Traffic Impact Study for the Westover Recreational Redevelopment

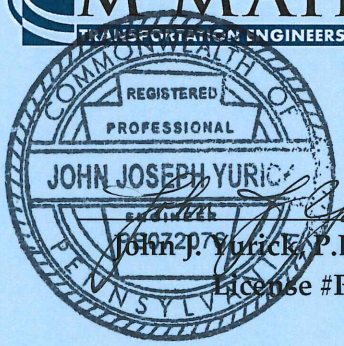
West Norriton Township, Montgomery County, PA

Prepared for

VRJ Associates, LP

Prepared by

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS



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License #PE072076

July 12, 2012

McMahon Project Number 812073.11

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Executive Summary

VRJ Associates, LP proposes to redevelop the existing Westover County Club property to provide a recreation center on the property. The site is located on the east side of Port Indian Road and south of Egypt Road in West Norriton Township, Montgomery County, Pennsylvania. Access to the site is proposed via the existing full-movement site access along Schuylkill Avenue, two new full movement unsignalized intersections along Port Indian Road, and continuation of Hemlock Road into the site.

The proposed recreation facility will provide a unique mix of outdoor athletic fields, including a variety of sports fields, courts, and other venues. In addition, a new club house will be provided in addition to the existing club house facility and golf course (five holes to remain) and various accessory uses. As such, trip generation studies were completed at three local recreational facilities in Montgomery and Chester Counties. Based on the results of these studies, the site will generate approximately 358 new trips (total two-way) during the weekday afternoon peak hour, and approximately 449 new trips (total two-way) during the Saturday midday peak hour. It is noted that these traffic generation forecasts are conservative, as the projections assume full utilization of all the athletic facilities (and do not account for seasonal sporting schedules).

Based on the results of the analysis, the proposed site access intersections, the intersections along Schuylkill Avenue, as well as the School Lane/Hemlock Road intersection operate at highly acceptable conditions today, and will continue to operate at highly acceptable conditions in the future.

In general, the remaining study intersections will function similar to future without-redevelopment conditions during the weekday afternoon and Saturday midday peak hour conditions. However, it is noted that the Egypt Road/Port Indian Road/Mill Road intersection does not currently warrant a traffic signal, and may not fully satisfy warrants in the future with the proposed redevelopment, and as such, the side street approaches will continue to function with delay during the peak hours. Nevertheless, this intersection should continue to be warranted to determine if future traffic volumes will satisfy applicable warrant criteria for signalization. Additional right-of-way would be required if this intersection were to be signalized and the offset side streets aligned. Also, it is noted that the Egypt Road/School Lane require improvements today, as well as in the future regardless of the proposed redevelopment, in order to maintain acceptable overall level of service operations.

In conjunction with the proposed recreation redevelopment, it will be required that VRJ Associates, LP construct the appropriate access improvements and contribute to various off-site improvements through the Township's Transportation Impact Fee. Due to the conservative approach in calculating the anticipated trip generation of the site (Table 5), and the uniqueness of the proposed recreational facility, it is recommended that the Township's Transportation Traffic Impact Fee be calculated based on a post-development study during typical operating conditions in order to provide an assessment based on actual traffic generation rather than conservative forecasts.

Introduction

VRJ Associates, LP proposes to redevelop the existing Westover County Club property to provide a recreation center on the property. The site is located on the east side of Port Indian Road and south of Egypt Road in West Norriton Township, Montgomery County, Pennsylvania. Access to the site is proposed via the existing full-movement site access along Schuylkill Avenue, two new full movement unsignalized intersections along Port Indian Road, and through continuation of Hemlock Road into the site. The site plan of the proposed development is shown in **Figures 1A and 1B**.

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 West Norriton Township, as well as provide recommendations regarding the proposed site access design in order to provide efficient access for the site.

Manual turning movement traffic counts were completed at seven intersections during the weekday afternoon peak period (4:00 PM to 8:00 PM) and the Saturday midday peak period (11:00 AM to 2:00 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 proposed recreation facility were projected utilizing an annual traffic growth rate to account for regional traffic growth. The future traffic volumes were projected to the year 2015, the anticipated build-out year of the development, at each of the study intersections. The future traffic volumes without redevelopment were then subjected to detailed capacity/level-of-service analysis.

Finally, the traffic generated by the proposed recreation facility was established based on traffic counts conducted at three similar facilities in Montgomery and Chester Counties, and assigned to the roadway network and site accesses. The site-generated traffic volumes were added to future without-redevelopment traffic volumes, and subjected to detailed capacity/level-of-service analysis to assess the future traffic conditions with the development.

Existing Transportation Setting

The proposed recreation facility will be located on the east side of Port Indian Road, south of Egypt Road in West Norriton 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	Travel Lanes (per direction)	Shoulders	Speed Limit
Egypt Road (S.R. 4002)	State	1	Yes	35 mph
Main Street (S.R. 3009)	State	2	No	40 mph
Schuylkill Avenue	Township	1	No	25 mph
Port Indian Road	Township	1	No	25 mph
School Lane	Township	1	No	25 mph
Hemlock Road	Township	1	No	Not posted
Brandon Road	Township	1	No	25 mph

The following key intersections in the vicinity of the site comprise the study area, and were selected based on the recommended scope of the Township Traffic Engineer.

- Schuylkill Avenue and Westover Access/Rivers Edge Drive
- Schuylkill Avenue and Brandon Road
- Schuylkill Avenue and Hemlock Road
- Schuylkill Avenue and Main Street (S.R. 3009)
- Hemlock Road and School Lane
- Egypt Road (S.R. 4002) and School Lane
- Egypt Road (S.R. 4002) and Port Indian Road/Mill Road

The existing characteristics of the study intersections, including field sketches and photographs, are summarized in **Appendix A**.

Existing Traffic Volumes

Manual turning movement traffic counts were conducted in March 2012 during the weekday afternoon peak period (4:00 PM to 8:00 PM) and the Saturday midday peak period (11:00 AM to 2:00 PM) at each of the study intersections. The results of these traffic counts are tabulated by 15-minute intervals in **Appendix B**. The four highest consecutive 15-minute peak intervals during these traffic count periods constitute the peak hours that are the basis of this traffic analysis.

Seasonal adjustment factors contained in the PennDOT publication, *2010 Pennsylvania Traffic Data*, were reviewed to ensure that the collected counts reflect typical conditions. The collected traffic data reflects higher than average data, and therefore, seasonal adjustment factors were not utilized to adjust the data. The resultant existing weekday afternoon and Saturday midday peak hour traffic volumes were balanced (adjusted upward) between intersections, as appropriate, and are illustrated in **Figures 3 and 4**, respectively.

Planned Roadway Improvements

Through a review of PennDOT's *Twelve Year Transportation Program*, there are no plans to improve any of the study area roadways by the Township or PennDOT that would have a significant effect on the traffic operations.

Future Traffic Volumes without Redevelopment

This section presents projected traffic volumes without the development of the proposed Westover recreation development for the future 2015, which is the anticipated build-out year. The future year 2015 without-development traffic volumes were estimated by increasing the existing 2012 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 5 and 6**, respectively.

Regional Traffic Growth

To account for regional traffic growth, the existing traffic volumes were increased by an annual traffic growth rate of 0.76 percent compounded for three, or 2.3 percent total, which is consistent with the traffic growth rate recommended by PennDOT's Bureau of Planning and Research for similar roadways in Montgomery County.

Local Traffic Growth

Based on discussions with West Norriton Township, there are no other planned or proposed future developments expected to have a significant effect on traffic conditions within the study area.

Future Traffic Volumes with Redevelopment

Evaluation of the proposed Westover recreation facility is based upon the incremental increase in traffic volumes generated by the development during the peak hours, as described below.

Trip Generation

The proposed recreation facility will provide a unique mix of outdoor athletic fields, including a variety of sports fields, courts, and other venues. In addition, a new club house will be provided in addition to the existing club house and golf course (five holes to remain) and various accessory uses.

The Institute of Transportation Engineers (ITE) publication, *Trip Generation, Eighth Edition*, contains trip generation data for various single-sport (i.e., Soccer Complex, Tennis Courts, Racquet/Tennis Club, etc.) and multi-sport (i.e., Athletic Club, Recreational Community Center) uses; however, these uses do not cover the variety of outdoor sports available at this site. As such, since ITE does not have data for the type of facility proposed, our office completed trip generation studies at three local recreational facilities in Montgomery and Chester Counties. **Table 2** provides a summary of the location and size of each of the counted sites, as well as the dates the traffic counts were conducted at each site.

Table 2. Local Recreational Facilities Trip Generation Count Locations

Site	Size (Acres)	Location	Dates Counted
United Sports Training Center	60	West Bradford Township Chester County	Thursday 4/12/2012 Saturday 4/14/2012
Manderach Park	50.32	Limerick Township Montgomery County	Thursday 5/17/2012 Saturday 4/28/2012
Hickory Park	26	Upper Uwchlan Township Chester County	Thursday 4/12/2012 Saturday 4/14/2012

Based on the variety of sporting facilities proposed in conjunction with the Westover redevelopment, it would be difficult to identify other similar sites with the exact number or mix of facilities. However, three local sites were studied due to their heavy usage by sports leagues, which will also be the most similar characteristic of the proposed facility. Of the three sites studied, two of the sites (Hickory Park and Maderach Park) are similar to typical community parks that contain outdoor sports fields, although they are used significantly by local adult and youth sports leagues for games. These two facilities provide a mix of soccer, lacrosse, and baseball/softball fields, as well as basketball, tennis, and volleyball courts. The United Sports Training Center (USTC) is a private facility which provides indoor and outdoor facilities for multiple sports leagues, as well as sports and coaching clinics. In addition, the USTC site requires a small yearly membership fee, as well as league fees to participate in the various team-sport leagues.

The trip generation counts were conducted during the weekday afternoon (4:00 PM to 7:00 PM) and Saturday midday (11:00 AM to 2:00 PM) peak periods in April and May during dry weather conditions. In addition, it is noted that the sports schedules for these facilities was verified prior to conducting the counts, and all of the facilities had a typical schedule of events during the count periods. A summary of the traffic counts in 15-minute increments is provided in **Appendix C** for each site, as well as an aerial

showing the location of each site is attached for each of the counted sites. **Tables 3 and 4** summarize the results of the weekday afternoon and Saturday midday peak hour trip generation counts, respectively. It is noted that in order to provide an accurate representation of the trips generated by each site, the acreage of the parking areas for each site was subtracted from the total site acreage, since the recreational/sporting areas are the trip generating portions of the site. By reducing the parking areas from the total acreage of the sites, the resulting trip generation rates are slightly higher, and thus, more conservative.

Table 3. Local Recreational Facilities Trip Generation Summary
Weekday Afternoon Peak Hour

Site	Size [1] (Acres)	Total Peak Hour Trips	Trip Generation Rate
United Sports Training Center	55.22	348	6.3 trips per acre
Manderach Park	46.45	258	5.6 trips per acre
Hickory Park	23.50	224	9.5 trips per acre
		Weighted Average Rate	**6.63 trips per acre**

1 – Site acreage less parking areas.

Table 4. Local Recreational Facilities Trip Generation Summary
Saturday Afternoon Peak Hour

Site	Size [1] (Acres)	Total Peak Hour Trips	Trip Generation Rate
United Sports Training Center	55.22	440	8.0 trips per acre
Manderach Park	46.45	380	8.2 trips per acre
Hickory Park	23.50	220	9.4 trips per acre
		Weighted Average Rate	**8.31 trips per acre**

1 – Site acreage less parking areas.

The weighted average rates shown in Tables 3 and 4 above were then applied to the acreage of the site used for athletic contests and recreational activities (i.e., the portions of the site used for parking and occupied by the remaining golf holes and banquet facility were excluded from the site trip generation). The resultant trip generation for the site is shown in **Table 5**. It is noted that due to the number of fields, courts, venues and activity areas offered at the site, as well as seasonal sports schedules, it is very unlikely that the site will be operating at full usage. Therefore, by calculating the trip generation for the site using the acreage of all proposed new facilities and providing no seasonal adjustment, the trip generation calculations provide a conservative analysis of future traffic generation.

Table 5. New Vehicular Trip Generation[1]
Westover Recreational Redevelopment

Land Use	Size [2] (Acres)	Weekday Afternoon Peak Hour			Saturday Midday Peak Hour		
		In	Out	Total	In	Out	Total
Multi-Use Recreation	54.046	222	136	358	207	242	449

1 – Based on the trip generation counts, as detailed in Tables 3 and 4. Existing Westover Country Club traffic has not been reduced from the traffic volume projections and are in addition to these new trips.
2 – Site acreage less parking areas, existing clubhouse, and remaining five golf holes.

Due to the conservative approach in calculating the anticipated trip generation of the site (Table 5), and the uniqueness of the proposed recreational facility, it is recommended that the Transportation Traffic Impact Fee for this project be calculated based on a post-development study during typical operating conditions in order to provide an assessment based on actual traffic generation rather than conservative forecasts.

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 distribution and traffic assignment percentages for the anticipated directions of approach and departure are illustrated in **Figure 7**.

Application of the percentages illustrated in Figure 7 to the new peak hour trips contained in Table 5, provides an estimate of site traffic to be added to the study area, and the resultant site generated traffic added to the study area is shown in **Figures 8 and 9**. The site-generated traffic volumes shown in Figures 8 and 9 were 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 10 and 11** for the weekday afternoon and Saturday midday peak hours, respectively.

Site Access

Primary access to the Westover recreation development is proposed to be provided via the existing site access along Schuylkill Avenue, two new full movement accesses that will intersect Port Indian Road, as well as continuation of Hemlock Road into the site. The proposed local roads on Port Indian Road are proposed to be located approximately 2,600 and 3,600 feet south of the intersection of Egypt Road and Port Indian Road.

Access Configuration and Traffic Control

The proposed recommendations for the access design, including the need for auxiliary turn lanes, traffic control and geometric design, were based on criteria and guidelines accepted by PennDOT Additionally, the geometric design of the proposed site accesses was preliminarily evaluated based on guidelines contained in PennDOT's *Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads*, as well as local PennDOT District policies. All auxiliary turn lane and traffic signal warrant worksheets are shown in **Appendix D**.

Based on the results of this evaluation, the following access configuration and traffic control is recommended at the proposed driveways along Port Indian Road.

Northern Port Indian Road Site Access

- Provide one curbed ingress lane and one curbed egress lane for the access.
- Provide anticipated curb radii as needed to accommodate emergency vehicles and delivery/service trucks.
- Separate left- and right-turn lanes are not warranted based on PennDOT's traffic volume guidelines; however, a southbound Port Indian Road left-turn lane is proposed.

Southern Port Indian Road Site Access

- Provide one curbed ingress lane and one curbed egress lane for the access.
- Provide anticipated curb radii as needed to accommodate emergency vehicles and delivery/service trucks.
- Separate left- and right-turn lanes are not warranted based on PennDOT's traffic volume guidelines.

The auxiliary lane warrant worksheets are provided in **Appendix E**.

Sight Distance

Sight distance field measurements and an evaluation were performed for each of the proposed unsignalized roadway intersections on Port Indian Road. Generally, the posted speed limit, roadway grades and profiles, and the number of travel lanes play a role in determining if safe sight distances are available for egress and ingress at the each of the proposed accesses. Since West Norriton Township's Ordinance requirements do not clearly address intersection sight distance, the available sight distances at the proposed access locations were measured and compared to PennDOT's safe stopping sight distance requirements. **Table 6** summarizes the available sight distance measurements, as well as safe stopping sight distances at the proposed access locations.

Table 6. Sight Distance Evaluation[1]

Northern Port Indian Road Site Access

Movement	Direction	Approximate Approach Grade	Assumed Speed (mph)[2]	Safe Stopping Sight Distance (feet)	
				Required	Available
Exiting	Looking Left	-0.7%	35	268	501[3]
	Looking Right	-1.3%	35	271	356
Left turn Entering	Looking Ahead	-0.7%	35	368	536
	From the Rear	-1.3%	35	271	358

Southern Port Indian Road Site Access

Movement	Direction	Approximate Approach Grade	Assumed Speed (mph)[2]	Safe Stopping Sight Distance (feet)	
				Required	Available
Exiting	Looking Left	+6.4%	35	241	500+[3]
	Looking Right	-7.5%	35	310	500+
Left turn Entering	Looking Ahead	+6.4%	35	241	500+
	From the Rear	-7.5%	35	310	500+

1 – Based on PennDOT requirements and an assumed speed of 35 miles per hour in accordance with Pennsylvania Code, Title 67, Transportation, Chapter 441.8.h.2.iv.

2 – Since the posted speed limit along Port Indian Road is only 25 miles per hour, a 35 miles per hour speed limit was assumed to provide a more conservative evaluation of the available sight distance.

3 – This measurement assumes tree/vegetation clearing on the south side of both the northern and southern accesses.

Proper landscaping must be maintained and tree/vegetation clearing on the south side of both the northern and southern Port Indian Road accesses must be provided for provision of sight distance according to the above table. Also, the available sight distance at the site accesses must be verified during the detailed engineering of the site access design.

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 development of the Westover Country Club recreation redevelopment, 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 the correlation between average total control delay and the respective level of service (LOS) 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.

The results of the capacity/level-of-service analyses are illustrated in **Figures 12, 13, and 14** for the existing, future without-development, and future with-development peak hour traffic conditions, respectively. Additionally, detailed capacity/level-of-service analysis worksheets are contained in **Appendix F, G, and H** for the existing, future-without development, and future with-development peak hour traffic conditions, respectively. The analysis results are summarized below for each study intersection.

Schuylkill Avenue and Westover Access/Rivers Edge Drive

This two-way stop sign controlled intersection currently operates at highly acceptable levels of service during both the weekday afternoon and Saturday midday peak hours, and will continue to operate acceptably in the future both without and with the redevelopment.

Schuylkill Avenue and Brandon Road

This all-way stop sign controlled intersection currently operates at highly acceptable conditions during both the weekday afternoon and Saturday midday peak hours, and will continue to operate acceptably in the future both without and with the redevelopment.

Schuylkill Avenue and Hemlock Road

This all-way stop sign controlled intersection currently operates at highly acceptable levels of service during both the weekday afternoon and Saturday midday peak hours, and will continue to operate acceptably in the future both without and with the redevelopment.

Schuylkill Avenue and Main Street

Under existing conditions, this signalized intersection operates at overall acceptable LOS B conditions during the study peak hours. In addition, most movements at this intersection operate at acceptable LOS D or better during both peak hours with the exception of the southbound side street Schuylkill Avenue approach, which operates at LOS E during the weekday afternoon peak hour only.

Under future without-redevelopment conditions, the intersection will continue to operate at acceptable overall LOS B during each of the peak hours and most movements will also continue to operate acceptably. Also, as under existing conditions, the southbound side street Schuylkill Avenue approach will continue to operate with delay.

Under future with-redevelopment conditions, the intersection will operate with acceptable overall LOS C or better during both peak hours. In addition, most movements will continue to operate at acceptable LOS D or better during both peak hours, again with the exception of the southbound side street Schuylkill Avenue approach will continue to operate with delay as under future without-redevelopment conditions.

Hemlock Road and School Lane

This two-way stop sign controlled intersection currently operates at highly acceptable levels of service during both the weekday afternoon and Saturday midday peak hours, and will continue to operate acceptably in the future both without and with the redevelopment.

Egypt Road and School Lane

Under existing conditions, this signalized intersection operates at with overall delay (LOS E) during the weekday afternoon peak hour, and at acceptable overall LOS B conditions during the Saturday midday peak hour. In addition, most movements at this intersection operate at acceptable LOS D or better during both peak hours with the exception of the eastbound Egypt Road approach, which operates at LOS F during the weekday afternoon peak hour only.

Under future without-redevelopment conditions, these signalized intersections will continue to operate with delay during the weekday afternoon peak hour, and acceptably during the Saturday midday peak hour. In order to improve traffic operations at this intersection, it would be necessary to optimize the traffic signal timings and widen Egypt Road for a separate eastbound left-turn lane.

Under future with-redevelopment conditions, the intersection will continue to operate with delay during the weekday afternoon peak hour. In order to improve operating conditions at this intersection, it would be necessary to widen eastbound Egypt Road to provide a separate left-turn lane and optimize the signal timings as under existing and future without-redevelopment conditions.

Egypt Road and Port Indian Road/Mill Road

Under existing conditions, this offset, unsignalized intersection currently operates at LOS E and F on the stop sign controlled northbound Port Indian Road and southbound Mill Road approaches during both peak hours due to the heavy traffic volumes along Egypt Road. In order for the intersection to function acceptably it would be necessary to signal the intersection and preferably realign the offset side streets. It is noted that 12-hour traffic counts were conducted at this intersection in order to evaluate traffic signal warrants. Based on this data, a traffic signal is not warranted at this intersection based on the Eight Hour, Four Hour, or Peak Hour Traffic Volume Warrants contained in PennDOT's *Publication 212, Official Traffic Control Devices.*

Under future without-redevelopment conditions, the offset unsignalized intersections will continue to operate at LOS F conditions on the stop sign controlled approaches during both peak hours without redevelopment. As under existing conditions, it is necessary to signalize the intersection; however, PennDOT's Peak Hour Traffic Volume Warrant will not be satisfied.

Under future with-redevelopment conditions, the offset unsignalized intersections will continue to operate with delay on the stop sign controlled approaches to the intersection. Based on the projected future with-redevelopment traffic volumes, the intersection will not satisfy peak hour warrants for traffic signalization (i.e., a traffic signal is warranted during the Saturday midday peak hour only) according to the Peak Hour Traffic Volume Warrant contained in PennDOT's *Publication 212, Official Traffic Control Devices*. It is our experience that PennDOT typically does not approve traffic signal warrants based on only one peak hour, especially if the warrant is satisfied based on future traffic projections only. As such, since traffic signal warrants are not met for this intersection under existing traffic conditions, this intersection should be monitored in the future to determine when/if a traffic signal is warranted.

New Site Accesses

Both unsignalized site accesses along Port Indian Road will operate with highly acceptable levels of service during the weekday afternoon and Saturday midday peak hours.

Recommendations

In conjunction with the proposed recreation development, it will be required that VRJ Associates, LP construct the appropriate access improvements and contribute to various off-site improvements through the Township's Transportation Impact Fee. Due to the conservative approach in calculating the anticipated trip generation of the site (Table 5), and the uniqueness of the proposed recreational facility, it is recommended that the Transportation Traffic Impact Fee be calculated based on a post-development study during typical operating conditions in order to provide an assessment based on actual traffic generation rather than conservative forecasts. Lastly, it is recommended that the Egypt Road/Port Indian Road/Mill Road intersection should be monitored to determine if future traffic volumes will satisfy applicable traffic signal warrants.

Conclusions

The traffic associated with the proposed recreation redevelopment can generally be accommodated at the surrounding study intersections. The proposed development will be required to contribute to off-site traffic improvements through the Township's Transportation Impact Fee. Also, the Egypt Road/Mill Road/Port Indian Road intersection should be monitored in the future to determine if a traffic signal is warranted based on PennDOT guidelines. Acquisition of significant right-of-way will be required should the side street approaches be realigned at this intersection. In addition, subject to the availability of right-of-way, an eastbound Egypt Road left-turn lane should be provided at the Egypt Road/School Lane intersection to improve existing and future operational delays.

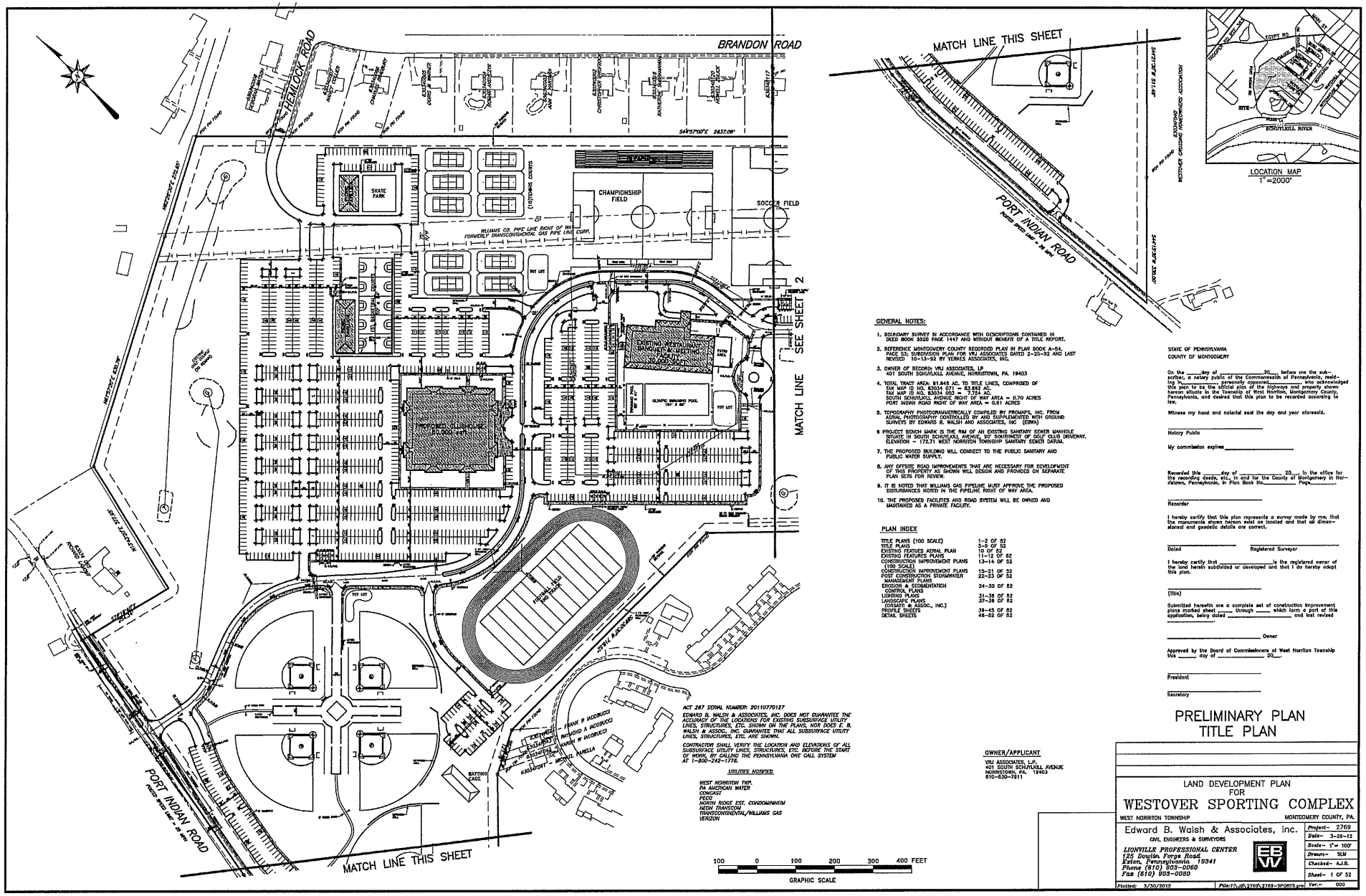

FIGURE 1A

Site Plan

WESTOVER RECREATIONAL DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

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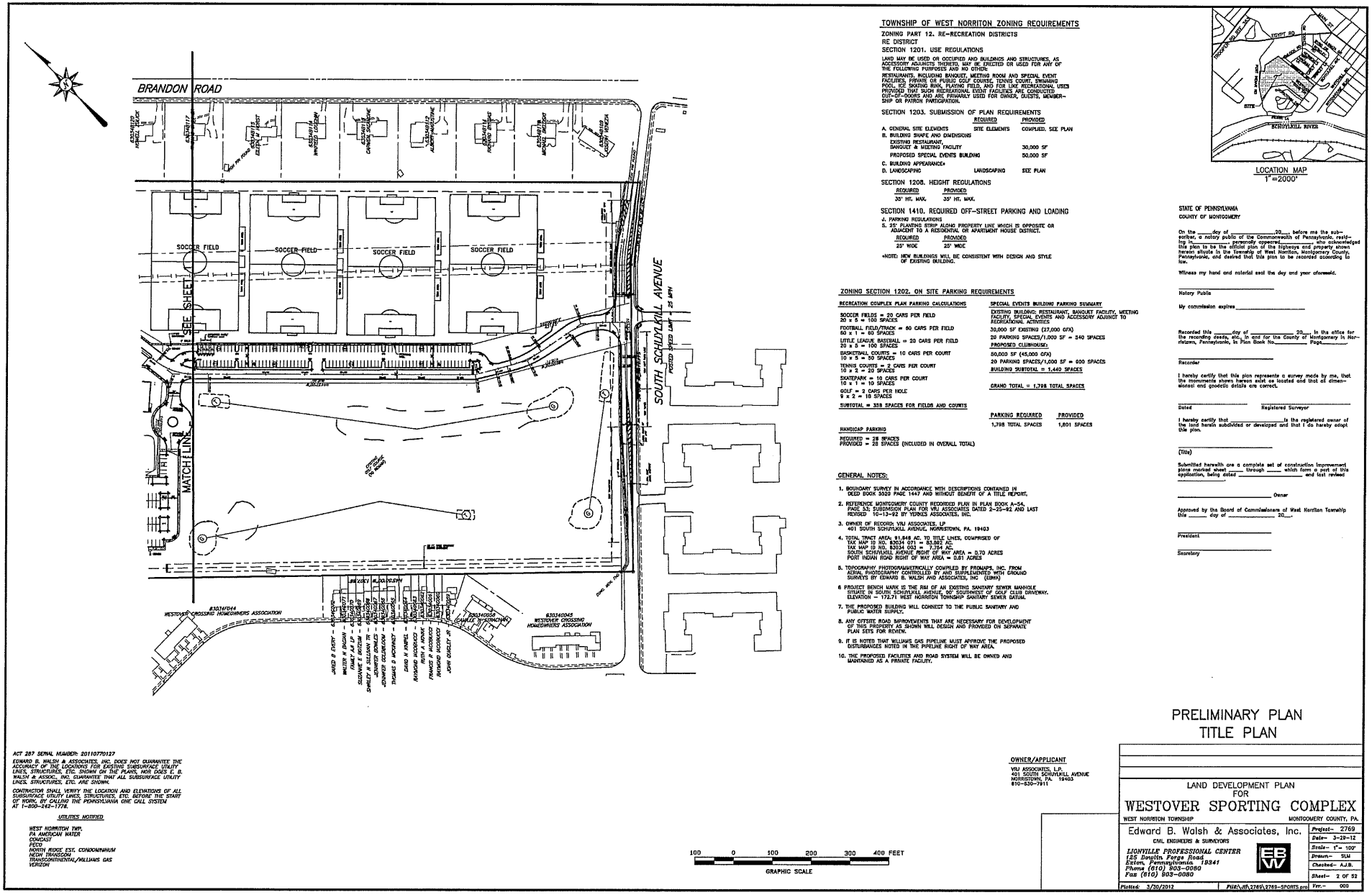


TOWNSHIP OF WEST NORRITON ZONING REQUIREMENTS

ZONING PART 12. RE-RECREATION DISTRICTS
RE DISTRICT
SECTION 1201. USE REGULATIONS

LAND MAY BE USED OR OCCUPIED AND BUILDINGS AND STRUCTURES, AS ACCESSORY ADJUNCTS THERETO, MAY BE ERECTED OR USED FOR ANY OF THE FOLLOWING PURPOSES AND NO OTHER:

RESTAURANTS, INCLUDING BANQUET, MEETING ROOM AND SPECIAL EVENT FACILITIES, PRIVATE OR PUBLIC GOLF COURSE, TENNIS COURT, SWIMMING POOL, ICE SKATING RINK, PLAYING FIELD, AND FOR LIKE RECREATIONAL USES PROVIDED THAT SUCH RECREATIONAL EVENT FACILITIES ARE CONDUCTED OUT-OF-DOORS AND ARE PRIMARILY USED FOR OWNER, GUESTS, MEMBERSHIP OR PATRON PARTICIPATION.

SECTION 1203. SUBMISSION OF PLAN REQUIREMENTS

	REQUIRED	PROVIDED
A. GENERAL SITE ELEMENTS	SITE ELEMENTS	COMPLIED. SEE PLAN
B. BUILDING SHAPE AND DIMENSIONS		
EXISTING RESTAURANT, BANQUET & MEETING FACILITY		30,000 SF
PROPOSED SPECIAL EVENTS BUILDING		50,000 SF
C. BUILDING APPEARANCE*		
D. LANDSCAPING	LANDSCAPING	SEE PLAN

SECTION 1208. HEIGHT REGULATIONS

REQUIRED	PROVIDED
35' Ht. MAX.	35' Ht. MAX.

SECTION 1410. REQUIRED OFF-STREET PARKING AND LOADING

J. PARKING REGULATIONS
5. 25' PLANTING STRIP ALONG PROPERTY LINE WHICH IS OPPOSITE OR ADJACENT TO A RESIDENTIAL OR APARTMENT HOUSE DISTRICT.

REQUIRED	PROVIDED
25' WIDE	25' WIDE

*NOTE: NEW BUILDINGS WILL BE CONSISTENT WITH DESIGN AND STYLE OF EXISTING BUILDING.

ZONING SECTION 1202. ON SITE PARKING REQUIREMENTS

RECREATION COMPLEX PLAN PARKING CALCULATIONS

SOCCER FIELDS = 20 CARS PER FIELD
20 x 5 = 100 SPACES

FOOTBALL FIELD/TRACK = 60 CARS PER FIELD
60 x 1 = 60 SPACES

LITTLE LEAGUE BASEBALL = 20 CARS PER FIELD
20 x 5 = 100 SPACES

BASKETBALL COURTS = 10 CARS PER COURT
10 x 5 = 50 SPACES

TENNIS COURTS = 2 CARS PER COURT
10 x 2 = 20 SPACES

SKATEPARK = 10 CARS PER COURT
10 x 1 = 10 SPACES

GOLF = 2 CARS PER HOLE
9 x 2 = 18 SPACES

SUBTOTAL = 358 SPACES FOR FIELDS AND COURTS

HANDICAP PARKING

REQUIRED = 28 SPACES
PROVIDED = 28 SPACES (INCLUDED IN OVERALL TOTAL)

SPECIAL EVENTS BUILDING PARKING SUMMARY

EXISTING BUILDING: RESTAURANT, BANQUET FACILITY, MEETING FACILITY, SPECIAL EVENTS AND ACCESSORY ADJUNCT TO RECREATIONAL ACTIVITIES
30,000 SF EXISTING (27,000 GFA)
20 PARKING SPACES/1,000 SF = 540 SPACES

PROPOSED CLUBHOUSE)
50,000 SF (45,000 GFA)
20 PARKING SPACES/1,000 SF = 600 SPACES

BUILDING SUBTOTAL = 1,440 SPACES

GRAND TOTAL = 1,798 TOTAL SPACES

PARKING REQUIRED	PROVIDED
1,798 TOTAL SPACES	1,801 SPACES

GENERAL NOTES:

1. BOUNDARY SURVEY IN ACCORDANCE WITH DESCRIPTIONS CONTAINED IN DEED BOOK 5520 PAGE 1447 AND WITHOUT BENEFIT OF A TITLE REPORT.
2. REFERENCE MONTGOMERY COUNTY RECORDED PLAN IN PLAN BOOK A-54, PAGE 53; SUBDIVISION PLAN FOR VRJ ASSOCIATES DATED 2-25-82 AND LAST REVISED 10-13-82 BY YERKES ASSOCIATES, INC.
3. OWNER OF RECORD: VRJ ASSOCIATES, LP
401 SOUTH SCHUYLKILL AVENUE, NORRISTOWN, PA. 19403
4. TOTAL TRACT AREA: 91.848 AC. TO TITLE LINES, COMPRISED OF
TAX MAP ID NO. 63034 071 = 83.987 AC.
TAX MAP ID NO. 63034 053 = 7.754 AC.
SOUTH SCHUYLKILL AVENUE RIGHT OF WAY AREA = 0.70 ACRES
POST INDIAN ROAD RIGHT OF WAY AREA = 0.61 ACRES
5. TOPOGRAPHY PHOTOGRAMMETRICALLY COMPILED BY PROMAPS, INC. FROM AERIAL PHOTOGRAPHY CONTROLLED BY AND SUPPLEMENTED WITH GROUND SURVEYS BY EDWARD B. WALSH AND ASSOCIATES, INC. (EBWA)
6. PROJECT BENCH MARK IS THE RIM OF AN EXISTING SANITARY SEWER MANHOLE SITUATE IN SOUTH SCHUYLKILL AVENUE, 60' SOUTHWEST OF GOLF CLUB DRIVEWAY. ELEVATION = 172.71 WEST NORRITON TOWNSHIP SANITARY SEWER DATUM.
7. THE PROPOSED BUILDING WILL CONNECT TO THE PUBLIC SANITARY AND PUBLIC WATER SUPPLY.
8. ANY OFFSITE ROAD IMPROVEMENTS THAT ARE NECESSARY FOR DEVELOPMENT OF THIS PROPERTY AS SHOWN WILL DESIGN AND PROVIDED ON SEPARATE PLAN SETS FOR REVIEW.
9. IT IS NOTED THAT WILLIAMS GAS PIPELINE MUST APPROVE THE PROPOSED DISTURBANCES NOTED IN THE PIPELINE RIGHT OF WAY AREA.
10. THE PROPOSED FACILITIES AND ROAD SYSTEM WILL BE OWNED AND MAINTAINED AS A PRIVATE FACILITY.

LOCATION MAP
1"=2000'

STATE OF PENNSYLVANIA
COUNTY OF MONTGOMERY

On the ____day of _____20__ before me the subscriber, a notary public of the Commonwealth of Pennsylvania, residing in _____, personally appeared _____, who acknowledged this plan to be the official plan of the highways and property shown hereon situate in the Township of West Norriton, Montgomery County, Pennsylvania, and desired that this plan to be recorded according to law.

Witness my hand and notarial seal the day and year aforesaid.

Notary Public

My commission expires _____

Recorded this ____day of _____ 20__ in the office for the recording deeds, etc., in and for the County of Montgomery in Norristown, Pennsylvania, in Plan Book No._____ Page_____.

Recorder

I hereby certify that this plan represents a survey made by me, that the monuments shown hereon exist as located and that all dimensional and geodetic details are correct.

Dated Registered Surveyor

I hereby certify that _____is the registered owner of the land herein subdivided or developed and that I do hereby adopt the plan.

(Title)

Submitted herewith are a complete set of construction improvement plans marked sheet ____ through ____ which form a part of this application, being dated _____ and last revised _____.

_____ Owner

Approved by the Board of Commissioners of West Norriton Township this ____ day of _____ 20__.

President

Secretary

ACT 287 SERIAL NUMBER: 20110770127

EDWARD B. WALSH & ASSOCIATES, INC. DOES NOT GUARANTEE THE ACCURACY OF THE LOCATIONS FOR EXISTING SUBSURFACE UTILITY LINES, STRUCTURES, ETC. SHOWN ON THE PLANS, NOR DOES E. B. WALSH & ASSOC., INC. GUARANTEE THAT ALL SUBSURFACE UTILITY LINES, STRUCTURES, ETC. ARE SHOWN.

CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATIONS OF ALL SUBSURFACE UTILITY LINES, STRUCTURES, ETC. BEFORE THE START OF WORK, BY CALLING THE PENNSYLVANIA ONE CALL SYSTEM AT 1-800-242-1776.

UTILITIES NOTIFIED

WEST NORRITON TWP.
PA AMERICAN WATER
COMCAST
PECO
NORTH RIDGE EST. CONDOMINIUM
NT TRANSCOM
TRANSCONTINENTAL/WILLIAMS GAS
VERIZON

OWNER/APPLICANT

VRJ ASSOCIATES, L.P.
401 SOUTH SCHUYLKILL AVENUE
NORRISTOWN, PA. 19403
610-630-7911

PRELIMINARY PLAN
TITLE PLAN

LAND DEVELOPMENT PLAN
FOR
WESTOVER SPORTING COMPLEX
WEST NORRITON TOWNSHIP MONTGOMERY COUNTY, PA.

Edward B. Walsh & Associates, Inc.
CIVIL ENGINEERS & SURVEYORS
LIONVILLE PROFESSIONAL CENTER
125 Dewitt Forge Road
Exton, Pennsylvania 19341
Phone (610) 903-0060
Fax (610) 903-0080

Project-	2769
Date-	3-29-12
Scale-	1"= 100'
Drawn-	SLH
Checked-	A.J.B.
Sheet-	2 OF 52
Ver.-	000

Plotted: 3/30/2012 FILE\...\2769\2769-SPORTS.pro

FIGURE 1B
Site Plan

WESTOVER RECREATIONAL DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab: 3/29/12) i:\Eng\812073\Dwg\Figures\Figure 1B.dwg

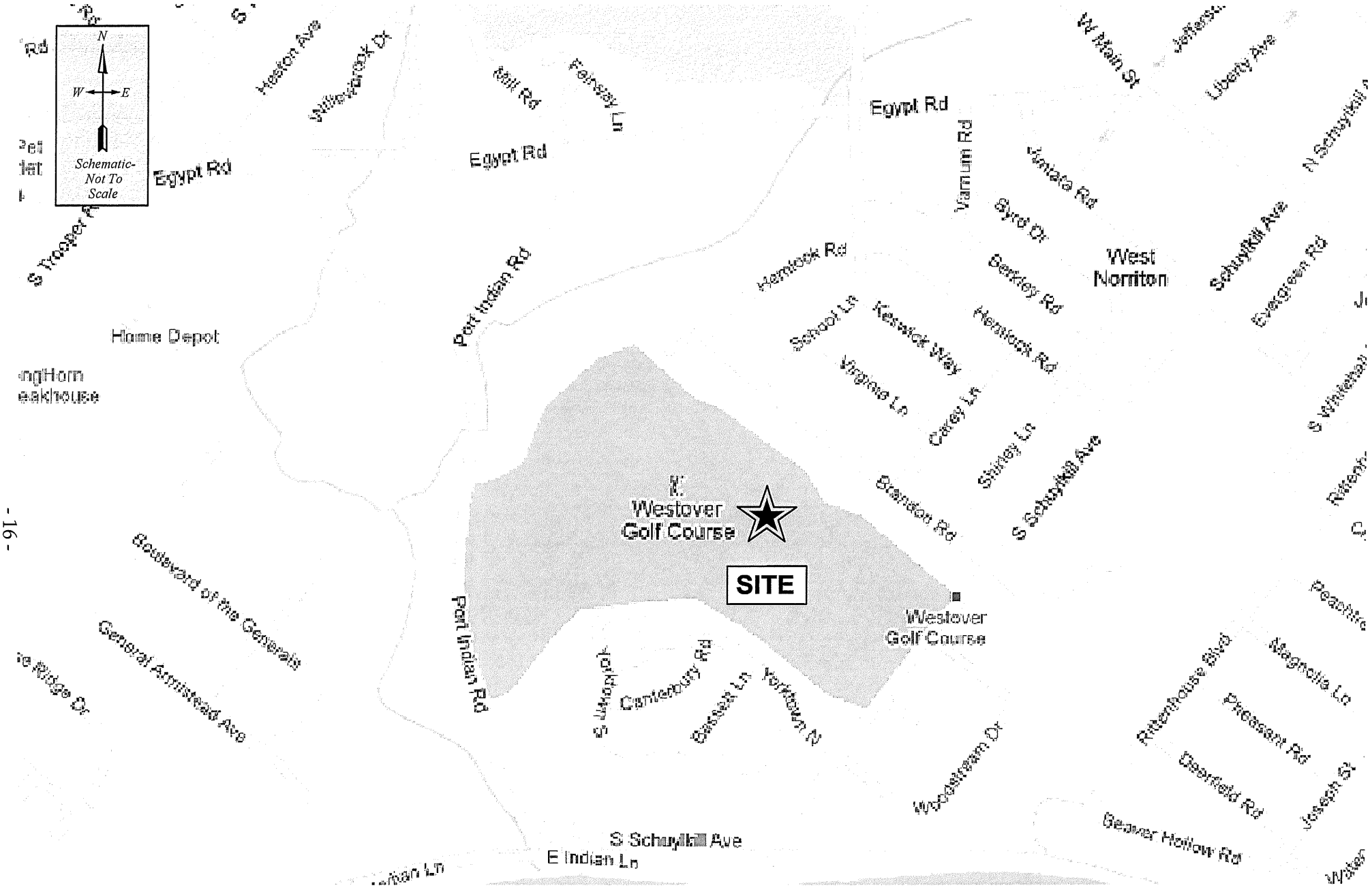


FIGURE 2
Site Location Map

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

WESTOVER RECREATIONAL DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

(DHW/ab: 3/29/12) i:\Eng\812073\Dwg\Figures\Figure 2.dwg

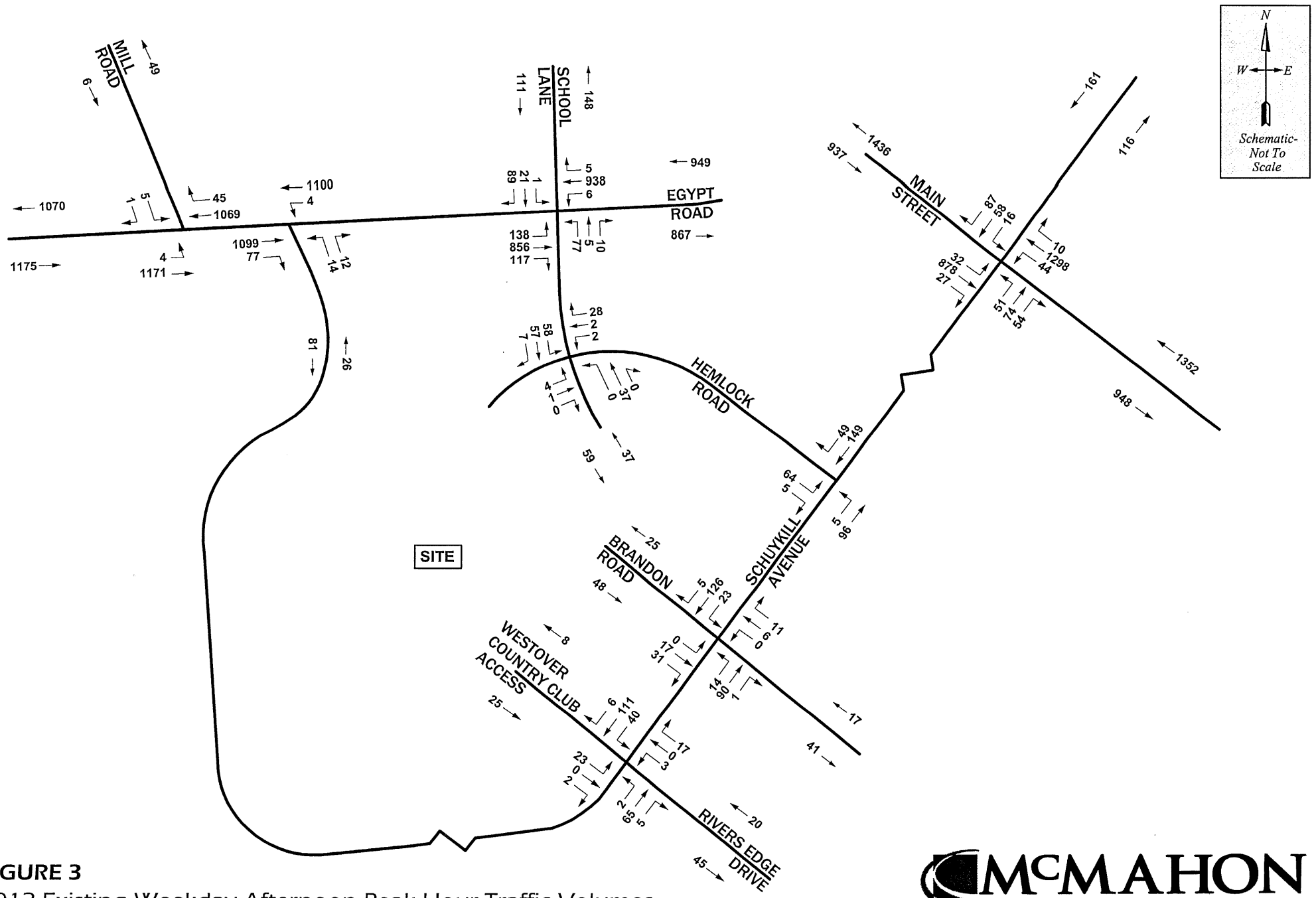


FIGURE 3

2012 Existing Weekday Afternoon Peak Hour Traffic Volumes

WESTOVER RECREATIONAL DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab: 3/29/12) i:\Eng\812073\Dwg\Figures\Figure 3.dwg

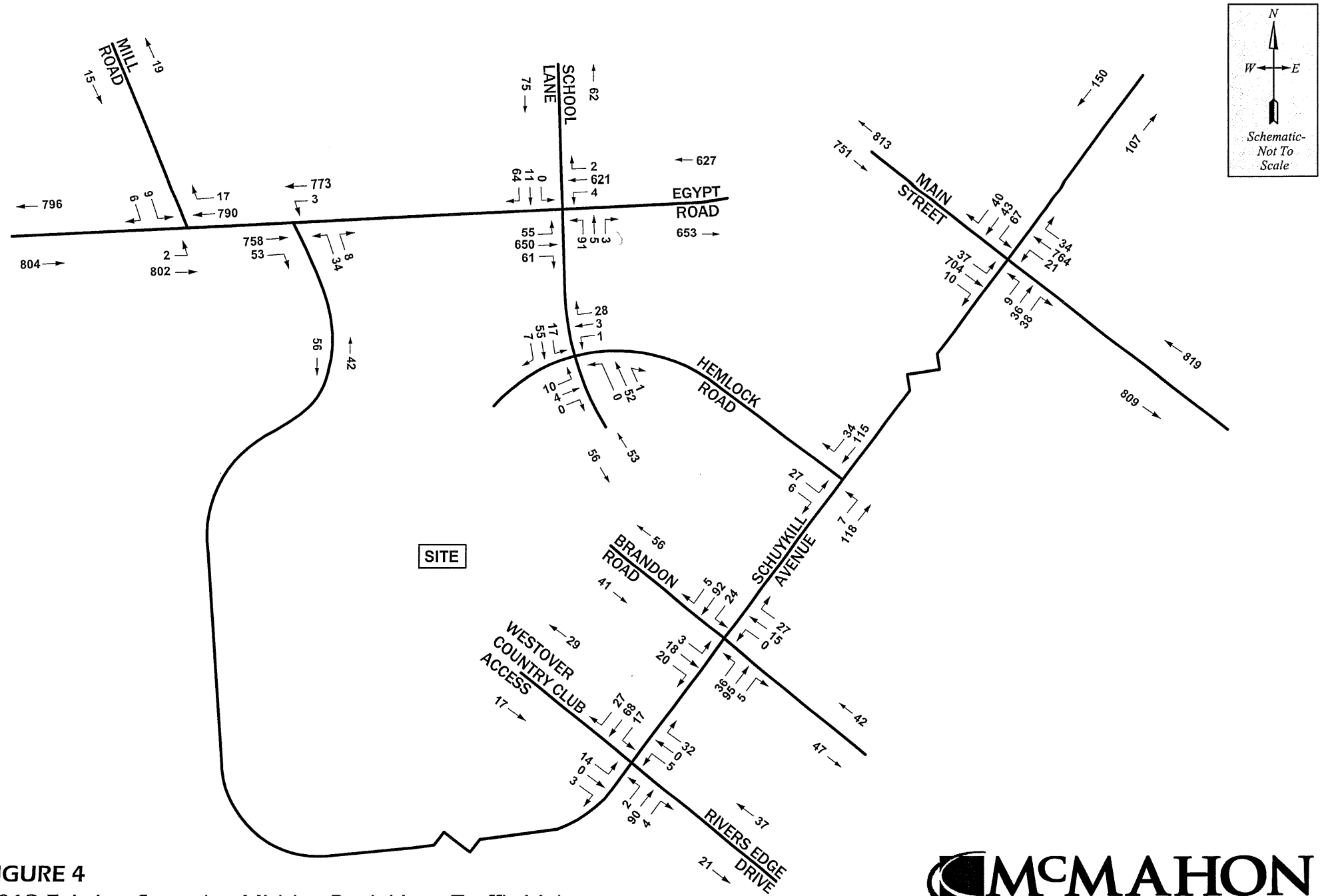


FIGURE 4

2012 Existing Saturday Midday Peak Hour Traffic Volumes

WESTOVER RECREATIONAL DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab: 3/29/12) i:\Eng\812073\Dwg\Figures\Figure 4.dwg

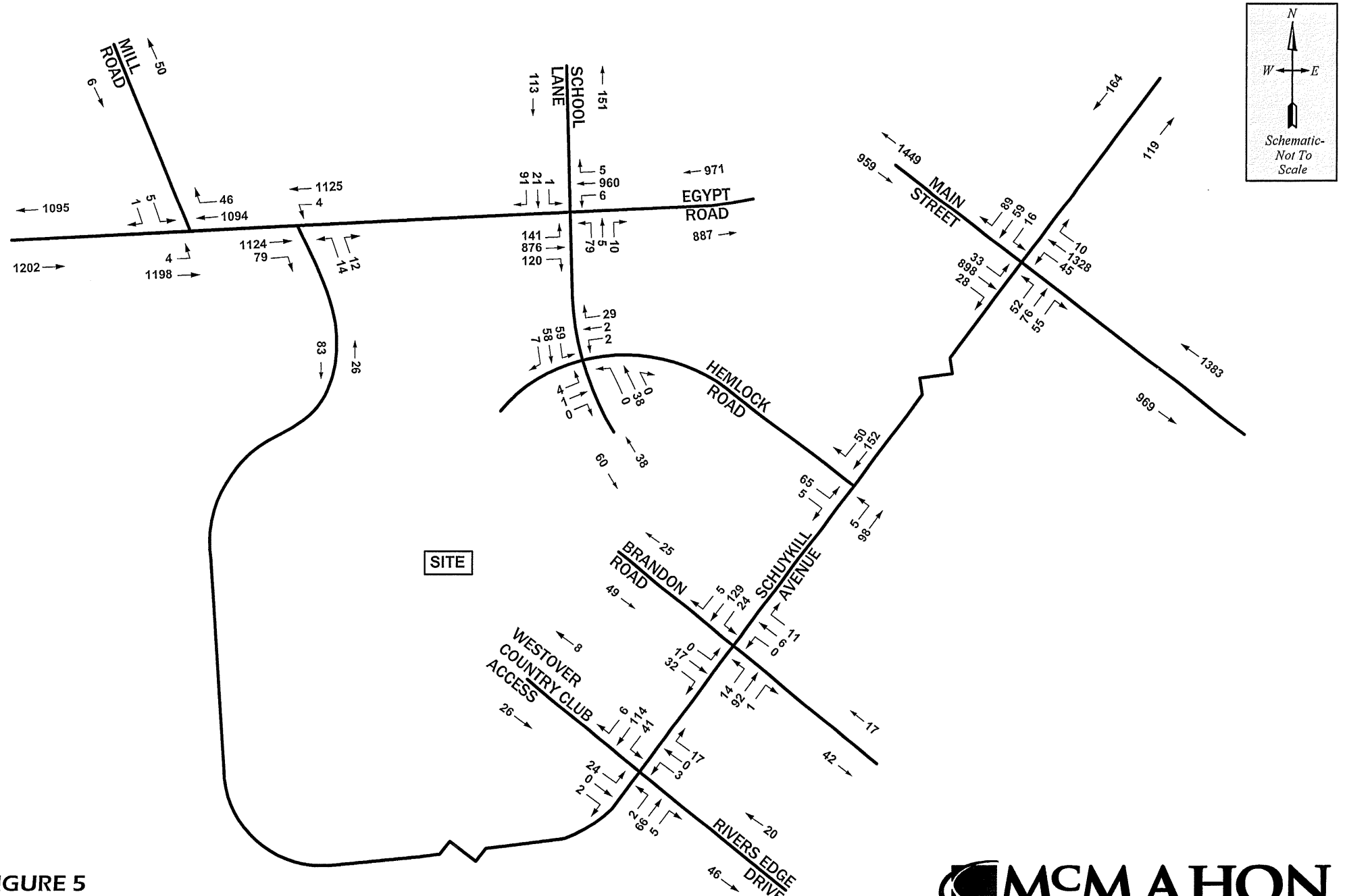


FIGURE 5

2015 Future Weekday Afternoon Peak Hour Traffic Volumes without Redevelopment

WESTOVER RECREATIONAL DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab/TL: 6/27/12) i:\Eng\812073\Dwg\Figures\Figure 5.dwg

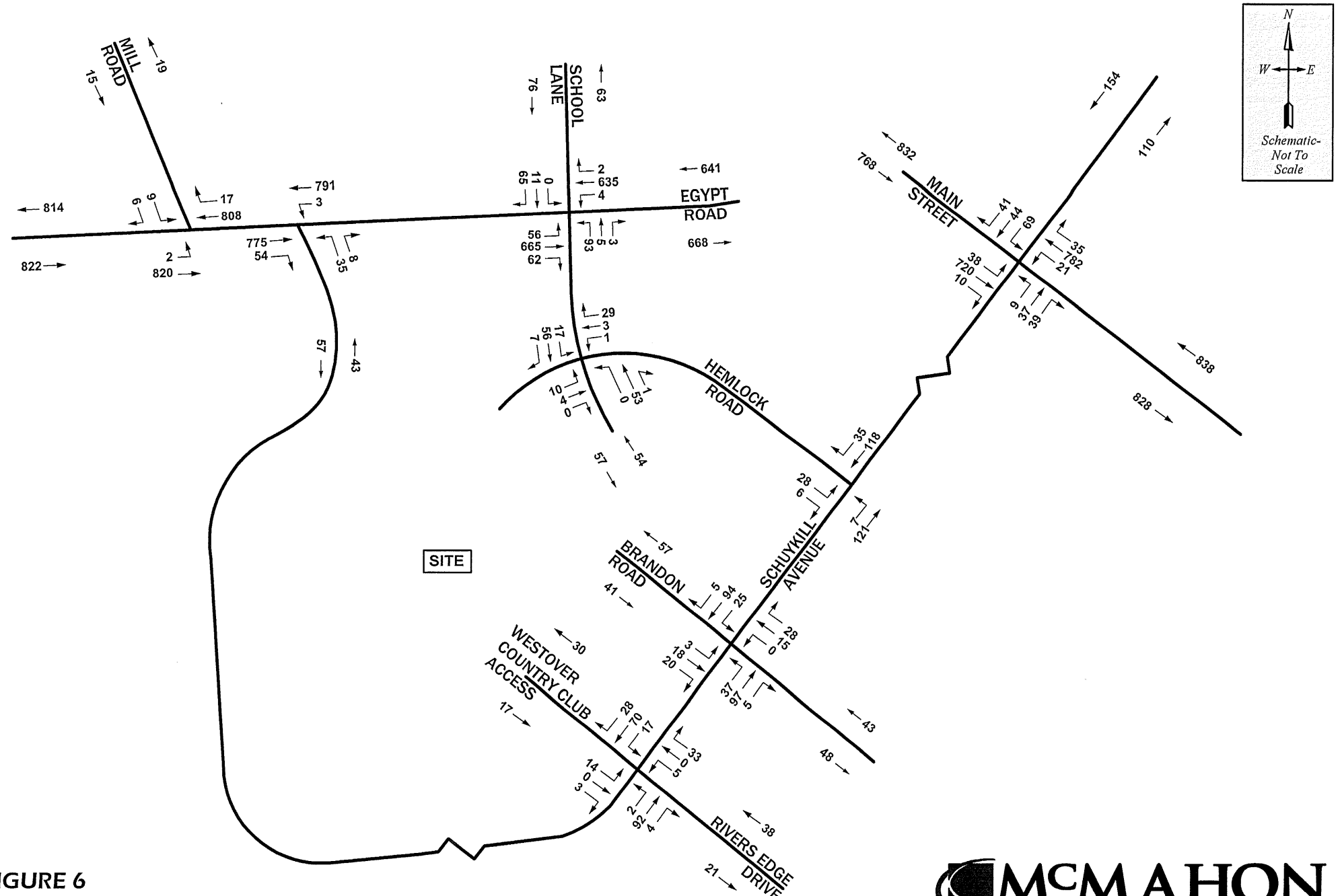


FIGURE 6

2015 Future Saturday Midday Peak Hour Traffic Volumes without Redevelopment

WESTOVER RECREATIONAL DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab/TL: 6/27/12) i:\Eng\812073\Dwg\Figures\Figure 6.dwg

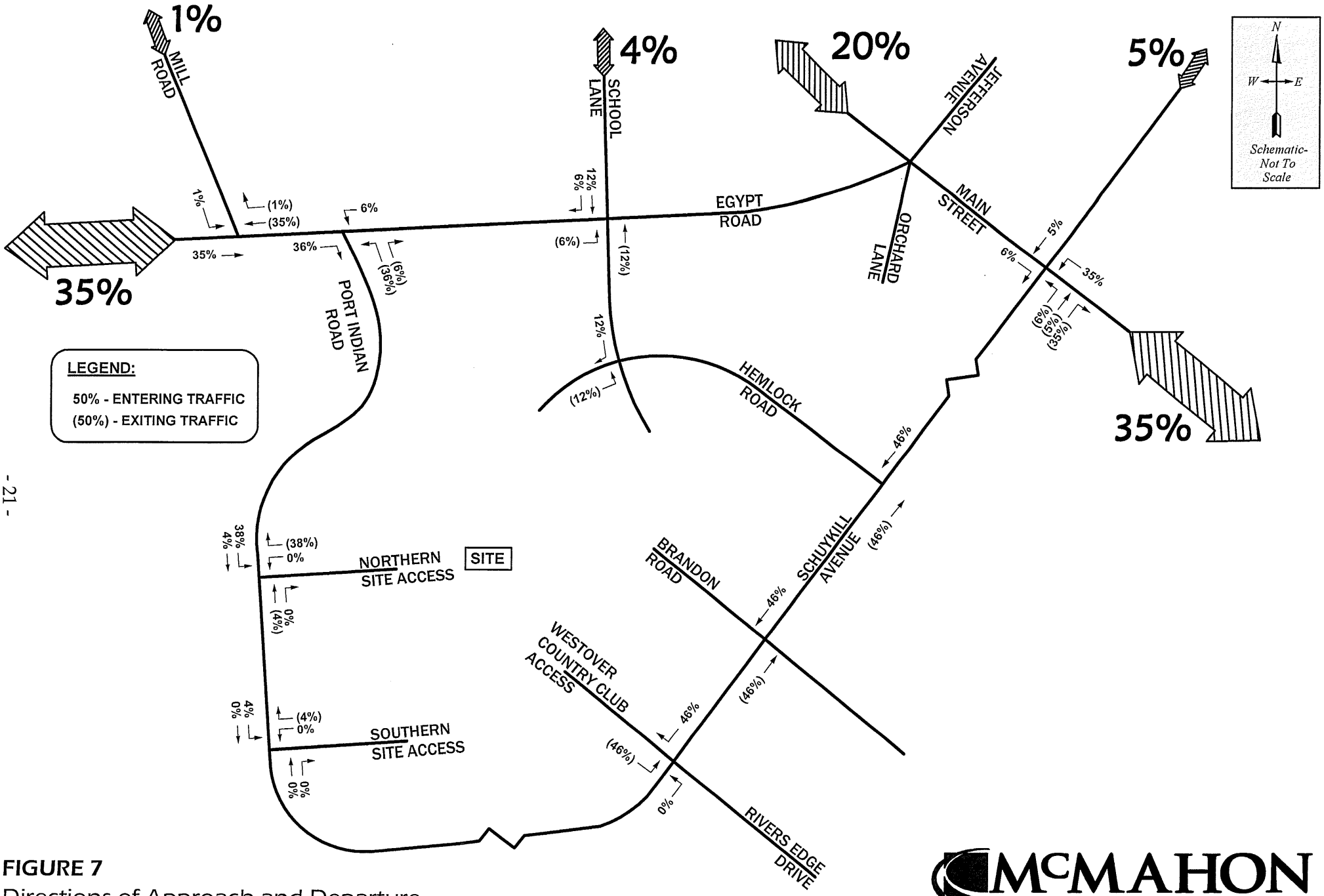


FIGURE 7

Directions of Approach and Departure

WESTOVER RECREATION DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab: 6/15/12) i:\Eng\812073\Dwg\Figures\Figure 7.dwg

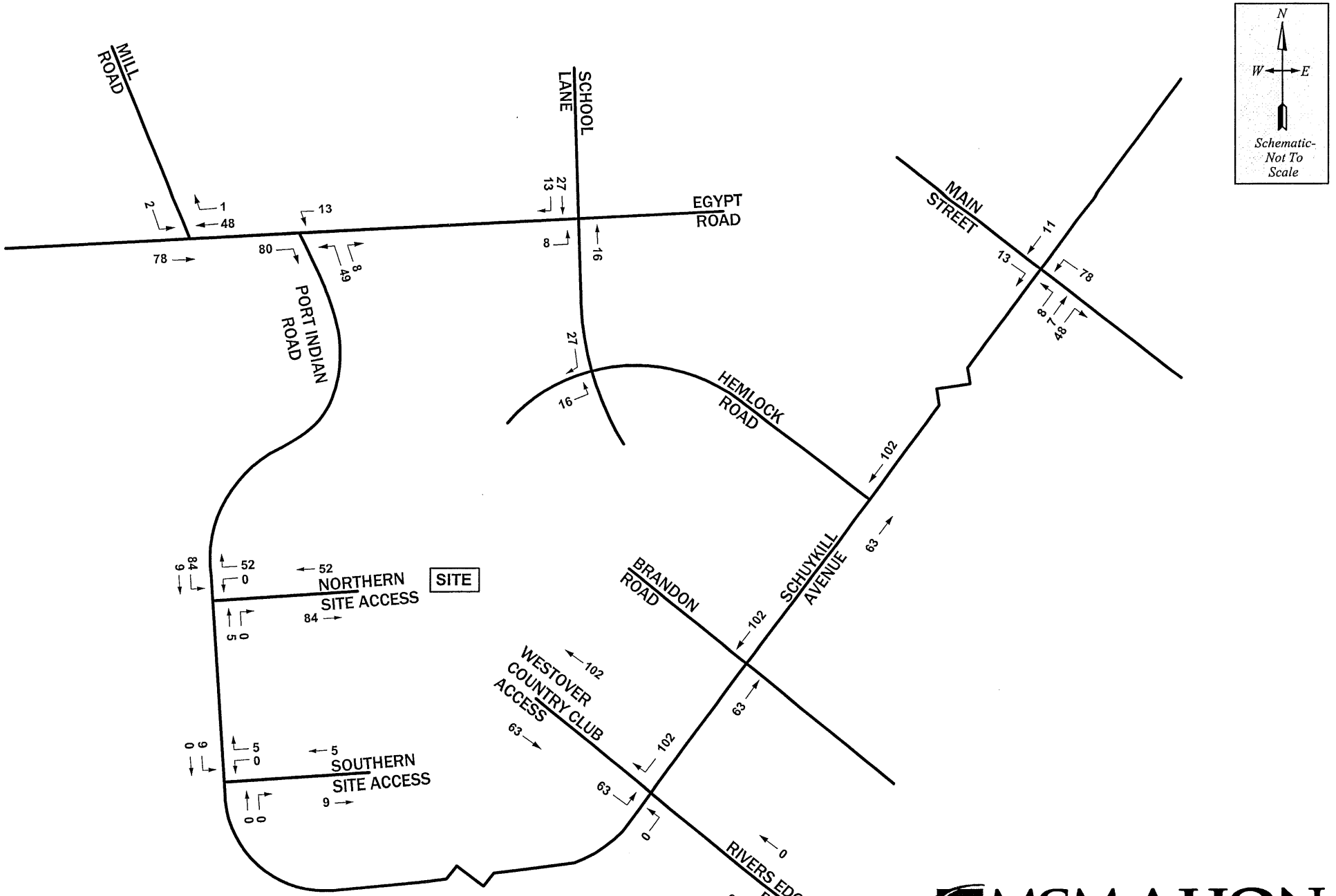


FIGURE 8

Weekday Afternoon Peak Hour Site Generated Traffic Volumes

WESTOVER RECREATION DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab: 6/15/12) i:\Eng\812073\Dwg\Figures\Figure 8.dwg

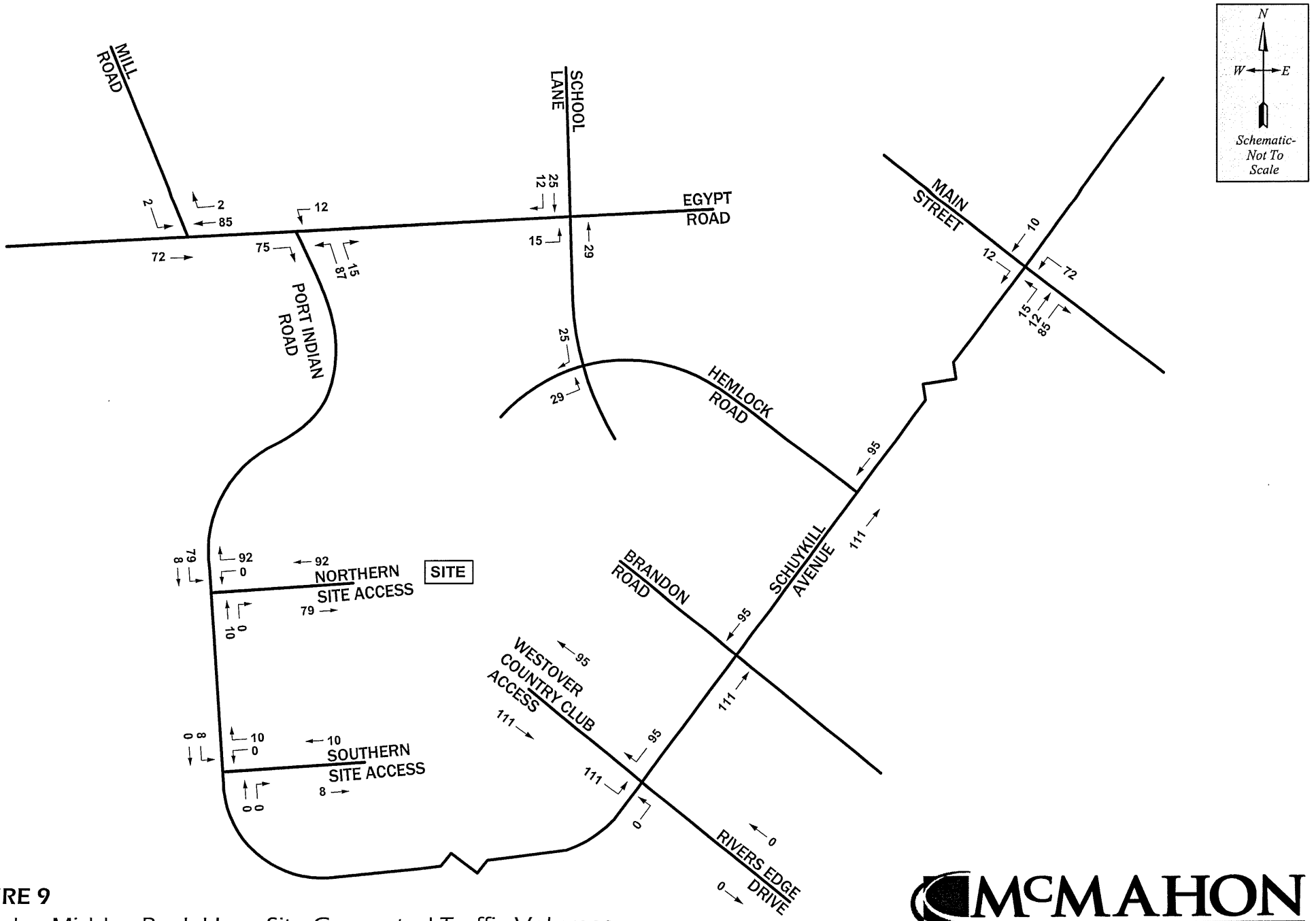


FIGURE 9

Saturday Midday Peak Hour Site Generated Traffic Volumes

WESTOVER RECREATION DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab: 6/15/12) i:\Eng\812073\Dwg\Figures\Figure 9.dwg

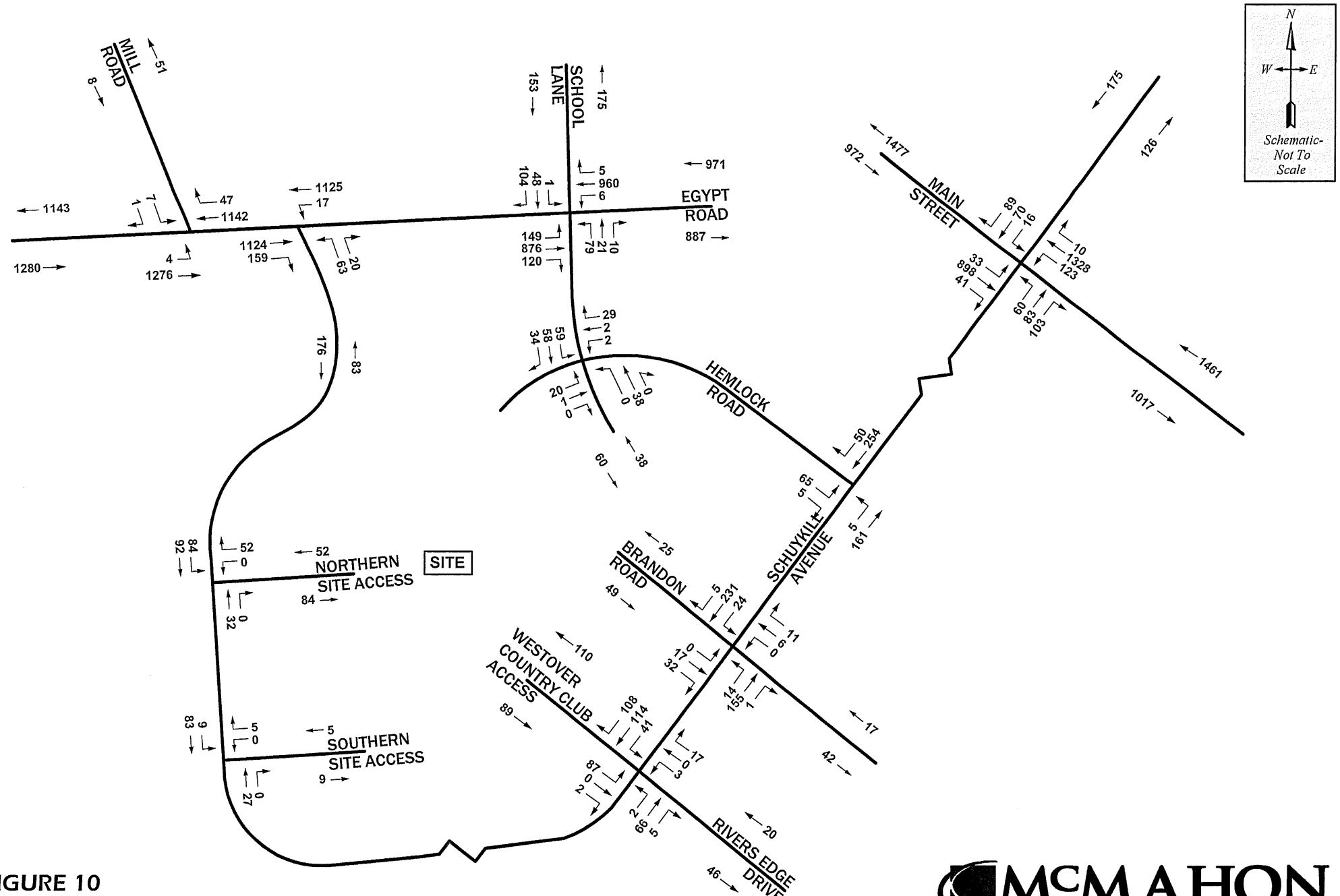


FIGURE 10

2015 Future Weekday Afternoon Peak Hour Traffic Volumes with Redevelopment

WESTOVER RECREATIONAL DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab: 6/22/12) i:\Eng\812073\Dwg\Figures\Figure 10.dwg

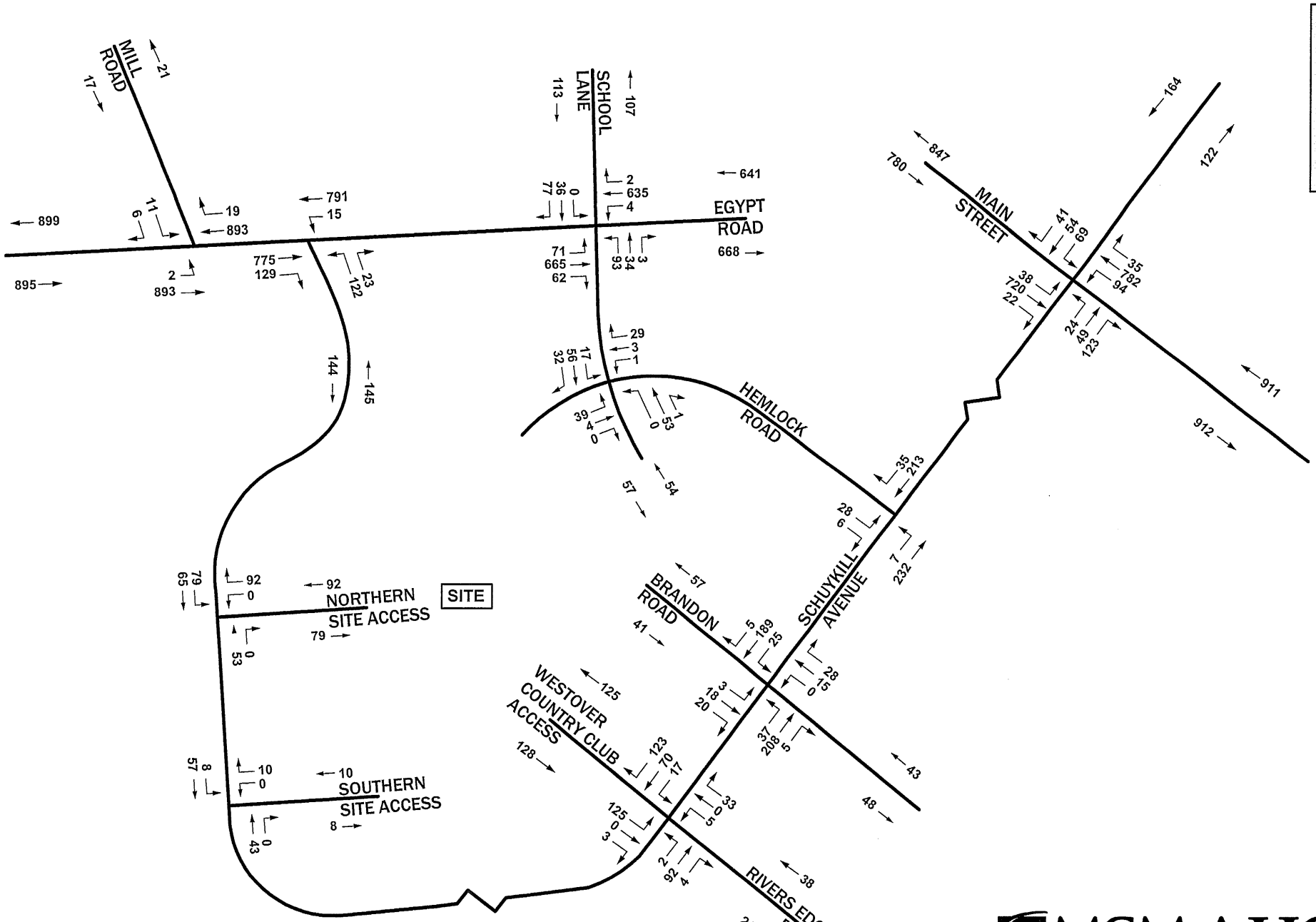


FIGURE 11

2015 Future Saturday Midday Peak Hour Traffic Volumes with Redevelopment

WESTOVER RECREATIONAL DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab: 6/22/12) i:\Eng\812073\Dwg\Figures\Figure 11.dwg

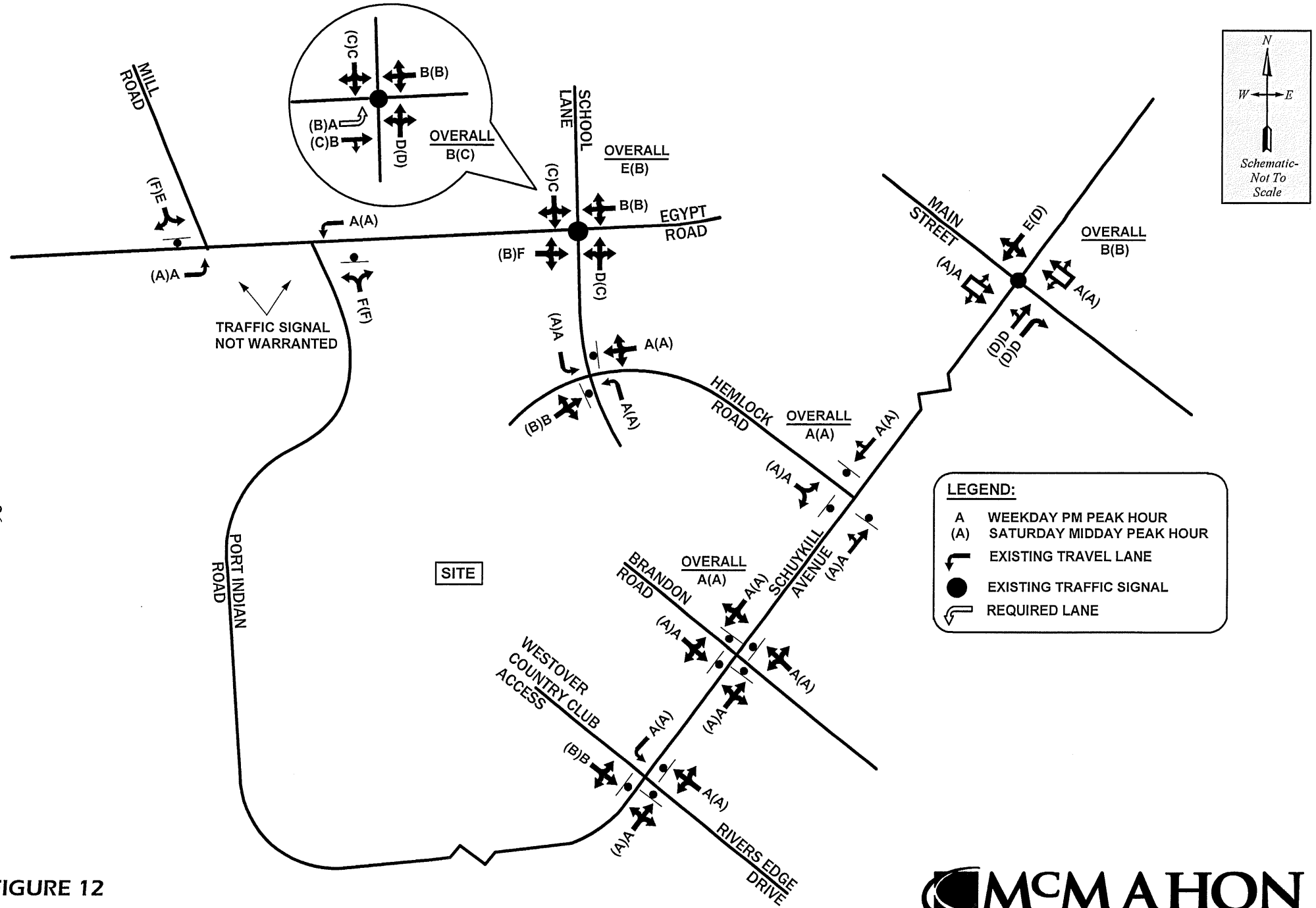


FIGURE 12

2012 Existing Traffic Conditions

WESTOVER RECREATION DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab/TL: 6/27/12) i:\Eng\812073\Dwg\Figures\Figure 12.dwg

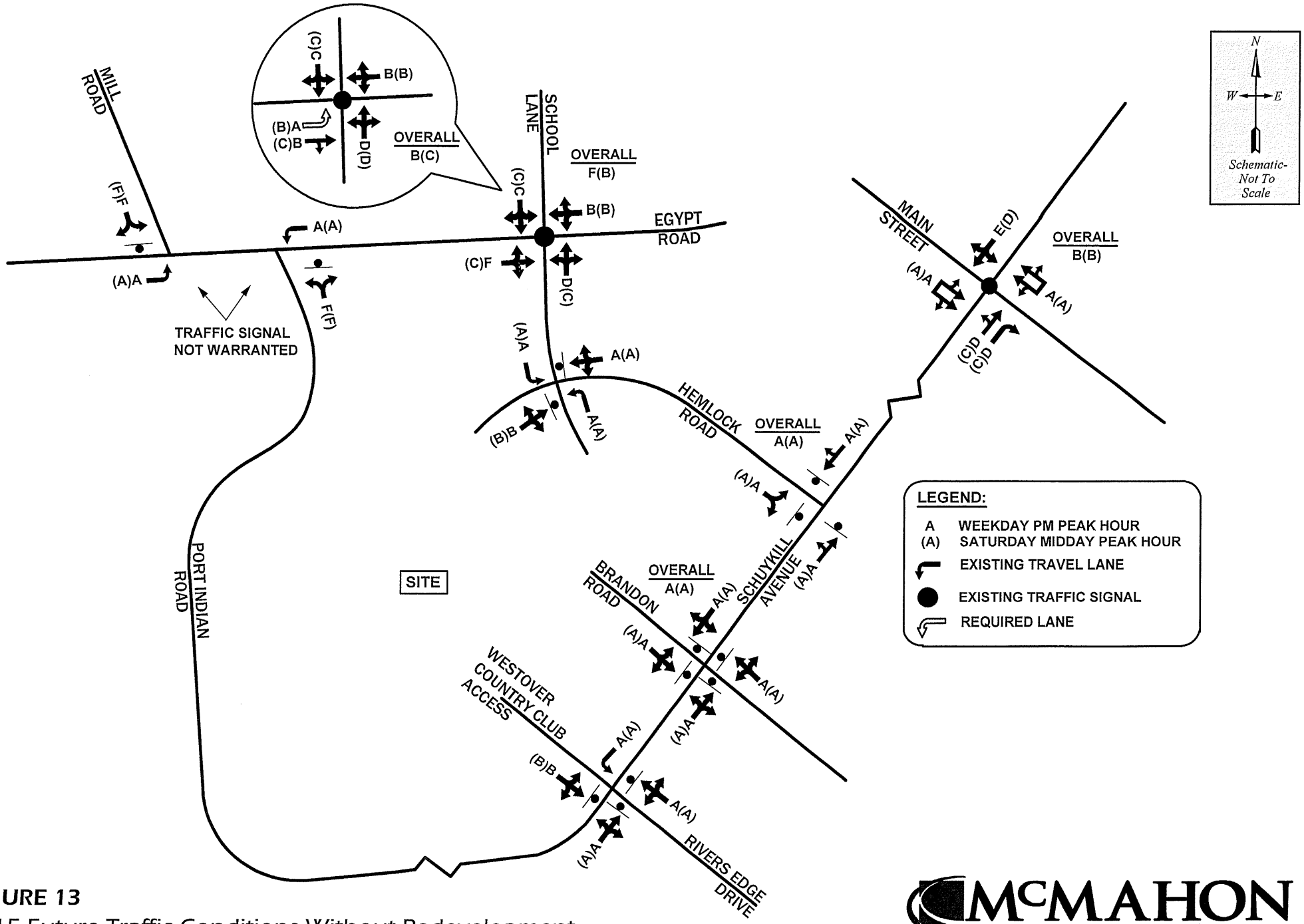


FIGURE 13

2015 Future Traffic Conditions Without Redevelopment

WESTOVER RECREATION DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab/TL: 6/27/12) i:\Eng\812073\Dwg\Figures\Figure 13.dwg

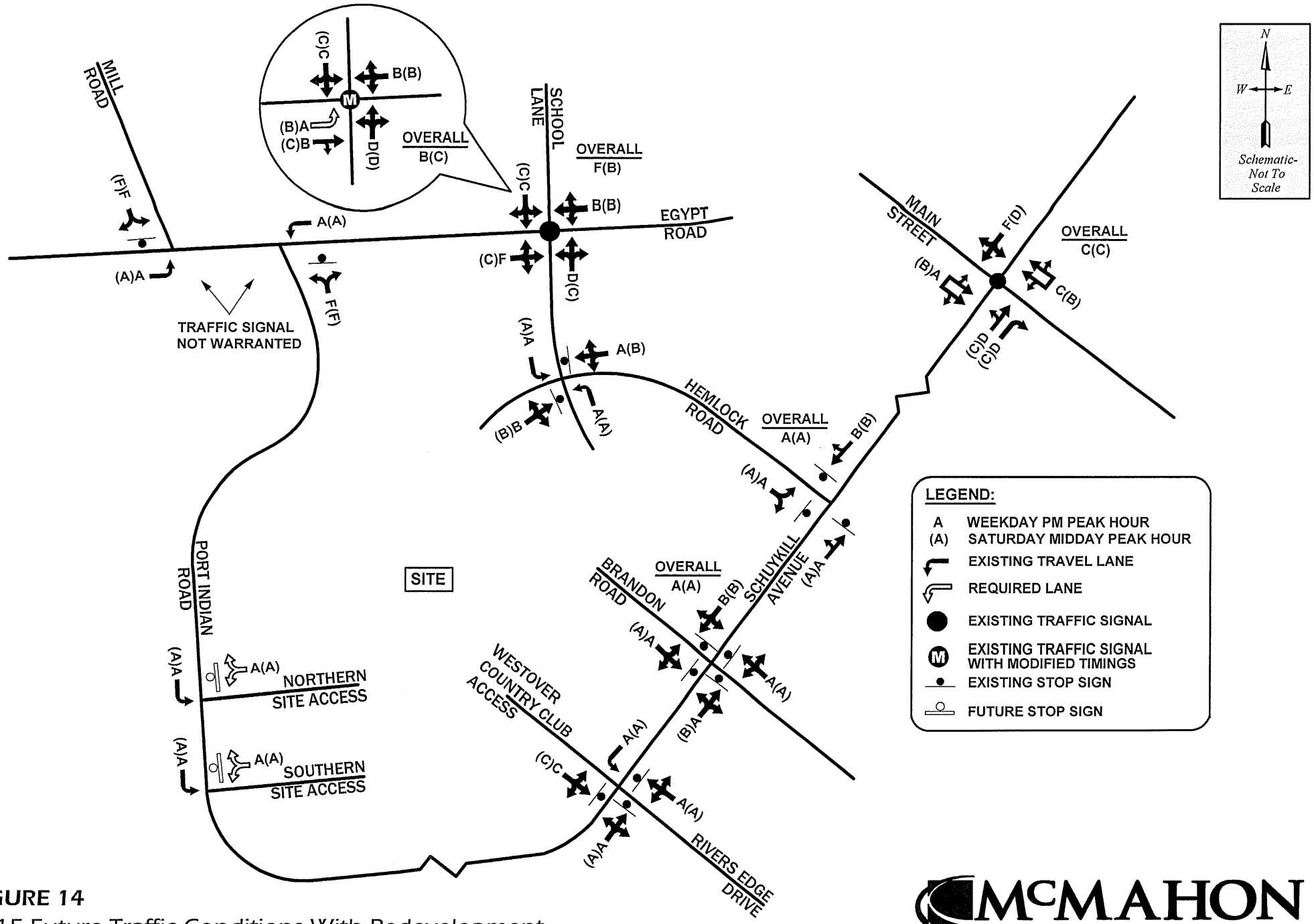


FIGURE 14

2015 Future Traffic Conditions With Redevelopment

WESTOVER RECREATION DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab/TL: 6/27/12) i:\Eng\812073\Dwg\Figures\Figure 14.dwg

APPENDIX A

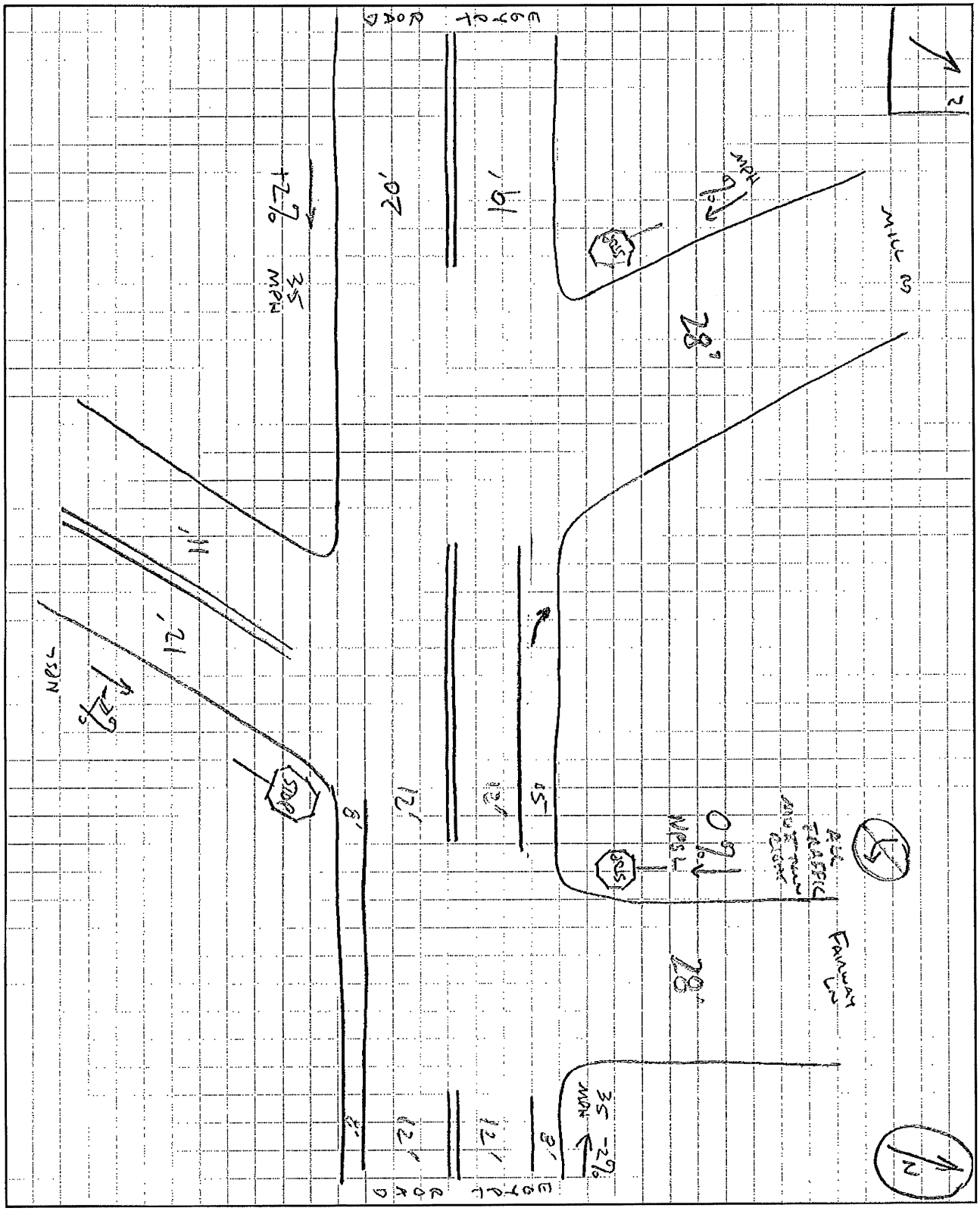
Intersection Sketches

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Job _____ McMahon Project No. 812073.11 Sheet _____ of ____

Description EGYPT ROAD + FAIRWAY LN Designed By NDB Date 3/26/12

+ PONT INDIAN RD / MILL ROAD Checked By _____ Date _____

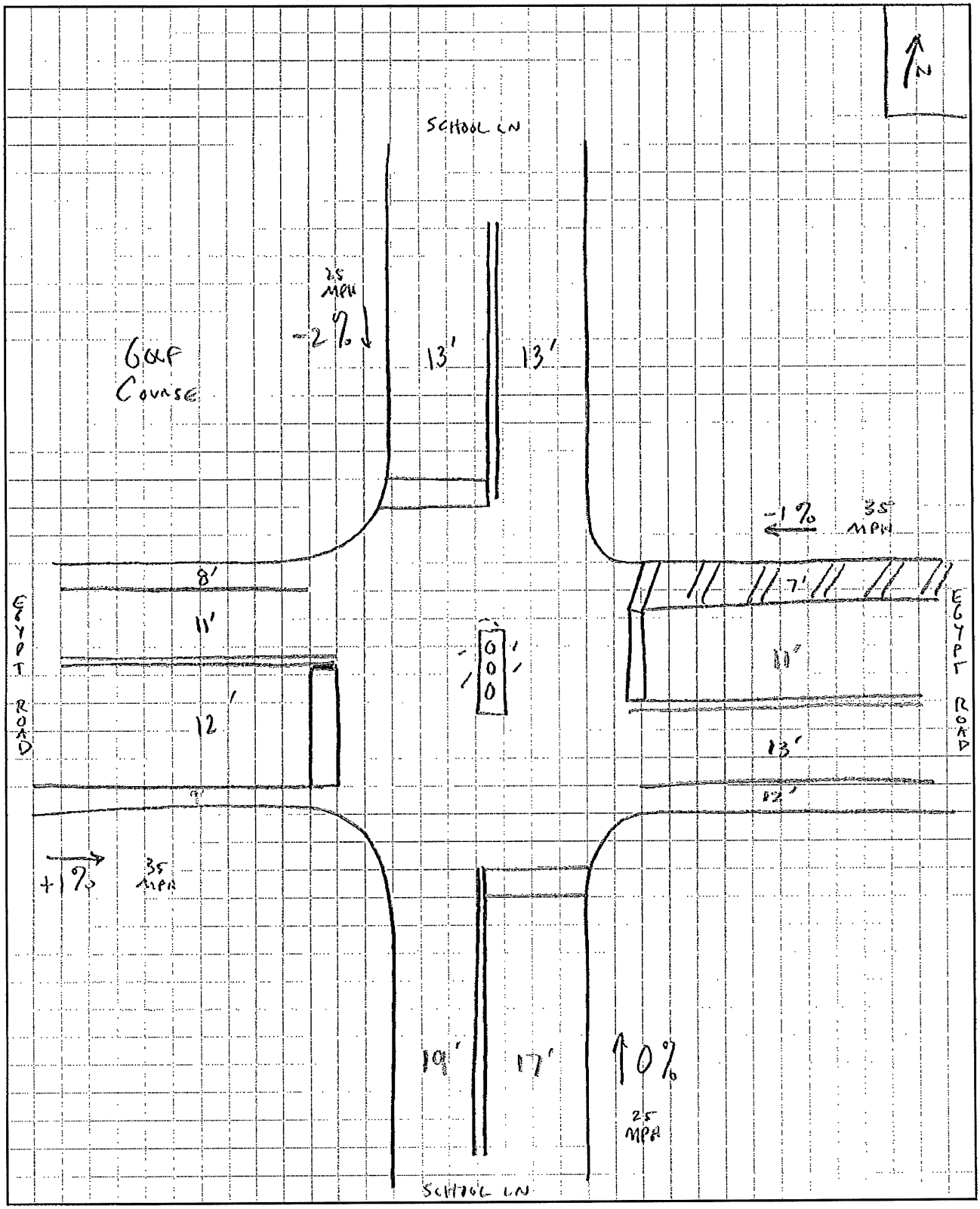


McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Job _____ McMahon Project No. 812073.11 Sheet _____ of _____

Description EGYPT ROAD + SCHOOL LANE Designed By NOB Date 5/26/12

Checked By _____ Date _____

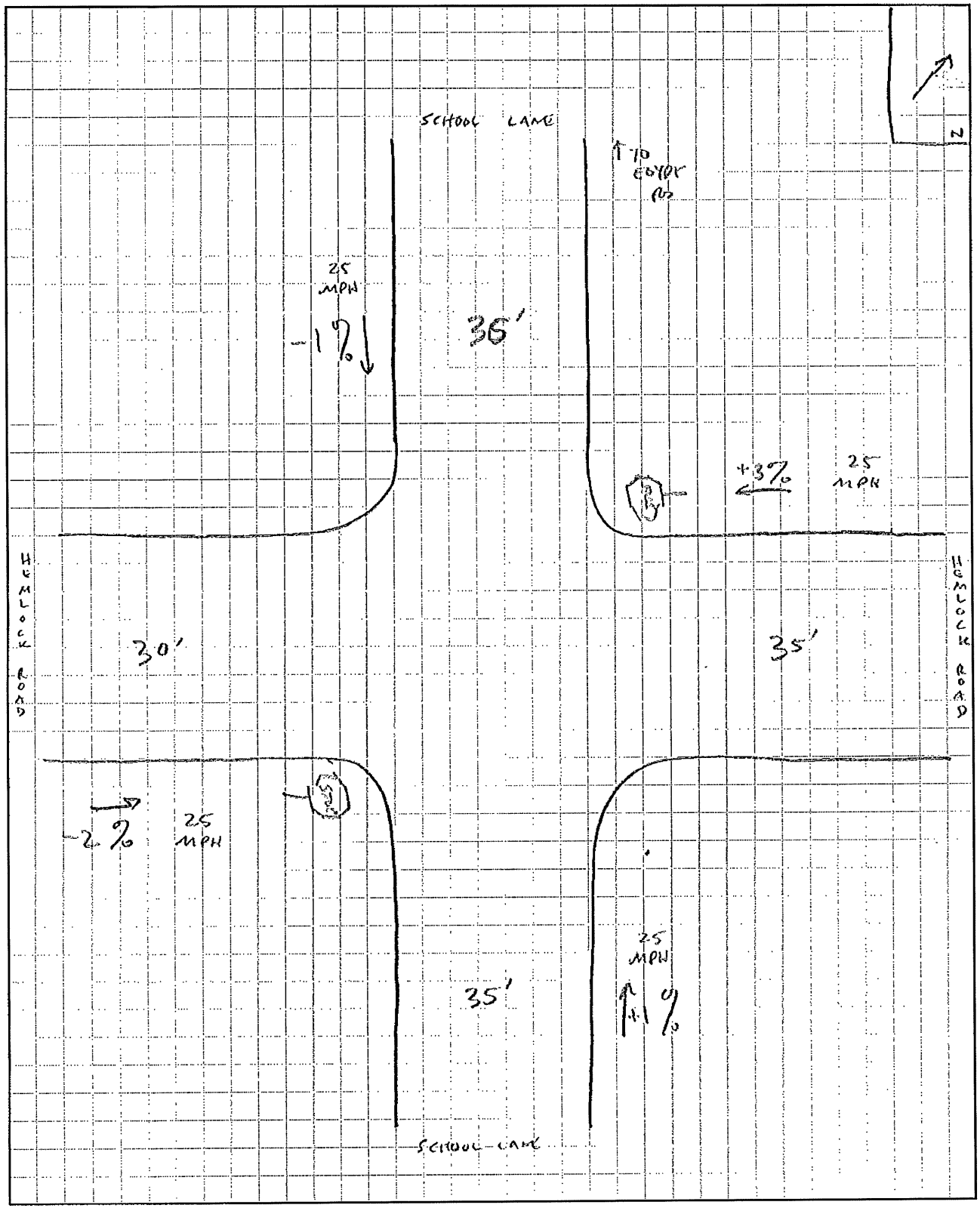


McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Job _____ McMahon Project No. 812073.11 Sheet _____ of _____

Description SCHOOL LANE + HEMLOCK ROAD Designed By NDB Date 3/26/11

Checked By _____ Date _____

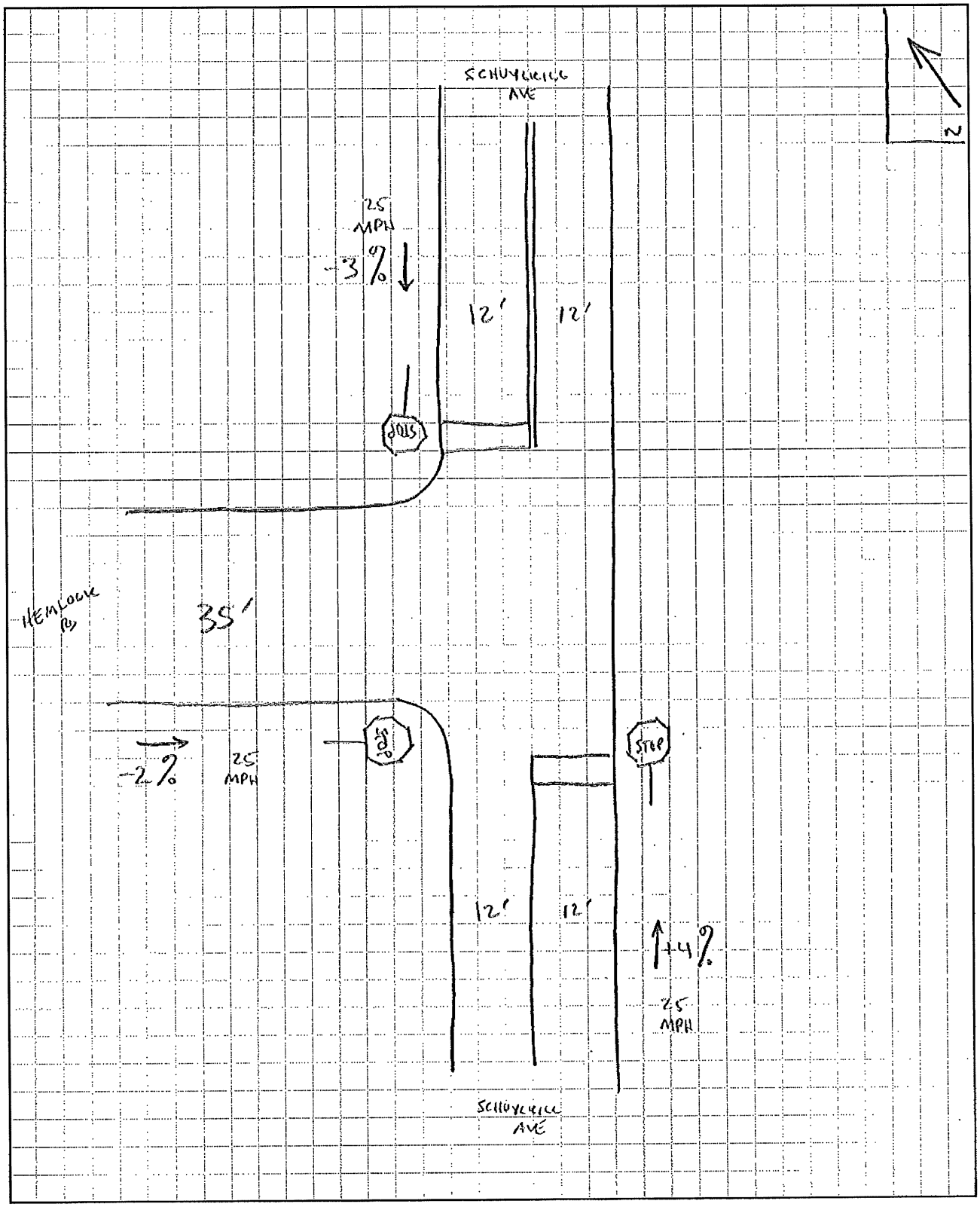


McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Job _____ McMahon Project No. 812073.11 Sheet _____ of ____

Description SCHUYLKILL AVE + HEMLOCK ROAD Designed By NDD Date 3/26/12

Checked By _____ Date _____

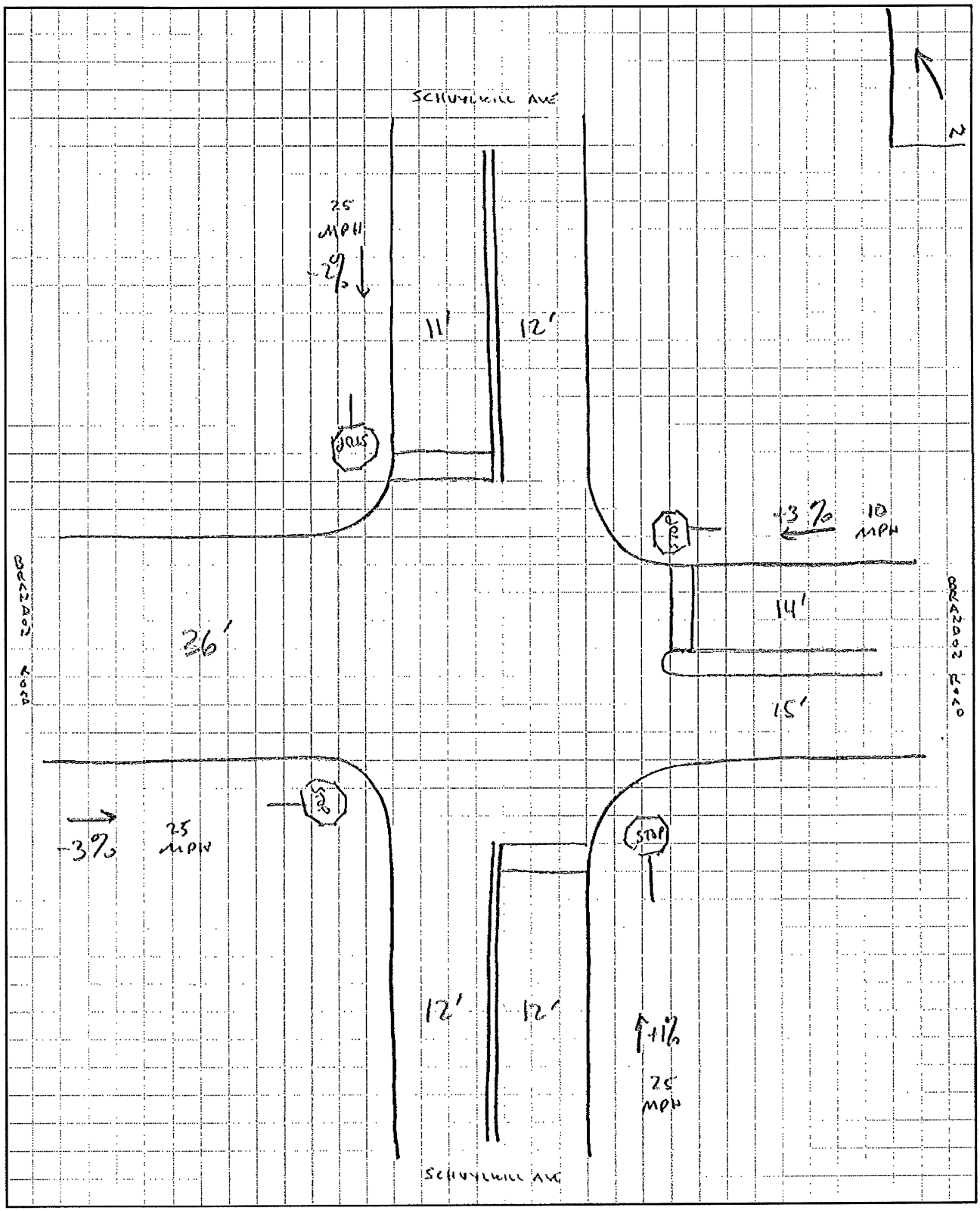


McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Job _____ McMahon Project No. 812.073.11 Sheet _____ of _____

Description SCHUYLKILL AVE + BRANDON RD Designed By MDB Date 3/26/12

Checked By _____ Date _____

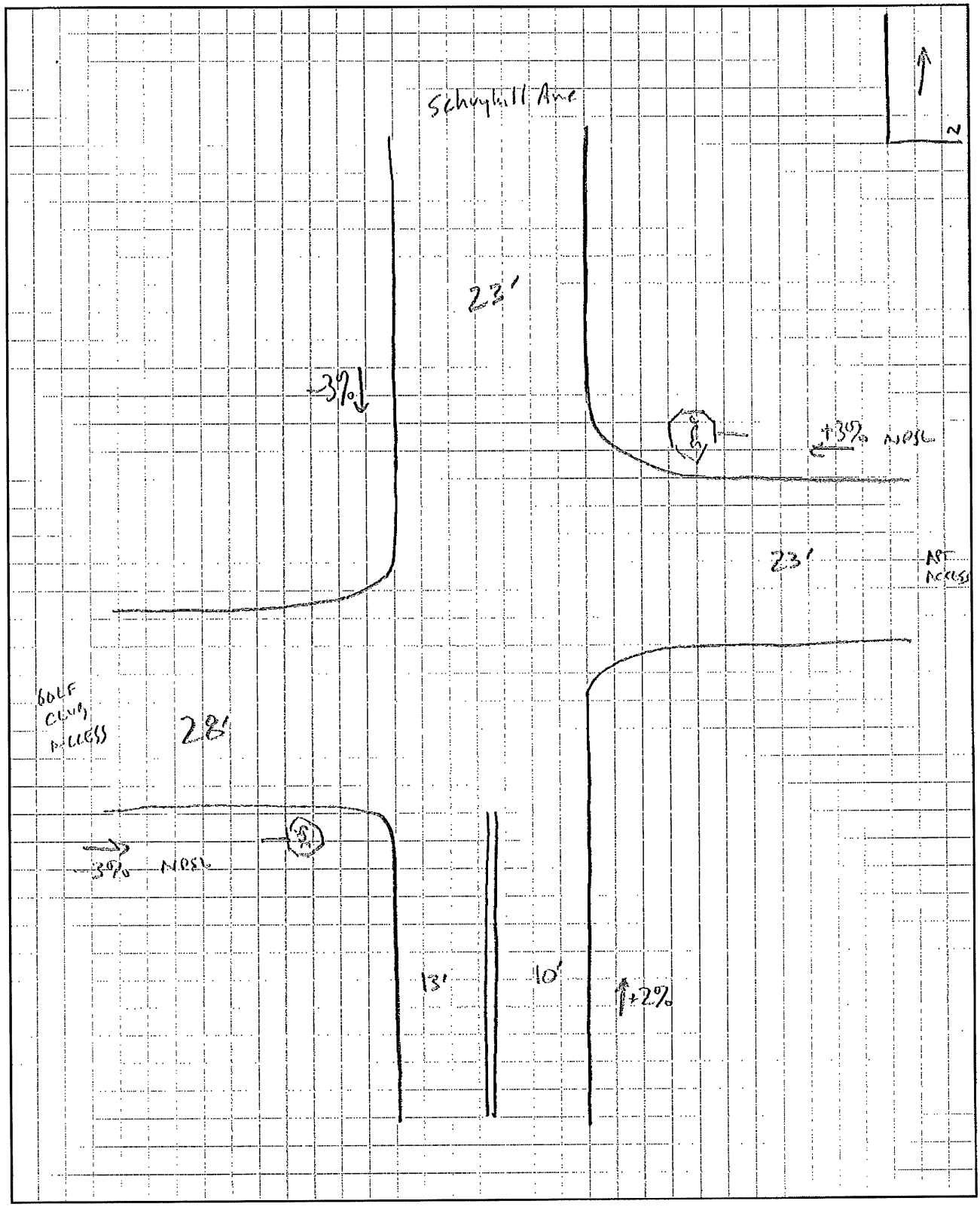


McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Job _____ McMahon Project No. 812073.11 Sheet _____ of _____

Description SCHUYLKILL AVE + Designed By NDB Date 3/26/12

WESTOVER CC ACCESS Checked By _____ Date _____

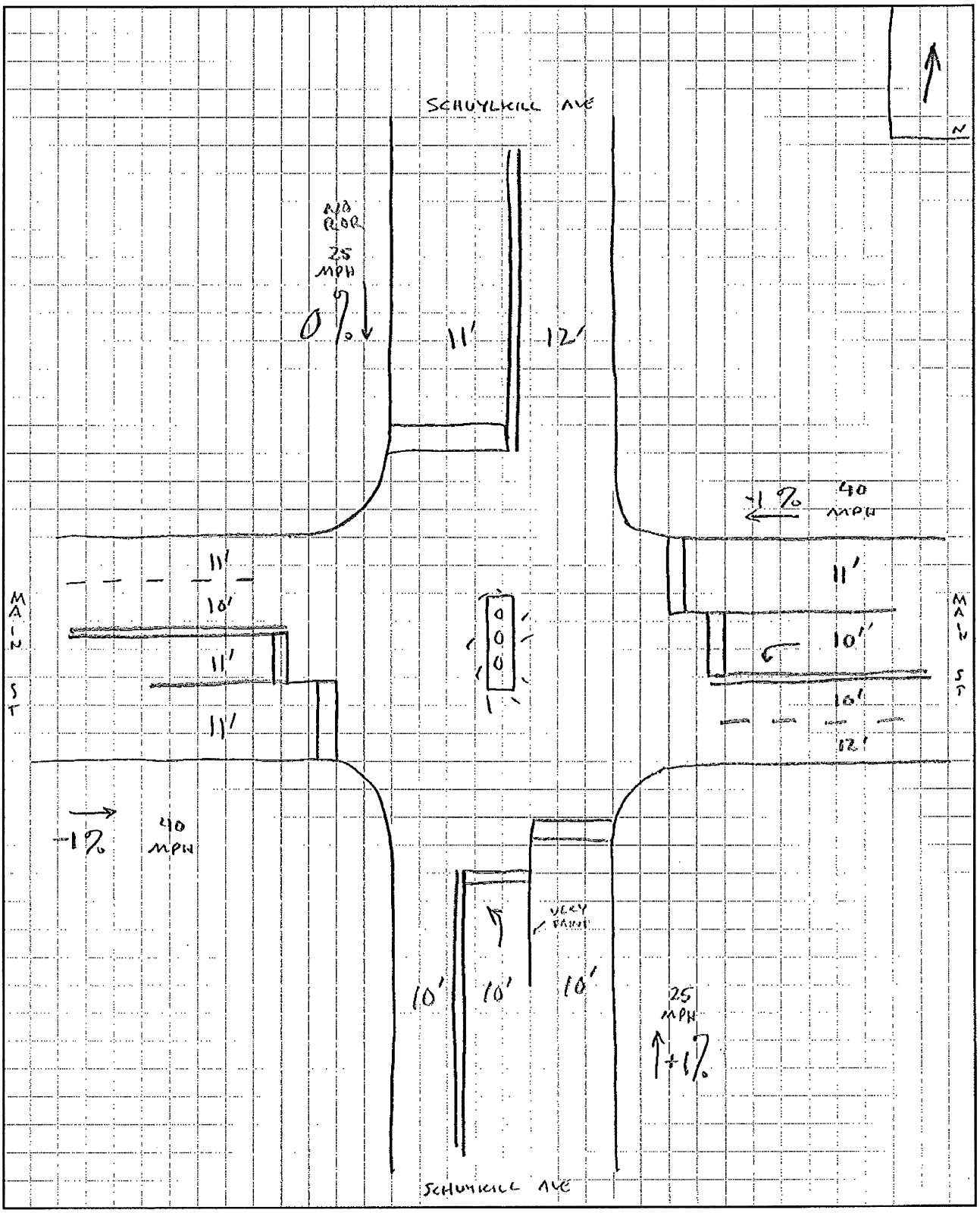


McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Job _____ McMahon Project No. _____ Sheet _____ of _____

Description MAIN ST + SCHUYLKILL AVE Designed By NOB Date 3/26/12

Checked By _____ Date _____

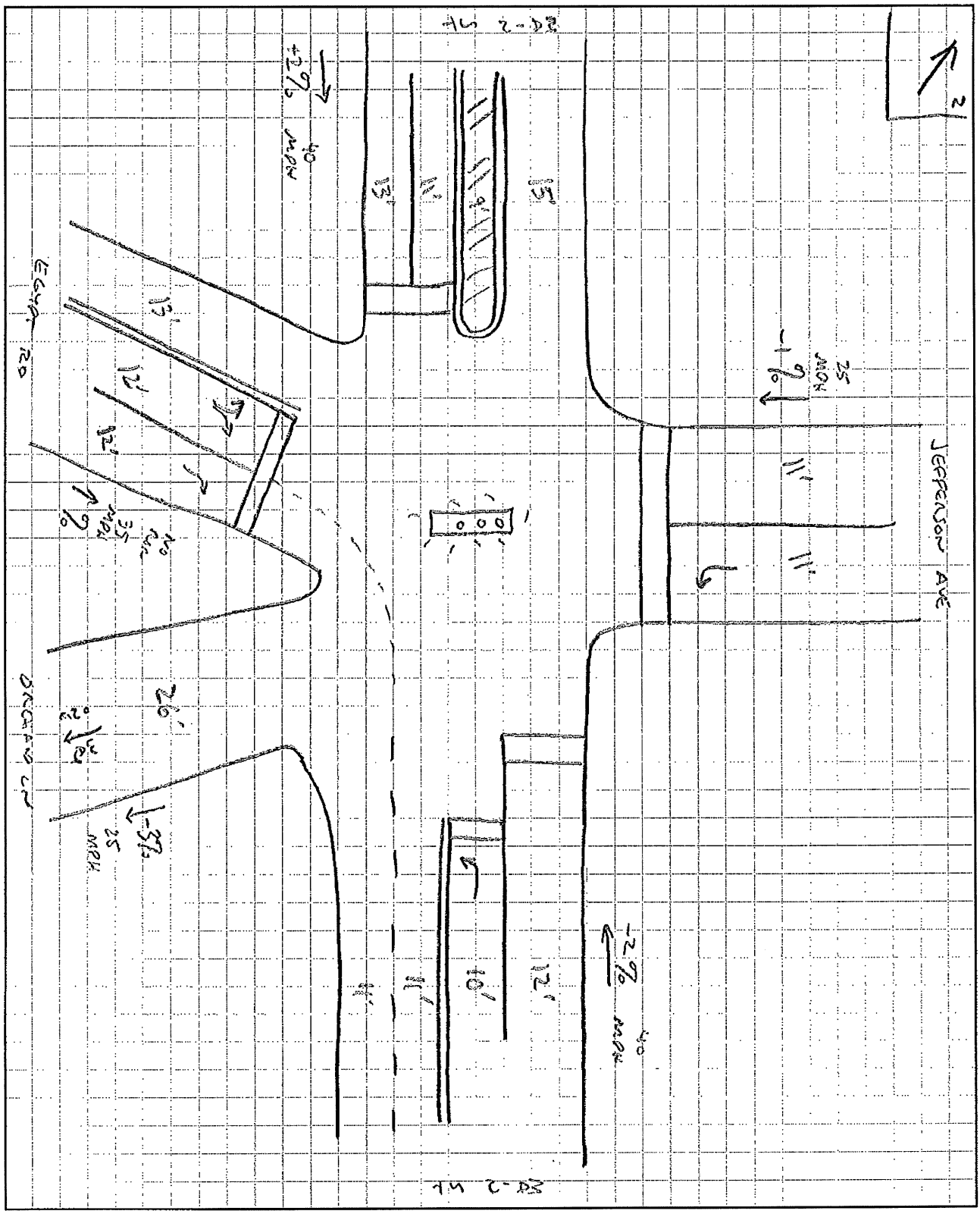


McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Job _____ McMahon Project No. 812073.11 Sheet _____ of _____

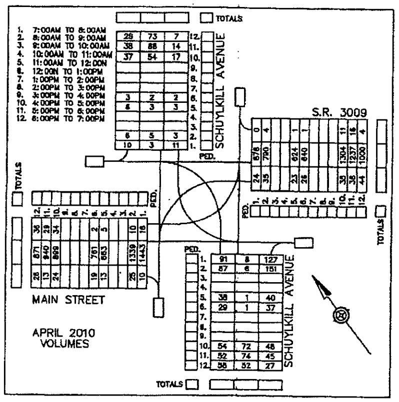
Description MAIN ST + JEFFERSON AVE Designed By NDB Date 3/26/12

+ ORCHARD LN + EGYPT RD Checked By _____ Date _____



West Norriton

File 0842



SIGN DETAILS

NOT TO SCALE

West Main St (A=96", G=90", B=16", 8")

SIGN E

CLEARVIEW 2W
8" UPPER CASE
6" LOWER CASE

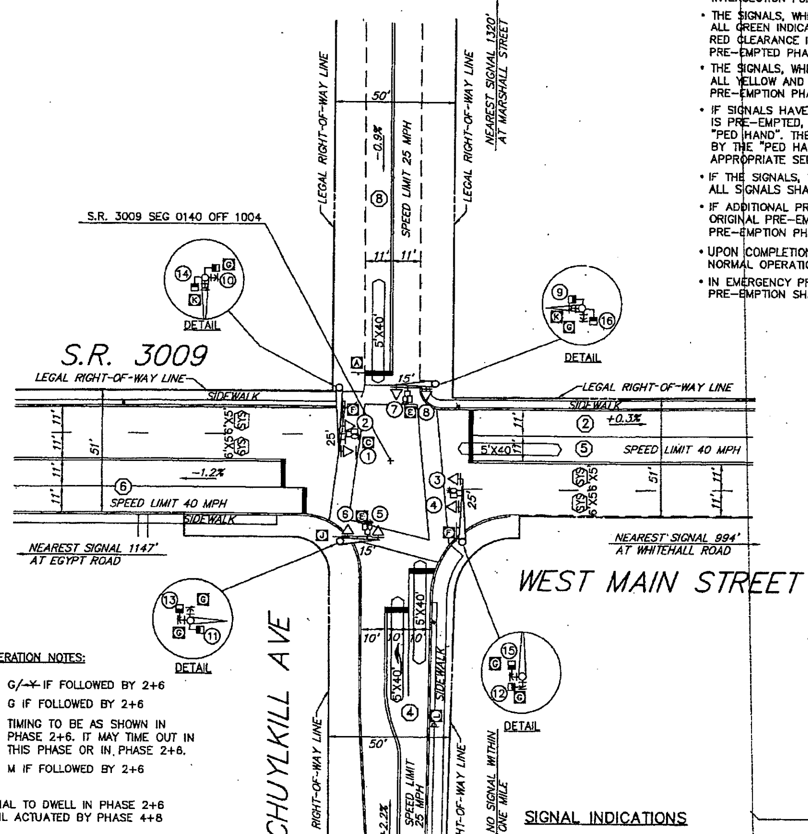
Schuylkill Ave (A=96", G=90", B=16", 10.6")

SIGN F

12% REDUCTION
CLEARVIEW 1W
10.6" UPPER CASE
8" LOWER CASE

SIGN TABULATION

PLAN SYMBOL	SERIES NUMBER	SIZE	REMARKS
A	R10-6L	24X30	STOP HERE ON RED
C	R10-12	30X36	LEFT TURN YIELD ON GREEN ●
E	D3-4	72X16	OVERHEAD STREET NAME SIGN (SEE DETAIL)
F	D3-4	96X16	OVERHEAD STREET NAME SIGN (SEE DETAIL)
G	R10-3B(L)	9X12	EDUCATIONAL PUSH BUTTON FOR WALKING PERSON
J	R10-11	30X36	NO TURN ON RED
K	R10-3B(R)	9X12	EDUCATIONAL PUSH BUTTON FOR WALKING PERSON
L	R3-7L	30X30	LEFT LANE MUST TURN LEFT



MOVEMENT, SEQUENCE AND TIMING DIAGRAM

PHASE	2+5				2+6				4+8				FLASH
SIGNALS \ INTERVAL	1	2	3	4	5	6	7	8	9	10	11	12	
1	G/G	G/G	Y ①	R ②	G	G	Y	R	R	R	R	R	Y
2	G	G	Y ②	R ②	G	G	Y	R	R	R	R	R	Y
3,4	R	R	R	R	G	G	Y	R	R	R	R	R	Y
5,6	R	R	R	R	R	R	R	R	G	G	Y	R	R
7,8	R	R	R	R	R	R	R	R	G	G	Y	R	R
9,10*	M	FH ④	H ④	H ④	M	FH	H	H	H	H	H	H	OFF
11,12*	H	H	H	H	M	FH	H	H	H	H	H	H	OFF
13,14,15,16*	H	H	H	H	H	H	H	H	M	FH	H	H	OFF

FIXED			4	2			4	2			3	3
MINIMUM	3				15				3			
PASSAGE	3								3			
MAXIMUM	7								13			
PEDESTRIAN	③				7	14			7	16		
MEMORY	NL				MN				NL			

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

OPERATION NOTES:

① G/↞ IF FOLLOWED BY 2+6

② G IF FOLLOWED BY 2+6

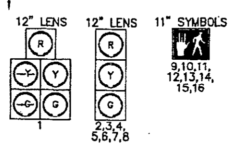
③ TIMING TO BE AS SHOWN IN PHASE 2+6. IT MAY TIME OUT IN THIS PHASE OR IN. PHASE 2+6.

④ M IF FOLLOWED BY 2+6

• SIGNAL TO DWELL IN PHASE 2+6 UNTIL ACTUATED BY PHASE 4+8

SYSTEM NOTE:
REFER TO SYSTEM PERMIT #I-0126 FOR PROGRAM TIMES AND WEEKLY PROGRAM CHART.

SIGNAL INDICATIONS



EMERGENCY PRE-EMPTION NOTES:

- CONTROLLER TO BE EQUIPPED WITH EMERGENCY PRE-EMPTION FOR THE NORTHBOUND & SOUTHBOUND APPROACHES OF SCHUYLKILL AVENUE AND THE EASTBOUND & WESTBOUND APPROACHES OF WEST MAIN STREET WITH A FAIL SAFE DEVICE FOR EACH DIRECTION OF OPERATION. THIS EMERGENCY BEACON SHALL CONSIST OF A FLASHING WHITE FLOOD LIGHT, AND SHALL FLASH WHEN THE EMERGENCY VEHICLE HAS CONTROL OF THE INTERSECTION FOR THE APPROPRIATE APPROACH.
- THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, SHALL TERMINATE ALL GREEN INDICATIONS IMMEDIATELY, FOLLOWED BY THE COMPLETE YELLOW AND RED CLEARANCE INTERVALS, ACCORDINGLY. THEN THE GREEN INTERVAL FOR THE PRE-EMPTED PHASE SHALL FOLLOW.
- THE SIGNALS, WHEN ACTIVATED BY EMERGENCY VEHICLE SHALL TIME OUT ALL YELLOW AND RED INDICATIONS, FOLLOWED BY THE GREEN INTERVAL OF THE PRE-EMPTION PHASE GOVERNED BY THE APPROACHING EMERGENCY VEHICLE.
- IF SIGNALS HAVE BEEN ACTUATED BY PEDESTRIAN PUSH BUTTON AND THE SIGNAL IS PRE-EMPTED, THE PEDESTRIAN TIME SHALL BE SPLIT BETWEEN "PED MAN" AND "PED HAND". THE "PED MAN" INTERVAL SHALL TERMINATE IMMEDIATELY FOLLOWED BY THE "PED HAND" INTERVAL. THIS INTERVAL SHALL TIME OUT FOLLOWED BY THE APPROPRIATE SELECTIVE CLEARANCES BEFORE GOING INTO EMERGENCY PRE-EMPTION.
- IF THE SIGNALS, WHEN ACTIVATED BY AN EMERGENCY VEHICLE, ARE FLASHING ALL SIGNALS SHALL REMAIN FLASHING.
- IF ADDITIONAL PRE-EMPTION PHASES ARE ACTIVATED WHILE IN PRE-EMPTION, THE ORIGINAL PRE-EMPTION PHASE SHALL TIME OUT BEFORE PROCEEDING TO THE NEXT PRE-EMPTION PHASE.
- UPON COMPLETION OF PRE-EMPTION, PHASE 2,4,6 OR 8 IN RETURNING TO NORMAL OPERATION, PHASE 2+6 INTERVAL 5 SHALL FOLLOW.
- IN EMERGENCY PRE-EMPTION, NO PRIORITY SHALL BE ESTABLISHED, PRE-EMPTION SHALL BE A "FIRST COME, FIRST SERVE" OPERATION.

EMERGENCY PRE-EMPTION PHASING

MOVEMENT, SEQUENCE AND TIMING DIAGRAM

PHASE	2				4				6				8			
SIGNALS \ INTERVAL	13	14	15		16	17	18		19	20	21		22	23	24	
1	G/G	Y ⓐ	R ⓑ		R	R	R		R	R	R		R	R	R	
2	G	Y ⓑ	R ⓑ		R	R	R		R	R	R		R	R	R	
3,4	R	R	R		R	R	R		G	Y ⓑ	R ⓑ		R	R	R	
5,6	R	R	R		R	R	R		R	R	R		G	Y	R	
7,8	R	R	R		G	Y	R		R	R	R		R	R	R	
9,10,11,12	H	H	H		H	H	H		H	H	H		H	H	H	
13,14,15,16	H	H	H		H	H	H		H	H	H		H	H	H	
FIXED	**	4	2		**	3	3		**	4	2		**	3	3	

** FOR DURATION OF PRE-EMPTION

NOTE:
IF PRE-EMPTION EQUIPMENT HAS ENCODING CAPABILITIES FOR VEHICLE IDENTIFICATION, IT IS RECOMMENDED TO HAVE THE ZERO "00" FEATURE ON, TO GIVE UNCODED EMITTERS THE ABILITY TO ACTIVATE THE EMERGENCY PRE-EMPTION.

ⓐ G/↞ WHEN RETURNING TO NORMAL OPERATION

ⓑ G WHEN RETURNING TO NORMAL OPERATION

SCALE

25 0 25

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/SIZE
- 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. 212.

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 THE LATEST AMENDMENT TO ACT 287, PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES, DATED DECEMBER 20, 1974.

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-8800 SERIES.

SYSTEM PERMIT# I-0126

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY
MUNICIPALITY: WEST NORRITON TOWNSHIP
INTERSECTION: WEST MAIN STREET (S.R. 3009) AND SCHUYLKILL AVENUE

REVIEWED:

DATE

MUNICIPAL OFFICIAL DATE

RECOMMENDED:

HARTLEY C. GAFRED 8/10/54
DISTRICT TRAFFIC ENGINEER DATE

NO.	REVISION	DES./REVW.	DATE	REVW.	DATE	RECOM.	DATE
1	NEW DWG, MODERIZATION	NV	5/12/98	MK	4/19/99	DWM	4/26/99
2	UPDATE COUNT BLOCK & MST	JLH	10/5/11	[illegible]	10/?/11	[illegible]	11/1/11
3							
4							
5							
6							
7							
7							

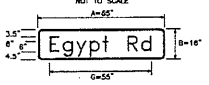
SHEET 2 OF 2 PERMIT # 64-0842 FILE # 0842

W. NORRITON TWP.

3405

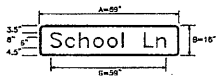
SIGN TABULATION			
PLAN SYMBOL	SERIES NUMBER	SIZE	REMARKS
A	R10-3B(L)	9"x12"	EDUCATIONAL PUSH BUTTON FOR WALKING PERSON SIGNAL SIGN ←
B	R10-3B(R)	9"x12"	EDUCATIONAL PUSH BUTTON FOR WALKING PERSON SIGNAL SIGN →
C	D3-4	85"x16"	"Egypt Rd" SIGN
D	D3-4	69"x16"	"School Ln" SIGN
E	R4-18	30"x30"	KEEP OFF SHOULDER
F	R7-1	12"x12"	NO PARKING
G	R7-7	12"x6"	NO PARKING ARROW PLAQUE ←
J	R10-11	24"X30"	NO TURN ON RED

DETAIL SIGN "C"
NOT TO SCALE

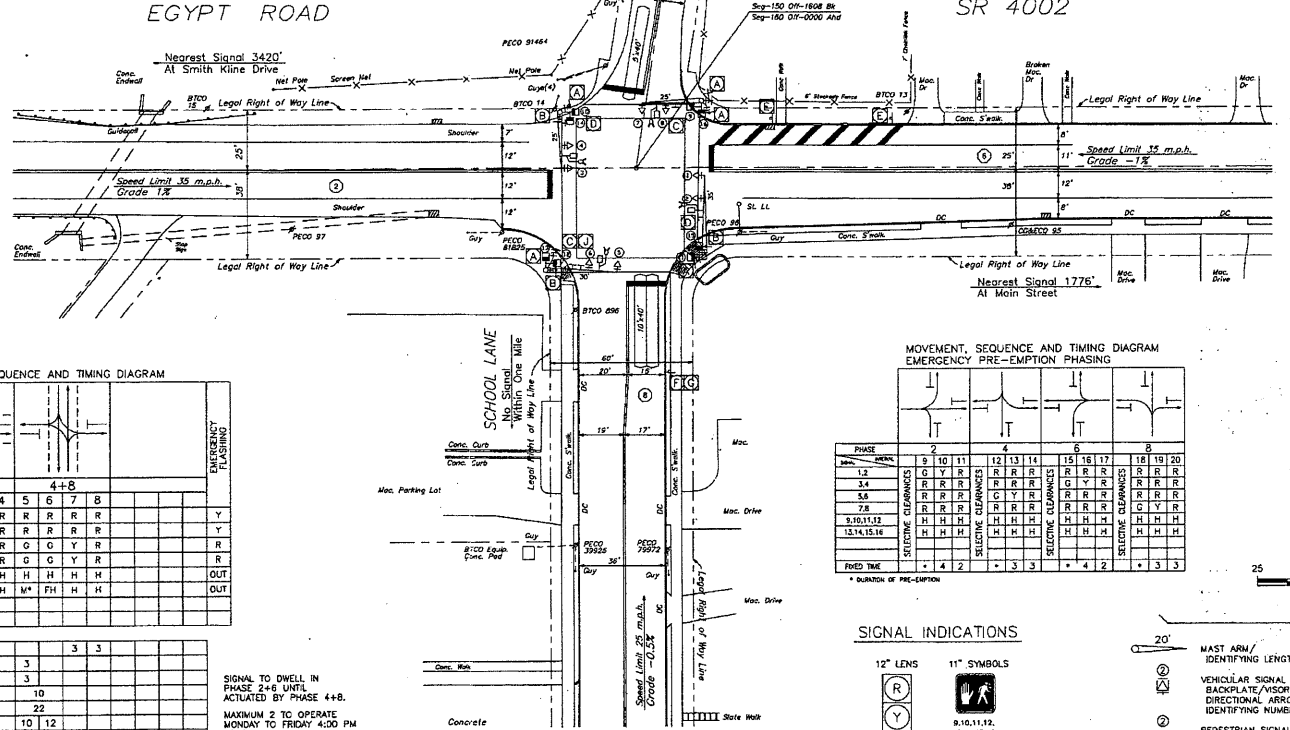


CLEARVIEW CHE CD-45 FONT
WHITE LETTERS, GREEN BACKGROUND
8" U.C.
6" L.C.

DETAIL SIGN "D"
NOT TO SCALE



CLEARVIEW CHE CD-45 FONT
WHITE LETTERS, GREEN BACKGROUND
8" U.C.
6" L.C.



EMERGENCY PRE-EMPTION NOTES

CONTROLLER TO BE EQUIPPED WITH EMERGENCY PRE-EMPTION FOR ALL FOUR APPROACHES TO THE INTERSECTION, WITH A FAIL SAFE DEVICE FOR EACH DIRECTION OF OPERATION.

THIS EMERGENCY REACTION SHALL CONSIST OF A FLASHING WHITE FLOOD LIGHT AND SHALL FLASH WHEN THE EMERGENCY VEHICLE HAS CONTROL OF THE INTERSECTION FOR THE APPROPRIATE APPROACH.

THE SIGNALS, WHEN ACTUATED BY EMERGENCY VEHICLES, SHALL TERMINATE ALL GREEN INDICATIONS IMMEDIATELY, FOLLOWED BY THE COMPLETE YELLOW AND RED CLEARANCE INTERVALS ACCORDINGLY, THEN THE GREEN INTERVAL FOR THE PREEMPTED PHASE SHALL FOLLOW.

THE SIGNALS, WHEN ACTUATED BY AN EMERGENCY VEHICLE, SHALL TIME OUT ALL YELLOW AND RED INDICATIONS, FOLLOWED BY THE GREEN INTERVAL OF THE PREEMPTION PHASE DESIRED BY THE APPROACHING EMERGENCY VEHICLE.

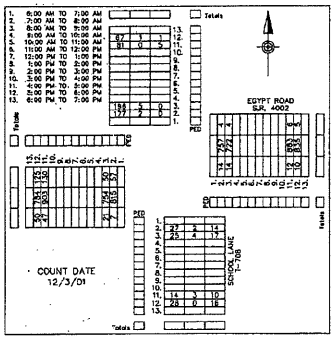
IF SIGNALS HAVE BEEN ACTUATED BY A PEDESTRIAN PUSHBUTTON, AND THE SIGNAL IS PRE-EMPTED, THE PEDESTRIAN TIME SHALL BE SPLIT BETWEEN PED WALK (WALK) AND PED CLEAR (CHANG). THE PED WALK (WALK) INTERVAL SHALL TERMINATE IMMEDIATELY, FOLLOWED BY THE PED CLEAR (WALK) INTERVAL. THIS INTERVAL SHALL TIME OUT, FOLLOWED BY THE APPROPRIATE SELECTIVE CLEARANCES, BEFORE GOING INTO EMERGENCY PRE-EMPTION.

IF THE SIGNALS, WHEN ACTUATED BY AN EMERGENCY VEHICLE, ARE FLASHING, ALL SIGNALS SHALL REMAIN FLASHING.

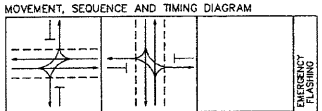
IF ADDITIONAL PRE-EMPTION PHASES ARE ACTIVATED WHILE IN PRE-EMPTION, THE ORIGINAL PRE-EMPTION PHASE SHALL TIME OUT BEFORE PROCEEDING TO THE NEXT PRE-EMPTION PHASE.

UPON COMPLETION OF PREEMPTION PHASE 2, 4, 6 OR 8, IN RETURNING TO NORMAL OPERATION, PHASE 2+6 INTERVAL 1 SHALL FOLLOW.

IN EMERGENCY PRE-EMPTION NO PRIORITY SHALL BE ESTABLISHED. PRE-EMPTION SHALL BE A "FIRST COME, FIRST SERVE" OPERATION.



MOVEMENT, SEQUENCE AND TIMING DIAGRAM



PHASE	2+6				4+8				EMERGENCY FLASHING
INTERVAL / SIGNALS	1	2	3	4	5	6	7	8	
1,2	G	G	Y	R	R	R	R	R	Y
3,4	G	G	Y	R	R	R	R	R	Y
5,6	R	R	R	R	G	G	Y	R	R
7,8	R	R	R	R	G	G	Y	R	R
9,10,11,12	M*	FH	H	H	H	H	H	H	OUT
13,14,15,16	H	H	H	H	M*	FH	H	H	OUT

FIXED		4	2				3	3
MINIMUM		15			3			
PASSAGE					3			
MAXIMUM 1		68			10			
MAXIMUM 2		56			22			
PEDESTRIAN *		8	9		10	12		
MEMORY		MR			NL			

* UPON PEDESTRIAN ACTUATION ONLY

SIGNAL TO DWELL IN PHASE 2+6 UNTIL ACTUATED BY PHASE 4+8.

MAXIMUM 2 TO OPERATE MONDAY TO FRIDAY 4:00 PM TO 6:00 PM.

MAXIMUM 1 TO OPERATE AT ALL OTHER TIMES.

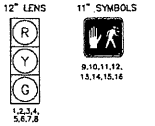
DETECTOR ON PHASE B TO OPERATE ON A 5 SECOND DELAY.

MOVEMENT, SEQUENCE AND TIMING DIAGRAM
EMERGENCY PRE-EMPTION PHASING

PHASE	2			4			6			8		
INTERVAL / SIGNALS	9	10	11	12	13	14	15	16	17	18	19	20
1,2	G	Y	R	R	R	R	R	R	R	R	R	R
3,4	R	R	R	G	Y	R	G	Y	R	R	R	R
5,6	R	R	R	G	Y	R	R	R	R	R	R	R
7,8	R	R	R	R	R	R	R	R	R	G	Y	R
9,10,11,12	H	H	H	H	H	H	H	H	H	H	H	H
13,14,15,16	H	H	H	H	H	H	H	H	H	H	H	H
FIXED TIME	*	4	2	*	3	3	*	4	2	*	3	3

* DURATION OF PRE-EMPTION

SIGNAL INDICATIONS



LEGEND

20' MAST ARM/ IDENTIFYING LENGTH	12'x6' LOOP SENSOR/SIZE
VEHICULAR SIGNAL HEAD/ BACKPLATE/VISORS/ DIRECTIONAL ARROW/ IDENTIFYING NUMBER	MICROWAVE DETECTOR
PEDESTRIAN SIGNAL HEAD/ IDENTIFYING NUMBER	EMERGENCY PREEMPTION BEACON
PEDESTRIAN PUSHBUTTON/ SIGN	EMERGENCY PREEMPTION DEVICE
SIGN/IDENTIFYING LETTER	CURB CUT RAMP
	UTILITY POLE
	PHASE NUMBER

SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS _____

SIGNALS TO BE EQUIPPED WITH TUNNEL VISORS & LOUVERS _____

02106

GENERAL NOTES

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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.

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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, 1996.

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.

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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: WEST NORRITON TOWNSHIP

INTERSECTION: EGYPT ROAD (S.R. 4002) & SCHOOL LANE (T-708)

REVIEWED: _____ DATE

MUNICIPAL OFFICIAL _____ DATE

RECOMMENDED: _____ 10/20/3

_____ 11/7/03

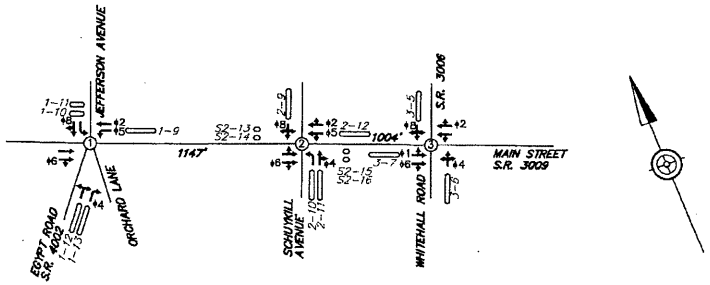
DISTRICT TRAFFIC ENGINEER DATE

NO.	REVISION	DES./ REVW.	DATE	REVW.	DATE	RECOM.	DATE

SHEET 2 OF 2 | PERMIT # 64-3405 | FILE # 3405

Lower Providence & W Norriton I 0126

TRAFFIC SIGNAL SYSTEM PERMIT PLAN



SYSTEM NOTES

1. PROGRAM TO BE SELECTED BY CLOSED LOOP SYSTEM (TIME OF DAY) OR TBC BACKUP.
2. OFFSETS ARE REFERENCED TO THE BEGINNING OF NEMA TS2 FIRST GREEN.
3. SYSTEM LIMITS : RIDGE PIKE/MAIN STREET (3 INTERSECTIONS) FROM EGYPT ROAD TO WHITEHALL ROAD.
   MASTER: LOWER PROVIDENCE TOWNSHIP BUILDING
4. PRIMARY COORDINATION: FIBER OPTIC CABLE.
   SECONDARY COORDINATION: TBC (DEFAULT TO BACKUP TBC).
5. PHONE DROP LOCATED AT MASTER CONTROLLER FOR TOWNSHIP AND PENNDOT ACCESS.

LEGEND

- SYSTEM DETECTOR, INTERSECTION X – LOOP NO. Y
- DETECTOR, INTERSECTION X – LOOP NO. Y
- PHASE

SCALE: NOT TO SCALE

WEEKLY PROGRAM CHART

EVENT	DAY	TIME	CYCLE	OFFSET	PROGRAM	REMARKS
1	1–7	00:00	–	–	MAX. 1	FREE
2	1–5	06:00	VARIES	VARIES	1	AM PEAK
3	1–5	10:00	VARIES	VARIES	2	OFF PEAK
4	1–5	15:00	VARIES	VARIES	3	PM PEAK
5	1–5	18:00	VARIES	VARIES	2	OFF PEAK
6	6,7	08:00	VARIES	VARIES	2	OFF PEAK
7	1–7	20:00	–	–	MAX. 1	FREE

MONDAY = DAY 1
OFFSET IN SECONDS
OFFSET REFERENCED TO START OF NEMA TS2 FIRST GREEN

NOTES:

- ALL SPLIT TIMES INCLUDE YELLOW AND RED TIMES FOR A GIVEN PHASE.
- REFER TO SIGNAL PERMIT PLAN FOR MAX 1, MAX 2, CLEARANCE AND PED TIMES.

INCIDENT PROGRAM CHART

EVENT	CYCLE	PROGRAM	REMARKS
1	150	10	EASTBOUND DETOUR PLAN
2	150	20	WESTBOUND DETOUR PLAN
3	–	30	NOT CURRENTLY IN USE
4			
5			
6			
7			

OFFSET IN SECONDS
OFFSET REFERENCED TO START OF NEMA TS2 FIRST GREEN

NOTES:

- ALL SPLIT TIMES INCLUDE YELLOW AND RED TIMES FOR A GIVEN PHASE.

CYCLE/SPLIT/OFFSET

Program 1 =

	Intersections	File #	Master	Phase 1	2	3	4	5	6	7	8	Cycle	Offset
1	MAIN ST & EGPYT RD/JEFFERSON AVE/ORCHARD LN	0662	1		57		63	34 (LEAD)	23		63	120	77
2	MAIN ST & SCHUYLKILL	0842	1		98		22	13 (LEAD)	85		22	120	1
3	MAIN ST & WHITEHALL RD	0111	1	13 (LEAD)	73		34		86		34	120	27
4													
5													
6													

Program 2 =

	Intersections	File #	Master	Phase 1	2	3	4	5	6	7	8	Cycle	Offset
1	MAIN ST & EGPYT RD/JEFFERSON AVE/ORCHARD LN	0662	1		74		46	45 (LEAD)	29		46	120	0
2	MAIN ST & SCHUYLKILL	0842	1		99		21	14 (LEAD)	85		21	120	67
3	MAIN ST & WHITEHALL RD	0111	1	13 (LEAD)	67		40		80		40	120	80
4													
5													
6													

Program 3 =

	Intersections	File #	Master	Phase 1	2	3	4	5	6	7	8	Cycle	Offset
1	MAIN ST & EGPYT RD/JEFFERSON AVE/ORCHARD LN	0662	1		67		53	44 (LEAD)	23		53	120	0
2	MAIN ST & SCHUYLKILL	0842	1		89		31	13 (LEAD)	76		31	120	22
3	MAIN ST & WHITEHALL RD	0111	1	13 (LEAD)	69		38		82		38	120	32
4													
5													
6													

Program 10 =

	Intersections	File #	Master	Phase 1	2	3	4	5	6	7	8	Cycle	Offset
1	MAIN ST & EGPYT RD/JEFFERSON AVE/ORCHARD LN	0662	1		98		52	28 (LEAD)	70		52	150	73
2	MAIN ST & SCHUYLKILL	0842	1		117		33	OMIT LEAD	117		33	150	88
3	MAIN ST & WHITEHALL RD	0111	1	15 (LEAD)	89		46		104		46	150	106
4													
5													
6													

Program 20 =

	Intersections	File #	Master	Phase 1	2	3	4	5	6	7	8	Cycle	Offset
1	MAIN ST & EGPYT RD/JEFFERSON AVE/ORCHARD LN	0662	1		91		59	27 (LEAD)	64		59	150	69
2	MAIN ST & SCHUYLKILL	0842	1		103		47	13 (LEAD)	90		47	150	38
3	MAIN ST & WHITEHALL RD	0111	1	OMIT LEAD	112		38		112		38	150	20
4													
5													
6													

Program 30 =

	Intersections	File #	Master	Phase 1	2	3	4	5	6	7	8	Cycle	Offset
1	MAIN ST & EGPYT RD/JEFFERSON AVE/ORCHARD LN	0662	1										
2	MAIN ST & SCHUYLKILL	0842	1										
3	MAIN ST & WHITEHALL RD	0111	1										
4													
5													
6													

GENERAL NOTES

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

REFER TO TRAFFIC SIGNAL PERMIT DRAWING FOR INDIVIDUAL INTERSECTION OPERATION, GEOMETRY, PHASING AND CRITICAL TIMES.

FOR CONSTRUCTION AND INSPECTION THE SYSTEM PERMIT SHOULD ALWAYS BE ACCOMPANIED WITH TRAFFIC SIGNAL PERMIT DRAWING.

TEST THE SYSTEM AT LOCAL INTERSECTION LEVEL, SUBSYSTEM LEVEL MASTER CONTROLLER LEVEL AND PERSONAL COMPUTER REMOTE DIAL UP LEVEL.

GATHER THE SYSTEM FAILURE CRITICAL ALARMS REPORT AND ARCHIVE THEM WHERE APPLICABLE.

SET UP PENNDOT DISTRICT 6-0 COMPUTER WITH THE SYSTEM DATABASE AND GRAPHICS. MODIFY THE DATABASE AND GRAPHICS FOR SYSTEMS REVISIONS.

ASSIGN LOOP DETECTORS AND PROGRAM THE CONTROLLERS TO GATHER TRAFFIC VOLUMES IN 15 MINUTE INTERVAL, WHERE APPLICABLE.

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

OBTAIN POLE ATTACHMENT PERMIT FOR AERIAL FIBER OPTIC INSTALLATION.

MAINTAIN MASTER CONTROLLER COMMUNICATION SUCH AS PHONE DROPS.

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 THE LATEST AMENDMENT TO ACT 287, PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES, DATED DECEMBER 20, 1974.

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-8800 SERIES.

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY

MUNICIPALITY: LOWER PROVIDENCE & WEST NORRITON

INTERSECTION: MAIN STREET/RIDGE PIKE (SR 3009/ 4031) FROM WHITEHALL ROAD (SR 3006) TO EAGLEVILLE ROAD

REVIEWED:

DATE

MUNICIPAL OFFICIAL DATE

RECOMMENDED:

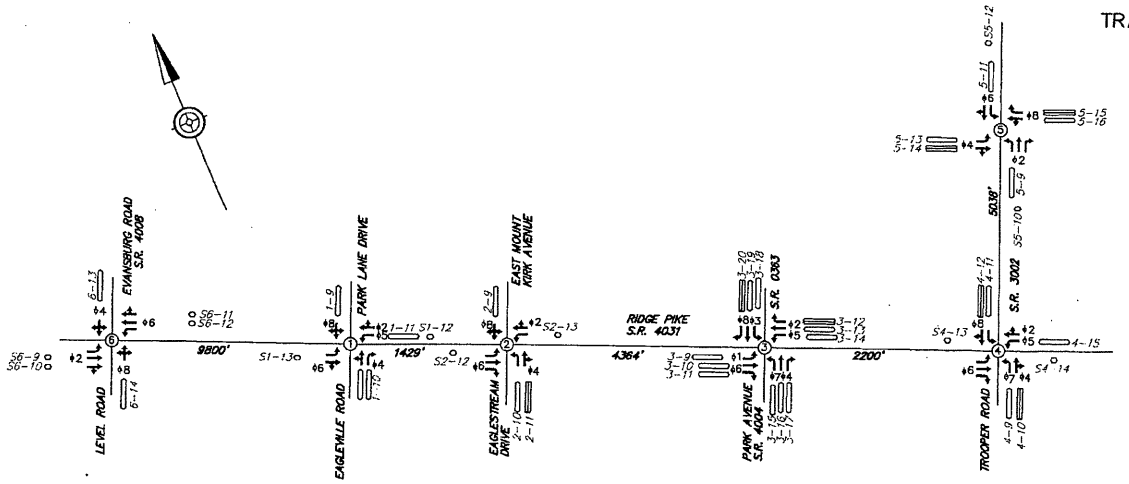
LOUIS R. BELMONTE, P.E. 10/17/06
DISTRICT TRAFFIC ENGINEER DATE

NO.	REVISION	DES./ REVR.	DATE	REVR.	DATE	RECOM.	DATE
1	RETIME & ADD LT LANE FOR #4 INT 2, SHT 2	TPD	9/4/07	SM	9/5/07	ABP	9/7/07
2	ADDITION OF EMERGENCY DETOUR PROGRAMS	MCM	-	DLA	4/28/08	LRB	4/29/08
3	REMOVE SPLIT PHASE FOR #4 INT 2, SHT 1	TPD	-	DLA	5/27/08	ABP	6/1/08
4	ADD EB RT LANE INT 4, SHT 2	MCM	-	DLA	8/7/08	ABP	8/13/08
5	AS BUILT DRAWING	MCM	-	DLA	8/13/10	ABP	9/7/10
6	REVISED TIMINGS	JLH	9/26/11	DLA	9/26/11	ABP	11/1/11
7							
8							

SYSTEM PERMIT # I-0126 SHEET 1 OF 2

I-0126

TRAFFIC SIGNAL SYSTEM PERMIT PLAN



SYSTEM NOTES

1. PROGRAM TO BE SELECTED BY CLOSED LOOP SYSTEM (TIME OF DAY) OR TBC BACKUP.
2. OFFSETS ARE REFERENCED TO THE BEGINNING OF NEMA TS2 FIRST GREEN.
3. SYSTEM LIMITS : RIDGE PIKE/TROOPER RD (6 INTERSECTIONS) TROOPER ROAD TO EAGLEVILLE ROAD
   MASTER: LOWER PROVIDENCE TOWNSHIP BUILDING
4. PRIMARY COORDINATION: FIBER OPTIC CABLE.
   SECONDARY COORDINATION: TBC (DEFAULT TO BACKUP TBC).
5. PHONE DROP LOCATED AT MASTER CONTROLLER FOR TOWNSHIP AND PENNDOT ACCESS.

LEGEND

- SYSTEM DETECTOR, INTERSECTION X – LOOP NO. Y
- DETECTOR, INTERSECTION X – LOOP NO. Y
- PHASE

SCALE: NOT TO SCALE

WEEKLY PROGRAM CHART

EVENT	DAY	TIME	CYCLE	OFFSET	PROGRAM	REMARKS
1	1-7	00:00	–	–	MAX. 1	FREE
2	1-5	06:00	VARIES	VARIES	1	AM PEAK
3	1-5	10:00	VARIES	VARIES	2	OFF PEAK
4	1-5	15:00	VARIES	VARIES	3	PM PEAK
5	1-5	18:00	VARIES	VARIES	2	OFF PEAK
6	6,7	08:00	VARIES	VARIES	2	OFF PEAK
7	1-7	20:00	–	–	MAX. 1	FREE

MONDAY = DAY 1
OFFSET IN SECONDS

OFFSET REFERENCED TO START OF NEMA TS2 FIRST GREEN

NOTES:

- ALL SPLIT TIMES INCLUDE YELLOW AND RED TIMES FOR A GIVEN PHASE.
- REFER TO SIGNAL PERMIT PLAN FOR MAX 1, MAX 2, CLEARANCE AND PED TIMES.

INCIDENT PROGRAM CHART

EVENT	CYCLE	PROGRAM	REMARKS
1	150	10	EASTBOUND DETOUR PLAN
2	150	20	WESTBOUND DETOUR PLAN
3	150	30	WB/NB TROOPER DETOUR
4			
5			
6			
7			

OFFSET IN SECONDS

OFFSET REFERENCED TO START OF NEMA TS2 FIRST GREEN

NOTES:

- ALL SPLIT TIMES INCLUDE YELLOW AND RED TIMES FOR A GIVEN PHASE.

CYCLE/SPLIT/OFFSET

Program 1 =

	Intersections	File #	Master	1	2	3	4	5	6	7	8	Cycle	Offset
				Phase									
1	RIDGE PK & PARK LANE DR/EAGLEVILLE RD	1919	4		63		15 (SPLIT)	13 (LEAD)	50		12 (SPLIT)	90	33
2	RIDGE PK & EAGLESTREAM DR/E. MOUNT KIRK AVE	1730	4		52		38		52		38	90	83
3	RIDGE PK & PARK AVENUE	0803	4	13 (LEAD)	56	13 (LEAD)	38	13 (LEAD)	56	13 (LEAD)	38	120	80
4	RIDGE PK & TROOPER ROAD	0209	4		69		51	13 (LEAD)	56	14 (LEAD)	37	120	0
5	TROOPER RD & CLARK HILL DR/NORRINGTON DR	2041	4									FREE	
6	RIDGE PK & LEVEL RD/EVANSBURG RD	1053	4									FREE	

Program 2 =

	Intersections	File #	Master	1	2	3	4	5	6	7	8	Cycle	Offset
				Phase									
1	RIDGE PK & PARK LANE DR/EAGLEVILLE RD	1919	4		58		18 (SPLIT)	13 (LEAD)	45		14 (SPLIT)	90	61
2	RIDGE PK & EAGLESTREAM DR/E. MOUNT KIRK AVE	1730	4		58		32		58		32	90	80
3	RIDGE PK & PARK AVENUE	0803	4	13 (LEAD)	39	13 (LEAD)	23	13 (LEAD)	39	15 (LEAD)	23	90	76
4	RIDGE PK & TROOPER ROAD	0209	4		49		41	13 (LEAD)	36	15 (LEAD)	26	90	31
5	TROOPER RD & CLARK HILL DR/NORRINGTON DR	2041	4									FREE	
6	RIDGE PK & LEVEL RD/EVANSBURG RD	1053	4									FREE	

Program 3 =

	Intersections	File #	Master	1	2	3	4	5	6	7	8	Cycle	Offset
				Phase									
1	RIDGE PK & PARK LANE DR/EAGLEVILLE RD	1919	4		55		23 (SPLIT)	13 (LEAD)	42		12 (SPLIT)	90	36
2	RIDGE PK & EAGLESTREAM DR/E. MOUNT KIRK AVE	1730	4		54		36		54		36	90	3
3	RIDGE PK & PARK AVENUE	0803	4	36 (LEAD)	37	16 (LEAD)	31	13 (LEAD)	60	18 (LEAD)	29	120	72
4	RIDGE PK & TROOPER ROAD	0209	4		53		67	13 (LEAD)	40	18 (LEAD)	49	120	15
5	TROOPER RD & CLARK HILL DR/NORRINGTON DR	2041	4									FREE	
6	RIDGE PK & LEVEL RD/EVANSBURG RD	1053	4									FREE	

Program 10 =

	Intersections	File #	Master	1	2	3	4	5	6	7	8	Cycle	Offset
				Phase									
1	RIDGE PK & PARK LANE DR/EAGLEVILLE RD	1919	4		124		13 (SPLIT)	13 (LEAD)	111		13 (SPLIT)	150	12
2	RIDGE PK & EAGLESTREAM DR/E. MOUNT KIRK AVE	1730	4		106		44		106		44	150	35
3	RIDGE PK & PARK AVENUE	0803	4	23 (LEAD)	82	14 (LEAD)	31	13 (LEAD)	92	13 (LEAD)	32	150	120
4	RIDGE PK & TROOPER ROAD	0209	4		98		52	13 (LEAD)	85	16 (LEAD)	36	150	0
5	TROOPER RD & CLARK HILL DR/NORRINGTON DR	2041	4									FREE	
6	RIDGE PK & LEVEL RD/EVANSBURG RD	1053	4									FREE	

Program 20 =

	Intersections	File #	Master	1	2	3	4	5	6	7	8	Cycle	Offset
				Phase									
1	RIDGE PK & PARK LANE DR/EAGLEVILLE RD	1919	4		121		16 (SPLIT)	13 (LEAD)	108		13 (SPLIT)	150	109
2	RIDGE PK & EAGLESTREAM DR/E. MOUNT KIRK AVE	1730	4		81		69		81		69	150	124
3	RIDGE PK & PARK AVENUE	0803	4	16 (LEAD)	85	17 (LEAD)	32	13 (LEAD)	88	19 (LEAD)	30	150	37
4	RIDGE PK & TROOPER ROAD	0209	4		87		63	13 (LEAD)	74	19 (LEAD)	44	150	0
5	TROOPER RD & CLARK HILL DR/NORRINGTON DR	2041	4									FREE	
6	RIDGE PK & LEVEL RD/EVANSBURG RD	1053	4									FREE	

Program 30 =

	Intersections	File #	Master	1	2	3	4	5	6	7	8	Cycle	Offset
				Phase									
1	RIDGE PK & PARK LANE DR/EAGLEVILLE RD	1919	4		121		16 (SPLIT)	13 (LEAD)	108		13 (SPLIT)	150	40
2	RIDGE PK & EAGLESTREAM DR/E. MOUNT KIRK AVE	1730	4		81		69		81		69	150	29
3	RIDGE PK & PARK AVENUE	0803	4	16 (LEAD)	85	17 (LEAD)	32	13 (LEAD)	88	19 (LEAD)	30	150	96
4	RIDGE PK & TROOPER ROAD	0209	4		60		90	13 (LEAD)	47	62 (LEAD)	28	150	0
5	TROOPER RD & CLARK HILL DR/NORRINGTON DR	2041	4									FREE	
6	RIDGE PK & LEVEL RD/EVANSBURG RD	1053	4									FREE	

GENERAL NOTES

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

REFER TO TRAFFIC SIGNAL PERMIT DRAWING FOR INDIVIDUAL INTERSECTION OPERATION, GEOMETRY, PHASING AND CRITICAL TIMES.

FOR CONSTRUCTION AND INSPECTION THE SYSTEM PERMIT SHOULD ALWAYS BE ACCOMPANIED WITH TRAFFIC SIGNAL PERMIT DRAWING.

TEST THE SYSTEM AT LOCAL INTERSECTION LEVEL, SUBSYSTEM LEVEL MASTER CONTROLLER LEVEL AND PERSONAL COMPUTER REMOTE DIAL UP LEVEL.

GATHER THE SYSTEM FAILURE CRITICAL ALARMS REPORT AND ARCHIVE THEM WHERE APPLICABLE.

SET UP PENNDOT DISTRICT 6-0 COMPUTER WITH THE SYSTEM DATABASE AND GRAPHICS. MODIFY THE DATABASE AND GRAPHICS FOR SYSTEMS REVISIONS.

ASSIGN LOOP DETECTORS AND PROGRAM THE CONTROLLERS TO GATHER TRAFFIC VOLUMES IN 15 MINUTE INTERVAL, WHERE APPLICABLE.

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

OBTAIN POLE ATTACHMENT PERMIT FOR AERIAL FIBER OPTIC INSTALLATION.

MAINTAIN MASTER CONTROLLER COMMUNICATION SUCH AS PHONE DROPS.

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 THE LATEST AMENDMENT TO ACT 287, PREVENTION OF DAMAGE TO UNDERGROUND UTILITIES, DATED DECEMBER 20, 1974.

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-8800 SERIES.

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
ENGINEERING DISTRICT 6-0

COUNTY: MONTGOMERY
MUNICIPALITY: LOWER PROVIDENCE & WEST NORRITON
INTERSECTION: MAIN STREET/RIDGE PIKE (SR 3009/4031) FROM WHITEHALL ROAD (SR 3006) TO EAGLEVILLE ROAD

REVIEWED:

DATE

MUNICIPAL OFFICIAL DATE

RECOMMENDED:

LOUIS R. BELMONTE, P.E. 10/17/06
DISTRICT TRAFFIC ENGINEER DATE

NO.	REVISION	DES./ RCVR.	DATE	REVR.	DATE	RECOM.	DATE
1	RETIME & ADD LT LANE FOR ø4 INT 2, SHT 2	TPD	9/4/07	SM	9/5/07	ABP	9/7/07
2	ADDITION OF EMERGENCY DETOUR PROGRAMS	MCM	-	DLA	4/28/08	LRB	4/29/08
3	REMOVE SPLIT PHASE FOR ø4 INT 2, SHT 1	TPD	-	DLA	3/27/08	ABP	4/1/08
4	ADD EB RT LANE INT 4, SHT 2	MCM	-	DLA	8/7/08	ABP	8/13/08
5	AS BUILT DRAWING	MCM	-	DLA	8/13/10	ABP	9/7/10
6	REVISED TIMINGS	JLH	9/28/11	DLA	9/29/11	ABP	9/30/11
7							
8							

SYSTEM PERMIT # I-0126 SHEET 2 OF 2

APPENDIX B

Manual Turning Movement Counts

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Egypt Road &
Mill Road / Port Indian Road
Counter/Countboard No.: TD

File Name : westover01s
Site Code : 81207301
Start Date : 3/24/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Mill Rd Southbound			Egypt Rd Westbound			Port Indian Rd Northbound			Egypt Rd Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:00	1	0	0	2	167	7	14	0	12	0	179	17	399
11:15	3	0	1	3	187	6	7	0	3	2	147	7	366
11:30	3	0	0	1	193	4	12	0	1	1	170	7	392
11:45	3	0	0	5	164	2	6	0	1	2	193	11	387
Total	10	0	1	11	711	19	39	0	17	5	689	42	1544
12:00	0	0	1	0	206	2	9	0	2	1	164	6	391
12:15	1	0	5	0	186	3	9	0	1	1	175	12	393
12:30	1	0	3	0	191	2	4	0	3	0	175	14	393
12:45	4	0	1	1	188	5	6	0	2	0	196	19	422
Total	6	0	10	1	771	12	28	0	8	2	710	51	1599
13:00	2	0	0	0	189	4	20	0	2	1	181	14	413
13:15	2	0	2	2	188	6	4	0	1	1	196	6	408
13:30	4	0	0	0	168	2	13	0	2	0	165	15	369
13:45	1	0	2	3	146	4	3	0	2	0	190	10	361
Total	9	0	4	5	691	16	40	0	7	2	732	45	1551
14:00	1	0	1	2	171	3	3	0	3	0	192	18	394
14:15	1	0	1	1	163	2	8	0	4	1	201	16	398
14:30	1	0	1	3	184	5	6	0	1	0	197	11	409
14:45	1	0	1	3	186	0	5	0	1	2	190	6	395
Total	4	0	4	9	704	10	22	0	9	3	780	51	1596
Grand Total	29	0	19	26	2877	57	129	0	41	12	2911	189	6290
Apprch %	60.4	0	39.6	0.9	97.2	1.9	75.9	0	24.1	0.4	93.5	6.1	
Total %	0.5	0	0.3	0.4	45.7	0.9	2.1	0	0.7	0.2	46.3	3	
Passenger Vehicles	26	0	19	26	2840	51	126	0	41	12	2868	188	6197
% Passenger Vehicles	89.7	0	100	100	98.7	89.5	97.7	0	100	100	98.5	99.5	98.5
Heavy Vehicles	3	0	0	0	37	6	3	0	0	0	43	1	93
% Heavy Vehicles	10.3	0	0	0	1.3	10.5	2.3	0	0	0	1.5	0.5	1.5

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

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Location: Egypt Road &
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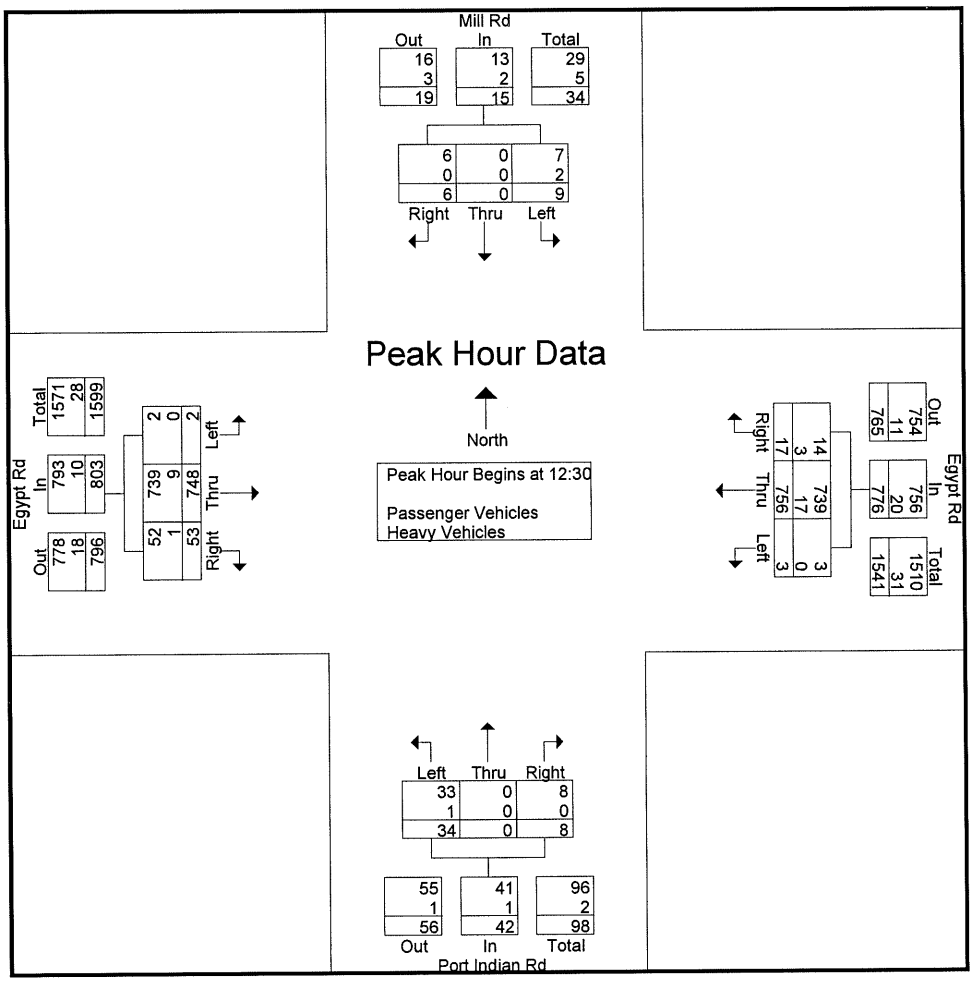
Counter/Countboard No.: TD

File Name : westover01s
Site Code : 81207301
Start Date : 3/24/2012
Page No : 2

	Mill Rd Southbound				Egypt Rd Westbound				Port Indian Rd Northbound				Egypt 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 11:00 to 14:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:30																	
12:30	1	0	**3**	4	0	**191**	2	193	4	0	**3**	7	0	175	14	189	393
12:45	**4**	0	1	**5**	1	188	5	194	6	0	2	8	0	**196**	**19**	**215**	**422**
13:00	2	0	0	2	0	189	4	193	**20**	0	2	**22**	**1**	181	14	196	413
13:15	2	0	2	4	**2**	188	**6**	**196**	4	0	1	5	1	196	6	203	408
Total Volume	9	0	6	15	3	756	17	776	34	0	8	42	2	748	53	803	1636
% App. Total	60	0	40		0.4	97.4	2.2		81	0	19		0.2	93.2	6.6		
PHF	.563	.000	.500	.750	.375	.990	.708	.990	.425	.000	.667	.477	.500	.954	.697	.934	.969
Passenger Vehicles	7	0	6	13	3	739	14	756	33	0	8	41	2	739	52	793	1603
% Passenger Vehicles	77.8	0	100	86.7	100	97.8	82.4	97.4	97.1	0	100	97.6	100	98.8	98.1	98.8	98.0
Heavy Vehicles	2	0	0	2	0	17	3	20	1	0	0	1	0	9	1	10	33
% Heavy Vehicles	22.2	0	0	13.3	0	2.2	17.6	2.6	2.9	0	0	2.4	0	1.2	1.9	1.2	2.0



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Egypt Road &
Port Indian Road / Mill Road
Counter/Countboard No.: TD/BW/TD

File Name : westover01w
Site Code : 81207301
Start Date : 3/20/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Mill Rd Southbound			Egypt Rd Westbound			Port Indian Rd Northbound			Egypt Rd Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00	3	0	1	2	139	1	8	0	1	1	173	6	335
07:15	2	0	5	5	197	8	6	1	0	1	205	10	440
07:30	3	0	5	3	213	2	8	0	3	1	176	6	420
07:45	2	0	0	10	251	4	2	0	1	1	215	15	501
Total	10	0	11	20	800	15	24	1	5	4	769	37	1696
08:00	3	1	2	17	204	3	4	0	7	0	199	23	463
08:15	5	0	1	12	170	3	9	1	5	0	194	13	413
08:30	0	1	2	15	192	3	6	0	1	0	190	17	427
08:45	2	3	1	15	189	6	3	0	6	0	160	12	397
Total	10	5	6	59	755	15	22	1	19	0	743	65	1700
09:00	1	0	3	10	165	0	8	0	3	0	176	8	374
09:15	3	0	0	3	162	5	7	0	3	1	156	5	345
09:30	0	0	1	2	150	2	10	0	7	0	157	9	338
09:45	1	0	0	8	159	3	10	0	7	0	115	6	309
Total	5	0	4	23	636	10	35	0	20	1	604	28	1366
10:00	0	0	2	4	131	4	6	0	3	0	149	11	310
10:15	0	0	2	3	118	1	10	2	4	1	106	9	256
10:30	2	0	0	4	137	4	9	1	5	0	132	4	298
10:45	1	2	1	2	145	5	10	1	11	2	127	8	315
Total	3	2	5	13	531	14	35	4	23	3	514	32	1179
11:00	0	0	0	1	140	0	6	0	2	0	150	11	310
11:15	1	0	2	5	164	4	9	0	8	1	122	8	324
11:30	2	0	0	1	126	2	15	0	4	1	154	9	314
11:45	2	0	0	3	162	4	18	0	8	0	149	6	352
Total	5	0	2	10	592	10	48	0	22	2	575	34	1300
12:00	2	0	0	0	158	3	9	0	2	0	148	15	337
12:15	0	1	1	2	172	2	4	0	4	0	161	11	358
12:30	0	1	0	9	143	4	10	3	5	0	156	14	345
12:45	1	1	1	4	175	6	5	0	6	0	149	12	360
Total	3	3	2	15	648	15	28	3	17	0	614	52	1400
13:00	1	3	1	7	171	8	12	1	10	2	136	6	358
13:15	4	0	0	1	166	5	3	1	4	1	172	10	367
13:30	2	1	0	3	131	1	9	1	5	0	161	15	329
13:45	1	1	0	2	167	1	4	0	1	2	167	7	353
Total	8	5	1	13	635	15	28	3	20	5	636	38	1407
14:00	3	0	1	3	163	0	5	0	9	1	163	13	361
14:15	0	0	1	2	159	3	2	1	3	0	173	7	351
14:30	2	1	0	6	202	0	3	1	5	1	188	16	425
14:45	3	0	0	8	159	4	6	0	5	0	173	13	371
Total	8	1	2	19	683	7	16	2	22	2	697	49	1508
15:00	2	0	3	1	176	11	19	2	13	0	168	11	406
15:15	0	0	0	2	189	4	13	2	9	2	197	14	432
15:30	0	0	2	2	182	4	10	2	8	0	196	15	421
15:45	2	0	0	5	200	6	9	0	6	1	205	12	446
Total	4	0	5	10	747	25	51	6	36	3	766	52	1705

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Egypt Road &
Port Indian Road / Mill Road
Counter/Countboard No.: TD/BW/TD

File Name : westover01w
Site Code : 81207301
Start Date : 3/20/2012
Page No : 2

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Mill Rd Southbound			Egypt Rd Westbound			Port Indian Rd Northbound			Egypt Rd Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	2	0	1	3	207	4	14	1	7	1	212	12	464
16:15	1	0	0	1	266	8	10	1	8	2	210	15	522
16:30	3	0	2	2	243	9	8	4	9	2	229	17	528
16:45	1	0	1	2	258	7	4	0	3	3	270	21	570
Total	7	0	4	8	974	28	36	6	27	8	921	65	2084
17:00	1	0	0	1	269	17	3	0	5	0	260	15	571
17:15	2	0	0	0	237	7	3	0	3	1	271	22	546
17:30	1	0	0	1	219	10	3	1	1	0	293	19	548
17:45	3	0	6	3	206	10	3	1	3	0	258	10	503
Total	7	0	6	5	931	44	12	2	12	1	1082	66	2168
Grand Total	70	16	48	195	7932	198	335	28	223	29	7921	518	17513
Apprch %	52.2	11.9	35.8	2.3	95.3	2.4	57.2	4.8	38.1	0.3	93.5	6.1	
Total %	0.4	0.1	0.3	1.1	45.3	1.1	1.9	0.2	1.3	0.2	45.2	3	
Passenger Vehicles	60	14	46	181	7666	192	321	25	211	28	7626	502	16872
% Passenger Vehicles	85.7	87.5	95.8	92.8	96.6	97	95.8	89.3	94.6	96.6	96.3	96.9	96.3
Heavy Vehicles	10	2	2	14	266	6	14	3	12	1	295	16	641
% Heavy Vehicles	14.3	12.5	4.2	7.2	3.4	3	4.2	10.7	5.4	3.4	3.7	3.1	3.7

McMahon Associates, Inc.

Transportation Engineers and Planners

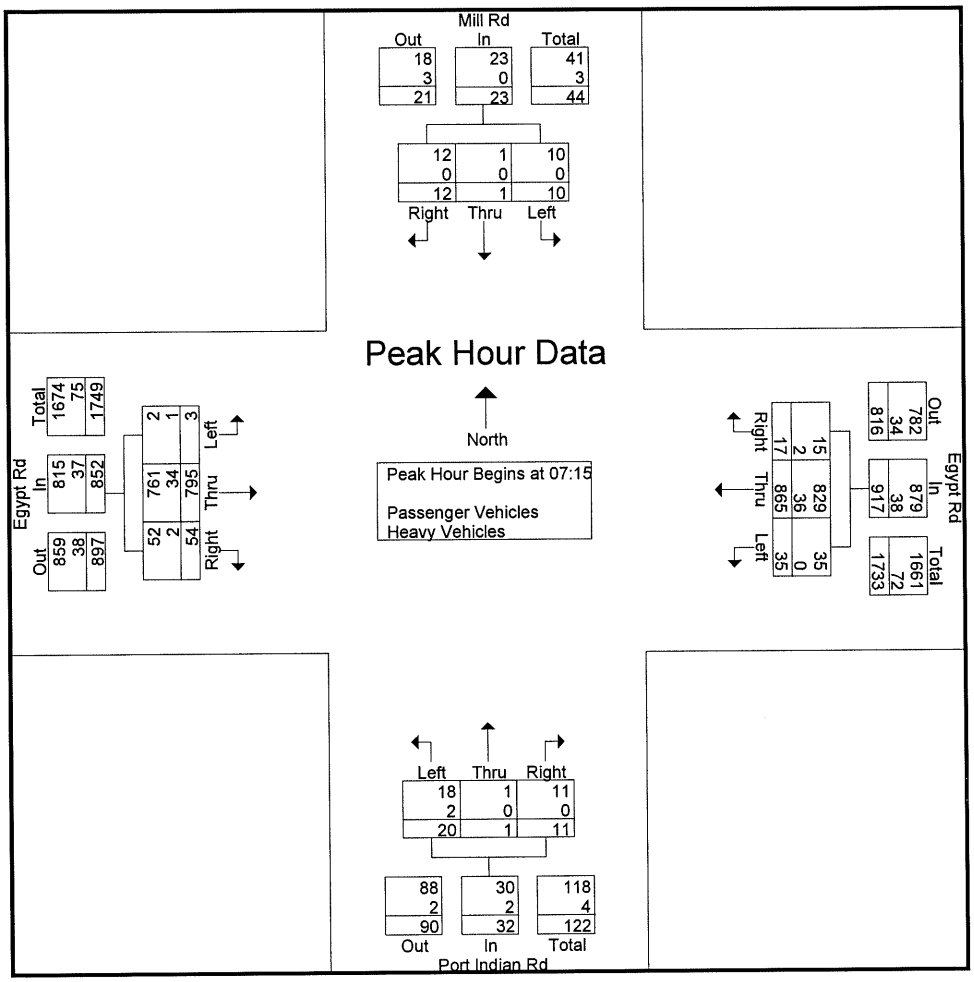
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Egypt Road &
Port Indian Road / Mill Road
Counter/Countboard No.: TD/BW/TD

File Name : westover01w
Site Code : 81207301
Start Date : 3/20/2012
Page No : 3

	Mill Rd Southbound				Egypt Rd Westbound				Port Indian Rd Northbound				Egypt 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 09:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	2	0	**5**	7	5	197	**8**	210	6	**1**	0	7	**1**	205	10	216	440
07:30	**3**	0	5	**8**	3	213	2	218	**8**	0	3	**11**	1	176	6	183	420
07:45	2	0	0	2	10	**251**	4	**265**	2	0	1	3	1	**215**	15	**231**	**501**
08:00	3	**1**	2	6	**17**	204	3	224	4	0	**7**	11	0	199	**23**	222	463
Total Volume	10	1	12	23	35	865	17	917	20	1	11	32	3	795	54	852	1824
% App. Total	43.5	4.3	52.2		3.8	94.3	1.9		62.5	3.1	34.4		0.4	93.3	6.3		
PHF	.833	.250	.600	.719	.515	.862	.531	.865	.625	.250	.393	.727	.750	.924	.587	.922	.910
Passenger Vehicles	10	1	12	23	35	829	15	879	18	1	11	30	2	761	52	815	1747
% Passenger Vehicles	100	100	100	100	100	95.8	88.2	95.9	90.0	100	100	93.8	66.7	95.7	96.3	95.7	95.8
Heavy Vehicles	0	0	0	0	0	36	2	38	2	0	0	2	1	34	2	37	77
% Heavy Vehicles	0	0	0	0	0	4.2	11.8	4.1	10.0	0	0	6.3	33.3	4.3	3.7	4.3	4.2



McMahon Associates, Inc.

Transportation Engineers and Planners

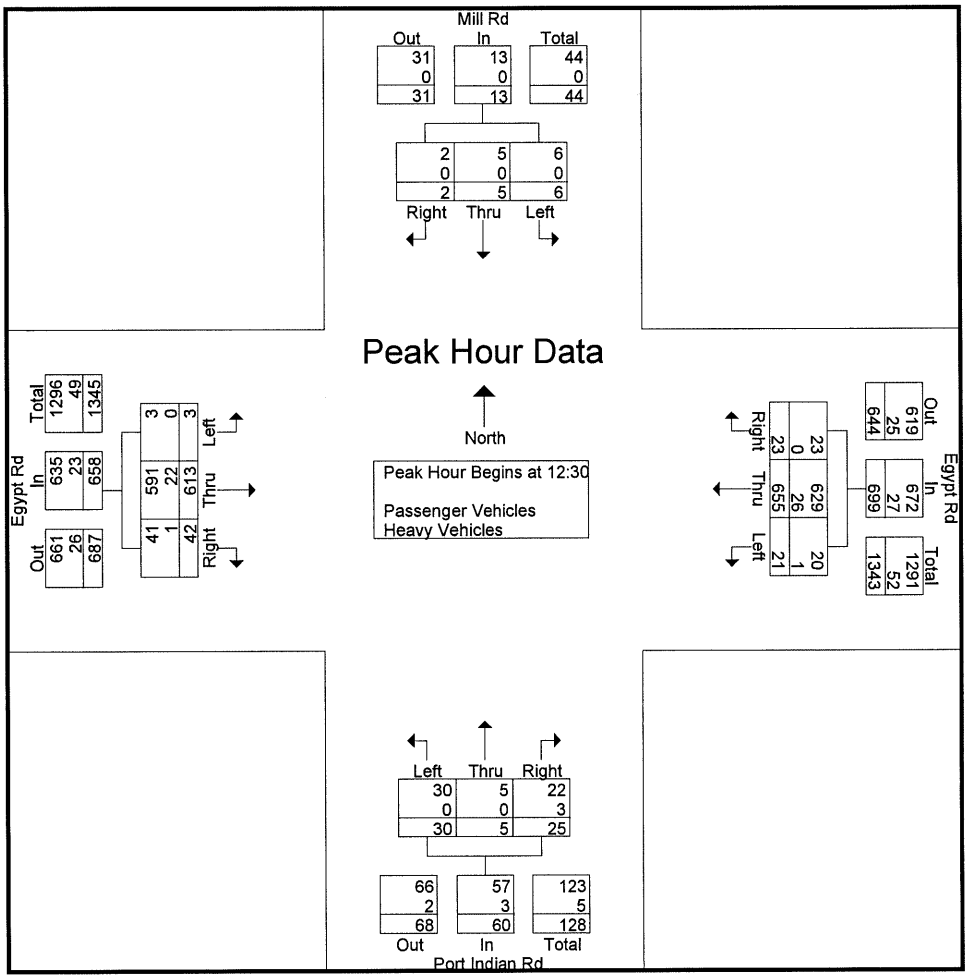
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Egypt Road &
Port Indian Road / Mill Road
Counter/Countboard No.: TD/BW/TD

File Name : westover01w
Site Code : 81207301
Start Date : 3/20/2012
Page No : 4

	Mill Rd Southbound				Egypt Rd Westbound				Port Indian Rd Northbound				Egypt 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 10:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:30																	
12:30	0	1	0	1	**9**	143	4	156	10	**3**	5	18	0	156	**14**	170	345
12:45	1	1	**1**	3	4	**175**	6	185	5	0	6	11	0	149	12	161	360
13:00	1	**3**	1	**5**	7	171	**8**	**186**	**12**	1	**10**	**23**	**2**	136	6	144	358
13:15	**4**	0	0	4	1	166	5	172	3	1	4	8	1	**172**	10	**183**	**367**
Total Volume	6	5	2	13	21	655	23	699	30	5	25	60	3	613	42	658	1430
% App. Total	46.2	38.5	15.4		3	93.7	3.3		50	8.3	41.7		0.5	93.2	6.4		
PHF	.375	.417	.500	.650	.583	.936	.719	.940	.625	.417	.625	.652	.375	.891	.750	.899	.974
Passenger Vehicles	6	5	2	13	20	629	23	672	30	5	22	57	3	591	41	635	1377
% Passenger Vehicles	100	100	100	100	95.2	96.0	100	96.1	100	100	88.0	95.0	100	96.4	97.6	96.5	96.3
Heavy Vehicles	0	0	0	0	1	26	0	27	0	0	3	3	0	22	1	23	53
% Heavy Vehicles	0	0	0	0	4.8	4.0	0	3.9	0	0	12.0	5.0	0	3.6	2.4	3.5	3.7



McMahon Associates, Inc.

Transportation Engineers and Planners

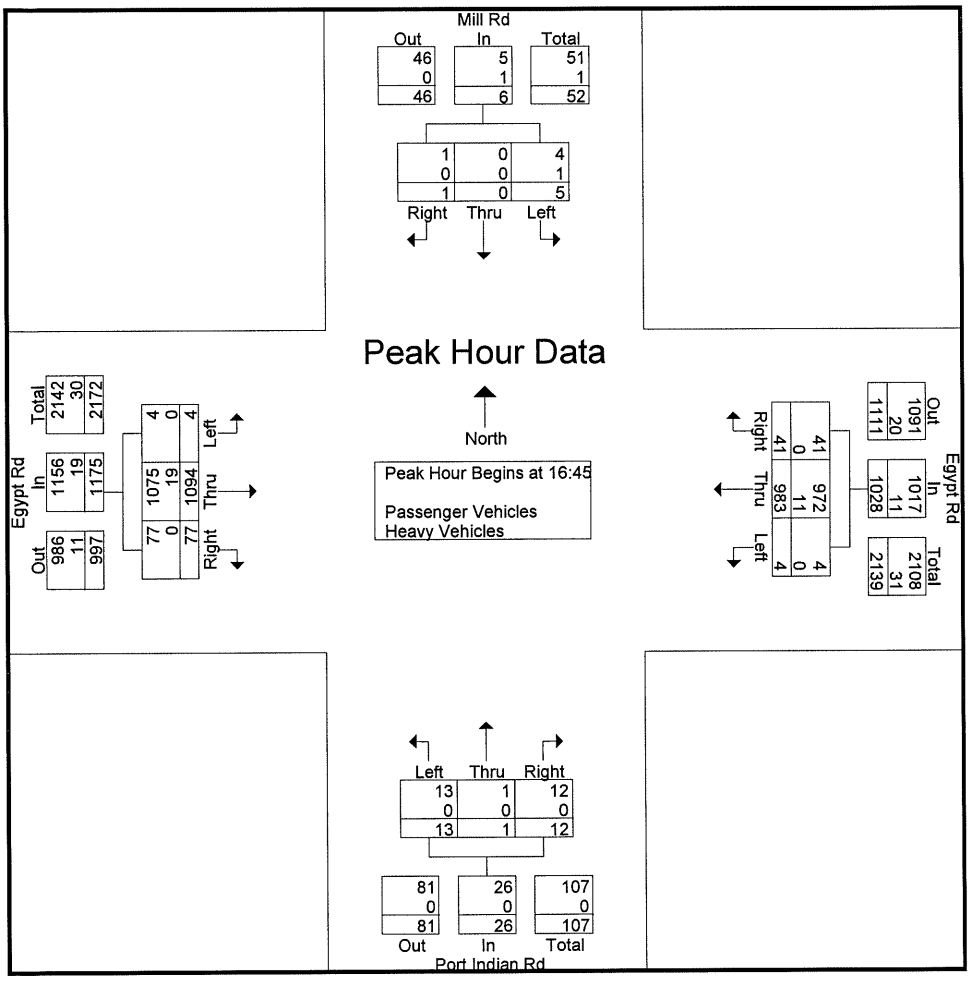
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Egypt Road &
Port Indian Road / Mill Road
Counter/Countboard No.: TD/BW/TD

File Name : westover01w
Site Code : 81207301
Start Date : 3/20/2012
Page No : 5

	Mill Rd Southbound				Egypt Rd Westbound				Port Indian Rd Northbound				Egypt 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 14:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	1	0	**1**	**2**	**2**	258	7	267	**4**	0	3	7	**3**	270	21	294	570
17:00	1	0	0	1	1	**269**	**17**	**287**	3	0	**5**	**8**	0	260	15	275	**571**
17:15	**2**	0	0	2	0	237	7	244	3	0	3	6	1	271	**22**	294	546
17:30	1	0	0	1	1	219	10	230	3	**1**	1	5	0	**293**	19	**312**	548
Total Volume	5	0	1	6	4	983	41	1028	13	1	12	26	4	1094	77	1175	2235
% App. Total	83.3	0	16.7		0.4	95.6	4		50	3.8	46.2		0.3	93.1	6.6		
PHF	.625	.000	.250	.750	.500	.914	.603	.895	.813	.250	.600	.813	.333	.933	.875	.942	.979
Passenger Vehicles	4	0	1	5	4	972	41	1017	13	1	12	26	4	1075	77	1156	2204
% Passenger Vehicles	80.0	0	100	83.3	100	98.9	100	98.9	100	100	100	100	100	98.3	100	98.4	98.6
Heavy Vehicles	1	0	0	1	0	11	0	11	0	0	0	0	0	19	0	19	31
% Heavy Vehicles	20.0	0	0	16.7	0	1.1	0	1.1	0	0	0	0	0	1.7	0	1.6	1.4



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Egypt Road &
Port Indian Road / Mill Road
Counter/Countboard No.: TD/BW/TD

File Name : westover01w
Site Code : 81207301
Start Date : 3/20/2012
Page No : 1

Groups Printed- Pedestrians

	Mill Rd Southbound	Egypt Rd Westbound	Port Indian Rd Northbound	Egypt Rd Eastbound	
Start Time	N/S Peds	E/W Peds	N/S Peds	E/W Peds	Int. Total
07:00	0	0	1	0	1
*** BREAK ***					
Total	0	0	1	0	1
*** BREAK ***					
08:30	0	0	0	1	1
*** BREAK ***					
Total	0	0	0	1	1
*** BREAK ***					
11:45	0	0	1	0	1
Total	0	0	1	0	1
12:00	1	0	0	0	1
*** BREAK ***					
Total	1	0	0	0	1
*** BREAK ***					
13:30	0	0	1	0	1
*** BREAK ***					
Total	0	0	1	0	1
*** BREAK ***					
14:15	0	0	1	0	1
*** BREAK ***					
14:45	0	0	0	1	1
Total	0	0	1	1	2
15:00	0	0	1	0	1
*** BREAK ***					
Total	0	0	1	0	1
*** BREAK ***					
16:45	0	0	1	0	1
Total	0	0	1	0	1
17:00	0	0	1	0	1
17:15	1	0	1	0	2
*** BREAK ***					
17:45	0	0	1	0	1
Total	1	0	3	0	4
Grand Total	2	0	9	2	13
Apprch %	100	0	100	100	
Total %	15.4	0	69.2	15.4	

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Main Street &
Schuylkill Avenue
Counter/Countboard No.: BW

File Name : westover03p
Site Code : 81207303
Start Date : 3/21/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Schuylkill Ave Southbound			Main St Westbound			Schuylkill Ave Northbound			Main St Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	9	20	4	6	258	3	11	10	14	10	203	8	556
16:15	4	17	9	7	295	5	12	16	4	4	221	2	596
16:30	1	17	7	5	322	2	15	11	10	10	191	6	597
16:45	3	12	11	10	312	1	9	23	12	6	226	9	634
Total	17	66	31	28	1187	11	47	60	40	30	841	25	2383
17:00	6	15	5	11	352	2	17	18	14	8	209	5	662
17:15	3	14	12	12	311	4	10	16	10	8	224	6	630
17:30	4	17	9	11	323	3	15	17	18	10	219	7	653
17:45	1	13	3	11	315	5	7	12	8	8	211	4	598
Total	14	59	29	45	1301	14	49	63	50	34	863	22	2543
Grand Total	31	125	60	73	2488	25	96	123	90	64	1704	47	4926
Apprch %	14.4	57.9	27.8	2.8	96.2	1	31.1	39.8	29.1	3.5	93.9	2.6	
Total %	0.6	2.5	1.2	1.5	50.5	0.5	1.9	2.5	1.8	1.3	34.6	1	
Passenger Vehicles	30	121	60	73	2434	25	94	120	88	59	1659	47	4810
% Passenger Vehicles	96.8	96.8	100	100	97.8	100	97.9	97.6	97.8	92.2	97.4	100	97.6
Heavy Vehicles	1	4	0	0	54	0	2	3	2	5	45	0	116
% Heavy Vehicles	3.2	3.2	0	0	2.2	0	2.1	2.4	2.2	7.8	2.6	0	2.4

McMahon Associates, Inc.

Transportation Engineers and Planners

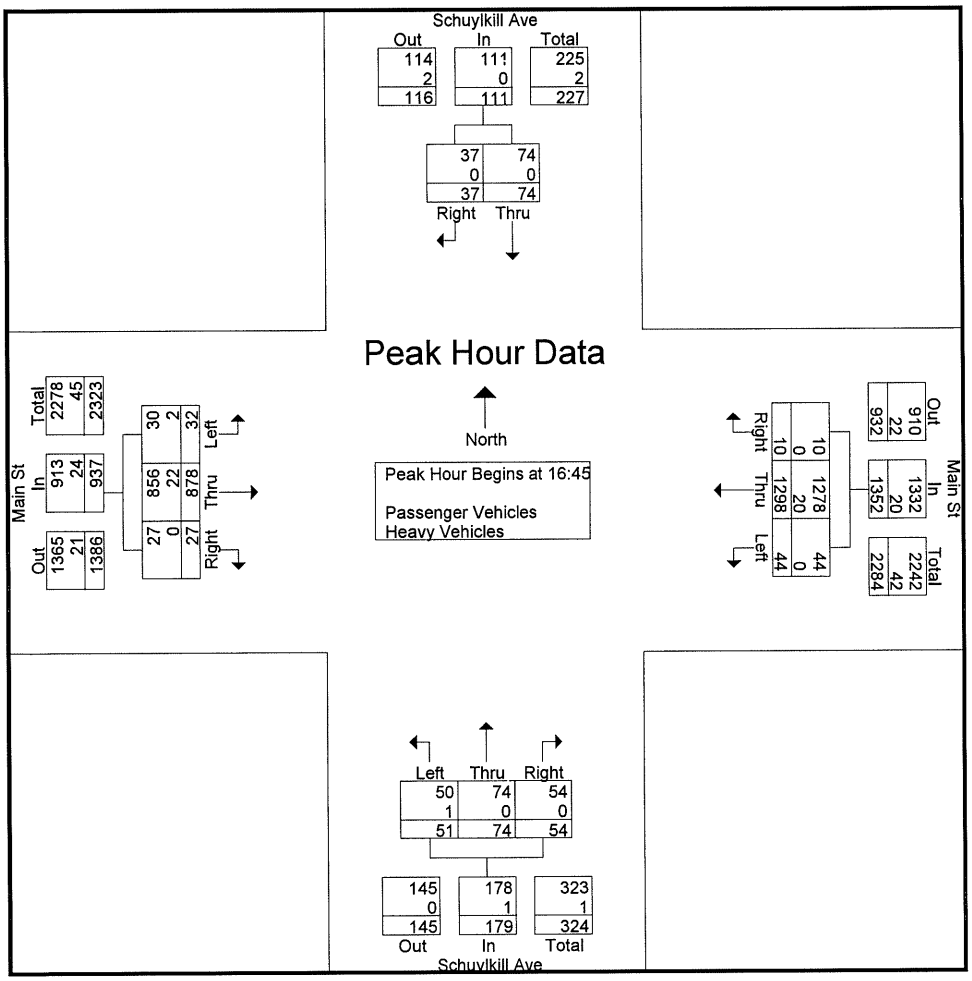
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Main Street &
Schuylkill Avenue
Counter/Countboard No.: BW

File Name : westover03p
Site Code : 81207303
Start Date : 3/21/2012
Page No : 2

	Schuylkill Ave Southbound				Main St Westbound				Schuylkill Ave Northbound				Main St 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 16:45																	
16:45	3	12	11	26	10	312	1	323	9	**23**	12	44	6	**226**	**9**	**241**	634
17:00	**6**	15	5	26	11	**352**	2	**365**	**17**	18	14	49	8	209	5	222	**662**
17:15	3	14	**12**	29	**12**	311	**4**	327	10	16	10	36	8	224	6	238	630
17:30	4	**17**	9	**30**	11	323	3	337	15	17	**18**	**50**	**10**	219	7	236	653
Total Volume	16	58	37	111	44	1298	10	1352	51	74	54	179	32	878	27	937	2579
% App. Total	14.4	52.3	33.3		3.3	96	0.7		28.5	41.3	30.2		3.4	93.7	2.9		
PHF	.667	.853	.771	.925	.917	.922	.625	.926	.750	.804	.750	.895	.800	.971	.750	.972	.974
Passenger Vehicles	16	58	37	111	44	1278	10	1332	50	74	54	178	30	856	27	913	2534
% Passenger Vehicles	100	100	100	100	100	98.5	100	98.5	98.0	100	100	99.4	93.8	97.5	100	97.4	98.3
Heavy Vehicles	0	0	0	0	0	20	0	20	1	0	0	1	2	22	0	24	45
% Heavy Vehicles	0	0	0	0	0	1.5	0	1.5	2.0	0	0	0.6	6.3	2.5	0	2.6	1.7



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Main Street &
Schuylkill Avenue
Counter/Countboard No.: BW

File Name : westover03p
Site Code : 81207303
Start Date : 3/21/2012
Page No : 1

Groups Printed- Pedestrians

	Schuylkill Ave Southbound	Main St Westbound	Schuylkill Ave Northbound	Main St Eastbound	
Start Time	E/W Peds	N/S Peds	E/W Peds	N/S Peds	Int. Total
*** BREAK ***					
16:15	2	0	1	0	3
16:30	3	0	1	0	4
16:45	1	0	5	0	6
Total	6	0	7	0	13
17:00	2	1	1	0	4
17:15	0	0	2	0	2
*** BREAK ***					
Total	2	1	3	0	6
Grand Total	8	1	10	0	19
Apprch %	100	100	100	0	
Total %	42.1	5.3	52.6	0	

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Main Street &
Schuylkill Avenue
Counter/Countboard No.: BW

File Name : westover03s
Site Code : 81207303
Start Date : 3/24/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Schuylkill Ave Southbound			Main St Westbound			Schuylkill Ave Northbound			Main St Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:00	14	12	10	7	190	9	3	6	10	7	167	4	439
11:15	18	11	11	6	182	14	1	11	6	13	188	2	463
11:30	17	11	9	2	200	7	2	8	13	8	176	2	455
11:45	18	9	10	6	192	4	3	11	9	9	173	2	446
Total	67	43	40	21	764	34	9	36	38	37	704	10	1803
12:00	19	12	11	10	170	9	0	9	4	4	178	1	427
12:15	16	12	8	3	189	6	0	6	6	6	181	0	433
12:30	19	9	6	9	178	8	2	7	9	5	187	1	440
12:45	16	6	13	9	161	11	3	8	9	7	175	4	422
Total	70	39	38	31	698	34	5	30	28	22	721	6	1722
13:00	7	4	7	11	202	6	1	12	10	5	179	3	447
13:15	12	7	11	7	201	5	3	10	8	7	158	1	430
13:30	15	8	5	7	200	3	3	6	6	3	198	1	455
13:45	17	14	12	7	173	5	2	5	6	8	163	0	412
Total	51	33	35	32	776	19	9	33	30	23	698	5	1744
14:00	16	5	12	7	194	6	2	6	9	5	166	2	430
14:15	12	8	10	9	212	13	2	11	5	4	174	1	461
14:30	11	7	10	9	187	4	2	12	6	10	182	1	441
14:45	10	1	7	10	197	5	1	7	5	4	174	3	424
Total	49	21	39	35	790	28	7	36	25	23	696	7	1756
Grand Total	237	136	152	119	3028	115	30	135	121	105	2819	28	7025
Apprch %	45.1	25.9	29	3.6	92.8	3.5	10.5	47.2	42.3	3.6	95.5	0.9	
Total %	3.4	1.9	2.2	1.7	43.1	1.6	0.4	1.9	1.7	1.5	40.1	0.4	
Passenger Vehicles	234	135	151	113	2984	113	30	133	119	104	2771	26	6913
% Passenger Vehicles	98.7	99.3	99.3	95	98.5	98.3	100	98.5	98.3	99	98.3	92.9	98.4
Heavy Vehicles	3	1	1	6	44	2	0	2	2	1	48	2	112
% Heavy Vehicles	1.3	0.7	0.7	5	1.5	1.7	0	1.5	1.7	1	1.7	7.1	1.6

McMahon Associates, Inc.

Transportation Engineers and Planners

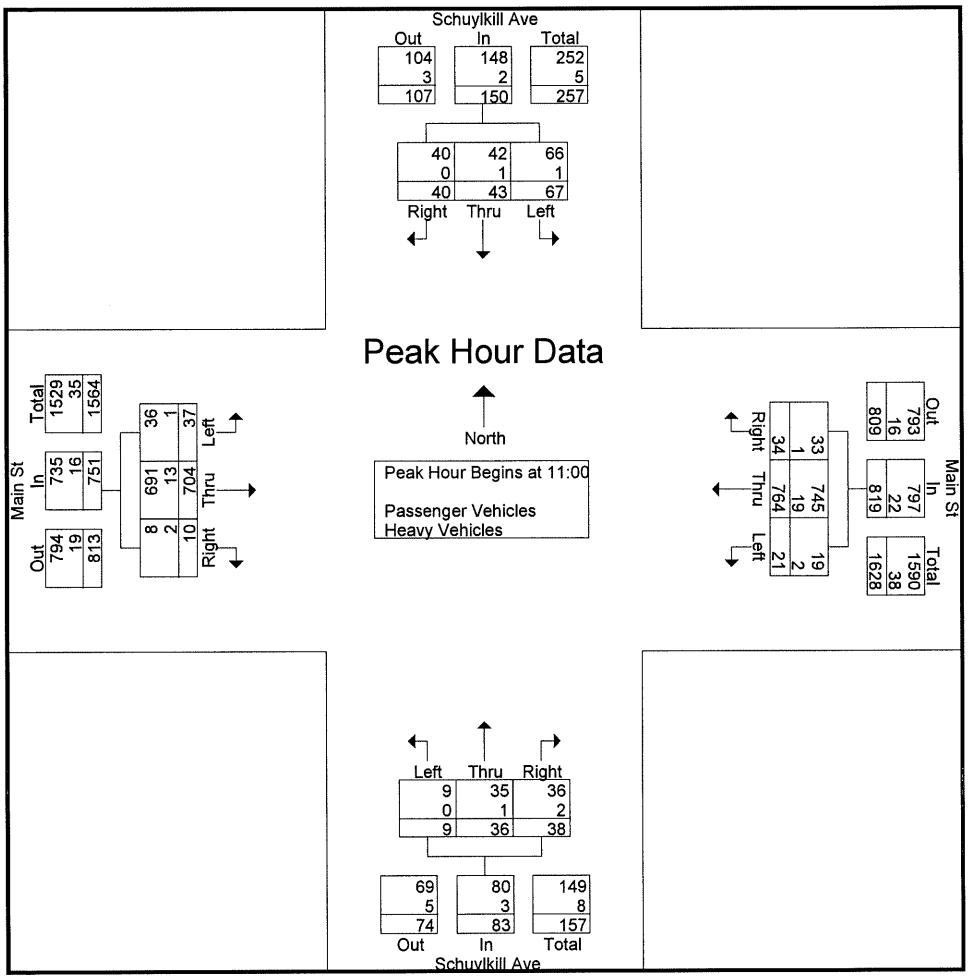
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Main Street &
Schuylkill Avenue
Counter/Countboard No.: BW

File Name : westover03s
Site Code : 81207303
Start Date : 3/24/2012
Page No : 2

	Schuylkill Ave Southbound				Main St Westbound				Schuylkill Ave Northbound				Main St 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 11:00 to 14:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:00																	
11:00	14	**12**	10	36	**7**	190	9	206	**3**	6	10	19	7	167	**4**	178	439
11:15	**18**	11	**11**	**40**	6	182	**14**	202	1	**11**	6	18	**13**	**188**	2	**203**	**463**
11:30	17	11	9	37	2	**200**	7	**209**	2	8	**13**	**23**	8	176	2	186	455
11:45	18	9	10	37	6	192	4	202	3	11	9	23	9	173	2	184	446
Total Volume	67	43	40	150	21	764	34	819	9	36	38	83	37	704	10	751	1803
% App. Total	44.7	28.7	26.7		2.6	93.3	4.2		10.8	43.4	45.8		4.9	93.7	1.3		
PHF	.931	.896	.909	.938	.750	.955	.607	.980	.750	.818	.731	.902	.712	.936	.625	.925	.974
Passenger Vehicles	66	42	40	148	19	745	33	797	9	35	36	80	36	691	8	735	1760
% Passenger Vehicles	98.5	97.7	100	98.7	90.5	97.5	97.1	97.3	100	97.2	94.7	96.4	97.3	98.2	80.0	97.9	97.6
Heavy Vehicles	1	1	0	2	2	19	1	22	0	1	2	3	1	13	2	16	43
% Heavy Vehicles	1.5	2.3	0	1.3	9.5	2.5	2.9	2.7	0	2.8	5.3	3.6	2.7	1.8	20.0	2.1	2.4



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Main Street &
Schuylkill Avenue
Counter/Countboard No.: BW

File Name : westover03s
Site Code : 81207303
Start Date : 3/24/2012
Page No : 1

Groups Printed- Pedestrians

	Schuylkill Ave Southbound	Main St Westbound	Schuylkill Ave Northbound	Main St Eastbound	
Start Time	E/W Peds	N/S Peds	E/W Peds	N/S Peds	Int. Total
11:00	0	0	1	0	1
11:15	0	0	1	0	1
11:30	2	0	0	1	3
*** BREAK ***					
Total	2	0	2	1	5
12:00	0	1	1	0	2
*** BREAK ***					
12:45	0	0	1	0	1
Total	0	1	2	0	3
13:00	0	0	1	0	1
*** BREAK ***					
13:45	1	0	0	0	1
Total	1	0	1	0	2
14:00	1	0	0	0	1
*** BREAK ***					
14:30	0	3	0	0	3
14:45	0	1	2	0	3
Total	1	4	2	0	7
Grand Total	4	5	7	1	17
Apprch %	100	100	100	100	
Total %	23.5	29.4	41.2	5.9	

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Schuylkill Avenue &
Hemlock Road
Counter/Countboard No.: TD

File Name : westover04p
Site Code : 81207304
Start Date : 3/21/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Schuylkill Ave Southbound		Schuylkill Ave Northbound		Hemlock Rd Eastbound		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
16:00	31	13	1	20	9	0	74
16:15	34	8	1	22	11	0	76
16:30	37	11	3	18	12	1	82
16:45	43	11	2	22	9	1	88
Total	145	43	7	82	41	2	320
17:00	30	14	1	27	22	3	97
17:15	32	9	2	18	18	0	79
17:30	44	15	0	29	15	1	104
17:45	37	14	2	23	8	1	85
Total	143	52	5	97	63	5	365
Grand Total	288	95	12	179	104	7	685
Apprch %	75.2	24.8	6.3	93.7	93.7	6.3	
Total %	42	13.9	1.8	26.1	15.2	1	
Passenger Vehicles	280	93	11	171	101	7	663
% Passenger Vehicles	97.2	97.9	91.7	95.5	97.1	100	96.8
Heavy Vehicles	8	2	1	8	3	0	22
% Heavy Vehicles	2.8	2.1	8.3	4.5	2.9	0	3.2

Zero Pedestrians were observed during this study.

McMahon Associates, Inc.

Transportation Engineers and Planners

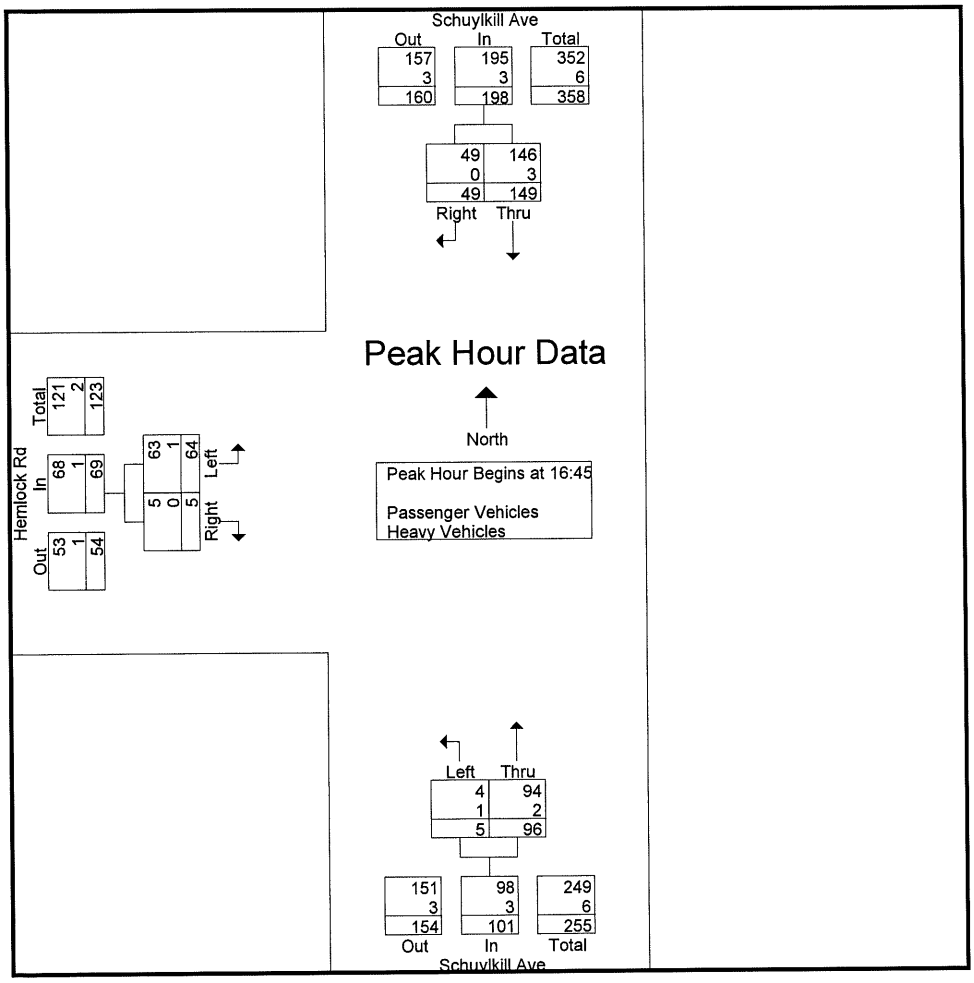
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Schuylkill Avenue &
Hemlock Road
Counter/Countboard No.: TD

File Name : westover04p
Site Code : 81207304
Start Date : 3/21/2012
Page No : 2

	Schuylkill Ave Southbound			Schuylkill Ave Northbound			Hemlock 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 16:45										
16:45	43	11	54	**2**	22	24	9	1	10	88
17:00	30	14	44	1	27	28	**22**	**3**	**25**	97
17:15	32	9	41	2	18	20	18	0	18	79
17:30	**44**	**15**	**59**	0	**29**	**29**	15	1	16	**104**
Total Volume	149	49	198	5	96	101	64	5	69	368
% App. Total	75.3	24.7		5	95		92.8	7.2		
PHF	.847	.817	.839	.625	.828	.871	.727	.417	.690	.885
Passenger Vehicles	146	49	195	4	94	98	63	5	68	361
% Passenger Vehicles	98.0	100	98.5	80.0	97.9	97.0	98.4	100	98.6	98.1
Heavy Vehicles	3	0	3	1	2	3	1	0	1	7
% Heavy Vehicles	2.0	0	1.5	20.0	2.1	3.0	1.6	0	1.4	1.9



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Schuylkill Avenue &
Hemlock Road
Counter/Countboard No.: EW

File Name : westover04s
Site Code : 81207304
Start Date : 3/31/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Schuylkill Ave Southbound		Schuylkill Ave Northbound		Hemlock Rd Eastbound		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
11:00	28	4	2	25	10	0	69
11:15	21	8	1	23	3	0	56
11:30	29	12	2	32	10	1	86
11:45	21	6	1	21	4	0	53
Total	99	30	6	101	27	1	264
12:00	22	8	2	22	5	0	59
12:15	21	12	1	25	7	1	67
12:30	23	9	0	20	6	2	60
12:45	35	5	2	30	7	0	79
Total	101	34	5	97	25	3	265
13:00	19	8	3	29	7	2	68
13:15	28	6	1	16	4	2	57
13:30	24	4	1	25	5	1	60
13:45	28	7	0	25	7	1	68
Total	99	25	5	95	23	6	253
14:00	23	8	0	17	1	1	50
14:15	32	11	3	20	9	0	75
14:30	28	11	0	27	7	0	73
14:45	25	7	2	18	11	0	63
Total	108	37	5	82	28	1	261
Grand Total	407	126	21	375	103	11	1043
Apprch %	76.4	23.6	5.3	94.7	90.4	9.6	
Total %	39	12.1	2	36	9.9	1.1	
Passenger Vehicles	399	125	21	372	100	11	1028
% Passenger Vehicles	98	99.2	100	99.2	97.1	100	98.6
Heavy Vehicles	8	1	0	3	3	0	15
% Heavy Vehicles	2	0.8	0	0.8	2.9	0	1.4

McMahon Associates, Inc.

Transportation Engineers and Planners

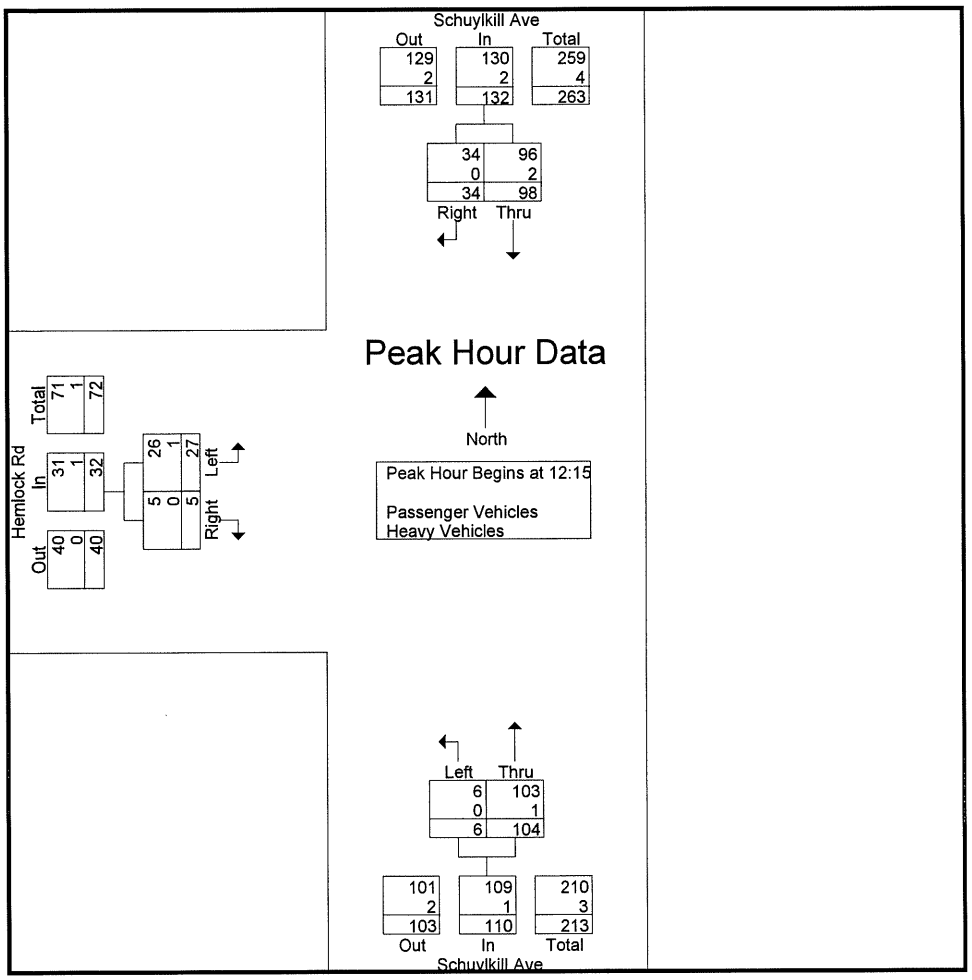
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Schuylkill Avenue &
Hemlock Road
Counter/Countboard No.: EW

File Name : westover04s
Site Code : 81207304
Start Date : 3/31/2012
Page No : 2

	Schuylkill Ave Southbound			Schuylkill Ave Northbound			Hemlock Rd Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 to 14:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 12:15										
12:15	21	**12**	33	1	25	26	**7**	1	8	67
12:30	23	9	32	0	20	20	6	**2**	8	60
12:45	**35**	5	**40**	2	**30**	**32**	7	0	7	**79**
13:00	19	8	27	**3**	29	32	7	2	**9**	68
Total Volume	98	34	132	6	104	110	27	5	32	274
% App. Total	74.2	25.8		5.5	94.5		84.4	15.6		
PHF	.700	.708	.825	.500	.867	.859	.964	.625	.889	.867
Passenger Vehicles	96	34	130	6	103	109	26	5	31	270
% Passenger Vehicles	98.0	100	98.5	100	99.0	99.1	96.3	100	96.9	98.5
Heavy Vehicles	2	0	2	0	1	1	1	0	1	4
% Heavy Vehicles	2.0	0	1.5	0	1.0	0.9	3.7	0	3.1	1.5



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Schuylkill Avenue & Hemlock Road
Counter/Countboard No.: EW

File Name : westover04s
Site Code : 81207304
Start Date : 3/31/2012
Page No : 1

Groups Printed- Pedestrians

	Schuylkill Ave Southbound	Schuylkill Ave Northbound	Hemlock Rd Eastbound	
Start Time	E/W Peds	E/W Peds	N/S Peds	Int. Total
*** BREAK ***				
12:15	0	0	1	1
*** BREAK ***				
12:45	0	0	1	1
Total	0	0	2	2
*** BREAK ***				
13:30	0	0	1	1
13:45	0	0	2	2
Total	0	0	3	3
14:00	0	0	1	1
14:15	0	0	4	4
*** BREAK ***				
Total	0	0	5	5
Grand Total	0	0	10	10
Apprch %	0	0	100	
Total %	0	0	100	

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norritown Township
Location: Schuylkill Avenue &
Brandon Road
Counter/Countboard No.: LB

File Name : westover05p
Site Code : 81207305
Start Date : 3/21/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Schuylkill Ave Southbound			Brandon Rd Westbound			Schuylkill Ave Northbound			Brandon Rd Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	7	23	1	0	2	5	3	12	0	0	3	2	58
16:15	6	27	0	0	0	1	5	14	0	1	4	3	61
16:30	9	33	2	0	1	6	6	18	0	0	2	3	80
16:45	6	26	1	0	1	6	4	18	0	1	4	8	75
Total	28	109	4	0	4	18	18	62	0	2	13	16	274
17:00	7	25	0	0	1	4	3	16	1	0	4	3	64
17:15	8	33	0	0	1	1	2	24	0	0	3	9	81
17:30	3	32	1	0	4	1	5	22	0	0	4	8	80
17:45	5	35	4	0	0	4	4	17	0	0	6	11	86
Total	23	125	5	0	6	10	14	79	1	0	17	31	311
Grand Total	51	234	9	0	10	28	32	141	1	2	30	47	585
Apprch %	17.3	79.6	3.1	0	26.3	73.7	18.4	81	0.6	2.5	38	59.5	
Total %	8.7	40	1.5	0	1.7	4.8	5.5	24.1	0.2	0.3	5.1	8	
Passenger Vehicles	51	230	9	0	10	28	32	138	1	2	30	47	578
% Passenger Vehicles	100	98.3	100	0	100	100	100	97.9	100	100	100	100	98.8
Heavy Vehicles	0	4	0	0	0	0	0	3	0	0	0	0	7
% Heavy Vehicles	0	1.7	0	0	0	0	0	2.1	0	0	0	0	1.2

McMahon Associates, Inc.

Transportation Engineers and Planners

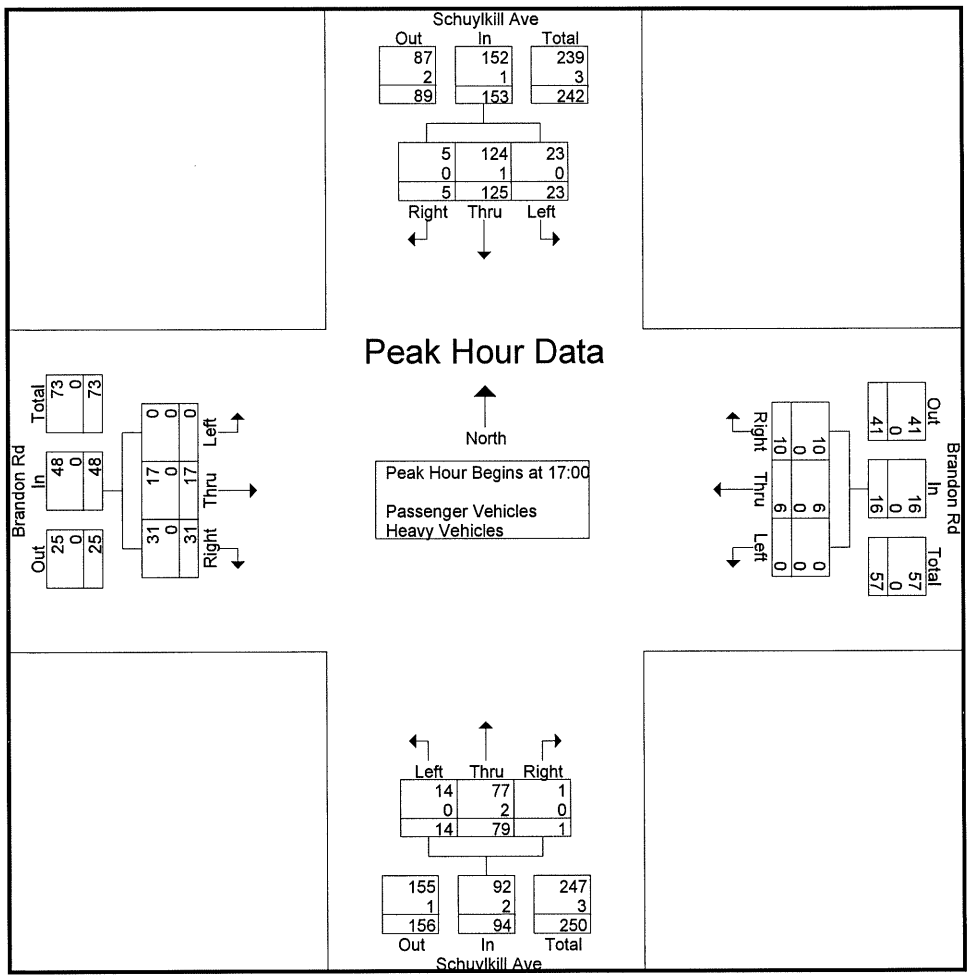
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norritown Township
Location: Schuylkill Avenue &
Brandon Road
Counter/Countboard No.: LB

File Name : westover05p
Site Code : 81207305
Start Date : 3/21/2012
Page No : 2

	Schuylkill Ave Southbound				Brandon Rd Westbound				Schuylkill Ave Northbound				Brandon 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 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	7	25	0	32	0	1	**4**	**5**	3	16	**1**	20	0	4	3	7	64
17:15	**8**	33	0	41	0	1	1	2	2	**24**	0	26	0	3	9	12	81
17:30	3	32	1	36	0	**4**	1	5	**5**	22	0	**27**	0	4	8	12	80
17:45	5	**35**	**4**	**44**	0	0	4	4	4	17	0	21	0	**6**	**11**	**17**	**86**
Total Volume	23	125	5	153	0	6	10	16	14	79	1	94	0	17	31	48	311
% App. Total	15	81.7	3.3		0	37.5	62.5		14.9	84	1.1		0	35.4	64.6		
PHF	.719	.893	.313	.869	.000	.375	.625	.800	.700	.823	.250	.870	.000	.708	.705	.706	.904
Passenger Vehicles	23	124	5	152	0	6	10	16	14	77	1	92	0	17	31	48	308
% Passenger Vehicles	100	99.2	100	99.3	0	100	100	100	100	97.5	100	97.9	0	100	100	100	99.0
Heavy Vehicles	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
% Heavy Vehicles	0	0.8	0	0.7	0	0	0	0	0	2.5	0	2.1	0	0	0	0	1.0



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norritown Township
Location: Schuylkill Avenue &
Brandon Road
Counter/Countboard No.: LB

File Name : westover05p
Site Code : 81207305
Start Date : 3/21/2012
Page No : 1

Groups Printed- Pedestrians

	Schuylkill Ave Southbound	Brandon Rd Westbound	Schuylkill Ave Northbound	Brandon Rd Eastbound	
Start Time	E/W Peds	N/S Peds	E/W Peds	N/S Peds	Int. Total
16:00	0	0	1	0	1
16:15	0	0	1	0	1
16:30	0	0	1	0	1
16:45	0	0	2	1	3
Total	0	0	5	1	6
17:00	0	0	2	1	3
*** BREAK ***					
Total	0	0	2	1	3
Grand Total	0	0	7	2	9
Apprch %	0	0	100	100	
Total %	0	0	77.8	22.2	

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norritonn Township
Location: Schuylkill Avenue
& Brandon Road
Counter/Countboard No.: JG

File Name : westover05s
Site Code : 81207305
Start Date : 3/24/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Schuylkill Ave Southbound			Brandon Rd Westbound			Schuylkill Ave Northbound			Brandon Rd Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:00	7	15	2	0	3	10	5	25	0	0	0	5	72
11:15	10	22	0	0	5	8	9	27	1	2	9	4	97
11:30	4	25	0	0	3	5	12	21	2	0	5	5	82
11:45	3	24	3	0	4	4	10	22	2	1	4	5	82
Total	24	86	5	0	15	27	36	95	5	3	18	19	333
12:00	7	15	2	1	4	3	8	18	2	1	2	9	72
12:15	6	24	2	2	2	7	8	25	0	1	3	4	84
12:30	8	18	0	1	1	6	5	19	0	0	7	4	69
12:45	7	24	0	0	2	4	7	23	1	2	10	1	81
Total	28	81	4	4	9	20	28	85	3	4	22	18	306
13:00	6	25	1	0	2	6	7	24	2	1	3	7	84
13:15	8	22	2	2	4	5	8	21	0	1	3	5	81
13:30	4	14	1	0	3	9	5	28	1	0	2	5	72
13:45	4	10	0	0	3	3	4	25	1	0	4	2	56
Total	22	71	4	2	12	23	24	98	4	2	12	19	293
14:00	4	13	2	1	5	6	7	15	0	1	2	6	62
14:15	7	16	1	0	2	1	3	19	0	4	3	4	60
14:30	6	17	2	0	2	3	5	22	1	1	4	7	70
14:45	8	13	0	0	4	2	9	19	0	2	3	8	68
Total	25	59	5	1	13	12	24	75	1	8	12	25	260
Grand Total	99	297	18	7	49	82	112	353	13	17	64	81	1192
Apprch %	23.9	71.7	4.3	5.1	35.5	59.4	23.4	73.8	2.7	10.5	39.5	50	
Total %	8.3	24.9	1.5	0.6	4.1	6.9	9.4	29.6	1.1	1.4	5.4	6.8	
Passenger Vehicles	99	295	18	7	49	82	112	352	13	17	63	81	1188
% Passenger Vehicles	100	99.3	100	100	100	100	100	99.7	100	100	98.4	100	99.7
Heavy Vehicles	0	2	0	0	0	0	0	1	0	0	1	0	4
% Heavy Vehicles	0	0.7	0	0	0	0	0	0.3	0	0	1.6	0	0.3

McMahon Associates, Inc.

Transportation Engineers and Planners

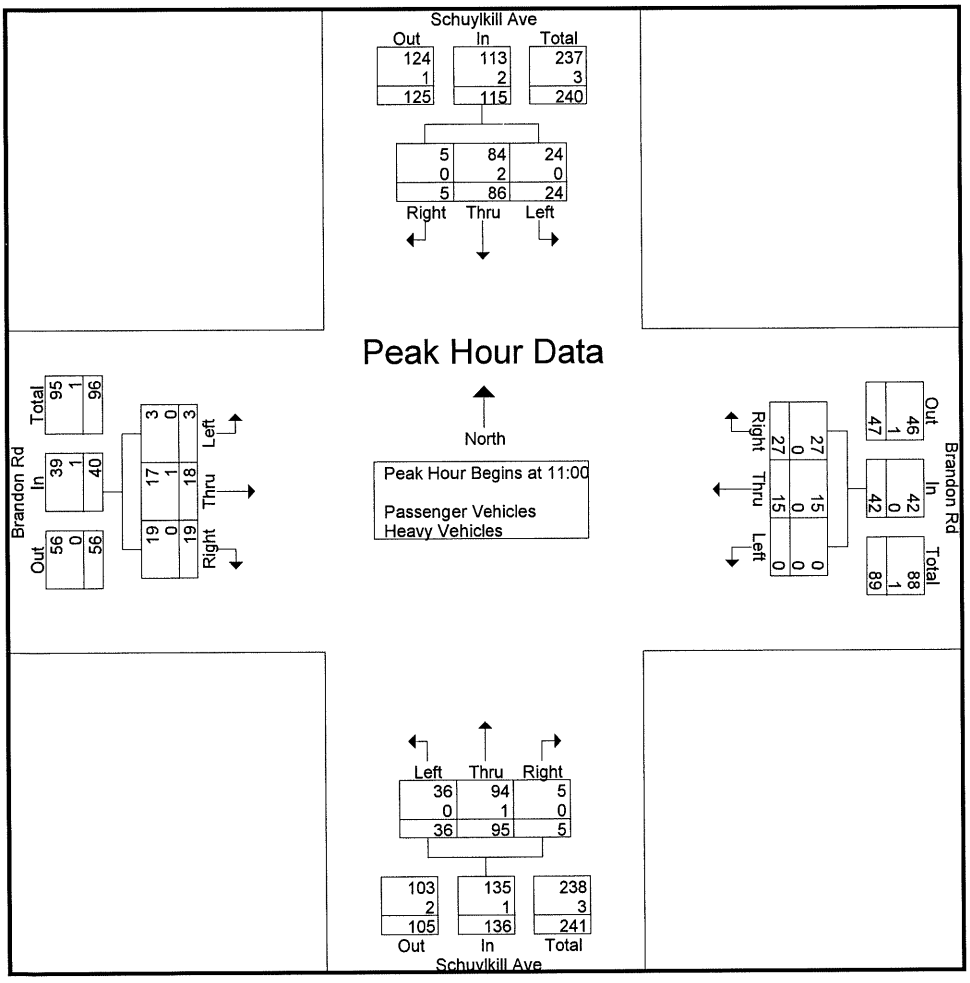
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norritonn Township
Location: Schuylkill Avenue
& Brandon Road
Counter/Countboard No.: JG

File Name : westover05s
Site Code : 81207305
Start Date : 3/24/2012
Page No : 2

	Schuylkill Ave Southbound				Brandon Rd Westbound				Schuylkill Ave Northbound				Brandon 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 11:00 to 14:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:00																	
11:00	7	15	2	24	0	3	**10**	**13**	5	25	0	30	0	0	**5**	5	72
11:15	**10**	22	0	**32**	0	**5**	8	13	9	**27**	1	**37**	**2**	**9**	4	**15**	**97**
11:30	4	**25**	0	29	0	3	5	8	**12**	21	**2**	35	0	5	5	10	82
11:45	3	24	**3**	30	0	4	4	8	10	22	2	34	1	4	5	10	82
Total Volume	24	86	5	115	0	15	27	42	36	95	5	136	3	18	19	40	333
% App. Total	20.9	74.8	4.3		0	35.7	64.3		26.5	69.9	3.7		7.5	45	47.5		
PHF	.600	.860	.417	.898	.000	.750	.675	.808	.750	.880	.625	.919	.375	.500	.950	.667	.858
Passenger Vehicles	24	84	5	113	0	15	27	42	36	94	5	135	3	17	19	39	329
% Passenger Vehicles	100	97.7	100	98.3	0	100	100	100	100	98.9	100	99.3	100	94.4	100	97.5	98.8
Heavy Vehicles	0	2	0	2	0	0	0	0	0	1	0	1	0	1	0	1	4
% Heavy Vehicles	0	2.3	0	1.7	0	0	0	0	0	1.1	0	0.7	0	5.6	0	2.5	1.2



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norritonn Township
Location: Schuylkill Avenue
& Brandon Road
Counter/Countboard No.: JG

File Name : westover05s
Site Code : 81207305
Start Date : 3/24/2012
Page No : 1

Groups Printed- Pedestrians

	Schuylkill Ave Southbound	Brandon Rd Westbound	Schuylkill Ave Northbound	Brandon Rd Eastbound	
Start Time	E/W Peds	N/S Peds	E/W Peds	N/S Peds	Int. Total
11:00	4	0	0	0	4
11:15	1	0	0	0	1
11:30	2	0	0	0	2
*** BREAK ***					
Total	7	0	0	0	7
12:00	0	0	0	1	1
*** BREAK ***					
Total	0	0	0	1	1
*** BREAK ***					
13:45	0	0	0	1	1
Total	0	0	0	1	1
14:00	0	0	0	2	2
*** BREAK ***					
Total	0	0	0	2	2
Grand Total	7	0	0	4	11
Apprch %	100	0	0	100	
Total %	63.6	0	0	36.4	

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Schyulkill Avenue &
Westover CC Access / Access
Counter/Countboard No.: JB

File Name : westover06p
Site Code : 81207306
Start Date : 3/21/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Schuylkill Ave Southbound			Westover CC Access Westbound			Schuylkill Ave Northbound			Access Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	0	7	0	5	0	0	6	18	1	0	0	1	38
16:15	1	18	1	5	0	0	4	26	0	0	0	1	56
16:30	0	19	2	0	0	2	8	18	0	0	0	0	49
16:45	0	23	0	1	0	3	6	27	3	0	0	4	67
Total	1	67	3	11	0	5	24	89	4	0	0	6	210
17:00	0	10	1	6	0	1	5	27	1	0	0	2	53
17:15	1	13	0	8	0	0	9	30	2	0	0	7	70
17:30	0	16	3	6	0	1	8	23	3	0	0	4	64
17:45	1	17	1	0	0	0	18	30	0	3	0	2	72
Total	2	56	5	20	0	2	40	110	6	3	0	15	259
Grand Total	3	123	8	31	0	7	64	199	10	3	0	21	469
Apprch %	2.2	91.8	6	81.6	0	18.4	23.4	72.9	3.7	12.5	0	87.5	
Total %	0.6	26.2	1.7	6.6	0	1.5	13.6	42.4	2.1	0.6	0	4.5	
Passenger Vehicles	1	120	8	30	0	6	63	195	10	3	0	21	457
% Passenger Vehicles	33.3	97.6	100	96.8	0	85.7	98.4	98	100	100	0	100	97.4
Heavy Vehicles	2	3	0	1	0	1	1	4	0	0	0	0	12
% Heavy Vehicles	66.7	2.4	0	3.2	0	14.3	1.6	2	0	0	0	0	2.6

McMahon Associates, Inc.

Transportation Engineers and Planners

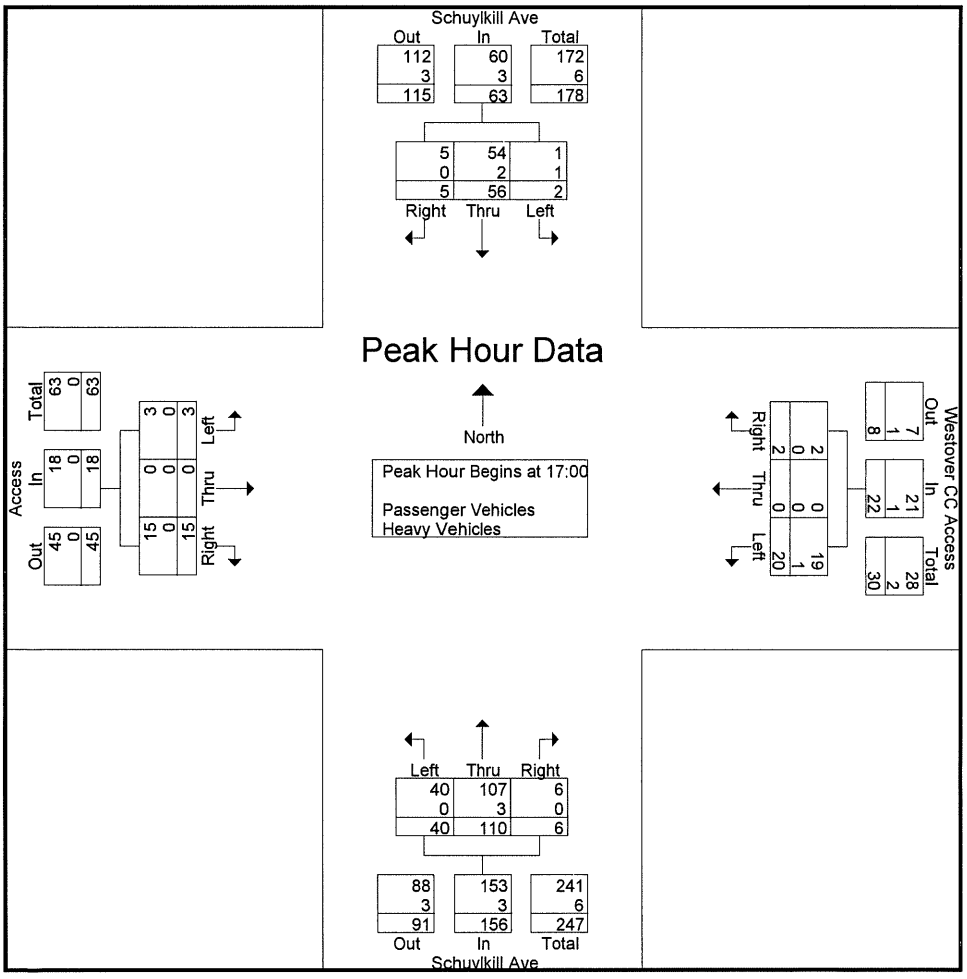
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Schyulkill Avenue &
Westover CC Access / Access
Counter/Countboard No.: JB

File Name : westover06p
Site Code : 81207306
Start Date : 3/21/2012
Page No : 2

	Schuylkill Ave Southbound				Westover CC Access Westbound				Schuylkill Ave Northbound				Access 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	0	10	1	11	6	0	**1**	7	5	27	1	33	0	0	2	2	53
17:15	**1**	13	0	14	**8**	0	0	**8**	9	**30**	2	41	0	0	**7**	**7**	70
17:30	0	16	**3**	**19**	6	0	1	7	8	23	**3**	34	0	0	4	4	64
17:45	1	**17**	1	19	0	0	0	0	**18**	30	0	**48**	**3**	0	2	5	**72**
Total Volume	2	56	5	63	20	0	2	22	40	110	6	156	3	0	15	18	259
% App. Total	3.2	88.9	7.9		90.9	0	9.1		25.6	70.5	3.8		16.7	0	83.3		
PHF	.500	.824	.417	.829	.625	.000	.500	.688	.556	.917	.500	.813	.250	.000	.536	.643	.899
Passenger Vehicles	1	54	5	60	19	0	2	21	40	107	6	153	3	0	15	18	252
% Passenger Vehicles	50.0	96.4	100	95.2	95.0	0	100	95.5	100	97.3	100	98.1	100	0	100	100	97.3
Heavy Vehicles	1	2	0	3	1	0	0	1	0	3	0	3	0	0	0	0	7
% Heavy Vehicles	50.0	3.6	0	4.8	5.0	0	0	4.5	0	2.7	0	1.9	0	0	0	0	2.7



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Schyulkill Avenue &
Westover CC Access / Access
Counter/Countboard No.: JB

File Name : westover06p
Site Code : 81207306
Start Date : 3/21/2012
Page No : 1

Groups Printed- Pedestrians

	Schuylkill Ave Southbound	Westover CC Access Westbound	Schuylkill Ave Northbound	Access Eastbound	
Start Time	E/W Peds	N/S Peds	E/W Peds	N/S Peds	Int. Total
*** BREAK ***					
16:15	0	0	0	1	1
16:30	0	0	0	1	1
16:45	0	0	0	1	1
Total	0	0	0	3	3
17:00	0	0	0	1	1
17:15	0	0	0	6	6
17:30	0	0	0	1	1
17:45	0	0	0	1	1
Total	0	0	0	9	9
Grand Total	0	0	0	12	12
Apprch %	0	0	0	100	
Total %	0	0	0	100	

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Schuylkill Avenue &
Country Club Access / Apartment Access
Counter/Countboard No.: TD

File Name : westover06s
Site Code : 81207306
Start Date : 3/31/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Schuylkill Ave Southbound			Apartment Access Westbound			Schuylkill Ave Northbound			Golf Club Access Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:00	1	21	3	1	1	4	1	19	2	1	0	1	55
11:15	2	16	3	1	0	4	0	12	0	1	0	2	41
11:30	3	15	4	0	0	8	2	20	0	2	0	0	54
11:45	5	13	2	0	0	8	2	16	2	2	0	0	50
Total	11	65	12	2	1	24	5	67	4	6	0	3	200
12:00	5	19	3	2	0	8	0	15	1	1	0	3	57
12:15	3	14	1	3	0	4	0	23	0	1	0	0	49
12:30	6	20	1	0	0	4	1	18	0	1	0	0	51
12:45	4	23	4	1	0	8	1	21	2	8	0	1	73
Total	18	76	9	6	0	24	2	77	3	11	0	4	230
13:00	3	15	10	1	0	8	0	24	1	1	0	0	63
13:15	5	12	6	2	0	8	1	13	1	2	0	2	52
13:30	5	18	7	1	0	5	0	22	0	2	0	0	60
13:45	5	14	1	0	0	3	1	18	1	2	0	1	46
Total	18	59	24	4	0	24	2	77	3	7	0	3	221
14:00	9	13	0	1	0	3	0	10	0	3	0	1	40
14:15	5	18	2	0	0	7	0	14	1	2	0	2	51
14:30	5	18	5	0	0	9	0	21	3	0	0	0	61
14:45	2	16	5	0	0	6	1	13	2	4	0	0	49
Total	21	65	12	1	0	25	1	58	6	9	0	3	201
Grand Total	68	265	57	13	1	97	10	279	16	33	0	13	852
Apprch %	17.4	67.9	14.6	11.7	0.9	87.4	3.3	91.5	5.2	71.7	0	28.3	
Total %	8	31.1	6.7	1.5	0.1	11.4	1.2	32.7	1.9	3.9	0	1.5	
Passenger Vehicles	68	262	52	12	1	96	8	276	16	31	0	13	835
% Passenger Vehicles	100	98.9	91.2	92.3	100	99	80	98.9	100	93.9	0	100	98
Heavy Vehicles	0	3	5	1	0	1	2	3	0	2	0	0	17
% Heavy Vehicles	0	1.1	8.8	7.7	0	1	20	1.1	0	6.1	0	0	2

McMahon Associates, Inc.

Transportation Engineers and Planners

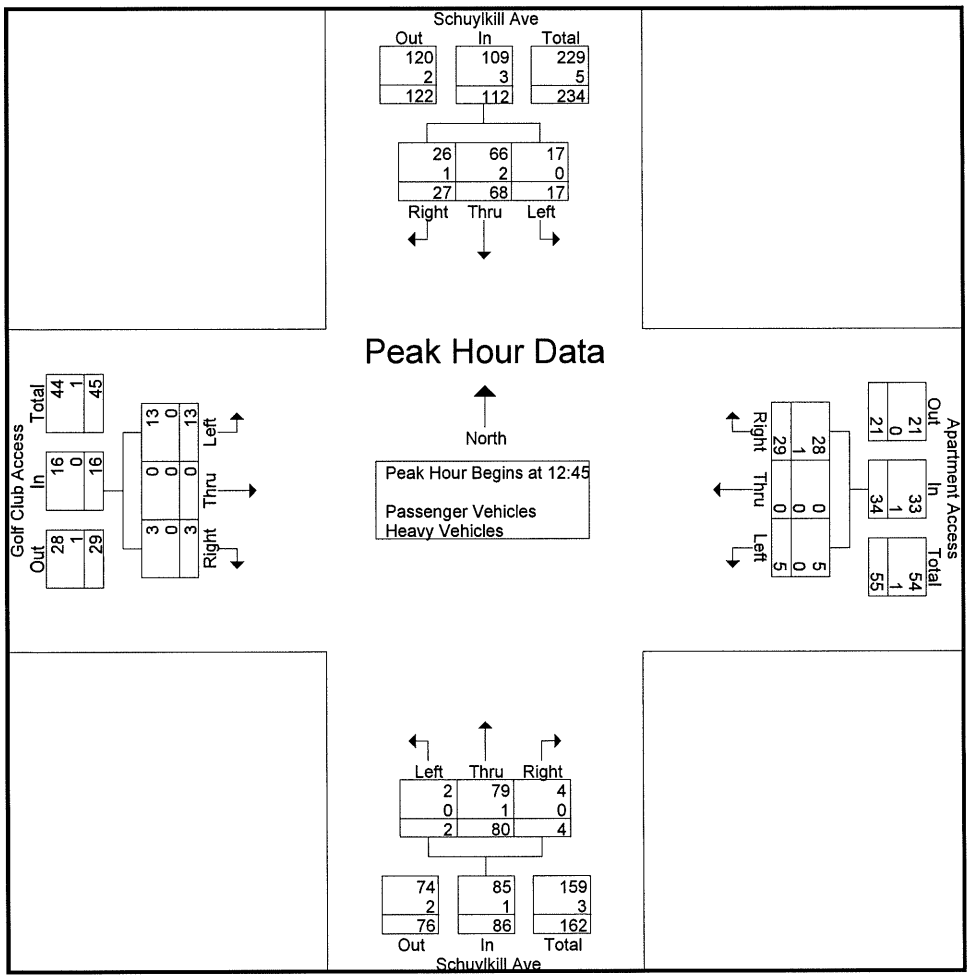
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Schuylkill Avenue &
Country Club Access / Apartment Access
Counter/Countboard No.: TD

File Name : westover06s
Site Code : 81207306
Start Date : 3/31/2012
Page No : 2

	Schuylkill Ave Southbound				Apartment Access Westbound				Schuylkill Ave Northbound				Golf Club Access 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 11:00 to 14:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:45																	
12:45	4	**23**	4	**31**	1	0	**8**	9	**1**	21	**2**	24	**8**	0	1	**9**	**73**
13:00	3	15	**10**	28	1	0	8	9	0	**24**	1	**25**	1	0	0	1	63
13:15	**5**	12	6	23	**2**	0	8	**10**	1	13	1	15	2	0	**2**	4	52
13:30	5	18	7	30	1	0	5	6	0	22	0	22	2	0	0	2	60
Total Volume	17	68	27	112	5	0	29	34	2	80	4	86	13	0	3	16	248
% App. Total	15.2	60.7	24.1		14.7	0	85.3		2.3	93	4.7		81.2	0	18.8		
PHF	.850	.739	.675	.903	.625	.000	.906	.850	.500	.833	.500	.860	.406	.000	.375	.444	.849
Passenger Vehicles	17	66	26	109	5	0	28	33	2	79	4	85	13	0	3	16	243
% Passenger Vehicles	100	97.1	96.3	97.3	100	0	96.6	97.1	100	98.8	100	98.8	100	0	100	100	98.0
Heavy Vehicles	0	2	1	3	0	0	1	1	0	1	0	1	0	0	0	0	5
% Heavy Vehicles	0	2.9	3.7	2.7	0	0	3.4	2.9	0	1.3	0	1.2	0	0	0	0	2.0



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: School Road &
Hemlock Road
Counter/Countboard No.: KB

File Name : westover07p
Site Code : 81207307
Start Date : 3/21/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	School Rd Southbound			Hemlock Rd Westbound			School Rd Northbound			Hemlock Rd Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	11	16	2	0	0	7	0	9	0	2	0	0	47
16:15	9	8	2	0	0	8	0	6	0	2	1	0	36
16:30	11	6	2	0	0	10	0	8	0	0	0	0	37
16:45	19	19	2	1	1	6	0	9	0	4	0	0	61
Total	50	49	8	1	1	31	0	32	0	8	1	0	181
17:00	18	10	1	1	0	5	0	8	0	0	0	0	43
17:15	13	13	1	0	1	10	0	6	0	0	1	0	45
17:30	8	15	3	0	0	7	0	14	0	0	0	0	47
17:45	9	19	1	0	1	10	0	8	0	1	0	0	49
Total	48	57	6	1	2	32	0	36	0	1	1	0	184
Grand Total	98	106	14	2	3	63	0	68	0	9	2	0	365
Apprch %	45	48.6	6.4	2.9	4.4	92.6	0	100	0	81.8	18.2	0	
Total %	26.8	29	3.8	0.5	0.8	17.3	0	18.6	0	2.5	0.5	0	
Passenger Vehicles	97	106	14	2	3	63	0	66	0	9	2	0	362
% Passenger Vehicles	99	100	100	100	100	100	0	97.1	0	100	100	0	99.2
Heavy Vehicles	1	0	0	0	0	0	0	2	0	0	0	0	3
% Heavy Vehicles	1	0	0	0	0	0	0	2.9	0	0	0	0	0.8

Zero Pedestrians were observed during this study.

McMahon Associates, Inc.

Transportation Engineers and Planners

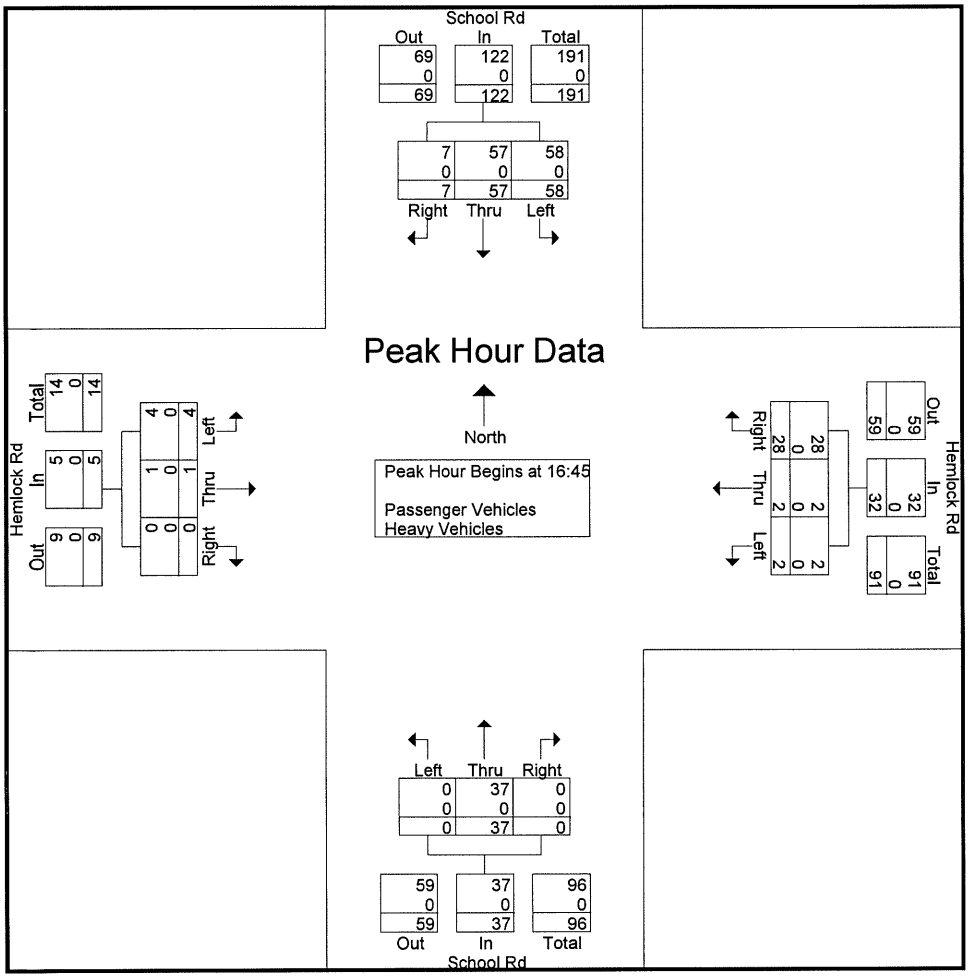
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: School Road &
Hemlock Road
Counter/Countboard No.: KB

File Name : westover07p
Site Code : 81207307
Start Date : 3/21/2012
Page No : 2

	School Rd Southbound				Hemlock Rd Westbound				School Rd Northbound				Hemlock 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 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	**19**	**19**	2	**40**	**1**	**1**	6	8	0	9	0	9	**4**	0	0	**4**	**61**
17:00	18	10	1	29	1	0	5	6	0	8	0	8	0	0	0	0	43
17:15	13	13	1	27	0	1	**10**	**11**	0	6	0	6	0	**1**	0	1	45
17:30	8	15	**3**	26	0	0	7	7	0	**14**	0	**14**	0	0	0	0	47
Total Volume	58	57	7	122	2	2	28	32	0	37	0	37	4	1	0	5	196
% App. Total	47.5	46.7	5.7		6.2	6.2	87.5		0	100	0		80	20	0		
PHF	.763	.750	.583	.763	.500	.500	.700	.727	.000	.661	.000	.661	.250	.250	.000	.313	.803
Passenger Vehicles	58	57	7	122	2	2	28	32	0	37	0	37	4	1	0	5	196
% Passenger Vehicles	100	100	100	100	100	100	100	100	0	100	0	100	100	100	0	100	100
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: School Lane &
Hemlock Road
Counter/Countboard No.: JC

File Name : westover07s
Site Code : 81207307
Start Date : 3/31/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	School Ln Southbound			Hemlock Rd Westbound			School Ln Northbound			Hemlock Rd Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:00	3	14	0	0	1	5	0	14	0	3	2	0	42
11:15	0	10	3	0	1	6	0	11	1	2	0	0	34
11:30	3	14	1	0	0	8	0	18	0	1	1	1	47
11:45	5	16	0	0	0	5	0	10	0	1	1	0	38
Total	11	54	4	0	2	24	0	53	1	7	4	1	161
12:00	3	15	1	0	0	6	0	17	0	0	0	0	42
12:15	4	19	1	0	0	6	0	14	0	5	0	0	49
12:30	5	12	3	0	1	6	0	13	0	3	2	0	45
12:45	4	11	3	1	1	5	0	9	1	1	0	0	36
Total	16	57	8	1	2	23	0	53	1	9	2	0	172
13:00	4	13	0	0	1	11	0	16	0	1	2	0	48
13:15	6	11	2	0	2	7	0	8	0	1	1	1	39
13:30	6	16	0	0	0	2	1	9	0	1	0	0	35
13:45	5	5	1	0	0	6	0	18	0	0	0	0	35
Total	21	45	3	0	3	26	1	51	0	3	3	1	157
14:00	4	9	0	0	0	5	0	14	0	2	1	0	35
14:15	7	9	2	0	0	9	0	14	0	1	0	0	42
14:30	6	16	0	0	1	6	0	12	1	0	0	0	42
14:45	6	12	2	1	0	7	0	9	0	1	0	1	39
Total	23	46	4	1	1	27	0	49	1	4	1	1	158
Grand Total	71	202	19	2	8	100	1	206	3	23	10	3	648
Apprch %	24.3	69.2	6.5	1.8	7.3	90.9	0.5	98.1	1.4	63.9	27.8	8.3	
Total %	11	31.2	2.9	0.3	1.2	15.4	0.2	31.8	0.5	3.5	1.5	0.5	
Passenger Vehicles	70	201	19	2	8	100	1	206	3	23	10	3	646
% Passenger Vehicles	98.6	99.5	100	100	100	100	100	100	100	100	100	100	99.7
Heavy Vehicles	1	1	0	0	0	0	0	0	0	0	0	0	2
% Heavy Vehicles	1.4	0.5	0	0	0	0	0	0	0	0	0	0	0.3

McMahon Associates, Inc.

Transportation Engineers and Planners

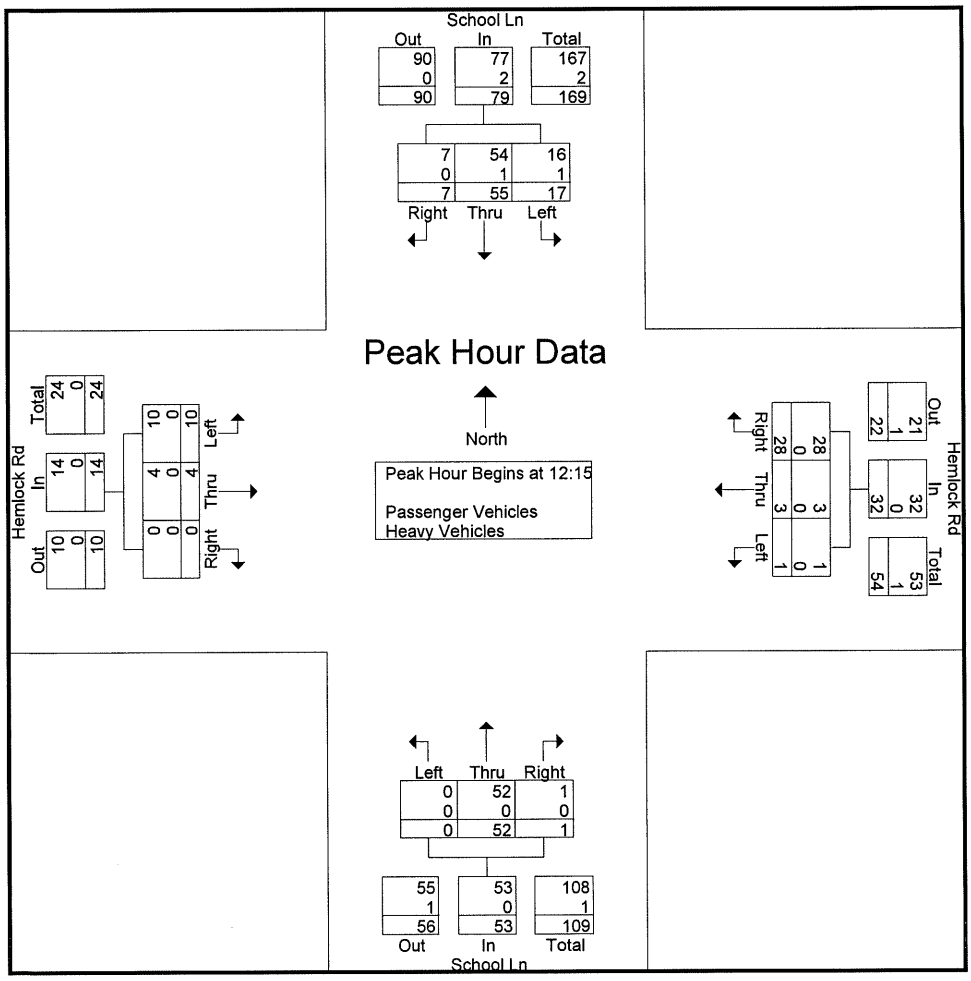
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: School Lane &
Hemlock Road
Counter/Countboard No.: JC

File Name : westover07s
Site Code : 81207307
Start Date : 3/31/2012
Page No : 2

	School Ln Southbound				Hemlock Rd Westbound				School Ln Northbound				Hemlock 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 11:00 to 14:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15																	
12:15	4	**19**	1	**24**	0	0	6	6	0	14	0	14	**5**	0	0	**5**	**49**
12:30	**5**	12	**3**	20	0	**1**	6	7	0	13	0	13	3	**2**	0	5	45
12:45	4	11	3	18	**1**	1	5	7	0	9	**1**	10	1	0	0	1	36
13:00	4	13	0	17	0	1	**11**	**12**	0	**16**	0	**16**	1	2	0	3	48
Total Volume	17	55	7	79	1	3	28	32	0	52	1	53	10	4	0	14	178
% App. Total	21.5	69.6	8.9		3.1	9.4	87.5		0	98.1	1.9		71.4	28.6	0		
PHF	.850	.724	.583	.823	.250	.750	.636	.667	.000	.813	.250	.828	.500	.500	.000	.700	.908
Passenger Vehicles	16	54	7	77	1	3	28	32	0	52	1	53	10	4	0	14	176
% Passenger Vehicles	94.1	98.2	100	97.5	100	100	100	100	0	100	100	100	100	100	0	100	98.9
Heavy Vehicles	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% Heavy Vehicles	5.9	1.8	0	2.5	0	0	0	0	0	0	0	0	0	0	0	0	1.1



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: School Lane &
Hemlock Road
Counter/Countboard No.: JC

File Name : westover07s
Site Code : 81207307
Start Date : 3/31/2012
Page No : 1

Groups Printed- Pedestrians

	School Ln Southbound	Hemlock Rd Westbound	School Ln Northbound	Hemlock Rd Eastbound	
Start Time	E/W Peds	N/S Peds	E/W Peds	N/S Peds	Int. Total
*** BREAK ***					
11:15	0	0	0	1	1
*** BREAK ***					
Total	0	0	0	1	1
*** BREAK ***					
12:30	0	0	0	1	1
*** BREAK ***					
Total	0	0	0	1	1
*** BREAK ***					
14:15	1	1	0	0	2
14:30	0	0	2	0	2
14:45	1	0	0	0	1
Total	2	1	2	0	5
Grand Total	2	1	2	2	7
Apprch %	100	100	100	100	
Total %	28.6	14.3	28.6	28.6	

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Egypt Road &
School Lane
Counter/Countboard No.: BW

File Name : westover09p
Site Code : 81207309
Start Date : 3/20/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	School Ln Southbound			Egypt Rd Westbound			School Ln Northbound			Egypt Rd Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	0	2	20	4	173	0	19	1	2	26	171	16	434
16:15	0	4	21	1	248	2	19	2	1	21	184	22	525
16:30	0	6	21	0	210	2	18	2	2	32	180	20	493
16:45	0	4	16	2	229	0	16	0	3	33	211	26	540
Total	0	16	78	7	860	4	72	5	8	112	746	84	1992
17:00	1	7	28	0	242	0	25	2	1	37	203	20	566
17:15	0	4	25	2	250	2	13	2	2	29	205	38	572
17:30	0	6	20	2	217	3	23	1	4	38	232	32	578
17:45	0	9	24	1	188	1	18	2	2	48	188	39	520
Total	1	26	97	5	897	6	79	7	9	152	828	129	2236
Grand Total	1	42	175	12	1757	10	151	12	17	264	1574	213	4228
Apprch %	0.5	19.3	80.3	0.7	98.8	0.6	83.9	6.7	9.4	12.9	76.7	10.4	
Total %	0	1	4.1	0.3	41.6	0.2	3.6	0.3	0.4	6.2	37.2	5	
Passenger Vehicles	1	41	173	11	1729	9	148	11	15	263	1537	212	4150
% Passenger Vehicles	100	97.6	98.9	91.7	98.4	90	98	91.7	88.2	99.6	97.6	99.5	98.2
Heavy Vehicles	0	1	2	1	28	1	3	1	2	1	37	1	78
% Heavy Vehicles	0	2.4	1.1	8.3	1.6	10	2	8.3	11.8	0.4	2.4	0.5	1.8

McMahon Associates, Inc.

Transportation Engineers and Planners

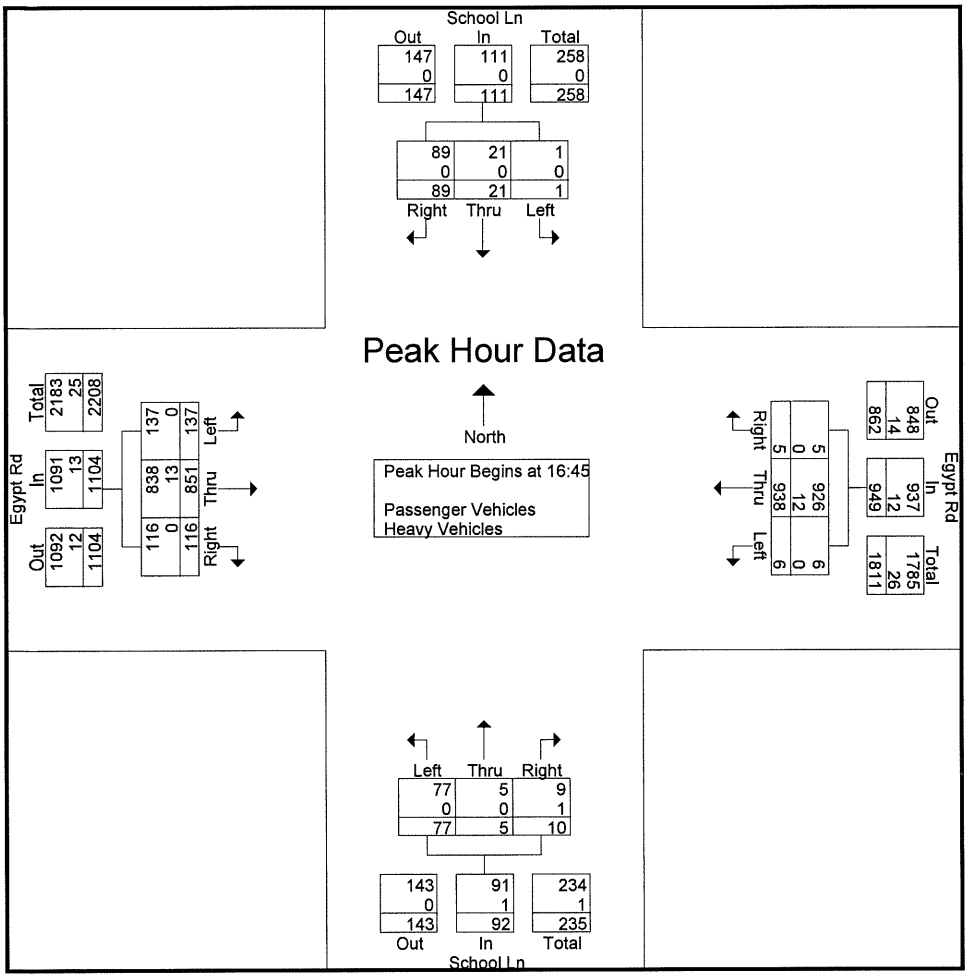
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Egypt Road &
School Lane
Counter/Countboard No.: BW

File Name : westover09p
Site Code : 81207309
Start Date : 3/20/2012
Page No : 2

	School Ln Southbound				Egypt Rd Westbound				School Ln Northbound				Egypt 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 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	0	4	16	20	**2**	229	0	231	16	0	3	19	33	211	26	270	540
17:00	**1**	**7**	**28**	**36**	0	242	0	242	**25**	**2**	1	**28**	37	203	20	260	566
17:15	0	4	25	29	2	**250**	2	**254**	13	2	2	17	29	205	**38**	272	572
17:30	0	6	20	26	2	217	**3**	222	23	1	**4**	28	**38**	**232**	32	**302**	**578**
Total Volume	1	21	89	111	6	938	5	949	77	5	10	92	137	851	116	1104	2256
% App. Total	0.9	18.9	80.2		0.6	98.8	0.5		83.7	5.4	10.9		12.4	77.1	10.5		
PHF	.250	.750	.795	.771	.750	.938	.417	.934	.770	.625	.625	.821	.901	.917	.763	.914	.976
Passenger Vehicles	1	21	89	111	6	926	5	937	77	5	9	91	137	838	116	1091	2230
% Passenger Vehicles	100	100	100	100	100	98.7	100	98.7	100	100	90.0	98.9	100	98.5	100	98.8	98.8
Heavy Vehicles	0	0	0	0	0	12	0	12	0	0	1	1	0	13	0	13	26
% Heavy Vehicles	0	0	0	0	0	1.3	0	1.3	0	0	10.0	1.1	0	1.5	0	1.2	1.2



McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Egypt Road &
School Lane
Counter/Countboard No.: BW

File Name : westover09p
Site Code : 81207309
Start Date : 3/20/2012
Page No : 1

Groups Printed- Pedestrians

	School Ln Southbound	Egypt Rd Westbound	School Ln Northbound	Egypt Rd Eastbound	
Start Time	E/W Peds	N/S Peds	E/W Peds	N/S Peds	Int. Total
16:00	1	1	0	0	2
16:15	0	1	1	0	2
*** BREAK ***					
16:45	0	0	1	0	1
Total	1	2	2	0	5
*** BREAK ***					
17:30	0	0	1	0	1
17:45	0	0	0	1	1
Total	0	0	1	1	2
Grand Total	1	2	3	1	7
Apprch %	100	100	100	100	
Total %	14.3	28.6	42.9	14.3	

McMahon Associates, Inc.

Transportation Engineers and Planners

425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Egypt Road &
School Road
Counter/Countboard No.: KB

File Name : westover09s
Site Code : 81207309
Start Date : 3/24/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	School Rd Southbound				Egypt Rd Westbound				School Rd Northbound				Egypt Rd Eastbound				
Start Time	Left	Thru	ROR	Right	Left	Thru	ROR	Right	Left	Thru	ROR	Right	Left	Thru	ROR	Right	Int. Total
11:00	0	3	1	24	1	116	0	0	17	1	0	0	9	137	0	14	323
11:15	0	2	0	13	2	139	0	1	32	0	1	2	10	116	5	15	338
11:30	1	4	2	19	2	148	0	1	17	0	1	2	19	145	0	20	381
11:45	2	5	0	18	1	150	0	4	13	3	0	2	14	154	1	14	381
Total	3	14	3	74	6	553	0	6	79	4	2	6	52	552	6	63	1423
12:00	1	6	3	25	0	149	0	0	24	1	1	0	11	141	3	15	380
12:15	0	3	0	17	0	147	0	0	21	1	0	1	16	126	1	13	346
12:30	0	4	0	20	1	166	0	0	17	0	0	0	10	157	2	17	394
12:45	0	6	0	15	3	145	0	2	28	1	0	0	13	177	2	18	410
Total	1	19	3	77	4	607	0	2	90	3	1	1	50	601	8	63	1530
13:00	0	0	0	14	0	156	0	0	25	1	0	1	15	164	1	6	383
13:15	0	1	2	12	0	145	0	0	20	3	1	1	17	152	4	11	369
13:30	0	2	0	13	0	121	0	1	17	2	0	1	15	124	1	17	314
13:45	0	6	0	19	1	125	0	0	17	4	0	2	21	150	1	15	361
Total	0	9	2	58	1	547	0	1	79	10	1	5	68	590	7	49	1427
14:00	0	3	1	7	3	130	0	0	22	0	0	4	21	159	1	16	367
14:15	0	0	0	11	2	140	0	0	18	1	0	0	18	148	2	18	358
14:30	0	3	0	16	0	132	0	2	17	1	1	1	13	169	1	17	373
14:45	1	0	3	20	1	166	0	0	14	1	0	4	12	165	0	12	399
Total	1	6	4	54	6	568	0	2	71	3	1	9	64	641	4	63	1497
Grand Total	5	48	12	263	17	2275	0	11	319	20	5	21	234	2384	25	238	5877
Apprch %	1.5	14.6	3.7	80.2	0.7	98.8	0	0.5	87.4	5.5	1.4	5.8	8.1	82.7	0.9	8.3	
Total %	0.1	0.8	0.2	4.5	0.3	38.7	0	0.2	5.4	0.3	0.1	0.4	4	40.6	0.4	4	
Passenger Vehicles	5	48	12	263	17	2263	0	11	318	20	5	21	234	2369	25	238	5849
% Passenger Vehicles	100	100	100	100	100	99.5	0	100	99.7	100	100	100	100	99.4	100	100	99.5
Heavy Vehicles	0	0	0	0	0	12	0	0	1	0	0	0	0	15	0	0	28
% Heavy Vehicles	0	0	0	0	0	0.5	0	0	0.3	0	0	0	0	0.6	0	0	0.5

Zero Pedestrians were observed during this study.

McMahon Associates, Inc.

Transportation Engineers and Planners

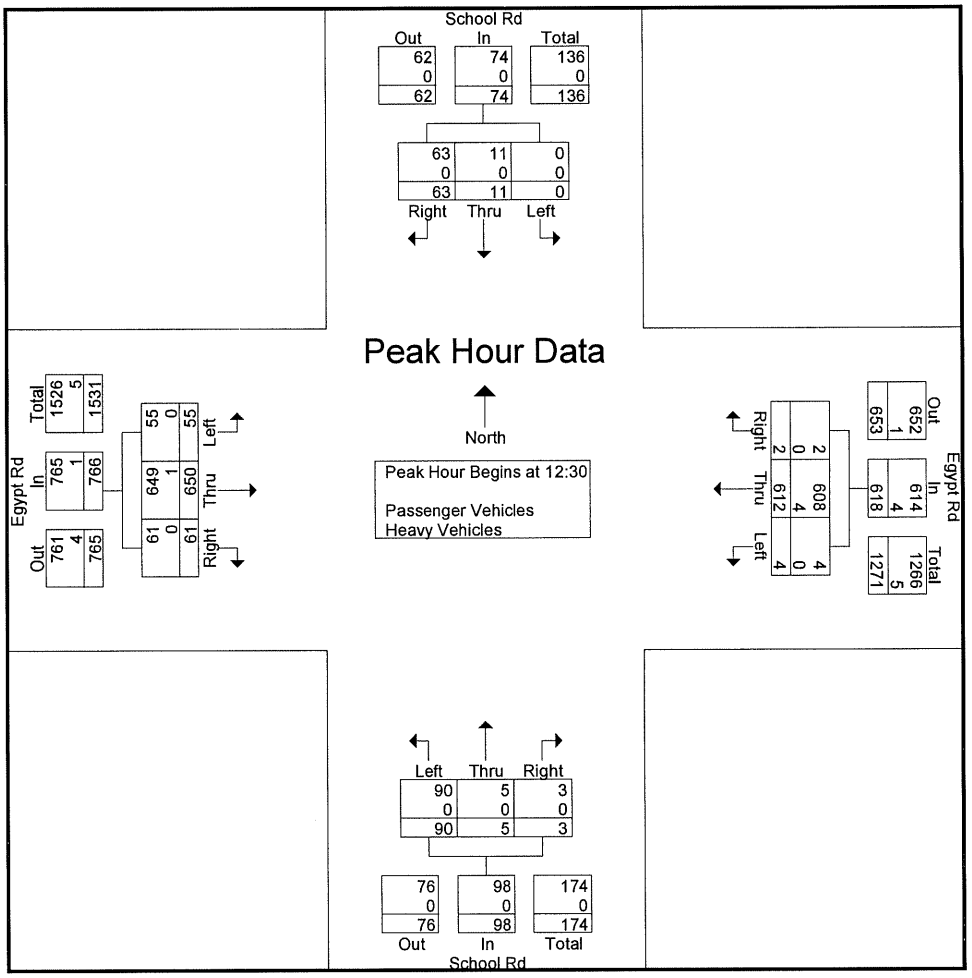
425 Commerce Drive, Suite 200

Fort Washington, PA 19034

Municipality: West Norriton Township
Location: Egypt Road &
School Road
Counter/Countboard No.: KB

File Name : westover09s
Site Code : 81207309
Start Date : 3/24/2012
Page No : 2

	School Rd Southbound					Egypt Rd Westbound					School Rd Northbound					Egypt Rd Eastbound					
Start Time	Left	Thru	ROR	Right	App. Total	Left	Thru	ROR	Right	App. Total	Left	Thru	ROR	Right	App. Total	Left	Thru	ROR	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 to 14:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:30																					
12:30	0	4	0	**20**	**24**	1	**166**	0	0	**167**	17	0	0	0	17	10	157	2	17	186	394
12:45	0	**6**	0	15	21	**3**	145	0	**2**	150	**28**	1	0	0	**29**	13	**177**	2	**18**	**210**	**410**
13:00	0	0	0	14	14	0	156	0	0	156	25	1	0	**1**	27	15	164	1	6	186	383
13:15	0	1	**2**	12	15	0	145	0	0	145	20	**3**	**1**	1	25	**17**	152	**4**	11	184	369
Total Volume	0	11	2	61	74	4	612	0	2	618	90	5	1	2	98	55	650	9	52	766	1556
% App. Total	0	14.9	2.7	82.4		0.6	99	0	0.3		91.8	5.1	1	2		7.2	84.9	1.2	6.8		
PHF	.000	.458	.250	.763	.771	.333	.922	.000	.250	.925	.804	.417	.250	.500	.845	.809	.918	.563	.722	.912	.949
Passenger Vehicles																					
% Passenger Vehicles	0	100	100	100	100	100	99.3	0	100	99.4	100	100	100	100	100	100	99.8	100	100	99.9	99.7
Heavy Vehicles																					
% Heavy Vehicles	0	0	0	0	0	0	0.7	0	0	0.6	0	0	0	0	0	0	0.2	0	0	0.1	0.3



APPENDIX C

Site Trip Generation Methodology

EXHIBIT 1

Site Location Map - United Sports Training Center

WESTOVER RECREATION DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab: 6/15/12) i:\Eng\812073\Dwg\Figures\Trip Gen Memo Figures\Exhibit 1.dwg

Trip Generation Summary: United Sports Training Center

Thursday 4/12/2012

Time	Site Acess		Hour Total
	In	Out	
16:00	10	4	
16:15	12	8	
16:30	13	8	
16:45	21	11	87
17:00	35	38	146
17:15	66	25	217
17:30	35	42	273
17:45	25	10	276
18:00	37	21	261
18:15	54	33	257
18:30	45	33	258
18:45	94	31	348

Peak Hour Total

In	Out	Total
230	118	348

55.22 ac. ***6.3*** ***Trips per Acre***

Saturday 4/14/2012

Time	Site Access		Hour Total
	In	Out	
11:00	59	91	
11:15	77	67	
11:30	31	51	
11:45	32	32	440
12:00	31	78	399
12:15	19	71	345
12:30	33	28	324
12:45	28	27	315
13:00	44	17	267
13:15	30	27	234
13:30	41	38	252
13:45	30	62	289

Peak Hour Total

In	Out	Total
199	241	440

55.22 ac. ***8.0*** ***Trips per Acre***

Note: Acreage used in the rate calculation is the total acreage of the site minus the acreage of all parking areas

EXHIBIT 2

Site Location Map - Manderach Park

WESTOVER RECREATION DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab: 6/15/12) i:\Eng\812073\Dwg\Figures\Trip Gen Memo Figures\Exhibit 2.dwg

Trip Generation Summary: Manderach Park

Thursday 5/18/2012

Time	Manderach Access 1		Manderach Access 2		Manderach Access 3		Totals	
	In	Out	In	Out	In	Out	15 Min Total	Hour Total
16:00	4	9	0	0	7	13	33	
16:15	2	3	0	0	14	9	28	
16:30	3	3	0	0	12	8	26	
16:45	6	2	0	1	11	17	37	124
17:00	6	10	0	1	16	11	44	135
17:15	5	6	0	0	13	10	34	141
17:30	6	7	0	0	15	9	37	152
17:45	7	24	0	0	28	15	74	189
18:00	9	13	0	2	25	19	68	213
18:15	13	17	0	1	31	5	67	246
18:30	3	15	0	0	15	16	49	258
18:45	4	11	1	1	14	16	47	231

Peak Hour Total

In	Out	Total	
131	127	258	
46.45 ac.		*5.6*	*Trips per Acre*

Saturday 4/28/2012

Time	Manderach Access 1		Manderach Access 2		Manderach Access 3		Totals	
	In	Out	In	Out	In	Out	15 Min Total	Hour Total
11:00	12	11	5	0	36	45	109	
11:15	18	6	1	2	22	31	80	
11:30	18	4	1	0	29	21	73	
11:45	17	6	1	1	42	13	80	342
12:00	11	38	2	2	31	63	147	380
12:15	5	8	1	0	14	39	67	367
12:30	14	6	2	0	29	23	74	368
12:45	9	4	0	1	36	26	76	364
13:00	8	31	0	0	31	77	147	364
13:15	6	6	0	0	15	27	54	351
13:30	4	2	1	0	14	13	34	311
13:45	7	4	1	2	9	11	34	269

Peak Hour Total

In	Out	Total	
193	187	380	
46.45 ac.		*8.2*	*Trips per Acre*

Note: Acreage used in the rate calculation is the total acreage of the site minus the acreage of all parking areas

EXHIBIT 3

Site Location Map - Hickory Park

WESTOVER RECREATION DEVELOPMENT

WEST NORRITON TOWNSHIP, MONTGOMERY COUNTY, PA

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

(DHW/ab: 6/15/12) i:\Eng\812073\Dwg\Figures\Trip Gen Memo Figures\Exhibit 3.dwg

Trip Generation Summary: Hickory Park

Thursday 4/12/2012

Time	Site Acess		Hour Total
	In	Out	
16:00	16	12	
16:15	9	6	
16:30	0	4	
16:45	6	2	55
17:00	12	4	43
17:15	38	8	74
17:30	40	25	135
17:45	53	8	188
18:00	22	30	224
18:15	9	7	194
18:30	6	5	140
18:45	4	12	95

Peak Hour Total

In	Out	Total
153	71	224

23.5 ac. ***9.5*** ***Trips per Acre***

Saturday 4/14/2012

Time	Site Access		Hour Total
	In	Out	
11:00	30	51	
11:15	26	13	
11:30	16	6	
11:45	6	15	163
12:00	9	33	124
12:15	8	28	121
12:30	11	13	123
12:45	19	12	133
13:00	26	41	158
13:15	19	35	176
13:30	27	41	220
13:45	21	3	213

Peak Hour Total

In	Out	Total
91	129	220

23.5 ac. ***9.4*** ***Trips per Acre***

Note: Acreage used in the rate calculation is the total acreage of the site minus the acreage of all parking areas

APPENDIX D

Turning Lane and Traffic Signal Warrant Analysis Worksheets

Warrant 1: Eight-hour Vehicular Volume

2012 EXISTING CONDITIONS

1: Egypt Road and Port Indian Road

Federal 2003 6/29/2012

Major Street **Egypt Road**
Major Direction **EB/WB**
Minor Direction **NB/SB**

Warrant 1 Met? **No**

Condition A or B Met? **No** 1 Hours met (8 required)
Condition A and B Met? **No** 0 Hours met (8 required)

Hour	Major Street Vehicles (total of both approaches)	Condition A		Condition B		High-volume Minor Approach Vehicles	Condition A		Condition B		100% Standard Met? Cond. A OR Cond. B		80% Standard Met? Cond. A AND Cond. B	
		Volume >= 100% column (600)?	Volume >= 80% column (480)?	Volume >= 100% column (900)?	Volume >= 80% column (720)?		Volume >= 100% column (150)?	Volume >= 80% column (120)?	Volume >= 100% column (75)?	Volume >= 80% column (60)?	Condition A 100% Column	Condition B 100% Column	Condition A 80% Column	Condition B 80% Column
00:00 to 01:00	1	No	No	No	No	0	No	No	No	No	No	No	No	No
07:00 to 08:00	1645	Yes	Yes	Yes	Yes	51	No	No	No	No	No	No	No	No
08:00 to 09:00	1637	Yes	Yes	Yes	Yes	42	No	No	No	No	No	No	No	No
09:00 to 10:00	1302	Yes	Yes	Yes	Yes	55	No	No	No	No	No	No	No	No
10:00 to 11:00	1107	Yes	Yes	Yes	Yes	62	No	No	No	Yes	No	No	No	Yes
11:00 to 12:00	1223	Yes	Yes	Yes	Yes	70	No	No	No	Yes	No	No	No	Yes
12:00 to 13:00	1344	Yes	Yes	Yes	Yes	48	No	No	No	No	No	No	No	No
13:00 to 14:00	1342	Yes	Yes	Yes	Yes	51	No	No	No	No	No	No	No	No
14:00 to 15:00	1457	Yes	Yes	Yes	Yes	40	No	No	No	No	No	No	No	No
15:00 to 16:00	1603	Yes	Yes	Yes	Yes	93	No	No	Yes	Yes	No	Yes*	No	Yes
16:00 to 17:00	2004	Yes	Yes	Yes	Yes	69	No	No	No	Yes	No	No	No	Yes
17:00 to 18:00	2129	Yes	Yes	Yes	Yes	26	No	No	No	No	No	No	No	No

Warrant 2: Four-hour Vehicular Volume

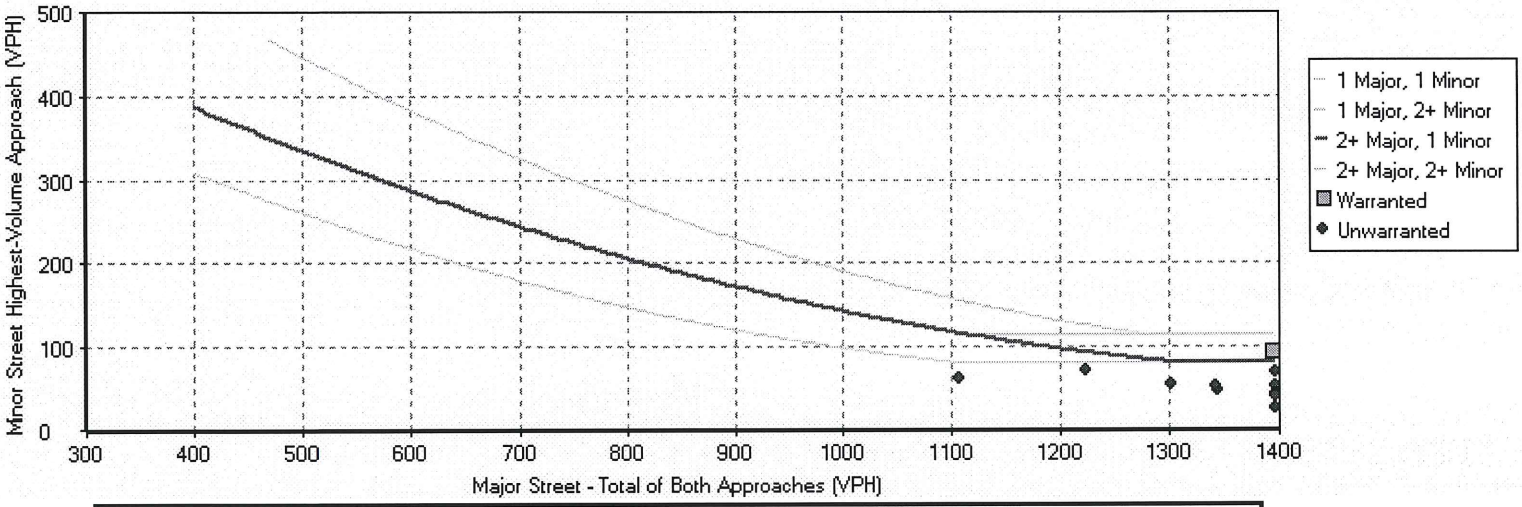
1: Egypt Road and Port Indian Road 2012 Existing Conditions Federal 2003 6/29/2012

	Major Street	Minor Street
Street Name	**Egypt Road**	**Mill Road**
Direction	**EB/WB**	**NB/SB**
Number of Lanes	**2**	**1**
Approach Speed	**35**	**30**

Warrant 2 Met? **No** 1 Hours met (4 required)

Low Population? **No**

Four-Hour Vehicular Volume
Community Population Greater Than 10,000 and Major Street Approach Speed Below 40 mph



Warranted / Unwarranted

Hour	Major Street Total of both approaches (VPH)	Minor Street Highest volume approach (VPH)
0:00	1	0
7:00	1645	51
8:00	1637	42
9:00	1302	55
10:00	1107	62
11:00	1223	70
12:00	1344	48
13:00	1342	51
14:00	1457	40
15:00	1603	93
16:00	2004	69
17:00	2129	26

Warrant 3: Peak Hour

1: Egypt Road and Port Indian Road

2012 EXISTING CONDITIONS

Federal 2003 6/29/2012

	Major Street	Minor Street
Street Name	**Egypt Road**	**Mill Road**
Direction	**EB/WB**	**NB/SB**
Number of Lanes	**2**	**1**
Approach Speed	**35**	**30**

Warrant 3 Met? No

Low Population? **No**

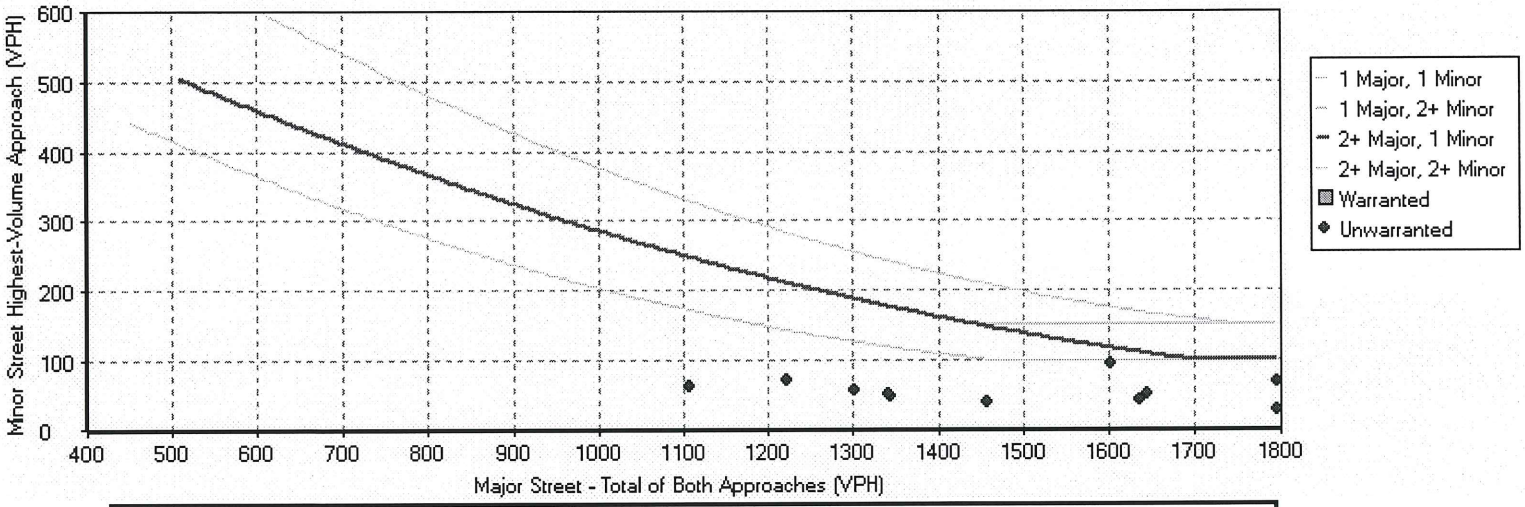
Condition A Met? **No** 0 Hours met (1 required)

Minor Approach Time Delay Condition	**Not Met**
Minor Approach Volume Condition	**Not Met**
Total Entering Intersection Volume Condition	**Not Met**

Condition B Met? **No** 0 Hours met (1 required)

Peak Hour Vehicular Volume

Community Population Greater Than 10,000 and Major Street Approach Speed Below 40 mph



Warranted / Unwarranted

Hour	Major Street Total of both approaches (VPH)	Minor Street Highest volume approach (VPH)
0:00	1	0
7:00	1645	51
8:00	1637	42
9:00	1302	55
10:00	1107	62
11:00	1223	70
12:00	1344	48
13:00	1342	51
14:00	1457	40
15:00	1603	93
16:00	2004	69
17:00	2129	26

Warrant 3: Peak Hour

2015 FUTURE WITH DEVELOPMENT CONDITIONS

1: Egypt Road and Port Indian Road

Federal 2003 6/29/2012

	Major Street	Minor Street
Street Name	**Egypt Road**	**Port Indian Road**
Direction	**EB/WB**	**NB**
Number of Lanes	**2**	**1**
Approach Speed	**35**	**30**

Warrant 3 Met? **Yes**

Low Population? **No**

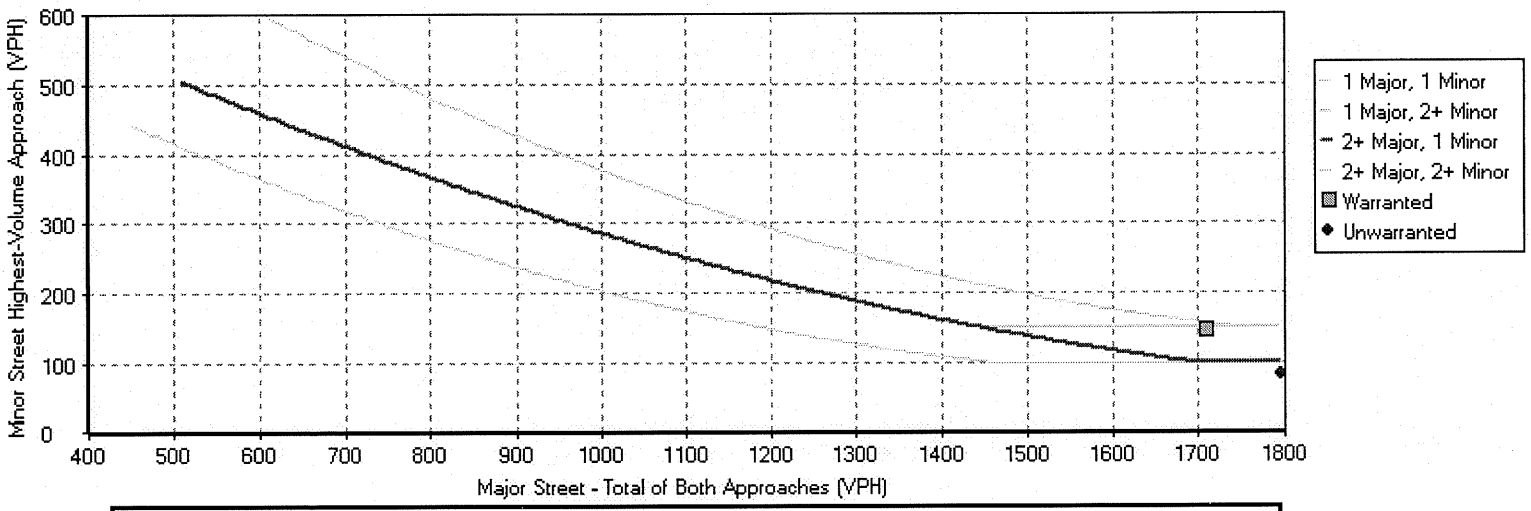
Condition A Met? **No** 0 Hours met (1 required)

Minor Approach Time Delay Condition	**Not Met**
Minor Approach Volume Condition	**Met**
Total Entering Intersection Volume Condition	**Not Met**

Condition B Met? **Yes** 1 Hours met (1 required)

Peak Hour Vehicular Volume

Community Population Greater Than 10,000 and Major Street Approach Speed Below 40 mph

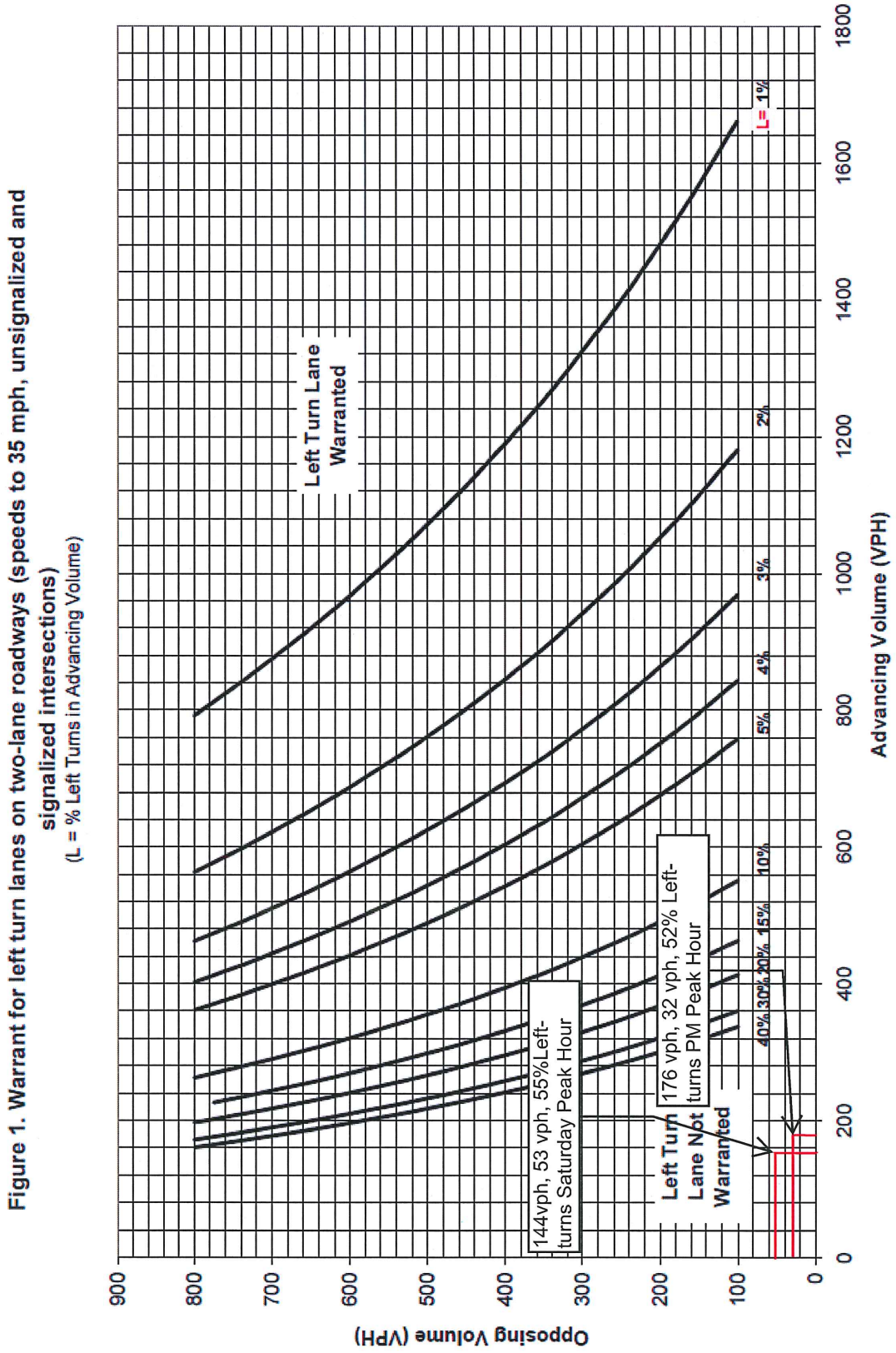


Warranted / Unwarranted

Hour	Major Street Total of both approaches (VPH)	Minor Street Highest volume approach (VPH)
12:00	1710	145
16:00	2425	83

Turn Lane Warrant Figures

Northern Site Access
2015 with Development Conditions
Left-turn Lane Warrant



Turn Lane Warrant Figures

Southern Site Access
2015 with Development Conditions
Left-turn Lane Warrant

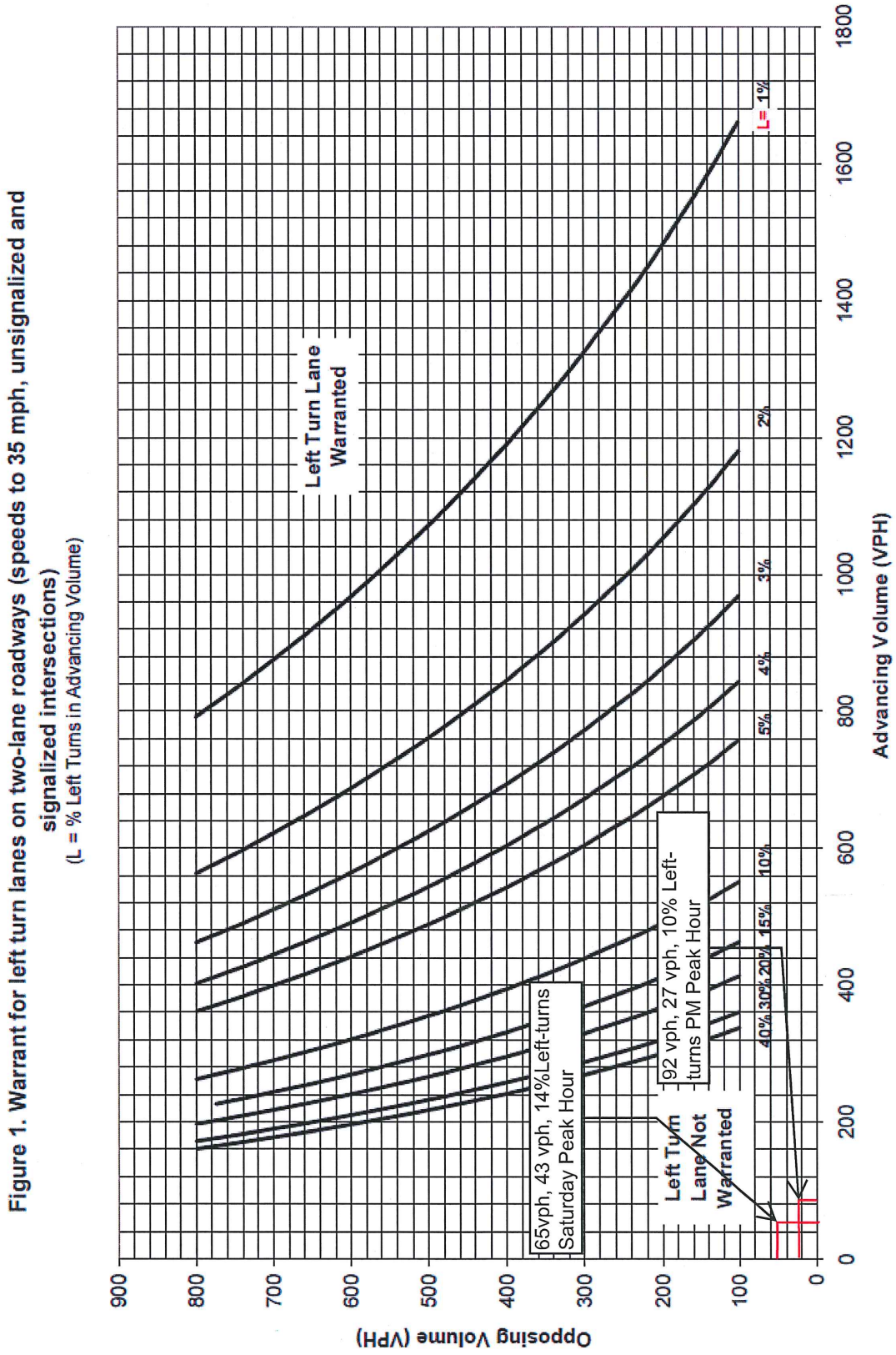


Figure 1. Warrant for left turn lanes on two-lane roadways (speeds to 35 mph, unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)

APPENDIX E

Capacity/Level-of-Service 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:

Unsignalized Intersections

Level of Service	Description	Control Delay Per Vehicle (seconds)
A	Little or no delay	$\leq$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

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

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	$\leq$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

2012 Existing Capacity/Level-of-Service Analysis Worksheets

Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	4	1171	1069	45	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	15	14	14
Grade (%)		2%	-2%		-2%	
Storage Length (ft)	0			0	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
Ped Bike Factor						
Frt				0.850	0.955	
Flt Protected					0.968	
Satd. Flow (prot)	0	2090	1900	1794	1670	0
Flt Permitted					0.968	
Satd. Flow (perm)	0	2090	1900	1794	1670	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		1056	113		905	
Travel Time (s)		20.6	2.2		24.7	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)						
Peak Hour Factor	0.33	0.93	0.91	0.90	0.62	0.25
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	1%	0%	20%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	12	1259	1175	50	8	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1271	1175	50	12	0
Sign Control		Free	Free		Stop	

Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	4	1171	1069	45	5	1
Sign Control		Free	Free		Stop	
Grade		2%	-2%		-2%	
Peak Hour Factor	0.33	0.93	0.91	0.90	0.62	0.25
Hourly flow rate (vph)	12	1259	1175	50	8	4
Pedestrians					1	
Lane Width (ft)					14.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1226				2459	1176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1226				2459	1176
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	98				72	98
cM capacity (veh/h)	575				29	235

Direction, Lane #	EB 1	WB 1	WB 2	SE 1
Volume Total	1271	1175	50	12
Volume Left	12	0	0	8
Volume Right	0	0	50	4
cSH	575	1700	1700	41
Volume to Capacity	0.02	0.69	0.03	0.30
Queue Length 95th (ft)	2	0	0	25
Control Delay (s)	1.0	0.0	0.0	126.9
Lane LOS	A			F
Approach Delay (s)	1.0	0.0		126.9
Approach LOS				F

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	74.8%	ICU Level of Service		D
Analysis Period (min)	15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1099	77	4	1100	14	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Grade (%)	2%			-2%	-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	0.991				0.927	
Flt Protected					0.978	
Satd. Flow (prot)	2074	0	0	1900	1740	0
Flt Permitted					0.978	
Satd. Flow (perm)	2074	0	0	1900	1740	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	113			1609	376	
Travel Time (s)	2.2			31.3	10.3	
Confl. Peds. (#/hr)		3	3			
Confl. Bikes (#/hr)						
Peak Hour Factor	0.93	0.88	0.50	0.91	0.81	0.60
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	0%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1182	88	8	1209	17	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1270	0	0	1217	37	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)	1099	77	4	1100	14	12
Sign Control	Free			Free	Stop	
Grade	2%			-2%	-2%	
Peak Hour Factor	0.93	0.88	0.50	0.91	0.81	0.60
Hourly flow rate (vph)	1182	88	8	1209	17	20
Pedestrians					3	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1272		2453	1228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1272		2453	1228
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		49	91
cM capacity (veh/h)			551		34	219

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1269	1217	37
Volume Left	0	8	17
Volume Right	88	0	20
cSH	1700	551	62
Volume to Capacity	0.75	0.01	0.60
Queue Length 95th (ft)	0	1	62
Control Delay (s)	0.0	0.7	127.0
Lane LOS		A	F
Approach Delay (s)	0.0	0.7	127.0
Approach LOS			F

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

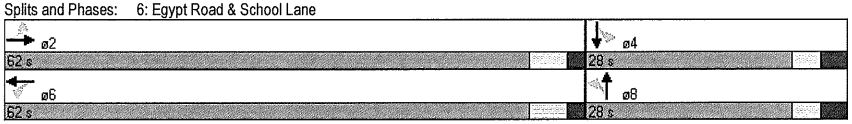
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	138	856	117	6	938	5	77	5	10	1	21	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
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		1.00										
Frt		0.983			0.998			0.983			0.895	
Flt Protected		0.994						0.961			0.999	
Satd. Flow (prot)	0	1814	0	0	1824	0	0	2008	0	0	1773	0
Flt Permitted		0.761			0.990			0.619			0.990	
Satd. Flow (perm)	0	1389	0	0	1806	0	0	1294	0	0	1757	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			1			8			111	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1609			522			839			591	
Travel Time (s)		31.3			10.2			22.9			16.1	
Confl. Peds. (#/hr)			2	2								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.92	0.76	0.75	0.94	0.42	0.77	0.62	0.62	0.25	0.75	0.80
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	10%	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)	153	930	154	8	998	12	100	8	16	4	28	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1237	0	0	1018	0	0	124	0	0	143	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		28.0	28.0		28.0	28.0	
Total Split (s)	62.0	62.0	0.0	62.0	62.0	0.0	28.0	28.0	0.0	28.0	28.0	0.0
Total Split (%)	68.9%	68.9%	0.0%	68.9%	68.9%	0.0%	31.1%	31.1%	0.0%	31.1%	31.1%	0.0%
Maximum Green (s)	56.0	56.0		56.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0

McMahon Associates, Inc.
6: Egypt Road & School Lane
Westover Recreation Development
2012 Existing PM

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	
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	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio		1.25			0.80			0.63			0.40	
Control Delay		139.9			15.6			44.3			13.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		139.9			15.6			44.3			13.1	
Queue Length 50th (ft)		~795			292			55			14	
Queue Length 95th (ft)		#1145			#722			69			42	
Internal Link Dist (ft)		1529			442			759			511	
Turn Bay Length (ft)												
Base Capacity (vph)		987			1278			349			548	
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		1.25			0.80			0.36			0.26	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 83.1
Natural Cycle: 150
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: 6: Egypt Road & School Lane



Lanes, Volumes, Timings
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6: Egypt Road & School Lane
Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	138	856	117	6	938	5	77	5	10	1	21	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			1.00			0.98			0.90	
Flt Protected		0.99			1.00			0.96			1.00	
Satd. Flow (prot)		1814			1824			2008			1773	
Flt Permitted		0.76			0.99			0.62			0.99	
Satd. Flow (perm)		1389			1807			1294			1757	
Peak-hour factor, PHF	0.90	0.92	0.76	0.75	0.94	0.42	0.77	0.62	0.62	0.25	0.75	0.80
Adj. Flow (vph)	153	930	154	8	998	12	100	8	16	4	28	111
RTOR Reduction (vph)	0	4	0	0	0	0	0	7	0	0	95	0
Lane Group Flow (vph)	0	1233	0	0	1018	0	0	117	0	0	48	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	10%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		58.8			58.8			12.3			12.3	
Effective Green, g (s)		58.8			58.8			12.3			12.3	
Actuated g/C Ratio		0.71			0.71			0.15			0.15	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		983			1279			192			260	
v/s Ratio Prot												
v/s Ratio Perm		c0.89			0.56			c0.09			0.03	
v/c Ratio		1.25			0.80			0.61			0.19	
Uniform Delay, d1		12.1			8.1			33.2			31.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		122.7			5.2			5.6			0.3	
Delay (s)		134.8			13.3			38.8			31.4	
Level of Service		F			B			D			C	
Approach Delay (s)		134.8			13.3			38.8			31.4	
Approach LOS		F			B			D			C	

Intersection Summary			
HCM Average Control Delay	75.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	83.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	136.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

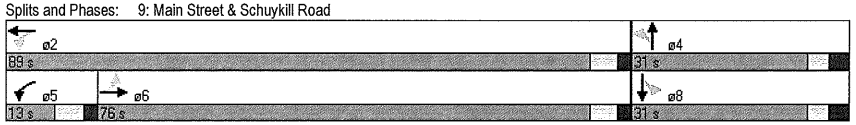
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑			↕	
Volume (vph)	32	878	27	44	1298	10	51	74	54	16	58	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	10	10	10	11	11	11
Grade (%)		-1%			-1%			1%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			1.00	
Frt		0.994			0.998			0.934			0.926	
Flt Protected		0.998			0.998		0.950				0.994	
Satd. Flow (prot)	0	3372	0	0	3426	0	1643	1638	0	0	1691	0
Flt Permitted		0.803			0.868		0.402				0.928	
Satd. Flow (perm)	0	2713	0	0	2980	0	695	1638	0	0	1578	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		5			2			30				
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1036			1076			1400			830	
Travel Time (s)		17.7			18.3			38.2			22.6	
Confl. Peds. (#/hr)	3		8	8		3			1	1		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.80	0.97	0.75	0.92	0.92	0.62	0.75	0.80	0.75	0.67	0.85	0.77
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	3%	0%	0%	2%	0%	2%	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)	40	905	36	48	1411	16	68	92	72	24	68	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	981	0	0	1475	0	68	164	0	0	205	0
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	25.0	25.0		4.0	25.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	31.0	31.0		10.0	31.0		11.0	11.0		11.0	11.0	
Total Split (s)	76.0	76.0	0.0	13.0	89.0	0.0	31.0	31.0	0.0	31.0	31.0	0.0
Total Split (%)	63.3%	63.3%	0.0%	10.8%	74.2%	0.0%	25.8%	25.8%	0.0%	25.8%	25.8%	0.0%
Maximum Green (s)	70.0	70.0		7.0	83.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	5.0	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
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		C-Min	C-Min		None	C-Min		None	None		None	None
Walk Time (s)		7.0	7.0			7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		14.0	14.0			14.0		16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0	0			0		0	0		0	0
v/c Ratio			0.49			0.68		0.58	0.54			0.76
Control Delay			8.5			11.5		63.6	42.6			65.2
Queue Delay			0.0			0.0		0.0	0.0			0.0
Total Delay			8.5			11.5		63.6	42.6			65.2
Queue Length 50th (ft)			147			282		49	95			153
Queue Length 95th (ft)			239			447		76	133			208
Internal Link Dist (ft)			956			996			1320			750
Turn Bay Length (ft)												
Base Capacity (vph)			1982			2189		148	372			336
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			0.49			0.67		0.46	0.44			0.61

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: Main Street & Schuykill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	878	27	44	1298	10	51	74	54	16	58	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	11	11	10	10	10	11	11	11
Grade (%)		-1%			-1%			1%			0%	
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			1.00		1.00	0.99			1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Frt		0.99			1.00		1.00	0.93			0.93	
Flt Protected		1.00			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		3374			3428		1643	1638			1690	
Flt Permitted		0.80			0.87		0.40	1.00			0.93	
Satd. Flow (perm)		2714			2980		696	1638			1578	
Peak-hour factor, PHF	0.80	0.97	0.75	0.92	0.92	0.62	0.75	0.80	0.75	0.67	0.85	0.77
Adj. Flow (vph)	40	905	36	48	1411	16	68	92	72	24	68	113
RTOR Reduction (vph)	0	1	0	0	1	0	0	25	0	0	0	0
Lane Group Flow (vph)	0	980	0	0	1474	0	68	139	0	0	205	0
Confl. Peds. (#/hr)	3		8	8		3			1	1		
Heavy Vehicles (%)	6%	3%	0%	0%	2%	0%	2%	0%	0%	0%	0%	0%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		87.6			87.6		20.4	20.4			20.4	
Effective Green, g (s)		87.6			87.6		20.4	20.4			20.4	
Actuated g/C Ratio		0.73			0.73		0.17	0.17			0.17	
Clearance Time (s)		6.0			6.0		6.0	6.0			6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		1981			2175		118	278			268	
v/s Ratio Prot								0.08				
v/s Ratio Perm		0.36			c0.49		0.10				c0.13	
v/c Ratio		0.49			0.68		0.58	0.50			0.76	
Uniform Delay, d1		6.8			8.7		45.8	45.2			47.5	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.9			0.9		6.7	1.4			12.2	
Delay (s)		7.7			9.5		52.5	46.6			59.7	
Level of Service		A			A		D	D			E	
Approach Delay (s)		7.7			9.5			48.3			59.7	
Approach LOS		A			A			D			E	

Intersection Summary

HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	64	5	5	96	149	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Grade (%)	-2%			4%	-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	0.984				0.966	
Flt Protected	0.958			0.997		
Satd. Flow (prot)	2015	0	0	1800	1836	0
Flt Permitted	0.958			0.997		
Satd. Flow (perm)	2015	0	0	1800	1836	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	1021			1000	1400	
Travel Time (s)	27.8			27.3	38.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.73	0.42	0.63	0.83	0.85	0.82
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	20%	2%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	88	12	8	116	175	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	100	0	0	124	235	0
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

McMahon Associates, Inc.
10: Hemlock Road & Schuykill Road
Westover Recreation Development
2012 Existing PM

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	64	5	5	96	149	49
Peak Hour Factor	0.73	0.42	0.63	0.83	0.85	0.82
Hourly flow rate (vph)	88	12	8	116	175	60

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	100	124	235
Volume Left (vph)	88	8	0
Volume Right (vph)	12	0	60
Hadj (s)	0.13	0.07	-0.13
Departure Headway (s)	4.8	4.5	4.2
Degree Utilization, x	0.13	0.15	0.27
Capacity (veh/h)	691	774	832
Control Delay (s)	8.6	8.3	8.7
Approach Delay (s)	8.6	8.3	8.7
Approach LOS	A	A	A

Intersection Summary			
Delay		8.6	
HCM Level of Service		A	
Intersection Capacity Utilization		21.3%	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	17	31	0	6	11	14	90	1	23	126	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	14	14	14	12	12	12	11	11	11
Grade (%)		-3%			3%			1%			-2%	
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		0.913			0.929			0.996			0.989	
Flt Protected								0.993			0.992	
Satd. Flow (prot)	0	1995	0	0	1855	0	0	1825	0	0	1806	0
Flt Permitted								0.993			0.992	
Satd. Flow (perm)	0	1995	0	0	1855	0	0	1825	0	0	1806	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1077			860			673			1000	
Travel Time (s)		29.4			23.5			18.4			27.3	
Confl. Peds. (#/hr)			2	2			1					1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.25	0.71	0.71	0.25	0.38	0.62	0.70	0.82	0.25	0.72	0.89	0.31
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	1%	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	24	44	0	16	18	20	110	4	32	142	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	68	0	0	34	0	0	134	0	0	190	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

McMahon Associates, Inc.
14: Brandon Road & Schuykill Road

Westover Recreation Development
2012 Existing PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	17	31	0	6	11	14	90	1	23	126	5
Peak Hour Factor	0.25	0.71	0.71	0.25	0.38	0.62	0.70	0.82	0.25	0.72	0.89	0.31
Hourly flow rate (vph)	0	24	44	0	16	18	20	110	4	32	142	16

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	68	34	134	190
Volume Left (vph)	0	0	20	32
Volume Right (vph)	44	18	4	16
Hadj (s)	-0.39	-0.32	0.05	0.00
Departure Headway (s)	4.3	4.4	4.4	4.3
Degree Utilization, x	0.08	0.04	0.16	0.22
Capacity (veh/h)	772	749	790	811
Control Delay (s)	7.7	7.6	8.2	8.5
Approach Delay (s)	7.7	7.6	8.2	8.5
Approach LOS	A	A	A	A

Intersection Summary					
Delay			8.2		
HCM Level of Service			A		
Intersection Capacity Utilization		22.1%	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)	23	0	2	3	0	17	2	65	5	40	111	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	11	11	11	10	10	10	11	11	11
Grade (%)		-3%			3%			2%			-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		0.987			0.903			0.983			0.992	
Flt Protected		0.957			0.986			0.998			0.983	
Satd. Flow (prot)	0	1859	0	0	1611	0	0	1634	0	0	1786	0
Flt Permitted		0.957			0.986			0.998			0.983	
Satd. Flow (perm)	0	1859	0	0	1611	0	0	1634	0	0	1786	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		1018			856			611			673	
Travel Time (s)		23.1			19.5			13.9			18.4	
Confl. Peds. (#/hr)							9					9
Confl. Bikes (#/hr)												
Peak Hour Factor	0.62	0.25	0.50	0.25	0.25	0.54	0.50	0.82	0.42	0.56	0.92	0.50
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	0%	0%	0%	0%	0%	50%	4%	0%	0%	3%	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)	37	0	4	12	0	31	4	79	12	71	121	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	41	0	0	43	0	0	95	0	0	204	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	2	3	0	17	2	65	5	40	111	6
Sign Control		Stop			Stop			Free			Free	
Grade		-3%			3%			2%			-3%	
Peak Hour Factor	0.62	0.25	0.50	0.25	0.25	0.54	0.50	0.82	0.42	0.56	0.92	0.50
Hourly flow rate (vph)	37	0	4	12	0	31	4	79	12	71	121	12
Pedestrians		9										
Lane Width (ft)		14.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		1										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	403	378	136	367	378	85	142			91		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	403	378	136	367	378	85	142			91		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.6			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.7			2.2		
p0 queue free %	93	100	100	98	100	97	100			95		
cM capacity (veh/h)	507	525	911	564	524	979	1183			1516		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	41	43	95	204
Volume Left	37	12	4	71
Volume Right	4	31	12	12
cSH	529	814	1183	1516
Volume to Capacity	0.08	0.05	0.00	0.05
Queue Length 95th (ft)	6	4	0	4
Control Delay (s)	12.4	9.7	0.4	2.9
Lane LOS	B	A	A	A
Approach Delay (s)	12.4	9.7	0.4	2.9
Approach LOS	B	A		

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	27.8%	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)	4	1	0	2	2	28	0	37	0	58	57	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	16	16	16	16	16	16	16	16	16
Grade (%)		-2%			3%			1%			-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					0.887						0.990	
Flt Protected		0.962			0.996						0.977	
Satd. Flow (prot)	0	2031	0	0	1874	0	0	2143	0	0	2093	0
Flt Permitted		0.962			0.996						0.977	
Satd. Flow (perm)	0	2031	0	0	1874	0	0	2143	0	0	2093	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		560			640			420			839	
Travel Time (s)		15.3			17.5			11.5			22.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.25	0.25	0.25	0.50	0.50	0.70	0.25	0.66	0.25	0.76	0.75	0.58
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)	16	4	0	4	4	40	0	56	0	76	76	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	20	0	0	48	0	0	56	0	0	164	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)	4	1	0	2	2	28	0	37	0	58	57	7
Sign Control		Stop			Stop			Free			Free	
Grade		-2%			3%			1%			-1%	
Peak Hour Factor	0.25	0.25	0.25	0.50	0.50	0.70	0.25	0.66	0.25	0.76	0.75	0.58
Hourly flow rate (vph)	16	4	0	4	4	40	0	56	0	76	76	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											839	
pX, platoon unblocked												
vC, conflicting volume	333	291	82	293	297	56	88			56		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	333	291	82	293	297	56	88			56		
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 %	97	99	100	99	99	96	100			95		
cM capacity (veh/h)	575	593	983	635	588	1016	1520			1562		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	20	48	56	164
Volume Left	16	4	0	76
Volume Right	0	40	0	12
cSH	578	915	1520	1562
Volume to Capacity	0.03	0.05	0.00	0.05
Queue Length 95th (ft)	3	4	0	4
Control Delay (s)	11.4	9.2	0.0	3.7
Lane LOS	B	A		A
Approach Delay (s)	11.4	9.2	0.0	3.7
Approach LOS	B	A		

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	23.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	8	802	790	17	9	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	15	14	14
Grade (%)		2%	-2%		-2%	
Storage Length (ft)	0			0	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
Ped Bike Factor						
Frt				0.850	0.942	
Flt Protected		0.999			0.972	
Satd. Flow (prot)	0	2109	1881	1521	1665	0
Flt Permitted		0.999			0.972	
Satd. Flow (perm)	0	2109	1881	1521	1665	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		1056	113		905	
Travel Time (s)		20.6	2.2		24.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.50	0.95	0.99	0.71	0.56	0.50
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	2%	18%	22%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	16	844	798	24	16	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	860	798	24	28	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	8	802	790	17	9	6
Sign Control		Free	Free		Stop	
Grade		2%	-2%		-2%	
Peak Hour Factor	0.50	0.95	0.99	0.71	0.56	0.50
Hourly flow rate (vph)	16	844	798	24	16	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	822				1674	798
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	822				1674	798
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	98				83	97
cM capacity (veh/h)	816				92	389

Direction, Lane #	EB 1	WB 1	WB 2	SE 1
Volume Total	860	798	24	28
Volume Left	16	0	0	16
Volume Right	0	0	24	12
cSH	816	1700	1700	137
Volume to Capacity	0.02	0.47	0.01	0.21
Queue Length 95th (ft)	1	0	0	18
Control Delay (s)	0.5	0.0	0.0	38.0
Lane LOS	A			E
Approach Delay (s)	0.5	0.0		38.0
Approach LOS				E

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	758	53	3	773	34	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Grade (%)	2%			-2%	-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	0.988				0.982	
Flt Protected				0.999	0.958	
Satd. Flow (prot)	2084	0	0	1880	1759	0
Flt Permitted				0.999	0.958	
Satd. Flow (perm)	2084	0	0	1880	1759	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	113			1609	376	
Travel Time (s)	2.2			31.3	10.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.95	0.70	0.38	0.99	0.43	0.67
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	2%	0%	2%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	798	76	8	781	79	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	874	0	0	789	91	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)	758	53	3	773	34	8
Sign Control	Free			Free	Stop	
Grade	2%			-2%	-2%	
Peak Hour Factor	0.95	0.70	0.38	0.99	0.43	0.67
Hourly flow rate (vph)	798	76	8	781	79	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			874		1632	836
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			874		1632	836
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		28	97
cM capacity (veh/h)			781		110	370

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	874	789	91
Volume Left	0	8	79
Volume Right	76	0	12
cSH	1700	781	121
Volume to Capacity	0.51	0.01	0.75
Queue Length 95th (ft)	0	1	106
Control Delay (s)	0.0	0.3	93.7
Lane LOS		A	F
Approach Delay (s)	0.0	0.3	93.7
Approach LOS			F

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	53.1%	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)	55	650	61	4	621	2	91	5	3	0	11	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
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		0.987			0.998			0.992			0.895	
Flt Protected		0.996			0.999			0.959				
Satd. Flow (prot)	0	1858	0	0	1823	0	0	2049	0	0	1775	0
Flt Permitted		0.902			0.984			0.684				
Satd. Flow (perm)	0	1683	0	0	1795	0	0	1461	0	0	1775	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		17			2			3				
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1609			522			839			591	
Travel Time (s)		31.3			10.2			22.9			16.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.92	0.76	0.33	0.92	0.25	0.80	0.42	0.38	0.25	0.46	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	1%	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)	68	707	80	12	675	8	114	12	8	0	24	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	855	0	0	695	0	0	134	0	0	108	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		22.0	22.0		22.0	22.0	
Total Split (s)	74.0	74.0	0.0	74.0	74.0	0.0	16.0	16.0	0.0	16.0	16.0	0.0
Total Split (%)	82.2%	82.2%	0.0%	82.2%	82.2%	0.0%	17.8%	17.8%	0.0%	17.8%	17.8%	0.0%
Maximum Green (s)	68.0	68.0		68.0	68.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0

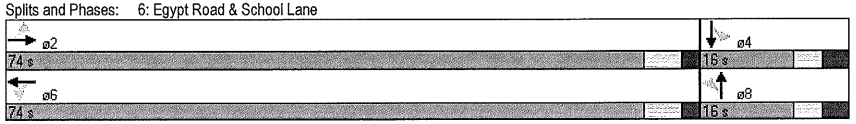
McMahon Associates, Inc.
6: Egypt Road & School Lane

Westover Recreation Development
2012 Existing Saturday

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	
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		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio		0.87			0.67			0.38			0.25	
Control Delay		21.6			12.6			30.6			28.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		21.6			12.6			30.6			28.8	
Queue Length 50th (ft)		259			173			45			36	
Queue Length 95th (ft)		407			256			55			52	
Internal Link Dist (ft)		1529			442			759			511	
Turn Bay Length (ft)												
Base Capacity (vph)		1558			1660			352			425	
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		0.55			0.42			0.38			0.25	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 69.7
Natural Cycle: 60
Control Type: Semi Act-Uncoord

Splits and Phases: 6: Egypt Road & School Lane



Lanes, Volumes, Timings
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6: Egypt Road & School Lane
Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	650	61	4	621	2	91	5	3	0	11	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.99			0.90	
Flt Protected		1.00			1.00			0.96			1.00	
Satd. Flow (prot)		1859			1824			2049			1775	
Flt Permitted		0.90			0.98			0.68			1.00	
Satd. Flow (perm)		1684			1795			1461			1775	
Peak-hour factor, PHF	0.81	0.92	0.76	0.33	0.92	0.25	0.80	0.42	0.38	0.25	0.46	0.76
Adj. Flow (vph)	68	707	80	12	675	8	114	12	8	0	24	84
RTOR Reduction (vph)	0	7	0	0	1	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	848	0	0	694	0	0	132	0	0	108	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		40.5			40.5			16.7			16.7	
Effective Green, g (s)		40.5			40.5			16.7			16.7	
Actuated g/C Ratio		0.59			0.59			0.24			0.24	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		986			1051			353			428	
v/s Ratio Prot											0.06	
v/s Ratio Perm		c0.50			0.39			c0.09				
v/c Ratio		0.86			0.66			0.37			0.25	
Uniform Delay, d1		12.0			9.7			21.9			21.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		7.6			1.6			3.0			1.4	
Delay (s)		19.6			11.3			24.9			22.6	
Level of Service		B			B			C			C	
Approach Delay (s)		19.6			11.3			24.9			22.6	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM Average Control Delay	16.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	99.0%	ICU Level of Service	F	
Analysis Period (min)	15			

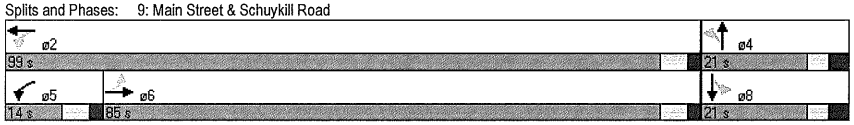
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	704	10	21	764	34	9	36	38	67	43	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	10	10	10	11	11	11
Grade (%)		-1%			-1%			1%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		1.00				1.00	
Frt		0.997			0.990			0.919			0.964	
Flt Protected		0.997			0.998		0.950				0.979	
Satd. Flow (prot)	0	3402	0	0	3351	0	1676	1558	0	0	1702	0
Flt Permitted		0.824			0.904		0.572				0.813	
Satd. Flow (perm)	0	2812	0	0	3036	0	1008	1558	0	0	1414	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			18			41			13	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1036			1076			1400			830	
Travel Time (s)		17.7			18.3			38.2			22.6	
Confl. Peds. (#/hr)	2		2	2		2	1					1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.71	0.94	0.63	0.75	0.96	0.61	0.75	0.82	0.73	0.93	0.90	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	2%	20%	10%	3%	3%	0%	3%	5%	2%	2%	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)	52	749	16	28	796	56	12	44	52	72	48	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	817	0	0	880	0	12	96	0	0	164	0
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	25.0	25.0		4.0	25.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	31.0	31.0		10.0	31.0		11.0	11.0		11.0	11.0	
Total Split (s)	85.0	85.0	0.0	14.0	99.0	0.0	21.0	21.0	0.0	21.0	21.0	0.0
Total Split (%)	70.8%	70.8%	0.0%	11.7%	82.5%	0.0%	17.5%	17.5%	0.0%	17.5%	17.5%	0.0%
Maximum Green (s)	79.0	79.0		8.0	93.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	5.0	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
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		C-Min	C-Min		None	C-Min		None	None		None	None
Walk Time (s)		7.0	7.0			7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		14.0	14.0			14.0		16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0	0			0		0	0		0	0
v/c Ratio			0.39			0.39		0.07	0.33			0.68
Control Delay			7.0			6.7		40.9	28.3			57.0
Queue Delay			0.0			0.0		0.0	0.0			0.0
Total Delay			7.0			6.7		40.9	28.3			57.0
Queue Length 50th (ft)			110			115		8	37			111
Queue Length 95th (ft)			167			174		20	73			178
Internal Link Dist (ft)			956			996			1320			750
Turn Bay Length (ft)												
Base Capacity (vph)			2073			2368		168	294			247
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			0.39			0.37		0.07	0.33			0.66

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Splits and Phases: 9: Main Street & Schuykill Road



McMahon Associates, Inc.
9: Main Street & Schuykill Road
Westover Recreation Development
2012 Existing Saturday

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	704	10	21	764	34	9	36	38	67	43	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	11	11	10	10	10	11	11	11
Grade (%)		-1%			-1%			1%			0%	
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Frt		1.00			0.99		1.00	0.92			0.96	
Flt Protected		1.00			1.00		0.95	1.00			0.98	
Satd. Flow (prot)		3401			3354		1675	1558			1701	
Flt Permitted		0.82			0.90		0.57	1.00			0.81	
Satd. Flow (perm)		2813			3037		1008	1558			1413	
Peak-hour factor, PHF	0.71	0.94	0.63	0.75	0.96	0.61	0.75	0.82	0.73	0.93	0.90	0.91
Adj. Flow (vph)	52	749	16	28	796	56	12	44	52	72	48	44
RTOR Reduction (vph)	0	1	0	0	5	0	0	34	0	0	11	0
Lane Group Flow (vph)	0	816	0	0	875	0	12	62	0	0	153	0
Confl. Peds. (#/hr)	2		2	2		2	1					1
Heavy Vehicles (%)	3%	2%	20%	10%	3%	3%	0%	3%	5%	2%	2%	0%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		88.4			88.4		19.6	19.6			19.6	
Effective Green, g (s)		88.4			88.4		19.6	19.6			19.6	
Actuated g/C Ratio		0.74			0.74		0.16	0.16			0.16	
Clearance Time (s)		6.0			6.0		6.0	6.0			6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		2072			2237		165	254			231	
v/s Ratio Prot								0.04				
v/s Ratio Perm		c0.29			0.29		0.01				c0.11	
v/c Ratio		0.39			0.39		0.07	0.24			0.66	
Uniform Delay, d1		5.9			5.8		42.5	43.7			47.1	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.6			0.1		0.2	0.5			7.0	
Delay (s)		6.4			6.0		42.7	44.2			54.1	
Level of Service		A			A		D	D			D	
Approach Delay (s)		6.4			6.0			44.1			54.1	
Approach LOS		A			A			D			D	

Intersection Summary

HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	27	6	7	118	115	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Grade (%)	-2%			4%	-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	0.964				0.969	
Flt Protected	0.964			0.995		
Satd. Flow (prot)	1963	0	0	1836	1840	0
Flt Permitted	0.964			0.995		
Satd. Flow (perm)	1963	0	0	1836	1840	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	1021			1000	1400	
Travel Time (s)	27.8			27.3	38.2	
Confl. Peds. (#/hr)			2			2
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.62	0.50	0.87	0.70	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	0%	0%	1%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	28	10	14	136	164	48
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	0	0	150	212	0
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

McMahon Associates, Inc.
10: Hemlock Road & Schuykill Road
Westover Recreation Development
2012 Existing Saturday

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	27	6	7	118	115	34
Peak Hour Factor	0.96	0.62	0.50	0.87	0.70	0.71
Hourly flow rate (vph)	28	10	14	136	164	48

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	38	150	212
Volume Left (vph)	28	14	0
Volume Right (vph)	10	0	48
Hadj (s)	0.05	0.03	-0.11
Departure Headway (s)	4.7	4.2	4.0
Degree Utilization, x	0.05	0.18	0.24
Capacity (veh/h)	701	828	877
Control Delay (s)	8.0	8.1	8.3
Approach Delay (s)	8.0	8.1	8.3
Approach LOS	A	A	A

Intersection Summary			
Delay		8.2	
HCM Level of Service		A	
Intersection Capacity Utilization	21.9%	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)	3	18	20	0	15	27	36	95	5	24	92	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	14	14	14	12	12	12	11	11	11
Grade (%)		-3%			3%			1%			-2%	
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		0.956			0.910			0.993			0.990	
Flt Protected		0.994						0.986			0.988	
Satd. Flow (prot)	0	2010	0	0	1817	0	0	1839	0	0	1790	0
Flt Permitted		0.994						0.986			0.988	
Satd. Flow (perm)	0	2010	0	0	1817	0	0	1839	0	0	1790	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1077			860			673			1000	
Travel Time (s)		29.4			23.5			18.4			27.3	
Confl. Peds. (#/hr)	7					7						
Confl. Bikes (#/hr)												
Peak Hour Factor	0.38	0.50	0.95	0.25	0.75	0.68	0.75	0.88	0.62	0.60	0.86	0.42
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	6%	0%	0%	0%	0%	0%	1%	0%	0%	2%	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)	8	36	21	0	20	40	48	108	8	40	107	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	65	0	0	60	0	0	164	0	0	159	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

McMahon Associates, Inc.
14: Brandon Road & Schuykill Road
Westover Recreation Development
2012 Existing Saturday

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	3	18	20	0	15	27	36	95	5	24	92	5
Peak Hour Factor	0.38	0.50	0.95	0.25	0.75	0.68	0.75	0.88	0.62	0.60	0.86	0.42
Hourly flow rate (vph)	8	36	21	0	20	40	48	108	8	40	107	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	65	60	164	159
Volume Left (vph)	8	0	48	40
Volume Right (vph)	21	40	8	12
Hadj (s)	-0.11	-0.40	0.04	0.03
Departure Headway (s)	4.6	4.3	4.4	4.4
Degree Utilization, x	0.08	0.07	0.20	0.19
Capacity (veh/h)	719	762	785	781
Control Delay (s)	8.0	7.7	8.5	8.5
Approach Delay (s)	8.0	7.7	8.5	8.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.3		
HCM Level of Service	A		
Intersection Capacity Utilization	23.0%	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)	14	0	3	5	0	32	2	90	4	17	68	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	11	11	11	10	10	10	11	11	11
Grade (%)		-3%			3%			2%			-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		0.974			0.890			0.991			0.964	
Flt Protected		0.961			0.991			0.998			0.993	
Satd. Flow (prot)	0	1925	0	0	1558	0	0	1721	0	0	1735	0
Flt Permitted		0.961			0.991			0.998			0.993	
Satd. Flow (perm)	0	1925	0	0	1558	0	0	1721	0	0	1735	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		1018			856			611			673	
Travel Time (s)		23.1			19.5			13.9			18.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.41	0.25	0.38	0.62	0.25	0.91	0.50	0.83	0.50	0.85	0.74	0.68
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	1%	0%	0%	3%	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)	34	0	8	8	0	35	4	108	8	20	92	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	0	43	0	0	120	0	0	152	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)	14	0	3	5	0	32	2	90	4	17	68	27
Sign Control		Stop			Stop			Free			Free	
Grade		-3%			3%			2%			-3%	
Peak Hour Factor	0.41	0.25	0.38	0.62	0.25	0.91	0.50	0.83	0.50	0.85	0.74	0.68
Hourly flow rate (vph)	34	0	8	8	0	35	4	108	8	20	92	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	307	276	112	280	292	112	132			116		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	307	276	112	280	292	112	132			116		
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 %	94	100	99	99	100	96	100			99		
cM capacity (veh/h)	617	625	947	662	612	938	1466			1485		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	42	43	120	152
Volume Left	34	8	4	20
Volume Right	8	35	8	40
cSH	660	870	1466	1485
Volume to Capacity	0.06	0.05	0.00	0.01
Queue Length 95th (ft)	5	4	0	1
Control Delay (s)	10.8	9.4	0.3	1.1
Lane LOS	B	A	A	A
Approach Delay (s)	10.8	9.4	0.3	1.1
Approach LOS	B	A		

Intersection Summary					
Average Delay	3.0				
Intersection Capacity Utilization	23.5%	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)	10	4	0	1	3	28	0	52	1	17	55	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	16	16	16	16	16	16	16	16	16
Grade (%)		-2%			3%			1%			-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					0.886			0.992			0.985	
Flt Protected		0.966			0.996						0.991	
Satd. Flow (prot)	0	2039	0	0	1872	0	0	2125	0	0	2061	0
Flt Permitted		0.966			0.996						0.991	
Satd. Flow (perm)	0	2039	0	0	1872	0	0	2125	0	0	2061	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		560			640			420			839	
Travel Time (s)		15.3			17.5			11.5			22.9	
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.50	0.50	0.25	0.25	0.75	0.64	0.25	0.81	0.25	0.85	0.72	0.58
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%	6%	2%	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)	20	8	0	4	4	44	0	64	4	20	76	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	0	0	52	0	0	68	0	0	108	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	4	0	1	3	28	0	52	1	17	55	7
Sign Control		Stop			Stop			Free			Free	
Grade		-2%			3%			1%			-1%	
Peak Hour Factor	0.50	0.50	0.25	0.25	0.75	0.64	0.25	0.81	0.25	0.85	0.72	0.58
Hourly flow rate (vph)	20	8	0	4	4	44	0	64	4	20	76	12
Pedestrians		1										
Lane Width (ft)		15.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											839	
pX, platoon unblocked												
vC, conflicting volume	235	192	83	193	196	66	89			68		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	235	192	83	193	196	66	89			68		
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 %	97	99	100	99	99	96	100			99		
cM capacity (veh/h)	681	697	981	756	693	1003	1517			1508		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	28	52	68	108
Volume Left	20	4	0	20
Volume Right	0	44	4	12
cSH	685	947	1517	1508
Volume to Capacity	0.04	0.05	0.00	0.01
Queue Length 95th (ft)	3	4	0	1
Control Delay (s)	10.5	9.0	0.0	1.5
Lane LOS	B	A		A
Approach Delay (s)	10.5	9.0	0.0	1.5
Approach LOS	B	A		

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	23.6%	ICU Level of Service	A
Analysis Period (min)	15		

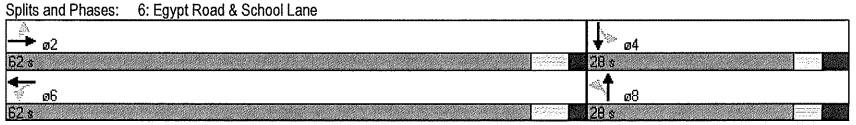
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	138	856	117	6	938	5	77	5	10	1	21	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		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		1.00										
Frt		0.979			0.998			0.983			0.895	
Flt Protected	0.950							0.961			0.999	
Satd. Flow (prot)	1796	1813	0	0	1824	0	0	2008	0	0	1773	0
Flt Permitted	0.286				0.992			0.619			0.990	
Satd. Flow (perm)	541	1813	0	0	1810	0	0	1294	0	0	1757	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			1			8			111	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1609			522			839			591	
Travel Time (s)		31.3			10.2			22.9			16.1	
Confl. Peds. (#/hr)			2	2								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.92	0.76	0.75	0.94	0.42	0.77	0.62	0.62	0.25	0.75	0.80
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	10%	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)	153	930	154	8	998	12	100	8	16	4	28	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	153	1084	0	0	1018	0	0	124	0	0	143	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		28.0	28.0		28.0	28.0	
Total Split (s)	62.0	62.0	0.0	62.0	62.0	0.0	28.0	28.0	0.0	28.0	28.0	0.0
Total Split (%)	68.9%	68.9%	0.0%	68.9%	68.9%	0.0%	31.1%	31.1%	0.0%	31.1%	31.1%	0.0%
Maximum Green (s)	56.0	56.0		56.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0

McMahon Associates, Inc.
6: Egypt Road & School Lane
Westover Recreation Development
2012 Existing PM with imps

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	
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	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio	0.40	0.84			0.79			0.63			0.40	
Control Delay	9.8	17.9			15.5			44.3			13.1	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	9.8	17.9			15.5			44.3			13.1	
Queue Length 50th (ft)	27	330			291			55			14	
Queue Length 95th (ft)	81	#793			#720			69			42	
Internal Link Dist (ft)		1529			442			759			511	
Turn Bay Length (ft)												
Base Capacity (vph)	383	1288			1281			349			548	
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	0.40	0.84			0.79			0.36			0.26	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 83.1
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: 6: Egypt Road & School Lane



Lanes, Volumes, Timings
I:\eng\812073\Traffic\analysis\existing\Existing PM with required left turn lane.syn
6: Egypt Road & School Lane
Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	138	856	117	6	938	5	77	5	10	1	21	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			1.00			0.98			0.90	
Flt Protected	0.95	1.00			1.00			0.96			1.00	
Satd. Flow (prot)	1796	1813			1824			2008			1773	
Flt Permitted	0.29	1.00			0.99			0.62			0.99	
Satd. Flow (perm)	541	1813			1810			1294			1757	
Peak-hour factor, PHF	0.90	0.92	0.76	0.75	0.94	0.42	0.77	0.62	0.62	0.25	0.75	0.80
Adj. Flow (vph)	153	930	154	8	998	12	100	8	16	4	28	111
RTOR Reduction (vph)	0	5	0	0	0	0	0	7	0	0	95	0
Lane Group Flow (vph)	153	1079	0	0	1018	0	0	117	0	0	48	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	10%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	58.8	58.8			58.8			12.3			12.3	
Effective Green, g (s)	58.8	58.8			58.8			12.3			12.3	
Actuated g/C Ratio	0.71	0.71			0.71			0.15			0.15	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	383	1283			1281			192			260	
v/s Ratio Prot		c0.60										
v/s Ratio Perm	0.28				0.56			c0.09			0.03	
v/c Ratio	0.40	0.84			0.79			0.61			0.19	
Uniform Delay, d1	5.0	8.8			8.1			33.2			31.0	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	3.1	6.8			5.1			5.6			0.3	
Delay (s)	8.0	15.5			13.3			38.8			31.4	
Level of Service	A	B			B			D			C	
Approach Delay (s)		14.6			13.3			38.8			31.4	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM Average Control Delay	16.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	83.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	126.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

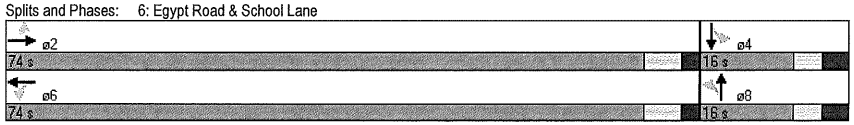
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	650	61	4	621	2	91	5	3	0	11	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		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		0.985			0.998			0.992			0.895	
Flt Protected	0.950				0.999			0.959				
Satd. Flow (prot)	1796	1862	0	0	1823	0	0	2049	0	0	1775	0
Flt Permitted	0.357				0.984			0.684				
Satd. Flow (perm)	675	1862	0	0	1795	0	0	1461	0	0	1775	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		19			2			3				
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1609			522			839			591	
Travel Time (s)		31.3			10.2			22.9			16.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.92	0.76	0.33	0.92	0.25	0.80	0.42	0.38	0.25	0.46	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	1%	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)	68	707	80	12	675	8	114	12	8	0	24	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	787	0	0	695	0	0	134	0	0	108	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		22.0	22.0		22.0	22.0	
Total Split (s)	74.0	74.0	0.0	74.0	74.0	0.0	16.0	16.0	0.0	16.0	16.0	0.0
Total Split (%)	82.2%	82.2%	0.0%	82.2%	82.2%	0.0%	17.8%	17.8%	0.0%	17.8%	17.8%	0.0%
Maximum Green (s)	68.0	68.0		68.0	68.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0

McMahon Associates, Inc.
6: Egypt Road & School Lane
Westover Recreation Development
2012 Existing Saturday with imps

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	
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		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio	0.19	0.81			0.75			0.33			0.22	
Control Delay	8.3	18.6			16.4			23.0			21.6	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	8.3	18.6			16.4			23.0			21.6	
Queue Length 50th (ft)	12	203			173			36			29	
Queue Length 95th (ft)	25	320			274			43			40	
Internal Link Dist (ft)		1529			442			759			511	
Turn Bay Length (ft)												
Base Capacity (vph)	664	1831			1765			405			490	
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	0.10	0.43			0.39			0.33			0.22	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 59.4
Natural Cycle: 60
Control Type: Semi Act-Uncoord

Splits and Phases: 6: Egypt Road & School Lane



Lanes, Volumes, Timings
I:\eng\812073\Traffic\analysis\existing\Existing SAT with required left turn lane.syn
6: Egypt Road & School Lane
Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	650	61	4	621	2	91	5	3	0	11	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			1.00			0.99			0.90	
Flt Protected	0.95	1.00			1.00			0.96			1.00	
Satd. Flow (prot)	1796	1862			1824			2049			1775	
Flt Permitted	0.36	1.00			0.98			0.68			1.00	
Satd. Flow (perm)	674	1862			1797			1461			1775	
Peak-hour factor, PHF	0.81	0.92	0.76	0.33	0.92	0.25	0.80	0.42	0.38	0.25	0.46	0.76
Adj. Flow (vph)	68	707	80	12	675	8	114	12	8	0	24	84
RTOR Reduction (vph)	0	9	0	0	1	0	0	2	0	0	0	0
Lane Group Flow (vph)	68	778	0	0	694	0	0	132	0	0	108	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	30.7	30.7			30.7			16.4			16.4	
Effective Green, g (s)	30.7	30.7			30.7			16.4			16.4	
Actuated g/C Ratio	0.52	0.52			0.52			0.28			0.28	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	350	967			933			405			493	
v/s Ratio Prot		c0.42									0.06	
v/s Ratio Perm	0.10				0.39			c0.09				
v/c Ratio	0.19	0.80			0.74			0.33			0.22	
Uniform Delay, d1	7.6	11.7			11.1			17.0			16.4	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.3	4.9			3.2			2.1			1.0	
Delay (s)	7.9	16.7			14.4			19.1			17.4	
Level of Service	A	B			B			B			B	
Approach Delay (s)		16.0			14.4			19.1			17.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX G

2015 Future Capacity/Level-of-Service Without Redevelopment Analysis Worksheets

Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	4	1198	1094	46	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	15	14	14
Grade (%)		2%	-2%		-2%	
Storage Length (ft)	0			0	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
Ped Bike Factor						
Frt				0.850	0.955	
Flt Protected					0.968	
Satd. Flow (prot)	0	2090	1900	1794	1670	0
Flt Permitted					0.968	
Satd. Flow (perm)	0	2090	1900	1794	1670	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		1056	113		905	
Travel Time (s)		20.6	2.2		24.7	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)						
Peak Hour Factor	0.33	0.93	0.91	0.90	0.62	0.25
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	1%	0%	20%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	12	1288	1202	51	8	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1300	1202	51	12	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	4	1198	1094	46	5	1
Sign Control		Free	Free		Stop	
Grade		2%	-2%		-2%	
Peak Hour Factor	0.33	0.93	0.91	0.90	0.62	0.25
Hourly flow rate (vph)	12	1288	1202	51	8	4
Pedestrians					1	
Lane Width (ft)					14.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1254				2516	1203
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1254				2516	1203
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	98				70	98
cM capacity (veh/h)	561				27	227

Direction, Lane #	EB 1	WB 1	WB 2	SE 1
Volume Total	1300	1202	51	12
Volume Left	12	0	0	8
Volume Right	0	0	51	4
cSH	561	1700	1700	37
Volume to Capacity	0.02	0.71	0.03	0.32
Queue Length 95th (ft)	2	0	0	27
Control Delay (s)	1.1	0.0	0.0	141.3
Lane LOS	A			F
Approach Delay (s)	1.1	0.0		141.3
Approach LOS				F

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1124	79	4	1125	14	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Grade (%)	2%			-2%	-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	0.991				0.927	
Flt Protected					0.978	
Satd. Flow (prot)	2074	0	0	1900	1740	0
Flt Permitted					0.978	
Satd. Flow (perm)	2074	0	0	1900	1740	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	113			1609	376	
Travel Time (s)	2.2			31.3	10.3	
Confl. Peds. (#/hr)		3	3			
Confl. Bikes (#/hr)						
Peak Hour Factor	0.93	0.88	0.50	0.91	0.81	0.60
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	0%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1209	90	8	1236	17	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1299	0	0	1244	37	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)	1124	79	4	1125	14	12
Sign Control	Free			Free	Stop	
Grade	2%			-2%	-2%	
Peak Hour Factor	0.93	0.88	0.50	0.91	0.81	0.60
Hourly flow rate (vph)	1209	90	8	1236	17	20
Pedestrians					3	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1301		2509	1256
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1301		2509	1256
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		45	91
cM capacity (veh/h)			538		31	211

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1298	1244	37
Volume Left	0	8	17
Volume Right	90	0	20
cSH	1700	538	58
Volume to Capacity	0.76	0.01	0.65
Queue Length 95th (ft)	0	1	67
Control Delay (s)	0.0	0.7	144.5
Lane LOS		A	F
Approach Delay (s)	0.0	0.7	144.5
Approach LOS			F

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	74.0%	ICU Level of Service	D	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	141	876	120	6	960	5	79	5	10	1	21	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
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		1.00										
Frt		0.983			0.998			0.983			0.895	
Flt Protected		0.994						0.961			0.999	
Satd. Flow (prot)	0	1814	0	0	1824	0	0	2009	0	0	1773	0
Flt Permitted		0.752			0.990			0.612			0.990	
Satd. Flow (perm)	0	1372	0	0	1806	0	0	1279	0	0	1757	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			1			8			114	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1609			522			839			591	
Travel Time (s)		31.3			10.2			22.9			16.1	
Confl. Peds. (#/hr)			2	2								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.92	0.76	0.75	0.94	0.42	0.77	0.62	0.62	0.25	0.75	0.80
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	10%	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)	157	952	158	8	1021	12	103	8	16	4	28	114
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1267	0	0	1041	0	0	127	0	0	146	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		28.0	28.0		28.0	28.0	
Total Split (s)	62.0	62.0	0.0	62.0	62.0	0.0	28.0	28.0	0.0	28.0	28.0	0.0
Total Split (%)	68.9%	68.9%	0.0%	68.9%	68.9%	0.0%	31.1%	31.1%	0.0%	31.1%	31.1%	0.0%
Maximum Green (s)	56.0	56.0		56.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0

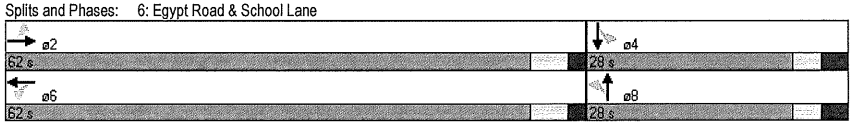
McMahon Associates, Inc.
6: Egypt Road & School Lane

Westover Recreation Development
2015 PM without Development

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	
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	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio		1.30			0.82			0.64			0.40	
Control Delay		162.3			16.9			44.8			12.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		162.3			16.9			44.8			12.9	
Queue Length 50th (ft)		~838			310			57			14	
Queue Length 95th (ft)		#1195			#757			71			42	
Internal Link Dist (ft)		1529			442			759			511	
Turn Bay Length (ft)												
Base Capacity (vph)		972			1273			346			550	
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		1.30			0.82			0.37			0.27	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 83
Natural Cycle: 150
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: 6: Egypt Road & School Lane



Lanes, Volumes, Timings
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6: Egypt Road & School Lane
Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	141	876	120	6	960	5	79	5	10	1	21	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			1.00			0.98			0.89	
Flt Protected		0.99			1.00			0.96			1.00	
Satd. Flow (prot)		1814			1824			2009			1772	
Flt Permitted		0.75			0.99			0.61			0.99	
Satd. Flow (perm)		1373			1806			1279			1756	
Peak-hour factor, PHF	0.90	0.92	0.76	0.75	0.94	0.42	0.77	0.62	0.62	0.25	0.75	0.80
Adj. Flow (vph)	157	952	158	8	1021	12	103	8	16	4	28	114
RTOR Reduction (vph)	0	4	0	0	0	0	0	7	0	0	97	0
Lane Group Flow (vph)	0	1263	0	0	1041	0	0	120	0	0	49	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	10%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		58.5			58.5			12.5			12.5	
Effective Green, g (s)		58.5			58.5			12.5			12.5	
Actuated g/C Ratio		0.70			0.70			0.15			0.15	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		968			1273			193			264	
v/s Ratio Prot												
v/s Ratio Perm		c0.92			0.58			c0.09			0.03	
v/c Ratio		1.30			0.82			0.62			0.19	
Uniform Delay, d1		12.2			8.5			33.0			30.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		144.5			5.9			6.1			0.3	
Delay (s)		156.7			14.4			39.2			31.1	
Level of Service		F			B			D			C	
Approach Delay (s)		156.7			14.4			39.2			31.1	
Approach LOS		F			B			D			C	

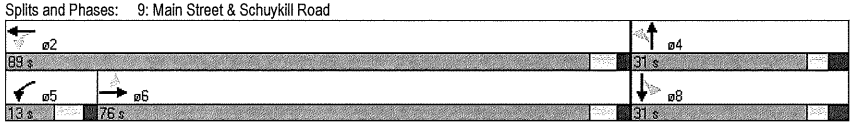
Intersection Summary			
HCM Average Control Delay	86.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	83.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	139.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑			↕	
Volume (vph)	33	898	28	45	1328	10	52	76	55	16	59	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	10	10	10	11	11	11
Grade (%)		-1%			-1%			1%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			1.00	
Frt		0.994			0.998			0.935			0.925	
Flt Protected		0.998			0.998		0.950				0.994	
Satd. Flow (prot)	0	3372	0	0	3426	0	1643	1640	0	0	1689	0
Flt Permitted		0.797			0.864		0.395				0.919	
Satd. Flow (perm)	0	2693	0	0	2966	0	683	1640	0	0	1561	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		5			2			29				
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1036			1076			1400			830	
Travel Time (s)		17.7			18.3			38.2			22.6	
Confl. Peds. (#/hr)	3		8	8		3			1	1		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.80	0.97	0.75	0.92	0.92	0.62	0.75	0.80	0.75	0.67	0.85	0.77
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	3%	0%	0%	2%	0%	2%	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)	41	926	37	49	1443	16	69	95	73	24	69	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1004	0	0	1508	0	69	168	0	0	209	0
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	25.0	25.0		4.0	25.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	31.0	31.0		10.0	31.0		11.0	11.0		11.0	11.0	
Total Split (s)	76.0	76.0	0.0	13.0	89.0	0.0	31.0	31.0	0.0	31.0	31.0	0.0
Total Split (%)	63.3%	63.3%	0.0%	10.8%	74.2%	0.0%	25.8%	25.8%	0.0%	25.8%	25.8%	0.0%
Maximum Green (s)	70.0	70.0		7.0	83.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	5.0	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
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		C-Min	C-Min		None	C-Min		None	None		None	None
Walk Time (s)		7.0	7.0			7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		14.0	14.0			14.0		16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0	0			0		0	0		0	0
v/c Ratio			0.51			0.70		0.59	0.55			0.78
Control Delay			8.7			12.0		65.1	43.5			67.2
Queue Delay			0.0			0.0		0.0	0.0			0.0
Total Delay			8.7			12.0		65.1	43.5			67.2
Queue Length 50th (ft)			156			300		50	99			156
Queue Length 95th (ft)			244			462		78	138			214
Internal Link Dist (ft)			956			996			1320			750
Turn Bay Length (ft)												
Base Capacity (vph)			1965			2173		144	370			330
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			0.51			0.69		0.48	0.45			0.63

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: Main Street & Schuykill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	898	28	45	1328	10	52	76	55	16	59	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	11	11	10	10	10	11	11	11
Grade (%)		-1%			-1%			1%			0%	
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			1.00		1.00	0.99			1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Frt		0.99			1.00		1.00	0.93			0.93	
Flt Protected		1.00			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		3373			3429		1643	1640			1689	
Flt Permitted		0.80			0.86		0.40	1.00			0.92	
Satd. Flow (perm)		2693			2968		684	1640			1562	
Peak-hour factor, PHF	0.80	0.97	0.75	0.92	0.92	0.62	0.75	0.80	0.75	0.67	0.85	0.77
Adj. Flow (vph)	41	926	37	49	1443	16	69	95	73	24	69	116
RTOR Reduction (vph)	0	1	0	0	1	0	0	24	0	0	0	0
Lane Group Flow (vph)	0	1003	0	0	1507	0	69	144	0	0	209	0
Confl. Peds. (#/hr)	3		8	8		3			1	1		
Heavy Vehicles (%)	6%	3%	0%	0%	2%	0%	2%	0%	0%	0%	0%	0%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		87.5			87.5		20.5	20.5			20.5	
Effective Green, g (s)		87.5			87.5		20.5	20.5			20.5	
Actuated g/C Ratio		0.73			0.73		0.17	0.17			0.17	
Clearance Time (s)		6.0			6.0		6.0	6.0			6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		1964			2164		117	280			267	
v/s Ratio Prot								0.09				
v/s Ratio Perm		0.37			c0.51		0.10				c0.13	
v/c Ratio		0.51			0.70		0.59	0.51			0.78	
Uniform Delay, d1		7.0			8.9		45.9	45.2			47.6	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		1.0			1.0		7.4	1.6			13.9	
Delay (s)		8.0			9.9		53.3	46.8			61.5	
Level of Service		A			A		D	D			E	
Approach Delay (s)		8.0			9.9			48.7			61.5	
Approach LOS		A			A			D			E	

Intersection Summary

HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	101.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	65	5	5	98	152	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Grade (%)	-2%			4%	-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	0.984				0.966	
Flt Protected	0.958			0.997		
Satd. Flow (prot)	2015	0	0	1800	1836	0
Flt Permitted	0.958			0.997		
Satd. Flow (perm)	2015	0	0	1800	1836	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	1021			1000	1400	
Travel Time (s)	27.8			27.3	38.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.73	0.42	0.63	0.83	0.85	0.82
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	20%	2%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	89	12	8	118	179	61
Shared Lane Traffic (%)						
Lane Group Flow (vph)	101	0	0	126	240	0
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	65	5	5	98	152	50
Peak Hour Factor	0.73	0.42	0.63	0.83	0.85	0.82
Hourly flow rate (vph)	89	12	8	118	179	61

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	101	126	240
Volume Left (vph)	89	8	0
Volume Right (vph)	12	0	61
Hadj (s)	0.14	0.07	-0.13
Departure Headway (s)	4.8	4.5	4.2
Degree Utilization, x	0.14	0.16	0.28
Capacity (veh/h)	688	773	831
Control Delay (s)	8.6	8.3	8.8
Approach Delay (s)	8.6	8.3	8.8
Approach LOS	A	A	A

Intersection Summary			
Delay	8.6		
HCM Level of Service	A		
Intersection Capacity Utilization	21.6%	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	17	32	0	6	11	14	92	1	24	129	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	14	14	14	12	12	12	11	11	11
Grade (%)		-3%			3%			1%			-2%	
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		0.912			0.929			0.996			0.989	
Flt Protected								0.993			0.992	
Satd. Flow (prot)	0	1993	0	0	1855	0	0	1825	0	0	1806	0
Flt Permitted								0.993			0.992	
Satd. Flow (perm)	0	1993	0	0	1855	0	0	1825	0	0	1806	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1077			860			673			1000	
Travel Time (s)		29.4			23.5			18.4			27.3	
Confl. Peds. (#/hr)			2	2			1					1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.25	0.71	0.71	0.25	0.38	0.62	0.70	0.82	0.25	0.72	0.89	0.31
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	1%	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	24	45	0	16	18	20	112	4	33	145	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	0	0	34	0	0	136	0	0	194	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

McMahon Associates, Inc.
14: Brandon Road & Schuykill Road
Westover Recreation Development
2015 PM without Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	17	32	0	6	11	14	92	1	24	129	5
Peak Hour Factor	0.25	0.71	0.71	0.25	0.38	0.62	0.70	0.82	0.25	0.72	0.89	0.31
Hourly flow rate (vph)	0	24	45	0	16	18	20	112	4	33	145	16

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	69	34	136	194
Volume Left (vph)	0	0	20	33
Volume Right (vph)	45	18	4	16
Hadj (s)	-0.39	-0.32	0.05	0.00
Departure Headway (s)	4.3	4.4	4.4	4.3
Degree Utilization, x	0.08	0.04	0.17	0.23
Capacity (veh/h)	769	744	788	809
Control Delay (s)	7.7	7.6	8.3	8.6
Approach Delay (s)	7.7	7.6	8.3	8.6
Approach LOS	A	A	A	A

Intersection Summary					
Delay	8.3				
HCM Level of Service	A				
Intersection Capacity Utilization	22.5%	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)	24	0	2	3	0	17	2	66	5	41	114	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	11	11	11	10	10	10	11	11	11
Grade (%)		-3%			3%			2%			-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		0.987			0.903			0.983			0.992	
Flt Protected		0.957			0.986			0.998			0.983	
Satd. Flow (prot)	0	1859	0	0	1611	0	0	1634	0	0	1786	0
Flt Permitted		0.957			0.986			0.998			0.983	
Satd. Flow (perm)	0	1859	0	0	1611	0	0	1634	0	0	1786	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		1018			856			611			673	
Travel Time (s)		23.1			19.5			13.9			18.4	
Confl. Peds. (#/hr)							9					9
Confl. Bikes (#/hr)												
Peak Hour Factor	0.62	0.25	0.50	0.25	0.25	0.54	0.50	0.82	0.42	0.56	0.92	0.50
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	0%	0%	0%	0%	0%	50%	4%	0%	0%	3%	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)	39	0	4	12	0	31	4	80	12	73	124	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	43	0	0	43	0	0	96	0	0	209	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)	24	0	2	3	0	17	2	66	5	41	114	6
Sign Control		Stop			Stop			Free			Free	
Grade		-3%			3%			2%			-3%	
Peak Hour Factor	0.62	0.25	0.50	0.25	0.25	0.54	0.50	0.82	0.42	0.56	0.92	0.50
Hourly flow rate (vph)	39	0	4	12	0	31	4	80	12	73	124	12
Pedestrians		9										
Lane Width (ft)		14.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		1										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	411	386	139	375	386	86	145			92		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	411	386	139	375	386	86	145			92		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.6			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.7			2.2		
p0 queue free %	92	100	100	98	100	97	100			95		
cM capacity (veh/h)	500	519	907	556	518	978	1180			1515		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	43	43	96	209
Volume Left	39	12	4	73
Volume Right	4	31	12	12
cSH	522	809	1180	1515
Volume to Capacity	0.08	0.05	0.00	0.05
Queue Length 95th (ft)	7	4	0	4
Control Delay (s)	12.5	9.7	0.4	2.9
Lane LOS	B	A	A	A
Approach Delay (s)	12.5	9.7	0.4	2.9
Approach LOS	B	A		

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	28.3%	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	1	0	2	2	29	0	38	0	59	58	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	16	16	16	16	16	16	16	16	16
Grade (%)		-2%			3%			1%			-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					0.887						0.990	
Flt Protected		0.962			0.996						0.977	
Satd. Flow (prot)	0	2031	0	0	1874	0	0	2143	0	0	2093	0
Flt Permitted		0.962			0.996						0.977	
Satd. Flow (perm)	0	2031	0	0	1874	0	0	2143	0	0	2093	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		560			640			420			839	
Travel Time (s)		15.3			17.5			11.5			22.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.25	0.25	0.25	0.50	0.50	0.70	0.25	0.66	0.25	0.76	0.75	0.58
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)	16	4	0	4	4	41	0	58	0	78	77	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	20	0	0	49	0	0	58	0	0	167	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)	4	1	0	2	2	29	0	38	0	59	58	7
Sign Control		Stop			Stop			Free			Free	
Grade		-2%			3%			1%			-1%	
Peak Hour Factor	0.25	0.25	0.25	0.50	0.50	0.70	0.25	0.66	0.25	0.76	0.75	0.58
Hourly flow rate (vph)	16	4	0	4	4	41	0	58	0	78	77	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											839	
pX, platoon unblocked												
vC, conflicting volume	340	296	83	298	302	58	89			58		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	340	296	83	298	302	58	89			58		
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 %	97	99	100	99	99	96	100			95		
cM capacity (veh/h)	568	588	982	629	583	1014	1519			1560		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	20	49	58	167
Volume Left	16	4	0	78
Volume Right	0	41	0	12
cSH	572	914	1519	1560
Volume to Capacity	0.03	0.05	0.00	0.05
Queue Length 95th (ft)	3	4	0	4
Control Delay (s)	11.5	9.2	0.0	3.7
Lane LOS	B	A		A
Approach Delay (s)	11.5	9.2	0.0	3.7
Approach LOS	B	A		

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	23.4%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	2	820	808	17	9	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	15	14	14
Grade (%)		2%	-2%		-2%	
Storage Length (ft)	0			0	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
Ped Bike Factor						
Frt				0.850	0.942	
Flt Protected					0.972	
Satd. Flow (prot)	0	2111	1881	1521	1665	0
Flt Permitted					0.972	
Satd. Flow (perm)	0	2111	1881	1521	1665	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		1056	113		905	
Travel Time (s)		20.6	2.2		24.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.50	0.95	0.99	0.71	0.56	0.50
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	2%	18%	22%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	4	863	816	24	16	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	867	816	24	28	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	2	820	808	17	9	6
Sign Control		Free	Free		Stop	
Grade		2%	-2%		-2%	
Peak Hour Factor	0.50	0.95	0.99	0.71	0.56	0.50
Hourly flow rate (vph)	4	863	816	24	16	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	840				1687	816
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	840				1687	816
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	100				82	97
cM capacity (veh/h)	804				92	380

Direction, Lane #	EB 1	WB 1	WB 2	SE 1
Volume Total	867	816	24	28
Volume Left	4	0	0	16
Volume Right	0	0	24	12
cSH	804	1700	1700	136
Volume to Capacity	0.00	0.48	0.01	0.21
Queue Length 95th (ft)	0	0	0	19
Control Delay (s)	0.1	0.0	0.0	38.3
Lane LOS	A			E
Approach Delay (s)	0.1	0.0		38.3
Approach LOS				E

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	775	54	3	791	35	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Grade (%)	2%			-2%	-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	0.988				0.983	
Flt Protected					0.958	
Satd. Flow (prot)	2084	0	0	1882	1761	0
Flt Permitted					0.958	
Satd. Flow (perm)	2084	0	0	1882	1761	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	113			1609	376	
Travel Time (s)	2.2			31.3	10.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.95	0.70	0.38	0.99	0.43	0.67
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	2%	0%	2%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	816	77	8	799	81	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	893	0	0	807	93	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)	775	54	3	791	35	8
Sign Control	Free			Free	Stop	
Grade	2%			-2%	-2%	
Peak Hour Factor	0.95	0.70	0.38	0.99	0.43	0.67
Hourly flow rate (vph)	816	77	8	799	81	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			893		1669	854
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			893		1669	854
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		22	97
cM capacity (veh/h)			768		104	361

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	893	807	93
Volume Left	0	8	81
Volume Right	77	0	12
cSH	1700	768	115
Volume to Capacity	0.53	0.01	0.81
Queue Length 95th (ft)	0	1	118
Control Delay (s)	0.0	0.3	109.5
Lane LOS		A	F
Approach Delay (s)	0.0	0.3	109.5
Approach LOS			F

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	54.1%	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)	56	665	62	4	635	2	93	5	3	0	11	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
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		0.987			0.998			0.992			0.894	
Flt Protected		0.996			0.999			0.959				
Satd. Flow (prot)	0	1858	0	0	1823	0	0	2049	0	0	1773	0
Flt Permitted		0.901			0.984			0.682				
Satd. Flow (perm)	0	1681	0	0	1795	0	0	1457	0	0	1773	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		17			2			3				
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1609			522			839			591	
Travel Time (s)		31.3			10.2			22.9			16.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.92	0.76	0.33	0.92	0.25	0.80	0.42	0.38	0.25	0.46	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	1%	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)	69	723	82	12	690	8	116	12	8	0	24	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	874	0	0	710	0	0	136	0	0	110	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		22.0	22.0		22.0	22.0	
Total Split (s)	74.0	74.0	0.0	74.0	74.0	0.0	16.0	16.0	0.0	16.0	16.0	0.0
Total Split (%)	82.2%	82.2%	0.0%	82.2%	82.2%	0.0%	17.8%	17.8%	0.0%	17.8%	17.8%	0.0%
Maximum Green (s)	68.0	68.0		68.0	68.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0

McMahon Associates, Inc.
6: Egypt Road & School Lane

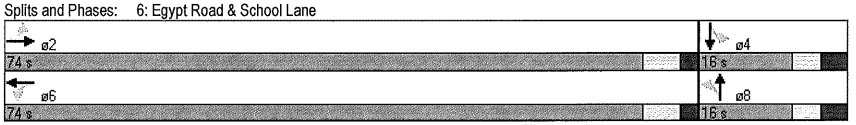
Westover Recreation Development
2015 Saturday without Development

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	
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		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio		0.87			0.67			0.40			0.26	
Control Delay		22.1			12.5			31.9			29.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		22.1			12.5			31.9			29.9	
Queue Length 50th (ft)		272			179			48			38	
Queue Length 95th (ft)		425			263			57			54	
Internal Link Dist (ft)		1529			442			759			511	
Turn Bay Length (ft)												
Base Capacity (vph)		1538			1641			344			416	
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		0.57			0.43			0.40			0.26	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 71.2
Natural Cycle: 65
Control Type: Semi Act-Uncoord

Splits and Phases: 6: Egypt Road & School Lane



Lanes, Volumes, Timings
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6: Egypt Road & School Lane
Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	56	665	62	4	635	2	93	5	3	0	11	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.99			0.89	
Flt Protected		1.00			1.00			0.96			1.00	
Satd. Flow (prot)		1859			1824			2049			1774	
Flt Permitted		0.90			0.98			0.68			1.00	
Satd. Flow (perm)		1681			1795			1457			1774	
Peak-hour factor, PHF	0.81	0.92	0.76	0.33	0.92	0.25	0.80	0.42	0.38	0.25	0.46	0.76
Adj. Flow (vph)	69	723	82	12	690	8	116	12	8	0	24	86
RTOR Reduction (vph)	0	7	0	0	1	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	867	0	0	709	0	0	134	0	0	110	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		42.0			42.0			16.7			16.7	
Effective Green, g (s)		42.0			42.0			16.7			16.7	
Actuated g/C Ratio		0.59			0.59			0.24			0.24	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		999			1066			344			419	
v/s Ratio Prot											0.06	
v/s Ratio Perm		c0.52			0.39			c0.09				
v/c Ratio		0.87			0.67			0.39			0.26	
Uniform Delay, d1		12.0			9.6			22.7			22.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.1			1.6			3.3			1.5	
Delay (s)		20.1			11.2			26.0			23.5	
Level of Service		C			B			C			C	
Approach Delay (s)		20.1			11.2			26.0			23.5	
Approach LOS		C			B			C			C	

Intersection Summary				
HCM Average Control Delay	17.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	70.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	100.8%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

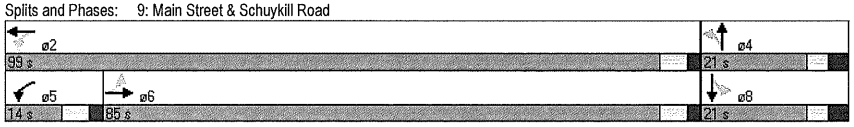
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑			↕	
Volume (vph)	38	720	10	21	782	35	9	37	39	69	44	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	10	10	10	11	11	11
Grade (%)		-1%			-1%			1%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		1.00				1.00	
Frt		0.997			0.990			0.919			0.964	
Flt Protected		0.997			0.998		0.950				0.978	
Satd. Flow (prot)	0	3402	0	0	3352	0	1676	1558	0	0	1700	0
Flt Permitted		0.817			0.904		0.572				0.812	
Satd. Flow (perm)	0	2788	0	0	3036	0	1008	1558	0	0	1412	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			18			40			13	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1036			1076			1400			830	
Travel Time (s)		17.7			18.3			38.2			22.6	
Confl. Peds. (#/hr)	2		2	2		2	1					1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.71	0.94	0.63	0.75	0.96	0.61	0.75	0.82	0.73	0.93	0.90	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	2%	20%	10%	3%	3%	0%	3%	5%	2%	2%	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)	54	766	16	28	815	57	12	45	53	74	49	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	836	0	0	900	0	12	98	0	0	168	0
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	25.0	25.0		4.0	25.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	31.0	31.0		10.0	31.0		11.0	11.0		11.0	11.0	
Total Split (s)	85.0	85.0	0.0	14.0	99.0	0.0	21.0	21.0	0.0	21.0	21.0	0.0
Total Split (%)	70.8%	70.8%	0.0%	11.7%	82.5%	0.0%	17.5%	17.5%	0.0%	17.5%	17.5%	0.0%
Maximum Green (s)	79.0	79.0		8.0	93.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	5.0	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
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		C-Min	C-Min		None	C-Min		None	None		None	None
Walk Time (s)		7.0	7.0			7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		14.0	14.0			14.0		16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0	0			0		0	0		0	0
v/c Ratio			0.41			0.41		0.07	0.33			0.67
Control Delay			7.4			7.1		40.3	28.5			55.8
Queue Delay			0.0			0.0		0.0	0.0			0.0
Total Delay			7.4			7.1		40.3	28.5			55.8
Queue Length 50th (ft)			117			123		8	39			113
Queue Length 95th (ft)			176			182		20	75			183
Internal Link Dist (ft)			956			996			1320			750
Turn Bay Length (ft)												
Base Capacity (vph)			2037			2363		173	301			253
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			0.41			0.38		0.07	0.33			0.66

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Splits and Phases: 9: Main Street & Schuykill Road



McMahon Associates, Inc.
9: Main Street & Schuykill Road
Westover Recreation Development
2015 Saturday without Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	720	10	21	782	35	9	37	39	69	44	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	11	11	10	10	10	11	11	11
Grade (%)		-1%			-1%			1%			0%	
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Frt		1.00			0.99		1.00	0.92			0.96	
Flt Protected		1.00			1.00		0.95	1.00			0.98	
Satd. Flow (prot)		3402			3355		1675	1558			1701	
Flt Permitted		0.82			0.90		0.57	1.00			0.81	
Satd. Flow (perm)		2790			3036		1009	1558			1411	
Peak-hour factor, PHF	0.71	0.94	0.63	0.75	0.96	0.61	0.75	0.82	0.73	0.93	0.90	0.91
Adj. Flow (vph)	54	766	16	28	815	57	12	45	53	74	49	45
RTOR Reduction (vph)	0	1	0	0	5	0	0	33	0	0	11	0
Lane Group Flow (vph)	0	835	0	0	895	0	12	65	0	0	157	0
Confl. Peds. (#/hr)	2		2	2		2	1					1
Heavy Vehicles (%)	3%	2%	20%	10%	3%	3%	0%	3%	5%	2%	2%	0%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		87.6			87.6		20.4	20.4			20.4	
Effective Green, g (s)		87.6			87.6		20.4	20.4			20.4	
Actuated g/C Ratio		0.73			0.73		0.17	0.17			0.17	
Clearance Time (s)		6.0			6.0		6.0	6.0			6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		2037			2216		172	265			240	
v/s Ratio Prot								0.04				
v/s Ratio Perm		c0.30			0.29		0.01				c0.11	
v/c Ratio		0.41			0.40		0.07	0.24			0.66	
Uniform Delay, d1		6.2			6.2		41.8	43.1			46.5	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.6			0.1		0.2	0.5			6.3	
Delay (s)		6.9			6.3		42.0	43.6			52.8	
Level of Service		A			A		D	D			D	
Approach Delay (s)		6.9			6.3			43.4			52.8	
Approach LOS		A			A			D			D	

Intersection Summary

HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	28	6	7	121	118	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Grade (%)	-2%			4%	-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	0.965				0.970	
Flt Protected	0.964			0.995		
Satd. Flow (prot)	1965	0	0	1836	1842	0
Flt Permitted	0.964			0.995		
Satd. Flow (perm)	1965	0	0	1836	1842	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	1021			1000	1400	
Travel Time (s)	27.8			27.3	38.2	
Confl. Peds. (#/hr)			2			2
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.62	0.50	0.87	0.70	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	0%	0%	1%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	29	10	14	139	169	49
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	0	0	153	218	0
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	28	6	7	121	118	35
Peak Hour Factor	0.96	0.62	0.50	0.87	0.70	0.71
Hourly flow rate (vph)	29	10	14	139	169	49

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	39	153	218
Volume Left (vph)	29	14	0
Volume Right (vph)	10	0	49
Hadj (s)	0.05	0.03	-0.11
Departure Headway (s)	4.7	4.2	4.0
Degree Utilization, x	0.05	0.18	0.24
Capacity (veh/h)	696	827	875
Control Delay (s)	8.0	8.2	8.3
Approach Delay (s)	8.0	8.2	8.3
Approach LOS	A	A	A

Intersection Summary			
Delay	8.2		
HCM Level of Service	A		
Intersection Capacity Utilization	22.1%	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	18	20	0	15	28	37	97	5	25	94	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	14	14	14	12	12	12	11	11	11
Grade (%)		-3%			3%			1%			-2%	
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		0.956			0.909			0.994			0.990	
Flt Protected		0.994						0.986			0.987	
Satd. Flow (prot)	0	2010	0	0	1815	0	0	1841	0	0	1789	0
Flt Permitted		0.994						0.986			0.987	
Satd. Flow (perm)	0	2010	0	0	1815	0	0	1841	0	0	1789	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1077			860			673			1000	
Travel Time (s)		29.4			23.5			18.4			27.3	
Confl. Peds. (#/hr)	7					7						
Confl. Bikes (#/hr)												
Peak Hour Factor	0.38	0.50	0.95	0.25	0.75	0.68	0.75	0.88	0.62	0.60	0.86	0.42
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	6%	0%	0%	0%	0%	0%	1%	0%	0%	2%	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)	8	36	21	0	20	41	49	110	8	42	109	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	65	0	0	61	0	0	167	0	0	163	0
Sign Control		Stop			Stop			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		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	3	18	20	0	15	28	37	97	5	25	94	5
Peak Hour Factor	0.38	0.50	0.95	0.25	0.75	0.68	0.75	0.88	0.62	0.60	0.86	0.42
Hourly flow rate (vph)	8	36	21	0	20	41	49	110	8	42	109	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	65	61	168	163
Volume Left (vph)	8	0	49	42
Volume Right (vph)	21	41	8	12
Hadj (s)	-0.11	-0.40	0.04	0.03
Departure Headway (s)	4.6	4.3	4.4	4.4
Degree Utilization, x	0.08	0.07	0.21	0.20
Capacity (veh/h)	715	758	783	779
Control Delay (s)	8.0	7.7	8.6	8.5
Approach Delay (s)	8.0	7.7	8.6	8.5
Approach LOS	A	A	A	A

Intersection Summary					
Delay	8.3				
HCM Level of Service	A				
Intersection Capacity Utilization	23.2%	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)	14	0	3	5	0	33	2	92	4	17	70	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	11	11	11	10	10	10	11	11	11
Grade (%)		-3%			3%			2%			-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		0.974			0.890			0.991			0.965	
Flt Protected		0.961			0.991			0.998			0.994	
Satd. Flow (prot)	0	1925	0	0	1557	0	0	1721	0	0	1738	0
Flt Permitted		0.961			0.991			0.998			0.994	
Satd. Flow (perm)	0	1925	0	0	1557	0	0	1721	0	0	1738	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		1018			856			611			673	
Travel Time (s)		23.1			19.5			13.9			18.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.41	0.25	0.38	0.62	0.25	0.91	0.50	0.83	0.50	0.85	0.74	0.68
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	1%	0%	0%	3%	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)	34	0	8	8	0	36	4	111	8	20	95	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	0	44	0	0	123	0	0	156	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

McMahon Associates, Inc.
17: Westover CC Access & Schuykill Avenue
Westover Recreation Development
2015 Saturday without Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	14	0	3	5	0	33	2	92	4	17	70	28
Sign Control		Stop			Stop			Free			Free	
Grade		-3%			3%			2%			-3%	
Peak Hour Factor	0.41	0.25	0.38	0.62	0.25	0.91	0.50	0.83	0.50	0.85	0.74	0.68
Hourly flow rate (vph)	34	0	8	8	0	36	4	111	8	20	95	41
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	314	282	115	286	299	115	136			119		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	314	282	115	286	299	115	136			119		
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 %	94	100	99	99	100	96	100			99		
cM capacity (veh/h)	610	620	943	656	607	935	1461			1482		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	42	44	123	156
Volume Left	34	8	4	20
Volume Right	8	36	8	41
cSH	653	868	1461	1482
Volume to Capacity	0.06	0.05	0.00	0.01
Queue Length 95th (ft)	5	4	0	1
Control Delay (s)	10.9	9.4	0.3	1.1
Lane LOS	B	A	A	A
Approach Delay (s)	10.9	9.4	0.3	1.1
Approach LOS	B	A		

Intersection Summary					
Average Delay	2.9				
Intersection Capacity Utilization	23.8%	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)	10	4	0	1	3	29	0	53	1	17	56	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	16	16	16	16	16	16	16	16	16
Grade (%)		-2%			3%			1%			-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					0.885			0.992			0.985	
Flt Protected		0.966			0.996						0.991	
Satd. Flow (prot)	0	2039	0	0	1870	0	0	2125	0	0	2061	0
Flt Permitted		0.966			0.996						0.991	
Satd. Flow (perm)	0	2039	0	0	1870	0	0	2125	0	0	2061	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		560			640			420			839	
Travel Time (s)		15.3			17.5			11.5			22.9	
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.50	0.50	0.25	0.25	0.75	0.64	0.25	0.81	0.25	0.85	0.72	0.58
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%	6%	2%	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)	20	8	0	4	4	45	0	65	4	20	78	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	0	0	53	0	0	69	0	0	110	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

McMahon Associates, Inc.
20: Hemlock Road & School Lane

Westover Recreation Development
2015 Saturday without Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	10	4	0	1	3	29	0	53	1	17	56	7
Sign Control		Stop			Stop			Free			Free	
Grade		-2%			3%			1%			-1%	
Peak Hour Factor	0.50	0.50	0.25	0.25	0.75	0.64	0.25	0.81	0.25	0.85	0.72	0.58
Hourly flow rate (vph)	20	8	0	4	4	45	0	65	4	20	78	12
Pedestrians		1										
Lane Width (ft)		15.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											839	
pX, platoon unblocked												
vC, conflicting volume	240	194	85	195	198	67	91			69		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	240	194	85	195	198	67	91			69		
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 %	97	99	100	99	99	95	100			99		
cM capacity (veh/h)	675	695	979	753	691	1002	1515			1506		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	28	53	69	110
Volume Left	20	4	0	20
Volume Right	0	45	4	12
cSH	681	946	1515	1506
Volume to Capacity	0.04	0.06	0.00	0.01
Queue Length 95th (ft)	3	4	0	1
Control Delay (s)	10.5	9.0	0.0	1.4
Lane LOS	B	A		A
Approach Delay (s)	10.5	9.0	0.0	1.4
Approach LOS	B	A		

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	23.7%	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)	141	876	120	6	960	5	79	5	10	1	21	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		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		1.00										
Frt		0.979			0.998			0.983			0.895	
Flt Protected	0.950							0.961			0.999	
Satd. Flow (prot)	1796	1813	0	0	1824	0	0	2009	0	0	1773	0
Flt Permitted	0.279				0.992			0.612			0.990	
Satd. Flow (perm)	527	1813	0	0	1810	0	0	1279	0	0	1757	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			1			8			114	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1609			522			839			591	
Travel Time (s)		31.3			10.2			22.9			16.1	
Confl. Peds. (#/hr)			2	2								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.92	0.76	0.75	0.94	0.42	0.77	0.62	0.62	0.25	0.75	0.80
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	10%	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)	157	952	158	8	1021	12	103	8	16	4	28	114
Shared Lane Traffic (%)												
Lane Group Flow (vph)	157	1110	0	0	1041	0	0	127	0	0	146	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		28.0	28.0		28.0	28.0	
Total Split (s)	62.0	62.0	0.0	62.0	62.0	0.0	28.0	28.0	0.0	28.0	28.0	0.0
Total Split (%)	68.9%	68.9%	0.0%	68.9%	68.9%	0.0%	31.1%	31.1%	0.0%	31.1%	31.1%	0.0%
Maximum Green (s)	56.0	56.0		56.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0

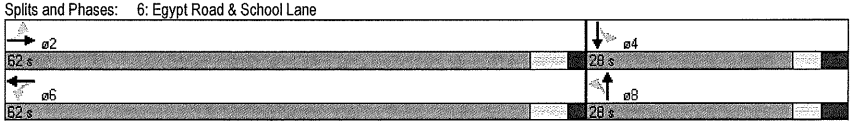
McMahon Associates, Inc.
6: Egypt Road & School Lane

Westover Recreation Development
2015 PM without Development with imps

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	
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	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio	0.42	0.87			0.82			0.64			0.40	
Control Delay	10.5	19.7			16.8			44.8			12.9	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	10.5	19.7			16.8			44.8			12.9	
Queue Length 50th (ft)	28	354			310			57			14	
Queue Length 95th (ft)	87	#831			#755			71			42	
Internal Link Dist (ft)		1529			442			759			511	
Turn Bay Length (ft)												
Base Capacity (vph)	371	1283			1276			346			550	
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	0.42	0.87			0.82			0.37			0.27	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 83
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: 6: Egypt Road & School Lane



Lanes, Volumes, Timings
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6: Egypt Road & School Lane
Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	876	120	6	960	5	79	5	10	1	21	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			1.00			0.98			0.89	
Flt Protected	0.95	1.00			1.00			0.96			1.00	
Satd. Flow (prot)	1796	1813			1824			2009			1772	
Flt Permitted	0.28	1.00			0.99			0.61			0.99	
Satd. Flow (perm)	527	1813			1810			1279			1756	
Peak-hour factor, PHF	0.90	0.92	0.76	0.75	0.94	0.42	0.77	0.62	0.62	0.25	0.75	0.80
Adj. Flow (vph)	157	952	158	8	1021	12	103	8	16	4	28	114
RTOR Reduction (vph)	0	5	0	0	0	0	0	7	0	0	97	0
Lane Group Flow (vph)	157	1105	0	0	1041	0	0	120	0	0	49	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	10%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	58.5	58.5			58.5			12.5			12.5	
Effective Green, g (s)	58.5	58.5			58.5			12.5			12.5	
Actuated g/C Ratio	0.70	0.70			0.70			0.15			0.15	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	371	1278			1276			193			264	
v/s Ratio Prot		c0.61										
v/s Ratio Perm	0.30				0.58			c0.09			0.03	
v/c Ratio	0.42	0.86			0.82			0.62			0.19	
Uniform Delay, d1	5.2	9.3			8.5			33.0			30.8	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	3.5	7.9			5.8			6.1			0.3	
Delay (s)	8.7	17.2			14.3			39.2			31.1	
Level of Service	A	B			B			D			C	
Approach Delay (s)		16.1			14.3			39.2			31.1	
Approach LOS		B			B			D			C	

Intersection Summary				
HCM Average Control Delay	17.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	83.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	129.1%	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)	56	665	62	4	635	2	93	5	3	0	11	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		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		0.985			0.998			0.992			0.894	
Flt Protected	0.950				0.999			0.959				
Satd. Flow (prot)	1796	1862	0	0	1823	0	0	2049	0	0	1773	0
Flt Permitted	0.352				0.984			0.682				
Satd. Flow (perm)	665	1862	0	0	1795	0	0	1457	0	0	1773	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		19			2			3				
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1609			522			839			591	
Travel Time (s)		31.3			10.2			22.9			16.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.92	0.76	0.33	0.92	0.25	0.80	0.42	0.38	0.25	0.46	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	1%	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)	69	723	82	12	690	8	116	12	8	0	24	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	69	805	0	0	710	0	0	136	0	0	110	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		22.0	22.0		22.0	22.0	
Total Split (s)	74.0	74.0	0.0	74.0	74.0	0.0	16.0	16.0	0.0	16.0	16.0	0.0
Total Split (%)	82.2%	82.2%	0.0%	82.2%	82.2%	0.0%	17.8%	17.8%	0.0%	17.8%	17.8%	0.0%
Maximum Green (s)	68.0	68.0		68.0	68.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0

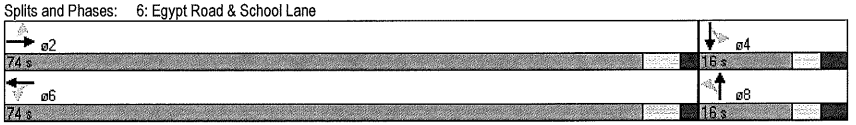
McMahon Associates, Inc.
6: Egypt Road & School Lane

Westover Recreation Development
2015 Saturday without Development with imps

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	
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		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio	0.20	0.82			0.75			0.34			0.23	
Control Delay	8.2	18.8			16.4			23.8			22.3	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	8.2	18.8			16.4			23.8			22.3	
Queue Length 50th (ft)	12	211			179			38			30	
Queue Length 95th (ft)	25	332			282			45			42	
Internal Link Dist (ft)		1529			442			759			511	
Turn Bay Length (ft)												
Base Capacity (vph)	651	1824			1758			399			482	
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	0.11	0.44			0.40			0.34			0.23	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 60.3
Natural Cycle: 60
Control Type: Semi Act-Uncoord

Splits and Phases: 6: Egypt Road & School Lane



Lanes, Volumes, Timings
I:\eng\812073\Traffic\analysis\2015 without\2015 SAT w-o Development with required left turn lane .syn

6: Egypt Road & School Lane
Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	665	62	4	635	2	93	5	3	0	11	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			1.00			0.99			0.89	
Flt Protected	0.95	1.00			1.00			0.96			1.00	
Satd. Flow (prot)	1796	1862			1824			2049			1774	
Flt Permitted	0.35	1.00			0.98			0.68			1.00	
Satd. Flow (perm)	665	1862			1797			1457			1774	
Peak-hour factor, PHF	0.81	0.92	0.76	0.33	0.92	0.25	0.80	0.42	0.38	0.25	0.46	0.76
Adj. Flow (vph)	69	723	82	12	690	8	116	12	8	0	24	86
RTOR Reduction (vph)	0	9	0	0	1	0	0	2	0	0	0	0
Lane Group Flow (vph)	69	796	0	0	709	0	0	134	0	0	110	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	31.6	31.6			31.6			16.4			16.4	
Effective Green, g (s)	31.6	31.6			31.6			16.4			16.4	
Actuated g/C Ratio	0.53	0.53			0.53			0.27			0.27	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	350	981			946			398			485	
v/s Ratio Prot		c0.43									0.06	
v/s Ratio Perm	0.10				0.39			c0.09				
v/c Ratio	0.20	0.81			0.75			0.34			0.23	
Uniform Delay, d1	7.5	11.7			11.1			17.4			16.9	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.3	5.2			3.3			2.3			1.1	
Delay (s)	7.8	16.9			14.4			19.7			18.0	
Level of Service	A	B			B			B			B	
Approach Delay (s)		16.2			14.4			19.7			18.0	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	15.9	HCM Level of Service		B
HCM Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	64.8%	ICU Level of Service		C
Analysis Period (min)	15			

c Critical Lane Group

APPENDIX H

2015 Future Capacity/Level-of-Service With Redevelopment Analysis Worksheets

Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	4	1276	1142	47	7	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	15	14	14
Grade (%)		2%	-2%		-2%	
Storage Length (ft)	0			0	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
Ped Bike Factor						
Frt				0.850	0.964	
Flt Protected					0.965	
Satd. Flow (prot)	0	2090	1900	1794	1661	0
Flt Permitted					0.965	
Satd. Flow (perm)	0	2090	1900	1794	1661	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		1056	113		905	
Travel Time (s)		20.6	2.2		24.7	
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)						
Peak Hour Factor	0.33	0.93	0.91	0.90	0.62	0.25
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	1%	0%	20%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	12	1372	1255	52	11	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1384	1255	52	15	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	4	1276	1142	47	7	1
Sign Control		Free	Free		Stop	
Grade		2%	-2%		-2%	
Peak Hour Factor	0.33	0.93	0.91	0.90	0.62	0.25
Hourly flow rate (vph)	12	1372	1255	52	11	4
Pedestrians					1	
Lane Width (ft)					14.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1308				2652	1256
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1308				2652	1256
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	98				48	98
cM capacity (veh/h)	535				22	211

Direction, Lane #	EB 1	WB 1	WB 2	SE 1
Volume Total	1384	1255	52	15
Volume Left	12	0	0	11
Volume Right	0	0	52	4
cSH	535	1700	1700	28
Volume to Capacity	0.02	0.74	0.03	0.54
Queue Length 95th (ft)	2	0	0	43
Control Delay (s)	1.5	0.0	0.0	235.0
Lane LOS	A			F
Approach Delay (s)	1.5	0.0		235.0
Approach LOS				F

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		80.3%	ICU Level of Service D
Analysis Period (min)		15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1124	159	17	1125	63	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Grade (%)	2%			-2%	-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	0.982				0.960	
Flt Protected				0.999	0.966	
Satd. Flow (prot)	2058	0	0	1899	1780	0
Flt Permitted				0.999	0.966	
Satd. Flow (perm)	2058	0	0	1899	1780	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	113			1609	376	
Travel Time (s)	2.2			31.3	10.3	
Confl. Peds. (#/hr)		3	3			
Confl. Bikes (#/hr)						
Peak Hour Factor	0.93	0.88	0.50	0.91	0.81	0.60
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	0%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	1209	181	34	1236	78	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1390	0	0	1270	111	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)	1124	159	17	1125	63	20
Sign Control	Free			Free	Stop	
Grade	2%			-2%	-2%	
Peak Hour Factor	0.93	0.88	0.50	0.91	0.81	0.60
Hourly flow rate (vph)	1209	181	34	1236	78	33
Pedestrians					3	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1392		2606	1302
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1392		2606	1302
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		0	83
cM capacity (veh/h)			496		26	198

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1389	1270	111
Volume Left	0	34	78
Volume Right	181	0	33
cSH	1700	496	35
Volume to Capacity	0.82	0.07	3.20
Queue Length 95th (ft)	0	5	Err
Control Delay (s)	0.0	3.5	Err
Lane LOS		A	F
Approach Delay (s)	0.0	3.5	Err
Approach LOS			F

Intersection Summary			
Average Delay	402.6		
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	149	876	120	6	960	5	79	21	10	1	48	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
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		1.00										
Frt		0.983			0.998			0.986			0.911	
Flt Protected		0.994						0.967			0.999	
Satd. Flow (prot)	0	1814	0	0	1824	0	0	2032	0	0	1805	0
Flt Permitted		0.729			0.990			0.546			0.993	
Satd. Flow (perm)	0	1331	0	0	1806	0	0	1147	0	0	1794	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			1			6			101	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1609			522			839			591	
Travel Time (s)		31.3			10.2			22.9			16.1	
Confl. Peds. (#/hr)			2	2								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.92	0.76	0.75	0.94	0.42	0.77	0.62	0.62	0.25	0.75	0.80
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	10%	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)	166	952	158	8	1021	12	103	34	16	4	64	130
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1276	0	0	1041	0	0	153	0	0	198	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		28.0	28.0		28.0	28.0	
Total Split (s)	62.0	62.0	0.0	62.0	62.0	0.0	28.0	28.0	0.0	28.0	28.0	0.0
Total Split (%)	68.9%	68.9%	0.0%	68.9%	68.9%	0.0%	31.1%	31.1%	0.0%	31.1%	31.1%	0.0%
Maximum Green (s)	56.0	56.0		56.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0

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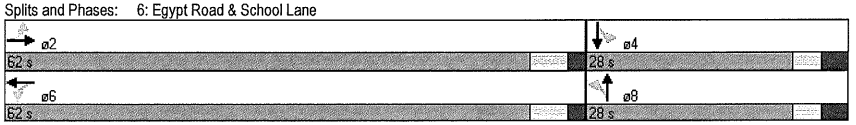
6: Egypt Road & School Lane
Westover Recreation Development
2015 PM with Development

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	
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	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio		1.41			0.85			0.74			0.49	
Control Delay		208.2			20.4			51.5			19.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		208.2			20.4			51.5			19.3	
Queue Length 50th (ft)		~909			355			73			44	
Queue Length 95th (ft)		#1288			#812			86			74	
Internal Link Dist (ft)		1529			442			759			511	
Turn Bay Length (ft)												
Base Capacity (vph)		908			1225			308			550	
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		1.41			0.85			0.50			0.36	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 83.2
Natural Cycle: 150
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: 6: Egypt Road & School Lane



Lanes, Volumes, Timings
I:\eng\812073\Traffic\analysis\2015 with\2015 PM w.syn
6: Egypt Road & School Lane
Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	876	120	6	960	5	79	21	10	1	48	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			1.00			0.99			0.91	
Flt Protected		0.99			1.00			0.97			1.00	
Satd. Flow (prot)		1814			1824			2033			1805	
Flt Permitted		0.73			0.99			0.55			0.99	
Satd. Flow (perm)		1331			1806			1148			1794	
Peak-hour factor, PHF	0.90	0.92	0.76	0.75	0.94	0.42	0.77	0.62	0.62	0.25	0.75	0.80
Adj. Flow (vph)	166	952	158	8	1021	12	103	34	16	4	64	130
RTOR Reduction (vph)	0	5	0	0	0	0	0	5	0	0	83	0
Lane Group Flow (vph)	0	1271	0	0	1041	0	0	148	0	0	115	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	10%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		56.5			56.5			14.7			14.7	
Effective Green, g (s)		56.5			56.5			14.7			14.7	
Actuated g/C Ratio		0.68			0.68			0.18			0.18	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		904			1226			203			317	
v/s Ratio Prot												
v/s Ratio Perm		c0.96			0.58			c0.13			0.06	
v/c Ratio		1.41			0.85			0.73			0.36	
Uniform Delay, d1		13.4			10.1			32.4			30.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		189.4			7.4			12.3			0.7	
Delay (s)		202.8			17.5			44.7			30.8	
Level of Service		F			B			D			C	
Approach Delay (s)		202.8			17.5			44.7			30.8	
Approach LOS		F			B			D			C	

Intersection Summary				
HCM Average Control Delay	108.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.27			
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	147.9%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

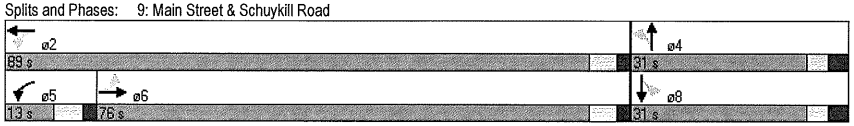
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	898	41	123	1328	10	60	83	103	16	70	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	10	10	10	11	11	11
Grade (%)		-1%			-1%			1%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			1.00	
Frt		0.992			0.998			0.915			0.929	
Flt Protected		0.998			0.996		0.950				0.995	
Satd. Flow (prot)	0	3365	0	0	3423	0	1643	1602	0	0	1698	0
Flt Permitted		0.783			0.666		0.395				0.747	
Satd. Flow (perm)	0	2640	0	0	2289	0	683	1602	0	0	1274	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		8			2			50				
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1036			1076			1400			830	
Travel Time (s)		17.7			18.3			38.2			22.6	
Confl. Peds. (#/hr)	3		8	8		3			1	1		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.80	0.97	0.75	0.92	0.92	0.62	0.75	0.80	0.75	0.67	0.85	0.77
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	3%	0%	0%	2%	0%	2%	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)	41	926	55	134	1443	16	80	104	137	24	82	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1022	0	0	1593	0	80	241	0	0	222	0
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	25.0	25.0		4.0	25.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	31.0	31.0		10.0	31.0		11.0	11.0		11.0	11.0	
Total Split (s)	76.0	76.0	0.0	13.0	89.0	0.0	31.0	31.0	0.0	31.0	31.0	0.0
Total Split (%)	63.3%	63.3%	0.0%	10.8%	74.2%	0.0%	25.8%	25.8%	0.0%	25.8%	25.8%	0.0%
Maximum Green (s)	70.0	70.0		7.0	83.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	5.0	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
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		C-Min	C-Min		None	C-Min		None	None		None	None
Walk Time (s)		7.0	7.0			7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		14.0	14.0			14.0		16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0	0			0		0	0		0	0
v/c Ratio			0.54			0.97		0.63	0.72			0.94
Control Delay			9.6			34.4		67.2	48.2			93.6
Queue Delay			0.0			0.0		0.0	0.0			0.0
Total Delay			9.6			34.4		67.2	48.2			93.6
Queue Length 50th (ft)			183			580		56	138			167
Queue Length 95th (ft)			239			#821		91	192			#275
Internal Link Dist (ft)			956			996			1320			750
Turn Bay Length (ft)												
Base Capacity (vph)			1890			1637		142	373			265
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			0.54			0.97		0.56	0.65			0.84

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: Main Street & Schuykill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	898	41	123	1328	10	60	83	103	16	70	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	11	11	10	10	10	11	11	11
Grade (%)		-1%			-1%			1%			0%	
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			1.00		1.00	0.99			1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Frt		0.99			1.00		1.00	0.91			0.93	
Flt Protected		1.00			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		3364			3423		1643	1602			1698	
Flt Permitted		0.78			0.67		0.40	1.00			0.75	
Satd. Flow (perm)		2639			2291		684	1602			1275	
Peak-hour factor, PHF	0.80	0.97	0.75	0.92	0.92	0.62	0.75	0.80	0.75	0.67	0.85	0.77
Adj. Flow (vph)	41	926	55	134	1443	16	80	104	137	24	82	116
RTOR Reduction (vph)	0	2	0	0	1	0	0	41	0	0	0	0
Lane Group Flow (vph)	0	1020	0	0	1592	0	80	200	0	0	222	0
Confl. Peds. (#/hr)	3		8	8		3			1	1		
Heavy Vehicles (%)	6%	3%	0%	0%	2%	0%	2%	0%	0%	0%	0%	0%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		85.8			85.8		22.2	22.2			22.2	
Effective Green, g (s)		85.8			85.8		22.2	22.2			22.2	
Actuated g/C Ratio		0.71			0.71		0.18	0.18			0.18	
Clearance Time (s)		6.0			6.0		6.0	6.0			6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		1887			1638		127	296			236	
v/s Ratio Prot								0.13				
v/s Ratio Perm		0.39			c0.70		0.12				c0.17	
v/c Ratio		0.54			0.97		0.63	0.68			0.94	
Uniform Delay, d1		7.9			16.0		45.1	45.6			48.3	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		1.1			16.0		9.4	6.0			42.3	
Delay (s)		9.1			32.0		54.5	51.6			90.6	
Level of Service		A			C		D	D			F	
Approach Delay (s)		9.1			32.0			52.3			90.6	
Approach LOS		A			C			D			F	

Intersection Summary

HCM Average Control Delay	30.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	65	5	5	161	254	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Grade (%)	-2%			4%	-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	0.984				0.977	
Flt Protected	0.958			0.998		
Satd. Flow (prot)	2015	0	0	1809	1853	0
Flt Permitted	0.958			0.998		
Satd. Flow (perm)	2015	0	0	1809	1853	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	1021			1000	1400	
Travel Time (s)	27.8			27.3	38.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.73	0.42	0.63	0.83	0.85	0.82
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	20%	2%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	89	12	8	194	299	61
Shared Lane Traffic (%)						
Lane Group Flow (vph)	101	0	0	202	360	0
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	65	5	5	161	254	50
Peak Hour Factor	0.73	0.42	0.63	0.83	0.85	0.82
Hourly flow rate (vph)	89	12	8	194	299	61

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	101	202	360
Volume Left (vph)	89	8	0
Volume Right (vph)	12	0	61
Hadj (s)	0.14	0.05	-0.07
Departure Headway (s)	5.3	4.6	4.3
Degree Utilization, x	0.15	0.26	0.43
Capacity (veh/h)	616	748	802
Control Delay (s)	9.2	9.2	10.6
Approach Delay (s)	9.2	9.2	10.6
Approach LOS	A	A	B

Intersection Summary					
Delay		10.0			
HCM Level of Service		A			
Intersection Capacity Utilization		27.0%	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)	0	17	32	0	6	11	14	155	1	24	231	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	14	14	14	12	12	12	11	11	11
Grade (%)		-3%			3%			1%			-2%	
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		0.912			0.929			0.997			0.993	
Flt Protected								0.995			0.995	
Satd. Flow (prot)	0	1993	0	0	1855	0	0	1827	0	0	1818	0
Flt Permitted								0.995			0.995	
Satd. Flow (perm)	0	1993	0	0	1855	0	0	1827	0	0	1818	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1077			860			673			1000	
Travel Time (s)		29.4			23.5			18.4			27.3	
Confl. Peds. (#/hr)			2	2			1					1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.25	0.71	0.71	0.25	0.38	0.62	0.70	0.82	0.25	0.72	0.89	0.31
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	1%	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	24	45	0	16	18	20	189	4	33	260	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	69	0	0	34	0	0	213	0	0	309	0
Sign Control		Stop			Stop			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		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	17	32	0	6	11	14	155	1	24	231	5
Peak Hour Factor	0.25	0.71	0.71	0.25	0.38	0.62	0.70	0.82	0.25	0.72	0.89	0.31
Hourly flow rate (vph)	0	24	45	0	16	18	20	189	4	33	260	16

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	69	34	213	309
Volume Left (vph)	0	0	20	33
Volume Right (vph)	45	18	4	16
Hadj (s)	-0.39	-0.32	0.05	0.00
Departure Headway (s)	4.7	4.9	4.5	4.4
Degree Utilization, x	0.09	0.05	0.27	0.38
Capacity (veh/h)	677	652	762	790
Control Delay (s)	8.2	8.1	9.2	10.0
Approach Delay (s)	8.2	8.1	9.2	10.0
Approach LOS	A	A	A	B

Intersection Summary			
Delay	9.5		
HCM Level of Service	A		
Intersection Capacity Utilization	29.3%	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)	87	0	2	3	0	17	2	66	5	41	114	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	11	11	11	10	10	10	11	11	11
Grade (%)		-3%			3%			2%			-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		0.996			0.903			0.983			0.929	
Flt Protected		0.954			0.986			0.998			0.991	
Satd. Flow (prot)	0	1864	0	0	1611	0	0	1634	0	0	1701	0
Flt Permitted		0.954			0.986			0.998			0.991	
Satd. Flow (perm)	0	1864	0	0	1611	0	0	1634	0	0	1701	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		1018			856			611			673	
Travel Time (s)		23.1			19.5			13.9			18.4	
Confl. Peds. (#/hr)							9					9
Confl. Bikes (#/hr)												
Peak Hour Factor	0.62	0.25	0.50	0.25	0.25	0.54	0.50	0.82	0.42	0.56	0.92	0.50
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	0%	0%	0%	0%	0%	50%	4%	0%	0%	3%	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)	140	0	4	12	0	31	4	80	12	73	124	216
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	144	0	0	43	0	0	96	0	0	413	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)	87	0	2	3	0	17	2	66	5	41	114	108
Sign Control		Stop			Stop			Free			Free	
Grade		-3%			3%			2%			-3%	
Peak Hour Factor	0.62	0.25	0.50	0.25	0.25	0.54	0.50	0.82	0.42	0.56	0.92	0.50
Hourly flow rate (vph)	140	0	4	12	0	31	4	80	12	73	124	216
Pedestrians		9										
Lane Width (ft)		14.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		1										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	513	488	241	477	590	86	349			92		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	513	488	241	477	590	86	349			92		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.6			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.7			2.2		
p0 queue free %	67	100	99	97	100	97	100			95		
cM capacity (veh/h)	427	454	796	476	397	978	978			1515		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	144	43	96	413
Volume Left	140	12	4	73
Volume Right	4	31	12	216
cSH	433	757	978	1515
Volume to Capacity	0.33	0.06	0.00	0.05
Queue Length 95th (ft)	36	5	0	4
Control Delay (s)	17.4	10.0	0.4	1.7
Lane LOS	C	B	A	A
Approach Delay (s)	17.4	10.0	0.4	1.7
Approach LOS	C	B		

Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	40.2%	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)	20	1	0	2	2	29	0	38	0	59	58	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	16	16	16	16	16	16	16	16	16
Grade (%)		-2%			3%			1%			-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					0.887						0.963	
Flt Protected		0.955			0.996						0.982	
Satd. Flow (prot)	0	2016	0	0	1874	0	0	2143	0	0	2047	0
Flt Permitted		0.955			0.996						0.982	
Satd. Flow (perm)	0	2016	0	0	1874	0	0	2143	0	0	2047	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		560			640			420			839	
Travel Time (s)		15.3			17.5			11.5			22.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.25	0.25	0.25	0.50	0.50	0.70	0.25	0.66	0.25	0.76	0.75	0.58
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)	80	4	0	4	4	41	0	58	0	78	77	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	84	0	0	49	0	0	58	0	0	214	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)	20	1	0	2	2	29	0	38	0	59	58	34
Sign Control		Stop			Stop			Free			Free	
Grade		-2%			3%			1%			-1%	
Peak Hour Factor	0.25	0.25	0.25	0.50	0.50	0.70	0.25	0.66	0.25	0.76	0.75	0.58
Hourly flow rate (vph)	80	4	0	4	4	41	0	58	0	78	77	59
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											839	
pX, platoon unblocked												
vC, conflicting volume	363	319	107	321	349	58	136			58		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	363	319	107	321	349	58	136			58		
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 %	85	99	100	99	99	96	100			95		
cM capacity (veh/h)	548	571	953	608	549	1014	1461			1560		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	84	49	58	214
Volume Left	80	4	0	78
Volume Right	0	41	0	59
cSH	549	903	1461	1560
Volume to Capacity	0.15	0.05	0.00	0.05
Queue Length 95th (ft)	13	4	0	4
Control Delay (s)	12.7	9.2	0.0	3.0
Lane LOS	B	A		A
Approach Delay (s)	12.7	9.2	0.0	3.0
Approach LOS	B	A		

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	29.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	57	26	0	87	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
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	0.865					
Flt Protected						0.976
Satd. Flow (prot)	1611	0	1863	0	0	1818
Flt Permitted						0.976
Satd. Flow (perm)	1611	0	1863	0	0	1818
Link Speed (mph)	30		25			25
Link Distance (ft)	489		745			655
Travel Time (s)	11.1		20.3			17.9
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	62	28	0	95	97
Shared Lane Traffic (%)						
Lane Group Flow (vph)	62	0	28	0	0	192
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)	0	57	26	0	87	89
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	62	28	0	95	97
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	314	28			28	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	314	28			28	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	94			94	
cM capacity (veh/h)	638	1047			1585	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	62	28	191
Volume Left	0	0	95
Volume Right	62	0	0
cSH	1047	1700	1585
Volume to Capacity	0.06	0.02	0.06
Queue Length 95th (ft)	5	0	5
Control Delay (s)	8.7	0.0	3.9
Lane LOS	A		A
Approach Delay (s)	8.7	0.0	3.9
Approach LOS	A		

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	26.4%	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)	149	876	120	6	960	5	79	21	10	1	48	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		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		1.00										
Frt		0.979			0.998			0.986			0.911	
Flt Protected	0.950							0.967			0.999	
Satd. Flow (prot)	1796	1813	0	0	1824	0	0	2032	0	0	1805	0
Flt Permitted	0.272				0.991			0.518			0.993	
Satd. Flow (perm)	514	1813	0	0	1808	0	0	1088	0	0	1794	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			1			6			104	
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1721			522			839			591	
Travel Time (s)		33.5			10.2			22.9			16.1	
Confl. Peds. (#/hr)			2	2								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.92	0.76	0.75	0.94	0.42	0.77	0.62	0.62	0.25	0.75	0.80
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	10%	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)	166	952	158	8	1021	12	103	34	16	4	64	130
Shared Lane Traffic (%)												
Lane Group Flow (vph)	166	1110	0	0	1041	0	0	153	0	0	198	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		28.0	28.0		28.0	28.0	
Total Split (s)	60.0	60.0	0.0	60.0	60.0	0.0	30.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	66.7%	66.7%	0.0%	66.7%	66.7%	0.0%	33.3%	33.3%	0.0%	33.3%	33.3%	0.0%
Maximum Green (s)	54.0	54.0		54.0	54.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0

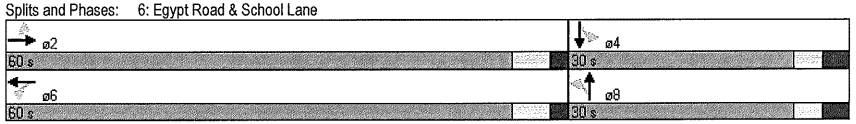
McMahon Associates, Inc.
6: Egypt Road & School Lane

Westover Recreation Development
2015 PM with Development with imps

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	
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	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio	0.46	0.88			0.83			0.80			0.50	
Control Delay	13.6	20.0			19.1			61.7			19.8	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	13.6	20.0			19.1			61.7			19.8	
Queue Length 50th (ft)	55	483			366			81			47	
Queue Length 95th (ft)	m72	m483			#814			86			72	
Internal Link Dist (ft)		1641			442			759			511	
Turn Bay Length (ft)												
Base Capacity (vph)	357	1265			1257			295			555	
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	0.46	0.88			0.83			0.52			0.36	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Egypt Road & School Lane



Lanes, Volumes, Timings
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6: Egypt Road & School Lane
Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	876	120	6	960	5	79	21	10	1	48	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			1.00			0.99			0.91	
Flt Protected	0.95	1.00			1.00			0.97			1.00	
Satd. Flow (prot)	1796	1812			1824			2033			1805	
Flt Permitted	0.27	1.00			0.99			0.52			0.99	
Satd. Flow (perm)	514	1812			1809			1089			1795	
Peak-hour factor, PHF	0.90	0.92	0.76	0.75	0.94	0.42	0.77	0.62	0.62	0.25	0.75	0.80
Adj. Flow (vph)	166	952	158	8	1021	12	103	34	16	4	64	130
RTOR Reduction (vph)	0	5	0	0	0	0	0	5	0	0	86	0
Lane Group Flow (vph)	166	1105	0	0	1041	0	0	148	0	0	112	0
Confl. Peds. (#/hr)			2	2								
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	10%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	62.5	62.5			62.5			15.5			15.5	
Effective Green, g (s)	62.5	62.5			62.5			15.5			15.5	
Actuated g/C Ratio	0.69	0.69			0.69			0.17			0.17	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	357	1258			1256			188			309	
v/s Ratio Prot		c0.61										
v/s Ratio Perm	0.32				0.58			c0.14			0.06	
v/c Ratio	0.46	0.88			0.83			0.79			0.36	
Uniform Delay, d1	6.2	10.8			9.9			35.7			32.9	
Progression Factor	1.44	1.38			1.00			1.00			1.00	
Incremental Delay, d2	1.1	2.4			6.4			19.2			0.7	
Delay (s)	10.0	17.3			16.3			54.9			33.6	
Level of Service	A	B			B			D			C	
Approach Delay (s)		16.3			16.3			54.9			33.6	
Approach LOS		B			B			D			C	

Intersection Summary				
HCM Average Control Delay	19.8	HCM Level of Service		B
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	139.6%	ICU Level of Service		H
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (vph)	2	893	893	19	11	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	15	14	14
Grade (%)		2%	-2%		-2%	
Storage Length (ft)	0			0	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
Ped Bike Factor						
Frt				0.850	0.949	
Flt Protected					0.970	
Satd. Flow (prot)	0	2111	1881	1521	1656	0
Flt Permitted					0.970	
Satd. Flow (perm)	0	2111	1881	1521	1656	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		1056	113		905	
Travel Time (s)		20.6	2.2		24.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.50	0.95	0.99	0.71	0.56	0.50
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	2%	18%	22%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	4	940	902	27	20	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	944	902	27	32	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Volume (veh/h)	2	893	893	19	11	6
Sign Control		Free	Free		Stop	
Grade		2%	-2%		-2%	
Peak Hour Factor	0.50	0.95	0.99	0.71	0.56	0.50
Hourly flow rate (vph)	4	940	902	27	20	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	929				1850	902
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	929				1850	902
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	99				73	96
cM capacity (veh/h)	745				72	339

Direction, Lane #	EB 1	WB 1	WB 2	SE 1
Volume Total	944	902	27	32
Volume Left	4	0	0	20
Volume Right	0	0	27	12
cSH	745	1700	1700	103
Volume to Capacity	0.01	0.53	0.02	0.31
Queue Length 95th (ft)	0	0	0	29
Control Delay (s)	0.2	0.0	0.0	54.8
Lane LOS	A			F
Approach Delay (s)	0.2	0.0		54.8
Approach LOS				F

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	775	129	15	791	122	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Grade (%)	2%			-2%	-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	0.975				0.986	
Flt Protected				0.998	0.957	
Satd. Flow (prot)	2054	0	0	1879	1764	0
Flt Permitted				0.998	0.957	
Satd. Flow (perm)	2054	0	0	1879	1764	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	113			1609	376	
Travel Time (s)	2.2			31.3	10.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.95	0.70	0.38	0.99	0.43	0.67
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	2%	0%	2%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	816	184	39	799	284	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1000	0	0	838	318	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)	775	129	15	791	122	23
Sign Control	Free			Free	Stop	
Grade	2%			-2%	-2%	
Peak Hour Factor	0.95	0.70	0.38	0.99	0.43	0.67
Hourly flow rate (vph)	816	184	39	799	284	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1000		1786	908
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1000		1786	908
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		0	90
cM capacity (veh/h)			700		84	337

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1000	838	318
Volume Left	0	39	284
Volume Right	184	0	34
cSH	1700	700	92
Volume to Capacity	0.59	0.06	3.47
Queue Length 95th (ft)	0	4	Err
Control Delay (s)	0.0	1.6	Err
Lane LOS		A	F
Approach Delay (s)	0.0	1.6	Err
Approach LOS			F

Intersection Summary			
Average Delay	1475.2		
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		

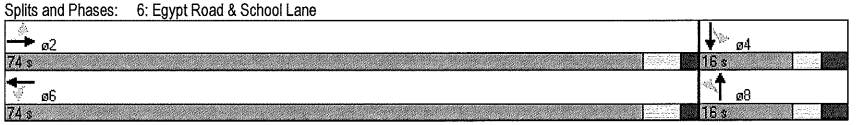
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	71	665	62	4	635	2	93	34	3	0	36	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
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		0.988			0.998			0.995			0.924	
Flt Protected		0.995			0.999			0.972				
Satd. Flow (prot)	0	1858	0	0	1823	0	0	2083	0	0	1832	0
Flt Permitted		0.876			0.983			0.714				
Satd. Flow (perm)	0	1636	0	0	1793	0	0	1530	0	0	1832	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		17			2			2				
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1609			522			839			591	
Travel Time (s)		31.3			10.2			22.9			16.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.92	0.76	0.33	0.92	0.25	0.80	0.42	0.38	0.25	0.46	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	1%	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)	88	723	82	12	690	8	116	81	8	0	78	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	893	0	0	710	0	0	205	0	0	179	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		22.0	22.0		22.0	22.0	
Total Split (s)	74.0	74.0	0.0	74.0	74.0	0.0	16.0	16.0	0.0	16.0	16.0	0.0
Total Split (%)	82.2%	82.2%	0.0%	82.2%	82.2%	0.0%	17.8%	17.8%	0.0%	17.8%	17.8%	0.0%
Maximum Green (s)	68.0	68.0		68.0	68.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0

McMahon Associates, Inc.
6: Egypt Road & School Lane
Westover Recreation Development
2015 Saturday with Development

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	
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		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio		0.89			0.65			0.59			0.44	
Control Delay		23.7			11.8			39.0			33.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		23.7			11.8			39.0			33.4	
Queue Length 50th (ft)		293			179			83			70	
Queue Length 95th (ft)		470			264			82			80	
Internal Link Dist (ft)		1529			442			759			511	
Turn Bay Length (ft)												
Base Capacity (vph)		1457			1595			345			411	
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		0.61			0.45			0.59			0.44	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 74.3
Natural Cycle: 70
Control Type: Semi Act-Uncoord

Splits and Phases: 6: Egypt Road & School Lane



Lanes, Volumes, Timings
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6: Egypt Road & School Lane
Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	71	665	62	4	635	2	93	34	3	0	36	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.99			0.92	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		1858			1824			2083			1832	
Flt Permitted		0.88			0.98			0.71			1.00	
Satd. Flow (perm)		1635			1795			1530			1832	
Peak-hour factor, PHF	0.81	0.92	0.76	0.33	0.92	0.25	0.80	0.42	0.38	0.25	0.46	0.76
Adj. Flow (vph)	88	723	82	12	690	8	116	81	8	0	78	101
RTOR Reduction (vph)	0	7	0	0	1	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	886	0	0	709	0	0	203	0	0	179	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		45.1			45.1			16.7			16.7	
Effective Green, g (s)		45.1			45.1			16.7			16.7	
Actuated g/C Ratio		0.61			0.61			0.23			0.23	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		999			1097			346			415	
v/s Ratio Prot											0.10	
v/s Ratio Perm		c0.54			0.40			c0.13				
v/c Ratio		0.89			0.65			0.59			0.43	
Uniform Delay, d1		12.2			9.2			25.5			24.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		9.6			1.3			7.1			3.2	
Delay (s)		21.8			10.5			32.6			27.7	
Level of Service		C			B			C			C	
Approach Delay (s)		21.8			10.5			32.6			27.7	
Approach LOS		C			B			C			C	

Intersection Summary				
HCM Average Control Delay	19.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	105.2%	ICU Level of Service	G	
Analysis Period (min)	15			

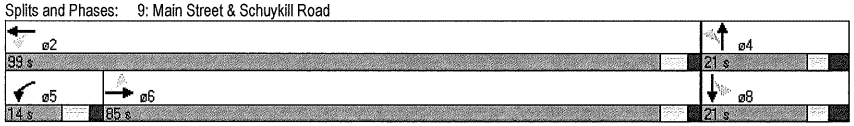
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑			↕	
Volume (vph)	38	720	22	94	782	35	24	49	123	69	54	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	10	10	10	11	11	11
Grade (%)		-1%			-1%			1%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		1.00				1.00	
Frt		0.994			0.991			0.889			0.966	
Flt Protected		0.997			0.994		0.950				0.980	
Satd. Flow (prot)	0	3377	0	0	3321	0	1676	1501	0	0	1707	0
Flt Permitted		0.802			0.652		0.608				0.662	
Satd. Flow (perm)	0	2717	0	0	2178	0	1072	1501	0	0	1153	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			16			96			12	
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		1036			1076			1400			830	
Travel Time (s)		17.7			18.3			38.2			22.6	
Confl. Peds. (#/hr)	2		2	2		2	1					1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.71	0.94	0.63	0.75	0.96	0.61	0.75	0.82	0.73	0.93	0.90	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	2%	20%	10%	3%	3%	0%	3%	5%	2%	2%	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)	54	766	35	125	815	57	32	60	168	74	60	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	855	0	0	997	0	32	228	0	0	179	0
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	25.0	25.0		4.0	25.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	31.0	31.0		10.0	31.0		11.0	11.0		11.0	11.0	
Total Split (s)	85.0	85.0	0.0	14.0	99.0	0.0	21.0	21.0	0.0	21.0	21.0	0.0
Total Split (%)	70.8%	70.8%	0.0%	11.7%	82.5%	0.0%	17.5%	17.5%	0.0%	17.5%	17.5%	0.0%
Maximum Green (s)	79.0	79.0		8.0	93.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-1.0	0.0	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	6.0	6.0	4.0	5.0	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
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		C-Min	C-Min		None	C-Min		None	None		None	None
Walk Time (s)		7.0	7.0			7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		14.0	14.0			14.0		16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)		0	0			0		0	0		0	0
v/c Ratio			0.51			0.74		0.11	0.46			0.53
Control Delay			13.4			18.9		42.1	27.8			45.6
Queue Delay			0.0			0.0		0.0	0.0			0.0
Total Delay			13.4			18.9		42.1	27.8			45.6
Queue Length 50th (ft)			175			256		19	83			111
Queue Length 95th (ft)			121			184		45	#192			#305
Internal Link Dist (ft)			956			996			1320			750
Turn Bay Length (ft)												
Base Capacity (vph)			1880			1692		304	495			336
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			0.45			0.59		0.11	0.46			0.53

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: Main Street & Schuykill Road



McMahon Associates, Inc.
9: Main Street & Schuykill Road
Westover Recreation Development
2015 Saturday with Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	720	22	94	782	35	24	49	123	69	54	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	11	11	10	10	10	11	11	11
Grade (%)		-1%			-1%			1%			0%	
Total Lost time (s)		6.0			6.0		6.0	6.0			6.0	
Lane Util. Factor		0.95			0.95		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Frt		0.99			0.99		1.00	0.89			0.97	
Flt Protected		1.00			0.99		0.95	1.00			0.98	
Satd. Flow (prot)		3376			3321		1675	1502			1707	
Flt Permitted		0.80			0.65		0.61	1.00			0.66	
Satd. Flow (perm)		2716			2180		1071	1502			1154	
Peak-hour factor, PHF	0.71	0.94	0.63	0.75	0.96	0.61	0.75	0.82	0.73	0.93	0.90	0.91
Adj. Flow (vph)	54	766	35	125	815	57	32	60	168	74	60	45
RTOR Reduction (vph)	0	3	0	0	6	0	0	69	0	0	9	0
Lane Group Flow (vph)	0	852	0	0	991	0	32	159	0	0	170	0
Confl. Peds. (#/hr)	2		2	2		2	1					1
Heavy Vehicles (%)	3%	2%	20%	10%	3%	3%	0%	3%	5%	2%	2%	0%
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		73.9			73.9		34.1	34.1			34.1	
Effective Green, g (s)		73.9			73.9		34.1	34.1			34.1	
Actuated g/C Ratio		0.62			0.62		0.28	0.28			0.28	
Clearance Time (s)		6.0			6.0		6.0	6.0			6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		1673			1343		304	427			328	
v/s Ratio Prot								0.11				
v/s Ratio Perm		0.31			c0.45		0.03				c0.15	
v/c Ratio		0.51			0.74		0.11	0.37			0.52	
Uniform Delay, d1		12.9			16.2		31.7	34.4			36.1	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		1.1			2.2		0.2	0.6			1.4	
Delay (s)		14.0			18.4		31.8	34.9			37.5	
Level of Service		B			B		C	C			D	
Approach Delay (s)		14.0			18.4			34.6			37.5	
Approach LOS		B			B			C			D	

Intersection Summary

HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	28	6	7	232	213	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	12	12	12	12
Grade (%)	-2%			4%	-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	0.965				0.981	
Flt Protected	0.964			0.998		
Satd. Flow (prot)	1965	0	0	1841	1860	0
Flt Permitted	0.964			0.998		
Satd. Flow (perm)	1965	0	0	1841	1860	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	1021			1000	1400	
Travel Time (s)	27.8			27.3	38.2	
Confl. Peds. (#/hr)			2			2
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.62	0.50	0.87	0.70	0.71
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	0%	0%	1%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	29	10	14	267	304	49
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	0	0	281	353	0
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	28	6	7	232	213	35
Peak Hour Factor	0.96	0.62	0.50	0.87	0.70	0.71
Hourly flow rate (vph)	29	10	14	267	304	49

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	39	281	354
Volume Left (vph)	29	14	0
Volume Right (vph)	10	0	49
Hadj (s)	0.05	0.03	-0.05
Departure Headway (s)	5.3	4.4	4.2
Degree Utilization, x	0.06	0.34	0.42
Capacity (veh/h)	601	800	827
Control Delay (s)	8.6	9.7	10.3
Approach Delay (s)	8.6	9.7	10.3
Approach LOS	A	A	B

Intersection Summary				
Delay		9.9		
HCM Level of Service		A		
Intersection Capacity Utilization	27.9%		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)	3	18	20	0	15	28	37	208	5	25	189	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	14	14	14	12	12	12	11	11	11
Grade (%)		-3%			3%			1%			-2%	
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		0.956			0.909			0.996			0.994	
Flt Protected		0.994						0.992			0.992	
Satd. Flow (prot)	0	2010	0	0	1815	0	0	1853	0	0	1800	0
Flt Permitted		0.994						0.992			0.992	
Satd. Flow (perm)	0	2010	0	0	1815	0	0	1853	0	0	1800	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1077			860			673			1000	
Travel Time (s)		29.4			23.5			18.4			27.3	
Confl. Peds. (#/hr)	7					7						
Confl. Bikes (#/hr)												
Peak Hour Factor	0.38	0.50	0.95	0.25	0.75	0.68	0.75	0.88	0.62	0.60	0.86	0.42
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	6%	0%	0%	0%	0%	0%	1%	0%	0%	2%	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)	8	36	21	0	20	41	49	236	8	42	220	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	65	0	0	61	0	0	293	0	0	274	0
Sign Control		Stop			Stop			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		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	3	18	20	0	15	28	37	208	5	25	189	5
Peak Hour Factor	0.38	0.50	0.95	0.25	0.75	0.68	0.75	0.88	0.62	0.60	0.86	0.42
Hourly flow rate (vph)	8	36	21	0	20	41	49	236	8	42	220	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	65	61	294	273
Volume Left (vph)	8	0	49	42
Volume Right (vph)	21	41	8	12
Hadj (s)	-0.11	-0.40	0.03	0.03
Departure Headway (s)	5.2	4.9	4.6	4.6
Degree Utilization, x	0.09	0.08	0.37	0.35
Capacity (veh/h)	614	643	758	750
Control Delay (s)	8.7	8.4	10.3	10.1
Approach Delay (s)	8.7	8.4	10.3	10.1
Approach LOS	A	A	B	B

Intersection Summary					
Delay			9.9		
HCM Level of Service			A		
Intersection Capacity Utilization			31.3%	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)	125	0	3	5	0	33	2	92	4	17	70	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	11	11	11	10	10	10	11	11	11
Grade (%)		-3%			3%			2%			-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		0.997			0.890			0.991			0.917	
Flt Protected		0.954			0.991			0.998			0.997	
Satd. Flow (prot)	0	1957	0	0	1557	0	0	1721	0	0	1648	0
Flt Permitted		0.954			0.991			0.998			0.997	
Satd. Flow (perm)	0	1957	0	0	1557	0	0	1721	0	0	1648	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		1018			856			611			673	
Travel Time (s)		23.1			19.5			13.9			18.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.41	0.25	0.38	0.62	0.25	0.91	0.50	0.83	0.50	0.85	0.74	0.68
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	1%	0%	0%	3%	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)	305	0	8	8	0	36	4	111	8	20	95	181
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	313	0	0	44	0	0	123	0	0	296	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)	125	0	3	5	0	33	2	92	4	17	70	123
Sign Control		Stop			Stop			Free			Free	
Grade		-3%			3%			2%			-3%	
Peak Hour Factor	0.41	0.25	0.38	0.62	0.25	0.91	0.50	0.83	0.50	0.85	0.74	0.68
Hourly flow rate (vph)	305	0	8	8	0	36	4	111	8	20	95	181
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	384	352	185	356	438	115	275			119		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	384	352	185	356	438	115	275			119		
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 %	44	100	99	99	100	96	100			99		
cM capacity (veh/h)	549	567	863	590	506	935	1299			1482		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	313	44	123	295
Volume Left	305	8	4	20
Volume Right	8	36	8	181
cSH	554	845	1299	1482
Volume to Capacity	0.56	0.05	0.00	0.01
Queue Length 95th (ft)	87	4	0	1
Control Delay (s)	19.6	9.5	0.3	0.6
Lane LOS	C	A	A	A
Approach Delay (s)	19.6	9.5	0.3	0.6
Approach LOS	C	A		

Intersection Summary				
Average Delay	8.7			
Intersection Capacity Utilization	39.3%	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)	39	4	0	1	3	29	0	53	1	17	56	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	16	16	16	16	16	16	16	16	16
Grade (%)		-2%			3%			1%			-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					0.885			0.992			0.951	
Flt Protected		0.957			0.996						0.994	
Satd. Flow (prot)	0	2020	0	0	1870	0	0	2125	0	0	2009	0
Flt Permitted		0.957			0.996						0.994	
Satd. Flow (perm)	0	2020	0	0	1870	0	0	2125	0	0	2009	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		560			640			420			839	
Travel Time (s)		15.3			17.5			11.5			22.9	
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)												
Peak Hour Factor	0.50	0.50	0.25	0.25	0.75	0.64	0.25	0.81	0.25	0.85	0.72	0.58
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%	6%	2%	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)	78	8	0	4	4	45	0	65	4	20	78	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	0	0	53	0	0	69	0	0	153	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)	39	4	0	1	3	29	0	53	1	17	56	32
Sign Control		Stop			Stop			Free			Free	
Grade		-2%			3%			1%			-1%	
Peak Hour Factor	0.50	0.50	0.25	0.25	0.75	0.64	0.25	0.81	0.25	0.85	0.72	0.58
Hourly flow rate (vph)	78	8	0	4	4	45	0	65	4	20	78	55
Pedestrians		1										
Lane Width (ft)		15.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											839	
pX, platoon unblocked												
vC, conflicting volume	261	216	106	217	241	67	134			69		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	261	216	106	217	241	67	134			69		
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 %	88	99	100	99	99	95	100			99		
cM capacity (veh/h)	654	676	952	729	654	1002	1462			1506		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	86	53	69	153
Volume Left	78	4	0	20
Volume Right	0	45	4	55
cSH	656	938	1462	1506
Volume to Capacity	0.13	0.06	0.00	0.01
Queue Length 95th (ft)	11	5	0	1
Control Delay (s)	11.3	9.1	0.0	1.1
Lane LOS	B	A		A
Approach Delay (s)	11.3	9.1	0.0	1.1
Approach LOS	B	A		

Intersection Summary					
Average Delay	4.5				
Intersection Capacity Utilization	28.3%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	57	88	0	93	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
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	0.865					
Flt Protected						0.969
Satd. Flow (prot)	1611	0	1863	0	0	1805
Flt Permitted						0.969
Satd. Flow (perm)	1611	0	1863	0	0	1805
Link Speed (mph)	30		25			25
Link Distance (ft)	736		815			585
Travel Time (s)	16.7		22.2			16.0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	62	96	0	101	55
Shared Lane Traffic (%)						
Lane Group Flow (vph)	62	0	96	0	0	156
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)	0	57	88	0	93	51
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	62	96	0	101	55
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	353	96			96	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	353	96			96	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	94			93	
cM capacity (veh/h)	601	961			1498	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	62	96	157
Volume Left	0	0	101
Volume Right	62	0	0
cSH	961	1700	1498
Volume to Capacity	0.06	0.06	0.07
Queue Length 95th (ft)	5	0	5
Control Delay (s)	9.0	0.0	5.1
Lane LOS	A		A
Approach Delay (s)	9.0	0.0	5.1
Approach LOS	A		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

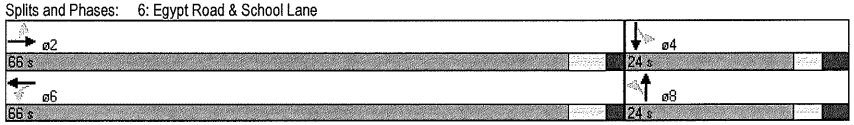
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	665	62	4	635	2	93	34	3	0	36	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		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		0.985			0.998			0.995			0.924	
Flt Protected	0.950				0.999			0.972				
Satd. Flow (prot)	1796	1862	0	0	1823	0	0	2083	0	0	1832	0
Flt Permitted	0.378				0.985			0.649				
Satd. Flow (perm)	715	1862	0	0	1797	0	0	1391	0	0	1832	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		14			1			2				
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1721			522			839			591	
Travel Time (s)		33.5			10.2			22.9			16.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.92	0.76	0.33	0.92	0.25	0.80	0.42	0.38	0.25	0.46	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	1%	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)	88	723	82	12	690	8	116	81	8	0	78	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	805	0	0	710	0	0	205	0	0	179	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		22.0	22.0		22.0	22.0	
Total Split (s)	66.0	66.0	0.0	66.0	66.0	0.0	24.0	24.0	0.0	24.0	24.0	0.0
Total Split (%)	73.3%	73.3%	0.0%	73.3%	73.3%	0.0%	26.7%	26.7%	0.0%	26.7%	26.7%	0.0%
Maximum Green (s)	60.0	60.0		60.0	60.0		18.0	18.0		18.0	18.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0

McMahon Associates, Inc.
6: Egypt Road & School Lane
Westover Recreation Development
2015 Saturday with Development with imps

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	
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	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	9.0	9.0		9.0	9.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
v/c Ratio	0.18	0.65			0.59			0.73			0.49	
Control Delay	12.1	22.9			10.8			50.5			37.2	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	12.1	22.9			10.8			50.5			37.2	
Queue Length 50th (ft)	36	464			195			109			91	
Queue Length 95th (ft)	m39	589			292			75			73	
Internal Link Dist (ft)		1641			442			759			511	
Turn Bay Length (ft)												
Base Capacity (vph)	477	1246			1198			280			366	
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	0.18	0.65			0.59			0.73			0.49	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Egypt Road & School Lane



Lanes, Volumes, Timings
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6: Egypt Road & School Lane
Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	665	62	4	635	2	93	34	3	0	36	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	16	16	16	13	13	13
Grade (%)		1%			-1%			0%			-2%	
Total Lost time (s)	6.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			1.00			0.99			0.92	
Flt Protected	0.95	1.00			1.00			0.97			1.00	
Satd. Flow (prot)	1796	1862			1824			2083			1832	
Flt Permitted	0.38	1.00			0.99			0.65			1.00	
Satd. Flow (perm)	715	1862			1798			1390			1832	
Peak-hour factor, PHF	0.81	0.92	0.76	0.33	0.92	0.25	0.80	0.42	0.38	0.25	0.46	0.76
Adj. Flow (vph)	88	723	82	12	690	8	116	81	8	0	78	101
RTOR Reduction (vph)	0	5	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	88	800	0	0	710	0	0	203	0	0	179	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.0	60.0			60.0			18.0			18.0	
Effective Green, g (s)	60.0	60.0			60.0			18.0			18.0	
Actuated g/C Ratio	0.67	0.67			0.67			0.20			0.20	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	477	1241			1199			278			366	
v/s Ratio Prot		c0.43									0.10	
v/s Ratio Perm	0.12				0.39			c0.15				
v/c Ratio	0.18	0.64			0.59			0.73			0.49	
Uniform Delay, d1	5.7	8.8			8.3			33.7			31.9	
Progression Factor	1.92	2.33			1.00			1.00			1.00	
Incremental Delay, d2	0.6	1.8			2.2			15.6			4.6	
Delay (s)	11.5	22.3			10.4			49.4			36.5	
Level of Service	B	C			B			D			D	
Approach Delay (s)		21.2			10.4			49.4			36.5	
Approach LOS		C			B			D			D	

Intersection Summary				
HCM Average Control Delay	21.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	77.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group