major	Higher Minor		War-1A			War-1B			War-1A&B		
Begin	Total	Vol	Dir	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
01:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
02:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
03:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
04:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
05:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
06:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
07:00	679	203	WB	500-Yes	200-Yes	Both	750-No	100-Yes	Minor	600-Yes	160-Yes	Both
08:00	925	267	WB	500-Yes	200-Yes	Both	750-Yes	100-Yes	Both	600-Yes	160-Yes	Both
09:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
10:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
11:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
12:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
13:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
14:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
15:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
16:00	950	160	WB	500-Yes	200-No	Major	750-Yes	100-Yes	Both	600-Yes	160-Yes	Both
17:00	1,053	294	WB	500-Yes	200-Yes	Both	750-Yes	100-Yes	Both	600-Yes	160-Yes	Both
18:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
19:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
20:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
21:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
22:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
23:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---

McMahon Associates, Inc.

New Second Street and Tookany Creek Parkway (2009 Counts)

Signal Warrants - Summary

Major Street Approaches

Northbound: **New Second Street**
Number of Lanes: **1**
Approach Speed: **35**
Total Approach Volume: **1,594**

Southbound: **New Second Street**
Number of Lanes: **1**
Approach Speed: **35**
Total Approach Volume: **2,005**

Minor Street Approaches

Eastbound:
Number of Lanes: **2**

Total Approach Volume: **0**

Westbound: **Tookany Creek Parkway**
Number of Lanes: **1**

Total Approach Volume: **717**

Warrant Summary (Urban values apply.)

Warrant 1 - Eight Hour Vehicular Volumes ..... **Not Satisfied**

Warrant 1A - Minimum Vehicular Volume ..... **Not Satisfied**
Required volumes reached for 1 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic ..... **Not Satisfied**
Required volumes reached for 3 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants ..... **Not Satisfied**
Required volumes reached for 3 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... **Satisfied**
Number of hours (4) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour ..... **Not Satisfied**

Warrant 3A - Peak Hour Delay ..... **Not Satisfied**
Total approach volumes and delays on minor street do not exceed minimums for any hour.

Warrant 3B - Peak Hour Volumes ..... **Not Satisfied**
Volumes do not exceed minimums for any hour.

Warrant 4 - Pedestrian Volumes ..... **Not Satisfied**
Required 4 Hr pedestrian volume reached for 0 hour(s) and the single hour volume for 0 hour(s)

Warrant 5 - School Crossing ..... **Not Satisfied**
Number of gaps > .0 seconds (0) exceeds the number of minutes in the crossing period (0).

Warrant 6 - Coordinated Signal System ..... **Not Satisfied**
No adjacent coordinated signals are present

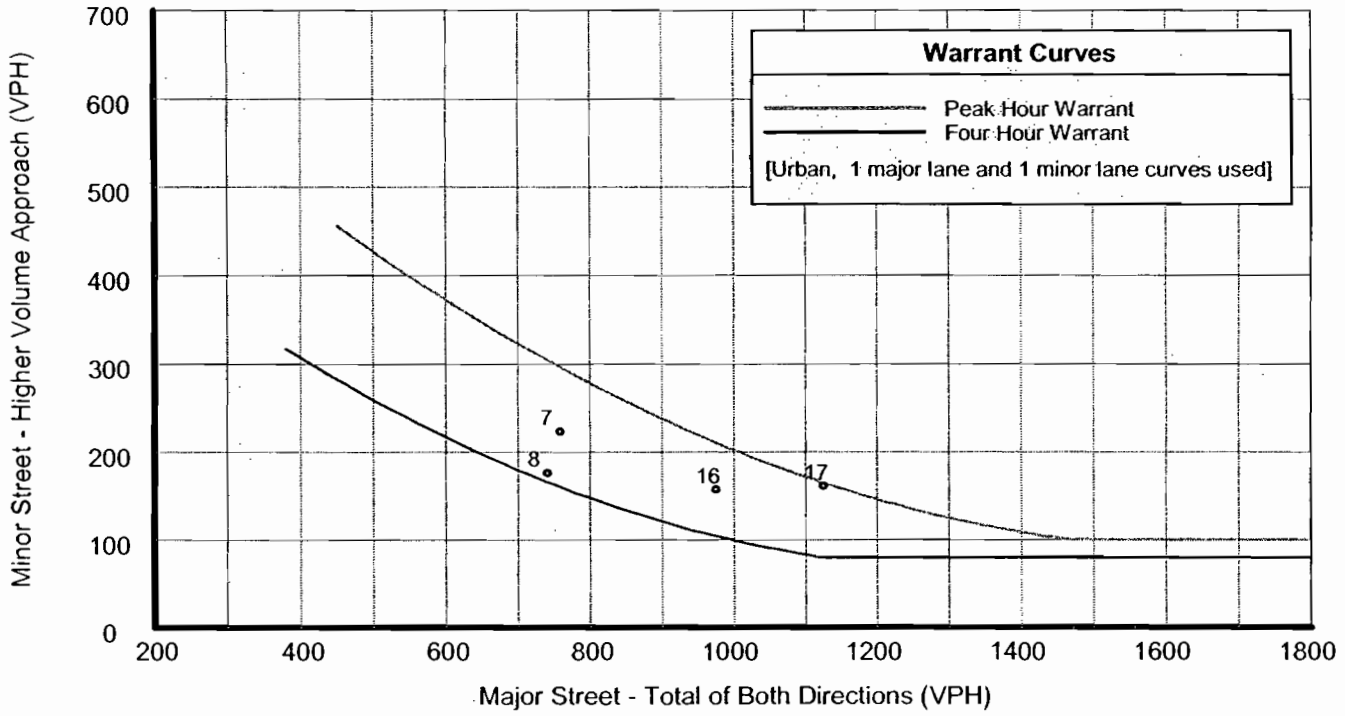
Warrant 7 - Crash Experience ..... **Not Satisfied**
Number of accidents (-1) is less than minimum (5). Volume minimums are not met.

Warrant 8 - Roadway Network ..... **Not Satisfied**
Major Route conditions not met. One or more volume requirement met.

McMahon Associates, Inc.

New Second Street and Tookany Creek Parkway (2009 Counts)

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

Hour	Major	Higher Minor		War-1A			War-1B			War-1A&B		
Begin	Total	Vol	Dir	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
01:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
02:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
03:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
04:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
05:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
06:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
07:00	758	223	WB	500-Yes	200-Yes	Both	750-Yes	100-Yes	Both	600-Yes	160-Yes	Both
08:00	741	176	WB	500-Yes	200-No	Major	750-No	100-Yes	Minor	600-Yes	160-Yes	Both
09:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
10:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
11:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
12:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
13:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
14:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
15:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
16:00	975	157	WB	500-Yes	200-No	Major	750-Yes	100-Yes	Both	600-Yes	160-No	Major
17:00	1,125	161	WB	500-Yes	200-No	Major	750-Yes	100-Yes	Both	600-Yes	160-Yes	Both
18:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
19:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
20:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
21:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
22:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---
23:00	0	0	EB	500-No	200-No	---	750-No	100-No	---	600-No	160-No	---

APPENDIX J

Supplemental Analysis
2013 Future with Development
Capacity/Level-of-Service
Analysis Worksheets

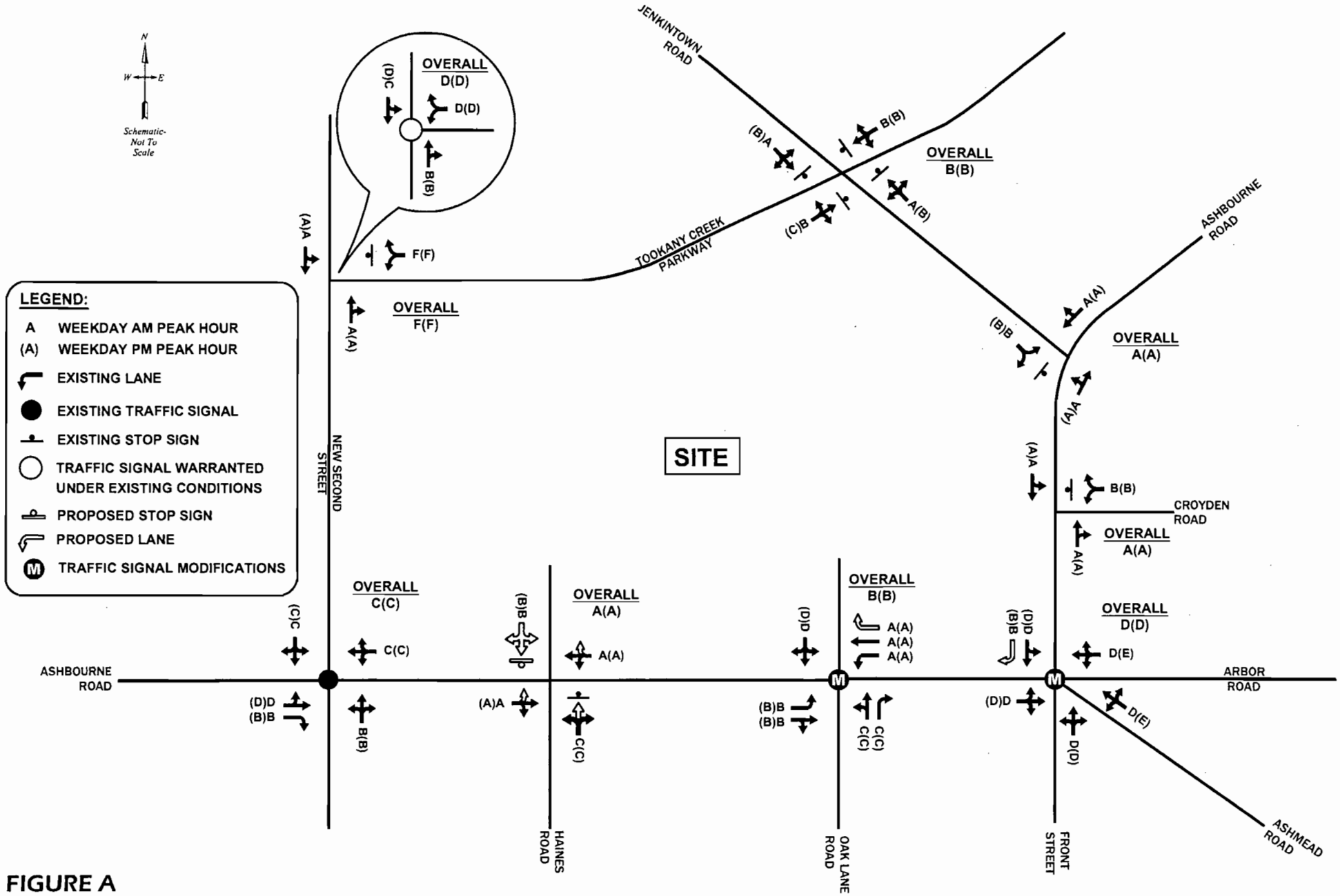


FIGURE A

Alternative Trip Generation Methodology

2013 Future Levels of Service With Development

ASHBOURNE COUNTRY CLUB

CHELTENHAM TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(9/22/09-LBK) i:\Eng\809015\Dwg\Figures\09-2009\Figurea.dwg

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	125	28	15	198	153	23	346	8	108	465	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Storage Length (ft)	0		110	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.944			0.997			0.981	
Flt Protected		0.978			0.998			0.997			0.992	
Satd. Flow (prot)	0	1840	1653	0	1895	0	0	2068	0	0	1805	0
Flt Permitted		0.562			0.981			0.940			0.855	
Satd. Flow (perm)	0	1057	1653	0	1862	0	0	1949	0	0	1555	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			36					2			18	
Link Speed (mph)		25			40			35			35	
Link Distance (ft)		500			433			500			1087	
Travel Time (s)		13.6			7.4			9.7			21.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	136	162	36	16	211	163	29	438	10	117	505	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	298	36	0	390	0	0	477	0	0	721	0
Number of Detectors	1	0	0	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	35	0	0	35	0		35	0		35	0	
Trailing Detector (ft)	-5	0	0	-5	0		-5	0		-5	0	
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase												
Switch Phase												
Minimum Initial (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		38.0	38.0		38.0	38.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	41.5%	0.0%	58.5%	58.5%	0.0%	58.5%	58.5%	0.0%
Maximum Green (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max	Max	Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.83	0.06		0.62			0.48			0.90	
Control Delay		42.9	6.0		23.2			12.4			32.2	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		42.9	6.0		23.2			12.4			32.2	
Queue Length 50th (ft)		107	0		127			114			236	
Queue Length 95th (ft)		#181	13		211			151			#463	
Internal Link Dist (ft)		420			353			420			1007	
Turn Bay Length (ft)			110									
Base Capacity (vph)		358	583		630			990			798	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.83	0.06		0.62			0.48			0.90	

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 65

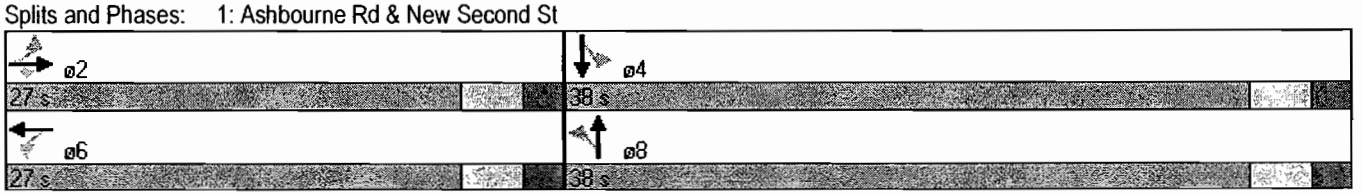
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 65

Control Type: Pretimed

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ashbourne Rd & New Second St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	125	28	15	198	153	23	346	8	108	465	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.94			1.00			0.98	
Flt Protected		0.98	1.00		1.00			1.00			0.99	
Satd. Flow (prot)		1840	1653		1894			2068			1805	
Flt Permitted		0.56	1.00		0.98			0.94			0.85	
Satd. Flow (perm)		1058	1653		1861			1951			1555	
Peak-hour factor, PHF	0.77	0.77	0.77	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.92	0.92
Adj. Flow (vph)	136	162	36	16	211	163	29	438	10	117	505	99
RTOR Reduction (vph)	0	0	24	0	0	0	0	1	0	0	9	0
Lane Group Flow (vph)	0	298	12	0	390	0	0	476	0	0	712	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	4%	4%	4%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)		22.0	22.0		22.0			33.0			33.0	
Effective Green, g (s)		22.0	22.0		22.0			33.0			33.0	
Actuated g/C Ratio		0.34	0.34		0.34			0.51			0.51	
Clearance Time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Grp Cap (vph)		358	559		630			991			789	
v/s Ratio Prot												
v/s Ratio Perm		c0.28	0.01		0.21			0.24			c0.46	
v/c Ratio		0.83	0.02		0.62			0.48			0.90	
Uniform Delay, d1		19.8	14.3		18.0			10.4			14.5	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		19.8	0.1		4.5			1.7			15.6	
Delay (s)		39.6	14.4		22.5			12.1			30.1	
Level of Service		D	B		C			B			C	
Approach Delay (s)		36.9			22.5			12.1			30.1	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM Average Control Delay	25.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	118.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	231	3	0	328	2	6	0	0	9	0	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		-4%			-4%			-2%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.999						0.894	
Flt Protected		0.999						0.950			0.989	
Satd. Flow (prot)	0	1932	0	0	1936	0	0	1762	0	0	1647	0
Flt Permitted		0.999						0.950			0.989	
Satd. Flow (perm)	0	1932	0	0	1936	0	0	1762	0	0	1647	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		433			1750			486			448	
Travel Time (s)		8.4			34.1			13.3			12.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.81	0.81	0.73	0.73	0.73	0.75	0.75	0.75	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	7	285	4	0	449	3	8	0	0	10	0	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	296	0	0	452	0	0	8	0	0	46	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	231	3	0	328	2	6	0	0	9	0	32
Sign Control		Free			Free			Stop			Stop	
Grade		-4%			-4%			-2%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.73	0.73	0.73	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	7	285	4	0	449	3	8	0	0	10	0	36
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		433										
pX, platoon unblocked												
vC, conflicting volume	452			289			788	754	287	753	754	451
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	452			289			788	754	287	753	754	451
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	100	100	97	100	94
cM capacity (veh/h)	1119			1285			292	339	757	325	336	609

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	296	452	8	46
Volume Left	7	0	8	10
Volume Right	4	3	0	36
cSH	1119	1285	292	511
Volume to Capacity	0.01	0.00	0.03	0.09
Queue Length 95th (ft)	0	0	2	7
Control Delay (s)	0.3	0.0	17.7	12.7
Lane LOS	A		C	B
Approach Delay (s)	0.3	0.0	17.7	12.7
Approach LOS			C	B

Intersection Summary			
Average Delay	1.0 – A		
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

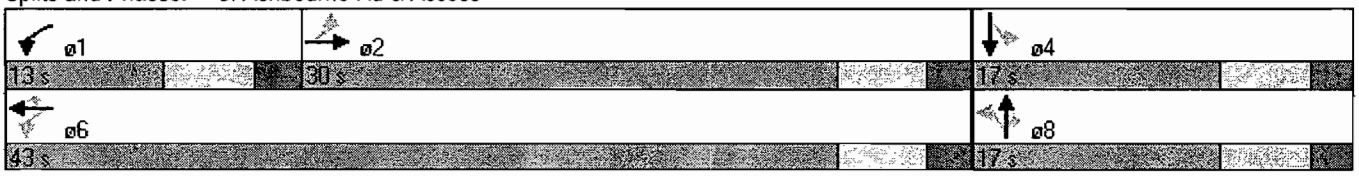
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	217	23	262	268	6	58	4	192	31	13	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Storage Length (ft)	140		0	150		75	0		45	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.986				0.850			0.850		0.989	
Flt Protected	0.950			0.950				0.955			0.969	
Satd. Flow (prot)	1627	1689	0	1525	1665	1617	0	1625	1596	0	1631	0
Flt Permitted	0.587			0.446				0.665			0.758	
Satd. Flow (perm)	1006	1689	0	716	1665	1617	0	1132	1596	0	1276	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						6			240			
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1750			1349			500			300	
Travel Time (s)		29.8			23.0			9.7			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.95	0.95	0.95	0.80	0.80	0.80	0.25	0.25	0.25
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	9%	9%	9%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1	265	28	276	282	6	72	5	240	124	52	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	293	0	276	282	6	0	77	240	0	192	0
Number of Detectors	0	0		1	0	0	1	1	1	1	1	
Detector Template												
Leading Detector (ft)	0	0		35	0	0	35	35	35	20	20	
Trailing Detector (ft)	0	0		-5	0	0	-5	-5	-5	-5	-5	
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Detector Phase				1		6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	24.0	24.0		7.0	33.0	33.0	3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	30.0	30.0		13.0	39.0	39.0	9.0	9.0	9.0	9.0	9.0	
Total Split (s)	30.0	30.0	0.0	13.0	43.0	43.0	17.0	17.0	17.0	17.0	17.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	21.7%	71.7%	71.7%	28.3%	28.3%	28.3%	28.3%	28.3%	0.0%
Maximum Green (s)	24.0	24.0		7.0	37.0	37.0	11.0	11.0	11.0	11.0	11.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	Min	Min		None	Min	Min	None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.00	0.43		0.51	0.27	0.01		0.38	0.50		0.84	
Control Delay	11.0	15.5		9.1	6.1	2.8		27.7	7.6		57.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	11.0	15.5		9.1	6.1	2.8		27.7	7.6		57.0	
Queue Length 50th (ft)	0	74		40	40	0		25	0		68	
Queue Length 95th (ft)	2	116		73	72	3		52	35		30	
Internal Link Dist (ft)		1670			1269			420			220	
Turn Bay Length (ft)	140			150		75			45			
Base Capacity (vph)	404	679		539	1032	1004		209	490		235	
Starvation Cap Reductn	0	0		0	0	0		0	0		0	
Spillback Cap Reductn	0	0		0	0	0		0	0		0	
Storage Cap Reductn	0	0		0	0	0		0	0		0	
Reduced v/c Ratio	0.00	0.43		0.51	0.27	0.01		0.37	0.49		0.82	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 59.7
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ashbourne Rd & Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	217	23	262	268	6	58	4	192	31	13	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		0.97	
Satd. Flow (prot)	1627	1689		1525	1665	1617		1626	1596		1630	
Flt Permitted	0.59	1.00		0.45	1.00	1.00		0.66	1.00		0.76	
Satd. Flow (perm)	1005	1689		716	1665	1617		1132	1596		1276	
Peak-hour factor, PHF	0.82	0.82	0.82	0.95	0.95	0.95	0.80	0.80	0.80	0.25	0.25	0.25
Adj. Flow (vph)	1	265	28	276	282	6	72	5	240	124	52	16
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	197	0	0	0
Lane Group Flow (vph)	1	293	0	276	282	4	0	77	43	0	192	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	9%	9%	9%	0%	0%	0%
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	24.0	24.0		37.0	37.0	37.0		10.7	10.7		10.7	
Effective Green, g (s)	24.0	24.0		37.0	37.0	37.0		10.7	10.7		10.7	
Actuated g/C Ratio	0.40	0.40		0.62	0.62	0.62		0.18	0.18		0.18	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	404	679		539	1032	1002		203	286		229	
v/s Ratio Prot		0.17		c0.06	0.17							
v/s Ratio Perm	0.00			c0.26		0.00		0.07	0.03		c0.15	
v/c Ratio	0.00	0.43		0.51	0.27	0.00		0.38	0.15		0.84	
Uniform Delay, d1	10.7	12.9		5.8	5.2	4.3		21.6	20.7		23.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.4		0.8	0.1	0.0		1.2	0.2		22.6	
Delay (s)	10.7	13.4		6.7	5.3	4.3		22.8	20.9		46.3	
Level of Service	B	B		A	A	A		C	C		D	
Approach Delay (s)		13.3			6.0			21.4			46.3	
Approach LOS		B			A			C			D	

Intersection Summary			
HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	59.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lane Configurations												
Volume (vph)	171	6	214	49	2	6	13	2	12	66	15	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	15	12	12	12	12	16	16	16	15
Grade (%)		0%					1%			1%		
Storage Length (ft)	0		0			0		0	0			
Storage Lanes	0		0			0		0	0			
Taper Length (ft)	25		25			25		25	25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.919					0.986			0.978		
Flt Protected		0.981					0.982			0.994		
Satd. Flow (prot)	0	1778	0	0	0	0	1743	0	0	2062	0	0
Flt Permitted		0.981					0.982			0.940		
Satd. Flow (perm)	0	1778	0	0	0	0	1743	0	0	1950	0	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)		40					25			15		
Link Distance (ft)		1349					528			501		
Travel Time (s)		23.0					14.4			22.8		
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.77	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	1%	1%	1%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%					0%			0%		
Adj. Flow (vph)	222	8	278	64	3	8	16	3	15	82	19	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	572	0	0	0	0	30	0	0	116	0	0
Number of Detectors	1	1			1	1	1		1	1		2
Detector Template												
Leading Detector (ft)	35	35			35	35	35		35	35		70
Trailing Detector (ft)	-5	-5			-5	-5	-5		-5	-5		-5
Turn Type	Split				Perm	Split			Perm			Perm
Protected Phases	2	2				6	6			8		
Permitted Phases		2			6				8			4
Detector Phase	2	2			6	6	6		8	8		4
Switch Phase												
Minimum Initial (s)	8.0	8.0			5.0	5.0	5.0		8.0	8.0		8.0
Minimum Split (s)	14.0	14.0			11.0	11.0	11.0		14.0	14.0		14.0
Total Split (s)	35.0	35.0	0.0	0.0	13.0	13.0	13.0	0.0	17.0	17.0	0.0	17.0
Total Split (%)	38.9%	38.9%	0.0%	0.0%	14.4%	14.4%	14.4%	0.0%	18.9%	18.9%	0.0%	18.9%
Maximum Green (s)	29.0	29.0			7.0	7.0	7.0		11.0	11.0		11.0
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	-2.0	-2.0	0.0	0.0	-2.0	0.0	0.0	-2.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	17	90	229	28	283	23	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Storage Length (ft)	0		150		0	0	
Storage Lanes	0		1		1	0	
Taper Length (ft)	25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							
Frt			0.850		0.990		
Flt Protected		0.992			0.956		
Satd. Flow (prot)	0	1938	1610	0	1978	0	0
Flt Permitted		0.930			0.956		
Satd. Flow (perm)	0	1817	1610	0	1978	0	0
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		35			25		
Link Distance (ft)		752			574		
Travel Time (s)		14.6			15.7		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.98	0.98	0.98	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%			0%		
Adj. Flow (vph)	17	92	234	29	298	24	1
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	110	234	0	352	0	0
Number of Detectors	2	2	1	1	1		
Detector Template							
Leading Detector (ft)	70	70	35	35	35		
Trailing Detector (ft)	-5	-5	-5	-5	-5		
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Detector Phase	4	4	2	9	9		
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		
Total Split (s)	17.0	17.0	35.0	25.0	25.0	0.0	0.0
Total Split (%)	18.9%	18.9%	38.9%	27.8%	27.8%	0.0%	0.0%
Maximum Green (s)	11.0	11.0	29.0	19.0	19.0		
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	4.0

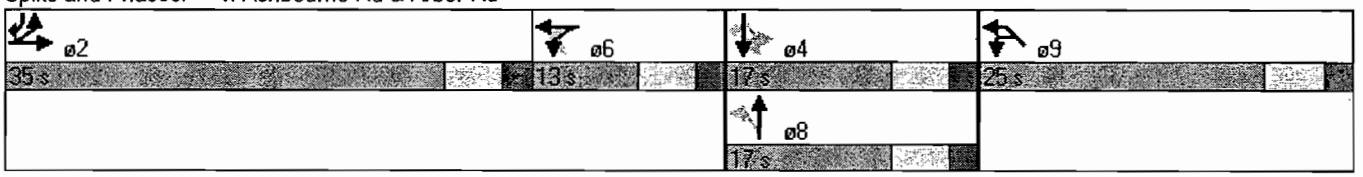
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0		5.0
Minimum Gap (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		3.0
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None			None	None	None		Max	Max		Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.93					0.21			0.45		
Control Delay		51.8					42.2			42.0		
Queue Delay		0.0					0.0			0.0		
Total Delay		51.8					42.2			42.0		
Queue Length 50th (ft)		322					16			63		
Queue Length 95th (ft)		#413					38			102		
Internal Link Dist (ft)		1269					448			421		
Turn Bay Length (ft)												
Base Capacity (vph)		618					146			257		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.93					0.21			0.45		

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 84.1
Natural Cycle: 80
Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Ashbourne Rd & Arbor Rd



Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0		
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Recall Mode	Max	Max	None	None	None		
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
v/c Ratio		0.46	0.28		0.81		
Control Delay		42.7	9.3		49.0		
Queue Delay		0.0	0.0		0.0		
Total Delay		42.7	9.3		49.0		
Queue Length 50th (ft)		59	48		193		
Queue Length 95th (ft)		112	79		#339		
Internal Link Dist (ft)		672			494		
Turn Bay Length (ft)			150				
Base Capacity (vph)		239	823		450		
Starvation Cap Reductn		0	0		0		
Spillback Cap Reductn		0	0		0		
Storage Cap Reductn		0	0		0		
Reduced v/c Ratio		0.46	0.28		0.78		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lane Configurations												
Volume (vph)	171	6	214	49	2	6	13	2	12	66	15	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	15	12	12	12	12	16	16	16	15
Grade (%)		0%					1%			1%		
Total Lost time (s)		6.0					6.0			6.0		
Lane Util. Factor		1.00					1.00			1.00		
Frt		0.92					0.99			0.98		
Flt Protected		0.98					0.98			0.99		
Satd. Flow (prot)		1778					1744			2061		
Flt Permitted		0.98					0.98			0.94		
Satd. Flow (perm)		1778					1744			1951		
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.98
Adj. Flow (vph)	222	8	278	64	3	8	16	3	15	82	19	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	572	0	0	0	0	30	0	0	116	0	0
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	1%	1%	1%	7%
Turn Type	Split				Perm	Split			Perm			Perm
Protected Phases	2	2				6	6			8		
Permitted Phases		2			6				8			4
Actuated Green, G (s)		29.2					3.9			11.1		
Effective Green, g (s)		29.2					3.9			11.1		
Actuated g/C Ratio		0.34					0.05			0.13		
Clearance Time (s)		6.0					6.0			6.0		
Vehicle Extension (s)		5.0					5.0			5.0		
Lane Grp Cap (vph)		600					79			250		
v/s Ratio Prot		c0.32					c0.02					
v/s Ratio Perm										0.06		
v/c Ratio		0.95					0.38			0.46		
Uniform Delay, d1		28.0					40.2			35.0		
Progression Factor		1.00					1.00			1.00		
Incremental Delay, d2		26.0					6.3			6.1		
Delay (s)		54.0					46.5			41.1		
Level of Service		D					D			D		
Approach Delay (s)		54.0					46.5			41.1		
Approach LOS		D					D			D		

Intersection Summary			
HCM Average Control Delay	43.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	86.6	Sum of lost time (s)	24.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	17	90	229	28	283	23	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Total Lost time (s)		6.0	6.0		6.0		
Lane Util. Factor		1.00	1.00		1.00		
Frt		1.00	0.85		0.99		
Flt Protected		0.99	1.00		0.96		
Satd. Flow (prot)		1937	1610		1978		
Flt Permitted		0.93	1.00		0.96		
Satd. Flow (perm)		1817	1610		1978		
Peak-hour factor, PHF	0.98	0.98	0.98	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	92	234	29	298	24	1
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	110	234	0	352	0	0
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	2%
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Actuated Green, G (s)		11.1	40.3		18.4		
Effective Green, g (s)		11.1	40.3		18.4		
Actuated g/C Ratio		0.13	0.47		0.21		
Clearance Time (s)		6.0	6.0		6.0		
Vehicle Extension (s)		5.0	5.0		5.0		
Lane Grp Cap (vph)		233	749		420		
v/s Ratio Prot			0.11		c0.18		
v/s Ratio Perm		c0.06	0.04				
v/c Ratio		0.47	0.31		0.84		
Uniform Delay, d1		35.0	14.5		32.7		
Progression Factor		1.00	1.00		1.00		
Incremental Delay, d2		6.7	0.5		15.0		
Delay (s)		41.7	15.0		47.7		
Level of Service		D	B		D		
Approach Delay (s)		23.5			47.7		
Approach LOS		C			D		

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	9	16	259	2	3	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	16	15	15
Grade (%)	-3%		-5%			3%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.912		0.999			
Flt Protected	0.983					
Satd. Flow (prot)	1729	0	2080	0	0	1942
Flt Permitted	0.983					
Satd. Flow (perm)	1729	0	2080	0	0	1942
Link Speed (mph)	25		35			35
Link Distance (ft)	484		752			350
Travel Time (s)	13.2		14.6			6.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.84	0.84	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	6%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	10	19	308	2	3	359
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	310	0	0	362
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	16	259	2	3	327
Sign Control	Stop		Free			Free
Grade	-3%		-5%			3%
Peak Hour Factor	0.86	0.86	0.84	0.84	0.91	0.91
Hourly flow rate (vph)	10	19	308	2	3	359
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			752			
pX, platoon unblocked						
vC, conflicting volume	675	310			311	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	675	310			311	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	98	97			100	
cM capacity (veh/h)	422	735			1227	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	29	311	363
Volume Left	10	0	3
Volume Right	19	2	0
cSH	580	1700	1227
Volume to Capacity	0.05	0.18	0.00
Queue Length 95th (ft)	4	0	0
Control Delay (s)	11.5	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	11.5	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay	0.5 — A		
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	12	76	80	196	255	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	15	15	16	16
Grade (%)	0%			-8%	3%	
Storage Length (ft)	0	50	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.884				0.989	
Flt Protected	0.993			0.986		
Satd. Flow (prot)	1673	0	0	2041	1942	0
Flt Permitted	0.993			0.986		
Satd. Flow (perm)	1673	0	0	2041	1942	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	1329			350	719	
Travel Time (s)	36.2			6.8	14.0	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.89	0.89	0.82	0.82
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	5%	5%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	17	107	90	220	311	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	124	0	0	310	338	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	12	76	80	196	255	22
Sign Control	Stop			Free	Free	
Grade	0%			-8%	3%	
Peak Hour Factor	0.71	0.71	0.89	0.89	0.82	0.82
Hourly flow rate (vph)	17	107	90	220	311	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	724	324	311			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	724	324	311			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	85	93			
cM capacity (veh/h)	362	714	1233			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	124	310	338
Volume Left	17	90	0
Volume Right	107	0	27
cSH	631	1233	1700
Volume to Capacity	0.20	0.07	0.20
Queue Length 95th (ft)	18	6	0
Control Delay (s)	12.1	2.8	0.0
Lane LOS	B	A	
Approach Delay (s)	12.1	2.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.1	– A	
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	7	176	16	41	246	23	21	31	8	55	32	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	9	9	9	14	14	14
Grade (%)		-1%			0%			-3%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.989			0.990			0.981			0.974	
Flt Protected		0.998			0.993			0.983			0.975	
Satd. Flow (prot)	0	2053	0	0	1831	0	0	1674	0	0	1878	0
Flt Permitted		0.998			0.993			0.983			0.975	
Satd. Flow (perm)	0	2053	0	0	1831	0	0	1674	0	0	1878	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2917			950			663			1329	
Travel Time (s)		56.8			18.5			18.1			36.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	8	198	18	46	276	26	25	37	10	65	38	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	224	0	0	348	0	0	72	0	0	128	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	7	176	16	41	246	23	21	31	8	55	32	21
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83	0.85	0.85	0.85
Hourly flow rate (vph)	8	198	18	46	276	26	25	37	10	65	38	25

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total (vph)	224	348	72	127
Volume Left (vph)	8	46	25	65
Volume Right (vph)	18	26	10	25
Hadj (s)	-0.02	0.02	-0.01	0.04
Departure Headway (s)	4.9	4.8	5.5	5.5
Degree Utilization, x	0.30	0.46	0.11	0.19
Capacity (veh/h)	690	722	571	585
Control Delay (s)	10.0	11.8	9.2	9.8
Approach Delay (s)	10.0	11.8	9.2	9.8
Approach LOS	B	B	A	A

Intersection Summary			
Delay	10.7		
HCM Level of Service	B		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	82	227	549	55	144	582
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.901		0.988			
Flt Protected	0.987					0.990
Satd. Flow (prot)	1729	0	2138	0	0	2059
Flt Permitted	0.987					0.990
Satd. Flow (perm)	1729	0	2138	0	0	2059
Link Speed (mph)	35		35			35
Link Distance (ft)	2917		1087			792
Travel Time (s)	56.8		21.2			15.4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	91	252	624	63	152	613
Shared Lane Traffic (%)						
Lane Group Flow (vph)	343	0	686	0	0	765
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	82	227	549	55	144	582
Sign Control	Stop		Free			Free
Grade	0%		-3%			-1%
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Hourly flow rate (vph)	91	252	624	62	152	613
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1087			
pX, platoon unblocked	0.91	0.91			0.91	
vC, conflicting volume	1571	655			686	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1578	576			610	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	1	47			83	
cM capacity (veh/h)	92	474			890	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	343	686	764
Volume Left	91	0	152
Volume Right	252	62	0
cSH	225	1700	890
Volume to Capacity	1.52	0.40	0.17
Queue Length 95th (ft)	523	0	15
Control Delay (s)	296.3	0.0	4.1
Lane LOS	F		A
Approach Delay (s)	296.3	0.0	4.1
Approach LOS	F		

Intersection Summary			
Average Delay	58.4 – F		
Intersection Capacity Utilization	99.3%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	82	227	549	55	144	582
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.901		0.988			
Flt Protected	0.987					0.990
Satd. Flow (prot)	1729	0	2138	0	0	2059
Flt Permitted	0.987					0.463
Satd. Flow (perm)	1729	0	2138	0	0	963
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	135		9			
Link Speed (mph)	35		35			35
Link Distance (ft)	2917		1087			792
Travel Time (s)	56.8		21.2			15.4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	91	252	624	62	152	613
Shared Lane Traffic (%)						
Lane Group Flow (vph)	343	0	686	0	0	765
Number of Detectors	1		0		1	0
Detector Template						
Leading Detector (ft)	35		0		35	0
Trailing Detector (ft)	-5		0		-5	0
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8					
Switch Phase						
Minimum Initial (s)	7.0		20.0		7.0	20.0
Minimum Split (s)	13.0		26.0		13.0	26.0
Total Split (s)	22.0	0.0	55.0	0.0	13.0	68.0
Total Split (%)	24.4%	0.0%	61.1%	0.0%	14.4%	75.6%
Maximum Green (s)	16.0		49.0		7.0	62.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0
Recall Mode	None		Max		Max	Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.87		0.58			1.00
Control Delay	45.0		15.5			47.3
Queue Delay	0.0		0.0			0.0
Total Delay	45.0		15.5			47.3
Queue Length 50th (ft)	116		242			~199
Queue Length 95th (ft)	#258		334			#451
Internal Link Dist (ft)	2837		1007			712
Turn Bay Length (ft)						
Base Capacity (vph)	423		1189			763
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.81		0.58			1.00

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 88.4

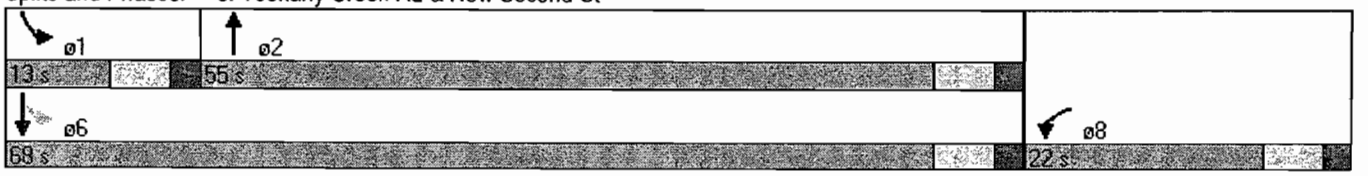
Natural Cycle: 90

Control Type: Semi Act-Uncoord

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Tookany Creek Rd & New Second St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	82	227	549	55	144	582
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	0.90		0.99			1.00
Flt Protected	0.99		1.00			0.99
Satd. Flow (prot)	1728		2138			2059
Flt Permitted	0.99		1.00			0.46
Satd. Flow (perm)	1728		2138			963
Peak-hour factor, PHF	0.90	0.90	0.88	0.88	0.95	0.95
Adj. Flow (vph)	91	252	624	62	152	613
RTOR Reduction (vph)	113	0	4	0	0	0
Lane Group Flow (vph)	230	0	682	0	0	765
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	14.4		49.1			62.1
Effective Green, g (s)	14.4		49.1			62.1
Actuated g/C Ratio	0.16		0.55			0.70
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	281		1186			762
v/s Ratio Prot	c0.13		0.32			c0.08
v/s Ratio Perm						c0.62
v/c Ratio	0.82		0.58			1.00
Uniform Delay, d1	35.8		12.9			13.2
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	16.7		2.0			33.6
Delay (s)	52.5		14.9			46.8
Level of Service	D		B			D
Approach Delay (s)	52.5		14.9			46.8
Approach LOS	D		B			D

Intersection Summary			
HCM Average Control Delay	35.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	104.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

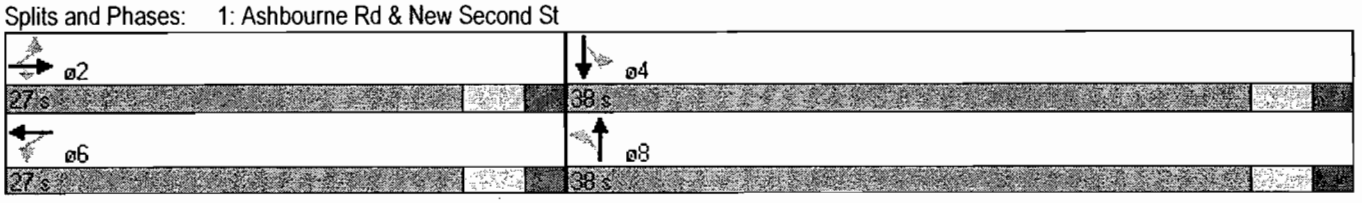
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	251	32	19	153	151	28	395	16	131	318	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	14	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Storage Length (ft)	0		110	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.937			0.995			0.980	
Flt Protected		0.986			0.997			0.997			0.988	
Satd. Flow (prot)	0	1873	1723	0	1933	0	0	2104	0	0	1831	0
Flt Permitted		0.686			0.963			0.946			0.761	
Satd. Flow (perm)	0	1303	1723	0	1868	0	0	1997	0	0	1410	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			36					4			19	
Link Speed (mph)		25			40			35			35	
Link Distance (ft)		500			433			500			1087	
Travel Time (s)		13.6			7.4			9.7			21.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.79	0.79	0.79	0.90	0.90	0.90	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	110	282	36	24	194	191	31	439	18	152	370	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	392	36	0	409	0	0	488	0	0	612	0
Number of Detectors	1	0	0	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	35	0	0	35	0		35	0		35	0	
Trailing Detector (ft)	-5	0	0	-5	0		-5	0		-5	0	
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase												
Switch Phase												
Minimum Initial (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		38.0	38.0		38.0	38.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	41.5%	0.0%	58.5%	58.5%	0.0%	58.5%	58.5%	0.0%
Maximum Green (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max	Max	Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.89	0.06		0.65			0.48			0.84	
Control Delay		46.1	6.0		24.0			12.3			27.0	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		46.1	6.0		24.0			12.3			27.0	
Queue Length 50th (ft)		144	0		135			116			188	
Queue Length 95th (ft)		#291	16		185			185			#357	
Internal Link Dist (ft)		420			353			420			1007	
Turn Bay Length (ft)			110									
Base Capacity (vph)		441	607		632			1016			725	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.89	0.06		0.65			0.48			0.84	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 70
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ashbourne Rd & New Second St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	251	32	19	153	151	28	395	16	131	318	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	14	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.94			1.00			0.98	
Flt Protected		0.99	1.00		1.00			1.00			0.99	
Satd. Flow (prot)		1874	1723		1934			2104			1830	
Flt Permitted		0.69	1.00		0.96			0.95			0.76	
Satd. Flow (perm)		1303	1723		1868			1996			1411	
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	110	282	36	24	194	191	31	439	18	152	370	90
RTOR Reduction (vph)	0	0	24	0	0	0	0	2	0	0	9	0
Lane Group Flow (vph)	0	392	12	0	409	0	0	486	0	0	603	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)		22.0	22.0		22.0			33.0			33.0	
Effective Green, g (s)		22.0	22.0		22.0			33.0			33.0	
Actuated g/C Ratio		0.34	0.34		0.34			0.51			0.51	
Clearance Time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Grp Cap (vph)		441	583		632			1013			716	
v/s Ratio Prot												
v/s Ratio Perm		c0.30	0.01		0.22			0.24			c0.43	
v/c Ratio		0.89	0.02		0.65			0.48			0.84	
Uniform Delay, d1		20.3	14.3		18.2			10.4			13.8	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		22.5	0.1		5.1			1.6			11.5	
Delay (s)		42.9	14.4		23.3			12.0			25.3	
Level of Service		D	B		C			B			C	
Approach Delay (s)		40.5			23.3			12.0			25.3	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM Average Control Delay	24.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	109.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	357	11	0	305	8	4	0	2	4	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		-4%			-4%			-2%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996			0.996			0.958			0.891	
Flt Protected		0.996						0.967			0.991	
Satd. Flow (prot)	0	1923	0	0	1930	0	0	1718	0	0	1645	0
Flt Permitted		0.996						0.967			0.991	
Satd. Flow (perm)	0	1923	0	0	1930	0	0	1718	0	0	1645	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		433			1750			526			356	
Travel Time (s)		8.4			34.1			14.3			9.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.84	0.84	0.84	0.38	0.38	0.38	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	39	482	15	0	363	10	11	0	5	4	0	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	536	0	0	373	0	0	16	0	0	21	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	29	357	11	0	305	8	4	0	2	4	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		-4%			-4%			-2%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.84	0.84	0.84	0.38	0.38	0.38	0.90	0.90	0.90
Hourly flow rate (vph)	39	482	15	0	363	10	11	0	5	4	0	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		433										
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	373			497			953	941	490	941	944	368
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	373			359			877	864	350	864	867	368
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			95	100	99	98	100	98
cM capacity (veh/h)	1197			1064			227	250	613	233	247	678

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	536	373	16	21
Volume Left	39	0	11	4
Volume Right	15	10	5	17
cSH	1197	1064	287	483
Volume to Capacity	0.03	0.00	0.06	0.04
Queue Length 95th (ft)	3	0	4	3
Control Delay (s)	0.9	0.0	18.3	12.8
Lane LOS	A		C	B
Approach Delay (s)	0.9	0.0	18.3	12.8
Approach LOS			C	B

Intersection Summary			
Average Delay	1.1 – A		
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	293	66	249	271	30	38	15	218	15	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Storage Length (ft)	140		0	150		75	0		45	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.973				0.850			0.850		0.989	
Flt Protected	0.950			0.950				0.966			0.970	
Satd. Flow (prot)	1676	1717	0	1569	1713	1664	0	1723	1673	0	816	0
Flt Permitted	0.571			0.340				0.728			0.773	
Satd. Flow (perm)	1008	1717	0	562	1713	1664	0	1299	1673	0	650	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						34			256			
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1750			1349			500			300	
Travel Time (s)		29.8			23.0			9.7			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.87	0.87	0.87	0.85	0.85	0.85	0.25	0.25	0.25
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	100%	100%	100%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	4	326	73	286	311	34	45	18	256	60	28	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	399	0	286	311	34	0	63	256	0	96	0
Number of Detectors	0	0		1	0	0	1	1	1	1	1	
Detector Template												
Leading Detector (ft)	0	0		35	0	0	35	35	35	20	20	
Trailing Detector (ft)	0	0		-5	0	0	-5	-5	-5	-5	-5	
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Detector Phase				1		6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	24.0	24.0		7.0	33.0	33.0	3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	30.0	30.0		13.0	39.0	39.0	9.0	9.0	9.0	9.0	9.0	
Total Split (s)	29.0	29.0	0.0	13.0	42.0	42.0	18.0	18.0	18.0	18.0	18.0	0.0
Total Split (%)	48.3%	48.3%	0.0%	21.7%	70.0%	70.0%	30.0%	30.0%	30.0%	30.0%	30.0%	0.0%
Maximum Green (s)	23.0	23.0		7.0	36.0	36.0	12.0	12.0	12.0	12.0	12.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	Min	Min		None	Min	Min	None	None	None	None	None	
Walk Time (s)					5.0	5.0						
Flash Dont Walk (s)					11.0	11.0						
Pedestrian Calls (#/hr)					0	0						
v/c Ratio	0.01	0.60		0.62	0.30	0.03		0.26	0.49		0.79	
Control Delay	11.8	19.3		12.6	6.7	2.1		23.4	7.0		67.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	11.8	19.3		12.6	6.7	2.1		23.4	7.0		67.3	
Queue Length 50th (ft)	1	112		44	48	0		19	0		33	
Queue Length 95th (ft)	6	193		76	80	8		45	43		18	
Internal Link Dist (ft)		1670			1269			420			220	
Turn Bay Length (ft)	140			150		75			45			
Base Capacity (vph)	392	668		462	1044	1027		264	543		132	
Starvation Cap Reductn	0	0		0	0	0		0	0		0	
Spillback Cap Reductn	0	0		0	0	0		0	0		0	
Storage Cap Reductn	0	0		0	0	0		0	0		0	
Reduced v/c Ratio	0.01	0.60		0.62	0.30	0.03		0.24	0.47		0.73	

Intersection Summary

Area Type: Other

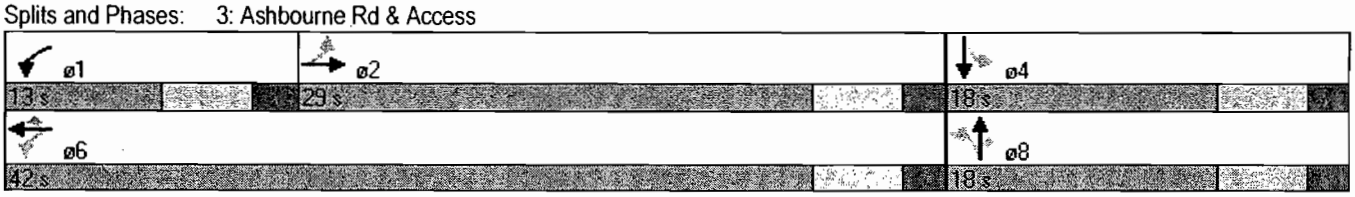
Cycle Length: 60

Actuated Cycle Length: 59.1

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ashbourne Rd & Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	293	66	249	271	30	38	15	218	15	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	
Satd. Flow (prot)	1676	1716		1569	1713	1664		1722	1673		816	
Flt Permitted	0.57	1.00		0.34	1.00	1.00		0.73	1.00		0.77	
Satd. Flow (perm)	1008	1716		562	1713	1664		1298	1673		650	
Peak-hour factor, PHF	0.90	0.90	0.90	0.87	0.87	0.87	0.85	0.85	0.85	0.25	0.25	0.25
Adj. Flow (vph)	4	326	73	286	311	34	45	18	256	60	28	8
RTOR Reduction (vph)	0	0	0	0	0	13	0	0	208	0	0	0
Lane Group Flow (vph)	4	399	0	286	311	21	0	63	48	0	96	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	100%	100%	100%
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	23.0	23.0		36.0	36.0	36.0		11.1	11.1		11.1	
Effective Green, g (s)	23.0	23.0		36.0	36.0	36.0		11.1	11.1		11.1	
Actuated g/C Ratio	0.39	0.39		0.61	0.61	0.61		0.19	0.19		0.19	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	392	668		462	1043	1014		244	314		122	
v/s Ratio Prot		0.23		c0.07	0.18							
v/s Ratio Perm	0.00			c0.30		0.01		0.05	0.03		c0.15	
v/c Ratio	0.01	0.60		0.62	0.30	0.02		0.26	0.15		0.79	
Uniform Delay, d1	11.1	14.4		6.9	5.5	4.6		20.5	20.1		22.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	1.4		2.5	0.2	0.0		0.6	0.2		27.6	
Delay (s)	11.1	15.8		9.3	5.7	4.6		21.0	20.3		50.5	
Level of Service	B	B		A	A	A		C	C		D	
Approach Delay (s)		15.8			7.3			20.4			50.5	
Approach LOS		B			A			C			D	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Volume (vph)	257	13	228	28	1	7	4	14	91	4	16	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	12	16	16	16	16	15
Grade (%)		0%				1%			1%			
Storage Length (ft)	0		0		0		0	0		0		
Storage Lanes	0		0		0		0	0		0		
Taper Length (ft)	25		25		25		25	25		25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.934				0.955			0.979			
Flt Protected		0.976				0.996			0.994			
Satd. Flow (prot)	0	1868	0	0	0	1199	0	0	2044	0	0	0
Flt Permitted		0.976				0.996			0.921			
Satd. Flow (perm)	0	1868	0	0	0	1199	0	0	1894	0	0	0
Right Turn on Red				No			No				No	
Satd. Flow (RTOR)												
Link Speed (mph)		40				25			15			
Link Distance (ft)		1349				527			500			
Travel Time (s)		23.0				14.4			22.7			
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.90	0.33	0.33	0.33	0.73	0.73	0.73	0.73	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	50%	50%	50%	2%	2%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%			0%			
Adj. Flow (vph)	292	15	259	31	3	21	12	19	125	5	22	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	597	0	0	0	36	0	0	171	0	0	0
Number of Detectors	1	1			1	1		1	1			2
Detector Template												
Leading Detector (ft)	35	35			35	35		35	35			70
Trailing Detector (ft)	-5	-5			-5	-5		-5	-5			-5
Turn Type	Split				Split			Perm				Perm
Protected Phases	2	2			6	6			8			
Permitted Phases		2						8				4
Detector Phase	2	2			6	6		8	8			4
Switch Phase												
Minimum Initial (s)	8.0	8.0			5.0	5.0		8.0	8.0			8.0
Minimum Split (s)	14.0	14.0			11.0	11.0		14.0	14.0			14.0
Total Split (s)	35.0	35.0	0.0	0.0	13.0	13.0	0.0	19.0	19.0	0.0	0.0	19.0
Total Split (%)	38.9%	38.9%	0.0%	0.0%	14.4%	14.4%	0.0%	21.1%	21.1%	0.0%	0.0%	21.1%
Maximum Green (s)	29.0	29.0			7.0	7.0		13.0	13.0			13.0
Yellow Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			4.0
All-Red Time (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0	-2.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0	4.0

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	33	127	243	23	286	18	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Storage Length (ft)	0		150		0	0	
Storage Lanes	0		1		1	0	
Taper Length (ft)	25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							
Frt			0.850		0.992		
Flt Protected		0.989			0.955		
Satd. Flow (prot)	0	1988	1656	0	1980	0	0
Flt Permitted		0.801			0.955		
Satd. Flow (perm)	0	1610	1656	0	1980	0	0
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		35			25		
Link Distance (ft)		752			573		
Travel Time (s)		14.6			15.6		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%			0%		
Adj. Flow (vph)	35	137	261	27	333	21	2
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	175	261	0	383	0	0
Number of Detectors	2	2	1	1	1		
Detector Template							
Leading Detector (ft)	70	70	35	35	35		
Trailing Detector (ft)	-5	-5	-5	-5	-5		
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Detector Phase	4	4	2	9	9		
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		
Total Split (s)	19.0	19.0	35.0	23.0	23.0	0.0	0.0
Total Split (%)	21.1%	21.1%	38.9%	25.6%	25.6%	0.0%	0.0%
Maximum Green (s)	13.0	13.0	29.0	17.0	17.0		
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	4.0

Lane Group	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0	5.0		5.0	5.0			5.0
Minimum Gap (s)	3.0	3.0			3.0	3.0		3.0	3.0			3.0
Time Before Reduce (s)	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Time To Reduce (s)	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Recall Mode	None	None			None	None		Max	Max			Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.93				0.36			0.59			
Control Delay		51.7				49.8			43.8			
Queue Delay		0.0				0.0			0.0			
Total Delay		51.7				49.8			43.8			
Queue Length 50th (ft)		335				20			93			
Queue Length 95th (ft)		#536				18			125			
Internal Link Dist (ft)		1269				447			420			
Turn Bay Length (ft)												
Base Capacity (vph)		643				99			292			
Starvation Cap Reductn		0				0			0			
Spillback Cap Reductn		0				0			0			
Storage Cap Reductn		0				0			0			
Reduced v/c Ratio		0.93				0.36			0.59			

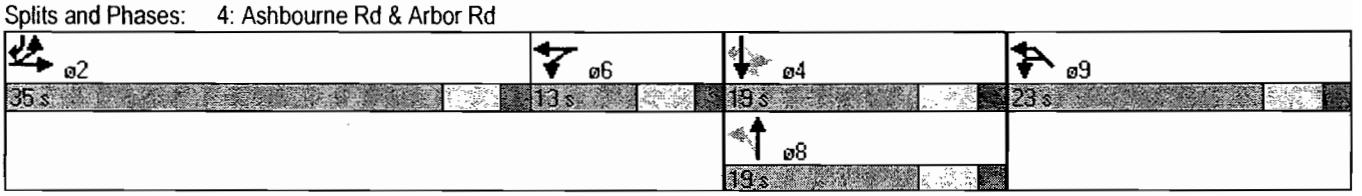
Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 84.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Ashbourne Rd & Arbor Rd



Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0		
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Recall Mode	Max	Max	None	None	None		
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
v/c Ratio		0.70	0.30		0.96		
Control Delay		52.6	8.7		72.9		
Queue Delay		0.0	0.0		0.0		
Total Delay		52.6	8.7		72.9		
Queue Length 50th (ft)		97	50		~234		
Queue Length 95th (ft)		#198	81		#380		
Internal Link Dist (ft)		672			493		
Turn Bay Length (ft)			150				
Base Capacity (vph)		249	877		399		
Starvation Cap Reductn		0	0		0		
Spillback Cap Reductn		0	0		0		
Storage Cap Reductn		0	0		0		
Reduced v/c Ratio		0.70	0.30		0.96		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Volume (vph)	257	13	228	28	1	7	4	14	91	4	16	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	12	12	12	12	16	16	16	16	15
Grade (%)		0%				1%			1%			
Total Lost time (s)		6.0				6.0			6.0			
Lane Util. Factor		1.00				1.00			1.00			
Frt		0.93				0.96			0.98			
Flt Protected		0.98				1.00			0.99			
Satd. Flow (prot)		1869				1199			2044			
Flt Permitted		0.98				1.00			0.92			
Satd. Flow (perm)		1869				1199			1894			
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.33	0.33	0.33	0.73	0.73	0.73	0.73	0.93
Adj. Flow (vph)	292	15	259	31	3	21	12	19	125	5	22	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	597	0	0	0	36	0	0	171	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	50%	50%	50%	2%	2%	2%	2%	4%
Turn Type	Split				Split			Perm				Perm
Protected Phases	2	2			6	6			8			
Permitted Phases		2						8				4
Actuated Green, G (s)		29.2				4.0			13.1			
Effective Green, g (s)		29.2				4.0			13.1			
Actuated g/C Ratio		0.33				0.05			0.15			
Clearance Time (s)		6.0				6.0			6.0			
Vehicle Extension (s)		5.0				5.0			5.0			
Lane Grp Cap (vph)		624				55			284			
v/s Ratio Prot		c0.32				c0.03						
v/s Ratio Perm									0.09			
v/c Ratio		0.96				0.65			0.60			
Uniform Delay, d1		28.5				41.0			34.7			
Progression Factor		1.00				1.00			1.00			
Incremental Delay, d2		26.0				31.9			9.1			
Delay (s)		54.4				72.9			43.8			
Level of Service		D				E			D			
Approach Delay (s)		54.4				72.9			43.8			
Approach LOS		D				E			D			

Intersection Summary			
HCM Average Control Delay	52.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	87.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	33	127	243	23	286	18	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Total Lost time (s)		6.0	6.0		6.0		
Lane Util. Factor		1.00	1.00		1.00		
Frt		1.00	0.85		0.99		
Flt Protected		0.99	1.00		0.96		
Satd. Flow (prot)		1988	1656		1980		
Flt Permitted		0.80	1.00		0.96		
Satd. Flow (perm)		1610	1656		1980		
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.86
Adj. Flow (vph)	35	137	261	27	333	21	2
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	175	261	0	383	0	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Actuated Green, G (s)		13.1	42.3		17.1		
Effective Green, g (s)		13.1	42.3		17.1		
Actuated g/C Ratio		0.15	0.48		0.20		
Clearance Time (s)		6.0	6.0		6.0		
Vehicle Extension (s)		5.0	5.0		5.0		
Lane Grp Cap (vph)		241	801		387		
v/s Ratio Prot			0.11		c0.19		
v/s Ratio Perm		c0.11	0.05				
v/c Ratio		0.73	0.33		0.99		
Uniform Delay, d1		35.4	13.8		35.1		
Progression Factor		1.00	1.00		1.00		
Incremental Delay, d2		17.4	0.5		42.8		
Delay (s)		52.8	14.3		77.9		
Level of Service		D	B		E		
Approach Delay (s)		29.8			77.9		
Approach LOS		C			E		

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	3	11	363	6	10	403
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	16	15	15
Grade (%)	-3%		-5%			3%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.893		0.998			
Flt Protected	0.990					0.999
Satd. Flow (prot)	1705	0	2139	0	0	1997
Flt Permitted	0.990					0.999
Satd. Flow (perm)	1705	0	2139	0	0	1997
Link Speed (mph)	25		35			35
Link Distance (ft)	595		752			350
Travel Time (s)	16.2		14.6			6.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.58	0.58	0.88	0.88	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	5	19	413	7	11	448
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	419	0	0	459
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	11	363	6	10	403
Sign Control	Stop		Free			Free
Grade	-3%		-5%			3%
Peak Hour Factor	0.58	0.58	0.88	0.88	0.90	0.90
Hourly flow rate (vph)	5	19	412	7	11	448
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			752			
pX, platoon unblocked						
vC, conflicting volume	886	416			419	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	886	416			419	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	97			99	
cM capacity (veh/h)	315	641			1134	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	419	459
Volume Left	5	0	11
Volume Right	19	7	0
cSH	525	1700	1134
Volume to Capacity	0.05	0.25	0.01
Queue Length 95th (ft)	4	0	1
Control Delay (s)	12.2	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	12.2	0.0	0.3
Approach LOS	B		

Intersection Summary			
Average Delay	0.5 - A		
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	32	86	61	314	328	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	15	15	16	16
Grade (%)	0%			-8%	3%	
Storage Length (ft)	0	50	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.901				0.989	
Flt Protected	0.987			0.992		
Satd. Flow (prot)	1746	0	0	2093	2037	0
Flt Permitted	0.987			0.992		
Satd. Flow (perm)	1746	0	0	2093	2037	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	1324			350	862	
Travel Time (s)	36.1			6.8	16.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.94	0.94	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	37	100	65	334	353	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	137	0	0	399	385	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	32	86	61	314	328	30
Sign Control	Stop			Free	Free	
Grade	0%			-8%	3%	
Peak Hour Factor	0.86	0.86	0.94	0.94	0.93	0.93
Hourly flow rate (vph)	37	100	65	334	353	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	833	369	353			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	833	369	353			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	85	95			
cM capacity (veh/h)	323	681	1201			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	137	399	385
Volume Left	37	65	0
Volume Right	100	0	32
cSH	524	1201	1700
Volume to Capacity	0.26	0.05	0.23
Queue Length 95th (ft)	26	4	0
Control Delay (s)	14.3	1.8	0.0
Lane LOS	B	A	
Approach Delay (s)	14.3	1.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.9 — A		
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	4	267	61	40	229	18	30	30	13	30	32	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	9	9	9	14	14	14
Grade (%)		-1%			0%			-3%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.975			0.991			0.976			0.953	
Flt Protected		0.999			0.993			0.980			0.985	
Satd. Flow (prot)	0	2046	0	0	1870	0	0	1660	0	0	1912	0
Flt Permitted		0.999			0.993			0.980			0.985	
Satd. Flow (perm)	0	2046	0	0	1870	0	0	1660	0	0	1912	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2916			718			672			1324	
Travel Time (s)		56.8			14.0			18.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.87	0.87	0.87	0.82	0.82	0.82	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	5	361	82	46	263	21	37	37	16	37	40	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	448	0	0	330	0	0	90	0	0	118	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	267	61	40	229	18	30	30	13	30	32	33
Peak Hour Factor	0.74	0.74	0.74	0.87	0.87	0.87	0.82	0.82	0.82	0.81	0.81	0.81
Hourly flow rate (vph)	5	361	82	46	263	21	37	37	16	37	40	41

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total (vph)	449	330	89	117
Volume Left (vph)	5	46	37	37
Volume Right (vph)	82	21	16	41
Hadj (s)	-0.11	-0.01	-0.02	-0.15
Departure Headway (s)	4.9	5.1	6.1	5.9
Degree Utilization, x	0.61	0.47	0.15	0.19
Capacity (veh/h)	707	667	503	526
Control Delay (s)	15.3	12.6	10.1	10.3
Approach Delay (s)	15.3	12.6	10.1	10.3
Approach LOS	C	B	B	B

Intersection Summary			
Delay	13.3		
HCM Level of Service	B		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	46	258	568	76	240	479
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.886		0.984			
Flt Protected	0.992					0.984
Satd. Flow (prot)	1726	0	2129	0	0	2067
Flt Permitted	0.992					0.984
Satd. Flow (perm)	1726	0	2129	0	0	2067
Link Speed (mph)	35		35			35
Link Distance (ft)	2916		1087			300
Travel Time (s)	56.8		21.2			5.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	55	307	617	83	282	564
Shared Lane Traffic (%)						
Lane Group Flow (vph)	362	0	700	0	0	846
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	46	258	568	76	240	479
Sign Control	Stop		Free			Free
Grade	0%		-3%			-1%
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Hourly flow rate (vph)	55	307	617	83	282	564
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1087			
pX, platoon unblocked	0.91	0.91			0.91	
vC, conflicting volume	1787	659			700	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1816	573			619	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	35			68	
cM capacity (veh/h)	54	474			882	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	362	700	846
Volume Left	55	0	282
Volume Right	307	83	0
cSH	217	1700	882
Volume to Capacity	1.67	0.41	0.32
Queue Length 95th (ft)	596	0	35
Control Delay (s)	360.1	0.0	7.2
Lane LOS	F		A
Approach Delay (s)	360.1	0.0	7.2
Approach LOS	F		

Intersection Summary			
Average Delay	71.5 – F		
Intersection Capacity Utilization	101.5%	ICU Level of Service	G
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	46	258	568	76	240	479
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.886		0.984			
Flt Protected	0.992					0.984
Satd. Flow (prot)	1726	0	2129	0	0	2067
Flt Permitted	0.992					*0.470
Satd. Flow (perm)	1726	0	2129	0	0	987
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	236		12			
Link Speed (mph)	35		35			35
Link Distance (ft)	2916		1087			300
Travel Time (s)	56.8		21.2			5.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	55	307	617	83	282	564
Shared Lane Traffic (%)						
Lane Group Flow (vph)	362	0	700	0	0	846
Number of Detectors	1		0		1	0
Detector Template	Left				Left	
Leading Detector (ft)	35		0		20	0
Trailing Detector (ft)	-5		0		0	0
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8					
Switch Phase						
Minimum Initial (s)	7.0		20.0		7.0	20.0
Minimum Split (s)	13.0		26.0		13.0	26.0
Total Split (s)	21.0	0.0	66.0	0.0	13.0	79.0
Total Split (%)	21.0%	0.0%	66.0%	0.0%	13.0%	79.0%
Maximum Green (s)	15.0		60.0		7.0	73.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0
Recall Mode	None		Max		Max	Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.85		0.53			1.03
Control Delay	34.5		12.7			53.9
Queue Delay	0.0		0.0			0.0
Total Delay	34.5		12.7			53.9
Queue Length 50th (ft)	75		238			~246
Queue Length 95th (ft)	#158		338			#432
Internal Link Dist (ft)	2836		1007			220
Turn Bay Length (ft)						
Base Capacity (vph)	466		1318			818
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.78		0.53			1.03

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 97.4

Natural Cycle: 75

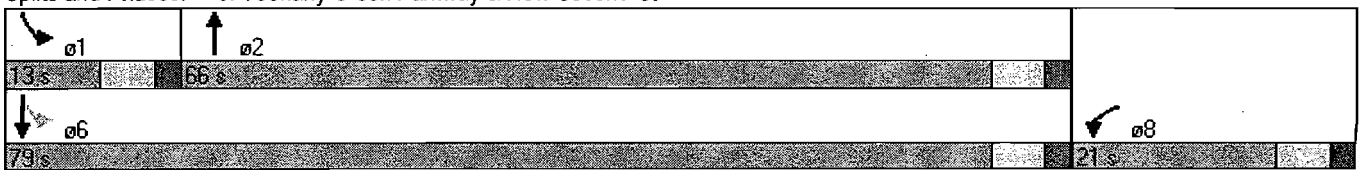
Control Type: Semi Act-Uncoord

* User Entered Value

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Tookany Creek Parkway & New Second St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	46	258	568	76	240	479
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	0.89		0.98			1.00
Flt Protected	0.99		1.00			0.98
Satd. Flow (prot)	1725		2129			2066
Flt Permitted	0.99		1.00			0.47
Satd. Flow (perm)	1725		2129			987
Peak-hour factor, PHF	0.84	0.84	0.92	0.92	0.85	0.85
Adj. Flow (vph)	55	307	617	83	282	564
RTOR Reduction (vph)	206	0	5	0	0	0
Lane Group Flow (vph)	156	0	695	0	0	846
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	12.3		60.1			73.1
Effective Green, g (s)	12.3		60.1			73.1
Actuated g/C Ratio	0.13		0.62			0.75
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	218		1314			818
v/s Ratio Prot	c0.09		0.33			c0.07
v/s Ratio Perm						c0.70
v/c Ratio	0.71		0.53			1.03
Uniform Delay, d1	40.9		10.6			12.2
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	10.6		1.5			40.6
Delay (s)	51.5		12.1			52.8
Level of Service	D		B			D
Approach Delay (s)	51.5		12.1			52.8
Approach LOS	D		B			D

Intersection Summary			
HCM Average Control Delay	37.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	97.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	106.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX K

Auxiliary Lane Warrants
Unsignalized, Carriage Home Access

2015 Future with Development Conditions
Ashbourne Road and Access for Carriage Homes
Left-Turn Lane Volume Adjustments

Time Period	Northbound		Southbound	
	2013		2013	
	AM	PM	AM	PM
Advancing Volumes				
$P_{Heavy\ Vehicles}$	0.06	0.03	0.06	0.03
$E_{Terrain}$	1.5	1.5	1.5	1.5
$T_{adjustment}$	1.0	1.0	1.0	1.0
Volumes				
Initial				
Lefts	4	17	3	11
Total Advancing	260	391	342	436
Adjusted				
Lefts	4	17	3	11
Total Advancing	268	397	352	443
Percent Lefts	2%	4%	1%	3%
Opposing Volumes				
Adjustment Factors				
$P_{Heavy\ Vehicles}$	0.06	0.03	0.06	0.03
$E_{Terrain}$	1.5	1.5	1.5	1.5
$T_{adjustment}$	1.0	1.0	1.0	1.0
Volumes				
Initial	342	436	260	391
Adjusted	352	443	268	397
Lane Warranted (1)	No	No	No	No

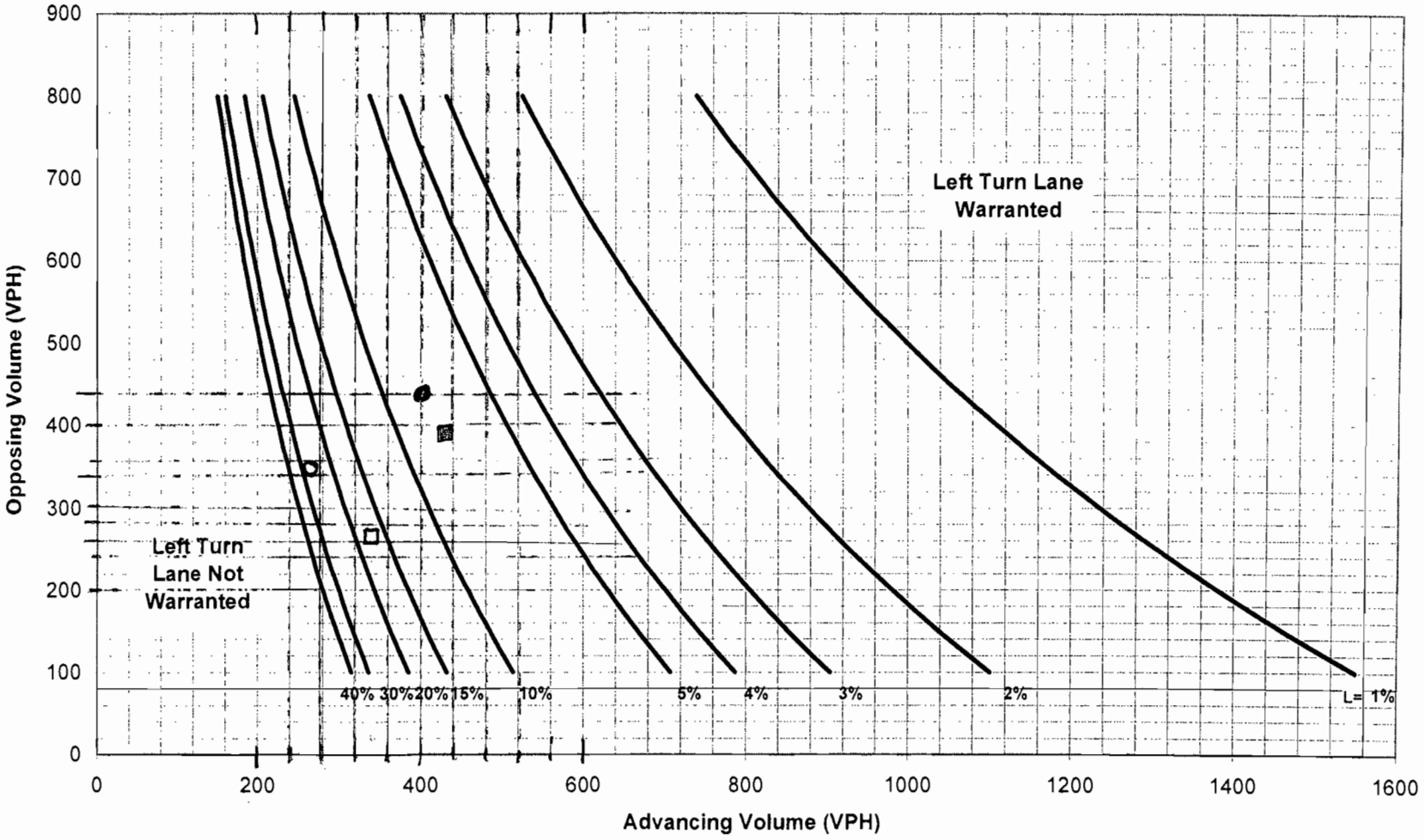
(1) Based on Pub 46 charts using speed of 40 miles per hour

Ashbourne Road and Croyden Road / Carriage Homes Access

2015 Future w/ Devel. Conditions

Figure 2. Warrant for left turn lanes on two-lane highways (40 mph speed, unsignalized and signalized intersections)

(L = % Left Turns in Advancing Volume)



		V_{ADV}	V_{OPP}	%L	
NB	AM	268	352	2%	○
	PM	397	443	4%	●
SB	AM	352	268	1%	□
	PM	443	397	3%	■

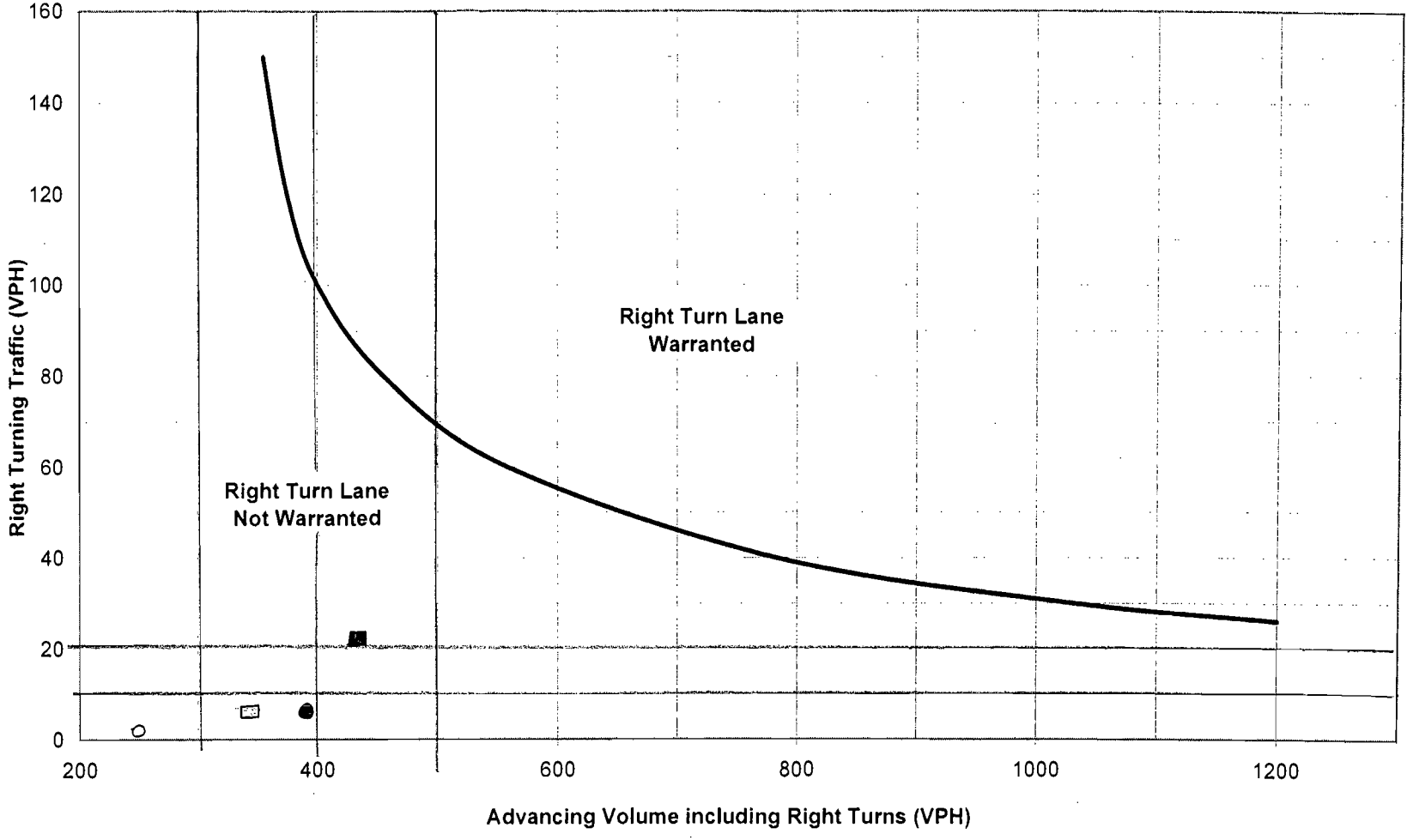
2015 Future with Development Conditions
Ashbourne Road and Access for Carriage Homes
Right-Turn Lane Volume Adjustments

Time Period	Northbound		Southbound	
	2013		2013	
	AM	PM	AM	PM
Adjustment Factors				
$P_{Heavy\ Vehicles}$	0.06	0.03	0.06	0.03
$E_{Terrain}$	1.5	1.5	1.5	1.5
$T_{adjustment}$	1.0	1.0	1.0	1.0
Initial Volumes				
Rights	2	6	5	22
Total Approaching	260	391	342	436
Adjusted Volumes				
Rights	2	6	5	22
Total Approaching	268	397	352	443
Percent Rights	1%	2%	1%	5%
Lane Warranted (1)	No	No	No	No

(1) Based on PUB 46 charts for speeds of 40 miles per hour or lower on two-lane roadways.

Ashbourne Road and Croyden Road / Carriage Homes Access
2015 Future w/Devel. Conditions

Figure 9. Warrant for right turn lanes on two-lane roadways (40 mph or lower speeds, unsignalized and signalized intersections)



		V_R	V_{ADV}	
NB	AM	2	268	○
	PM	6	397	●
SB	AM	5	352	□
	PM	[illegible]	443	■

APPENDIX L

2015 Future without Development Capacity/Level-of-Service Analysis Worksheets

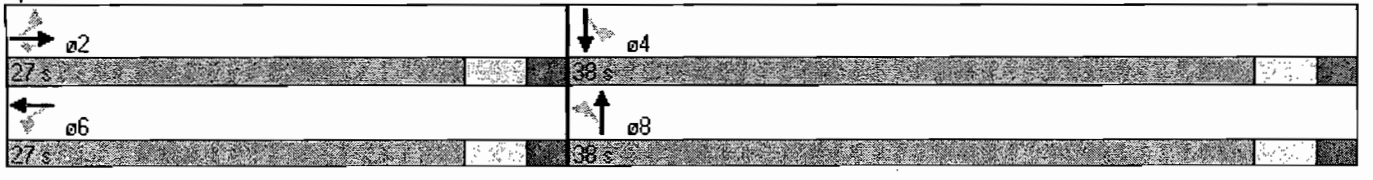
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	128	28	14	199	143	23	352	8	112	474	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Storage Length (ft)	0		110	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.946			0.997			0.982	
Flt Protected		0.978			0.998			0.997			0.992	
Satd. Flow (prot)	0	1840	1653	0	1899	0	0	2068	0	0	1806	0
Flt Permitted		0.573			0.982			0.940			0.847	
Satd. Flow (perm)	0	1078	1653	0	1868	0	0	1949	0	0	1542	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			36					2			18	
Link Speed (mph)		25			40			35			35	
Link Distance (ft)		500			433			500			1087	
Travel Time (s)		13.6			7.4			9.7			21.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	139	166	36	15	212	152	29	446	10	122	515	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	305	36	0	379	0	0	485	0	0	738	0
Number of Detectors	1	0	0	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	35	0	0	35	0		35	0		35	0	
Trailing Detector (ft)	-5	0	0	-5	0		-5	0		-5	0	
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase												
Switch Phase												
Minimum Initial (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		38.0	38.0		38.0	38.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	41.5%	0.0%	58.5%	58.5%	0.0%	58.5%	58.5%	0.0%
Maximum Green (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max	Max	Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.84	0.06		0.60			0.49			0.93	
Control Delay		42.9	6.0		22.6			12.6			36.5	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		42.9	6.0		22.6			12.6			36.5	
Queue Length 50th (ft)		109	0		122			116			248	
Queue Length 95th (ft)		#185	13		203			155			#483	
Internal Link Dist (ft)		420			353			420			1007	
Turn Bay Length (ft)			110									
Base Capacity (vph)		365	583		632			990			792	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.84	0.06		0.60			0.49			0.93	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 65
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ashbourne Rd & New Second St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	128	28	14	199	143	23	352	8	112	474	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.95			1.00			0.98	
Flt Protected		0.98	1.00		1.00			1.00			0.99	
Satd. Flow (prot)		1840	1653		1898			2068			1805	
Flt Permitted		0.57	1.00		0.98			0.94			0.85	
Satd. Flow (perm)		1077	1653		1867			1950			1541	
Peak-hour factor, PHF	0.77	0.77	0.77	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.92	0.92
Adj. Flow (vph)	139	166	36	15	212	152	29	446	10	122	515	101
RTOR Reduction (vph)	0	0	24	0	0	0	0	1	0	0	9	0
Lane Group Flow (vph)	0	305	12	0	379	0	0	484	0	0	729	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	4%	4%	4%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)		22.0	22.0		22.0			33.0			33.0	
Effective Green, g (s)		22.0	22.0		22.0			33.0			33.0	
Actuated g/C Ratio		0.34	0.34		0.34			0.51			0.51	
Clearance Time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Grp Cap (vph)		365	559		632			990			782	
v/s Ratio Prot												
v/s Ratio Perm		c0.28	0.01		0.20			0.25			c0.47	
v/c Ratio		0.84	0.02		0.60			0.49			0.93	
Uniform Delay, d1		19.8	14.3		17.8			10.5			15.0	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		19.8	0.1		4.2			1.7			19.4	
Delay (s)		39.6	14.4		22.0			12.2			34.3	
Level of Service		D	B		C			B			C	
Approach Delay (s)		37.0			22.0			12.2			34.3	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM Average Control Delay	26.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	119.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	235	3	0	332	2	6	0	0	5	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		-4%			-4%			-2%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.999						0.897	
Flt Protected		0.998						0.950			0.988	
Satd. Flow (prot)	0	1930	0	0	1936	0	0	1762	0	0	1651	0
Flt Permitted		0.998						0.950			0.988	
Satd. Flow (perm)	0	1930	0	0	1936	0	0	1762	0	0	1651	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		433			1750			486			448	
Travel Time (s)		8.4			34.1			13.3			12.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.81	0.81	0.73	0.73	0.73	0.75	0.75	0.75	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	290	4	0	455	3	8	0	0	6	0	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	305	0	0	458	0	0	8	0	0	25	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	235	3	0	332	2	6	0	0	5	0	17
Sign Control		Free			Free			Stop			Stop	
Grade		-4%			-4%			-2%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.73	0.73	0.73	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	11	290	4	0	455	3	8	0	0	6	0	19
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		433										
pX, platoon unblocked												
vC, conflicting volume	458			294			789	772	292	770	772	456
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	458			294			789	772	292	770	772	456
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	100	100	98	100	97
cM capacity (veh/h)	1114			1279			299	330	752	315	327	604

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	305	458	8	24
Volume Left	11	0	8	6
Volume Right	4	3	0	19
cSH	1114	1279	299	500
Volume to Capacity	0.01	0.00	0.03	0.05
Queue Length 95th (ft)	1	0	2	4
Control Delay (s)	0.4	0.0	17.4	12.6
Lane LOS	A		C	B
Approach Delay (s)	0.4	0.0	17.4	12.6
Approach LOS			C	B

Intersection Summary			
Average Delay	0.7 – A		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

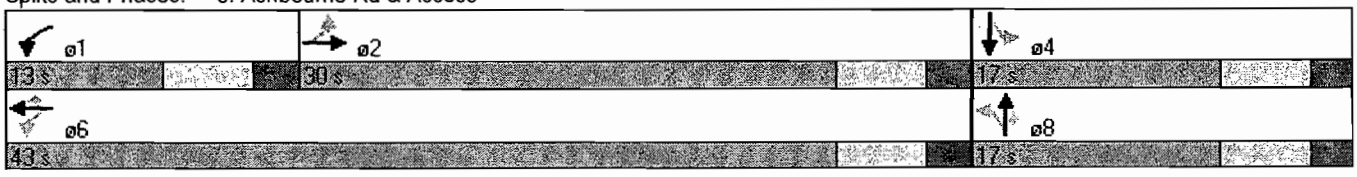
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	219	21	267	273	9	59	5	195	16	8	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Storage Length (ft)	140		0	150		75	0		45	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987				0.850			0.850		0.990	
Flt Protected	0.950			0.950				0.956			0.970	
Satd. Flow (prot)	1627	1691	0	1525	1665	1617	0	1627	1596	0	1634	0
Flt Permitted	0.584			0.452				0.743			0.765	
Satd. Flow (perm)	1000	1691	0	726	1665	1617	0	1264	1596	0	1289	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						9			244			
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1750			1349			500			300	
Travel Time (s)		29.8			23.0			9.7			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.95	0.95	0.95	0.80	0.80	0.80	0.25	0.25	0.25
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	9%	9%	9%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1	267	26	281	287	9	74	6	244	64	32	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	293	0	281	287	9	0	80	244	0	104	0
Number of Detectors	0	0		1	0	0	1	1	1	1	1	
Detector Template												
Leading Detector (ft)	0	0		35	0	0	35	35	35	20	20	
Trailing Detector (ft)	0	0		-5	0	0	-5	-5	-5	-5	-5	
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Detector Phase				1		6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	24.0	24.0		7.0	33.0	33.0	3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	30.0	30.0		13.0	39.0	39.0	9.0	9.0	9.0	9.0	9.0	
Total Split (s)	30.0	30.0	0.0	13.0	43.0	43.0	17.0	17.0	17.0	17.0	17.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	21.7%	71.7%	71.7%	28.3%	28.3%	28.3%	28.3%	28.3%	0.0%
Maximum Green (s)	24.0	24.0		7.0	37.0	37.0	11.0	11.0	11.0	11.0	11.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	Min	Min		None	Min	Min	None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.00	0.42		0.50	0.27	0.01		0.40	0.54		0.51	
Control Delay	11.0	15.0		8.6	5.8	2.8		28.3	8.4		31.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	11.0	15.0		8.6	5.8	2.8		28.3	8.4		31.9	
Queue Length 50th (ft)	0	72		39	39	0		26	0		34	
Queue Length 95th (ft)	2	116		75	73	4		53	35		19	
Internal Link Dist (ft)		1670			1269			420			220	
Turn Bay Length (ft)	140			150		75			45			
Base Capacity (vph)	413	698		558	1060	1033		239	500		244	
Starvation Cap Reductn	0	0		0	0	0		0	0		0	
Spillback Cap Reductn	0	0		0	0	0		0	0		0	
Storage Cap Reductn	0	0		0	0	0		0	0		0	
Reduced v/c Ratio	0.00	0.42		0.50	0.27	0.01		0.33	0.49		0.43	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 58.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ashbourne Rd & Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	219	21	267	273	9	59	5	195	16	8	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		0.97	
Satd. Flow (prot)	1627	1690		1525	1665	1617		1627	1596		1634	
Flt Permitted	0.58	1.00		0.45	1.00	1.00		0.74	1.00		0.77	
Satd. Flow (perm)	1000	1690		726	1665	1617		1265	1596		1289	
Peak-hour factor, PHF	0.82	0.82	0.82	0.95	0.95	0.95	0.80	0.80	0.80	0.25	0.25	0.25
Adj. Flow (vph)	1	267	26	281	287	9	74	6	244	64	32	8
RTOR Reduction (vph)	0	0	0	0	0	3	0	0	206	0	0	0
Lane Group Flow (vph)	1	293	0	281	287	6	0	80	38	0	104	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	9%	9%	9%	0%	0%	0%
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	24.0	24.0		37.0	37.0	37.0		9.1	9.1		9.1	
Effective Green, g (s)	24.0	24.0		37.0	37.0	37.0		9.1	9.1		9.1	
Actuated g/C Ratio	0.41	0.41		0.64	0.64	0.64		0.16	0.16		0.16	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	413	698		559	1060	1030		198	250		202	
v/s Ratio Prot		0.17		c0.06	0.17							
v/s Ratio Perm	0.00			c0.26		0.00		0.06	0.02		c0.08	
v/c Ratio	0.00	0.42		0.50	0.27	0.01		0.40	0.15		0.51	
Uniform Delay, d1	10.0	12.1		5.2	4.6	3.8		22.1	21.2		22.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.4		0.7	0.1	0.0		1.3	0.3		2.2	
Delay (s)	10.0	12.5		6.0	4.8	3.8		23.4	21.5		24.7	
Level of Service	B	B		A	A	A		C	C		C	
Approach Delay (s)		12.5			5.3			21.9			24.7	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lane Configurations												
Volume (vph)	164	6	213	47	2	6	13	2	13	67	15	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	15	12	12	12	12	16	16	16	15
Grade (%)		0%					1%			1%		
Storage Length (ft)	0		0			0		0	0			
Storage Lanes	0		0			0		0	0			
Taper Length (ft)	25		25			25		25	25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.918					0.986			0.978		
Flt Protected		0.981					0.982			0.993		
Satd. Flow (prot)	0	1776	0	0	0	0	1743	0	0	2060	0	0
Flt Permitted		0.981					0.982			0.937		
Satd. Flow (perm)	0	1776	0	0	0	0	1743	0	0	1944	0	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)		40					25			15		
Link Distance (ft)		1349					528			501		
Travel Time (s)		23.0					14.4			22.8		
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.77	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	1%	1%	1%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%					0%			0%		
Adj. Flow (vph)	213	8	277	61	3	8	16	3	16	84	19	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	559	0	0	0	0	30	0	0	119	0	0
Number of Detectors	1	1			1	1	1		1	1		2
Detector Template												
Leading Detector (ft)	35	35			35	35	35		35	35		70
Trailing Detector (ft)	-5	-5			-5	-5	-5		-5	-5		-5
Turn Type	Split				Perm	Split			Perm			Perm
Protected Phases	2	2				6	6			8		
Permitted Phases		2			6				8			4
Detector Phase	2	2			6	6	6		8	8		4
Switch Phase												
Minimum Initial (s)	8.0	8.0			5.0	5.0	5.0		8.0	8.0		8.0
Minimum Split (s)	14.0	14.0			11.0	11.0	11.0		14.0	14.0		14.0
Total Split (s)	35.0	35.0	0.0	0.0	13.0	13.0	13.0	0.0	17.0	17.0	0.0	17.0
Total Split (%)	38.9%	38.9%	0.0%	0.0%	14.4%	14.4%	14.4%	0.0%	18.9%	18.9%	0.0%	18.9%
Maximum Green (s)	29.0	29.0			7.0	7.0	7.0		11.0	11.0		11.0
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	-2.0	-2.0	0.0	0.0	-2.0	0.0	0.0	-2.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	17	92	234	28	290	23	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Storage Length (ft)	0		150		0	0	
Storage Lanes	0		1		1	0	
Taper Length (ft)	25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							
Frt			0.850		0.991		
Flt Protected		0.992			0.956		
Satd. Flow (prot)	0	1938	1610	0	1980	0	0
Flt Permitted		0.929			0.956		
Satd. Flow (perm)	0	1815	1610	0	1980	0	0
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		35			25		
Link Distance (ft)		752			574		
Travel Time (s)		14.6			15.7		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.98	0.98	0.98	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%			0%		
Adj. Flow (vph)	17	94	239	29	305	24	1
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	112	239	0	359	0	0
Number of Detectors	2	2	1	1	1		
Detector Template							
Leading Detector (ft)	70	70	35	35	35		
Trailing Detector (ft)	-5	-5	-5	-5	-5		
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Detector Phase	4	4	2	9	9		
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		
Total Split (s)	17.0	17.0	35.0	25.0	25.0	0.0	0.0
Total Split (%)	18.9%	18.9%	38.9%	27.8%	27.8%	0.0%	0.0%
Maximum Green (s)	11.0	11.0	29.0	19.0	19.0		
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	4.0

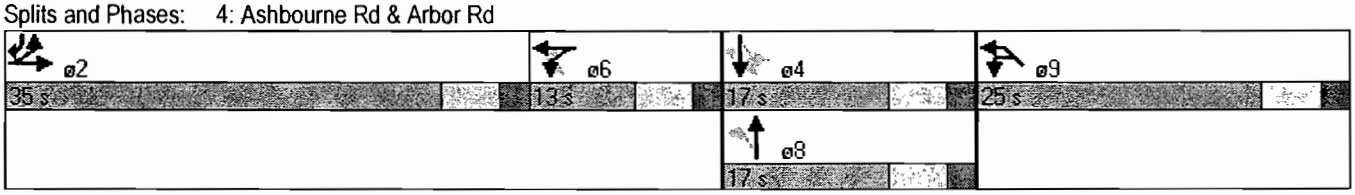
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0		5.0
Minimum Gap (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		3.0
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None			None	None	None		Max	Max		Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.91					0.21			0.46		
Control Delay		49.2					42.2			42.4		
Queue Delay		0.0					0.0			0.0		
Total Delay		49.2					42.2			42.4		
Queue Length 50th (ft)		312					16			64		
Queue Length 95th (ft)		#399					38			104		
Internal Link Dist (ft)		1269					448			421		
Turn Bay Length (ft)												
Base Capacity (vph)		616					146			256		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.91					0.21			0.46		

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 84.2
Natural Cycle: 80
Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Ashbourne Rd & Arbor Rd



Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0		
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Recall Mode	Max	Max	None	None	None		
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
v/c Ratio		0.47	0.29		0.83		
Control Delay		43.0	9.4		50.1		
Queue Delay		0.0	0.0		0.0		
Total Delay		43.0	9.4		50.1		
Queue Length 50th (ft)		60	49		198		
Queue Length 95th (ft)		114	81		#348		
Internal Link Dist (ft)		672			494		
Turn Bay Length (ft)			150				
Base Capacity (vph)		239	822		450		
Starvation Cap Reductn		0	0		0		
Spillback Cap Reductn		0	0		0		
Storage Cap Reductn		0	0		0		
Reduced v/c Ratio		0.47	0.29		0.80		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lane Configurations												
Volume (vph)	164	6	213	47	2	6	13	2	13	67	15	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	15	12	12	12	12	16	16	16	15
Grade (%)		0%					1%			1%		
Total Lost time (s)		6.0					6.0			6.0		
Lane Util. Factor		1.00					1.00			1.00		
Frt		0.92					0.99			0.98		
Flt Protected		0.98					0.98			0.99		
Satd. Flow (prot)		1777					1744			2062		
Flt Permitted		0.98					0.98			0.94		
Satd. Flow (perm)		1777					1744			1945		
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.98
Adj. Flow (vph)	213	8	277	61	3	8	16	3	16	84	19	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	559	0	0	0	0	30	0	0	119	0	0
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	1%	1%	1%	7%
Turn Type	Split				Perm	Split			Perm			Perm
Protected Phases	2	2				6	6			8		
Permitted Phases		2			6				8			4
Actuated Green, G (s)		29.2					3.9			11.1		
Effective Green, g (s)		29.2					3.9			11.1		
Actuated g/C Ratio		0.34					0.04			0.13		
Clearance Time (s)		6.0					6.0			6.0		
Vehicle Extension (s)		5.0					5.0			5.0		
Lane Grp Cap (vph)		598					78			249		
v/s Ratio Prot		c0.31					c0.02					
v/s Ratio Perm										0.06		
v/c Ratio		0.93					0.38			0.48		
Uniform Delay, d1		27.8					40.2			35.1		
Progression Factor		1.00					1.00			1.00		
Incremental Delay, d2		22.6					6.5			6.4		
Delay (s)		50.5					46.7			41.5		
Level of Service		D					D			D		
Approach Delay (s)		50.5					46.7			41.5		
Approach LOS		D					D			D		

Intersection Summary			
HCM Average Control Delay	42.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	86.7	Sum of lost time (s)	24.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	17	92	234	28	290	23	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Total Lost time (s)		6.0	6.0		6.0		
Lane Util. Factor		1.00	1.00		1.00		
Frt		1.00	0.85		0.99		
Flt Protected		0.99	1.00		0.96		
Satd. Flow (prot)		1938	1610		1978		
Flt Permitted		0.93	1.00		0.96		
Satd. Flow (perm)		1814	1610		1978		
Peak-hour factor, PHF	0.98	0.98	0.98	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	94	239	29	305	24	1
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	112	239	0	359	0	0
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	2%
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Actuated Green, G (s)		11.1	40.3		18.5		
Effective Green, g (s)		11.1	40.3		18.5		
Actuated g/C Ratio		0.13	0.46		0.21		
Clearance Time (s)		6.0	6.0		6.0		
Vehicle Extension (s)		5.0	5.0		5.0		
Lane Grp Cap (vph)		232	748		422		
v/s Ratio Prot			0.11		c0.18		
v/s Ratio Perm		c0.06	0.04				
v/c Ratio		0.48	0.32		0.85		
Uniform Delay, d1		35.1	14.6		32.8		
Progression Factor		1.00	1.00		1.00		
Incremental Delay, d2		7.0	0.5		16.4		
Delay (s)		42.2	15.1		49.2		
Level of Service		D	B		D		
Approach Delay (s)		23.7			49.2		
Approach LOS		C			D		

Intersection Summary

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	9	16	254	2	3	334
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	16	15	15
Grade (%)	-3%		-5%			3%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.912		0.999			
Flt Protected	0.983					
Satd. Flow (prot)	1729	0	2080	0	0	1942
Flt Permitted	0.983					
Satd. Flow (perm)	1729	0	2080	0	0	1942
Link Speed (mph)	25		35			35
Link Distance (ft)	484		752			350
Travel Time (s)	13.2		14.6			6.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.84	0.84	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	6%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	10	19	302	2	3	367
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	304	0	0	370
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	16	254	2	3	334
Sign Control	Stop		Free			Free
Grade	-3%		-5%			3%
Peak Hour Factor	0.86	0.86	0.84	0.84	0.91	0.91
Hourly flow rate (vph)	10	19	302	2	3	367
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			752			
pX, platoon unblocked						
vC, conflicting volume	677	304			305	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	677	304			305	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	98	97			100	
cM capacity (veh/h)	421	741			1234	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	29	305	370
Volume Left	10	0	3
Volume Right	19	2	0
cSH	582	1700	1234
Volume to Capacity	0.05	0.18	0.00
Queue Length 95th (ft)	4	0	0
Control Delay (s)	11.5	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	11.5	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay	0.5 – A		
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	13	77	79	191	260	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	15	15	16	16
Grade (%)	0%			-8%	3%	
Storage Length (ft)	0	50	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.884				0.989	
Flt Protected	0.993			0.986		
Satd. Flow (prot)	1673	0	0	2041	1942	0
Flt Permitted	0.993			0.986		
Satd. Flow (perm)	1673	0	0	2041	1942	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	1329			350	719	
Travel Time (s)	36.2			6.8	14.0	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.89	0.89	0.82	0.82
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	5%	5%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	18	108	89	215	317	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	126	0	0	304	344	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	13	77	79	191	260	22
Sign Control	Stop			Free	Free	
Grade	0%			-8%	3%	
Peak Hour Factor	0.71	0.71	0.89	0.89	0.82	0.82
Hourly flow rate (vph)	18	108	89	215	317	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	723	330	317			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	723	330	317			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	85	93			
cM capacity (veh/h)	363	709	1226			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	127	303	344
Volume Left	18	89	0
Volume Right	108	0	27
cSH	623	1226	1700
Volume to Capacity	0.20	0.07	0.20
Queue Length 95th (ft)	19	6	0
Control Delay (s)	12.2	2.9	0.0
Lane LOS	B	A	
Approach Delay (s)	12.2	2.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.1 – A		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	7	179	16	42	250	23	21	32	8	54	33	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	9	9	9	14	14	14
Grade (%)		-1%			0%			-3%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.989			0.990			0.982			0.974	
Flt Protected		0.998			0.993			0.983			0.976	
Satd. Flow (prot)	0	2053	0	0	1831	0	0	1675	0	0	1880	0
Flt Permitted		0.998			0.993			0.983			0.976	
Satd. Flow (perm)	0	2053	0	0	1831	0	0	1675	0	0	1880	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2917			950			663			1329	
Travel Time (s)		56.8			18.5			18.1			36.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	8	201	18	47	281	26	25	39	10	64	39	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	227	0	0	354	0	0	74	0	0	128	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	7	179	16	42	250	23	21	32	8	54	33	21
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83	0.85	0.85	0.85
Hourly flow rate (vph)	8	201	18	47	281	26	25	39	10	64	39	25

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total (vph)	227	354	73	127
Volume Left (vph)	8	47	25	64
Volume Right (vph)	18	26	10	25
Hadj (s)	-0.02	0.02	-0.01	0.03
Departure Headway (s)	4.9	4.8	5.6	5.5
Degree Utilization, x	0.31	0.47	0.11	0.19
Capacity (veh/h)	688	720	567	581
Control Delay (s)	10.1	12.0	9.3	9.8
Approach Delay (s)	10.1	12.0	9.3	9.8
Approach LOS	B	B	A	A

Intersection Summary			
Delay	10.8		
HCM Level of Service	B		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	83	229	546	56	147	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.901		0.987			
Flt Protected	0.987					0.990
Satd. Flow (prot)	1729	0	2136	0	0	2059
Flt Permitted	0.987					0.990
Satd. Flow (perm)	1729	0	2136	0	0	2059
Link Speed (mph)	35		35			35
Link Distance (ft)	2917		1087			792
Travel Time (s)	56.8		21.2			15.4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	92	254	620	64	155	626
Shared Lane Traffic (%)						
Lane Group Flow (vph)	346	0	684	0	0	781
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	83	229	546	56	147	595
Sign Control	Stop		Free			Free
Grade	0%		-3%			-1%
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Hourly flow rate (vph)	92	254	620	64	155	626
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1087			
pX, platoon unblocked	0.91	0.91			0.91	
vC, conflicting volume	1588	652			684	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1597	567			602	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	47			83	
cM capacity (veh/h)	89	477			891	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	347	684	781
Volume Left	92	0	155
Volume Right	254	64	0
cSH	220	1700	891
Volume to Capacity	1.58	0.40	0.17
Queue Length 95th (ft)	545	0	16
Control Delay (s)	319.3	0.0	4.1
Lane LOS	F		A
Approach Delay (s)	319.3	0.0	4.1
Approach LOS	F		

Intersection Summary			
Average Delay	62.9 -F		
Intersection Capacity Utilization	100.3%	ICU Level of Service	G
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	83	229	546	56	147	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.901		0.987			
Flt Protected	0.987					0.990
Satd. Flow (prot)	1729	0	2136	0	0	2059
Flt Permitted	0.987					0.460
Satd. Flow (perm)	1729	0	2136	0	0	*964
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	134		9			
Link Speed (mph)	35		35			35
Link Distance (ft)	2917		1087			792
Travel Time (s)	56.8		21.2			15.4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	92	254	620	64	155	626
Shared Lane Traffic (%)						
Lane Group Flow (vph)	346	0	684	0	0	781
Number of Detectors	1		0		1	0
Detector Template						
Leading Detector (ft)	35		0		35	0
Trailing Detector (ft)	-5		0		-5	0
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8					
Switch Phase						
Minimum Initial (s)	7.0		20.0		7.0	20.0
Minimum Split (s)	13.0		26.0		13.0	26.0
Total Split (s)	22.0	0.0	55.0	0.0	13.0	68.0
Total Split (%)	24.4%	0.0%	61.1%	0.0%	14.4%	75.6%
Maximum Green (s)	16.0		49.0		7.0	62.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0

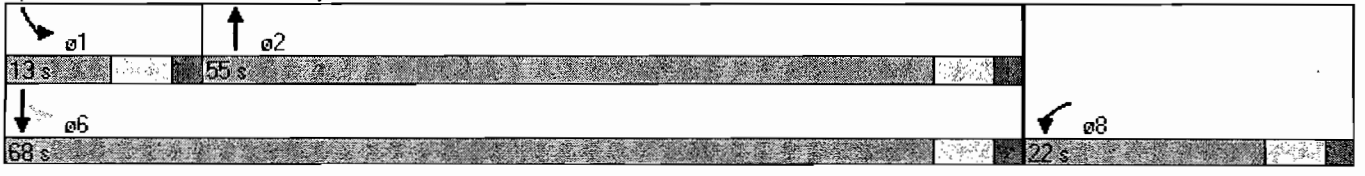
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0
Recall Mode	None		Max		Max	Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.88		0.58			1.02
Control Delay	45.7		15.5			53.4
Queue Delay	0.0		0.0			0.0
Total Delay	45.7		15.5			53.4
Queue Length 50th (ft)	118		241			~218
Queue Length 95th (ft)	#264		334			#478
Internal Link Dist (ft)	2837		1007			712
Turn Bay Length (ft)						
Base Capacity (vph)	423		1187			762
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.82		0.58			1.02

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 88.6
Natural Cycle: 75
Control Type: Semi Act-Uncoord

* User Entered Value
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Tookany Creek Rd & New Second St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	83	229	546	56	147	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	0.90		0.99			1.00
Flt Protected	0.99		1.00			0.99
Satd. Flow (prot)	1728		2137			2059
Flt Permitted	0.99		1.00			0.46
Satd. Flow (perm)	1728		2137			964
Peak-hour factor, PHF	0.90	0.90	0.88	0.88	0.95	0.95
Adj. Flow (vph)	92	254	620	64	155	626
RTOR Reduction (vph)	112	0	4	0	0	0
Lane Group Flow (vph)	234	0	680	0	0	781
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	14.5		49.0			62.0
Effective Green, g (s)	14.5		49.0			62.0
Actuated g/C Ratio	0.16		0.55			0.70
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	283		1183			762
v/s Ratio Prot	c0.14		0.32			c0.08
v/s Ratio Perm						c0.64
v/c Ratio	0.83		0.57			1.02
Uniform Delay, d1	35.8		12.9			13.2
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	17.6		2.0			39.1
Delay (s)	53.4		15.0			52.3
Level of Service	D		B			D
Approach Delay (s)	53.4		15.0			52.3
Approach LOS	D		B			D

Intersection Summary			
HCM Average Control Delay	38.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

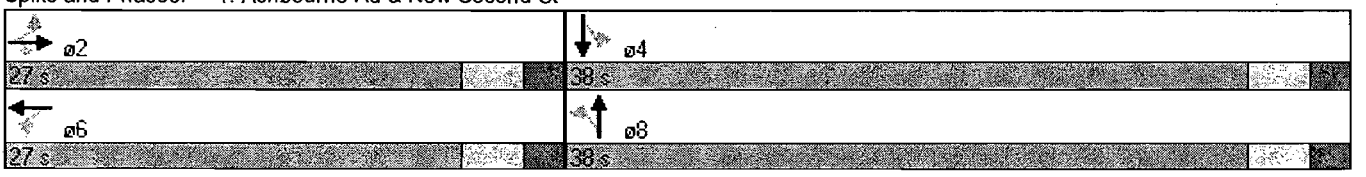
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	254	33	19	156	150	28	402	16	124	324	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	14	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Storage Length (ft)	0		110	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.938			0.995			0.980	
Flt Protected		0.986			0.997			0.997			0.988	
Satd. Flow (prot)	0	1873	1723	0	1936	0	0	2104	0	0	1831	0
Flt Permitted		0.680			0.963			0.946			0.773	
Satd. Flow (perm)	0	1292	1723	0	1870	0	0	1997	0	0	1432	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			37					4			20	
Link Speed (mph)		25			40			35			35	
Link Distance (ft)		500			433			500			1087	
Travel Time (s)		13.6			7.4			9.7			21.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.79	0.79	0.79	0.90	0.90	0.90	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	112	285	37	24	197	190	31	447	18	144	377	91
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	397	37	0	411	0	0	496	0	0	612	0
Number of Detectors	1	0	0	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	35	0	0	35	0		35	0		35	0	
Trailing Detector (ft)	-5	0	0	-5	0		-5	0		-5	0	
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase												
Switch Phase												
Minimum Initial (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		38.0	38.0		38.0	38.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	41.5%	0.0%	58.5%	58.5%	0.0%	58.5%	58.5%	0.0%
Maximum Green (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max	Max	Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.91	0.06		0.65			0.49			0.83	
Control Delay		49.4	6.0		24.0			12.4			25.7	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		49.4	6.0		24.0			12.4			25.7	
Queue Length 50th (ft)		147	0		135			118			186	
Queue Length 95th (ft)		#298	17		186			190			#352	
Internal Link Dist (ft)		420			353			420			1007	
Turn Bay Length (ft)			110									
Base Capacity (vph)		437	608		633			1016			737	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.91	0.06		0.65			0.49			0.83	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 70
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ashbourne Rd & New Second St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	254	33	19	156	150	28	402	16	124	324	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	14	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.94			1.00			0.98	
Flt Protected		0.99	1.00		1.00			1.00			0.99	
Satd. Flow (prot)		1874	1723		1935			2104			1831	
Flt Permitted		0.68	1.00		0.96			0.95			0.77	
Satd. Flow (perm)		1292	1723		1869			1998			1433	
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	112	285	37	24	197	190	31	447	18	144	377	91
RTOR Reduction (vph)	0	0	24	0	0	0	0	2	0	0	10	0
Lane Group Flow (vph)	0	397	13	0	411	0	0	494	0	0	602	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)		22.0	22.0		22.0			33.0			33.0	
Effective Green, g (s)		22.0	22.0		22.0			33.0			33.0	
Actuated g/C Ratio		0.34	0.34		0.34			0.51			0.51	
Clearance Time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Grp Cap (vph)		437	583		633			1014			728	
v/s Ratio Prot												
v/s Ratio Perm		c0.31	0.01		0.22			0.25			c0.42	
v/c Ratio		0.91	0.02		0.65			0.49			0.83	
Uniform Delay, d1		20.5	14.3		18.2			10.5			13.6	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		25.3	0.1		5.1			1.7			10.4	
Delay (s)		45.9	14.4		23.3			12.1			24.0	
Level of Service		D	B		C			B			C	
Approach Delay (s)		43.2			23.3			12.1			24.0	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	110.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	356	11	0	305	5	4	0	2	3	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		-4%			-4%			-2%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996			0.998			0.958			0.890	
Flt Protected		0.998						0.967			0.991	
Satd. Flow (prot)	0	1926	0	0	1934	0	0	1718	0	0	1643	0
Flt Permitted		0.998						0.967			0.991	
Satd. Flow (perm)	0	1926	0	0	1934	0	0	1718	0	0	1643	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		433			1750			526			356	
Travel Time (s)		8.4			34.1			14.3			9.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.84	0.84	0.84	0.38	0.38	0.38	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	26	481	15	0	363	6	11	0	5	3	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	522	0	0	369	0	0	16	0	0	16	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	356	11	0	305	5	4	0	2	3	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		-4%			-4%			-2%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.84	0.84	0.84	0.38	0.38	0.38	0.90	0.90	0.90
Hourly flow rate (vph)	26	481	15	0	363	6	11	0	5	3	0	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		433										
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	369			496			919	909	489	911	913	366
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	369			354			837	825	345	828	830	366
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			96	100	99	99	100	98
cM capacity (veh/h)	1201			1065			244	266	615	248	262	679

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	522	369	16	17
Volume Left	26	0	11	3
Volume Right	15	6	5	13
cSH	1201	1065	305	504
Volume to Capacity	0.02	0.00	0.05	0.03
Queue Length 95th (ft)	2	0	4	3
Control Delay (s)	0.6	0.0	17.4	12.4
Lane LOS	A		C	B
Approach Delay (s)	0.6	0.0	17.4	12.4
Approach LOS			C	B

Intersection Summary			
Average Delay	0.9 — A		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	298	66	253	275	20	37	9	221	12	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Storage Length (ft)	140		0	150		75	0		45	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.973				0.850			0.850		0.986	
Flt Protected	0.950			0.950				0.962			0.971	
Satd. Flow (prot)	1676	1717	0	1569	1713	1664	0	1716	1673	0	814	0
Flt Permitted	0.569			0.347				0.715			0.784	
Satd. Flow (perm)	1004	1717	0	573	1713	1664	0	1275	1673	0	658	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						23			260			
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1750			1349			500			300	
Travel Time (s)		29.8			23.0			9.7			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.87	0.87	0.87	0.85	0.85	0.85	0.25	0.25	0.25
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	100%	100%	100%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	3	331	73	291	316	23	44	11	260	48	24	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	404	0	291	316	23	0	55	260	0	80	0
Number of Detectors	0	0		1	0	0	1	1	1	1	1	
Detector Template												
Leading Detector (ft)	0	0		35	0	0	35	35	35	20	20	
Trailing Detector (ft)	0	0		-5	0	0	-5	-5	-5	-5	-5	
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Detector Phase				1		6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	24.0	24.0		7.0	33.0	33.0	3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	30.0	30.0		13.0	39.0	39.0	9.0	9.0	9.0	9.0	9.0	
Total Split (s)	30.0	30.0	0.0	13.0	43.0	43.0	17.0	17.0	17.0	17.0	17.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	21.7%	71.7%	71.7%	28.3%	28.3%	28.3%	28.3%	28.3%	0.0%
Maximum Green (s)	24.0	24.0		7.0	37.0	37.0	11.0	11.0	11.0	11.0	11.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	Min	Min		None	Min	Min	None	None	None	None	None	
Walk Time (s)					5.0	5.0						
Flash Dont Walk (s)					11.0	11.0						
Pedestrian Calls (#/hr)					0	0						
v/c Ratio	0.01	0.58		0.61	0.29	0.02		0.25	0.52		0.71	
Control Delay	11.0	18.0		11.6	6.2	2.2		24.4	7.7		59.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	11.0	18.0		11.6	6.2	2.2		24.4	7.7		59.9	
Queue Length 50th (ft)	1	110		42	46	0		17	0		27	
Queue Length 95th (ft)	5	190		73	77	6		42	44		16	
Internal Link Dist (ft)		1670			1269			420			220	
Turn Bay Length (ft)	140			150		75			45			
Base Capacity (vph)	408	698		477	1073	1051		238	523		123	
Starvation Cap Reductn	0	0		0	0	0		0	0		0	
Spillback Cap Reductn	0	0		0	0	0		0	0		0	
Storage Cap Reductn	0	0		0	0	0		0	0		0	
Reduced v/c Ratio	0.01	0.58		0.61	0.29	0.02		0.23	0.50		0.65	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 59.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ashbourne Rd & Access

ø1	ø2	ø4
13 s	30 s	17 s
ø6		ø8
43 s		17 s

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	298	66	253	275	20	37	9	221	12	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		0.97	
Satd. Flow (prot)	1676	1717		1569	1713	1664		1715	1673		815	
Flt Permitted	0.57	1.00		0.35	1.00	1.00		0.72	1.00		0.78	
Satd. Flow (perm)	1003	1717		573	1713	1664		1276	1673		658	
Peak-hour factor, PHF	0.90	0.90	0.90	0.87	0.87	0.87	0.85	0.85	0.85	0.25	0.25	0.25
Adj. Flow (vph)	3	331	73	291	316	23	44	11	260	48	24	8
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	216	0	0	0
Lane Group Flow (vph)	3	404	0	291	316	14	0	55	44	0	80	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	100%	100%	100%
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	24.0	24.0		37.0	37.0	37.0		10.1	10.1		10.1	
Effective Green, g (s)	24.0	24.0		37.0	37.0	37.0		10.1	10.1		10.1	
Actuated g/C Ratio	0.41	0.41		0.63	0.63	0.63		0.17	0.17		0.17	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	407	697		477	1072	1042		218	286		112	
v/s Ratio Prot		0.24		c0.07	0.18							
v/s Ratio Perm	0.00			c0.31		0.01		0.04	0.03		c0.12	
v/c Ratio	0.01	0.58		0.61	0.29	0.01		0.25	0.16		0.71	
Uniform Delay, d1	10.5	13.6		6.4	5.1	4.2		21.2	20.9		23.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	1.2		2.3	0.2	0.0		0.6	0.3		19.3	
Delay (s)	10.5	14.8		8.7	5.2	4.2		21.8	21.1		42.5	
Level of Service	B	B		A	A	A		C	C		D	
Approach Delay (s)		14.8			6.8			21.2			42.5	
Approach LOS		B			A			C			D	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Volume (vph)	259	13	231	28	1	7	4	14	93	4	16	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	12	16	16	16	16	15
Grade (%)		0%				1%			1%			
Storage Length (ft)	0		0		0		0	0		0		
Storage Lanes	0		0		0		0	0		0		
Taper Length (ft)	25		25		25		25	25		25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.934				0.955			0.979			
Flt Protected		0.976				0.996			0.995			
Satd. Flow (prot)	0	1868	0	0	0	1199	0	0	2046	0	0	0
Flt Permitted		0.976				0.996			0.903			
Satd. Flow (perm)	0	1868	0	0	0	1199	0	0	1857	0	0	0
Right Turn on Red				No			No				No	
Satd. Flow (RTOR)												
Link Speed (mph)		40				25			15			
Link Distance (ft)		1349				527			500			
Travel Time (s)		23.0				14.4			22.7			
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.90	0.33	0.33	0.33	0.73	0.73	0.73	0.73	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	50%	50%	50%	2%	2%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%			0%			
Adj. Flow (vph)	294	15	262	31	3	21	12	19	127	5	22	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	602	0	0	0	36	0	0	173	0	0	0
Number of Detectors	1	1			1	1		1	1			2
Detector Template												
Leading Detector (ft)	35	35			35	35		35	35			70
Trailing Detector (ft)	-5	-5			-5	-5		-5	-5			-5
Turn Type	Split				Split			Perm				Perm
Protected Phases	2	2			6	6			8			
Permitted Phases		2						8				4
Detector Phase	2	2			6	6		8	8			4
Switch Phase												
Minimum Initial (s)	8.0	8.0			5.0	5.0		8.0	8.0			8.0
Minimum Split (s)	14.0	14.0			11.0	11.0		14.0	14.0			14.0
Total Split (s)	35.0	35.0	0.0	0.0	13.0	13.0	0.0	19.0	19.0	0.0	0.0	19.0
Total Split (%)	38.9%	38.9%	0.0%	0.0%	14.4%	14.4%	0.0%	21.1%	21.1%	0.0%	0.0%	21.1%
Maximum Green (s)	29.0	29.0			7.0	7.0		13.0	13.0			13.0
Yellow Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			4.0
All-Red Time (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0	-2.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0	4.0

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	34	130	240	23	288	18	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Storage Length (ft)	0		150		0	0	
Storage Lanes	0		1		1	0	
Taper Length (ft)	25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							
Frt			0.850		0.992		
Flt Protected		0.989			0.955		
Satd. Flow (prot)	0	1988	1656	0	1980	0	0
Flt Permitted		0.793			0.955		
Satd. Flow (perm)	0	1594	1656	0	1980	0	0
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		35			25		
Link Distance (ft)		752			573		
Travel Time (s)		14.6			15.6		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%			0%		
Adj. Flow (vph)	37	140	258	27	335	21	2
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	180	258	0	385	0	0
Number of Detectors	2	2	1	1	1		
Detector Template							
Leading Detector (ft)	70	70	35	35	35		
Trailing Detector (ft)	-5	-5	-5	-5	-5		
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Detector Phase	4	4	2	9	9		
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		
Total Split (s)	19.0	19.0	35.0	23.0	23.0	0.0	0.0
Total Split (%)	21.1%	21.1%	38.9%	25.6%	25.6%	0.0%	0.0%
Maximum Green (s)	13.0	13.0	29.0	17.0	17.0		
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	4.0

Lane Group	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0	5.0		5.0	5.0			5.0
Minimum Gap (s)	3.0	3.0			3.0	3.0		3.0	3.0			3.0
Time Before Reduce (s)	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Time To Reduce (s)	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Recall Mode	None	None			None	None		Max	Max			Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.94				0.36			0.60			
Control Delay		53.0				49.8			44.9			
Queue Delay		0.0				0.0			0.0			
Total Delay		53.0				49.8			44.9			
Queue Length 50th (ft)		~340				20			94			
Queue Length 95th (ft)		#542				18			127			
Internal Link Dist (ft)		1269				447			420			
Turn Bay Length (ft)												
Base Capacity (vph)		643				99			286			
Starvation Cap Reductn		0				0			0			
Spillback Cap Reductn		0				0			0			
Storage Cap Reductn		0				0			0			
Reduced v/c Ratio		0.94				0.36			0.60			

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 84.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Ashbourne Rd & Arbor Rd

ø2	ø6	ø4	ø9
35 s	13 s	19 s	23 s
		ø8	
		19 s	

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0		
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Recall Mode	Max	Max	None	None	None		
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
v/c Ratio		0.73	0.29		0.96		
Control Delay		55.0	8.6		74.0		
Queue Delay		0.0	0.0		0.0		
Total Delay		55.0	8.6		74.0		
Queue Length 50th (ft)		100	49		~237		
Queue Length 95th (ft)		#207	80		#382		
Internal Link Dist (ft)		672			493		
Turn Bay Length (ft)			150				
Base Capacity (vph)		246	877		399		
Starvation Cap Reductn		0	0		0		
Spillback Cap Reductn		0	0		0		
Storage Cap Reductn		0	0		0		
Reduced v/c Ratio		0.73	0.29		0.96		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Volume (vph)	259	13	231	28	1	7	4	14	93	4	16	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	12	12	12	12	16	16	16	16	15
Grade (%)		0%				1%			1%			
Total Lost time (s)		6.0				6.0			6.0			
Lane Util. Factor		1.00				1.00			1.00			
Frt		0.93				0.96			0.98			
Flt Protected		0.98				1.00			0.99			
Satd. Flow (prot)		1869				1199			2045			
Flt Permitted		0.98				1.00			0.90			
Satd. Flow (perm)		1869				1199			1857			
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.33	0.33	0.33	0.73	0.73	0.73	0.73	0.93
Adj. Flow (vph)	294	15	262	31	3	21	12	19	127	5	22	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	602	0	0	0	36	0	0	173	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	50%	50%	50%	2%	2%	2%	2%	4%
Turn Type	Split				Split			Perm				Perm
Protected Phases	2	2			6	6			8			
Permitted Phases		2						8				4
Actuated Green, G (s)		29.2				4.0			13.1			
Effective Green, g (s)		29.2				4.0			13.1			
Actuated g/C Ratio		0.33				0.05			0.15			
Clearance Time (s)		6.0				6.0			6.0			
Vehicle Extension (s)		5.0				5.0			5.0			
Lane Grp Cap (vph)		624				55			278			
v/s Ratio Prot		c0.32				c0.03						
v/s Ratio Perm									0.09			
v/c Ratio		0.96				0.65			0.62			
Uniform Delay, d1		28.6				41.0			34.8			
Progression Factor		1.00				1.00			1.00			
Incremental Delay, d2		27.6				31.9			10.1			
Delay (s)		56.2				72.9			44.9			
Level of Service		E				E			D			
Approach Delay (s)		56.2				72.9			44.9			
Approach LOS		E				E			D			

Intersection Summary			
HCM Average Control Delay	54.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	87.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	34	130	240	23	288	18	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Total Lost time (s)		6.0	6.0		6.0		
Lane Util. Factor		1.00	1.00		1.00		
Frt		1.00	0.85		0.99		
Flt Protected		0.99	1.00		0.96		
Satd. Flow (prot)		1988	1656		1980		
Flt Permitted		0.79	1.00		0.96		
Satd. Flow (perm)		1595	1656		1980		
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.86
Adj. Flow (vph)	37	140	258	27	335	21	2
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	180	258	0	385	0	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Actuated Green, G (s)		13.1	42.3		17.1		
Effective Green, g (s)		13.1	42.3		17.1		
Actuated g/C Ratio		0.15	0.48		0.20		
Clearance Time (s)		6.0	6.0		6.0		
Vehicle Extension (s)		5.0	5.0		5.0		
Lane Grp Cap (vph)		239	801		387		
v/s Ratio Prot			0.11		c0.19		
v/s Ratio Perm		c0.11	0.05				
v/c Ratio		0.75	0.32		0.99		
Uniform Delay, d1		35.6	13.8		35.1		
Progression Factor		1.00	1.00		1.00		
Incremental Delay, d2		19.5	0.5		44.3		
Delay (s)		55.1	14.3		79.4		
Level of Service		E	B		E		
Approach Delay (s)		31.1			79.4		
Approach LOS		C			E		
Intersection Summary							

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	3	12	368	6	11	403
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	16	15	15
Grade (%)	-3%		-5%			3%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.891		0.998			
Flt Protected	0.990					0.999
Satd. Flow (prot)	1701	0	2139	0	0	1997
Flt Permitted	0.990					0.999
Satd. Flow (perm)	1701	0	2139	0	0	1997
Link Speed (mph)	25		35			35
Link Distance (ft)	595		752			350
Travel Time (s)	16.2		14.6			6.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.58	0.58	0.88	0.88	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	5	21	418	7	12	448
Shared Lane Traffic (%)						
Lane Group Flow (vph)	26	0	425	0	0	460
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	12	368	6	11	403
Sign Control	Stop		Free			Free
Grade	-3%		-5%			3%
Peak Hour Factor	0.58	0.58	0.88	0.88	0.90	0.90
Hourly flow rate (vph)	5	21	418	7	12	448
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			752			
pX, platoon unblocked						
vC, conflicting volume	894	422			425	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	894	422			425	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	97			99	
cM capacity (veh/h)	311	637			1129	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	26	425	460
Volume Left	5	0	12
Volume Right	21	7	0
cSH	527	1700	1129
Volume to Capacity	0.05	0.25	0.01
Queue Length 95th (ft)	4	0	1
Control Delay (s)	12.2	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	12.2	0.0	0.3
Approach LOS	B		

Intersection Summary			
Average Delay	0.5 — A		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	33	86	62	317	327	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	15	15	16	16
Grade (%)	0%			-8%	3%	
Storage Length (ft)	0	50	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.902				0.988	
Flt Protected	0.986			0.992		
Satd. Flow (prot)	1746	0	0	2093	2035	0
Flt Permitted	0.986			0.992		
Satd. Flow (perm)	1746	0	0	2093	2035	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	1324			350	862	
Travel Time (s)	36.1			6.8	16.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.94	0.94	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	38	100	66	337	352	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	138	0	0	403	385	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	33	86	62	317	327	31
Sign Control	Stop			Free	Free	
Grade	0%			-8%	3%	
Peak Hour Factor	0.86	0.86	0.94	0.94	0.93	0.93
Hourly flow rate (vph)	38	100	66	337	352	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	837	368	352			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	837	368	352			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	85	95			
cM capacity (veh/h)	321	682	1202			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	138	403	385
Volume Left	38	66	0
Volume Right	100	0	33
cSH	519	1202	1700
Volume to Capacity	0.27	0.05	0.23
Queue Length 95th (ft)	27	4	0
Control Delay (s)	14.4	1.8	0.0
Lane LOS	B	A	
Approach Delay (s)	14.4	1.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.9 — A		
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	4	272	60	41	233	18	31	31	14	31	33	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	9	9	9	14	14	14
Grade (%)		-1%			0%			-3%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.976			0.992			0.975			0.953	
Flt Protected		0.999			0.993			0.980			0.985	
Satd. Flow (prot)	0	2048	0	0	1872	0	0	1658	0	0	1912	0
Flt Permitted		0.999			0.993			0.980			0.985	
Satd. Flow (perm)	0	2048	0	0	1872	0	0	1658	0	0	1912	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2916			718			672			1324	
Travel Time (s)		56.8			14.0			18.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.87	0.87	0.87	0.82	0.82	0.82	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	5	368	81	47	268	21	38	38	17	38	41	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	454	0	0	336	0	0	93	0	0	121	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	272	60	41	233	18	31	31	14	31	33	34
Peak Hour Factor	0.74	0.74	0.74	0.87	0.87	0.87	0.82	0.82	0.82	0.81	0.81	0.81
Hourly flow rate (vph)	5	368	81	47	268	21	38	38	17	38	41	42

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total (vph)	454	336	93	121
Volume Left (vph)	5	47	38	38
Volume Right (vph)	81	21	17	42
Hadj (s)	-0.10	-0.01	-0.03	-0.14
Departure Headway (s)	4.9	5.2	6.1	5.9
Degree Utilization, x	0.62	0.48	0.16	0.20
Capacity (veh/h)	700	661	497	520
Control Delay (s)	15.8	12.9	10.3	10.4
Approach Delay (s)	15.8	12.9	10.3	10.4
Approach LOS	C	B	B	B

Intersection Summary			
Delay	13.7		
HCM Level of Service	B		
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	47	263	575	77	243	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.885		0.984			
Flt Protected	0.992					0.983
Satd. Flow (prot)	1724	0	2129	0	0	2065
Flt Permitted	0.992					0.983
Satd. Flow (perm)	1724	0	2129	0	0	2065
Link Speed (mph)	35		35			35
Link Distance (ft)	2916		1087			300
Travel Time (s)	56.8		21.2			5.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	56	313	625	84	286	562
Shared Lane Traffic (%)						
Lane Group Flow (vph)	369	0	709	0	0	848
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	47	263	575	77	243	478
Sign Control	Stop		Free			Free
Grade	0%		-3%			-1%
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Hourly flow rate (vph)	56	313	625	84	286	562
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1087			
pX, platoon unblocked	0.90	0.90			0.90	
vC, conflicting volume	1801	667			709	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1834	575			622	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	33			67	
cM capacity (veh/h)	51	470			873	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	369	709	848
Volume Left	56	0	286
Volume Right	313	84	0
cSH	210	1700	873
Volume to Capacity	1.76	0.42	0.33
Queue Length 95th (ft)	634	0	36
Control Delay (s)	399.4	0.0	7.4
Lane LOS	F		A
Approach Delay (s)	399.4	0.0	7.4
Approach LOS	F		

Intersection Summary			
Average Delay	79.8 – F		
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	47	263	575	77	243	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.885		0.984			
Flt Protected	0.992					0.983
Satd. Flow (prot)	1724	0	2129	0	0	2065
Flt Permitted	0.992					*0.470
Satd. Flow (perm)	1724	0	2129	0	0	987
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	237		12			
Link Speed (mph)	35		35			35
Link Distance (ft)	2916		1087			300
Travel Time (s)	56.8		21.2			5.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	56	313	625	84	286	562
Shared Lane Traffic (%)						
Lane Group Flow (vph)	369	0	709	0	0	848
Number of Detectors	1		0		1	0
Detector Template	Left				Left	
Leading Detector (ft)	35		0		20	0
Trailing Detector (ft)	-5		0		0	0
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8					
Switch Phase						
Minimum Initial (s)	7.0		20.0		7.0	20.0
Minimum Split (s)	13.0		26.0		13.0	26.0
Total Split (s)	21.0	0.0	66.0	0.0	13.0	79.0
Total Split (%)	21.0%	0.0%	66.0%	0.0%	13.0%	79.0%
Maximum Green (s)	15.0		60.0		7.0	73.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0
Recall Mode	None		Max		Max	Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.86		0.54			1.04
Control Delay	35.8		12.9			55.4
Queue Delay	0.0		0.0			0.0
Total Delay	35.8		12.9			55.4
Queue Length 50th (ft)	80		246			~258
Queue Length 95th (ft)	#172		346			#437
Internal Link Dist (ft)	2836		1007			220
Turn Bay Length (ft)						
Base Capacity (vph)	466		1315			817
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.79		0.54			1.04

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 97.6

Natural Cycle: 75

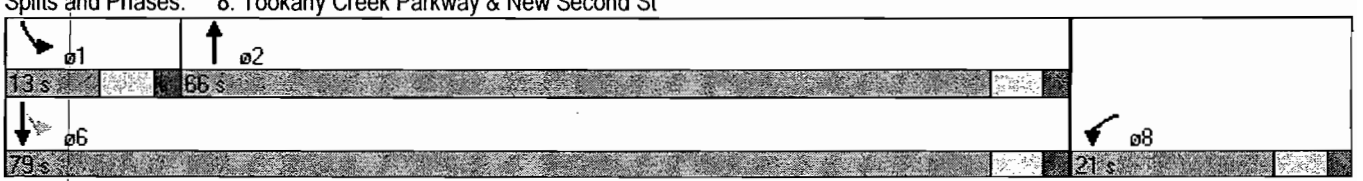
Control Type: Semi Act-Uncoord

* User Entered Value

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Tookany Creek Parkway & New Second St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	47	263	575	77	243	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	0.89		0.98			1.00
Flt Protected	0.99		1.00			0.98
Satd. Flow (prot)	1725		2129			2066
Flt Permitted	0.99		1.00			0.47
Satd. Flow (perm)	1725		2129			987
Peak-hour factor, PHF	0.84	0.84	0.92	0.92	0.85	0.85
Adj. Flow (vph)	56	313	625	84	286	562
RTOR Reduction (vph)	207	0	5	0	0	0
Lane Group Flow (vph)	162	0	704	0	0	848
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	12.5		60.1			73.1
Effective Green, g (s)	12.5		60.1			73.1
Actuated g/C Ratio	0.13		0.62			0.75
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	221		1311			817
v/s Ratio Prot	c0.09		0.33			c0.07
v/s Ratio Perm						c0.70
v/c Ratio	0.73		0.54			1.04
Uniform Delay, d1	41.0		10.8			12.2
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	11.9		1.6			41.7
Delay (s)	52.9		12.3			54.0
Level of Service	D		B			D
Approach Delay (s)	52.9		12.3			54.0
Approach LOS	D		B			D

Intersection Summary			
HCM Average Control Delay	38.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	97.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	107.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX M

2015 Future with Development Capacity/Level-of-Service Analysis Worksheets

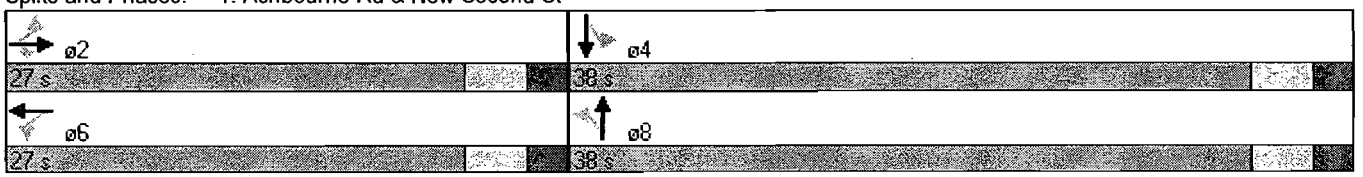
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	128	28	14	201	143	23	352	8	112	474	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Storage Length (ft)	0		110	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.946			0.997			0.982	
Flt Protected		0.978			0.998			0.997			0.992	
Satd. Flow (prot)	0	1840	1653	0	1899	0	0	2068	0	0	1806	0
Flt Permitted		0.571			0.982			0.940			0.847	
Satd. Flow (perm)	0	1074	1653	0	1868	0	0	1949	0	0	1542	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			36					2			18	
Link Speed (mph)		25			40			35			35	
Link Distance (ft)		500			433			500			1087	
Travel Time (s)		13.6			7.4			9.7			21.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	139	166	36	15	214	152	29	446	10	122	515	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	305	36	0	381	0	0	485	0	0	738	0
Number of Detectors	1	0	0	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	35	0	0	35	0		35	0		35	0	
Trailing Detector (ft)	-5	0	0	-5	0		-5	0		-5	0	
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase												
Switch Phase												
Minimum Initial (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		38.0	38.0		38.0	38.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	41.5%	0.0%	58.5%	58.5%	0.0%	58.5%	58.5%	0.0%
Maximum Green (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max	Max	Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.84	0.06		0.60			0.49			0.93	
Control Delay		43.2	6.0		22.7			12.6			36.5	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		43.2	6.0		22.7			12.6			36.5	
Queue Length 50th (ft)		110	0		123			116			248	
Queue Length 95th (ft)		#185	13		205			155			#483	
Internal Link Dist (ft)		420			353			420			1007	
Turn Bay Length (ft)			110									
Base Capacity (vph)		364	583		632			990			792	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.84	0.06		0.60			0.49			0.93	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 65
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ashbourne Rd & New Second St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	128	28	14	201	143	23	352	8	112	474	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.95			1.00			0.98	
Flt Protected		0.98	1.00		1.00			1.00			0.99	
Satd. Flow (prot)		1840	1653		1899			2068			1805	
Flt Permitted		0.57	1.00		0.98			0.94			0.85	
Satd. Flow (perm)		1074	1653		1868			1950			1541	
Peak-hour factor, PHF	0.77	0.77	0.77	0.94	0.94	0.94	0.79	0.79	0.79	0.92	0.92	0.92
Adj. Flow (vph)	139	166	36	15	214	152	29	446	10	122	515	101
RTOR Reduction (vph)	0	0	24	0	0	0	0	1	0	0	9	0
Lane Group Flow (vph)	0	305	12	0	381	0	0	484	0	0	729	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	3%	3%	3%	4%	4%	4%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)		22.0	22.0		22.0			33.0			33.0	
Effective Green, g (s)		22.0	22.0		22.0			33.0			33.0	
Actuated g/C Ratio		0.34	0.34		0.34			0.51			0.51	
Clearance Time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Grp Cap (vph)		364	559		632			990			782	
v/s Ratio Prot												
v/s Ratio Perm		c0.28	0.01		0.20			0.25			c0.47	
v/c Ratio		0.84	0.02		0.60			0.49			0.93	
Uniform Delay, d1		19.9	14.3		17.9			10.5			15.0	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		20.1	0.1		4.2			1.7			19.4	
Delay (s)		39.9	14.4		22.1			12.2			34.3	
Level of Service		D	B		C			B			C	
Approach Delay (s)		37.2			22.1			12.2			34.3	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM Average Control Delay	26.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	119.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	235	3	0	334	2	6	0	0	5	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		-4%			-4%			-2%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.999						0.897	
Flt Protected		0.998						0.950			0.988	
Satd. Flow (prot)	0	1930	0	0	1936	0	0	1762	0	0	1651	0
Flt Permitted		0.998						0.950			0.988	
Satd. Flow (perm)	0	1930	0	0	1936	0	0	1762	0	0	1651	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		433			1750			486			448	
Travel Time (s)		8.4			34.1			13.3			12.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.81	0.81	0.73	0.73	0.73	0.75	0.75	0.75	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	290	4	0	458	3	8	0	0	6	0	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	305	0	0	461	0	0	8	0	0	25	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	235	3	0	334	2	6	0	0	5	0	17
Sign Control		Free			Free			Stop			Stop	
Grade		-4%			-4%			-2%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.73	0.73	0.73	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	11	290	4	0	458	3	8	0	0	6	0	19
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		433										
pX, platoon unblocked												
vC, conflicting volume	460			294			792	774	292	773	775	459
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	460			294			792	774	292	773	775	459
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	100	100	98	100	97
cM capacity (veh/h)	1111			1279			298	328	752	314	326	602

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	305	460	8	24
Volume Left	11	0	8	6
Volume Right	4	3	0	19
cSH	1111	1279	298	498
Volume to Capacity	0.01	0.00	0.03	0.05
Queue Length 95th (ft)	1	0	2	4
Control Delay (s)	0.4	0.0	17.4	12.6
Lane LOS	A		C	B
Approach Delay (s)	0.4	0.0	17.4	12.6
Approach LOS			C	B

Intersection Summary			
Average Delay	0.7 – A		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

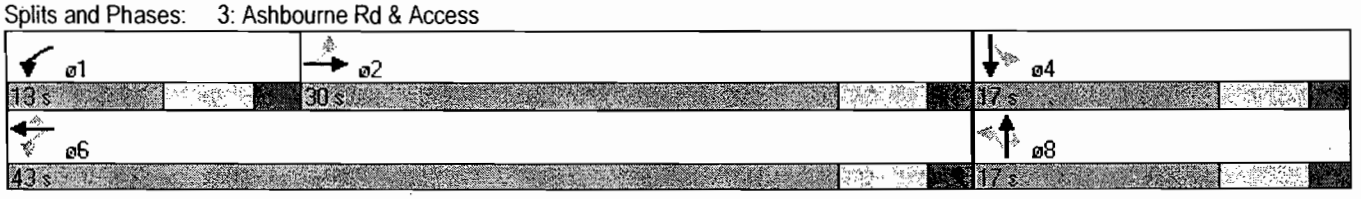
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	219	21	271	274	9	59	5	196	16	8	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Storage Length (ft)	140		0	150		75	0		45	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987				0.850			0.850		0.990	
Flt Protected	0.950			0.950				0.956			0.970	
Satd. Flow (prot)	1627	1691	0	1525	1665	1617	0	1627	1596	0	1634	0
Flt Permitted	0.583			0.452				0.743			0.765	
Satd. Flow (perm)	999	1691	0	726	1665	1617	0	1264	1596	0	1289	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						9			245			
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1750			1349			500			300	
Travel Time (s)		29.8			23.0			9.7			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.95	0.95	0.95	0.80	0.80	0.80	0.25	0.25	0.25
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	9%	9%	9%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	1	267	26	285	288	9	74	6	245	64	32	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	293	0	285	288	9	0	80	245	0	104	0
Number of Detectors	0	0		1	0	0	1	1	1	1	1	
Detector Template												
Leading Detector (ft)	0	0		35	0	0	35	35	35	20	20	
Trailing Detector (ft)	0	0		-5	0	0	-5	-5	-5	-5	-5	
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Detector Phase				1		6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	24.0	24.0		3.0	24.0	24.0	3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	30.0	30.0		10.0	30.0	30.0	9.0	9.0	9.0	9.0	9.0	
Total Split (s)	30.0	30.0	0.0	13.0	43.0	43.0	17.0	17.0	17.0	17.0	17.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	21.7%	71.7%	71.7%	28.3%	28.3%	28.3%	28.3%	28.3%	0.0%
Maximum Green (s)	24.0	24.0		7.0	37.0	37.0	11.0	11.0	11.0	11.0	11.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	Min	Min		None	Min	Min	None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.00	0.42		0.51	0.27	0.01		0.40	0.54		0.51	
Control Delay	11.0	15.0		8.8	5.8	2.8		28.3	8.4		31.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	11.0	15.0		8.8	5.8	2.8		28.3	8.4		31.9	
Queue Length 50th (ft)	0	72		39	39	0		26	0		34	
Queue Length 95th (ft)	2	116		75	74	4		53	35		19	
Internal Link Dist (ft)		1670			1269			420			220	
Turn Bay Length (ft)	140			150		75			45			
Base Capacity (vph)	413	698		558	1060	1033		239	501		244	
Starvation Cap Reductn	0	0		0	0	0		0	0		0	
Spillback Cap Reductn	0	0		0	0	0		0	0		0	
Storage Cap Reductn	0	0		0	0	0		0	0		0	
Reduced v/c Ratio	0.00	0.42		0.51	0.27	0.01		0.33	0.49		0.43	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 58.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ashbourne Rd & Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	219	21	271	274	9	59	5	196	16	8	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		0.97	
Satd. Flow (prot)	1627	1690		1525	1665	1617		1627	1596		1634	
Flt Permitted	0.58	1.00		0.45	1.00	1.00		0.74	1.00		0.77	
Satd. Flow (perm)	999	1690		726	1665	1617		1265	1596		1289	
Peak-hour factor, PHF	0.82	0.82	0.82	0.95	0.95	0.95	0.80	0.80	0.80	0.25	0.25	0.25
Adj. Flow (vph)	1	267	26	285	288	9	74	6	245	64	32	8
RTOR Reduction (vph)	0	0	0	0	0	3	0	0	207	0	0	0
Lane Group Flow (vph)	1	293	0	285	288	6	0	80	38	0	104	0
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	9%	9%	9%	0%	0%	0%
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	24.0	24.0		37.0	37.0	37.0		9.1	9.1		9.1	
Effective Green, g (s)	24.0	24.0		37.0	37.0	37.0		9.1	9.1		9.1	
Actuated g/C Ratio	0.41	0.41		0.64	0.64	0.64		0.16	0.16		0.16	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	413	698		559	1060	1030		198	250		202	
v/s Ratio Prot		0.17		c0.06	0.17							
v/s Ratio Perm	0.00			c0.26		0.00		0.06	0.02		c0.08	
v/c Ratio	0.00	0.42		0.51	0.27	0.01		0.40	0.15		0.51	
Uniform Delay, d1	10.0	12.1		5.3	4.6	3.8		22.1	21.2		22.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.4		0.7	0.1	0.0		1.3	0.3		2.2	
Delay (s)	10.0	12.5		6.0	4.8	3.8		23.4	21.5		24.7	
Level of Service	B	B		A	A	A		C	C		C	
Approach Delay (s)		12.5			5.4			21.9			24.7	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lane Configurations												
Volume (vph)	165	6	213	47	2	6	13	2	13	69	15	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12	12	12	16	16	16	15
Grade (%)		0%					1%			1%		
Storage Length (ft)	220		0			0		0	0			
Storage Lanes	1		0			0		0	0			
Taper Length (ft)	25		25			25		25	25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.853					0.986			0.979		
Flt Protected	0.950						0.982			0.993		
Satd. Flow (prot)	1646	1478	0	0	0	0	1743	0	0	2062	0	0
Flt Permitted	0.950						0.982			0.937		
Satd. Flow (perm)	1646	1478	0	0	0	0	1743	0	0	1946	0	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)		40					25			15		
Link Distance (ft)		1349					528			501		
Travel Time (s)		23.0					14.4			22.8		
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.77	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	1%	1%	1%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%					0%			0%		
Adj. Flow (vph)	214	8	277	61	3	8	16	3	16	86	19	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	214	346	0	0	0	0	30	0	0	121	0	0
Number of Detectors	1	1			1	1	1		1	1		2
Detector Template												
Leading Detector (ft)	35	35			35	35	35		35	35		70
Trailing Detector (ft)	-5	-5			-5	-5	-5		-5	-5		-5
Turn Type	Split				Perm	Split			Perm			Perm
Protected Phases	2	2				6	6			8		
Permitted Phases		2			6				8			4
Detector Phase	2	2			6	6	6		8	8		4
Switch Phase												
Minimum Initial (s)	8.0	8.0			5.0	5.0	5.0		8.0	8.0		8.0
Minimum Split (s)	14.0	14.0			11.0	11.0	11.0		14.0	14.0		14.0
Total Split (s)	35.0	35.0	0.0	0.0	13.0	13.0	13.0	0.0	17.0	17.0	0.0	17.0
Total Split (%)	38.9%	38.9%	0.0%	0.0%	14.4%	14.4%	14.4%	0.0%	18.9%	18.9%	0.0%	18.9%
Maximum Green (s)	29.0	29.0			7.0	7.0	7.0		11.0	11.0		11.0
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		4.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	-2.0	-2.0	0.0	0.0	-2.0	0.0	0.0	-2.0
Total Lost Time (s)	6.0	6.0	4.0	4.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	21	100	240	28	290	24	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Storage Length (ft)	0		150		0	0	
Storage Lanes	0		1		1	0	
Taper Length (ft)	25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							
Frt			0.850		0.990		
Flt Protected		0.991			0.956		
Satd. Flow (prot)	0	1936	1610	0	1978	0	0
Flt Permitted		0.922			0.956		
Satd. Flow (perm)	0	1801	1610	0	1978	0	0
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		35			25		
Link Distance (ft)		752			574		
Travel Time (s)		14.6			15.7		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.98	0.98	0.98	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%			0%		
Adj. Flow (vph)	21	102	245	29	305	25	1
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	124	245	0	360	0	0
Number of Detectors	2	2	1	1	1		
Detector Template							
Leading Detector (ft)	70	70	35	35	35		
Trailing Detector (ft)	-5	-5	-5	-5	-5		
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Detector Phase	4	4	2	9	9		
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		
Total Split (s)	17.0	17.0	35.0	25.0	25.0	0.0	0.0
Total Split (%)	18.9%	18.9%	38.9%	27.8%	27.8%	0.0%	0.0%
Maximum Green (s)	11.0	11.0	29.0	19.0	19.0		
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	4.0

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0	5.0	5.0		5.0	5.0		5.0
Minimum Gap (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		3.0
Time Before Reduce (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0			0.0	0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None			None	None	None		Max	Max		Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.42	0.76					0.19			0.44		
Control Delay	25.9	38.2					41.6			41.0		
Queue Delay	0.0	0.0					0.0			0.0		
Total Delay	25.9	38.2					41.6			41.0		
Queue Length 50th (ft)	94	173					16			65		
Queue Length 95th (ft)	130	221					38			106		
Internal Link Dist (ft)		1269					448			421		
Turn Bay Length (ft)	220											
Base Capacity (vph)	615	552					157			276		
Starvation Cap Reductn	0	0					0			0		
Spillback Cap Reductn	0	0					0			0		
Storage Cap Reductn	0	0					0			0		
Reduced v/c Ratio	0.35	0.63					0.19			0.44		

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 79.9

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Ashbourne Rd & Arbor Rd

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0		
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Recall Mode	Max	Max	None	None	None		
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
v/c Ratio		0.49	0.31		0.79		
Control Delay		42.7	9.8		45.4		
Queue Delay		0.0	0.0		0.0		
Total Delay		42.7	9.8		45.4		
Queue Length 50th (ft)		68	50		199		
Queue Length 95th (ft)		124	83		#349		
Internal Link Dist (ft)		672			494		
Turn Bay Length (ft)			150				
Base Capacity (vph)		255	785		485		
Starvation Cap Reductn		0	0		0		
Spillback Cap Reductn		0	0		0		
Storage Cap Reductn		0	0		0		
Reduced v/c Ratio		0.49	0.31		0.74		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL2
Lane Configurations												
Volume (vph)	165	6	213	47	2	6	13	2	13	69	15	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	12	12	12	12	16	16	16	15
Grade (%)		0%					1%			1%		
Total Lost time (s)	6.0	6.0					6.0			6.0		
Lane Util. Factor	1.00	1.00					1.00			1.00		
Frt	1.00	0.85					0.99			0.98		
Flt Protected	0.95	1.00					0.98			0.99		
Satd. Flow (prot)	1646	1479					1744			2063		
Flt Permitted	0.95	1.00					0.98			0.94		
Satd. Flow (perm)	1646	1479					1744			1946		
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.79	0.79	0.79	0.79	0.80	0.80	0.80	0.98
Adj. Flow (vph)	214	8	277	61	3	8	16	3	16	86	19	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	214	346	0	0	0	0	30	0	0	121	0	0
Heavy Vehicles (%)	6%	6%	6%	6%	5%	5%	5%	5%	1%	1%	1%	7%
Turn Type	Split				Perm	Split			Perm			Perm
Protected Phases	2	2				6	6			8		
Permitted Phases		2			6				8			4
Actuated Green, G (s)	24.6	24.6					3.7			11.3		
Effective Green, g (s)	24.6	24.6					3.7			11.3		
Actuated g/C Ratio	0.30	0.30					0.05			0.14		
Clearance Time (s)	6.0	6.0					6.0			6.0		
Vehicle Extension (s)	5.0	5.0					5.0			5.0		
Lane Grp Cap (vph)	493	443					79			268		
v/s Ratio Prot	0.13	c0.23					c0.02					
v/s Ratio Perm										0.06		
v/c Ratio	0.43	0.78					0.38			0.45		
Uniform Delay, d1	23.1	26.3					38.1			32.6		
Progression Factor	1.00	1.00					1.00			1.00		
Incremental Delay, d2	1.3	10.0					6.3			5.4		
Delay (s)	24.4	36.3					44.4			38.0		
Level of Service	C	D					D			D		
Approach Delay (s)		31.8					44.4			38.0		
Approach LOS		C					D			D		

Intersection Summary			
HCM Average Control Delay	33.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	82.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	21	100	240	28	290	24	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Total Lost time (s)		6.0	6.0		6.0		
Lane Util. Factor		1.00	1.00		1.00		
Frt		1.00	0.85		0.99		
Flt Protected		0.99	1.00		0.96		
Satd. Flow (prot)		1936	1610		1978		
Flt Permitted		0.92	1.00		0.96		
Satd. Flow (perm)		1801	1610		1978		
Peak-hour factor, PHF	0.98	0.98	0.98	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	102	245	29	305	25	1
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	124	245	0	360	0	0
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	2%
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Actuated Green, G (s)		11.3	35.9		18.5		
Effective Green, g (s)		11.3	35.9		18.5		
Actuated g/C Ratio		0.14	0.44		0.23		
Clearance Time (s)		6.0	6.0		6.0		
Vehicle Extension (s)		5.0	5.0		5.0		
Lane Grp Cap (vph)		248	704		446		
v/s Ratio Prot			0.10		c0.18		
v/s Ratio Perm		c0.07	0.05				
v/c Ratio		0.50	0.35		0.81		
Uniform Delay, d1		32.8	15.3		30.1		
Progression Factor		1.00	1.00		1.00		
Incremental Delay, d2		7.0	0.6		11.6		
Delay (s)		39.8	16.0		41.7		
Level of Service		D	B		D		
Approach Delay (s)		24.0			41.7		
Approach LOS		C			D		

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	0	18	9	0	16	4	254	2	3	334	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	16	15	15	12
Grade (%)		0%			-3%			-5%			3%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.941			0.912			0.999			0.998	
Flt Protected		0.973			0.983			0.999				
Satd. Flow (prot)	0	1706	0	0	1729	0	0	2079	0	0	1939	0
Flt Permitted		0.973			0.983			0.999				
Satd. Flow (perm)	0	1706	0	0	1729	0	0	2079	0	0	1939	0
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		285			484			752			350	
Travel Time (s)		7.8			13.2			14.6			6.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.86	0.90	0.86	0.90	0.84	0.84	0.91	0.91	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	6%	6%	6%	6%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	26	0	20	10	0	19	4	302	2	3	367	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	46	0	0	29	0	0	308	0	0	376	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	0	18	9	0	16	4	254	2	3	334	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			-3%			-5%			3%	
Peak Hour Factor	0.90	0.90	0.90	0.86	0.90	0.86	0.90	0.84	0.84	0.91	0.91	0.90
Hourly flow rate (vph)	26	0	20	10	0	19	4	302	2	3	367	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								752				
pX, platoon unblocked												
vC, conflicting volume	707	690	370	709	692	304	373			305		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	707	690	370	709	692	304	373			305		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	92	100	97	97	100	97	100			100		
cM capacity (veh/h)	339	366	676	340	365	741	1186			1234		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	46	29	309	376
Volume Left	26	10	4	3
Volume Right	20	19	2	6
cSH	434	520	1186	1234
Volume to Capacity	0.10	0.06	0.00	0.00
Queue Length 95th (ft)	9	4	0	0
Control Delay (s)	14.3	12.3	0.2	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	14.3	12.3	0.2	0.1
Approach LOS	B	B		

Intersection Summary			
Average Delay	1.4 – A		
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	13	80	93	200	262	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	15	15	16	16
Grade (%)	0%			-8%	3%	
Storage Length (ft)	0	50	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.884				0.989	
Flt Protected	0.993			0.984		
Satd. Flow (prot)	1673	0	0	2037	1942	0
Flt Permitted	0.993			0.984		
Satd. Flow (perm)	1673	0	0	2037	1942	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	1329			350	719	
Travel Time (s)	36.2			6.8	14.0	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.71	0.71	0.89	0.89	0.82	0.82
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	5%	5%	8%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	18	113	104	225	320	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	131	0	0	329	347	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	13	80	93	200	262	22
Sign Control	Stop			Free	Free	
Grade	0%			-8%	3%	
Peak Hour Factor	0.71	0.71	0.89	0.89	0.82	0.82
Hourly flow rate (vph)	18	113	104	225	320	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	767	333	320			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	767	333	320			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	84	91			
cM capacity (veh/h)	338	707	1224			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	131	329	346
Volume Left	18	104	0
Volume Right	113	0	27
cSH	613	1224	1700
Volume to Capacity	0.21	0.09	0.20
Queue Length 95th (ft)	20	7	0
Control Delay (s)	12.5	3.2	0.0
Lane LOS	B	A	
Approach Delay (s)	12.5	3.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.3 – A		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	7	179	17	42	250	23	21	35	8	56	45	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	9	9	9	14	14	14
Grade (%)		-1%			0%			-3%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.989			0.990			0.982			0.977	
Flt Protected		0.998			0.993			0.984			0.978	
Satd. Flow (prot)	0	2053	0	0	1831	0	0	1677	0	0	1889	0
Flt Permitted		0.998			0.993			0.984			0.978	
Satd. Flow (perm)	0	2053	0	0	1831	0	0	1677	0	0	1889	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2917			950			663			1329	
Travel Time (s)		56.8			18.5			18.1			36.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	8	201	19	47	281	26	25	42	10	66	53	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	228	0	0	354	0	0	77	0	0	144	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	7	179	17	42	250	23	21	35	8	56	45	21
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.83	0.83	0.83	0.85	0.85	0.85
Hourly flow rate (vph)	8	201	19	47	281	26	25	42	10	66	53	25

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total (vph)	228	354	77	144
Volume Left (vph)	8	47	25	66
Volume Right (vph)	19	26	10	25
Hadj (s)	-0.03	0.02	-0.01	0.04
Departure Headway (s)	5.0	4.9	5.6	5.5
Degree Utilization, x	0.32	0.48	0.12	0.22
Capacity (veh/h)	674	708	560	580
Control Delay (s)	10.3	12.3	9.4	10.1
Approach Delay (s)	10.3	12.3	9.4	10.1
Approach LOS	B	B	A	B

Intersection Summary			
Delay	11.0		
HCM Level of Service	B		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	83	231	546	56	148	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.901		0.987			
Flt Protected	0.987					0.990
Satd. Flow (prot)	1729	0	2136	0	0	2059
Flt Permitted	0.987					0.990
Satd. Flow (perm)	1729	0	2136	0	0	2059
Link Speed (mph)	35		35			35
Link Distance (ft)	2917		1087			792
Travel Time (s)	56.8		21.2			15.4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	92	257	620	64	156	626
Shared Lane Traffic (%)						
Lane Group Flow (vph)	349	0	684	0	0	782
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	83	231	546	56	148	595
Sign Control	Stop		Free			Free
Grade	0%		-3%			-1%
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Hourly flow rate (vph)	92	257	620	64	156	626
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1087			
pX, platoon unblocked	0.91	0.91			0.91	
vC, conflicting volume	1590	652			684	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1599	567			602	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	46			83	
cM capacity (veh/h)	88	477			891	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	349	684	782
Volume Left	92	0	156
Volume Right	257	64	0
cSH	220	1700	891
Volume to Capacity	1.59	0.40	0.17
Queue Length 95th (ft)	551	0	16
Control Delay (s)	323.3	0.0	4.2
Lane LOS	F		A
Approach Delay (s)	323.3	0.0	4.2
Approach LOS	F		

Intersection Summary			
Average Delay	63.9	F	
Intersection Capacity Utilization	100.5%	ICU Level of Service	G
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	83	231	546	56	148	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.901		0.987			
Flt Protected	0.987					0.990
Satd. Flow (prot)	1729	0	2136	0	0	2059
Flt Permitted	0.987					0.457
Satd. Flow (perm)	1729	0	2136	0	0	*957
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	136		9			
Link Speed (mph)	35		35			35
Link Distance (ft)	2917		1087			792
Travel Time (s)	56.8		21.2			15.4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.88	0.88	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	92	257	620	64	156	626
Shared Lane Traffic (%)						
Lane Group Flow (vph)	349	0	684	0	0	782
Number of Detectors	1		0		1	0
Detector Template						
Leading Detector (ft)	35		0		35	0
Trailing Detector (ft)	-5		0		-5	0
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8					
Switch Phase						
Minimum Initial (s)	7.0		20.0		7.0	20.0
Minimum Split (s)	13.0		26.0		13.0	26.0
Total Split (s)	22.0	0.0	55.0	0.0	13.0	68.0
Total Split (%)	24.4%	0.0%	61.1%	0.0%	14.4%	75.6%
Maximum Green (s)	16.0		49.0		7.0	62.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0

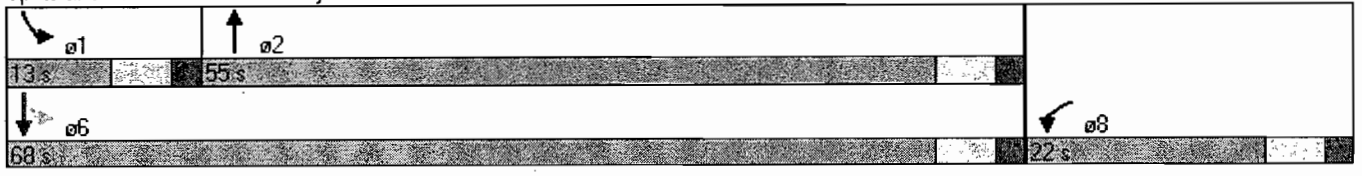
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0
Recall Mode	None		Max		Max	Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.88		0.58			1.03
Control Delay	45.8		15.5			55.9
Queue Delay	0.0		0.0			0.0
Total Delay	45.8		15.5			55.9
Queue Length 50th (ft)	119		241			~222
Queue Length 95th (ft)	#266		334			#483
Internal Link Dist (ft)	2837		1007			712
Turn Bay Length (ft)						
Base Capacity (vph)	424		1186			757
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.82		0.58			1.03

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 88.6
Natural Cycle: 70
Control Type: Semi Act-Uncoord

* User Entered Value
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Tookany Creek Rd & New Second St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	83	231	546	56	148	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	0.90		0.99			1.00
Flt Protected	0.99		1.00			0.99
Satd. Flow (prot)	1728		2137			2059
Flt Permitted	0.99		1.00			0.46
Satd. Flow (perm)	1728		2137			957
Peak-hour factor, PHF	0.90	0.90	0.88	0.88	0.95	0.95
Adj. Flow (vph)	92	257	620	64	156	626
RTOR Reduction (vph)	114	0	4	0	0	0
Lane Group Flow (vph)	235	0	680	0	0	782
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	14.6		49.0			62.0
Effective Green, g (s)	14.6		49.0			62.0
Actuated g/C Ratio	0.16		0.55			0.70
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	285		1182			757
v/s Ratio Prot	c0.14		0.32			c0.08
v/s Ratio Perm						c0.64
v/c Ratio	0.83		0.58			1.03
Uniform Delay, d1	35.8		13.0			13.3
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	17.5		2.0			41.5
Delay (s)	53.2		15.0			54.8
Level of Service	D		B			D
Approach Delay (s)	53.2		15.0			54.8
Approach LOS	D		B			D

Intersection Summary			
HCM Average Control Delay	39.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	88.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	256	33	19	157	150	28	402	16	124	324	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	14	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Storage Length (ft)	0		110	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850		0.938			0.995			0.980	
Flt Protected		0.986			0.997			0.997			0.988	
Satd. Flow (prot)	0	1873	1723	0	1936	0	0	2104	0	0	1831	0
Flt Permitted		0.680			0.963			0.946			0.773	
Satd. Flow (perm)	0	1292	1723	0	1870	0	0	1997	0	0	1432	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			37					4			20	
Link Speed (mph)		25			40			35			35	
Link Distance (ft)		500			433			500			1087	
Travel Time (s)		13.6			7.4			9.7			21.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.79	0.79	0.79	0.90	0.90	0.90	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	112	288	37	24	199	190	31	447	18	144	377	91
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	400	37	0	413	0	0	496	0	0	612	0
Number of Detectors	1	0	0	1	0		1	0		1	0	
Detector Template												
Leading Detector (ft)	35	0	0	35	0		35	0		35	0	
Trailing Detector (ft)	-5	0	0	-5	0		-5	0		-5	0	
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase												
Switch Phase												
Minimum Initial (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		38.0	38.0		38.0	38.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Split (%)	41.5%	41.5%	41.5%	41.5%	41.5%	0.0%	58.5%	58.5%	0.0%	58.5%	58.5%	0.0%
Maximum Green (s)	22.0	22.0	22.0	22.0	22.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max	Max	Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.92	0.06		0.65			0.49			0.83	
Control Delay		50.5	6.0		24.1			12.4			25.7	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		50.5	6.0		24.1			12.4			25.7	
Queue Length 50th (ft)		149	0		136			118			186	
Queue Length 95th (ft)		#301	17		187			190			#352	
Internal Link Dist (ft)		420			353			420			1007	
Turn Bay Length (ft)			110									
Base Capacity (vph)		437	608		633			1016			737	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.92	0.06		0.65			0.49			0.83	

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 65

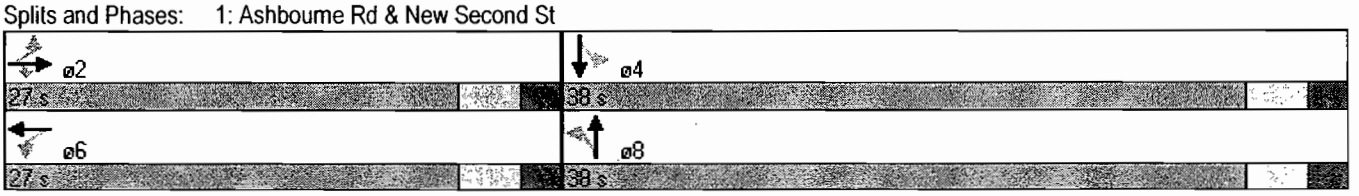
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 70

Control Type: Pretimed

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Ashbourne Rd & New Second St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	256	33	19	157	150	28	402	16	124	324	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	14	16	16	16	16	16	16	12	12	12
Grade (%)		-4%			2%			1%			-3%	
Total Lost time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.94			1.00			0.98	
Flt Protected		0.99	1.00		1.00			1.00			0.99	
Satd. Flow (prot)		1874	1723		1936			2104			1831	
Flt Permitted		0.68	1.00		0.96			0.95			0.77	
Satd. Flow (perm)		1292	1723		1869			1998			1433	
Peak-hour factor, PHF	0.89	0.89	0.89	0.79	0.79	0.79	0.90	0.90	0.90	0.86	0.86	0.86
Adj. Flow (vph)	112	288	37	24	199	190	31	447	18	144	377	91
RTOR Reduction (vph)	0	0	24	0	0	0	0	2	0	0	10	0
Lane Group Flow (vph)	0	400	13	0	413	0	0	494	0	0	602	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)		22.0	22.0		22.0			33.0			33.0	
Effective Green, g (s)		22.0	22.0		22.0			33.0			33.0	
Actuated g/C Ratio		0.34	0.34		0.34			0.51			0.51	
Clearance Time (s)		5.0	5.0		5.0			5.0			5.0	
Lane Grp Cap (vph)		437	583		633			1014			728	
v/s Ratio Prot												
v/s Ratio Perm		c0.31	0.01		0.22			0.25			c0.42	
v/c Ratio		0.92	0.02		0.65			0.49			0.83	
Uniform Delay, d1		20.6	14.3		18.3			10.5			13.6	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		26.3	0.1		5.2			1.7			10.4	
Delay (s)		46.9	14.4		23.4			12.1			24.0	
Level of Service		D	B		C			B			C	
Approach Delay (s)		44.2			23.4			12.1			24.0	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM Average Control Delay	25.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	110.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	365	12	0	312	5	4	0	2	3	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		-4%			-4%			-2%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996			0.998			0.958			0.890	
Flt Protected		0.998						0.967			0.991	
Satd. Flow (prot)	0	1926	0	0	1934	0	0	1718	0	0	1643	0
Flt Permitted		0.998						0.967			0.991	
Satd. Flow (perm)	0	1926	0	0	1934	0	0	1718	0	0	1643	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		433			1750			526			356	
Travel Time (s)		8.4			34.1			14.3			9.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.84	0.84	0.84	0.38	0.38	0.38	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	26	493	16	0	371	6	11	0	5	3	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	535	0	0	377	0	0	16	0	0	16	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	365	12	0	312	5	4	0	2	3	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		-4%			-4%			-2%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.84	0.84	0.84	0.38	0.38	0.38	0.90	0.90	0.90
Hourly flow rate (vph)	26	493	16	0	371	6	11	0	5	3	0	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		433										
pX, platoon unblocked				0.87			0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	377			509			940	930	501	932	935	374
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	377			366			859	848	357	850	853	374
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			96	100	99	99	100	98
cM capacity (veh/h)	1192			1051			235	257	605	239	253	672

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	535	377	16	17
Volume Left	26	0	11	3
Volume Right	16	6	5	13
cSH	1192	1051	295	493
Volume to Capacity	0.02	0.00	0.05	0.03
Queue Length 95th (ft)	2	0	4	3
Control Delay (s)	0.6	0.0	17.9	12.6
Lane LOS	A		C	B
Approach Delay (s)	0.6	0.0	17.9	12.6
Approach LOS			C	B

Intersection Summary			
Average Delay	0.9 – A		
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		

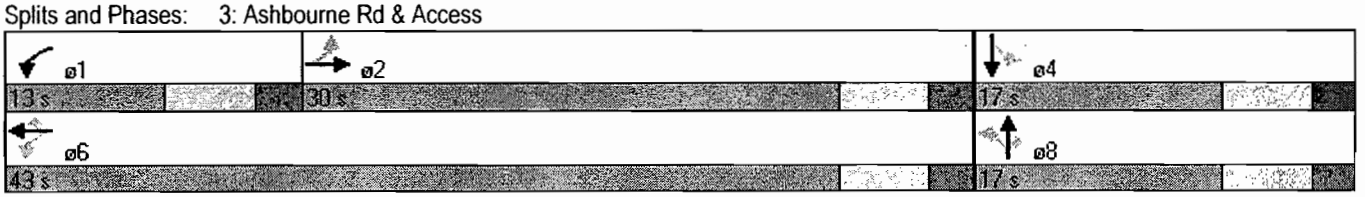
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	300	66	255	276	20	37	9	225	12	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Storage Length (ft)	140		0	150		75	0		45	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.973				0.850			0.850		0.986	
Flt Protected	0.950			0.950				0.962			0.971	
Satd. Flow (prot)	1676	1717	0	1569	1713	1664	0	1716	1673	0	814	0
Flt Permitted	0.568			0.345				0.715			0.784	
Satd. Flow (perm)	1002	1717	0	570	1713	1664	0	1275	1673	0	658	0
Right Turn on Red			No			Yes			Yes			No
Satd. Flow (RTOR)						23			265			
Link Speed (mph)		40			40			35			35	
Link Distance (ft)		1750			1349			500			300	
Travel Time (s)		29.8			23.0			9.7			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.87	0.87	0.87	0.85	0.85	0.85	0.25	0.25	0.25
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	100%	100%	100%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	3	333	73	293	317	23	44	11	265	48	24	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	406	0	293	317	23	0	55	265	0	80	0
Number of Detectors	0	0		1	0	0	1	1	1	1	1	
Detector Template												
Leading Detector (ft)	0	0		35	0	0	35	35	35	20	20	
Trailing Detector (ft)	0	0		-5	0	0	-5	-5	-5	-5	-5	
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Detector Phase				1		6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	24.0	24.0		7.0	24.0	24.0	3.0	3.0	3.0	3.0	3.0	
Minimum Split (s)	30.0	30.0		13.0	30.0	30.0	9.0	9.0	9.0	9.0	9.0	
Total Split (s)	30.0	30.0	0.0	13.0	43.0	43.0	17.0	17.0	17.0	17.0	17.0	0.0
Total Split (%)	50.0%	50.0%	0.0%	21.7%	71.7%	71.7%	28.3%	28.3%	28.3%	28.3%	28.3%	0.0%
Maximum Green (s)	24.0	24.0		7.0	37.0	37.0	11.0	11.0	11.0	11.0	11.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	Min	Min		None	Min	Min	None	None	None	None	None	
Walk Time (s)					5.0	5.0						
Flash Dont Walk (s)					11.0	11.0						
Pedestrian Calls (#/hr)					0	0						
v/c Ratio	0.01	0.58		0.62	0.30	0.02		0.25	0.52		0.71	
Control Delay	11.0	18.1		11.8	6.2	2.2		24.4	7.7		59.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	11.0	18.1		11.8	6.2	2.2		24.4	7.7		59.9	
Queue Length 50th (ft)	1	111		42	46	0		17	0		27	
Queue Length 95th (ft)	5	191		73	77	6		42	44		16	
Internal Link Dist (ft)		1670			1269			420			220	
Turn Bay Length (ft)	140			150		75			45			
Base Capacity (vph)	407	698		475	1073	1051		238	527		123	
Starvation Cap Reductn	0	0		0	0	0		0	0		0	
Spillback Cap Reductn	0	0		0	0	0		0	0		0	
Storage Cap Reductn	0	0		0	0	0		0	0		0	
Reduced v/c Ratio	0.01	0.58		0.62	0.30	0.02		0.23	0.50		0.65	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 59.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Ashbourne Rd & Access



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	300	66	255	276	20	37	9	225	12	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	10	14	11	11	14	9	9	9
Grade (%)		1%			1%			-2%			1%	
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		0.97	
Satd. Flow (prot)	1676	1717		1569	1713	1664		1715	1673		815	
Flt Permitted	0.57	1.00		0.35	1.00	1.00		0.72	1.00		0.78	
Satd. Flow (perm)	1002	1717		570	1713	1664		1276	1673		658	
Peak-hour factor, PHF	0.90	0.90	0.90	0.87	0.87	0.87	0.85	0.85	0.85	0.25	0.25	0.25
Adj. Flow (vph)	3	333	73	293	317	23	44	11	265	48	24	8
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	220	0	0	0
Lane Group Flow (vph)	3	406	0	293	317	14	0	55	45	0	80	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	100%	100%	100%
Turn Type	Perm			pm+pt		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		
Actuated Green, G (s)	24.0	24.0		37.0	37.0	37.0		10.1	10.1		10.1	
Effective Green, g (s)	24.0	24.0		37.0	37.0	37.0		10.1	10.1		10.1	
Actuated g/C Ratio	0.41	0.41		0.63	0.63	0.63		0.17	0.17		0.17	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	407	697		475	1072	1042		218	286		112	
v/s Ratio Prot		0.24		c0.07	0.19							
v/s Ratio Perm	0.00			c0.31		0.01		0.04	0.03		c0.12	
v/c Ratio	0.01	0.58		0.62	0.30	0.01		0.25	0.16		0.71	
Uniform Delay, d1	10.5	13.7		6.4	5.1	4.2		21.2	20.9		23.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	1.2		2.4	0.2	0.0		0.6	0.3		19.3	
Delay (s)	10.5	14.9		8.8	5.2	4.2		21.8	21.1		42.5	
Level of Service	B	B		A	A	A		C	C		D	
Approach Delay (s)		14.9			6.8			21.3			42.5	
Approach LOS		B			A			C			D	

Intersection Summary			
HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Volume (vph)	265	13	231	28	1	7	4	14	98	4	16	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12	12	16	16	16	16	15
Grade (%)		0%				1%			1%			
Storage Length (ft)	220		0		0		0	0		0		
Storage Lanes	1		0		0		0	0		0		
Taper Length (ft)	25		25		25		25	25		25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.857				0.955			0.980			
Flt Protected	0.950					0.996			0.995			
Satd. Flow (prot)	1711	1543	0	0	0	1199	0	0	2048	0	0	0
Flt Permitted	0.950					0.996			0.941			
Satd. Flow (perm)	1711	1543	0	0	0	1199	0	0	1937	0	0	0
Right Turn on Red				No			No				No	
Satd. Flow (RTOR)												
Link Speed (mph)		40				25			15			
Link Distance (ft)		1349				527			500			
Travel Time (s)		23.0				14.4			22.7			
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.90	0.33	0.33	0.33	0.73	0.73	0.73	0.73	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	50%	50%	50%	2%	2%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%			0%			
Adj. Flow (vph)	301	15	262	31	3	21	12	19	134	5	22	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	301	308	0	0	0	36	0	0	180	0	0	0
Number of Detectors	1	1			1	1		1	1			2
Detector Template												
Leading Detector (ft)	35	35			35	35		35	35			70
Trailing Detector (ft)	-5	-5			-5	-5		-5	-5			-5
Turn Type	Split				Split			Perm				Perm
Protected Phases	2	2			6	6			8			
Permitted Phases		2						8				4
Detector Phase	2	2			6	6		8	8			4
Switch Phase												
Minimum Initial (s)	8.0	8.0			5.0	5.0		8.0	8.0			8.0
Minimum Split (s)	14.0	14.0			11.0	11.0		14.0	14.0			14.0
Total Split (s)	32.0	32.0	0.0	0.0	15.0	15.0	0.0	19.0	19.0	0.0	0.0	19.0
Total Split (%)	35.6%	35.6%	0.0%	0.0%	16.7%	16.7%	0.0%	21.1%	21.1%	0.0%	0.0%	21.1%
Maximum Green (s)	26.0	26.0			9.0	9.0		13.0	13.0			13.0
Yellow Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			4.0
All-Red Time (s)	2.0	2.0			2.0	2.0		2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0	-2.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	4.0	6.0	4.0	4.0	6.0	4.0	4.0	4.0

Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	36	134	243	23	288	22	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Storage Length (ft)	0		150		0	0	
Storage Lanes	0		1		1	0	
Taper Length (ft)	25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							
Frt			0.850		0.990		
Flt Protected		0.989			0.956		
Satd. Flow (prot)	0	1988	1656	0	1978	0	0
Flt Permitted		0.800			0.956		
Satd. Flow (perm)	0	1608	1656	0	1978	0	0
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		35			25		
Link Distance (ft)		752			573		
Travel Time (s)		14.6			15.6		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%			0%		
Adj. Flow (vph)	39	144	261	27	335	26	2
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	186	261	0	390	0	0
Number of Detectors	2	2	1	1	1		
Detector Template							
Leading Detector (ft)	70	70	35	35	35		
Trailing Detector (ft)	-5	-5	-5	-5	-5		
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Detector Phase	4	4	2	9	9		
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0		
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		
Total Split (s)	19.0	19.0	32.0	24.0	24.0	0.0	0.0
Total Split (%)	21.1%	21.1%	35.6%	26.7%	26.7%	0.0%	0.0%
Maximum Green (s)	13.0	13.0	26.0	18.0	18.0		
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	4.0

Lane Group	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0			5.0	5.0		5.0	5.0			5.0
Minimum Gap (s)	3.0	3.0			3.0	3.0		3.0	3.0			3.0
Time Before Reduce (s)	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Time To Reduce (s)	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Recall Mode	None	None			None	None		Max	Max			Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.58	0.72				0.28			0.56			
Control Delay	29.9	38.0				43.0			41.7			
Queue Delay	0.0	0.0				0.0			0.0			
Total Delay	29.9	38.0				43.0			41.7			
Queue Length 50th (ft)	142	155				19			98			
Queue Length 95th (ft)	219	242				17			131			
Internal Link Dist (ft)		1269				447			420			
Turn Bay Length (ft)	220											
Base Capacity (vph)	609	510				137			320			
Starvation Cap Reductn	0	0				0			0			
Spillback Cap Reductn	0	0				0			0			
Storage Cap Reductn	0	0				0			0			
Reduced v/c Ratio	0.49	0.60				0.26			0.56			

Intersection Summary

Area Type: Other

Cycle Length: 90

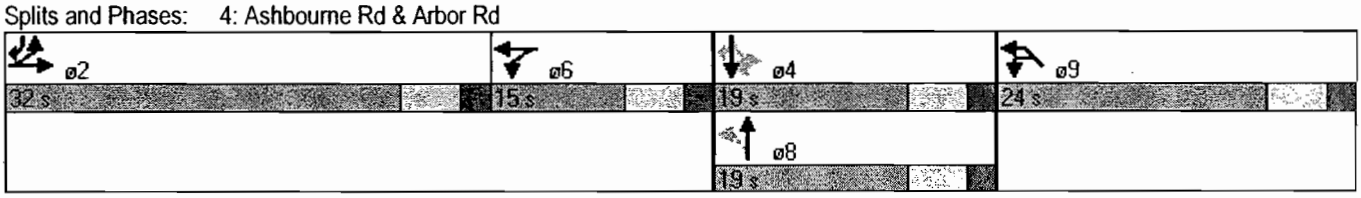
Actuated Cycle Length: 80.5

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Ashbourne Rd & Arbor Rd



Lane Group	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0		
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0		
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		
Recall Mode	Max	Max	None	None	None		
Walk Time (s)							
Flash Dont Walk (s)							
Pedestrian Calls (#/hr)							
v/c Ratio		0.70	0.33		0.86		
Control Delay		50.9	10.0		53.4		
Queue Delay		0.0	0.0		0.0		
Total Delay		50.9	10.0		53.4		
Queue Length 50th (ft)		104	52		223		
Queue Length 95th (ft)		#214	84		#376		
Internal Link Dist (ft)		672			493		
Turn Bay Length (ft)			150				
Base Capacity (vph)		266	793		453		
Starvation Cap Reductn		0	0		0		
Spillback Cap Reductn		0	0		0		
Storage Cap Reductn		0	0		0		
Reduced v/c Ratio		0.70	0.33		0.86		

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Volume (vph)	265	13	231	28	1	7	4	14	98	4	16	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	12	12	12	16	16	16	16	15
Grade (%)		0%				1%			1%			
Total Lost time (s)	4.0	6.0				6.0			6.0			
Lane Util. Factor	1.00	1.00				1.00			1.00			
Frt	1.00	0.86				0.96			0.98			
Flt Protected	0.95	1.00				1.00			0.99			
Satd. Flow (prot)	1711	1544				1199			2047			
Flt Permitted	0.95	1.00				1.00			0.94			
Satd. Flow (perm)	1711	1544				1199			1937			
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.33	0.33	0.33	0.73	0.73	0.73	0.73	0.93
Adj. Flow (vph)	301	15	262	31	3	21	12	19	134	5	22	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	301	308	0	0	0	36	0	0	180	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	50%	50%	50%	2%	2%	2%	2%	4%
Turn Type	Split				Split			Perm				Perm
Protected Phases	2	2			6	6			8			
Permitted Phases		2						8				4
Actuated Green, G (s)	22.3	22.3				4.8			13.3			
Effective Green, g (s)	24.3	22.3				4.8			13.3			
Actuated g/C Ratio	0.29	0.27				0.06			0.16			
Clearance Time (s)	6.0	6.0				6.0			6.0			
Vehicle Extension (s)	5.0	5.0				5.0			5.0			
Lane Grp Cap (vph)	502	416				70			311			
v/s Ratio Prot	0.18	c0.20				c0.03						
v/s Ratio Perm									0.09			
v/c Ratio	0.60	0.74				0.51			0.58			
Uniform Delay, d1	25.1	27.6				37.9			32.2			
Progression Factor	1.00	1.00				1.00			1.00			
Incremental Delay, d2	2.9	8.3				12.1			7.6			
Delay (s)	28.0	35.9				50.0			39.8			
Level of Service	C	D				D			D			
Approach Delay (s)		32.0				50.0			39.8			
Approach LOS		C				D			D			

Intersection Summary			
HCM Average Control Delay	37.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	82.8	Sum of lost time (s)	24.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	NWL2	NWL	NWR	NWR2
Lane Configurations							
Volume (vph)	36	134	243	23	288	22	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	14	16	16	16	16
Grade (%)		0%			2%		
Total Lost time (s)		6.0	6.0		6.0		
Lane Util. Factor		1.00	1.00		1.00		
Frt		1.00	0.85		0.99		
Flt Protected		0.99	1.00		0.96		
Satd. Flow (prot)		1987	1656		1978		
Flt Permitted		0.80	1.00		0.96		
Satd. Flow (perm)		1608	1656		1978		
Peak-hour factor, PHF	0.93	0.93	0.93	0.86	0.86	0.86	0.86
Adj. Flow (vph)	39	144	261	27	335	26	2
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	186	261	0	390	0	0
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	2%
Turn Type	Perm		pm+ov	Split			
Protected Phases		4	2	9	9		
Permitted Phases	4		4				
Actuated Green, G (s)		13.3	35.6		18.4		
Effective Green, g (s)		13.3	35.6		18.4		
Actuated g/C Ratio		0.16	0.43		0.22		
Clearance Time (s)		6.0	6.0		6.0		
Vehicle Extension (s)		5.0	5.0		5.0		
Lane Grp Cap (vph)		258	712		440		
v/s Ratio Prot			0.10		c0.20		
v/s Ratio Perm		c0.12	0.06				
v/c Ratio		0.72	0.37		0.89		
Uniform Delay, d1		33.0	16.0		31.2		
Progression Factor		1.00	1.00		1.00		
Incremental Delay, d2		16.0	0.7		20.1		
Delay (s)		49.0	16.6		51.3		
Level of Service		D	B		D		
Approach Delay (s)		30.1			51.3		
Approach LOS		C			D		

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	0	9	3	0	12	17	368	6	11	403	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	16	15	15	12
Grade (%)		0%			-3%			-5%			3%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.936			0.891			0.998			0.993	
Flt Protected		0.974			0.990			0.998			0.999	
Satd. Flow (prot)	0	1698	0	0	1701	0	0	2135	0	0	1984	0
Flt Permitted		0.974			0.990			0.998			0.999	
Satd. Flow (perm)	0	1698	0	0	1701	0	0	2135	0	0	1984	0
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		329			595			752			350	
Travel Time (s)		9.0			16.2			14.6			6.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.58	0.90	0.58	0.90	0.88	0.88	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	0%	2%	0%	2%	3%	3%	3%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	0	10	5	0	21	19	418	7	12	448	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	0	26	0	0	444	0	0	484	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	0	9	3	0	12	17	368	6	11	403	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			-3%			-5%			3%	
Peak Hour Factor	0.90	0.90	0.90	0.58	0.90	0.58	0.90	0.88	0.88	0.90	0.90	0.90
Hourly flow rate (vph)	11	0	10	5	0	21	19	418	7	12	448	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								752				
pX, platoon unblocked												
vC, conflicting volume	965	947	460	954	956	422	472			425		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	965	947	460	954	956	422	472			425		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	100	98	98	100	97	98			99		
cM capacity (veh/h)	222	254	601	232	251	637	1090			1129		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	26	444	484
Volume Left	11	5	19	12
Volume Right	10	21	7	24
cSH	317	472	1090	1129
Volume to Capacity	0.07	0.05	0.02	0.01
Queue Length 95th (ft)	5	4	1	1
Control Delay (s)	17.2	13.1	0.5	0.3
Lane LOS	C	B	A	A
Approach Delay (s)	17.2	13.1	0.5	0.3
Approach LOS	C	B		

Intersection Summary			
Average Delay	1.1 – A		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	33	100	69	320	335	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	15	15	16	16
Grade (%)	0%			-8%	3%	
Storage Length (ft)	0	50	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.898				0.989	
Flt Protected	0.988			0.991		
Satd. Flow (prot)	1742	0	0	2091	2037	0
Flt Permitted	0.988			0.991		
Satd. Flow (perm)	1742	0	0	2091	2037	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	1324			350	862	
Travel Time (s)	36.1			6.8	16.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.86	0.94	0.94	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	38	116	73	340	360	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	154	0	0	413	393	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	33	100	69	320	335	31
Sign Control	Stop			Free	Free	
Grade	0%			-8%	3%	
Peak Hour Factor	0.86	0.86	0.94	0.94	0.93	0.93
Hourly flow rate (vph)	38	116	73	340	360	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				1102		
pX, platoon unblocked						
vC, conflicting volume	864	377	360			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	864	377	360			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	83	94			
cM capacity (veh/h)	307	674	1193			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	155	414	394
Volume Left	38	73	0
Volume Right	116	0	33
cSH	520	1193	1700
Volume to Capacity	0.30	0.06	0.23
Queue Length 95th (ft)	31	5	0
Control Delay (s)	14.8	2.0	0.0
Lane LOS	B	A	
Approach Delay (s)	14.8	2.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.2 — A		
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	4	272	62	41	233	18	31	43	14	32	39	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	12	12	12	9	9	9	14	14	14
Grade (%)		-1%			0%			-3%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.975			0.992			0.979			0.956	
Flt Protected		0.999			0.993			0.983			0.985	
Satd. Flow (prot)	0	2046	0	0	1872	0	0	1670	0	0	1918	0
Flt Permitted		0.999			0.993			0.983			0.985	
Satd. Flow (perm)	0	2046	0	0	1872	0	0	1670	0	0	1918	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		2916			718			672			1324	
Travel Time (s)		56.8			14.0			18.3			36.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.87	0.87	0.87	0.82	0.82	0.82	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	5	368	84	47	268	21	38	52	17	40	48	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	457	0	0	336	0	0	107	0	0	130	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	272	62	41	233	18	31	43	14	32	39	34
Peak Hour Factor	0.74	0.74	0.74	0.87	0.87	0.87	0.82	0.82	0.82	0.81	0.81	0.81
Hourly flow rate (vph)	5	368	84	47	268	21	38	52	17	40	48	42

Direction, Lane #	EB 1	WB 1	SE 1	NW 1
Volume Total (vph)	457	336	107	130
Volume Left (vph)	5	47	38	40
Volume Right (vph)	84	21	17	42
Hadj (s)	-0.11	-0.01	-0.02	-0.13
Departure Headway (s)	5.0	5.3	6.2	6.0
Degree Utilization, x	0.64	0.49	0.18	0.22
Capacity (veh/h)	684	645	482	509
Control Delay (s)	16.6	13.4	10.6	10.7
Approach Delay (s)	16.6	13.4	10.6	10.7
Approach LOS	C	B	B	B

Intersection Summary			
Delay	14.2		
HCM Level of Service	B		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	47	264	575	77	245	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.885		0.984			
Flt Protected	0.992					0.983
Satd. Flow (prot)	1724	0	2129	0	0	2065
Flt Permitted	0.992					0.983
Satd. Flow (perm)	1724	0	2129	0	0	2065
Link Speed (mph)	35		35			35
Link Distance (ft)	2916		1087			300
Travel Time (s)	56.8		21.2			5.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	56	314	625	84	288	562
Shared Lane Traffic (%)						
Lane Group Flow (vph)	370	0	709	0	0	850
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	47	264	575	77	245	478
Sign Control	Stop		Free			Free
Grade	0%		-3%			-1%
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Hourly flow rate (vph)	56	314	625	84	288	562
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			1087			
pX, platoon unblocked	0.90	0.90			0.90	
vC, conflicting volume	1806	667			709	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1839	575			622	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	33			67	
cM capacity (veh/h)	51	470			873	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	370	709	851
Volume Left	56	0	288
Volume Right	314	84	0
cSH	209	1700	873
Volume to Capacity	1.77	0.42	0.33
Queue Length 95th (ft)	640	0	36
Control Delay (s)	406.2	0.0	7.4
Lane LOS	F		A
Approach Delay (s)	406.2	0.0	7.4
Approach LOS	F		

Intersection Summary			
Average Delay	81.2 – F		
Intersection Capacity Utilization	102.5%	ICU Level of Service	G
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	47	264	575	77	245	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.885		0.984			
Flt Protected	0.992					0.983
Satd. Flow (prot)	1724	0	2129	0	0	2065
Flt Permitted	0.992					*0.470
Satd. Flow (perm)	1724	0	2129	0	0	987
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	237		12			
Link Speed (mph)	35		35			35
Link Distance (ft)	2916		1087			300
Travel Time (s)	56.8		21.2			5.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.84	0.84	0.92	0.92	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	56	314	625	84	288	562
Shared Lane Traffic (%)						
Lane Group Flow (vph)	370	0	709	0	0	850
Number of Detectors	1		0		1	0
Detector Template	Left				Left	
Leading Detector (ft)	35		0		20	0
Trailing Detector (ft)	-5		0		0	0
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Detector Phase	8					
Switch Phase						
Minimum Initial (s)	7.0		20.0		7.0	20.0
Minimum Split (s)	13.0		26.0		13.0	26.0
Total Split (s)	21.0	0.0	66.0	0.0	13.0	79.0
Total Split (%)	21.0%	0.0%	66.0%	0.0%	13.0%	79.0%
Maximum Green (s)	15.0		60.0		7.0	73.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0
Recall Mode	None		Max		Max	Max
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
v/c Ratio	0.87		0.54			1.04
Control Delay	36.1		12.9			56.2
Queue Delay	0.0		0.0			0.0
Total Delay	36.1		12.9			56.2
Queue Length 50th (ft)	80		246			~261
Queue Length 95th (ft)	#172		346			#440
Internal Link Dist (ft)	2836		1007			220
Turn Bay Length (ft)						
Base Capacity (vph)	466		1315			816
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.79		0.54			1.04

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 97.6

Natural Cycle: 75

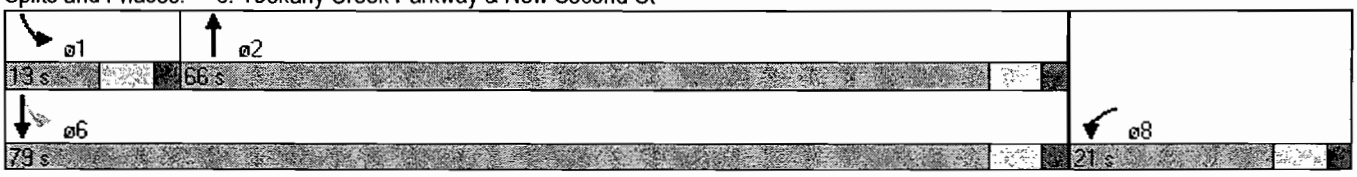
Control Type: Semi Act-Uncoord

* User Entered Value

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Tookany Creek Parkway & New Second St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	47	264	575	77	245	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	16	16	15	15
Grade (%)	0%		-3%			-1%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		1.00			1.00
Frt	0.89		0.98			1.00
Flt Protected	0.99		1.00			0.98
Satd. Flow (prot)	1725		2129			2065
Flt Permitted	0.99		1.00			0.47
Satd. Flow (perm)	1725		2129			987
Peak-hour factor, PHF	0.84	0.84	0.92	0.92	0.85	0.85
Adj. Flow (vph)	56	314	625	84	288	562
RTOR Reduction (vph)	207	0	5	0	0	0
Lane Group Flow (vph)	163	0	704	0	0	850
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%
Turn Type					pm+pt	
Protected Phases	8		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	12.5		60.1			73.1
Effective Green, g (s)	12.5		60.1			73.1
Actuated g/C Ratio	0.13		0.62			0.75
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	221		1311			817
v/s Ratio Prot	c0.09		0.33			c0.07
v/s Ratio Perm						c0.70
v/c Ratio	0.74		0.54			1.04
Uniform Delay, d1	41.0		10.8			12.2
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	12.2		1.6			42.5
Delay (s)	53.2		12.3			54.7
Level of Service	D		B			D
Approach Delay (s)	53.2		12.3			54.7
Approach LOS	D		B			D

Intersection Summary			
HCM Average Control Delay	38.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	97.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	107.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group