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The Engineering Corp.com

December 4, 2015

DATE:

# MEMORANDUM

- TO: Mr. William Depietri Capital Group Properties 259 Turnpike Road, Suite 100 Southborough, Massachusetts 01772
- FROM:Rebecca L. Brown, P.E., PTOE, Senior Traffic EngineerPROJECT NO.:T0524Douglas S. Halpert, E.I.T., Traffic Engineer
  - **RE:** Proposed Mixed-Use Residential Development Park Central, Southborough, MA Updated Traffic Impact and Access Study for Proposed Master Plan

## INTRODUCTION

TEC, Inc. has been retained by Capital Group Properties (the Proponent) to prepare a Traffic Impact and Access Study (TIAS) associated with a proposed residential mixed-use development on Turnpike Road (Route 9) in Southborough, MA. The site is located on a ±100 acre parcel on the northeast corner of the Turnpike Road (Route 9) and Interstate 495 (I-495) Exit 23 Interchange. Access to the site is currently provided via a connection to Turnpike Road (Route 9) known as Park Central Drive, which also provides access to the Red Roof Inn and Park Central at Southborough office building. As proposed, the project includes construction of 180 residential rental apartments, 140 residential condominiums/townhouses, a 150-bed assisted living facility, and a 125-room hotel. The project is proposed to be developed in phases, with the first phase consisting of the construction of the 180 residential apartment units to be developed under Chapter 40-B regulations. Access to the site will be provided via the existing Park Central Drive connection on Turnpike Road (Route 9). In addition, a new crossconnection will be constructed between Park Central Drive and Flagg Road, which will allow access and egress via Flagg Road to Turnpike Road (Route 9). An emergency access driveway is also proposed at the northerly end of the site, connecting to Blackthorn Drive. This driveway would be gated to prevent cut-through traffic through the Blackthorn Drive neighborhood.

Turnpike Road (Route 9) is under the jurisdiction of the Massachusetts Department of Transportation (MassDOT). Therefore, this project will require a Permit to Access State Highway from MassDOT. In addition, because the project is anticipated to generate more than 3,000 new vehicle trips per day, the project will require review by the Massachusetts Environmental Policy Act (MEPA) office in the form of an Environmental Notification Form (ENF) and a mandatory Environmental Impact Report (EIR).

The following TIAS has been prepared in accordance with MassDOT guidelines for the preparation of a Traffic Impact Study. As part of this TIAS, TEC has evaluated the traffic operations for the site driveways and study area intersections under existing and future conditions. The future year planning horizon examines traffic operations under existing conditions (2014) as well as a 9-year design horizon (2023) for traffic-volume projections, which includes an evaluation of the no-build conditions (without the proposed project) and build

Mr. William Depietri December 1, 2015 Page 2 of 38

conditions (with site traffic added). These conditions are compared to determine what, if any, additional off-site mitigation is necessary to provide reasonable traffic operations in the area after the project is complete.

# **EXISTING CONDITIONS**

The study area was selected to contain the major roadways providing local access to the project site. The following intersections were included in the study area:

- 1. Turnpike Road (Route 9) / Park Central Drive
- 2. Turnpike Road (Route 9) / Flagg Road
- 3. Turnpike Road (Route 9) / Crystal Pond Road
- 4. Flagg Road / Proposed Access Road
- 5. Flagg Road / Blackthorn Drive
- 6. Deerfoot Road / Main Street (Route 30)
- 7. Interstate 495 / Turnpike Road (Route 9) Interchange 23

The study area intersections are shown graphically in Figure 1.

### **Geometry**

A comprehensive field inventory of existing traffic conditions at the study area intersections was conducted by TEC staff in March 2015 to obtain information related to intersection geometry and lane usage. The field investigation consisted of an inventory of existing roadway geometrics, operating characteristics, and safety characteristics. A description of the existing roadway and intersection inventory is provided below.

## Roadways

## Turnpike Road (Route 9)

Turnpike Road, signed as Massachusetts Route 9 and the Boston Worcester Turnpike, is a twoto four-lane, east-west principal arterial roadway maintained by MassDOT. The roadway provides statewide connections between the Boston Metropolitan Area and central/western Massachusetts. Locally, Turnpike Road (Route 9) provides connection between Interstate 495 and Westborough to the west, and Southborough and Framingham to the east. Turnpike Road (Route 9) is generally  $\pm$ 75-feet wide within the  $\pm$ 110-foot State Highway Layout (SHLO) with auxiliary turn lanes at various signalized and unsignalized intersection locations. Directional flow along the roadway, in the vicinity of the study area, is separated by a concrete barrier. The posted speed limit along Turnpike Road (Route 9) is 55 miles per hour (mph). Land uses along Turnpike Road (Route 9) include primarily retail, commercial, and industrial uses.







Project Location Map & Study Area Intersections

Mr. William Depietri December 1, 2015 Page 4 of 38

Park Central Drive

Park Central Drive is a two-lane, north-south private roadway and provides direct access and egress to/from multiple commercial businesses including the Red Roof Inn, a Cumberland Farms gas station / convenience market, and a three-story office building with multiple tenants. Access and egress from Park Central Drive is provided to Turnpike Road (Route 9) westbound only. Directional flow along Park Central Drive is unmarked and there is no posted speed limit. The state prima facie speed for unposted roadways of this type is 30 mph.

## Flagg Road

Flagg Road is a two-lane, northeast-southwest local roadway maintained by the Town of Southborough. The roadway provides a local connection between Turnpike Road (Route 9) to the south and Deerfoot Road to the north. The speed limit along the roadway is 25 mph while the 85<sup>th</sup> percentile speed along the roadway was measured at 37 mph.

There is an existing culvert crossing on Flagg Road approximately 450 feet north of Turnpike Road (Route 9). Flagg Road over this culvert crossing is approximately 17.5 feet wide with guard rail on either side. There is currently no signage along Flagg Road to alert drivers to the narrowing roadway over this culvert. Independent of the proposed residential project, TEC recommends that the Town of Southborough install *Road Narrows* (W5-1) signs on Flagg Road approaching the culvert crossing from either direction.

### Deerfoot Road

Deerfoot Road is a two-lane, north-south local roadway maintained by the Town of Southborough. The roadway provides a local connection between Turnpike Road (Route 9) to the south and Main Street (Route 30) to the north. Directional flow along Deerfoot Road is unmarked. The speed limit along the roadway is 25 mph while the 85<sup>th</sup> percentile speed along the roadway was measured at 37 mph.

### Blackthorn Drive

Blackthorn Drive is a two-lane local neighborhood roadway maintained by the Town of Southborough. A future gated, emergency-access connection for the proposed development will be located where Blackthorn Drive currently dead-ends. There is no posted speed limit along Blackthorn Drive.

## Intersections

## Turnpike Road (Route 9) / Park Central Drive

Park Central Drive intersects Turnpike Road (Route 9) to form a two-way (three-legged) unsignalized intersection. The Park Central Drive southbound approach is under STOP control while the Turnpike Road (Route 9) westbound approach is free-flowing. The Park Central Drive southbound approach consists of a single right-turn out travel lane as part of a right-in / right-out access/egress point. The Turnpike Road (Route 9) westbound approach consists of two general purpose travel lanes with an expansive shoulder, which is frequently utilized as a right-



Mr. William Depietri December 1, 2015 Page 5 of 38

turn lane into Park Central Drive. Turnpike Road (Route 9) is median-divided at the intersection with Park Central Drive, restricting access/egress to/from Turnpike Road (Route 9) eastbound.

# Turnpike Road (Route 9) / Flagg Road

Flagg Road intersects Turnpike Road (Route 9) to form a two-way (three-legged) unsignalized intersection. The Flagg Road southbound approach is under STOP control while the Turnpike Road (Route 9) westbound approach is free-flowing. The Flagg Road southbound approach consists of a single right-turn-out travel lane as part of a right-in/right-out access/egress point. The Turnpike Road (Route 9) westbound approach consists of two through lanes and an exclusive right-turn lane that provides concurrent access to several commercial establishments along the northerly edge of Turnpike Road (Route 9) upstream, as well as Park Central Drive. Turnpike Road (Route 9) is median-divided at the intersection with Park Central Drive, restricting access/egress to/from Turnpike Road (Route 9) eastbound.

## Turnpike Road (Route 9) / Crystal Pond Road

Crystal Pond Road intersects Turnpike Road (Route 9) to form a three-way, actuated signalized intersection. The Crystal Pond Road northbound approach consists of two exclusive left-turn lanes and a channelized right-turn lane. Directional flow along Crystal Pond Road is separated by a raised concrete median and marked centerline. The Turnpike Road (Route 9) eastbound approach consists of an exclusive U-turn lane, two through lanes, and an exclusive right-turn lane. The Turnpike Road (Route 9) westbound approach consists of a shared left-turn / U-turn lane, and three through lanes. Directional flow along Turnpike Road (Route 9) is separated by concrete barriers.

## Flagg Road / Blackthorn Drive

Blackthorn Drive intersects Flagg Road to form a three-way unsignalized intersection. Although there is no posted sign control, Blackthorn Drive operates under assumed STOP control while Flagg Road is free-flowing. The Blackthorn Drive eastbound approach consists of a single general purpose travel lane with directional flow unmarked. Both the Flagg Road northbound and southbound approaches consist of single general purpose travel lanes with directional flow unmarked.

## Main Street (Route 30) / Deerfoot Road

Deerfoot Road intersects Main Street (Route 30) to form a three-way unsignalized intersection. Deerfoot Road is under STOP control while the Main Street (Route 30) eastbound and westbound approaches are free-flowing. All approaches to the intersection consist of a general-purpose travel lane. Directional flow on Main Street (Route 30) is separated by a marked centerline, which directional flow on Deerfoot Road is unmarked.

### Existing Traffic Volumes

In order to establish existing traffic-volume conditions at the study area intersections, manual Turning Movements Counts (TMCs) were obtained from multiple published sources; which



Mr. William Depietri December 1, 2015 Page 6 of 38

included: the *Interstate 495 and Route 9 Interchange Improvement Study*<sup>1</sup> and the Traffic Impact and Access Study<sup>2</sup> previously prepared for the proposed project by Green International Affiliates, Inc. Counts were conducted during the weekday morning (7:00 AM – 9:00 AM) and weekday evening (3:00 PM – 6:00 PM) peak periods in September 2011 for intersections along Turnpike Road (Route 9) and on Thursday, May 30, 2013 at intersections along Flagg Road, Blackthorn Drive, and Deerfoot Road. A detailed summary of the turning movement counts, partitioned into 15-minute intervals, is provided within Attachment A.

In addition, Automatic Traffic Recorder (ATR) counts were conducted along Flagg Road and Deerfoot Road on Tuesday, February 5, 2013 through Wednesday, February 6, 2013 and along Blackthorn Road on Wednesday, May 29, 2013 through Thursday, May 30, 2013 to gather daily traffic-volume data during a continuous 48-hour time period. A summary of the Weekday ATR traffic data is presented in Table 1. A detailed summary of the ATR data, partitioned into 15-minute intervals, is provided within Attachment B.

	Weekday	Weekd	ay Morning	Peak Hour	Weekday Evening Peak Hour				
Location	Traffic Volume <sup>(a)</sup>	Traffic Volume <sup>(b)</sup>	K Factor <sup>(c)</sup>	Directional Distribution <sup>(d)</sup>	Traffic Volume	K Factor	Directional Distribution		
Flagg Road (north of Turnpike Road)	978	89	9.1	84.3% SB	90	9.2	50.0%		
Deerfoot Road (south of Main St.)	1,882	258	13.7	57.0% SB	179	9.5	52.0% SB		
Blackthorn Drive (west of Flagg Road)	394	33	8.4	60.6% EB	36	9.1	61.1% WB		
Route 9 EB (east of I-495) <sup>(e)</sup>	27,200	3,035	11.2	-	2,230	8.2	-		
Route 9 WB (east of I-495) <sup>(e)</sup>	27,300	2,530	9.3	-	3,040	11.1	-		

 Table 1 – Existing Weekday Traffic Volume Summary

<sup>a</sup> Daily traffic expressed in vehicles per day

<sup>b</sup> Hourly traffic expressed in vehicles per day

<sup>c</sup> Percent of daily traffic volumes which occurs during the peak hour

<sup>d</sup> Percent of peak-hour volume in the predominant direction of travel

<sup>e</sup> Route 9 ADT information referenced from Interstate 495 & Route 9 Interchange Improvement Study, MassDOT

### Seasonal Adjustment

In accordance with MassDOT standards, traffic volumes are typically adjusted to average-month conditions. Based on a review of historic traffic-volume counts collected by MassDOT at a permanent count station along Route 9 in Westborough<sup>3</sup>, traffic volumes in February are 4.7 percent lower than average-month conditions, while traffic volumes in May are 3.8 percent higher than average month conditions. Therefore, the February 2013 traffic volumes were upwardly adjusted by 4.7 percent, and the May 2013 traffic volumes were unadjusted to reflect a conservative (worse case) analysis scenario. Traffic counts along Route 9 obtained from the

<sup>&</sup>lt;sup>3</sup> MassDOT Permanent Count Station 307 – Westborough – Route 9 – East of Northborough Town Line



<sup>&</sup>lt;sup>1</sup> Interstate 495 and Route 9 Interchange Improvement Study – Final Report, Westborough and Southborough, Massachusetts AECOM; November 2013

<sup>&</sup>lt;sup>2</sup> *Traffic Impact and Access Study – Proposed Residences at Park Central*; Southborough, Massachusetts; Green International Affiliates, Inc.; June 2013

Mr. William Depietri December 1, 2015 Page 7 of 38

*Interstate 495 & Route 9 Interchange Improvement Study* were unadjusted and assumed to be seasonally adjusted as part of this study. The compiled seasonal adjustment data is provided in Attachment C. The resulting 2014 Existing weekday morning and evening peak-hour traffic-volume networks are illustrated in Figure 2.

## Public Transportation

Currently, there is one Metro West Regional Transit Authority (MWRTA) bus route that travels along Turnpike Road (Route 9) near the site. Bus route and schedule data are included in Attachment D and a summary of the route is provided below:

 MWRTA Bus Route 7 (Southborough / Marlborough Line) – Regular service is provided at designated stops in Framingham, Ashland, Southborough, and Marlborough. The closest stop to the project site is in Downtown Southborough along Main Street approximately 2.5 miles to the east of the site. This route operates from 5:30 AM to 8:30 PM at 45- to 90-minute headways on weekdays and 105 minute headways on weekends.

Massachusetts Bay Transportation Authority (MBTA) Commuter Rail service is provided to the Town of Southborough via the Framingham / Worcester Line. Commuter rail route and schedule data are included in Attachment D and a summary of the route is provided below:

 Framingham / Worcester Commuter Rail Line - The MBTA commuter train provides connections from South Station in Boston with stations at Back Bay, Yawkey, Newtonville, West Newton, Auburndale, Wellesley Farms, Wellesley Hills, Wellesley Square, Natick, West Natick, Framingham, Southborough, Westborough, Grafton, and Worcester. Inbound service runs between 4:45 AM and 1:29 AM, and outbound service runs between 4:20 AM and 1:00 AM with headways of approximately 20 minutes to two hours on weekdays. On Saturdays and Sundays, inbound service runs between 7:00 AM and 12:30 AM and outbound service runs between 6:40 AM and 12:30 AM, with headways of approximately 90 minutes to two hours.





## Crash History Analysis

Collision data for the study area intersections was compiled and analyzed for the most recent consecutive three-year period (2011-2013) on file from MassDOT. The motor vehicle crash data was reviewed to determine if any collision trends exist within the study area. A summary of the vehicle collision data and intersection crash rates are provided in Table 2. None of the intersections within the study area are considered Highway Safety Improvement Program (HSIP) eligible or appear on MassDOT's Top 200 Crash Locations.

### **Crash Rate Worksheets**

In addition to examining the number of collisions at the study area intersections, a crash rate was calculated to compare occurrence of collisions to the volume of traffic passing through the intersection. The crash rate per million entering vehicles (MEV) was calculated using the weekday evening peak hour volumes from the TMCs and a calculated K-factor obtained from ATR counts conducted in September 2011 and February 2013 and the *Interstate 495 & Route 9 Interchange Improvement Study*. The crash rates at each of the study area intersections were compared to the statewide and district-wide averages published by MassDOT in January 2013 to determine the significance of the collision occurrence. The statewide average for signalized intersections is 0.80 per MEV and the District 3 average for signalized intersections is 0.89 per MEV. The statewide average for unsignalized intersections is 0.60 per MEV and the District 3 average for signalized intersections of the MEV rate calculation worksheets and detailed crash data are provided in Attachment E.

## **Collision Data Summary**

The intersection of Turnpike Road (Route 9) / Crystal Pond Road experienced an average of approximately four (4) collisions per year over the three-year study period. The crash rate for this intersection is below the statewide and District 3 averages for signalized intersections. Approximately 62 percent (8 of 13) of the collisions were rear-end collisions, which are typical at signalized intersections. The majority of the collisions (12 of 13) resulted in property damage only. Approximately half of the collisions (6 of 13) occurred during the evening commuter peak period, which indicates that long queues extending from the signal may be a contributing factor to rear-end collisions.

All other intersections within the study area experienced fewer than two (2) crashes per year over the three-year study period and crash rates significantly lower than statewide and district-wide averages, indicating that no noticeable trend exists. A compilation of the MEV rate calculation worksheets and crash data can be found in Attachment E.



Table 2	–Intersection	Collision	History	Summary
		0011101011		<b>•••</b>

Pa	arameter	Route 9 / Park Central Drive	Route 9 / Flagg Road	Route 9 / Crystal Pond Road	Flagg Road / Blackthorn Road	Main Street / Deerfoot Road
	2011	1	4	5	0	1
One she Maran	2012	0	1	3	0	0
Crash Year	2013	0	0	5	0	1
	TOTAL	1	5	13	0	2
Aver	age Annual	0.33	1.67	4.33	0.00	0.67
Rat	e per MEV	0.03	0.17	0.25	0.00	0.16
	Angle	1	0	1	0	0
	Rear-end	0	4	8	0	0
	Sideswipe	0	0	3	0	0
Manner of	Single Vehicle	0	1	1	0	1
Collision	Head-On	0	0	0	0	0
	Ped / Bike	0	0	0	0	0
	Not Reported	0	0	0	0	1
	TOTAL	1	5	13	0	2
	Dry	0	4	10	0	0
Road	Wet	1	1	2	0	0
Surface	Snow / Ice	0	0	1	0	1
Conditions	Other / Unknown	0	0	0	0	1
	TOTAL	1	5	13	0	2
	Prop Damage	1	3	12	0	1
Injury	Non-Fatal Injury	0	2	1	0	0
Status (Crash	Fatal Injury	0	0	0	0	0
Severity)	TOTAL1Average Annual0.33Rate per MEV0.03Angle1Rear-end0Sideswipe0Single Vehicle0Banner of collisionSingle VehicleSingle Vehicle0Head-On0Ped / Bike0Not Reported0Vet1Snow / Ice0Other / Unknown0Other / Unknown0TOTAL1Injury Status (Crash everity)Prop DamageNon-Fatal Injury Status (Crash everity)0Monday-Friday Saturday-Sunday1Day of Week6:00AM-9:00AM09:00AM-3:00PM113:00PM-6:00PM06:00PM-6:00AM00100100100	0	0	0	0	1
	TOTAL	1	5	13	Flagg Road / Blackthorn       E         0       0	2
	Monday-Friday	1	3	11	0	2
Day of Week	Saturday-Sunday	0	2	2	0	0
	TOTAL	1	5	13	0	2
	6:00AM-9:00AM	0	0	0	0	0
_	9:00AM-3:00PM	1	3	6	0	1
Time of Dav	3:00PM-6:00PM	0	2	6	0	0
- <b>J</b>	6:00PM-6:00AM	0	0	1	0	1
	TOTAL	1	5	13	0	2



### Sight Distance Measurements

TEC, Inc. visited the site on Tuesday, March 11, 2014 to measure the available sight distances along the study area roadways and at the proposed access road connection to Flagg Road. The available sight distances were compared to minimum requirements established by the American Association of State Highway and Transportation Officials (AASHTO).

Sight distance represents the length of roadway that is visible to a driver traveling within the roadway. Two types of sight distance are typically evaluated for driveways and intersections: stopping sight distance (SSD) and intersection sight distance (ISD). SSD is the minimum distance required for a driver traveling along a roadway to perceive an object in the roadway and stop safely in advance of the object when traveling on a wet pavement surface. SSD is measured from an eye height of 3.5 feet to an object height of 2 feet above the ground, which is equivalent to a driver viewing the taillight of a vehicle ahead. SSD is measured along the centerline of the travel lane approaching the driveway or intersection.

ISD represents the length of the roadway visible to a driver waiting to exit a driveway or minor street. Minimum ISD requirements are based on the distance required for a driver to exit a minor street onto a major street without requiring an approaching vehicle to reduce its speed from the design speed to less than 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet, and is measured from a distance 15 feet off the edge of the travel-way of the major roadway to represent a driver waiting to exit a driveway or minor roadway.

SSD is typically considered the critical sight distance, as it represents the minimum distance required for safe stopping, while ISD represents an acceptable speed reduction for approaching vehicles. The ISD, however, must be at least equal to the minimum required SSD in order to prevent a driver from entering the roadway when an approaching vehicle is too close to safely stop. The guidance provided by AASHTO states:

"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."

Table 3 provides a summary of the available sight distances at the study intersections.



#### Table 3 – Sight Distance Measurements

			Meas	sured
Approach / Direction	Speed	Minimum Required	Stopping Sight Distance	Intersection Sight Distance
Park Central Drive at Route 9: East of Park Central Drive	60 mph <sup>(a)</sup>	570 FT	>650 FT	>650 FT
Flagg Road at Route 9: East of Flagg Road	60 mph <sup>(a)</sup>	570 FT	>650 FT	>650 FT
Proposed Site Access Road at Flagg Road: North of Driveway South of Driveway	37 mph <sup>(b)</sup> 37 mph <sup>(b)</sup>	270 FT 270 FT	350 FT 270 FT <sup>(c)</sup>	160 FT (270 FT) 270 FT <sup>(c)</sup>
Blackthorn Drive at Flagg Road: North of Blackthorn Drive South of Blackthorn Drive	37 mph <sup>(b)</sup> 37 mph <sup>(b)</sup>	270 FT 270 FT	280 FT >400 FT	340 FT 110 FT
Deerfoot Road at Main Street: <i>East of Deerfoot Road</i> <i>West of Deerfoot Road</i>	35 mph <sup>(a)</sup> 35 mph <sup>(a)</sup>	250 FT 250 FT	480 FT 560 FT	>600 FT 430 FT

<sup>a</sup> Speed based on posted speed limit plus 5 miles per hour

<sup>b</sup> Speed based on measured 85<sup>th</sup> percentile speed

<sup>c</sup> Sight distance back to prior intersection

As shown in Table 3, the SSD at the study area intersections and proposed Access Road exceed AASHTO's minimum recommendations for safe operations. The ISD looking north exiting the proposed Access Road onto Flagg Road is partially obstructed by a large tree immediately adjacent to the edge of pavement on the easterly side of Flagg Road just north of the proposed Access Road. It is recommended that this tree be removed to increase sight distances and increase the clear zone along Flagg Road. With removal of this tree and clearing of vegetation close to the roadway, sight distances can be extended to 270 feet to meet AASHTO recommendations. Figure F-1 in Attachment F provides a depiction of the area within the right-of-way that should be kept clear of vegetation to meet minimum sight distance requirements at this location.

The ISD looking south exiting Blackthorn Drive onto Flagg Road is partially obstructed by a historic stone wall along the property at the southwest corner of this intersection. As removal of the stone wall is not desired to preserve the scenic character of the roadway, TEC recommends installation of an All-Way STOP control at the Flagg Road / Blackthorn Drive intersection to improve the safety of this intersection and eliminate the sight distance issue.

### **FUTURE CONDITIONS**

Traffic volumes in the study area were projected to the year 2023, which reflects a 9-year planning horizon consistent with MassDOT's standard of a minimum 7 year horizon from the date of project permitting. The traffic conditions for the year 2023, under No-Build conditions, were developed to document the operating conditions independent of the proposed project, including all existing traffic, new traffic resulting from background growth, and traffic from specific development projects expected to be completed by 2023. Anticipated site-generated traffic volumes for the proposed residential mixed-use development were superimposed upon the No-Build traffic networks to reflect the Build conditions with the proposed project.



Mr. William Depietri December 1, 2015 Page 13 of 38

### Background Traffic Growth

Traffic growth is a function of the expected land development in the immediate area and the surrounding region. Several methods can be used to estimate this growth. Traffic engineers frequently employ an annual percentage increase in traffic growth, which is applied to all traffic volumes under study. The drawback to such a procedure is that some turning volumes may actually grow at either a higher or a lower rate at particular intersections.

An alternative procedure identifies the location and type of planned development, estimates the traffic to be generated, and assigns it to the area roadway network. This procedure produces a more realistic estimate of growth for local traffic. However, the drawback of this procedure is that the potential growth in population and development external to the study area would not be accounted for in the traffic projections.

To provide a conservative analysis framework, both procedures were considered.

## General Background Growth

Traffic-volume data compiled by MassDOT from permanent count stations and historic traffic counts in Southborough<sup>4,5,6,7,8,9</sup> along Turnpike Road (Route 9) and local roadways within the vicinity of the project were reviewed in order to determine traffic growth trends. Based on the MassDOT traffic volume data, traffic volumes in the area along Turnpike Road (Route 9) have been decreasing at a rate of 0.1 percent per year since 2004. In addition, traffic volumes in the area along local roadways have been decreasing at an average rate of 0.9 percent per year since 2004. Therefore, to provide a conservative (worse-case) analysis scenario, a 0.5 percent and a 1.0 percent per year compounded annual background traffic growth rate was applied for side street roadways and for Turnpike Road (Route 9), respectively. These growth rates are used to account for potential future traffic growth external to the study area and presently unforeseen development. Count station data have been included in Attachment G.

### **Specific Developments by Others**

TEC coordinated with the Town of Southborough Planning Board and Town of Westborough Planning Board to identify nearby private / public development projects in the vicinity of the study area that are either in the planning process or were recently approved but not yet occupied. Based on these discussions, the Town of Southborough identified nine (9) projects that would contribute significant traffic volumes to the study area. These projects are described in detail below:

• *Madison Place* – This project has been fully constructed and includes 168 apartment units with access / egress provided along Crystal Pond Road. As this



<sup>&</sup>lt;sup>4</sup> MassDOT Temporary Count Station 307 – Westborough – Boston Turnpike (Route 9) east of Otis Street

<sup>&</sup>lt;sup>5</sup> MassDOT Temporary Count Station 3308 – Southborough – Boston Turnpike (Route 9) east of East Main Street (Route 30)

<sup>&</sup>lt;sup>6</sup> MassDOT Temporary Count Station 3086 – Southborough – Deerfoot Road south of Main Street (Route 30)

<sup>&</sup>lt;sup>7</sup> MassDOT Temporary Count Station 3087 – Southborough – Deerfoot Road north of Route 9

<sup>&</sup>lt;sup>8</sup> MassDOT Temporary Count Station 3094 – Southborough – Flagg Road north of Route 9

<sup>&</sup>lt;sup>9</sup> MassDOT Temporary Count Station 3096 – Southborough – Clifford Street south of Deerfoot Road

Mr. William Depietri December 1, 2015 Page 14 of 38

project is under construction and was unoccupied at the time of traffic counts, vehicle trips expected to be generated by this development have been included under future year analysis conditions. Site trip generation information was obtained from the *Traffic Impact and Access Study Addendum*<sup>10</sup> dated July 15, 2013 for this project.

- New England Center for Children This project has been partially constructed and is currently under review with the Planning Board. The development is located along Pleasant Street and will include a ±9,930 SF school for children with Autism. As this project is under construction and was unoccupied at the time of traffic counts, vehicle trips expected to be generated by this development have been included under future year analysis conditions. Site trip generation information was obtained from the Site Plans<sup>11</sup> dated January 7, 2014.
- Proposed Firman Avenue Office Expansion This project is currently in the preconstruction phase and under site plan review with the Planning Board. The development will include a 63,000 SF office expansion to an existing office complex along the Pleasant Street Connector at the Southborough / Framingham City Line. Site trip generation information for this project was obtained from the *Traffic Impact and Access Study*<sup>12</sup> dated August 2013.
- *EMC Commercial Office Park* This project has been partially constructed and is currently under review with the Town of Southborough Planning Board. The subdivided lots along a connector roadway between Turnpike Road (Route 9) and Flanders Road. There are currently 445 undeveloped acres for which each site must go through Town approval. Construction of the subdivision was approved by the Town of Southborough in 2008. This project was currently under construction and was unoccupied at the time of traffic counts; however, because there has been no formal construction project submitted to the Town of Southborough to base future trips on and therefore has not been included under future year analysis conditions.
- Westboro Village This project is has been partially constructed and has been approved by the Town of Westborough Planning Board. The mixed-use development is located at the Fisher Street / Gleason Street intersection and will include a ±2,500 SF convenience store, ±2,500 SF restaurant, ±10,500 SF office development, and 350 residential units. Site trip generation information was obtained from the *Technical Memorandum*<sup>13</sup> dated February 16, 2006.
- *Village Commons* This project has been partially construction and is currently under review with the Westborough Planning Board. The development is located along Fisher Street just east of Gleason Street and will include 10-12 single family residential units. Given the size of the development and proximity to the

<sup>&</sup>lt;sup>13</sup> Technical Memorandum – Response to Peer Review Traffic Comments – Westboro Village – Westborough, Massachusetts; Abend Associates; February 16, 2006



<sup>&</sup>lt;sup>10</sup> Traffic Impact and Access Study Addendum – Madison Place Southborough – Southborough, Massachusetts, Bristol Traffic and Transportation Consulting, LLC; July 15, 2013

<sup>&</sup>lt;sup>11</sup> Plan Set - *New England Center for Children – Southborough, Massachusetts*, Bristol Traffic and Transportation Consulting, LLC; January 7, 2014

<sup>&</sup>lt;sup>12</sup> *Traffic Impact and Access Study – Proposed Office Expansion – Southborough & Framingham, Massachusetts*, MDM Transportation Consulting, Inc.; August 2013

Mr. William Depietri December 1, 2015 Page 15 of 38

project study area, all trips associated with Village Commons are assumed to be incorporated into the background growth rate.

- *Westborough Woods* The development consists of 250 rental apartments under Chapter 40B permitting, 5,346 sf of retail space, and a 6,234 sf club house, with club house access limited to residents. Access to the site is provided by a single driveway on the eastbound side of Route 9 (Turnpike Road), approximately 1,400 feet west of Otis Street. As this project is under construction and was unoccupied at the time of the traffic counts, vehicle trips expected to be generated by this development have been included under future year analysis conditions. Site trip generation information was obtained from the *Traffic Impact Study*<sup>14</sup> dated November 2012.
- Extended Stay Hotel A 107 room, 3 story hotel development located at 15 Connector Road has received a building permit by the Town of Westborough. A start date for construction has not been identified. The tenant for the ±2,200 SF accessory building on site has not been identified yet. The original study was performed 15 years ago. Therefore, TEC has estimated the rates contained within the Institute of Transportation Engineers (ITE) publication *Trip Generation, 9<sup>th</sup> Edition* for Land Use Code (LUC) 310 – Hotel and LUC 937 – Coffee/Donut Shop with Drive-Through Window. Trip distribution of sitegenerated trips was based on existing traffic patterns in the surrounding area.
- *Preservation Acres* This project has been partially construction and is currently under review with the Westborough Planning Board. The development is located at the Arch Street / Eric Drive intersection and will include 10 single family residential units. Given the size of the development and proximity to the project study area, all trips associated with Preservation Acres are assumed to be incorporated into the background growth rate.

The resulting "Specific Developments by Others" traffic-volumes are illustrated in Figures H-1 and H-2 for the weekday morning and weekday evening peak hours, respectively. Detailed trip distribution information is provided in Attachment H.

# Planned Roadway Improvement Projects

MassDOT recently prepared a study for improvements to the I-495 / Route 9 Interchange in January 2013, which includes construction of improvements along Turnpike Road (Route 9) within the study area. These improvements consist of constructing a third through travel-lane on Turnpike Road (Route 9) in the westbound direction between I-495 SB and Computer Drive, necessary widening of Route 9 as required, and reconstruction of the Route 9/Crystal Pond Road intersection. Funding for construction of these improvements has not yet been identified and construction of the improvements is not anticipated to begin until Summer 2023 based on MassDOT's Projects Database (MassDOT Project #607701). As a result, the improvements were not incorporated into the No-Build or Build conditions.

MassDOT is currently in the process of resurfacing Turnpike Road (Route 9) as part of the MassDOT Project # 607172 – *Westborough – Southborough – Resurfacing and related work on* 

<sup>&</sup>lt;sup>14</sup> *Traffic Impact Study – Westborough Woods – Westborough, Massachusetts*, Tetra Tech; November 2012



Mr. William Depietri December 1, 2015 Page 16 of 38

*Route 9.* The project consists of resurfacing work along Turnpike Road (Route 9) between Lyman Street in Westborough and White Bagely / Breakneck Hill Road in Southborough passing through the study area. Construction is expected to end Summer 2016.

## No-Build Traffic Volumes

The 2023 No-Build weekday morning and weekday evening peak-hour traffic-volume networks were developed by applying the 0.5 percent and 1.0 percent per year compounded annual background traffic growth rate on side roads and Turnpike Road (Route 9) to the 2014 Existing peak-hour traffic-volumes over the 9-year design horizon and adding traffic to be generated by the specific developments by others. The resulting 2023 No-Build weekday morning and weekday evening peak-hour traffic-volume networks are illustrated in Figure 3.





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### Site-Generated Traffic

The project consists of the construction of a 180-unit apartment development, 140 units of residential condominium/townhouses, a 150-room assisted living development, and a 125-room hotel. The site-generated traffic-volumes for the project were estimated based on standard trip rates published in the Institute of Transportation Engineers (ITE) publication *Trip Generation, 9th Edition* for Land Use Code (LUC) 220 – Apartment, LUC 230 – Residential Condominium/Townhouses, LUC 254 – Assisted Living, and LUC 310 – Hotel. Table 4 provides a summary of the resulting trip generation estimate. The detailed trip generation calculation worksheets are provided in Attachment I.

Time Period / Direction	Apartments (LUC 220)	Condominium / Townhouses (LUC 230)	Assisted Living (LUC 254)	Hotel (LUC 310)	Total Trips		
Weekday Daily	1,214	862	400	746	3,222		
Weekday Morning Peak Hour							
Enter	18	12	14	39	83		
Exit	74	56	7	27	164		
Total	92	68	21	66	247		
Weekday Evening Peak Hour							
Enter	76	53	15	38	182		
Exit	41	26	18	37	122		
Total	117	79	33	75	304		
Saturday Daily	1,150	934	330	908	3,322		
Saturday Midday Peak Hour							
Enter	47	45	26	51	169		
Exit	46	38	24	40	148		
Total	93	83	50	91	317		

## Table 4 – Trip Generation Summary

# Trip Distribution

The distribution of site-generated traffic-volumes for residential and assisted living trips were based upon a gravity model using 2000 U.S. Census Journey-to-Work data for residents residing in the Town of Southborough, as this is the most recent year in which journey-to-work information was collected as part of the U.S. Census. The resulting primary trip distribution is shown in Table 5 and the gravity model is included in Attachment J. Due to the median divided highway layout on Turnpike Road (Route 9), the entering and exiting traffic will experience different trip distribution patterns and have been considered individually. The resulting weekday morning and weekday evening trip distribution percentage networks for residential and assisted living trips are presented in Figure 4 and Figure 5 respectively.



# Mr. William Depietri December 1, 2015 Page 19 of 38

Direction	Entering %	Exiting %
Route 9 to/from East	55%	29%
Route 9 to/from West	12%	12%
Interstate 495 to/from North	12%	14%
Interstate 495 to/from South	6%	30%
Route 30 to/from East	13%	13%
Route 30 to/from West	<u>2%</u>	<u>2%</u>
Total	100%	100%

## Table 5 – Trip Distribution Summary – Residential and Assisted Living

The distribution of site-generated traffic-volumes for hotel trips was based on anticipated travel patterns and the proximity to Interstate 495 and Interstate 90. A limited volume of trips were assigned to Turnpike Road (Route 9) due to unfamiliarity with local roads. The resulting primary trip distribution is shown in Table 6.

Direction	Entering %	Exiting %									
Route 9 to/from East	10%	10%									
Route 9 to/from West	10%	10%									
Interstate 495 to/from North	30%	30%									
Interstate 495 to/from South	50%	50%									
Route 30 to/from East	0%	0%									
Route 30 to/from West	<u>0%</u>	<u>0%</u>									
Total	100%	100%									

# Table 6 – Trip Distribution Summary - Hotel

Due to the median divided highway layout on Turnpike Road (Route 9), the entering and exiting traffic will experience different trip distribution patterns and have been considered individually. The resulting weekday morning and weekday evening trip distribution percentage networks for the hotel trips are presented in Figure 6.

The resulting site generated trips during the weekday morning and weekday evening peak hour traffic-volume networks are presented in Figure 7 and Figure 8, respectively.

# **Build Traffic Volumes**

The 2023 Build condition traffic-volume networks consist of the 2023 No-Build traffic-volumes with the addition of the site-generated traffic. The resulting 2023 Build weekday morning and evening peak-hour traffic-volume networks are presented in Figure 9.











Weekday Morning **Peak Hour Traffic Volumes** 



Peak Hour Traffic Volumes



Mr. William Depietri December 1, 2015 Page 26 of 38

## TRAFFIC OPERATIONS ANALYSIS

Measuring existing and future traffic volumes quantifies traffic flow within the study area. To assess quality of flow, roadway capacity and vehicle queue analyses were conducted under Existing, No-Build, and Build traffic-volume conditions. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them, with vehicle queue analyses providing a secondary measure of the operational characteristics of an intersection or section of roadway under study.

## Methodology for Analyzing Traffic Operations

### Signalized and Unsignalized Intersections

The unsignalized and signalized intersection capacity and queue analysis was conducted using methodology from the *Highway Capacity Manual (HCM) 2000* due to the restrictions posed on signalized intersection analysis using Synchro 8.0 or Highway Capacity Software 2010 (HCS 2010) by the more recently published *HCM 2010*. This includes the inability of *HCM 2010* to correctly analyze U-turns which are present at study area intersections. To remain consistent throughout the study, all signalized and unsignalized intersection capacity and queue analyses were therefore conducted using *HCM 2000* methodology.

MassDOT has recognized the significant errors and deficiencies in the *HCM 2010* methodology and traffic impact software such as Synchro 8.0 or HCS 2010 when attempting to analyze traffic signals. Based on conversations with the MassDOT – Highway Division's Traffic Section, alternate methodologies to analyze capacity, delays, and queues can be conducted as long as the models are properly calibrated. TEC uses *HCM 2000* methodology over "Synchro 8 Percentile Queue and Percentile Delay" methodology, as *HCM 2000* represents the most recent previous state and federally accepted methodology for analyzing capacity, delay, and queues.

### Levels-of-Service

A primary result of capacity analyses is the assignment of level-of-service to traffic facilities under various traffic-flow conditions.<sup>15</sup> The concept of level-of-service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels-of-service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best operating conditions and LOS F representing the worst. Since the level-of-service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels-of-service, depending on the time of day, day of week, or period of year.

<sup>&</sup>lt;sup>15</sup>The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual 2000*; Transportation Research Board; Washington, DC; 2000.



Mr. William Depietri December 1, 2015 Page 27 of 38

### Intersection Queue Length Analysis

Vehicle queue analyses are a direct measurement of an intersection's ability to process vehicles under various traffic control and volume scenarios and lane use arrangements.

The vehicle queue analysis was performed using the Synchro 8.0 intersection capacity analysis software which is also based upon the methodology and procedures presented in the *HCM 2000.* Synchro reports the 95<sup>th</sup> percentile queues for unsignalized intersections and both the 50<sup>th</sup> (average) and 95<sup>th</sup> percentile vehicle queues for signalized intersections, which are based on the number of vehicles that experience a delay of six seconds or more at an intersection and is a function of the traffic signal timing; vehicle arrival patterns during the analysis period; and the saturation flow rate. The 50<sup>th</sup> percentile or average vehicle queue is the average number of vehicles that are projected to be delayed by six seconds or more at the intersection under study during the analysis period. The 95<sup>th</sup> percentile vehicle queue is the vehicle queue length that will be exceeded only 5 percent of the time; or approximately three minutes out of sixty minutes during the peak one hour of the day. During the remaining fifty-seven minutes, the vehicle queue length will be less than the 95<sup>th</sup> percentile queue length.

## Freeway Merge and Diverge Analysis

The analysis of merge and diverge operations at freeway ramps and interchanges is based on methodologies presented in Chapter 13, Freeway Merge and Diverge Segments, of the *HCM 2010.*<sup>16</sup> The methodology assesses the interaction of the freeway mainline section traffic and traffic diverging or merging to/from the freeway ramps. The analysis is based on geometric and operational factors such as length of acceleration or deceleration lanes, the free-flow speed along the freeway and the ramps, adjacent ramps along the freeway, and the number of vehicles in merging and diverging influence area.

The focus of the analysis is at the freeway-ramp junction for merge and diverge movements, which forces entering or exiting vehicles to shift subsequent to entering or exiting the freeway and to occupy the correct travel lane, causing temporary instability as the vehicles shift lanes and accelerate or decelerate. According to *HCM 2010*, the influence area for these movements is approximately 1,500-feet after the merge area or before the diverge area. Acceleration and deceleration lengths used in the merge and diverge analyses were based on existing taper lengths.

## Freeway Weave Analysis

The analysis of freeway weave segment operations is based on standard methodologies presented in Chapter 12, Freeway Weaving Segments, of the *HCM 2010*. The methodology assesses the intersection of the freeway mainline section traffic and the traffic weaving through the segment, both to and from the freeway ramps. The analysis is based on geometric and operational factors such as length of weave, the free-flow speed along the freeway and the ramps, the number of lane maneuvers necessary to weave, and the number of vehicles in the merging and diverging influence area.

<sup>&</sup>lt;sup>16</sup> The freeway merge analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual 2010*; Transportation Research Board; Washington, DC; 2010.



Mr. William Depietri December 1, 2015 Page 28 of 38

The focus of the analysis is within the freeway weave segment, which forces entering or exiting vehicles to maneuver and directly conflict with vehicles conducting the opposing weave in addition to the merge and diverge from the freeway mainline, causing temporary instability as the vehicles shift lanes and accelerate or decelerate. Weave segment lengths used in the weave analyses were based on existing lengths from gore to gore.

## Parameters for Traffic Impact Analyses

## **Unsignalized Intersections**

The levels-of-service of unsignalized intersections are determined by application of a procedure described in the *HCM 2000*. Level-of-service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level-of-service at unsignalized intersections are also given in the *HCM 2000*. Table 7 summarizes the relationship between level-of-service and average control delay.

Level-of- Service	Average Control Delay (seconds per vehicle)	Description
А	≤10.0	LOS A represents a condition with little or no control delay to minor street traffic.
В	10.1 to 15.0	LOS B represents a condition with short control delays to minor street traffic.
С	15.1 to 25.0	LOS C represents a condition with average control delays to minor street traffic.
D	25.1 to 35.0	LOS D represents a condition with long control delays to minor street traffic.
E	35.1 to 50.0	LOS E represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
F	>50.0	LOS F represents a condition where minor street demand volume exceeds capacity of an approach lane, with excessive control delays resulting.

Table 7 – Level-of-Service Criteria for Unsignalized Intersections<sup>(a)</sup>

<sup>a</sup> Source: Highway Capacity Manual 2000, Transportation Research Board; Washington D.C.; 2000

## Signalized Intersections

Level-of-service for signalized intersections is calculated using the operational analysis methodology of the *HCM 2000*. This method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on delay. Level-of-service designations are based on the criterion of control or signal delay per vehicle. Control or signal delay can be related to driver discomfort, frustration, and fuel consumption, and includes initial deceleration delay approaching the traffic signal, queue move-up time, stopped delay and final acceleration delay. Table 8 summarizes the relationship between level-of-service and control delay. The tabulated control delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to entire intersections.



Level-of- Service	Average Control Delay (seconds per vehicle)	Description
A	≤10.0	<i>LOS A</i> describes operations with very low control delay; most vehicles do not stop at all.
В	10.1 to 20.0	<i>LOS B</i> describes operations with relatively low control delay. However, more vehicles stop than LOS A.
С	20.1 to 35.0	<i>LOS C</i> describes operations with higher control delays. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	35.1 to 55.0	<i>LOS D</i> describes operations with control delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop and individual cycle failures are noticeable, whereby motorists are not able to get through the signal on one cycle.
Е	55.1 to 80.0	<i>LOS E</i> describes operations with high control delay values. Individual cycle failures are frequent occurrences.
F	>80.0	<i>LOS F</i> describes operations with high control delay values that often occur with over-saturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

# Table 8 – Level-of-Service Criteria for Signalized Intersections<sup>(a)</sup>

<sup>a</sup> Source: Highway Capacity Manual 2000; Transportation Research Board; Washington D.C.; 2000

### Weave Segments

LOS for merge and diverge junctions is calculated using the operational analysis methodology of the *HCM 2010*. This method assesses the effects of ramp and freeway volume, as well as volume on upstream or downstream ramps within the influence area, number of lanes, the length of acceleration or deceleration lane, ramp and freeway free-flow speed, and other such measures such as driver type. LOS designations are based on the criterion of density in terms of passenger cars per mile per lane (pcpmpln). Density can be related to driver discomfort, frustration, and fuel consumption. Table 9 summarizes the relationship between LOS and density. The tabulated density criterion may be applied in assigning LOS designations to individual lane groups, to individual intersection approaches, or to entire intersections.

	Density (passer per	nger cars per mile lane)	
Level-of- Service	Freeway	Multi-lane Highways or C-D Roadways	Description
A	≤10.0	≤12.0	<i>LOS A</i> describes operations with very low density; unrestricted operations.
В	10.1 to 20.0	12.1 to 24.0	<i>LOS B</i> describes operations with relatively low density. Weaving are noticeable to drivers.
С	20.1 to 28.0	24.1 to 32.0	<i>LOS C</i> describes operations with higher densities. The vehicle speeds within the influence areas begin to decline as a result of weave maneuvers.
D	28.1 to 35.0	32.1 to 36.0	<i>LOS D</i> describes operations with densities in the range where the influence area turbulence becomes intrusive.
E	>35.0	>36.0	<i>LOS E</i> describes operations with high densities. Turbulence is felt by all drivers.
F	Demand Exe	ceeds Capacity	<i>LOS F</i> describes operations with high densities where weave queues form.

### Table 9 – Level-of-Service Criteria for Weave Segments<sup>(a)</sup>

<sup>a</sup> Source: *Highway Capacity Manual 2010*; Transportation Research Board; Washington D.C.; 2010; page 12-10



### Intersection Capacity and Queue Analysis Results

Level-of-service and queue analyses were conducted for 2014 Existing, 2023 No-Build, 2023 Build, and Build with Mitigation conditions for the unsignalized and signalized intersections within the study area. The results of the intersection capacity and queue analysis are summarized in Table 10. The intersection capacity and queue analysis worksheets are provided in Attachment K.

## Turnpike Road (Route 9) / Park Central Drive

Traffic exiting Park Central Drive onto Turnpike Road (Route 9) currently experiences delays during the weekday morning and evening peak periods, which will see additional delay as traffic volumes continue to grow. As part of the MassDOT restriping along Turnpike Road (Route 9), the existing shoulder has been restriped to serve as a continuous acceleration / deceleration lane for vehicles entering and exiting Turnpike Road (Route 9) via Flagg Road, Park Central Drive, and the I-495 NB On-Ramp. This acceleration / deceleration lane will allow vehicles to exit Flagg Road and Park Central Drive onto Turnpike Road (Route 9) with limited conflict in a separate lane and merge with traffic between Flagg Road and the I-495 NB On-Ramp. The delays on this side-street approach are associated with a private driveway and not a public street.

## Turnpike Road (Route 9) / Flagg Road

Traffic exiting Flagg Road onto Turnpike Road (Route 9) will experience some delay during the weekday morning and evening peak hours as a result of the increase in traffic volumes south of the proposed access road. Although there is anticipated to be approximately 3 minutes of delay per vehicle along this approach during the weekday morning peak period, this is typical for any side street approach to Route 9 in this area. It should be noted that the Synchro analysis does not take into account gaps in traffic that would be created by the upstream traffic signal and therefore delay per vehicle may be less. The access/egress for the proposed access road to the site was a request for access to Turnpike Road (Route 9) that MassDOT, who has exclusive authority for these curb-cuts, has asked the Proponent to pursue.

## Turnpike Road (Route 9) / Crystal Pond Road

Several movements at the intersection of Turnpike Road (Route 9) / Crystal Pond Road are anticipated to operate at LOS E or F under 2023 No-Build and Build conditions. Signal timing improvements are recommended to optimize the operations of this intersection. With these improvements, the additional traffic generated by the proposed development is not anticipated to increase overall intersection delay by more than five seconds per vehicle during the weekday evening peak hour. With the improvements, the overall intersection operations will be improved to better than No-Build conditions during the weekday morning peak hour.

## Flagg Road / Blackthorn Road

TEC recommends installation of an All-Way STOP control at the Flagg Road / Blackthorn Drive intersection to improve the safety of this intersection and address sight distance restrictions. With installation of an All-Way STOP, all movements at this intersection are anticipated to



Mr. William Depietri December 1, 2015 Page 31 of 38

operate at LOS A with queues not exceeding a single vehicle. As mitigation for the proposed mixed-use residential development, MUTCD compliant signage at the intersection will be installed along with advanced warning signage.

## Main Street (Route 30) / Deerfoot Road

Traffic exiting Deerfoot Road onto Main Street (Route 30) will experience delay during the weekday morning peak hour. However, the volume-to-capacity (v/c) ratio will be well below 1.00, indicating there will be adequate capacity to accommodate the anticipated traffic volumes. In addition, queues exiting Deerfoot Road are not anticipated to exceed seven vehicles. All other movements at this intersection are anticipated to operate at acceptable levels of service (LOS C or better) under all analysis scenarios.

All movements at all other study intersections are expected to operate at acceptable levels-ofservice (LOS B or better) and queues not exceeding a single vehicle under all analysis scenarios.



# Table 10 – Intersection Capacity and Queue Analysis Summary

	2014 Existing 2023 No-Build 2023 Build								2023 Build with Mitigation							
Intersection / Lane Group	V/C <sup>(a)</sup>	Delay <sup>(b)</sup>	LOS <sup>(c)</sup>	Queue <sup>(d)</sup>	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Turnpike Road (Route 9) / Park Central Drive																·
Weekday Morning Peak Period																
Park Central Drive SB RT	1.22	207.1	F	255	0.75	56.2	F	130	1.00	110.9	F	221				
Weekday Evening Peak Period													I	No Change fi	rom 2023	Build
Park Central Drive SB RT	2.14	623.1	F	430	1.17	178.8	F	263	1.70	391.7	F	467				
Turnpike Road (Route 9) / Flagg Road																
Weekday Morning Peak Period																
Flagg Road SB RT	0.47	30.7	D	59	0.59	42.7	Е	83	1.26	196.7	F	346				
Weekday Evening Peak Period													I	No Change fi	rom 2023	Build
Flagg Road SB RT	0.29	28.8	D	29	0.39	39.0	Е	42	0.94	116.7	F	171				
Turnpike Road (Route 9) / Crystal Pond Road																
Weekday Morning Peak Period																
Route 9 EB UT	0.67	51.3	Е	110/182	0.67	59.9	Е	110/183	0.79	68.9	Е	155/267	0.76	72.7	Е	182/262
Route 9 EB TH	1.08	62.9	Е	1371/1567	1.26	140.2	F	1723/1935	1.27	145.3	F	1802/1977	1.21	116.7	F	2041/2164
Route 9 EB RT	0.01	5.2	А	<25/<25	0.01	5.9	А	<25/<25	0.01	5.9	А	<25/<25	0.01	5.2	А	<25/<25
Route 9 WB UT/LT	0.64	51.5	Е	102/168	0.67	60.1	Е	110/182	0.67	61.6	Е	113/182	0.75	78.7	Е	133/220
Route 9 TH	0.78	11.8	В	556/672	0.88	17.7	В	709/880	0.91	20.7	С	794/902	0.88	20.1	С	854/1082
Crystal Pond Road NBL	0.13	56.4	Е	<25/<25	0.30	57.1	Е	<25/43	0.30	58.3	Е	<25/43	0.35	68.9	Е	25/50
Crystal Pond Road NBR	0.00	56.1	Е	<25/<25	0.02	55.4	Е	<25/38	0.02	56.6	Е	<25/38	0.02	66.7	Е	<25/41
Overall Intersection	0.99	38.5	D	-	1.12	77.7	Е	-	1.17	81.7	F	-	1.13	68.7	Е	-
Weekday Evening Peak Period																
Route 9 EB UT	1.12	59.0	F	273/471	1.12	154.1	F	276/475	1.48	293.7	F	431/655	1.30	217.4	F	415/618
Route 9 EB TH	0.96	18.1	С	980/1395	1.13	84.5	F	1478/1742	1.14	89.8	F	1508/1772	1.10	71.3	Е	1533/1654
Route 9 EB RT	0.01	5.9	А	<25/<25	0.04	7.6	А	<25/<25	0.04	7.6	А	<25/<25	0.04	6.6	А	<25/<25
Route 9 WB UT/LT	0.44	62.2	Е	38/79	0.54	63.1	Е	71/127	0.54	63.1	Е	71/127	0.61	69.7	Е	74/131
Route 9 TH	0.86	20.5	С	706/848	0.99	38.9	D	978/1221	1.02	46.2	D	1140/1282	1.02	48.1	D	1186/1256
Crystal Pond Road NBL	0.65	62.1	Е	107/153	0.67	62.1	Е	117/164	0.67	62.1	Е	117/164	0.76	69.9	Е	122/171
Crystal Pond Road NBR	0.02	54.1	D	<25/32	0.03	53.4	D	<25/41	0.03	53.4	D	<25/41	0.03	56.4	Е	<25/42
Overall Intersection	0.96	33.0	С	-	1.09	63.3	Е	-	1.15	77.0	Е	-	1.11	66.9	Е	-



# Table 11 – Intersection Capacity and Queue Analysis Summary (Continued)

		2014	Existing		2023 No-Build 2023 Build					2023 Build with Mitigation						
Intersection / Lane Group	V/C <sup>(a)</sup>	Delay <sup>(b)</sup>	LOS <sup>(c)</sup>	Queue <sup>(d)</sup>	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Flagg Road / Proposed Access Road																
Weekday Morning Peak Period																
Access Road EB RT	-	-	-	-	-	-	-	-	0.16	9.9	А	<25		No Chango fr	om 2022 B	ild
Flagg Road NB LT/TH	-	-	-	-	-	-	-	-	0.03	4.6	А	<25				uliu
Weekday Evening Peak Period																
Access Road EB RT	-	-	-	-	-	-	-	-	0.09	9.8	А	<25		No Chango fr	om 2022 B	ild
Flagg Road NB LT/TH	-	-	-	-	-	-	-	-	0.10	5.6	А	<25		NO Change II		uliu
Flagg Road / Blackthorn Drive																
Weekday Morning Peak Period																
Blackthorn Road EB LT/RT	0.04	9.5	Α	<25	0.04	9.6	А	<25	0.04	9.8	А	<25	0.13	7.7	А	<25
Flagg Road NB LT/TH	0.01	1.8	Α	<25	0.01	1.7	А	<25	0.01	1.1	А	<25	0.15	7.8	А	<25
Flagg Road SB TH/RT	-	-	-	-	-	-	-	-	-	-	-	-	0.04	7.7	А	<25
Weekday Evening Peak Period																
Blackthorn Road EB LT/RT	0.04	9.2	Α	<25	0.04	9.3	А	<25	0.04	9.5	А	<25	0.04	7.6	А	<25
Flagg Road NB LT/TH	0.01	1.6	Α	<25	0.01	1.5	А	<25	0.01	1.1	А	<25	0.08	7.5	А	<25
Flagg Road SB TH/RT	-	-	-	-	-	-	-	-	-	-	-	-	0.12	7.6	Α	<25
Main Street (Route 30) / Deerfoot Road																
Weekday Morning Peak Period																
Main Street WB LT/TH	0.08	2.5	Α	<25	0.09	2.6	А	<25	0.10	2.8	А	<25				
Deerfoot Road NB LT /RT	0.63	35.8	Е	100	0.71	44.0	Е	122	0.80	54.4	F	159				
Weekday Evening Peak Period														No Change fr	om 2023 B	uild
Main Street WB LT/TH	0.05	1.4	Α	<25	0.06	1.4	А	<25	0.08	1.9	А	<25				
Deerfoot Road NB LT /RT	0.29	18.8	С	30	0.32	20.2	С	34	0.38	21.9	С	44				

<sup>a</sup> Volume-to-capacity ratio
 <sup>b</sup> Delay expressed in seconds per vehicle (average)
 <sup>c</sup> Level-of-Service
 <sup>d</sup> 50<sup>th</sup> / 95<sup>th</sup> Percentile Queue (feet) [only 95<sup>th</sup> Percentile Queue expressed for unsignalized intersections



### Interchange Analysis Results

Density and level-of-service analyses were conducted for 2014 Existing, 2023 No-Build, and 2023 Build conditions for the ramp merge, diverge, and weave locations along Turnpike Road (Route 9) within the study area. The results of the density and level-of-service analyses are summarized in Table 11. The freeway weave analysis worksheets are provided in Attachment L.

All weave locations within the study area are anticipated to operate at acceptable levels-ofservice (LOS D or better) under 2023 Build conditions. No further improvements or mitigation are necessary.

	2014 Existing		2023 No-Build		2023 Build	
Intersection/Approach	Density <sup>(a)</sup>	LOS <sup>(b)</sup>	Density	LOS	Density	LOS
Route 9 EB: I-495 SB Off-Ramp to						
I-495 NB On-Ramp						
Weekday Morning Peak Period	19.8	В	23.3	В	24.0	В
Weekday Evening Peak Period	23.3	В	27.0	С	27.9	С
Route 9 WB: I-495 NB Off-Ramp to I-495 SB On-Ramp						
Weekday Morning Peak Period	26.8	С	31.0	С	32.4	D
Weekday Evening Peak Period	25.3	С	29.7	С	30.7	С
Route 9 WB: Park Central Drive to I- 495 NB On-Ramp						
Weekday Morning Peak Period	20.8	В	23.5	В	25.2	С
Weekday Evening Peak Period	26.2	С	30.4	С	32.3	D

#### Table 11 – Freeway Ramp Weave Analysis Summary

<sup>a</sup> Density expressed in passenger cars per mile per lane (pcpmpl) <sup>b</sup> Level-of-Service



Mr. William Depietri December 1, 2015 Page 35 of 38

# PARKING

Based on the site plan prepared by Capital Group Properties dated April 8, 2015, a total of 260 surface parking spaces and 44 garage parking spaces will be provided to serve the 180-unit residential apartments. In addition, two (2) parking spaces (one in driveway and one in garage) per unit and 92 visitor parking spaces, for a total of 372 spaces, will be provided to serve the 140 residential condominium / townhouse units. The proposed parking lot for the 125-room hotel will provide 145 spaces and the parking lot for the 150-bed assisted living facility is proposed to provide 115 spaces.

## Town of Southborough Zoning Regulations

The Town of Southborough Zoning Regulations contains off-street parking supply requirements for various land uses within the Town of Southborough. Based on zoning regulations for the industrial district, a total of 350 parking spaces (two spaces for each dwelling unit containing one or two bedrooms, and three spaces for each dwelling unit containing three or more bedrooms Per Section \$174-12(E)(1)) are required to serve the 140 residential condominium / townhouse units and 360 parking spaces are required to serve the 180 residential apartment units. A total of 304 parking spaces are proposed for the apartment units to minimize parking supply and trips generated by the proposed development. Overflow parking during occasional peak parking periods may be accommodated within the surplus of visitor parking spaces for the condominium / townhouses, spread throughout the site.

Based on zoning regulations for the industrial district, a total of 75 parking spaces (one space for two (2) beds) are required to serve the 150-unit assisted living facility (Per Section §174-12(E)(6)). As a total of 115 parking spaces are proposed for the assisted living facility, the proposed parking supply is adequate to accommodate the anticipated parking demand and allow for some overflow of parking from the hotel during peak operations.

The Town of Southborough zoning regulations require that hotels provide one (1) space for each room, plus one (1) space for each two (2) employees, and one (1) space for each four hundred (400) square feet of public meeting area and restaurant space. No public function or restaurant space is proposed within the hotel. A total of 145 parking spaces are proposed within the hotel parking lot. Therefore, there will be adequate parking available for the 125 guest rooms and up to 40 employees.

## Parking Generation

TEC estimated the peak parking demand generated by the proposed residential mixed-use development based on average peak period parking demand rates published in the ITE publication *Parking Generation, 4th Edition* for Land Use Code (LUC) 221 – Apartment, LUC 254 – Assisted Living Facility, and LUC 310 – Hotel. As more than adequate parking spaces have been provided to accommodate the 140 residential condominium / townhouses based on Town of Southborough zoning regulations, the parking demand for this land use was not evaluated.



Land Use	Peak Parking Demand	Spaces Provided
LUC 221 – Apartments	222 spaces (1.23 spaces per unit)	304 spaces
LUC 254 – Assisted Living	81 spaces (0.54 spaces per bed)	115 spaces
LUC 310 – Hotel	150 spaces (1.2 spaces per room)	145 spaces

As shown in Table 12, the proposed parking supply for the apartments and assisted living facility will be adequate to accommodate the peak parking demand generated by each of these uses. Although the peak parking demand may exceed the proposed parking supply for the hotel, the hotel is located immediately adjacent to the proposed assisted living facility, which will provide a surplus of parking to accommodate any overflow demand from the hotel. In addition, the hotel is anticipated to experience its peak parking demand during the day. To manage parking between the hotel and assisted living facility, hotel employees working in the evening or overnight may be directed to park in the lot nearest the assisted living facility to provide adequate space near the hotel for hotel guest parking.

### CONCLUSIONS AND RECOMMENDATIONS

TEC has examined the potential traffic impacts associated with the proposed residential mixeduse development and reached the following conclusions:

- To relieve traffic congestion at the existing Park Central Drive connection to Turnpike Road (Route 9), the Proponent will construct a secondary full-access/egress driveway on Flagg Road.
- The Proponent is committed to providing a network of sidewalks throughout the site, including a connection to Flagg Road, to encourage walking and improve accessibility.
- The intersection sight distance (ISD) looking north exiting the proposed Access Road onto Flagg Road is partially obstructed by a large tree immediately adjacent to the edge of pavement on the easterly side of Flagg Road just north of the proposed Access Road. It is recommended that this tree be removed to increase sight distances and increase the clear zone along Flagg Road. With removal of this tree and clearing of vegetation close to the roadway, sight distances will exceed AASHTO recommendations.
- The ISD looking south exiting Blackthorn Drive onto Flagg Road is partially obstructed by a historic stone wall along the property at the southwest corner of this intersection. As removal of the stone wall is not desired to preserve the scenic character of the roadway, TEC recommends installation of an All-Way STOP control at the Flagg Road / Blackthorn Drive intersection to improve the safety of this intersection and eliminate the sight distance issue. With installation of an All-Way STOP, all movements at this intersection are anticipated to operate at LOS A with queues not exceeding a single vehicle. As mitigation for the proposed mixed-use residential development, MUTCD compliant signage at the intersection will be installed along with advanced warning signage.
- There is an existing culvert crossing on Flagg Road approximately 450 feet north of Turnpike Road (Route 9). Flagg Road over this culvert crossing is approximately


17.5 feet wide with guard rail on either side, which assists in keeping traffic within the speed limit along the roadway. There is currently no signage along Flagg Road to alert drivers to the narrowing roadway over this culvert. Independent of the proposed residential project, TEC recommends that the Town of Southborough install Road Narrows (W5-1) signs on Flagg Road approaching the culvert crossing from either direction.

- Traffic exiting Park Central Drive onto Turnpike Road (Route 9) currently experiences delays during the weekday morning and evening peak periods, which will see additional delay as traffic volumes continue to grow. As part of the MassDOT restriping along Turnpike Road (Route 9), the existing shoulder has been restriped to serve as a continuous acceleration / deceleration lane for vehicles entering and exiting Turnpike Road (Route 9) via Flagg Road, Park Central Drive, and the I-495 NB On-Ramp. This acceleration / deceleration lane will allow vehicles to exit Flagg Road and Park Central Drive onto Turnpike Road (Route 9) with limited conflict in a separate lane and merge with traffic between Flagg Road and the I-495 NB On-Ramp. The delays on this side-street approach are associated with a private driveway and not a public street.
- Traffic exiting Flagg Road onto Turnpike Road (Route 9) will experience some delay during the weekday morning and evening peak hours as a result of the increase in traffic volumes south of the proposed access road. Although there is anticipated to be approximately 3 minutes of delay per vehicle along this approach during the weekday morning peak period, this is typical for any side street approach to Route 9 in this area. It should be noted that the Synchro analysis does not take into account gaps in traffic that would be created by the upstream traffic signal and therefore delay per vehicle may be less. The access/egress for the proposed access road to the site was a request for access to Turnpike Road (Route 9) that MassDOT, who has exclusive authority for these curb-cuts, has asked the Proponent to pursue.
- Several movements at the intersection of Turnpike Road (Route 9) / Crystal Pond Road are anticipated to operate at LOS E or F under 2023 No-Build and Build conditions. Signal timing improvements are recommended to optimize the operations of this intersection. With these improvements, the additional traffic generated by the proposed development is not anticipated to increase overall intersection delay by more than five seconds per vehicle during the weekday evening peak hour. With the improvements, the overall intersection operations will be improved to better than No-Build conditions during the weekday morning peak hour.
- Traffic exiting Deerfoot Road onto Main Street (Route 30) will experience delay during the weekday morning peak hour. However, the volume-to-capacity (v/c) ratio will be well below 1.00, indicating there will be adequate capacity to accommodate the anticipated traffic volumes. In addition, queues exiting Deerfoot Road are not anticipated to exceed seven vehicles. All other movements at this intersection are anticipated to operate at acceptable levels of service (LOS C or better) under all analysis scenarios.
- All movements at all other study intersections are expected to operate at acceptable levels-of-service (LOS B or better) and queues not exceeding a single vehicle under all analysis scenarios.



Mr. William Depietri December 1, 2015 Page 38 of 38

• All weave locations within the study area are anticipated to operate at acceptable levels-of-service (LOS D or better) under 2023 Build conditions. No further improvements or mitigation are necessary.

In conclusion, the traffic generated by the proposed mixed-use residential development at Park Central Drive can be reasonably accommodated along the existing street system with implementation of the recommended improvements. The minor increase in delay at the remaining study area intersections resulting from the development does not warrant any additional project-specific mitigation.



# Attachment A

Turning Movement Counts (TMCs)



Figure 2.4-7: I-495 Study Interchanges Existing Conditions 2011 Weekday Average Daily



Figure 2.4-8: I-495 Study Interchanges Existing Conditions 2011 Weekday AM Peak Hour



Figure 2.4-9: I-495 Study Interchanges Existing Conditions 2011 Weekday PM Peak Hour

		Weel	cday Aver	'age <sup>1</sup>			Saturday	
ATR Location		AN		١d	٧		Peak Hour	c
	ADT	Peak Hour Volume	K Factor <sup>2</sup>	Peak Hour Volume	K Factor <sup>2</sup>	ADT	Volume	K Factor <sup>∡</sup>
I-495 Mainline								
NB Mainline n/o Rt. 9	47,400	4,450	9.4%	4,450	9.4%	NA	AN	NA
SB Mainline n/o Rt. 9	47,200	4,450	9.4%	4,100	8.7%	NA	NA	AN
NB Mainline s/o Rt. 9	49,300	5,660	11.5%	3,835	7.8%	NA	NA	AN
SB Mainline s/o Rt. 9	49,000	3,340	6.8%	5,355	10.9%	NA	NA	AN
NB Mainline s/o I-90	50,900	5,870	11.5%	3,985	7.8%	NA	NA	NA
SB Mainline s/o I-90	50,100	3,340	6.7%	5,635	11.2%	NA	NA	NA
Route 9 Mainline								
Rt. 9 EB e/o I-495	27,200	3,035	11.2%	2,230	8.2%	NA	AN	NA
Rt. 9 WB e/o I-495	27,300	2,530	9.3%	3,040	11.1%	22,600	1,252	5.5%
Rt. 9 EB w/o I-495	31,400	2,135	6.8%	3,805	12.1%	NA	NA	AN
Rt. 9 WB w/o I-495	31,600	3,950	12.5%	2,745	8.7%	NA	NA	NA
I-495/Route 9 Interchange								
I-495 NB Off-Ramp to Rt. 9 EB	5,700	950	16.7%	325	5.7%	4,800	615	12.8%
I-495 NB On-Ramp from Rt.9 EB	6,800	395	5.8%	940	13.8%	3,600	315	8.8%
I-495 NB Off-Ramp to Rt. 9 WB	11,500	1,355	11.8%	945	8.2%	9,100	815	9.0%
I-495 NB On-Ramp from Rt. 9 WB	8,500	200	8.2%	945	11.1%	4,900	355	7.2%
I-495 SB Off-Ramp to Rt. 9 WB	6,900	1,110	16.1%	430	6.2%	4,000	340	8.5%
I-495 SB On-Ramp from Rt. 9 WB	5,600	345	6.2%	725	13.0%	4,000	350	8.8%
I-495 SB Off-Ramp to Rt. 9 EB	9,100	1,150	12.6%	660	7.3%	5,900	455	7.7%
I-495 SB On-Ramp from Rt.9 EB	12,200	805	6.6%	1,620	13.3%	6,800	525	7.7%
I-495/I-90 Interchange								
I-495 NB Off-Ramp to I-90	20,700	1,950	9.4%	1,600	7.7%	16,400	1,295	7.9%
I-495 NB On-Ramp from I-90	19,100	1,740	9.1%	1,450	7.6%	14,300	1,100	7.7%
I-495 SB Off-Ramp to I-90	20,100	1,500	7.5%	1,750	8.7%	14,800	1,185	8.0%

Volumes
Traffic
(2011)
Existing
2.4-8:
able

		Week	cday Aver	age <sup>1</sup>			Saturday <sup>1</sup>	
ATR Location		MA		Id	5		Doak Hour	c
	ADT	Peak Hour Volume	K Factor <sup>2</sup>	Peak Hour Volume	K Factor <sup>2</sup>	ADT	Volume	K Factor <sup>z</sup>
I-495 SB On-Ramp from I-90	21,200	1,500	7.1%	2,030	9.6%	16,400	1,245	7.6%
I-90 EB On-Ramp from I-495	21,400	2,570	12.0%	1,590	7.4%	15,000	1,160	7.7%
I-90 EB Off-Ramp to I-495	19,200	1,850	9.6%	1,170	6.1%	17,600	1,410	8.0%
I-90 WB On-Ramp from I-495	19,100	950	5.0%	1,775	9.3%	15,300	1,350	8.8%
I-90 WB Off-Ramp to I-495	20,700	1,370	6.6%	2,330	11.3%	12,700	1,000	7.9%
Notes:								

Notes: 1. Traffic counts were conducted by MassDOT using ATR machines between Monday, September 12 and Sunday, September 18, 2011. 2. Percent of daily traffic that occurred during the peak hour.

Percent of daily traffic that occurred during the peak hour.







Figure 2.4-17: Study Intersections East of I-495 – Existing Conditions 2011 Weekday PM Peak Hour



 File Name
 : 133380 A

 Site Code
 : 12059.04

 Start Date
 : 5/30/2013

 Page No
 : 1

#### Groups Printed- Cars - Heavy Vehicles

		Drivew	'ay			Blackthor	n Drive			Bantry I	Road			Blackthor	m Drive		
		From No	orth			From 1	East			From S	outh			From	West		
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	0	1	0	0	1	0	0	0	0	6	0	0	8
07:15 AM	0	0	0	0	0	2	1	0	3	0	0	0	0	3	0	0	9
07:30 AM	0	0	0	0	0	2	1	0	4	0	0	0	0	2	0	0	9
07:45 AM	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	4
Total	0	0	0	0	0	6	3	0	10	0	0	0	0	11	0	0	30
08:00 AM	0	0	0	0	0	1	4	0	0	0	0	0	0	3	0	0	8
08:15 AM	0	0	0	0	0	0	2	0	6	0	0	0	0	2	0	0	10
08:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	3
Total	0	0	0	0	0	1	7	0	7	0	0	0	0	7	0	0	22
Grand Total	0	0	0	0	0	7	10	0	17	0	0	0	0	18	0	0	52
Apprch %	0	0	0	0	0	41.2	58.8	0	100	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	13.5	19.2	0	32.7	0	0	0	0	34.6	0	0	
Cars	0	0	0	0	0	5	10	0	15	0	0	0	0	18	0	0	48
% Cars	0	0	0	0	0	71.4	100	0	88.2	0	0	0	0	100	0	0	92.3
Heavy Vehicles	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	4
% Heavy Vehicles	0	0	0	0	0	28.6	0	0	11.8	0	0	0	0	0	0	0	7.7

			Drivewa	у			Bla	ckthorn I	Drive			В	antry Ro	ad			Blac	kthorn I	Drive		
		F	rom Nor	th			]	From East	st			F	rom Sou	th			F	from We	st		
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analys	is From 0	7:00 AM	to 08:45	AM - Pea	ak 1 of 1																
Peak Hour for	Entire	Intersec	ction B	egins at	07:30 A	М															
07:30 AM	0	0	0	0	0	0	2	1	0	3	4	0	0	0	4	0	2	0	0	2	9
07:45 AM	0	0	0	0	0	0	1	1	0	2	2	0	0	0	2	0	0	0	0	0	4
08:00 AM	0	0	0	0	0	0	1	4	0	5	0	0	0	0	0	0	3	0	0	3	8
08:15 AM	0	0	0	0	0	0	0	2	0	2	6	0	0	0	6	0	2	0	0	2	10
Total Volume	0	0	0	0	0	0	4	8	0	12	12	0	0	0	12	0	7	0	0	7	31
% App. Total	0	0	0	0		0	33.3	66.7	0		100	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.500	.500	.000	.600	.500	.000	.000	.000	.500	.000	.583	.000	.000	.583	.775
Cars	0	0	0	0	0	0	3	8	0	11	10	0	0	0	10	0	7	0	0	7	28
% Cars	0	0	0	0	0	0	75.0	100	0	91.7	83.3	0	0	0	83.3	0	100	0	0	100	90.3
Heavy Vehicles	0	0	0	0	0	0	1	0	0	1	2	0	0	0	2	0	0	0	0	0	3
% Heavy Vehicles	0	0	0	0	0	0	25.0	0	0	8.3	16.7	0	0	0	16.7	0	0	0	0	0	9.7



 File Name
 : 133380 A

 Site Code
 : 12059.04

 Start Date
 : 5/30/2013

 Page No
 : 1

							Gro	ups Printed	- Cars								
		Drivev	way			Blackthor	n Drive			Bantry F	Road			Blackthorn	n Drive		
		From N	orth			From I	East			From So	outh			From V	Vest		
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	0	1	0	0	1	0	0	0	0	6	0	0	8
07:15 AM	0	0	0	0	0	1	1	0	3	0	0	0	0	3	0	0	8
07:30 AM	0	0	0	0	0	2	1	0	3	0	0	0	0	2	0	0	8
07:45 AM	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	4
Total	0	0	0	0	0	5	3	0	9	0	0	0	0	11	0	0	28
08:00 AM	0	0	0	0	0	0	4	0	0	0	0	0	0	3	0	0	7
08:15 AM	0	0	0	0	0	0	2	0	5	0	0	0	0	2	0	0	9
08:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	3
Total	0	0	0	0	0	0	7	0	6	0	0	0	0	7	0	0	20
Grand Total	0	0	0	0	0	5	10	0	15	0	0	0	0	18	0	0	/18
Approb 0/	0	0	0	0	0	22.2	667	0	100	0	0	0	0	100	0	0	-0
Appren %	0	0	0	0	0	33.3	00.7	0	100	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	10.4	20.8	0	51.2	0	0	0	0	37.5	0	0	

			Drivewa	у			Bla	ckthorn I	Drive			В	antry Ro	ad			Bla	ckthorn I	Drive		
		F	rom Nor	th			j	From Eas	st			F	rom Sou	th			F	From We	st		
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analys	is From 0	7:00 AM	to 08:45	AM - Pea	ak 1 of 1																
Peak Hour for	Entire	Intersec	tion Be	egins at	07:00 A	Μ															
07:00 AM	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	6	0	0	6	8
07:15 AM	0	0	0	0	0	0	1	1	0	2	3	0	0	0	3	0	3	0	0	3	8
07:30 AM	0	0	0	0	0	0	2	1	0	3	3	0	0	0	3	0	2	0	0	2	8
07:45 AM	0	0	0	0	0	0	1	1	0	2	2	0	0	0	2	0	0	0	0	0	4
Total Volume	0	0	0	0	0	0	5	3	0	8	9	0	0	0	9	0	11	0	0	11	28
% App. Total	0	0	0	0		0	62.5	37.5	0		100	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.625	.750	.000	.667	.750	.000	.000	.000	.750	.000	.458	.000	.000	.458	.875



 File Name
 : 133380 A

 Site Code
 : 12059.04

 Start Date
 : 5/30/2013

 Page No
 : 1

#### Groups Printed- Heavy Vehicles

		Drivew	ay			Blackthorr	n Drive			Bantry	Road			Blackthor	n Drive		
		From No	orth			From E	last			From S	outh			From V	West		
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2
Grand Total	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	4
Apprch %	0	0	0	0	0	100	0	0	100	0	0	0	0	0	0	0	
Total %	0	0	0	0	0	50	0	0	50	0	0	0	0	0	0	0	

			Drivewa	у			Blac	ckthorn I	Drive			В	antry Ro	ad			Blac	ckthorn I	Drive		
		F	rom Nor	th			1	From Eas	st			F	rom Sou	th			F	From We	st		
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analys	is From 0	7:00 AM	to 08:45	AM - Pe	ak 1 of 1																
Peak Hour for	Entire	Intersec	ction Be	egins at	07:15 A	М															
07:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	0	0	0	0	0	3
% App. Total	0	0	0	0		0	100	0	0		100	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.250	.000	.000	.000	.250	.000	.000	.000	.000	.000	.750



 File Name
 : 133380 A

 Site Code
 : 12059.04

 Start Date
 : 5/30/2013

 Page No
 : 1

#### Groups Printed- Peds and Bicycles

		Drivew	/ay			Blackthorn	Drive			Bantry F	Road			Blackthorn	n Drive		
		From No	orth			From E	ast			From Se	outh			From V	Vest		
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
Grand Total	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0	0	4
Apprch %	0	0	0	0	0	0	0	100	0	0	0	100	0	100	0	0	
Total %	0	0	0	0	0	0	0	25	0	0	0	25	0	50	0	0	

			Drivewa	y			Bla	ckthorn I	Drive			В	antry Ro	ad			Bla	ckthorn I	Drive		
		F	from Nor	th			]	From Eas	st			F	From Sou	th			F	From We	st		
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analys	sis From 0	7:00 AM	to 08:45	AM - Pe	ak 1 of 1																
Peak Hour for	Entire	Intersec	ction Be	egins a	t 07:30 A	М															
07:30 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	1	0	0	1	3
% App. Total	0	0	0	0		0	0	0	100		0	0	0	100		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.000	.250	.000	.000	.250	.375



File Name : 133380 A Site Code : 12059.04 Start Date : 5/30/2013 Page No : 1

			Drivewa	у			Bla	ckthorn I	Drive			В	antry Ro	ad			Blac	kthorn I	Drive		
		F	rom Nor	th				From East	st			F	rom Sou	th			F	from We	st		
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analys	is From 0	7:00 AM	to 08:45	AM - Pe	ak 1 of 1																
Peak Hour for	Entire	Intersec	tion Be	egins at	07:30 A	Μ															
07:30 AM	0	0	0	0	0	0	2	1	0	3	4	0	0	0	4	0	2	0	0	2	9
07:45 AM	0	0	0	0	0	0	1	1	0	2	2	0	0	0	2	0	0	0	0	0	4
08:00 AM	0	0	0	0	0	0	1	4	0	5	0	0	0	0	0	0	3	0	0	3	8
08:15 AM	0	0	0	0	0	0	0	2	0	2	6	0	0	0	6	0	2	0	0	2	10
Total Volume	0	0	0	0	0	0	4	8	0	12	12	0	0	0	12	0	7	0	0	7	31
% App. Total	0	0	0	0		0	33.3	66.7	0		100	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.500	.500	.000	.600	.500	.000	.000	.000	.500	.000	.583	.000	.000	.583	.775
Cars	0	0	0	0	0	0	3	8	0	11	10	0	0	0	10	0	7	0	0	7	28
% Cars	0	0	0	0	0	0	75.0	100	0	91.7	83.3	0	0	0	83.3	0	100	0	0	100	90.3
Heavy Vehicles	0	0	0	0	0	0	1	0	0	1	2	0	0	0	2	0	0	0	0	0	3
% Heavy Vehicles	0	0	0	0	0	0	25.0	0	0	8.3	16.7	0	0	0	16.7	0	0	0	0	0	9.7





 File Name
 : 133380 AA

 Site Code
 : 12059.04

 Start Date
 : 5/30/2013

 Page No
 : 1

#### Groups Printed- Cars - Heavy Vehicles

		Drivew From No	ay			Blackthor	n Drive			Bantry F	Road			Blackthor	n Drive Vest		
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	0	0	0	0	0	2	1	0	1	0	0	0	0	1	0	0	5
03:15 PM	0	0	0	0	0	1	1	0	4	0	0	0	0	0	0	0	6
03:30 PM	0	0	0	0	0	1	2	0	3	0	0	0	0	3	0	0	9
03:45 PM	0	0	0	0	0	2	1	0	1	0	0	0	0	2	0	0	6
Total	0	0	0	0	0	6	5	0	9	0	0	0	0	6	0	0	26
04:00 PM	0	0	0	0	0	6	0	0	1	0	0	0	0	0	0	0	7
04:15 PM	0	0	0	0	0	2	3	0	6	0	0	0	0	1	0	0	12
04:30 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	3
04:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
Total	0	0	0	0	0	10	5	0	7	0	0	0	0	4	0	0	26
05:00 PM	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	6
05:15 PM	0	0	0	0	0	2	2	0	1	0	0	0	0	1	0	0	6
05:30 PM	0	0	0	0	0	5	1	0	2	0	0	0	0	3	0	0	11
05:45 PM	0	0	0	0	0	4	3	0	3	0	0	0	0	0	0	0	10
Total	0	0	0	0	0	14	6	0	9	0	0	0	0	4	0	0	33
Grand Total	0	0	0	0	0	30	16	0	25	0	0	0	0	14	0	0	85
Apprch %	0	0	0	0	0	65.2	34.8	0	100	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	35.3	18.8	0	29.4	0	0	0	0	16.5	0	0	
Cars	0	0	0	0	0	27	16	0	22	0	0	0	0	14	0	0	79
% Cars	0	0	0	0	0	90	100	0	88	0	0	0	0	100	0	0	92.9
Heavy Vehicles	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	6
% Heavy Vehicles	0	0	0	0	0	10	0	0	12	0	0	0	0	0	0	0	7.1

			Drivewa	ıy			Bla	ckthorn I	Drive			В	antry Ro	ad			Blac	ckthorn I	Drive		
		F	From Nor	rth			1	From Eas	st			F	rom Sou	th			F	From We	st		
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analys	is From 0	03:00 PM	to 05:45	PM - Pea	ak 1 of 1																
Peak Hour for	Entire	Intersed	ction B	egins at	t 03:30 P	М															
03:30 PM	0	0	0	0	0	0	1	2	0	3	3	0	0	0	3	0	3	0	0	3	9
03:45 PM	0	0	0	0	0	0	2	1	0	3	1	0	0	0	1	0	2	0	0	2	6
04:00 PM	0	0	0	0	0	0	6	0	0	6	1	0	0	0	1	0	0	0	0	0	7
04:15 PM	0	0	0	0	0	0	2	3	0	5	6	0	0	0	6	0	1	0	0	1	12
Total Volume	0	0	0	0	0	0	11	6	0	17	11	0	0	0	11	0	6	0	0	6	34
% App. Total	0	0	0	0		0	64.7	35.3	0		100	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.458	.500	.000	.708	.458	.000	.000	.000	.458	.000	.500	.000	.000	.500	.708
Cars	0	0	0	0	0	0	8	6	0	14	8	0	0	0	8	0	6	0	0	6	28
% Cars	0	0	0	0	0	0	72.7	100	0	82.4	72.7	0	0	0	72.7	0	100	0	0	100	82.4
Heavy Vehicles	0	0	0	0	0	0	3	0	0	3	3	0	0	0	3	0	0	0	0	0	6
% Heavy Vehicles	0	0	0	0	0	0	27.3	0	0	17.6	27.3	0	0	0	27.3	0	0	0	0	0	17.6



 File Name
 : 133380 AA

 Site Code
 : 12059.04

 Start Date
 : 5/30/2013

 Page No
 : 1

							Gro	ups Printed-	Cars								
		Drivew	/ay			Blackthor	n Drive			Bantry I	Road			Blackthorn	n Drive		
		From No	orth			From I	East			From S	outh			From V	Vest		
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	0	0	0	0	0	2	1	0	1	0	0	0	0	1	0	0	5
03:15 PM	0	0	0	0	0	1	1	0	4	0	0	0	0	0	0	0	6
03:30 PM	0	0	0	0	0	0	2	0	2	0	0	0	0	3	0	0	7
03:45 PM	0	0	0	0	0	2	1	0	1	0	0	0	0	2	0	0	6
Total	0	0	0	0	0	5	5	0	8	0	0	0	0	6	0	0	24
04:00 PM	0	0	0	0	0	5	0	0	1	0	0	0	0	0	0	0	6
04:15 PM	0	0	0	0	0	1	3	0	4	0	0	0	0	1	0	0	9
04:30 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	3
04:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
Total	0	0	0	0	0	8	5	0	5	0	0	0	0	4	0	0	22
05:00 PM	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	6
05:15 PM	0	0	0	0	0	2	2	0	1	0	0	0	0	1	0	0	6
05:30 PM	0	0	0	0	0	5	1	0	2	0	0	0	0	3	0	0	11
05:45 PM	0	0	0	0	0	4	3	0	3	0	0	0	0	0	0	0	10
Total	0	0	0	0	0	14	6	0	9	0	0	0	0	4	0	0	33
		÷		-	÷		, e	• 1	-	÷			÷				
Grand Total	0	0	0	0	0	27	16	0	22	0	0	0	0	14	0	0	79
Apprch %	0	0	0	0	0	62.8	37.2	0	100	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	34.2	20.3	0	27.8	0	0	0	0	17.7	0	0	

		-	Drivewa	у			Bla	ckthorn I	Drive			В	antry Ro	ad			Bla	ckthorn I	Drive		
		ŀ	rom Noi	th				From Eas	st			F	rom Sou	th			ł	rom We	st		
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analys	sis From (	3:00 PM	to 05:45	PM - Pea	ık 1 of 1																
Peak Hour for	Entire	Intersec	ction B	egins at	05:00 P	М															
05:00 PM	0	0	0	0	0	0	3	0	0	3	3	0	0	0	3	0	0	0	0	0	6
05:15 PM	0	0	0	0	0	0	2	2	0	4	1	0	0	0	1	0	1	0	0	1	6
05:30 PM	0	0	0	0	0	0	5	1	0	6	2	0	0	0	2	0	3	0	0	3	11
05:45 PM	0	0	0	0	0	0	4	3	0	7	3	0	0	0	3	0	0	0	0	0	10
Total Volume	0	0	0	0	0	0	14	6	0	20	9	0	0	0	9	0	4	0	0	4	33
% App. Total	0	0	0	0		0	70	30	0		100	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.700	.500	.000	.714	.750	.000	.000	.000	.750	.000	.333	.000	.000	.333	.750



 File Name
 : 133380 AA

 Site Code
 : 12059.04

 Start Date
 : 5/30/2013

 Page No
 : 1

#### Groups Printed- Heavy Vehicles

		Drivew	ay		Blackthorn Drive From East					Bantry I	Road			Blackthor	n Drive		
		From No	orth			From E	tast			From S	outh			From	West		
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2
04:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	4
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	6
Apprch %	0	0	0	0	0	100	0	0	100	0	0	0	0	0	0	0	
Total %	0	0	0	0	0	50	0	0	50	0	0	0	0	0	0	0	

			Drivewa	y			Bla	ckthorn I	Drive			В	antry Ro	ad			Bla	ckthorn I	Drive		]
		F	From Nor	th			1	From Eas	st			F	rom Sou	th			F	From We	st		
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analys	sis From 0	3:00 PM	to 05:45	PM - Pea	ık 1 of 1																
Peak Hour for	Entire	Intersec	ction B	egins at	03:30 P	М															
03:30 PM	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	2
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	1	0	0	1	2	0	0	0	2	0	0	0	0	0	3
Total Volume	0	0	0	0	0	0	3	0	0	3	3	0	0	0	3	0	0	0	0	0	6
% App. Total	0	0	0	0		0	100	0	0		100	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.750	.000	.000	.750	.375	.000	.000	.000	.375	.000	.000	.000	.000	.000	.500



 File Name
 : 133380 AA

 Site Code
 : 12059.04

 Start Date
 : 5/30/2013

 Page No
 : 1

#### Groups Printed- Peds and Bicycles

		Drivew	ay			Blackthorn	Drive			Bantry R	load			Blackthorn	n Drive		
		From No	orth			From E	ast			From So	outh		,	From V	Vest		
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
04:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	4
Apprch %	0	0	0	0	0	0	0	100	0	0	0	100	0	0	0	0	
Total %	0	0	0	0	0	0	0	25	0	0	0	75	0	0	0	0	

			Drivewa	у			Bla	ckthorn I	Drive			В	antry Ro	ad			Bla	ckthorn I	Drive		]
		ŀ	from Nor	'th				From Eas	st			ŀ	rom Sou	th			ŀ	from We	st		
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analys	sis From (	03:00 PM	to 05:45	PM - Pea	ak 1 of 1																
Peak Hour for	Entire	Intersec	ction Be	egins at	t 03:15 P	М															
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2	0	0	0	0	0	3
% App. Total	0	0	0	0		0	0	0	100		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.375



File Name : 133380 AA Site Code : 12059.04 Start Date : 5/30/2013 Page No : 1

			Drivewa	ıy			Bla	ckthorn I	Drive			В	antry Ro	ad			Blac	kthorn I	Drive		l I
		F	rom Nor	rth				From East	st			F	rom Sou	th			F	from We	st		1
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analys	is From 0	3:00 PM	to 05:45	PM - Pea	k 1 of 1																
Peak Hour for	Entire	Intersec	tion B	egins at	03:30 P	М															
03:30 PM	0	0	0	0	0	0	1	2	0	3	3	0	0	0	3	0	3	0	0	3	9
03:45 PM	0	0	0	0	0	0	2	1	0	3	1	0	0	0	1	0	2	0	0	2	6
04:00 PM	0	0	0	0	0	0	6	0	0	6	1	0	0	0	1	0	0	0	0	0	7
04:15 PM	0	0	0	0	0	0	2	3	0	5	6	0	0	0	6	0	1	0	0	1	12
Total Volume	0	0	0	0	0	0	11	6	0	17	11	0	0	0	11	0	6	0	0	6	34
% App. Total	0	0	0	0		0	64.7	35.3	0		100	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.458	.500	.000	.708	.458	.000	.000	.000	.458	.000	.500	.000	.000	.500	.708
Cars	0	0	0	0	0	0	8	6	0	14	8	0	0	0	8	0	6	0	0	6	28
% Cars	0	0	0	0	0	0	72.7	100	0	82.4	72.7	0	0	0	72.7	0	100	0	0	100	82.4
Heavy Vehicles	0	0	0	0	0	0	3	0	0	3	3	0	0	0	3	0	0	0	0	0	6
% Heavy Vehicles	0	0	0	0	0	0	27.3	0	0	17.6	27.3	0	0	0	27.3	0	0	0	0	0	17.6





File Name	: 133380 B
Site Code	: 12059.04
Start Date	: 5/30/2013
Page No	: 1

			(	Broups Printed- C	ars - Heavy Vehic	es				
		Flagg Road			Flagg Road		] ]	Blackthorn Drive		
		From North			From South			From West		
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
07:00 AM	1	9	0	1	0	0	2	5	0	18
07:15 AM	0	12	0	11	3	0	1	6	0	33
07:30 AM	2	10	0	3	1	0	3	5	0	24
07:45 AM	2	26	0	8	0	0	0	3	0	39
Total	5	57	0	23	4	0	6	19	0	114
08:00 AM	2	16	0	3	3	0	0	3	0	27
08:15 AM	1	6	0	7	1	0	4	4	0	23
08:30 AM	0	17	0	3	0	0	3	0	0	23
08:45 AM	0	16	0	4	1	0	1	2	0	24
Total	3	55	0	17	5	0	8	9	0	97
	-		_			- 1			_	
Grand Total	8	112	0	40	9	0	14	28	0	211
Apprch %	6.7	93.3	0	81.6	18.4	0	33.3	66.7	0	
Total %	3.8	53.1	0	19	4.3	0	6.6	13.3	0	
Cars	8	112	0	38	7	0	14	26	0	205
<u> </u>	100	100	0	95	77.8	0	100	92.9	0	97.2
Heavy Vehicles	0	0	0	2	2	0	0	2	0	6
% Heavy Vehicles	0	0	0	5	22.2	0	0	7.1	0	2.8

		Flagg	Road			Flagg	Road			Blacktho	rn Drive		
		FIOIII	North			From	Soum			FIOIII	west		
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	07:00 AM to 0	8:45 AM - Pe	ak 1 of 1										
Peak Hour for Entire	Intersection	Begins at (	07:15 AM										
07:15 AM	0	12	0	12	11	3	0	14	1	6	0	7	33
07:30 AM	2	10	0	12	3	1	0	4	3	5	0	8	24
07:45 AM	2	26	0	28	8	0	0	8	0	3	0	3	39
08:00 AM	2	16	0	18	3	3	0	6	0	3	0	3	27
Total Volume	6	64	0	70	25	7	0	32	4	17	0	21	123
% App. Total	8.6	91.4	0		78.1	21.9	0		19	81	0		
PHF	.750	.615	.000	.625	.568	.583	.000	.571	.333	.708	.000	.656	.788
Cars	6	64	0	70	24	5	0	29	4	16	0	20	119
% Cars	100	100	0	100	96.0	71.4	0	90.6	100	94.1	0	95.2	96.7
Heavy Vehicles	0	0	0	0	1	2	0	3	0	1	0	1	4
% Heavy Vehicles	0	0	0	0	4.0	28.6	0	9.4	0	5.9	0	4.8	3.3



File Name	: 133380 B
Site Code	: 12059.04
Start Date	: 5/30/2013
Page No	: 1

		Elece Deed		Gloups I	Flags Deed		-	Dlasletham Duise		1
		Flagg Koad			Flagg Koad		-	Erom West		
0 T.	D' L	FIOIII NOTUI	11.00	701	From South		D' 1.	From west	11.00	T . T . 1
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
07:00 AM	1	9	0	1	0	0	2	5	0	18
07:15 AM	0	12	0	10	2	0	1	6	0	31
07:30 AM	2	10	0	3	1	0	3	4	0	23
07:45 AM	2	26	0	8	0	0	0	3	0	39
Total	5	57	0	22	3	0	6	18	0	111
08:00 AM	2	16	0	3	2	0	0	3	0	26
08:15 AM	1	6	0	6	1	0	4	3	0	21
08:30 AM	0	17	0	3	0	0	3	0	0	23
08:45 AM	0	16	0	4	1	0	1	2	0	24
Total	3	55	0	16	4	0	8	8	0	94
Grand Total	8	112	0	38	7	0	14	26	0	205
Apprch %	6.7	93.3	0	84.4	15.6	0	35	65	0	
Total %	3.9	54.6	0	18.5	3.4	0	6.8	12.7	0	

		Flagg From	Road North			Flagg From	Road South			Blacktho	orn Drive West		
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	07:00 AM to 08	:45 AM - Pe	ak 1 of 1										
Peak Hour for Entire	Intersection 1	Begins at (	07:15 AM										
07:15 AM	0	12	0	12	10	2	0	12	1	6	0	7	31
07:30 AM	2	10	0	12	3	1	0	4	3	4	0	7	23
07:45 AM	2	26	0	28	8	0	0	8	0	3	0	3	39
08:00 AM	2	16	0	18	3	2	0	5	0	3	0	3	26
Total Volume	6	64	0	70	24	5	0	29	4	16	0	20	119
% App. Total	8.6	91.4	0		82.8	17.2	0		20	80	0		
PHF	.750	.615	.000	.625	.600	.625	.000	.604	.333	.667	.000	.714	.763



S, LLC n, MA 01503 ax: 508,545.1234 s@pdillc.com 

 File Name
 : 133380 B

 Site Code
 : 12059.04

 Start Date
 : 5/30/2013

 Page No
 : 1

		Flagg Road		•	Flagg Road		I	Blackthorn Drive		
		From North			From South			From West		
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	1	1	0	0	0	0	2
07:30 AM	0	0	0	0	0	0	0	1	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	1	0	0	1	0	3
08:00 AM	0	0	0	0	1	0	0	0	0	1
08:15 AM	0	0	0	1	0	0	0	1	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	1	0	0	1	0	3
Grand Total	0	0	0	2	2	0	0	2	0	6
Apprch %	0	0	0	50	50	0	0	100	0	
Total %	0	0	0	33.3	33.3	0	0	33.3	0	

		Flagg From	Road North			Flagg From	Road South			Blacktho From	orn Drive West		
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	07:00 AM to 08	3:45 AM - Pe	ak 1 of 1										
Peak Hour for Entire	Intersection	Begins at (	07:15 AM										
07:15 AM	0	0	0	0	1	1	0	2	0	0	0	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	0	0	0	1	2	0	3	0	1	0	1	4
% App. Total	0	0	0		33.3	66.7	0		0	100	0		
PHF	.000	.000	.000	.000	.250	.500	.000	.375	.000	.250	.000	.250	.500



 File Name
 : 133380 B

 Site Code
 : 12059.04

 Start Date
 : 5/30/2013

 Page No
 : 1

INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503 Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

				Groups Printed-	Peds and Bicycles					
		Flagg Road			Flagg Road		E	Blackthorn Drive		
		From North			From South			From West		
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	1	1
07:45 AM	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	2	2
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	1	1	1	0	0	0	0	1	4
08:45 AM	0	0	0	0	0	0	0	0	1	1
Total	0	1	1	1	0	0	0	0	2	5
Grand Total	0	1	1	1	0	0	0	0	4	7
Apprch %	0	50	50	100	0	0	0	0	100	
Total %	0	14.3	14.3	14.3	0	0	0	0	57.1	

		Flagg From	Road North			Flagg From	Road South			Blackth From	orn Drive West		
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From	07:00 AM to 0	8:45 AM - Pe	ak 1 of 1										
Peak Hour for Entire	Intersection	Begins at (	07:45 AM										
07:45 AM	0	0	0	0	0	0	0	0	0	0	1	1	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	1	1	2	1	0	0	1	0	0	1	1	4
Total Volume	0	1	1	2	1	0	0	1	0	0	2	2	5
% App. Total	0	50	50		100	0	0		0	0	100		
PHF	.000	.250	.250	.250	.250	.000	.000	.250	.000	.000	.500	.500	.313



 File Name
 : 133380 B

 Site Code
 : 12059.04

 Start Date
 : 5/30/2013

 Page No
 : 1

		Flagg I From 1	Koad North			Flagg I From S	Koad Jouth			From	West		
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	07:00 AM to 0	8:45 AM - Pea	ak 1 of 1										
Peak Hour for Entire	Intersection	Begins at 0	7:15 AM	1									
07:15 AM	0	12	0	12	11	3	0	14	1	6	0	7	33
07:30 AM	2	10	0	12	3	1	0	4	3	5	0	8	24
07:45 AM	2	26	0	28 19	8	0	0	8	0	3	0	3	39
08:00 AM	2	16	0	18	3	3	0	6	0	17	0	3	27
1 otal volume	86	04	0	70	25 78 1	21.0	0	32	4	1 / 9 1	0	21	123
70 App. 10tal PHF	750	615	0	625	568	583	0	571	333	708	0	656	788
Cars	.730	64	0.000	.025	24	5	000	29	4	16	0.000	20	119
% Cars	100	100	Ő	100	96.0	71.4	0	90.6	100	94.1	0	95.2	96.7
Heavy Vehicles	0	0	0	0	1	2	0	3	0	1	0	1	4
% Heavy Vehicles	0	0	0	0	4.0	28.6	0	9.4	0	5.9	0	4.8	3.3
	Blackthorn Drive	Out In Total 11 20 31 13 21 34 21 34	0 4 16 0 0 4 17 U-Tum Right Left	 ↓	Peak H Cars Heavy	Inagg Roa In To To To To To To To To To To	Total 110 2 112 0 0 0 0 0 0 J-Turn • Data						
						B B B B C C C C C C C C C C C C C C C C	J-Turn 0 0 0 97 3 100 Total d						



File Name	: 133380 BB
Site Code	: 12059.04
Start Date	: 5/30/2013
Page No	: 1

			(	Groups Printed- C	ars - Heavy Vehic	eles				
		Flagg Road			Flagg Road		I	Blackthorn Drive		
		From North			From South			From West		
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
03:00 PM	3	14	0	7	2	0	2	1	1	30
03:15 PM	1	13	0	2	0	0	3	2	0	21
03:30 PM	2	9	0	10	2	0	3	3	0	29
03:45 PM	0	13	0	6	3	0	1	3	0	26
Total	6	49	0	25	7	0	9	9	1	106
04:00 PM	6	8	0	3	0	0	2	0	0	19
04:15 PM	2	9	0	6	4	0	2	6	0	29
04:30 PM	2	17	0	12	0	0	1	1	0	33
04:45 PM	3	10	0	6	2	0	0	1	0	22
Total	13	44	0	27	6	0	5	8	0	103
05:00 PM	1	9	0	7	2	0	0	4	0	23
05:15 PM	3	9	1	6	2	0	3	1	0	25
05:30 PM	6	17	0	2	2	0	2	3	0	32
05:45 PM	5	11	0	5	2	0	4	0	0	27
Total	15	46	1	20	8	0	9	8	0	107
Grand Total	34	139	1	72	21	0	23	25	1	316
Apprch %	19.5	79.9	0.6	77.4	22.6	0	46.9	51	2	
Total %	10.8	44	0.3	22.8	6.6	0	7.3	7.9	0.3	
Cars	32	136	1	70	20	0	22	23	1	305
% Cars	94.1	97.8	100	97.2	95.2	0	95.7	92	100	96.5
Heavy Vehicles	2	3	0	2	1	0	1	2	0	11
% Heavy Vehicles	5.9	2.2	0	2.8	4.8	0	4.3	8	0	3.5

		Flagg	Road			Flagg	Road			Blacktho	orn Drive West		
Start Time	Right	Thru	U-Turn	App Total	Thru	Left	U-Turn	App Total	Right	Left	U-Turn	App Total	Int Total
Peak Hour Analysis From	03:00 PM to 05	5:45 PM - Pe	ak 1 of 1	ripp: rotai	Tinu	Beit	e rum	rippi rotai	Tugit	Lon	e rum	ripp: rotai	inti Totui
Peak Hour for Entire	Intersection	Begins at	03:45 PM										
03:45 PM	0	13	0	13	6	3	0	9	1	3	0	4	26
04:00 PM	6	8	0	14	3	0	0	3	2	0	0	2	19
04:15 PM	2	9	0	11	6	4	0	10	2	6	0	8	29
04:30 PM	2	17	0	19	12	0	0	12	1	1	0	2	33
Total Volume	10	47	0	57	27	7	0	34	6	10	0	16	107
% App. Total	17.5	82.5	0		79.4	20.6	0		37.5	62.5	0		
PHF	.417	.691	.000	.750	.563	.438	.000	.708	.750	.417	.000	.500	.811
Cars	8	45	0	53	26	7	0	33	5	9	0	14	100
% Cars	80.0	95.7	0	93.0	96.3	100	0	97.1	83.3	90.0	0	87.5	93.5
Heavy Vehicles	2	2	0	4	1	0	0	1	1	1	0	2	7
% Heavy Vehicles	20.0	4.3	0	7.0	3.7	0	0	2.9	16.7	10.0	0	12.5	6.5



Eilo Nomo	· 10000 DD
Flie Maille	. 133300 DD
Site Code	: 12059.04
Start Date	: 5/30/2013
Page No	: 1

				Groups I	Printed- Cars					
		Flagg Road			Flagg Road		I I			
		From North			From South					
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
03:00 PM	3	14	0	7	2	0	2	1	1	30
03:15 PM	1	13	0	2	0	0	3	2	0	21
03:30 PM	2	9	0	10	1	0	3	2	0	27
03:45 PM	0	12	0	6	3	0	1	3	0	25
Total	6	48	0	25	6	0	9	8	1	103
04:00 PM	5	7	0	2	0	0	2	0	0	16
04:15 PM	1	9	0	6	4	0	1	5	0	26
04:30 PM	2	17	0	12	0	0	1	1	0	33
04:45 PM	3	10	0	5	2	0	0	1	0	21
Total	11	43	0	25	6	0	4	7	0	96
05:00 PM	1	9	0	7	2	0	0	4	0	23
05:15 PM	3	9	1	6	2	0	3	1	0	25
05:30 PM	6	16	0	2	2	Ő	2	3	Õ	31
05:45 PM	5	11	0	5	2	Õ	4	0	Õ	27
Total	15	45	1	20	8	0	9	8	0	106
Grand Total	32	136	1	70	20	0	22	23	1	305
Appreh %	18.9	80.5	0.6	77.8	20	0	17.8	50	22	505
Total %	10.9	44.6	0.0	23	<u> </u>	0	7.0	75	0.3	
10tal 70	10.5	44.0	0.5	23	0.0	0	1.2	1.5	0.5	

		Flagg	Road			Flagg	Road		Blackthorn Drive				
		From	North			From	South			From	West		
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	03:00 PM to 0	5:45 PM - Pea	ak 1 of 1										
Peak Hour for Entire	Intersection	Begins at (	05:00 PM										
05:00 PM	1	9	0	10	7	2	0	9	0	4	0	4	23
05:15 PM	3	9	1	13	6	2	0	8	3	1	0	4	25
05:30 PM	6	16	0	22	2	2	0	4	2	3	0	5	31
05:45 PM	5	11	0	16	5	2	0	7	4	0	0	4	27
Total Volume	15	45	1	61	20	8	0	28	9	8	0	17	106
% App. Total	24.6	73.8	1.6		71.4	28.6	0		52.9	47.1	0		
PHF	.625	.703	.250	.693	.714	1.00	.000	.778	.563	.500	.000	.850	.855



File Name	: 133380 BB
Site Code	12059 04
Start Date	5/30/2013
Page No	: 1
	• •

				Groups Printed	I- Heavy Vehicles					
		Flagg Road			Flagg Road			Blackthorn Drive		
		From North			From South			From West		
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	1	0	0	1	0	2
03:45 PM	0	1	0	0	0	0	0	0	0	1
Total	0	1	0	0	1	0	0	1	0	3
04:00 PM	1	1	0	1	0	0	0	0	0	3
04:15 PM	1	0	0	0	0	0	1	1	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	1	0	0	0	0	0	1
Total	2	1	0	2	0	0	1	1	0	7
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	Õ	0	0	Õ	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	1
Grand Total	2	3	0	2	1	0	1	2	0	11
Apprch %	40	60	0	66.7	33.3	0	33.3	66.7	0	
Total %	18.2	27.3	Ő	18.2	9.1	0	9.1	18.2	ů 0	

		Flagg From	Road North		Flagg Road From South				Blackthorn Drive From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	03:00 PM to 0	5:45 PM - Pe	ak 1 of 1										
Peak Hour for Entire	Intersection	Begins at	03:30 PM										
03:30 PM	0	0	0	0	0	1	0	1	0	1	0	1	2
03:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
04:00 PM	1	1	0	2	1	0	0	1	0	0	0	0	3
04:15 PM	1	0	0	1	0	0	0	0	1	1	0	2	3
Total Volume	2	2	0	4	1	1	0	2	1	2	0	3	9
% App. Total	50	50	0		50	50	0		33.3	66.7	0		
PHF	.500	.500	.000	.500	.250	.250	.000	.500	.250	.500	.000	.375	.750



File Name	· 133380 BB
Site Code	· 12059 04
Start Data	$\cdot 5/20/2012$
	. 3/ 30/ 2013
Page No	: 1

		Flagg Road From North			Flagg Road From South		E	Blackthorn Drive		
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
	1						1			
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
	L						I.			
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
	L						I.			
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

		Flagg From	Road North		Flagg Road From South				Blackthorn Drive From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From	03:00 PM to 05:	:45 PM - Pea	uk 1 of 1										
Peak Hour for Entire	Intersection I	Begins at (	)3:00 PM										
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



File Name : 133380 BB Site Code : 12059.04 Start Date : 5/30/2013 Page No : 1

		Flagg	Road			Flagg	Road		Blackthorn Drive				
		From	North			From	South			From	West		
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	03:00 PM to 05	:45 PM - Pea	ık 1 of 1										
Peak Hour for Entire	Intersection	Begins at (	)3:45 PM										
03:45 PM	0	13	0	13	6	3	0	9	1	3	0	4	26
04:00 PM	6	8	0	14	3	0	0	3	2	0	0	2	19
04:15 PM	2	9	0	11	6	4	0	10	2	6	0	8	29
04:30 PM	2	17	0	19	12	0	0	12	1	1	0	2	33
Total Volume	10	47	0	57	27	7	0	34	6	10	0	16	107
% App. Total	17.5	82.5	0		79.4	20.6	0		37.5	62.5	0		
PHF	.417	.691	.000	.750	.563	.438	.000	.708	.750	.417	.000	.500	.811
Cars	8	45	0	53	26	7	0	33	5	9	0	14	100
% Cars	80.0	95.7	0	93.0	96.3	100	0	97.1	83.3	90.0	0	87.5	93.5
Heavy Vehicles	2	2	0	4	1	0	0	1	1	1	0	2	7
% Heavy Vehicles	20.0	4.3	0	7.0	3.7	0	0	2.9	16.7	10.0	0	12.5	6.5





File Name	: 133380 C
Site Code	: 12059.04
Start Date	: 5/30/2013
Page No	: 1

Groups Printed- Cars - Heavy Vehicles													
	Mai	in Street (Route 30	))		Deerfoot Road		Ma	in Street (Route 3	0)				
		From East			From South			From West					
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total			
07:00 AM	33	6	0	20	5	0	7	115	0	186			
07:15 AM	39	4	0	14	3	0	19	137	0	216			
07:30 AM	49	11	0	11	8	0	16	152	0	247			
07:45 AM	76	29	1	28	19	0	49	130	0	332			
Total	197	50	1	73	35	0	91	534	0	981			
08:00 AM	69	3	0	16	22	0	13	113	0	236			
08:15 AM	52	9	0	16	2	0	5	134	0	218			
08:30 AM	52	5	0	12	2	0	3	123	0	197			
08:45 AM	61	8	0	10	5	0	12	96	0	192			
Total	234	25	0	54	31	0	33	466	0	843			
Grand Total	431	75	1	127	66	0	124	1000	0	1824			
Apprch %	85	14.8	0.2	65.8	34.2	0	11	89	0				
Total %	23.6	4.1	0.1	7	3.6	0	6.8	54.8	0				
Cars	415	74	1	126	66	0	123	970	0	1775			
% Cars	96.3	98.7	100	99.2	100	0	99.2	97	0	97.3			
Heavy Vehicles	16	1	0	1	0	0	1	30	0	49			
% Heavy Vehicles	3.7	1.3	0	0.8	0	0	0.8	3	0	2.7			

	Main Street (Route 30) From East					Deerfoo	ot Road						
		From	East			FIOIII	South			FIOID	west		
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	07:00 AM to 0	8:45 AM - Pe	ak 1 of 1										
Peak Hour for Entire	Intersection	Begins at (	07:30 AM										
07:30 AM	49	11	0	60	11	8	0	19	16	152	0	168	247
07:45 AM	76	29	1	106	28	19	0	47	49	130	0	179	332
08:00 AM	69	3	0	72	16	22	0	38	13	113	0	126	236
08:15 AM	52	9	0	61	16	2	0	18	5	134	0	139	218
Total Volume	246	52	1	299	71	51	0	122	83	529	0	612	1033
% App. Total	82.3	17.4	0.3		58.2	41.8	0		13.6	86.4	0		
PHF	.809	.448	.250	.705	.634	.580	.000	.649	.423	.870	.000	.855	.778
Cars	238	51	1	290	70	51	0	121	83	516	0	599	1010
% Cars	96.7	98.1	100	97.0	98.6	100	0	99.2	100	97.5	0	97.9	97.8
Heavy Vehicles	8	1	0	9	1	0	0	1	0	13	0	13	23
% Heavy Vehicles	3.3	1.9	0	3.0	1.4	0	0	0.8	0	2.5	0	2.1	2.2



File Name	: 133380 C
Site Code	: 12059.04
Start Date	: 5/30/2013
Page No	: 1

				Groups I	Printed- Cars					
	Mai	in Street (Route 30	))		Deerfoot Road		Mai	n Street (Route 30	))	
		From East			From South			From West		
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
07:00 AM	32	6	0	20	5	0	7	109	0	179
07:15 AM	38	4	0	14	3	0	19	132	0	210
07:30 AM	48	11	0	10	8	0	16	151	0	244
07:45 AM	71	29	1	28	19	0	49	124	0	321
Total	189	50	1	72	35	0	91	516	0	954
08:00 AM	67	2	0	16	22	0	13	112	0	232
08:15 AM	52	9	0	16	2	0	5	129	0	213
08:30 AM	52	5	0	12	2	0	3	119	0	193
08:45 AM	55	8	0	10	5	0	11	94	0	183
Total	226	24	0	54	31	0	32	454	0	821
Grand Total	415	74	1	126	66	0	123	970	0	1775
Apprch %	84.7	15.1	0.2	65.6	34.4	0	11.3	88.7	0	
Total %	23.4	4.2	0.1	7.1	3.7	0	6.9	54.6	0	
							-			

		Main Street Fron	(Route 30) n East			Deerfo From	ot Road South						
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	07:00 AM to (	08:45 AM - Pe	eak 1 of 1										
Peak Hour for Entire	Intersection	Begins at	07:30 AM										
07:30 AM	48	11	0	59	10	8	0	18	16	151	0	167	244
07:45 AM	71	29	1	101	28	19	0	47	49	124	0	173	321
08:00 AM	67	2	0	69	16	22	0	38	13	112	0	125	232
08:15 AM	52	9	0	61	16	2	0	18	5	129	0	134	213
Total Volume	238	51	1	290	70	51	0	121	83	516	0	599	1010
% App. Total	82.1	17.6	0.3		57.9	42.1	0		13.9	86.1	0		
PHF	.838	.440	.250	.718	.625	.580	.000	.644	.423	.854	.000	.866	.787



 File Name
 : 133380 C

 Site Code
 : 12059.04

 Start Date
 : 5/30/2013

 Page No
 : 1

[				Groups Printec	I- Heavy Vehicles					1
	Mai	in Street (Route 30	))		Deerfoot Road		Mai	in Street (Route 3	0)	
		From East			From South			From West		
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
07:00 AM	1	0	0	0	0	0	0	6	0	7
07:15 AM	1	0	0	0	0	0	0	5	0	6
07:30 AM	1	0	0	1	0	0	0	1	0	3
07:45 AM	5	0	0	0	0	0	0	6	0	11
Total	8	0	0	1	0	0	0	18	0	27
08:00 AM	2	1	0	0	0	0	0	1	0	4
08:15 AM	0	0	0	0	0	0	0	5	0	5
08:30 AM	0	0	0	0	0	0	0	4	0	4
08:45 AM	6	0	0	0	0	0	1	2	0	9
Total	8	1	0	0	0	0	1	12	0	22
Grand Total	16	1	0	1	0	0	1	30	0	49
Apprch %	94.1	5.9	0	100	0	0	3.2	96.8	0	
Total %	32.7	2	0	2	0	0	2	61.2	0	

		Main Street	(Route 30)			Deerfoo	ot Road						
		From	East			From	South			From	Nest		
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	07:00 AM to 0	8:45 AM - Pe	ak 1 of 1										
Peak Hour for Entire	Intersection	Begins at (	07:00 AM										
07:00 AM	1	0	0	1	0	0	0	0	0	6	0	6	7
07:15 AM	1	0	0	1	0	0	0	0	0	5	0	5	6
07:30 AM	1	0	0	1	1	0	0	1	0	1	0	1	3
07:45 AM	5	0	0	5	0	0	0	0	0	6	0	6	11
Total Volume	8	0	0	8	1	0	0	1	0	18	0	18	27
% App. Total	100	0	0		100	0	0		0	100	0		
PHF	.400	.000	.000	.400	.250	.000	.000	.250	.000	.750	.000	.750	.614



 File Name
 : 133380 C

 Site Code
 : 12059.04

 Start Date
 : 5/30/2013

 Page No
 : 1

				Groups Printed-	Peds and Bicycles					1
	Mai	n Street (Route 30	)		Deerfoot Road		Main	n Street (Route 30	)	
		From East			From South			From West		
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	1	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	0	0	0	0	0	0	0	1
Total	2	0	0	0	0	0	0	0	0	2
08:00 AM	1	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	0	0	1
Grand Total	3	0	0	0	0	0	0	0	0	3
Apprch %	100	0	0	0	0	0	0	0	0	
Total %	100	0	0	0	0	0	0	0	0	

		Main Street (Route 30) From East				Deerfoo	ot Road South		Main Street (Route 30) From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From	07:00 AM to 0	8:45 AM - Pe	ak 1 of 1										
Peak Hour for Entire	Intersection	Begins at 0	7:00 AM										
07:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Volume	2	0	0	2	0	0	0	0	0	0	0	0	2
% App. Total	100	0	0		0	0	0		0	0	0		
PHF	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.500



File Name : 133380 C Site Code : 12059.04 Start Date : 5/30/2013 Page No : 1

		Main Street (Route 30)				Deerfoo	ot Road						
		From	East			From	South			From	West		
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	07:00 AM to 0	8:45 AM - Pe	ak 1 of 1										
Peak Hour for Entire	Intersection	Begins at (	7:30 AM										
07:30 AM	49	11	0	60	11	8	0	19	16	152	0	168	247
07:45 AM	76	29	1	106	28	19	0	47	49	130	0	179	332
08:00 AM	69	3	0	72	16	22	0	38	13	113	0	126	236
08:15 AM	52	9	0	61	16	2	0	18	5	134	0	139	218
Total Volume	246	52	1	299	71	51	0	122	83	529	0	612	1033
<u> </u>	82.3	17.4	0.3		58.2	41.8	0		13.6	86.4	0		
PHF	.809	.448	.250	.705	.634	.580	.000	.649	.423	.870	.000	.855	.778
Cars	238	51	1	290	70	51	0	121	83	516	0	599	1010
% Cars	96.7	98.1	100	97.0	98.6	100	0	99.2	100	97.5	0	97.9	97.8
Heavy Vehicles	8	1	0	9	1	0	0	1	0	13	0	13	23
% Heavy Vehicles	3.3	1.9	0	3.0	1.4	0	0	0.8	0	2.5	0	2.1	2.2





File Name	: 133380 CC
Site Code	: 12059.04
Start Date	: 5/30/2013
Page No	: 1

			0	Froups Printed- Ca	ars - Heavy Vehic	les				
	Main	n Street (Route 30	)		Deerfoot Road		Mai	n Street (Route 30	))	
		From East			From South			From West		
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	89	15	0	12	9	0	5	61	0	191
03:15 PM	98	14	0	10	13	0	9	57	0	201
03:30 PM	72	15	0	9	7	0	4	63	0	170
03:45 PM	81	9	0	12	9	0	8	73	0	192
Total	340	53	0	43	38	0	26	254	0	754
04:00 PM	91	7	0	10	10	0	6	55	0	179
04:15 PM	107	11	0	10	9	0	8	79	0	224
04:30 PM	115	14	0	13	9	0	9	58	0	218
04:45 PM	131	13	0	9	2	0	10	77	0	242
Total	444	45	0	42	30	0	33	269	0	863
05:00 PM	136	15	0	14	9	0	9	78	0	261
05:15 PM	166	15	0	9	7	0	11	70	0	278
05:30 PM	161	10	0	19	8	0	10	95	0	303
05:45 PM	127	14	0	12	6	0	2	69	0	230
Total	590	54	0	54	30	0	32	312	0	1072
Grand Total	1374	152	0	139	98	0	91	835	0	2689
Apprch %	90	10	0	58.6	41.4	0	9.8	90.2	0	
Total %	51.1	5.7	0	5.2	3.6	0	3.4	31.1	0	
Cars	1349	148	0	136	95	0	91	818	0	2637
% Cars	98.2	97.4	0	97.8	96.9	0	100	98	0	98.1
Heavy Vehicles	25	4	0	3	3	0	0	17	0	52
% Heavy Vehicles	1.8	2.6	0	2.2	3.1	0	0	2	0	1.9

		Main Street (Route 30) From East				Deerfoo	t Road		Main Street (Route 30) From West				
G	751	FIOID	Lasi	A (T) 1	D: 1	From	South	4 77 1	D' 1.	FIOID	west	4 75 1	T . T . 1
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	03:00 PM to 05	5:45 PM - Pea	k 1 of 1										
Peak Hour for Entire	Intersection	Begins at 0	4:45 PM										
04:45 PM	131	13	0	144	9	2	0	11	10	77	0	87	242
05:00 PM	136	15	0	151	14	9	0	23	9	78	0	87	261
05:15 PM	166	15	0	181	9	7	0	16	11	70	0	81	278
05:30 PM	161	10	0	171	19	8	0	27	10	95	0	105	303
Total Volume	594	53	0	647	51	26	0	77	40	320	0	360	1084
% App. Total	91.8	8.2	0		66.2	33.8	0		11.1	88.9	0		
PHF	.895	.883	.000	.894	.671	.722	.000	.713	.909	.842	.000	.857	.894
Cars	587	51	0	638	51	26	0	77	40	315	0	355	1070
% Cars	98.8	96.2	0	98.6	100	100	0	100	100	98.4	0	98.6	98.7
Heavy Vehicles	7	2	0	9	0	0	0	0	0	5	0	5	14
% Heavy Vehicles	1.2	3.8	0	1.4	0	0	0	0	0	1.6	0	1.4	1.3


: 133380 CC
: 12059.04
: 5/30/2013
: 1

P.O. Box 301 Berlin, MA 01503 Office: 508.481.3999 Fax: 508.545.1234 Email: datarequests@pdillc.com

				Groups Printe	ed- Cars					
	Main Stre	eet (Route 30)		Dee	erfoot Road		Main Str	reet (Route 30)		
	Fr	om East		Fr	om South		Fr	om West		
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	86	15	0	11	9	0	5	59	0	185
03:15 PM	95	14	0	10	13	0	9	53	0	194
03:30 PM	70	14	0	9	7	0	4	62	0	166
03:45 PM	77	8	0	12	8	0	8	72	0	185
Total	328	51	0	42	37	0	26	246	0	730
04:00 PM	89	7	0	9	10	0	6	55	0	176
04:15 PM	105	11	0	9	9	0	8	77	0	219
04:30 PM	113	14	0	13	7	0	9	57	0	213
04:45 PM	129	13	0	9	2	0	10	75	0	238
Total	436	45	0	40	28	0	33	264	0	846
05:00 PM	134	14	0	14	9	0	9	78	0	258
05:15 PM	165	15	0	9	7	0	11	70	0	277
05:30 PM	159	9	0	19	8	0	10	92	0	297
05:45 PM	127	14	0	12	6	0	2	68	0	229
Total	585	52	0	54	30	0	32	308	0	1061
			~ 1			- 1			~ 1	
Grand Total	1349	148	0	136	95	0	91	818	0	2637
Apprch %	90.1	9.9	0	58.9	41.1	0	10	90	0	
Total %	51.2	5.6	0	5.2	3.6	0	3.5	31	0	

		Main Street	(Route 30)			Deerfoo	t Road			Main Street	(Route 30)		
		From	East			From	South			From	n West		
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	03:00 PM to 05:	45 PM - Pea	ak 1 of 1										
Peak Hour for Entire	Intersection I	Begins at (	04:45 PM										
04:45 PM	129	13	0	142	9	2	0	11	10	75	0	85	238
05:00 PM	134	14	0	148	14	9	0	23	9	78	0	87	258
05:15 PM	165	15	0	180	9	7	0	16	11	70	0	81	277
05:30 PM	159	9	0	168	19	8	0	27	10	92	0	102	297
Total Volume	587	51	0	638	51	26	0	77	40	315	0	355	1070
% App. Total	92	8	0		66.2	33.8	0		11.3	88.7	0		
PHF	.889	.850	.000	.886	.671	.722	.000	.713	.909	.856	.000	.870	.901



: 133380 CC
: 12059.04
: 5/30/2013
: 1

	Main St	reat (Poute 30)		Groups Printed- He	rfoot Poad		Main Str	reat (Poute 30)		
	F	From East		Fr	om South		Fr	rom West		
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	3	0	0	1	0	0	0	2	0	6
03:15 PM	3	0	0	0	0	0	0	4	0	7
03:30 PM	2	1	0	0	0	0	0	1	0	4
03:45 PM	4	1	0	0	1	0	0	1	0	7
Total	12	2	0	1	1	0	0	8	0	24
04:00 PM	2	0	0	1	0	0	0	0	0	3
04:15 PM	2	0	0	1	0	0	0	2	0	5
04.15 T M	2	0	0	1	2	0	0	2 1	0	5
04.30 F M	2	0	0	0	2	0	0	1	0	J 4
04:45 PM	2	0	0	0	0	0	0	2	0	4
Total	8	0	0	2	2	0	0	5	0	17
05:00 PM	2	1	0	0	0	0	0	0	0	3
05:15 PM	1	0	0	0	0	0	0	0	0	1
05:30 PM	2	1	0	0	0	0	0	3	0	6
05:45 PM	0	0	0	0	0	0	0	1	0	1
Total	5	2	0	0	0	0	0	4	0	11
Grand Total	25	4	0	3	3	0	0	17	0	52
Approb %	86.2	13.8	0	50	50	0	0	100	0	52
Total %	48.1	13.0	0	58	58	0	0	32.7	0	
10tal 70	+0.1	/./	0	5.0	5.0	0	0	54.1	0	

		Main Street	(Route 30)			Deerfoo	ot Road			Main Stree	t (Route 30)		
		From	1 East			From	South			From	n West		
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	03:00 PM to 0	5:45 PM - Pe	ak 1 of 1										
Peak Hour for Entire	Intersection	Begins at (	03:00 PM										
03:00 PM	3	0	0	3	1	0	0	1	0	2	0	2	6
03:15 PM	3	0	0	3	0	0	0	0	0	4	0	4	7
03:30 PM	2	1	0	3	0	0	0	0	0	1	0	1	4
03:45 PM	4	1	0	5	0	1	0	1	0	1	0	1	7
Total Volume	12	2	0	14	1	1	0	2	0	8	0	8	24
% App. Total	85.7	14.3	0		50	50	0		0	100	0		
PHF	.750	.500	.000	.700	.250	.250	.000	.500	.000	.500	.000	.500	.857



: 133380 CC
: 12059.04
: 5/30/2013
: 1

	Main St	reet (Route 30)		Dee	rfoot Road		Main Str	reet (Route 30)		
	F	rom East		Fre	om South		Fr	rom West		
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	1	0	1
03:30 PM	1	0	0	0	0	0	0	0	0	1
03:45 PM	0	0	0	0	0	0	0	1	0	1
Total	1	0	0	0	0	0	0	2	0	3
			1						1	
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	1	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	1	0	0	0	1
Total	0	0	0	0	0	2	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	1	0	1
05:15 PM	2	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	2	0	0	0	0	0	0	0	0	2
Total	4	0	0	0	0	0	0	1	0	5
Crond T-t-1	5	0	0	0	0	2	0	2	0	10
Grand Total	5	0	0	0	0	100	0	3	0	10
Apprch %	100	0	0	0	0	100	0	100	0	
Total %	50	0	0	0	0	20	0	30	0	

		Main Street	(Route 30) Fast		Deerfoot Road From South					Main Street (Route 30) From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total	
Peak Hour Analysis From	03:00 PM to 0	5:45 PM - Pe	ak 1 of 1									••		
Peak Hour for Entire	Intersection	Begins at	05:00 PM											
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	1	
05:15 PM	2	0	0	2	0	0	0	0	0	0	0	0	2	
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:45 PM	2	0	0	2	0	0	0	0	0	0	0	0	2	
Total Volume	4	0	0	4	0	0	0	0	0	1	0	1	5	
% App. Total	100	0	0		0	0	0		0	100	0			
PHF	.500	.000	.000	.500	.000	.000	.000	.000	.000	.250	.000	.250	.625	



File Name : 133380 CC Site Code : 12059.04 Start Date : 5/30/2013 Page No : 1

		Main Street	(Route 30)			Deerfoo	t Road			Main Street	(Route 30)		
		From	East			From	South			From	West		
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From	03:00 PM to 0	5:45 PM - Pea	ık 1 of 1										
Peak Hour for Entire	Intersection	Begins at (	)4:45 PM										
04:45 PM	131	13	0	144	9	2	0	11	10	77	0	87	242
05:00 PM	136	15	0	151	14	9	0	23	9	78	0	87	261
05:15 PM	166	15	0	181	9	7	0	16	11	70	0	81	278
05:30 PM	161	10	0	171	19	8	0	27	10	95	0	105	303
Total Volume	594	53	0	647	51	26	0	77	40	320	0	360	1084
% App. Total	91.8	8.2	0		66.2	33.8	0		11.1	88.9	0		
PHF	.895	.883	.000	.894	.671	.722	.000	.713	.909	.842	.000	.857	.894
Cars	587	51	0	638	51	26	0	77	40	315	0	355	1070
% Cars	98.8	96.2	0	98.6	100	100	0	100	100	98.4	0	98.6	98.7
Heavy Vehicles	7	2	0	9	0	0	0	0	0	5	0	5	14
% Heavy Vehicles	1.2	3.8	0	1.4	0	0	0	0	0	1.6	0	1.4	1.3



## Attachment B

Automatic Traffic Recorder (ATR) Counts



#### 133380 A VOLUME Site Code: 12059.004

Start		FR				\\/R				Combir	1		29-May-
Timo	Δ Μ	LD	DM		Λ Μ	000	DM		A 1.4	ed	DМ		13 Wed
12·00	A.IVI. 0		<u> </u>		<u>Α.Ινί.</u> Ο		<u> </u>		A.ⅣI. ∩		<u> </u>		vveu
12:00	0		1		0		0		0		1		
12:30	0 0		1		ñ		5		0		6		
12:00	0	0	2	7	0	0	5	12	0	٥	7	19	
01:00	0	U	3	'	0	0	4	12	0	0	7	15	
01:00	0		6		0		4		0		10		
01.13	0		1		0		- 2		0		6		
01.30	0	٥	2	15	0	0	2	12	0	٥	1	27	
01.40	0	0	1	15	0	0	1	12	0	0	2	21	
02.00	0		3		0		5		0		2 0		
02.13	0		1		0		0		0		0		
02.30	0	٥	4	15	0	0	2	8	0	٥	4 0	23	
02.43	0	0	2	15	0	0	2	0	0	0	9 5	23	
03.00	0		2		0		3		0		5		
03.13	0		3		0		4		0		2		
03.30	1	1	1	0	1	4	2	10	0	2	3	22	
03.45	1	I	ა ი	9	1	1	4	13	2	Z	10	22	
04.00	0		ა ი		0		1		0		10		
04.15	0		0		0		4		0		12		
04:30	0	0	2	45	0	0	4	10	0	0	6	22	
04:45	0	0	2	15	0	0	3	18	0	0	5 7	33	
05:00	0		2		0		5		0		1		
05:15	0		4		0		4		0		8		
05:30	2	0	4	4.0	0	•	(	00	2	•	11	00	
05:45	0	2	6	16	0	0	4	20	0	2	10	36	
06:00	2		3		0		7		2		10		
06:15	2		2		0		6		2		8		
06:30	4		2	4.0	1	•	3	~~	5		5	~-	
06:45	3	11	5	12	1	2	7	23	4	13	12	35	
07:00	6		2		1		3		7		5		
07:15	12		3		1		0		13		3		
07:30	8		3		5		8		13		11		
07:45	3	29	2	10	3	10	3	14	6	39	5	24	
08:00	5		4		3		1		8		5		
08:15	6		1		3		2		9		3		
08:30	3		2	_	1		2	_	4		4		
08:45	3	17	1	8	1	8	3	8	4	25	4	16	
09:00	5		0		3		3		8		3		
09:15	1		1		2		2		3		3		
09:30	2		0		3		3		5		3		
09:45	4	12	0	1	4	12	4	12	8	24	4	13	
10:00	1		0		1		0		2		0		
10:15	1		0		2		0		3		0		
10:30	3	_	0		0		1		3		1		
10:45	0	5	0	0	3	6	0	1	3	11	0	1	
11:00	4		0		3		0		7		0		
11:15	2		0		2		3		4		3		
11:30	3		0		1		0	_	4		0		
<u>11:45</u>	2	11	0	0	2	8	0	3	4	19	0	3	
Total	88		108		47		144		135		252		
Percent	65.2%		42.9%		34.8%		57.1%						
Day Total		196				191				387			
Day Ioldi		130				131				507			
Peak	06:45	-	05:15	-	07:30	-	05:30	-	07:15	-	05:15	-	
Vol.	29	-	17	-	14	-	24	-	40	-	39	-	
P.H.F.	0.604		0.531		0.700		0.857		0.769		0.886		



#### 133380 A VOLUME Site Code: 12059.004

-

Start		EB				WB				Comb	in		30-May-
Time	A.M.		P.M.		A.M.		P.M.		A.M.	ed	P.M.		13 Thu
12:00	0		3		0		5		0		8		
12:15	0		2		0		3		0		5		
12:30	0		2		1		1		1		3		
12:45	0	0	2	9	0	1	3	12	0	1	5	21	
01:00	0		1		0		3		0		4		
01:15	0		3		0		1		0		4		
01:30	0		2		0		5		0		7		
01:45	0	0	0	6	0	0	0	9	0	0	0	15	
02:00	0		0		0		5		0		5		
02:15	0		4		0		2		0		6		
02:30	0		5		0		3		0		8		
02:45	0	0	3	12	0	0	8	18	0	0	11	30	
03:00	0		3		0		3		0		6		
03:15	0		5		0		2		0		7		
03:30	0		6		0		4		0		10		
03:45	0	0	4	18	0	0	3	12	0	0	7	30	
04:00	0		1		0		6		0		7		
04:15	0		8		0		6		0		14		
04:30	0		2		0		2		0		4		
04:45	0	0	1	12	0	0	3	17	0	0	4	29	
05:00	0		3		0		3		0		6		
05:15	0		3		0		4		0		7		
05:30	3		5		0		8		3		13		
05:45	1	4	3	14	1	1	7	22	2	5	10	36	
06:00	2		3		0		10		2		13		
06:15	0		3		0		5		0		8		
06:30	4		3		2		3		6		6		
06:45	4	10	1	10	2	4	4	22	6	14	5	32	
07:00	7		4		1		1		8		5		
07:15	7		7		3		7		10		14		
07:30	8		2		3		3		11		5		
07:45	2	24	1	14	2	9	5	16	4	33	6	30	
08:00	3		0		5		2		8		2		
08:15	7		1		2		4		9		5		
08:30	4		1		0		3		4		4		
08:45	2	16	0	2	1	8	4	13	3	24	4	15	
09:00	3		0		3		2		6		2		
09:15	4		1		3		1		7		2		
09:30	2		1		2		0		4		1		
09:45	3	12	0	2	1	9	1	4	4	21	1	6	
10:00	4		0		1		0		5		0		
10:15	3		1		1		2		4		3		
10:30	3		2		3		1		6		3		
10:45	2	12	0	3	3	8	0	3	5	20	0	6	
11:00	5		0		3		2		8		2		
11:15	4		0		0		0		4		0		
11:30	5		0		2		0		7		0		
11:45	0	14	0	0	4	9	1	3	4	23	1	3	
Iotal	92		102		49		151		141		253		
Percent	65.2%		40.3%		34.8%		59.7%						
ь <del>т</del>													
Day Total		194	4			200	J			39	4		
Deal	06.45		02.20		07.45		05.00		06.45		05.00		
Peak	00:45	-	03:30	-	07:15	-	05:30	-	00:45	-	05:30	-	-
	∠0 0.040	-	19	-	13 0 650	-	3U 0 7E0	-	30 0 705	-	44	-	-
г.п.г.	0.013		0.594		0.000		0.750		0.795		0.040		



EB						Email: data	arequests@pdi	llc.com						
Start		Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axl	5 Axle	>6 Axl	<6 Axl	6 Axle	>6 Axl	
Time	Bikes	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Total
05/29/1			-											
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
06:00	0	9	1	0	1	0	0	0	0	0	0	0	0	11
07:00	0	21	7	1	0	0	0	0	0	0	0	0	0	29
08:00	0	15	1	1	0	0	0	0	0	0	0	0	0	17
09:00	0	9	0	0	2	1	0	0	0	0	0	0	0	12
10:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
11:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
12 PM	0	7	0	0	0	0	0	0	0	0	0	0	0	7
13:00	0	12	2	0	1	0	0	0	0	0	0	0	0	15
14:00	0	7	4	1	3	0	0	0	0	0	0	0	0	15
15:00	0	8	0	1	0	0	0	0	0	0	0	0	0	9
16:00	0	12	2	0	1	0	0	0	0	0	0	0	0	15
17:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
18:00	0	7	4	0	0	0	0	1	0	0	0	0	0	12
19:00	0	6	4	0	0	0	0	0	0	0	0	0	0	10
20:00	0	2	5	0	1	0	0	0	0	0	0	0	0	8
21:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	145	36	4	9	1	0	1	0	0	0	0	0	196
Percent	0.0%	74.0%	18.4%	2.0%	4.6%	0.5%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM		07.00	07.00	07.00	00.00	00.00								07.00
Peak		07.00	07.00	07.00	00.00	00.00								07.00
Vol.		21	7	1	2	1								29
Midday		13.00	14.00	14.00	14.00									13.00
Peak		10.00	14.00	14.00	14.00									10.00
Vol.		12	4	1	3									15
PM		17.00	20.00	15.00	16.00			18.00						17.00
Peak		17.00	20.00	10.00	10.00			10.00						11.00
Vol.		13	5	1	1			1						16



EB						Email: dat	arequests@pdi	llc.com						
Start		Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axl	5 Axle	>6 Axl	<6 Axl	6 Axle	>6 Axl	
Time	Bikes	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Total
05/30/1														
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
06:00	0	6	3	0	1	0	0	0	0	0	0	0	0	10
07:00	0	19	4	1	0	0	0	0	0	0	0	0	0	24
08:00	0	14	1	1	0	0	0	0	0	0	0	0	0	16
09:00	0	9	2	0	1	0	0	0	0	0	0	0	0	12
10:00	0	9	2	0	1	0	0	0	0	0	0	0	0	12
11:00	0	13	1	0	0	0	0	0	0	0	0	0	0	14
12 PM	0	6	2	0	1	0	0	0	0	0	0	0	0	9
13:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
14:00	0	5	4	1	2	0	0	0	0	0	0	0	0	12
15:00	0	16	1	1	0	0	0	0	0	0	0	0	0	18
16:00	0	7	4	0	0	1	0	0	0	0	0	0	0	12
17:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
18:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
19:00	0	12	1	0	0	0	0	1	0	0	0	0	0	14
20:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
21:00	1	1	0	0	0	0	0	0	0	0	0	0	0	2
22:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	150	31	4	6	1	0	1	0	0	0	0	0	194
Percent	0.5%	77.3%	16.0%	2.1%	3.1%	0.5%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM		07.00	07.00	07.00	06.00									07.00
Peak		01.00	01.00	01.00	00.00									01.00
Vol.		19	4	1_	1									24
Midday		11:00	14:00	14:00	14:00									11:00
Peak														
Vol.		13	4	1	2									14
PM	21:00	15:00	16:00	15:00		16:00		19:00						15:00
Peak		. 5100												. 5100
Vol.	1	16	4	1		1		1						18



WB						Email: data	arequests@pdi	llc.com						
Start		Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axl	5 Axle	>6 Axl	<6 Axl	6 Axle	>6 Axl	
Time	Bikes	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Total
05/29/1														
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2
07:00	0	5	4	1	0	0	0	0	0	0	0	0	0	10
08:00	0	3	3	1	0	0	0	1	0	0	0	0	0	8
09:00	0	8	2	0	1	1	0	0	0	0	0	0	0	12
10:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
11:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
12 PM	0	10	2	0	0	0	0	0	0	0	0	0	0	12
13:00	0	8	1	0	3	0	0	0	0	0	0	0	0	12
14:00	0	4	2	1	1	0	0	0	0	0	0	0	0	8
15:00	0	12	0	1	0	0	0	0	0	0	0	0	0	13
16:00	0	17	1	0	0	0	0	0	0	0	0	0	0	18
17:00	0	18	2	0	0	0	0	0	0	0	0	0	0	20
18:00	0	20	3	0	0	0	0	0	0	0	0	0	0	23
19:00	0	13	1	0	0	0	0	0	0	0	0	0	0	14
20:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
21:00	0	9	3	0	0	0	0	0	0	0	0	0	0	12
22:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
23:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	151	28	4	6	1	0	1	0	0	0	0	0	191
Percent	0.0%	79.1%	14.7%	2.1%	3.1%	0.5%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM		09.00	07.00	07.00	06.00	09.00		08.00						09.00
Peak		00.00	01.00	01.00	00.00	00.00		00.00						00.00
Vol.		8	4	1	1	1		1						12
Midday		12.00	12.00	14.00	13.00									12.00
Peak		12.00	12.00	11.00	10.00									12.00
Vol.		10	2	1	3									12
PM		18:00	18:00	15:00										18:00
Peak														
Vol.		20	3	1										23



WB						Office: 508.48 Email: dat	1.3999 Fax: 50 arequests@pdi	8.545.1234 llc.com				O.	0 0000. 1	2000.004
Start		Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axl	5 Axle	>6 Axl	<6 Axl	6 Axle	>6 Axl	
Time	Bikes	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Total
05/30/1														
3	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
06:00	0	2	1	0	1	0	0	0	0	0	0	0	0	4
07:00	0	4	4	1	0	0	0	0	0	0	0	0	0	9
08:00	0	6	1	1	0	0	0	0	0	0	0	0	0	8
09:00	0	5	3	0	1	0	0	0	0	0	0	0	0	9
10:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
11:00	0	7	2	0	0	0	0	0	0	0	0	0	0	9
12 PM	0	10	1	0	1	0	0	0	0	0	0	0	0	12
13:00	0	7	2	0	0	0	0	0	0	0	0	0	0	9
14:00	0	14	2	1	1	0	0	0	0	0	0	0	0	18
15:00	0	9	2	1	0	0	0	0	0	0	0	0	0	12
16:00	0	15	1	0	0	1	0	0	0	0	0	0	0	17
17:00	0	21	1	0	0	0	0	0	0	0	0	0	0	22
18:00	0	20	1	0	0	0	0	1	0	0	0	0	0	22
19:00	0	16	0	0	0	0	0	0	0	0	0	0	0	16
20:00	0	13	0	0	0	0	0	0	0	0	0	0	0	13
21:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
22:00	1	2	0	0	0	0	0	0	0	0	0	0	0	3
23:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Total	1	165	24	4	4	1	0	1	0	0	0	0	0	200
Percent	0.5%	82.5%	12.0%	2.0%	2.0%	0.5%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM		08:00	07:00	07:00	06:00									07:00
Peak		-												-
Vol.		6	4	1	1									9
Midday		14:00	11:00	14:00	12:00									14:00
Peak														
Vol.		14	2	1	1									18
PM	22:00	17:00	15:00	15:00		16:00		18:00						17:00
Peak														
VOI.	1	21	2	1		1		1						22



EB							Ema	il: datareque	sts@pdillc.co	.1234 m							
Start	1	4	7	10	13	16	19	22	25	28	31	34	37	40		85th	AVE
Time	3	6	9	12	15	18	21	24	27	30	33	36	39	999	Total	% ile	MPH
05/29/																	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01.00	Ő	Õ	Õ	Õ	Õ	Õ	Õ	Õ	õ	Õ	Õ	Õ	Ő	Õ	õ	*	*
02.00	0	Ő	Ő	Ő	Ő	Ő	Ő	0	0	Ő	Ő	Õ	0	Ő	Ő	*	*
02.00	0	Ő	0	õ	0	Ő	0	0	1	Ő	Ő	Ő	0	0	1	26	26
03.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20
04.00	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	22	20
05.00	0	0	0	0	0	0	1	2	6	1	1	0	0	0	ے 11	20	20
00.00	0	0	0	0	0	1	י י	2	0	, c	- -	0	0	0	20	20	20
07:00	0	0	0	0	0	1	3	9	0	0	2	0	0	0	29	28	25
08:00	0	0	0	0	0	1	2	2	4	6	1	1	0	0	17	30	26
09:00	0	0	0	0	1	0	2	2	2	4	1	0	0	0	12	29	25
10:00	0	0	0	0	0	0	1	1	2	0	1	0	0	0	5	30	25
11:00	0	0	0	0	0	1	0	4	4	2	0	0	0	0	11	27	25
12	_	_		_				_		_		_	_		_		
PM	0	0	0	0	0	1	0	2	2	1	1	0	0	0		29	25
13:00	0	0	0	0	0	1	1	3	7	1	1	1	0	0	15	29	26
14:00	0	0	0	0	0	0	4	2	4	4	1	0	0	0	15	29	25
15:00	0	0	0	0	0	0	2	2	2	2	0	1	0	0	9	29	26
16:00	0	0	0	0	1	1	1	3	4	4	1	0	0	0	15	29	25
17:00	0	0	0	0	1	0	0	3	8	4	0	0	0	0	16	28	25
18:00	0	0	0	0	0	1	1	1	4	3	1	1	0	0	12	30	27
19:00	0	0	0	0	1	1	1	2	2	3	0	0	0	0	10	28	24
20:00	0	0	0	0	1	0	3	0	0	3	1	0	0	0	8	30	24
21:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	23	23
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	Ō	Ō	Ō	Ō	Ō	Ō	Ō	Ō	Ō	Ō	Ō	Ō	Ō	Ō	Õ	*	*
Total	0	0	0	0	5	8	22	39	60	45	13	4	0	0	196		
	0.00/	0.00/	0.00/	0.00/	0.00/		11.2	19.9	30.6	23.0	0.00/	0.00/	0.00/	0.00/			
%	0.0%	0.0%	0.0%	0.0%	2.6%	4.1%	%	%	%	%	6.6%	2.0%	0.0%	0.0%			
AM					00.00	07.00	07.00	07.00	07.00	07.00	07.00	08.00			07.00		
Peak					00.00	07.00	07.00	07.00	07.00	07.00	07.00	00.00			01.00		
Vol.					1	1	3	9	8	6	2	1			29		
Midda																	
У						11:00	14:00	11:00	13:00	14:00	12:00	13:00			13:00		
Peak																	
Vol.						1	4	4	7	4	1	1			15		
PM					16:00	16:00	20:00	16:00	17:00	16:00	16:00	15:00			17:00		
Vol					1	1	3	3	8	1	1	1			16		
viles			15t	h Perce	ntile ·	20	MPH	5	0	4	I	I			10		
/01103			50t	h Percei	ntile :	20											
			851	h Porco	ntile :	20	MDH										
			051	h Dorco	ntilo :	20	MDH										
			901	ITFEICE	ille.	51	IVIETT										
Stats		1	0 MPH	Pace Sp	eed :	21-30	MPH										
			Num	nber in P	ace :		148										
			Perc	cent in P	ace :	7	75.5%										
	Nu	mber of	Vehicles	s>25 N	1PH :		100										
	Pe	ercent of	Vehicles	s>25 N	1PH :	Ę	51.2%										
		M	ean Spe	ed(Avera	age) :	25	MPH										



EB							Ema	il: datareque	sts@pdillc.co	m							
Start	1	4	7	10	13	16	19	22	25	28	31	34	37	40		85th	AVE
Time	3	6	9	12	15	18	21	24	27	30	33	36	39	999	Total	% ile	MPH
05/30/																/00	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	1	0	1	2	0	0	0	0	4	29	26
06.00	0	0	0	0	0	0	1	2	4	3	Ō	0	0	Ô	10	28	26
07.00	Ő	1	Õ	Õ	Õ	1	2	6	1	ã	Ă	Õ	Ő	0	24	20	25
07.00	0		0	0	4		2	0	4	U 4		0	0	0	40	30	23
08:00	0	0	0	0	1	1	1	2	0	4	1	0	0	0	16	28	25
09:00	0	0	0	0	0	0	3	2	2	4	1	0	0	0	12	29	25
10:00	0	0	0	0	0	1	3	2	2	3	0	1	0	0	12	29	25
11:00	0	0	0	0	0	1	0	3	4	4	2	0	0	0	14	30	26
12																	
PM	0	0	0	0	0	0	2	2	4	1	0	0	0	0	q	26	24
12.00	0	õ	õ	õ	õ	1	_	1	1	1	2	0	0	0	6	21	27
13.00	0	0	0	0	0		0	1	1		2	4	0	0	40	20	21
14:00	0	0	0	0	0	0	1	2	4	1	3	1	0	0	12	32	28
15:00	0	0	0	0	0	1	4	3	8	2	0	0	0	0	18	26	24
16:00	0	0	0	0	0	0	0	1	7	3	1	0	0	0	12	29	27
17:00	0	0	0	0	0	0	0	4	5	3	2	0	0	0	14	30	27
18:00	0	0	0	0	0	2	1	0	4	3	0	0	0	0	10	28	25
10.00	Õ	Õ	ž	Õ	Õ	1	0	Å	3	2	Õ	Õ	Õ	Õ	14	27	22
20.00	0	0	-	0	0	0	0	0	1	4	0	0	0	0	2	20	22
20.00	0	0	0	0	0	0	0	0		1	0	0	0	0	2	29	21
21:00	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2	26	24
22:00	0	0	0	0	0	0	0	0	0	2	1	0	0	0	3	31	30
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	0	1	2	0	1	9	19	37	61	45	17	2	0	0	194		
0/_	0.0%	0.5%	1 0%	0.0%	0.5%	1 6%	0.8%	19.1	31.4	23.2	8 8%	1 0%	0.0%	0.0%			
70	0.070	0.070	1.070	0.070	0.070	ч.070	5.070	%	%	%	0.070	1.070	0.070	0.070			
AM		07.00			00.00	07.00	00.00	07.00	00.00	07.00	07.00				07.00		
Peak		07.00			00.00	07.00	09.00	07.00	06.00	07.00	07.00				07.00		
Vol.		1			1	1	3	6	6	6	4				24		
Midda																	
v						11.00	12.00	11.00	11.00	11.00	14.00	14.00			11.00		
Peak						11.00	12.00	11.00	11.00	11.00	11.00	11.00			11.00		
Vol						1	2	2	1	1	2	1			11		
							2	5	4	4	5	1			14		
PIVI			19:00			18:00	15:00	19:00	15:00	16:00	17:00				15:00		
Реак			0			0		0	0	0	0				40		
			2			2	4	6	8	3	2				18		
%iles			15t	h Percei	ntile :	20	MPH										
			50t	h Perce	ntile :	25	MPH										
			85t	h Perce	ntile :	29	MPH										
			95t	h Perce	ntile :	31	MPH										
Stats		1	0 MPH I	Pace Sp	eed :	22-31	MPH										
			Num	ber in P	ace :		147										
			Per	ent in P	ace	7	75.8%										
	Nh	imber of	Vehicles	> 25 M	IPH ·	'	103										
		arcont of	Vohiolog	> 25 N	пп. ИDЦ ·		2 00/										
	PE			> ∠⊃ IV			JJ.U%										
		Me	ean Spee	ed(Avera	age) :	- 25	WPH										



WB							Ema	ail: datareque	sts@pdillc.co	m							
Start	1	4	7	10	13	16	19	22	25	28	31	34	37	40		85th	AVE
Time	3	6	9	12	15	18	21	24	27	30	33	36	39	999	Total	% ile	MPH
05/29/																	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	26	26
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	0	0	0	0	Ō	0	0	0	0	*	*
06:00	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2	26	24
07:00	0	0	0	0	0	1	3	0	5	1	0	0	0	0	10	26	24
08:00	Õ	Õ	Õ	0	1	1	2	2	2	0	Ő	Ő	Ő	Õ		25	21
09.00	Ő	Ő	Ő	0	1	1	1	4	1	ž	ž	Õ	Õ	Ő	12	30	24
10.00	0	0	0	0	0	1	2	1	2	0	0	0	0	0	6	25	22
11.00	0	0	0	0	0	0	2	1	2	0	0	0	0	0	8	25	22
12	0	0	0	0	0	0	2	4	2	0	0	0	0	0	0	25	20
	0	0	0	2	0	1	2	1	2	0	0	0	0	0	12	24	20
12.00	0	0	0	2	1	1	3	4 7	4	1	0	0	0	0	12	24	20
13:00	0	0	0	0	1	0	2	1	1	1	0	0	0	0	12	24	22
14:00	0	0	0	1	0	1	2	2	0	1	1	0	0	0	8	29	22
15:00	0	0	0	1	0	1	2	5	3	1	0	0	0	0	13	26	22
16:00	0	0	0	0	0	2	1	10	4	1	0	0	0	0	18	25	23
17:00	0	0	0	0	2	0	3	5	5	4	1	0	0	0	20	28	24
18:00	0	0	0	0	0	1	5	7	8	2	0	0	0	0	23	26	24
19:00	0	0	0	0	0	1	4	6	3	0	0	0	0	0	14	24	22
20:00	0	0	0	0	0	0	0	3	2	3	0	0	0	0	8	28	26
21:00	0	0	0	0	0	0	3	5	4	0	0	0	0	0	12	25	23
22:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	23	23
23:00	0	0	0	0	0	0	1	1	1	0	0	0	0	0	3	25	23
Total	0	0	0	4	5	11	36	68	47	16	4	0	0	0	191		
%	0.0%	0.0%	0.0%	2 1%	2.6%	5.8%	18.8	35.6	24.6	8 4%	2 1%	0.0%	0.0%	0.0%			
70	0.070	0.070	0.070	2.170	2.070	0.070	%	%	%	0.470	2.170	0.070	0.070	0.070			
AM					08.00	07.00	07.00	00.00	07.00	00.00	00.00				00.00		
Peak					00.00	01.00	01.00	00.00	01.00	00.00	00.00				00.00		
Vol.					1	1	3	4	5	2	2				12		
Midda																	
У				12:00	13:00	12:00	12:00	13:00	11:00	13:00	14:00				12:00		
Peak																	
Vol.				2	1	1	3	7	2	1	1				12		
PM				15.00	17.00	16.00	18.00	16.00	18.00	17.00	17.00				18.00		
Peak				10.00	17.00	10.00	10.00	10.00	10.00	17.00	17.00				10.00		
Vol.				1	2	2	5	10	8	4	1				23		
%iles			15t	th Perce	ntile :	18	MPH										
			50t	th Perce	ntile :	22	MPH										
			85t	th Perce	ntile :	26	MPH										
			95t	th Perce	ntile :	28	MPH										
Stats		1	0 MPH	Pace Sp	eed :	19-28	MPH										
			Num	nber in P	ace :		154										
			Per	cent in P	ace :	8	30.6%										
	Nu	imber of	Vehicles	s>25 N	1PH :		48										
	Pe	ercent of	Vehicles	s>25 N	1PH :	2	25.1%										
		M	ean Spe	ed(Avera	age) :	23	MPH										



WB							Ema	il: datareque	sts@pdillc.co	m							
Start	1	4	7	10	13	16	19	22	25	28	31	34	37	40		85th	AVE
Time	3	6	9	12	15	18	21	24	27	30	33	36	39	999	Total	% ile	MPH
05/30/																	
13	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	29	29
01.00	Ő	Ő	Õ	Ő	Ő	Ő	Õ	Õ	Õ	0	Õ	Ő	Õ	Ő	0	*	*
02.00	õ	Õ	Ő	Õ	Ő	õ	õ	õ	õ	Õ	õ	Ő	Ő	õ	õ	*	*
02.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04.00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	20	20
00.00	0	0	0	0	0	0	0	1	1	2	0	0	0	0	1	20	20
00.00	0	0	0	0	0	0	0	י י	1	2	0	0	0	0	4	29	21
07:00	0	0	0	0	0	0	2	J 2	3	1	0	0	0	0	9	20	24
08:00	0	0	0	0	2	0	0	1	2	1	2	0	0	0	8	31	24
09:00	0	0	0	0	0	0	2	2	4	1	0	0	0	0	9	26	24
10:00	0	0	0	0	0	0	3	3	1	1	0	0	0	0	8	26	23
11:00	0	0	0	0	0	0	4	2	3	0	0	0	0	0	9	25	23
12								-									
PM	0	0	0	0	0	0	2	6	3	1	0	0	0	0	12	26	24
13:00	0	0	0	0	0	1	1	1	4	1	1	0	0	0	9	28	25
14:00	0	0	0	0	1	1	2	4	8	2	0	0	0	0	18	26	24
15:00	0	0	0	0	0	1	1	6	3	1	0	0	0	0	12	26	23
16:00	0	0	0	1	0	3	4	5	1	3	0	0	0	0	17	27	22
17:00	0	0	0	1	0	1	2	9	5	4	0	0	0	0	22	27	24
18:00	0	0	0	2	0	0	5	8	6	1	0	0	0	0	22	25	22
19:00	0	0	1	1	1	3	2	5	2	1	0	0	0	0	16	24	20
20:00	0	0	0	1	0	0	3	5	2	2	0	0	0	0	13	27	23
21:00	0	0	0	0	0	0	1	0	1	2	0	0	0	0	4	29	26
22:00	0	Ō	Ō	0	0	0	0	0	2	1	0	0	Ō	0	3	28	27
23:00	0	0	0	0	0	0	1	1	0	1	0	0	0	0	3	28	24
Total	0	0	1	6	4	10	36	62	51	27	3	0	0	0	200		
							18.0	31.0	25.5	13.5							
%	0.0%	0.0%	0.5%	3.0%	2.0%	5.0%	%	%	%	%	1.5%	0.0%	0.0%	0.0%			
AM					08:00		07:00	07:00	09:00	06:00	08:00				07:00		
Peak																	
Vol.					2		2	3	4	2	2				9		
Midda						40.00		40.00			40.00						
у					14:00	13:00	11:00	12:00	14:00	14:00	13:00				14:00		
Реак															4.0		
					1	1	4	6	8	2	1				18		
Peak			19:00	18:00	19:00	16:00	18:00	17:00	18:00	17:00					17:00		
Vol.			1	2	1	3	5	9	6	4					22		
%iles			15t	h Percei	ntile :	18	MPH										
			50t	h Percei	ntile :	23	MPH										
			85t	h Percei	ntile :	27	MPH										
			95t	h Percei	ntile :	29	MPH										
01.1				<b>D C</b>		40.00											
Stats		1		Pace Sp	eea :	19-28											
				iber in P		-	155										
	N.L.	mheret	Per				01.0%										
		Inder of	Vehicles	> ∠5 IV													
	Pe	ercent of	venicles	5 > 25 IV			5U.7%										
		IVI	ean spe	eu(Avera	ige):	23	WPH										



133207 B volume Site Code: TBA

3	06-Fé	eb-13	07-Feb	-13	08-Feb-1	с С	09-Feb-1	с С	10-Feb-	3	11-Feb-	13	Week Ave	rage
SB NB		л М	۹N,	'n	, NB	'n,	ΥR NB	л Ч	°,	л Ч	۹N,	Å,	SB5	л Д
0		-	×	×	×	×	×	×	×	ĸ	×	×	0	0
~		0	*	*	*	*	*	*	*	*	*	*	<del></del>	0
0		0	*	*	*	*	*	*	*	*	*	*	0	0
0		0	*	*	*	*	*	*	*	*	*	*	0	0
ო		-	*	*	*	*	*	*	*	*	*	*	2	-
12		7	*	*	*	*	*	*	*	*	*	*	10	4
38		24	*	*	*	*	*	*	*	*	*	*	34	22
113		38	*	*	*	*	*	*	*	*	*	*	108	144
73		67	*	*	*	*	*	*	*	*	*	*	73	74
49		36	*	*	*	*	*	*	*	*	*	*	44	42
36		22	*	*	*	*	*	*	*	*	*	*	36	23
44		31	*	*	*	*	*	*	*	*	*	*	40	32
45		36	*	*	*	*	*	*	*	*	*	*	42	31
47		45	*	*	*	*	*	*	*	*	*	*	40	38
95		66	*	*	*	*	*	*	*	*	*	*	06	59
		20	*	*	*	*	*	*	*	*	*	*	20	73
60	U	37	*	*	*	*	*	*	*	*	*	*	66	74
86	•.	33	*	*	*	*	*	*	*	*	*	*	84	85
52	•	78	*	*	*	*	*	*	*	*	*	*	47	58
75		65	*	*	*	*	*	*	*	*	*	*	59	49
25		35	*	*	*	*	*	*	*	*	*	*	18	25
30		22	*	*	*	*	*	*	*	*	*	*	22	16
6		4	*	*	*	*	*	*	*	*	*	*	9	4
-		4	*	*	*	*	*	*	*	*	*	*	2	З
670	0,	912	0	0	0	0	0	0	0	0	0	0	894	857
1882	2		0		0		0		0		0		1751	
01:00	0	2:00											02:00	00:20
113		138											108	144
14:00 17	÷	2:00											14:00	17:00
95		93											06	85
		0		¢		G		c		c		¢		
	<del>.</del>	282		D		D		D		D		D		16/1
1,751		A	ADT 1,751											

Page 1

PRECISION D A T A INDUSTRIES, LLC P.O. Box 301 Berlin, MA 01503 Office: 508.481.3999 Fax: 508.545.1234 Email: datarequests@pdillc.com

Deerfoot Road approx 1600' south of Main Street (Route 30) City, State: Southborough, MA Client: Green International/ S. Musto

Start		NR				SB				Combined			05-Eeb-13
Time	A.M.	ND	P.M.		A.M.	30	P.M.		A.M.	Complified	P.M.		Tue
12:00	0		8		0				0		16	-	
12.00	Õ		12		0		12		0 0		24		
12:10	0		5		0		1		0		6		
12:00	0	0	1/	30	0	٥	5	26	0	0	10	65	
01:00	0	0	14	55	0	0	0	20	0	0	10	05	
01.00	0				0		0		0		19		
01:15	0		0		0		1		0		13		
01:30	1		1	~~	1		6		2		13	~~	
01:45	0	1	8	32	0	1	10	31	0	2	18	63	
02:00	0		7		0		10		0		17		
02:15	0		10		0		20		0		30		
02:30	0		43		0		15		0		58		
02:45	0	0	24	84	0	0	7	52	0	0	31	136	
03:00	0		13		0		15		0		28		
03:15	0		12		0		21		0		33		
03:30	0		18		0		19		0		37		
03:45	Ő	0	20	63	Ő	0	21	76	Ő	0	41	139	
04:00	0	Ũ	25	00	0	Ũ	15	10	0 0	Ũ	40	100	
04:00	0		15		0		13		0		-10		
04.13	0		10		1		10		0		20		
04.30	2	0	10	74	1		10	00	3	0	34	450	
04:45	0	2	15	71	0	1	36	82	0	3	51	153	
05:00	1		28		0		22		1		50		
05:15	0		25		1		17		1		42		
05:30	3		17		0		16		3		33		
05:45	5	9	13	83	0	1	22	77	5	10	35	160	
06:00	2		12		3		16		5		28		
06:15	8		15		1		7		9		22		
06:30	8		6		6		6		14		12		
06:45	13	31	9	42	11	21	9	38	24	52	18	80	
07.00	13		18		16		11		29		29		
07:15	17		6		27		14		44		20		
07:30	29		13		28		6		57		19		
07.30	42	102	15	42	20	140	2	22	121	251	13	76	
07.43	43	102	0	43	70	149	<u>ک</u>		121	201	0	70	
00.00	31		4		29		1		60		5		
08:15	17		3		19		8		36		11		
08:30	13		1		14		4	. –	27	. – .	5		
08:45	12	73	3	11	19	81	2	15	31	154	5	26	
09:00	10		7		17		5		27		12		
09:15	12		4		13		1		25		5		
09:30	9		3		12		2		21		5		
09:45	7	38	1	15	6	48	1	9	13	86	2	24	
10:00	10		0		7		1		17		1		
10:15	5		1		4		0		9		1		
10:30	10		1		6		1		16		2		
10:45	11	36	0	2	7	24	3	5	18	60	3	7	
11.00	9		Õ	-	8	- ·	0	U U	17		0	•	
11.00	15		Ő		8		1		23		1		
11.10	15		2		8		0		16		2		
11.30	5	27	2	2	0	22	1	2	10	60	2	4	
11.45 			0	Z	0	32	140	Z	13	69		4	
Total	329		487		358		440		687		933		
Percent	47.9%		52.2%		52.1%		47.8%						
<b>_</b>		<b>-</b> · · ·											
Day Total		816				804	1			1620			
Peak	07:15		02:30		07:15		04:30		07:15		04:30		
Vol.	120		92		162		93		282		177		
P.H.F.	0.698		0.535		0.519		0.646		0.583		0.868		

133207 B volume Site Code: TBA PRECISION D A T A INDUSTRIES, LLC P.O. Box 301 Berlin, MA 01503 Office: 508, 841, 3999 Fax: 508, 545, 1234 Email: datarequests@pdillc.com

133207 B volume Site Code: TBA

Start		NB				SB				Combined			06-Feb-13
Time	A.M.		P.M.		A.M.	00	P.M.		A.M.	Combined	P.M.		Wed
12:00	0		9		1		9		1		18		
12.15	0		12		0		10		0		22		
12:30	0		17		õ		10		Ő		27		
12:00	0	0	7	45	0	1	7	36	0	1	1/	Q1	
12.40	0	0	1	45	0	1	1	30	0	1	14	01	
01:00	1		11		0		10		1		21		
01:15	0		15		0		12		0		27		
01:30	0		9		0		6		0		15		
01:45	0	1	12	47	0	0	17	45	0	1	29	92	
02:00	0		6		0		16		0		22		
02:15	0		14		0		24		0		38		
02:30	0		53		0		17		0		70		
02:45	0	0	22	95	õ	0	à	66	Ő	0	31	161	
02.40	0	0	22	35	0	0	16	00	0	0	20	101	
03.00	0		22		0		10		0		30		
03:15	0		15		0		16		0		31		
03:30	0		12		0		8		0		20		
03:45	0	0	27	76	0	0	30	70	0	0	57	146	
04:00	0		19		0		16		0		35		
04:15	0		12		0		18		0		30		
04:30	2		14		0		9		2		23		
04:45	1	З	15	60	1	1	24	67	2	4	39	127	
05:00	0	5	19	00	1		23	07	1	-	41	121	
05.00	1		10		1		23		1		4 I 5 4		
05.15	1		32		1		22		2		54		
05:30	6		18		2	_	27		8		45		
05:45	5	12	18	86	3	7	21	93	8	19	39	179	
06:00	2		14		4		21		6		35		
06:15	8		12		2		13		10		25		
06:30	7		8		3		15		10		23		
06:45	21	38	18	52	15	24	29	78	36	62	47	130	
07:00	28		15		10		15		47		30		
07:00	12		22		19		15		21		47		
07.13	13		15		10		15		51		47		
07.30	17	440	15	75	33	400	25	05	50	054	40	4.40	
07:45	55	113	13	75	68	138	10	65	123	251	23	140	
08:00	26		2		28		11		54		13		
08:15	14		10		11		7		25		17		
08:30	15		1		14		10		29		11		
08:45	18	73	12	25	14	67	7	35	32	140	19	60	
09:00	11		2		13		11		24		13		
09.15	12		16		8		6		20		22		
00.10	10		8		õ		3		10		11		
00.45	16	40	4	20	5	26	5	22	13	95	6	50	
09.40	10	49	4	30	0	30	2	22	22	00	0	52	
10:00	12		2		1		2		19		4		
10:15	9		2		8		1		17		3		
10:30	7		3		3		1		10		4		
10:45	8	36	2	9	4	22	0	4	12	58	2	13	
11:00	9		1		8		2		17		3		
11:15	18		0		7		1		25		1		
11:30	10		0		10		1		20		1		
11:45	7	44	0 0	1	6	31	O	4	13	75	0	5	
Total	360		601		227		585	<del>_</del>	606	10	1196	<u>J</u>	
Dereent	509		EO 70/		47.00/		40.20/		090		1100		
Feiceni	55.0%		50.7%		47.0%		49.3%						
											_		
Day Total		970				912	2			1882	2		
Peak	07:00		02:30		07:15		04:45		07:15		04:45		
Vol.	113		112		147		96		258		179		
P.H.F.	0.514		0.528		0.540		0.889		0.524		0.639		
	0.017		0.020		0.040		0.000		0.02-		0.000		

<b>N</b> S
PRECISION
DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503 Office: 508.481.3999 Fax: 508.545.1234 Email: datarequests@pdillc.com

Client: Gre	en Interna	ational/ S.	Musto			P.O. Box 3 Office: 508.48 Email: data	01 Berlin, MA 1.3999 Fax: 50 arequests@pdi	01503 8.545.1234 llc.com					133207 Site Co	7 B class
NB						Emainada	inequestise pui						Sile Cl	
Start		Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axl	5 Axle	>6 Axl	<6 Axl	6 Axle	>6 Axl	
Time	Bikes	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Total
02/05/1														
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
05:00	0	1	1	0	1	0	0	0	0	0	0	0	0	9
06:00	0	26	4	0	1	0	0	0	0	0	0	0	0	31
07:00	0	87	11	1	3	0	0	0	0	0	0	0	0	102
08:00	0	52	18	0	3	0	0	0	0	0	0	0	0	73
09:00	0	31	5 10	0	1	1	0	0	0	0	0	0	0	38
10:00	0	23	12	0	1	0	0	0	0	0	0	0	0	30
12 DM	0	20	0	0	ی ۱	0	0	0	0	0	0	0	0	20
12 111	0	29	9	0	1	0	0	0	0	0	0	0	0	22
14:00	0	20 61	21	0	2	0	0	0	0	0	0	0	0	8/
15:00	0	45	15	1	2	0	0	0	0	0	0	0	0	63
16:00	0	51	17	0	3	0	0	0	0	0	0	0	0	71
17:00	0	67	14	Õ	2	Õ	õ	Õ	Õ	Ő	Õ	Õ	Õ	83
18:00	0	31	11	0	0	Õ	Õ	Ő	0	0	0	Õ	Õ	42
19:00	0	29	13	0	1	0	0	0	0	0	0	0	0	43
20:00	0	5	6	0	0	0	0	0	0	0	0	0	0	11
21:00	0	10	5	0	0	0	0	0	0	0	0	0	0	15
22:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
23:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
Total	0	610	177	2	26	1	0	0	0	0	0	0	0	816
Percent	0.0%	74.8%	21.7%	0.2%	3.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM		07:00	08:00	07:00	07:00	09:00								07:00
Peak					01.00									01.00
Vol		87	18	1	3	1								102
Midday		14:00	14:00		11:00									14:00
Peak		04	04		0									0.4
VOI.		61	21		3									84
Pivi Poak		17:00	16:00	15:00	16:00									17:00
Vol		67	17	1	2									83
v0i.		07	17	1	3									03

<b>N</b>
PRECISION
DΑΤΑ
INDUSTRIES, LLC

City State	<ul> <li>Southbo</li> </ul>	nouah MA	7				00111120/22	~						
Client: Gre	en Intern	ational/ S.	Musto			P.O. Box 3 Office: 508.48 Email: data	01 Berlin, MA 1.3999 Fax: 50 arequests@pd	01503 8.545.1234 illc.com					13320 Site Co	7 B class
NB							· ·							
Start		Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axl	5 Axle	>6 Axl	<6 Axl	6 Axle	>6 Axl	
Time	Bikes	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Total
02/06/1														
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
05:00	0	7	3	0	2	0	0	0	0	0	0	0	0	12
06:00	0	26	8	0	4	0	0	0	0	0	0	0	0	38
07:00	1	90	20	0	1	0	0	1	0	0	0	0	0	113
08:00	0	60	11	0	2	0	0	0	0	0	0	0	0	73
09:00	0	34	12	0	3	0	0	0	0	0	0	0	0	49
10:00	0	27	8	0	1	0	0	0	0	0	0	0	0	36
11:00	0	29	15	0	0	0	0	0	0	0	0	0	0	44
12 PM	0	29	15	0	0	1	0	0	0	0	0	0	0	45
13:00	0	38	9	0	0	0	0	0	0	0	0	0	0	47
14:00	0	74	19	0	2	0	0	0	0	0	0	0	0	95
15:00	1	52	18	1	4	0	0	0	0	0	0	0	0	76
16:00	0	41	18	0	1	0	0	0	0	0	0	0	0	60
17:00	0	58	26	0	2	0	0	0	0	0	0	0	0	86
18:00	0	40	9	0	3	0	0	0	0	0	0	0	0	52
19:00	0	54	18	0	3	0	0	0	0	0	0	0	0	75
20:00	0	18	7	0	0	0	0	0	0	0	0	0	0	25
21:00	0	19	9	0	1	0	0	1	0	0	0	0	0	30
22:00	0	6	3	0	0	0	0	0	0	0	0	0	0	9
23:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	2	706	229	1	29	1	0	2	0	0	0	0	0	970
Percent	0.2%	72.8%	23.6%	0.1%	3.0%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM	07:00	07:00	07:00		06:00			07:00						07:00
Peak														
Vol	1	90	20		4			1						113
Midday		14:00	14:00		14:00	12:00								14:00
Peak														
Vol.		74	19		2	1								95
PM Deel:	15:00	17:00	17:00	15:00	15:00			21:00						17:00
Peak	4	50	00	- -	4									00
VOI.	1	58	26	1	4			1						86

R	S
PRECISI	ON
D A T	A 5, LLC

City, State: Client: Gre SB	en Intern	orough, MA ational/ S.	A Musto			P.O. Box 3 Office: 508.48 Email: data	01 Berlin, MA 1.3999 Fax: 50 arequests@pdi	01503 8.545.1234 illc.com					13320 Site Co	7 B class ode: TBA
Start		Cars &	2 Axle	-	2 Axle	3 Axle	4 Axle	<5 Axl	5 Axle	>6 Axl	<6 Axl	6 Axle	>6 Axl	-
lime	Bikes	Irailers	Long	Buses	6 Lire	Single	Single	Double	Double	Double	Multi	Multi	Multi	lotal
02/05/1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03.00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04.00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05.00	0	18	3	0	0	0	0	0	0	0	0	0	0	21
07:00	0	126	17	1	5	0	0	0	0	0	0	0	0	149
08:00	õ	64	12	1	3	0	Õ	1	Ő	0	0 0	0	Õ	81
09:00	Õ	35	10	0	2	1	Õ	0	0	0	0	0	0	48
10:00	0	17	7	0	0	0	0	0	0	0	0	Ō	0	24
11:00	0	24	8	0	0	0	0	0	0	0	0	0	0	32
12 PM	0	23	3	0	0	0	0	0	0	0	0	0	0	26
13:00	0	23	6	0	2	0	0	0	0	0	0	0	0	31
14:00	0	41	9	0	1	1	0	0	0	0	0	0	0	52
15:00	0	61	14	1	0	0	0	0	0	0	0	0	0	76
16:00	0	72	9	0	1	0	0	0	0	0	0	0	0	82
17:00	0	61	16	0	0	0	0	0	0	0	0	0	0	77
18:00	0	29	8	0	1	0	0	0	0	0	0	0	0	38
19:00	0	25	8	0	0	0	0	0	0	0	0	0	0	33
20:00	0	12	3	0	0	0	0	0	0	0	0	0	0	15
21:00	0	5	4	0	0	0	0	0	0	0	0	0	0	9
22:00	0	3 1	2	0	0	0	0	0	0	0	0	0	0	ວ 2
 Total	0	641	142	3	15	2	0	1	0	0	0	0	0	804
Percent	0.0%	79.7%	17.7%	0.4%	1.9%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	004
AM		07.00	07.00	07.00	07.00									07.00
Peak		07:00	07:00	07:00	07:00	09:00		08:00						07:00
Vol.		126	17	1	5	1		1						149
Midday		14.00	14.00		12.00	14.00								14.00
Peak		14.00	14.00		13.00	14.00								14.00
Vol.		41	9		2	1								52
PM		16:00	17:00	15:00	16:00									16:00
Peak														
Vol.		72	16	1	1									82

<b>I</b> C	S
PRECISI	ON
D A I INDUSTRIES,	A ,LLC

City State	Southbo	rough MA	7				00111120/22	~						
Client: Gre	en Intern	ational/ S.	Musto			P.O. Box 3 Office: 508.48 Email: data	01 Berlin, MA 1.3999 Fax: 50 arequests@pd	01503 8.545.1234 illc.com					13320 Site Co	7 B class ode: TBA
SB		0 0	0.4.1.		0.4.1.	0.4.1.	4 4	<b>F</b> A. J	E Aula	0.4.1	0.4.1	0.4.1.	0.4.1	
Start Time	Bikes	Cars & Trailers	2 Axie	Buses	2 Axie 6 Tire	3 Axie Single	4 Axie Single	<5 AXI Double	5 Axie Double	>6 AXI Double	<6 AXI Multi	6 Axie Multi	>6 AXI Multi	Total
02/06/1	Direct		g	24000	0 1.10	eg.e	enigie	200010	200.0.0	2000.0				
3	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:00	0	4	2	0	1	0	0	0	0	0	0	0	0	7
06:00	0	18	6	0	0	0	0	0	0	0	0	0	0	24
07:00	0	114	22	1	0	0	0	1	0	0	0	0	0	138
08:00	0	55	9	1	2	0	0	0	0	0	0	0	0	67
09:00	0	24	9	0	3	0	0	0	0	0	0	0	0	36
10:00	0	17	4	0	1	0	0	0	0	0	0	0	0	22
11:00	0	21	8	1	1	0	0	0	0	0	0	0	0	31
12 PM	0	28	7	0	0	1	0	0	0	0	0	0	0	36
13:00	0	39	5	0	1	0	0	0	0	0	0	0	0	45
14:00	0	47	17	0	2	0	0	0	0	0	0	0	0	66
15:00	0	50	18	1	1	0	0	0	0	0	0	0	0	70
16:00	0	52	12	0	2	0	0	0	1	0	0	0	0	67
17:00	0	76	16	0	1	0	0	0	0	0	0	0	0	93
18:00	0	59	15	0	3	1	0	0	0	0	0	0	0	78
19:00	0	51	14	0	0	0	0	0	0	0	0	0	0	65
20:00	0	24	11	0	0	0	0	0	0	0	0	0	0	30
21:00	0	201	4	0	0	0	0	0	0	0	0	0	0	22
22.00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
 Total	0	704	182	4	18	2	0	1	1	0	0	0	0	<del>4</del>
Percent	0.0%	77.2%	20.0%	0.4%	2.0%	0.2%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	512
AM	0.070					0.270	0.070		01170	0.070	0.070	0.070	0.070	
Peak		07:00	07:00	07:00	09:00			07:00						07:00
Vol.		114	22	1	3			1						138
Midday		44.00	44.00	44.00	44.00	40.00								44.00
Peak		14:00	14:00	11:00	14:00	12:00								14:00
Vol.		47	17	1	2	1								66
PM		17.00	15.00	15.00	18.00	18.00			16.00					17.00
Peak		17.00	10.00	10.00	10.00	10.00			10.00					17.00
Vol.		76	18	1	3	1			1					93



NB							Email: data	requests@pdi	llc.com						Site Co	ode: TBA
Start	1	15	20	25	30	35	40	45	50	55	60	65	70	Total	85th	Ave
Time	14	19	24	29	34	39	44	49	54	59	64	69	9999		% ile	Speed
02/05/1																
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	1	1	0	0	0	0	0	0	2	*	39
05:00	0	1	1	1	4	0	1	1	0	0	0	0	0	9	32	30
06:00	0	1	3	13	1	7	0	0	0	0	0	0	0	31	35	29
07:00	0	0	4	29	45	22	2	0	0	0	0	0	0	102	35	31
08:00	0	0	1	19	30	13	4	0	0	0	0	0	0	73	36	31
09:00	0	0	0	1	19	11	1	0	0	0	0	0	0	38	36	33
10:00	0	1	4	5	12	12	2	0	0	0	0	0	0	36	37	32
11:00	1	0	0	5	11	18	1	1	0	0	0	0	0	37	37	33
12 PM	0	0	2	10	12	11	4	0	0	0	0	0	0	39	38	33
13:00	0	0	2	8 20	9	12	1	0	0	0	0	0	0	32	37	32
14:00	0	0	5	20	34	13	4	0	0	0	0	0	0	04 60	30	21
15:00	0	0	ີ 2	19	22	13	4	1	0	0	0	0	0	03 71	30 27	3 I 22
16:00	0	0	2	10	32 26	21	4	1	0	0	0	0	0	02	37	33
17:00	0	0	3	12	10	20	3	1	0	0	0	0	0	40	37	აა 22
10.00	0	3	1	7	19	14	5	0	1	0	0	0	0	42	20	33
20:00	0	0	2	5	13	1	0	1	0	0	0	0	0	43	32	32
20.00	0	0	0	5	4 5	5	0	0	0	0	0	0	0	15	36	32
22:00	0	0	0	1	0	1	0	0	0	0	0	0	0	2	*	32
23:00	0	0	0	1	Ő	1	0	0	0	0	Ő	Ő	0	2	*	32
Total	1	6	41	191	317	216	38	5	1	0	0	0	0	816		
%	0.1%	0.7%	5.0%	23.4%	38.8%	26.5%	4.7%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0		
AM		05.00	00.00	07.00	07.00	07.00	00.00	05.00						07.00		
Peak		05.00	08:00	07:00	07.00	07:00	08:00	05:00						07.00		
Vol.		1	7	29	45	22	4	1						102		
Midday	11.00		14.00	14.00	14.00	11.00	12.00	11.00						14.00		
Peak	11.00		14.00	14.00	14.00	11.00	12.00	11.00						14.00		
Vol.	1		5	28	34	18	4	1						84		
PM Peak		19:00	15:00	15:00	17:00	17:00	19:00	16:00	19:00					17:00		
Vol.		3	5	19	36	28	5	1	1					83		
% iles			15th Pe	ercentile :	2	25 MPH										
			50th P	ercentile :		31 MPH										
			85th P	ercentile :	;	37 MPH										
			95th P	ercentile :	4	40 MPH										
State		10 1	APH Pac	e Sneed ·	28-3	7 MPH										
Oluis		10 1	Number	in Pace	20 0	521										
			Percent	in Pace		63.8%										
	Num	nber of Ve	hicles > 3	35 MPH		220										
	Per	cent of Ve	hicles > 3	35 MPH :		26.9%										
		Mean	Speed(A	Average) :	;	32 MPH										



NB							Email: data	requests@pdi	llc.com						Site Co	ode: TBA
Start	1	15	20	25	30	35	40	45	50	55	60	65	70	Total	85th	Ave
Time	14	19	24	29	34	39	44	49	54	59	64	69	9999		% ile	Speed
02/06/1																
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	1	0	0	3	0	0	0	0	0	0	0	0	3	31	32
05.00	0	0	3	5 16	10	0	0	0	0	0	0	0	0	20	30	20
00.00	0	0	2	34	54	9 21	2	0	0	0	0	0	0	113	35	30
07.00	0	0	1	14	31	23	4	0	0	0	0	0	0	73	37	33
09:00	0	1	0	6	20	16	6	Ő	0	0	Ő	Ő	0	49	39	34
10:00	0	0	1	3	17	11	4	0	0	0	0	0	0	36	38	34
11:00	0	0	5	3	10	18	8	0	0	0	0	0	0	44	40	34
12 PM	0	0	2	8	14	17	3	1	0	0	0	0	0	45	38	34
13:00	0	1	3	6	16	16	3	1	1	0	0	0	0	47	38	33
14:00	0	0	6	29	40	17	3	0	0	0	0	0	0	95	35	31
15:00	0	0	2	18	30	23	3	0	0	0	0	0	0	76	36	32
16:00	0	2	2	8	18	24	5	1	0	0	0	0	0	60	38	33
17:00	0	0	3	13	37	29	4	0	0	0	0	0	0	86	37	33
18:00	0	0	3	11	20	13	5	0	0	0	0	0	0	52	38	33
19:00	0	0	2	10	42	18	3	0	0	0	0	0	0	/5 25	36	33
20.00	0	0	1	6	0 10	10	1	0	0	0	0	0	0	20	3/	აა 32
21.00	0	0	0	0	13	4	0	1	0	0	0	0	0	9 9	36	36
23:00	0	õ	Õ	Õ	0	1	Õ	0	0	0	0	Ő	0	1	*	37
Total	0	5	37	197	396	275	55	4	1	0	0	0	0	970		
%	0.0%	0.5%	3.8%	20.3%	40.8%	28.4%	5.7%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM		05.00	06.00	07.00	07.00	08.00	09.00							07.00		
Peak		00.00	00.00	01.00	51.00	00.00	00.00									
VOI.		1	3	34	54	23	6							113		
Rook		13:00	14:00	14:00	14:00	11:00	11:00	12:00	13:00					14:00		
Vol		1	6	29	40	18	8	1	1					95		
PM		40.00	47.00	45.00	10.00	47.00	40.00	40.00	· · ·					47.00		
Peak		16:00	17:00	15:00	19:00	17:00	16:00	16:00						17:00		
Vol.		2	3	18	42	29	5	1						86		
% iles			15th Pe	ercentile :	:	26 MPH										
			50th Pe	ercentile :		32 MPH										
			85th Pe	ercentile :	;	37 MPH										
			95th Pe	ercentile :		40 MPH										
Stats		10	MPH Pace	e Speed :	28-3	7 MPH										
elato			Number	in Pace :	20 0	638										
			Percent	in Pace :		65.8%										
	Nun	nber of Ve	hicles > 3	85 MPH :		284										
	Per	cent of Ve	hicles > 3	35 MPH :		29.3%										
		Mear	n Speed(A	verage) :	;	33 MPH										
19:00 20:00 21:00 22:00 70tal % AM Peak Vol. PM Peak Vol. PM Peak Vol. % iles	0 0 0 0.0%	0 0 0 5 0.5% 05:00 1 13:00 1 16:00 2 10 I nber of Ve cent of Ve cent of Ve	2 0 1 0 37 3.8% 06:00 3 14:00 6 17:00 6 17:00 3 15th Pe 50th Pe 85th Pe 95th Pe 95th Pe 95th Pe 95th Pe 95th Pe 95th Pe 95th Pe 95th Pe 95th Pe	10 7 6 0 197 20.3% 07:00 34 14:00 29 15:00 18 ercentile : ercentile : ercentil	42 8 19 4 0 396 40.8% 07:00 54 14:00 40 19:00 42	18 10 3 4 1 275 28.4% 08:00 23 11:00 18 17:00 29 26 MPH 37 MPH 40 MPH 57 MPH 638 65.8% 284 29.3% 33 MPH	3 0 1 0 55 5.7% 09:00 6 11:00 8 16:00 5	0 0 1 0 4 0.4% 12:00 1 16:00 1	0 0 0 1 0.1% 13:00 1					75 25 30 9 1 970 07:00 113 14:00 95 17:00 86	36 37 34 36 *	33 33 32 36 37



SB							Email: data	arequests@pdi	llc.com						Site Co	ode: TBA
Start	1	15	20	25	30	35	40	45	50	55	60	65	70	Total	85th	Ave
Time	14	19	24	29	34	39	44	49	54	59	64	69	9999		% ile	Speed
02/05/1																
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
05:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
06:00	0	0	0	9	9	3	0	0	0	0	0	0	0	21	33	31
07:00	0	0	6	36	69	34	4	0	0	0	0	0	0	149	36	32
08:00	0	0	6	17	34	22	2	0	0	0	0	0	0	81	36	32
09:00	0	1	2	6	17	17	4	1	0	0	0	0	0	48	38	33
10:00	0	1	1	5	10	1	0	0	0	0	0	0	0	24	36	31
11:00	0	1	0	10	6	10	4	1	0	0	0	0	0	32	39	33
12 PM	0	0	1	5	5	13	0	2	0	0	0	0	0	26	38	34
13:00	0	0	0	5	9	11	5	1	0	0	0	0	0	31	40	35
14:00	0	0	2	17	18	10	5	0	0	0	0	0	0	52	37	32
15:00	0	1	2	12	35	23	3	0	0	0	0	0	0	76	37	33
16:00	0	0	5	8	38	25	6	0	0	0	0	0	0	82	37	33
17:00	0	0	2	13	32	24	6	0	0	0	0	0	0	77	37	33
18:00	0	0	0	3	17	14	4	0	0	0	0	0	0	38	38	35
19:00	0	0	1	6	17	1	2	0	0	0	0	0	0	33	36	32
20:00	0	0	2	/	4	2	0	0	0	0	0	0	0	15	33	29
21:00	0	0	1	0	5	3	0	0	0	0	0	0	0	9	35	33
22:00	0	0	1	1	3	1	0	0	0	0	0	0	0	с С	3Z *	3 I 22
<u>Z3.00</u>	0		22	162	220	220	45	 5	0	0	0	0	0	<u> </u>		32
10tai %	0.0%	0.5%	4.0%	20.1%	40.8%	28.4%	5.6%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	004		
AM		00.00	07.00	07.00	07.00	07.00	07.00	00.00						07.00		
Peak		09:00	07:00	07:00	07:00	07:00	07:00	09:00						07:00		
Vol.		1	6	36	69	34	4	1						149		
Midday		11:00	14:00	14:00	14:00	12:00	13:00	12:00						14:00		
Vol		1	2	17	18	13	5	2						52		
PM		45.00	40.00	17 00	10 00	10 00	40.00	<u> </u>		-				10.00		
Peak		15:00	16:00	17:00	16:00	16:00	16:00							16:00		
Vol.		1	5	13	38	25	6							82		
% iles			15th P	ercentile :	2	26 MPH										
			50th P	ercentile :	:	32 MPH										
			85th P	ercentile :		37 MPH										
			95th P	ercentile :	4	40 MPH										
Stats		10	MPH Pac	e Speed :	28-3	7 MPH										
			Number	in Pace :		528										
			Percent	t in Pace :		65.7%										
	Nun	nber of Ve	hicles > 3	35 MPH:		236										
	Per	cent of Ve	hicles > 3	35 MPH:		29.3%										
		Mear	n Speed(A	Average) :	÷	33 MPH										



SB							Email: data	arequests@pai	lic.com						Site Co	ode: IBA
Start	1	15	20	25	30	35	40	45	50	55	60	65	70	Total	85th	Ave
Time	14	19	24	29	34	39	44	49	54	59	64	69	9999		% ile	Speed
02/06/1																~ -
3	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03.00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	*	22
04.00	0	0	1	5	1	0	0	0	0	0	0	0	0	7	28	22
06:00	0	0	1	7	9	6	1	0	0	0	Ő	0	0	24	36	32
07:00	õ	Õ	6	25	68	32	7	0	õ	õ	0	0	Õ	138	36	32
08:00	0	1	9	11	14	27	5	0	0	0	0	0	0	67	38	32
09:00	0	0	2	9	11	13	1	0	0	0	0	0	0	36	37	32
10:00	0	0	0	3	8	8	3	0	0	0	0	0	0	22	38	34
11:00	0	0	1	4	12	12	2	0	0	0	0	0	0	31	37	34
12 PM	0	0	0	4	17	11	4	0	0	0	0	0	0	36	38	34
13:00	0	0	0	6	14	22	3	0	0	0	0	0	0	45	38	34
14:00	0	0	6	14	23	17	4	2	0	0	0	0	0	66	37	32
15:00	0	0	1	17	26	20	6	0	0	0	0	0	0	70	37	33
16:00	0	0	1	10	34	13	5	4	0	0	0	0	0	67	38	34
17:00	0	0	3	12	48	25	5	0	0	0	0	0	0	93	37	33
18:00	0	0	0	13	33	25	3	2	2	0	0	0	0	78	37	34
19:00	0	0	1	13	25	22	4	0	0	0	0	0	0	65	37	33
20:00	0	0	1	/ F	14	10	4	0	0	0	1	0	0	30	30	34
21:00	0	0	1	ວ 1	о 2	0	3 1	0	0	0	0	0	0	22	39 *	33
22:00	0	0	0	0	1	3	0	0	0	0	0	0	0	4	36	36
Total	0	1	34	166	365	274	61	8	2	0	1	0	0	912	00	0
%	0.0%	0.1%	3.7%	18.2%	40.0%	30.0%	6.7%	0.9%	0.2%	0.0%	0.1%	0.0%	0.0%	•		
AM		00.00	00.00	07.00	07:00	07:00	07:00							07:00		
Peak		06.00	06.00	07.00	07.00	07.00	07.00							07.00		
Vol.		1	9	25	68	32	7							138		
Midday			14:00	14:00	14:00	13:00	12:00	14:00						14:00		
Peak																
VOI.			6	14	23	22	4	2						60		
PIVI			17:00	15:00	17:00	17:00	15:00	16:00	18:00		21:00			17:00		
Vol			З	17	48	25	6	4	2		1			93		
% iles			15th P	ercentile :		27 MPH			£							
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			50th Pe	ercentile :		32 MPH										
			85th Pe	ercentile :	;	37 MPH										
			95th Pe	ercentile :		41 MPH										
<b>0</b> · · ·				о ·												
Stats		10	MPH Pac	e Speed :	29-3	B MPH										
			Number	in Pace :		601 65.0%										
	Nuo	her of Va	hicles > ?			00.9% 205										
	Per	cent of Ve	hicles > 3	35 MPH		290 32.3%										
		Mear	Speed(A	Average) ·		33 MPH										
		mean	. 50566(/		•											



133207 A volume Site Code: TBA

erade	ŠB	0	0	0	0	0	12	34	72	78	32	26	26	32	27	42	40	34	42	30	20	8	9	e	4	568		08:00	78	14:00	42		963	
Week Av	NB	0	~	0	0	0	2	9	12	14	17	18	18	29	22	26	37	29	44	98 98	34	18	18	80	4	395	963	10:00	18	17:00	44			
0-13	SB	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0							0	
11-Fel	NB	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0	0							
-13	SB	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0							0	
10-Feb	NB	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0	0							
-13	SB	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0							0	
09-Feb	NB	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0	0							
-13	SB	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0							0	
08-Feb	NB	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0	0							
-13	SB	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0							0	
07-Feb	NB	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0	0							AADT 961
eb-13	SB	0	0	0	0	0	15	34	63	68	33	22	26	26	33	54	31	36	45	39	18	6	9	ო	5	566		08:00	68	14:00	54		978	
06-Fe	NB	0	2	0	0	0	2	6	11	12	14	20	20	27	29	29	37	29	45	41	36	20	17	10	2	412	978	10:00	20	17:00	45			Γ 961
-13	SB	0	-	0	0	-	10	35	81	87	32	29	25	37	21	30	49	33	38	20	22	7	S	e	2	568		08:00	87	15:00	49		944	AD
05-Feb	NB	0	0	0	-	-	0	4	12	15	20	16	17	31	14	24	37	29	42	35	32	15	19	5	S	376	944	00:60	20	17:00	42			
Start	Time	12:00 AM	01:00	02:00	03:00	04:00	02:00	00:00	01:00	08:00	00:60	10:00	11:00	12:00 PM	01:00	02:00	03:00	04:00	05:00	06:00	02:00	08:00	00:60	10:00	11:00	Total	Day	AM Peak	Vol.	PM Peak	Vol.	4	Total	ADT

Page 1



133207 A volume Site Code: TBA

Start	A 14	NB			A 14	SB	DM		A 14	Combined			05-Feb-13
12:00	A.M.		<u>P.M.</u> 12		A.M		<u> </u>		A.M		<u>P.M.</u> 20		Iue
12.00	0		12		0		15		0		20		
12.13	0		6		0		7		0		13		
12.30	0	٥	3	31	0	0	7	37	0	0	10	68	
01:00	0	0	5	51	0	0	7 8	57	0	0	10	00	
01.00	0		5		0		0		0		13		
01.15	0		0		1		4		1		4		
01.30	0	0	4	11	1	4	3	21	1	1	9	25	
01:45	0	0	5	14	0	1	4	21	0	1	9	35	
02:00	0		6		0		4		0		10		
02:15	0		4		0		5		0		9		
02:30	0	0	4	0.4	0	0	10		0	0	14	- 4	
02:45	0	0	10	24	0	0	11	30	0	0	21	54	
03:00	0		11		0		18		0		29		
03:15	1		8		0		8		1		16		
03:30	0		9		0		7		0		16		
03:45	0	1	9	37	0	0	16	49	0	1	25	86	
04:00	0		11		0		12		0		23		
04:15	0		8		0		5		0		13		
04:30	1		5		0		11		1		16		
04:45	0	1	5	29	1	1	5	33	1	2	10	62	
05:00	1		7		2		9		3		16		
05:15	0		9		1		12		1		21		
05:30	1		18		2		8		3		26		
05:45	0	2	8	42	5	10	9	38	5	12	17	80	
06:00	1		9		4		2		5		11		
06:15	1		6		4		4		5		10		
06:30	0		13		13		6		13		19		
06:45	2	4	7	35	14	35	8	20	16	39	15	55	
07:00	1	-	10		16		9	_0	17		19		
07:15	2		6		20		5		22		11		
07:10	2		8		20		6		22		14		
07:00	7	12	8	32	25	81	2	22	32	93	10	54	
07.40	3	12	3	52	16	01	1	22	10	55	10	54	
08.00	4		8		18		3		22		11		
00.15	+ 2		0		24		2		26		6		
08:45	2	15	4	15	24	87	2 1	7	20	102	0	22	
00.40	3	15	0	15	29	07	1	'	33	102	11	22	
09.00	3		3		7		2		11		1		
09.13	4		2		10		2 1		10		4		
09.30	5	20	3	10	10	30	1	Б	10	52	0	24	
10:00	5	20	1	19	9	52	1	5	14	52	3	24	
10.00	0		1		9		1		10		2		
10.15	2		0		10		1		12		1		
10.30	2	10	1	-	4	20	0	2	10	45	1	0	
10.45	6	10	3	Э	6	29	1	3	12	45	4	0	
11:00	3		3		5		2		8		5		
11:15	6		1		5		0		11		1		
11:30	4	47	1	-	/	05	0	0	11	10	1	-	
<u> </u>	4	17	0	5	8	25	0	2	12	42	0		
Iotal	88		288		301		267		389		555		
Percent	22.6%		51.9%		11.4%		48.1%						
Day Tatal		070				500				044			
Day Total		3/6				566	)			944			
Peak	09.15		05.15		08.00		03.00		08.00		03.00		
Vol	23		44		87		49		102		86		
P.H.F.	0.719		0.611		0.750		0.681		0.729		0.741		



133207 A volume Site Code: TBA

Start		NB				SB				Combined			06-Feb-13
Time	A.M.		P.M.	-	A.M		P.M	-	A.M.		P.M.		Wed
12:00	0		3		0		6		0		9		
12:15	0		4		0		5		0		9		
12:30	0		7		0		9		0		16		
12:45	0	0	13	27	0	0	6	26	0	0	19	53	
01:00	1		3		0		7		1		10		
01:15	1		9		0		11		1		20		
01:30	0		8		0		6		0		14		
01:45	0	2	9	29	0	0	9	33	0	2	18	62	
02:00	Õ	-	õ	20	Õ	Ŭ	10	00	Õ	-	16	02	
02:00	0		o o		0		10		0		21		
02.10	0		6		0		17		0		27		
02.30	0	0	0	20	0	0	17	E A	0	0	23	02	
02.45	0	0	0	29	0	0	15	54	0	0	23	03	
03:00	0		11		0		6		0		17		
03:15	0		11		0		9		0		20		
03:30	0	_	8		0		5		0		13		
03:45	0	0	7	37	0	0	11	31	0	0	18	68	
04:00	0		5		0		6		0		11		
04:15	0		7		0		12		0		19		
04:30	0		11		0		10		0		21		
04:45	0	0	6	29	0	0	8	36	0	0	14	65	
05:00	1	-	11	-	3	-	11		4	-	22		
05.15	0 0		10		8		14		8		24		
05:30	1		à		3		15		4		24		
05:45	0	2	15	45	1	15	5	45	4	17	24	00	
05.45	2	2	10	45	1	15	12	45	7	17	20	90	
00.00	3		11		4		12		1		23		
06:15	1		11		3		13		4		24		
06:30	3	-	9		12		9		15		18		
06:45	2	9	10	41	15	34	5	39	17	43	15	80	
07:00	1		3		15		7		16		10		
07:15	2		12		7		4		9		16		
07:30	3		11		22		4		25		15		
07:45	5	11	10	36	19	63	3	18	24	74	13	54	
08:00	3		5		15		1		18		6		
08:15	3		6		19		1		22		7		
08:30	3		5		17		4		20		9		
08:45	3	12	1	20	17	68	3	٩	20	80	7	20	
00.40	0	12	4	20	11	00	2	5	20	00	6	25	
09.00	0		4		5		2		12		0		
09.15	0		0		5		1		13		1		
09:30	2		2	47	5	00	2	0	1	47	4		
09:45	4	14	5	17	12	33	1	6	16	47	6	23	
10:00	3		5		8		2		11		7		
10:15	2		3		2		1		4		4		
10:30	6		1		3		0		9		1		
10:45	9	20	1	10	9	22	0	3	18	42	1	13	
11:00	5		0		8		1		13		1		
11:15	6		0		5		2		11		2		
11:30	4		2		4		1		8		3		
11.45	5	20	0	2	9	26	1	5	14	46	1	7	
Total	<u> </u>	20	322	<u> </u>	261	20	305		351	-10	627		
Percent	25.6%		51 4%		74 4%		48.6%		551		021		
i elcent	20.070		JI. <del>T</del> /0		/ +. + /0		-10.070						
		440				FCC				070			
Day Total		412				566				978			
<b>_</b> .	10										o= /-		
Peak	10:30		05:30		07:30		02:00		07:30		05:15		
Vol.	26		46		75		54		89		91		
P.H.F.	0.722		0.767		0.852		0.794		0.890		0.948		

NB



133207 A class Site Code: TBA

Start		Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axl	5 Axle	>6 Axl	<6 Axl	6 Axle	>6 Axl	
Time	Bikes	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Total
02/05/1														
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
06:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
07:00	0	8	1	1	2	0	0	0	0	0	0	0	0	12
08:00	0	12	3	0	0	0	0	0	0	0	0	0	0	15
09:00	0	16	2	0	2	0	0	0	0	0	0	0	0	20
10:00	0	13	2	0	1	0	0	0	0	0	0	0	0	16
11:00	0	16	1	0	0	0	0	0	0	0	0	0	0	17
12 PM	0	25	5	0	0	1	0	0	0	0	0	0	0	31
13:00	0	11	2	0	1	0	0	0	0	0	0	0	0	14
14:00	0	21	2	0	1	0	0	0	0	0	0	0	0	24
15:00	0	22	13	1	1	0	0	0	0	0	0	0	0	37
16:00	0	23	5	0	1	0	0	0	0	0	0	0	0	29
17:00	0	34	8	0	0	0	0	0	0	0	0	0	0	42
18:00	0	31	4	0	0	0	0	0	0	0	0	0	0	35
19:00	0	27	5	0	0	0	0	0	0	0	0	0	0	32
20:00	0	12	3	0	0	0	0	0	0	0	0	0	0	15
21:00	0	15	3	0	1	0	0	0	0	0	0	0	0	19
22:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
23:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
Total	0	300	63	2	10	1	0	0	0	0	0	0	0	376
Percent	0.0%	79.8%	16.8%	0.5%	2.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM		00.00	08.00	07.00	07.00									00.00
Peak		03.00	00.00	07.00	07.00									03.00
Vol.		16	3	1	2									20
Midday		12.00	12.00		13.00	12.00								12.00
Peak		12.00	12.00		15.00	12.00								12.00
Vol.		25	5		1	1								31
PM		17.00	15.00	15.00	15.00									17.00
Peak		17.00	10.00	10.00	10.00									17.00
Vol.		34	13	1	1									42

NB



133207 A class Site Code: TBA

Start		Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axl	5 Axle	>6 Axl	<6 Axl	6 Axle	>6 Axl	
Time	Bikes	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Total
02/06/1														
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2
06:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
07:00	0	9	1	1	0	0	0	0	0	0	0	0	0	11
08:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
09:00	0	8	4	0	2	0	0	0	0	0	0	0	0	14
10:00	1	14	3	0	1	1	0	0	0	0	0	0	0	20
11:00	0	18	2	0	0	0	0	0	0	0	0	0	0	20
12 PM	1	22	3	0	1	0	0	0	0	0	0	0	0	27
13:00	0	19	8	1	1	0	0	0	0	0	0	0	0	29
14:00	0	21	7	0	1	0	0	0	0	0	0	0	0	29
15:00	0	27	8	1	1	0	0	0	0	0	0	0	0	37
16:00	0	18	9	0	2	0	0	0	0	0	0	0	0	29
17:00	1	36	8	0	0	0	0	0	0	0	0	0	0	45
18:00	0	33	7	0	1	0	0	0	0	0	0	0	0	41
19:00	0	31	5	0	0	0	0	0	0	0	0	0	0	36
20:00	0	15	5	0	0	0	0	0	0	0	0	0	0	20
21:00	0	14	3	0	0	0	0	0	0	0	0	0	0	17
22:00	0	7	3	0	0	0	0	0	0	0	0	0	0	10
23:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
Iotal	3	315	79	3	11	1	0	0	0	0	0	0	0	412
Percent	0.7%	76.5%	19.2%	0.7%	2.7%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM		08:00	09:00	07:00	09:00									09:00
Peak			4	4	0									
VOI.		11	4	1	2									14
Nildday	12:00	12:00	13:00	13:00	12:00									13:00
Vol	1	22	8	1	1									20
PM	I		0	I	1									
Peak	17:00	17:00	16:00	15:00	16:00									17:00
Vol.	1	36	9	1	2									45



133207 A class Site Code: TBA

Start		Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axl	5 Axle	>6 Axl	<6 Axl	6 Axle	>6 Axl	
Time	Bikes	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Total
02/05/1														
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
06:00	0	28	6	0	1	0	0	0	0	0	0	0	0	35
07:00	0	61	20	0	0	0	0	0	0	0	0	0	0	81
08:00	0	61	21	0	4	0	0	1	0	0	0	0	0	87
09:00	0	25	7	0	0	0	0	0	0	0	0	0	0	32
10:00	0	20	6	0	3	0	0	0	0	0	0	0	0	29
11:00	0	16	8	0	1	0	0	0	0	0	0	0	0	25
12 PM	0	31	6	0	0	0	0	0	0	0	0	0	0	37
13:00	0	13	5	1	2	0	0	0	0	0	0	0	0	21
14:00	0	20	5	1	2	1	0	0	1	0	0	0	0	30
15:00	0	30	18	0	1	0	0	0	0	0	0	0	0	49
16:00	0	22	11	0	0	0	0	0	0	0	0	0	0	33
17:00	0	30	8	0	0	0	0	0	0	0	0	0	0	38
18:00	0	13	5	0	2	0	0	0	0	0	0	0	0	20
19:00	0	16	6	0	0	0	0	0	0	0	0	0	0	22
20:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
21:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
22:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
23:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Iotal	0	408	139	2	16	1	0	1	1	0	0	0	0	568
Percent	0.0%	71.8%	24.5%	0.4%	2.8%	0.2%	0.0%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM		07:00	08:00		08:00			08:00						08:00
Peak														
Vol.		61	21		4			1						87
Midday		12:00	11:00	13:00	13:00	14:00			14:00					12:00
Peak														
Vol.		31	8	1	2	1			1					37
PM		15:00	15:00		18:00									15:00
Реак		20	40		~									40
VOI.		30	18		2									49

Page 3



Start		Cars &	2 Axle		2 Axle	3 Axle	4 Axle	<5 Axl	5 Axle	>6 Axl	<6 Axl	6 Axle	>6 Axl	
Time	Bikes	Trailers	Long	Buses	6 Tire	Single	Single	Double	Double	Double	Multi	Multi	Multi	Total
02/06/1														
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	13	2	0	0	0	0	0	0	0	0	0	0	15
06:00	0	25	7	0	2	0	0	0	0	0	0	0	0	34
07:00	0	48	14	0	1	0	0	0	0	0	0	0	0	63
08:00	0	53	14	0	1	0	0	0	0	0	0	0	0	68
09:00	0	28	5	0	0	0	0	0	0	0	0	0	0	33
10:00	0	15	4	0	2	0	0	0	1	0	0	0	0	22
11:00	0	15	6	2	3	0	0	0	0	0	0	0	0	26
12 PM	0	16	10	0	0	0	0	0	0	0	0	0	0	26
13:00	0	23	9	0	1	0	0	0	0	0	0	0	0	33
14:00	0	35	16	2	1	0	0	0	0	0	0	0	0	54
15:00	0	22	9	0	0	0	0	0	0	0	0	0	0	31
16:00	0	29	3	0	3	0	0	0	1	0	0	0	0	36
17:00	0	34	9	0	1	1	0	0	0	0	0	0	0	45
18:00	0	31	8	0	0	0	0	0	0	0	0	0	0	39
19:00	0	13	4	0	1	0	0	0	0	0	0	0	0	18
20:00	0	(	2	0	0	0	0	0	0	0	0	0	0	9
21:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
22:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
23:00	0	2	3	0	0		0	0	0	0	0	0	0	5
Iotal	0	416	127	4	16	1	0	0	2	0	0	0	0	566
Percent	0.0%	73.5%	22.4%	0.7%	2.8%	0.2%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	
Aivi		08:00	07:00		06:00									08:00
Peak		50	11		0									60
VOI.		53	14		Z									68
Niluday		14:00	14:00	11:00	11:00									14:00
Vol		25	16	2	2									54
		<u></u>	10	Ζ.	3									
Poak		17:00	15:00		16:00	17:00			16:00					17:00
Vol		3/	0		2	1			1					15
v0i.		54	9		3	1			1					40

<u>SB</u> Sta Tin 02/0



NB							Email: data	requests@pdi	llc.com						Site Co	ode: TBA
Start	1	15	20	25	30	35	40	45	50	55	60	65	70	Total	85th	Ave
Time	14	19	24	29	34	39	44	49	54	59	64	69	9999		% ile	Speed
02/05/1																
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
04:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
05:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2	*	29
06:00	0	0	0	1	3	0	0	0	0	0	0	0	0	4	31	31
07:00	0	0	3	4	4	1	0	0	0	0	0	0	0	12	32	28
08:00	0	0	3	5	7	0	0	0	0	0	0	0	0	15	32	28
09:00	0	1	5	4	6	3	1	0	0	0	0	0	0	20	35	29
10:00	0	0	2	8	3	3	0	0	0	0	0	0	0	16	34	29
11:00	1	1	1	/	5	2	0	0	0	0	0	0	0	1/	33	26
12 PM	0	1	5	8	13	4	0	0	0	0	0	0	0	31	33	29
13:00	1	0	4	4	3	2	0	0	0	0	0	0	0	14	31	20
14:00	0	2	1	0	12	3	0	0	0	0	0	0	0	24	34	29
15:00	0	3 0	0	14	13	1	0	0	0	0	0	0	0	37	32	21
10.00	0	0	2	16	10	2	1	0	0	0	0	0	0	29 <b>12</b>	30	32
12.00	0	1	ی ۱	10	14	3 7	0	0	0	0	0	0	0	4Z 25	33 25	30
10.00	0	1	ן פ	12	14	2	1	0	0	0	0	0	0	30	30	20
20:00	0	0	0	5	7	2	1	0	0	0	0	0	0	15	3/	20
20.00	0	1	1	8	8	1	0	0	0	0	0	0	0	19	32	28
22:00	0	0	Ó	1	3	1	0	0	0	0	0	0	0	5	32	32
23:00	Ő	0	1	1	3	0	0	0	0	Ő	0	Õ	0	5	31	29
Total	2	11	45	123	149	42	4	0	0	0	0	0	0	376		
%	0.5%	2.9%	12.0%	32.7%	39.6%	11.2%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM		00.00	00.00	08.00	08.00	00.00	00.00							00.00		
Peak		09.00	09.00	06.00	06.00	09.00	09.00							09.00		
Vol.		1	5	5	7	3	1							20		
Midday	11:00	14:00	12:00	12:00	12:00	12:00								12:00		
Peak			-													
Vol.	1	2	5	8	13	4								31		
PM Peak		15:00	19:00	17:00	17:00	18:00	17:00							17:00		
Vol.		3	8	16	19	7	1							42		
% iles			15th P	ercentile :	1	22 MPH										
			50th P	ercentile :	:	29 MPH										
			85th P	ercentile :		34 MPH										
			95th P	ercentile :		37 MPH										
State		10		a Shaad .	25.2											
Otats		10	Number	in Pace :	20-0	245										
			Percent	in Pace :		65.2%										
	Nun	nber of Ve	ehicles > 2	30 MPH		161										
	Per	cent of Ve	hicles > 3	30 MPH		42.9%										
		Mea	n Speed(A	(verage)	:	29 MPH										
			1 (	0.7												



NB							Email: data	irequests@pdil	lc.com						Site Co	ode: TBA
Start	1	15	20	25	30	35	40	45	50	55	60	65	70	Total	85th	Ave
Time	14	19	24	29	34	39	44	49	54	59	64	69	9999		% ile	Speed
02/06/1																
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	2	0	0	0	0	0	0	0	0	0	2	*	27
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	1	1	0	0	0	0	0	0	0	0	0	2	*	24
06:00	0	0	0	6	1	2	0	0	0	0	0	0	0	9	29	30
07:00	0	0	3	4	3	1	0	0	0	0	0	0	0	11	31	28
08:00	0	0	0	4	6	2	0	0	0	0	0	0	0	12	34	31
09:00	0	0	2	8	3	1	0	0	0	0	0	0	0	14	31	28
10:00	2	0	1	6	10	1	0	0	0	0	0	0	0	20	33	27
11:00	0	1	2	8	8	0	1	0	0	0	0	0	0	20	32	28
12 PM	2	1	6		6	4	1	0	0	0	0	0	0	27	35	26
13:00	0	0	5	5	14	4	1	0	0	0	0	0	0	29	34	30
14:00	0	1	2	10	12	4	0	0	0	0	0	0	0	29	34	29
15:00	0	0	6	11	17	1	2	0	0	0	0	0	0	37	32	30
16:00	0	0	3	10	12	4	0	0	0	0	0	0	0	29	34	30
17:00	0	2	6	13	20	4	0	0	0	0	0	0	0	45	33	29
18:00	1	2	3	18	11	4	2	0	0	0	0	0	0	41	34	28
19:00	0	1	1	14	16	4	0	0	0	0	0	0	0	36	33	30
20:00	0	0	2	5	9	3	0	1	0	0	0	0	0	20	34	31
21:00	0	1	0	4	10	2	0	0	0	0	0	0	0	17	33	30
22:00	0	0	0	4	5 0	1	0	0	0	0	0	0	0	10	აა *	30
<u>23.00</u>	<u>5</u>	0	42	1/2	162	42	7	1	0	0	0	0	0	<u> </u>		
10181	1 2%	2.2%	10.4%	34 5%	39.6%	10.2%	17%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	412		
AM	1.2/0	2.270	10.470	04.070	00.070	10.270	1.7 /0	0.270	0.070	0.070	0.070	0.070	0.070			
Peak			07:00	09:00	08:00	06:00								09:00		
Vol.			3	8	6	2								14		
Midday	40.00	44.00	40.00	44.00	40.00	40.00	44.00							40.00		
Peak	12:00	11:00	12:00	14:00	13:00	12:00	11:00							13:00		
Vol.	2	1	6	10	14	4	1							29		
PM Peak	18:00	17:00	15:00	18:00	17:00	16:00	15:00	20:00						17:00		
Vol.	1	2	6	18	20	4	2	1						45		
% iles			15th Pe	ercentile :		23 MPH										
			50th Pe	ercentile :	2	28 MPH										
			85th Pe	ercentile :	3	34 MPH										
			95th Pe	ercentile :	: 37 MPH											
				<b>.</b>												
Stats		10	MPH Pac	e Speed :	25-3	4 MPH										
			Number	in Pace :		273										
	N I	abox -f \/-	Percent	IN Pace :		00.3%										
	INUN					0/1										
	Per					42.0%										
		iviear	i Speed(A	verage):	4	29 IVIPH										



SB	Email: datarequests@pdillc.com S													Site Co	ode: TBA	
Start	1	15	20	25	30	35	40	45	50	55	60	65	70	Total	85th	Ave
Time	14	19	24	29	34	39	44	49	54	59	64	69	9999		% ile	Speed
02/05/1																
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
05:00	0	0	0	3	4	3	0	0	0	0	0	0	0	10	35	32
06:00	0	0	1	6	18	8	2	0	0	0	0	0	0	35	36	33
07:00	0	0	4	10	35	20	10	2	0	0	0	0	0	81	39	34
08:00	1	0	3	14	31	29	9	0	0	0	0	0	0	87	38	33
09:00	0	0	3	5	13	9	2	0	0	0	0	0	0	32	37	32
10:00	1	1	2	6	9	10	0	0	0	0	0	0	0	29	37	30
11:00	0	1	1	4	11	5	2	0	1	0	0	0	0	25	37	32
12 PM	0	0	1	8	15	10	0	1	2	0	0	0	0	37	36	33
13:00	0	0	2	3	6	7	3	0	0	0	0	0	0	21	39	33
14:00	0	1	1	11	7	5	4	1	0	0	0	0	0	30	39	32
15:00	0	1	3	7	22	13	2	1	0	0	0	0	0	49	36	32
16:00	0	0	0	6	13	10	4	0	0	0	0	0	0	33	38	34
17:00	0	3	2	6	13	12	2	0	0	0	0	0	0	38	37	31
18:00	0	0	1	5	8	4	2	0	0	0	0	0	0	20	37	32
19:00	1	1	1	5	10	4	0	0	0	0	0	0	0	22	35	29
20:00	1	1	0	2	3	0	0	0	0	0	0	0	0	7	31	23
21:00	0	0	1	0	3	1	0	0	0	0	0	0	0	5	32	31
22:00	0	0	0	0	2	1	0	0	0	0	0	0	0	3	*	34
23:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	^	32
Iotai	0 70/	1 60/	26	103	225	151	42	5	3	0	0	0	0	568		
<u>%</u>	0.7%	1.0%	4.0%	10.1%	39.0%	20.0%	7.4%	0.9%	0.5%	0.0%	0.0%	0.0%	0.0%			
Rivi	08:00		07:00	08:00	07:00	08:00	07:00	07:00						08:00		
Vol	1		4	14	35	20	10	2						87		
Midday			Ŧ_				10	<b>Z</b>								
Peak		11:00	13:00	14:00	12:00	12:00	14:00	12:00	12:00					12:00		
Vol.		1	2	11	15	10	4	1	2					37		
PM	19:00	17:00	15:00	15:00	15:00	15:00	16:00	15:00						15:00		
Peak Vol	1	3	3	7	22	13	4	1						49		
% iles			15th P	ercentile ·		26 MPH		I						43		
<i>,</i> • <b>.</b> • •			50th P	ercentile :		32 MPH										
			85th P	ercentile :		37 MPH										
			95th P	ercentile :	e: 41 MPH											
State		10 1		a Spood ·	20.2											
Jiais		10 1	Number	in Pace .	29-0	252										
			Percent	in Pace :		62.1%										
	Nun	nber of Ve	hicles > ?			371										
	Per	cent of Ve	hicles > 2	30 MPH ·		65.4%										
		Mear	Speed(2	Average) ·		32 MPH										
		mean	· Opecu(/	(volago).	•											
Flagg Road approx. 1200' north of Turnpike Road (Route 9) City, State: Southborough, MA Client: Green International/ S. Musto



133207 A speed Site Code: TBA

SB							Email: data	arequests@pdi	llc.com						Site Co	ode: TBA
Start	1	15	20	25	30	35	40	45	50	55	60	65	70	Total	85th	Ave
Time	14	19	24	29	34	39	44	49	54	59	64	69	9999		% ile	Speed
02/06/1																•
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	1	9	5	0	0	0	0	0	0	0	0	15	31	28
06:00	1	0	0	11	12	10	0	0	0	0	0	0	0	34	36	31
07:00	0	0	0	8	25	22	8	0	0	0	0	0	0	63	39	34
08:00	2	0	1	9	27	21	8	0	0	0	0	0	0	68	39	33
09:00	1	0	0	3	8	17	3	1	0	0	0	0	0	33	39	34
10:00	0	1	1	2	6	10	2	0	0	0	0	0	0	22	38	33
11:00	0	0	1	4	8	11	2	0	0	0	0	0	0	26	37	34
12 PM	0	1	3	3	5	11	3	0	0	0	0	0	0	26	38	33
13:00	0	1	1	47	8	9	5	1	1	0	0	0	0	33	40	34
14:00	0	0	3	17	10	10	2	0	0	0	0	0	0	<b>54</b>	37	32
15:00	0	0	ן ס	0	10	11	2	1	0	0	0	0	0	31	37	33
16.00	0	1	3	2 11	10	14	2	2	0	0	0	0	0	30 AE	37	32
12:00	0	3	0	11	19	9	<b>ນ</b> ດ	2	0	0	0	0	0	40	37	33 20
10:00	1	<b>J</b>	2	9	17	0	2	0	0	0	0	0	0	39	30 26	30
19.00	0	0	2	2	4	3 1	2	0	0	0	0	0	0	10	22	29
20.00	0	0	0	1	2	3	0	0	0	0	0	0	0	9	36	34
22:00	0	0	0	0	2	1	0	0	0	0	0	0	0	3	*	34
23:00	Ő	õ	0	Õ	3	2	0	Ő	0	Ő	0	Ő	Õ	5	33	34
Total	5	8	19	113	196	177	42	5	1	0	0	0	0	566		
%	0.9%	1.4%	3.4%	20.0%	34.6%	31.3%	7.4%	0.9%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM	00.00		05.00	06:00	00.00	07:00	07:00	00.00						00.00		
Peak	06.00		05.00	00.00	06.00	07.00	07.00	09.00						06.00		
Vol.	2		1	11	27	22	8	1						68		
Midday		12.00	12.00	14.00	14.00	14.00	13.00	13.00	13.00					14.00		
Peak		12.00	12.00		11.00	11.00		10.00								
Vol.		1	3	17	16	16	5	1	1					54		
PM	19:00	18:00	16:00	17:00	17:00	16:00	17:00	17:00						17:00		
Peak	4	2	2	11	10	14	2	2						45		
	I	3	15th D	orcontilo :	19		3	Z						40		
70 IIES			50th P	ercentile :		20 MPH										
			85th P	ercentile :		38 MPH										
			95th P	ercentile :		41 MPH										
Stats		10 I	MPH Pac	e Speed :	29-3	8 MPH										
			Number	in Pace :		347										
			Percent	t in Pace :		61.3%										
	Nun	nber of Ve	hicles > 3	30 MPH:		374										
	Per	cent of Ve	hicles > 3	30 MPH :		66.0%										
		Mear	Speed(A	Average) :		32 MPH										

# Attachment C

Seasonal Adjustment Data

Seasonal Adjustment

 
 Project:
 T0524 - Proposed Mixed-Use Development at Park Central - Southborough, Massachusetts Date:
 March 13, 2014

 Analyst:
 TEC, Inc. / Douglas S. Halpert, E.I.T.
 Source:

 MassDOT Permanent Count Station 307
 Source:
 MassDOT Permanent Count Station 307

# STATION 307 - WESTBOROUGH - RTE.9 - EAST OF NORTHBOROUGH T.L.

_ 1	-				
May Seasona <u>Adjustment</u>	-5.6%	-4.4%	-0.5%	-4.7%	-3.9%
Feb Seasonal <u>Adjustment</u>	2.4%	9.4%	4.9%	4.4%	2.5%
YEAR	50,569	49,534	49,732	48,245	47,626
DEC	48,515	50,032	47,007	46,696	47,564
NOV	47,901	50,043	49,662	47,490	47,379
ост	50,848	50,194	50,571	49,009	48,663
SEP	50,556	50,998	49,031	48,531	47,762
AUG	50,468	50,270	52,322	48,759	47,056
JUL	52,365	48,052	53,000	48,629	47,638
NUL	55,189	52,438	52,000	49,936	49,934
МАҮ	53,408	51,729	50,000	50,518	49,474
APR	52,971	51,170	49,136	49,816	49,049
MAR	50,060	50,326	49,268	47,829	46,455
FEB	49,366	44,854	47,283	46,112	46,434
JAN	45,180	44,301	47,505	45,614	44,103
ΥR	05	90	07	08	60

Seasonal Average =

T0524\_Traffic Data Worksheet

Sheet 1 of 1

# Attachment D

Public Transportation Schedules

#### **ROUTE 7:** Southborough/Marlborough (MW) MetroWest Regional Transportation Authority

#### **Cash Fare Information**

ervice S (Monday-Friday ROUTE

Adult fare: \$1.50 / \$1.10 with a Charlie Card Student fare:\$1.00 with valid Student ID. Children under 6 ride free when

accompanied by an adult. Children under 12 may not ride unaccompanied.

Elderly (65 years of age or older)-\$0.75 with photo ID indicating date of birth or a MWRTA senior TAP Pass or \$0.70 with a Charlie Card Individuals with disabilities-Valid MBTA Access Card, Medicare Card or MWRTA Disabled TAP Pass are accepted as proof of eligibility for the MWRTA half-fare program. Charlie Cards are available free of charge at the Central Hub or on the bus. Value can be added to existing cards onboard, online at mbta.com, or at an MBTA kiosk.

#### No service provided on the following Holidays:

New Year's Day Patriot's Day Memorial Day Independence Day Thanksgiving Day Christmas Day

#### **Transfer/Connections**

Transfer coupons are available on all buses and are good for transfers within the MWRTA system only. Transfers are not compatable within the MBTA system. Riders wishing to transfer, (free of charge), from one route to another must ask the driver for a transfer coupon and present it to the next driver within 90 minutes.

Riders can access MBTA Commuter Rail Service in Downtown Framingham, at the West Natick Commuter Rail Station, as well as in Downtown Natick. For MBTA schedule and service information call 617.222.3200.

Scan the QR code below with your smartphone to be directed to the MWRTA Routes and Schedules website.





#### Č Effective Summer 2015

Please visit our website: www.mwrta.com Central Hub: (508) 935-2222



# ROUTE 7 Weekday (Monday-Friday Service)

				AM							РМ				
Outbound															
Central Hub (37 Waverly Street)	5:30 A	6:15 A	6:45 A					12:22 P	1:00 P	1:45 P					
Banana Lot*	5:35 A	6:20 A	6:50 A	7:50 A	8:35 A	10:05 A	10:50 A	12:27 P	1:05 P	1:50 P	3:20 P	4:05 P	5:35 P	6:20 P	
Framingham State Univ. /	5:42 A	6:27 A	6:58 A	7:57 A	8:42 A	10:12 A	10:57 A	12:34 P	1:12 P	1:57 P	3:27 P	4:12 P	5:42 P	6:27 P	
State Street McCarthy Center															
Stop and Shop /Temple St.	5:46 A	6:31 A	7:01 A	8:01A	8:46 A	10:16 A	11:01 A	12:38 P	1:16 P	2:01 P	3:31 P	4:13 P	5:46 P	6:31 P	
Jefferson Hills Complex	5:51 A	6:36 A	EXPR	8:06 A	8:51 A	10:21 A	11:06 A	12:43 P	1:21 P	2:06 P	3:36 P	4:21 P	5:51 P	6:36 P	
Staples (Bus Shelter)	5:58 A	6:43 A	EXPR	8:13 A	8:58 A	10:28 A	11:13 A	12:50 P	1:28 P	2:13 P	3:43 P	4:28 P	5:58 P	6:43 P	
Rt. 9 Park & Ride	6:07 A	6:52 A	EXPR	8:22 A	9:07 A	10:37 A	11:22 A	12:53 P	1:37 P	2:22 P	3:52 P	4:37 P	6:07 P	6:52 P	
Downtown Southborough	6:18 A	7:03 A	EXPR	8:33 A	9:18 A	10:48 A	11:33 A	EXPR	1:48 P	2:33 P	4:03 P	4:48 P	6:18 P	7:03 P	
Main Street (opposite City Hall) **	6:32 A	7:17 A	EXPR	8:47 A	9:32 A	11:02 A	11:47 A	EXPR	2:02 P	2:47 P	4:17 P	5:02 P	6:32 P	7:17 P	
Inbound															
Seven 11 on Broad St. **	6:40 A	7:25 A		8:55 A	9:40 A	11:10 A	11:55 A	1:24 P	2:10 P	2:55 P	4:25 P	5:10 P	6:40 P	7:25 P	
Bolton Bus Shelter	6:44 A	7:29 A		8:59 A	9:44 A	11:14 A	11:59 A	1:29 P	2:14 P	2:59 P	4:29 P	5:14 P	6:44 P	7:29 P	8:09 P
Downtown Southborough	6:57 A	7:42 A		9:12 A	9:57 A	11:27 A	12:12 P	1:41 P	2:27 P	3:12 P	4:42 P	5:27 P	6:57 P	7:42 P	EXPR
Staples (Bus Shelter)	7:11 A	7:56 A		9:26 A	10:11 A	11:41 A	12:26 P	1:55 P	2:41 P	3:26 P	4:56 P	5:41 P	7:11 P	7:56 P	EXPR
Rt. 9 Park & Ride	7:19 A	8:04 A		9:34 A	10:19 A	11:49 A	12:34 P	2:03 P	2:49 P	3:34 P	5:04 P	5:49 P	7:19 P	8:04 P	8:25 P
Jefferson Hills Complex	7:21 A	8:06 A		9:36 A	10:21 A	11:51 A	12:36 P	2:05 P	2:51 P	3:36 P	5:06 P	5:51 P	7:21 P	8:06 P	8:27 P
Stop and Shop /Temple St.	7:27 A	8:12 A		9:42 A	10:27 A	11:57 A	12:42 P	2:11 P	2:57 P	3:42 P	5:12 P	5:57 P	7:27 P	8:12 P	8:32 P
Framingham State Univ. /	7:31 A	8:16 A		9:46 A	10:31 A	12:01 P	12:46 P	2:15 P	3:01 P	3:46 P	5:16 P	6:01 P	7:31 P	8:16 P	8:35P
State Street McCarthy Center															
Banana Lot*	7:39 A	8:24 A		9:54 A	10:39 A	12:09 P	12:54 P	2:23 P	3:09 P	3:54 P	5:24 P	6:09 P	7:39 P	8:24 P	8:40 P
Howard St. at Casa del Carne						12:10 P	12:55 P	2:25 P					7:40 P	8:25 P	8:41 P
Central Hub (37 Waverly St.)						12:15 P	1:00 P	2:30 P					7:45 P	8:30 P	8:45 P

#### **Scheduled Times**

Scheduled times are only approximate; please wait for the MWRTA ten minutes in advance of scheduled times to assure not missing the bus.

For up to the minute bus information call the MWRTA at 508.935.2222 or 888.996.9782, or visit www.mwrta.com for GPS tracking.

The MWRTA uses the Flag Down System which allows buses to stop anywhere along their routes to pick up passengers, where it is safe to do so. Passengers can hail MWRTA buses by waving.

Buses will NOT stop where express (EXPR) is indicated. Any scheduled times shown in red continue on as the 7C after arriving at the Main Street (opposite City Hall) stop. Both inbound scheduled times listed in red (previously the 7C) will continue on as the Route 7 into Framingham.

\*Banana Lot is the Framingham MBTA Commuter Rail Station Northside Parking Lot

\*\* Make connections to the 7C at Main Street (opposite City Hall) or the Seven 11 on Broad St.

#### **Transfers**

Route 7 passengers can make the following transfers: Routes 2 and 3 at the Banana Lot; Route 9 at Framingham State University, Route 7C at Main St. (City Hall) in Marlborough and Route 9 at Jefferson Hills, Rte. 9 Park and Ride and Staples Headquarters.

\*\*\*To request a deviation please call Customer Service at 508-935-2222

MN

MetroWest Regional Transit Authority Public Transportation System Route 7 - Southborough Marlborough Line - Morning (AM) Stops

37 Waverly St. (Waverly Hub)	9:15 9:20				
	9:20				
Banana Lot (MBTA Framingham Commuter North Parking Lot		11:05			
Proctor and Franklin Streets	9:22	11:07			
Franklin and Mount Wayte Streets	9:24	11:09			
Framingham State University	9:27	11:12			
Stop and Shop on Temple Street	9:31	11:16			
Jefferson Hills Complex	9:36	11:21			
Route 9 Park and Ride	9:42	11:27			
Southborough	_				
Central Street	9:46	11:31			
Downtown Southborough (K of C)	9:52	11:37			
Marlborough		1	-	 r	 -
Maple and Walker Streets	9:58	11:43			
Main Street Opposite City Hall	10:02	11:47			
Seven 11 on Broad Street	10:06	11:51			
Marlborough					
Lincoln and Pleasant Streets at Shell Station	10:08	11:53			
41 Mechanic Street opposite Am Vets	10:10	11:55			
Main Street	10:12	11:57			
Bolton Street Bus Shelter	10:13	11:58			
Maple Street opposite Golds Gym	10:17				
Southborough		-1		 	
Downtown Southborough K of C	10:23				
Central Street	10:29				
Framingham	_		-	 	
Route 9 Park and Ride	10:32				
Jefferson Hills Complex	10:36				
Stop and Shop on Temple Street	10:41				
Framingham State University -McCarthy Center	10:45				
Franklin and Mount Wayte Streets	10:49				
Banana Lot	10:53				
Howard Street at Casa del Carne					
37 Waverly St. (Waverly Hub)					

7A & B passengers can transfer to the inner city Rt 7C at various locations in Marlborough. Please contact Customer Service (508-935-2222) for more information. D-Deviated Fixed Route on Call

### Find out where your bus is in real time!

Route 7 - Southborough Marlborough Line - Evening (PM) Stops

	Framingham									Ш	
	37 Waverly St. (Waverly Hub)										
	Banana Lot (MBTA Framingham Commuter North Parking Lot				12:50	2:35	4:20				
	Proctor and Franklin Streets				12:52	2:37	4:22				
	Franklin and Mount Wayte Streets				12:54	2:39	4:24			$\square$	
	Framingham State University				12:57	2:42	4:27				
	Stop and Shop at Temple Street				1:01	2:46	4:31			Π	
Ð	Jefferson Hills Complex				1:06	2:51	4:36			Π	
١.	Route 9 Park and Ride				1:12	2:57	4:42				
outt	Southborough										
-	Central Street				1:16	3:01	4:46				
	Marlborough	-	1				r			<del>.</del>	
	Downtown Southborough K of C		-		1:22	3:07	4:52				
	Southborough	_					·			<del></del>	
	Maple Street opposite Golds Gym				1:28	3:13	4:58				
	Marlborough	-					r		—		_
	Main Street Opposite City Hall				1:32	3:17	5:02	$\perp$	$\perp$	$\square$	_
	Seven 11 near Broad and Lincoln Streets				1:36	3:21	5:06				
	Marlborough							_	_	_	
	Lincoln and Pleasant Streets				1:38	3:23	5:08				
	41 Mechanic Street opposite Am Vets				1:40	3:25	5:10				
	Main Street				1:42	3:37	5:12				
	Bolton Street Bus Shelter				1:43	3:28	5:13				
	Maple Street opposite Golds Gym			12:02	1:47	3:32	5:17				
	Southborough		1								
	Downtown Southborough K of C			12:08	1:53	3:38	5:23			Ш	
pun	Central Street			12:14	1:59	3:44	5:29				
qu	Framingham	-					·	<b></b> _		т <u>г</u>	
	Route 9 Park and Ride			12:17	2:02	3:47	5:32	$\perp$	$\bot$	Ц	
	Jefferson Hills Complex			12:21	2:06	3:51	5:36	$\perp$	$\bot$	Ш	
	Stop and Shop at Temple Street			12:26	2:11	3:56	5:41			Ц	
	Framingham State University			12:30	2:15	4:00	5:45			Ш	
	Franklin and Mount Wayte Streets			12:34	2:19	4:04	5:49				
	Banana Lot (MBTA Framingham Commuter North Parking Lot			12:38	2:23	4:08	5:53			Ш	
	Howard Street at Casa del Carne						5:55				
	37 Waverly St. (Waverly Hub)						6:00				

7A & B passengers can transfer to the inner city Rt 7C at various locations in Marlborough. Please contact Customer Service (508-935-2222) for more information. D-Deviated Fixed Route on Call

#### FRAMINGHAM/WORCESTER LINE Train Schedule Effective July 1, 2014

#### Monday to Friday

Inb	ound to Boston							AM												PM						АМ	Inbo	ound to Boston
ZONE	STATION TRAIN #		500	502	504	582	506	508	510	512	514	516	518	520	522	524	526	528	530	532	534	536	538	540	542	544		SATURDAY TR
	Bikes Allowed		676									676	676	676	6%	676	56	676	රෑම	676	රෑම	56	ණ	ණ්	<i>6</i> %	<i>6</i> %	ZONE	STATION SUNDAY TR
8	Worcester	\$	4:45	5:20	5:45	6:05	6:35	7:00	-	7:35	-	8:40	10:45	12:10	1:50	2:50	3:55	4:40	-	5:50	-	7:50	8:30	9:30	11:10	12:10		Bikes Allowed
8	Grafton	\$	4:58	5:33	5:58	6:18	6:48	7:13	-	7:48	-	8:53	10:58	12:23	2:03	3:03	4:08	4:53	-	6:03	-	8:03	8:43	9:43	11:23	<b>f</b> 12:23	8	Worcester
7	Westborough	\$	5:03	5:38	6:03	6:23	6:53	7:18	-	7:53		8:57	11:02	12:27	2:07	3:07	4:12	4:57		6:07	-	8:07	8:47	9:47	11:27	<b>f</b> 12:27	8	Grafton
6	Southborough	\$	5:12	5:47	6:12	6:32	7:02	7:27	-	8:02	-	9:06	11:11	12:36	2:16	3:16	4:21	5:06	-	6:16	-	8:16	8:55	9:55	11:35	<b>f</b> 12:35	7	Westborough
6	Ashland	\$	5:17	5:52	6:17	6:37	7:07	7:32	-	8:07	-	9:10	11:15	12:40	2:20	3:20	4:25	5:10	-	6:20	-	8:20	8:59	9:59	11:39	f 12:38	6	Southborough
5	Framingham	\$	5:29	6:04	6:29	6:48	7:19	7:44	8:02	8:18	8:45	9:21	11:26	12:51	2:31	3:31	4:36	5:21	6:15	6:31	6:45	8:31	9:09	10:09	11:49	f 12.48	6	Ashland
4	West Natick	4	5.34	6.10	6.35		7.24	7.50	8.07	8.23	8.50	9.26	11.31	12.56	2.36	3.36	4.41	5.26	6.20	6.36	6.50		9.14	10.14	11.54	f 12:51	5	Framingham
4	Natick Center	0	5.39	6:15	6:40		7.29	7:55	8.12	8.28	8.55	9.31	11:36	1.01	2:00	3:41	4:46	5:31	6.25	6:41	6.55		9.18	10.11	11.58	f 12:54	4	West Natick
2	Wellesley Square		5:45	0.15	6:46		7:25	7.55	0.12	0.20	0.00	0.37	11.30	1:07	2:46	3:46	4.52	5:37	6.21	6:47	7:01		0.22	10.10	12:02	f 12:59	4	Natick Center
2	Wellesley Square		5.40	-	6.50	-	7.30	-	0.10	0.34	9.05	9.37	11:45	1.07	2:50	3.40	4.52	5.41	6.25	6.51	7:05	-	9.25	10.25	12:02	f 1:01	3	Wellesley Squa
2	Wellesley Farms		5.52		6:53		7:42		0.22	9.41	0.00	0.44	11.40	1.11	2:50	3.50	4.50	5.44	6.39	6:54	7:08		0.20	10.20	12:00	£1:03	з	Wellesley Hills
2	Auburndalo		5.52		6.59		7:42		8.30	8.46	9.00	5.44	11.40	1.14	£ 2:58	£ 3:58	4.55	5.44	0.50	0.54	7.00		5.25	10.2.5	£12:00	f 1:06	3	Wellesley Farm
2	West Newton		6:00		7.02		7:50		8.33	0.40	9:16		11:56		f 3:01	f 4:01					-				f 12:10	f1:09	2	Auburndale
1	Newtonville		6:04		7:06		7:54		9.37		0.10		11.50		£3:04	€ 4:04									¢ 12:10	<b>F</b> 1:11	2	West Newton
10	Yawkov	đ	1.6:14	16:29	1.7.17	1.7:10	1.9:04	1.0-10	0.37	10.50	10:20	10.50	112:00	11:20	1 2.14	14:04	1.5-14	15.50	16:52	17:00	17:22	19:54	10.17	110:47	112:13	1 1:10	1	Newtonville
14	Back Bay	0	1.6:10	1.6:42	17:22	1.7.15	1.0:00	10.10	10.50	10:02	10.25	10:04	12:00	11:23	1.2.10	1.4.10	1.5.10	16:04	1.6.50	17:14	17:20	10.54	10.52	110:52	112:27	11:24	1A	Yawkey
44	South Station	6	C:24	L0.43	7.27	L7.15	0.14	0.20	0.57	0.00	0.40	10.04	12.14	1.20	2.24	4.24	E3.19	L0.04	7.02	7:10	L7.20	0.04	0.57	10.52	12.32	1:24	1A	Back Bay
IA	South Station	1.2	0:24	0:48	/:27	/:20	o:14	8:28	8:57	9:08	9:40	10:09	12:19	1:39	3:24	4:24	5:24	6:09	7:03	7:19	7:33	9:04	9:57	10:57	12:37	1:29	1A	South Station
Mon	dav to Fridav		iraińs in	purple p	ox indica	пе реак р	Jenud tra	1115.																			Cat	unday 0 C
																											I	Innav & SUD/

OL	utbound from Bostor					AM												PM									Out	bound from B
ZON	E STATION TRAIN #		501	503	505	507	509	511	513	515	517	519	521	523	525	527	529	583	531	533	535	537	539	541	543	545		SATURDA
	Bikes Allowed		640	<b>6</b> 46	<b>6%</b>	640	<i>6</i> 46	<i>6</i> 76	రాశు	రాశ్ర	640	640	646									<i>6</i> %6	<b>4</b> 0	రాశు	<b>6%</b>	<b>66</b>	ZONE	STATION SUNDA
1A	South Station	s	4:20	5:45	7:00	7:15	7:45	9:00	10:15	12:05	1:05	2:05	2:55	4:05	4:25	5:00	5:15	5:30	5:35	6:05	6:40	7:20	8:35	9:25	10:25	11:25		Bikes Allowed
1A	Back Bay	q	-	5:51	7:06	7:21	7:51	9:06	10:21	12:11	1:11	2:11	3:01	4:11	4:31	5:06	5:21	5:36	5:41	6:11	6:46	7:26	8:41	9:31	10:31	11:31	1A	South Station
1A	Yawkey	q	<b>f</b> 4:30	5:56	7:11	7:26	7:56	9:11	10:26	12:16	1:16	2:16	3:06	4:16	4:36	5:11	5:26	5:41	5:46	6:16	6:51	7:31	8:46	9:36	10:36	11:36	1A	Back Bay
1	Newtonville		-	-	-	-	<b>f</b> 8:06	-	<b>f</b> 10:34	<b>f</b> 12:24	<b>f</b> 1:24	2:24	3:14	-	4:46	-	5:36	-	5:56	6:25	7:00	7:40	8:55	9:45	10:45	11:45	1A	Yawkey
2	West Newton		-	-	-	-	<b>f</b> 8:08	-	<b>f</b> 10:36	<b>f</b> 12:26	<b>f</b> 1:26	2:27	3:17	-	4:50	-	5:40	-	6:00	6:29	7:04	7:44	8:59	9:49	10:49	11:49	1	Newtonville
2	Auburndale		-	-	-	-	<b>f</b> 8:10	-	<b>f</b> 10:38	<b>f</b> 12:28	<b>f</b> 1:28	2:30	3:20	-	4:53	-	5:43	-	6:03	6:32	7:07	7:47	9:02	9:52	10:52	11:52	2	West Newton
3	Wellesley Farms		-	6:09	-	-	8:14	9:25	10:42	12:32	1:32	2:34	3:24	-	4:58	-	5:48	-	6:08	6:36	7:12	7:51	9:06	9:56	10:56	11:56	2	Auburndale
3	Wellesley Hills		-	6:12	7:27	-	8:17	9:28	10:45	12:35	1:35	2:37	3:27	-	5:01	-	5:51	-	6:11	6:39	7:15	7:54	9:09	9:59	10:59	11:59	3	Wellesley Farm
3	Wellesley Square		-	6:16	7:31	-	8:20	9:32	10:49	12:39	1:39	2:41	3:31	-	5:05	-	5:55	-	6:15	6:43	7:19	7:58	9:13	10:03	11:03	12:03	3	Wellesley Hills
4	Natick Center		-	6:20	7:35	-	8:24	9:38	10:55	12:45	1:45	2:47	3:37	-	5:11	-	6:01	-	6:21	6:49	7:25	8:04	9:19	10:09	11:09	12:09	з	Wellesley Squ
4	West Natick	\$	-	6:25	7:39	-	<b>L</b> 8:28	9:43	11:00	12:50	1:50	2:52	3:42	4:37	<b>L</b> 5:17	5:34	<b>L</b> 6:07	-	6:26	6:55	7:32	8:10	9:25	10:15	11:15	12:15	4	Natick Center
5	Framingham	\$	5:00	6:30	7:44	7:51	8:33	9:48	11:06	12:56	1:56	2:58	3:48	4:43	5:23	5:42	6:13	6:06	6:31	7:00	7:37	8:15	9:30	10:20	11:20	12:20	4	West Natick
6	Ashland	\$	-	6:37	7:51	-	-	9:54	11:12	1:02	2:02	3:04	3:54	4:49	-	5:48	-	6:12	6:38	7:06	7:43	8:21	9:36	10:26	11:26	12:26	5	Framingham
6	Southborough	\$	-	6:42	7:56	-	-	9:59	11:17	1:07	2:07	3:09	3:59	4:54	-	5:53	-	6:17	6:43	7:11	7:48	8:26	9:41	10:31	11:31	12:31	6	Ashland
7	Westborough	\$	-	6:51	8:05	-	-	10:08	11:26	1:16	2:16	3:18	4:08	5:04	-	6:03	-	6:26	6:52	7:20	7:57	8:35	9:50	10:40	11:40	12:40	6	Southborough
8	Grafton	\$	<b>L</b> 5:20	<b>L</b> 6:59	<b>L</b> 8:13	-	-	<b>L</b> 10:15	<b>L</b> 11:32	<b>L</b> 1:22	L2:22	<b>L</b> 3:24	L4:14	<b>L</b> 5:10	-	<b>L</b> 6:10	-	<b>L</b> 6:32	<b>L</b> 6:58	<b>L</b> 7:26	<b>L</b> 8:03	<b>L</b> 8:41	<b>L</b> 9:56	<b>L</b> 10:46	L11:47	L12:46	7	Westborough
8	Worcester	\$	5:35	7:13	8:27	-	-	10:29	11:46	1:36	2:36	3:38	4:28	5:25	-	6:25	-	6:47	7:13	7:40	8:17	8:55	10:10	11:00	12:00	1:00	8	Grafton
		5								· · · ·				Trainc in	nurnlo	hov indi	icato no	ak porio	d traine								-	

#### Keep in Mind

This schedule will be effective from July 1, 2014, and will replace the schedule of March 10, 2014.

#### Holiday Service:

Saturday service: Presidents' Day, 4th of July (train #1517 may be held for 30 minutes after the 4th of July fireworks).

Sunday service: New Year's Day, Memorial Day, Labor Day, Thanksgiving Day, Christmas Day.

All other holidays: For other holiday schedules, please check MBTA.com or call 617-222-3200.

- Times in purple with "f" indicate a flag stop: Passengers must tell the conductor that they wish to leave. Passengers waiting to board must be visible on the platform for the train to stop.
- Times in blue indicate an early departure (L stop): Times in blue indicate an early departure a story. The train may leave ahead of schedule at these stops.

Bikes: Bicycles are allowed on trains with the bicycle symbol shown below the train number.



Make your train on time. Download the official MBTA Commuter Rail mobile app. Get schedule info, train progress, and alerts easily and conveniently.



Stay connected with us on Twitter.









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\$ 6:46

SATURDAY TRAIN #

SUNDAY TRAIN #

Wellesley Farms

Wellesley Square

8 Worcester 1500 1502 1504 1506

2504

#### Saturday & Sunday

SATURDAY TRAIN #

SUNDAY TRAIN #

# Attachment E

MassDOT Crash Data (2011-2013)



CITY/TOWN : SOUTHBOF	ROUGH			COUNT DAT	ГЕ: <u>S</u>	SEPTEMBER 2011
DISTRICT : 3	UNSIGN	ALIZED :	YES	SIGNA	LIZED :	NO
		~ IN	TERSECTIO	N DATA ~		
MAJOR STREET :	TURNPIKE RO	ad (Route 9)	WESTBOUND			
MINOR STREET(S) :	PARK CENTRA	AL DRIVE				
INTERSECTION DIAGRAM (Label Approaches)	<b>↑</b> North		Park Central Drive	9 WB		
			Peak Hou	r Volumes		
APPROACH :	EB	WB	NB	SB	5	Entering
DIRECTION :	<b>→</b>	•	T	•		Vehicles
VOLUMES (PM) :	0	3,042	0	150		3,192
"K" FACTOR :	0.110	APPROA	CH ADT :	29,018	ADT = TOT	AL VOL <b>/</b> "K" FACT.
TOTAL # OF CRASHES :	1	# OF YEARS :	3	AVERA CRASH	GE # OF ES ( <b>A</b> ) :	0.33
CRASH RATE CALCU	JLATION :	0.03	RATE =	<u>( A * 1,0</u> ( ADT	000,000 ) * 365 )	
Comments : <u>K DETERM</u>		R ON TURNPI	KE ROAD (ROL PARK CENITRAL	JTE 9)		
	I NOFUSED N					





CITY/TOWN : SOUTHBOF	ROUGH			COUNT DAT	TE: <u>S</u>	SEPTEMBER 2011
DISTRICT : 3	UNSIGN	ALIZED :	YES	SIGNA	LIZED :	NO
		~ IN	TERSECTION	N DATA ~		
MAJOR STREET :	TURNPIKE RC	ad (Route 9)	WESTBOUND			
MINOR STREET(S) :	FLAGG ROAD					
INTERSECTION DIAGRAM (Label Approaches)	<b>↑</b> North		Pagg Road Roate	9 WB		
			Peak Hou	r Volumes		
APPROACH :	EB	WB	NB	SB	5	Total Entering
DIRECTION :	<b>→</b>	•	Ť	↓		Vehicles
VOLUMES (PM) :	0	2,976	0	47		3,023
"K "FACTOR :	0.110	APPROA	CH ADT :	27,482	ADT = TOT	AL VOL/"K" FACT.
TOTAL # OF CRASHES :	5	# OF YEARS :	3	AVERA CRASH	GE # OF ES( <b>A</b> ):	1.67
CRASH RATE CALCU	JLATION :	0.17	RATE =	<u>( A * 1,0</u> ( ADT	000,000) * 365)	
Comments : K DETERM	INED FROM AT	R ON TURNPI	KE ROAD (ROL	jte 9)		
Project Title & Date:	PROPOSED R	ESIDENCE AT F	PARK CENTRAL	PROJECT		





CITY/TOWN : SOUTHBOR	OUGH			COUNT DAT	E : <u>Sei</u>	PTEMBER 2011
DISTRICT : 3	UNSIGN	ALIZED :	NO	SIGNA	LIZED :	YES
		~ IN	TERSECTIO	N DATA ~		
MAJOR STREET :	TURNPIKE RC	ad (Route 9)	)			
MINOR STREET(S) :	CRYSTAL POR	ND ROAD				
INTERSECTION DIAGRAM (Label Approaches)	North	Route	9	Crystal Pond Road		
APPROACH :	EB	WB	Peak Hou NB	r Volumes SB	5	Total
DIRECTION :		- -				Entering Vehicles
VOLUMES (PM) :	2,592	2,707	285	· · · · · · · · · · · · · · · · · · ·		5,584
"K " FACTOR :	0.110	APPROA	CH ADT :	50,764	ADT = TOTAL	VOL/"K" FACT.
TOTAL # OF CRASHES :	13	# OF YEARS :	3	AVERA CRASH	GE # OF ES( <b>A</b> ):	4.33
CRASH RATE CALCU	ILATION :	0.23	RATE =	<u>( A * 1,0</u> ( ADT	000,000 ) * 365 )	
Comments : <u>K DETERM</u> Project Title & Date:	INED FROM AT PROPOSED R	R ON TURNPI	KE ROAD (ROU Park Centrai	JTE 9) - PROJECT		





CITY/TOWN : SOUTHBOR	ROUGH			COUNT DAT	ГЕ:	MAY 2013
DISTRICT : 3	UNSIGN	ALIZED :	YES	SIGNA	LIZED :	NO
		~ IN	TERSECTION	N DATA ~		
MAJOR STREET :	FLAGG ROAD					
MINOR STREET(S) :	BLACKTHORN	Drive				
INTERSECTION DIAGRAM (Label Approaches)	<b>↑</b> North	Blackth	orn Drive		Flagg Road	
APPROACH :	EB	WB	Peak Hou NB	r volumes SB	5	Total
DIRECTION :		-	<b>↑</b>	↓		Entering Vehicles
VOLUMES (PM) :	17	0	34	57		108
"K "FACTOR :	0.092	APPROA	CH ADT :	1,174	ADT = TOTAL	VOL/"K" FACT.
TOTAL # OF CRASHES :	0	# OF YEARS :	3	AVERA CRASH	GE # OF ES( <b>A</b> ):	0.00
CRASH RATE CALCU	JLATION :		RATE =	<u>( A * 1,0</u> ( ADT	000,000 ) * 365 )	
Comments : <u>K DETERM</u> Project Title & Date:	INED FROM AT PROPOSED R	R ON FLAGG	Road Park Central	PROJECT		





CITY/TOWN : SOUTHBOF	ROUGH			COUNT DAT	E:	May 2013
DISTRICT : 3	UNSIGN	ALIZED :	YES	SIGNA	LIZED :	NO
		~ IN	TERSECTIO	N DATA ~		
MAJOR STREET :	MAIN STREET	(Route 30)				
MINOR STREET(S) :	DEERFOOT R	OAD				
INTERSECTION DIAGRAM (Label Approaches)	North	Main St	rreet (Route 3	0)		
			Peak Hou	r Volumes		
APPROACH :	EB	WB	NB	SB	5	Total Entering
DIRECTION :	<b>→</b>	-	1	<b>\</b>		Vehicles
VOLUMES (PM) :	363	654	78	0		1,095
"K "FACTOR :	0.095	APPROA	CH ADT :	11,526	ADT = TOTAL	VOL/"K" FACT.
TOTAL # OF CRASHES :	2	# OF YEARS :	3	AVERA CRASH	GE # OF ES( <b>A</b> ):	0.67
CRASH RATE CALCU	JLATION :	0.16	RATE =	<u>( A * 1,0</u> ( ADT	000,000) * 365)	
Comments : <u>K DETERM</u> Project Title & Date:	IINED FROM AT PROPOSED R	R ON DEERFO	DOT ROAD Park Central	PROJECT		





## SEGMENT CRASH RATE WORKSHEET

CITY/TOWN : SOUTHBOR	OUGH	COUNT DATE :	MAY 2013					
DISTRICT : 3								
	~ SEGMENT DATA ~							
ROADWAY NAME:	FLAGG ROAD							
START POINT: ROUTE 9								
END POINT: DEERFOOT	END POINT: DEERFOOT ROAD							
FUNCTIONAL CLASSIFIC	CATION OF ROADWAY: COLLECTOR							







	ay	~ N				~						304	
	Distance from Nearest Roadw Intersection	365 TURNPIKE ROAD Rte 9 V PARK CENTRAL				TURNPIKE ROAD Rte 9 W / FLAGG ROAD						1000 feet W from Intersection 5 TURNPIKE ROAD Rte 9 E / CRYSTAL POND ROAD	
	At Roadway Intersection		TURNPIKE ROAD Rte 9 / FLAGG ROAD	FLAGG ROAD / TURNPIKE ROAD Rte 9 W	FLAGG ROAD / LOVERS LANE		TURNPIKE ROAD / FLAGG ROAD	TURNPIKE ROAD / CRYSTAL POND ROAD	Rte 9 / TURNPIKE ROAD / CRYSTAL POND ROAD	TURNPIKE ROAD / CRYSTAL POND ROAD	TURNPIKE ROAD Rte 9 E / CRYSTAL POND ROAD		MAIN STREET / DEERFOOT ROAD
	Weather Condition	Clear/Clear	Clear/Clear	Clear/Clear	Rain/Rain	Clear/Clear	Rain/Cloudy	Clear/Clear	Clear/Clear	Clear/Clear	Clear/Clear	Cloudy/Clear	Unknown/Unknown
	Ambient Light	Daylight	Daylight	Daylight	Daylight	Daylight	Daylight	Daylight	Daylight	Daylight	Daylight	Daylight	Unknown
	Road Surface Condition	Wet	Dry	D	Wet	Dry	Wet	Dry	Dry	Dry	Dry	Dry	Unknown
	Vehicle Configuration	V1: Passenger car / V2:Passenger car	V1: Passenger car / V2:Passenger car	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tites / V2: Light truck(van, mini-van, panel, pickup, sport utility) with only pickup, sport utility) with only	V1: Passenger car	V1: Passenger car / V2:Passenger car	V1: Passenger car / V2:Passenger car	V1: Passenger car / V2:Passenger car	V1: Passenger car / V2:Passenger car / V3:Not reported	V1: Passenger car / V2: Passenger car / V3:Passenger car	V1: Passenger car / V2:Single- unit truck (2-axle, 6-tire)	V1: Passenger car / V2:Passenger car	V1: Passenger car
	Most Harmful Events	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Collision with unknown fixed object	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Not reported / V2: Not reported	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Not reported	V1: Not reported / V2: Not reported / V3: Not reported	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Unknown
	Vehicle Travel Directions	V1:Westbound / V2:Northbound	V1:Southbound / V2:Southbound	V1:Southbound / V2:Northbound	V1:Southbound	V1:Westbound / V2:Westbound	V1:Westbound / V2:Westbound	V1:Not reported / V2:Not reported	V1:Eastbound / V2:Eastbound / V3:Not reported	V1:Eastbound / V2:Eastbound / V3:Eastbound	V1:Eastbound / V2:Eastbound	V1:Eastbound / V2:Eastbound	V1:Not reported
for the year 2011	Vehicle Action Prior to Crash	V1: Entering traffic lane / V2:Travelling straight ahead	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1: Slowing or stopped in traffic / V2:Traveling straight ahead	V1: Travelling straight ahead	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1: Making U-turn / V2:Making U-turn	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Not reported	V1: Travelling straight ahead / V2:Slowing or stopped in traffic / V3:Slowing or stopped in traffic	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1: Travelling straight ahead / V2:Travelling straight ahead	V1: Unknown
HBOROUGH	Manner of Collision	Angle	Rear-end	Rear-end	Single vehicle crash	Rear-end	Rear-end	Angle	Sideswipe, same direction	Single vehicle crash	Rear-end	Sideswipe, same direction	Unknown
SOUT	Total Fatal Injuries	0	0	0	0	0	0	0	0	0	0	0	0
rt for 9	f Total Nonfatal Injuries	0	0	~	0	0	0	0	0	0	7	0	0
Repor	Number o Vehicles	2	Ν	N	t	Ν	2	Ν	'n	ĸ	7	N	-
OT Crash	Crash Severity	Property damage only (none injured)	Not Reported	Non-fatal injury	Property damage only (none injured)	Property damage only (none injured)	Property damage only (none injured)	Property damage only (none injured)	Property damage only (none injured)	Property damage only (none injured)	Non-fatal injury	Property damage only (none injured)	Not Reported
MassD	Crash Time	10:00 AM	11:34 AM	3:00 PM	5:27 PM	5:20 PM	9:27 AM	12:38 PM	4:00 PM	4:10 PM	2:42 PM	3:35 PM	1:42 PM
DOT	Day of Week	Monday	Saturday	Thursday	Monday	Thursday	Thursday	Saturday	Thursday	Tuesday	Monday	Thursday	Tuesday
massL	Crash Date	14-Feb-2011	07-May-2011	14-Jul-2011	25-Jul-2011	20-Oct-2011	27-Oct-2011	29-Jan-2011	18-Aug-2011	18-Oct-2011	31-Oct-2011	22-Dec-2011	11-Oct-2011

SOUTHBOROUGH2011.xls

massD	6	MassDC	OT Crash	Report	t for S	OUTH	<b>BOROUGH f</b>	or the year 2012								
Crash Date Da	ay of Week	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries I	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection
	-															
02-Mar-2012	Friday	4:00 PM	Property damage only (none injured)	e	o	0	Rear-end	1: Slowing or stopped in traffic / V2:Slowing or stopped in V traffic / V3:Travelling straight traffic / V3:Travelling straight	/1:Westbound / V2:Westbound / V3:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car / V3:Passenger car	Dry	Daylight	Cloudy/Cloudy	TURNPIKE ROAD Rte 9 W / CRYSTAL POND ROAD	
21-Mar-2012 W	/ednesday	4:10 PM	Property damage only (none injured)	5	0	0	Rear-end V	<ol> <li>Travelling straight ahead /</li> <li>Slowing or stopped in traffic</li> </ol>	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Dry	Daylight	Clear/Clear	TURNPIKE ROAD / CRYSTAL POND ROAD	
27-Dec-2012	Thursday	2:00 PM	Property damage only (none injured)	7	0	0	V V V	<ol> <li>Travelling straight ahead /</li> <li>Slowing or stopped in traffic</li> </ol>	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car	Ice	Daylight	Cloudy/Rain	TURNPIKE ROAD Rte 9 E / CRYSTAL POND ROAD	
04-Aug-2012	Saturday	12:31 PM	Property damage only (none injured)	-	0	0	Single vehicle crash	V1: Turning right	V1:Northbound	V1: Collision with other movable object	V1: Passenger car	Dry	Dark - unknown roadway lighting	Clear/Clear	FLAGG ROAD / TURNPIKE ROAD Rte 9 W	
30-Oct-2012	Tuesday	11:38 PM	Non-fatal injury	-	1	3 0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Overturn/rollover	V1: Passenger car	Wet	Dark - lighted roadway	Cloudy/Rain		40 FLAGG ROAD
26-Nov-2012	Monday	11:15 PM	Property damage only (none injured)	-	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with other movable object	V1: Passenger car	Dry	Dark - lighted roadway	Clear/Clear		FLAGG ROAD / LOVERS LANE

					1		
	Distance from Nearest Roadway Intersection						MAIN STREET Rte 30 W / DEERFOOT ROAD
	At Roadway Intersection	TURNPIKE ROAD / CRYSTAL POND ROAD	TURNPIKE ROAD Rte 9 W / CRYSTAL POND ROAD	TURNPIKE ROAD Rie 9 E / CRYSTAL POND ROAD	TURNPIKE ROAD / CRYSTAL POND ROAD	TURNPIKE RD Rte 9 W / CRYSTAL POND RD	
	Weather Condition	Clear/Clear	Cloudy/Cloudy	Rain/Cloudy	Clear/Clear	Clear/Clear	Snow/Cloudy
	Ambient Light	Daylight	Daylight	Daylight	Dark - lighted roadway	Daylight	Dark - lighted roadway
	Road Surface Condition	Dry	Wet	Wet	Dry	ĥд	MonS
	Vehicle Configuration	V1: Passenger car / V2:Passenger car	V1: Truck/trailer / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires	V1: Passenger car / V2: Passenger car / V3: Passenger car / V4: Passenger car	V1: Single-unit truck (2-axle, 6- tire)	V1: Passenger car / V2:Passenger car	V1: Passenger car
	Most Harmful Events	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / with motor vehicle in traffic / vehicle in traffic / V4: Collision with motor vehicle in traffic	V1: Collision with motor vehicle in traffic	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Collision with utility pole
	Vehicle Travel Directions	V1:Eastbound / V2:Eastbound	V1:Westbound / V2:Westbound	V1:Eastbound / V2:Eastbound / V3:Eastbound / V4:Eastbound	V1:Eastbound	V1:Westbound / V2:Westbound	V1:Eastbound
for the year 2013	Vehicle Action Prior to Crash	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	<ul> <li>V1: Travelling straight ahead /</li> <li>V2:Travelling straight ahead /</li> <li>V3:Travelling straight ahead /</li> <li>V4:Travelling straight ahead</li> </ul>	V1: Turning left	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1: Travelling straight ahead
HBOROUGH	Manner of Collision	Rear-end	Rear-end	Rear-end	Sideswipe, same direction	Rear-end	Single vehicle crash
SOUT	Total Fatal Injuries	0	0	0	0	0	0
Report for \$	Total Nonfata Injuries	0	0	0	0	0	0
	Number of Vehicles	7	2	4	-	2	۲
OT Crash I	Crash Severity	Property damage only (none injured)	Property damage only (none injured)	Property damage only (none injured)	Property damage only (none injured)	Property damage only (none injured)	Property damage only (none iniured)
MassD	Crash Time	2:19 PM	11:24 AM	2:02 PM	00:00 AM	11:42 AM	5:18 AM
001	Day of Week	Friday	Friday	Thursday	Saturday	Tuesday	Friday
mass	Crash Date	2-Mar-2013	4-May-2013	3-Jun-2013	7-Aug-2013	0-Aug-2013	8-Mar-2013

SOUTHBOROUGH2013.xls

Page 1

# Attachment F

Sight Distance



# Attachment G

Ambient Growth Data

# Average Daily Traffic Summary Table

Project: T0524 - Proposed Mixed-Use Development at Park Central - Southborough, Massachusetts Date: 3/12/2014, Revised 9/14/2015 Analyst: TEC, Inc. / Douglas S. Halpert, E.I.T. & Eric R. Paquette, E.I.T. Source: MassDOT Permanent Count Station 3086, 3087, 3094, 3096, 307

STA.	TOWN	<b>ROUTE/STREET</b>	LOCATION	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Amb. Growth
3086	Southborough	Deerfoot Road	South of Main Street (Route 30)	2200	2226	2187	1600	1583	1575	1800	1880	1719	1735	1789	-1.48%
3087	Southborough	Deerfoot Road	North of Route 9	374	379	340	339	333	290	289	305	306	310	320	-1.39%
3094	Southborough	Flagg Road	North of Route 9	980	1400	1396	1388	1000	992	995	1636	1631	1642	1163	-1.70%
3096	Southborough	Clifford Street	South of Deerfoot Road	310	314	308	250	247	246	300	316	314	318	328	1.00%

Average Annual Ambient Growth on Local Streets =

-0.9%

Assume 0.5% Ambient Growth Rate

Amb. Growth	1.28%	
2014	60098	
2013	56965	
2012	56583	
2011	56439	
2010	55568	
2009	55359	
2008	54222	
2007	55200	
2006	53356	
2005	53094	
2004	53000	
LOCATION	East of East Main Street (Route 30)	
ROUTE/STREET	Boston Turnpike (Route 9)	
TOWN	Southborough	
STA.	3308	



# Attachment H

Specific Development by Others





Madison Place – Southborough, MA



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N.E. Center for Children – Southborough, MA


0 Firman Drive – Southborough, MA







15 Connector Road – Westborough, MA

#### Site Generated Trip Assessment

Project:	Proposed Hotel Development - 15 Connector Road, Westborough, MA
Date:	October 1, 2015
Analyst:	TEC, Inc. / Douglas S. Halpert, E.I.T.
Source:	Institute of Transportation Engineers - Trip Generation, 9th Edition

#### ITE Land Use Code (LUC) 310 - Hotel

Average Vehicle Trips vs:	Dwellin	g Units
Independent Variable (X):	107	Rooms

#### AVERAGE WEEKDAY DAILY

T = 3	8.95 * (X)	- 373.16	6		
T = 3	8.95 *	107	- (373.16)		
T =	584	vehicle	trips		
W	vith 50% (	292	vpd) entering and 50% (	292	vpd) exiting.

#### WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

 $\begin{array}{l} T = 0.53 * (X) \\ T = 0.53 * 107 \\ T = \boxed{57} \\ \text{with } 59\% ( 34 \text{ vph}) \text{ entering and } 41\% ( 23 \text{ vpd}) \text{ exiting.} \end{array}$ 

#### WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

 $\begin{array}{l} T = 0.60 * (X) \\ T = 0.60 * 107 \\ T = \boxed{64} \\ \text{which } 51\% ( 33 \text{ vph}) \text{ entering and } 49\% ( 31 \text{ vpd}) \text{ exiting.} \end{array}$ 

#### SATURDAY DAILY

T = 9.62 \* (X) - 294.56 T = 9.62 \* 107 - 294.56  $T = \boxed{735}$  vehicle trips with 50% ( 368 vpd) entering and 50% ( 367 vpd) exiting.

#### SATURDAY PEAK HOUR OF GENERATOR

 $\begin{array}{l} T = 0.69 * (X) + 4.32 \\ T = 0.69 * 107 + (4.32) \\ T = \boxed{\textbf{78}} \\ \text{ with } 56\% ( 44 \text{ vph}) \text{ entering and } 44\% ( 34 \text{ vpd}) \text{ exiting.} \end{array}$ 



#### Site Generated Trip Assessment

Project:	Proposed Hotel Development - 15 Connector Road, Westborough, MA
Date:	October 1, 2015
Analyst:	TEC, Inc. / Douglas S. Halpert, E.I.T.
Source:	Institute of Transportation Engineers - Trip Generation, 9th Edition

#### ITE Land Use Code (LUC) 937 - Coffee/Donut Shop with Drive-Through Window

Average Vehicle Trips Ends vs:1,000 Sq. Feet Gross Floor AreaIndependent Variable (X):2.2 ksf

#### WEEKDAY DAILY

T =	818.58 * (X)				
T =	818.58 *	2.20			
T =	1,800	vehicle	e trips		
	with 50% (	900	vph) entering and 50% (	900	vph) exiting.

#### WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

 $\begin{array}{l} T = 100.58 * (X) \\ T = 100.58 * 2.20 \\ T = \fbox{221} \\ \text{with 51\% (} 113 \text{ vph) entering and 49\% (} 108 \text{ vph) exiting.} \end{array}$ 

#### WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

 $\begin{array}{l} T = 42.80 * (X) \\ T = 42.80 * 2.20 \\ T = \underline{94} \\ \text{with } 50\% ( 47 \text{ vph}) \text{ entering and } 50\% ( 47 \text{ vph}) \text{ exiting.} \end{array}$ 

#### SATURDAY DAILY

ITE LUC 933 Saturday Daily Trip Rate ITE LUC 933 Saturday Midday Trip Rate = ITE LUC 937 Saturday Daily Trip Rate ITE LUC 937 Saturday Midday Trip Rate

$$\frac{.696.00}{.54.55} = \frac{.(Y)}{.84.52} \qquad Y = 1078.3853$$

T = Y \* 2.20 T = 2,372 vehicle trips with 50% (1,186 vph) entering and 50% (1,186 vph) exiting.

#### SATURDAY MIDDAY PEAK HOUR OF GENERATOR

Ln T = 0.64 Ln (X) + 4.68 Ln T = 0.64 Ln ( 2.20 ) + 4.68 Ln T = 5.18Ln T = 179 vehicle trips with 50% ( 90 vph) entering and 50% ( 89 vph) exiting.



Westborough Village – Westborough, MA















Westborough Woods – Westborough, MA

**Trip Distribution Analysis** Residents Aged 16+ in 2000 by Town of Employment and Means of Transportation to Work *Source: 2000 Census Transportation Planning Package* 

Workplace	State	Total Cars	To/From the West on Rte. 9	To/From the East on Rte. 9	To/From the North on Otis St.	To/From the South on Otis St.	Total
East Hartford	CT	8	100				100
Greenwich	CT	7	100				100
Acton	MA	8	495 N	100			100
Andover	MA	29	495 N	100			100
Arlington	MA	8	Rte9	100			100
Ashburnham	MA	6	100				100
Ashland	MA	54	Flanders	100			100
Athol	MA	45	100				100
Auburn	MA	52	100				100
Ayer	MA	0	495 N	100			100
Barnstable	MA	9	495 5	100			100
Barre	MA	6	100	100			100
Bedford	MA	13	Rtey	100			100
Beimont	MA	15	Rte 9	100			100
Beyerly	MA	10	495 N	100	20		100
Billerica	MA	42	Kteg	100			100
Bolton	MA	4	HUS N	100			100
Boston	MA	443	495 N	100			100
Bourne	MA	11	Kte9	100			100
Boxborough	MA	6	492	100			100
Braintree	MA	15	Rte 9	100			100
Brockton	MA	8	Rteg	100			100
Brookfield	MA	6	100				100
Burlington	MA	44	Rte9	100			100
Cambridge	MA	109	Rte 9	100			100
Canton	MA	11	Rte 9	100			100
Charlton	MA	14	100	100			100
Chelmsford	MA	42	975 10	100			100
Chelsea	MA	8	Kte y	100			100
Clinton	MA	35	Dag 9	100			100
Concord	MA	43	Rich	100			100
Dednam	MA	0	100	100			100
Everett	MA	9	Rte9	100			100
Fall River	MA	8	495 5	100			100
Fitehburg	MA	8	100				100
Foxborough	MA	4	495 5	100			100
Framingham	MA	. 520	Rte 9	100			100
Franklin	MA	36	4955	100			100
-Gardner	MA	14	100				100
Gloucester	MA	0	Rteg	100			100
Grafton	MA	62	100				100
Groton	MA	13	495 N	100			100
Holden	MA	12	Di-O	100			100
Holliston	MA	59	4955	100			100
	MA	20	Rd-12C	70		-30	100
Hudson	MA	86	DL-Q	100		-30	100
l ancaster	MA	14	100	100			100
leicester	MA	5	100				100
Leominster	MA	19	100				100
Lexington	MA	24	Rte 9	100			100
Littleton	MA	45	495 N	100			100
Lowell	MA	50	495 1	100			100
Lunenburg	MA	9	100				100
Lynn	MA	35	Rteg	100			100
Lynnfield	MA	4	Rte9	100			100
Malden	MA	29	Rto9	100			100
Mansfield	MA	14	495 N	100			100
Marlborough	MA	632	Pte9	100			100
Maynard	MA	19	495 N	100			100
Medfield	MA	8	495 5	100			100
Medway	MA	6	LAC	100			100
ivieuway	IVIA	0	2222	100			100

Workplace	State	Total Cars	To/From the West on Rte. 9	To/From the East on Rte. 9	To/From the North on Otis St.	To/From the South on Otis St.	Total
Melrose	MA	8	Rte 9	100			100
Milford	MA	92	495 5	100			100
Millbury	MA	26	100				100
Milton	MA	7	Rte9	100			100
Natick	MA	198	Rte9	100			100
Needham	MA	18	Rto a	100			100
New Braintree	MA	6	100				100
Newton	MA	83	Rte9	100			100
North Attleborough	MA	10	4956	100			100
North Brookfield	MA	10	100	100			100
North Booding	MA	6	81-9	100			100
Northborough		261	Mite 1	100	100		100
Nonthbolough	NAA	201	Q4-125	50	100	- 50	100
Northbridge	MA	0	NIC ISS	50		50	100
Norton	MA	8	495 >	100			100
Norwood	MA	12	Kte 9	100			100
Oxford	MA	7	100				100
Plainville	MA	10	100				100
Plymouth	MA	7	495 5	100			100
Quincy	MA	21	Rteg	100			100
Randolph	MA	8	Rteg	100			100
Revere	MA	5	Rtey	100			100
Rockport	MA	9	Rtea	100			100
Rutland	MA	4	100				100
Shrewsbury	MA	236	100				100
Somerville	MA	24	Rto G	100			100
Southborough	MA	246	Ria	100			100
Southbridge	MA	21	100	100			100
Sponsor	MA	21	100				100
Spencer		4	Qto 9	100			100
Stonenam	MA	0	ane i	100			100
Stow	MA	31	Kter	100			100
Sturbridge	MA	8	100				100
Sudbury	MA	21	Kte 7	100			100
Sutton	MA	6	100				100
Taunton	MA	5	4955	100			100
Tewksbury	MA	36	495 N	100			100
Tyngsborough	MA	11	495 N	100			100
Uxbridge	MA	9	100				100
Wakefield	MA	14	Kte 4	100			100
Waltham	MA	137	Rteg	100			100
Watertown	MA	16	Rteg	100			100
Webster	MA	33	100				100
Welleslev	MA	90	Rtog	100			100
West Boylston	MA	12	100				100
Westborough	MA	1 851	Rto 135	70		-30-	100
Westford	MA	46	Laces a l	100		00	100
Weetminstor	MA	12	100 N	100			100
Westwood	MA	Q	2409	100			100
Wilmington		47	Dana	100			100
vv infilington		17	OL O	100			100
vvincnester	IVIA	21	RET	100			100
vvoburn	MA	12	Kte 9	100			100
Worcester	MA	873	100	10 million 10			100
Bedford	NH	9	495 N	100			100
Bristol	NH	9	with N	100			100
Manchester	NH	4	495 N	100			100
Nashua	NH	6	495 N	100			100
Salem	NH	6	495	100			100
Peapack and Gladstor	ne NJ	5	100				100
Manhattan	NY	0	100				100
Wilkes-Barre	PA	10	100				100
Cranston	RI	7	100				100
East Providence	RI	15	100				100
Closester	DI	13	100				100
Providence	RI	33	100				100
		7.044				7.00	400
IOTAIS		7,844	21.40	67.40	3.37	7.83	100

## Attachment I

Site Trip Generation

#### Site Generated Trip Assessment - Proposed

Project:	T0524 - Proposed Mixed-Use Residential Development - Park Central
Location:	Southborough, Massachusetts
Date:	November 6, 2015
Analyst:	TEC, Inc. / Douglas S. Halpert, E.I.T.
Source:	Institute of Transportation Engineers - Trip Generation - 9th Ed.

#### ITE Land Use Code (LUC) 220 - Apartment

Average Vehicle Trips vs:	Dwelling Units
Independent Variable (X):	180

#### AVERAGE WEEKDAY DAILY

T = 6.06 \* (X) + 123.56 T = 6.06 \* 180 + (123.56) T = 1214 vehicle trips with 50% ( 607 vpd) entering and 50% ( 607 vpd) exiting.

#### WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.49 \* (X) + 3.73 T = 0.49 \* 180 + (3.73) T = 92 vehicle trips with 20% (18 vph) entering and 80% (74 vph) exiting.

#### WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.55 \* (X) + 17.65 T = 0.55 \* 180 + (17.65) T = 117 vehicle trips with 65% (76 vph) entering and 35% (41 vph) exiting.

#### SATURDAY DAILY

T = 6.39 \* (X) T = 6.39 \* 180 T = 1150 vehicle trips with 50% (575 vpd) entering and 50% (575 vpd) exiting.

#### SATURDAY MIDDAY PEAK HOUR OF GENERATOR

 $\begin{array}{l} T = 0.41 * (X) + 19.23 \\ T = 0.41 * 180 + (19.23) \\ T = \boxed{93} \\ \text{ with 50\% (} 47 \quad \text{vph) entering and 50\% (} 46 \quad \text{vph) exiting.} \end{array}$ 



#### Site Generated Trip Assessment - Proposed

Project: T0524 - Proposed Mixed-Use Residential Development - Park Central Location: Southborough, Massachusetts
Date: November 6, 2015
Analyst: TEC, Inc. / Douglas S. Halpert, E.I.T.
Source: Institute of Transportation Engineers - Trip Generation - 9th Ed.

### ITE Land Use Code (LUC) 230 - Residential Condominium/Townhouse

Average Vehicle Trips vs: Independent Variable (X):	Dwelling Units 140
AVERAGE WEEKDAY DAILY	
$\ln T = 0.87 \ln (X) + 2.46$	
LnT = 0.07 Ln(X) + 2.40	1 2 46
$L_{11} I = 0.07 L_{11} I = 140$	+ 2.40
Ln = 0.76	
I = 862 vehicle t	rips
with 50% ( 431	vpd) entering and 50% ( 431 vpd) exiting.
WEEKDAY MORNING PEAK HOUF	R OF ADJACENT STREET TRAFFIC
Ln T = 0.80 Ln (X) + 0.26	
Ln T = 0.80 Ln 140	+ 0.26
Ln T = 4.21	
T = 68 vehicle t	rins
with 17% ( 12	vph) entering and 83% (56 vph) exiting
WEEKDAY EVENING PEAK HOUR	OF ADJACENT STREET TRAFFIC
Ln T = 0.82 Ln (X) + 0.32	
Ln T = 0.82 Ln 140	+ 0.32
Ln T = 4.37	
T = 79 vehicle t	rins
with 67% ( 53	vph) entering and 33% ( 26 vph) exiting
T = 2.62 * (V) + 427.02	
I = 3.62 (A) + 427.93	. 407.00
1 = 3.62 140	+ 427.95
I = 934 vehicle t	rips
with 50% ( 467	vpd) entering and 50% ( 467 vpd) exiting.
SATURDAY MIDDAY PEAK HOUR	OF GENERATOR
T = 0.29 * (X) + 42.63	
T = 0.29 * 140	+ 42 63
T 0.20 140	·

 $T = \underbrace{0.29^{+}}_{With 54\%} = \underbrace{140^{+} 42.63}_{Vehicle trips}$ with 54% ( 45 vph) entering and 46% ( 38 vph) exiting.



### Site Generated Trip Assessment - Proposed

Project: T0524 - Proposed Mixed-Use Residential Development - Park Central Location: Southborough, Massachusetts November 6, 2015 Date: Analyst: TEC, Inc. / Douglas S. Halpert, E.I.T. Source: Institute of Transportation Engineers - Trip Generation, 9th Edition

### ITE Land Use Code (LUC) 254 - Assisted Living

Average Vehicle Trips v Independent Variable (>	/s: K):	Dwelling Units 150		
Average Weekday Dall T = 2.66 * (X) T = 2.66 * T = 400 v with 50% (	LY 150 rehicle 200	trips vpd) entering and 50% (	200	vpd) exiting.
<b>WEEKDAY MORNING PEA</b> T = 0.14 * (X) T = 0.14 * T = 21	к <b>Но</b> и 150 ehicle	R OF ADJACENT STREET TRA	FFIC	
with 65% (	14	vph) entering and 35% (	7	vph) exiting.
WEEKDAY EVENING PEAK T = 0.22 * (X) T = 0.22 * T = 33 v with 44% (	<b>K HOUR</b> 150 rehicle 15	<b>OF ADJACENT STREET TRAI</b> trips vph) entering and 56% (	<b>-FIC</b> 18	vph) exiting.
SATURDAY DAILY T = 2.20 * (X) T = 2.20 * T = 330 v with 50% (	150 ehicle 165	trips vpd) entering and 50% (	165	vpd) exiting.
SATURDAY MIDDAY PEAK T = 0.33 * (X) T = 0.33 * T = 50 v	<b>HOUR</b> 150 rehicle	OF GENERATOR		



#### Site Generated Trip Assessment

Project: T0524 - Proposed Mixed-Use Residential Development - Park Central Location: Southborough, Massachusetts
Date: November 6, 2015
Analyst: TEC, Inc. / Douglas S. Halpert, E.I.T.
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

#### ITE Land Use Code (LUC) 310 - Hotel

Average Vehicle Trips vs:	Dwelling Units
Independent Variable (X):	125 Rooms

#### AVERAGE WEEKDAY DAILY

T = 8.95 \* (X) - 373.16 T = 8.95 \* 125 - (373.16)  $T = \boxed{746}$  vehicle trips with 50% ( 373 vpd) entering and 50% ( 373 vpd) exiting.

#### WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

 $\begin{array}{l} T = 0.53 * (X) \\ T = 0.53 * 125 \\ T = \boxed{66} \\ \text{whicle trips} \\ \text{with 59\% ( 39 vph) entering and 41\% ( 27 vpd) exiting.} \end{array}$ 

#### WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

 $\begin{array}{l} T = 0.60 * (X) \\ T = 0.60 * 125 \\ T = \boxed{75} \\ \text{with } 51\% ( 38 \text{ vph}) \text{ entering and } 49\% ( 37 \text{ vpd}) \text{ exiting.} \end{array}$ 

#### SATURDAY DAILY

T = 9.62 \* (X) - 294.56 T = 9.62 \* 125 - 294.56 T = 9.62 \* vehicle tripswith 50% (454 vpd) entering and 50% (454 vpd) exiting.

#### SATURDAY PEAK HOUR OF GENERATOR

T = 0.69 \* (X) + 4.32 T = 0.69 \* 125 + (4.32)  $T = \boxed{91}$  vehicle trips with 56% (51 vph) entering and 44% (40 vpd) exiting.



## Attachment J

Gravity Model

#### Trip Distribution Gravity Model - Residence to Workplace Residence Distribution

Project:	T0524 - Pr
Date:	March 13,
Analyst:	TEC Inc.

T0524 - Proposed Mixed-Use Residential Development at Park Central - Southborough, Massachusetts March 13, 2014 TEC, Inc. / Rebecca L. Brown, P.E., PTOE / Douglas S. Halpert, E.I.T. United States Census Bureau, 2000

Analyst: Source:

							Major Rout	te Entering						Maj	or Route E:	xiting					Major Rou	Major Route Entering				Major Route Exiting					
			% of Total	% of		Route 9	I-495	I-495		Route 30									Route 9	Route 9	I-495	I-495		Route 30							
Residence State-County-MCD			Southborough	Distributed	Route 9	From	From	From	Route 30	From		To Route	To Route	To I-495	To I-495	To Route	To Route		From	From	From	From	Route 30	From	Route 9	Rout 9	I-495	I-495	Route 30	Route 30	
Name	Workplace State-County-MCD Name	Count	Workforce	Workforce	From East	West	North	South	From East	West	Check	9 East	9 West	North	South	30 East	30 West	Check	East	West	North	South	From East	West	East	West	North	South	East	West	
Southbor. town Worcester Co. MA	Southbor. town Worcester Co. MA	638	15.10%	17.84%	45%				50%	5%	100%	45%				50%	5%	100%	8%	0%	0%	0%	9%	1%	8%	0%	0%	0%	9%	1%	
Southbor. town Worcester Co. MA	Boston city Suffolk Co. MA	478	11.31%	13.36%	100%						100%				100%			100%	13%	0%	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	
Southbor. town Worcester Co. MA	Framingham town Middlesex Co. MA	411	9.73%	11.49%	90%				10%		100%	90%				10%		100%	10%	0%	0%	0%	1%	0%	10%	0%	0%	0%	1%	0%	
Southbor. town Worcester Co. MA	Marlbor. city Middlesex Co. MA	283	6.70%	7.91%	25%		35%		35%	5%	100%	10%		50%		35%	5%	100%	2%	0%	3%	0%	3%	0%	1%	0%	4%	0%	3%	0%	
Southbor. town Worcester Co. MA	Worcester city Worcester Co. MA	267	6.32%	7.46%		60%	30%	10%			100%		60%	30%	10%			100%	0%	4%	2%	1%	0%	0%	0%	4%	2%	1%	0%	0%	
Southbor. town Worcester Co. MA	Westbor. town Worcester Co. MA	227	5.37%	6.35%		95%				5%	100%		100%					100%	0%	6%	0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	
Southbor. town Worcester Co. MA	Cambridge city Middlesex Co. MA	131	3.10%	3.66%	100%						100%				100%			100%	4%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	
Southbor. town Worcester Co. MA	Natick town Middlesex Co. MA	127	3.01%	3.55%	100%						100%	60%			40%			100%	4%	0%	0%	0%	0%	0%	2%	0%	0%	1%	0%	0%	
Southbor. town Worcester Co. MA	Wellesley town Norfolk Co. MA	109	2.58%	3.05%	100%						100%	100%						100%	3%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	
Southbor. town Worcester Co. MA	Waltham city Middlesex Co. MA	74	1.75%	2.07%	100%						100%	25%			75%			100%	2%	0%	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	
Southbor. town Worcester Co. MA	Milford town Worcester Co. MA	66	1.56%	1.85%				100%			100%				100%			100%	0%	0%	0%	2%	0%	0%	0%	0%	0%	2%	0%	0%	
Southbor. town Worcester Co. MA	Burlington town Middlesex Co. MA	63	1.49%	1.76%	100%						100%	25%			75%			100%	2%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	
Southbor. town Worcester Co. MA	Lowell city Middlesex Co. MA	57	1.35%	1.59%			100%				100%			100%				100%	0%	0%	2%	0%	0%	0%	0%	0%	2%	0%	0%	0%	
Southbor. town Worcester Co. MA	Northbor. town Worcester Co. MA	55	1.30%	1.54%		40%	35%			25%	100%		50%	25%			25%	100%	0%	1%	1%	0%	0%	0%	0%	1%	0%	0%	0%	0%	
Southbor. town Worcester Co. MA	Woburn city Middlesex Co. MA	50	1.18%	1.40%	100%						100%	25%			75%			100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	
Southbor. town Worcester Co. MA	Hopkinton town Middlesex Co. MA	42	0.99%	1.17%	50%			50%			100%	30%			70%			100%	1%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	
Southbor. town Worcester Co. MA	Ashland town Middlesex Co. MA	41	0.97%	1.15%	100%						100%	100%						100%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	
Southbor. town Worcester Co. MA	Acton town Middlesex Co. MA	37	0.88%	1.03%			100%				100%			100%				100%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	
Southbor. town Worcester Co. MA	Concord town Middlesex Co. MA	35	0.83%	0.98%	50%		50%				100%	25%		75%				100%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	
Southbor. town Worcester Co. MA	Hudson town Middlesex Co. MA	33	0.78%	0.92%	25%		50%		25%		100%			75%		25%		100%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	
Southbor. town Worcester Co. MA	Andover town Essex Co. MA	29	0.69%	0.81%			100%				100%			100%				100%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	
Southbor. town Worcester Co. MA	Chelmsford town Middlesex Co. MA	29	0.69%	0.81%			100%				100%			100%				100%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	
Southbor. town Worcester Co. MA	Charlton town Worcester Co. MA	29	0.69%	0.81%		40%		60%			100%		40%		60%			100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Southbor. town Worcester Co. MA	Malden city Middlesex Co. MA	28	0.66%	0.78%	100%						100%				100%			100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	
Southbor. town Worcester Co. MA	Northbridge town Worcester Co. MA	27	0.64%	0.75%		40%		60%			100%		40%		60%			100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Southbor. town Worcester Co. MA	Holliston town Middlesex Co. MA	25	0.59%	0.70%	75%			25%			100%	50%			50%			100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Southbor. town Worcester Co. MA	Lexington town Middlesex Co. MA	25	0.59%	0.70%	100%						100%				100%			100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	
Southbor. town Worcester Co. MA	Newton city Middlesex Co. MA	24	0.57%	0.67%	100%						100%	50%			50%			100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Southbor. town Worcester Co. MA	Wayland town Middlesex Co. MA	24	0.57%	0.67%	100%						100%	35%		35%	30%			100%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Southbor. town Worcester Co. MA	Franklin city Norfolk Co. MA	24	0.57%	0.67%	10%			90%			100%				100%			100%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	
Southbor. town Worcester Co. MA	Stow town Middlesex Co. MA	23	0.54%	0.64%	25%		50%		25%		100%			75%		25%		100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Southbor. town Worcester Co. MA	Brookfield town Worcester Co. MA	23	0.54%	0.64%				100%			100%				100%			100%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	
Southbor. town Worcester Co. MA	Haverhill city Essex Co. MA	22	0.52%	0.62%		40.00/	100%				100%		1000	100%				100%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	
Southbor. town Worcester Co. MA	Shrewsbury town Worcester Co. MA	21	0.50%	0.59%		100%					100%	Į	100%					100%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	
TOTAL		4225	84.66%	100.00%															55.2%	12.3%	11.7%	5.5%	13.2%	2.0%	28.3%	12.8%	13.6%	30.4%	13.2%	1.7%	
																		SAY	55%	12%	12%	6%	13%	2%	29%	12%	14%	30%	13%	2%	
																							Check	100%					Check	100%	

Check 100%

## <u>Attachment K</u>

Intersection Capacity and Queue Analyses

## 2014 Existing Conditions

# Lanes, Volumes, Timings 1: Route 9 & Park Central Drive

	≯		+	•	· 🖌	-
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			<b>^</b>	1		1
Volume (vph)	0	0	2440	41	0	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	13	16	16
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	1.00
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	0	3657	1669	0	1774
Flt Permitted						
Satd. Flow (perm)	0	0	3657	1669	0	1774
Link Speed (mph)		55	55		30	
Link Distance (ft)		506	270		330	
Travel Time (s)		6.3	3.3		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.96	0.96
Heavy Vehicles (%)	0%	0%	2%	0%	0%	5%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						

Area Type: Control Type: Unsignalized Other
### Lanes, Volumes, Timings 2: Route 9 & Flagg Road

	٦	-	-	•	1	~
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			<b>4†</b> \$			1
Volume (vph)	0	0	2555	16	0	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	16	16	16
Storage Length (ft)	0			650	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5250	0	0	1757
Flt Permitted						
Satd. Flow (perm)	0	0	5250	0	0	1757
Link Speed (mph)		55	55		30	
Link Distance (ft)		270	964		662	
Travel Time (s)		3.3	12.0		15.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Heavy Vehicles (%) Shared Lane Traffic (%)	0%	0%	2%	0%	0%	6%
Sign Control		Free	Free		Stop	
Intersection Summarv						

Area Type:

Other Control Type: Unsignalized

	٭	-	-	•	1	-	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations			<u>ተተ</u> ኈ			1	
Volume (veh/h)	0	0	2555	16	0	92	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75	
Hourly flow rate (vph)	0	0	2777	17	0	123	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)		News	News				
Median type		None	None				
Wedian Storage Ven)							
upstream signal (it)							
$\mu$ X, platoon unblocked	רדרנ				2706	024	
vC, connicting volume	2111				2700	734	
vC1, stage 1 conf vol							
vCu_unblocked vol	2777				2786	934	
tC single (s)	4 1				6.8	7.0	
tC. 2 stage (s)					0.0		
tF (s)	2.2				3.5	3.4	
p0 queue free %	100				100	53	
cM capacity (veh/h)	144				15	260	
Direction, Lane #	WB 1	WB 2	WB 3	SB 1			
Volume Total	1111	1111	573	123			
Volume Left	0	0	0	0			
Volume Right	0	0	17	123			
cSH	1700	1700	1700	260			
Volume to Capacity	0.65	0.65	0.34	0.47			
Queue Length 95th (ft)	0	0	0	59			
Control Delay (s)	0.0	0.0	0.0	30.7			
Lane LOS	- ·			D			
Approach Delay (s)	0.0			30.7			
Approach LOS				D			
Intersection Summary							
Average Delay			1.3				_
Intersection Capacity Utili	zation		62.1%	IC	CU Level o	of Service	В
Analysis Period (min)			15				

### Lanes, Volumes, Timings 3: Crystal Pond Road & Route 9

		-	$\rightarrow$	⋤	-	-	- 1	1	
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR	
Lane Configurations	9	<b>^</b>	1		24	<b>^</b>	ሻሻ	1	1
Volume (vph)	130	2576	10	50	70	2648	15	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	J
Lane Width (ft)	13	13	13	12	13	13	12	16	,
Storage Length (ft)	400		400		500		0	140	J
Storage Lanes	1		1		1		2	1	
Taper Length (ft)	25				25		25		
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	0.95	0.97	1.00	J
Frt			0.850					0.850	ļ
Flt Protected	0.950				0.950		0.950		
Satd. Flow (prot)	1829	3657	1636	0	1829	3657	3433	1794	
Flt Permitted	0.950				0.950		0.950		
Satd. Flow (perm)	1829	3657	1636	0	1829	3657	3433	1794	
Right Turn on Red			Yes					Yes	
Satd. Flow (RTOR)			8					5	
Link Speed (mph)		30				30	30		
Link Distance (ft)		981				900	578		
Travel Time (s)		22.3				20.5	13.1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Shared Lane Traffic (%)									
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot	
Protected Phases	5	2		1	1	6	7	7	
Permitted Phases			2						
Detector Phase	5	2	2	1	1	6	7	7	
Switch Phase									
Minimum Initial (s)	6.0	15.0	15.0	6.0	6.0	15.0	8.0	8.0	ļ
Minimum Split (s)	11.0	22.5	22.5	11.0	11.0	22.5	13.0	13.0	ļ
Total Split (s)	23.0	92.0	92.0	23.0	23.0	92.0	25.0	25.0	ļ
Total Split (%)	16.4%	65.7%	65.7%	16.4%	16.4%	65.7%	17.9%	17.9%	,
Maximum Green (s)	18.0	84.5	84.5	18.0	18.0	84.5	20.0	20.0	J
Yellow Time (s)	4.0	5.5	5.5	4.0	4.0	5.5	4.0	4.0	J
All-Red Time (s)	1.0	2.0	2.0	1.0	1.0	2.0	1.0	1.0	J
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	J
Total Lost Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	ļ
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	,
Recall Mode	None	Min	Min	None	None	Min	None	None	!

Intersection Summary

Area Type: Other Cycle Length: 140 Actuated Cycle Length: 119 Natural Cycle: 150 Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Crystal Pond Road & Route 9



#### Queues 3: Crystal Pond Road & Route 9

	⋬	-	$\mathbf{r}$	•	-	1	1
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	141	2800	11	130	2878	16	5
v/c Ratio	0.66	1.06	0.01	0.63	1.10	0.07	0.04
Control Delay	66.0	56.8	4.5	65.2	71.6	56.5	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.0	56.8	4.5	65.2	71.6	56.5	33.6
Queue Length 50th (ft)	110	~1371	1	102	~1448	6	0
Queue Length 95th (ft)	182	#1567	7	168	#1635	19	14
Internal Link Dist (ft)		901			820	498	
Turn Bay Length (ft)	400		400	500			140
Base Capacity (vph)	278	2631	1179	278	2614	581	307
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	1.06	0.01	0.47	1.10	0.03	0.02

Intersection Summary

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.

### HCM Signalized Intersection Capacity Analysis 3: Crystal Pond Road & Route 9

	≤	-	$\rightarrow$	F	4	-	1	1	
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR	
Lane Configurations	Ð	<b>^</b>	1		ă.	<b>^</b>	ሻሻ	1	
Volume (vph)	130	2576	10	50	70	2648	15	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	13	13	13	12	13	13	12	16	
Total Lost time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95	0.97	1.00	
Frt	1.00	1.00	0.85		1.00	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1829	3657	1636		1829	3657	3433	1794	
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1829	3657	1636		1829	3657	3433	1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	141	2800	11	54	76	2878	16	5	
RTOR Reduction (vph)	0	0	2	0	0	0	0	5	
Lane Group Flow (vph)	141	2800	9	0	130	2878	16	0	
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot	
Protected Phases	5	2		1	1	6	7	7	
Permitted Phases			2						
Actuated Green, G (s)	14.0	85.6	85.6		13.5	85.1	4.5	4.5	
Effective Green, g (s)	14.0	85.6	85.6		13.5	85.1	4.5	4.5	
Actuated g/C Ratio	0.12	0.71	0.71		0.11	0.70	0.04	0.04	
Clearance Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	211	2584	1156		203	2569	127	66	
v/s Ratio Prot	c0.08	0.77			0.07	c0.79	c0.00	0.00	
v/s Ratio Perm			0.01						
v/c Ratio	0.67	1.08	0.01		0.64	1.12	0.13	0.00	
Uniform Delay, d1	51.3	17.8	5.2		51.5	18.0	56.4	56.1	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.8	45.1	0.0		6.7	60.0	0.4	0.0	
Delay (s)	59.1	62.9	5.2		58.2	78.0	56.8	56.2	
Level of Service	E	E	А		E	E	E	E	
Approach Delay (s)		62.5				77.2	56.7		
Approach LOS		E				E	E		
Intersection Summary									
HCM 2000 Control Delay			69.8	H	CM 2000	Level of S	Service		E
HCM 2000 Volume to Capacit	y ratio		1.02						
Actuated Cycle Length (s)			121.1	Si	um of lost	t time (s)			17.5
Intersection Capacity Utilization	n		101.6%	IC	CU Level o	of Service	:		G
Analysis Period (min)			15						

c Critical Lane Group

# Lanes, Volumes, Timings 5: Flagg Road & Blackthorn Drive

	≯	$\mathbf{r}$	1	<b>†</b>	Ļ	1
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	- Y			୍ କ	4î	
Volume (vph)	17	4	7	25	64	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.975				0.988	
Flt Protected	0.961			0.989		
Satd. Flow (prot)	1811	0	0	1661	1815	0
Flt Permitted	0.961			0.989		
Satd. Flow (perm)	1811	0	0	1661	1815	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	239			662	334	
Travel Time (s)	5.4			15.0	7.6	
Peak Hour Factor	0.66	0.66	0.57	0.57	0.63	0.63
Heavy Vehicles (%)	6%	0%	29%	4%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						

	∕	$\rightarrow$	1	<b>†</b>	Ŧ	-		
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	¥			र्भ	4Î			
Volume (veh/h)	17	4	7	25	64	6		
Sign Control	Stop			Free	Free			
Grade	0%			0%	0%			
Peak Hour Factor	0.66	0.66	0.57	0.57	0.63	0.63		
Hourly flow rate (vph)	26	6	12	44	102	10		
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	175	106	111					
vC1, stage 1 conf vol								
vC2, stage 2 conf vol	475	10/						
vCu, unblocked vol	1/5	106	111					
tC, single (s)	6.5	6.2	4.4					
IC, 2 stage (s)	27	2.2	ЭΓ					
IF (S)	3.0 07	3.3	2.5					
pu queue nee %	97 700	99	99 1007					
	/90	903	1327					
Direction, Lane #	EB 1	NB 1	SB 1					
Volume Lotal	32	56	111					
Volume Leit	26	12	10					
	0	1227	1700					
CSH Volumo to Consoitu	824	1327	1/00					
Oucus Longth Of the (ft)	0.04 2	0.01	0.07					
Control Dolay (s)	د ۵ ج	1 1 9						
Lano LOS	۲.U ۸	۱.0 ۸	0.0					
Lane LUS Approach Dolay (s)	н 0 Б	А 1 9	0.0					
Approach LOS	9.0 Δ	1.0	0.0					
	А							
Intersection Summary								
Average Delay	rotion		2.U	17		of Condoo	۸	
Analysis Doriod (min)	เลแบบ		۱/.4% ۱۲	IC	O Level (	I Selvice	A	
Analysis Penou (IIIII)			10					

## Lanes, Volumes, Timings 6: Deerfoot Road & Main Street

	-	$\mathbf{r}$	•	-	1	1
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	ef 👘			स	Y	
Volume (vph)	532	83	53	247	51	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	14	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.982				0.921	
Flt Protected				0.991	0.980	
Satd. Flow (prot)	1940	0	0	1953	1762	0
Flt Permitted				0.991	0.980	
Satd. Flow (perm)	1940	0	0	1953	1762	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	300			300	353	
Travel Time (s)	6.8			6.8	8.0	
Peak Hour Factor	0.86	0.86	0.71	0.71	0.65	0.65
Heavy Vehicles (%)	3%	0%	2%	3%	0%	1%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						

	-	$\rightarrow$	1	-	1	1	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	¢Î			र्स	Y		
Volume (veh/h)	532	83	53	247	51	71	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.86	0.86	0.71	0.71	0.65	0.65	
Hourly flow rate (vph)	619	97	75	348	78	109	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage ven)							
Upstream signal (II)							
pX, platoon unblocked			710		11/1	//7	
vC, conflicting volume			/15		1104	00/	
VC1, Stage 1 CONT VOI							
VCZ, Staye Z CUTI VUI			715		1164	667	
tC single (s)			/15		6/	62	
$tC_2 \text{ stane}(s)$			7.1		0.4	0.2	
tF (s)			22		35	33	
p0 queue free %			92		60	76	
cM capacity (veh/h)			885		199	461	
Direction Lane #	FR 1	WR 1	NR 1				
Volume Total	715	423	188				
Volume Left	, .0	75	78				
Volume Right	97	0	109				
cSH	1700	885	297				
Volume to Capacity	0.42	0.08	0.63				
Queue Length 95th (ft)	0	7	100				
Control Delay (s)	0.0	2.5	35.8				
Lane LOS		А	Е				
Approach Delay (s)	0.0	2.5	35.8				
Approach LOS			E				
Intersection Summary							
Average Delay			5.9				
Intersection Capacity Utiliza	ation		66.2%	IC	CU Level o	of Service	С
Analysis Period (min)			15				

## Lanes, Volumes, Timings 1: Route 9 & Park Central Drive

	≯	-	+	•	1	-
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			<u>^</u>	1		1
Volume (vph)	0	0	2980	12	0	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	13	16	16
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	1.00
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	0	3657	1636	0	1808
Flt Permitted						
Satd. Flow (perm)	0	0	3657	1636	0	1808
Link Speed (mph)		55	55		30	
Link Distance (ft)		506	270		330	
Travel Time (s)		6.3	3.3		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.78	0.78
Heavy Vehicles (%)	0%	0%	2%	2%	0%	3%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						

	٠	-	+	•	1	-	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations			<b>^</b>	1		1	
Volume (veh/h)	0	0	2980	12	0	152	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.78	0.78	
Hourly flow rate (vph)	0	0	3239	13	0	195	
Lane widin (ii)							
Walking Speed (II/S)							
Percent Diockaye							
Median type		None	None				
Median storage veh)		NULL	NULL				
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	3239				3239	1620	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	3239				3239	1620	
tC, single (s)	4.1				6.8	7.0	
tC, 2 stage (s)							
tF (s)	2.2				3.5	3.3	
p0 queue free %	100				100	0	
civi capacity (ven/h)	94				/	91	
Direction, Lane #	WB 1	WB 2	WB 3	SB 1			
Volume Total	1620	1620	13	195			
Volume Left	0	0	0	0			
Volume Right	0	0	13	195			
CSH Volume to Conceltur	1/00	1/00	1/00	91			
Vulume to Capacity	0.95	0.95	0.01	2.14 420			
Control Dolay (c)		0		43U 672 1			
Lane LOS	0.0	0.0	0.0	023.1 F			
Approach Delay (s)	0.0			623.1			
Approach LOS	0.0			F			
Intersection Summarv							
Average Delay			35.2				
Intersection Capacity Utili	ization		98.5%	IC	U Level o	of Service	F
Analysis Period (min)			15				

### Lanes, Volumes, Timings 2: Route 9 & Flagg Road

	≯	-	-	•	1	4
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			<b>*††</b>			1
Volume (vph)	0	0	2885	47	0	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	16	16	16
Storage Length (ft)	0			650	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.998			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5243	0	0	1791
Flt Permitted						
Satd. Flow (perm)	0	0	5243	0	0	1791
Link Speed (mph)		55	55		30	
Link Distance (ft)		270	964		662	
Travel Time (s)		3.3	12.0		15.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Heavy Vehicles (%)	0%	0%	2%	4%	0%	4%
Shared Lane Traffic (%)		<b>F</b>	E		Char	
Sign Control		Free	Free		Stop	
Intersection Summarv						

Area Type:

Other Control Type: Unsignalized

	≯	-	-	•	×	-	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations			ተተኈ			1	
Volume (veh/h)	0	0	2885	47	0	47	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75	
Hourly flow rate (vph)	0	0	3136	51	0	63	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right lurn liare (ven)		Nono	Nono				
Median storage yeb)		None	None				
Unstroam signal (ft)							
nX nlatoon unblocked							
vC conflicting volume	3136				3161	1071	
vC1_stage 1 conf vol	5150				5101	1071	
vC2, stage 2 conf vol							
vCu, unblocked vol	3136				3161	1071	
tC, single (s)	4.1				6.8	7.0	
tC, 2 stage (s)							
tF (s)	2.2				3.5	3.3	
p0 queue free %	100				100	71	
cM capacity (veh/h)	103				8	213	
Direction, Lane #	WB 1	WB 2	WB 3	SB 1			
Volume Total	1254	1254	678	63			
Volume Left	0	0	0	0			
Volume Right	0	0	51	63			
cSH	1/00	1/00	1/00	213			
Volume to Capacity	0.74	0.74	0.40	0.29			
Queue Length 95th (ft)	0	0	0	29			
Control Delay (S)	0.0	0.0	0.0	۲۵.۵ م			
Lane LUS Approach Dolay (c)	0.0			U 200			
Approach LOS	0.0			20.0 D			
Intersection Summary							
Average Delay			0.6				
Intersection Canacity Utili	zation		66.8%	IC	Ulevel	of Service	С
Analysis Period (min)			15	10			-

### Lanes, Volumes, Timings 3: Crystal Pond Road & Route 9

		-	$\rightarrow$	⋤	-	-	1	1	
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR	
Lane Configurations	a.	- <b>†</b> †	1		2	***	ካካ	1	
Volume (vph)	250	2277	20	30	10	2627	225	30	J
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	J
Lane Width (ft)	13	13	13	12	13	13	12	16	,
Storage Length (ft)	400		400		500		0	140	J
Storage Lanes	1		1		1		2	1	
Taper Length (ft)	25				25		25		
Lane Util. Factor	1.00	0.95	1.00	0.91	1.00	0.91	0.97	1.00	ļ
Frt			0.850					0.850	ļ
Flt Protected	0.950				0.950		0.950		
Satd. Flow (prot)	1829	3657	1636	0	1829	5255	3433	1794	
Flt Permitted	0.950				0.950		0.950		
Satd. Flow (perm)	1829	3657	1636	0	1829	5255	3433	1794	
Right Turn on Red			Yes					Yes	
Satd. Flow (RTOR)			19					33	
Link Speed (mph)		30				30	30		
Link Distance (ft)		981				900	578		
Travel Time (s)		22.3				20.5	13.1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Shared Lane Traffic (%)									
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot	
Protected Phases	5	2		1	1	6	7	7	
Permitted Phases			2						
Detector Phase	5	2	2	1	1	6	7	7	
Switch Phase									
Minimum Initial (s)	6.0	15.0	15.0	6.0	6.0	15.0	8.0	8.0	J
Minimum Split (s)	11.0	22.5	22.5	11.0	11.0	22.5	13.0	13.0	J
Total Split (s)	23.0	92.0	92.0	23.0	23.0	92.0	25.0	25.0	J
Total Split (%)	16.4%	65.7%	65.7%	16.4%	16.4%	65.7%	17.9%	17.9%	,
Maximum Green (s)	18.0	84.5	84.5	18.0	18.0	84.5	20.0	20.0	J
Yellow Time (s)	4.0	5.5	5.5	4.0	4.0	5.5	4.0	4.0	J
All-Red Time (s)	1.0	2.0	2.0	1.0	1.0	2.0	1.0	1.0	ļ
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	ļ
Total Lost Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	J
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	)
Recall Mode	None	Min	Min	None	None	Min	None	None	ļ

Intersection Summary

Area Type:OtherCycle Length: 140Actuated Cycle Length: 134.9Natural Cycle: 100Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Crystal Pond Road & Route 9



#### Queues 3: Crystal Pond Road & Route 9

	≤	-	$\mathbf{r}$	-	-	1	1
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	272	2475	22	44	2855	245	33
v/c Ratio	1.11	0.95	0.02	0.37	0.87	0.65	0.15
Control Delay	144.5	28.7	3.6	69.7	24.7	65.8	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	144.5	28.7	3.6	69.7	24.7	65.8	17.7
Queue Length 50th (ft)	~273	980	1	38	706	107	0
Queue Length 95th (ft)	#471	#1395	11	79	848	153	32
Internal Link Dist (ft)		901			820	498	
Turn Bay Length (ft)	400		400	500			140
Base Capacity (vph)	244	2604	1170	244	3292	508	294
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.95	0.02	0.18	0.87	0.48	0.11

Intersection Summary

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.

### HCM Signalized Intersection Capacity Analysis 3: Crystal Pond Road & Route 9

	₫	-	$\rightarrow$	F	4	-	1	1	
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR	
Lane Configurations	a.	<b>*</b> *	1		2	***	ኘካ	1	
Volume (vph)	250	2277	20	30	10	2627	225	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	13	13	13	12	13	13	12	16	
Total Lost time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00		1.00	0.91	0.97	1.00	
Frt	1.00	1.00	0.85		1.00	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1829	3657	1636		1829	5255	3433	1794	
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1829	3657	1636		1829	5255	3433	1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	272	2475	22	33	11	2855	245	33	
RTOR Reduction (vph)	0	0	6	0	0	0	0	29	
Lane Group Flow (vph)	272	2475	16	0	44	2855	245	4	
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot	
Protected Phases	5	2		1	1	6	7	7	
Permitted Phases			2						
Actuated Green, G (s)	18.0	96.1	96.1		7.5	85.6	14.9	14.9	
Effective Green, g (s)	18.0	96.1	96.1		7.5	85.6	14.9	14.9	
Actuated g/C Ratio	0.13	0.71	0.71		0.06	0.63	0.11	0.11	
Clearance Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	242	2584	1156		100	3307	376	196	
v/s Ratio Prot	c0.15	c0.68			0.02	0.54	c0.07	0.00	
v/s Ratio Perm			0.01						
v/c Ratio	1.12	0.96	0.01		0.44	0.86	0.65	0.02	
Uniform Delay, d1	59.0	18.1	5.9		62.2	20.5	58.1	54.0	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	95.3	9.6	0.0		3.1	2.6	4.0	0.0	
Delay (s)	154.3	27.8	5.9		65.3	23.0	62.1	54.1	
Level of Service	F	С	А		E	С	E	D	
Approach Delay (s)		40.0				23.7	61.1		
Approach LOS		D				С	E		
Intersection Summary									
HCM 2000 Control Delay			33.0	H	CM 2000	Level of S	Service		С
HCM 2000 Volume to Capacit	y ratio		0.96						
Actuated Cycle Length (s)			136.0	Si	um of lost	time (s)			17.5
Intersection Capacity Utilization	n		89.2%	IC	U Level o	of Service	:		E
Analysis Period (min)			15						

c Critical Lane Group

# Lanes, Volumes, Timings 5: Flagg Road & Blackthorn Drive

	٦	$\mathbf{r}$	1	<b>†</b>	.↓	1
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥.			र्च	ef 👘	
Volume (vph)	10	6	7	27	47	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.949				0.977	
Flt Protected	0.970			0.990		
Satd. Flow (prot)	1656	0	0	1762	1681	0
Flt Permitted	0.970			0.990		
Satd. Flow (perm)	1656	0	0	1762	1681	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	239			662	334	
Travel Time (s)	5.4			15.0	7.6	
Peak Hour Factor	0.50	0.50	0.71	0.71	0.75	0.75
Heavy Vehicles (%)	10%	17%	0%	4%	4%	20%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						

	≯	$\mathbf{r}$	1	<b>†</b>	Ļ	<		
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations Volume (veh/h) Sign Control	Y 10 Stop	6	7	₹ 27 Free	47 Free	10		
Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s)	0% 0.50 20	0.50 12	0.71 10	0% 0.71 38	0% 0.75 63	0.75 13		
Percent Blockage Right turn flare (veh) Median type Median storage veh) Upstream signal (ft) pX. platoon unblocked				None	None			
vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol	127	69	76					
vCu, unblocked vol tC, single (s) tC, 2 stage (s)	127 6.5	69 6.4	76 4.1					
tF (s) p0 queue free % cM capacity (veh/h)	3.6 98 843	3.5 99 953	2.2 99 1536					
Direction, Lane #	EB 1	NB 1	SB 1					
Volume Total Volume Left Volume Right cSH Volume to Capacity Queue Length 95th (ft) Control Delay (s) Lane LOS Approach Delay (s) Approach LOS Intersection Summary	32 20 12 881 0.04 3 9.2 A 9.2 A	48 10 0 1536 0.01 0 1.6 A 1.6	76 0 13 1700 0.04 0.0 0.0					
Average Delay Intersection Capacity Utiliza Analysis Period (min)	ation		2.4 17.5% 15	IC	CU Level o	of Service	А	

## Lanes, Volumes, Timings 6: Deerfoot Road & Main Street

	-	$\mathbf{r}$	1	-	1	1
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	f,			स	Y	
Volume (vph)	323	40	53	597	26	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	14	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.985				0.911	
Flt Protected				0.996	0.983	
Satd. Flow (prot)	1961	0	0	1994	1758	0
Flt Permitted				0.996	0.983	
Satd. Flow (perm)	1961	0	0	1994	1758	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	300			300	353	
Travel Time (s)	6.8			6.8	8.0	
Peak Hour Factor	0.86	0.86	0.89	0.89	0.71	0.71
Heavy Vehicles (%)	2%	0%	4%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						

	-	$\rightarrow$	1	+	1	1	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	eî.			र्स	Y		
Volume (veh/h)	323	40	53	597	26	51	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.86	0.86	0.89	0.89	0.71	0.71	
Hourly flow rate (vph)	376	47	60	671	37	72	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)	Niewe			N			
Median type	INONE			None			
Median Storage Ven)							
Dystream signal (it)							
$\mu$ , platoon unblocked			122		1100	300	
vC, connicting volume			422		1107	377	
vC2 stage 2 conf vol							
vCu_unblocked vol			422		1189	399	
tC. single (s)			4.1		6.4	6.2	
tC, 2 stage (s)							
tF (s)			2.2		3.5	3.3	
p0 queue free %			95		82	89	
cM capacity (veh/h)			1126		199	655	
Direction, Lane #	EB 1	WB 1	NB 1				
Volume Total	422	730	108				
Volume Left	0	60	37				
Volume Right	47	0	72				
cSH	1700	1126	369				
Volume to Capacity	0.25	0.05	0.29				
Queue Length 95th (tt)	0	4	30				
Control Delay (s)	0.0	1.4	18.8				
Lane LUS	0.0	A	C 10.0				
Approach LOS	0.0	1.4	18.8				
Approach LUS			C				
Intersection Summary							
Average Delay			2.4				2
Intersection Capacity Utiliz	ation		68.4%	IC	U Level o	of Service	C
Analysis Period (min)			15				

### 2023 No-Build Conditions

## Lanes, Volumes, Timings 1: Route 9 & Park Central Drive

	≯	-	-	•	1	-
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			ተተኈ			1
Volume (vph)	0	0	2741	41	0	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	13	16	16
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.998			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5246	0	0	1774
Flt Permitted						
Satd. Flow (perm)	0	0	5246	0	0	1774
Link Speed (mph)		55	55		30	
Link Distance (ft)		506	270		330	
Travel Time (s)		6.3	3.3		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.96	0.96
Heavy Vehicles (%)	0%	0%	2%	0%	0%	5%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						

	∕	-	-	•	1	-	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations			<u>ተተ</u> ኈ			1	
Volume (veh/h)	0	0	2741	41	0	166	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.96	0.96	
Hourly flow rate (vph)	0	0	2979	45	0	173	
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	2070				2002	1015	
vC, conflicting volume	2979				3002	1015	
VC1, Stage 1 cont vol							
VCZ, Staye Z CUTII VUI	2070				2002	1015	
tC single (s)	2979 // 1				5002 6.8	70	
$tC_1$ single (s) $tC_2$ stare (s)	4.1				0.0	7.0	
tF (s)	22				35	2 2	
n0 queue free %	100				100	25	
cM capacity (veh/h)	119				11	231	
Direction Lane #	WR 1	W/R 2	W/R 3	SR 1			
	1102	1102	6/0	173			
Volume Left	0	0	0+0	0			
Volume Right	0	0	45	173			
cSH	1700	1700	1700	231			
Volume to Capacity	0.70	0.70	0.38	0.75			
Queue Length 95th (ft)	0	0	0	130			
Control Delay (s)	0.0	0.0	0.0	56.2			
Lane LOS				F			
Approach Delay (s)	0.0			56.2			
Approach LOS				F			
Intersection Summary							
Average Delay			3.0				
Intersection Capacity Utili	zation		70.8%	IC	U Level o	of Service	С
Analysis Period (min)			15				

### Lanes, Volumes, Timings 2: Route 9 & Flagg Road

	۶	-	-	•	1	~
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			ተተኈ			1
Volume (vph)	0	0	2866	17	0	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	16	16	16
Storage Length (ft)	0			650	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5250	0	0	1757
Flt Permitted						
Satd. Flow (perm)	0	0	5250	0	0	1757
Link Speed (mph)		55	55		30	
Link Distance (ft)		270	964		662	
Travel Time (s)		3.3	12.0		15.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Heavy Vehicles (%) Shared Lane Traffic (%)	0%	0%	2%	0%	0%	6%
Sign Control		Free	Free		Stop	
Intersection Summary						

Area Type:

Other

Control Type: Unsignalized

	≯	-	-	•	1	-	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations Volume (veh/h) Sign Control	0	0 Free	<b>↑↑</b> 2866 Free	17	0 Stop	<b>ř</b> 96	
Grade		0%	0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75	
Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage Right turn flare (veh)	0	0	3113	10	U	120	
Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked		None	None				
vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol	3115				3124	1048	
vCu, unblocked vol	3115				3124	1048	
tC, single (s) tC, 2 stage (s)	4.1				6.8	7.0	
tF (s)	2.2				3.5	3.4	
p0 queue free %	100				100	41	
cM capacity (veh/h)	105				9	218	
Direction, Lane #	WB 1	WB 2	WB 3	SB 1			
Volume Total	1246	1246	642	128			
Volume Left	0	0	0	0			
	U 1700	U 1700	١٥ 1700	128			
USIT Volumo to Canacity	0.73	0.72	0.38	210			
Oueue Length 95th (ft)	0.75	0.75	0.30	83			
Control Delay (s)	0.0	0.0	0.0	42.7			
Lane LOS	010	010	010	E			
Approach Delay (s) Approach LOS	0.0			42.7 E			
Intersection Summary							
Average Delay Intersection Capacity Utiliz Analysis Period (min)	zation		1.7 68.4% 15	IC	CU Level o	of Service	C

### Lanes, Volumes, Timings 3: Crystal Pond Road & Route 9

Lane Group     EBU     EBT     EBR     WBU     WBL     WBT     NBL     NBR       Lane Configurations     1
Lane Configurations     ↑     ↓
Volume (vph)     130     2934     18     50     79     2934     49     40       Ideal Flow (vphpl)     1900     140
Ideal Flow (vphpl)190019001900190019001900190019001900Lane Width (ft)1313131213131213131216Storage Length (ft)400400500010140140111213131216Storage Lanes111112111111111100100100100100100140100140100140 </td
Lane Width (t)     13     13     13     12     13     13     12     13     13     12     16       Storage Length (ft)     400     400     500     0     140       Storage Lanes     1     1     1     2     1       Taper Length (ft)     25     25     25     25       Lane Util. Factor     1.00     0.95     1.00     0.91     1.00     0.97     1.00       Ft     0.850     0.950     0.950     0.850     0.950     0.850       Stdt. Flow (prot)     1829     3657     1636     0     1829     5255     3433     1794       Right Turn on Red     Yes     0.950     0.950     0.950     0.950     13       Link Distance (ft)     981     30     132     13     143     143       Link Distance (ft)     981     22.3     20.5     13.1     143       Peak Hour Factor     0.92     0.92     0.92     0.92     0.92     0.92     0.92
Storage Length (ft)     400     400     500     0     140       Storage Lanes     1     1     1     2     1       Taper Length (ft)     25     25     25     25       Lane Util. Factor     1.00     0.95     1.00     0.91     1.00     0.97     1.00       Frt     0.850     0.950     0.950     0.950     0.950     0.850       Stdt. Flow (prot)     1829     3657     1636     0     1829     5255     3433     1794       Flt Permitted     0.950 <t< td=""></t<>
Storage Lanes     1     1     1     2     1       Taper Length (ft)     25     25     25     25       Lane Util. Factor     1.00     0.95     1.00     0.91     1.00     0.97     1.00       Frt     0.850     0.950     0.950     0.950     0.950     0.850       Std. Flow (prot)     1829     3657     1636     0     1829     5255     3433     1794       Flt Permitted     0.950     0.950     0.950     0.950     0.950     0.950       Satd. Flow (perm)     1829     3657     1636     0     1829     5255     3433     1794       Right Turn on Red     Yes     Yes     Yes     Yes     Yes     Yes     Yes     Yes     Yes     30     30     11     10     10     11     10     11     11     11     11     11     11     11     11     11     11     11     11     11     11     11     11     11     11
Taper Length (ft)252525Lane Util. Factor1.000.951.000.911.000.971.00Frt0.8500.9500.9500.9500.950Satd. Flow (prot)18293657163601829525534331794Flt Permitted0.9500.9500.9500.9500.9500.950Satd. Flow (perm)18293657163601829525534331794Right Turn on RedYes13Yes3030433Link Speed (mph)30133030433Link Speed (mph)3022.320.513.1900Peak Hour Factor0.920.920.920.920.920.92Shared Lane Traffic (%)2211677Permitted Phases2211677Switch Phase52211677Switch Phase52211677Switch Phase11.022.523.092.023.023.023.03.03.0Minimum Split (s)11.022.522.511.011.022.513.013.0Total Split (%)16.4%65.7%65.7%16.4%16.4%65.7%17.9%17.9%Maximum Green (s)18.084.584.518.018.084.5<
Lane Util. Factor     1.00     0.95     1.00     0.91     1.00     0.97     1.00       Frt     0.850     0.950     0.950     0.950     0.950     0.850       Satd. Flow (prot)     1829     3657     1636     0     1829     5255     3433     1794       Flt Permitted     0.950     0.950     0.950     0.950     0.950     0.950       Satd. Flow (perm)     1829     3657     1636     0     1829     5255     3433     1794       Right Turn on Red     Yes     0.950     0.950     Yes
Frt   0.850   0.950   0.950     Satd. Flow (prot)   1829   3657   1636   0   1829   5255   3433   1794     Flt Permitted   0.950   0.950   0.950   0.950   0.950   0.950     Satd. Flow (perm)   1829   3657   1636   0   1829   5255   3433   1794     Right Turn on Red   Yes   0.950   1829   5255   3433   1794     Right Turn on Red   Yes   13   1829   5255   3433   1794     Link Speed (mph)   30   13   1829   5255   3433   1794     Link Speed (mph)   30   13   13   1636   1637   17   17   131
Fit Protected   0.950   0.950   0.950     Satd. Flow (prot)   1829   3657   1636   0   1829   5255   3433   1794     Fit Permitted   0.950   0.950   0.950   0.950   0.950   1636   0   1829   5255   3433   1794     Right Turn on Red   Yes   13   1525   3433   1794     Right Turn on Red   Yes   30   30   1636   1829   5255   3433   1794     Link Speed (mph)   30   13   1636   0   1829   5255   3433   1794     Link Speed (mph)   30   13   13   1636   1829   5255   3433   1794     Link Speed (mph)   30   13   13   16   17   43     Link Distance (ft)   981   22.3   20.5   13.1   110   11.1   11.1   11.1   11.1   11.1   11.1   11.1   11.1   11.1   11.1   11.1   11.1   11.1   11.1   11.1   11.1   11.1   11.1   11.1
Satd. Flow (prot)     1829     3657     1636     0     1829     5255     3433     1794       Fit Permitted     0.950     0.950     0.950     0.950     0.950     1794       Right Turn on Red     Yes     13     1829     5255     3433     1794       Right Turn on Red     Yes     13     1829     5255     3433     1794       Link Speed (mph)     30     13     1829     5255     3433     1794       Link Speed (mph)     30     13     1829     5255     3433     1794       Link Speed (mph)     30     13     1829     5255     3433     1794       Link Speed (mph)     30     13     1794     43     43     1794       Link Speed (mph)     20.3     20.3     30     30     163     163     163     163     163     163     179       Fravel Time (s)     2.2.3     2.0.92     0.92     0.92     0.92     0.92     0.92     0.92     0.92     0.92<
Fit Permitted     0.950     0.950       Satd. Flow (perm)     1829     3657     1636     0     1829     5255     3433     1794       Right Turn on Red     Yes     13     Yes     Yes     Yes       Satd. Flow (RTOR)     13     30     30     30     13       Link Speed (mph)     30     22.3     20.5     13.1     100       Peak Hour Factor     0.92 </td
Satd. Flow (perm)   1829   3657   1636   0   1829   5255   3433   1794     Right Turn on Red   Yes   13   Yes   43     Link Speed (mph)   30   30   30   30   43     Link Distance (ft)   981   900   578   43     Travel Time (s)   22.3   20.5   13.1   902     Peak Hour Factor   0.92   0.92   0.92   0.92   0.92   0.92     Shared Lane Traffic (%)   7   7   7   7   7   7     Protected Phases   5   2   1   1   6   7   7     Permitted Phases   5   2   2   1   1   6   7   7     Switch Phase   5   2   2   1   1   6   7   7     Switch Phase   5   2   2   1   1   6   7   7     Switch Phase   5   2   2   1   1   6   7   7     Switch Phase   5
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
Link Speed (mph)   30   30   30     Link Distance (ft)   981   900   578     Travel Time (s)   22.3   20.5   13.1     Peak Hour Factor   0.92   0.92   0.92   0.92   0.92   0.92     Shared Lane Traffic (%)            Turn Type   Prot   NA   Perm   Prot   NA   Prot   Prot   NA   Prot     Protected Phases   5   2   1   1   6   7   7     Permitted Phases   5   2   2   1   1   6   7   7     Switch Phase   5   2   2   1   1   6   7   7     Switch Phase   5   2   2.5   11.0   11.0   8.0   8.0     Minimum Initial (s)   6.0   15.0   15.0   6.0   6.0   15.0   13.0   13.0     Total Split (s)   11.0   22.5   22.5   11.0   11.0   22.5   25.0   25.0
Link Distance (ft)981900578Travel Time (s)22.320.513.1Peak Hour Factor0.920.920.920.920.920.92Shared Lane Traffic (%)PermProtNAPermTurn TypeProtNAPermProtNAProtProtProtected Phases5211677Permitted Phases52211677Switch Phase52211677Switch Phase522.511.011.022.513.013.0Minimum Initial (s)6.015.015.06.06.015.08.08.0Minimum Split (s)11.022.522.511.011.022.513.013.0Total Split (%)16.4%65.7%65.7%16.4%16.4%65.7%17.9%17.9%Maximum Green (s)18.084.584.518.018.084.520.020.0Yellow Time (s)4.05.55.54.04.05.54.04.0
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
Peak Hour Factor0.920.9
Shared Lane Traffic (%)   Prot   NA   Perm   Prot   Prot   NA   Prot   Prot   NA   Prot   Prot   NA   Prot
Turn TypeProtNAPermProtProtNAProtProtProtected Phases5211677Permitted Phases2211677Detector Phase52211677Switch Phase
Protected Phases     5     2     1     1     6     7     7       Permitted Phases     2     2     1     1     6     7     7       Detector Phase     5     2     2     1     1     6     7     7       Switch Phase     5     2     2     1     1     6     7     7       Minimum Initial (s)     6.0     15.0     15.0     6.0     6.0     15.0     8.0     8.0       Minimum Split (s)     11.0     22.5     22.5     11.0     11.0     22.5     13.0     13.0       Total Split (s)     23.0     92.0     92.0     23.0     92.0     25.0     25.0       Total Split (%)     16.4%     65.7%     65.7%     16.4%     16.4%     65.7%     17.9%     17.9%       Maximum Green (s)     18.0     84.5     84.5     18.0     18.0     84.5     20.0     20.0       Yellow Time (s)     4.0     5.5     5.5     4.0     4
Permitted Phases2Detector Phase52211677Switch Phase15.015.06.06.015.08.08.0Minimum Initial (s)6.015.015.06.06.015.08.08.0Minimum Split (s)11.022.522.511.011.022.513.013.0Total Split (s)23.092.092.023.023.092.025.025.0Total Split (%)16.4%65.7%65.7%16.4%16.4%65.7%17.9%17.9%Maximum Green (s)18.084.584.518.018.084.520.020.0Yellow Time (s)4.05.55.54.04.05.54.04.0
Detector Phase52211677Switch PhaseMinimum Initial (s)6.015.015.06.06.015.08.08.0Minimum Split (s)11.022.522.511.011.022.513.013.0Total Split (s)23.092.092.023.023.092.025.025.0Total Split (%)16.4%65.7%65.7%16.4%16.4%65.7%17.9%17.9%Maximum Green (s)18.084.584.518.018.084.520.020.0Yellow Time (s)4.05.55.54.04.05.54.04.0
Switch PhaseMinimum Initial (s)6.015.015.06.06.015.08.0Minimum Split (s)11.022.522.511.011.022.513.013.0Total Split (s)23.092.092.023.023.092.025.025.0Total Split (%)16.4%65.7%65.7%16.4%16.4%65.7%17.9%17.9%Maximum Green (s)18.084.584.518.018.084.520.020.0Yellow Time (s)4.05.55.54.04.05.54.04.0
Minimum Initial (s)6.015.015.06.06.015.08.08.0Minimum Split (s)11.022.522.511.011.022.513.013.0Total Split (s)23.092.092.023.023.092.025.025.0Total Split (%)16.4%65.7%65.7%16.4%16.4%65.7%17.9%17.9%Maximum Green (s)18.084.584.518.018.084.520.020.0Yellow Time (s)4.05.55.54.04.05.54.04.0
Minimum Split (s)11.022.522.511.011.022.513.013.0Total Split (s)23.092.092.023.023.092.025.025.0Total Split (%)16.4%65.7%65.7%16.4%16.4%65.7%17.9%17.9%Maximum Green (s)18.084.584.518.018.084.520.020.0Yellow Time (s)4.05.55.54.04.05.54.04.0
Total Split (s)23.092.092.023.023.092.025.025.0Total Split (%)16.4%65.7%65.7%16.4%16.4%65.7%17.9%17.9%Maximum Green (s)18.084.584.518.018.084.520.020.0Yellow Time (s)4.05.55.54.04.05.54.04.0
Total Split (%)16.4%65.7%65.7%16.4%16.4%65.7%17.9%Maximum Green (s)18.084.584.518.018.084.520.020.0Yellow Time (s)4.05.55.54.04.05.54.04.0
Maximum Green (s)18.084.584.518.018.084.520.020.0Yellow Time (s)4.05.55.54.04.05.54.04.0
Yellow Time (s)     4.0     5.5     5.5     4.0     4.0     5.5     4.0     4.0
All-Red Time (s) 1.0 2.0 2.0 1.0 1.0 2.0 1.0 1.0
Lost Time Adjust (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Total Lost Time (s) 5.0 7.5 7.5 5.0 7.5 5.0 5.0
Lead/Lag Lead Lag Lag Lead Lead Lag
Lead-Lag Optimize? Yes Yes Yes Yes Yes Yes
Vehicle Extension (s)     3.0
Recall Mode None Min Min None None Min None None

Intersection Summary

Area Type:OtherCycle Length: 140Actuated Cycle Length: 122Natural Cycle: 150Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Crystal Pond Road & Route 9



#### Queues 3: Crystal Pond Road & Route 9

	\$	-	$\mathbf{r}$	</th <th>-</th> <th>1</th> <th>1</th>	-	1	1
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	141	3189	20	140	3189	53	43
v/c Ratio	0.67	1.25	0.02	0.66	0.87	0.23	0.27
Control Delay	67.8	138.3	4.4	67.7	19.4	58.8	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.8	138.3	4.4	67.7	19.4	58.8	20.4
Queue Length 50th (ft)	110	~1723	2	110	709	21	0
Queue Length 95th (ft)	183	#1935	11	182	880	43	38
Internal Link Dist (ft)		901			820	498	
Turn Bay Length (ft)	400		400	500			140
Base Capacity (vph)	271	2547	1143	271	3658	565	331
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	1.25	0.02	0.52	0.87	0.09	0.13

Intersection Summary

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.

### HCM Signalized Intersection Capacity Analysis 3: Crystal Pond Road & Route 9

	₫	-	$\mathbf{r}$	F	∢	+	•	1	
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR	
Lane Configurations	D	<b>*</b> *	1	-	3	***	ሻሻ	1	
Volume (vph)	130	2934	18	50	79	2934	49	40	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	13	13	13	12	13	13	12	16	
Total Lost time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00		1.00	0.91	0.97	1.00	
Frt	1.00	1.00	0.85		1.00	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1829	3657	1636		1829	5255	3433	1794	
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1829	3657	1636		1829	5255	3433	1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	141	3189	20	54	86	3189	53	43	
RTOR Reduction (vph)	0	0	4	0	0	0	0	41	
Lane Group Flow (vph)	141	3189	16	0	140	3189	53	2	
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot	
Protected Phases	5	2		1	1	6	7	7	
Permitted Phases			2						
Actuated Green, G (s)	14.2	85.0	85.0		14.1	84.9	6.4	6.4	
Effective Green, g (s)	14.2	85.0	85.0		14.1	84.9	6.4	6.4	
Actuated g/C Ratio	0.12	0.69	0.69		0.11	0.69	0.05	0.05	
Clearance Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	211	2527	1130		209	3627	178	93	
v/s Ratio Prot	c0.08	c0.87			0.08	0.61	c0.02	0.00	
v/s Ratio Perm			0.01						
v/c Ratio	0.67	1.26	0.01		0.67	0.88	0.30	0.02	
Uniform Delay, d1	52.1	19.0	5.9		52.2	15.0	56.1	55.3	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.8	121.2	0.0		7.9	2.7	0.9	0.1	
Delay (s)	59.9	140.2	5.9		60.1	17.7	57.1	55.4	
Level of Service	Е	F	А		Е	В	E	E	
Approach Delay (s)		136.0				19.5	56.3		
Approach LOS		F				В	E		
Intersection Summary									
HCM 2000 Control Delay			77.7	H	CM 2000	Level of	Service		E
HCM 2000 Volume to Capacit	y ratio		1.12						
Actuated Cycle Length (s)			123.0	Si	um of lost	time (s)			17.5
Intersection Capacity Utilization	n		109.5%	IC	U Level o	of Service	<del>)</del>		Н
Analysis Period (min)			15						

c Critical Lane Group

# Lanes, Volumes, Timings 5: Flagg Road & Blackthorn Drive

	٦	$\mathbf{r}$	1	<b>†</b>	↓	1
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			<u>स</u>	4Î	
Volume (vph)	17	4	7	26	67	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.975				0.988	
Flt Protected	0.961			0.990		
Satd. Flow (prot)	1811	0	0	1666	1815	0
Flt Permitted	0.961			0.990		
Satd. Flow (perm)	1811	0	0	1666	1815	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	239			662	334	
Travel Time (s)	5.4			15.0	7.6	
Peak Hour Factor	0.66	0.66	0.57	0.57	0.63	0.63
Heavy Vehicles (%)	6%	0%	29%	4%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						

	≯	$\mathbf{r}$	1	<b>†</b>	. ↓	1		
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations Volume (veh/h) Sign Control	۲ 17 Stop	4	7	্ব 26 Free	67 Free	6		
Grade	0%	0//		0%	0%	0 ( )		
Hourly flow rate (vph) Pedestrians Lane Width (ft)	26	0.66	0.57 12	0.57 46	0.63 106	0.83 10		
Walking Speed (ft/s) Percent Blockage Right turn flare (veh)				Nono	None			
Median storage veh) Upstream signal (ft) pX, platoon unblocked				None	NONE			
vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol	181	111	116					
vCu, unblocked vol tC, single (s) tC, 2 stage (s)	181 6.5	111 6.2	116 4.4					
tF (s) p0 queue free % cM capacity (veh/h)	3.6 97 792	3.3 99 948	2.5 99 1321					
Direction, Lane #	EB 1	NB 1	SB 1					
Volume Total Volume Left Volume Right cSH Volume to Capacity Queue Length 95th (ft)	32 26 6 817 0.04 3	58 12 0 1321 0.01 1	116 0 10 1700 0.07 0					
Control Delay (s) Lane LOS Approach Delay (s) Approach LOS	9.6 A 9.6 A	1.7 A 1.7	0.0 0.0					
Intersection Summary Average Delay	otion		2.0			of Convice	 ٨	
Analysis Period (min)	ation		17.4% 15	IC	JU Level (	DT Service	A	

### Lanes, Volumes, Timings 6: Deerfoot Road & Main Street

	-	$\mathbf{F}$	1	-	1	1
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	4			स	Y	
Volume (vph)	560	87	55	258	53	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	14	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.982				0.921	
Flt Protected				0.991	0.980	
Satd. Flow (prot)	1940	0	0	1953	1762	0
Flt Permitted				0.991	0.980	
Satd. Flow (perm)	1940	0	0	1953	1762	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	300			300	353	
Travel Time (s)	6.8			6.8	8.0	
Peak Hour Factor	0.86	0.86	0.71	0.71	0.65	0.65
Heavy Vehicles (%)	3%	0%	2%	3%	0%	1%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						

	-	$\rightarrow$	1	+	1	1	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations Volume (veh/h)	<b>5</b> 60	87	55	258	<b>¥</b> 53	74	
Grade	0%	0.04	0 71	0%	5.0p 0%	0.45	
Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage Right turn flare (veh)	651	101	77	363	82	0.65	
Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked vC, conflicting volume	None		752	None	1220	702	
vC1, stage 1 conf vol vC2, stage 2 conf vol			750		1000	700	
tC, single (s) tC, 2 stage (s)			4.1		6.4	6.2	
tF (s) p0 queue free % cM capacity (veh/h)			2.2 91 857		3.5 55 183	3.3 74 440	
Direction, Lane #	EB 1	WB 1	NB 1				
Volume Total Volume Left	752 0	441 77	195 82				
cSH	101 1700	0 857	114 277				
Volume to Capacity	0.44	0.09	0.71				
Queue Length 95th (ft) Control Delay (s)	0 0.0	7 2.6	122 44.0				
Lane LOS Approach Delay (s) Approach LOS	0.0	A 2.6	E 44.0 E				
Intersection Summary							
Average Delay Intersection Capacity Utiliz Analysis Period (min)	ation		7.0 68.9% 15	IC	CU Level o	of Service	С

## Lanes, Volumes, Timings 1: Route 9 & Park Central Drive

	≯	-	-	•	1	-
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			<b>**</b>			1
Volume (vph)	0	0	3393	12	0	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	13	16	16
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5250	0	0	1808
Flt Permitted						
Satd. Flow (perm)	0	0	5250	0	0	1808
Link Speed (mph)		55	55		30	
Link Distance (ft)		506	270		330	
Travel Time (s)		6.3	3.3		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.78	0.78
Heavy Vehicles (%)	0%	0%	2%	2%	0%	3%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						

	≯	-	-	•	1	-	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations			<u>↑</u> ↑₽			1	
Volume (veh/h)	0	_ 0	3393	12	0	152	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%	0.70	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.78	0.78	
Houriy flow rate (vpn)	0	0	3688	13	0	195	
Pedestrians							
Lane wiulii (ii) Walking Spood (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		None	None				
Median storage veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	3688				3695	1236	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol	0,000				0/05	100/	
vCu, unblocked vol	3688				3695	1236	
tC, single (s)	4.1				6.8	7.0	
tC, Z Staye (S) tF (s)	2.2				35	2 2	
n0 queue free %	100				100	0.5	
cM capacity (veh/h)	62				4	166	
Direction Lane #	WR 1	W/R 2	W/R 3	SR 1			
Volume Total	1475	1475	751	195			
Volume Left	0	0	0	0			
Volume Right	0	0	13	195			
cSH	1700	1700	1700	166			
Volume to Capacity	0.87	0.87	0.44	1.17			
Queue Length 95th (ft)	0	0	0	263			
Control Delay (s)	0.0	0.0	0.0	178.8			
Lane LOS				F			
Approach Delay (s)	0.0			1/8.8			
Approach LOS				F			
Intersection Summary							
Average Delay	zation		8.9			of Convice	D
Analysis Period (min)	ZaliUH		01.9% 15	IC	O Level (	JI SEIVICE	D
maiysis r thuu (min)			10				
### Lanes, Volumes, Timings 2: Route 9 & Flagg Road

	٦	-	←	•	1	1
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			<b>**</b>			1
Volume (vph)	0	0	3289	49	0	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	16	16	16
Storage Length (ft)	0			650	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.998			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5243	0	0	1791
Flt Permitted						
Satd. Flow (perm)	0	0	5243	0	0	1791
Link Speed (mph)		55	55		30	
Link Distance (ft)		270	964		662	
Travel Time (s)		3.3	12.0		15.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Heavy Vehicles (%) Shared Lane Traffic (%)	0%	0%	2%	4%	0%	4%
Sign Control		Free	Free		Stop	
Intersection Summary						

Area Type:

Other Control Type: Unsignalized

	≯	-	+	•	1	-	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations Volume (veh/h) Sign Control	0	0 Free	<b>↑↑</b> 3289 Free	49	0 Stop	<b>ř</b> 49	
Grade Peak Hour Factor	0.92	0% 0.92	0% 0.92	0.92	0% 0.75	0.75	
Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage Right turn flare (veh)	0	0	3575	53	0	65	
Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked	0575	None	None			1010	
vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol	3575				3602	1218	
vCu, unblocked vol tC, single (s)	3575 4.1				3602 6.8	1218 7.0	
tF (s) p0 queue free % cM capacity (yeb/b)	2.2 100 69				3.5 100	3.3 61 170	
Direction Lane #	WB 1	WB 2	WB 3	SB 1	т	170	
Volume Total Volume Left Volume Right cSH Volume to Capacity Queue Length 95th (ft) Control Delay (s) Lane LOS	1430 0 0 1700 0.84 0 0.0	1430 0 1700 0.84 0 0.0	768 0 53 1700 0.45 0 0.0	65 0 65 170 0.39 42 39.0 E			
Approach Delay (s) Approach LOS	0.0			39.0 E			
Intersection Summary Average Delay Intersection Capacity Utiliz Analysis Period (min)	zation		0.7 74.6% 15	IC	CU Level o	of Service	D

#### Lanes, Volumes, Timings 3: Crystal Pond Road & Route 9

	≤	-	$\rightarrow$	F	1	+	1	1
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	a l	- <b>†</b> †	1		2	***	ካካ	1
Volume (vph)	250	2541	56	30	46	2988	244	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	12	13	13	12	16
Storage Length (ft)	400		400		500		0	140
Storage Lanes	1		1		1		2	1
Taper Length (ft)	25				25		25	
Lane Util. Factor	1.00	0.95	1.00	0.91	1.00	0.91	0.97	1.00
Frt			0.850					0.850
Flt Protected	0.950				0.950		0.950	
Satd. Flow (prot)	1829	3657	1636	0	1829	5255	3433	1794
Flt Permitted	0.950				0.950		0.950	
Satd. Flow (perm)	1829	3657	1636	0	1829	5255	3433	1794
Right Turn on Red			Yes					Yes
Satd. Flow (RTOR)			46					53
Link Speed (mph)		30				30	30	
Link Distance (ft)		981				900	578	
Travel Time (s)		22.3				20.5	13.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)								
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot
Protected Phases	5	2		1	1	6	7	7
Permitted Phases			2					
Detector Phase	5	2	2	1	1	6	7	7
Switch Phase								
Minimum Initial (s)	6.0	15.0	15.0	6.0	6.0	15.0	8.0	8.0
Minimum Split (s)	11.0	22.5	22.5	11.0	11.0	22.5	13.0	13.0
Total Split (s)	23.0	92.0	92.0	23.0	23.0	92.0	25.0	25.0
Total Split (%)	16.4%	65.7%	65.7%	16.4%	16.4%	65.7%	17.9%	17.9%
Maximum Green (s)	18.0	84.5	84.5	18.0	18.0	84.5	20.0	20.0
Yellow Time (s)	4.0	5.5	5.5	4.0	4.0	5.5	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	None	Min	None	None

Intersection Summary

Area Type:OtherCycle Length: 140Actuated Cycle Length: 135.7Natural Cycle: 150Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Crystal Pond Road & Route 9



#### Queues 3: Crystal Pond Road & Route 9

	₫	-	$\mathbf{r}$	4	-	1	1
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	272	2762	61	83	3248	265	53
v/c Ratio	1.12	1.13	0.05	0.54	0.99	0.67	0.21
Control Delay	147.2	86.0	3.8	72.3	39.5	66.3	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	147.2	86.0	3.8	72.3	39.5	66.3	15.3
Queue Length 50th (ft)	~276	~1478	4	71	978	117	0
Queue Length 95th (ft)	#475	#1742	23	127	#1221	164	41
Internal Link Dist (ft)		901			820	498	
Turn Bay Length (ft)	400		400	500			140
Base Capacity (vph)	242	2454	1113	242	3273	506	309
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	1.13	0.05	0.34	0.99	0.52	0.17

Intersection Summary

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.

### HCM Signalized Intersection Capacity Analysis 3: Crystal Pond Road & Route 9

	⊴	-	$\mathbf{r}$	F	4	-	1	1	
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR	
Lane Configurations	£	<b>†</b> †	1		3	***	ሻሻ	1	
Volume (vph)	250	2541	56	30	46	2988	244	49	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	13	13	13	12	13	13	12	16	
Total Lost time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00		1.00	0.91	0.97	1.00	
Frt	1.00	1.00	0.85		1.00	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1829	3657	1636		1829	5255	3433	1794	
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1829	3657	1636		1829	5255	3433	1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	272	2762	61	33	50	3248	265	53	
RTOR Reduction (vph)	0	0	15	0	0	0	0	47	
Lane Group Flow (vph)	272	2762	46	0	83	3248	265	6	
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot	
Protected Phases	5	2		1	1	6	7	7	
Permitted Phases			2						
Actuated Green, G (s)	18.0	91.1	91.1		11.5	84.6	15.6	15.6	
Effective Green, g (s)	18.0	91.1	91.1		11.5	84.6	15.6	15.6	
Actuated g/C Ratio	0.13	0.67	0.67		0.08	0.62	0.11	0.11	
Clearance Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	242	2455	1098		155	3276	394	206	
v/s Ratio Prot	c0.15	c0.76			0.05	0.62	c0.08	0.00	
v/s Ratio Perm			0.03						
v/c Ratio	1.12	1.13	0.04		0.54	0.99	0.67	0.03	
Uniform Delay, d1	58.8	22.3	7.5		59.5	25.2	57.6	53.3	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	95.3	62.2	0.0		3.5	13.7	4.5	0.1	
Delay (s)	154.1	84.5	7.6		63.1	38.9	62.1	53.4	
Level of Service	F	F	А		E	D	E	D	
Approach Delay (s)		89.1				39.5	60.6		
Approach LOS		F				D	E		
Intersection Summary									
HCM 2000 Control Delay			63.3	H	CM 2000	Level of	Service		E
HCM 2000 Volume to Capaci	ty ratio		1.09						
Actuated Cycle Length (s)	-		135.7	Si	um of lost	time (s)			17.5
Intersection Capacity Utilization	on		96.8%	IC	U Level o	of Service	,		F
Analysis Period (min)			15						

c Critical Lane Group

## Lanes, Volumes, Timings 5: Flagg Road & Blackthorn Drive

	٦	$\mathbf{r}$	1	<b>†</b>	.↓	1
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥.			स	eî 👘	
Volume (vph)	10	6	7	28	49	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.949				0.977	
Flt Protected	0.970			0.990		
Satd. Flow (prot)	1656	0	0	1762	1682	0
Flt Permitted	0.970			0.990		
Satd. Flow (perm)	1656	0	0	1762	1682	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	239			662	334	
Travel Time (s)	5.4			15.0	7.6	
Peak Hour Factor	0.50	0.50	0.71	0.71	0.75	0.75
Heavy Vehicles (%)	10%	17%	0%	4%	4%	20%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						

	≯	$\rightarrow$	1	<b>†</b>	Ŧ	1		
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations Volume (veh/h) Sign Control Grade	¥ 10 Stop 0%	6	7	<b>4</b> 28 Free 0%	49 Free 0%	10		
Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage	0.50 20	0.50 12	0.71 10	0.71 39	0.75 65	0.75 13		
Right turn flare (veh) Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked vC, conflicting volume	131	72	79	None	None			
vC1, stage 1 conf vol vC2, stage 2 conf vol	101	72	70					
vCu, unblocked vol tC, single (s) tC, 2 stage (s)	6.5	72 6.4	79 4.1					
tF (s) p0 queue free % cM capacity (veh/h)	3.6 98 839	3.5 99 950	2.2 99 1532					
Direction, Lane #	EB 1	NB 1	SB 1					
Volume Total Volume Left Volume Right cSH Volume to Capacity Queue Length 95th (ft) Control Delay (s) Lane LOS Approach Delay (s) Approach LOS	32 20 12 877 0.04 3 9.3 A 9.3 A	49 10 0 1532 0.01 0 1.5 A 1.5	79 0 13 1700 0.05 0 0.0 0.0					
Intersection Summary Average Delay Intersection Capacity Utilize Analysis Period (min)	ation		2.3 17.5% 15	IC	CU Level o	of Service	А	

## Lanes, Volumes, Timings 6: Deerfoot Road & Main Street

	-	$\mathbf{r}$	1	-	1	1
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	ef 👘			स	Y	
Volume (vph)	337	42	55	627	27	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	14	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.985				0.910	
Flt Protected				0.996	0.983	
Satd. Flow (prot)	1961	0	0	1994	1756	0
Flt Permitted				0.996	0.983	
Satd. Flow (perm)	1961	0	0	1994	1756	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	300			300	353	
Travel Time (s)	6.8			6.8	8.0	
Peak Hour Factor	0.86	0.86	0.89	0.89	0.71	0.71
Heavy Vehicles (%)	2%	0%	4%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						

	-	$\rightarrow$	1	+	1	1	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	4			र्स	۰Y		
Volume (veh/h)	337	42	55	627	27	53	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.86	0.86	0.89	0.89	0.71	0.71	
Hourly flow rate (vph)	392	49	62	704	38	75	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)	News			N			
Median type	None			None			
Median storage ven)							
upstream signal (it)							
$\mu$ , $\mu$ aluon unbiockeu			111		1244	116	
vC, connicting volume			441		1244	410	
vC2 stage 2 conf vol							
vCu_unblocked vol			441		1244	416	
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		79	88	
cM capacity (veh/h)			1109		183	641	
Direction, Lane #	EB 1	WB 1	NB 1				
Volume Total	441	766	113				
Volume Left	0	62	38				
Volume Right	49	0	75				
cSH	1700	1109	348				
Volume to Capacity	0.26	0.06	0.32				
Queue Length 95th (tt)	0	4	34				
Control Delay (S)	0.0	1.4	20.2				
Lane LUS	0.0	A 1 /	ل 20.2				
Approach LOS	0.0	1.4	20.2 C				
			C				
Intersection Summary			2.4				
Average Delay	ion		2.0 71 10/	10		of Convioc	C
Analysis Period (min)			1.170	IC.		JI JEI VILE	C
pX, platoon unblocked vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol vCu, unblocked vol tC, single (s) tC, 2 stage (s) tF (s) p0 queue free % cM capacity (veh/h) <u>Direction, Lane #</u> Volume Total Volume Total Volume Left Volume Right cSH Volume to Capacity Queue Length 95th (ft) Control Delay (s) Lane LOS Approach Delay (s) Approach Delay (s) <u>Approach LOS</u> <u>Intersection Summary</u> Average Delay Intersection Capacity Utilizati Analysis Period (min)	EB 1 441 0 49 1700 0.26 0 0.0 0.0 0.0	WB 1 766 62 0 1109 0.06 4 1.4 A 1.4	441 441 4.1 2.2 94 1109 NB 1 113 38 75 348 0.32 34 20.2 C 20.2 C 20.2 C 20.2 C 20.2 C 20.2 C 20.2 C 20.2 C 20.2 C 20.2 C 20.2 C 2.5 2.6 71.1% 15	IC	1244 1244 6.4 3.5 79 183	416 416 6.2 3.3 88 641	

### 2023 Build Conditions

## Lanes, Volumes, Timings 1: Route 9 & Park Central Drive

	≯	-	-	•	1	-
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			<u>ተተ</u> ጮ			1
Volume (vph)	0	0	2852	94	0	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	13	16	16
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.995			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5232	0	0	1774
Flt Permitted						
Satd. Flow (perm)	0	0	5232	0	0	1774
Link Speed (mph)		55	55		30	
Link Distance (ft)		506	270		330	
Travel Time (s)		6.3	3.3		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.96	0.96
Heavy Vehicles (%)	0%	0%	2%	0%	0%	5%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						

	≯	-	+	•	5	1	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	_	_	<u>↑</u> ↑₽		_	1	
Volume (veh/h)	0	0 5	2852	94	0	199	
Sign Control		Free	Free		Stop		
Glaue Doak Hour Factor	0 02	0%	0%	0 02	0 %	0.06	
Hourly flow rate (vph)	0.72	0.72	3100	102	0.70	207	
Pedestrians	C C	°,	0.00	102	Ū	207	
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (ven)		Nono	Nono				
Median storage veh)		NULLE	NULLE				
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume	3100				3151	1084	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol	2100				2151	1004	
tC single (s)	3100				3151	1084 7 0	
tC, 2 stage (s)	7.1				0.0	7.0	
tF (s)	2.2				3.5	3.3	
p0 queue free %	100				100	0	
cM capacity (veh/h)	107				9	207	
Direction, Lane #	WB 1	WB 2	WB 3	SB 1			
Volume Total	1240	1240	722	207			
Volume Left	0	0	0	0			
Volume Right	0 1700	0	102	207			
CSH Volumo to Canacity	1700 0.73	0.73	0.42	207			
Oueue Length 95th (ft)	0.73	0.73	0.42	221			
Control Delay (s)	0.0	0.0	0.0	110.9			
Lane LOS				F			
Approach Delay (s)	0.0			110.9			
Approach LOS				F			
Intersection Summary							 
Average Delay			6.7				
Intersection Capacity Utiliz	zation		76.2%	IC	U Level o	of Service	
Analysis Period (min)			15				

### Lanes, Volumes, Timings 2: Route 9 & Flagg Road

	٦	-	←	•	1	1
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			<b>**</b>			1
Volume (vph)	0	0	2917	42	0	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	16	16	16
Storage Length (ft)	0			650	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.998			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5246	0	0	1757
Flt Permitted						
Satd. Flow (perm)	0	0	5246	0	0	1757
Link Speed (mph)		55	55		30	
Link Distance (ft)		270	964		320	
Travel Time (s)		3.3	12.0		7.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.80	0.80
Heavy Vehicles (%)	0%	0%	2%	0%	0%	6%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						

Area Type:

Other

Control Type: Unsignalized

-		
Movement EBL EBT WBT WBR SBL	SBR	
Lane Configurations	1	
Volume (veh/h)     0     0     2917     42     0       Cian Control     Free     Free     Stan	209	
Grade 0% 0%		
Peak Hour Factor 0.92 0.92 0.92 0.92 0.80	0.80	
Hourly flow rate (vph) 0 0 3171 46 0	261	
Pedestrians		
Lane Width (ft)		
Walking Speed (fl/s)		
Right turn flare (veh)		
Median type None None		
Median storage veh)		
Upstream signal (ft)		
pX, platoon unblocked	1000	
vCi stage 1 conf vol	1000	
vC2, stage 2 conf vol		
vCu, unblocked vol 3171 3193	1080	
tC, single (s) 4.1 6.8	7.0	
tC, 2 stage (s)	2.4	
IF (5)     2.2     3.3       p0 queue free %     100     100	3.4 0	
cM capacity (veh/h) 100 8	207	
Direction, Lane # WB 1 WB 2 WB 3 SB 1		
Volume Total 1268 1268 680 261		
Volume Left 0 0 0 0		
Volume Right 0 0 46 261		
CSH 1/00 1/00 1/00 20/		
$\begin{array}{cccc} \text{Volume to Capacity} & 0.75 & 0.75 & 0.40 & 1.20 \\ \text{Oucuse Length 95th (ft)} & 0 & 0 & 0 & 346 \\ \end{array}$		
Control Delay (s) 0.0 0.0 0.0 196.7		
Lane LOS F		
Approach Delay (s) 0.0 196.7		
Approach LOS F		
Intersection Summary		
Average Delay 14.8		
Intersection Capacity Utilization /6.9% ICU Level Analysis Period (min) 15	UI SERVICE	e

#### Lanes, Volumes, Timings 3: Crystal Pond Road & Route 9

		-	$\rightarrow$	- ⋤	-	-	1	1
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	Д,	- <b>†</b> †	1		2	***	ካካ	1
Volume (vph)	177	2978	18	50	79	2963	49	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	12	13	13	12	16
Storage Length (ft)	400		400		500		0	140
Storage Lanes	1		1		1		2	1
Taper Length (ft)	25				25		25	
Lane Util. Factor	1.00	0.95	1.00	0.91	1.00	0.91	0.97	1.00
Frt			0.850					0.850
Flt Protected	0.950				0.950		0.950	
Satd. Flow (prot)	1829	3657	1636	0	1829	5255	3433	1794
Flt Permitted	0.950				0.950		0.950	
Satd. Flow (perm)	1829	3657	1636	0	1829	5255	3433	1794
Right Turn on Red			Yes					Yes
Satd. Flow (RTOR)			13					43
Link Speed (mph)		30				30	30	
Link Distance (ft)		981				900	578	
Travel Time (s)		22.3				20.5	13.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)								
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot
Protected Phases	5	2		1	1	6	7	7
Permitted Phases			2					
Detector Phase	5	2	2	1	1	6	7	7
Switch Phase								
Minimum Initial (s)	6.0	15.0	15.0	6.0	6.0	15.0	8.0	8.0
Minimum Split (s)	11.0	22.5	22.5	11.0	11.0	22.5	13.0	13.0
Total Split (s)	23.0	92.0	92.0	23.0	23.0	92.0	25.0	25.0
Total Split (%)	16.4%	65.7%	65.7%	16.4%	16.4%	65.7%	17.9%	17.9%
Maximum Green (s)	18.0	84.5	84.5	18.0	18.0	84.5	20.0	20.0
Yellow Time (s)	4.0	5.5	5.5	4.0	4.0	5.5	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	None	Min	None	None

Intersection Summary

Area Type:OtherCycle Length: 140Actuated Cycle Length: 124.3Natural Cycle: 150Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Crystal Pond Road & Route 9



#### Queues 3: Crystal Pond Road & Route 9

	_	-	$\mathbf{r}$	1	-	1	1
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	192	3237	20	140	3221	53	43
v/c Ratio	0.79	1.26	0.02	0.67	0.90	0.23	0.27
Control Delay	75.4	143.1	4.4	68.9	22.0	59.6	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.4	143.1	4.4	68.9	22.0	59.6	20.5
Queue Length 50th (ft)	155	~1802	2	113	794	22	0
Queue Length 95th (ft)	#267	#1977	11	182	903	43	38
Internal Link Dist (ft)		901			820	498	
Turn Bay Length (ft)	400		400	500			140
Base Capacity (vph)	266	2563	1150	266	3586	554	325
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.26	0.02	0.53	0.90	0.10	0.13

Intersection Summary

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.

### HCM Signalized Intersection Capacity Analysis 3: Crystal Pond Road & Route 9

	₫	-	$\rightarrow$	F	4	-	1	1		
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR		
Lane Configurations	£	<b>^</b>	1		ă.	***	ሻሻ	1		
Volume (vph)	177	2978	18	50	79	2963	49	40		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	13	13	13	12	13	13	12	16		
Total Lost time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0		
Lane Util. Factor	1.00	0.95	1.00		1.00	0.91	0.97	1.00		
Frt	1.00	1.00	0.85		1.00	1.00	1.00	0.85		
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00		
Satd. Flow (prot)	1829	3657	1636		1829	5255	3433	1794		
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00		
Satd. Flow (perm)	1829	3657	1636		1829	5255	3433	1794		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adi, Flow (vph)	192	3237	20	54	86	3221	53	43		
RTOR Reduction (vph)	0	0_0	4	0	0	0	0	41		
Lane Group Flow (vph)	192	3237	16	0	140	3221	53	2		
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot		
Protected Phases	5	2	1 onn	1	1	6	7	7		
Permitted Phases	U	-	2	•		Ũ				
Actuated Green, G (s)	16.6	87.1	87.1		14.3	84.8	6.4	6.4		
Effective Green, g (s)	16.6	87.1	87.1		14.3	84.8	6.4	6.4		
Actuated g/C Ratio	0.13	0.70	0.70		0.11	0.68	0.05	0.05		
Clearance Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0		
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		
Lane Grn Can (vnh)	242	2542	1137		208	3556	175	91		
v/s Ratio Prot	c0 10	c0 89	1107		0.08	0.61	c0.02	0.00		
v/s Ratio Perm	00.10	00.07	0.01		0.00	0.01	00.02	0.00		
v/c Ratio	0 79	1 27	0.01		0.67	0.91	0.30	0.02		
Uniform Delay d1	527	19 1	59		53.3	16.9	57.3	56.5		
Progression Factor	1 00	1 00	1 00		1 00	1 00	1 00	1 00		
Incremental Delay d2	16.2	126.2	0.0		8.3	3.8	10	0.1		
Delay (s)	68.9	145.3	59		61.6	20.7	58.3	56.6		
Level of Service	F	F	A		F	С	F	F		
Approach Delay (s)	E	140.3			L	22.4	57.5	L		
Approach LOS		F				С	E			
Intersection Summary										
HCM 2000 Control Delay			81.7	Н	CM 2000	Level of S	Service		F	
HCM 2000 Volume to Capaci	ty ratio		1.17							
Actuated Cycle Length (s)	2		125.3	Si	um of lost	time (s)			17.5	
Intersection Capacity Utilizati	on		110.7%	IC	U Level o	of Service	<del>)</del>		Н	
Analysis Period (min)			15							
c Critical Lane Group										

## Lanes, Volumes, Timings 4: Flagg Road & Access Road

	٦	$\mathbf{r}$	1	<b>†</b>	Ŧ	1
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	. Y			स	eî 👘	
Volume (vph)	20	111	25	17	98	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.886				0.993	
Flt Protected	0.992			0.971		
Satd. Flow (prot)	1637	0	0	1735	1724	0
Flt Permitted	0.992			0.971		
Satd. Flow (perm)	1637	0	0	1735	1724	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	217			320	342	
Travel Time (s)	4.9			7.3	7.8	
Peak Hour Factor	0.92	0.92	0.57	0.57	0.75	0.75
Heavy Vehicles (%)	2%	2%	2%	4%	6%	2%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						

	≯	$\rightarrow$	1	<b>†</b>	Ŧ	<		
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations Volume (veh/h) Sign Control	20 Stop	111	25	4 17 Free	<b>%</b> 98 Free 0%	5		
Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage	0.92 22	0.92 121	0.57 44	0% 0.57 30	0.75 131	0.75 7		
Right turn flare (veh) Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked	252	13/	137	None	None			
vC1, stage 1 conf vol vC2, stage 2 conf vol	232	134	137					
vCu, unblocked vol tC, single (s) tC. 2 stage (s)	252 6.4	134 6.2	137 4.1					
tF (s) p0 queue free % cM capacity (veh/h)	3.5 97 715	3.3 87 915	2.2 97 1447					
Direction, Lane #	EB 1	NB 1	SB 1					
Volume Total Volume Left Volume Right cSH Volume to Capacity Queue Length 95th (ft) Control Delay (s) Lane LOS Approach Delay (s) Approach LOS Intersection Summary	142 22 121 877 0.16 14 9.9 A 9.9 A	74 44 0 1447 0.03 2 4.6 A 4.6	137 0 7 1700 0.08 0 0.0 0.0					
Average Delay Intersection Capacity Utiliza Analysis Period (min)	tion		4.9 23.6% 15	IC	CU Level d	of Service	А	

	٦	$\mathbf{r}$	1	<b>†</b>	↓	1
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			र्भ	ef 👘	
Volume (vph)	17	4	7	46	74	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.975				0.989	
Flt Protected	0.961			0.994		
Satd. Flow (prot)	1811	0	0	1703	1816	0
Flt Permitted	0.961			0.994		
Satd. Flow (perm)	1811	0	0	1703	1816	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	239			342	334	
Travel Time (s)	5.4			7.8	7.6	
Peak Hour Factor	0.66	0.66	0.57	0.57	0.63	0.63
Heavy Vehicles (%)	6%	0%	29%	4%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						

	∕	$\mathbf{i}$	1	<b>†</b>	Ŧ	-		
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations Volume (veh/h)	<b>¥</b> 17	4	7	<b>दी</b> 46	<b>₽</b> 74	6		
Sign Control Grade	Stop 0%			Free 0%	Free 0%			
Peak Hour Factor	0.66	0.66	0.57	0.57	0.63	0.63		
Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage Right turn flare (veh)	26	6	12	81	117	10		
Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked				None	None			
vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol	227	122	127					
vCu, unblocked vol	227	122	127					
tC, single (s) tC, 2 stage (s)	6.5	6.2	4.4					
tF (s)	3.6	3.3	2.5					
p0 queue free %	97	99	99					
cM capacity (veh/h)	745	934	1308					
Direction, Lane #	EB 1	NB 1	SB 1					
Volume Total	32	93	127					
Volume Left	26	12	0					
Volume Right	6	0	1700					
CSH Volume te Conseitu	1/5	1308	1/00					
Volume to Capacity	0.04 2	0.01	0.07					
Control Dolay (c)	3 0 0	 1 1						
Lang LOS	7.ð ^	1.1 A	0.0					
Lane LUS	A 0 0	A 1 1	0.0					
Approach LOS	9.8 A	1.1	0.0					
Intersection Summary								
Average Delay Intersection Capacity Utiliz Analysis Period (min)	ation		1.6 18.3% 15	IC	CU Level o	of Service	А	

# Lanes, Volumes, Timings 6: Deerfoot Road & Main Street

	-	$\mathbf{i}$	1	+	1	1
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	4			स	- Y	
Volume (vph)	560	88	61	258	55	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	14	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.982				0.916	
Flt Protected				0.991	0.982	
Satd. Flow (prot)	1940	0	0	1954	1755	0
Flt Permitted				0.991	0.982	
Satd. Flow (perm)	1940	0	0	1954	1755	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	300			300	353	
Travel Time (s)	6.8			6.8	8.0	
Peak Hour Factor	0.86	0.86	0.71	0.71	0.65	0.65
Heavy Vehicles (%)	3%	0%	2%	3%	0%	1%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						

Area Type: Control Type: Unsignalized

Other

	-	$\rightarrow$	-	-	1	1	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	eî.			<del>ب</del> ا	Y		
Volume (veh/h)	560	88	61	258	55	92	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.86	0.86	0.71	0.71	0.65	0.65	
Hourly flow rate (vph)	651	102	86	363	85	142	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (ven)	Mana			Nono			
Median type	None			None			
lueuran storage ven)							
ny platoon unblockod							
VC conflicting volume			753		1238	702	
vC1_stage 1 conf vol			755		1250	102	
vC2_stage 2 conf vol							
vCu, unblocked vol			753		1238	702	
tC, single (s)			4.1		6.4	6.2	
tC, 2 stage (s)							
tF (s)			2.2		3.5	3.3	
p0 queue free %			90		52	68	
cM capacity (veh/h)			857		176	440	
Direction, Lane #	EB 1	WB 1	NB 1				
Volume Total	753	449	226				
Volume Left	0	86	85				
Volume Right	102	0	142				
cSH	1700	857	282				
Volume to Capacity	0.44	0.10	0.80				
Queue Length 95th (tt)	0	8	159				
Control Delay (s)	0.0	2.8	54.4				
Lane LUS	0.0	A					
Approach LOS	0.0	۷.۷	54.4 Г				
Approach LUS			F				
Intersection Summary							
Average Delay			9.5			( <b>0</b> )	
Intersection Capacity Utiliz	ation		/0.5%	IC	U Level o	of Service	С
Analysis Period (min)			15				

## Lanes, Volumes, Timings 1: Route 9 & Park Central Drive

	≯	-	+	•	1	-
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			ተተኈ			1
Volume (vph)	0	0	3450	65	0	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	13	16	16
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.997			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5239	0	0	1808
Flt Permitted						
Satd. Flow (perm)	0	0	5239	0	0	1808
Link Speed (mph)		55	55		30	
Link Distance (ft)		506	270		330	
Travel Time (s)		6.3	3.3		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.78	0.78
Heavy Vehicles (%)	0%	0%	2%	2%	0%	3%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						

•	→	-	•	×	-		
EBL	EBT	WBT	WBR	SBL	SBR		
		<u>↑</u> ↑₽			1		
0	0	3450	65	0	204		
	Free	Free		Stop			
	0%	0%		0%			
0.92	0.92	0.92	0.92	0.78	0.78		
0	0	3750	71	0	262		
	Nono	Nono					
	NULLE	NULLE					
3750				3785	1285		
3750				3785	1285		
4.1				6.8	7.0		
2.2				3.5	3.3		
100				100	0		
58				3	154		
WB 1	WB 2	WB 3	SB 1				
1500	1500	821	262				
0	0	0	0				
0	0	71	262				
1/00	1/00	1/00	154				
0.88	0.88	0.48	I./U				
0	0	0	40/ 201 7				
0.0	0.0	0.0	371./ E				
0.0			Г 201 7				
0.0			371.7 F				
			I				
		ን⊑ 1					
ation		20.1 87.4%	IC		of Service		F
		15					L
	EBL 0 0.92 0 3750 3750 4.1 2.2 100 58 WB 1 1500 0 1700 0 8 WB 1 1500 0 0 0 1700 0 0 0 1700 0 0 1700 0 0 3750 4.1 2.2 100 58 0 0 0 3750 4.1 100 58 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	EBL   EBT     0   0     0   0     0   0     0   0     0   0     0   0     0   0     0   0     0   0     0   0     0   0     3750   4.1     2.2   100     100   58     WB 1   WB 2     1500   1500     0   0     0   0     0   0     0   0     0   0     0   0     0   0     0   0     0.00   0.0     0.00   0.0     0.00   0.0     0.00   0.0	EBL     EBT     WBT       0     0     3450       Free     Free     0%       0%     0.92     0.92       0     0     3750       3750     4.1	EBL     EBT     WBT     WBR       0     0     3450     65       Free     Free     0%     0%       0%     0%     0%     0.92       0     0     3750     71       None     None     None     71       3750	EBL     EBT     WBT     WBR     SBL       0     0     3450     65     0       Free     Free     Free     Stop       0%     0%     0%     0%     0%       0.92     0.92     0.92     0.92     0.78       0     0     3750     71     0       3750     3785     3785     3785       3750     3785     6.8     35       3750     3785     6.8     35       3750     3785     35     100     100       58     37     3785     3.5     100     30       0     0     0     0     3     3       WB 1     WB 2     WB 3     SB 1     3       1500     1500     821     262     3       0     0     0     0     3     3       WB 1     WB 2     WB 3     SB 1     5       1000     1500     821     262     <	EBL     EBT     WBT     WBR     SBL     SBR       0     0     3450     65     0     204       Free     Free     Free     Stop     0%     0%     0%       0.92     0.92     0.92     0.92     0.78     0.78     0.78       0     0     3750     71     0     262       None     None     3785     1285       3750     3785     1285     3.5     3.3       100     3     3755     3755     3.5     3.3       100     3     154     56.8     7.0       2.2     3.5     3.3     3.3     100     0     3       1500     1500     821     262     3     154       WB1     WB 2     WB 3     SB 1	EBL     EBT     WBT     WBR     SBL     SBR       0     0     3450     65     0     204       Free     Free     Stop     0%     0%       0%     0%     0%     0%     0%       0.92     0.92     0.92     0.92     0.78     0.78       0     0     3750     71     0     262       None       3750     3785     1285       3750     3785     1285       4.1     6.8     7.0       2.2     3.5     3.3       100     1000     0       58     3154     154       WB1     WB2     WB3     SB1       1500     1500     821     262       0     0     0     154       0.88     0.48     1.70       0     0     467       0.0     391.7     F       0.0     0.0     391.7       0.0 <td< td=""></td<>

### Lanes, Volumes, Timings 2: Route 9 & Flagg Road

	٦	-	+	•	1	~
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			ተተኈ			1
Volume (vph)	0	0	3340	159	0	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	16	16	16
Storage Length (ft)	0			650	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.993			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5213	0	0	1826
Flt Permitted						
Satd. Flow (perm)	0	0	5213	0	0	1826
Link Speed (mph)		55	55		30	
Link Distance (ft)		270	964		320	
Travel Time (s)		3.3	12.0		7.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Heavy Vehicles (%)	0%	0%	2%	4%	0%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						

Area Type:

Control Type: Unsignalized

Other

	∕	-	+	•	×	-	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations			ተተቡ			1	
Volume (veh/h)	0	0	3340	159	0	108	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75	
Hourly flow rate (vph)	0	0	3630	173	0	144	
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	3630				3717	1297	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	3630				3/1/	1297	
tC, single (s)	4.1				6.8	6.9	
tC, 2 stage (s)	0.0				0.5	0.0	
tF (S)	2.2				3.5	3.3	
pu queue free %	100				100	0 150	
civi capacity (ven/n)	65				3	153	
Direction, Lane #	WB 1	WB 2	WB 3	SB 1			
Volume Total	1452	1452	899	144			
Volume Left	0	0	0	0			
Volume Right	0	0	173	144			
cSH	1700	1700	1700	153			
Volume to Capacity	0.85	0.85	0.53	0.94			
Queue Length 95th (ft)	0	0	0	171			
Control Delay (s)	0.0	0.0	0.0	116.7			
Lane LOS				F			
Approach Delay (s)	0.0			116.7			
Approach LOS				F			
Intersection Summary							
Average Delay			4.3				
Intersection Capacity Utiliz	ation		81.4%	IC	U Level	of Service	D
Analysis Period (min)			15				

#### Lanes, Volumes, Timings 3: Crystal Pond Road & Route 9

		-	$\rightarrow$	- ⋤	-	-	1	1
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	Д,	<b>*</b>	1		2	***	ካካ	1
Volume (vph)	328	2570	56	30	46	3071	244	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	12	13	13	12	16
Storage Length (ft)	400		400		500		0	140
Storage Lanes	1		1		1		2	1
Taper Length (ft)	25				25		25	
Lane Util. Factor	1.00	0.95	1.00	0.91	1.00	0.91	0.97	1.00
Frt			0.850					0.850
Flt Protected	0.950				0.950		0.950	
Satd. Flow (prot)	1829	3657	1636	0	1829	5255	3433	1794
Flt Permitted	0.950				0.950		0.950	
Satd. Flow (perm)	1829	3657	1636	0	1829	5255	3433	1794
Right Turn on Red			Yes					Yes
Satd. Flow (RTOR)			46					53
Link Speed (mph)		30				30	30	
Link Distance (ft)		981				900	578	
Travel Time (s)		22.3				20.5	13.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)								
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot
Protected Phases	5	2		1	1	6	7	7
Permitted Phases			2					
Detector Phase	5	2	2	1	1	6	7	7
Switch Phase								
Minimum Initial (s)	6.0	15.0	15.0	6.0	6.0	15.0	8.0	8.0
Minimum Split (s)	11.0	22.5	22.5	11.0	11.0	22.5	13.0	13.0
Total Split (s)	23.0	92.0	92.0	23.0	23.0	92.0	25.0	25.0
Total Split (%)	16.4%	65.7%	65.7%	16.4%	16.4%	65.7%	17.9%	17.9%
Maximum Green (s)	18.0	84.5	84.5	18.0	18.0	84.5	20.0	20.0
Yellow Time (s)	4.0	5.5	5.5	4.0	4.0	5.5	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	Min	None	None	Min	None	None

Intersection Summary

Area Type:OtherCycle Length: 140Actuated Cycle Length: 135.7Natural Cycle: 140Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Crystal Pond Road & Route 9



#### Queues 3: Crystal Pond Road & Route 9

	≤	-	$\mathbf{r}$	•	-	1	1
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	357	2793	61	83	3338	265	53
v/c Ratio	1.48	1.14	0.05	0.54	1.02	0.67	0.21
Control Delay	274.4	91.3	3.8	72.3	46.8	66.3	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	274.4	91.3	3.8	72.3	46.8	66.3	15.3
Queue Length 50th (ft)	~431	~1508	4	71	~1140	117	0
Queue Length 95th (ft)	#655	#1772	23	127	#1282	164	41
Internal Link Dist (ft)		901			820	498	
Turn Bay Length (ft)	400		400	500			140
Base Capacity (vph)	242	2454	1113	242	3273	506	309
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.48	1.14	0.05	0.34	1.02	0.52	0.17

Intersection Summary

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.

### HCM Signalized Intersection Capacity Analysis 3: Crystal Pond Road & Route 9

	₫	-	$\rightarrow$	F	-	-	1	1	
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR	
Lane Configurations	9	<b>*</b> *	1		Ľ.	***	ሻሻ	*	
Volume (vph)	328	2570	56	30	46	3071	244	49	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	13	13	13	12	13	13	12	16	
Total Lost time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00		1.00	0.91	0.97	1.00	
Frt	1.00	1.00	0.85		1.00	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1829	3657	1636		1829	5255	3433	1794	
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1829	3657	1636		1829	5255	3433	1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	357	2793	61	33	50	3338	265	53	
RTOR Reduction (vph)	0	0	15	0	0	0	0	47	
Lane Group Flow (vph)	357	2793	46	0	83	3338	265	6	
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot	
Protected Phases	5	2		1	1	6	7	7	
Permitted Phases			2						
Actuated Green, G (s)	18.0	91.1	91.1		11.5	84.6	15.6	15.6	
Effective Green, a (s)	18.0	91.1	91.1		11.5	84.6	15.6	15.6	
Actuated q/C Ratio	0.13	0.67	0.67		0.08	0.62	0.11	0.11	
Clearance Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	242	2455	1098		155	3276	394	206	
v/s Ratio Prot	c0.20	c0.76			0.05	0.64	c0.08	0.00	
v/s Ratio Perm			0.03						
v/c Ratio	1.48	1.14	0.04		0.54	1.02	0.67	0.03	
Uniform Delay, d1	58.8	22.3	7.5		59.5	25.5	57.6	53.3	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	234.9	67.5	0.0		3.5	20.7	4.5	0.1	
Delay (s)	293.7	89.8	7.6		63.1	46.2	62.1	53.4	
Level of Service	F	F	A		E	D	E	D	
Approach Delay (s)		110.9				46.7	60.6		
Approach LOS		F				D	E		
Intersection Summary									
HCM 2000 Control Delav			77.0	H	CM 2000	Level of S	Service		E
HCM 2000 Volume to Capaci	ty ratio		1.15						
Actuated Cycle Length (s)	,		135.7	Si	um of lost	time (s)			17.5
Intersection Capacity Utilization	on		99.1%	IC	CU Level o	of Service	<u>è</u>		F
Analysis Period (min)			15						

c Critical Lane Group

## Lanes, Volumes, Timings 4: Flagg Road & Access Road

	≯	$\mathbf{r}$	1	<b>†</b>	↓	-
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥.			र्च	ef 👘	
Volume (vph)	13	57	110	49	51	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.890				0.964	
Flt Protected	0.991			0.967		
Satd. Flow (prot)	1643	0	0	1790	1770	0
Flt Permitted	0.991			0.967		
Satd. Flow (perm)	1643	0	0	1790	1770	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	217			320	342	
Travel Time (s)	4.9			7.3	7.8	
Peak Hour Factor	0.92	0.92	0.71	0.71	0.75	0.75
Heavy Vehicles (%)	2%	2%	2%	4%	4%	2%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						

Area Type:

Other Control Type: Unsignalized

	∕	$\rightarrow$	1	<b>†</b>	Ŧ	-			
Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations	¥			र्भ	4Î				
Volume (veh/h)	13	57	110	49	51	19			
Sign Control	Stop			Free	Free				
Grade	0%			0%	0%				
Peak Hour Factor	0.92	0.92	0.71	0.71	0.75	0.75			
Hourly flow rate (vph)	14	62	155	69	68	25			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type				None	None				
Median storage ven)									
Upstream signal (ft)									
pX, platoon unblocked	1/0	01	00						
vC, conflicting volume	460	81	93						
VC1, stage 1 conf vol									
VC2, stage 2 cont vol	1/0	01	00						
VCU, UNDIOCKED VOI	460	81	93 4 1						
tC, Sillyle (S)	0.4	0.2	4.1						
tC, Z Stage (S)	2 5	<b>^ ^ ^</b>	<b>~</b>						
IF (S)	3.0 07	3.3 04	2.2						
cM capacity (yob/b)	97 502	94 070	90 1501						
	502	9/9	1001						
Direction, Lane #	<u>EB 1</u>	NB 1	SB 1						
Volume Lota	/6	224	93						
Volume Leit	14	155	0 25						
	02 000	U 1001	25 1700						
CSH Volume to Consolity	832	1501	1700						
Vuluine to Capacity	0.09	0.10	0.05						
Control Dolay (c)	Ŭ O O	У Б 6							
Lang LOS	9.ð 1	0.C	0.0						
Lane LUS	A 0.0	A E Z	0.0						
Approach LOS	9.ð N	0.0	0.0						
Approachieus	А								
Intersection Summary									
Average Delay			5.1					٨	
Intersection Capacity Utiliz	ation		26.2%	IC	U Level o	of Service		A	
Analysis Period (min)			15						

	٦	$\mathbf{r}$	1	<b>†</b>	.↓	1
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥.			र्च	ef 👘	
Volume (vph)	10	6	7	41	70	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.949				0.983	
Flt Protected	0.970			0.993		
Satd. Flow (prot)	1656	0	0	1764	1704	0
Flt Permitted	0.970			0.993		
Satd. Flow (perm)	1656	0	0	1764	1704	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	239			342	334	
Travel Time (s)	5.4			7.8	7.6	
Peak Hour Factor	0.50	0.50	0.71	0.71	0.75	0.75
Heavy Vehicles (%)	10%	17%	0%	4%	4%	20%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						

	∕	$\rightarrow$	1	<b>†</b>	Ŧ	-		
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	Y			<del>र्</del> ग	eî.			
Volume (veh/h)	10	6	7	41	70	10		
Sign Control	Stop			Free	Free			
Grade	0%			0%	0%			
Peak Hour Factor	0.50	0.50	0.71	0.71	0.75	0.75		
Hourly flow rate (vph)	20	12	10	58	93	13		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)				News	News			
Median type				None	None			
Median Storage Ven)								
upstream signal (it)								
$\mu$ X, platoon unblocked	177	100	107					
vC, connicting volume	1/7	100	107					
VC1, Stage 1 CUTI VUI								
	177	100	107					
tC single (s)	65	6.4	107 4 1					
tC. 2 stane (s)	0.0	0.4	7.1					
tE(s)	3.6	3.5	2.2					
p0 queue free %	97	99	99					
cM capacity (veh/h)	789	916	1497					
Direction Lane #	FB 1	NB 1	SB 1					
Volume Total	32	68	107					
Volume Left	20	10	0					
Volume Right	12	0	13					
cSH	832	1497	1700					
Volume to Capacity	0.04	0.01	0.06					
Queue Length 95th (ft)	3	0	0					
Control Delay (s)	9.5	1.1	0.0					
Lane LOS	А	А						
Approach Delay (s)	9.5	1.1	0.0					
Approach LOS	А							
Intersection Summary								
Average Delay			1.8					 
Intersection Capacity Utiliz	ation		18.1%	IC	CU Level o	of Service	А	
Analysis Period (min)			15					

# Lanes, Volumes, Timings 6: Deerfoot Road & Main Street

	-	$\mathbf{r}$	•	-	1	1	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	4			स	- Y		
Volume (vph)	337	44	74	627	29	64	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	14	14	14	13	13	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	0.984				0.907		
Flt Protected				0.995	0.985		
Satd. Flow (prot)	1960	0	0	1990	1754	0	
Flt Permitted				0.995	0.985		
Satd. Flow (perm)	1960	0	0	1990	1754	0	
Link Speed (mph)	30			30	30		
Link Distance (ft)	300			300	353		
Travel Time (s)	6.8			6.8	8.0		
Peak Hour Factor	0.86	0.86	0.89	0.89	0.71	0.71	
Heavy Vehicles (%)	2%	0%	4%	1%	0%	0%	
Shared Lane Traffic (%)							
Sign Control	Free			Free	Stop		
Intersection Summary							
	-	$\rightarrow$	-	-	1	1	
-----------------------------------	-------	---------------	-------	--------------	-------------	------------	---
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	et			<del>ب</del>	Y		
Volume (veh/h)	337	44	74	627	29	64	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.86	0.86	0.89	0.89	0.71	0.71	
Hourly flow rate (vph)	392	51	83	704	41	90	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (ven)	Nama			Mana			
Median type	inone			ivone			
Median Storage ven)							
upstream signal (it)							
$\mu$ X, platoon unblocked			112		1000	117	
vC, connicting volume			443		1200	417	
vC1, stage 1 confive							
			443		1288	417	
tC single (s)			4 1		6.4	62	
tC, 2 stage (s)					0.1	0.2	
tF (s)			2.2		3.5	3.3	
p0 queue free %			92		76	86	
cM capacity (veh/h)			1106		169	640	
Direction Lane #	FB 1	WB 1	NB 1				
Volume Total	443	788	131				
Volume Left	0	83	41				
Volume Right	51	0	90				
cSH	1700	1106	342				
Volume to Capacity	0.26	0.08	0.38				
Queue Length 95th (ft)	0	6	44				
Control Delay (s)	0.0	1.9	21.9				
Lane LOS		А	С				
Approach Delay (s)	0.0	1.9	21.9				
Approach LOS			С				
Intersection Summary							
Average Delay			3.2				
Intersection Capacity Utilization	ation		73.0%	IC	CU Level of	of Service	D
Analysis Period (min)			15				

2023 Build with Mitigation Conditions

# Lanes, Volumes, Timings 1: Route 9 & Park Central Drive

	≯	-	-	•	1	1
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			<b>*††</b>			1
Volume (vph)	0	0	2852	94	0	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	13	16	16
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.995			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5232	0	0	1774
Flt Permitted						
Satd. Flow (perm)	0	0	5232	0	0	1774
Link Speed (mph)		55	55		30	
Link Distance (ft)		506	270		330	
Travel Time (s)		6.3	3.3		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.96	0.96
Heavy Vehicles (%)	0%	0%	2%	0%	0%	5%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						

	≯	-	+	•	1	-	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations Volume (veh/h) Sign Control Grade	0	0 Free 0%	<b>↑↑</b> 2852 Free 0%	94	0 Stop 0%	<b>ř</b> 199	
Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s)	0.92 0	0.92 0	0.92 3100	0.92 102	0.96 0	0.96 207	
Right turn flare (veh) Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked		None	None				
vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol	3100				3151	1084	
vCu, unblocked vol tC, single (s)	3100 4.1				3151 6.8	1084 7.0	
tF (s) p0 queue free % cM capacity (veh/h)	2.2 100 107				3.5 100 9	3.3 0 207	
Direction, Lane #	WB 1	WB 2	WB 3	SB 1			
Volume Total Volume Left Volume Right cSH Volume to Capacity Queue Length 95th (ft) Control Delay (s) Lane LOS Approach Delay (s) Approach LOS	1240 0 1700 0.73 0 0.0	1240 0 1700 0.73 0 0.0	722 0 102 1700 0.42 0 0.0	207 0 207 207 1.00 221 110.9 F 110.9 F			
Intersection Summary Average Delay Intersection Capacity Utiliz Analysis Period (min)	zation		6.7 76.2% 15	IC	CU Level o	of Service	D

### Lanes, Volumes, Timings 2: Route 9 & Flagg Road

	≯	-	-	•	1	-
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			4 <b>4</b> 1			1
Volume (vph)	0	0	2917	42	0	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	13	16	16
Storage Length (ft)	0			650	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.998			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5246	0	0	1757
Flt Permitted						
Satd. Flow (perm)	0	0	5246	0	0	1757
Link Speed (mph)		55	55		30	
Link Distance (ft)		270	964		320	
Travel Time (s)		3.3	12.0		7.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.80	0.80
Heavy Vehicles (%) Shared Lane Traffic (%)	0%	0%	2%	0%	0%	6%
Sign Control		Free	Free		Stop	
Intersection Summary						

Area Type:

Control Type: Unsignalized

Other

	٦	-	+	•	1	<	
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations Volume (veh/h) Sign Control Grade	0	0 Free 0%	<b>↑↑</b> 2917 Free 0%	42	0 Stop 0%	<b>ř</b> 209	
Peak Hour Factor Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage	0.92 0	0.92	0.92 3171	0.92 46	0.80	0.80 261	
Right turn flare (veh) Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked vC, conflicting volume	3171	None	None		3193	1080	
vC1, stage 1 conf vol vC2, stage 2 conf vol	2171				2102	1090	
tC, single (s) tC, 2 stage (s)	4.1				6.8	7.0	
tF (s) p0 queue free % cM capacity (veh/h)	2.2 100 100				3.5 100 8	3.4 0 207	
Direction, Lane #	WB 1	WB 2	WB 3	SB 1			
Volume Total Volume Left Volume Right cSH Volume to Capacity Queue Length 95th (ft) Control Delay (s) Lane LOS Approach Delay (s) Approach LOS	1268 0 1700 0.75 0 0.0	1268 0 1700 0.75 0 0.0	680 0 46 1700 0.40 0 0.0	261 0 261 207 1.26 346 196.7 F 196.7 F			
Average Delay Intersection Capacity Utiliz Analysis Period (min)	zation		14.8 76.9% 15	IC	CU Level o	of Service	D

#### Lanes, Volumes, Timings 3: Crystal Pond Road & Route 9

		-	$\rightarrow$	⋤	1	-	1	1	
Lane Group	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR	
Lane Configurations	a.	- <b>†</b> †	1		2	***	ካካ	1	
Volume (vph)	177	2978	18	50	79	2963	49	40	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	13	13	13	12	13	13	12	16	
Storage Length (ft)	400		400		500		0	140	
Storage Lanes	1		1		1		2	1	
Taper Length (ft)	25				25		25		
Lane Util. Factor	1.00	0.95	1.00	0.91	1.00	0.91	0.97	1.00	
Frt			0.850					0.850	
Flt Protected	0.950				0.950		0.950		
Satd. Flow (prot)	1829	3657	1636	0	1829	5255	3433	1794	
Flt Permitted	0.950				0.950		0.950		
Satd. Flow (perm)	1829	3657	1636	0	1829	5255	3433	1794	
Right Turn on Red			Yes					Yes	
Satd. Flow (RTOR)			17					43	
Link Speed (mph)		30				30	30		
Link Distance (ft)		981				900	578		
Travel Time (s)		22.3				20.5	13.1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Shared Lane Traffic (%)									
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot	
Protected Phases	5	2		1	1	6	7	7	
Permitted Phases			2						
Detector Phase	5	2	2	1	1	6	7	7	
Switch Phase									
Minimum Initial (s)	6.0	15.0	15.0	6.0	6.0	15.0	8.0	8.0	
Minimum Split (s)	11.0	22.5	22.5	11.0	11.0	22.5	13.0	13.0	
Total Split (s)	32.0	114.0	114.0	22.0	22.0	104.0	14.0	14.0	
Total Split (%)	21.3%	76.0%	76.0%	14.7%	14.7%	69.3%	9.3%	9.3%	
Maximum Green (s)	27.0	106.5	106.5	17.0	17.0	96.5	9.0	9.0	
Yellow Time (s)	4.0	5.5	5.5	4.0	4.0	5.5	4.0	4.0	
All-Red Time (s)	1.0	2.0	2.0	1.0	1.0	2.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min	Min	None	None	Min	None	None	

Intersection Summary

Area Type:OtherCycle Length: 150Actuated Cycle Length: 144.7Natural Cycle: 150Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Crystal Pond Road & Route 9



#### Queues 3: Crystal Pond Road & Route 9

	≤	-	$\mathbf{r}$	1	-	1	1
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	192	3237	20	140	3221	53	43
v/c Ratio	0.75	1.20	0.02	0.74	0.87	0.27	0.30
Control Delay	78.5	114.9	2.9	87.2	22.0	70.9	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.5	114.9	2.9	87.2	22.0	70.9	23.7
Queue Length 50th (ft)	182	~2041	1	133	854	25	0
Queue Length 95th (ft)	262	#2164	9	#220	1082	50	41
Internal Link Dist (ft)		901			820	498	
Turn Bay Length (ft)	400		400	500			140
Base Capacity (vph)	342	2699	1212	215	3687	214	152
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	1.20	0.02	0.65	0.87	0.25	0.28

Intersection Summary

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.

### HCM Signalized Intersection Capacity Analysis 3: Crystal Pond Road & Route 9

	₫	-	$\rightarrow$	F	4	-	1	1	
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR	
Lane Configurations	ŋ	<b>*</b> *	1		ă.	***	ሻሻ	1	
Volume (vph)	177	2978	18	50	79	2963	49	40	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	13	13	13	12	13	13	12	16	
Total Lost time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00		1.00	0.91	0.97	1.00	
Frt	1.00	1.00	0.85		1.00	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1829	3657	1636		1829	5255	3433	1794	
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1829	3657	1636		1829	5255	3433	1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	192	3237	20	54	86	3221	53	43	
RTOR Reduction (vph)	0	0	5	0	0	0	0	41	
Lane Group Flow (vph)	192	3237	15	0	140	3221	53	2	
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot	
Protected Phases	5	2		1	1	6	7	7	
Permitted Phases			2						
Actuated Green, G (s)	20.2	106.8	106.8		14.9	101.5	6.5	6.5	
Effective Green, g (s)	20.2	106.8	106.8		14.9	101.5	6.5	6.5	
Actuated g/C Ratio	0.14	0.73	0.73		0.10	0.70	0.04	0.04	
Clearance Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	253	2680	1199		187	3660	153	80	
v/s Ratio Prot	c0.10	c0.89			0.08	0.61	c0.02	0.00	
v/s Ratio Perm			0.01						
v/c Ratio	0.76	1.21	0.01		0.75	0.88	0.35	0.02	
Uniform Delay, d1	60.4	19.4	5.2		63.6	17.3	67.5	66.6	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.3	97.3	0.0		15.1	2.8	1.4	0.1	
Delay (s)	72.7	116.7	5.2		78.7	20.1	68.9	66.7	
Level of Service	E	F	А		E	С	E	E	
Approach Delay (s)		113.6				22.5	67.9		
Approach LOS		F				С	E		
Intersection Summary									
HCM 2000 Control Delay			68.7	H	CM 2000	Level of	Service		E
HCM 2000 Volume to Capacit	ty ratio		1.13						
Actuated Cycle Length (s)			145.7	S	um of lost	t time (s)			17.5
Intersection Capacity Utilization	on		110.7%	IC	CU Level o	of Service	;		Н
Analysis Period (min)			15						

c Critical Lane Group

	٦	$\mathbf{\hat{z}}$	1	1	↓	∢
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥.			स	eî 👘	
Volume (vph)	20	111	25	17	98	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.886				0.993	
Flt Protected	0.992			0.971		
Satd. Flow (prot)	1637	0	0	1735	1724	0
Flt Permitted	0.992			0.971		
Satd. Flow (perm)	1637	0	0	1735	1724	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	217			320	342	
Travel Time (s)	4.9			7.3	7.8	
Peak Hour Factor	0.92	0.92	0.57	0.57	0.75	0.75
Heavy Vehicles (%)	2%	2%	2%	4%	6%	2%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						

	≯	$\mathbf{r}$	1	1	Ŧ	-	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations Volume (veh/h) Sign Control	20 Stop	111	25	4 17 Free 0%	98 Free 0%	5	
Peak Hour Factor	0.92	0.92	0.57	0.57	0.75	0.75	
Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage Right turn flare (veh)	22	121	44	30	131	7	
Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked				None	None		
vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol	252	134	137				
vCu, unblocked vol	252	134	137				
tC, single (s) tC, 2 stage (s)	6.4	6.2	4.1				
tF (s)	3.5	3.3	2.2				
p0 queue free %	97	87	97				
cM capacity (veh/h)	715	915	1447				
Direction, Lane #	EB 1	NB 1	SB 1				
Volume Total	142	74	137				
Volume Lett	22	44	0				
	121 977	U 1447	/ 1700				
Volume to Canacity	017	0.03	0.08				
Queue Length 95th (ft)	14	0.03	0.00				
Control Delay (s)	9.9	4.6	0.0				
Lane LOS	А	А					
Approach Delay (s)	9.9	4.6	0.0				
Approach LOS	А						
Intersection Summary							
Average Delay	-		4.9	10		f Condoc	٥
Analysis Period (min)	1		23.0% 15	IC	JU Level (	I SELVICE	A

	٦	$\mathbf{r}$	1	1	Ļ	-
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥.			र्स	ef 👘	
Volume (vph)	17	4	7	46	74	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.975				0.989	
Flt Protected	0.961			0.994		
Satd. Flow (prot)	1811	0	0	1703	1816	0
Flt Permitted	0.961			0.994		
Satd. Flow (perm)	1811	0	0	1703	1816	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	239			342	334	
Travel Time (s)	5.4			7.8	7.6	
Peak Hour Factor	0.66	0.66	0.57	0.57	0.63	0.63
Heavy Vehicles (%)	6%	0%	29%	4%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	
Intersection Summary						

Area Type: Control Type: Unsignalized

Other

≯	$\mathbf{r}$	1	1	Ŧ	∢	
EBL	EBR	NBL	NBT	SBT	SBR	
Y			ર્સ	4Î		
Stop			Stop	Stop		
17	4	7	46	74	6	
0.66	0.66	0.57	0.57	0.63	0.63	
26	6	12	81	117	10	
EB 1	NB 1	SB 1				
32	93	127				
26	12	0				
6	0	10				
0.13	0.15	-0.04				
4.5	4.2	4.0				
0.04	0.11	0.14				
759	827	881				
7.7	7.8	7.7				
7.7	7.8	7.7				
А	А	А				
		7.7				
		А				
n		18.3%	IC	U Level c	f Service	А
		15				
	EBL Stop 17 0.66 26 EB 1 32 26 6 0.13 4.5 0.04 759 7.7 7.7 A	EBL       EBR         Stop       17       4         0.66       0.66       0.66         26       12       6         0.13       0.15       4.5       4.2         0.04       0.11       759       827         7.7       7.8       7.7       7.8         7.7       7.8       A       A	EBL         EBR         NBL           Stop         17         4         7           0.66         0.66         0.57         26         6         12           EB1         NB1         SB1         32         93         127         26         12         0         6         0         10         0.13         0.15         -0.04         4.5         4.2         4.0         0.04         0.11         0.14         759         827         881         7.7         7.8         7.7         7.8         7.7         7.8         7.7         A	EBL       EBR       NBL       NBT         Y       A       7       46         Stop       Stop       17       4       7       46         0.66       0.66       0.57       0.57       26       6       12       81         EB 1       NB 1       SB 1       SB 1       1 <th1< th=""> <th1< th=""></th1<></th1<>	EBL       EBR       NBL       NBT       SBT         Y       A       7       46       74         0.66       0.66       0.57       0.57       0.63         26       6       12       81       117         EB 1       NB 1       SB 1       SB 1       SB 1         32       93       127       26       12       0         6       0       10       0.13       0.15       -0.04         4.5       4.2       4.0       0.04       0.11       0.14         759       827       881       7.7       7.8       7.7         A       A       A       A       A       A         ICU Level o         18.3%	EBL       EBR       NBL       NBT       SBT       SBR         Stop       Stop       Stop       Stop       Stop       1         17       4       7       46       74       6         0.66       0.66       0.57       0.57       0.63       0.63         26       6       12       81       117       10         EB1       NB1       SB1       SB1       SB1       SB1         32       93       127       26       12       0         6       0       10       0.13       0.15       -0.04         4.5       4.2       4.0       0.04       0.11       0.14         759       827       881       7.7       7.8       7.7         A       A       A       A       A       A         0.0       18.3%       ICU Level of Service       15



65 GLENN STREET, LAWRENCE, MA 01843 169 Ocean Boulevard, Unit 101, Hampton, NH 03842 TEL 978.794.1792 | FAX 978.794.1793 | TheEngineeringCorp.com

JDB: PROPOSED MIXED-USE RESIDENTIAL AT PARK CENTRAL	JOB NUMBER:		T0524		
LOCATION: SOUTHBOROUGH, MA	DATE:		11/12/2015		
ANALYSIS YEAR/PERIOD: 2023 BUILD MITIGATED AM PEAK	SHEET:	1	OF	2	
CALCULATED BY: DSH	CHECKED BY:				

<u>Approach</u>	Input Values	<u>C</u>	alculated Value	es
Blackthorn Drive EB	Volume = 32 vph Capacity = 759 vph	V/C Ratio	95th Percentile Queue (ft)	95th Percentile Queue (veh)
Analy	Delay = 7.7 s/veh ysis Period = 1 hr	0.04	3.0	0.1
Approach	Input Values	<u>C</u>	alculated Value	es
Flagg Road NB	Volume = 93 vph Capacity = 827 vph	V/C Ratio	95th Percentile Queue (ft)	95th Percentile Queue (veh)
Analy	Delay = 7.8 s/veh ysis Period = 1 hr	0.11	9.0	0.4
<u>Approach</u>	Input Values	<u>C</u> .	alculated Value	<u>es</u>
Flagg Road SB	Volume = 127 vph Capacity = 881 vph	V/C Ratio	95th Percentile Queue (ft)	95th Percentile Queue (veh)
Analy	Delay = 7.7 s/veh ysis Period = 1 hr	0.14	13.0	0.5

## Lanes, Volumes, Timings 6: Deerfoot Road & Main Street

	-	$\mathbf{r}$	•	-	1	1
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	ef 👘			र्स	Y	
Volume (vph)	560	88	61	258	55	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	14	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.982				0.916	
Flt Protected				0.991	0.982	
Satd. Flow (prot)	1940	0	0	1954	1755	0
Flt Permitted				0.991	0.982	
Satd. Flow (perm)	1940	0	0	1954	1755	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	300			300	353	
Travel Time (s)	6.8			6.8	8.0	
Peak Hour Factor	0.86	0.86	0.71	0.71	0.65	0.65
Heavy Vehicles (%)	3%	0%	2%	3%	0%	1%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						

	-	$\rightarrow$	1	-	1	1	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations Volume (veh/h) Sign Control	<b>560</b> Free	88	61	<b>4</b> 258 Free	55 Stop	92	
Grade Peak Hour Factor	0% 0.86	0.86	0 71	0% 0.71	0% 0.65	0.65	
Hourly flow rate (vph) Pedestrians Lane Width (ft) Walking Speed (ft/s) Percent Blockage Right turn flare (veh)	651	102	86	363	85	142	
Median type Median storage veh) Upstream signal (ft) pX, platoon unblocked	None			None			
vC, conflicting volume vC1, stage 1 conf vol vC2, stage 2 conf vol			753		1238	702	
vCu, unblocked vol tC, single (s)			753 4.1		1238 6.4	702 6.2	
tC, 2 stage (s)			0.0		0.5	0.0	
tF (S) p0 queue free %			2.2 90		3.5 52	3.3 68	
civi capacity (ven/n)			857		1/6	440	
Direction, Lane #	EB 1	WB 1	NB 1				
Volume Left	/53	449 86	220 85				
Volume Right	102	0	142				
cSH	1700	857	282				
Volume to Capacity	0.44	0.10	0.80				
Queue Length 95th (ft)	0	8	159				
Control Delay (s)	0.0	2.8	54.4				
Lane LOS		А	F				
Approach Delay (s) Approach LOS	0.0	2.8	54.4 F				
Intersection Summary							
Average Delay Intersection Capacity Utiliza Analysis Period (min)	ation		9.5 70.5% 15	IC	CU Level o	of Service	С

# Lanes, Volumes, Timings 1: Route 9 & Park Central Drive

	≯	-	+	•	1	-
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			ተተኈ			1
Volume (vph)	0	0	3450	65	0	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	13	16	16
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.997			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5239	0	0	1808
Flt Permitted						
Satd. Flow (perm)	0	0	5239	0	0	1808
Link Speed (mph)		55	55		30	
Link Distance (ft)		506	270		330	
Travel Time (s)		6.3	3.3		7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.78	0.78
Heavy Vehicles (%)	0%	0%	2%	2%	0%	3%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						

•	→	-	•	×	-		
EBL	EBT	WBT	WBR	SBL	SBR		
		<u>↑</u> ↑₽			1		
0	0	3450	65	0	204		
	Free	Free		Stop			
	0%	0%		0%			
0.92	0.92	0.92	0.92	0.78	0.78		
0	0	3750	71	0	262		
	Nono	Nono					
	NULLE	NULLE					
3750				3785	1285		
3750				3785	1285		
4.1				6.8	7.0		
2.2				3.5	3.3		
100				100	0		
58				3	154		
WB 1	WB 2	WB 3	SB 1				
1500	1500	821	262				
0	0	0	0				
0	0	71	262				
1/00	1/00	1/00	154				
0.88	0.88	0.48	I./U				
0	0	0	40/ 201 7				
0.0	0.0	0.0	371./ E				
0.0			Г 201 7				
0.0			371.7 F				
			I				
		ን⊑ 1					
ation		20.1 87.4%	IC		of Service		F
		15					L
	EBL 0 0.92 0 3750 3750 4.1 2.2 100 58 WB 1 1500 0 1700 0 8 WB 1 1500 0 0 0 1700 0 0 0 1700 0 0 1700 0 0 3750 4.1 2.2 100 58 0 0 0 3750 4.1 100 58 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	EBL       EBT         0       0         0       0         0       0         0       0         0       0         0       0         0       0         0       0         0       0         0       0         0       0         3750       4.1         2.2       100         100       58         WB 1       WB 2         1500       1500         0       0         0       0         0       0         0       0         0       0         0       0         0       0         0       0         0.00       0.0         0.00       0.0         0.00       0.0         0.00       0.0	EBL         EBT         WBT           0         0         3450           Free         Free         0%           0%         0.92         0.92           0         0         3750           3750         4.1	EBL         EBT         WBT         WBR           0         0         3450         65           Free         Free         0%         0%           0%         0%         0%         0.92           0         0         3750         71           None         None         None         71           3750	EBL         EBT         WBT         WBR         SBL           0         0         3450         65         0           Free         Free         Free         Stop           0%         0%         0%         0%         0%           0.92         0.92         0.92         0.92         0.78           0         0         3750         71         0           3750         3785         3785         3785           3750         3785         6.8         35           3750         3785         6.8         35           3750         3785         35         100         100           58         37         3785         3.5         100         30           0         0         0         0         3         3           WB 1         WB 2         WB 3         SB 1         3           1500         1500         821         262         3           0         0         0         0         3         3           WB 1         WB 2         WB 3         SB 1         5           1000         1500         821         262         <	EBL         EBT         WBT         WBR         SBL         SBR           0         0         3450         65         0         204           Free         Free         Free         Stop         0%         0%         0%           0.92         0.92         0.92         0.92         0.78         0.78         0.78           0         0         3750         71         0         262           None         None         3785         1285           3750         3785         1285         3.5         3.3           100         3         3755         3755         3.5         3.3           100         3         154         56.8         7.0           2.2         3.5         3.3         3.3         100         0         3           1500         1500         821         262         3         154           WB1         WB 2         WB 3         SB 1	EBL         EBT         WBT         WBR         SBL         SBR           0         0         3450         65         0         204           Free         Free         Stop         0%         0%           0%         0%         0%         0%         0%           0.92         0.92         0.92         0.92         0.78         0.78           0         0         3750         71         0         262           None           3750         3785         1285           3750         3785         1285           4.1         6.8         7.0           2.2         3.5         3.3           100         1000         0           58         3154         154           WB1         WB2         WB3         SB1           1500         1500         821         262           0         0         0         154           0.88         0.48         1.70           0         0         467           0.0         391.7         F           0.0         0.0         391.7           0.0 <td< td=""></td<>

### Lanes, Volumes, Timings 2: Route 9 & Flagg Road

	٦	-	+	•	1	~
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			ተተኈ			1
Volume (vph)	0	0	3340	159	0	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	13	16	16
Storage Length (ft)	0			650	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt			0.993			0.865
Flt Protected						
Satd. Flow (prot)	0	0	5213	0	0	1826
Flt Permitted						
Satd. Flow (perm)	0	0	5213	0	0	1826
Link Speed (mph)		55	55		30	
Link Distance (ft)		270	964		320	
Travel Time (s)		3.3	12.0		7.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75
Heavy Vehicles (%)	0%	0%	2%	4%	0%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						

Area Type:

Control Type: Unsignalized

Other

	∕	-	+	•	×	-		
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations			<u>ተተ</u> ኈ			1		
Volume (veh/h)	0	0	3340	159	0	108		
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.75	0.75		
Hourly flow rate (vph)	0	0	3630	173	0	144		
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	3630				3717	1297		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	3630				3717	1297		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)								
tF (s)	2.2				3.5	3.3		
p0 queue free %	100				100	6		
cM capacity (veh/h)	65				3	153		
Direction, Lane #	WB 1	WB 2	WB 3	SB 1				
Volume Total	1452	1452	899	144				
Volume Left	0	0	0	0				
Volume Right	0	0	173	144				
cSH	1700	1700	1700	153				
Volume to Capacity	0.85	0.85	0.53	0.94				
Queue Length 95th (ft)	0	0	0	171				
Control Delay (s)	0.0	0.0	0.0	116.7				
Lane LOS				F				
Approach Delay (s)	0.0			116.7				
Approach LOS				F				
Intersection Summary								
Average Delay			4.3					
Intersection Capacity Utiliz	ation		81.4%	IC	CU Level	of Service	D	
Analysis Period (min)			15					

#### Lanes, Volumes, Timings 3: Crystal Pond Road & Route 9

Lane Group         EBU         EBT         EBR         WBU         WBL         WBT         NBL         NBR           Lane Configurations         1
Lane Configurations $1$
Volume (vph)       328       2570       56       30       46       3071       244       49         Ideal Flow (vphpl)       1900       140       Storage Length (ft)       2       1       1       1       1       2       1       1       1       2       1       1       1       0       1       100       100       100       100       100       100       100       100       100       100<
Ideal Flow (vphpl)190019001900190019001900190019001900Lane Width (ft)131313131213131216Storage Length (ft)4004005000140Storage Lanes11121Taper Length (ft)252525Lane Util. Factor1.000.951.000.911.000.910.971.00Frt0.8500.9500.9500.9500.8500.8500.8500.850Flt Protected0.9500.9500.9500.9500.9500.9500.950Satd. Flow (prot)18293657163601829525534331794Flt Permitted0.950257163601829525534331794Kight Turn on RedYesYesYes5313.1YesSatd. Flow (RTOR)3030303011.120.5Link Speed (mph)3022.320.513.120.5Peak Hour Factor0.920.920.920.920.920.920.92Shared Lane Traffic (%)14.114.114.114.114.114.11.11.11.000.911.000.911.001.00Stat. Flow (prot)18293657163601829525534331.794Stat. Flow (RTOR)57
Lane Width (ft)       13       13       13       12       13       13       12       16         Storage Length (ft)       400       400       500       0       140         Storage Lanes       1       1       1       2       1         Taper Length (ft)       25       25       25       25         Lane Util. Factor       1.00       0.95       1.00       0.91       1.00       0.97       1.00         Frt       0.850       0.950       0.950       0.850       0.850       0.850       0.850         Fit Protected       0.950       0.950       0.950       0.950       0.950       0.850         Satd. Flow (prot)       1829       3657       1636       0       1829       5255       3433       1794         Fit Permitted       0.950 <t< td=""></t<>
Storage Length (ft)       400       400       500       0       140         Storage Lanes       1       1       1       2       1         Taper Length (ft)       25       25       25       25         Lane Util. Factor       1.00       0.95       1.00       0.91       1.00       0.91       0.97       1.00         Frt       0.850       0.950       0.950       0.850       0.950       0.850       0.950       0.850       0.950       0.850       0.950       0.950       0.950       0.950       0.950       0.950       0.950       0.950       0.950       0.950       0.950       0.950
Storage Lanes       1       1       1       1       2       1         Taper Length (ft)       25       25       25       25       25         Lane Util. Factor       1.00       0.95       1.00       0.91       1.00       0.97       1.00         Frt       0.850       0.950       0.950       0.950       0.850       0.850       0.850         Fit Protected       0.950       0.950       0.950       0.950       0.950       0.850         Satd. Flow (prot)       1829       3657       1636       0       1829       5255       3433       1794         Fit Permitted       0.950       0.950       0.950       0.950       0.950       0.950       0.950         Satd. Flow (perm)       1829       3657       1636       0       1829       5255       3433       1794         Right Turn on Red       Yes       Yes       53       53       53       53       53       13.1       1         Ink Speed (mph)       30       30       30       30       30       30       11         Peak Hour Factor       0.92       0.92       0.92       0.92       0.92       0.92       0.92
Taper Length (ft)         25         25         25           Lane Util. Factor         1.00         0.95         1.00         0.91         1.00         0.91         0.97         1.00           Frt         0.850         0.950         0.950         0.950         0.850         0.850           Fit Protected         0.950         0.950         0.950         0.950         0.850           Satd. Flow (prot)         1829         3657         1636         0         1829         5255         3433         1794           Fit Permitted         0.950         0.950         0.950         0.950         0.950         0.950           Satd. Flow (perm)         1829         3657         1636         0         1829         5255         3433         1794           Right Turn on Red         Yes         Yes         Yes         Yes         Yes         Yes         Satd. Flow (RTOR)         57         53         110
Lane Util. Factor       1.00       0.95       1.00       0.91       1.00       0.91       0.97       1.00         Frt       0.850       0.850       0.950       0.950       0.850         Flt Protected       0.950       0.950       0.950       0.950         Satd. Flow (prot)       1829       3657       1636       0       1829       5255       3433       1794         Flt Permitted       0.950       0.950       0.950       0.950       0.950       0.950         Satd. Flow (perm)       1829       3657       1636       0       1829       5255       3433       1794         Right Turn on Red       Yes       Yes       Yes       Yes       Yes       Yes       Satd. Flow (RTOR)       57       53         Link Speed (mph)       30       30       30       30       30       30       11         Peak Hour Factor       0.92
Frt       0.850       0.950       0.950         Flt Protected       0.950       0.950       0.950       1794         Satd. Flow (prot)       1829       3657       1636       0       1829       5255       3433       1794         Flt Permitted       0.950       0.950       0.950       0.950       0.950       0.950         Satd. Flow (perm)       1829       3657       1636       0       1829       5255       3433       1794         Right Turn on Red       Yes       Yes       Yes       Yes       Yes       Yes         Satd. Flow (RTOR)       57       57       53       1104 <t< td=""></t<>
Fit Protected       0.950       0.950       0.950         Satd. Flow (prot)       1829       3657       1636       0       1829       5255       3433       1794         Fit Permitted       0.950       0.950       0.950       0.950       0.950       0.950         Satd. Flow (perm)       1829       3657       1636       0       1829       5255       3433       1794         Right Turn on Red       Yes       Yes       Yes       Yes       Yes       Yes       53         Link Speed (mph)       30       30       30       30       30       11.1         Peak Hour Factor       0.92
Satd. Flow (prot)       1829       3657       1636       0       1829       5255       3433       1794         Flt Permitted       0.950       0.950       0.950       0.950       0.950       0.950         Satd. Flow (perm)       1829       3657       1636       0       1829       5255       3433       1794         Right Turn on Red       Yes       Yes       Yes       Yes       Yes       Yes         Satd. Flow (RTOR)       57       57       53       110
Flt Permitted       0.950       0.950       0.950         Satd. Flow (perm)       1829       3657       1636       0       1829       5255       3433       1794         Right Turn on Red       Yes       Yes       Yes       Yes       Yes       Yes         Satd. Flow (RTOR)       57       57       53       53       1100
Satd. Flow (perm)       1829       3657       1636       0       1829       5255       3433       1794         Right Turn on Red       Yes       Yes       Yes       Yes       Yes         Satd. Flow (RTOR)       57       57       53       Satd       Satd       Satd       Satd       Satd       Satd       Satd       Yes       Satd       Yes       Satd       Yes       Satd       Satd       Yes       Satd       Satd       Yes       Yes       Satd       Yes
Right Turn on Red     Yes     Yes       Satd. Flow (RTOR)     57     53       Link Speed (mph)     30     30       Link Distance (ft)     981     900       Travel Time (s)     22.3     20.5     13.1       Peak Hour Factor     0.92     0.92     0.92     0.92     0.92       Shared Lane Traffic (%)     0     0     0     0
Satd. Flow (RTOR)     57     53       Link Speed (mph)     30     30     30       Link Distance (ft)     981     900     578       Travel Time (s)     22.3     20.5     13.1       Peak Hour Factor     0.92     0.92     0.92     0.92     0.92     0.92       Shared Lane Traffic (%)     Determine Sector     Determine Sector     Determine Sector     Determine Sector     Determine Sector
Link Speed (mph)         30         30         30           Link Distance (ft)         981         900         578           Travel Time (s)         22.3         20.5         13.1           Peak Hour Factor         0.92         0.92         0.92         0.92         0.92         0.92           Shared Lane Traffic (%)         Data         Data         Data         Data         Data         Data
Link Distance (ft)         981         900         578           Travel Time (s)         22.3         20.5         13.1           Peak Hour Factor         0.92         0.92         0.92         0.92         0.92         0.92           Shared Lane Traffic (%)         Det         Det         Det         Det         Det         Det         Det
Travel Time (s)         22.3         20.5         13.1           Peak Hour Factor         0.92         0
Peak Hour Factor         0.92
Shared Lane Traffic (%)
Turn Type Prot NA Perm Prot Prot NA Prot Prot
Protected Phases 5 2 1 1 6 7 7
Permitted Phases 2
Detector Phase         5         2         2         1         1         6         7         7
Switch Phase
Minimum Initial (s)         6.0         15.0         15.0         6.0         15.0         8.0         8.0
Minimum Split (s) 11.0 22.5 22.5 11.0 11.0 22.5 13.0 13.0
Total Split (s) 26.0 103.0 103.0 17.0 17.0 94.0 20.0 20.0
Total Split (%) 18.6% 73.6% 73.6% 12.1% 12.1% 67.1% 14.3% 14.3%
Maximum Green (s) 21.0 95.5 95.5 12.0 12.0 86.5 15.0 15.0
Yellow Time (s) 4.0 5.5 5.5 4.0 4.0 5.5 4.0 4.0
All-Red Time (s) 1.0 2.0 2.0 1.0 1.0 2.0 1.0 1.0
Lost Time Adjust (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Total Lost Time (s) 5.0 7.5 7.5 5.0 7.5 5.0 5.0
Lead/Lag Lead Lag Lead Lead Lag
Lead-Lag Optimize? Yes Yes Yes Yes Yes Yes
Vehicle Extension (s)         3.0
Recall Mode None Min Min None None Min None None

Intersection Summary

Area Type:OtherCycle Length: 140Actuated Cycle Length: 139.2Natural Cycle: 140Control Type: Actuated-Uncoordinated

Splits and Phases: 3: Crystal Pond Road & Route 9



#### Queues 3: Crystal Pond Road & Route 9

	1	-	$\mathbf{r}$	1	-	1	1
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	357	2793	61	83	3338	265	53
v/c Ratio	1.30	1.10	0.05	0.60	1.02	0.76	0.23
Control Delay	203.1	72.8	2.1	80.4	48.2	75.4	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	203.1	72.8	2.1	80.4	48.2	75.4	16.6
Queue Length 50th (ft)	~415	~1533	1	74	~1186	122	0
Queue Length 95th (ft)	#618	#1654	16	131	#1256	171	42
Internal Link Dist (ft)		901			820	498	
Turn Bay Length (ft)	400		400	500			140
Base Capacity (vph)	275	2547	1157	157	3265	369	240
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.30	1.10	0.05	0.53	1.02	0.72	0.22

Intersection Summary

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.

### HCM Signalized Intersection Capacity Analysis 3: Crystal Pond Road & Route 9

	₫	-	$\mathbf{r}$	F	-	-	1	1	
Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBL	NBR	
Lane Configurations	D	<b>^</b>	1		3	444	ሻሻ	1	
Volume (vph)	328	2570	56	30	46	3071	244	49	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	13	13	13	12	13	13	12	16	
Total Lost time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00		1.00	0.91	0.97	1.00	
Frt	1.00	1.00	0.85		1.00	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1829	3657	1636		1829	5255	3433	1794	
Flt Permitted	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1829	3657	1636		1829	5255	3433	1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	357	2793	61	33	50	3338	265	53	
RTOR Reduction (vph)	0	0	17	0	0	0	0	48	
Lane Group Flow (vph)	357	2793	44	0	83	3338	265	5	
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Prot	Prot	
Protected Phases	5	2		1	1	6	7	7	
Permitted Phases			2						
Actuated Green, G (s)	21.0	97.0	97.0		10.5	86.5	14.2	14.2	
Effective Green, g (s)	21.0	97.0	97.0		10.5	86.5	14.2	14.2	
Actuated q/C Ratio	0.15	0.70	0.70		0.08	0.62	0.10	0.10	
Clearance Time (s)	5.0	7.5	7.5		5.0	7.5	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	275	2548	1140		137	3265	350	183	
v/s Ratio Prot	c0.20	c0.76			0.05	0.64	c0.08	0.00	
v/s Ratio Perm			0.03						
v/c Ratio	1.30	1.10	0.04		0.61	1.02	0.76	0.03	
Uniform Delay, d1	59.1	21.1	6.6		62.3	26.3	60.8	56.3	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	158.3	50.2	0.0		7.4	21.7	9.0	0.1	
Delay (s)	217.4	71.3	6.6		69.7	48.1	69.9	56.4	
Level of Service	F	Е	А		Е	D	Е	E	
Approach Delay (s)		86.3				48.6	67.6		
Approach LOS		F				D	E		
Intersection Summary									
HCM 2000 Control Delay			66.9	H	CM 2000	Level of S	Service		E
HCM 2000 Volume to Capacit	y ratio		1.11						
Actuated Cycle Length (s)	<i>,</i>		139.2	Si	um of lost	time (s)			17.5
Intersection Capacity Utilization	n		99.1%	IC	U Level o	of Service	:		F
Analysis Period (min)			15						

c Critical Lane Group

# Lanes, Volumes, Timings 4: Flagg Road & Access Road

	≯	$\mathbf{r}$	1	<b>†</b>	Ŧ	1
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥.			र्स	ef 👘	
Volume (vph)	13	57	110	49	51	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.890				0.964	
Flt Protected	0.991			0.967		
Satd. Flow (prot)	1643	0	0	1790	1770	0
Flt Permitted	0.991			0.967		
Satd. Flow (perm)	1643	0	0	1790	1770	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	217			320	342	
Travel Time (s)	4.9			7.3	7.8	
Peak Hour Factor	0.92	0.92	0.71	0.71	0.75	0.75
Heavy Vehicles (%)	2%	2%	2%	4%	4%	2%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						

Area Type:

Other Control Type: Unsignalized

	∕	$\rightarrow$	1	<b>†</b>	Ŧ	-			
Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations	¥			<del>با</del>	4Î				
Volume (veh/h)	13	57	110	49	51	19			
Sign Control	Stop			Free	Free				
Grade	0%			0%	0%				
Peak Hour Factor	0.92	0.92	0.71	0.71	0.75	0.75			
Hourly flow rate (vph)	14	62	155	69	68	25			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type				None	None				
Median storage ven)									
Upstream signal (ft)									
pX, platoon unblocked	1/0	01	00						
vC, conflicting volume	460	81	93						
VC1, stage 1 conf vol									
VC2, stage 2 cont vol	1/0	01	00						
VCU, UNDIOCKED VOI	460	81	93 4 1						
tC, Sillyle (S)	0.4	0.2	4.1						
tC, Z Stage (S)	2 5	<b>^ ^ ^</b>	<b>~</b>						
IF (S)	3.0 07	3.3 04	2.2						
cM capacity (yob/b)	97 502	94 070	90 1501						
	502	9/9	1001						
Direction, Lane #	<u>EB 1</u>	NB 1	SB 1						
Volume Lota	/6	224	93						
Volume Leit	14	155	0 25						
	02 000	U 1F01	25 1700						
CSH Volume to Consolity	832	1501	1700						
Vuluine to Capacity	0.09	0.10	0.05						
Control Dolay (c)	Ŭ O O	У Б 6							
Lang LOS	9.ð 1	0.C	0.0						
Lane LUS	A 0.0	A E Z	0.0						
Approach LOS	9.ð N	0.0	0.0						
Approach LUS	А								
Intersection Summary									
Average Delay			5.1					٨	
Intersection Capacity Utiliz	ation		26.2%	IC	U Level o	of Service		A	
Analysis Period (min)			15						

	٦	$\mathbf{r}$	1	<b>†</b>	.↓	1
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			र्भ	ef 👘	
Volume (vph)	10	6	7	41	70	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	11	11	11	11
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.949				0.983	
Flt Protected	0.970			0.993		
Satd. Flow (prot)	1656	0	0	1764	1704	0
Flt Permitted	0.970			0.993		
Satd. Flow (perm)	1656	0	0	1764	1704	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	239			342	334	
Travel Time (s)	5.4			7.8	7.6	
Peak Hour Factor	0.50	0.50	0.71	0.71	0.75	0.75
Heavy Vehicles (%)	10%	17%	0%	4%	4%	20%
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	
Intersection Summary						

≁	$\mathbf{r}$	▲	T.	Ŧ	-	
EBL	EBR	NBL	NBT	SBT	SBR	
Y			÷	ef 🔰		
Stop			Stop	Stop		
10	6	7	41	70	10	
0.50	0.50	0.71	0.71	0.75	0.75	
20	12	10	58	93	13	
EB 1	NB 1	SB 1				
32	68	107				
20	10	0				
12	0	13				
0.11	0.09	0.03				
4.4	4.2	4.1				
0.04	0.08	0.12				
785	843	872				
7.6	7.5	7.6				
7.6	7.5	7.6				
А	А	А				
		7.6				
		А				
		18.1%	IC	U Level c	of Service	А
		15				
	EBL Y Stop 10 0.50 20 EB 1 32 20 12 0.11 4.4 0.04 785 7.6 7.6 A	EBL         EBR           Y         Stop           10         6           0.50         0.50           20         12           EB 1         NB 1           32         68           20         10           12         0           0.11         0.09           4.4         4.2           0.04         0.08           785         843           7.6         7.5           A         A	EBL         EBR         NBL           Stop         0         6         7           0.50         0.50         0.71         20           20         12         10           EB 1         NB 1         SB 1           32         68         107           20         10         0           12         0         13           0.11         0.09         0.03           4.4         4.2         4.1           0.04         0.08         0.12           785         843         872           7.6         7.5         7.6           7.6         7.5         7.6           A         A         A           I8.1%         18.1%         15	EBL       EBR       NBL       NBT         Y       Stop       Stop         10       6       7       41         0.50       0.50       0.71       0.71         20       12       10       58         EB 1       NB 1       SB 1       SB 1         32       68       107       0         20       10       0       12         12       0       13       0.11       0.09       0.03         4.4       4.2       4.1       0.04       0.08       0.12         785       843       872       7.6       7.6         7.6       7.5       7.6       A       A         7.6       7.5       7.6       A       A         18.1%       IC       15       15	EBL       EBR       NBL       NBT       SBT         Y       Stop       Stop       Stop       Stop         10       6       7       41       70         0.50       0.50       0.71       0.71       0.75         20       12       10       58       93         EB1       NB1       SB1       SB1         32       68       107       20       10       0         12       0       13       0.11       0.09       0.03         4.4       4.2       4.1       0.04       0.08       0.12         785       843       872       7.6       7.5       7.6         7.6       7.5       7.6       A       A       A         18.1%       ICU Level of 15       15       1000000000000000000000000000000000000	EBL       EBR       NBL       NBT       SBT       SBR         Y       Stop       Stop       Stop       Stop       Stop         10       6       7       41       70       10         0.50       0.50       0.71       0.71       0.75       0.75         20       12       10       58       93       13         EB 1       NB 1       SB 1       SB 1       SB 1       SB 1         32       68       107       20       10       0         20       10       0       13       0.11       0.09       0.03         4.4       4.2       4.1       0.04       0.08       0.12       785       843       872         7.6       7.5       7.6       7.5       7.6       7.5       7.6         7.6       7.5       7.6       A       A       A       A         18.1%       ICU Level of Service       15       15



65 GLENN STREET, LAWRENCE, MA 01843 169 Ocean Boulevard, Unit 101, Hampton, NH 03842 TEL 978.794.1792 | FAX 978.794.1793 | TheEngineeringCorp.com

JDB: PROPOSED MIXED-USE RESIDENTIAL AT PARK CENTRAL	JOB NUMBER:		T0524		
LOCATION: SOUTHBOROUGH, MA	DATE:		11/12/2015		
ANALYSIS YEAR/PERIOD: 2023 BUILD MITIGATED PM PEAK	SHEET:	2	OF	2	
CALCULATED BY: DSH	CHECKED BY:				

<u>Approach</u>	Input Values	<u>Ca</u>	Calculated Values					
Blackthorn Drive EB	Volume = 32 vph Capacity = 785 vph	V/C Ratio	95th Percentile Queue (ft)	95th Percentile Queue (veh)				
Analy	Delay = 7.6 s/veh ysis Period = 1 hr	0.04	3.0	0.1				
Approach	Input Values	<u>Ca</u>	alculated Value	<u>es</u>				
Flagg Road NB	Volume = 68 vph Capacity = 843 vph	V/C Ratio	95th Percentile Queue (ft)	95th Percentile Queue (veh)				
Analy	Delay = 7.5 s/veh vsis Period = 1 hr	0.08	7.0	0.3				
<u>Approach</u>	Input Values	<u>C</u> ;	alculated Value	<u>es</u>				
Flagg Road SB	Volume = 107 vph Capacity = 872 vph	V/C Ratio	95th Percentile Queue (ft)	95th Percentile Queue (veh)				
Analy	Delay = 7.6 s/veh ysis Period = 1 hr	0.12	10.0	0.4				

# Lanes, Volumes, Timings 6: Deerfoot Road & Main Street

	-	$\mathbf{r}$	•	-	1	1
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	4			स	- Y	
Volume (vph)	337	44	74	627	29	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	14	14	14	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.984				0.907	
Flt Protected				0.995	0.985	
Satd. Flow (prot)	1960	0	0	1990	1754	0
Flt Permitted				0.995	0.985	
Satd. Flow (perm)	1960	0	0	1990	1754	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	300			300	353	
Travel Time (s)	6.8			6.8	8.0	
Peak Hour Factor	0.86	0.86	0.89	0.89	0.71	0.71
Heavy Vehicles (%)	2%	0%	4%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						

	-	$\rightarrow$	-	-	1	1	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	et			<del>ب</del>	Y		
Volume (veh/h)	337	44	74	627	29	64	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.86	0.86	0.89	0.89	0.71	0.71	
Hourly flow rate (vph)	392	51	83	704	41	90	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage veh)							
Upstream signal (It)							
pX, platoon unblocked			112		1000	117	
vC, conflicting volume			443		1288	417	
VC1, Stage 1 CUTI VUI							
VC2, Stage 2 com voi			113		1288	/17	
tC single (s)			44J // 1		6/	62	
$tC_{2}$ state (s)			7.1		U.T	0.2	
tF (s)			22		35	33	
p0 queue free %			92		76	86	
cM capacity (veh/h)			1106		169	640	
Direction Lane #	FR 1	WR 1	NR 1				
Volume Total	443	788	131				
Volume Left	0	83	41				
Volume Right	51	0	90				
cSH	1700	1106	342				
Volume to Capacity	0.26	0.08	0.38				
Queue Length 95th (ft)	0	6	44				
Control Delay (s)	0.0	1.9	21.9				
Lane LOS		А	С				
Approach Delay (s)	0.0	1.9	21.9				
Approach LOS			С				
Intersection Summary							
Average Delay			3.2				
Intersection Capacity Utiliz	ation		73.0%	IC	CU Level o	of Service	D
Analysis Period (min)			15				

## Attachment L

Freeway Weave Analysis

### 2014 Existing Conditions

		F	REEWAY	WEAV	ING WOR	KSHEE	Т				
Genera	al Informati	on		Site Information							
AnalystSWGAgency/CompanyTEC, Inc.Date Performed3/19/2014Analysis Time PeriodWeekday Morning					Freeway/Dir of TravelRoute 9 EBWeaving Segment LocationI-495 SB Off to I-495 NB OnAnalysis Year2014 Existing Conditions						
Project De	scription Mixed-L	Jse at Park Ce	entral - Southb	orough, Mas	ssachsuetts						
Inputs Weaving c Weaving n Weaving s Freeway fr	onfiguration iumber of lanes, N egment length, L ree-flow speed, Fl	N S FS		C-D Roadw Segment type Multil Highw Freeway minimum speed, S <sub>MIN</sub> Freeway maximum capacity, C <sub>IFL</sub> 2							
0		- //- 111	. D 0.		Terrain type				Level		
Conve	rsions to po	C/n Undel		Div (0()	S I	Г	f	6	(n o /lo)		
	v (ven/n)	PHF	Truck (%)	RV (%)				lp	V (pc/n)		
v <sub>FF</sub>	963	0.92	2	0	1.5	1.2	0.990	1.00	1057		
v <sub>RF</sub>	1185	0.92	2	0	1.5	1.2	0.990	1.00	1301		
V <sub>FR</sub>	407	0.92	2	0	1.5	1.2	0.990	1.00	44/		
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0		
V <sub>NW</sub>	1057					2778					
V <sub>W</sub>	1748										
VR	0.623										
Config	uration Cha	aracterist	ICS						47401.4		
Minimum	maneuver lanes,	N <sub>WL</sub>		2 lc	Minimum weaving lane changes, LC <sub>MIN</sub> 1748						
Interchang	ge density, ID			3.0 int/mi	Weaving lane changes, LC <sub>w</sub> 1981 lc						
Minimum	RF lane changes,	LC <sub>RF</sub>		1 lc/pc	Non-weaving lane changes, $LC_{NW}$ 63 lc.						
Minimum	FR lane changes,	LC <sub>FR</sub>		1 lc/pc	Total lane changes, LC <sub>ALL</sub> 2044 lc/						
Minimum	RR lane changes	, LC <sub>RR</sub>		lc/pc	Non-weaving vehicle index, I <sub>NW</sub> 247						
Weavir	ng Segment	t Speed,	Density, I	_evel of	Service,	and Cap	pacity				
Weaving segment flow rate, v2778 veh/hWeaving segment capacity, cw3813 veh/h					Weaving intensity factor, W0.48Weaving segment speed, S47.2 mpl						
Weaving s	segment v/c ratio			0.728	Average wea	aving speed,	S <sub>W</sub>		50.2 mph		
Weaving s	segment density,	D	19	9.8 pc/mi/ln	Average non	n-weaving spo	eed, S <sub>NW</sub>		42.9 mph		
Level of S	ervice, LOS			В	Maximum we	eaving length	n, L <sub>MAX</sub>		9301 ft		
Notes											

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
 b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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		FREEWAY	WEAV	ING WOF	RKSHEE	Т		
General Informati	on			Site Info	ormation			
Analyst SWG Agency/Company TEC, Inc. Date Performed 3/19/2014 Analysis Time Period Weekday Morning Project Description Mixed-Use at Park Central - Southborough, N				Freeway/Dir of TravelRoute 9 WBWeaving Segment LocationI-495 NB Off to I-495 SB OnAnalysis Year2014 Existing Conditions				
Project Description Mixed-	Use at Park C	entral - Southb	orough, Mas	ssachsuetts				
Inputs Weaving configuration Weaving number of lanes, I Weaving segment length, L Freeway free-flow speed, F	N s FS		One-Sided 3 820ft 60 mph	Segment typ Freeway mir Freeway ma Terrain type	e nimum speed ximum capad	, S <sub>MIN</sub> city, C <sub>IFL</sub>		C-D Roadway/ Multilane Highways 30 2300 Level
Conversions to p	c/h Unde	r Base Co	ondition	S				
V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub> 1530	0.92	2	0	1.5	1.2	0.990	1.00	1680
V <sub>RF</sub> 1396	0.92	2	0	1.5	1.2	0.990	1.00	1533
V <sub>FR</sub> 355	0.92	2	0	1.5	1.2	0.990	1.00	390
V <sub>RR</sub> 0	0.92	2	0	1.5	1.2	0.990	1.00	0
V <sub>NW</sub> 1680					•		V =	3568
V <sub>W</sub> 1923							•	
VR 0.534								
Configuration Ch	aracteris	tics		•				
Minimum maneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	eaving lane c	hanges, LC <sub>MIN</sub>	I	1923 lc/h
Interchange density, ID			3.0 int/mi	Weaving lan	ne changes, L	_C <sub>w</sub>		2166 lc/h
Minimum RF lane changes	, LC <sub>rf</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		213 lc/h
Minimum FR lane changes	, LC <sub>fr</sub>		1 lc/pc	Total lane cl	hanges, LC <sub>AL</sub>	L		2379 lc/h
Minimum RR lane changes	, LC <sub>RR</sub>		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		413
Weaving Segmen	t Speed,	Density, I	_evel of	Service,	and Cap	oacity		
Weaving segment flow rate	e, V		3568 veh/h	Weaving inte	ensity factor,	W		0.524
Weaving segment capacity, c <sub>w</sub> 4452 veh/l				Weaving segment speed, S				44.9 mph
Weaving segment v/c ratio 0.801				Average weaving speed, S <sub>w</sub>				49.7 mph
Weaving segment density, D 26.8 pc/mi/li				i/In Average non-weaving speed, S <sub>NW</sub> 40				40.4 mph
Level of Service, LUS			С	Maximum w	eaving length	n, L <sub>MAX</sub>		8223 ft
Notes	han the colorit	atod movimum la	nath chauld	o troated as in	coloted marrie	and divorge at	ooo uning the	procedures of

b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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		F	REEWAY	WEAV	ING WOR	KSHEE	Т		
Gener	al Informati	on			Site Info	rmation			
Analyst Agency/C Date Perfo Analysis T	ompany ormed ⁻ime Period	DSH TEC, In 11/17/1 Weekda	c. 5 ay Morning		Freeway/Dir of TravelRoute 9 WBWeaving Segment LocationPark Central Dr to I-495 NB OnAnalysis Year2014 Existing Conditions				
Project De	escription Mixed-L	Jse at Park Ce	entral - Southb	orough, Mas	ssachsuetts				
Inputs Weaving ( Weaving ) Weaving s Freeway f	configuration number of lanes, N segment length, L ree-flow speed, F	N s FS		One-Sided 3 430ft 60 mph	Segment typ Freeway min Freeway may Terrain type	e imum speed ximum capac	, S <sub>MIN</sub> city, C <sub>IFL</sub>		C-D Roadway/ Multilane Highways 30 2300 Level
Conve	rsions to p	c/h Undei	r Base Co	ondition	S				
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub>	1885	0.92	2	0	1.5	1.2	0.990	1.00	2069
V <sub>RF</sub>	166	0.96	5	0	1.5	1.2	0.976	1.00	177
V <sub>FR</sub>	721	0.92	2	0	1.5	1.2	0.990	1.00	792
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0
V <sub>NW</sub>	2069		-					V =	3008
V <sub>W</sub>	969								
VR	0.319								
Config	juration Cha	aracterist	ics		1				
Minimum	maneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	eaving lane c	hanges, LC <sub>MIN</sub>	I	969 lc/h
Interchan	ge density, ID			3.0 int/mi	Weaving lan	e changes, L	-C <sub>W</sub>		1090 lc/h
Minimum	RF lane changes,	LC <sub>RF</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		81 lc/h
Minimum	FR lane changes,	LC <sub>FR</sub>		1 lc/pc	Total lane ch	nanges, LC <sub>AL</sub>	L		1171 lc/h
Minimum	RR lane changes	, LC <sub>RR</sub>		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		267
Weavi	ng Segmen	t Speed, I	Density, I	_evel of	Service,	and Cap	oacity		
Weaving	segment flow rate	, V		3008 veh/h	Weaving inte	ensity factor,	W		0.498
Weaving	Weaving segment capacity, c <sub>w</sub> 5614 veh/					Weaving segment speed, S			
Weaving segment v/c ratio 0.536					Average weaving speed, S <sub>w</sub>				50.0 mph
Weaving segment density, D 20.8 pc/mi/li				0.8 pc/mi/ln	I/In Average non-weaving speed, S <sub>NW</sub> 48.2				48.2 mph
Level of S	Level of Service, LOS B					eaving length	n, L <sub>MAX</sub>		5788 ft
Notes	a ogemente lange+	han the select-	tod movimum !-	nath abaul-1	o trooted as !-		and diverse -		propodures of

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		I	FREEWAY	( WEAV	ING WOF	RKSHEE	Т		
Genera	Informati	on			Site Info	rmation			
Analyst Agency/Con Date Perforr Analysis Tin	npany ned ne Period	SWG TEC, li 3/19/20 Weekd	nc. )14 lay Evening		Freeway/Dir of TravelRoute 9 EBWeaving Segment LocationI-495 SB Off to I-495 NB OnAnalysis Year2014 Existing Conditions				
Project Desc	cription Mixed-L	Jse at Park C	entral - Southb	orough, Mas	ssachsuetts				
<b>Inputs</b> Weaving col Weaving nu Weaving se Freeway fre	nfiguration mber of lanes, f gment length, L e-flow speed, F	N s FS		One-Sided 3 780ft 60 mph	Segment typ Freeway min Freeway max Terrain type	e imum speed ximum capac	, S <sub>MIN</sub> ity, C <sub>IFL</sub>		C-D Roadway/ Multilane Highways 30 2300 Level
Convers	sions to p	c/h Unde	r Base Co	ondition	S				
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub>	1283	0.92	2	0	1.5	1.2	0.990	1.00	1409
V <sub>RF</sub>	680	0.92	2	0	1.5	1.2	0.990	1.00	747
V <sub>FR</sub>	968	0.92	2	0	1.5	1.2	0.990	1.00	1063
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0
V <sub>NW</sub>	1409							V =	3188
V <sub>W</sub>	1810								
VR	0.562								
Configu	ration Cha	aracteris	tics		•				
Minimum m	aneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	eaving lane cl	hanges, LC <sub>MIN</sub>	I	1810 lc/h
Interchange	e density, ID			3.0 int/mi	Weaving lan	e changes, L	.C <sub>w</sub>		2043 lc/h
Minimum R	F lane changes	, LC <sub>rf</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		135 lc/h
Minimum Fl	R lane changes	, LC <sub>FR</sub>		1 lc/pc	Total lane ch	nanges, LC <sub>AL</sub>	L		2178 lc/h
Minimum R	R lane changes	, LC <sub>RR</sub>		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		330
Weaving	g Segmen	t Speed,	Density, I	Level of	Service,	and Cap	oacity		
Weaving segment flow rate, v3188 veh/hWeaving segment capacity, c4226 veh/h			3188 veh/h 4226 veh/h	Weaving intensity factor, W Weaving segment speed, S				0.508 46.0 mph	
Weaving segment v/c ratio 0.754				0.754	A Average weaving speed, Sw				47.7 111µ11 11 0 mnh
l evel of Sei	Level of Service, LOS B				Maximum weaving length L				41.0111111 0561 ft
				U	IVIAXIMUM W	eaving lengtr	I, L <sub>MAX</sub>		8004 II

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		F	REEWAY	WEAV	ING WOR	KSHEE	Т		
Gener	al Informati	on			Site Info	rmation			
AnalystSWGAgency/CompanyTEC, Inc.Date Performed3/19/2014Analysis Time PeriodWeekday EveningProject Description Mixed-Use at Park Central - Southborough,					Freeway/Dir Weaving Seg Analysis Yea	of Travel jment Locati r	Route on I-495 2014	e 9 WB NB Off to I-4 Existing Con	95 SB On ditions
Project De	escription Mixed-L	Jse at Park Ce	entral - Southb	orough, Mas	ssachsuetts				
Weaving ( Weaving ) Weaving ! Freeway f	configuration number of lanes, N segment length, L ree-flow speed, F	N s FS		One-Sided 3 820ft 60 mph	Segment type Freeway min Freeway may Terrain type	e imum speed kimum capac	, S <sub>MIN</sub> iity, C <sub>IFL</sub>		C-D Roadway/ Multilane Highways 30 2300 Level
Conve	ersions to po	c/h Under	<sup>-</sup> Base Co	ondition	S				
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub>	1411	0.92	2	0	1.5	1.2	0.990	1.00	1549
V <sub>RF</sub>	974	0.92	2	0	1.5	1.2	0.990	1.00	1069
V <sub>FR</sub>	747	0.92	2	0	1.5	1.2	0.990	1.00	820
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0
V <sub>NW</sub>	1549							V =	3404
V <sub>W</sub>	1889								
VR	0.549								
Config	juration Cha	aracterist	ics		1				
Minimum	maneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	aving lane c	hanges, LC <sub>MIN</sub>		1889 lc/h
Interchan	ge density, ID			3.0 int/mi	Weaving land	e changes, L	.C <sub>w</sub>		2132 lc/h
Minimum	RF lane changes,	LC <sub>RF</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		186 lc/h
Minimum	FR lane changes,	LC <sub>FR</sub>		1 lc/pc	Total lane ch	anges, LC <sub>AL</sub>	L		2318 lc/h
Minimum	RR lane changes	, LC <sub>RR</sub>		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		381
Weavi	ng Segmen <sup>-</sup>	t Speed, I	Density, I	_evel of	Service,	and Cap	oacity		
Weaving segment flow rate, v3404 veh/Weaving segment capacity, c4325 veh/			3404 veh/h 4325 veh/h	Weaving intensity factor, W Weaving segment speed, S				0.513 45.4 mph	
Weaving	Neaving segment v/c ratio 0.787				7 Average weaving speed, S <sub>w</sub>				49.8 mph
Weaving segment density, D 25.3 pc/mi/lr				b.3 pc/mi/ln	Maximum weaving longth 1				40.9 mph
				U	waximum we	eaving lengtr	I, L <sub>MAX</sub>		84 IU II
INUTES									

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		F	REEWAY	WEAV	ING WOR	KSHEE	Т		
Gener	al Informati	on			Site Info	rmation			
Analyst Agency/C Date Perfo Analysis T	ompany ormed Fime Period	DSH TEC, Ir 11/17/1 Weekd	nc. 5 ay Evening		Freeway/Dir of TravelRoute 9 WBWeaving Segment LocationPark Central Dr to I-495 NB OnAnalysis Year2014 Existing Conditions				
Project De	escription Mixed-L	Jse at Park C	entral - Southb	orough, Mas	ssachsuetts				
Weaving of Weaving r Weaving r Weaving s Freeway f	configuration number of lanes, N segment length, L ree-flow speed, F	N s FS		One-Sided 3 430ft 60 mph	Segment typ Freeway min Freeway may Terrain type	e imum speed ximum capad	, S <sub>MIN</sub> iity, C <sub>IFL</sub>		C-D Roadway/ Multilane Highways 30 2300 Level
Conve	rsions to p	c/h Unde	r Base Co	ondition	S				
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub>	2158	0.92	2	0	1.5	1.2	0.990	1.00	2369
V <sub>RF</sub>	152	0.78	3	0	1.5	1.2	0.985	1.00	198
V <sub>FR</sub>	974	0.92	2	0	1.5	1.2	0.990	1.00	1069
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0
V <sub>NW</sub>	2369						•	V =	3600
V <sub>W</sub>	1267								
VR	0.348								
Config	juration Cha	aracterist	tics		•				
Minimum	maneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	eaving lane c	hanges, LC <sub>MIN</sub>	l	1267 lc/h
Interchan	ge density, ID			3.0 int/mi	Weaving lan	e changes, L	-C <sub>w</sub>		1388 lc/h
Minimum	RF lane changes,	LC <sub>RF</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		143 lc/h
Minimum	FR lane changes,	LC <sub>FR</sub>		1 lc/pc	Total lane ch	nanges, LC <sub>AL</sub>	L		1531 lc/h
Minimum	RR lane changes	, LC <sub>RR</sub>		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		306
Weavi	ng Segmen	t Speed,	Density, l	_evel of	Service,	and Cap	oacity		
Weaving segment flow rate, v3600 vehWeaving segment capacity, c5543 veh				3600 veh/h 5543 veh/h	Weaving intensity factor, W Weaving segment speed, S				0.616 46.2 mph
Weaving	Weaving segment v/c ratio 0.649					9 Average weaving speed, S <sub>w</sub>			
Weaving segment density, D 26.2 pc/mi/li				5.2 pc/mi/ln	I/In Average non-weaving speed, S <sub>NW</sub> 45.1 m				45.1 mph
Level of S	Level of Service, LOS C				Maximum we	eaving length	n, L <sub>MAX</sub>		6110 ft
Notes									

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## 2023 No-Build Conditions

REEWAY WEAVIN	G WORKSHEET			Page 1 of
	FREEWA	Y WEAVI	NG WORKSHEET	
General Informatio	on		Site Information	
Analyst Agency/Company Date Performed Analysis Time Period	DSH TEC, Inc. 11/12/2015 Weekday Morning		Freeway/Dir of Travel Weaving Segment Location Analysis Year	Route 9 EB I-495 SB Off to I-495 NB On 2023 No-Build Conditions
Project Description Mixed-U	se at Park Central - South	borough, Mas	sachsuetts	
Inputs				
Weaving configuration Weaving number of lanes, N Weaving segment length, L <sub>s</sub> Freeway free-flow speed, FF	S	One-Sided 3 780ft 60 mph	Segment type Freeway minimum speed, S <sub>MN</sub> Freeway maximum capacity, C₁₅	C-D Roadway/ Multilane Highways 30 2300

Conve	ersions to po	c/h Unde	r Base Co	ondition	5				
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub>	1139	0.92	2	0	1.5	1.2	0.990	1.00	1250
V <sub>RF</sub>	1315	0.92	2	0	1.5	1.2	0.990	1.00	1444
V <sub>FR</sub>	459	0.92	2	0	1.5	1.2	0.990	1.00	504
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0
V <sub>NW</sub>	1250				•	•		V =	3167
V <sub>W</sub>	1948							-	
VR	0.609								
Config	juration Cha	aracterist	ics						
Minimum	maneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	eaving lane ch	nanges, LC <sub>MIN</sub>		1948 lc/h
Interchan	ge density, ID			3.0 int/mi	Weaving lane changes, $LC_w$				2181 lc/h
Minimum	RF lane changes,	$\mathrm{LC}_{\mathrm{RF}}$		1 lc/pc	Non-weaving lane changes, $LC_{NW}$				102 lc/h
Minimum	FR lane changes,	$LC_{FR}$		1 lc/pc	Total lane changes, $LC_{ALL}$ 22				2283 lc/h
Minimum	RR lane changes	, LC <sub>RR</sub>		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		293
Weavi	ng Segment	t Speed,	Density, I	_evel of	Service,	and Cap	acity		
Weaving	segment flow rate	, V		3167 veh/h	Weaving inte	ensity factor,	W		0.527
Weaving segment capacity, c <sub>w</sub> 3901 veh/h				3901 veh/h	Weaving seg	gment speed,	S		45.8 mph
Weaving segment v/c ratio 0.81				0.812	$_{2}$ Average weaving speed, S <sub>w</sub> 49				49.6 mph
Weaving	Weaving segment density, D 23.3 pc/mi/				In Average non-weaving speed, S <sub>NW</sub> 40.9				40.9 mph
Level of S	Level of Service, LOS B					Maximum weaving length, L <sub>MAX</sub> 913			

Terrain type

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".

b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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TEC, Inc.

General Information

Analyst

Agency/Company

FREEWAY WE

	Page 1 o
AVING WORKSHEET	
Site Information	
Freeway/Dir of Travel Weaving Segment Location Analysis Year	Route 9 WB I-495 NB Off to I-495 SB On 2023 No-Build Conditions
Massachsuetts	

Date Perfor Analysis Tir	med ne Period	11/12/ Weeko	2015 day Morning		Analysis Year 2023 No-Build Conditions					
Project Des	cription Mixed-l	Jse at Park (	Central - Southb	orough, Mas	sachsuetts					
Inputs					1					
Weaving configuration   One-Sided     Weaving number of lanes, N   3     Weaving segment length, L <sub>s</sub> 820fi     Freeway free-flow speed, FFS   60 mph     Conversions to pc/h Under Base Condition					C-D Road Segment type t Freeway minimum speed, S <sub>MIN</sub> Freeway maximum capacity, C <sub>IFL</sub>					
Conver	sions to po	c/h Unde	er Base Co	ondition	S	_		<u> </u>		
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)	
V <sub>FF</sub>	1707	0.92	2	0	1.5	1.2	0.990	1.00	1874	
V <sub>RF</sub>	1550	0.92	2	0	1.5	1.2	0.990	1.00	1702	
V <sub>FR</sub>	404	0.92	2	0	1.5	1.2	0.990	1.00	444	
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0	
V <sub>NW</sub>	1874							V =	3981	
V <sub>w</sub>	2146									
VR	0.534									
Configu	ration Cha	aracteris	stics							
Minimum m	aneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	aving lane c	hanges, LC <sub>MIN</sub>		2146 lc/h	
Interchange	e density, ID			3.0 int/mi	Weaving lane	e changes, L	_C <sub>w</sub>		2389 lc/h	
Minimum R	F lane changes,	, LC <sub>RF</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		253 lc/h	
Minimum F	R lane changes,	, LC <sub>FR</sub>		1 lc/pc	Total lane ch	anges, LC <sub>AL</sub>	L		2642 lc/h	
Minimum R	R lane changes	, LC <sub>rr</sub>		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		461	
Weavin	g Segmen <sup>-</sup>	t Speed,	Density, I	Level of	Service,	and Cap	oacity			
Weaving se	egment flow rate	, V		3981 veh/h	Weaving inte	ensity factor,	W		0.569	
Weaving segment capacity, c <sub>w</sub> 4451 veh/h				4451 veh/h	n Weaving segment speed, S				43.3 mph	
Weaving se	Veaving segment v/c ratio 0.894				Average weaving speed, $S_w$				49.1 mph	
Weaving se	Veaving segment density, D 31.0 pc/mi/ln				/In Average non-weaving speed, $S_{NW}$ 38.1				38.1 mph	
Level of Se	rvice, LOS			С	Maximum weaving length, L <sub>MAX</sub> 8225 ft					

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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		F	REEWAY	WEAV	ING WOF	<b>KSHEE</b>	Т			
Gener	al Informati	on			Site Info	rmation				
Analyst Agency/C Date Perf Analysis	Analyst DSH Agency/Company TEC, Inc. Date Performed 11/17/15 Analysis Time Period Weekday Morning Project Description, Mixed, Use at Park Central - Southborough, N					Freeway/Dir of TravelRoute 9 WBWeaving Segment LocationPark Central Dr to 1-495 NB OnAnalysis Year2023 No-Build Conditions				
Project D	escription Mixed-U	Jse at Park Co	entral - Southb	orough, Mas	ssachsuetts					
Inputs Weaving Weaving Freeway	configuration number of lanes, f segment length, L free-flow speed, F	N s FS		One-Sided 3 430ft 60 mph	Segment typ Freeway min Freeway ma: Terrain type	e imum speed ximum capac	, S <sub>MIN</sub> iity, C <sub>IFL</sub>		C-D Roadway/ Multilane Highways 30 2300 Level	
Conve	ersions to p	c/h Unde	r Base Co	ondition	S					
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)	
V <sub>FF</sub>	2111	0.92	2	0	1.5	1.2	0.990	1.00	2318	
V <sub>RF</sub>	166	0.96	5	0	1.5	1.2	0.976	1.00	177	
V <sub>FR</sub>	796	0.92	2	0	1.5	1.2	0.990	1.00	874	
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0	
V <sub>NW</sub>	2318							V =	3336	
V <sub>W</sub>	1051									
VR	0.312									
Config	guration Cha	aracterist	tics							
Minimum	maneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	aving lane cl	hanges, LC <sub>MIN</sub>	I	1051 lc/h	
Interchan	nge density, ID			3.0 int/mi	Weaving lan	e changes, L	.C <sub>w</sub>		1172 lc/h	
Minimum	RF lane changes	, LC <sub>RF</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		133 lc/h	
Minimum	FR lane changes	, LC <sub>FR</sub>		1 lc/pc	Total lane ch	nanges, LC <sub>AL</sub>	L		1305 lc/h	
Minimum	RR lane changes	, LC <sub>RR</sub>		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		299	
Weavi	ing Segmen	t Speed,	Density, l	_evel of	Service,	and Cap	oacity			
Weaving segment flow rate, v3336 veh/hWeaving segment capacity, c5632 veh/h				3336 veh/h 5632 veh/h	Weaving inte Weaving sec	ensity factor, gment speed	W , S		0.543 47.8 mph	
Weaving	Weaving segment v/c ratio 0.592					Average weaving speed, S <sub>w</sub>				
Weaving	Weaving segment density, D 23.5 pc/mi/lr					n/In Average non-weaving speed, S <sub>NW</sub> 47.0 m				
	Seivice, LUS			В	Maximum w	eaving length	n, L <sub>MAX</sub>		5713 ft	
Notes	a acamonto los sos t	han the colorie	tod maximum la	nath chould	o troated as is	olated mores	and diverge	oog uping the	procedures of	

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DSH

TEC, Inc. 11/12/2015

General Information

Analyst

Agency/Company Date Performed

KSHEET		Page 1 of 2
FREEWAY W	EAVING WORKSHEET	
Inc. 2/2015 xday Evening	Freeway/Dir of Travel Weaving Segment Location Analysis Year	Route 9 EB I-495 SB Off to I-495 NB On 2023 No-Build Conditions
Central - Southboroug	h, Massachsuetts	

Analysis Tir	ne Period	Weeko	lay Evening								
Project Des	cription Mixed-l	Jse at Park C	Central - Southb	orough, Mas	ssachsuetts						
Inputs					1						
Weaving cc Weaving nu Weaving se Freeway fre	nfiguration Imber of lanes, M gment length, L ee-flow speed, F	N s FS		One-Sided 3 780ft 60 mph	Segment typ Freeway min Freeway max Terrain type		C-D Roadway/ Multilane Highways 30 2300 Level				
Conver	sions to p	c/h Unde	r Base Co	ondition	S						
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)		
V <sub>FF</sub>	1463	0.92	2	0	1.5	1.2	0.990	1.00	1606		
V <sub>RF</sub>	756	0.92	2	0	1.5	1.2	0.990	1.00	830		
V <sub>FR</sub>	1069	0.92	2	0	1.5	1.2	0.990	1.00	1174		
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0		
V <sub>NW</sub>	1606							V =	3575		
V <sub>w</sub>	2004										
VR	0.555										
Configu	ration Cha	aracteris	tics		1						
Minimum m	naneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	eaving lane c	hanges, LC <sub>MIN</sub>		2004 lc/h		
Interchange	e density, ID			3.0 int/mi	Weaving lan	e changes, l	_C <sub>w</sub>		2237 lc/h		
Minimum R	F lane changes,	, LC <sub>RF</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		176 lc/h		
Minimum F	R lane changes,	, LC <sub>FR</sub>		1 lc/pc	Total lane ch	nanges, LC <sub>AL</sub>	L		2413 lc/h		
Minimum R	R lane changes	, LC <sub>RR</sub>		lc/pc	Non-weaving	g vehicle ind	ex, I <sub>NW</sub>		376		
Weavin	g Segmen	t Speed,	Density, I	Level of	Service,	and Ca	pacity		0 551		
Weaving se	egment flow rate	e, V		3575 veh/h	Weaving Inte	ensity factor, ament speed	W S		0.551 44.6 mph		
Weaving se	Weaving segment capacity, c <sub>w</sub> 4281 veh/h				Average weaving speed, S				49.3 mph		
Weaving se	egment density.	D	2	0.835 7.0 pc/mi/ln	Average non-weaving speed, S <sub>max</sub>				39.8 mph		
Level of Se	evel of Service, LOS C				Maximum weaving length, L <sub>MAX</sub> 8478 f						
Notes					I	5 5					

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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VR

0.542

-			REEWAY	WEAV	ING WOR	KSHEE			
Gener	al Information	on			Site Info	ormation			
Analyst Agency/C Date Perf Analysis⊺	ompany ormed Fime Period	DSH TEC, li 11/12/2 Weeko	nc. 2015 lay Evening		Freeway/Dir of TravelRoute 9 WBWeaving Segment LocationI-495 NB Off to I-495 SEAnalysis Year2023 No-Build Condition			95 SB On nditions	
Project De	escription Mixed-L	Jse at Park C	entral - Southb	orough, Ma	ssachsuetts				
Inputs					1				
Weaving Weaving Weaving Freeway f	configuration number of lanes, N segment length, L <sub>s</sub> ree-flow speed, Ff	S S	- 8 6	One-Sided 3 820ft 60 mph	C-D Roadway Multilan Freeway minimum speed, S <sub>MIN</sub> 3 Freeway maximum capacity, C <sub>IFL</sub> 230 Terrain type Leve				
	V (veh/h)	PHF	Truck (%)	RV (%)	<b>з</b> Е <sub>т</sub>	ER	funz	fp	v (pc/h)
V <sub>EE</sub>	1624	0.92	2	0	1.5	к 1.2	0.990	1.00	1783
V <sub>pf</sub>	1081	0.92	2	0	1.5	1.2	0.990	1.00	1187
V <sub>FR</sub>	840	0.92	2	0	1.5	1.2	0.990	1.00	922
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0
V <sub>NW</sub>	1783		8	8		8		V =	3854
V <sub>W</sub>	2109							-	-
VD	0.542	1							

Configu	ration Ch	aracteristics

Minimum maneuver lanes, N <sub>WL</sub>	2 lc	Minimum weaving lane changes, LC <sub>MIN</sub>	2109 lc/h
Interchange density, ID	3.0 int/mi	Weaving lane changes, $LC_w$	2352 lc/h
Minimum RF lane changes, $LC_{RF}$	1 lc/pc	Non-weaving lane changes, $LC_{NW}$	234 lc/h
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc	Total lane changes, LC <sub>ALL</sub>	2586 lc/h
Minimum RR lane changes, $LC_{RR}$	lc/pc	Non-weaving vehicle index, $I_{_{\rm NW}}$	439
Weaving Segment Speed, D	ensity, Level of	Service, and Capacity	
Weaving segment flow rate, v Weaving segment capacity, c <sub>w</sub>	3854 veh/h 4385 veh/h	Weaving intensity factor, W Weaving segment speed, S	0.559 43.7 mph
Weaving segment v/c ratio	0.879	Average weaving speed, $S_w$	49.2 mph
Weaving segment density, D	29.7 pc/mi/ln	Average non-weaving speed, $S_{NW}$	38.6 mph
Level of Service, LOS	С	Maximum weaving length, $L_{MAX}$	8320 ft
Natao			

Notes

Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
For volumes that exceed the weaving segment capacity, the level of service is "F".

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		F	REEWA	WEAV	ING WOF	RKSHEE	Т		
Gener	al Informati	on			Site Info	rmation			
Analyst Agency/C Date Perfo Analysis T	ompany ormed īime Period	DSH TEC, li 11/17/ <sup>2</sup> Weekd	nc. 15 ay Evening		Freeway/Dir Weaving Seg Analysis Yea	of Travel gment Locati ar	Route on Park 2023	e 9 WB Central Dr to No-Build Cor	I-495 NB On nditions
Project De	escription Mixed-L	Jse at Park C	entral - Southb	orough, Mas	ssachsuetts				
Inputs Weaving o Weaving r Weaving s Freeway f	configuration number of lanes, N segment length, L ree-flow speed, Fl	N s FS		One-Sided 3 430ft 60 mph	Segment typ Freeway min Freeway ma Terrain type	e iimum speed ximum capad	, S <sub>MIN</sub> city, C <sub>IFL</sub>		C-D Roadway/ Multilane Highways 30 2300 Level
Conve	rsions to po	c/h Unde	r Base Co	ondition	S				
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub>	2464	0.92	2	0	1.5	1.2	0.990	1.00	2705
V <sub>RF</sub>	152	0.78	3	0	1.5	1.2	0.985	1.00	198
V <sub>FR</sub>	1081	0.92	2	0	1.5	1.2	0.990	1.00	1187
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0
V <sub>NW</sub>	2705			-		•	•	V =	4050
V <sub>W</sub>	1385								
VR	0.339								
Config	uration Cha	aracteris	tics		1				
Minimum	maneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	eaving lane c	hanges, LC <sub>MIN</sub>	I	1385 lc/h
Interchan	ge density, ID			3.0 int/mi	Weaving lan	ie changes, L	-C <sub>W</sub>		1506 lc/h
Minimum	RF lane changes,	LC <sub>RF</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		212 lc/h
Minimum	FR lane changes,	LC <sub>FR</sub>		1 lc/pc	Total lane ch	nanges, LC <sub>AL</sub>	L		1718 lc/h
Minimum	RR lane changes	, LC <sub>rr</sub>		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		349
Weavi	ng Segmen	t Speed,	Density, I	Level of	Service,	and Cap	oacity		
Weaving Weaving	segment flow rate segment capacity,	, V , C <sub>W</sub>		4050 veh/h 5566 veh/h	Weaving intensity factor, W Weaving segment speed, S Average weaving speed, S				0.674 44.9 mph 47.9 mph
Weaving	segment density.	Average non-weaving speed. S				43.5 mph			
Level of Service, LOS C					Maximum weaving length, $L_{MAY}$ 6002 ff				
Notes							, IVIAX		
Weeving	a a a a manta langar t	han the colouid		and the abound I	a tracted on in	olotod morgo	and divarga or	and uning the	procedures of

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## 2023 Build Conditions

			FKEEWA			KOHEE	. I		
Genera	al Information	on			Site Info	ormation			
Analyst Agency/Co Date Perfo Analysis T	ompany ormed ime Period	DSH TEC, I 11/12/ Weeko	nc. 2015 day Morning		Freeway/Dir of TravelRoute 9 EBWeaving Segment LocationI-495 SB Off to I-495 NB OnAnalysis Year2023 Build Conditions				
Project De	scription Mixed-L	Jse at Park (	Central - South	oorough, Mas	ssachsuetts				
Inputs									
Weaving c Weaving r Weaving s Freeway fi	configuration number of lanes, N segment length, L ree-flow speed, Fl	N s FS		One-Sided 3 780ft 60 mph	Segment typ Freeway mir Freeway ma Terrain type	oe nimum speec iximum capa	I, S <sub>MIN</sub> city, C <sub>IFL</sub>		C-D Roadway, Multilane Highways 30 2300 Leve
Conve	rsions to po	c/h Unde	er Base Co	ondition	S	<u>г</u>	-		
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub>	1148	0.92	2	0	1.5	1.2	0.990	) 1.00	1260
V <sub>RF</sub>	1375	0.92	2	0	1.5	1.2	0.990	) 1.00	1510
V <sub>FR</sub>	459	0.92	2	0	1.5	1.2	0.990	) 1.00	504
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	) 1.00	0
V <sub>NW</sub>	1260							V =	3242
V <sub>W</sub>	2014								
VR	0.615								
Config	uration Cha	aracteris	tics		ī				
Minimum	maneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	eaving lane c	hanges, L	C <sub>MIN</sub>	2014 lc/h
Interchan	ge density, ID			3.0 int/mi	Weaving lar	ne changes, l	LCw		2247 lc/h
Minimum	RF lane changes,	LC <sub>RF</sub>		1 lc/pc	Non-weavin	g lane chang	ges, LC <sub>NW</sub>		105 lc/h
Minimum	FR lane changes,	1 lc/pc	Total lane c	2352 lc/h					
Minimum	RR lane changes	, LC <sub>rr</sub>		lc/pc	Non-weavin	g vehicle ind	ex, I <sub>NW</sub>		295
Weavii	ng Segment	t Speed,	Density,	Level of	Service,	and Ca	pacity		
Weaving : Weaving	segment flow rate	3242 veh/h	Weaving intensity factor, W Weaving segment speed, S 45.5				0.540 45.5 mph		
Weaving	segment v/c ratio	W		0.839	Average weaving speed, S <sub>w</sub> 49.5 mph				

## Notes

Weaving segment density, D

Level of Service, LOS

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".

24.0 pc/mi/ln

В

b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Average non-weaving speed, S<sub>NW</sub>

Maximum weaving length, L<sub>MAX</sub>

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40.3 mph

9203 ft

		F	REEWA	Y WEAV	ING WOF	<b>KSHEE</b>	Т			
Genera	al Informatio	on			Site Info	rmation				
Analyst Agency/Co Date Perfo Analysis T	ompany ormed ïme Period	DSH TEC, Ir 11/12/2 Weekd	nc. 2015 ay Morning		Freeway/Dir Weaving Seg Analysis Yea	of Travel gment Locati r	R on I- 2 <sup>1</sup>	oute <sup>(</sup> 495 N 023 B	9 WB IB Off to I-49 Suild Conditio	95 SB On ons
Project De	scription Mixed-L	se at Park C	entral - South	orough, Mas	ssachsuetts					
Inputs					•					
Weaving c Weaving r Weaving s Freeway fi	configuration number of lanes, N cegment length, L <sub>s</sub> ree-flow speed, FF	S		One-Sided 3 820ft 60 mph	Segment typ Freeway min Freeway ma Terrain type	e imum speed ximum capad	, S <sub>MIN</sub> city, C <sub>IFL</sub>			C-D Roadway/ Multilane Highways 30 2300 Level
Conve	rsions to po	/h Unde	r Base Co	ondition	S					
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>		fp	v (pc/h)
V <sub>FF</sub>	1727	0.92	2	0	1.5	1.2	0.990	)	1.00	1896
/	1550	0.92	2	0	1.5	1.2	0.990	)	1.00	1702

V <sub>FF</sub>	1727	0.92	2	0	1.5	1.2	0.990	1.00	1896	
V <sub>RF</sub>	1550	0.92	2	0	1.5	1.2	0.990	1.00	1702	
V <sub>FR</sub>	501	0.92	2	0	1.5	1.2	0.990	1.00	550	
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0	
V <sub>NW</sub>	1896							V =	4107	
V <sub>w</sub>	2252									
VR	0.543									
Configu	uration Cha	aracterist	ics							
Minimum n	naneuver lanes, l	N <sub>WL</sub>		2 lc	Minimum we		2252 lc/h			
Interchange	e density, ID			3.0 int/mi	Weaving lan	e changes, L	C <sub>w</sub>		2495 lc/h	
Minimum R	F lane changes,	$\text{LC}_{\text{RF}}$		1 lc/pc	Non-weaving	g lane change	es, LC <sub>NW</sub>		257 lc/h	
Minimum F	R lane changes,	$LC_{FR}$		1 lc/pc	Total lane ch		2752 lc/h			
Minimum R	R lane changes,	$LC_{RR}$		lc/pc	Non-weaving vehicle index, I <sub>NW</sub>					
Weavin	g Segment	Speed,	Density, I	Level of	Service,	and Cap	acity			
Weaving se	egment flow rate,	V		4107 veh/h	Weaving inte	ensity factor,	W		0.587	
Weaving se	egment capacity,	C <sub>w</sub>		4377 veh/h	Weaving seg		42.7 mph			
Weaving se	Veaving segment v/c ratio 0.938					Average weaving speed, $S_w$				
Weaving se	Weaving segment density, D 32.4 pc/mi/ln					Average non-weaving speed, $S_{NW}$				
Level of Se	Level of Service, LOS D					Maximum weaving length, $L_{\text{MAX}}$				
Nataa										

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".

b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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		FREEWAY	WEAV	ING WOF	RKSHEE	Т		
General Informati	on			Site Info	ormation			
Analyst Agency/Company Date Performed Analysis Time Period	DSH TEC, I 12/3/1 Weeko	nc. 5 Iay Morning		Freeway/Dir of TravelRoute 9 WBWeaving Segment LocationPark Central Dr to I-495 NB OnAnalysis Year2023 Build Conditions				
Project Description Mixed-	Use at Park C	central - Southb	orough, Mas	ssachsuetts				
Weaving configuration Weaving number of lanes, Weaving segment length, L Freeway free-flow speed, F	N s FS		One-Sided 3 430ft 60 mph	Segment typ Freeway mir Freeway ma Terrain type	be nimum speed ximum capad	, S <sub>MIN</sub> city, C <sub>IFL</sub>		C-D Roadway/ Multilane Highways 30 2300 Level
Conversions to p	c/h Unde	r Base Co	ondition	S				
V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub> 2228	0.92	2	0	1.5	1.2	0.990	1.00	2446
V <sub>RF</sub> 199	0.96	5	0	1.5	1.2	0.976	1.00	212
V <sub>FR</sub> 823	0.92	2	0	1.5	1.2	0.990	1.00	904
V <sub>RR</sub> 0	0.92	2	0	1.5	1.2	0.990	1.00	0
V <sub>NW</sub> 2446		•		-	-	-	V =	3527
V <sub>w</sub> 1116							•	
VR 0.313								
Configuration Ch	aracteris	tics						
Minimum maneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	eaving lane c	hanges, LC <sub>MIN</sub>	I	1116 lc/h
Interchange density, ID			3.0 int/mi	Weaving lar	ne changes, L	-C <sub>W</sub>		1237 lc/h
Minimum RF lane changes	, LC <sub>RF</sub>		1 lc/pc	Non-weavin	g lane chang	es, LC <sub>NW</sub>		159 lc/h
Minimum FR lane changes	, LC <sub>FR</sub>		1 lc/pc	Total lane cl	hanges, LC <sub>AL</sub>	L		1396 lc/h
Minimum RR lane changes	s, LC <sub>RR</sub>		lc/pc	Non-weavin	g vehicle inde	ex, I <sub>NW</sub>		316
Weaving Segmen	t Speed,	Density, I	Level of	Service,	and Cap	oacity		
Weaving segment flow rate	e, V		3527 veh/h	Weaving inte	ensity factor,	W		0.572
Weaving segment capacity	', C <sub>w</sub>		5629 veh/h	Weaving se	gment speed	, S		47.1 mph
Weaving segment v/c ratio	Average weaving speed, $S_w$				49.1 mph			
Weaving segment density,	Average non-weaving speed, S <sub>NW</sub> 40				46.3 mph			
Level of Service, LOS			С	Maximum w	eaving length	n, L <sub>MAX</sub>		5727 ft
Notes	de sus de sus de la d		and the state of the	- 4 4		and all		

Chapter 13, "Freeway Merge and Diverge Segments". b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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			FREEWA'	Y WEAV	ING WOI	<u>RKSHE</u> E	T		
Gener	al Informati	on		Site Information					
Analyst Agency/C Date Perf Analysis	company formed Time Period	DSH TEC, I 11/12/ Weeko	nc. 2015 Jay Evening		Freeway/Dir of TravelRoute 9 EBWeaving Segment LocationI-495 SB Off to I-495 NB OnAnalysis Year2023 Build Conditions				
Project D	escription Mixed-	Use at Park (	Central - South	orough, Mas	ssachsuetts				
Inputs	5				,				
Weaving Weaving Weaving Freeway	configuration number of lanes, l segment length, L free-flow speed, F	N <sup>S</sup> FS		One-Sided 3 780ft 60 mph	Segment typ Freeway miu Freeway ma Terrain type	be nimum speed Iximum capad	I, S <sub>MIN</sub> city, C <sub>IFL</sub>		C-D Roadway Multilane Highways 30 2300 Leve
Conve	ersions to p	c/h Unde	er Base Co	ondition	s		-		
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub>	1484	0.92	2	0	1.5	1.2	0.990	1.00	1629
V <sub>rf</sub>	813	0.92	2	0	1.5	1.2	0.990	1.00	893
V <sub>FR</sub>	1069	0.92	2	0	1.5	1.2	0.990	1.00	1174
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0
V <sub>NW</sub>	1629							V =	3660
V <sub>W</sub>	2067								
VR	0.559								
Config	guration Ch	aracteris	tics		r				
Minimum	maneuver lanes,	N <sub>WL</sub>		2 lc	Minimum w	eaving lane c	hanges, LC <sub>MIN</sub>	I	2067 lc/h
Interchar	ige density, ID			3.0 int/mi	Weaving lar	ne changes, l	LC <sub>w</sub>		2300 lc/h
Minimum	RF lane changes	, LC <sub>RF</sub>		1 lc/pc	Non-weavin	ig lane chang	jes, LC <sub>NW</sub>		181 lc/h
Minimum	FR lane changes	, LC <sub>FR</sub>	1 lc/pc	Total lane c	hanges, LC <sub>AI</sub>	LL		2481 lc/h	
Minimum	RR lane changes	s, LC <sub>RR</sub>		lc/pc	Non-weaving vehicle index, I <sub>NW</sub> 38				
Weavi	ng Segmen	t Speed,	Density,	Level of	Service,	and Ca	pacity		
Weaving	segment flow rate	Weaving intensity factor, W							
Weaving	segment capacity	ν, C <sub>W</sub>		4249 veh/h	Weaving segment speed, S 44.2 m				
Weaving	segment v/c ratio	D	0	0.861	Average we	aving speed,	S <sub>W</sub>		49.2 mph

Notes

Level of Service, LOS

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments". b. For volumes that exceed the weaving segment capacity, the level of service is "F".

С

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Maximum weaving length, L<sub>MAX</sub>

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8527 ft

Weaving segment flow rate, v

Weaving segment capacity, c<sub>w</sub>

Weaving segment v/c ratio

Level of Service, LOS

Notes

Weaving segment density, D

			FREEWA	Y WEAV	ING WOF	RKSHEE	Т			
Genera	al Information	on		Site Info	rmation					
Analyst Agency/Co Date Perfo Analysis T	ompany rmed ime Period	DSH TEC, 11/12/ Week	Inc. 2015 day Evening		Freeway/Dir of TravelRoute 9 WBWeaving Segment LocationI-495 NB Off to I-495 SB OnAnalysis Year2023 Build Conditions					
Project De	scription Mixed-L	Jse at Park (	Central - South	oorough, Mas	ssachsuetts					
nputs					1					
Neaving c Neaving n Neaving s Freeway fr	onfiguration umber of lanes, N egment length, L <sub>s</sub> ee-flow speed, FF	S		One-Sided 3 820ft 60 mph	Segment typ Freeway mir Freeway ma Terrain type	e iimum speed ximum capad	I, S <sub>MIN</sub> city, C <sub>IFL</sub>		C-D Roadway Multilan Highway 3 230 Leve	
Conve	rsions to po	:/h Unde	er Base Co	ondition	s	0				
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)	
/ <sub>FF</sub>	1638	0.92	2	0	1.5	1.2	0.990	1.00	1798	
/ <sub>RF</sub>	1081	0.92	2	0	1.5	1.2	0.990	1.00	1187	
/ FR	912	0.92	2	0	1.5	1.2	0.990	1.00	1001	
/ RR	0	0.92	2	0	1.5	1.2	0.990	1.00	0	
/ <sub>NW</sub>	1798							V =	3947	
/ <sub>w</sub>	2188									
/R	0.549									
Config	uration Cha	racteris	stics		<b>.</b>					
Minimum	maneuver lanes, l	N <sub>WL</sub>		2 lc	Minimum we	eaving lane c	hanges, LC <sub>MIN</sub>		2188 lc/ł	
Interchange density, ID 3.0 int				3.0 int/mi	Weaving lane changes, $LC_w$ 2					
Minimum RF lane changes, LC <sub>RF</sub> 1 lc/pc					Non-weaving	g lane chang	jes, LC <sub>NW</sub>		237 lc/ł	
Minimum FR lane changes, LC <sub>FR</sub> 1 lc/pc					Total lane changes, LC <sub>ALL</sub> 266				2668 lc/h	
Minimum	/inimum RR lane changes, LC <sub>RR</sub> Ic/pc					Non-weaving vehicle index, I <sub>NW</sub> 442				

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Weaving intensity factor, W

Weaving segment speed, S

Average weaving speed, S<sub>w</sub>

Average non-weaving speed,  $S_{NW}$ 

Maximum weaving length, L<sub>MAX</sub>

3947 veh/h

4329 veh/h

30.7 pc/mi/ln

0.912

С

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".

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b. For volumes that exceed the weaving segment capacity, the level of service is "F"

0.573

43.3 mph

49.1 mph

37.9 mph

8404 ft

		F	REEWAY	WEAV	ING WOF	KSHEE	Т		
Gener	al Informati	on			Site Info	rmation			
Analyst Agency/C Date Perf Analysis	Company Formed Time Period	DSH TEC, Ir 12/3/15 Weekd	nc. 5 ay Evening		Freeway/Dir of TravelRoute 9 WBWeaving Segment LocationPark Central Dr to I-495 NB OAnalysis Year2023 Build Conditions				
Project D Innuts	escription Mixed-L	Jse at Park C	entral - Southb	orough, Mas	ssachsuetts				
Weaving Weaving Weaving Freeway	configuration number of lanes, I segment length, L free-flow speed, F	N s FS		One-Sided 3 430ft 60 mph	Segment typ Freeway min Freeway ma: Terrain type	e iimum speed ximum capad	, S <sub>MIN</sub> City, C <sub>IFL</sub>		C-D Roadway/ Multilane Highways 30 2300 Level
Conve	ersions to p	c/h Unde	r Base Co	ondition	S				
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub>	2550	0.92	2	0	1.5	1.2	0.990	1.00	2799
V <sub>RF</sub>	204	0.78	3	0	1.5	1.2	0.985	1.00	265
V <sub>FR</sub>	1105	0.92	2	0	1.5	1.2	0.990	1.00	1213
V <sub>RR</sub>	0	0.92	2	0	1.5	1.2	0.990	1.00	0
V <sub>NW</sub>	2799		-		-			V =	4235
V <sub>W</sub>	1478								
VR	0.346								
Config	guration Cha	aracteris	tics		•				
Minimum	maneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	eaving lane c	hanges, LC <sub>MIN</sub>	I	1478 lc/h
Interchan	nge density, ID			3.0 int/mi	Weaving lan	e changes, L	_C <sub>w</sub>		1599 lc/h
Minimum	RF lane changes	, LC <sub>rf</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		232 lc/h
Minimum	FR lane changes	, LC <sub>fr</sub>		1 lc/pc	Total lane ch	nanges, LC <sub>AL</sub>	L		1831 lc/h
Minimum	RR lane changes	, LC <sub>RR</sub>		lc/pc	Non-weaving	g vehicle ind	ex, I <sub>NW</sub>		361
Weavi	ng Segmen	t Speed,	Density, l	_evel of	Service,	and Cap	oacity		
Weaving	segment flow rate	e, V		4235 veh/h	Weaving inte	ensity factor,	W		0.709
Weaving	segment capacity	, C <sub>w</sub>		5549 veh/h	Weaving sec	gment speed	, S		44.1 mph
Weaving segment v/c ratio 0.763					Average weaving speed, $S_{W}$				47.6 mph
Weaving	segment density,	D	32	2.3 pc/mi/ln	Average non-weaving speed, S <sub>NW</sub>				42.5 mph
Level of S	Service, LOS			D	Maximum we	eaving length	n, L <sub>MAX</sub>		6078 ft
Notes									

Chapter 13, "Freeway Merge and Diverge Segments". b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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