EAST GOSHEN TOWNSHIP
PLANNING COMMISSION
Meeting Agenda
Wednesday, September 2, 2015
7:00 PM

A. Call to Order / Pledge of Allegiance and Moment of Silence
B. Chairman will ask if anyone is going to record the meeting
C. Review of Tracking Log / Determine need for Workshop Meeting
D. Public Comment on Non-Agenda Items
E. Approval of Minutes
   1. August 5, 2015
F. Subdivision and Land Development Applications
   1. 942 Cornwallis Drive (SKETCH PLAN)
G. Conditional Uses and Variances
   1. Goshen Village Shopping Center / Conditional Use for Beverage Café (Dunkin Donuts)
   2. Goshen Village Shopping Center / ZHB Application to Amend current ZHB Decision
H. Ordinance Amendments
I. Comprehensive Plan Update
J. Old Business
K. New Business
L. 2015 Goals
M. Any Other Matter
N. Liaison Reports
O. Correspondence
P. Dates of Importance

Aug 29, 2015	Community Day	5 PM / Fireworks at Dusk
Sept 07, 2015	Labor Day / Township Office Closed	
Sept 09, 2015	Conservancy Board	7:00 pm
Sept 10, 2015	Historical Commission	7:00 pm
Sept 14, 2015	Municipal Authority	7:00 pm
Sept 15, 2015	Trail Open House	6:30 pm
Sept 15, 2015	Board of Supervisors Trail Plan Update	7:00 pm
Sept 16, 2015	Futurist Committee	7:00 pm
Sept 17, 2015	Commerce Commission	7:00 pm
Sept 29, 2015	Zoning Hearing Board	7:30 pm

Newsletter Deadlines for 2015:
Winter: October 30

Bold Items indicate new information to review.

Draft
EAST GOSHEN TOWNSHIP
PLANNING COMMISSION MEETING
August 5, 2015

The East Goshen Township Planning Commission held a regularly scheduled meeting on Wednesday, August 5, 2015 at 7:00 p.m. at the East Goshen Township building. Members present were: Vice Chairman Adam Knox, Dan Landis, Jim McRee, Monica Close, Lori Kier and new member Brad Giresi. Also present was Mark Gordon, Zoning Officer.

COMMON ACRONYMS:

BOS – Board of Supervisors
BC – Brandywine Conservancy
CB – Conservancy Board
CCPC – Chester Co Planning Commission
CPTF – Comprehensive Plan Task Force
CVS – Community Visioning Session
SWM – Storm Water Management

A. FORMAL MEETING – 7:00

1. Adam called the meeting to order at 7:00 pm. He led the Pledge of Allegiance and a moment of silence to remember our troops.
2. Adam asked if anyone would be recording the meeting and if there were any public comments about non-agenda items. There was no response.
3. Adam reviewed the Tracking Log and determined no need for a workshop
4. Adam noted that the minutes of the July 1, 2015 meeting were approved.

B. ORDINANCE REVIEW

The Commission reviewed the outline of items in Article II thru IV of the Zoning Ordinance:

Article II
1. PRD/PUD – no changes needed
2. Animal Husbandry – Jim gave some background on what was discussed so far. The Commission will continue to review this section
3. Temporary structure – This will be reviewed.
4. Publically & privately owned recreation – Definitions need to be consistent. This will be reviewed.
5. Solar – This is done.
6. Wind – This will be reviewed.
7. Single Family Cluster – This will be reviewed.
8. Single Family Open space – This will be reviewed.

Article III - C1 and C2 will be reviewed and updated.

Article IV - Max Building Height and Rooftop structures are done. All other items will be reviewed.

C. COMPREHENSIVE PLAN

Mark reported that the final draft will be on the website soon. He reviewed the process to adoption planned for October 20th. The next meeting is Monday, August 17, 2015 at 7:00 pm.

D. ANY OTHER MATTER

1. Ordinance Amendment – Dogs – The proposed ordinance was reviewed. The reasons for this ordinance are listed at the beginning. No more than 4 adult dogs. Adam found that this is the standard number in ordinances across the country. It was noted that on page 2 it should read "against property damage". Jim moved to recommend that the Board of Supervisors adopt the amendment to the accessory use section of the Zoning Ordinance as it relates to dogs. Dan seconded the motion. The motion passed 5 to 1 – Lori voted no.

2. Drone Ordinance – After some discussion, the Commission members will read this ordinance for discussion at a future meeting.

E. ADJOURNMENT

There being no further business, Monica moved to adjourn the meeting. Lori seconded the motion. The meeting adjourned at 9:20 pm. The next regular meeting will be held on September 2, 2015 at 7:00 pm.

Respectfully submitted,_____

Ruth Kiefer, Recording Secretary

East Goshen Township Planning Commission
Application Tracking Log

Application Name	Application (CU,LD,O, SD,V, SE, CA	Type (Sk, P, F)	Date Filed	Start Date	Date to Township Engineer	Date to CCPC	Date to Abutting Prop. / ABC's	Extension	PC NLT Action Date	BOS NLT Action Date	Hearing Date	Drop Dead date	
942 Cornwallis Drive	SD	Sk	8/26/15	NA	NA	NA	NA	NA	NA	NA	NA	NA	
GVSC CU APP Beverage Café (Abijibapa / DUNKIN)	CU	Sk	8/6/15	8/6/15	NA	NA	8/12/15		9/2/15	10/5/15	9/15/15	10/9/15	
GVSC ZHB APP Freestanding Signs	ZHB	SK	8/6/15	8/6/15	NA	NA	1/10/00		9/2/15	10/5/15	9/29/15	10/5/15	
Bold = New Application or PC action required													
Completed in 2015													
New Kent Final Plan Revision	LD	P/F	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Approved
19 Hill St. / Smith	V		5/27/15	5/27/15	NA	NA	5/29/15		7/1/15	7/7/15	7/9/15	7/24/15	Approved
1596 Paoli Pike (Swiss Farms)	ZHB	Sk	2/23/15	2/23/15	NA	NA	2/242015		**4/1/15**	4/7/15	4/14/15	4/24/15	Approved
10A Reservoir Rd.	SK		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Sketch
1131 N. Chester Rd.	SD	P/F	10/15/14	11/5/14	10/16/14	10/16/14	10/16/14		1/7/15	1/20/15	NA	1/24/15	Approved
1331 E. Strasburg Ln.	ZHB	Sk	12/5/14	12/5/14	NA	NA	12/18/14		1/7/15	1/20/15	1/21/15	1/26/15	Denied
612 Meadow Drive (Christenson)	V	Sk	2/23/15	2/23/15	NA	NA	2/242015		4/1/15	4/7/15	4/14/15	4/24/15	Approved

Memorandum

East Goshen Township
1580 Paoli Pike
West Chester, PA 19380
Voice: 610-692-7171
Fax: 610-692-8950
E-mail: mgordon@eastgoshen.org

Date: 8/26/2015
To: Planning Commission
From: Mark Gordon, Township Zoning Officer MG
Re: 942 Cornwallis Dr. Sketch Plan

Commission Members,

The Township has received a SD Sketch Plan Submission for 942 Cornwallis Dr. The sketch plan shows a subdivision of the 3.5+ acre parcel creating on additional residential building lot.

The applicant is seeking the PC's review and comments prior to submitting a complete SD/LD Application.

610-692-7171
www.eastgoshen.org

BOARD OF SUPERVISORS

EAST GOSHEN TOWNSHIP
CHESTER COUNTY
1580 PAOLI PIKE, WEST CHESTER, PA 19380-6199

August 26, 2015

Dear Property Owner:

The purpose of this letter is to inform you that Robert and Amanda Gionfriddo, the owners of 942 Cornwallis Dr., West Chester, PA 19380, have submitted a Sketch Plan to the Township for review. The sketch plan proposes a subdivision of the 3.5+ acre lot into two residential building lots.

Pursuant to Township policy, property owners and residents within 1000 feet of the subject property are notified of sketch plan submissions. The applicant will present the plan to the Planning Commission in order to hear the Commissions' initial comments prior to submitting an official subdivision and Land Development application.

The plan will be reviewed and discussed at the date and time outlined below and is subject to change without further written notice.

<u>September 2, 2015</u> - Planning Commission Meeting (7:00 pm)

All meetings are held at the Township Building and are open to the public. The plan is available for review at the Township building during normal business hours. Please give me a call if you have any questions or need additional information.

Sincerely,

Mark A. Gordon
Township Zoning Officer

Cc: All Township Authorities, Boards and Commissions

Memorandum

East Goshen Township
1580 Paoli Pike
West Chester, PA 19380
Voice: 610-692-7171
Fax: 610-692-8950
E-mail: mgordon@eastgoshen.org

Date: 8/27/2015
To: Planning Commission
From: Mark Gordon, Township Zoning Officer mg
Re: Beverage Café Conditional Use / Dunkin Donuts/ Goshen Village Shopping Center

Commission Members,

As you know and can see in your meeting packet, the Conditional Use application has been submitted for the proposed Dunkin Donuts Store in the former Citadel Bank building in the Goshen Village Shopping Center (GVSC).

All of the Conditional use issues were contemplated during the Zoning Ordinance amendment that was approved early this year. The ordinance is not yet codified however I have enclosed a copy for your use here.

Staff has reviewed the application and plans for the use and has determined that it meets the ordinance requirements.

The hearing is scheduled for 9/15. I have provided a draft motion for your review and consideration.

Draft Motion:

Mr. Chairman, I move that the Planning Commission recommend approval of the Conditional Use application of Abjibapa Enterprises, LLC. To operate a Beverage Café at 1500 Paoli Pike as outlined in the Zoning Ordinance with the following conditions:

1. The applicant shall provide the Township with a draft parking agreement which addresses the 5 parking spaces eliminated for the drive thru in the event the Township determines in the future that they are needed.
2. The Drive Thru menu board shall automatically turn off when the store is closed.
3. The trash enclosure shall be closed at all times except when being serviced.
4. The use shall include a serviceable grease trap for food waste sewage if determined by the Township upon building plan review.
5. The drive thru landscape screening shall be installed as described in the Conservancy Board Review letter dated August 13, 2015.
6. All new rooftop structures shall be painted to be aesthetically compatible with the roof façade.
7. There shall be no outside storage of any kind, not including the arrangement of outdoor seating.

EAST GOSHEN CONSERVANCY

August 13, 2015

East Goshen Township
Planning Commission
1580 Paoli Pike
West Chester, Pa. 19380

Re: Beverage Café / Conditional Use Plan for Dunkin Donuts
Landscape Screening Recommendation

Dear Commission Members:

At their meeting on August 12, 2014 the Conservancy Board unanimously approved the following motion:

Mr. Chairman, I move that we recommend that the Planning Commission accept the Landscape screening proposed on the Goshen Village plans for the new Dunkin Donuts location proposed with the following conditions:

1. Eastern white pines shall not be used as a landscape screening species for this project.
2. Arborvitae is acceptable for the drive thru screening so long as a deer resistant variety such as the Green Giant is used.
3. The evergreen screening for the garbage dumpster enclosure shall be consistent with the Township Tree Resolution and not include species identified as invasive plants in the east Goshen Township code. These evergreen plantings shall be diversified.

Sincerely,

Mark A. Gordon
Zoning Officer

1580 PAOLI PIKE, WEST CHESTER, PA. 19380

610-692-7171
www.eastgoshen.org

BOARD OF SUPERVISORS
EAST GOSHEN TOWNSHIP

CHESTER COUNTY
1580 PAOLI PIKE, WEST CHESTER, PA 19380-6199

FYI

August 12, 2015

Dear Property Owner:

The purpose of this letter is to inform you that Abjibapa Enterprises LLC (The Applicant) has submitted a Conditional Use application for a Beverage Café use within the Goshen Village Shopping Center. The Applicant proposes to locate the Beverage Café Use within the former Citadel Bank Branch Building within the Goshen Village Shopping Center at 1504 Paoli Pike, West Chester, PA 19380 which is located in the C-2 zoning district, Local Convenience Commercial. The Applicant proposes no changes to the exterior of the existing building other than signage. The applicant proposes a drive thru service lane to service their customers and an enclosed garbage dumpster area adjacent to the building location. A Beverage Café use is permitted use in the C-2 zoning district. The full application is available for review at the Township building.

Pursuant to Township policy, property owners within 1000 feet of the subject property are notified of Conditional Use applications. **The meeting dates for this matter are listed below and subject to change without further written notice:**

September 2, 2015 – Planning Commission (7:00 PM)
September 15, 2015 – Board of Supervisors (7:00 PM – Conditional Use Hearing)

All meetings are held at the Township Building and are open to the public. The Zoning Hearing Board Application is available for review at the Township building during normal business hours. If any person who wishes to attend the hearing has a disability and/or requires an auxiliary aid, service or other accommodation to observe or participate in the proceedings, he or she should contact East Goshen Township at 610-692-7171 to discuss how those needs may be accommodated.

Please give me a call if you have any questions or need additional information.

Sincerely,

Mark A. Gordon
Township Zoning Officer

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ORA Orth-Rodgers & Associates, Inc.
TRANSPORTATION ENGINEERS AND PLANNERS

August 29, 2014

Mr. Louis F. Smith, Jr., Township Manager
East Goshen Township
1580 Paoli Pike
West Chester, PA 19380-6199

RE: Dunkin Donuts Review

Dear Rick:

I am in receipt of McMahon Associates Transportation Impact Study dated August 2014 regarding the 3,000 square-foot eatery with a drive-through lane's impact to local traffic in the vicinity of the above referenced site located in the Goshen Village Shopping Center at Paoli Pike and Boot Road in the Township. The site entails the redevelopment of the existing vacant bank facility with access to both Paoli Pike and Boot Road via existing driveways to each via signalized access at Paoli Pike and stop control at Boot Road.

The following constitutes my review of the impact study:

1. ORA concurs in general with the introduction and the existing conditions reported for both Paoli Pike and Boot Road in the vicinity of the site. It should be noted that the intersection of Paoli and Boot has channelized right turn lanes in the eastbound and southbound that typically only effect the southbound and westbound directions of Boot and Paoli, respectively (noted in Appendix A photographs).

2. ORA concurs with the existing traffic count periods and the various peak hours found (7:30 AM, 4:45 PM and 11:45 AM Saturday) for Paoli & Boot, (8:00 AM, 5:00 PM and 11:30 AM Saturday) for Paoli & Site Access, and (7:30 AM, 4:45 PM and 11:45 AM Saturday) for Boot & Site Access. The peak hours are within the general timeframe that may only see minor differential volumes between the adjacent intersections.

   It was specifically noted that due to school not being in session, an additional count would need to be done after school has been in session for at least one week. The applicant has agreed to have the count performed to determine if the data presented with a 'growth' of 2% indicated in the report to account for the reduced summertime traffic.

   An additional note, the study does not include the channelized right turn volumes at either terminus of Paoli Pike or Boot Road channelized right turns. Through discussions with the applicant's traffic consultant, it was determined that the new count conducted in September will at least get the eastbound to southbound channelized right, since this node is near the Boot Road Site Access point.

3. A review of the existing traffic conditions at the intersection of Paoli Pike & Boot Road indicates that current levels of service are between 'A's and 'D's for all three peak periods with a level of service 'E' for the westbound Boot Road through movement during the AM peak. The signalized access on Paoli Pike operates with driveway levels of service 'D's during all peaks while the Boot Road access only shows a 'D' for the drive during the PM peak. ORA concurs with these as reported.

4. Site traffic was investigated for the proposed 3,000 square-foot facility. Based on the ITE Trip Generation Manual, the calculated trips are acceptable. Two comments we have regarding this investigation:

    a. The comparison generations between the previous bank use and the new Dunkin Donuts makes sense as part of the overall usage of the facility and its general comparison of generated trips. After discussions with McMahon regarding this, it was determined that the 'bank' trips are being reincorporated as background growth traffic. Though this should be clearly identified within the text, additional description should be provided as to where the bank traffic is being incorporated.

    Our concern with this approach stems from the fact that the reduction of bank traffic from the Dunkin Donuts traffic provides the developer with traffic 'credits' for his proposed site. The "with-out development" traffic is artificially higher with the added bank traffic which did not exist at all during the traffic counts conducted at the beginning of August 2014.

    b. Regarding the AM vs. PM vs. Saturday trip generation rates for the Dunkin Donuts facility, we are in concurrence with the use of the ITE rates by square-footage which are conservatively higher than the number of seats rate.

5. Trip distribution of the site traffic was based on current traffic patterns of Paoli Pike, Boot Road and the shopping center access patterns. ORA concurs with this distribution.

6. Future assessments of the three key intersections indicate that levels of service will still be acceptable during the peak hours with a growth factor of 1.91%. Proposed site traffic attributes approximately 10.2% of the AM peak hour Paoli & Access volumes, 13.5% of the AM peak hour Boot & Access volumes and 3.1% of the AM peak hour Paoli & Boot intersection volumes in the future and does not look to impact the two signalized intersection operations after minor timing adjustments. The afternoon peak hour at the Boot & Access drive is identified with a 13 second degradation (D to E for exiting movements, existing compared to with-out development volumes), but only an additional 4 second delay with the additional site traffic. *(Again, would 'with-out' development traffic be that significant and 'with' development traffic be that small based on our comments made in #4a above?)*

7. In general, ORA also concurs that the queue analysis performed at the intersections indicates insufficient eastbound left turn storage for the Boot Road left turn lane at Paoli Pike occurring today. All other turn movement lanes are currently sufficient and even with the growth and build out of the site, lane storage will should suffice. This is encouraging to note that the Boot & Access left turn in and exits appear to not be significantly impacted by the increased volumes associated with the redeveloped site.

8. Regarding internal site circulation, the site plan provided indicates a potential operation for the drive-thru lane that removes existing parking spaces while increasing the stacking available for drive-thru customers in the adjacent drive aisle. Our only concern is the potential for numerous customers to want to visit the facility in the AM period making the stacking longer than the available eight vehicles represented. We assume the developer hasn't provided any significant input to this concept to date so we will only comment to the concept's suspect layout at this time. As with many small restaurants/eateries with drive

throughs, the typical layout 'wraps' around the building to limit the footprint that stacking vehicles use away from the building. This site lends itself to just that operation as well.

So overall, ORA concurs with the bulk of study as presented. As requested, new AM and PM peak hour traffic counts are required to determine if the West Chester Area School District traffic effects the current study intersections significantly. Additional explanation of bank vs. new facility trip generation should address the concern about reduced new site traffic from the 'with development' scenario.

I can be reached at (610) 407-9700 or dkaiser@orth-rodgers.com if you have any questions or comments regarding this review.

Sincerely:
ORTH-RODGERS & ASSOCIATES, INC.

DEAN J. KAISER, P.E., PTOE
Director of Traffic Signal Operations

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FYI: ORTH-RODGERS (TWP TRAFFIC ENG.) WAS ACQUIRED BY THE BURNS GROUP.

THE **Burns** GROUP

ENGINEERING AND CONSTRUCTION

August 27, 2015

Mr. Mark Gordon, Township Zoning Officer
East Goshen Township
1580 Paoli Pike
West Chester, PA 19380-6199

RE: Dunkin Donuts Review 2

Dear Mark:

I am in receipt of McMahon Associates August 6, 2015 Response Letter regarding the Transportation Impact Study dated August 2014 for the 3,000 square-foot eatery with a drive-through lane. Additionally, an August 4, 2015 Transportation Impact Study Supplement was issued for the above referenced site located in the Goshen Village Shopping Center at Paoli Pike and Boot Road in the Township. The site entails the redevelopment of the existing vacant bank facility with access to both Paoli Pike and Boot Road via existing driveways to each via signalized access at Paoli Pike and stop control at Boot Road.

The following constitutes my review of the provided material:

1. An additional AM peak period turning movement count was performed as requested due to the 2014 summer count taken. Upon review, it is noted that AM peak volume is higher while school is in session. All but Paoli's northbound left, southbound left and Boot's westbound left and thru movements were higher in September versus the August volumes. Overall, traffic was approximately 11% higher when school is in session.
2. McMahon also complied with our request to provide turning movement count data for the channelized northbound Paoli Pike right turn lane understanding that this volume will impact the shopping center's Boot Road driveway. One concern we have with the provided supplemental information is that the provided count data sheet for Paoli and Boot identifies the direction of travel opposite of the Figure 1 graphic. Please ensure that the data is correctly represented.
3. Upon review of the site generated vehicular trips, their turning movement assignments and the background growth of existing traffic, we concur with the new AM peak hour volumes and operational analyses. Note that the supplement Figure 2 legend should identify '[A] 2015 WITH DEVELOPMENT PM PEAK HOUR' to "AM".
4. The critical center driveway on Boot Road shows acceptable levels of service, specifically during the critical AM peak. McMahon provided a gap analysis of the current conditions at the driveway and have identified that for outbound left turn traffic, 90 true (nonfactored) gaps over 8 seconds in duration exist on Boot Road near the access. The left turn critical gap time of 7.1 seconds needs to be exceeded, and the number of gaps greater than 7.1 seconds exceeds the number of AM and PM peak left turn motorists.

Additionally, McMahon factored out the longer duration gaps to help identify the 'additional' gaps that would be used by additional motorists in the left turn queue. They identified 188 gaps that the left turn motorists from the driveway would have to make their maneuver onto Boot Road which well exceeds the amount of left turn motorists during those peak periods.

Right turning motorists have minimally 120 gaps to over 400 gaps to work with, and we feel that the minimal delay associated with the new site traffic will not impede this access.

5. The revised site plan provided within the supplement as well as independently illustrates a new drive thru alignment approaching the facility. All eight existing parking spaces to the west side of the parking stalls are to be removed to potentially allow for extended queuing for the drive thru. Upwards of 10 vehicles could be queued in the approach while not impacting any potential thru vehicles in the adjacent drive aisle. This is better that the previously proposed scheme.

   As a result of the intended use of the building, it is also identified that a right exit only access be incorporated near the Boot Road access as well. We feel this is prudent to get those drive thru customers out efficiently. It's location at the corner of the two existing aisles works well. There will be a net loss of 10 parking spaces that the Township will have to agree to if not accommodated for elsewhere.

Based on the provided response letter, supplemental report and revised site plan, we concur with the updated traffic assessment for the revitalized site .

I can be reached at (610) 407-9700 or dkaiser@burns-group.com if you have any questions or comments regarding this review.

Sincerely,
THE BURNS GROUP

DEAN J. KAISER, P.E., PTOE
Principal Traffic Engineer

cc: Rick Smith – East Goshen

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EAST GOSHEN TOWNSHIP

CHESTER COUNTY, PENNSYLVANIA

ORDINANCE NO. _ 129-F-2015

AN ORDINANCE AMENDING THE EAST GOSHEN TOWNSHIP ZONING ORDINANCE OF 1997, AS AMENDED, SECTION 240-6 TO ADD A DEFINITION FOR BEVERAGE CAFÉ AND SHOPPING CENTER; SECTION 240-15.C TO ADD A NEW SUBPARAGRAPH (9) TO ALLOW A BEVERAGE CAFÉ IN A SHOPPING CENTER BY CONDITIONAL USE; SECTION 240-22.H TO ESTABLISH REGULATIONS FOR MENU BOARDS, BILLS OF FARE AND PRICE LISTS; SECTION 240-22.P TO AMEND THE SIGN REGULATIONS FOR SIGNS ERECTED IN THE COMMERCIAL DISTRICT; SECTION 240-31.C(3)(cc) TO ADD CONDITIONAL USE REGULATIONS FOR A BEVERAGE CAFÉ; AND TO DELETE SECTION 240-20.G(3).

BE IT ENACTED AND ORDAINED by the Board of Supervisors of East Goshen Township, that the East Goshen Township Zoning Ordinance of 1997, as amended, which is codified in Chapter 240 of the East Goshen Township Code, titled, "Zoning", shall be amended as follows:

SECTION 1. Section 240-6, titled, "Definitions", shall be amended to include the following definitions:

Beverage Café – a building measuring not more than 3,500 square feet of gross floor area where beverages and light fare normally and customarily associated with coffee shops or tea rooms are served for on-site or off-site consumption. Beverage café may also offer for sale coffee beans, tea, containers, mugs, coffee or tea brewing equipment and other related products. A beverage café shall not be considered a fast food restaurant and may have a drive-through lane.

Shopping Center- The multiple use of a single property for a group of nonresidential uses, such as, but not limited to, retail stores, restaurants and personal services, that are owned and maintained by a common entity. The shopping center shall be planned and designed as an integrated unit with common vehicular and pedestrian access, parking, utilities and stormwater management facilities.

SECTION 2. Section 240-15.C shall be amended to add a new subparagraph (9) as follows:

"(9) Beverage café with or without drive-through service in a shopping center."

SECTION 3. Section 240-22.H shall be amended as follows:

"**§240-22.H. Menu Boards, bills of fare or price lists.**

(1) Notwithstanding anything in this Ordinance to the contrary, menu boards for restaurants shall be permitted provided that all of the following conditions are met:

(a) the menu board is 3 square feet or less in area;

(b) the letters and numbers on the menu board are a maximum of 3 inches in height; and

(c) the sign is located on the building next to the entrance of the establishment or in the window next to the entrance to the establishment.

(2) Notwithstanding anything to the contrary in this Ordinance, menu boards associated with a beverage cafe with drive-through service in a shopping center permitted pursuant to Section 240-15.C(9) shall be permitted provided that all of the following conditions are met:

(a) the menu board shall not exceed eight feet in height, including the base, as measured from the elevation of the vehicle drive-through;

(b) the menu board shall not exceed fifty square feet in area;

(c) if the menu board is illuminated it shall only be internally illuminated and may only be illuminated during normal business hours;

(d) the menu board shall be located so as not to obstruct traffic or sight lines of vehicles in a shopping center; and

(e) landscaping shall be planted to minimize the visibility of the menu board from any public street."

SECTION 4. Section 240-22.P shall be amended as follows:

"P. Signs permitted in commercial districts. Only the following types of signs are permitted in a commercial district:

(1) Exempt signs as provided in Subsection J.

(2) Temporary signs as provided in Subsection I.

(3) Signs relating to the principal use on a lot, with a maximum of one commercial establishment in accordance with the following regulations:

(a) Wall sign. One wall sign shall be permitted for the commercial establishment. Such sign shall not exceed two square feet in area for each linear foot of wall-signable area, but not exceed 60 square feet.

(b) A freestanding sign not to exceed 10 square feet in area. No more than one freestanding sign shall be permitted on each street frontage.

(c) A window sign not to exceed 20% of window area to which it is attached.

(4) Signs relating to the principal use on a lot, including more than one commercial establishment are permitted in accordance with the following regulations:

(a) Wall sign. One wall sign shall be permitted for each commercial establishment. Such sign shall not exceed two feet in height or be longer than 75% of the linear length of the individual commercial establishment, with a maximum size of 32 square feet. Two wall signs shall be permitted if the commercial establishment is in a stand-alone building in a shopping center.

[1] All newly placed wall signs attached to the same building:

[a] Shall be generally consistent in proportion with existing signs.

[b] Shall not be box-type signs if at least 75% of the existing signs are not box-type signs.

[c] Shall maintain common vertical and horizontal lines with other signs in a manner consistent with the architecture of the building.

[d] Should be generally consistent in materials, font style and type size with other signs attached to the same building.

[2] An applicant for construction of a new principal building intended to include more than one establishment is strongly encouraged to submit a proposed set of standards that the

building owner intends to use to control the types and colors of signs to ensure compatibility among the signs.

[3] See Subsection K which prohibits certain types of signs, such as flashing and above-the-roofline signs.

[4] Wall sign alternative. In lieu of the wall sign referred to in Subsection P(4)(a), each commercial establishment in the structure shall be permitted to erect one freestanding sign in accordance with the following requirements:

[a] Each freestanding sign shall have a maximum size of 10 square feet and a maximum height of 10 feet.

[b] Each freestanding sign shall be located immediately in front of its respective establishment.

[c] All portions of the freestanding sign shall be located no more than 10 feet from the respective establishment.

[d] The freestanding signs shall comply with all front, rear and side yard requirements and they shall comply with the setback requirements for the zoning district.

(b) Freestanding signs.

[1] A shopping center use in the C-2 District or within a PRD may have a freestanding sign with a maximum area of 120 square feet and a maximum height of 14 feet on each street frontage. No more than one freestanding sign shall be permitted on each street frontage.

[2] All other freestanding signs shall not exceed 10 square feet in area nor five feet in height. No more than one freestanding sign shall be permitted on each street frontage.

(c) Window signs. The cumulative size of window signs is not to exceed 20% of the window area to which it or they are attached. Such signs may contain the names or businesses of the occupants of the facilities.

(d) All signs on the structure shall be of the same design and lit in a similar manner and shall be architecturally compatible with the structure.

(5) Sign bonus. Each permitted 10 square feet maximum freestanding sign in a commercial district may be increased in size to a maximum of 20 square feet if the sign is not internally illuminated and is constructed of relief-cut wood (other than plywood).

(6) Any sign (as defined in § 240-6, which includes but is not limited to graphics and logos) attached to or incorporated into functional elements of a building or development (including but not limited to awnings, canopies or murals) that serve an advertising or use identification purpose shall be considered to be a sign, and specifically shall be regulated by all provisions of this section for the applicable zoning district."

SECTION 5. Section 240-31.C(3)(cc) shall be amended as follows:

"(cc) Restaurant and beverage café.

[1] Any restaurant or beverage café with a drive-through shall be designed to allow safe pedestrian movement on the property and with sufficient stacking capacity to prevent backups of traffic onto a street.

[2] All outdoor trash dumpsters shall be totally screened as required by § 240-27C(4)."

SECTION 6. Section 240-20.G(3) shall be deleted.

SECTION 7. **Severability**. If any sentence, clause, section or part of this Ordinance is for any reason found to be unconstitutional, illegal or invalid, such unconstitutionality, illegality or invalidity shall not affect or impair any of the remaining provisions, sentences, clauses, sections, or parts hereof. It is hereby declared as the intent of the Board of Supervisors that this Ordinance would have been adopted had such unconstitutional, illegal or invalid sentence, clause, section or part thereof not been included herein.

SECTION 8. **Repealer**. All ordinances or parts of ordinances conflicting with any provision of this Ordinance are hereby repealed insofar as the same affects this Ordinance.

SECTION 9. **Effective Date**. This Ordinance shall become effective in five (5) days from the date of adoption.

ENACTED AND ORDAINED this 7th day of July, 2015.

ATTEST:

Louis F. Smith, Secretary

EAST GOSHEN TOWNSHIP
BOARD OF SUPERVISORS

E. Martin Shane, Chairman

Senya D. Isayeff, Vice-Chairman

Carmen Battavio, Member

Charles W. Proctor, III, Esquire, Member

Janet L. Emanuel, Member

Memorandum

East Goshen Township
1580 Paoli Pike
West Chester, PA 19380
Voice: 610-692-7171
Fax: 610-692-8950
E-mail: mgordon@eastgoshen.org

Date: 8/27/2015
To: Planning Commission
From: Mark Gordon, Township Zoning Officer
Re: ZHB Application / 1988 ZHB Decision Amendment/ Goshen Village freestanding signs

Commission Members,

As you may know the GVSC is prohibited from having freestanding "Monument Signs" on the property due to a Zoning Hearing Board Decision from 1988 when the owner at the time agreed to that condition in return for zoning relief for two signs on the supermarket and a second the wall sign on the corner stores in the shopping center.

The ordinance permits freestanding "monument" signs on all road frontages for shopping centers within the C-2 Zoning District. Staff is of the opinion that the freestanding signs would pose little impact to the surrounding residential neighborhoods do to the heavy landscape screening that exists today which buffers these neighborhoods.

I have drafted a motion for your review and consideration.

Draft Motion:

Mr. Chairman, I move that the Planning Commission recommend approval of the Zoning Hearing Board Application to amend the ZHB Decision from 1988 and permit freestanding signs on the Goshen Village Shopping Center property as permitted in the ordinance, with the following condition:

1. The property owner agrees to meet with the Township and it's consultants in order to orient the sign locations so as to best accommodate the alignment of the proposed Paoli Pike Trail.

610-692-7171
www.eastgoshen.org

BOARD OF SUPERVISORS

EAST GOSHEN TOWNSHIP
CHESTER COUNTY
1580 PAOLI PIKE, WEST CHESTER, PA 19380-6199

August 18, 2015

Dear Property Owner:

The purpose of this letter is to inform you that Goshen Equities, LLC, (The Applicant and owner of the Goshen Village Shopping Center at the corner of Boot Rd. and Paoli Pike) has submitted a Zoning Hearing Board application. The applicant is requesting to amend this Board's March 30, 1988 Decision for the shopping center, which in granting three variances, also attached the following condition: "There shall never be erected, on the site, a freestanding sign other than at the location of the intersection of Paoli Pike and Boot Road, as shown and described generally, on Exhibit A-10."

The property subject to the application is a 11.03 acre parcel known as Goshen Village Shopping Center at the northeast corner of Paoli Pike and Boot Road, East Goshen Township, Chester County, Pennsylvania (Tax Parcel No. 53-4-77). Applicant proposes to erect two freestanding pylon signs, one along the street frontage of Paoli Pike, and the other along the street frontage of Boot Road, each totaling 120 square feet in area and being no more than 14 feet in height, which signs are currently permitted by the Zoning Chapter of the East Goshen Code.

Pursuant to Township policy, property owners within 1000 feet of the subject property are notified of Conditional Use applications. **The meeting dates for this matter are listed below and subject to change without further written notice**:

September 2, 2015 – Planning Commission (7:00 PM)
September 15, 2015 – Board of Supervisors (7:00 PM)
September 29, 2015 – Zoning Hearing Board (7:30 PM / Zoning Hearing)

All meetings will be held at the Township Building and are open to the public. The Zoning Hearing Board Application is available for review at the Township building during normal business hours. If any person who wishes to attend the hearing has a disability and/or requires an auxiliary aid, service or other accommodation to observe or participate in the proceedings, he or she should contact the Township Building at 610-692-7171, to discuss how those needs may be accommodated.

Please give me a call if you have any questions or need additional information.

Sincerely,

Mark A. Gordon
Township Zoning Officer

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

McMAHON ASSOCIATES, INC
840 Springdale Drive | Exton, PA 1934
p 610-594-9995 | f 610-594-956
mcmahonassociates.cor

PRINCIPAL
Joseph W. McMahon, P.I
Joseph J. DeSantis, P.E., PTC
John S. DePalm
William T. Steffer
Casey A. Moore, P.I
Gary R. McNaughton, P.E., PTC

ASSOCIATE
John J. Mitchell, P.I
Christopher J. Williams, P.I
R. Trent Ebersole, P.I
Matthew M. Kozsuch, P.I
Maureen Chlebek, P.E., PTC

August 6, 2015

Mr. Louis F. Smith, Jr.
Township Manager
1580 Paoli Pike
West Chester, PA 19380-6199

RE: Response to Traffic Engineering Comments
East Goshen Dunkin Donuts
East Goshen Township, Chester County, PA
McMahon Project No. 814440.12

Dear Mr. Smith:

Our office has received the Traffic Engineering Review letter prepared by the Burns Group (formerly Orth-Rodgers & Associates, Inc.) dated August 29, 2014. On behalf of our client, we respectfully offer the following responses to each of the review comments repeated below:

1. ORA concurs in general with the introduction and the existing conditions reported for both Paoli Pike and Boot Road in the vicinity of the site. It should be noted that the intersection of Paoli and Boot has channelized right turn lanes in the eastbound and southbound that typically only effect the southbound and westbound directions of Boot and Paoli, respectively (noted in Appendix A photographs).

   Response | No response required.

2. ORA concurs with the existing traffic count periods and the various peak hours found (7:30 AM, 4:45 PM and 11:45 AM Saturday) for Paoli & Boot, (8:00 AM, 5:00 PM and 11:30 AM Saturday) for Paoli & Site Access, and (7:30 AM, 4:45 PM and 11:45 AM Saturday) for Boot & Site Access. The peak hours are within the general timeframe that may only see minor differential volumes between the adjacent intersections.

   It was specifically noted that due to school not being in session, an additional count would need to be done after school has been in session for at least one week. The applicant has agreed to have the count performed to determine if the data presented with a 'growth' of 2% indicated in the report to account for the reduced summertime traffic.

   An additional note, the study does not include the channelized right turn volumes at either terminus of Paoli Pike or Boot Road channelized right turns. Through discussions with the applicant's traffic consultant, it was determined that the new count conducted in September will at least get the eastbound to southbound channelized right, since this node is near the

Boot Road Site Access point.

Response | An additional traffic count was conducted in September 2014 when school was back in session. It was discussed with the Township Traffic Engineer that the weekday morning peak period would be recounted, as this was the only studied period that would be significantly influenced by school traffic. Please see the enclosed Transportation Study Supplement.

3. A review of the existing traffic conditions at the intersection of Paoli Pike & Boot Road indicates that current levels of service are between 'A's and 'D's for all three peak periods with a level of service 'E' for the westbound Boot Road through movement during the AM peak. The signalized access on Paoli Pike operates with driveway levels of service 'D's during all peaks while the Boot Road access only shows a 'D' for the drive during the PM peak. ORA concurs with these as reported.

   Response | No response required.

4. Site traffic was investigated for the proposed 3,000 square-foot facility. Based on the ITE Trip Generation Manual, the calculated trips are acceptable. Two comments we have regarding this investigation:
   a. The comparison generations between the previous bank use and the new Dunkin Donuts makes sense as part of the overall usage of the facility and its general comparison of generated trips. After discussions with McMahon regarding this, it was determined that the 'bank' trips are being reincorporated as background growth traffic. Though this should be clearly identified within the text, additional description should be provided as to where the bank traffic is being incorporated.

      Our concern with this approach stems from the fact that the reduction of bank traffic from the Dunkin Donuts traffic provides the developer with traffic 'credits' for his proposed site. The "with-out development" traffic is artificially higher with the added bank traffic which did not exist at all during the traffic counts conducted at the beginning of August 2014.

   b. Regarding the AM vs. PM vs. Saturday trip generation rates for the Dunkin Donuts facility, we are in concurrence with the use of the ITE rates by square-footage which are conservatively higher than the number of seats rate.

   Response | The traffic impact study conservatively and appropriately evaluates the traffic conditions of the study area and intersections with full occupancy conditions of the approved shopping center under future without-development conditions. In the future with-development conditions, the study evaluates the incremental traffic impacts of the Dunkin Donuts project/application (beyond what is permitted with current shopping center approvals). Occupancy of the existing buildings and vacant space does not require Township approval, and therefore, should not be utilized in determining the impacts of the application, nor should it be considered a "credit".

5. Trip distribution of the site traffic was based on current traffic patterns of Paoli Pike, Boot Road and the shopping center access patterns. ORA concurs with this distribution.

   Response | No response required.

6. Future assessments of the three key intersections indicate that levels of service will still be acceptable during the peak hours with a growth factor of 1.91%. Proposed site traffic attributes approximately 10.2% of the AM peak hour Paoli & Access volumes, 13.5% of the AM peak hour Boot & Access volumes and 3.1% of the AM peak hour Paoli & Boot intersection volumes in the future and does not look to impact the two signalized intersection operations after minor timing adjustments. The afternoon peak hour at the Boot & Access drive is identified with a 13 second degradation (D to E for exiting movements, existing compared to with-out development volumes), but only an additional 4 second delay with the additional site traffic. *(Again, would 'with-out' development traffic be that significant and 'with' development traffic be that small based on our comments made in #4a above?)*

   Response | Occupancy of the vacant, approved retail space within the shopping center, including the existing bank building, will add traffic to the adjacent roadway network and have minor impacts to the traffic operations. Again, the incremental traffic associated with the proposed Dunkin Donuts will only add a negligible amount of delay to the adjacent roadway network, compared to full occupancy conditions of the approved shopping center. Regardless, the signalized study intersections will continue to function at acceptable levels of service and there are sufficient gaps for traffic exiting the unsignalized driveway (see enclosed TIA Supplement).

7. In general, ORA also concurs that the queue analysis performed at the intersections indicates insufficient eastbound left turn storage for the Boot Road left turn lane at Paoli Pike occurring today. All other turn movement lanes are currently sufficient and even with the growth and build out of the site, lane storage will should suffice. This is encouraging to note that the Boot & Access left turn in and exits appear to not be significantly impacted by the increased volumes associated with the redeveloped site.

   Response | We concur with this assessment and further note that the additional site-traffic will only increase the queue length for the eastbound left turn storage for the Boot Road left turn lane at the Paoli Pike intersection by a few feet (less than one vehicle length).

8. Regarding internal site circulation, the site plan provided indicates a potential operation for the drive-thru lane that removes existing parking spaces while increasing the stacking available for drive-thru customers in the adjacent drive aisle. Our only concern is the potential for numerous customers to want to visit the facility in the AM period making the stacking longer than the available eight vehicles represented. We assume the developer hasn't provided any significant input to this concept to date so we will only comment to the concept's suspect layout at this

time. As with many small restaurants/eateries with drive throughs, the typical layout 'wraps' around the building to limit the footprint that stacking vehicles use away from the building. This site lends itself to just that operation as well.

Response | The site plan has been updated and includes improvements to the configuration of the drive-thru facility that will better accommodate the drive-thru queuing by reducing both drive-thru/parking conflicts and drive-thru/pedestrian conflicts. Please refer to the TIS Supplement (dated 8/4/2015) for addition information.

We trust the preceding responses, as well as the enclosed Transportation Impact Study Supplement, satisfactorily addresses the traffic engineering review. If you have any questions or wish to discuss any of the responses in further detail, please do not hesitate to contact Christopher J. Williams, P.E., or me at your convenience.

Sincerely,

John J. Yurick, P.E., PTOE, PTP
Senior Project Manager

Enclosure

cc: Diptesh Patel, Abjibapa Enterprises, LLC
Patrick McKenna, Esquire, Gawthrop Greenwood, PC

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McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

McMAHON ASSOCIATES, INC
840 Springdale Drive | Exton, PA 1934
p 610-594-9995 | f 610-594-956
mcmahonassociates.cor

PRINCIPAL
Joseph W. McMahon, P.I
Joseph J. DeSantis, P.E., PTC
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R. Trent Ebersole, P.I
Matthew M. Kozsuch, P.I
Maureen Chlebek, P.E., PTC

September 16, 2014
Updated August 4, 2015

Mr. Diptesh Patel
Abjibapa Enterprises, LLC
5101 Pennell Road
Media, PA 19063

RE: **Transportation Impact Study Supplement**
Dunkin' Donuts – Goshen Village Shopping Center
East Goshen Township, Chester County, PA
McMahon Project No. 814440.11

Dear Mr. Patel:

McMahon Associates, Inc. has completed a transportation impact study supplement for the proposed Dunkin' Donuts located within the Goshen Village Shopping Center in East Goshen Township, Chester County, PA. As you are aware, our office completed a transportation impact study entitled *Transportation Impact Study for the Proposed Dunkin' Donuts* dated August 2014, which evaluates the transportation impact of the proposed Dunkin' Donuts store with a drive-thru window. The purpose of this supplement is to 1) provide updated weekday morning peak hour traffic count data, 2) summarize a gap study completed to evaluate the Boot Road access during the weekday afternoon peak hour, and 3) summarize the traffic implications of the revised site plan.

Updated Weekday Morning Peak Hour Analysis

The traffic counts contained in the original transportation impact study were conducted in August 2014 prior to the opening of area schools. As such, in order to evaluate traffic conditions when all of the area schools are open, our office completed updated manual turning movement traffic counts in September 2014 at the intersection of Boot Road and Paoli Pike during the weekday morning commuter peak period (7:00 AM to 9:00 AM). In addition, the updated weekday morning peak hour count also included the traffic volumes at the northbound Paoli Pike channelized right-turn lane. In addition, the through traffic volumes at the Paoli Pike and Boot Road access intersections were also updated/increased by balancing the approach volumes from the Paoli Pike/Boot Road intersection. The traffic count data is tabulated in 15-minute increments in **Attachment 1**.

In order to complete the revised weekday morning peak hour analysis, our office used the same future traffic projection assumptions used in the original transportation impact study. The existing, 2015 future without-development, and 2015 future with-development traffic volumes are shown in **Figure 1**. The traffic volumes in Figure 1 were subjected to detailed capacity/level-of-service analysis, the results of which are shown in **Figure 2**, and summarized in **Table 1**. In addition, the existing and future queues based on this updated analysis are shown in **Table 2**. The detailed

capacity/level-of-service analysis worksheets are provided in **Attachment 2** for existing conditions, **Attachment 3** for 2015 future without-development conditions, and **Attachment 4** for 2015 future with-development conditions.

Based on the results of the analysis, the study intersections generally operate with similar conditions under existing, 2015 future without-development, and 2015 future with-development conditions as compared to the analysis results shown in the original transportation impact study. Futhermore, the impact of the development is mitigated at the Paoli Pike/Boot Road intersection, and both site access intersections operate at acceptable LOS D or better overall and for all movements with the traffic generated by the proposed Dunkin Donuts.

Gap Study

As shown in the original transportation impact study, the capacity analysis indicates that the Boot Road site access will operate at LOS E during the weekday afternoon peak hour only. Since this access is located approximately 515 feet east of the signalized Paoli Pike/Boot Road intersection, it is likely that there are more gaps in the Boot Road traffic stream for use by side street traffic at the Boot Road site access intersection than are assumed in the capacity analysis, which does not account for the extra gaps created by the traffic signal. In order to determine the actual gaps in the Boot Road traffic stream at the Goshen Village Shopping Center access, our office completed a gap study in September 2014 during the weekday afternoon intersection peak hour (from 4:45 PM to 5:45 PM) at the Paoli Pike/Boot Road intersection. The results of the gap study are summarized in **Table 3**, and the gaps study counts and detailed calculations are provided in **Attachment 5.**

Table 3. Gap Study Summary

Movement	Number of Effective Gaps	Turning Movement Volume	Adequate Available Gaps?
Southbound Goshen Village Shopping Center Access Left-Turn	188[1]	66	**Yes**
Southbound Goshen Village Shopping Center Access Right-Turn	444[2]	68	**Yes**

1. Based on the number of combined gaps in the Boot Road traffic stream.
2. Based in the number of westbound gaps in the Boot Road traffic stream.

As shown in Table 3, there are more than adequate gaps in the Boot Road traffic stream for use by side street Goshen Village Shopping Center Access traffic. Based on this evaluation, it is likely that traffic exiting this access in the future will experience less delay than reported by the analysis, and the access will operate acceptably during the weekday afternoon peak hour with the traffic generated by the proposed Dunkin Donuts.

Revised Site Plan Review

The revised site plan **(see Figure 3)** provides modifications to the drive-thru facility as well as provides a right-turn only exit lane from the main parking field to the Boot Road driveway. The drive-thru modifications separate the queuing from the general parking field which will reduce conflicts. Further, the drive-thru lane will accommodate approximately 12 vehicles so as to reduce the potential of drive-thru spillover into the parking lot or drive aisles. Based on observations by McMahon at other Dunkin Donut stores, we do not anticipate a queue to exceed the available proposed queue storage for this facility. Also, this drive-thru configuration will also reduce the number of pedestrian-vehicle conflicts compared to wrap-around drive-thru facilities seen at many other fast food restaurants that require customers to walk through the drive-thru queue at least one if not all of the building entrances.

In addition, the right-turn only turn lane to the Boot Road driveway will improve the traffic circulation within the shopping center by allowing some exiting traffic to avoid utilizing the main drive aisle along the store frontages. This modification will be more convenient for all customers leaving the shopping center (and destined to the Boot Road access) and will reduce vehicle-pedestrian conflicts along the store frontages.

If you have any questions, or require further information regarding the above analysis, please do not hesitate to contact our office.

Sincerely,

John J. Yurick, P.E., PTOE, PTP
Senior Project Manager

JJY/JDG/ab
Attachments

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Table 1. Level-of-Service Matrix

Paoli Pike and Boot Road

Time Period			Weekday Morning Peak Hour		
Design Year			2014	2015	
			Existing	Without Dev.	With Dev.
Boot Road	EB	Left	D 36.7	D 39.8	D 45.1
		Thru	D 35.3	D 35.7	D 36.5
	WB	Left	C 26.6	C 27.0	C 28.5
		Thru	E 58.9	E 61.4	E 67.0
		Right	A 0.0	A 0.0	A 0.0
Paoli Pike	NB	Left	C 20.3	C 20.8	C 20.8
		Thru	D 43.6	D 46.2	D 46.8
	SB	Left	C 25.3	C 26.0	C 26.1
		Thru	B 13.8	B 14.8	B 14.9
		Right	A 9.5	A 9.8	A 9.9
Overall			D 36.6	D 38.1	D 40.0

Paoli Pike and Shopping Center Access

Time Period			Weekday Morning Peak Hour		
Design Year			2014	2015	
			Existing	Without Dev.	With Dev.
Shopping Center Access	WB	Left	D 54.4	D 52.3	D 47.8
		Right	D 48.3	D 50.5	D 51.4
Paoli Pike	NB	Thru	A 0.9	A 0.9	A 1.0
		Right	A 0.0	A 0.0	A 0.0
	SB	Left	A 1.5	A 1.6	A 2.5
		Thru	A 2.0	A 2.1	A 3.1
Overall			A 2.0	A 2.3	A 4.7

Boot Road and Shopping Center Access

Time Period			Weekday Morning Peak Hour		
Design Year			2014	2015	
			Existing	Without Dev.	With Dev.
Boot Road	EB	Left	B 10.3	B 10.6	B 10.9
		Thru	(1)	(1)	(1)
	WB	Thru	(1)	(1)	(1)
		Right			
Shopping Center Access	SB	Left/Right	C 17.6	C 18.7	D 28.0
Overall			A 0.2	A 0.5	A 2.6

(1) Movement operates at free flow

Table 2. 95th Percentile Queue Matrix

Paoli Pike and Boot Road

Time Period / Design Year			Existing Storage (feet)	Weekday Morning Peak Hour		
				2014	2015	
				Existing	Without Dev.	With Dev.
Boot Road	EB	Left	350	160	173	188
		Thru	>1000	335	345	363
	WB	Left	125	160	168	185
		Thru	>1000	615	645	685
		Right	300	0	0	0
Paoli Pike	NB	Left	100	45	48	48
		Thru	>1000	670	700	713
	SB	Left	100	13	13	13
		Thru	800	243	265	275
		Right	350	50	55	58

Paoli Pike and Shopping Center Access

Time Period / Design Year			Existing Storage (feet)	Weekday Morning Peak Hour		
				2014	2015	
				Existing	Without Dev.	With Dev.
Shopping Center Access	WB	Left	100	18	20	53
		Right	100	5	13	68
Paoli Pike	NB	Thru	800	23	15	15
		Right	150	0	0	0
	SB	Left	90	5	5	18
		Thru	>1000	130	140	175

Boot Road and Shopping Center Access

Time Period / Design Year			Existing Storage (feet)	Weekday Morning Peak Hour		
				2014	2015	
				Existing	Without Dev.	With Dev.
Boot Road	EB	Left	150	0	3	8
		Thru	(1)	(1)	(1)	(1)
	WB	Thru	(1)	(1)	(1)	(1)
		Right				
Shopping Center Access	SB	Left/Right	-	3	5	45

(1) Movement operates at free flow

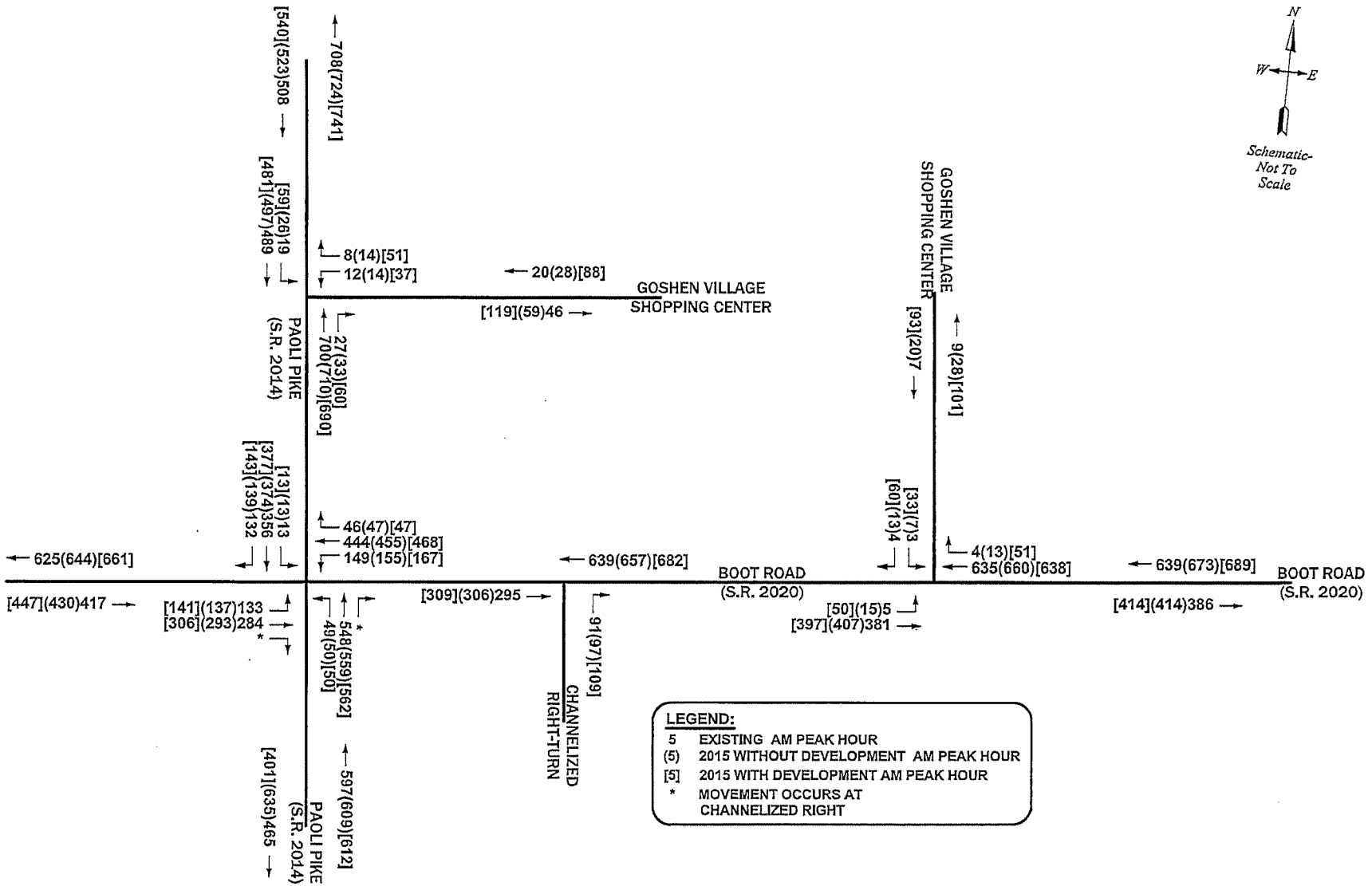

FIGURE 1

Weekday Morning Peak Hour Traffic Volumes

DUNKIN' DONUTS - GOSHEN VILLAGE SHOPPING CENTER

EAST GOSHEN TOWNSHIP, CHESTER COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

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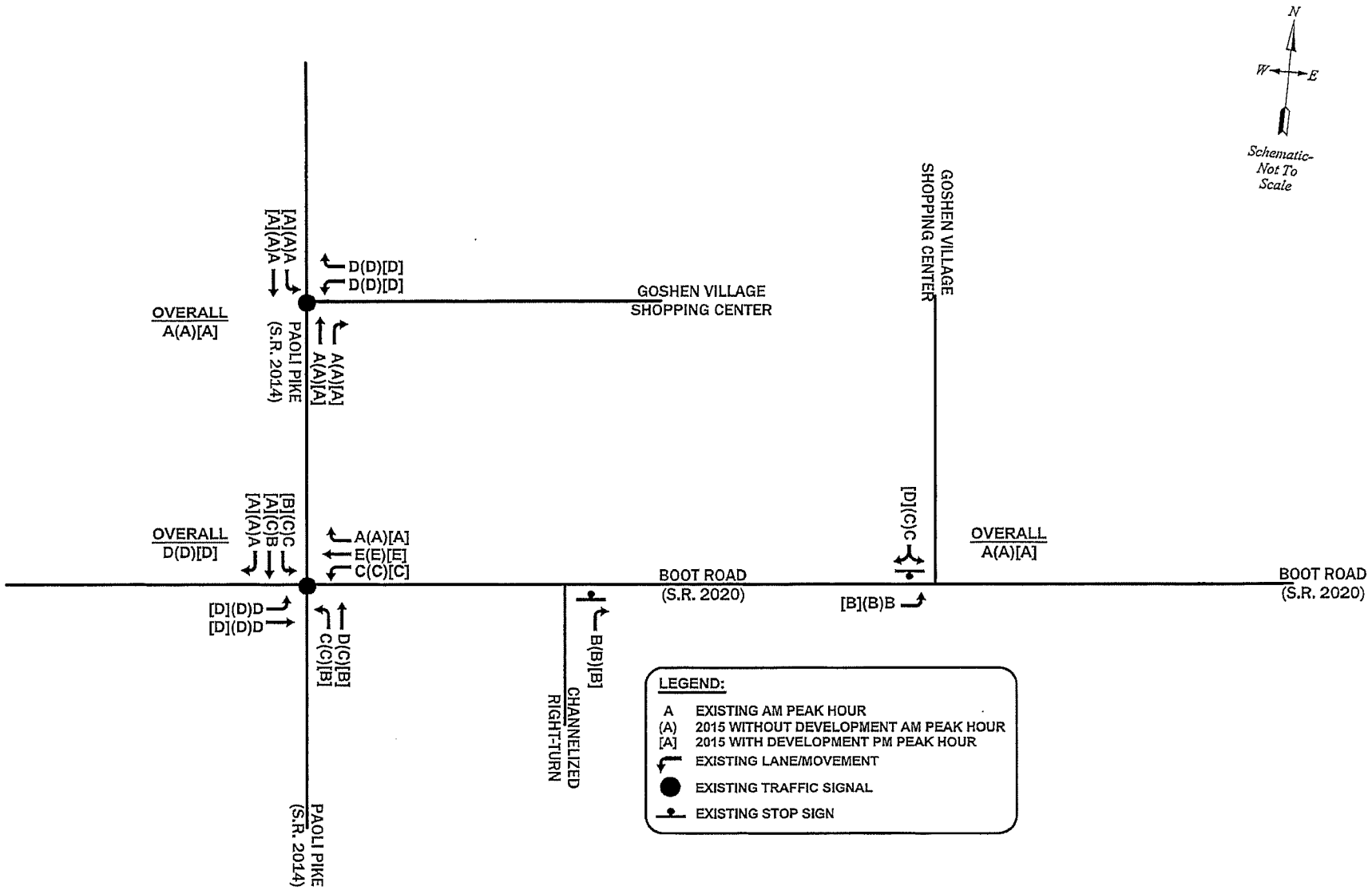

FIGURE 2

Weekday Morning Peak Hour Levels of Service

DUNKIN' DONUTS - GOSHEN VILLAGE SHOPPING CENTER

EAST GOSHEN TOWNSHIP, CHESTER COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

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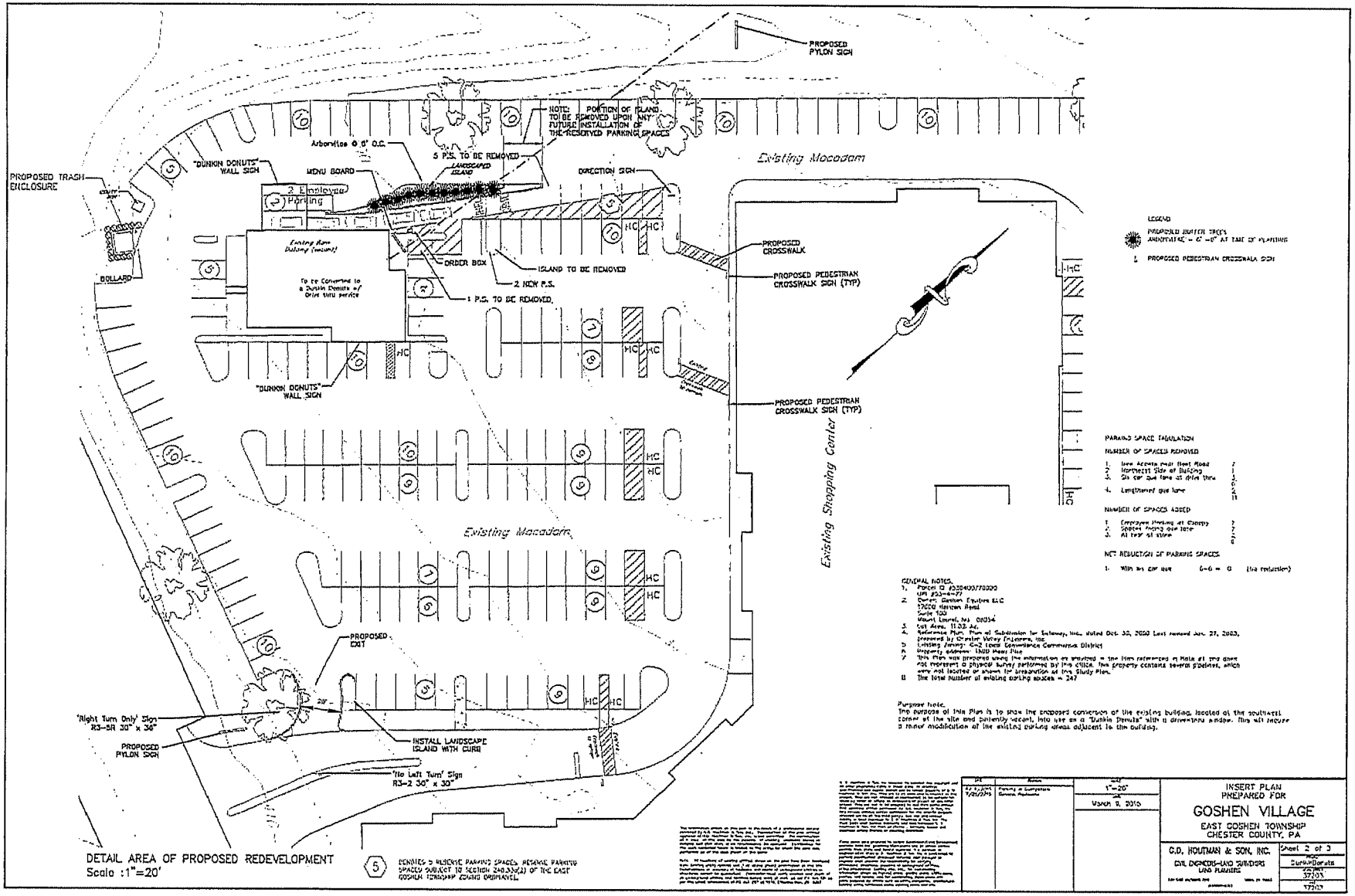

FIGURE 3

Site Plan

DUNKIN' DONUTS - GOSHEN VILLAGE SHOPPING CENTER

EAST GOSHEN TOWNSHIP, CHESTER COUNTY, PA

McMAHON TRANSPORTATION ENGINEERS & PLANNERS

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ATTACHMENT 1

McMahon Associates Inc.

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: East Goshen Township
Location: Paoli Pike &
Boot Road
Counter/Board #: HR

File Name : egoshenboot01whr
Site Code : 81444401
Start Date : 9/3/2014
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Paoli Pk Southbound				Boot Rd Westbound				Paoli Pk Northbound				Boot Rd Eastbound				
Start Time	Left	Thru	ROR	Right	Left	Thru	ROR	Right	Left	Thru	ROR	Right	Left	Thru	ROR	Right	Int. Total
07:00	8	107	0	1	29	71	0	0	4	102	2	13	53	94	0	10	494
07:15	15	149	0	1	23	80	0	0	0	89	15	6	53	96	0	9	536
07:30	12	131	0	0	37	77	0	0	5	70	3	21	31	116	0	11	514
07:45	18	127	0	0	31	60	0	1	1	88	13	15	39	98	0	10	501
Total	53	514	0	2	120	288	0	1	10	349	33	55	176	404	0	40	2045
08:00	6	132	0	0	35	71	0	0	3	85	9	22	44	120	0	16	543
08:15	13	158	0	0	30	74	1	0	4	113	7	42	35	110	0	9	596
08:30	14	114	0	2	25	58	0	0	3	91	9	28	37	119	0	9	509
08:45	9	87	0	1	34	51	0	1	0	79	10	23	41	108	0	12	456
Total	42	491	0	3	124	254	1	1	10	368	35	115	157	457	0	46	2104
Grand Total	95	1005	0	5	244	542	1	2	20	717	68	170	333	861	0	86	4149
Apprch %	8.6	91	0	0.5	30.9	68.7	0.1	0.3	2.1	73.5	7	17.4	26	67.3	0	6.7	
Total %	2.3	24.2	0	0.1	5.9	13.1	0	0	0.5	17.3	1.6	4.1	8	20.8	0	2.1	
Passenger Vehicles	92	963	0	5	224	514	1	2	20	692	68	152	320	833	0	81	3967
% Passenger Vehicles	96.8	95.8	0	100	91.8	94.8	100	100	100	96.5	100	89.4	96.1	96.7	0	94.2	95.6
Heavy Vehicles	3	42	0	0	20	28	0	0	0	25	0	18	13	28	0	5	182
% Heavy Vehicles	3.2	4.2	0	0	8.2	5.2	0	0	0	3.5	0	10.6	3.9	3.3	0	5.8	4.4

McMahon Associates Inc.

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: East Goshen
Location: Boot Road &
Paoli Pk Northbound Right Channelization
Counter/Board #: RR

File Name : egoshenboot02aRR
Site Code : 81444402
Start Date : 9/3/2014
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Boot Road Westbound		Paoli Pk Right Northbound		Boot Road Eastbound		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00	0	0	0	21	0	0	21
07:15	0	0	0	29	0	0	29
07:30	0	0	0	18	0	0	18
07:45	0	0	0	23	0	0	23
Total	0	0	0	91	0	0	91
08:00	0	0	0	20	0	0	20
08:15	0	0	0	28	0	0	28
08:30	0	0	0	19	0	0	19
08:45	0	0	0	22	0	0	22
Total	0	0	0	89	0	0	89
Grand Total	0	0	0	180	0	0	180
Apprch %	0	0	0	100	0	0	
Total %	0	0	0	100	0	0	
Passenger Vehicles	0	0	0	162	0	0	162
% Passenger Vehicles	0	0	0	90	0	0	90
Heavy Vehicles	0	0	0	18	0	0	18
% Heavy Vehicles	0	0	0	10	0	0	10

ATTACHMENT 2

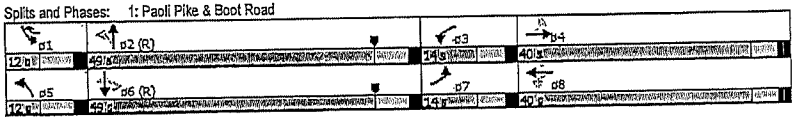
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	133	284	0	149	444	46	49	548	0	13	355	132
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			1%			3%	
Storage Length (ft)	350		0	125		0	100		0	100		350
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	45			45			45			45		
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
Frt						0.850						0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1517	1657	0	1629	1748	1530	1701	1739	0	1620	1705	1507
Flt Permitted	0.130			0.371			0.371			0.151		
Satd. Flow (perm)	208	1657	0	636	1748	1530	664	1739	0	257	1705	1507
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						95						152
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		767			160			717			900	
Travel Time (s)		11.6			2.4			10.9			13.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	9%	5%	0%	5%	3%	0%	0%	3%	0%	4%	4%	0%
Adj. Flow (vph)	146	312	0	164	488	51	54	602	0	14	391	145
Shared Lane Traffic (%)												
Lane Group Flow (vph)	146	312	0	164	488	51	54	602	0	14	391	145
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.12	1.12	1.12	1.07	1.07	1.07	1.08	1.08	1.08	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1		1	1	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	35	35		35	35	5	35	5		35	5	5
Trailing Detector (ft)	-5	-5		-5	-5	0	-5	0		-5	0	0
Detector 1 Position(ft)	-5	-5		-5	-5	0	-5	0		-5	0	0
Detector 1 Size(ft)	40	40		40	40	5	40	5		40	5	5
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	7	4		3	8	1	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0	3.0	3.0	39.0		3.0	39.0	39.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	9.0	9.0		9.0	9.0	10.0	10.0	46.0		10.0	46.0	46.0
Total Split (s)	14.0	40.0		14.0	40.0	12.0	12.0	49.0		12.0	49.0	49.0
Total Split (%)	12.2%	34.8%		12.2%	34.8%	10.4%	10.4%	42.6%		10.4%	42.6%	42.6%
Maximum Green (s)	8.0	34.0		8.0	34.0	5.0	5.0	42.0		5.0	42.0	42.0
Yellow Time (s)	4.0	4.0		4.0	4.0	5.0	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	6.0	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 1: Paoli Pike & Boot Road



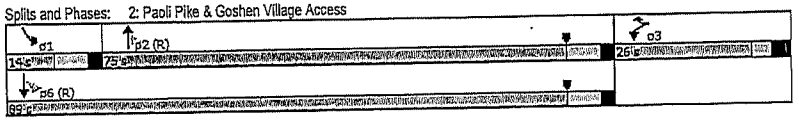
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	12	8	700	27	19	489
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	11	14	12	12
Storage Length (ft)	0	0		150	90	
Storage Lanes	1	1		1	1	
Taper Length (ft)	45				45	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1368	1224	1626	1569	1710	1731
Flt Permitted	0.950				0.310	
Satd. Flow (perm)	1368	1224	1626	1569	558	1731
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		9		21		
Link Speed (mph)	25		45			45
Link Distance (ft)	501		900			981
Travel Time (s)	13.7		13.6			14.9
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	25%	25%	7%	4%	0%	4%
Adj. Flow (vph)	13	9	753	29	20	526
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	9	753	29	20	526
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.07	1.07	1.12	0.99	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	1	1	1	1
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	35	35	5	5	35	5
Trailing Detector (ft)	-5	-5	0	0	-5	0
Detector 1 Position(ft)	-5	-5	0	0	-5	0
Detector 1 Size(ft)	40	40	5	5	40	5
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	Prot	NA	Perm	pm+pt	NA
Protected Phases	3	3	2		1	6
Permitted Phases				2	6	
Detector Phase	3	3	2	2	1	6
Switch Phase						
Minimum Initial (s)	3.0	3.0	40.0	40.0	3.0	40.0
Minimum Split (s)	9.0	9.0	47.0	47.0	11.0	47.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Total Split (s)	26.0	26.0	75.0	75.0	14.0	89.0
Total Split (%)	22.6%	22.6%	65.2%	65.2%	12.2%	77.4%
Maximum Green (s)	20.0	20.0	68.0	68.0	7.0	82.0
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	6.0	6.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 32 (28%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 2: Paoli Pike & Goshen Village Access



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑↑		↱
Volume (vph)	295	0	0	639	0	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%			0%	0%	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	1800	0	0	3539	0	1522
Flt Permitted						
Satd. Flow (perm)	1800	0	0	3539	0	1522
Link Speed (mph)	45			45	30	
Link Distance (ft)	160			340	256	
Travel Time (s)	2.4			5.2	5.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	2%	4%	2%	2%	8%
Adj. Flow (vph)	328	0	0	710	0	101
Shared Lane Traffic (%)						
Lane Group Flow (vph)	328	0	0	710	0	101
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection

Int Delay, s/veh 1

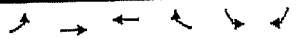
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	295	0	0	639	0	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	1	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	2	4	2	2	8
Mvmt Flow	328	0	0	710	0	101

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	328	0	683	328
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	355	-
Critical Hdwy	-	-	4.14	-	6.63	6.32
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.236	-	3.519	3.376
Pot Cap-1 Maneuver	-	-	1220	-	399	696
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	681	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1220	-	399	696
Mov Cap-2 Maneuver	-	-	-	-	399	-
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	681	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	696	-	-	1220	-
HCM Lane V/C Ratio	0.145	-	-	-	-
HCM Control Delay (s)	11.1	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0	-

ATTACHMENT 3



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	5	381	635	4	3	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	16	16
Grade (%)		1%	-1%		-1%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	45				45	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999		0.923	
Flt Protected	0.950				0.979	
Satd. Flow (prot)	1447	1757	1788	0	1713	0
Flt Permitted	0.950				0.979	
Satd. Flow (perm)	1447	1757	1788	0	1713	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		340	1418		335	
Travel Time (s)		5.2	21.5		9.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	20%	4%	3%	25%	33%	0%
Adj. Flow (vph)	5	419	698	4	3	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	419	702	0	7	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		16	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.05	1.05	1.04	1.04	0.84	0.84
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	5	381	635	4	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	1	-1	-	-1	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	20	4	3	25	33	0
Mvmt Flow	5	419	698	4	3	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	702	0	-	0	1130	700
Stage 1	-	-	-	-	700	-
Stage 2	-	-	-	-	430	-
Critical Hdwy	4.3	-	-	-	7.1	6.2
Critical Hdwy Stg 1	-	-	-	-	5.53	-
Critical Hdwy Stg 2	-	-	-	-	5.53	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	685	-	-	-	199	463
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	738	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	685	-	-	-	198	463
Mov Cap-2 Maneuver	-	-	-	-	198	-
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	733	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	17.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	685	-	-	-	294
HCM Lane V/C Ratio	0.008	-	-	-	0.026
HCM Control Delay (s)	10.3	-	-	-	17.6
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	137	293	0	155	455	47	50	559	0	13	374	139
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1651	1714	0	1714	1748	1800	1791	1739	0	1705	1705	1773
Adj Flow Rate, veh/h	151	322	0	170	500	0	55	614	0	14	411	124
Adj No. of Lanes	1	1	0	1	1	1	1	1	0	1	1	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	9	5	0	5	3	0	0	3	0	4	4	0
Cap, veh/h	206	522	0	329	532	494	364	709	0	155	654	578
Arrive On Green	0.08	0.30	0.00	0.08	0.30	0.00	0.04	0.41	0.00	0.04	0.77	0.77
Sat Flow, veh/h	1573	1714	0	1633	1748	1530	1706	1739	0	1624	1705	1507
Grp Volume(v), veh/h	151	322	0	170	500	0	55	614	0	14	411	124
Grp Sat Flow(s),veh/h/ln	1573	1714	0	1633	1748	1530	1706	1739	0	1624	1705	1507
Q Serve(g_s), s	7.5	18.5	0.0	8.3	32.1	0.0	2.2	37.2	0.0	0.6	12.5	2.6
Cycle Q Clear(g_c), s	7.5	18.5	0.0	8.3	32.1	0.0	2.2	37.2	0.0	0.6	12.5	2.6
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	206	522	0	329	532	494	364	709	0	155	654	578
V/C Ratio(X)	0.73	0.62	0.00	0.52	0.94	0.00	0.15	0.87	0.00	0.09	0.63	0.21
Avail Cap(c_a), veh/h	206	522	0	329	532	494	381	709	0	209	654	578
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.95	0.95	0.95
Uniform Delay (d), s/veh	29.4	34.3	0.0	26.3	39.0	0.0	20.3	31.2	0.0	25.5	9.7	8.6
Incr Delay (d2), s/veh	12.6	2.2	0.0	1.4	25.0	0.0	0.2	13.4	0.0	0.2	4.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	4.0	9.1	0.0	3.8	19.1	0.0	1.0	20.4	0.0	0.3	6.4	1.2
LnGrp Delay(d),s/veh	42.0	36.5	0.0	27.7	64.0	0.0	20.5	44.6	0.0	25.7	14.0	9.4
LnGrp LOS	D	D		C	E		C	D		C	B	A
Approach Vol, veh/h		473			670			669			549	
Approach Delay, s/veh		38.2			54.7			42.6			13.3	
Approach LOS		D			D			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	52.9	14.0	40.0	10.9	50.1	14.0	40.0
Change Period (Y+Rc), s	7.0	7.0	6.0	6.0	7.0	7.0	6.0	6.0
Max Green Setting (Gmax), s	5.0	42.0	8.0	34.0	5.0	42.0	8.0	34.0
Max Q Clear Time (g_c+I1), s	3.1	39.7	10.8	21.0	4.7	15.0	10.0	34.6
Green Ext Time (p_c), s	0.0	0.9	0.0	2.4	0.0	3.1	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	38.4
HCM 2010 LOS	D

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	14	14	710	33	26	497
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1440	1440	1682	1800	1800	1731
Adj Flow Rate, veh/h	15	10	763	34	28	534
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	25	25	7	4	0	4
Cap, veh/h	37	33	1348	1226	630	1519
Arrive On Green	0.03	0.03	1.00	1.00	0.02	0.88
Sat Flow, veh/h	1371	1224	1682	1530	1714	1731
Grp Volume(v), veh/h	15	10	763	34	28	534
Grp Sat Flow(s),veh/h/ln	1371	1224	1682	1530	1714	1731
Q Serve(g_s), s	1.2	0.9	0.0	0.0	0.3	6.3
Cycle Q Clear(g_c), s	1.2	0.9	0.0	0.0	0.3	6.3
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	37	33	1348	1226	630	1519
V/C Ratio(X)	0.41	0.31	0.57	0.03	0.04	0.35
Avail Cap(c_a), veh/h	250	224	1348	1226	707	1519
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.45	0.45	1.00	1.00
Uniform Delay (d), s/veh	55.1	54.9	0.0	0.0	1.4	1.2
Incr Delay (d2), s/veh	7.2	5.1	0.8	0.0	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.5	0.4	0.3	0.0	0.1	3.1
LnGrp Delay(d),s/veh	62.2	60.1	0.8	0.0	1.4	1.9
LnGrp LOS	E	E	A	A	A	A
Approach Vol, veh/h	25		797			562
Approach Delay, s/veh	61.4		0.7			1.9
Approach LOS	E		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	8.8	98.2				106.9		8.1
Change Period (Y+Rc), s	7.0	7.0				7.0		6.0
Max Green Setting (Gmax), s	7.0	68.0				82.0		20.0
Max Q Clear Time (g_c+I1), s	2.8	2.5				8.8		3.7
Green Ext Time (p_c), s	0.0	4.0				4.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	2.3
HCM 2010 LOS	A

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	15	407	660	13	7	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	16	16
Grade (%)		1%	-1%		-1%	
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	45				45	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.997		0.914	
Flt Protected	0.950				0.982	
Satd. Flow (prot)	1447	1757	1780	0	1734	0
Flt Permitted	0.950				0.982	
Satd. Flow (perm)	1447	1757	1780	0	1734	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		340	1418		335	
Travel Time (s)		5.2	21.5		9.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	20%	4%	3%	25%	33%	0%
Adj. Flow (vph)	16	447	725	14	8	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	16	447	739	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		16	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.05	1.05	1.04	1.04	0.84	0.84
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection

Int Delay, s/veh 0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	15	407	660	13	7	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	1	-1	-	-1	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	20	4	3	25	33	0
Mvmt Flow	16	447	725	14	8	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	740	0	-	0	1212	732
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	480	-
Critical Hdwy	4.3	-	-	-	7.1	6.2
Critical Hdwy Stg 1	-	-	-	-	5.53	-
Critical Hdwy Stg 2	-	-	-	-	5.53	-
Follow-up Hdwy	3	-	-	-	3	3.1
Pot Cap-1 Maneuver	664	-	-	-	175	444
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	697	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	664	-	-	-	171	444
Mov Cap-2 Maneuver	-	-	-	-	171	-
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	680	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	18.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	664	-	-	-	285
HCM Lane V/C Ratio	0.025	-	-	-	0.077
HCM Control Delay (s)	10.6	-	-	-	18.7
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

ATTACHMENT 4

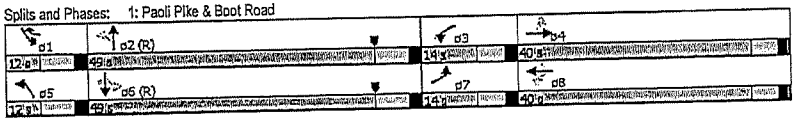
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	133	284	0	149	444	46	49	548	0	13	356	132
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (ft)	11	11	11	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			1%			3%	
Storage Length (ft)	350		0	125		0	100		0	100		350
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	45			45			45			45		
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
Frt						0.850						0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1517	1557	0	1629	1748	1530	1701	1739	0	1620	1705	1507
Flt Permitted	0.130			0.371			0.371			0.151		
Satd. Flow (perm)	208	1657	0	636	1748	1530	664	1739	0	257	1705	1507
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						95						152
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		767			160			717			900	
Travel Time (s)		11.6			2.4			10.9			13.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	9%	5%	0%	5%	3%	0%	0%	3%	0%	4%	4%	0%
Adj. Flow (vph)	146	312	0	164	488	51	54	602	0	14	391	145
Shared Lane Traffic (%)												
Lane Group Flow (vph)	146	312	0	164	488	51	54	602	0	14	391	145
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.12	1.12	1.12	1.07	1.07	1.07	1.08	1.08	1.08	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1	1	1	1		1	1	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	35	35		35	35	5	35	5		35	5	5
Trailing Detector (ft)	-5	-5		-5	-5	0	-5	0		-5	0	0
Detector 1 Position(ft)	-5	-5		-5	-5	0	-5	0		-5	0	0
Detector 1 Size(ft)	40	40		40	40	5	40	5		40	5	5
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		6	2			6		6
Detector Phase	7	4		3	8	1	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0	3.0	3.0	39.0		3.0	39.0	39.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	9.0	9.0		9.0	9.0	10.0	10.0	46.0		10.0	46.0	46.0
Total Split (s)	14.0	40.0		14.0	40.0	12.0	12.0	49.0		12.0	49.0	49.0
Total Split (%)	12.2%	34.8%		12.2%	34.8%	10.4%	10.4%	42.6%		10.4%	42.6%	42.6%
Maximum Green (s)	8.0	34.0		8.0	34.0	5.0	5.0	42.0		5.0	42.0	42.0
Yellow Time (s)	4.0	4.0		4.0	4.0	5.0	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	-1.0	-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	6.0	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 1: Paoli Pike & Boot Road



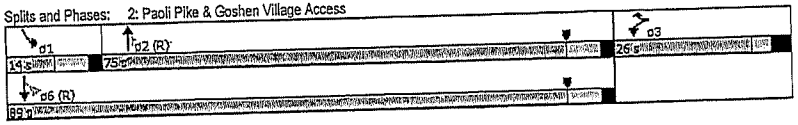
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	12	8	700	27	19	489
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (ft)	12	12	11	14	12	12
Storage Length (ft)	0	0		150	90	
Storage Lanes	1	1		1	1	
Taper Length (ft)	45				45	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1368	1224	1626	1569	1710	1731
Flt Permitted	0.950				0.310	
Satd. Flow (perm)	1368	1224	1626	1569	558	1731
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		9		21		
Link Speed (mph)	25		45			45
Link Distance (ft)	501		900			981
Travel Time (s)	13.7		13.6			14.9
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	25%	25%	7%	4%	0%	4%
Adj. Flow (vph)	13	9	753	29	20	526
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	9	753	29	20	526
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.07	1.07	1.12	0.99	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	1	1	1	1
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	35	35	5	5	35	5
Trailing Detector (ft)	-5	-5	0	0	-5	0
Detector 1 Position(ft)	-5	-5	0	0	-5	0
Detector 1 Size(ft)	40	40	5	5	40	5
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	Prot	NA	Perm	pm+pt	NA
Protected Phases	3	3	2		1	6
Permitted Phases				2	6	
Detector Phase	3	3	2	2	1	6
Switch Phase						
Minimum Initial (s)	3.0	3.0	40.0	40.0	3.0	40.0
Minimum Split (s)	9.0	9.0	47.0	47.0	11.0	47.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Total Split (s)	26.0	26.0	75.0	75.0	14.0	89.0
Total Split (%)	22.6%	22.6%	65.2%	65.2%	12.2%	77.4%
Maximum Green (s)	20.0	20.0	68.0	68.0	7.0	82.0
Yellow Time (s)	3.0	3.0	5.0	5.0	5.0	5.0
All-Red Time (s)	3.0	3.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	5.0	6.0	6.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	None	C-Max

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 32 (28%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 2: Paoli Pike & Goshen Village Access



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑↑		↱
Volume (vph)	295	0	0	639	0	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%			0%	0%	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	1800	0	0	3539	0	1522
Flt Permitted						
Satd. Flow (perm)	1800	0	0	3539	0	1522
Link Speed (mph)	45			45	30	
Link Distance (ft)	160			340	256	
Travel Time (s)	2.4			5.2	5.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	2%	4%	2%	2%	8%
Adj. Flow (vph)	328	0	0	710	0	101
Shared Lane Traffic (%)						
Lane Group Flow (vph)	328	0	0	710	0	101
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	295	0	0	639	0	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	1	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	5	2	4	2	2	8
Mvmt Flow	328	0	0	710	0	101

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	328	0	683	328
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	355	-
Critical Hdwy	-	-	4.14	-	6.63	6.32
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.236	-	3.519	3.376
Pot Cap-1 Maneuver	-	-	1220	-	399	696
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	681	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1220	-	399	696
Mov Cap-2 Maneuver	-	-	-	-	399	-
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	681	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	696	-	-	1220	-
HCM Lane V/C Ratio	0.145	-	-	-	-
HCM Control Delay (s)	11.1	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0	-

ATTACHMENT 5

Gap Study Data Results
Intersection of Boot Road and Goshen Village Access
Combined Gaps - Boot Road

9/12/2014
End of Study (17:45)
Start of Study (16:45)
Total Survey Time (60)
One Eastbound Through and one Westbound Through
24' Cartway

Gap Size (Seconds)	Number of Gaps	Gap Size Factor	Multiply Gap Size Factor by Number of Gaps
0 to 7	207	0	0
8 to 11	44	1	44
12 to 15	24	2	48
16 to 17	3	3	9
18 to 21	11	4	44
22 to 25	5	5	25
26 to 29	3	6	18
over 29	0	7	0
Total			188

Westbnound Gaps - Boot Road

9/12/2014
End of Study (17:45)
Start of Study (16:45)
Total Survey Time (60)
One Eastbound Through and one Westbound Through
24' Cartway

Gap Size (Seconds)	Number of Gaps	Gap Size Factor	Multiply Gap Size Factor by Number of Gaps
0 to 7	123	0	0
8 to 9	29	1	29
10 to 13	18	2	36
14 to 17	22	3	66
18 to 19	4	4	16
20 to 23	13	5	65
24 to 25	6	6	36
over 25	28	7	196
Total			444

McMahon Associates Inc.

425 Commerce Drive, Suite 200
Fort Washington, PA 19034

Municipality: East Goshen Township
Location: Boot Road &
Shopping Center Access
Counter/Board #: BW

File Name : paolibootGAP01p
Site Code : 11111111
Start Date : 9/12/2014
Page No : 1

Directions Printed: Westbound

Start Time	Volume	2 - 3	4 - 5	6 - 7	8 - 9	10 - 11	12 - 13	14 - 15	16 - 17	18 - 19	20 - 21	22 - 23	24 - 25	26 - 27	28 - 29	>29	Int. Total	Average
16:45	0	16	16	13	8	3	2	2	4	1	2	0	2	1	2	1	73	6 - 7
Total	0	16	16	13	8	3	2	2	4	1	2	0	2	1	2	1	73	6 - 7
17:00	0	7	10	9	7	1	2	4	3	0	1	1	1	1	0	7	54	8 - 9
17:15	0	10	12	5	7	4	3	2	1	1	1	4	1	1	0	6	58	8 - 9
17:30	0	10	9	6	7	1	2	4	2	2	2	2	2	2	1	6	58	8 - 9
Grand Total	0	43	47	33	29	9	9	12	10	4	6	7	6	5	3	20	243	6 - 7
Total %		17.7	19.3	13.6	11.9	3.7	3.7	4.9	4.1	1.6	2.5	2.9	2.5	2.1	1.2	8.2		

Similar to the computation of critical headways, the analyst begins the computation of follow-up headways with the base follow-up headways given in Exhibit 19-11. The analyst then makes movement-specific adjustments to the base follow-up headways with information gathered on heavy vehicles and the geometrics of the major street per the adjustment factors given in Equation 19-31.

Equation 19-31

$$t_{f,x} = t_{f,base} + t_{f,HV} P_{HV}$$

where

t_{fx} = follow-up headway for movement x (s),

$t_{f,base}$ = base follow-up headway from Exhibit 19-11 (s),

$t_{f,HV}$ = adjustment factor for heavy vehicles (0.9 for major streets with one lane in each direction, 1.0 for major streets with two or three lanes in each direction), and

P_{HV} = proportion of heavy vehicles for movement (expressed as a decimal; e.g., $P_{HV} = 0.02$ for 2% heavy vehicles).

Exhibit 19-11
Base Follow-Up Headways for TWSC Intersections

Vehicle Movement	Base Follow-Up Headway, $t_{f,base}$ (s)		
	Two Lanes	Four Lanes	Six Lanes
Left turn from major	2.2	2.2	3.1
U-turn from major	N/A	2.5 (wide) 3.1 (narrow)	2.3
Right turn from minor	3.3	3.3	3.9
Through traffic on minor	4.0	4.0	4.0
Left turn from minor	3.5	3.5	3.8

Values from Exhibit 19-10 and Exhibit 19-11 are based on studies throughout the United States and are representative of a broad range of conditions. If smaller values for t_c and t_f are observed, capacity will be increased. If larger values for t_c and t_f are used, capacity will be decreased.

Step 5: Compute Potential Capacities

Step 5a: Potential Capacity If No Upstream Signal Effects Are Present

The potential capacity $c_{p,x}$ of a movement is computed according to the gap-acceptance model provided in Equation 19-32 (6). This model requires the analyst to input the conflicting flow rate $v_{c,x}$, the critical headway $t_{c,x}$, and the follow-up headway $t_{f,x}$, for movement x.

Equation 19-32

$$c_{p,x} = v_{c,x} \frac{e^{-v_{c,x} t_{c,x}/3,600}}{1 - e^{-v_{c,x} t_{f,x}/3,600}}$$

where

$c_{p,x}$ = potential capacity of movement x (veh/h),

$v_{c,x}$ = conflicting flow rate for movement x (veh/h),

$t_{c,x}$ = critical headway for minor movement x (s), and

t_{fx} = follow-up headway for minor movement x (s).