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TRAFFIC STUDY

Proposed Delivery Station Building
5 Research Parkway
Wallingford, CT

PREPARED BY:
BL Companies
355 Research Parkway
Meriden, CT 06450



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EXECUTIVE SUMMARY

This traffic study has been prepared for a new tenant and change of use of an existing Site at 5 Research Parkway in Wallingford, CT. The study area is primarily business parks with residential neighborhoods to the south and east. The Site will serve as a package delivery station which will provide "last mile" package delivery services to residences and businesses with an approximate 60-minute driving time radius of the Site. It should be noted that for the Town of Wallingford planning purposes; delivery station shall be interpreted as warehouse.

This study investigated the potential traffic impacts of the proposed development during the weekday morning, mid-day, and evening traffic periods. To assess existing traffic conditions in the vicinity of the Site, peak hour manual turning movement traffic volumes, vehicle classification and pedestrian counts were recorded at key intersections within the study area.

The level of traffic likely generated by the proposed development has been estimated by the tenant to determine the potential traffic impact on the study intersections. The tenant completed a detailed analysis determining the number and time of Site traffic arrivals and departures at the Site, which is a function of the delivery area population and business density. The proposed delivery station is projected to generate 3 (1 enter, 2 exit) vehicle trips, trucks only, during the weekday morning peak hour, 148 (0 enter, 148 exit) vehicle trips during the mid-day peak hour, 136 (91 enter, 45 exit) during the weekday evening peak hour, 427 (113 enter, 314 exit) vehicle trips during am peak generator hour, and 440 (220 enter, 220 exit) vehicle trips during pm peak generator hour.

A holiday season analysis was performed per town peer review request and included in the **Appendix** for comparison. It should be noted CTDOT does not require holiday

analysis per OSTA Major Traffic Generator Administrative Decision Request Guidelines, Section III (Traffic Information) D-3.

A detailed traffic analysis was also conducted at key intersections and roadways in the general vicinity of the Site in accordance with methodologies outlined in the Highway Capacity Manual 2010, published by the Transportation Research Board. At the three signalized intersections along Route 68 (Barnes Road) with overall acceptable traffic operations during all average weekday scenarios analyzed. Some deterioration is observed at specific movements; however, overall intersections performance is acceptable. During some periods, certain movements at signalized intersections are projected to perform at LOS E /F that is generally considered undesirable motorist delay.

At the proposed development driveway (Site #1) formerly signalized intersection that presently operates in "Flash" mode, for all build scenarios, the intersection signal was activated. As such, the LOS for all build scenario periods operates at LOS A and LOS B. At the second access point to the site at Carpenter Lane performs adequately for all movements. The stop-controlled movement from the Site #2 approach performs at LOS A and LOS B.

The following is a summary of the results/recommendations for this Site:

- Capacity analyses indicate that all analyzed intersections, overall, are projected to perform at an acceptable Level of Service between all average weekday scenarios analyzed.
- The undesirable Levels of Service are observed for individual movements and deterioration occurs between the Existing and No Build scenarios.
- Additional analysis with improved lane configuration on the I-91 northbound Off-Ramp approach and optimization of signal phases (only during PM Peak hour) was performed to accommodate holiday traffic. Details provided in the **Appendix.**

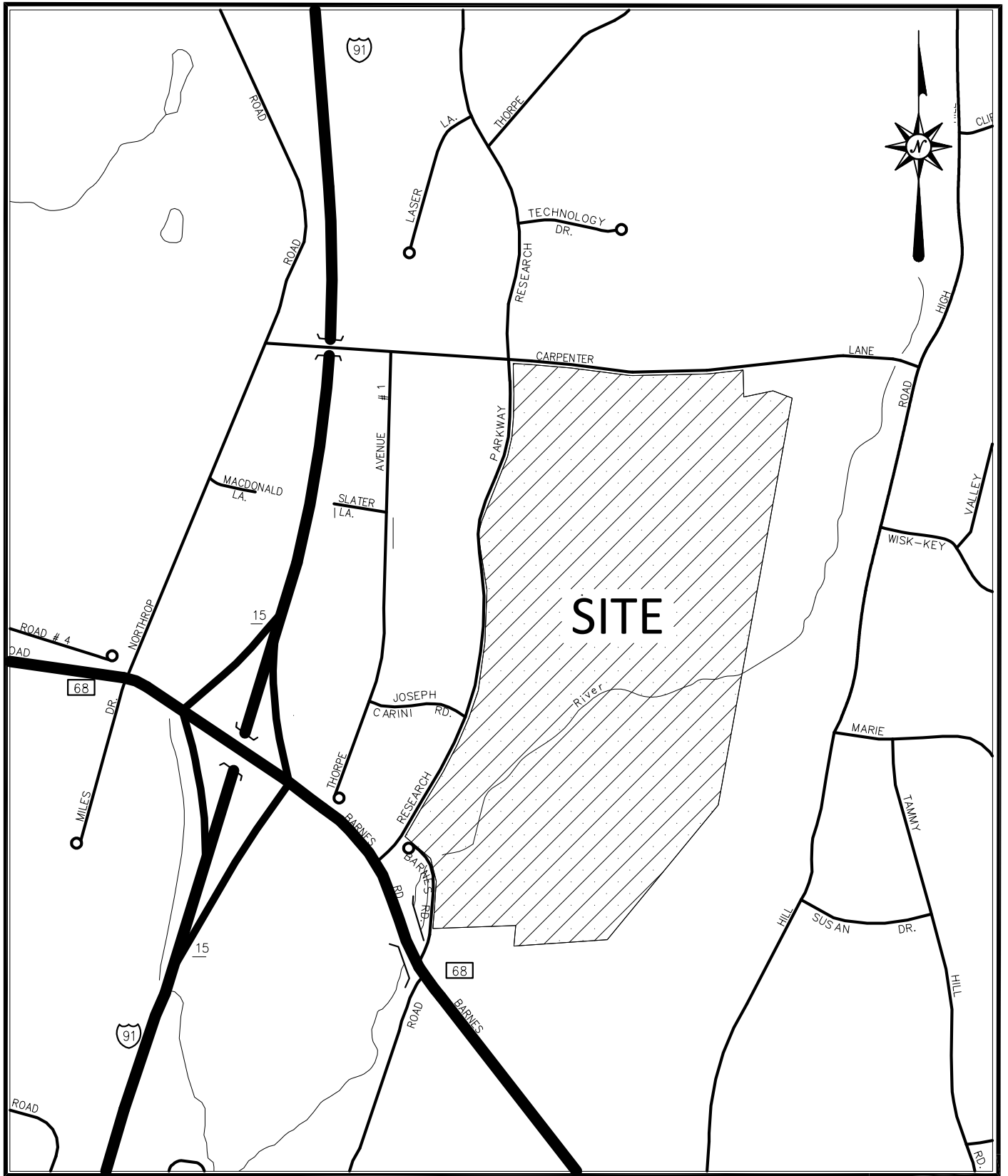
- Install “Stop” sign and stop bar at the Site drive's access / egress at Carpenter Lane as noted on Site Plans.
- Clear of overgrown shrubs to meet the sight line requirements at the Carpenter Lane Site driveway.
- Clearing of vegetation at the Research Parkway at Carpenter Lane to increase sight lines.
- Move the Research Parkway northbound stop bar at the Site Drive #1 to accommodate truck turns from the Site.
- Route 68 Left Turn into Research Parkway operates with throat width of 27.5'±. Current CTDOT guidelines suggest an expanded throat width of 30' to avoid conflicts in turning paths at double left turn. Sketch Plan TT-2 shows WB-67 truck turns with restriped travel lanes to 11ft wide to accommodate the movements without widening of roadway or conflict areas.

I. INTRODUCTION

This traffic study has been prepared for a new tenant and change of use of an existing building at 5 Research Parkway in Wallingford, CT. The focus of this study was to evaluate the traffic flows and operating conditions on the roadways and intersections projected to be used by motorists traveling to and from the proposed development and to quantify the potential traffic impacts on these roadways and intersections. The study area is primarily business parks with residential neighborhoods to the south and east. See **Figure 1** for a location map.

The Site will serve as a package delivery station which will provide “last mile” package delivery services to residences and businesses with an approximate 60-minute driving time radius of the Site. It should be noted that for the Town of Wallingford planning purposes; delivery station shall be interpreted as warehouse. The project will include proposed redevelopment of the Site with ±219,000 SF warehouse building and will include 1,508 parking spaces. Access to the Site will be via two existing curb cuts on Research Parkway and Carpenter Lane. The Carpenter Lane driveway will be limited to right in only and left out only.

The study investigated the potential traffic impacts associated with the development in the weekday morning, mid-day, and evening peak periods. The greatest cumulative impacts of project related traffic are likely to occur during the weekday morning, mid-day, and evening peak hours, when traffic consists mostly of commuters. As such, traffic operating conditions at the study intersections were analyzed during these peak periods.



APRIL 2021



LOCATION MAP
 5 RESEARCH PARKWAY
 PROPOSED DEVELOPMENT
 WALLINGFORD, CT

SCHEMATIC, NOT TO SCALE

FIGURE 1

II. EXISTING CONDITIONS

An investigation of the existing traffic conditions on the adjacent roadway network formed the basis for assessing any traffic issues associated with the proposed development. This investigation included a field reconnaissance, traffic counting, and research of pertinent planning and traffic data available with Connecticut Department of Transportation (CTDOT) and the Town of Wallingford.

Access Network

The project study area consists of signalized intersections at the following locations:

- CT Route 68 (Barnes Road) at I-91 Southbound Exit 15 on/off ramps
- CT Route 68 (Barnes Road) at I-91 Northbound Exit 15 on/off ramps
- CT Route 68 (Barnes Road) at Research Parkway
- Research Parkway at Site #1 Driveway and Connecticut Food Bank Driveway

The project study area also consists of unsignalized intersections at the following locations:

- Research Parkway at Carpenter Lane
- Carpenter Lane at Site #2 Driveway
- Research Parkway at Joseph Carini Road

Major roadways in the vicinity of the project include I-91, CT Route 68 (Barnes Road), Research Parkway, and Carpenter Lane.

I-91 is an urban interstate that originates from a junction with I-95 in New Haven in the south and terminates to the north at an international border with Canada in Derby Line, VT. Along most of its length thru Connecticut, I-91 has three travel lanes in both directions and speed limit of 65 mph. The latest average daily traffic (ADT), provided by CTDOT, was 42,900 vehicles per day (vpd) northbound and 42,500 vpd southbound north of the Route 68 ramps. The on-ramps for both I-91 NB and SB are single lanes. The off ramps for both I-91 NB and SB have posted advisory speeds of 30 mph. The I-91 NB

Exit 15 off-ramp and on-ramp has an ADT of 6,700 vehicles. The I-91 SB Exit 15 off-ramp and on-ramp has an ADT of 6,200 vehicles and 6,600 vehicles, respectively.

CT Route 68 (Barnes Road) is an arterial State Highway routed through the Town of Wallingford in the east/west direction from the Cheshire town line in the west to the Durham town line the east. In the study area, the speed limit is 35 mph and increases to 45 mph west of the intersection of Barnes Road and the Interstate 91 SB Exit 15 On/Off-Ramps. Within the study area, Barnes Road has two through lanes in each direction and exclusive left and right turn lanes at key intersections. Across the I-91 interchange, the ADT varies from 16,100 vehicles to 22,300 vehicles along CT Route 68 with the highest being west of the interchange. All counts were recorded, per volumes collected by the Connecticut Department of Transportation in 2016. There are no observed sidewalks along CT Route 68 and illumination is sporadic within the study area.

Research Parkway is an urban minor arterial that begins at an intersection with East Main Street in the City of Meriden and continues south to its intersection with CT Route 68 (Barnes Road). The only ADT recorded along Research Parkway by CTDOT, in 2016, is just north of its intersection with Carpenter Lane with an average daily traffic of 5,600 vehicles. The speed limit along Research Parkway is 45 mph and has a single through lane in each direction with exclusive left and right turn lanes at key intersections

Carpenter Lane is a 0.8 miles long local road that begins at an intersection with Northrop Road and ends at intersection with High Hill Road. There are no ADT recorded by CTDOT, however our study determined traffic volumes to be at 125 vehicles per direction during peak hour per day.

Intersection Characteristics

Several key intersections were reviewed in this study to determine if they would be impacted by the expected Site traffic volumes. They are as follows:

CT Route 68 (Barnes Road) at Hilton Garden Inn Drive and Research Parkway – At this fully actuated signalized intersection, the Barnes Road eastbound approach consists of dual left-turn lanes for a three-hour window, 6:30AM to 9:30AM, Monday through Friday, and a shared through/right-turn lane. All other times, the approach is an exclusive single left-turn lane, an exclusive through lane, and a shared through/right-turn lane. The westbound approach consists of an exclusive left-turn lane, dual through lanes, and an exclusive right-turn lane. The northbound approach, exiting the hotel property, consists of an exclusive left-turn lane and a shared through/right-turn lane. The Research Parkway southbound approach consists of a shared left-turn/through lane and an exclusive right-turn lane. This intersection operates on two different phasings, one for Monday-Friday 6:30AM to 9:30AM for the dual left-turn lanes, and the other for all other times. Research Parkway southbound has a protected right-turn overlap with the eastbound protected left-turn phase. The signal is part of a closed loop coordinated system along CT Route 68. It has an 80" cycle length in the AM and PM peak hours and 75" in the mid-day peak hour.

CT Route 68 (Barnes Road) at Interstate 91 Northbound Exit 15 On/Off Ramps –

This four phase fully actuated signalized intersection is located about 800' west of the Proposed Site. Barnes Road eastbound consists of an exclusive leading left-turn lane and dual through lanes. Barnes Road westbound consists of two through lanes and a right-turn only lane. The I-91 NB Exit 15 Off-Ramp approach has dual left-turn lanes and a right-turn lane. Turns on red are prohibited on the off-ramp approach. The signal is part of a closed loop coordinated system along CT Route 68. It has an 80" cycle length in the AM and PM peak hours and 75" in the mid-day peak hour.

CT Route 68 (Barnes Road) at Interstate 91 Southbound Exit 15 On/Off Ramps –

This three phase fully signalized intersection is located approximately 1700' northwest of the Proposed Site. The Barnes Road eastbound approach consists of dual through lanes and a right-turn only lane. Barnes Road westbound consists of an exclusive leading left-turn lane and dual through lanes. The I-91 SB Exit 15 Off-Ramp approach consists of an exclusive left-turn lane, a shared left/right-turn lane, and a right-turn only lane. Turns on red are prohibited on the off-ramp approach. The signal is part of a closed loop coordinated system along CT Route 68. It has an 80" cycle length in the AM and PM peak hours and 75" in the mid-day peak hour.

Research Parkway at Connecticut Food Bank Driveway and Proposed Site

Development – this is a stop-controlled intersection where the approaches of Research Parkway have free movements and the approach of Food Bank Driveway and Proposed Site are stop-controlled. The existing signal is flashing yellow on Research Parkway and flashing red on the east-west approaches. There are four exclusive left turn lanes for each approach. Research Parkway has single thru/right turn lanes and in northbound direction has an additional exclusive right turn lane. The approach from CT Food Bank is composed of exclusive left turn lane and thru/right turn lane. At present, the Proposed Site Development consists of an exclusive left-turn lane and a shared through/right-turn lane.

Research Parkway at Carpenter Lane – this is an all way stop-controlled intersection, where all four approaches have a single lane.

Research Parkway at Joseph Carini Road – this is a stop-controlled intersection where the approaches of Research Parkway have free movements and the approach of Joseph Carini Road is stop-controlled.

Access/Egress and Sight Distance

Carpenter Lane – A curb cut will be provided for employee/visitor driveway used by DSP Vans, associates, and managers. The Carpenter Lane driveway will be limited to right in only and left out only. All truck trips will utilize Research Parkway access/egress point separate from car site traffic. Adequate intersection sight distance should be provided for the prevailing speeds along Carpenter Lane. Sight distance appears good to/from the west but limited due to the crest of a hill several hundred feet to the east. While the speed limit on Carpenter Lane is 35 mph, a speed study conducted for a prior project, indicates the prevailing speed (85th percentile) to be nearly 45 mph. The curb cut for the employee/visitor lot should therefore have 500' of sight distance (based on the CTDOT Highway Design Manual) available in both directions based on current roadway conditions. Measurements indicate the sight distance will be well more than 500' to/from the west and just meet the 500' to/from the east.

5 Research Parkway – The northbound Research Parkway stop bar should be moved to the south slightly to allow for truck turns from the Site.

Route 68 Left Turn into Research Parkway – The part time double left turn from Route 68 into Research Parkway was implemented as a 2004 change order to the traffic signal plan in the I-91/Route 68 interchange project (#148-179). At that time, the double left turn operation was active during both the morning and afternoon peak periods. While the traffic signal plan was modified, the original Research Parkway acceptance width of 27.5'± was not revised. Current CTDOT guidelines suggest a 30' width to accept a double left turn. In a 2008 traffic study for the Hilton Garden Inn, when Bristol Myers was still an important operation, 565 morning peak hour left turns into Research Parkway were counted. The background left turn volume is currently projected to be about 380 AM peak hour trips. The redevelopment of the former Bristol Myers Site into warehouse use will result in increased truck traffic in the "outside" left turn lane on Route 68.

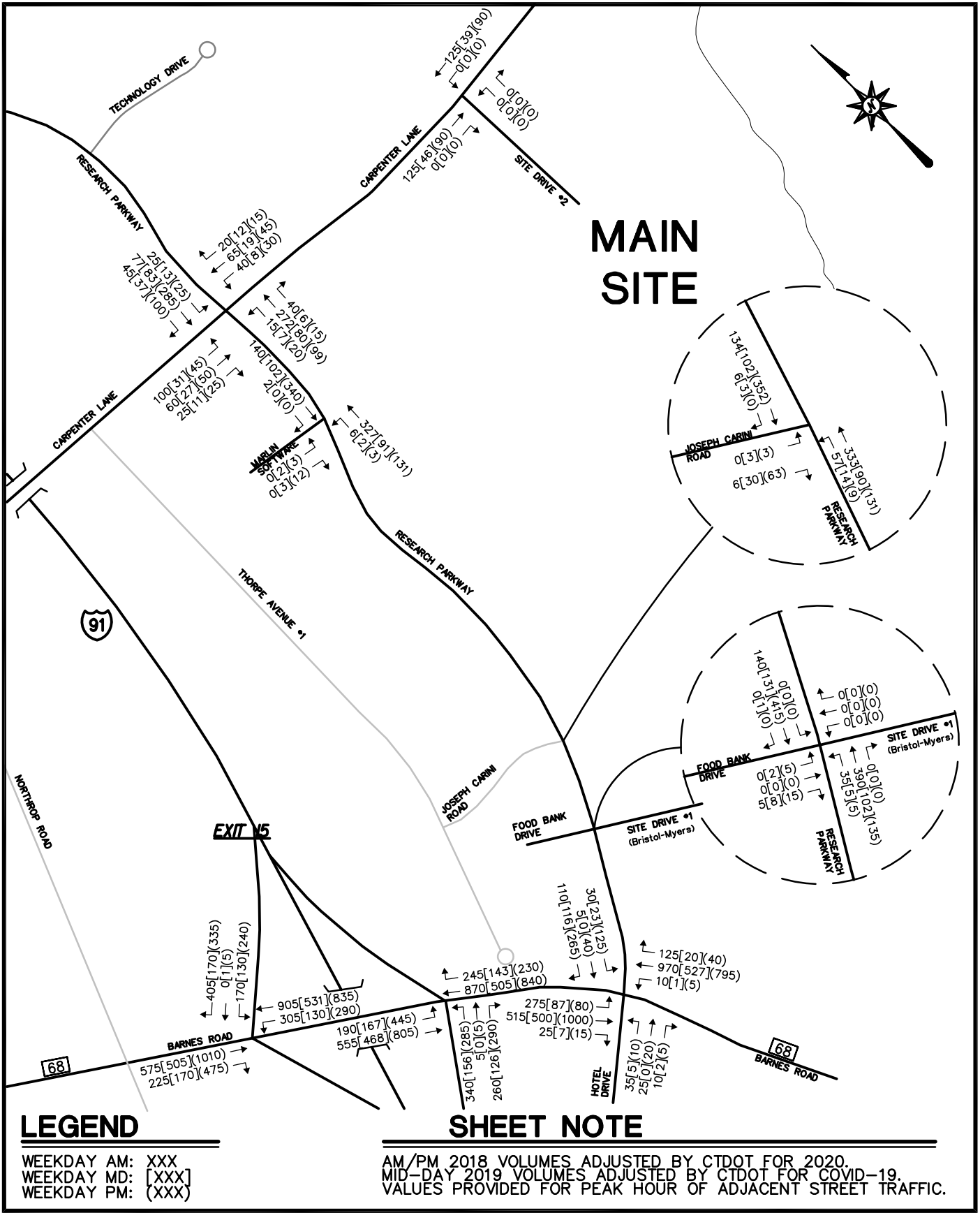
Existing Traffic Volumes

To assess existing traffic conditions in the vicinity of the Site, peak hour manual turning movement traffic volumes, vehicle classification and pedestrian counts were recorded at the intersections above. The counts were recorded during typical weekday morning (7am-9am), evening (4pm-6pm) in October of 2018 and mid-day (11am-1pm) peak traffic periods in October of 2020. It should be noted that during 2018 count collection, a small number of workers were present at the Site and utilizing Site #1 Driveway. These trips were removed from the existing and no build conditions to reflect the vacancy of the Site. The total number of trips were 90 vehicles in the morning and 80 vehicles in the afternoon peak hour. There were no records for the mid-day trips.

For the 2020 mid-day counts, due to the ongoing Coronavirus pandemic, existing traffic volumes were adjusted by CTDOT Bureau of Policy and Planning. After review of the approved CTDOT traffic counts, the 2020 mid-day traffic volumes along Route 68 (Barnes Road) were further adjusted by adding 150 through vehicles in both direction along Route 68 (Barnes Road) to resemble the CTDOT traffic counter (WALL-030 Route 68 - 16.94 milepost - southeast of I-91 NB Off Ramp / Exit 15).

In March of 2021, AM peak generator and PM peak generator manual turning movement traffic volumes, vehicle classification, and pedestrian counts were recorded for the study area. Using the CTDOT traffic counter (WALL-030), the AM peak generator and PM peak generator factors were developed. These counts were adjusted using 1.27 factor for AM peak generator and 1.36 factor for PM peak generator. Detail information on all counts and factor calculation are included in the **Appendix**.

All counts in the study area were further adjusted to ensure continuity of volumes across all studies intersections. The current peak hour traffic volumes for the intersections are illustrated in **Figure 2.1** and **Figure 2.2**.

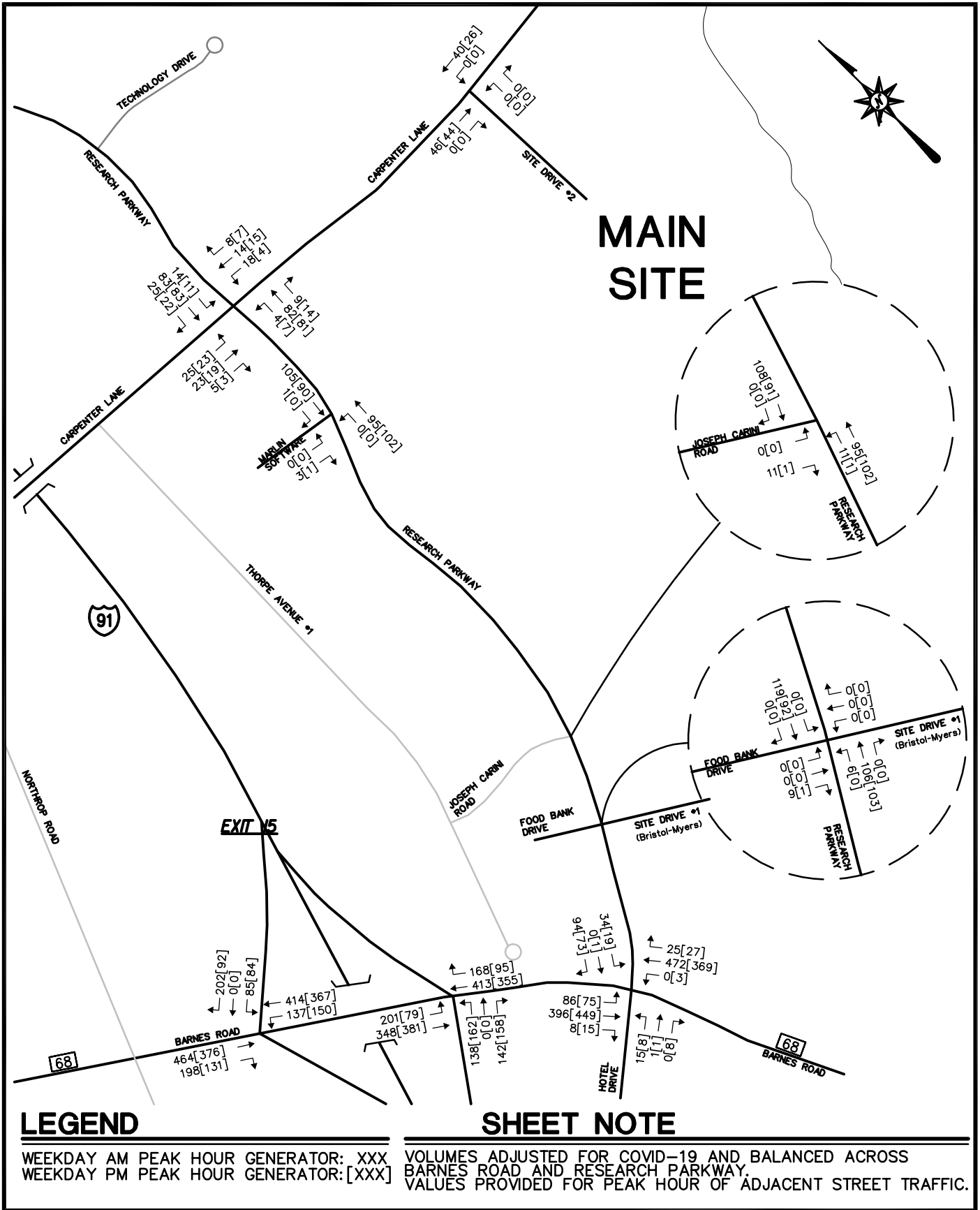


**EXISTING (2020) TRAFFIC VOLUMES
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT**

SCHMATIC, NOT TO SCALE

APRIL 2021

FIGURE 2.1



**EXISTING (2020) TRAFFIC VOLUMES
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT**

APRIL 2021

FIGURE 2.2

SCHEMATIC, NOT TO SCALE

Pedestrian Characteristics

Pedestrian counts were collected at the same time as vehicular turning movements and raw counts are included in the **Appendix**. It should be noted that that site location and the study area is located in non-pedestrian zones, where minimal pedestrian / bicycle facilities are provided. Within the study area, only the I-91 overpass viaduct has sidewalk present. The observed pedestrians were minimal and did not trigger further operation analysis.

Crash Data Analysis

As part of the existing conditions analysis, crash data for the most recent three-year period, January 1st, 2017 through December 31st, 2019, was obtained from the Connecticut Crash Data Repository.

Twenty-five (25) crashes in the study area were reviewed, the most common crash was “the front to rear” at forty eight percent (48%). Majority of crashes resulted in “Possible Injury” at forty percent (40%) and “No Apparent Injury” at thirty six percent (36%). There were no fatalities in the corridor for the three-year period.

According to the crash records mentioned above, the intersection of Research Parkway at Carpenter Lane had seven (7) crashes. Four (4) of these crashes were angle collisions and three (3) crashes were rear-end collisions. These crash patterns suggest that there may be sightline or geometric issues where drivers are not aware of the stop-control. Clearing of vegetation at the intersection to increase sight lines is proposed. At the intersection of CT Route 68 (Barnes Road) at Williams Road there were also seven (7) crashes: three (3) front-to-front, two (2) angle, and two (2) other/not applicable. Possible sightlines and geometric issues such as grade could also contribute to crash count. There were no recorded crashes at the proposed Site Driveways. Below in **Table 1** summarizes the crash data.

Table 1 – Crash Data Summary

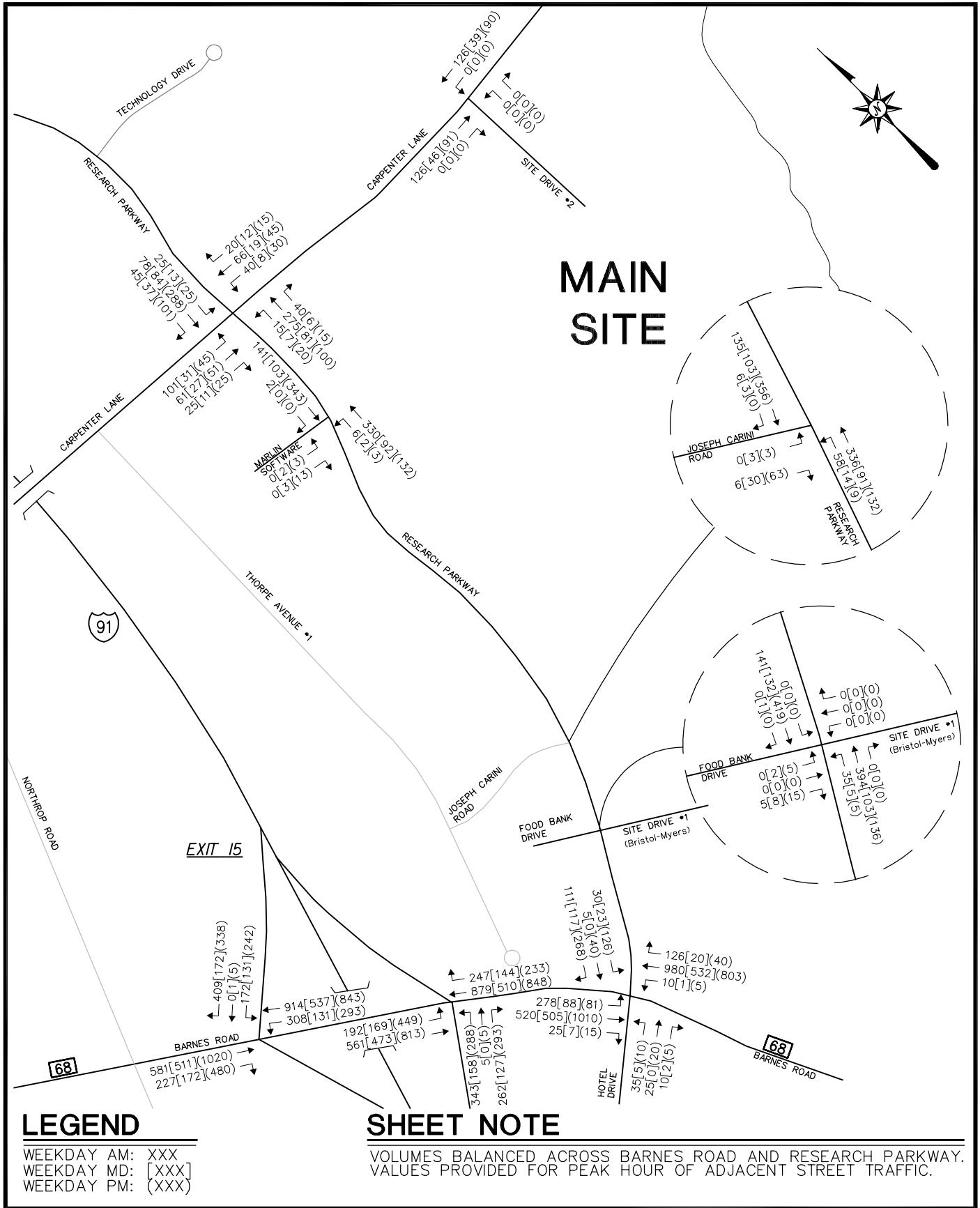
Location	Proposed Delivery Station, Wallingford, CT										Total
	CT Route 68 (Barnes Road) at Access to I-91NB	CT Route 68 (Barnes Road) at Exit from I-91SB	CT Route 68 (Barnes Road) at Research Parkway	CT Route 68 (Barnes Road) at Williams Road	Research Parkway at Carpenter Lane	Research Parkway at Joseph Carini Drive	Research Parkway at Marlin Software Driveway	Segment of Research Parkway North of J. Carini Drive and South of Carpenter Lane	Research Parkway at Site Drive #1	Carpenter Lane at Site Drive #2	
Year											
2017	1		3	2							6
2018			1	2	4	1		1			9
2019		1		3	3	2		1			10
Total	1	1	4	7	7	3		2			25
Crash Type											
Angle		1		2	4						7
Front to Front	1		4	3	2	1		1			12
Front to Rear											0
Not Applicable				1	1	1		1			4
Other				1							1
Rear to Rear											0
Rear to Side											0
Sideswipe, Opposite Direction											0
Sideswipe, Same Direction						1					1
Total	1	1	4	7	7	3		2			25
Severity											
Fatal Injury (K)											0
Suspected Serious Injury (A)		1	1	2	1						5
Suspected Minor Injury (B)				1							1
Possible Injury (C)	1		3	4	1			1			10
No Apparent Injury (O)					5	3		1			9
Unknown											0
Total	1	1	4	7	7	3		2			25

III. PROJECTED TRAFFIC CONDITIONS

In order to evaluate traffic conditions when the proposed development is completed in 2021, current traffic volumes were forecasted to the 2021 No Build Conditions (without the proposed delivery station development) and 2021 Build Conditions (with the proposed delivery station development). The projected traffic volumes on the roadway network under 2021 No Build conditions were assumed to include all existing traffic and new traffic resulting from background sources of traffic growth, independent of the proposed development.

No Build Traffic Volumes

A 1.0% annual growth rate was applied to the existing traffic volumes to develop the 2021 No Build traffic volumes. In addition to applying this growth rate, any approved or pending developments in the area that may add substantial traffic volume to the study intersections were considered. Any additional proposed improvements to the roadway, and intersections were checked with the Office of the State Traffic Administration (OSTA). There were none, thus annual growth volumes were added to the Existing Traffic Volumes to determine the 2021 No Build Traffic Volumes and are graphically illustrated in **Figure 3.1 and Figure 3.2.**

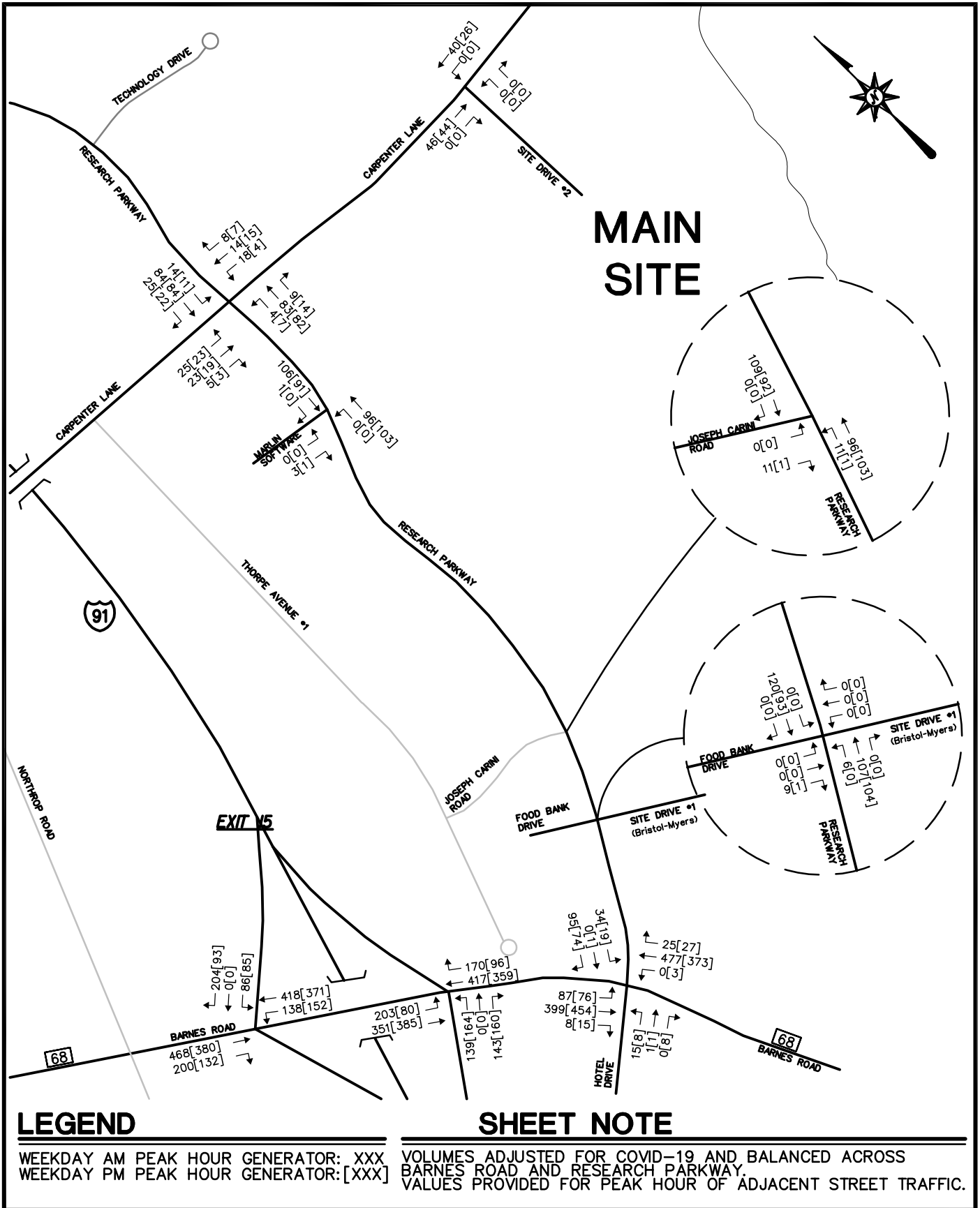


**BACKGROUND (2021) TRAFFIC VOLUMES
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT**

APRIL 2021

FIGURE 3.1

SCHMATIC, NOT TO SCALE



**BACKGROUND (2021) TRAFFIC VOLUMES
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT**

SCHMATIC, NOT TO SCALE

APRIL 2021

FIGURE 3.2

Trip Generation and On-Site Circulation

The level of traffic likely generated by the proposed delivery station has been estimated by the tenant to determine the potential traffic impact on the study intersections. The tenant completed a detailed analysis determining the number and time of the Site traffic arrivals and departures at the Site, which is a function of the delivery area population and business density. The Tenant anticipates that this facility will employ approximately 280 associates/managers on-site over various shifts during the day. All associates/managers will utilize one existing drive on Carpenter Lane.

Delivery stations operate 24/7 to support delivery of packages to at customer locations between 11:00 AM and 9:00 PM. At our proposed Wallingford, CT facility, the client anticipates approximately 32 line haul trucks delivering packages to the delivery station each day, primarily between the hours of 10:00 PM to 8:00 AM. The customer packages are sorted, picked to the delivery routes, placed onto movable racks and staged for dispatch. Approximately 121 associates and 27 managers support this operation and the shift structure is designed between 2:00 AM and 12:30 PM that mitigates traffic impact during rush hour periods. Additionally, there will be approximately 43 managers and dispatchers supervising the delivery operations, arriving at 6:00 AM and departing at 2:30 PM followed by another shift of dispatchers arriving at 1:30 PM and departing at 10:00 PM.

The delivery associates arrive at a delivery station at 9:20 AM. Starting at 9:50 AM and ending at 10:50 AM, 344 delivery vans will load and depart from the delivery station at a rate of 160 vans every 20 minutes to facilitate a regulated traffic flow into the surrounding area. The 1st wave of delivery vans leave at 10:10am. The departure window is designed to mitigate impact on rush hour periods. Approximately 8-10 hours after dispatch, delivery routes are completed, and the vans return to the station between 7:10 PM and 8:50 PM. The drivers park the delivery van on-site and leave using a personal vehicle.

The Client will also use "Flex" to deliver packages from this location. Flex works in concert with an advanced logistics systems and technology that the Client has been building since day one. The Client anticipates approximately 90 traditional passenger vehicles entering the facility staggered between 4:30 PM and 6:00 PM. Flex vehicles will load and depart every 15 minutes.

Approximately 43 associates will work in the delivery station between 12:00 PM and 10:30 PM to support the Flex and DSP drivers as they return to the station. After the check out and release of all delivery vehicles by 9:20 PM, delivery station associates prepare the delivery station for the next day's packages.

The delivery station is anticipated to generate a total of approximately 2,056 trips per day; the majority of which are off-peak hours.

The redevelopment of the Bristol Myers Site for delivery station use is expected to generate significantly less traffic than the historic actual usage. A traffic impact study prepared in 2003 by Wilbur Smith Associates for the Bristol Myers central utility plant (CUP) found the Site generated 620 morning and 535 afternoon peak hour trips, the highest documented volumes. A summary of the trip generation projections for the proposed delivery station is presented in **Table 2.1** during average daily operations. As indicated in this table, the proposed delivery station is projected to generate 3 (1 enter, 2 exit) vehicle trips, trucks only, during the weekday morning peak hour, 148 (0 enter, 148 exit) vehicle trips during the mid-day peak hour, 136 (91 enter, 45 exit) during the weekday evening peak hour, 427 (113 enter, 314 exit) vehicle trips during am peak generator hour, and 440 (220 enter, 220 exit) vehicle trips during pm peak generator hour.

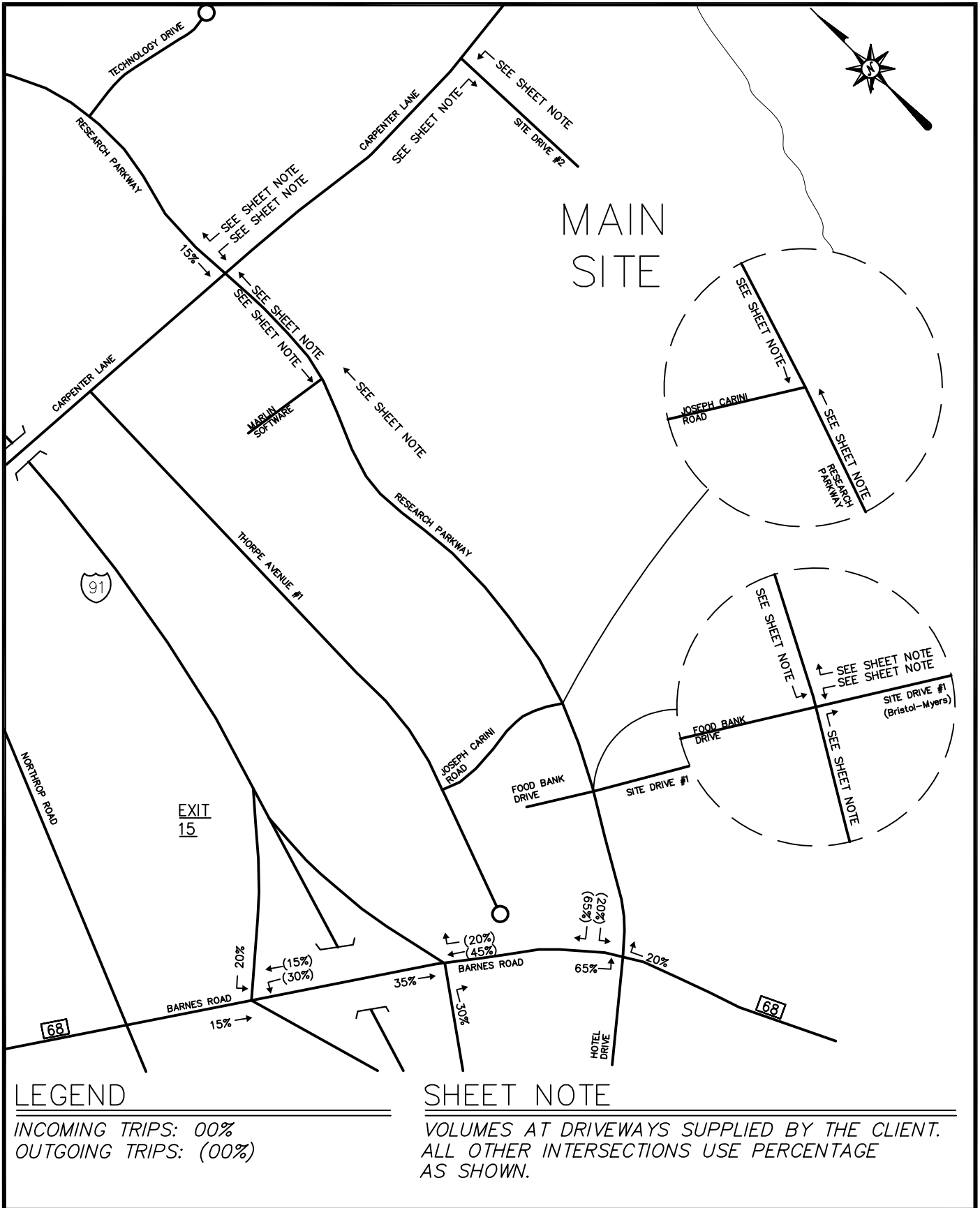
Table 2.1 – Peak Hour Trip Generation (Weekday)

	Table 2.1 Peak Hour Trip Generation - Weekday (Client Provided)														
	Trips														
	AM Peak Hour			Mid-Day Peak Hour			PM Peak Hour			AM Peak Generator Hour			PM Peak Generator Hour		
	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out
LU-156: High-Cube Parcel Hub Warehouse (219 GFA) ¹	153	76	77	No Available Data			140	95	45	193	66	127	155	97	58
Bristol-Myers Squibb Cup Development	620	592	28	No Available Data			533	47	486	No Available Data			No Available Data		
<u>Net Old Trips</u>	<u>620</u>	<u>592</u>	<u>28</u>				<u>533</u>	<u>47</u>	<u>486</u>						
Associates/Managers	0	0	0	148	0	148	0	0	0	0	0	0	0	0	0
DSP	0	0	0	0	0	0	0	0	0	426	113	313	436	218	218
Flex Drivers	0	0	0	0	0	0	135	90	45	0	0	0	0	0	0
Trucks	3	1	2	0	0	0	1	1	0	1	0	1	4	2	2
<u>Net New Trips</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>148</u>	<u>0</u>	<u>148</u>	<u>136</u>	<u>91</u>	<u>45</u>	<u>427</u>	<u>113</u>	<u>314</u>	<u>440</u>	<u>220</u>	<u>220</u>
Difference	-617	-591	-26	148	0	148	-397	44	-441	427	113	314	440	220	220

Ref: Trip Generation developed by Tenant
 1: ITE Trip Generation Manual, 10th Edition Values for Land Use code: 156: High-Cube Parcel Hub Warehouse. It should be noted there are limited studies available for High-Cube Parcel Warehouse.

Trip Distribution

The directional distribution of traffic is typically a function of population densities, competing opportunities, existing travel patterns adjacent to the Site, and the efficiency and limitations of the existing roadway system. Based upon the Site's close proximity to CT Route 68 and Interstate 91, it is anticipated that the majority of employees/delivery vehicles will utilize these roadways for access and egress from the Site. The distribution of the anticipated traffic volumes was based on arrival / departure patterns shown in **Figure 4**. Note, that the percentages are a rough estimate of where total vehicles trip will be distributed. The distribution patterns was provided for the 2 driveways was based on purpose and usage by vehicle types. Thus, trucks would only utilize access via Site #1 (Research Parkway), associates would only utilize access via Site #2 (Carpenter Lane), while Flex and DSP Vans would enter via Site #1 ((Research Parkway) and leave via the two Site egress points (Site#1 and Site#2).



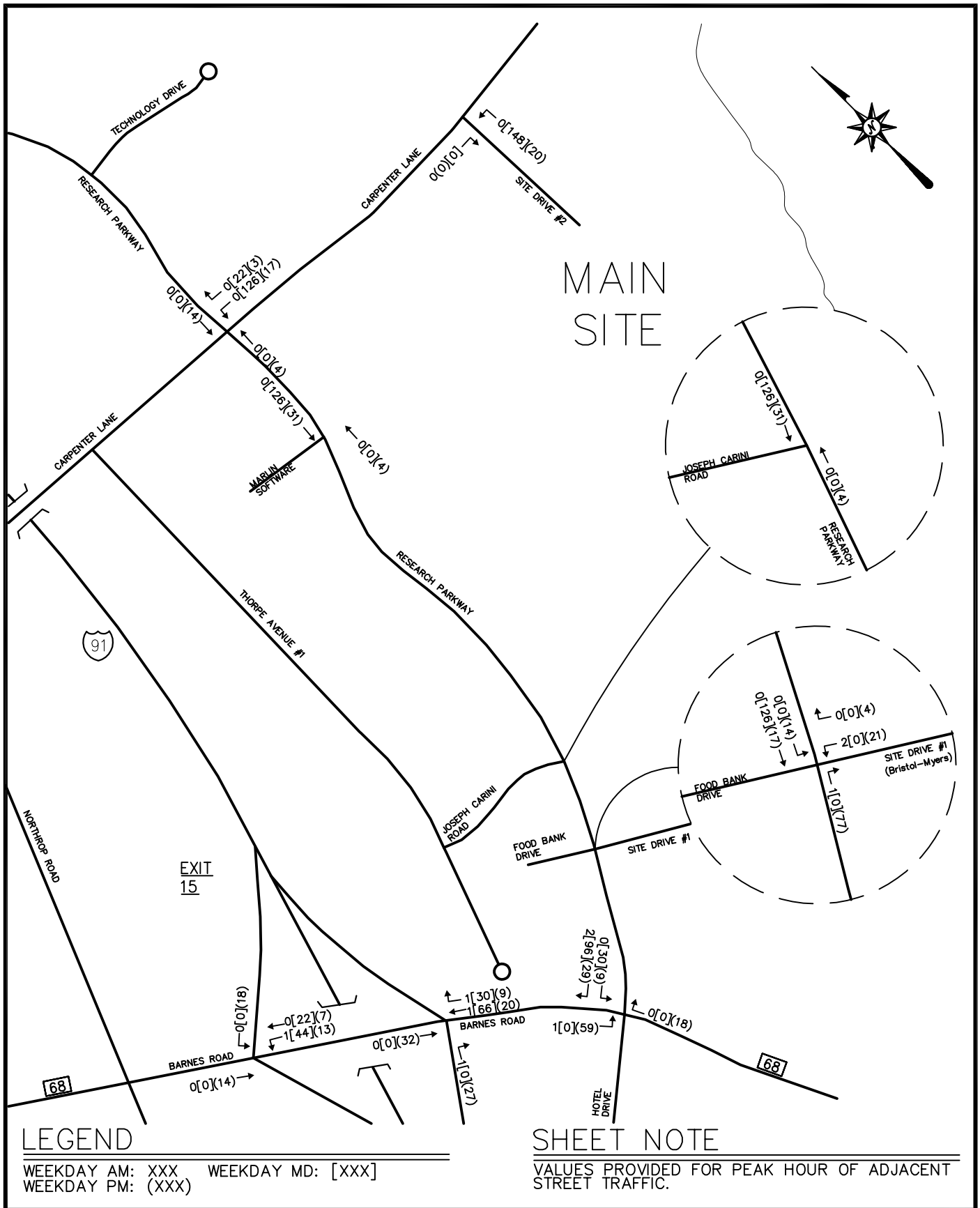
TRIP DISTRIBUTION
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT
 SCHEMATIC, NOT TO SCALE

APRIL 2021

FIGURE 4

Assigned Site Generated Traffic Volumes

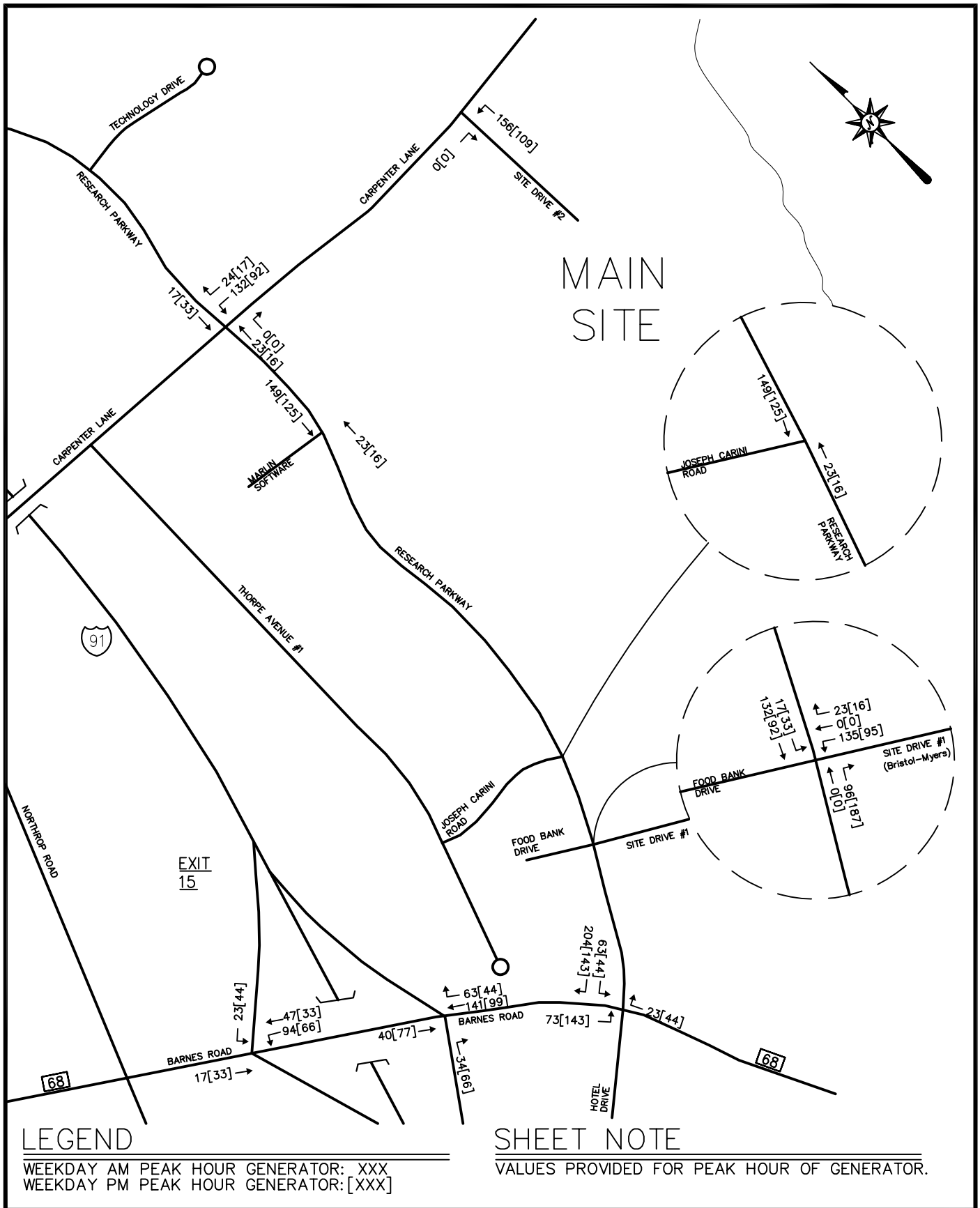
The generated trips are multiplied by the corresponding proportions to ascertain the Site-generated traffic volumes. **Figure 5.1 and Figure 5.2** shows the Site generated peak hour traffic assigned to the nearby roadway network during an average weekday. Note, at the Site access / egress, the assigned volumes follow distribution patterns established by the site operations and vehicle types.



SITE GENERATED TRAFFIC
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT
 SCHEMATIC, NOT TO SCALE

APRIL 2021

FIGURE 5.1



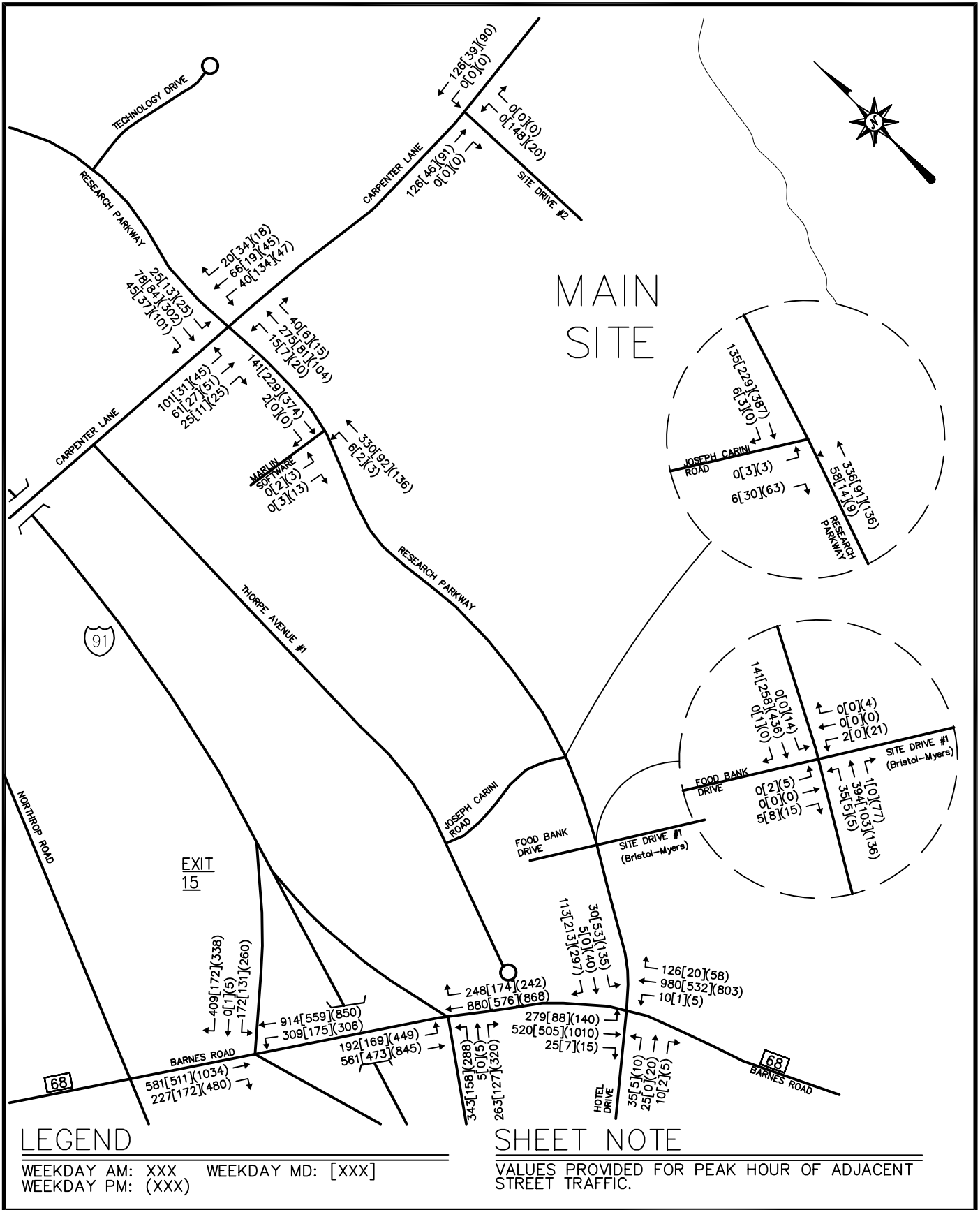
SITE GENERATED TRAFFIC
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT
 SCHEMATIC, NOT TO SCALE

APRIL 2021

FIGURE 5.2

Build Traffic Volumes

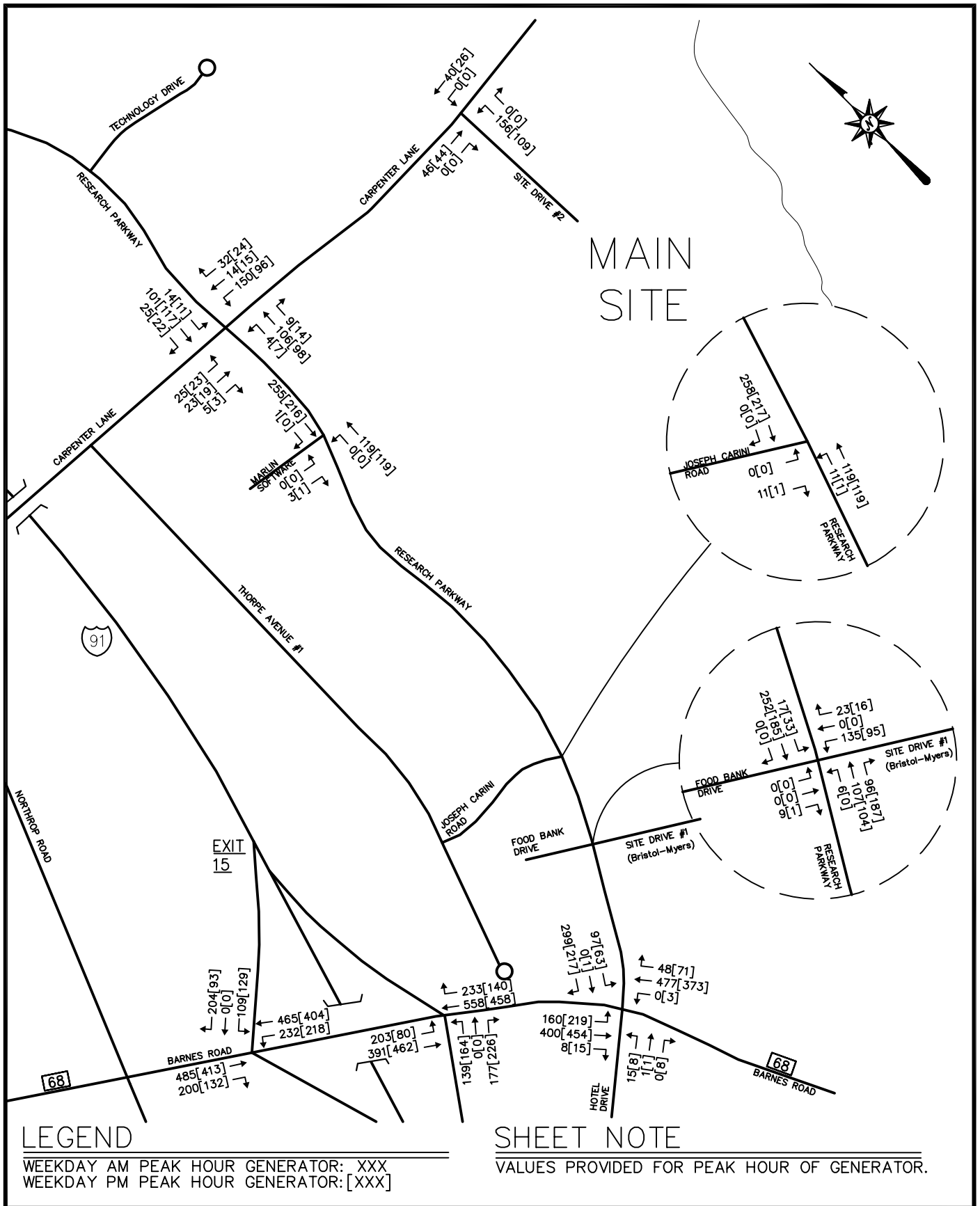
The assigned site-generated traffic volumes were superimposed onto the 2021 No Build Traffic volumes to establish the future 2021 Build Traffic volumes, as illustrated in **Figure 6.1** and **Figure 6.2**.



BUILD (2021) TRAFFIC VOLUMES
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT
 SCHEMATIC, NOT TO SCALE

APRIL 2021

FIGURE 6.1



BUILD (2021) TRAFFIC VOLUMES
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT

SCHEMATIC, NOT TO SCALE

APRIL 2021

FIGURE 6.2

IV. ROADWAY ADEQUACY

The intersection capacity analyses were prepared using the methodology described in the Highway Capacity Manual (HCM), published by the Transportation Research Board (TRB) for the existing and build traffic volume scenarios to simulate the traffic impact of a proposed Delivery Station on the adjacent roadway network. As documented in the HCM, intersection performance is influenced by several factors, including traffic demand; lane configurations; lane widths; turning restrictions; roadway grades; and signal phasing. The existing physical roadway characteristics and signal phasing and timing settings were determined by observing conditions in the field and reviewing the current traffic control signal plans provided by the Connecticut Department of Transportation.

Synchro™ software (Version 9) was used to model the study intersections based on the parameters mentioned above. The Synchro software is widely utilized by the traffic engineering industry and is consistent with the procedures in the HCM.

Signalized Intersections

Signalized intersections are analyzed in terms of vehicle capacity and motorist delay. Capacity is the maximum rate of vehicle flow through an intersection given typical operating conditions. The number of vehicles traveling through an intersection is divided by the capacity of the intersection to determine an overall volume to capacity ratio (v/c). A v/c value under 1.00 indicates that the number of vehicles traveling through an intersection is less than capacity.

As stated in the HCM, level of service for signalized intersections is defined in terms of control delay. Control delay measures the increase in delay a motorist experiences while encountering a traffic control signal. These factors include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. This delay is measured per vehicle for a 15-minute analysis period and is associated with the levels of service, which are summarized in **Table 3** below:

Table 3 – Signalized Intersection – Level of Service

<u>Level of Service</u>¹	<u>Average Control Delay</u> <u>(seconds per vehicle)</u>
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

¹If volume-to-capacity ratio is over 1.0 for a lane group, LOS F. Intersection and approach-based LOS is based solely on control delay.

Level of service A represents the optimum level where most motorists arrive at the subject intersection during the green phase and thus experience virtually no delay. Conversely, level of service F indicates that motorists are delayed over 80 seconds while traveling

through the intersection and can often imply a complete breakdown of that location. Level of service D is generally considered the limit of acceptable motorist delay.

Unsignalized Intersections

Unsignalized intersections are generally evaluated in terms of average side street delay, as well as the capacity of the roadway approach. This analysis is based on the random arrival of vehicles and the associated gaps generated by this random arrival within the traffic stream. There is no overall level of service for unsignalized intersections. The relationship between levels of service and average side street delay are summarized in **Table 4** below:

Table 4 – Unsignalized Intersection – Level of Service

<u>Level of Service¹</u>	<u>Average Control Delay (seconds per vehicle)</u>
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

¹If volume-to-capacity ratio is over 1.0 for a lane group, LOS F. Intersection and approach-based LOS is based solely on control delay.

It should be noted that unsignalized levels of service do not correspond to those for signalized intersections, nor do they constitute warrants for the installation of traffic control signals. It is also recognized that the methodology is overly conservative and that computations can indicate operations at poor levels of service (E or F) with even very low side street volumes, although they often function without serious problems in the real world. **Table 5.1** through **Table 5.2** shows the levels of service (LOS) at the subject intersections. Synchro result tables provided in the **Appendix**.

Table 5.1 – Peak Hour Levels of Service (AM, Mid-Day, PM)

Intersection	AM				Mid-Day				PM			
	Existing	2021 No Build	2021 Build	2021 Build Improved	Existing	2021 No Build	2021 Build	2021 Build Improved	Existing	2021 No Build	2021 Build	2021 Build Improved
Route 68 (Barnes Road) at Interstate 91 Southbound Exit 15 On/Off-Ramps ¹	C/21.9	C/22.0	C/22.1	C/22.1	B/14.5	B/14.6	B/15.3	B/15.3	C/29.4	C/31.3	C/33.0	C/32.8
Route 68 EB Thru	D/0.73/#260	D/0.75/#265	D/0.75/#265	D/0.75/#265	B/0.40/160	B/0.41/160	B/0.43/160	B/0.43/160	D/0.98/#435	D/1.00/#445	E/1.02/#450	E/1.02/#450
Route 68 EB Right (345')	A/0.41/60	A/0.42/60	A/0.42/60	A/0.42/60	A/0.26/40	A/0.26/40	A/0.27/40	A/0.27/40	A/0.55/55	A/0.55/60	A/0.56/60	A/0.56/60
Route 68 WB Left (910')	C/0.76/m190	C/0.76/m190	C/0.77/m190	C/0.77/m195	C/0.54/65	C/0.54/65	C/0.65/80	C/0.65/80	D/0.82/m140	D/0.82/m160	D/0.86/m145	D/0.86/m145
Route 68 WB Thru	A/0.58/m235	A/0.58/m235	A/0.58/m235	A/0.58/m240	A/0.25/25	A/0.25/25	A/0.26/25	A/0.26/25	A/0.49/m25	A/0.50/m25	A/0.50/m25	A/0.50/m25
Exit 15 Off-Ramp SB Left (240')	C/0.43/120	C/0.43/120	C/0.43/120	C/0.43/120	C/0.43/95	C/0.44/95	C/0.44/95	C/0.44/95	D/0.75/#200	D/0.75/#205	D/0.78/#215	D/0.78/#215
Exit 15 Off-Ramp SB Left/Right	D/0.75/185	D/0.76/185	D/0.76/185	D/0.76/185	D/0.53/100	D/0.54/100	D/0.54/100	D/0.54/100	E/0.83/#220	E/0.84/#225	E/0.85/#235	E/0.85/#235
Exit 15 Off-Ramp SB Right (240')	D/0.69/170	D/0.69/170	D/0.69/170	D/0.69/170	D/0.50/90	D/0.50/90	D/0.50/90	D/0.50/90	D/0.76/#195	D/0.76/#200	D/0.77/#205	D/0.77/#205
Route 68 (Barnes Road) at Interstate 91 Northbound Exit 15 On/Off-Ramps ¹	C/26.5	C/26.7	C/26.8	C/26.9	B/12.8	B/12.8	B/12.8	B/12.9	D/37.4	D/38.2	D/43.6	D/36.2
Route 68 EB Left (910')	D/0.61/m105	D/0.62/m105	D/0.62/m105	D/0.62/m105	C/0.64/55	C/0.64/55	C/0.64/55	C/0.64/55	C/0.84/m115	C/0.84/m115	C/0.84/m115	C/0.84/m115
Route 68 EB Thru	A/0.30/25	A/0.31/25	A/0.31/25	A/0.30/25	A/0.21/25	A/0.21/25	A/0.21/25	A/0.21/25	A/0.49/m25	A/0.49/m25	A/0.51/m25	A/0.50/m25
Route 68 WB Thru	C/0.86/m#275	D/0.87/m#270	D/0.87/m#275	C/0.85/m#275	B/0.38/75	B/0.38/75	B/0.43/95	B/0.43/95	F/1.09/m#345	F/1.10/m#345	F/1.13/m#355	F/1.09/m#355
Route 68 WB Right (480')	B/0.37/m50	B/0.37/m50	B/0.37/m50	B/0.37/m50	A/0.24/25	A/0.24/25	A/0.28/25	A/0.28/25	A/0.39/m35	A/0.40/m30	A/0.41/m35	A/0.40/m35
Exit 15 Off-Ramp NB Left (180')	C/0.53/150	C/0.53/150	C/0.53/150	D/0.68/185	C/0.32/75	C/0.33/75	C/0.33/75	C/0.43/90	C/0.47/135	C/0.47/135	C/0.47/135	D/0.73/195
Exit 15 Off-Ramp NB Thru	C/0.56/150	C/0.56/150	C/0.56/150	D/0.76/195	C/0.35/75	C/0.35/75	C/0.35/75	D/0.50/95	C/0.49/135	C/0.50/135	C/0.50/135	E/0.83/#230
Exit 15 Off-Ramp NB Right (180')	D/0.80/#215	D/0.80/#220	D/0.80/#225	D/0.64/165	D/0.54/105	D/0.54/105	D/0.54/105	C/0.43/85	E/0.93/#300	E/0.94/#305	F/1.03/#340	D/0.70/180

Overall Intersection – X/XX.X - Level of Service/Intersection Signal Delay in sec

Approaches - X/X.XX/XXX – Level of Service/Volume to Capacity Ratio/95% Queue Length in ft

¹ – Signalized Intersection

² – Unsignalized Intersections, controlled movements

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

m – Volume for 95th percentile queue is metered by upstream signal.

Movement (XX') – Storage length



Intersection	AM				Mid-Day				PM			
	Existing	2021 No Build	2021 Build	2021 Build Improved	Existing	2021 No Build	2021 Build	2021 Build Improved	Existing	2021 No Build	2021 Build	2021 Build Improved
Route 68 (Barnes Road) at Hotel Drive and Research Parkway ¹	D/35.7	D/37.5	D/37.5	D/37.6	A/9.3	A/9.3	B/10.6	B/10.6	C/23.5	C/24.0	C/24.8	C/25.1
Route 68 EB Left (570')	C/0.39/m105	C/0.39/m105	C/0.39/m105	C/0.39/110	D/0.47/85	D/0.47/85	D/0.46/90	D/0.46/90	C/0.21/m70	C/0.22/m70	C/0.38/m110	D/0.38/m120
Route 68 EB Thru/Right	B/0.62/130	B/0.62/140	B/0.62/135	B/0.62/145	A/0.24/35	A/0.24/35	A/0.24/40	A/0.24/40	B/0.76/m80	B/0.76/m80	B/0.77/m80	B/0.77/85
Route 68 WB Left (100')	D/0.09/25	D/0.09/25	D/0.09/25	D/0.09/25	C/0.01/25	C/0.01/25	C/0.01/25	C/0.01/25	D/0.05/25	D/0.05/25	D/0.05/25	D/0.05/25
Route 68 WB Thru	E/1.02/#465	E/1.03/#470	E/1.03/#470	E/1.03/#470	A/0.29/130	A/0.29/130	B/0.30/130	B/0.30/130	C/0.87/#315	D/0.88/#320	D/0.89/#320	D/0.89/#320
Route 68 WB Right (250')	A/0.19/35	A/0.19/35	A/0.19/35	A/0.19/35	A/0.02/25	A/0.02/25	A/0.02/25	A/0.02/25	A/0.07/25	A/0.07/25	A/0.10/25	A/0.10/25
Hotel NB Left	D/0.46/40	D/0.46/40	D/0.46/40	D/0.46/40	C/0.09/25	C/0.09/25	C/0.09/25	C/0.09/25	C/0.08/25	C/0.08/25	C/0.09/25	C/0.09/25
Hotel NB Thru/Right	C/0.31/30	C/0.31/30	C/0.31/30	C/0.31/30	A/0.01/25	A/0.01/25	A/0.01/25	A/0.01/25	C/0.10/30	C/0.10/30	C/0.10/30	C/0.10/30
Research Parkway SB Left/Thru (345')	D/0.28/45	D/0.28/45	D/0.28/45	D/0.28/45	C/0.19/35	C/0.19/35	D/0.45/65	D/0.45/65	D/0.80/150	D/0.80/150	E/0.82/#170	E/0.82/#170
Research Parkway SB Right	A/0.19/25	A/0.19/25	A/0.19/30	A/0.19/30	A/0.32/35	A/0.32/35	A/0.49/55	A/0.49/55	B/0.44/105	B/0.44/105	B/0.49/125	B/0.49/125
Research Parkway at Food Bank Drive and Site Drive ¹⁻²	-	-	A/1.9	A/1.9	-	-	A/1.9	A/1.9	-	-	A/6.9	A/6.9
Food Bank Drive EB Left	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	B/0.01/25	B/0.01/25	B/0.01/25	B/0.18/25	C/0.04/25	C/0.04/25	C/0.03/25	C/0.03/25
Food Bank Drive EB Right/Thru	A/0.01/25	A/0.01/25	A/0.01/25	A/0.01/25	A/0.01/25	A/0.00/25	A/0.02/25	A/0.18/25	B/0.07/25	B/0.07/25	A/0.07/25	A/0.07/25
Site Drive 1 WB Left	A/0.00/25	A/0.00/25	B/0.01/25	B/0.01/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	C/0.08/30	C/0.08/30
Site Drive 1 WB Thru/Right	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.01/25	A/0.01/25
Research Parkway NB Left (140')	A/0.04/25	A/0.04/25	A/0.05/25	A/0.05/25	A/0.00/25	A/0.00/25	A/0.01/25	A/0.01/25	A/0.01/25	A/0.01/25	A/0.02/25	A/0.02/25
Research Parkway NB Thru	-	-	A/0.34/80	A/0.34/80	-	-	A/0.09/25	A/0.09/25	-	-	A/0.17/40	A/0.17/40
Research Parkway NB Right	-	-	A/0.00/25	A/0.00/25	-	-	A/0.00/25	A/0.00/25	-	-	A/0.10/25	A/0.10/25
Research Parkway SB Left (115')	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.02/25	A/0.02/25
Research Parkway SB Thru/Right	-	-	A/0.12/30	A/0.12/30	-	-	A/0.20/60	A/0.20/60	-	-	A/0.51/140	A/0.51/140
Research Parkway at Joseph Carini Road ²	-	-	-	-	-	-	-	-	-	-	-	-
Joseph Carini Road EB Left/Right	B/0.02/25	B/0.02/25	B/0.02/25	B/0.02/25	A/0.06/25	A/0.06/25	B/0.07/25	B/0.07/25	B/0.20/25	B/0.20/25	B/0.21/25	B/0.21/25
Research Parkway NB Left/Thru	A/0.05/25	A/0.05/25	A/0.05/25	A/0.05/25	A/0.01/25	A/0.01/25	A/0.02/25	A/0.01/25	A/0.01/25	A/0.01/25	A/0.01/25	A/0.01/25
Research Parkway SB Thru/Right	-	-	-	-	-	-	-	-	-	-	-	-

Overall Intersection – X/XX.X - Level of Service/Intersection Signal Delay in sec

Approaches - X/X.XX/XXX – Level of Service/Volume to Capacity Ratio/95% Queue Length in ft

¹ – Signalized Intersection

² – Unsignalized Intersections, controlled movements

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

m – Volume for 95th percentile queue is metered by upstream signal.

Movement (XX') – Storage length



Intersection	AM				Mid-Day				PM			
	Existing	2021 No Build	2021 Build	2021 Build Improved	Existing	2021 No Build	2021 Build	2021 Build Improved	Existing	2021 No Build	2021 Build	2021 Build Improved
Research Parkway at Marlin Software Driveway ²	-	-	-	-	-	-	-	-	-	-	-	-
Marlin Software Driveway EB Left/Right	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	B/0.01/25	B/0.01/25	B/0.01/25	B/0.01/25	B/0.05/25	B/0.05/25	B/0.05/25	B/0.05/25
Research Parkway NB Left (100')	A/0.01/25	A/0.01/25	A/0.01/25	A/0.01/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25
Research Parkway NB Thru	-	-	-	-	-	-	-	-	-	-	-	-
Research Parkway SB Thru/Right	-	-	-	-	-	-	-	-	-	-	-	-
Research Parkway at Carpenter Lane ²	-	-	-	-	-	-	-	-	-	-	-	-
Carpenter Lane EB Right/Thru/ Left	C/0.53/80	C/0.54/80	C/0.54/80	C/0.54/195	A/0.10/25	A/0.10/25	A/0.11/25	A/0.11/25	B/0.24/25	B/0.24/25	B/0.25/25	B/0.25/40
Carpenter Lane WB Right/Thru/ Left	B/0.33/35	B/0.34/40	B/0.34/40	B/0.34/80	A/0.07/25	A/0.07/25	B/0.34/40	B/0.34/25	B/0.20/25	B/0.21/25	B/0.26/25	B/0.26/25
Research Parkway NB Right/Thru/ Left	D/0.79/190	D/0.79/195	D/0.79/195	D/0.79/40	A/0.13/25	A/0.13/25	A/0.15/25	A/0.15/40	B/0.33/35	B/0.33/35	B/0.35/40	B/0.35/25
Research Parkway SB Right/Thru/ Left	B/0.35/40	B/0.36/40	B/0.36/40	B/0.36/40	A/0.17/25	A/0.18/25	A/0.20/25	A/0.20/25	C/0.78/200	C/0.79/205	D/0.84/240	D/0.84/240
Carpenter Lane at Site Drive 2 ²	-	-	-	-	-	-	-	-	-	-	-	-
Carpenter Lane EB Right/Thru/ Left	-	-	-	-	-	-	-	-	-	-	-	-
Carpenter Lane WB Right/Thru/ Left	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25
Site Drive 2 NB Right/ Left	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.18/25	A/0.18/25	A/0.00/25	A/0.00/25	A/0.03/25	A/0.03/25

Overall Intersection – X/XX.X - Level of Service/Intersection Signal Delay in sec
Approaches - X/X.XX/XXX – Level of Service/Volume to Capacity Ratio/95% Queue Length in ft

¹ – Signalized Intersection

² – Unsignalized Intersections, controlled movements

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

m – Volume for 95th percentile queue is metered by upstream signal.

Movement (XX') – Storage length



Table 5.2 – Peak Hour Levels of Service (AM/PM Peak Hour Generator)

Intersection	AM Peak Hour Generator				PM Peak Hour of Generator			
	Existing	2021 No Build	2021 Build	2021 Build Improved	Existing	2021 No Build	2021 Build	2021 Build Improved
Route 68 (Barnes Road) at Interstate 91 Southbound Exit 15 On/Off-Ramps ¹	B/15.2	B/15.3	B/17.6	B/17.6	B/13.1	B/13.1	B/14.7	B/14.8
Route 68 EB Thru	B/0.38/145	B/0.38/145	C/0.48/150	C/0.48/150	B/0.27/115	B/0.28/115	B/0.37/125	B/0.37/125
Route 68 EB Right (345')	A/0.30/45	A/0.30/45	A/0.34/45	A/0.34/45	A/0.20/30	A/0.20/30	A/0.23/30	A/0.23/30
Route 68 WB Left (910')	C/0.62/70	C/0.62/75	C/0.77/#200	C/0.77/#200	C/0.61/65	C/0.61/75	C/0.67/90	C/0.67/90
Route 68 WB Thru	A/0.25/25	A/0.25/25	A/0.28/25	A/0.28/25	A/0.22/25	A/0.23/25	A/0.25/25	A/0.25/25
Exit 15 Off-Ramp SB Left (240')	C/0.32/70	C/0.33/70	C/0.40/90	C/0.40/90	C/0.31/65	C/0.31/65	C/0.37/75	C/0.37/75
Exit 15 Off-Ramp SB Left/Right	D/0.57/100	D/0.57/105	D/0.57/105	D/0.57/105	C/0.35/65	C/0.35/70	C/0.40/80	C/0.40/80
Exit 15 Off-Ramp SB Right (240')	C/0.52/95	C/0.52/95	C/0.51/95	C/0.51/95	C/0.32/65	C/0.32/65	C/0.37/70	C/0.37/70
Route 68 (Barnes Road) at Interstate 91 Northbound Exit 15 On/Off-Ramps ¹	B/14.9	B/15.0	B/15.1	B/14.7	B/12.2	B/12.1	B/12.9	B/13.1
Route 68 EB Left (910')	C/0.75/#180	C/0.76/#185	C/0.77/#190	C/0.74/#180	C/0.39/30	C/0.39/30	C/0.36/30	C/0.37/30
Route 68 EB Thru	A/0.17/25	A/0.18/25	A/0.20/25	A/0.19/25	A/0.18/25	A/0.18/25	A/0.23/25	A/0.22/25
Route 68 WB Thru	B/0.34/60	B/0.34/60	B/0.47/110	B/0.45/110	A/0.26/45	A/0.26/45	A/0.36/80	A/0.34/80
Route 68 WB Right (480')	A/0.28/25	A/0.28/25	A/0.37/25	A/0.36/25	A/0.16/25	A/0.16/25	A/0.24/25	A/0.23/25
Exit 15 Off-Ramp NB Left (180')	C/0.27/65	C/0.27/65	C/0.25/65	C/0.45/95	C/0.31/75	C/0.31/75	C/0.27/75	C/0.52/110
Exit 15 Off-Ramp NB Thru	C/0.29/65	C/0.29/65	C/0.27/65	D/0.53/100	C/0.34/75	C/0.34/75	C/0.29/75	D/0.59/115
Exit 15 Off-Ramp NB Right (180')	D/0.57/110	D/0.57/115	D/0.65/135	C/0.44/90	D/0.59/120	D/0.59/125	D/0.73/170	C/0.50/105

Overall Intersection – X/XX.X - Level of Service/Intersection Signal Delay in sec

Approaches - X/X.XX/XXX – Level of Service/Volume to Capacity Ratio/95% Queue Length in ft

¹ – Signalized Intersection

² – Unsignalized Intersections, controlled movements

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

m – Volume for 95th percentile queue is metered by upstream signal.

Movement (XX') – Storage length



Intersection	AM Peak Hour Generator				PM Peak Hour of Generator			
	Existing	2021 No Build	2021 Build	2021 Build Improved	Existing	2021 No Build	2021 Build	2021 Build Improved
Route 68 (Barnes Road) at Hotel Drive and Research Parkway ¹	B/10.9	B/10.9	B/17.1	B/17.1	A/8.6	A/8.6	B/14.2	B/14.2
Route 68 EB Left (570')	D/0.55/80	D/0.55/80	D/0.74/#190	D/0.74/#190	D/0.42/65	D/0.42/65	D/0.66/#245	D/0.66/#255
Route 68 EB Thru/Right	A/0.23/30	A/0.23/30	A/0.25/35	A/0.25/40	A/0.24/35	A/0.25/35	A/0.27/45	A/0.27/50
Route 68 WB Left (100')	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	C/0.03/25	C/0.03/25	C/0.03/25	C/0.03/25
Route 68 WB Thru	A/0.28/115	A/0.28/115	B/0.35/115	B/0.35/115	A/0.22/85	A/0.22/85	B/0.31/85	B/0.31/85
Route 68 WB Right (250')	A/0.03/25	A/0.03/25	A/0.07/25	A/0.07/25	A/0.03/25	A/0.03/25	A/0.12/25	A/0.12/25
Hotel NB Left	D/0.27/25	D/0.27/25	C/0.24/25	C/0.24/25	C/0.07/25	C/0.07/25	C/0.07/25	C/0.07/25
Hotel NB Thru/Right	C/0.02/25	C/0.02/25	C/0.01/25	C/0.01/25	B/0.07/25	B/0.07/25	B/0.06/25	B/0.06/25
Research Parkway SB Left/Thru (345')	D/0.28/45	D/0.28/45	D/0.63/95	D/0.63/95	C/0.15/30	C/0.15/30	D/0.47/70	D/0.47/70
Research Parkway SB Right	A/0.30/25	A/0.30/25	B/0.63/100	B/0.63/100	A/0.22/25	A/0.23/25	A/0.39/40	A/0.39/40
Research Parkway at Food Bank Drive and Site Drive 1 ¹⁻²	-	-	B/10.3	B/10.3	-	-	A/8.7	A/8.7
Food Bank Drive EB Left	A/0.00/25	A/0.00/25	A/0.00/25	A/0.02/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25
Food Bank Drive EB Right/Thru	A/0.02/25	A/0.02/25	A/0.02/25	C/0.49/95	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25
Site Drive 1 WB Left	A/0.00/25	A/0.00/25	C/0.49/95	A/0.03/25	A/0.00/25	A/0.00/25	B/0.35/60	B/0.35/60
Site Drive 1 WB Thru/Right	A/0.00/25	A/0.00/25	A/0.03/25	A/0.02/25	A/0.00/25	A/0.00/25	A/0.02/25	A/0.02/25
Research Parkway NB Left (140')	A/0.01/25	A/0.01/25	A/0.02/25	A/0.24/50	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25
Research Parkway NB Thru	-	-	A/0.24/50	A/0.18/25	-	-	A/0.13/55	A/0.13/55
Research Parkway NB Right	-	-	A/0.18/25	A/0.03/25	-	-	A/0.22/35	A/0.22/35
Research Parkway SB Left (115')	A/0.00/25	A/0.00/25	A/0.03/25	A/0.44/125	A/0.00/25	A/0.00/25	A/0.05/25	A/0.05/25
Research Parkway SB Thru/Right	-	-	B/0.44/125	A/0.00/25	-	-	B/0.24/85	B/0.24/85
Research Parkway at Joseph Carini Road ²	-	-	-	-	-	-	-	-
Joseph Carini Road EB Left/Right	A/0.02/25	A/0.02/25	B/0.03/25	B/0.03/25	A/0.00/25	A/0.00/25	A/0.01/25	A/0.01/25
Research Parkway NB Left/Thru	A/0.01/25	A/0.01/25	A/0.01/25	A/0.01/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25
Research Parkway SB Thru/Right	-	-	-	-	-	-	-	-

Overall Intersection – X/XX.X - Level of Service/Intersection Signal Delay in sec
Approaches - X/X.XX/XXX – Level of Service/Volume to Capacity Ratio/95% Queue Length in ft

¹ – Signalized Intersection

² – Unsignalized Intersections, controlled movements

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

m – Volume for 95th percentile queue is metered by upstream signal.

Movement (XX') – Storage length



Intersection	AM Peak Hour Generator				PM Peak Hour of Generator			
	Existing	2021 No Build	2021 Build	2021 Build Improved	Existing	2021 No Build	2021 Build	2021 Build Improved
Research Parkway at Marlin Software Driveway ²	-	-	-	-	-	-	-	-
Marlin Software Driveway EB Left/Right	A/0.01/25	A/0.01/25	B/0.01/25	B/0.01/25	A/0.00/25	A/0.00/25	A/0.01/25	A/0.01/25
Research Parkway NB Left (100')	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25
Research Parkway NB Thru	-	-	-	-	-	-	-	-
Research Parkway SB Thru/Right	-	-	-	-	-	-	-	-
Research Parkway at Carpenter Lane ²	-	-	-	-	-	-	-	-
Carpenter Lane EB Right/Thru/ Left	A/0.12/25	A/0.12/25	B/0.15/25	B/0.15/25	A/0.09/25	A/0.09/25	A/0.10/25	A/0.10/25
Carpenter Lane WB Right/Thru/ Left	A/0.12/25	A/0.12/25	C/0.66/125	C/0.66/125	A/0.05/25	A/0.05/25	A/0.28/30	A/0.28/30
Research Parkway NB Right/Thru/ Left	A/0.17/25	A/0.17/25	B/0.27/30	B/0.27/30	A/0.17/25	A/0.17/25	A/0.22/25	A/0.22/25
Research Parkway SB Right/Thru/ Left	A/0.23/25	A/0.23/25	B/0.34/40	B/0.34/40	A/0.20/25	A/0.21/25	A/0.30/30	A/0.30/30
Carpenter Lane at Site Drive 2 ²	-	-	-	-	-	-	-	-
Carpenter Lane EB Right/Thru/ Left	-	-	-	-	-	-	-	-
Carpenter Lane WB Right/Thru/ Left	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25
Site Drive 2 NB Right/ Left	A/0.00/25	A/0.00/25	A/0.19/25	A/0.19/25	A/0.00/25	A/0.00/25	A/0.13/25	A/0.13/25

Overall Intersection – X/XX.X - Level of Service/Intersection Signal Delay in sec
Approaches - X/X.XX/XXX – Level of Service/Volume to Capacity Ratio/95% Queue Length in ft

¹ – Signalized Intersection

² – Unsignalized Intersections, controlled movements

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

m – Volume for 95th percentile queue is metered by upstream signal.

Movement (XX') – Storage length



As illustrated in **Table 5.1** through **Table 5.2**, there are three signalized intersections along Route 68 (Barnes Road) with overall acceptable traffic operations during AM, Mid-Day, PM, AM Peak Generator, and PM Peak Generator Peak Hour. Some deterioration is observed at specific movements, however overall intersections performance is acceptable. Certain movements at signalized intersections are projected to perform at LOS E /F that is generally considered undesirable motorist delay, these are:

- Route 68 (Barnes Road) at Interstate 91 Southbound Exit 15 On/Off-Ramps:
 - Route 68 Eastbound Thru (PM Build)
 - Exit 15 Off-Ramp SB Left/Right (All PM Scenarios)
- Route 68 (Barnes Road) at Interstate 91 Northbound Exit 15 On/Off-Ramps
 - Route 68 WB Thru (All PM Scenarios)
 - Exit 15 Off-Ramp NB Right (All PM Scenarios)
- Route 68 (Barnes Road) at Hotel Drive and Research Parkway:
 - Route 68 WB Thru (All AM Scenarios)
 - Research Parkway SB Left/Thru (PM Build)

From the analysis the Build Scenarios there are low impacts to the roadway network for the proposed delivery station facility. At the proposed development driveway (Site #1) with Research Parkway in the existing and no build conditions, the intersection operates as a two-way stop-controlled intersection with stop-control on the driveways. As this is formerly signalized intersection that operates in "Flash" mode, for all build scenarios, the intersection signal was activated. As such, the LOS for all build scenario periods, weekday operates at LOS A and LOS B. At the second access point to the site at Carpenter Lane performs adequately for all movements. The stop-controlled movement from the Site #2 approach performs at LOS A and LOS B.

V. CONCLUSIONS AND RECOMMENDATIONS

This traffic study has been prepared for a new tenant and change of use of an existing building at 5 Research Parkway in Wallingford, CT. The focus of this study was to evaluate the traffic flows and operating conditions on the roadways and intersections projected to be used by motorists traveling to and from the proposed development and to quantify the potential traffic impacts on these roadways and intersections. After analyses of the Existing and No Build Scenarios of the AM, Mid-Day, PM, AM Peak Generator, and PM Peak Generator Peak Hours there are no notable deterioration from the other proposed developments. For build conditions, a build improved scenario was included.

The redevelopment of the former Bristol Myers Site for package delivery station use is expected to generate significantly less traffic than the historic actual usage, or that would be generated by re-occupancy of the Site by a similar (office) user. The project will not have significant impact on roadway capacity compared to the prior full use of the facility and Site. The existing signalized driveway on Research Parkway will service fewer peak hour trips than under the Bristol Myers use. No large trucks are anticipated at the new access point on Carpenter Lane.

At the three signalized intersections along Route 68 (Barnes Road) with overall acceptable traffic operations during all average weekday scenarios analyzed. Some deterioration is observed at specific movements; however, overall intersections performance is acceptable. During some periods, certain movements at signalized intersections are projected to perform at LOS E /F that is generally considered undesirable motorist delay.

A holiday season analysis was performed per town peer review request and included in the **Appendix** for comparison. It should be noted CTDOT does not require holiday analysis per OSTA Major Traffic Generator Administrative Decision Request Guidelines,

Section III (Traffic Information) D-3. A summary of the results/recommendations for holiday season analysis is included in the **Appendix**.

The following is a summary of the results/recommendations for this Site:

- Capacity analyses indicate that all analyzed intersections, overall, are projected to perform at an acceptable Level of Service between all average weekday scenarios analyzed.
- The undesirable Levels of Service are observed for individual movements and deterioration occurs between the Existing and No Build scenarios.
- Install "Stop" sign and stop bar at the Site drive's access / egress at Carpenter Lane as noted on Site Plans.
- Clear of overgrown shrubs to meet the sight line requirements at the Carpenter Lane Site driveway.
- Clearing of vegetation at the Research Parkway at Carpenter Lane to increase sight lines.
- Move the Research Parkway northbound stop bar at the Site Drive #1 to accommodate truck turns from the Site.
- Route 68 Left Turn into Research Parkway operates with throat width of 27.5'±. Current CTDOT guidelines suggest expanded throat width of 30' to avoid conflicts in turning paths at double left turn. Sketch Plan TT-2 shows WB-67 truck turns with restriped travel lanes to 11ft wide to accommodate the movements without widening of roadway or conflict areas.

APPENDIX

TRIP GENERATION

Steady State Operations

DOB6 in Wallingford, CT - Site Specific

Time	Associates			Trucks			DSP Drivers			DSP Vans			Flex			Total				
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		
00:00	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	1	1	2		
00:30	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	1	1	2		
01:00	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	1	1	2		
01:30	148	0	148	1	1	2	0	0	0	0	0	0	0	0	149	1	150			
02:00	0	0	0	1	1	2	0	0	0	0	0	0	0	0	1	1	2			
02:30	0	0	0	1	1	2	0	0	0	0	0	0	0	0	1	1	2			
03:00	0	0	0	1	1	2	0	0	0	0	0	0	0	0	1	1	2			
03:30	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	1		
04:00	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	1			
04:30	0	0	0	1	1	2	0	0	0	0	0	0	0	0	1	1	2			
05:00	0	0	0	1	1	2	0	0	0	0	0	0	0	0	1	1	2			
05:30	43	0	43	1	1	2	0	0	0	0	0	0	0	44	1	45				
06:00	0	0	0	1	1	2	0	0	0	0	0	0	0	1	1	2				
06:30	0	0	0	1	1	2	0	0	0	0	0	0	0	1	1	2				
07:00	0	0	0	1	1	2	0	0	0	0	0	0	0	1	1	2		AM		
07:30	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	1		AM	
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		AM
08:30	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1			AM	
09:00	0	0	0	1	1	2	40	0	40	0	0	0	0	41	1	42			AM Gen.	
09:30	0	0	0	1	1	2	160	0	160	0	0	0	0	161	1	162			AM Gen.	
10:00	0	0	0	0	1	1	113	0	113	0	120	120	0	0	0	113	121	234		AM Gen.
10:30	0	0	0	0	0	0	0	0	0	0	193	193	0	0	0	0	193	193		AM Gen.
11:00	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1		AM Gen.
11:30	8	0	8	0	1	1	0	0	0	0	0	0	0	0	8	1	9			AM Gen.
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		MD
12:30	0	148	148	0	0	0	0	0	0	0	0	0	0	0	148	148			MD	
13:00	43	0	43	0	0	0	0	0	0	0	0	0	0	43	0	43				MD
13:30	38	0	38	0	0	0	0	0	0	0	0	0	0	38	0	38				MD
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				MD
14:30	0	43	43	0	0	0	0	0	0	0	0	0	0	0	43	43				MD
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				MD
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				MD
16:00	0	0	0	0	0	0	0	0	0	0	0	0	90	0	90	90	0	90		PM
16:30	0	0	0	1	0	1	0	0	0	0	0	0	0	45	45	1	45	46		PM
17:00	0	0	0	1	1	2	0	0	0	0	0	0	0	45	45	1	46	47		PM
17:30	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1				PM
18:00	0	38	38	1	0	1	0	0	0	0	0	0	0	1	38	39				PM
18:30	0	0	0	1	1	2	0	0	0	0	0	0	0	1	1	2				PM
19:00	0	0	0	1	1	2	0	30	30	30	0	30	0	0	31	31	62			PM
19:30	0	0	0	1	1	2	0	60	60	139	0	139	0	0	140	61	201			PM Gen.
20:00	0	0	0	1	1	2	0	158	158	79	0	79	0	0	80	159	239			PM Gen.
20:30	0	0	0	1	1	2	0	49	49	65	0	65	0	0	66	50	116			PM Gen.
21:00	0	0	0	1	1	2	0	16	16	0	0	0	0	1	17	18				PM Gen.
21:30	0	0	0	1	1	2	0	0	0	0	0	0	0	1	1	2				PM Gen.
22:00	0	43	43	1	1	2	0	0	0	0	0	0	0	1	44	45				PM Gen.
22:30	0	8	8	1	1	2	0	0	0	0	0	0	0	1	9	10				PM Gen.
23:00	0	0	0	1	1	2	0	0	0	0	0	0	0	1	1	2				PM Gen.
23:30	0	0	0	1	1	2	0	0	0	0	0	0	0	1	1	2				PM Gen.
Total	280	280	560	32	32	64	313	313	626	313	313	626	90	90	180	1,028	1,028	2,056		

Holiday Operations

DOB6 in Wallingford, CT - Site Specific

Time	Associates			Trucks			DSP Drivers			DSP Vans			Flex			Total		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
00:00	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	1	2	3
00:30	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	1	1	2
01:00	0	272	272	1	1	2	0	0	0	0	0	0	0	0	0	1	273	274
01:30	279	0	279	2	1	3	0	0	0	0	0	0	0	0	0	281	1	282
02:00	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	1	2	3
02:30	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	1	1	2
03:00	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	1	1	2
03:30	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	2	1	3
04:00	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	1	2	3
04:30	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	1	1	2
05:00	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	1	1	2
05:30	43	0	43	1	1	2	0	0	0	0	0	0	0	0	0	44	1	45
06:00	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	2	1	3
06:30	0	0	0	1	2	3	160	0	160	0	0	0	0	0	0	161	2	163
07:00	0	0	0	1	1	2	90	0	90	0	120	120	0	0	0	91	121	212
07:30	0	0	0	0	1	1	6	0	6	0	120	120	0	0	0	6	121	127
08:00	0	0	0	1	0	1	0	0	0	16	16	0	0	0	0	1	16	17
08:30	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	1	1	2
09:00	0	0	0	1	1	2	40	0	40	0	0	0	0	0	0	41	1	42
09:30	0	0	0	1	1	2	160	0	160	0	0	0	0	0	0	161	1	162
10:00	0	0	0	1	1	2	200	0	200	0	120	120	0	0	0	201	121	322
10:30	0	0	0	1	1	2	132	0	132	0	240	240	0	0	0	133	241	374
11:00	0	0	0	1	1	2	26	0	26	0	120	120	0	0	0	27	121	146
11:30	8	0	8	0	1	1	0	0	0	78	78	0	0	0	8	79	87	
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	279	279	0	0	0	0	0	0	0	0	0	0	0	0	0	279	279
13:00	43	0	43	0	0	0	0	0	0	0	0	0	0	0	0	43	0	43
13:30	39	0	39	0	0	0	0	0	0	0	0	0	0	0	0	39	0	39
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	43	43	0	0	0	0	0	0	0	0	0	0	0	0	0	43	43
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	1	0	1	0	0	0	0	0	0	90	0	90	91	0	91
16:30	0	0	0	2	1	3	0	0	0	30	0	30	0	45	45	32	46	78
17:00	272	0	272	2	2	4	0	90	90	60	0	60	0	45	45	334	137	471
17:30	0	0	0	1	2	3	0	64	64	128	0	128	0	0	0	129	66	195
18:00	0	39	39	3	1	4	0	98	98	34	0	34	0	0	0	37	138	175
18:30	0	0	0	6	3	9	0	4	4	4	0	4	0	0	0	10	7	17
19:00	0	0	0	4	6	10	0	30	30	30	0	30	0	0	0	34	36	70
19:30	0	0	0	2	4	7	0	60	60	150	0	150	0	0	0	152	64	217
20:00	0	0	0	3	3	6	0	210	210	120	0	120	0	0	0	123	213	336
20:30	0	0	0	2	3	5	0	110	110	190	0	190	0	0	0	192	113	305
21:00	0	0	0	4	2	6	0	130	130	50	0	50	0	0	0	54	132	186
21:30	0	0	0	1	4	5	0	18	18	18	0	18	0	0	0	19	22	41
22:00	0	43	43	2	1	3	0	0	0	0	0	0	0	0	0	2	44	46
22:30	0	8	8	1	2	3	0	0	0	0	0	0	0	0	0	1	10	11
23:00	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	1	1	2
23:30	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	2	1	3
Total	684	684	1,368	63	63	126	814	814	1,628	814	814	1,628	90	90	180	2,465	2,465	4,930

AM

AM Gen.

MD

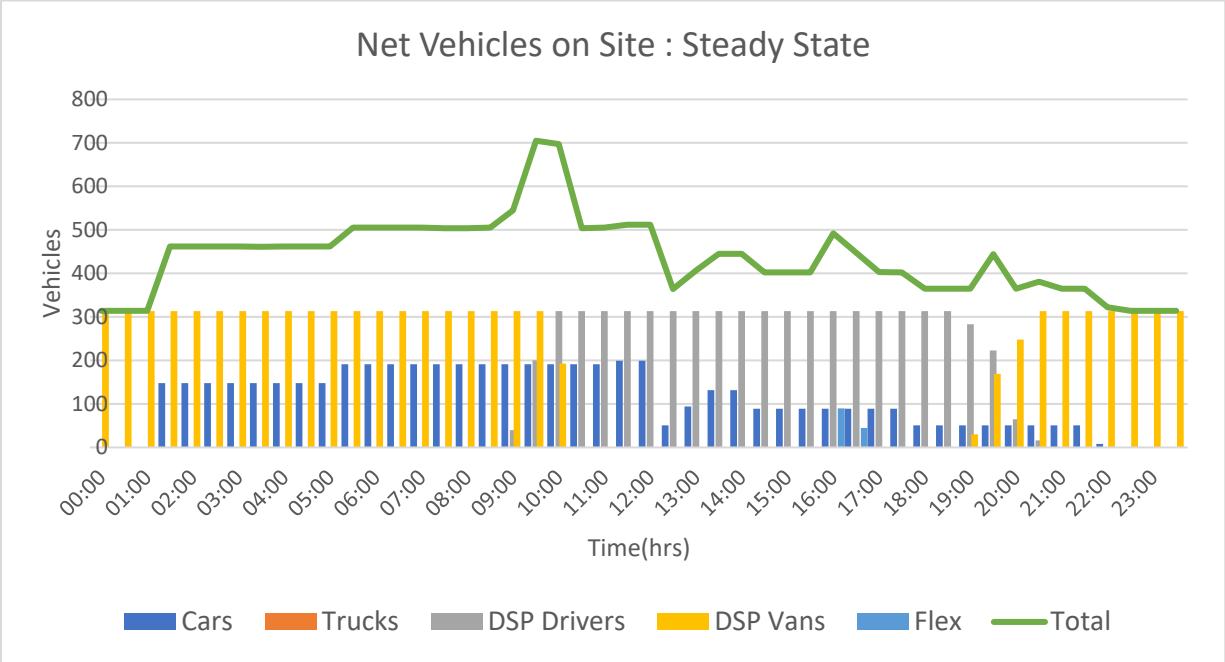
PM

PM Gen.

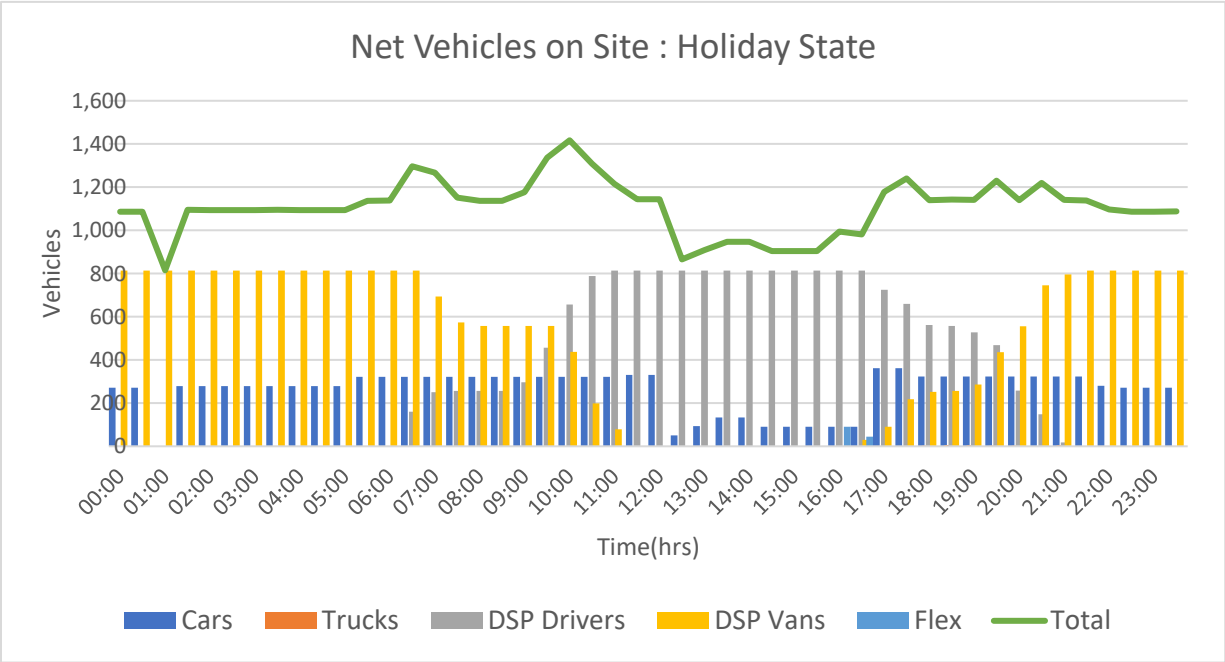
	Appendix Table														
	Peak Hour Trip Generation (comparison of Client Provided Versus ITE Trip Generation Manual)														
	Trips														
	AM Peak Hour			Mid-Day Peak Hour			PM Peak Hour			AM Peak Generator Hour			PM Peak Generator Hour		
	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out
LU-156, High-Cube Parcel Hub Warehouse (219 GFA)	153	76	77	No Available Data			140	95	45	193	66	127	155	97	58
Client Provided Trip Generation	3	1	2	136	0	148	136	91	45	427	113	314	440	220	220
Difference	-150	-75	-75	148	0	0	-4	-4	0	234	47	187	285	123	162

Note: This table summarizes the comparison of trip generation provided by the tenant versus ITE Trip Generation Manual 10th Edition. It should be noted during AM and PM Peak Generator Hour, the tenant's trip generation is higher than industry standards (ITE Trip Generation Manual). During PM peak the difference is negligible and during AM Peak, the difference is of 150 vehicles.

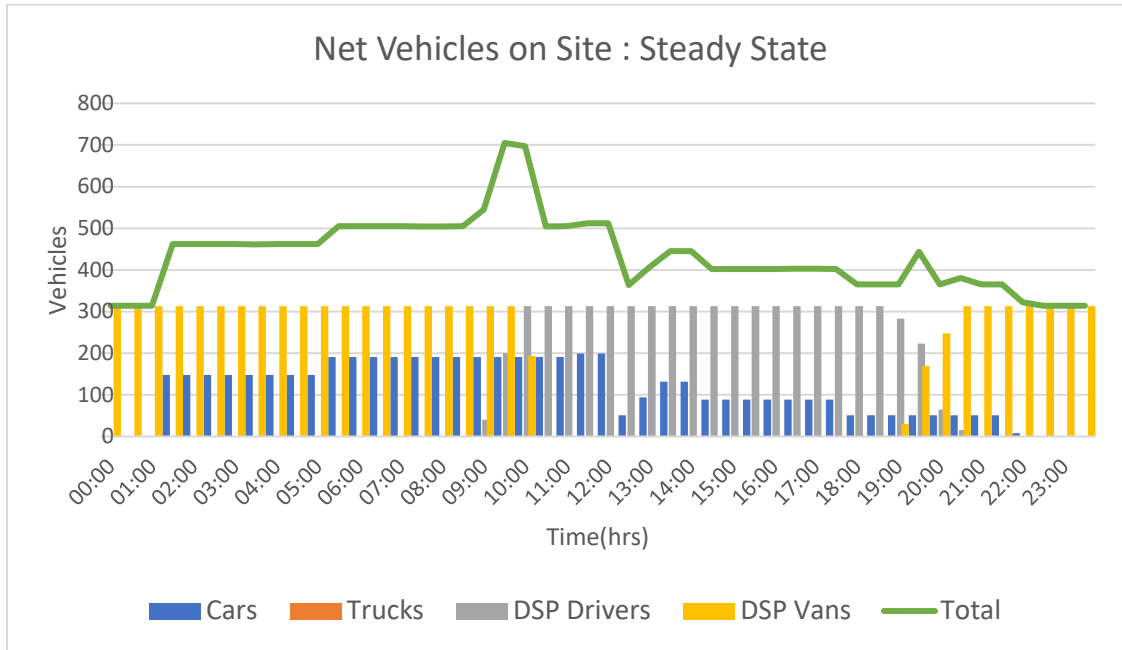
Estimation of Net Vehicles on Site: Average Weekday



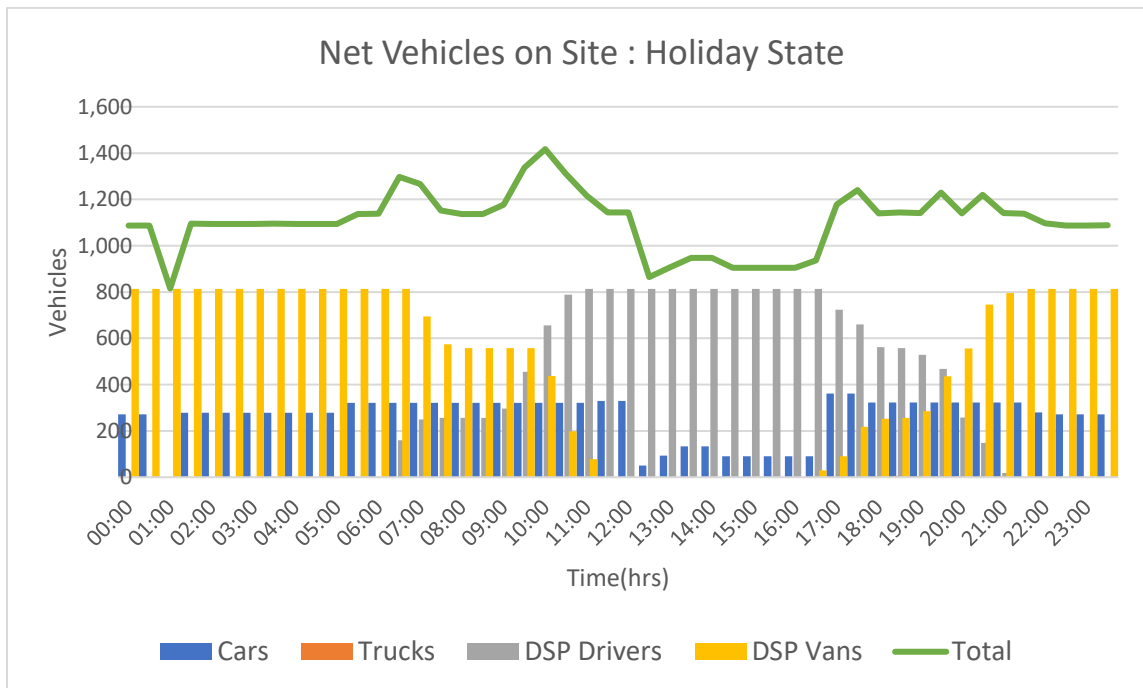
Estimation of Net Vehicles on Site: Holiday Season



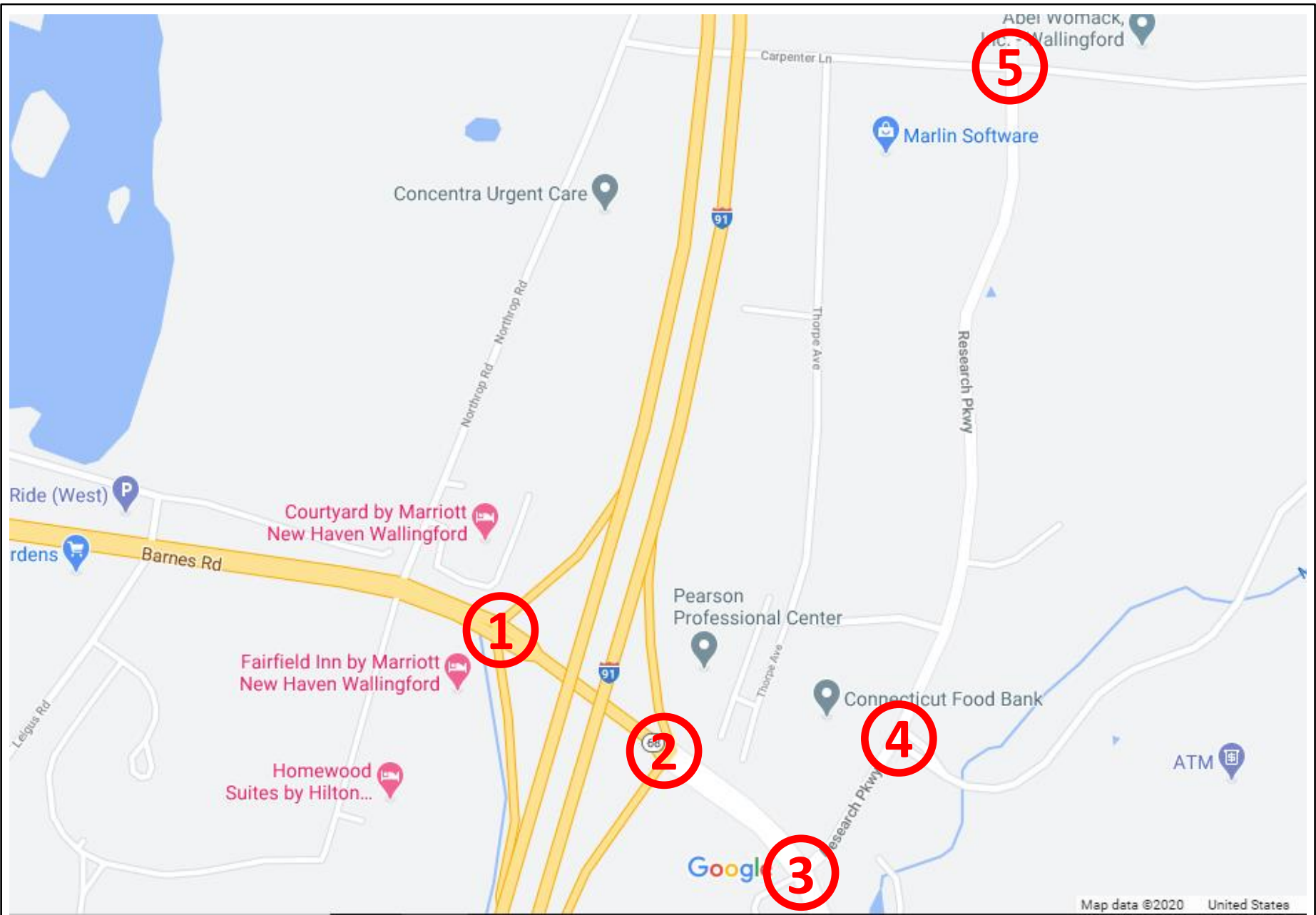
Estimation of Net Vehicles on Site: Average Weekday without Flex



Estimation of Net Vehicles on Site: Holiday Season without Flex



TRAFFIC COUNTS



	ID: 622_029_BL	Wallingford, CT	# of TMC's: 05	Client: BL Companies
		Collected on October 13, 2020	# of ATR's: 00	Contact: Katherine Klose, RSP1

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTD #: Location 1
 Location: Wallingford, CT
 Street 1: CT Route 68 (Barnes Road)
 Street 2: I-91 Southbound Exit 15 Ramps
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

PASSENGER CARS & HEAVY VEHICLES COMBINED

Start Time	I-91 Southbound Exit 15 On Ramp Northbound				I-91 Southbound Exit 15 Off Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	0	0	24	0	26	0	0	94	39	0	21	88	0
11:15 AM	0	0	0	0	0	17	1	29	0	0	73	26	0	26	89	0
11:30 AM	0	0	0	0	0	17	0	26	0	0	97	37	0	27	83	0
11:45 AM	0	0	0	0	0	18	0	34	0	0	81	37	0	28	92	0
12:00 PM	0	0	0	0	0	25	0	36	0	0	73	36	0	22	87	0
12:15 PM	0	0	0	0	0	29	0	29	0	0	81	29	0	30	89	0
12:30 PM	0	0	0	0	0	24	0	48	0	0	88	30	0	23	101	0
12:45 PM	0	0	0	0	0	24	1	43	0	0	91	45	0	29	104	0

MID PEAK HOUR 12:00 PM to 1:00 PM	I-91 Southbound Exit 15 On Ramp Northbound				I-91 Southbound Exit 15 Off Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	0	0	0	102	1	156	0	0	333	140	0	104	381	0
<i>PHF</i>	0.00				0.90				0.87				0.91			
<i>HV %</i>	0.0%	0.0%	0.0%	0.0%	0.0%	15.7%	0.0%	30.8%	0.0%	0.0%	11.7%	11.4%	0.0%	23.1%	7.9%	0.0%

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTD #: Location 1
 Location: Wallingford, CT
 Street 1: CT Route 68 (Barnes Road)
 Street 2: I-91 Southbound Exit 15 Ramps
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

HEAVY VEHICLES

Start Time	I-91 Southbound Exit 15 On Ramp Northbound				I-91 Southbound Exit 15 Off Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	0	0	7	0	7	0	0	17	11	0	6	12	0
11:15 AM	0	0	0	0	0	3	0	6	0	0	12	4	0	8	13	0
11:30 AM	0	0	0	0	0	2	0	10	0	0	22	14	0	13	6	0
11:45 AM	0	0	0	0	0	3	0	4	0	0	13	5	0	8	14	0
12:00 PM	0	0	0	0	0	1	0	10	0	0	14	4	0	6	10	0
12:15 PM	0	0	0	0	0	4	0	8	0	0	9	2	0	6	9	0
12:30 PM	0	0	0	0	0	5	0	17	0	0	6	3	0	4	7	0
12:45 PM	0	0	0	0	0	6	0	13	0	0	10	7	0	8	4	0

MID PEAK HOUR 11:00 AM to 12:00 PM <i>PHF</i>	I-91 Southbound Exit 15 On Ramp Northbound				I-91 Southbound Exit 15 Off Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	0	0	0	15	0	27	0	0	64	34	0	35	45	0
	0.00				0.75				0.68				0.91			

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTD #: Location 1
 Location: Wallingford, CT
 Street 1: CT Route 68 (Barnes Road)
 Street 2: I-91 Southbound Exit 15 Ramps
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

PEDESTRIANS & BICYCLES

Start Time	I-91 Southbound Exit 15 On Ramp Northbound				I-91 Southbound Exit 15 Off Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 12:00 PM to 1:00 PM	I-91 Southbound Exit 15 On Ramp Northbound				I-91 Southbound Exit 15 Off Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTM #: Location 2
 Location: Wallingford, CT
 Street 1: CT Route 68 (Barnes Road)
 Street 2: I-91 Northbound Exit 15 Ramps
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

PASSENGER CARS & HEAVY VEHICLES COMBINED

Start Time	I-91 Northbound Exit 15 Off Ramp Northbound				I-91 Northbound Exit 15 On Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	32	0	18	0	0	0	0	0	38	80	0	0	0	77	20
11:15 AM	0	27	0	17	0	0	0	0	0	30	60	0	0	0	88	26
11:30 AM	0	30	0	25	0	0	0	0	0	41	74	0	0	0	81	26
11:45 AM	0	31	0	24	0	0	0	0	0	23	75	0	0	0	88	15
12:00 PM	0	39	0	26	0	0	0	0	0	35	63	0	0	0	74	23
12:15 PM	0	40	0	28	0	0	0	0	0	23	85	0	0	0	75	27
12:30 PM	0	36	0	35	0	0	0	0	0	25	89	0	0	0	88	19
12:45 PM	0	41	0	37	0	0	0	0	0	34	81	0	0	0	92	24

MID PEAK HOUR 12:00 PM to 1:00 PM	I-91 Northbound Exit 15 Off Ramp Northbound				I-91 Northbound Exit 15 On Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	156	0	126	0	0	0	0	0	117	318	0	0	0	329	93
<i>PHF</i>	0.90				0.00				0.95				0.91			
<i>HV %</i>	0.0%	14.1%	0.0%	18.3%	0.0%	0.0%	0.0%	0.0%	0.0%	25.6%	7.9%	0.0%	0.0%	0.0%	9.7%	22.6%

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTM #: Location 2
 Location: Wallingford, CT
 Street 1: CT Route 68 (Barnes Road)
 Street 2: I-91 Northbound Exit 15 Ramps
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

HEAVY VEHICLES

Start Time	I-91 Northbound Exit 15 Off Ramp Northbound				I-91 Northbound Exit 15 On Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	9	0	0	0	0	0	0	0	11	13	0	0	0	8	3
11:15 AM	0	6	0	9	0	0	0	0	0	6	10	0	0	0	15	2
11:30 AM	0	4	0	5	0	0	0	0	0	16	8	0	0	0	16	2
11:45 AM	0	8	0	4	0	0	0	0	0	6	8	0	0	0	14	1
12:00 PM	0	7	0	5	0	0	0	0	0	12	3	0	0	0	9	5
12:15 PM	0	6	0	7	0	0	0	0	0	5	8	0	0	0	8	6
12:30 PM	0	6	0	4	0	0	0	0	0	5	6	0	0	0	6	7
12:45 PM	0	3	0	7	0	0	0	0	0	8	8	0	0	0	9	3

MID PEAK HOUR 11:00 AM to 12:00 PM <i>PHF</i>	I-91 Northbound Exit 15 Off Ramp Northbound				I-91 Northbound Exit 15 On Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	27	0	18	0	0	0	0	0	39	39	0	0	0	53	8
	0.75				0.00				0.81				0.85			

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTM #: Location 2
 Location: Wallingford, CT
 Street 1: CT Route 68 (Barnes Road)
 Street 2: I-91 Northbound Exit 15 Ramps
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

PEDESTRIANS & BICYCLES

Start Time	I-91 Northbound Exit 15 Off Ramp Northbound				I-91 Northbound Exit 15 On Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 12:00 PM to 1:00 PM	I-91 Northbound Exit 15 Off Ramp Northbound				I-91 Northbound Exit 15 On Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTD #: Location 3
 Location: Wallingford, CT
 Street 1: CT Route 68 (Barnes Road)
 Street 2: Research Parkway
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

PASSENGER CARS & HEAVY VEHICLES COMBINED

Start Time	Hilton Garden Inn Drive Northbound				Research Parkway Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	2	0	1	0	6	0	13	0	16	79	3	0	0	82	3
11:15 AM	0	4	0	0	0	7	0	12	0	12	65	0	0	0	98	5
11:30 AM	0	4	0	0	0	8	0	22	0	15	81	2	0	0	81	5
11:45 AM	0	2	0	0	0	6	0	28	0	14	82	2	0	0	77	3
12:00 PM	0	3	0	0	0	7	0	25	0	21	65	2	0	0	69	8
12:15 PM	0	2	0	2	0	6	0	21	0	20	96	2	0	1	79	4
12:30 PM	0	0	0	0	0	4	0	27	0	22	98	0	0	0	85	5
12:45 PM	0	0	0	0	0	6	0	19	0	24	91	3	0	0	90	3

MID PEAK HOUR 12:00 PM to 1:00 PM	Hilton Garden Inn Drive Northbound				Research Parkway Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	5	0	2	0	23	0	92	0	87	350	7	0	1	323	20
<i>PHF</i>	0.44				0.90				0.93				0.92			
<i>HV %</i>	0.0%	20.0%	0.0%	50.0%	0.0%	21.7%	0.0%	26.1%	0.0%	27.6%	6.6%	14.3%	0.0%	0.0%	8.7%	5.0%

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTD #: Location 3
 Location: Wallingford, CT
 Street 1: CT Route 68 (Barnes Road)
 Street 2: Research Parkway
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

HEAVY VEHICLES

Start Time	Hilton Garden Inn Drive Northbound				Research Parkway Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	1	0	0	0	1	0	5	0	5	7	0	0	0	5	0
11:15 AM	0	0	0	0	0	1	0	7	0	7	12	0	0	0	9	0
11:30 AM	0	0	0	0	0	2	0	10	0	6	6	1	0	0	8	0
11:45 AM	0	0	0	0	0	2	0	7	0	4	9	0	0	0	8	1
12:00 PM	0	0	0	0	0	0	0	7	0	6	2	0	0	0	9	0
12:15 PM	0	1	0	1	0	3	0	5	0	5	9	1	0	0	6	0
12:30 PM	0	0	0	0	0	1	0	8	0	7	3	0	0	0	6	1
12:45 PM	0	0	0	0	0	1	0	4	0	6	9	0	0	0	7	0

MID PEAK HOUR 11:00 AM to 12:00 PM <i>PHF</i>	Hilton Garden Inn Drive Northbound				Research Parkway Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	1	0	0	0	6	0	29	0	22	34	1	0	0	30	1
	0.25				0.73				0.75				0.86			

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTM #: Location 3
 Location: Wallingford, CT
 Street 1: CT Route 68 (Barnes Road)
 Street 2: Research Parkway
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

PEDESTRIANS & BICYCLES

Start Time	Hilton Garden Inn Drive Northbound				Research Parkway Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 12:00 PM to 1:00 PM	Hilton Garden Inn Drive Northbound				Research Parkway Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTD #: Location 4
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Site #1 Drive & CT Food Bank Drive
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

PASSENGER CARS & HEAVY VEHICLES COMBINED

Start Time	Research Parkway Northbound				Research Parkway Southbound				Connecticut Food Bank Driveway Eastbound				Site #1 Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	18	0	0	0	18	1	0	0	0	2	0	0	0	0
11:15 AM	0	0	20	0	0	0	18	0	0	1	0	1	0	0	0	0
11:30 AM	0	0	15	0	0	0	25	0	0	0	0	4	0	0	0	0
11:45 AM	0	0	19	0	0	0	32	0	0	1	0	3	0	0	0	0
12:00 PM	0	1	23	0	0	0	29	1	0	1	0	3	0	0	0	0
12:15 PM	0	1	25	0	0	0	26	0	0	0	0	1	0	0	0	0
12:30 PM	0	3	28	0	0	0	30	0	0	0	0	1	0	0	0	0
12:45 PM	0	8	20	0	0	0	20	2	0	0	0	5	0	0	0	0

MID PEAK HOUR 11:45 AM to 12:45 PM	Research Parkway Northbound				Research Parkway Southbound				Connecticut Food Bank Driveway Eastbound				Site #1 Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	5	95	0	0	0	117	1	0	2	0	8	0	0	0	0
PHF	0.81				0.92				0.63				0.00			
HV %	0.0%	0.0%	25.3%	0.0%	0.0%	0.0%	28.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTD #: Location 4
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Site #1 Drive & CT Food Bank Drive
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

HEAVY VEHICLES

Start Time	Research Parkway Northbound				Research Parkway Southbound				Connecticut Food Bank Driveway Eastbound				Site #1 Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	5	0	0	0	7	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	7	0	0	0	6	0	0	0	0	1	0	0	0	0
11:30 AM	0	0	6	0	0	0	12	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	5	0	0	0	9	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	6	0	0	0	7	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	5	0	0	0	8	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	8	0	0	0	9	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	6	0	0	0	5	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:15 AM to 12:15 PM <i>PHF</i>	Research Parkway Northbound				Research Parkway Southbound				Connecticut Food Bank Driveway Eastbound				Site #1 Driveway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	24	0	0	0	34	0	0	0	0	1	0	0	0	0
	0.86				0.71				0.25				0.00			

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTD #: Location 4
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Site #1 Drive & CT Food Bank Drive
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

PEDESTRIANS & BICYCLES

Start Time	Research Parkway Northbound				Research Parkway Southbound				Connecticut Food Bank Driveway Eastbound				Site #1 Driveway Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:45 AM to 12:45 PM	Research Parkway Northbound				Research Parkway Southbound				Connecticut Food Bank Driveway Eastbound				Site #1 Driveway Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTD #: Location 5
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Carpenter Lane
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

PASSENGER CARS & HEAVY VEHICLES COMBINED

Start Time	Research Parkway Northbound				Research Parkway Southbound				Carpenter Lane Eastbound				Carpenter Lane Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	15	2	0	3	16	9	0	6	5	1	0	3	5	1
11:15 AM	0	0	14	1	0	0	10	4	0	1	5	3	0	1	3	0
11:30 AM	0	2	13	1	0	0	20	5	0	4	2	0	0	1	6	1
11:45 AM	0	1	18	1	0	1	20	5	0	4	1	4	0	6	5	0
12:00 PM	0	3	21	3	0	3	24	10	0	10	6	2	0	0	4	5
12:15 PM	0	2	23	1	0	3	19	10	0	4	6	3	0	2	2	4
12:30 PM	0	1	21	1	0	3	23	9	0	9	8	3	0	2	8	3
12:45 PM	0	1	14	1	0	4	16	8	0	8	7	3	0	4	5	0

MID PEAK HOUR 12:00 PM to 1:00 PM	Research Parkway Northbound				Research Parkway Southbound				Carpenter Lane Eastbound				Carpenter Lane Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	7	79	6	0	13	82	37	0	31	27	11	0	8	19	12
<i>PHF</i>	0.85				0.89				0.86				0.75			
<i>HV %</i>	0.0%	0.0%	27.8%	16.7%	0.0%	0.0%	37.8%	2.7%	0.0%	3.2%	3.7%	9.1%	0.0%	12.5%	15.8%	0.0%

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTD #: Location 5
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Carpenter Lane
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

HEAVY VEHICLES

Start Time	Research Parkway Northbound				Research Parkway Southbound				Carpenter Lane Eastbound				Carpenter Lane Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	4	1	0	0	6	0	0	2	1	0	0	0	0	1
11:15 AM	0	0	7	0	0	0	6	1	0	1	0	0	0	0	0	0
11:30 AM	0	0	6	0	0	0	8	1	0	0	0	0	0	1	0	0
11:45 AM	0	0	3	0	0	0	9	0	0	1	0	0	0	0	0	0
12:00 PM	0	0	6	0	0	0	8	0	0	0	0	0	0	0	2	0
12:15 PM	0	0	5	0	0	0	9	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	6	0	0	0	10	1	0	0	1	0	0	1	1	0
12:45 PM	0	0	5	1	0	0	4	0	0	1	0	1	0	0	0	0

MID PEAK HOUR 11:45 AM to 12:45 PM <i>PHF</i>	Research Parkway Northbound				Research Parkway Southbound				Carpenter Lane Eastbound				Carpenter Lane Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	20	0	0	0	36	1	0	1	1	0	0	1	3	0
	0.83				0.84				0.50				0.50			

Client: Katherine Klose, RSP1
 Project #: 622_029_BL
 BTM #: Location 5
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Carpenter Lane
 Count Date: 10/13/2020
 Day of Week: Tuesday
 Weather: Showers, 60°F



PO Box 1723
 Framingham, MA 01701

PEDESTRIANS & BICYCLES

Start Time	Research Parkway Northbound				Research Parkway Southbound				Carpenter Lane Eastbound				Carpenter Lane Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 12:00 PM to 1:00 PM	Research Parkway Northbound				Research Parkway Southbound				Carpenter Lane Eastbound				Carpenter Lane Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Route 68 at I-91 NB Ramps
Wallingford, Connecticut

File Name : 17900
Site Code : 17900
Start Date : 10/26/2018
Page No : 1

Groups Printed- Lights - Buses - Trucks - Bicycles on Crosswalk - Pedestrians

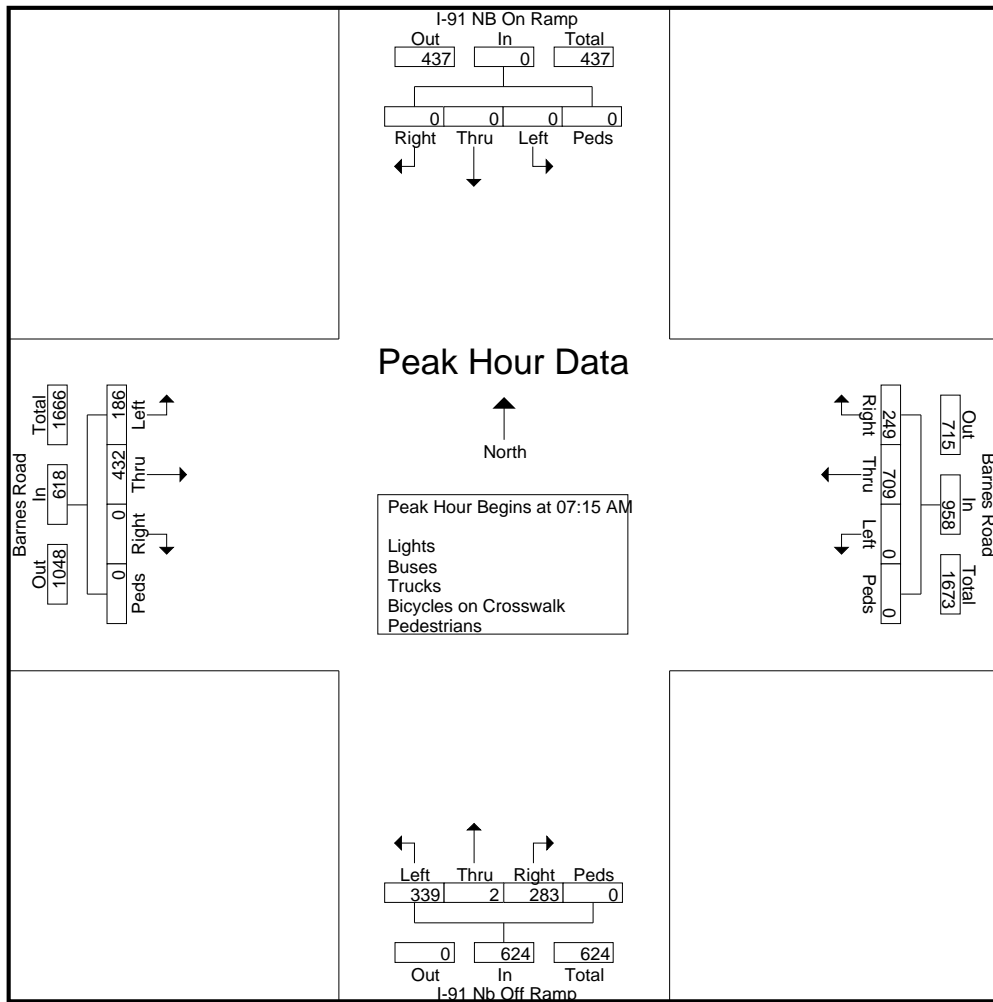
Start Time	I-91 NB On Ramp From North					Barnes Road From East					I-91 Nb Off Ramp From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
06:00 AM	0	0	0	0	0	35	47	0	0	82	29	0	26	0	55	0	49	25	0	74	211
06:15 AM	0	0	0	0	0	32	83	0	0	115	35	0	29	0	64	0	74	29	0	103	282
06:30 AM	0	0	0	0	0	59	132	0	0	191	65	0	38	0	103	0	84	31	0	115	409
06:45 AM	0	0	0	0	0	58	134	0	0	192	74	0	62	0	136	0	106	36	0	142	470
Total	0	0	0	0	0	184	396	0	0	580	203	0	155	0	358	0	313	121	0	434	1372
07:00 AM	0	0	0	0	0	55	171	0	0	226	80	0	52	0	132	0	76	64	0	140	498
07:15 AM	0	0	0	0	0	61	180	0	0	241	66	0	55	0	121	0	101	52	0	153	515
07:30 AM	0	0	0	0	0	72	175	0	0	247	62	0	106	0	168	0	105	39	0	144	559
07:45 AM	0	0	0	0	0	61	180	0	0	241	79	0	103	0	182	0	112	54	0	166	589
Total	0	0	0	0	0	249	706	0	0	955	287	0	316	0	603	0	394	209	0	603	2161
08:00 AM	0	0	0	0	0	55	174	0	0	229	76	2	75	0	153	0	114	41	0	155	537
08:15 AM	0	0	0	0	0	58	168	0	0	226	65	0	70	0	135	0	99	47	0	146	507
08:30 AM	0	0	0	0	0	61	144	0	0	205	46	0	58	0	104	0	89	36	0	125	434
08:45 AM	0	0	0	0	0	38	133	0	0	171	50	0	66	0	116	0	78	44	0	122	409
Total	0	0	0	0	0	212	619	0	0	831	237	2	269	0	508	0	380	168	0	548	1887
Grand Total	0	0	0	0	0	645	1721	0	0	2366	727	2	740	0	1469	0	1087	498	0	1585	5420
Apprch %	0	0	0	0		27.3	72.7	0	0		49.5	0.1	50.4	0		0	68.6	31.4	0		
Total %	0	0	0	0	0	11.9	31.8	0	0	43.7	13.4	0	13.7	0	27.1	0	20.1	9.2	0	29.2	
Lights	0	0	0	0	0	590	1594	0	0	92.3	92.4	100	92.8	0	92.6	0	88.7	79.1	0	85.7	90.5
% Lights	0	0	0	0	0	91.5	92.6	0	0	92.3	92.4	100	92.8	0	92.6	0	88.7	79.1	0	85.7	90.5
Buses	0	0	0	0	0	0	37	0	0	37	3	0	10	0	13	0	5	1	0	6	56
% Buses	0	0	0	0	0	0	2.1	0	0	1.6	0.4	0	1.4	0	0.9	0	0.5	0.2	0	0.4	1
Trucks	0	0	0	0	0	55	90	0	0	145	52	0	43	0	95	0	118	103	0	221	461
% Trucks	0	0	0	0	0	8.5	5.2	0	0	6.1	7.2	0	5.8	0	6.5	0	10.9	20.7	0	13.9	8.5
Bicycles on Crosswalk																					
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 17900
Site Code : 17900
Start Date : 10/26/2018
Page No : 2

Start Time	I-91 NB On Ramp From North					Barnes Road From East					I-91 Nb Off Ramp From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	61	180	0	0	241	66	0	55	0	121	0	101	52	0	153	515
07:30 AM	0	0	0	0	0	72	175	0	0	247	62	0	106	0	168	0	105	39	0	144	559
07:45 AM	0	0	0	0	0	61	180	0	0	241	79	0	103	0	182	0	112	54	0	166	589
08:00 AM	0	0	0	0	0	55	174	0	0	229	76	2	75	0	153	0	114	41	0	155	537
Total Volume	0	0	0	0	0	249	709	0	0	958	283	2	339	0	624	0	432	186	0	618	2200
% App. Total	0	0	0	0	0	26	74	0	0		45.4	0.3	54.3	0		0	69.9	30.1	0		
PHF	.000	.000	.000	.000	.000	.865	.985	.000	.000	.970	.896	.250	.800	.000	.857	.000	.947	.861	.000	.931	.934

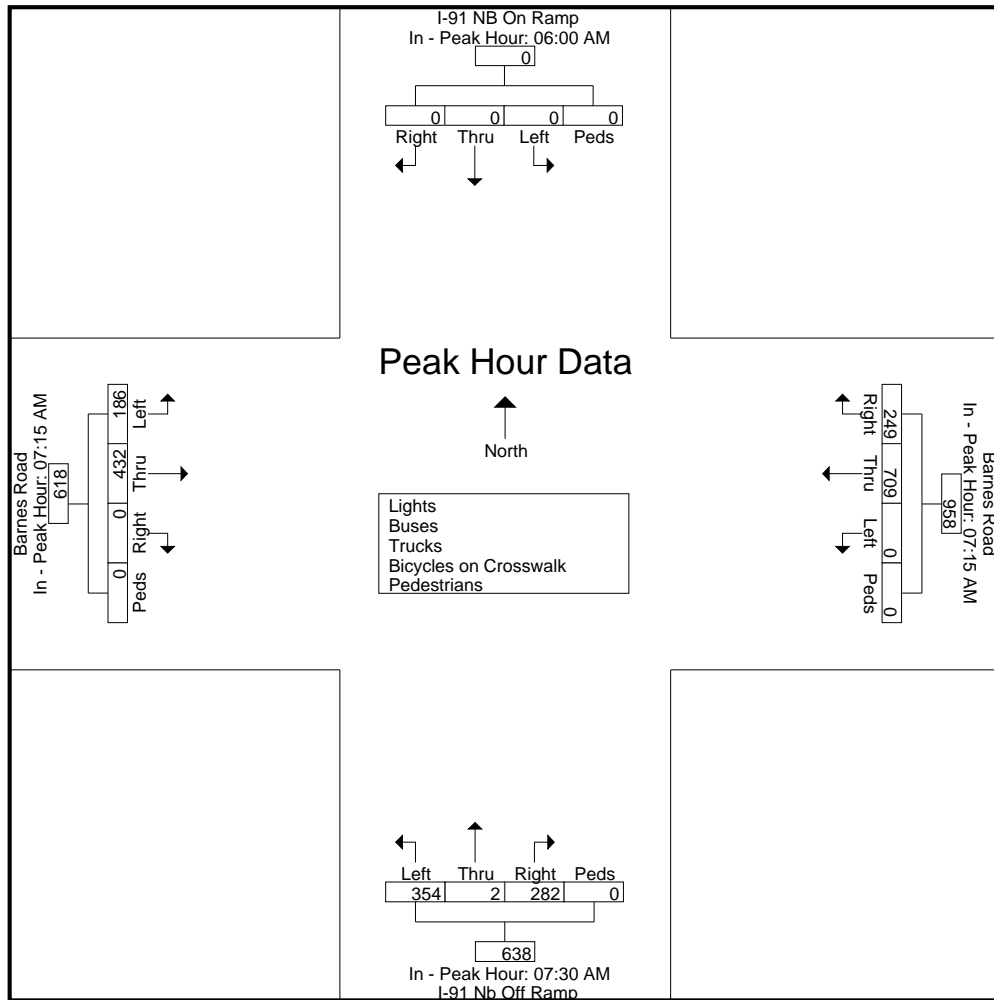


Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 17900
Site Code : 17900
Start Date : 10/26/2018
Page No : 3

Start Time	I-91 NB On Ramp From North					Barnes Road From East					I-91 Nb Off Ramp From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	06:00 AM					07:15 AM					07:30 AM					07:15 AM					
+0 mins.	0	0	0	0	0	61	180	0	0	241	62	0	106	0	168	0	101	52	0	153	
+15 mins.	0	0	0	0	0	72	175	0	0	247	79	0	103	0	182	0	105	39	0	144	
+30 mins.	0	0	0	0	0	61	180	0	0	241	76	2	75	0	153	0	112	54	0	166	
+45 mins.	0	0	0	0	0	55	174	0	0	229	65	0	70	0	135	0	114	41	0	155	
Total Volume	0	0	0	0	0	249	709	0	0	958	282	2	354	0	638	0	432	186	0	618	
% App. Total	0	0	0	0	0	26	74	0	0		44.2	0.3	55.5	0		0	69.9	30.1	0		
PHF	.000	.000	.000	.000	.000	.865	.985	.000	.000	.970	.892	.250	.835	.000	.876	.000	.947	.861	.000	.931	



Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

Route 68 at I-95 SB Ramps
Wallingford, Connecticut

File Name : 17902
Site Code : 17902
Start Date : 10/26/2018
Page No : 1

Groups Printed- Lights - Buses - Trucks - Bicycles on Crosswalk - Pedestrians

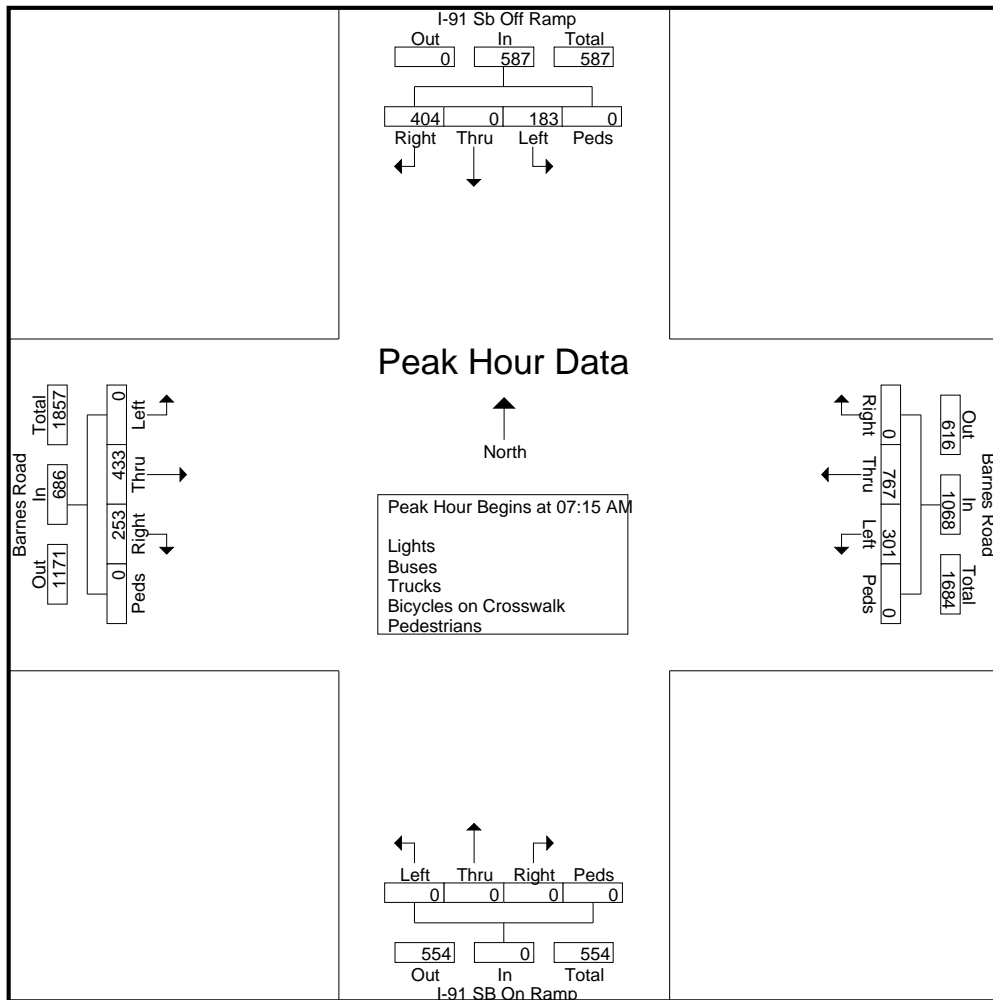
Start Time	I-91 Sb Off Ramp From North					Barnes Road From East					I-91 SB On Ramp From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
06:00 AM	37	0	26	0	63	0	47	26	0	73	0	0	0	0	0	32	52	0	0	84	220
06:15 AM	47	0	41	0	88	0	68	44	0	112	0	0	0	0	0	42	65	0	0	107	307
06:30 AM	43	0	45	0	88	0	112	68	0	180	0	0	0	0	0	37	78	0	0	115	383
06:45 AM	68	0	45	0	113	0	137	65	0	202	0	0	0	0	0	43	101	0	0	144	459
Total	195	0	157	0	352	0	364	203	0	567	0	0	0	0	0	154	296	0	0	450	1369
07:00 AM	72	0	27	0	99	0	148	81	0	229	0	0	0	0	0	55	111	0	0	166	494
07:15 AM	86	0	42	0	128	0	163	76	0	239	0	0	0	0	0	63	115	0	0	178	545
07:30 AM	103	0	39	0	142	0	197	77	0	274	0	0	0	0	0	61	95	0	0	156	572
07:45 AM	123	0	57	0	180	0	218	72	0	290	0	0	0	0	0	74	108	0	0	182	652
Total	384	0	165	0	549	0	726	306	0	1032	0	0	0	0	0	253	429	0	0	682	2263
08:00 AM	92	0	45	0	137	0	189	76	0	265	0	0	0	0	0	55	115	0	0	170	572
08:15 AM	113	0	43	0	156	0	172	58	0	230	0	0	0	0	0	52	103	0	0	155	541
08:30 AM	99	0	33	0	132	0	152	56	0	208	0	0	0	0	0	57	98	0	0	155	495
08:45 AM	82	0	31	0	113	0	173	44	0	217	0	0	0	0	0	46	88	0	0	134	464
Total	386	0	152	0	538	0	686	234	0	920	0	0	0	0	0	210	404	0	0	614	2072
Grand Total	965	0	474	0	1439	0	1776	743	0	2519	0	0	0	0	0	617	1129	0	0	1746	5704
Apprch %	67.1	0	32.9	0		0	70.5	29.5	0		0	0	0	0		35.3	64.7	0	0		
Total %	16.9	0	8.3	0	25.2	0	31.1	13	0	44.2	0	0	0	0	0	10.8	19.8	0	0	30.6	
Lights	866	0	406	0	1272	0	1673	0	0		0	0	0	0	0	90.8	85	0	0	87.1	90
% Lights	89.7	0	85.7	0	88.4	0	94.2	89.6	0	92.9	0	0	0	0	0	90.8	85	0	0	87.1	90
Buses	3	0	1	0	4	0	31	17	0	48	0	0	0	0	0	8	6	0	0	14	66
% Buses	0.3	0	0.2	0	0.3	0	1.7	2.3	0	1.9	0	0	0	0	0	1.3	0.5	0	0	0.8	1.2
Trucks	96	0	67	0	163	0	72	60	0	132	0	0	0	0	0	49	163	0	0	212	507
% Trucks	9.9	0	14.1	0	11.3	0	4.1	8.1	0	5.2	0	0	0	0	0	7.9	14.4	0	0	12.1	8.9
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 17902
Site Code : 17902
Start Date : 10/26/2018
Page No : 2

Start Time	I-91 Sb Off Ramp From North					Barnes Road From East					I-91 SB On Ramp From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	86	0	42	0	128	0	163	76	0	239	0	0	0	0	0	63	115	0	0	178	545
07:30 AM	103	0	39	0	142	0	197	77	0	274	0	0	0	0	0	61	95	0	0	156	572
07:45 AM	123	0	57	0	180	0	218	72	0	290	0	0	0	0	0	74	108	0	0	182	652
08:00 AM	92	0	45	0	137	0	189	76	0	265	0	0	0	0	0	55	115	0	0	170	572
Total Volume	404	0	183	0	587	0	767	301	0	1068	0	0	0	0	0	253	433	0	0	686	2341
% App. Total	68.8	0	31.2	0		0	71.8	28.2	0		0	0	0	0		36.9	63.1	0	0		
PHF	.821	.000	.803	.000	.815	.000	.880	.977	.000	.921	.000	.000	.000	.000	.000	.855	.941	.000	.000	.942	.898



Connecticut Counts LLC

Kensington, Connecticut 06037
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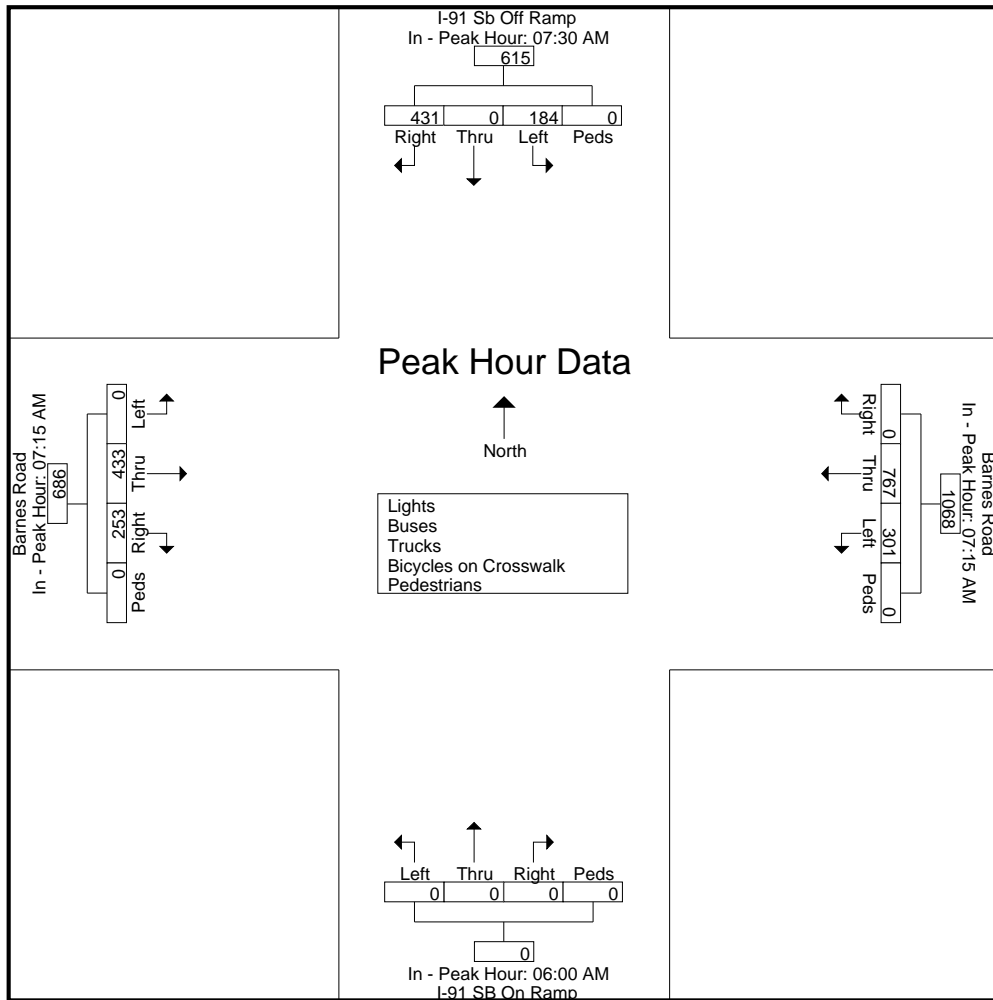
File Name : 17902
Site Code : 17902
Start Date : 10/26/2018
Page No : 3

Start Time	I-91 Sb Off Ramp From North					Barnes Road From East					I-91 SB On Ramp From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM					07:15 AM					06:00 AM					07:15 AM				
+0 mins.	103	0	39	0	142	0	163	76	0	239	0	0	0	0	0	63	115	0	0	178
+15 mins.	123	0	57	0	180	0	197	77	0	274	0	0	0	0	0	61	95	0	0	156
+30 mins.	92	0	45	0	137	0	218	72	0	290	0	0	0	0	0	74	108	0	0	182
+45 mins.	113	0	43	0	156	0	189	76	0	265	0	0	0	0	0	55	115	0	0	170
Total Volume	431	0	184	0	615	0	767	301	0	1068	0	0	0	0	0	253	433	0	0	686
% App. Total	70.1	0	29.9	0		0	71.8	28.2	0		0	0	0	0		36.9	63.1	0	0	
PHF	.876	.000	.807	.000	.854	.000	.880	.977	.000	.921	.000	.000	.000	.000	.000	.855	.941	.000	.000	.942

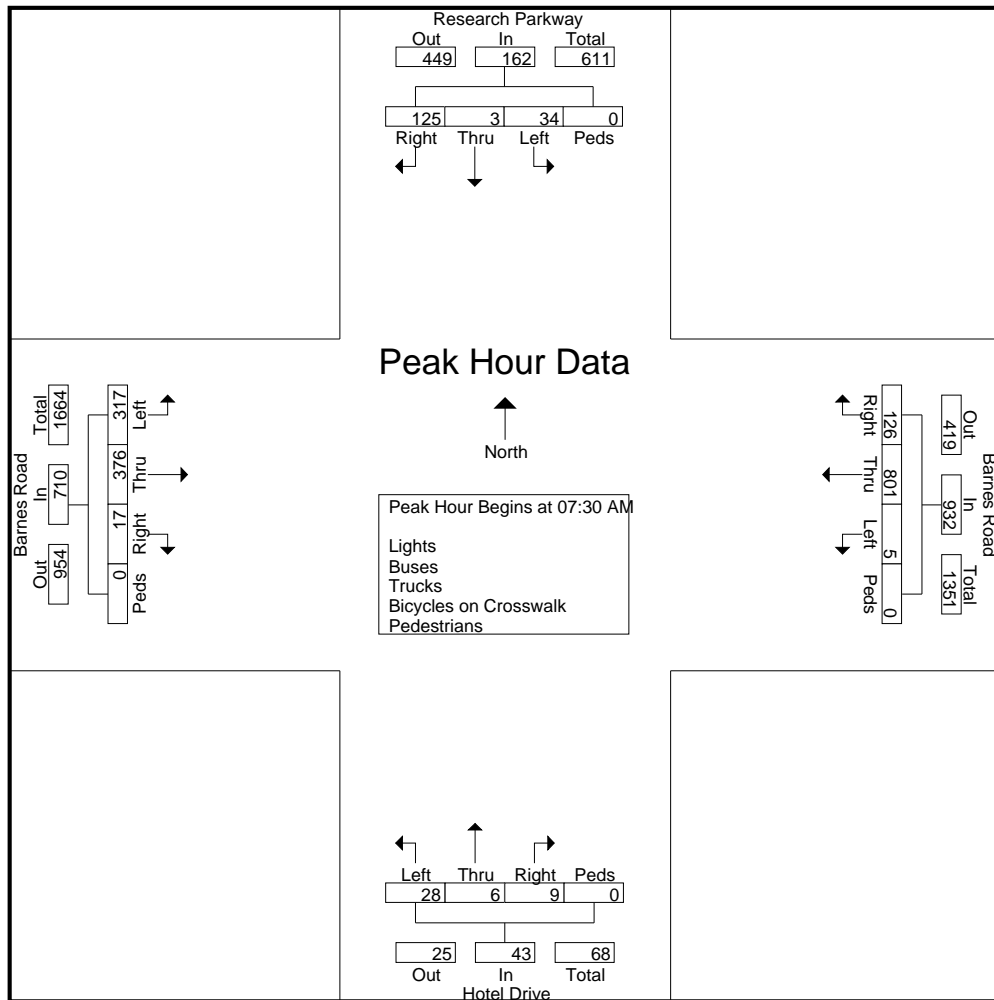


Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 17898
Site Code : 17898
Start Date : 10/26/2018
Page No : 2

Start Time	Research Parkway From North					Barnes Road From East					Hotel Drive From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	29	1	8	0	38	23	205	2	0	230	6	3	12	0	21	7	108	63	0	178	467
07:45 AM	27	0	6	0	33	41	219	2	0	262	1	0	4	0	5	3	101	88	0	192	492
08:00 AM	36	0	5	0	41	33	180	0	0	213	2	2	8	0	12	1	94	82	0	177	443
08:15 AM	33	2	15	0	50	29	197	1	0	227	0	1	4	0	5	6	73	84	0	163	445
Total Volume	125	3	34	0	162	126	801	5	0	932	9	6	28	0	43	17	376	317	0	710	1847
% App. Total	77.2	1.9	21	0		13.5	85.9	0.5	0		20.9	14	65.1	0		2.4	53	44.6	0		
PHF	.868	.375	.567	.000	.810	.768	.914	.625	.000	.889	.375	.500	.583	.000	.512	.607	.870	.901	.000	.924	.939



Connecticut Counts LLC

Kensington, Connecticut 06037
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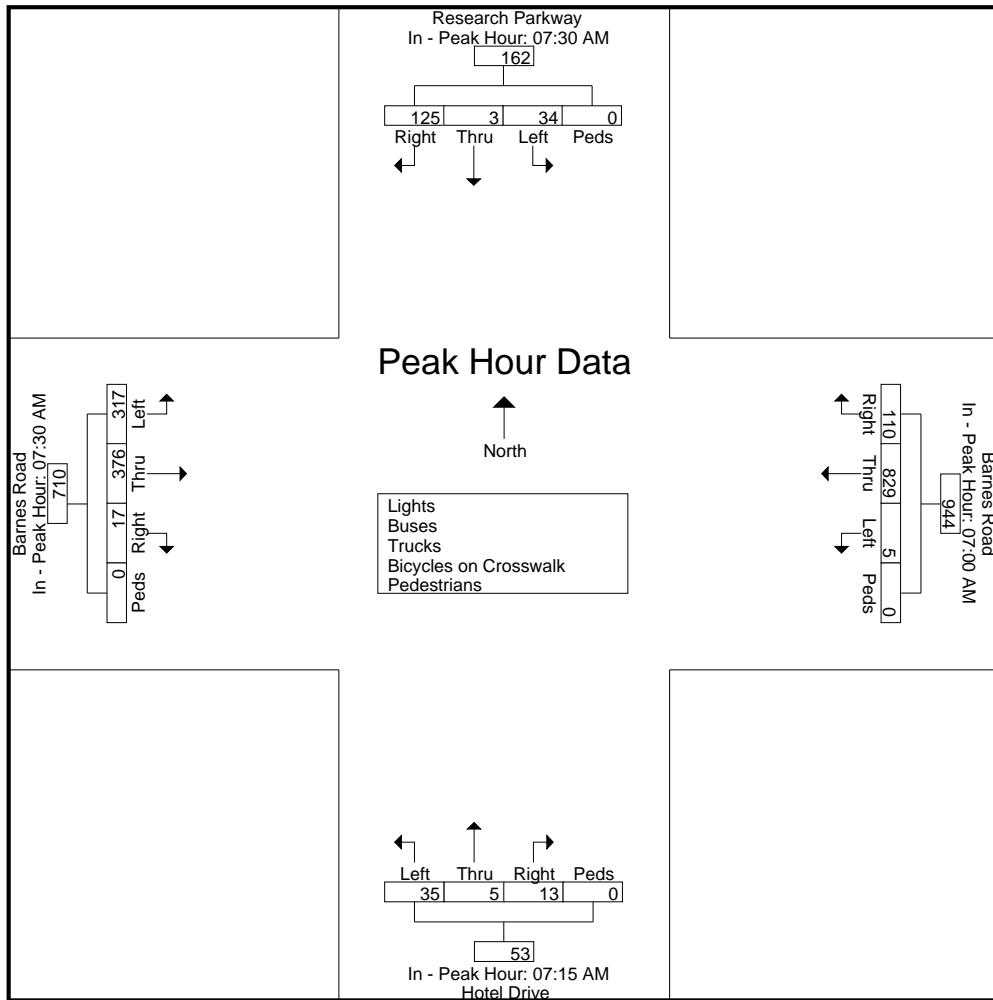
File Name : 17898
Site Code : 17898
Start Date : 10/26/2018
Page No : 3

Start Time	Research Parkway From North					Barnes Road From East					Hotel Drive From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM					07:00 AM					07:15 AM					07:30 AM				
+0 mins.	29	1	8	0	38	22	198	1	0	221	4	0	11	0	15	7	108	63	0	178
+15 mins.	27	0	6	0	33	24	207	0	0	231	6	3	12	0	21	3	101	88	0	192
+30 mins.	36	0	5	0	41	23	205	2	0	230	1	0	4	0	5	1	94	82	0	177
+45 mins.	33	2	15	0	50	41	219	2	0	262	2	2	8	0	12	6	73	84	0	163
Total Volume	125	3	34	0	162	110	829	5	0	944	13	5	35	0	53	17	376	317	0	710
% App. Total	77.2	1.9	21	0		11.7	87.8	0.5	0		24.5	9.4	66	0		2.4	53	44.6	0	
PHF	.868	.375	.567	.000	.810	.671	.946	.625	.000	.901	.542	.417	.729	.000	.631	.607	.870	.901	.000	.924



Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

Route 68 at I-91 NB Ramps
Wallingford, Connecticut

File Name : 17901
Site Code : 17901
Start Date : 10/25/2018
Page No : 1

Groups Printed- Lights - Buses - Trucks - Bicycles on Crosswalk - Pedestrians

Start Time	I-91 NB On Ramp From North					Barnes Road From East					I-91 NB Off Ramp From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
03:00 PM	0	0	0	0	0	50	129	0	0	179	61	0	66	0	127	0	140	70	0	210	516
03:15 PM	0	0	0	0	0	39	136	0	0	175	48	0	79	0	127	0	122	45	0	167	469
03:30 PM	0	1	0	0	1	44	204	0	0	248	61	0	68	0	129	0	156	79	0	235	613
03:45 PM	0	0	0	0	0	46	135	0	0	181	76	0	72	0	148	0	152	63	0	215	544
Total	0	1	0	0	1	179	604	0	0	783	246	0	285	0	531	0	570	257	0	827	2142
04:00 PM	0	0	0	0	0	70	170	0	0	240	65	0	70	0	135	0	178	118	0	296	671
04:15 PM	0	0	0	0	0	57	154	0	0	211	75	0	76	0	151	0	169	73	0	242	604
04:30 PM	0	0	0	0	0	76	212	0	0	288	71	1	44	0	116	0	171	106	0	277	681
04:45 PM	0	0	0	0	0	52	160	0	0	212	71	0	74	0	145	0	181	114	0	295	652
Total	0	0	0	0	0	255	696	0	0	951	282	1	264	0	547	0	699	411	0	1110	2608
05:00 PM	0	0	0	0	0	63	153	0	0	216	61	0	83	0	144	0	204	126	0	330	690
05:15 PM	0	0	0	0	0	55	196	0	0	251	90	0	83	0	173	0	174	97	0	271	695
05:30 PM	0	0	0	0	0	39	146	0	0	185	71	0	97	0	168	0	175	106	0	281	634
05:45 PM	0	0	0	0	0	42	125	0	0	167	62	0	63	0	125	0	144	73	0	217	509
Total	0	0	0	0	0	199	620	0	0	819	284	0	326	0	610	0	697	402	0	1099	2528
Grand Total	0	1	0	0	1	633	1920	0	0	2553	812	1	875	0	1688	0	1966	1070	0	3036	7278
Apprch %	0	100	0	0		24.8	75.2	0	0		48.1	0.1	51.8	0		0	64.8	35.2	0		
Total %	0	0	0	0	0	8.7	26.4	0	0	35.1	11.2	0	12	0	23.2	0	27	14.7	0	41.7	
Lights	0	1	0	0	1	603	1829	0	0	95.3	93	100	92.3	0	92.7	0	1919	1009	0	96.4	95.1
% Lights	0	100	0	0	100	95.3	95.3	0	0	95.3	93	100	92.3	0	92.7	0	97.6	94.3	0	96.4	95.1
Buses	0	0	0	0	0	0	11	0	0	11	3	0	21	0	24	0	3	4	0	7	42
% Buses	0	0	0	0	0	0	0.6	0	0	0.4	0.4	0	2.4	0	1.4	0	0.2	0.4	0	0.2	0.6
Trucks	0	0	0	0	0	30	80	0	0	110	54	0	46	0	100	0	44	57	0	101	311
% Trucks	0	0	0	0	0	4.7	4.2	0	0	4.3	6.7	0	5.3	0	5.9	0	2.2	5.3	0	3.3	4.3
Bicycles on Crosswalk																					
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

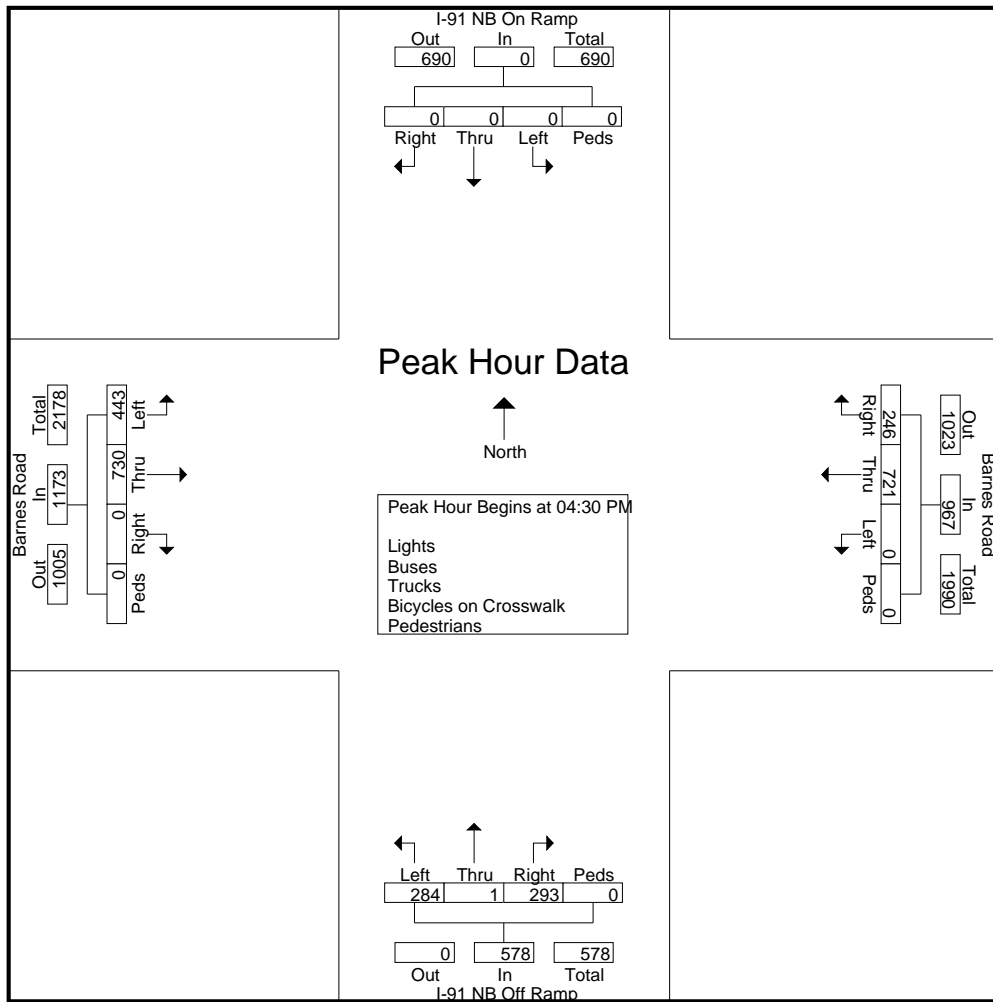
Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

File Name : 17901
 Site Code : 17901
 Start Date : 10/25/2018
 Page No : 2

Start Time	I-91 NB On Ramp From North					Barnes Road From East					I-91 NB Off Ramp From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	76	212	0	0	288	71	1	44	0	116	0	171	106	0	277	681
04:45 PM	0	0	0	0	0	52	160	0	0	212	71	0	74	0	145	0	181	114	0	295	652
05:00 PM	0	0	0	0	0	63	153	0	0	216	61	0	83	0	144	0	204	126	0	330	690
05:15 PM	0	0	0	0	0	55	196	0	0	251	90	0	83	0	173	0	174	97	0	271	695
Total Volume	0	0	0	0	0	246	721	0	0	967	293	1	284	0	578	0	730	443	0	1173	2718
% App. Total	0	0	0	0	0	25.4	74.6	0	0		50.7	0.2	49.1	0		0	62.2	37.8	0		
PHF	.000	.000	.000	.000	.000	.809	.850	.000	.000	.839	.814	.250	.855	.000	.835	.000	.895	.879	.000	.889	.978

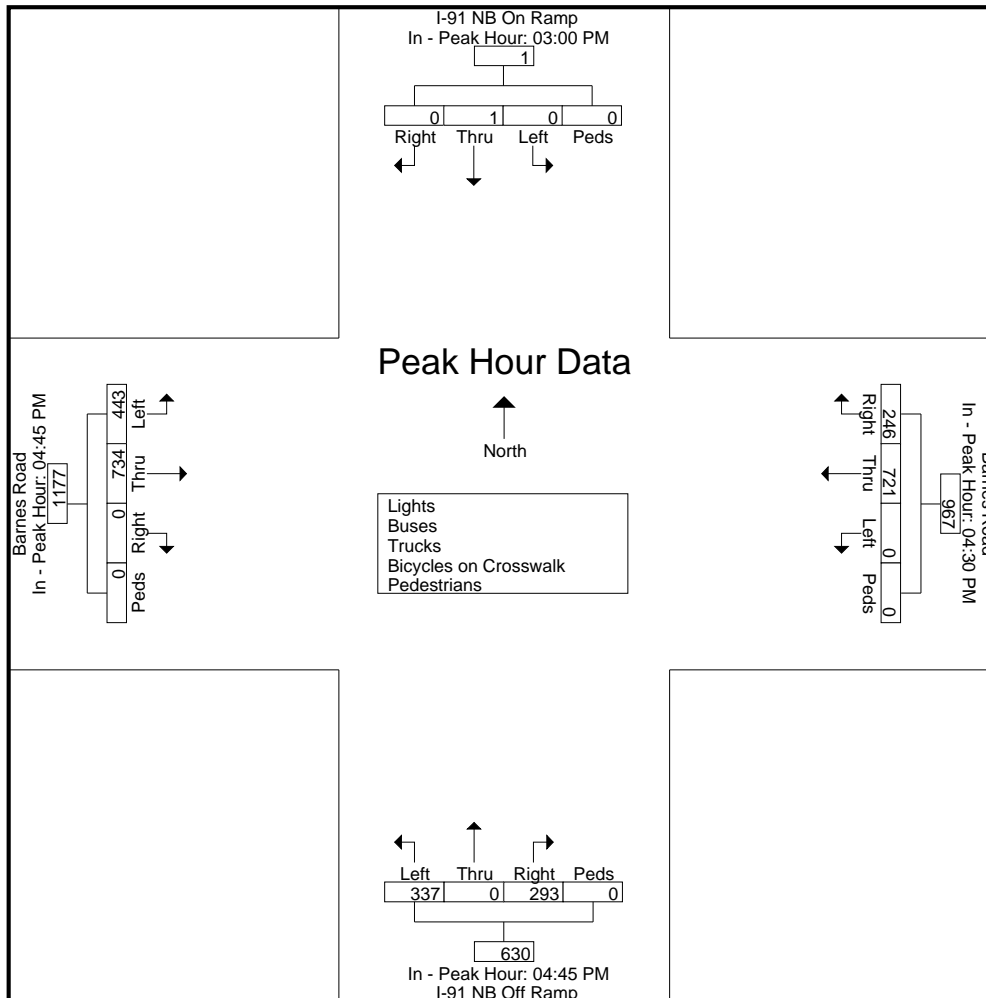


Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 17901
Site Code : 17901
Start Date : 10/25/2018
Page No : 3

Start Time	I-91 NB On Ramp From North					Barnes Road From East					I-91 NB Off Ramp From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	03:00 PM					04:30 PM					04:45 PM					04:45 PM					
+0 mins.	0	0	0	0	0	76	212	0	0	288	71	0	74	0	145	0	181	114	0	295	
+15 mins.	0	0	0	0	0	52	160	0	0	212	61	0	83	0	144	0	204	126	0	330	
+30 mins.	0	1	0	0	1	63	153	0	0	216	90	0	83	0	173	0	174	97	0	271	
+45 mins.	0	0	0	0	0	55	196	0	0	251	71	0	97	0	168	0	175	106	0	281	
Total Volume	0	1	0	0	1	246	721	0	0	967	293	0	337	0	630	0	734	443	0	1177	
% App. Total	0	100	0	0		25.4	74.6	0	0		46.5	0	53.5	0		0	62.4	37.6	0		
PHF	.000	.250	.000	.000	.250	.809	.850	.000	.000	.839	.814	.000	.869	.000	.910	.000	.900	.879	.000	.892	



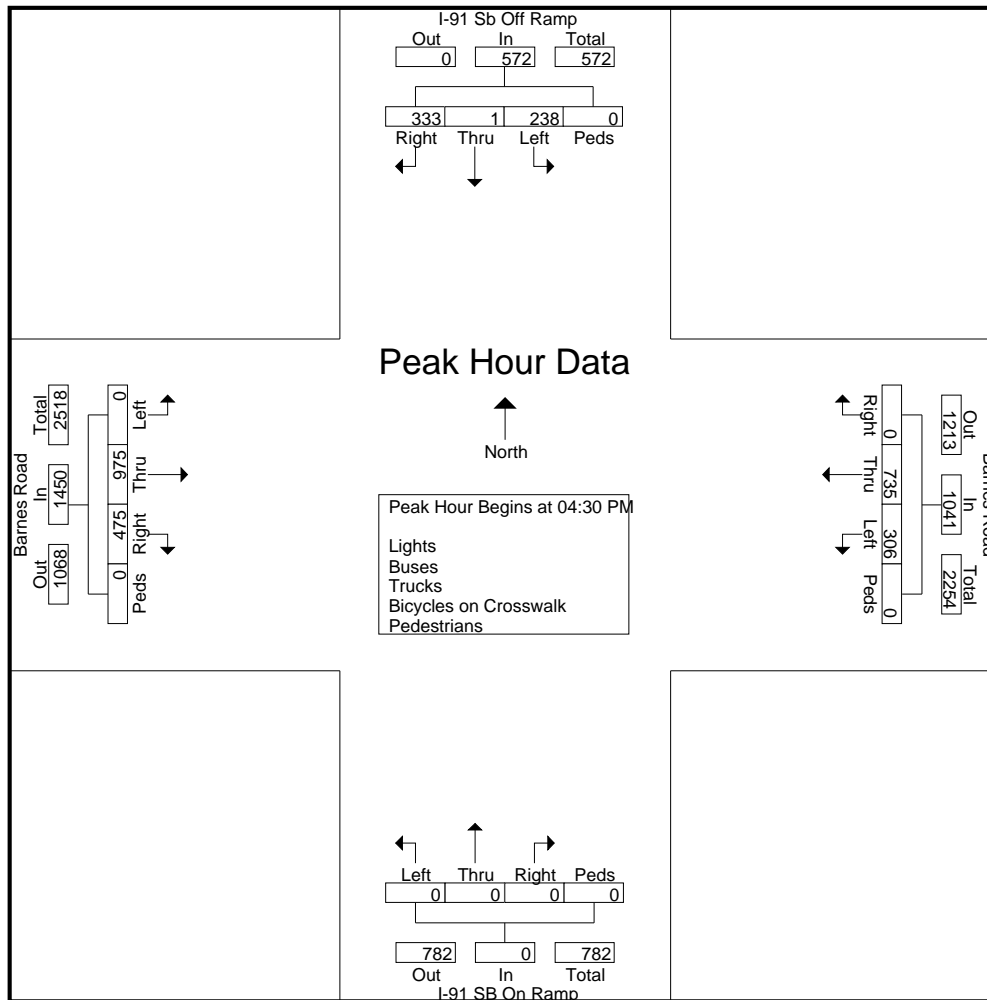
Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

File Name : 17903
 Site Code : 17903
 Start Date : 10/25/2018
 Page No : 2

Start Time	I-91 Sb Off Ramp From North					Barnes Road From East					I-91 SB On Ramp From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	80	0	54	0	134	0	181	89	0	270	0	0	0	0	0	138	244	0	0	382	786
04:45 PM	93	0	75	0	168	0	170	80	0	250	0	0	0	0	0	101	221	0	0	322	740
05:00 PM	80	1	56	0	137	0	182	67	0	249	0	0	0	0	0	137	279	0	0	416	802
05:15 PM	80	0	53	0	133	0	202	70	0	272	0	0	0	0	0	99	231	0	0	330	735
Total Volume	333	1	238	0	572	0	735	306	0	1041	0	0	0	0	0	475	975	0	0	1450	3063
% App. Total	58.2	0.2	41.6	0		0	70.6	29.4	0		0	0	0	0		32.8	67.2	0	0		
PHF	.895	.250	.793	.000	.851	.000	.910	.860	.000	.957	.000	.000	.000	.000	.000	.861	.874	.000	.000	.871	.955

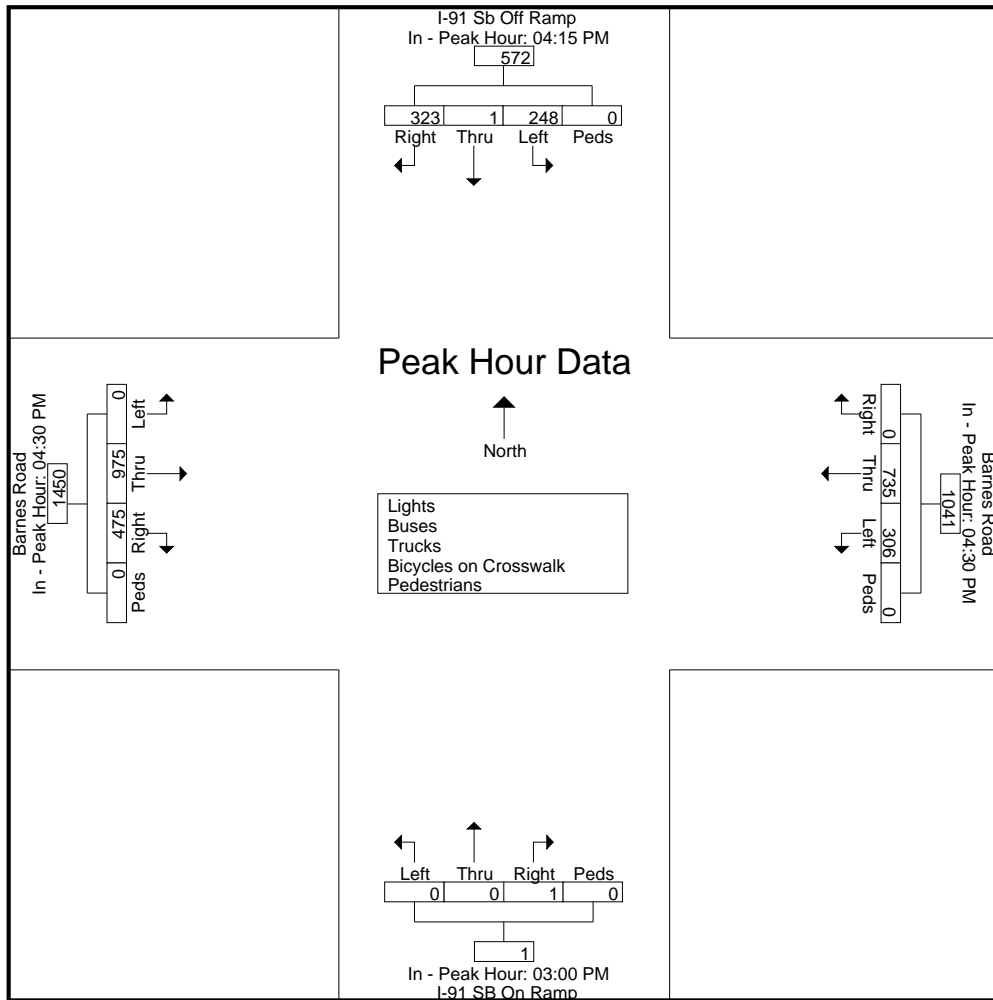


Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 17903
Site Code : 17903
Start Date : 10/25/2018
Page No : 3

Start Time	I-91 Sb Off Ramp From North					Barnes Road From East					I-91 SB On Ramp From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	04:15 PM					04:30 PM					03:00 PM					04:30 PM					
+0 mins.	70	0	63	0	133	0	181	89	0	270	1	0	0	0	1	138	244	0	0	382	
+15 mins.	80	0	54	0	134	0	170	80	0	250	0	0	0	0	0	101	221	0	0	322	
+30 mins.	93	0	75	0	168	0	182	67	0	249	0	0	0	0	0	137	279	0	0	416	
+45 mins.	80	1	56	0	137	0	202	70	0	272	0	0	0	0	0	99	231	0	0	330	
Total Volume	323	1	248	0	572	0	735	306	0	1041	1	0	0	0	1	475	975	0	0	1450	
% App. Total	56.5	0.2	43.4	0		0	70.6	29.4	0		100	0	0	0		32.8	67.2	0	0		
PHF	.868	.250	.827	.000	.851	.000	.910	.860	.000	.957	.250	.000	.000	.000	.250	.861	.874	.000	.000	.871	

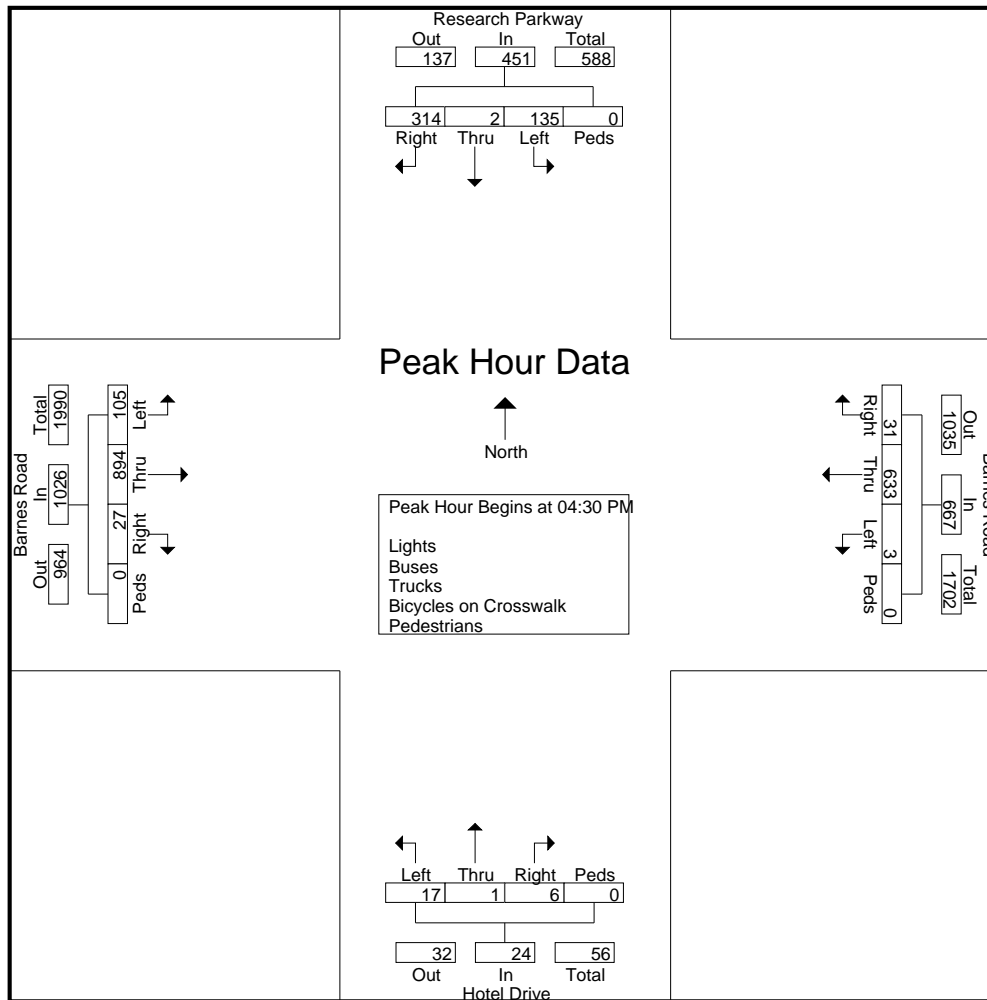


Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 17899
Site Code : 17899
Start Date : 10/25/2018
Page No : 2

Start Time	Research Parkway From North					Barnes Road From East					Hotel Drive From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	100	2	33	0	135	13	177	0	0	190	1	1	6	0	8	4	216	22	0	242	575
04:45 PM	67	0	22	0	89	8	141	0	0	149	2	0	5	0	7	10	212	30	0	252	497
05:00 PM	95	0	42	0	137	3	128	2	0	133	0	0	2	0	2	6	236	27	0	269	541
05:15 PM	52	0	38	0	90	7	187	1	0	195	3	0	4	0	7	7	230	26	0	263	555
Total Volume	314	2	135	0	451	31	633	3	0	667	6	1	17	0	24	27	894	105	0	1026	2168
% App. Total	69.6	0.4	29.9	0		4.6	94.9	0.4	0		25	4.2	70.8	0		2.6	87.1	10.2	0		
PHF	.785	.250	.804	.000	.823	.596	.846	.375	.000	.855	.500	.250	.708	.000	.750	.675	.947	.875	.000	.954	.943



Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

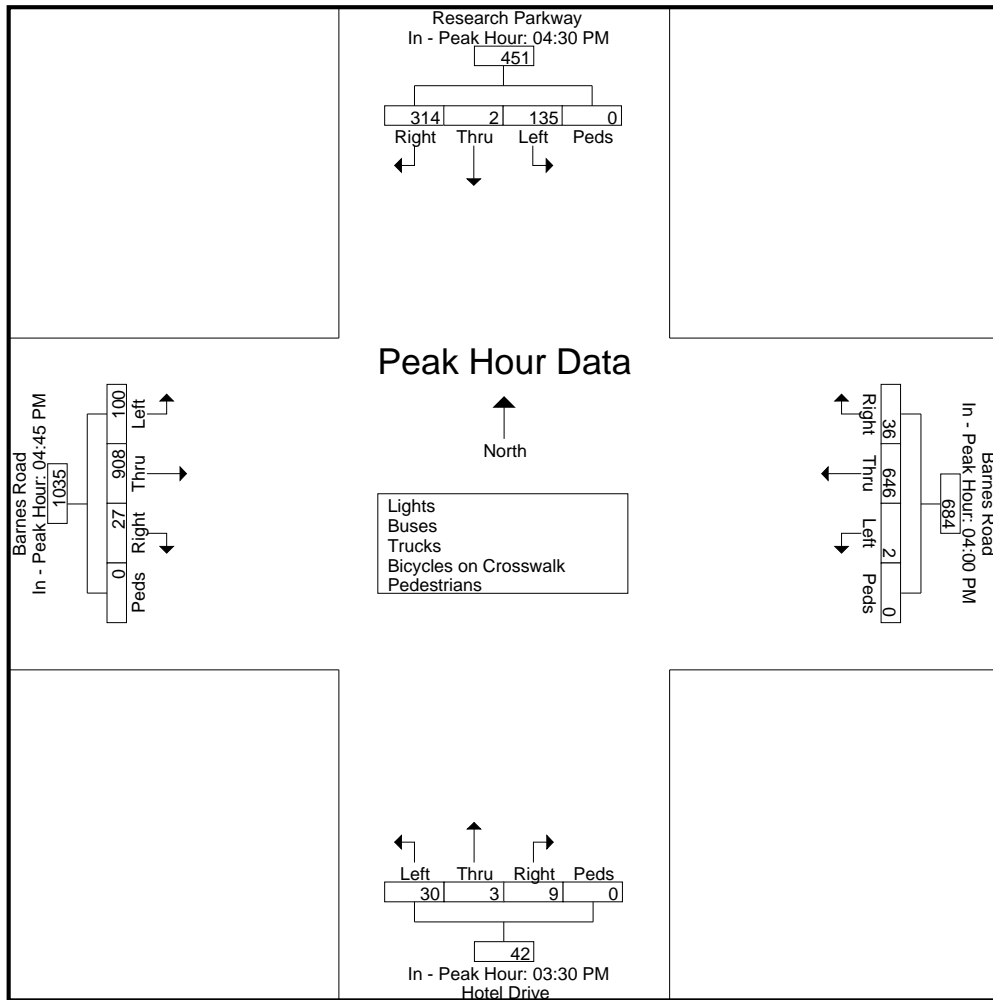
File Name : 17899
 Site Code : 17899
 Start Date : 10/25/2018
 Page No : 3

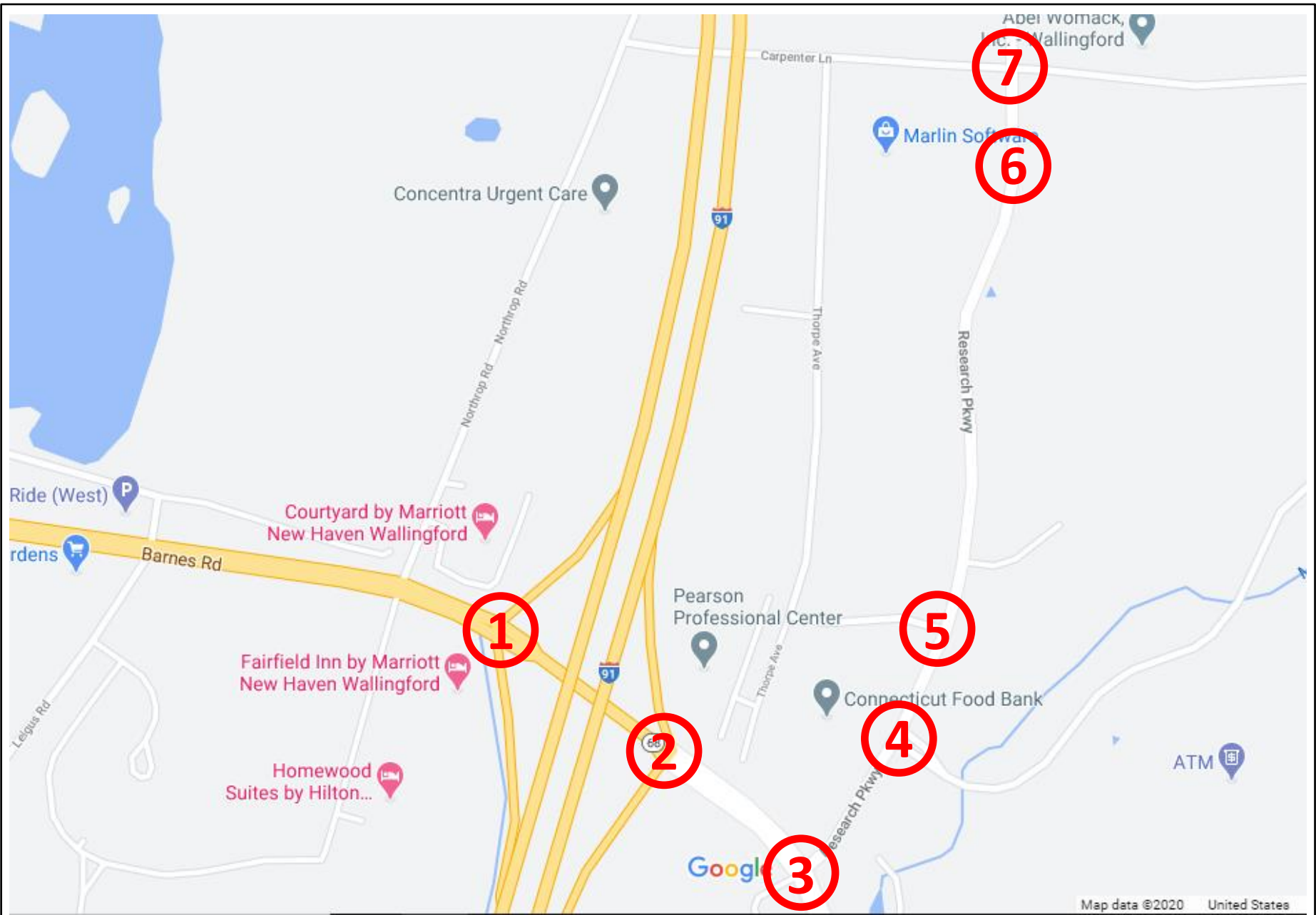
Start Time	Research Parkway From North					Barnes Road From East					Hotel Drive From South					Barnes Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:30 PM					04:00 PM					03:30 PM					04:45 PM				
+0 mins.	100	2	33	0	135	9	175	1	0	185	6	2	12	0	20	10	212	30	0	252
+15 mins.	67	0	22	0	89	6	153	1	0	160	0	0	3	0	3	6	236	27	0	269
+30 mins.	95	0	42	0	137	13	177	0	0	190	2	1	11	0	14	7	230	26	0	263
+45 mins.	52	0	38	0	90	8	141	0	0	149	1	0	4	0	5	4	230	17	0	251
Total Volume	314	2	135	0	451	36	646	2	0	684	9	3	30	0	42	27	908	100	0	1035
% App. Total	69.6	0.4	29.9	0		5.3	94.4	0.3	0		21.4	7.1	71.4	0		2.6	87.7	9.7	0	
PHF	.785	.250	.804	.000	.823	.692	.912	.500	.000	.900	.375	.375	.625	.000	.525	.675	.962	.833	.000	.962





	ID: 688_046_BL	Wallingford, CT	# of TMC's: 07	Client: BL Companies
		Collected on April 8, 2021	# of ATR's: 00	Contact: Pat Padlo, P.E., PTOE

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTD #: Location 1
 Location: Wallingford, CT
 Street 1: Route 68 (Barnes Road)
 Street 2: I-91 Southbound On/Off Ramps
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PASSENGER CARS & HEAVY VEHICLES COMBINED

Start Time	I-91 Southbound On Ramp Northbound				I-91 Southbound Off Ramp Southbound				Route 68 (Barnes Road) Eastbound				Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
10:00 AM	0	0	0	0	0	16	0	43	0	0	74	46	0	31	80	0
10:15 AM	0	0	0	0	0	14	0	42	0	0	99	36	0	24	77	0
10:30 AM	0	0	0	0	0	17	0	32	0	0	90	34	0	21	76	0
10:45 AM	0	0	0	0	0	20	0	42	0	0	101	40	0	32	93	0
7:00 PM	0	0	0	0	0	11	0	19	0	0	73	16	0	37	85	0
7:15 PM	0	0	0	0	0	16	0	17	0	0	70	33	0	27	77	0
7:30 PM	0	0	0	0	0	16	0	13	0	0	75	19	0	24	56	0
7:45 PM	0	0	0	0	0	19	0	19	0	0	60	28	0	22	53	0
8:00 PM	0	0	0	0	0	18	0	21	0	0	53	15	0	27	58	0
8:15 PM	0	0	0	0	0	7	0	19	0	0	42	17	0	16	63	0
8:30 PM	0	0	0	0	0	14	0	23	0	0	44	21	0	12	34	0
8:45 PM	0	0	0	0	0	13	0	16	0	0	40	13	0	10	42	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 1
 Location: Wallingford, CT
 Street 1: Route 68 (Barnes Road)
 Street 2: I-91 Southbound On/Off Ramps
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

HEAVY VEHICLES

Start Time	I-91 Southbound On Ramp Northbound				I-91 Southbound Off Ramp Southbound				Route 68 (Barnes Road) Eastbound				Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
10:00 AM	0	0	0	0	0	5	0	12	0	0	15	13	0	2	10	0
10:15 AM	0	0	0	0	0	3	0	11	0	0	19	7	0	2	12	0
10:30 AM	0	0	0	0	0	4	0	16	0	0	15	1	0	4	10	0
10:45 AM	0	0	0	0	0	3	0	11	0	0	23	10	0	7	9	0
7:00 PM	0	0	0	0	0	1	0	2	0	0	0	1	0	1	4	0
7:15 PM	0	0	0	0	0	1	0	2	0	0	0	2	0	1	2	0
7:30 PM	0	0	0	0	0	1	0	1	0	0	1	0	0	2	0	0
7:45 PM	0	0	0	0	0	1	0	1	0	0	2	1	0	2	3	0
8:00 PM	0	0	0	0	0	2	0	4	0	0	3	0	0	1	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	2	3	0
8:30 PM	0	0	0	0	0	3	0	4	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	2	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 1
 Location: Wallingford, CT
 Street 1: Route 68 (Barnes Road)
 Street 2: I-91 Southbound On/Off Ramps
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PEDESTRIANS & BICYCLES

Start Time	I-91 Southbound On Ramp Northbound				I-91 Southbound Off Ramp Southbound				Route 68 (Barnes Road) Eastbound				Route 68 (Barnes Road) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 2
 Location: Wallingford, CT
 Street 1: Route 68 (Barnes Road)
 Street 2: I-91 Northbound On/Off Ramps
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PASSENGER CARS & HEAVY VEHICLES COMBINED

Start Time	I-91 Northbound Off Ramp				I-91 Northbound On Ramp				Route 68 (Barnes Road)				Route 68 (Barnes Road)			
	U-Turn	Northbound			U-Turn	Southbound			U-Turn	Eastbound			U-Turn	Westbound		
		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right
10:00 AM	0	22	0	28	0	0	0	0	0	28	61	0	0	0	87	39
10:15 AM	0	33	0	24	0	0	0	0	0	45	67	0	0	0	68	32
10:30 AM	0	26	0	30	0	0	0	0	0	36	74	0	0	0	78	27
10:45 AM	0	28	0	30	0	0	0	0	0	49	72	0	0	0	92	33
7:00 PM	0	34	0	21	0	0	0	0	0	15	66	0	0	0	88	20
7:15 PM	0	36	0	34	0	0	0	0	0	8	78	0	0	0	69	17
7:30 PM	0	20	0	34	0	0	0	0	0	18	71	0	0	0	56	18
7:45 PM	0	29	0	27	0	0	0	0	0	17	65	0	0	0	48	15
8:00 PM	0	20	0	26	0	0	0	0	0	7	65	0	0	0	60	21
8:15 PM	0	30	0	33	0	0	0	0	0	10	40	0	0	0	53	19
8:30 PM	0	14	0	14	0	0	0	0	0	2	56	0	0	0	34	11
8:45 PM	0	17	0	18	0	0	0	0	0	12	42	0	0	0	34	12

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 2
 Location: Wallingford, CT
 Street 1: Route 68 (Barnes Road)
 Street 2: I-91 Northbound On/Off Ramps
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

HEAVY VEHICLES

Start Time	I-91 Northbound Off Ramp				I-91 Northbound On Ramp				Route 68 (Barnes Road)				Route 68 (Barnes Road)			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
10:00 AM	0	7	0	7	0	0	0	0	0	6	10	0	0	0	9	6
10:15 AM	0	6	0	7	0	0	0	0	0	15	8	0	0	0	8	1
10:30 AM	0	4	0	5	0	0	0	0	0	13	8	0	0	0	12	11
10:45 AM	0	3	0	4	0	0	0	0	0	16	10	0	0	0	13	7
7:00 PM	0	3	0	2	0	0	0	0	0	0	1	0	0	0	2	4
7:15 PM	0	2	0	2	0	0	0	0	0	0	1	0	0	0	1	1
7:30 PM	0	2	0	2	0	0	0	0	0	1	1	0	0	0	0	2
7:45 PM	0	4	0	0	0	0	0	0	0	2	1	0	0	0	1	1
8:00 PM	0	0	0	2	0	0	0	0	0	2	3	0	0	0	1	1
8:15 PM	0	2	0	1	0	0	0	0	0	0	1	0	0	0	3	3
8:30 PM	0	0	0	2	0	0	0	0	0	0	3	0	0	0	0	0
8:45 PM	0	2	0	0	0	0	0	0	0	0	2	0	0	0	2	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 2
 Location: Wallingford, CT
 Street 1: Route 68 (Barnes Road)
 Street 2: I-91 Northbound On/Off Ramps
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PEDESTRIANS & BICYCLES

Start Time	I-91 Northbound Off Ramp				I-91 Northbound On Ramp				Route 68 (Barnes Road)				Route 68 (Barnes Road)			
	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTD #: Location 3
 Location: Wallingford, CT
 Street 1: Route 68 (Barnes Road)
 Street 2: Research Parkway
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PASSENGER CARS & HEAVY VEHICLES COMBINED

Start Time	Hilton Garden Inn Drive Northbound			Research Parkway Southbound			Route 68 (Barnes Road) Eastbound			Route 68 (Barnes Road) Westbound						
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right				
10:00 AM	0	1	0	0	0	9	0	18	0	18	71	2	0	0	104	5
10:15 AM	0	5	0	0	0	6	0	12	0	14	73	1	0	0	86	4
10:30 AM	0	6	1	0	0	4	0	20	0	15	91	2	0	0	79	6
10:45 AM	0	0	0	0	0	8	0	24	0	21	77	1	0	0	103	5
7:00 PM	0	3	1	1	0	4	1	16	0	8	77	3	0	0	88	6
7:15 PM	0	1	0	2	0	3	0	14	0	15	84	4	0	1	71	4
7:30 PM	0	1	0	2	0	4	0	13	0	19	87	3	0	1	60	4
7:45 PM	0	1	0	1	0	3	0	11	0	13	76	1	0	0	52	6
8:00 PM	0	0	0	0	0	4	0	12	0	11	79	3	0	1	74	3
8:15 PM	0	0	0	0	0	2	0	9	0	11	66	2	0	0	58	3
8:30 PM	0	1	0	0	0	2	0	4	0	7	56	3	0	0	40	1
8:45 PM	0	3	0	2	0	1	0	7	0	1	56	5	0	0	36	3

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 3
 Location: Wallingford, CT
 Street 1: Route 68 (Barnes Road)
 Street 2: Research Parkway
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

HEAVY VEHICLES

Start Time	Hilton Garden Inn Drive Northbound				Research Parkway Southbound				Route 68 (Barnes Road) Eastbound				Route 68 (Barnes Road) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
10:00 AM	0	0	0	0	0	0	0	6	0	5	12	0	0	0	8	0
10:15 AM	0	0	0	0	0	1	0	2	0	6	10	0	0	0	9	0
10:30 AM	0	1	0	0	0	0	0	8	0	5	6	1	0	0	13	1
10:45 AM	0	0	0	0	0	0	0	10	0	6	9	0	0	0	9	1
7:00 PM	0	0	0	0	0	0	0	3	0	2	2	0	0	0	4	0
7:15 PM	0	0	0	0	0	0	0	1	0	2	1	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	2	0	1	1	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0
8:00 PM	0	0	0	0	0	0	0	1	0	2	2	0	0	0	1	0
8:15 PM	0	0	0	0	0	0	0	4	0	2	0	0	0	0	1	0
8:30 PM	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	2	0	1	3	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 3
 Location: Wallingford, CT
 Street 1: Route 68 (Barnes Road)
 Street 2: Research Parkway
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PEDESTRIANS & BICYCLES

Start Time	Hilton Garden Inn Drive Northbound				Research Parkway Southbound				Route 68 (Barnes Road) Eastbound				Route 68 (Barnes Road) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTD #: Location 4
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Site Drive & Food Bank Drive
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PASSENGER CARS & HEAVY VEHICLES COMBINED

Start Time	Research Parkway Northbound				Research Parkway Southbound				Food Bank Drive Eastbound				Site Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
10:00 AM	0	3	19	0	0	0	25	0	0	0	0	1	0	0	0	0
10:15 AM	0	0	20	0	0	0	17	0	0	0	0	2	0	0	0	0
10:30 AM	0	1	21	0	0	0	22	0	0	0	0	1	0	0	0	0
10:45 AM	0	1	25	0	0	0	29	0	0	0	0	3	0	0	0	0
7:00 PM	0	0	15	0	0	0	21	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	20	0	0	0	16	0	0	0	0	1	0	0	0	0
7:30 PM	0	0	21	0	0	0	17	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	20	0	0	0	15	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	14	0	0	0	16	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	14	0	0	0	11	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	8	0	0	0	6	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	4	0	0	0	8	0	0	0	0	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 4
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Site Drive & Food Bank Drive
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

HEAVY VEHICLES

Start Time	Research Parkway Northbound				Research Parkway Southbound				Food Bank Drive Eastbound				Site Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
10:00 AM	0	1	4	0	0	0	6	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	6	0	0	0	3	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	6	0	0	0	8	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	7	0	0	0	9	0	0	0	0	1	0	0	0	0
7:00 PM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 4
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Site Drive & Food Bank Drive
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PEDESTRIANS & BICYCLES

Start Time	Research Parkway Northbound				Research Parkway Southbound				Food Bank Drive Eastbound				Site Drive Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTD #: Location 5
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Joseph Carini Road
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PASSENGER CARS & HEAVY VEHICLES COMBINED

Start Time	U-Turn	Research Parkway Northbound			Research Parkway Southbound			Joseph Carini Road Eastbound			Westbound					
		Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right				
7:00 AM	0	4	34	0	0	0	22	0	0	0	0	3	0	0	0	0
7:15 AM	0	2	24	0	0	0	20	1	0	0	0	0	0	0	0	0
7:30 AM	0	4	25	0	0	0	21	1	0	0	0	3	0	0	0	0
7:45 AM	0	5	45	0	0	0	34	2	0	0	0	0	0	0	0	0
8:00 AM	0	7	42	0	0	0	31	1	0	0	0	1	0	0	0	0
8:15 AM	0	12	46	0	0	0	57	1	0	0	0	1	0	0	0	0
8:30 AM	0	14	38	0	0	0	19	0	0	0	0	2	0	0	0	0
8:45 AM	0	18	32	0	0	0	23	0	0	0	0	2	0	0	0	0
10:00 AM	0	4	14	0	0	0	22	0	0	0	0	3	0	0	0	0
10:15 AM	0	1	19	0	0	0	17	0	0	0	0	0	0	0	0	0
10:30 AM	0	3	17	0	0	0	19	0	0	0	0	2	0	0	0	0
10:45 AM	0	1	25	0	0	0	26	0	0	0	0	4	0	0	0	0
11:00 AM	0	1	19	0	0	0	24	0	0	0	0	0	0	0	0	0
11:15 AM	0	2	21	0	0	0	20	0	0	0	0	3	0	0	0	0
11:30 AM	0	5	9	0	0	0	22	1	0	0	0	2	0	0	0	0
11:45 AM	0	3	16	0	0	0	43	0	0	0	0	5	0	0	0	0
12:00 PM	0	1	19	0	0	0	55	1	0	0	0	8	0	0	0	0
12:15 PM	0	3	21	0	0	0	27	1	0	0	0	4	0	0	0	0
12:30 PM	0	3	27	0	0	0	23	0	0	2	0	3	0	0	0	0
12:45 PM	0	2	30	0	0	0	38	0	0	0	0	5	0	0	0	0
4:00 PM	0	2	19	0	0	0	42	0	0	1	0	7	0	0	0	0
4:15 PM	0	2	31	0	0	0	36	1	0	1	0	6	0	0	0	0
4:30 PM	0	1	27	0	0	0	51	0	0	2	0	18	0	0	0	0
4:45 PM	0	2	32	0	0	0	41	0	0	0	0	7	0	0	0	0
5:00 PM	0	2	31	0	0	0	62	0	0	0	0	9	0	0	0	0
5:15 PM	0	1	26	0	0	0	45	0	0	0	0	8	0	0	0	0
5:30 PM	0	0	26	0	0	0	37	0	0	0	0	6	0	0	0	0
5:45 PM	0	2	26	0	0	0	28	0	0	0	0	5	0	0	0	0
7:00 PM	0	1	13	0	0	0	20	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	21	0	0	0	17	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	19	0	0	0	15	0	0	0	0	1	0	0	0	0
7:45 PM	0	0	23	0	0	0	16	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	15	0	0	0	15	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	14	0	0	0	10	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	7	0	0	0	6	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	5	0	0	0	8	0	0	0	0	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 5
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Joseph Carini Road
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

HEAVY VEHICLES

Start Time	Research Parkway Northbound				Research Parkway Southbound				Joseph Carini Road Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	12	0	0	0	5	0	0	0	0	1	0	0	0	0
7:15 AM	0	0	3	0	0	0	4	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	1	0	0	0	3	0	0	0	0	2	0	0	0	0
7:45 AM	0	0	6	0	0	0	8	0	0	0	0	0	0	0	0	0
8:00 AM	0	1	5	0	0	0	4	0	0	0	0	1	0	0	0	0
8:15 AM	0	0	4	0	0	0	13	0	0	0	0	1	0	0	0	0
8:30 AM	0	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	2	0	0	0	7	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	5	0	0	0	6	0	0	0	0	1	0	0	0	0
10:15 AM	0	0	6	0	0	0	3	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	6	0	0	0	7	0	0	0	0	1	0	0	0	0
10:45 AM	0	0	7	0	0	0	9	0	0	0	0	0	0	0	0	0
11:00 AM	0	1	5	0	0	0	5	0	0	0	0	0	0	0	0	0
11:15 AM	0	1	6	0	0	0	8	0	0	0	0	0	0	0	0	0
11:30 AM	0	2	1	0	0	0	8	1	0	0	0	1	0	0	0	0
11:45 AM	0	0	3	0	0	0	19	0	0	0	0	1	0	0	0	0
12:00 PM	0	0	2	0	0	0	7	0	0	0	0	2	0	0	0	0
12:15 PM	0	0	2	0	0	0	5	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0
12:45 PM	0	1	4	0	0	0	5	0	0	0	0	1	0	0	0	0
4:00 PM	0	0	5	0	0	0	4	0	0	0	0	1	0	0	0	0
4:15 PM	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	4	0	0	0	5	0	0	1	0	0	0	0	0	0
4:45 PM	0	0	5	0	0	0	4	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	6	0	0	0	8	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	9	0	0	0	3	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTD #: Location 5
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Joseph Carini Road
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PEDESTRIANS & BICYCLES

Start Time	Research Parkway Northbound				Research Parkway Southbound				Joseph Carini Road Eastbound				Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTD #: Location 6
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: #10 Research Parkway Drive
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PASSENGER CARS & HEAVY VEHICLES COMBINED

Start Time	Research Parkway Northbound				Research Parkway Southbound				#10 Research Parkway Drive Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	29	0	0	0	22	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	24	0	0	0	20	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	19	0	0	0	22	1	0	0	0	1	0	0	0	0
7:45 AM	0	1	41	0	0	0	35	1	0	0	0	0	0	0	0	0
8:00 AM	0	1	33	0	0	0	31	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	40	0	0	0	29	0	0	0	0	0	0	0	0	0
8:30 AM	0	1	32	0	0	0	20	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	24	0	0	0	22	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	15	0	0	0	20	0	0	0	0	1	0	0	0	0
10:15 AM	0	0	18	0	0	0	18	1	0	0	0	0	0	0	0	0
10:30 AM	0	0	17	0	0	0	16	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	23	0	0	0	25	0	0	0	0	1	0	0	0	0
11:00 AM	0	1	21	0	0	0	18	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	22	0	0	0	20	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	7	0	0	0	25	0	0	0	0	1	0	0	0	0
11:45 AM	0	3	14	0	0	0	35	0	0	0	0	2	0	0	0	0
12:00 PM	0	0	18	0	0	0	52	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	21	0	0	0	25	0	0	0	0	1	0	0	0	0
12:30 PM	0	0	29	0	0	0	23	0	0	0	0	0	0	0	0	0
12:45 PM	0	1	27	0	0	0	38	0	0	1	0	1	0	0	0	0
4:00 PM	0	0	20	0	0	0	37	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	37	0	0	0	35	0	0	0	0	2	0	0	0	0
4:30 PM	0	0	30	0	0	0	43	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	37	0	0	0	35	0	0	0	0	2	0	0	0	0
5:00 PM	0	0	31	0	0	0	52	0	0	2	0	4	0	0	0	0
5:15 PM	0	0	27	0	0	0	37	0	0	0	0	3	0	0	0	0
5:30 PM	0	0	27	0	0	0	34	0	0	0	0	1	0	0	0	0
5:45 PM	0	0	18	0	0	0	26	0	0	0	0	1	0	0	0	0
7:00 PM	0	0	13	0	0	0	21	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	22	0	0	0	15	0	0	0	0	1	0	0	0	0
7:30 PM	0	0	21	0	0	0	16	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	25	0	0	0	13	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	14	0	0	0	14	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	14	0	0	0	11	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	7	0	0	0	4	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	4	0	0	0	10	0	0	0	0	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 6
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: #10 Research Parkway Drive
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

HEAVY VEHICLES

Start Time	Research Parkway Northbound				Research Parkway Southbound				#10 Research Parkway Drive Eastbound				Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	11	0	0	0	5	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	5	0	0	0	4	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	6	0	0	0	8	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	2	0	0	0	7	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	5	0	0	0	6	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	5	0	0	0	3	1	0	0	0	0	0	0	0	0
10:30 AM	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	7	0	0	0	8	0	0	0	0	1	0	0	0	0
11:00 AM	0	0	5	0	0	0	4	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	6	0	0	0	8	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	1	0	0	0	9	0	0	0	0	1	0	0	0	0
11:45 AM	0	0	3	0	0	0	17	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	2	0	0	0	9	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	6	0	0	0	2	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	4	0	0	0	6	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	6	0	0	0	4	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	6	0	0	0	8	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	3	0	0	0	5	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	6	0	0	0	3	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 6
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: #10 Research Parkway Drive
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PEDESTRIANS & BICYCLES

Start Time	Research Parkway Northbound				Research Parkway Southbound				#10 Research Parkway Drive Eastbound				Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTD #: Location 7
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Carpenter Lane
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PASSENGER CARS & HEAVY VEHICLES COMBINED

Start Time	Research Parkway Northbound			Research Parkway Southbound			Carpenter Lane Eastbound			Carpenter Lane Westbound						
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right				
10:00 AM	0	0	13	2	0	2	16	5	0	3	6	1	0	3	2	2
10:15 AM	0	1	15	1	0	4	15	4	0	5	3	2	0	2	8	0
10:30 AM	0	1	16	1	0	0	9	4	0	8	6	0	0	7	0	3
10:45 AM	0	1	19	3	0	5	23	7	0	4	3	1	0	2	1	1
7:00 PM	0	0	12	1	0	3	19	7	0	4	2	1	0	1	3	2
7:15 PM	0	1	18	3	0	2	15	2	0	6	5	0	0	0	3	1
7:30 PM	0	1	17	3	0	1	13	3	0	5	3	0	0	2	1	2
7:45 PM	0	3	18	3	0	2	12	4	0	2	4	1	0	0	4	0
8:00 PM	0	1	13	0	0	1	10	3	0	0	4	2	0	2	2	0
8:15 PM	0	2	9	3	0	1	9	5	0	2	4	0	0	3	0	1
8:30 PM	0	0	6	2	0	0	3	0	0	2	6	1	0	0	1	0
8:45 PM	0	0	5	0	0	1	2	2	0	3	1	0	0	8	9	1

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 7
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Carpenter Lane
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

HEAVY VEHICLES

Start Time	Research Parkway Northbound				Research Parkway Southbound				Carpenter Lane Eastbound				Carpenter Lane Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
10:00 AM	0	0	4	0	0	0	6	0	0	1	2	0	0	0	0	1
10:15 AM	0	0	4	0	0	0	3	2	0	1	0	2	0	0	0	0
10:30 AM	0	1	6	0	0	0	3	0	0	4	0	0	0	2	0	0
10:45 AM	0	0	7	0	0	0	9	1	0	0	0	0	0	0	0	0
7:00 PM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
8:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	1	0	0	0	2	1	0	0	0	0	0	0	0	0

Client: Pat Padlo, P.E., PTOE
 Project #: 688_046_BL
 BTM #: Location 7
 Location: Wallingford, CT
 Street 1: Research Parkway
 Street 2: Carpenter Lane
 Count Date: 4/8/2021
 Day of Week: Thursday
 Weather: Mostly Cloudy, 60°F



PO Box 1723
 Framingham, MA 01701

PEDESTRIANS & BICYCLES

Start Time	Research Parkway Northbound				Research Parkway Southbound				Carpenter Lane Eastbound				Carpenter Lane Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Lane Group Data		from west (EB)			from east (WB)			from south (NB)			from north (SB)			RECORDNAME	
	RECORDNAME	INTID	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	HeavyVehicles	1	0	20	11	13	31	0	0	0	0	9	0	17	1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)
AM	HeavyVehicles	2	9	20	0	0	32	12	14	0	14	0	0	0	2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)
AM	HeavyVehicles	3	15	23	1	0	45	6	1	0	1	2	0	7	3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)
AM	HeavyVehicles	4	0	0	0	0	0	0	0	3	0	11	10	0	4: Research Parkway & Food Bank Driv/Site Drive
AM	HeavyVehicles	5	0	0	50	0	0	0	3	12	0	0	19	0	5: Joseph Carini R
AM	HeavyVehicles	6	0	0	0	0	0	0	0	14	0	0	17	0	6: Research Parkway & Private Drive
AM	HeavyVehicles	7	0	5	17	6	2	5	8	3	5	9	4	2	7: Research Parkway & Carpenter Lane
AM	HeavyVehicles	8		2	2	2	2		2		2				8: Site Drive 2 & Carpenter Lane
AM PK Gen	HeavyVehicles	1	0	20	20	14	13	0	0	0	0	22	0	31	1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)
AM PK Gen	HeavyVehicles	2	32	12	0	0	13	19	18	0	21	0	0	0	2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)
AM PK Gen	HeavyVehicles	3	32	12	17	0	10	10	0	0	0	4	0	35	3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)
AM PK Gen	HeavyVehicles	4	0	0	14	0	0	0	20	27	0	0	28	0	4: Research Parkway & Food Bank Driv/Site Drive
AM PK Gen	HeavyVehicles	5	0	0	22	0	0	0	0	32	0	0	30	0	5: Joseph Carini R
AM PK Gen	HeavyVehicles	6	0	0	50	0	0	0	0	32	0	0	29	0	6: Research Parkway & Private Drive
AM PK Gen	HeavyVehicles	7	30	11	50	14	0	17	33	33	0	0	33	15	7: Research Parkway & Carpenter Lane
AM PK Gen	HeavyVehicles	8		2	2	2	2		2		2				8: Site Drive 2 & Carpenter Lane
MD	HeavyVehicles	1	0	12	11	23	8	0	0	0	0	16	0	31	1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)
MD	HeavyVehicles	2	26	8	0	0	10	23	14	0	18	0	0	0	2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)
MD	HeavyVehicles	3	28	7	14	0	9	5	20	0	50	22	0	26	3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)
MD	HeavyVehicles	4	0	0	0	0	0	0	0	25	0	0	28	0	4: Research Parkway & Food Bank Driv/Site Drive
MD	HeavyVehicles	5	0	0	15	0	0	0	11	13	0	0	13	0	5: Joseph Carini R
MD	HeavyVehicles	6	0	0	2	2	2	2	0	13	0	0	15	0	6: Research Parkway & Private Drive
MD	HeavyVehicles	7	3	4	9	13	16	0	0	30	17	0	38	3	7: Research Parkway & Carpenter Lane
MD	HeavyVehicles	8		2	2	2	2		2		2				8: Site Drive 2 & Carpenter Lane
PM	HeavyVehicles	1	15	27	0	0	26	9	12	0	11	0	0	0	1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)
PM	HeavyVehicles	2	0	31	14	11	26	0	0	0	0	8	0	11	2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)
PM	HeavyVehicles	3	5	41	1	0	30	2	2	0	0	5	0	13	3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)
PM	HeavyVehicles	4	0	0	0	0	0	0	0	6	0	0	2	0	4: Research Parkway & Food Bank Driv/Site Drive
PM	HeavyVehicles	5	50	0	0	2	2	2	0	15	0	0	12	0	5: Joseph Carini R
PM	HeavyVehicles	6	0	0	0	2	2	2	0	16	0	0	12	0	6: Research Parkway & Private Drive
PM	HeavyVehicles	7	2	0	0	0	0	0	0	10	0	0	2	1	7: Research Parkway & Carpenter Lane
PM	HeavyVehicles	8		2	2	2	2		2		2				8: Site Drive 2 & Carpenter Lane
PM PK Gen	HeavyVehicles	1	0	1	4	5	3	0	0	0	0	6	0	9	1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)
PM PK Gen	HeavyVehicles	2	5	1	0	0	2	11	9	0	5	0	0	0	2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)
PM PK Gen	HeavyVehicles	3	13	1	0	0	2	0	0	0	0	4	0	35	3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)
PM PK Gen	HeavyVehicles	4	0	0	0	0	0	0	0	9	0	0	9	0	4: Research Parkway & Food Bank Driv/Site Drive
PM PK Gen	HeavyVehicles	5	0	0	0	0	0	0	0	9	0	0	9	0	5: Joseph Carini R
PM PK Gen	HeavyVehicles	6	0	0	0	0	0	0	0	9	0	0	12	0	6: Research Parkway & Private Drive
PM PK Gen	HeavyVehicles	7	0	0	0	0	0	0	0	11	0	0	12	6	7: Research Parkway & Carpenter Lane
PM PK Gen	HeavyVehicles	8		2	2	2	2		2		2				8: Site Drive 2 & Carpenter Lane

Lane Group Data			from west (EB)			from east (WB)			from south (NB)			from north (SB)			RECORDNAME
RECORDNAME	INTID		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
AM	PHF	1	0.94	0.94	0.94	0.92	0.92	0.92	0.88	0.88	0.88	0.82	0.82	0.82	1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)
AM	PHF	2	0.93	0.93	0.93	0.97	0.97	0.97	0.86	0.86	0.86	0.88	0.88	0.88	2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)
AM	PHF	3	0.92	0.92	0.92	0.89	0.89	0.89	0.51	0.51	0.51	0.81	0.81	0.81	3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)
AM	PHF	4	0.42	0.42	0.42	0.88	0.88	0.88	0.67	0.67	0.67	0.73	0.73	0.73	4: Research Parkway & Food Bank Drive/Site Drive
AM	PHF	5	0.5	0.5	0.5	0.88	0.88	0.88	0.9	0.9	0.9	0.63	0.63	0.63	5: Josheph Carini R
AM	PHF	6	0.88	0.88	0.88	0.88	0.88	0.88	0.89	0.89	0.89	0.81	0.81	0.81	6: Research Parkway & Private Drive
AM	PHF	7	0.62	0.62	0.62	0.71	0.71	0.71	0.69	0.69	0.69	0.76	0.76	0.76	7: Research Parkway & Carpenter Lane
AM	PHF	8		0.92	0.92	0.92	0.92		0.92		0.92				8: Site Drive 2 & Carpenter Lane
AM PK Gen	PHF	1	0.94	0.94	0.94	0.74	0.74	0.74	0.88	0.88	0.88	0.89	0.89	0.89	1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)
AM PK Gen	PHF	2	0.88	0.88	0.88	0.94	0.94	0.94	0.95	0.95	0.95	0.88	0.88	0.88	2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)
AM PK Gen	PHF	3	0.81	0.81	0.81	0.86	0.86	0.86	0.38	0.38	0.38	0.81	0.81	0.81	3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)
AM PK Gen	PHF	4	0.58	0.58	0.58	0.88	0.88	0.88	0.63	0.63	0.63	0.8	0.8	0.8	4: Research Parkway & Food Bank Drive/Site Drive
AM PK Gen	PHF	5	0.56	0.56	0.56	0.88	0.88	0.88	0.75	0.75	0.75	0.81	0.81	0.81	5: Josheph Carini R
AM PK Gen	PHF	6	0.5	0.5	0.5	0.88	0.88	0.88	0.79	0.79	0.79	0.79	0.79	0.79	6: Research Parkway & Private Drive
AM PK Gen	PHF	7	0.63	0.63	0.63	0.45	0.45	0.45	0.79	0.79	0.79	0.65	0.65	0.65	7: Research Parkway & Carpenter Lane
AM PK Gen	PHF	8		0.92	0.92	0.92	0.92		0.92		0.92				8: Site Drive 2 & Carpenter Lane
MD	PHF	1	0.87	0.87	0.87	0.91	0.91	0.91	0.88	0.88	0.88	0.9	0.9	0.9	1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)
MD	PHF	2	0.95	0.95	0.95	0.91	0.91	0.91	0.9	0.9	0.9	0.88	0.88	0.88	2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)
MD	PHF	3	0.93	0.93	0.93	0.92	0.92	0.92	0.44	0.44	0.44	0.9	0.9	0.9	3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)
MD	PHF	4	0.63	0.63	0.63	0.88	0.88	0.88	0.81	0.81	0.81	0.92	0.92	0.92	4: Research Parkway & Food Bank Drive/Site Drive
MD	PHF	5	0.69	0.69	0.69	0.92	0.92	0.92	0.83	0.83	0.83	0.65	0.65	0.65	5: Josheph Carini R
MD	PHF	6	0.38	0.38	0.38	0.92	0.92	0.92	0.83	0.83	0.83	0.66	0.66	0.66	6: Research Parkway & Private Drive
MD	PHF	7	0.86	0.86	0.86	0.75	0.75	0.75	0.85	0.85	0.85	0.89	0.89	0.89	7: Research Parkway & Carpenter Lane
MD	PHF	8		0.92	0.92	0.92	0.92		0.92		0.92				8: Site Drive 2 & Carpenter Lane
PM	PHF	1	0.89	0.89	0.89	0.84	0.84	0.84	0.88	0.88	0.88	0.85	0.85	0.85	1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)
PM	PHF	2	0.87	0.87	0.87	0.96	0.96	0.96	0.84	0.84	0.84	0.88	0.88	0.88	2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)
PM	PHF	3	0.95	0.95	0.95	0.86	0.86	0.86	0.75	0.75	0.75	0.82	0.82	0.82	3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)
PM	PHF	4	0.48	0.48	0.48	0.88	0.88	0.88	0.59	0.59	0.59	0.6	0.6	0.6	4: Research Parkway & Food Bank Drive/Site Drive
PM	PHF	5	0.55	0.55	0.55	0.92	0.92	0.92	0.9	0.9	0.9	0.8	0.8	0.8	5: Josheph Carini R
PM	PHF	6	0.42	0.42	0.42	0.92	0.92	0.92	0.9	0.9	0.9	0.79	0.79	0.79	6: Research Parkway & Private Drive
PM	PHF	7	0.86	0.86	0.86	0.76	0.76	0.76	0.63	0.63	0.63	0.71	0.71	0.71	7: Research Parkway & Carpenter Lane
PM	PHF	8		0.92	0.92	0.92	0.92		0.92		0.92				8: Site Drive 2 & Carpenter Lane
PM PK Gen	PHF	1	0.83	0.83	0.83	0.59	0.59	0.59	0.88	0.88	0.88	0.86	0.86	0.86	1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)
PM PK Gen	PHF	2	0.85	0.85	0.85	0.81	0.81	0.81	0.84	0.84	0.84	0.88	0.88	0.88	2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)
PM PK Gen	PHF	3	0.78	0.78	0.78	0.8	0.8	0.8	0.75	0.75	0.75	0.86	0.86	0.86	3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)
PM PK Gen	PHF	4	0.25	0.25	0.25	0.88	0.88	0.88	0.9	0.9	0.9	0.82	0.82	0.82	4: Research Parkway & Food Bank Drive/Site Drive
PM PK Gen	PHF	5	0.25	0.25	0.25	0.88	0.88	0.88	0.83	0.83	0.83	0.85	0.85	0.85	5: Josheph Carini R
PM PK Gen	PHF	6	0.25	0.25	0.25	0.88	0.88	0.88	0.81	0.81	0.81	0.77	0.77	0.77	6: Research Parkway & Private Drive
PM PK Gen	PHF	7	0.64	0.64	0.64	0.66	0.66	0.66	0.72	0.72	0.72	0.67	0.67	0.67	7: Research Parkway & Carpenter Lane
PM PK Gen	PHF	8		0.92	0.92	0.92	0.92		0.92		0.92				8: Site Drive 2 & Carpenter Lane

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF POLICY & PLANNING - ROADWAY INFORMATION SYSTEMS
TRAFFIC MONITORING & DATA ANALYSIS SECTION

FACTORS FOR EXPANDING 24-HOUR COUNTS TO
ANNUAL AVERAGE DAILY TRAFFIC VOLUMES
(BASED ON 2013 & 2014 CONTINUOUS COUNT STATION DATA)

GROUP - 1 ** INTERSTATE **

INTERSTATE-URBAN(7,24, 30, 31, 32, 45), INTERSTATE-RURAL(54)

STATION(S): 7, 24, 30, 31, 32, 45, 54

	AVG.	WEEKDAY	FRIDAY	SATURDAY	SUNDAY
JANUARY		1.05	0.97	1.22	1.39
FEBRUARY		1.03	0.94	1.17	1.43
MARCH		1.02	0.92	1.10	1.26
APRIL		0.97	0.89	1.03	1.15
MAY		0.94	0.86	0.99	1.08
JUNE		0.93	0.85	0.96	1.04
JULY		0.91	0.85	0.96	1.03
AUGUST		0.91	0.83	0.94	1.02
SEPTEMBER		0.96	0.87	1.02	1.10
OCTOBER		0.97	0.86	1.01	1.10
NOVEMBER		0.99	0.93	1.07	1.24
DECEMBER		1.00	0.91	1.04	1.24

GROUP - 2 ** RURAL **

MINOR ART-RURAL(4, 10, 13, 16), RURAL PRINC ART-OTHER-RURAL(20), PRINC ART-OTHER EXPY-RURAL(51)

STATION(S): 4, 10, 13, 16, 20, 51

	AVG.	WEEKDAY	FRIDAY	SATURDAY	SUNDAY
JANUARY		1.05	0.99	1.20	1.48
FEBRUARY		1.03	0.98	1.14	1.49
MARCH		1.02	0.95	1.08	1.36
APRIL		0.97	0.91	1.03	1.22
MAY		0.92	0.85	0.95	1.10
JUNE		0.91	0.84	0.91	1.06
JULY		0.91	0.84	0.95	1.10
AUGUST		0.91	0.85	0.95	1.08
SEPTEMBER		0.94	0.84	0.97	1.14
OCTOBER		0.95	0.86	1.01	1.20
NOVEMBER		0.98	0.92	1.08	1.33
DECEMBER		0.99	0.92	1.08	1.39

GROUP - 3 ** INTERSTATE **

INTERSTATE I-84 FROM ROUTE 195 TO MASS STATE LINE(27)

STATION(S): 27 (I-84 FROM ROUTE 195 TO MASS. STATE LINE)

	AVG.	WEEKDAY	FRIDAY	SATURDAY	SUNDAY
JANUARY		1.46	1.12	1.23	1.16
FEBRUARY		1.37	1.02	1.20	1.26
MARCH		1.29	0.99	1.06	0.90
APRIL		1.13	0.87	0.92	0.80
MAY		1.06	0.78	0.84	0.76
JUNE		1.07	0.78	0.83	0.72
JULY		0.97	0.73	0.76	0.67
AUGUST		0.93	0.69	0.70	0.66
SEPTEMBER		1.10	0.82	0.91	0.77
OCTOBER		1.14	0.78	0.84	0.74
NOVEMBER		1.16	0.89	0.97	0.91
DECEMBER		1.17	0.92	0.91	0.91

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF POLICY & PLANNING - ROADWAY INFORMATION SYSTEMS
TRAFFIC MONITORING & DATA ANALYSIS SECTION

**FACTORS FOR EXPANDING 24-HOUR COUNTS TO
ANNUAL AVERAGE DAILY TRAFFIC VOLUMES
(BASED ON 2013 & 2014 CONTINUOUS COUNT STATION DATA)**

GROUP - 4 ** URBAN **

PRINC ART-OTHER EXPY-URBAN(15, 17, 19, 23),PRINC ART-OTHER-URBAN(8, 9, 11, 28, 47, 48, 52),MINOR ART-URBAN (2, 22)

STATION(S): 2, 8, 9, 11, 15, 17, 19, 22, 23, 28, 47, 48, 52

	AVG.	WEEKDAY	FRIDAY	SATURDAY	SUNDAY
JANUARY		1.02	0.95	1.23	1.51
FEBRUARY		1.02	0.95	1.17	1.52
MARCH		1.00	0.92	1.12	1.40
APRIL		0.95	0.89	1.06	1.28
MAY		0.91	0.84	1.02	1.19
JUNE		0.90	0.84	0.99	1.18
JULY		0.91	0.86	1.06	1.21
AUGUST		0.93	0.86	1.07	1.27
SEPTEMBER		0.93	0.85	1.04	1.24
OCTOBER		0.93	0.84	1.04	1.23
NOVEMBER		0.93	0.88	1.06	1.32
DECEMBER		0.94	0.89	1.07	1.35

GROUP - 5 **NORTHWEST RECREATIONAL **

MINOR ARTERIAL-RURAL KENT(1)

STATION(S): 1 (AVERAGE OF 2011-2012, 2012-2013 & 2013-2014)

	AVG.	WEEKDAY	FRIDAY	SATURDAY	SUNDAY
JANUARY		1.41	1.16	1.11	1.11
FEBRUARY		1.40	1.06	1.12	1.12
MARCH		1.38	1.11	1.12	1.11
APRIL		1.23	0.98	0.95	0.97
MAY		1.15	0.82	0.83	0.74
JUNE		1.05	0.81	0.72	0.67
JULY		0.95	0.72	0.62	0.60
AUGUST		0.93	0.71	0.66	0.61
SEPTEMBER		1.09	0.83	0.77	0.74
OCTOBER		1.08	0.81	0.65	0.71
NOVEMBER		1.25	1.03	1.04	1.10
DECEMBER		1.26	1.04	1.16	1.32

GROUP - 6 ** SOUTHEAST RECREATIONAL **

MINOR ART-URBAN MONTVILLE(5), INTERSTATE-RURAL EAST LYME(33), GROTON(44), PRINC ART-OTHE-RURAL HEBRON(66)

STATION(S): 5, 33, 44, 46

	AVG.	WEEKDAY	FRIDAY	SATURDAY	SUNDAY
JANUARY		1.16	0.99	1.16	1.32
FEBRUARY		1.12	0.94	1.06	1.36
MARCH		1.10	0.93	1.00	1.16
APRIL		1.05	0.89	0.96	1.09
MAY		0.99	0.83	0.91	1.00
JUNE		0.97	0.82	0.87	0.95
JULY		0.91	0.76	0.83	0.93
AUGUST		0.90	0.77	0.84	0.91
SEPTEMBER		1.01	0.84	0.92	1.03
OCTOBER		1.05	0.87	0.96	1.10
NOVEMBER		1.09	0.93	1.01	1.20
DECEMBER		1.08	0.94	1.05	1.23

WALL-030 - Combined - e/w

	26-Sep	27-Sep	28-Sep	29-Sep	2016	2016		
	Mon	Tue	Wed	Thu	East	West		
12:00am		x		169	169	67	102	0.60
01:00am		x		130	130	60	70	0.54
02:00am		x		104	104	32	72	0.69
03:00am	x	x		152	152	52	100	0.66
04:00am	x		192	205	205	83	122	0.60
05:00am	x		518	495	495	265	230	0.46
06:00am	x		1247	1245	1245	579	666	0.53
07:00am	x		1907	1918	1918	796	1122	0.58
08:00am	x		1900	1914	1914	891	1023	0.53
09:00am	x		1360	1294	1294	626	668	0.52
10:00am	x		968	1034	1034	486	548	0.53
11:00am	x		1020	1067	1067	519	548	0.51
12:00pm	x		1218	1233	1233	586	647	0.52
01:00pm	x		1126	1237	1237	611	626	0.51
02:00pm	x		1431	1384	1384	722	662	0.48
03:00pm	x		1779	1701	1701	848	853	0.50
04:00pm	x		2153	2244	2244	1071	1173	0.52
05:00pm	x		2104	2094	2094	1141	953	0.46
06:00pm	x		1268	1221	1221	670	551	0.45
07:00pm	x		940	943	943	549	394	0.42
08:00pm	x		707	648	648	412	236	0.36
09:00pm	x		428	472	472	310	162	0.34
10:00pm	x		243	263	263	155	108	0.41
11:00pm	x		213	238	238	110	128	0.54
Totals	0	22722	23405	521	23405	11641	11764	0.50

WALL-030 - Combined - e/w	Tot	E	W	Year	
	1034	486	548	2016	10-11AM
	1076	506	570	2020	

Town.....Wallingford					
Station.....30	943	549	394	2016	7-8PM
Location.....41.479706,-72.767773	981	571	410	2020	
2015-Minor Arterial 4.....2015-Urban					
Start Report.....27-Sep-2016 04:00AM					
End Report.....29-Sep-2016 04:00AM					
2016:DURH-009 Axle Correction.....0.96					
Annualized ADT.....20300					
24-Hour Count.....23277 * G4(0.91) = 21182.1					
Day 1.....+23405 * G4(0.91) = 42480.6					
UnRounded...42480.6 / 2 * ACF(0.9575) = 20337					
OK 2016 Mon 26-Sep -this report-.....20300					
OK 2013 Thu 07-Nov19100	1918	796	1122	2016	7-8AM
OK 2007 Wed 01-Aug21600	1996	828	1168	2020	7-8AM

	2244	1071	1173	2016	4-5PM
	2335	1114	1221	2020	4-5PM

Route 68 - 16.94 mi SE of I-91 NB Off Ramp (Exit 15)

	1233	586	647	2016	12-1PM
	1283	610	673	2020	12-1PM

Tot	E	W	Year	10-11AM
1034	486	548	2016	WALL-030
1076	506	570	2020	WALL-030
844	386	458	TMC 3	
1.274882	Factor AM Peak Gen			
Tot	E	W	Year	10-11AM
1076	492	584	ADJ TMC3	10-11AM

Tot	E	W	Year	7-8PM
943	549	394	2016	WALL-030
981	571	410	2020	WALL-030
721	390	331	TMC 3	
1.36061	Factor PM Peak Gen			
Tot	E	W	Year	7-8PM
981	531	450	ADJ TMC3	7-8PM

MID PEAK HOUR 12:00 PM to 1:00 PM	I-91 Southbound Exit 15 On Ramp Northbound				I-91 Southbound Exit 15 Off Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

MID PEAK HOUR 12:00 PM to 1:00 PM	I-91 Northbound Exit 15 Off Ramp Northbound				I-91 Northbound Exit 15 On Ramp Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

MID PEAK HOUR 12:00 PM to 1:00 PM	Hilton Garden Inn Drive Northbound				Research Parkway Southbound				CT Route 68 (Barnes Road) Eastbound				CT Route 68 (Barnes Road) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

MID PEAK HOUR 11:45 AM to 12:45 PM	Research Parkway Northbound				Research Parkway Southbound				Connecticut Food Bank Driveway Eastbound				Site #1 Driveway Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

MID PEAK HOUR 12:00 PM to 1:00 PM	Research Parkway Northbound				Research Parkway Southbound				Carpenter Lane Eastbound				Carpenter Lane Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

MID PEAK HOUR 12:00 PM to 1:00 PM	Research Parkway Northbound				Research Parkway Southbound				Joseph Carini Road Eastbound				Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

MID PEAK HOUR 12:00 PM to 1:00 PM	Research Parkway Northbound				Research Parkway Southbound				#10 Research Parkway Drive Eastbound				Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

CAPACITY ANALYSES

EXISTING

Lanes, Volumes, Timings

Existing

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘	↕	↗
Traffic Volume (vph)	0	575	225	305	905	0	0	0	0	170	0	405
Future Volume (vph)	0	575	225	305	905	0	0	0	0	170	0	405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.862	0.850
Fl _t Protected				0.950						0.950	0.996	
Satd. Flow (prot)	0	3008	1455	1597	2756	0	0	0	0	1678	1318	1442
Fl _t Permitted				0.950						0.950	0.996	
Satd. Flow (perm)	0	3008	1455	1597	2756	0	0	0	0	1678	1318	1442
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			239									
Link Speed (mph)		40			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.9			17.8			8.5			11.3	
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.88	0.88	0.88	0.82	0.82	0.82
Heavy Vehicles (%)	0%	20%	11%	13%	31%	0%	0%	0%	0%	9%	0%	17%
Adj. Flow (vph)	0	612	239	332	984	0	0	0	0	207	0	494
Shared Lane Traffic (%)										10%		48%
Lane Group Flow (vph)	0	612	239	332	984	0	0	0	0	186	258	257
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		2	2	1	1 2					4	4	4
Permitted Phases												
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		23.0	23.0	26.0						31.0	31.0	31.0
Total Split (%)		28.8%	28.8%	32.5%						38.8%	38.8%	38.8%
Maximum Green (s)		17.5	17.5	22.0						25.5	25.5	25.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Existing Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		22.2	22.2	22.0	49.7					20.8	20.8	20.8
Actuated g/C Ratio		0.28	0.28	0.28	0.62					0.26	0.26	0.26
v/c Ratio		0.73	0.41	0.76	0.58					0.43	0.75	0.69
Control Delay		35.4	6.4	30.8	4.7					26.5	40.7	35.6
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		35.4	6.4	30.8	4.7					26.5	40.7	35.6
LOS		D	A	C	A					C	D	D
Approach Delay		27.2			11.3						35.1	
Approach LOS		C			B						D	
Queue Length 50th (ft)		158	0	112	43					78	126	117
Queue Length 95th (ft)		#260	56	m189	m235					116	181	167
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		834	576	457	1710					534	420	459
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		0.73	0.41	0.73	0.58					0.35	0.61	0.56

Intersection Summary






















Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 78 (98%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 21.9 Intersection LOS: C
 Intersection Capacity Utilization 56.2% ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Existing Timing Plan: AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	190	555	0	0	870	245	340	5	260	0	0	0
Future Volume (vph)	190	555	0	0	870	245	340	5	260	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.954				
Satd. Flow (prot)	1656	3008	0	0	2735	1394	1604	1516	1606	0	0	0
Fl _t Permitted	0.950						0.950	0.954				
Satd. Flow (perm)	1656	3008	0	0	2735	1394	1604	1516	1606	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						253						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.93	0.93	0.93	0.97	0.97	0.97	0.86	0.86	0.86	0.88	0.88	0.88
Heavy Vehicles (%)	9%	20%	0%	0%	32%	12%	14%	0%	14%	0%	0%	0%
Adj. Flow (vph)	204	597	0	0	897	253	395	6	302	0	0	0
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	204	597	0	0	897	253	201	200	302	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			12			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	25.0				29.0	29.0	26.0	26.0	26.0			
Total Split (%)	31.3%				36.3%	36.3%	32.5%	32.5%	32.5%			
Maximum Green (s)	21.0				23.5	23.5	21.0	21.0	21.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Existing Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	16.1	52.1			30.5	30.5	18.9	18.9	18.9			
Actuated g/C Ratio	0.20	0.65			0.38	0.38	0.24	0.24	0.24			
v/c Ratio	0.61	0.30			0.86	0.37	0.53	0.56	0.80			
Control Delay	44.2	1.0			34.9	11.2	31.6	32.8	44.9			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	44.2	1.0			34.9	11.2	31.6	32.8	44.9			
LOS	D	A			C	B	C	C	D			
Approach Delay		12.0			29.7			37.7				
Approach LOS		B			C			D				
Queue Length 50th (ft)	92	4			176	39	89	89	137			
Queue Length 95th (ft)	m105	10			m#271	m49	147	148	#215			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	434	1937			1041	687	421	397	421			
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	0.47	0.31			0.86	0.37	0.48	0.50	0.72			

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 34 (43%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 26.5 Intersection LOS: C
 Intersection Capacity Utilization 56.2% ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔		↔	↕↕	↔	↔	↔	↔		↔	↔
Traffic Volume (vph)	275	515	25	10	970	125	35	25	10	30	5	110
Future Volume (vph)	275	515	25	10	970	125	35	25	10	30	5	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			0			130		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.957				0.850
Flt Protected	0.950			0.950			0.950				0.959	
Satd. Flow (prot)	3045	1547	0	1796	2477	1516	1668	1753	0	0	1791	1509
Flt Permitted	0.950			0.950			0.729				0.708	
Satd. Flow (perm)	3045	1547	0	1796	2477	1516	1280	1753	0	0	1322	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				140		20				115
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.51	0.51	0.51	0.81	0.81	0.81
Heavy Vehicles (%)	15%	23%	1%	0%	45%	6%	1%	0%	1%	2%	0%	7%
Adj. Flow (vph)	299	560	27	11	1090	140	69	49	20	37	6	136
Shared Lane Traffic (%)												
Lane Group Flow (vph)	299	587	0	11	1090	140	69	69	0	0	43	136
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pt+ov
Protected Phases	7	7 8		3	3 8	3 8		4			4	4 7
Permitted Phases							4			4		
Detector Phase	7	7 8		3	3 8	3 8	4	4		4	4	4 7
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	
Total Split (s)	26.0			11.0			19.0	19.0		19.0	19.0	
Total Split (%)	32.5%			13.8%			23.8%	23.8%		23.8%	23.8%	
Maximum Green (s)	20.6			5.7			14.1	14.1		14.1	14.1	
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	
Lost Time Adjust (s)	0.0			0.0			0.0	0.0			0.0	
Total Lost Time (s)	5.4			5.3			4.9	4.9			4.9	
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: AM

Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	24.0
Total Split (%)	30%
Maximum Green (s)	17.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0		1.5			2.0		2.0		2.0		2.0
Recall Mode	None			None			None		None		None	
Act Effct Green (s)	20.4	49.3	5.7		34.6	34.6	9.4	9.4			9.4	35.2
Actuated g/C Ratio	0.26	0.62	0.07		0.43	0.43	0.12	0.12			0.12	0.44
v/c Ratio	0.39	0.62	0.09		1.02	0.19	0.46	0.31			0.28	0.19
Control Delay	27.3	11.9	36.4		59.1	4.0	41.9	27.3			35.5	3.8
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	27.3	11.9	36.4		59.1	4.0	41.9	27.3			35.5	3.8
LOS	C	B	D		E	A	D	C			D	A
Approach Delay	17.1			52.6			34.6				11.4	
Approach LOS	B			D			C				B	
Queue Length 50th (ft)	60	66	5		~338	0	33	23			20	5
Queue Length 95th (ft)	m102	130	21		#463	33	37	27			42	25
Internal Link Dist (ft)	684			671			171				640	
Turn Bay Length (ft)	570		100			250						
Base Capacity (vph)	843	940	127		1070	734	225	325			233	738
Starvation Cap Reductn	0	0	0		0	0	0	0			0	0
Spillback Cap Reductn	0	0	0		0	0	0	0			0	0
Storage Cap Reductn	0	0	0		0	0	0	0			0	0
Reduced v/c Ratio	0.35	0.62	0.09		1.02	0.19	0.31	0.21			0.18	0.18

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 27 (34%), Referenced to phase 8:EBWB, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 35.7 Intersection LOS: D
 Intersection Capacity Utilization 56.3% ICU Level of Service B
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

























Lanes, Volumes, Timings
3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
Timing Plan: AM

Lane Group	Ø8
Vehicle Extension (s)	5.0
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Existing
 Timing Plan: AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	5	0	0	0	35	390	0	0	140	0
Future Volume (vph)	0	0	5	0	0	0	35	390	0	0	140	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										
Flt Protected							0.950					
Satd. Flow (prot)	1900	1615	0	1900	1900	0	1805	1845	1900	1712	1727	0
Flt Permitted							0.950					
Satd. Flow (perm)	1900	1615	0	1900	1900	0	1805	1845	1900	1712	1727	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.42	0.42	0.42	0.88	0.88	0.88	0.67	0.67	0.67	0.73	0.73	0.73
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	11%	10%	0%
Adj. Flow (vph)	0	0	12	0	0	0	52	582	0	0	192	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	0	0	52	582	0	0	192	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	37.2%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑	↗	↖	↗	
Traffic Vol, veh/h	0	0	5	0	0	0	35	390	0	0	140	0
Future Vol, veh/h	0	0	5	0	0	0	35	390	0	0	140	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	170	-	-	140	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	42	42	88	88	88	67	67	67	73	73	73
Heavy Vehicles, %	0	0	0	0	0	0	0	3	0	11	10	0
Mvmt Flow	0	0	12	0	0	0	52	582	0	0	192	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	878	878	192	884	878	582	192	0	0	582	0	0
Stage 1	192	192	-	686	686	-	-	-	-	-	-	-
Stage 2	686	686	-	198	192	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.21	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.299	-	-
Pot Cap-1 Maneuver	271	289	855	268	289	517	1394	-	-	949	-	-
Stage 1	814	745	-	441	451	-	-	-	-	-	-	-
Stage 2	441	451	-	808	745	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	263	278	855	257	278	517	1394	-	-	949	-	-
Mov Cap-2 Maneuver	263	278	-	257	278	-	-	-	-	-	-	-
Stage 1	784	745	-	425	434	-	-	-	-	-	-	-
Stage 2	425	434	-	797	745	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	0	0.6	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1394	-	-	-	855	-	-	949	-	-
HCM Lane V/C Ratio	0.037	-	-	-	0.014	-	-	-	-	-
HCM Control Delay (s)	7.7	-	-	0	9.3	0	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0	-	-	0	-	-

Lanes, Volumes, Timings
5: Josheph Carini Rd

Existing
Timing Plan: AM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	6	57	333	134	6
Future Volume (vph)	0	6	57	333	134	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865			0.994		
Fl _t Protected				0.993		
Satd. Flow (prot)	1096	0	0	1704	1599	0
Fl _t Permitted				0.993		
Satd. Flow (perm)	1096	0	0	1704	1599	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.50	0.50	0.90	0.90	0.63	0.63
Heavy Vehicles (%)	0%	50%	3%	12%	19%	0%
Adj. Flow (vph)	0	12	63	370	213	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	433	223	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.4%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	6	57	333	134	6
Future Vol, veh/h	0	6	57	333	134	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	90	90	63	63
Heavy Vehicles, %	0	50	3	12	19	0
Mvmt Flow	0	12	63	370	213	10

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	714	218	223	0	0
Stage 1	218	-	-	-	-
Stage 2	496	-	-	-	-
Critical Hdwy	6.4	6.7	4.13	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.75	2.227	-	-
Pot Cap-1 Maneuver	401	715	1340	-	-
Stage 1	823	-	-	-	-
Stage 2	616	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	377	715	1340	-	-
Mov Cap-2 Maneuver	377	-	-	-	-
Stage 1	774	-	-	-	-
Stage 2	616	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1340	-	715	-	-
HCM Lane V/C Ratio	0.047	-	0.017	-	-
HCM Control Delay (s)	7.8	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Lanes, Volumes, Timings
6: Research Parkway

Existing
Timing Plan: AM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	6	327	140	2
Future Volume (vph)	0	0	6	327	140	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998	
Flt Protected			0.950			
Satd. Flow (prot)	1900	1900	1805	1667	1623	0
Flt Permitted			0.950			
Satd. Flow (perm)	1900	1900	1805	1667	1623	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.25	0.25	0.89	0.89	0.81	0.81
Heavy Vehicles (%)	0%	0%	0%	14%	17%	0%
Adj. Flow (vph)	0	0	7	367	173	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	7	367	175	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	20.5%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶	↷	↶	↶	↷	
Traffic Vol, veh/h	0	0	6	327	140	2
Future Vol, veh/h	0	0	6	327	140	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	89	89	81	81
Heavy Vehicles, %	0	0	0	14	17	0
Mvmt Flow	0	0	7	367	173	2

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	555	174	175	0	0
Stage 1	174	-	-	-	-
Stage 2	381	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	496	875	1414	-	-
Stage 1	861	-	-	-	-
Stage 2	695	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	494	875	1414	-	-
Mov Cap-2 Maneuver	494	-	-	-	-
Stage 1	857	-	-	-	-
Stage 2	695	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1414	-	-	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-	-	-
HCM Control Delay (s)	7.6	-	0	0	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Existing
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	100	60	25	40	65	20	15	272	40	25	77	45
Future Volume (vph)	100	60	25	40	65	20	15	272	40	25	77	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.982			0.979			0.983			0.959	
Fl _t Protected		0.974			0.984			0.998			0.992	
Satd. Flow (prot)	0	1749	0	0	1764	0	0	1801	0	0	1734	0
Fl _t Permitted		0.974			0.984			0.998			0.992	
Satd. Flow (perm)	0	1749	0	0	1764	0	0	1801	0	0	1734	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.62	0.62	0.62	0.71	0.71	0.71	0.69	0.69	0.69	0.76	0.76	0.76
Heavy Vehicles (%)	0%	5%	17%	6%	2%	5%	8%	3%	5%	9%	4%	2%
Adj. Flow (vph)	161	97	40	56	92	28	22	394	58	33	101	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	298	0	0	176	0	0	474	0	0	193	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	20.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	100	60	25	40	65	20	15	272	40	25	77	45
Future Vol, veh/h	100	60	25	40	65	20	15	272	40	25	77	45
Peak Hour Factor	0.62	0.62	0.62	0.71	0.71	0.71	0.69	0.69	0.69	0.76	0.76	0.76
Heavy Vehicles, %	0	5	17	6	2	5	8	3	5	9	4	2
Mvmt Flow	161	97	40	56	92	28	22	394	58	33	101	59
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	16.7	13.2	27.8	13
HCM LOS	C	B	D	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	54%	32%	17%
Vol Thru, %	83%	32%	52%	52%
Vol Right, %	12%	14%	16%	31%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	327	185	125	147
LT Vol	15	100	40	25
Through Vol	272	60	65	77
RT Vol	40	25	20	45
Lane Flow Rate	474	298	176	193
Geometry Grp	1	1	1	1
Degree of Util (X)	0.788	0.534	0.332	0.349
Departure Headway (Hd)	5.984	6.44	6.795	6.504
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	602	558	528	551
Service Time	4.03	4.495	4.861	4.566
HCM Lane V/C Ratio	0.787	0.534	0.333	0.35
HCM Control Delay	27.8	16.7	13.2	13
HCM Lane LOS	D	C	B	B
HCM 95th-tile Q	7.5	3.1	1.4	1.6

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Existing
Timing Plan: AM



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	↩
Traffic Volume (vph)	125	0	0	125	0	0
Future Volume (vph)	125	0	0	125	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	136	0	0	136	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	136	0	0	136	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	9.9%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	125	0	0	125	0	0
Future Vol, veh/h	125	0	0	125	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	136	0	0	136	0	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	136	0	272
Stage 1	-	-	-	-	136
Stage 2	-	-	-	-	136
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1448	-	717
Stage 1	-	-	-	-	890
Stage 2	-	-	-	-	890
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1448	-	717
Mov Cap-2 Maneuver	-	-	-	-	717
Stage 1	-	-	-	-	890
Stage 2	-	-	-	-	890

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1448	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lanes, Volumes, Timings

Existing

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	505	170	130	531	0	0	0	0	130	1	170
Future Volume (vph)	0	505	170	130	531	0	0	0	0	130	1	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.891	0.850
Fl _t Protected				0.950						0.950	0.987	
Satd. Flow (prot)	0	3223	1455	1467	3343	0	0	0	0	1577	1239	1288
Fl _t Permitted				0.950						0.950	0.987	
Satd. Flow (perm)	0	3223	1455	1467	3343	0	0	0	0	1577	1239	1288
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			195									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.87	0.87	0.87	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Heavy Vehicles (%)	0%	12%	11%	23%	8%	0%	0%	0%	0%	16%	0%	31%
Adj. Flow (vph)	0	580	195	143	584	0	0	0	0	144	1	189
Shared Lane Traffic (%)										20%		43%
Lane Group Flow (vph)	0	580	195	143	584	0	0	0	0	115	111	108
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Existing Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		33.8	33.8	13.5	52.9					12.6	12.6	12.6
Actuated g/C Ratio		0.45	0.45	0.18	0.71					0.17	0.17	0.17
v/c Ratio		0.40	0.26	0.54	0.25					0.43	0.53	0.50
Control Delay		16.6	4.0	28.7	0.8					32.1	37.1	35.4
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		16.6	4.0	28.7	0.8					32.1	37.1	35.4
LOS		B	A	C	A					C	D	D
Approach Delay		13.4			6.3						34.8	
Approach LOS		B			A						C	
Queue Length 50th (ft)		91	0	32	0					51	52	49
Queue Length 95th (ft)		157	38	63	1					91	96	89
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1453	763	322	2335					410	322	334
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		0.40	0.26	0.44	0.25					0.28	0.34	0.32

Intersection Summary




















Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 14.5
 Intersection Capacity Utilization 42.8%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Existing Timing Plan: MD

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	468	0	0	505	143	156	0	126	0	0	0
Future Volume (vph)	167	468	0	0	505	143	156	0	126	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1433	3343	0	0	3282	1269	1604	1504	1551	0	0	0
Fl _t Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1433	3343	0	0	3282	1269	1604	1504	1551	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						157						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.95	0.95	0.95	0.91	0.91	0.91	0.90	0.90	0.90	0.88	0.88	0.88
Heavy Vehicles (%)	26%	8%	0%	0%	10%	23%	14%	0%	18%	0%	0%	0%
Adj. Flow (vph)	176	493	0	0	555	157	173	0	140	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	176	493	0	0	555	157	86	87	140	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			12			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Existing Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max	None	None	None		
Act Effct Green (s)	14.4	53.5			33.6	33.6	12.5	12.5	12.5			
Actuated g/C Ratio	0.19	0.71			0.45	0.45	0.17	0.17	0.17			
v/c Ratio	0.64	0.21			0.38	0.24	0.32	0.35	0.54			
Control Delay	28.2	0.9			10.3	1.8	29.6	30.3	35.8			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	28.2	0.9			10.3	1.8	29.6	30.3	35.8			
LOS	C	A			B	A	C	C	D			
Approach Delay		8.1			8.5			32.6				
Approach LOS		A			A			C				
Queue Length 50th (ft)	35	0			38	1	37	38	61			
Queue Length 95th (ft)	53	1			71	8	72	73	105			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	319	2347			1468	654	406	381	392			
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	0.55	0.21			0.38	0.24	0.21	0.23	0.36			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 12.8
 Intersection Capacity Utilization 42.8%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕	↗	↖	↗			↕	↗
Traffic Volume (vph)	87	500	7	1	527	20	5	0	2	23	0	116
Future Volume (vph)	87	500	7	1	527	20	5	0	2	23	0	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			0			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998				0.850		0.850				0.850
Flt Protected	0.950			0.950			0.950				0.950	
Satd. Flow (prot)	1410	3364	0	1796	3295	1530	1404	1041	0	0	1480	1282
Flt Permitted	0.950			0.950			0.870				0.870	
Satd. Flow (perm)	1410	3364	0	1796	3295	1530	1286	1041	0	0	1355	1282
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				106		431				129
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.44	0.44	0.44	0.90	0.90	0.90
Heavy Vehicles (%)	28%	7%	14%	0%	9%	5%	20%	0%	50%	22%	0%	26%
Adj. Flow (vph)	94	538	8	1	573	22	11	0	5	26	0	129
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	546	0	1	573	22	11	5	0	0	26	129
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	20.0			12.0			15.0	15.0		15.0	15.0	20.0
Total Split (%)	26.7%			16.0%			20.0%	20.0%		20.0%	20.0%	26.7%
Maximum Green (s)	14.6			6.7			10.1	10.1		10.1	10.1	14.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: MD

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	28.0
Total Split (%)	37%
Maximum Green (s)	21.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: MD



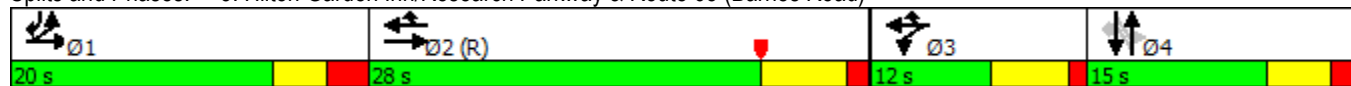
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	10.7	51.2		5.5	45.3	45.3	7.4	7.4			7.4	18.2
Actuated g/C Ratio	0.14	0.68		0.07	0.60	0.60	0.10	0.10			0.10	0.24
v/c Ratio	0.47	0.24		0.01	0.29	0.02	0.09	0.01			0.19	0.32
Control Delay	40.8	3.2		32.0	9.7	0.1	31.8	0.0			34.3	5.5
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	40.8	3.2		32.0	9.7	0.1	31.8	0.0			34.3	5.5
LOS	D	A		C	A	A	C	A			C	A
Approach Delay		8.7			9.3			21.9			10.3	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	39	31		0	71	0	5	0			11	0
Queue Length 95th (ft)	84	35		5	126	0	9	0			34	31
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	279	2250		160	2042	988	173	513			182	473
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.34	0.24		0.01	0.28	0.02	0.06	0.01			0.14	0.27

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.47
 Intersection Signal Delay: 9.3
 Intersection Capacity Utilization 41.3%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

























Lanes, Volumes, Timings
3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
Timing Plan: MD

Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Existing
Timing Plan: MD

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	8	0	0	0	5	102	0	0	131	1
Future Volume (vph)	2	0	8	0	0	0	5	102	0	0	131	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										0.999
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1805	1615	0	1900	1900	0	1805	1520	1900	1900	1485	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1805	1615	0	1900	1900	0	1805	1520	1900	1900	1485	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.63	0.63	0.63	0.88	0.88	0.88	0.81	0.81	0.81	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	28%	0%
Adj. Flow (vph)	3	0	13	0	0	0	6	126	0	0	142	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	13	0	0	0	0	6	126	0	0	143	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	17.0%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷		↶	↶	↶	↶	↷	
Traffic Vol, veh/h	2	0	8	0	0	0	5	102	0	0	131	1
Future Vol, veh/h	2	0	8	0	0	0	5	102	0	0	131	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	170	-	-	140	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	88	88	88	81	81	81	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	25	0	0	28	0
Mvmt Flow	3	0	13	0	0	0	6	126	0	0	142	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	281	281	143	287	281	126	143	0	0	126	0	0
Stage 1	143	143	-	138	138	-	-	-	-	-	-	-
Stage 2	138	138	-	149	143	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	675	631	910	669	631	930	1452	-	-	1473	-	-
Stage 1	865	782	-	870	786	-	-	-	-	-	-	-
Stage 2	870	786	-	858	782	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	673	628	910	658	628	930	1452	-	-	1473	-	-
Mov Cap-2 Maneuver	673	628	-	658	628	-	-	-	-	-	-	-
Stage 1	862	782	-	867	783	-	-	-	-	-	-	-
Stage 2	866	783	-	846	782	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	0	0.4	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1452	-	-	673	910	-	-	1473	-	-
HCM Lane V/C Ratio	0.004	-	-	0.005	0.014	-	-	-	-	-
HCM Control Delay (s)	7.5	-	-	10.4	9	0	0	0	-	-
HCM Lane LOS	A	-	-	B	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	-	-	0	-	-

Lanes, Volumes, Timings
5: Josheph Carini Rd

Existing
Timing Plan: MD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	30	14	90	102	3
Future Volume (vph)	3	30	14	90	102	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.876				0.996	
Fl _t Protected	0.996			0.993		
Satd. Flow (prot)	1458	0	0	1674	1681	0
Fl _t Permitted	0.996			0.993		
Satd. Flow (perm)	1458	0	0	1674	1681	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.69	0.69	0.83	0.83	0.65	0.65
Heavy Vehicles (%)	0%	15%	11%	13%	13%	0%
Adj. Flow (vph)	4	43	17	108	157	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	0	125	162	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.2%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	3	30	14	90	102	3
Future Vol, veh/h	3	30	14	90	102	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	83	83	65	65
Heavy Vehicles, %	0	15	11	13	13	0
Mvmt Flow	4	43	17	108	157	5

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	302	160	162	0	0
Stage 1	160	-	-	-	-
Stage 2	142	-	-	-	-
Critical Hdwy	6.4	6.35	4.21	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.435	2.299	-	-
Pot Cap-1 Maneuver	694	852	1364	-	-
Stage 1	874	-	-	-	-
Stage 2	890	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	685	852	1364	-	-
Mov Cap-2 Maneuver	685	-	-	-	-
Stage 1	863	-	-	-	-
Stage 2	890	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1364	-	834	-	-
HCM Lane V/C Ratio	0.012	-	0.057	-	-
HCM Control Delay (s)	7.7	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Existing
Timing Plan: MD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	3	2	91	102	0
Future Volume (vph)	2	3	2	91	102	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1583	1805	1681	1652	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1583	1805	1681	1652	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.38	0.38	0.83	0.83	0.66	0.66
Heavy Vehicles (%)	0%	2%	0%	13%	15%	0%
Adj. Flow (vph)	5	8	2	110	155	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	8	2	110	155	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.4%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	2	3	2	91	102	0
Future Vol, veh/h	2	3	2	91	102	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	38	38	83	83	66	66
Heavy Vehicles, %	0	2	0	13	15	0
Mvmt Flow	5	8	2	110	155	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	269	155	155	0	-	0
Stage 1	155	-	-	-	-	-
Stage 2	114	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.2	-	-	-
Pot Cap-1 Maneuver	725	891	1438	-	-	-
Stage 1	878	-	-	-	-	-
Stage 2	916	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	724	891	1438	-	-	-
Mov Cap-2 Maneuver	724	-	-	-	-	-
Stage 1	877	-	-	-	-	-
Stage 2	916	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1438	-	724	891	-	-
HCM Lane V/C Ratio	0.002	-	0.007	0.009	-	-
HCM Control Delay (s)	7.5	-	10	9.1	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Existing
Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	31	27	11	8	19	12	7	80	6	13	83	37
Future Volume (vph)	31	27	11	8	19	12	7	80	6	13	83	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.978			0.958			0.991			0.962	
Fl _t Protected		0.978			0.990			0.996			0.995	
Satd. Flow (prot)	0	1741	0	0	1632	0	0	1477	0	0	1462	0
Fl _t Permitted		0.978			0.990			0.996			0.995	
Satd. Flow (perm)	0	1741	0	0	1632	0	0	1477	0	0	1462	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles (%)	3%	4%	9%	13%	16%	0%	0%	30%	17%	0%	38%	3%
Adj. Flow (vph)	36	31	13	11	25	16	8	94	7	15	93	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	80	0	0	52	0	0	109	0	0	150	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.5%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	27	11	8	19	12	7	80	6	13	83	37
Future Vol, veh/h	31	27	11	8	19	12	7	80	6	13	83	37
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles, %	3	4	9	13	16	0	0	30	17	0	38	3
Mvmt Flow	36	31	13	11	25	16	8	94	7	15	93	42
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	8	8	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	45%	21%	10%
Vol Thru, %	86%	39%	49%	62%
Vol Right, %	6%	16%	31%	28%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	93	69	39	133
LT Vol	7	31	8	13
Through Vol	80	27	19	83
RT Vol	6	11	12	37
Lane Flow Rate	109	80	52	149
Geometry Grp	1	1	1	1
Degree of Util (X)	0.132	0.102	0.067	0.174
Departure Headway (Hd)	4.347	4.577	4.642	4.186
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	827	785	773	859
Service Time	2.362	2.596	2.663	2.199
HCM Lane V/C Ratio	0.132	0.102	0.067	0.173
HCM Control Delay	8	8.1	8	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.3	0.2	0.6

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Existing
Timing Plan: MD



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	46	0	0	39	0	0
Future Volume (vph)	46	0	0	39	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	0	42	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	42	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	6.7%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	46	0	0	39	0	0
Future Vol, veh/h	46	0	0	39	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	0	0	42	0	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	50	0	92
Stage 1	-	-	-	-	50
Stage 2	-	-	-	-	42
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1557	-	908
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	980
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1557	-	908
Mov Cap-2 Maneuver	-	-	-	-	908
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	980

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1557	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lanes, Volumes, Timings

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Existing Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	1010	475	290	835	0	0	0	0	240	5	335
Future Volume (vph)	0	1010	475	290	835	0	0	0	0	240	5	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.884	0.850
Fl _t Protected				0.950						0.950	0.990	
Satd. Flow (prot)	0	2843	1615	1805	2865	0	0	0	0	1829	1564	1688
Fl _t Permitted				0.950						0.950	0.990	
Satd. Flow (perm)	0	2843	1615	1805	2865	0	0	0	0	1829	1564	1688
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			534									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.89	0.89	0.89	0.84	0.84	0.84	0.88	0.88	0.88	0.85	0.85	0.85
Heavy Vehicles (%)	15%	27%	0%	0%	26%	9%	12%	0%	11%	0%	0%	0%
Adj. Flow (vph)	0	1135	534	345	994	0	0	0	0	282	6	394
Shared Lane Traffic (%)										16%		44%
Lane Group Flow (vph)	0	1135	534	345	994	0	0	0	0	237	224	221
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		37.0	37.0	23.0						20.0	20.0	20.0
Total Split (%)		46.3%	46.3%	28.8%						25.0%	25.0%	25.0%
Maximum Green (s)		31.5	31.5	19.0						14.5	14.5	14.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Existing Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effect Green (s)		32.6	32.6	18.6	56.7					13.8	13.8	13.8
Actuated g/C Ratio		0.41	0.41	0.23	0.71					0.17	0.17	0.17
v/c Ratio		0.98	0.55	0.82	0.49					0.75	0.83	0.76
Control Delay		47.9	4.0	45.8	1.1					47.5	58.2	49.5
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		47.9	4.0	45.8	1.1					47.5	58.2	49.5
LOS		D	A	D	A					D	E	D
Approach Delay		33.9			12.6						51.6	
Approach LOS		C			B						D	
Queue Length 50th (ft)		~300	0	129	6					118	118	110
Queue Length 95th (ft)		#434	55	m137	m6					#200	#219	#193
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1157	974	428	2015					331	283	305
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		0.98	0.55	0.81	0.49					0.72	0.79	0.72

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 1 (1%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 29.4
 Intersection LOS: C
 Intersection Capacity Utilization 68.2%
 ICU Level of Service C
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Existing

Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	445	805	0	0	840	230	285	5	290	0	0	0
Future Volume (vph)	445	805	0	0	840	230	285	5	290	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.954				
Satd. Flow (prot)	1805	2756	0	0	2865	1561	1829	1722	1830	0	0	0
Fl _t Permitted	0.950						0.950	0.954				
Satd. Flow (perm)	1805	2756	0	0	2865	1561	1829	1722	1830	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						240						
Link Speed (mph)		35			35			30				30
Link Distance (ft)		913			764			683				489
Travel Time (s)		17.8			14.9			15.5				11.1
Peak Hour Factor	0.87	0.87	0.87	0.96	0.96	0.96	0.85	0.85	0.85	0.88	0.88	0.88
Heavy Vehicles (%)	0%	31%	14%	11%	26%	0%	0%	0%	0%	8%	0%	11%
Adj. Flow (vph)	511	925	0	0	875	240	335	6	341	0	0	0
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	511	925	0	0	875	240	171	170	341	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14				14
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	32.0				27.0	27.0	21.0	21.0	21.0			
Total Split (%)	40.0%				33.8%	33.8%	26.3%	26.3%	26.3%			
Maximum Green (s)	28.0				21.5	21.5	16.0	16.0	16.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Existing Timing Plan: PM

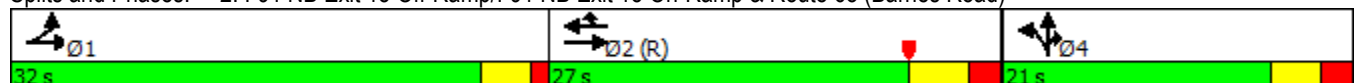


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	27.1	55.0			22.4	22.4	16.0	16.0	16.0			
Actuated g/C Ratio	0.34	0.69			0.28	0.28	0.20	0.20	0.20			
v/c Ratio	0.84	0.49			1.09	0.39	0.47	0.49	0.93			
Control Delay	22.6	0.5			83.0	8.3	33.1	34.1	66.6			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	22.6	0.5			83.0	8.3	33.1	34.1	66.6			
LOS	C	A			F	A	C	C	E			
Approach Delay		8.3			66.9			50.1				
Approach LOS		A			E			D				
Queue Length 50th (ft)	96	1			~257	15	80	80	169			
Queue Length 95th (ft)	m113	m1			m#344	m34	132	133	#296			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	631	1894			803	610	365	344	366			
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	0.81	0.49			1.09	0.39	0.47	0.49	0.93			

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 39 (49%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.09
 Intersection Signal Delay: 37.4
 Intersection LOS: D
 Intersection Capacity Utilization 68.2%
 ICU Level of Service C
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	1000	15	5	795	40	10	20	5	125	40	265
Future Volume (vph)	80	1000	15	5	795	40	10	20	5	125	40	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			0			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.998				0.850		0.969				0.850
Fl _t Protected	0.950			0.950			0.950				0.964	
Satd. Flow (prot)	1719	2566	0	1796	2763	1575	1652	1780	0	0	1765	1429
Fl _t Permitted	0.950			0.950			0.488				0.756	
Satd. Flow (perm)	1719	2566	0	1796	2763	1575	848	1780	0	0	1384	1429
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				100		7				115
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.95	0.95	0.95	0.86	0.86	0.86	0.75	0.75	0.75	0.82	0.82	0.82
Heavy Vehicles (%)	5%	41%	1%	0%	30%	2%	2%	0%	0%	5%	0%	13%
Adj. Flow (vph)	84	1053	16	6	924	47	13	27	7	152	49	323
Shared Lane Traffic (%)												
Lane Group Flow (vph)	84	1069	0	6	924	47	13	34	0	0	201	323
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	22.0			11.0			22.0	22.0		22.0	22.0	22.0
Total Split (%)	27.5%			13.8%			27.5%	27.5%		27.5%	27.5%	27.5%
Maximum Green (s)	16.6			5.7			17.1	17.1		17.1	17.1	16.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0			0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9			4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: PM

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	25.0
Total Split (%)	31%
Maximum Green (s)	18.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: PM

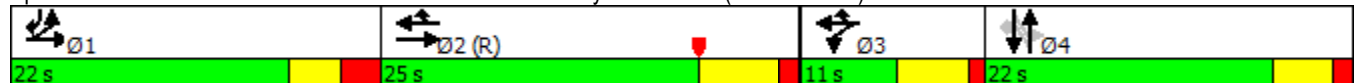


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	18.2	44.1		5.7	30.8	30.8	14.6	14.6			14.6	37.7
Actuated g/C Ratio	0.23	0.55		0.07	0.38	0.38	0.18	0.18			0.18	0.47
v/c Ratio	0.21	0.76		0.05	0.87	0.07	0.08	0.10			0.80	0.44
Control Delay	32.9	12.7		35.6	34.0	0.6	26.9	22.5			54.1	10.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	32.9	12.7		35.6	34.0	0.6	26.9	22.5			54.1	10.7
LOS	C	B		D	C	A	C	C			D	B
Approach Delay		14.2			32.4			23.7			27.3	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	36	68		3	223	0	5	11			94	60
Queue Length 95th (ft)	m67	m80		14	#315	2	17	28			147	103
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	391	1415		127	1062	667	181	385			295	735
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.21	0.76		0.05	0.87	0.07	0.07	0.09			0.68	0.44

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 29 (36%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 23.5 Intersection LOS: C
 Intersection Capacity Utilization 61.0% ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lanes, Volumes, Timings
3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
Timing Plan: PM

Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Existing
 Timing Plan: PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	15	0	0	0	5	135	0	0	415	0
Future Volume (vph)	5	0	15	0	0	0	5	135	0	0	415	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1805	1615	0	1900	1900	0	1805	1792	1900	1900	1863	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1805	1615	0	1900	1900	0	1805	1792	1900	1900	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.48	0.48	0.48	0.88	0.88	0.88	0.59	0.59	0.59	0.60	0.60	0.60
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	2%	0%
Adj. Flow (vph)	10	0	31	0	0	0	8	229	0	0	692	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	31	0	0	0	0	8	229	0	0	692	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	31.8%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷		↶	↷	↶	↷	↶	↷
Traffic Vol, veh/h	5	0	15	0	0	0	5	135	0	0	415	0
Future Vol, veh/h	5	0	15	0	0	0	5	135	0	0	415	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	170	-	-	140	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	48	48	48	88	88	88	59	59	59	60	60	60
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	2	0
Mvmt Flow	10	0	31	0	0	0	8	229	0	0	692	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	937	937	692	953	937	229	692	0	0	229	0	0
Stage 1	692	692	-	245	245	-	-	-	-	-	-	-
Stage 2	245	245	-	708	692	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	247	267	447	241	267	815	912	-	-	1351	-	-
Stage 1	437	448	-	763	707	-	-	-	-	-	-	-
Stage 2	763	707	-	429	448	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	245	265	447	223	265	815	912	-	-	1351	-	-
Mov Cap-2 Maneuver	245	265	-	223	265	-	-	-	-	-	-	-
Stage 1	433	448	-	756	701	-	-	-	-	-	-	-
Stage 2	756	701	-	399	448	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.4	0	0.3	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	912	-	-	245	447	-	-	1351	-	-
HCM Lane V/C Ratio	0.009	-	-	0.043	0.07	-	-	-	-	-
HCM Control Delay (s)	9	-	-	20.3	13.7	0	0	0	-	-
HCM Lane LOS	A	-	-	C	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	-	-	0	-	-

Lanes, Volumes, Timings
5: Josheph Carini Rd

Existing
Timing Plan: PM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	63	9	131	352	0
Future Volume (vph)	3	63	9	131	352	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.871					
Fl _t Protected	0.998			0.997		
Satd. Flow (prot)	1618	0	0	1661	1696	0
Fl _t Permitted	0.998			0.997		
Satd. Flow (perm)	1618	0	0	1661	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.55	0.55	0.90	0.90	0.80	0.80
Heavy Vehicles (%)	50%	0%	0%	15%	12%	0%
Adj. Flow (vph)	5	115	10	146	440	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	120	0	0	156	440	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	3	63	9	131	352	0
Future Vol, veh/h	3	63	9	131	352	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	55	55	90	90	80	80
Heavy Vehicles, %	50	0	0	15	12	0
Mvmt Flow	5	115	10	146	440	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	606	440	440	0	-	0
Stage 1	440	-	-	-	-	-
Stage 2	166	-	-	-	-	-
Critical Hdwy	6.9	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	391	621	1131	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	759	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	387	621	1131	-	-	-
Mov Cap-2 Maneuver	387	-	-	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	759	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1131	-	604	-	-
HCM Lane V/C Ratio	0.009	-	0.199	-	-
HCM Control Delay (s)	8.2	0	12.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Existing
Timing Plan: PM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	12	3	131	340	0
Future Volume (vph)	3	12	3	131	340	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1638	1696	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1638	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.42	0.42	0.90	0.90	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	16%	12%	0%
Adj. Flow (vph)	7	29	3	146	430	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	29	3	146	430	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	27.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	3	12	3	131	340	0
Future Vol, veh/h	3	12	3	131	340	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	42	42	90	90	79	79
Heavy Vehicles, %	0	0	0	16	12	0
Mvmt Flow	7	29	3	146	430	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	582	430	430	0	-	0
Stage 1	430	-	-	-	-	-
Stage 2	152	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	479	629	1140	-	-	-
Stage 1	660	-	-	-	-	-
Stage 2	881	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	478	629	1140	-	-	-
Mov Cap-2 Maneuver	478	-	-	-	-	-
Stage 1	658	-	-	-	-	-
Stage 2	881	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1140	-	478	629	-	-
HCM Lane V/C Ratio	0.003	-	0.015	0.045	-	-
HCM Control Delay (s)	8.2	-	12.6	11	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Existing
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	45	50	25	30	45	15	20	99	15	25	285	100
Future Volume (vph)	45	50	25	30	45	15	20	99	15	25	285	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.972			0.977			0.985			0.967	
Fl _t Protected		0.982			0.984			0.993			0.997	
Satd. Flow (prot)	0	1800	0	0	1827	0	0	1731	0	0	1802	0
Fl _t Permitted		0.982			0.984			0.993			0.997	
Satd. Flow (perm)	0	1800	0	0	1827	0	0	1731	0	0	1802	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.86	0.86	0.86	0.76	0.76	0.76	0.63	0.63	0.63	0.71	0.71	0.71
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	10%	0%	0%	2%	1%
Adj. Flow (vph)	52	58	29	39	59	20	32	157	24	35	401	141
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	139	0	0	118	0	0	213	0	0	577	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	18
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	50	25	30	45	15	20	99	15	25	285	100
Future Vol, veh/h	45	50	25	30	45	15	20	99	15	25	285	100
Peak Hour Factor	0.86	0.86	0.86	0.76	0.76	0.76	0.63	0.63	0.63	0.71	0.71	0.71
Heavy Vehicles, %	2	0	0	0	0	0	0	10	0	0	2	1
Mvmt Flow	52	58	29	39	59	20	32	157	24	35	401	141
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.1	10.8	11.2	23.6
HCM LOS	B	B	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	38%	33%	6%
Vol Thru, %	74%	42%	50%	70%
Vol Right, %	11%	21%	17%	24%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	134	120	90	410
LT Vol	20	45	30	25
Through Vol	99	50	45	285
RT Vol	15	25	15	100
Lane Flow Rate	213	140	118	577
Geometry Grp	1	1	1	1
Degree of Util (X)	0.324	0.238	0.203	0.786
Departure Headway (Hd)	5.48	6.137	6.172	4.902
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	653	583	579	739
Service Time	3.535	4.2	4.237	2.942
HCM Lane V/C Ratio	0.326	0.24	0.204	0.781
HCM Control Delay	11.2	11.1	10.8	23.6
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	1.4	0.9	0.8	7.9

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Existing
Timing Plan: PM



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	90	0	0	90	0	0
Future Volume (vph)	90	0	0	90	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frnt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	0	0	98	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	0	0	98	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	8.1% ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	90	0	0	90	0	0
Future Vol, veh/h	90	0	0	90	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	0	0	98	0	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	98	0	196
Stage 1	-	-	-	-	98
Stage 2	-	-	-	-	98
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1495	-	793
Stage 1	-	-	-	-	926
Stage 2	-	-	-	-	926
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1495	-	793
Mov Cap-2 Maneuver	-	-	-	-	793
Stage 1	-	-	-	-	926
Stage 2	-	-	-	-	926

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1495	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lanes, Volumes, Timings

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Existing Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	464	198	137	414	0	0	0	0	85	0	202
Future Volume (vph)	0	464	198	137	414	0	0	0	0	85	0	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.863	0.850
Fl _t Protected				0.950						0.950	0.996	
Satd. Flow (prot)	0	3008	1346	1583	3195	0	0	0	0	1499	1179	1288
Fl _t Permitted				0.950						0.950	0.996	
Satd. Flow (perm)	0	3008	1346	1583	3195	0	0	0	0	1499	1179	1288
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			211									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.94	0.94	0.94	0.74	0.74	0.74	0.88	0.88	0.88	0.89	0.89	0.89
Heavy Vehicles (%)	0%	20%	20%	14%	13%	0%	0%	0%	0%	22%	0%	31%
Adj. Flow (vph)	0	494	211	185	559	0	0	0	0	96	0	227
Shared Lane Traffic (%)										10%		48%
Lane Group Flow (vph)	0	494	211	185	559	0	0	0	0	86	119	118
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Existing

Timing Plan: AM Pk Gen

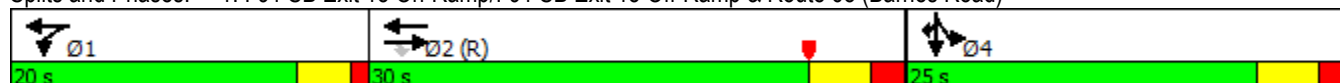


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		32.4	32.4	14.2	52.1					13.4	13.4	13.4
Actuated g/C Ratio		0.43	0.43	0.19	0.69					0.18	0.18	0.18
v/c Ratio		0.38	0.30	0.62	0.25					0.32	0.57	0.52
Control Delay		17.4	4.3	30.1	1.5					28.6	37.9	34.9
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		17.4	4.3	30.1	1.5					28.6	37.9	34.9
LOS		B	A	C	A					C	D	C
Approach Delay		13.5			8.6						34.4	
Approach LOS		B			A						C	
Queue Length 50th (ft)		81	0	47	7					37	57	53
Queue Length 95th (ft)		141	44	67	13					69	100	93
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1298	700	348	2184					389	306	334
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		0.38	0.30	0.53	0.26					0.22	0.39	0.35

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.62
 Intersection Signal Delay: 15.2
 Intersection Capacity Utilization 43.2%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Existing Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	201	348	0	0	413	168	138	0	142	0	0	0
Future Volume (vph)	201	348	0	0	413	168	138	0	142	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1367	3223	0	0	3195	1312	1550	1453	1513	0	0	0
Fl _t Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1367	3223	0	0	3195	1312	1550	1453	1513	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						179						
Link Speed (mph)		35			35			30				30
Link Distance (ft)		913			764			683				489
Travel Time (s)		17.8			14.9			15.5				11.1
Peak Hour Factor	0.88	0.88	0.88	0.94	0.94	0.94	0.95	0.95	0.95	0.88	0.88	0.88
Heavy Vehicles (%)	32%	12%	0%	0%	13%	19%	18%	0%	21%	0%	0%	0%
Adj. Flow (vph)	228	395	0	0	439	179	145	0	149	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	228	395	0	0	439	179	72	73	149	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14				14
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Existing Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	16.7	52.9			30.8	30.8	13.1	13.1	13.1			
Actuated g/C Ratio	0.22	0.71			0.41	0.41	0.17	0.17	0.17			
v/c Ratio	0.75	0.17			0.34	0.28	0.27	0.29	0.57			
Control Delay	33.4	0.9			11.6	2.1	27.9	28.5	36.2			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	33.4	0.9			11.6	2.1	27.9	28.5	36.2			
LOS	C	A			B	A	C	C	D			
Approach Delay		12.8			8.9			32.3				
Approach LOS		B			A			C				
Queue Length 50th (ft)	38	1			30	0	31	31	65			
Queue Length 95th (ft)	#179	3			60	7	62	63	110			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	321	2243			1310	643	392	368	383			
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	0.71	0.18			0.34	0.28	0.18	0.20	0.39			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 14.9
 Intersection LOS: B
 Intersection Capacity Utilization 43.2%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕	↖	↖	↕			↕	↖
Traffic Volume (vph)	86	396	8	0	472	25	15	1	0	34	0	94
Future Volume (vph)	86	396	8	0	472	25	15	1	0	34	0	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			0			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997				0.850						0.850
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1367	3211	0	1890	3265	1461	1685	1837	0	0	1736	1196
Flt Permitted	0.950						0.800				0.800	
Satd. Flow (perm)	1367	3211	0	1890	3265	1461	1419	1837	0	0	1462	1196
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				106						122
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		764			751			251			720	
Travel Time (s)		14.9			14.6			5.7			16.4	
Peak Hour Factor	0.81	0.81	0.81	0.86	0.86	0.86	0.38	0.38	0.38	0.81	0.81	0.81
Heavy Vehicles (%)	32%	12%	17%	0%	10%	10%	0%	0%	0%	4%	0%	35%
Adj. Flow (vph)	106	489	10	0	549	29	39	3	0	42	0	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	106	499	0	0	549	29	39	3	0	0	42	116
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	17.0			11.0			17.0	17.0		17.0	17.0	17.0
Total Split (%)	22.7%			14.7%			22.7%	22.7%		22.7%	22.7%	22.7%
Maximum Green (s)	11.6			5.7			12.1	12.1		12.1	12.1	11.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: AM Pk Gen

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	30.0
Total Split (%)	40%
Maximum Green (s)	23.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: AM Pk Gen

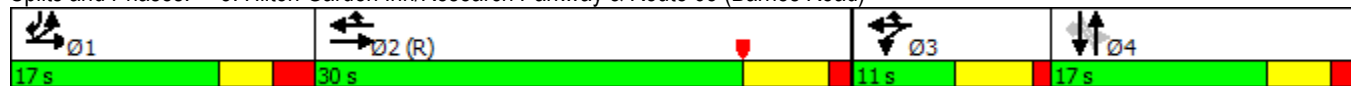


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effect Green (s)	10.6	51.1			45.0	45.0	7.8	7.8			7.8	18.5
Actuated g/C Ratio	0.14	0.68			0.60	0.60	0.10	0.10			0.10	0.25
v/c Ratio	0.55	0.23			0.28	0.03	0.27	0.02			0.28	0.30
Control Delay	43.4	3.1			9.7	0.1	35.3	29.0			35.5	5.3
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	43.4	3.1			9.7	0.1	35.3	29.0			35.5	5.3
LOS	D	A			A	A	D	C			D	A
Approach Delay		10.2			9.2			34.9			13.3	
Approach LOS		B			A			C			B	
Queue Length 50th (ft)	48	27			68	0	17	1			19	0
Queue Length 95th (ft)	79	27			111	0	18	4			41	22
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570					250						
Base Capacity (vph)	228	2133			1978	926	228	296			235	414
Starvation Cap Reductn	0	0			0	0	0	0			0	0
Spillback Cap Reductn	0	0			0	0	0	0			0	0
Storage Cap Reductn	0	0			0	0	0	0			0	0
Reduced v/c Ratio	0.46	0.23			0.28	0.03	0.17	0.01			0.18	0.28

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.55
 Intersection Signal Delay: 10.9
 Intersection Capacity Utilization 40.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A























Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Existing
 Timing Plan: AM Pk Gen

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	9	0	0	0	6	106	0	0	119	0
Future Volume (vph)	0	0	9	0	0	0	6	106	0	0	119	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										
Flt Protected							0.950					
Satd. Flow (prot)	1900	1417	0	1900	1900	0	1504	1496	1900	1900	1484	0
Flt Permitted							0.950					
Satd. Flow (perm)	1900	1417	0	1900	1900	0	1504	1496	1900	1900	1484	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.58	0.58	0.58	0.88	0.88	0.88	0.63	0.63	0.63	0.80	0.80	0.80
Heavy Vehicles (%)	0%	0%	14%	0%	0%	0%	20%	27%	0%	0%	28%	0%
Adj. Flow (vph)	0	0	16	0	0	0	10	168	0	0	149	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	0	0	10	168	0	0	149	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	16.3%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷		↶	↶	↶	↶	↷	↷
Traffic Vol, veh/h	0	0	9	0	0	0	6	106	0	0	119	0
Future Vol, veh/h	0	0	9	0	0	0	6	106	0	0	119	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	170	-	-	140	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	58	58	58	88	88	88	63	63	63	80	80	80
Heavy Vehicles, %	0	0	14	0	0	0	20	27	0	0	28	0
Mvmt Flow	0	0	16	0	0	0	10	168	0	0	149	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	337	337	149	345	337	168	149	0	0	168	0	0
Stage 1	149	149	-	188	188	-	-	-	-	-	-	-
Stage 2	188	188	-	157	149	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.34	7.1	6.5	6.2	4.3	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.426	3.5	4	3.3	2.38	-	-	2.2	-	-
Pot Cap-1 Maneuver	621	587	867	613	587	881	1329	-	-	1422	-	-
Stage 1	858	778	-	818	748	-	-	-	-	-	-	-
Stage 2	818	748	-	850	778	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	617	582	867	598	582	881	1329	-	-	1422	-	-
Mov Cap-2 Maneuver	617	582	-	598	582	-	-	-	-	-	-	-
Stage 1	851	778	-	811	742	-	-	-	-	-	-	-
Stage 2	812	742	-	835	778	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	0	0.4	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1329	-	-	-	867	-	-	1422	-	-
HCM Lane V/C Ratio	0.007	-	-	-	0.018	-	-	-	-	-
HCM Control Delay (s)	7.7	-	-	0	9.2	0	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.1	-	-	0	-	-

Lanes, Volumes, Timings
5: Josheph Carini Rd

Existing
Timing Plan: AM Pk Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	11	11	95	108	0
Future Volume (vph)	0	11	11	95	108	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fl _t Protected	0.995					
Satd. Flow (prot)	1347	0	0	1470	1462	0
Fl _t Permitted	0.995					
Satd. Flow (perm)	1347	0	0	1470	1462	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.56	0.56	0.75	0.75	0.81	0.81
Heavy Vehicles (%)	0%	22%	0%	32%	30%	0%
Adj. Flow (vph)	0	20	15	127	133	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	0	0	142	133	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	11	11	95	108	0
Future Vol, veh/h	0	11	11	95	108	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	75	75	81	81
Heavy Vehicles, %	0	22	0	32	30	0
Mvmt Flow	0	20	15	127	133	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	290	133	133	0	-	0
Stage 1	133	-	-	-	-	-
Stage 2	157	-	-	-	-	-
Critical Hdwy	6.4	6.42	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.498	2.2	-	-	-
Pot Cap-1 Maneuver	705	865	1464	-	-	-
Stage 1	898	-	-	-	-	-
Stage 2	876	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	697	865	1464	-	-	-
Mov Cap-2 Maneuver	697	-	-	-	-	-
Stage 1	888	-	-	-	-	-
Stage 2	876	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1464	-	865	-	-
HCM Lane V/C Ratio	0.01	-	0.023	-	-
HCM Control Delay (s)	7.5	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Existing
Timing Plan: AM Pk Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	3	0	95	105	1
Future Volume (vph)	0	3	0	95	105	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.999	
Flt Protected						
Satd. Flow (prot)	1900	1077	1900	1439	1474	0
Flt Permitted						
Satd. Flow (perm)	1900	1077	1900	1439	1474	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.50	0.50	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	50%	0%	32%	29%	0%
Adj. Flow (vph)	0	6	0	120	133	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	6	0	120	134	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.6%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	3	0	95	105	1
Future Vol, veh/h	0	3	0	95	105	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	79	79	79	79
Heavy Vehicles, %	0	50	0	32	29	0
Mvmt Flow	0	6	0	120	133	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	254	134	134	0	-	0
Stage 1	134	-	-	-	-	-
Stage 2	120	-	-	-	-	-
Critical Hdwy	6.4	6.7	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.75	2.2	-	-	-
Pot Cap-1 Maneuver	739	802	1463	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	739	802	1463	-	-	-
Mov Cap-2 Maneuver	739	-	-	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	910	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1463	-	-	802	-	-
HCM Lane V/C Ratio	-	-	-	0.007	-	-
HCM Control Delay (s)	0	-	0	9.5	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Existing
Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	25	23	5	18	14	8	4	82	9	14	83	25
Future Volume (vph)	25	23	5	18	14	8	4	82	9	14	83	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.987			0.973			0.988			0.973	
Fl _t Protected		0.977			0.978			0.998			0.994	
Satd. Flow (prot)	0	1482	0	0	1648	0	0	1441	0	0	1464	0
Fl _t Permitted		0.977			0.978			0.998			0.994	
Satd. Flow (perm)	0	1482	0	0	1648	0	0	1441	0	0	1464	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.63	0.63	0.63	0.45	0.45	0.45	0.79	0.79	0.79	0.65	0.65	0.65
Heavy Vehicles (%)	30%	11%	50%	14%	0%	17%	33%	33%	0%	0%	33%	15%
Adj. Flow (vph)	40	37	8	40	31	18	5	104	11	22	128	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	85	0	0	89	0	0	120	0	0	188	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	23	5	18	14	8	4	82	9	14	83	25
Future Vol, veh/h	25	23	5	18	14	8	4	82	9	14	83	25
Peak Hour Factor	0.63	0.63	0.63	0.45	0.45	0.45	0.79	0.79	0.79	0.65	0.65	0.65
Heavy Vehicles, %	30	11	50	14	0	17	33	33	0	0	33	15
Mvmt Flow	40	37	8	40	31	18	5	104	11	22	128	38
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.1	8.7	9.1	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	47%	45%	11%
Vol Thru, %	86%	43%	35%	68%
Vol Right, %	9%	9%	20%	20%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	95	53	40	122
LT Vol	4	25	18	14
Through Vol	82	23	14	83
RT Vol	9	5	8	25
Lane Flow Rate	120	84	89	188
Geometry Grp	1	1	1	1
Degree of Util (X)	0.169	0.124	0.122	0.23
Departure Headway (Hd)	5.073	5.294	4.954	4.402
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	707	676	722	815
Service Time	3.107	3.335	2.994	2.432
HCM Lane V/C Ratio	0.17	0.124	0.123	0.231
HCM Control Delay	9.1	9.1	8.7	8.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.4	0.4	0.9

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Existing
Timing Plan: AM Pk Gen



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	46	0	0	40	0	0
Future Volume (vph)	46	0	0	40	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	0	43	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	43	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	6.7%
Analysis Period (min)	15
	ICU Level of Service A

Intersection

Int Delay, s/veh 0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	46	0	0	40	0	0
Future Vol, veh/h	46	0	0	40	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	0	0	43	0	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	50	0	93
Stage 1	-	-	-	-	50
Stage 2	-	-	-	-	43
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1557	-	907
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	979
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1557	-	907
Mov Cap-2 Maneuver	-	-	-	-	907
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	979

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1557	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lanes, Volumes, Timings

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Existing Timing Plan: PM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	376	131	150	367	0	0	0	0	84	0	92
Future Volume (vph)	0	376	131	150	367	0	0	0	0	84	0	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.907	0.850
Fl _t Protected				0.950						0.950	0.981	
Satd. Flow (prot)	0	3574	1553	1719	3505	0	0	0	0	1726	1474	1548
Fl _t Permitted				0.950						0.950	0.981	
Satd. Flow (perm)	0	3574	1553	1719	3505	0	0	0	0	1726	1474	1548
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			158									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.83	0.83	0.83	0.59	0.59	0.59	0.88	0.88	0.88	0.86	0.86	0.86
Heavy Vehicles (%)	0%	1%	4%	5%	3%	0%	0%	0%	0%	6%	0%	9%
Adj. Flow (vph)	0	453	158	254	622	0	0	0	0	98	0	107
Shared Lane Traffic (%)										27%		39%
Lane Group Flow (vph)	0	453	158	254	622	0	0	0	0	72	68	65
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Existing

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: PM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		34.8	34.8	18.2	59.3					9.9	9.9	9.9
Actuated g/C Ratio		0.46	0.46	0.24	0.79					0.13	0.13	0.13
v/c Ratio		0.27	0.20	0.61	0.22					0.31	0.35	0.32
Control Delay		15.5	4.1	26.6	1.3					32.9	34.4	33.4
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		15.5	4.1	26.6	1.3					32.9	34.4	33.4
LOS		B	A	C	A					C	C	C
Approach Delay		12.5			8.6						33.6	
Approach LOS		B			A						C	
Queue Length 50th (ft)		70	0	84	8					32	32	29
Queue Length 95th (ft)		112	30	63	11					65	65	61
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1656	804	439	2733					448	383	402
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		0.27	0.20	0.58	0.23					0.16	0.18	0.16

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 13.1
 Intersection LOS: B
 Intersection Capacity Utilization 40.8%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Existing

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: PM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	79	381	0	0	355	95	162	0	158	0	0	0
Future Volume (vph)	79	381	0	0	355	95	162	0	158	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1719	3574	0	0	3539	1406	1678	1573	1743	0	0	0
Fl _t Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1719	3574	0	0	3539	1406	1678	1573	1743	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						117						
Link Speed (mph)		35			35			30				30
Link Distance (ft)		913			764			683				489
Travel Time (s)		17.8			14.9			15.5				11.1
Peak Hour Factor	0.85	0.85	0.85	0.81	0.81	0.81	0.84	0.84	0.84	0.88	0.88	0.88
Heavy Vehicles (%)	5%	1%	0%	0%	2%	11%	9%	0%	5%	0%	0%	0%
Adj. Flow (vph)	93	448	0	0	438	117	193	0	188	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	93	448	0	0	438	117	96	97	188	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14				14
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Existing Timing Plan: PM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	10.4	52.3			36.4	36.4	13.7	13.7	13.7			
Actuated g/C Ratio	0.14	0.70			0.49	0.49	0.18	0.18	0.18			
v/c Ratio	0.39	0.18			0.26	0.16	0.31	0.34	0.59			
Control Delay	22.2	0.9			7.7	1.4	27.9	28.6	35.0			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	22.2	0.9			7.7	1.4	27.9	28.6	35.0			
LOS	C	A			A	A	C	C	D			
Approach Delay		4.5			6.3			31.6				
Approach LOS		A			A			C				
Queue Length 50th (ft)	20	0			20	1	41	42	82			
Queue Length 95th (ft)	27	0			45	5	71	72	120			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	366	2463			1717	742	425	398	441			
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	0.25	0.18			0.26	0.16	0.23	0.24	0.43			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 12.2
 Intersection Capacity Utilization 40.8%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: PM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	449	15	3	369	27	8	1	8	19	1	73
Future Volume (vph)	75	449	15	3	369	27	8	1	8	19	1	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			0			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850		0.862				0.850
Flt Protected	0.950			0.950			0.950				0.954	
Satd. Flow (prot)	1597	3558	0	1796	3522	1607	1685	1583	0	0	1746	1196
Flt Permitted	0.950			0.950			0.909				0.889	
Satd. Flow (perm)	1597	3558	0	1796	3522	1607	1612	1583	0	0	1627	1196
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				106		11				122
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.78	0.78	0.78	0.80	0.80	0.80	0.75	0.75	0.75	0.86	0.86	0.86
Heavy Vehicles (%)	13%	1%	0%	0%	2%	0%	0%	0%	0%	4%	0%	35%
Adj. Flow (vph)	96	576	19	4	461	34	11	1	11	22	1	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	595	0	4	461	34	11	12	0	0	23	85
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	17.0			11.0			17.0	17.0		17.0	17.0	17.0
Total Split (%)	22.7%			14.7%			22.7%	22.7%		22.7%	22.7%	22.7%
Maximum Green (s)	11.6			5.7			12.1	12.1		12.1	12.1	11.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: PM Pk Gen

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	30.0
Total Split (%)	40%
Maximum Green (s)	23.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Existing
 Timing Plan: PM Pk Gen

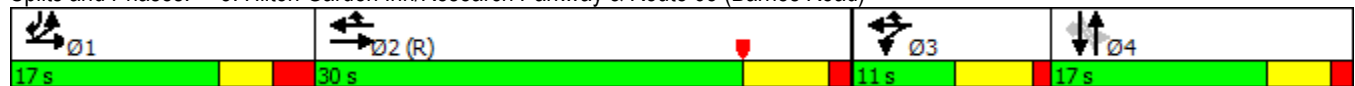


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	10.7	51.7		5.3	45.5	45.5	7.2	7.2			7.2	18.0
Actuated g/C Ratio	0.14	0.69		0.07	0.61	0.61	0.10	0.10			0.10	0.24
v/c Ratio	0.42	0.24		0.03	0.22	0.03	0.07	0.07			0.15	0.22
Control Delay	38.6	3.0		32.7	8.9	0.1	31.9	19.0			33.4	2.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	38.6	3.0		32.7	8.9	0.1	31.9	19.0			33.4	2.9
LOS	D	A		C	A	A	C	B			C	A
Approach Delay		7.9			8.5			25.2			9.4	
Approach LOS		A			A			C			A	
Queue Length 50th (ft)	48	35		2	54	0	5	0			10	0
Queue Length 95th (ft)	61	32		10	84	0	16	12			30	12
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	272	2409		139	2112	1006	260	264			262	409
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.35	0.25		0.03	0.22	0.03	0.04	0.05			0.09	0.21

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.42
 Intersection Signal Delay: 8.6
 Intersection Capacity Utilization 38.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A























Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Existing
 Timing Plan: PM Pk Gen

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	1	0	0	0	0	103	0	0	92	0
Future Volume (vph)	0	0	1	0	0	0	0	103	0	0	92	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										
Flt Protected												
Satd. Flow (prot)	1900	1615	0	1900	1900	0	1900	1743	1900	1900	1743	0
Flt Permitted												
Satd. Flow (perm)	1900	1615	0	1900	1900	0	1900	1743	1900	1900	1743	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.25	0.25	0.25	0.88	0.88	0.88	0.90	0.90	0.90	0.82	0.82	0.82
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	9%	0%
Adj. Flow (vph)	0	0	4	0	0	0	0	114	0	0	112	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	0	0	0	114	0	0	112	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	15.4%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷		↶	↶	↶	↶	↷	↷
Traffic Vol, veh/h	0	0	1	0	0	0	0	103	0	0	92	0
Future Vol, veh/h	0	0	1	0	0	0	0	103	0	0	92	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	170	-	-	140	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	25	25	88	88	88	90	90	90	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	0	9	0	0	9	0
Mvmt Flow	0	0	4	0	0	0	0	114	0	0	112	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	226	226	112	228	226	114	112	0	0	114	0	0
Stage 1	112	112	-	114	114	-	-	-	-	-	-	-
Stage 2	114	114	-	114	112	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	734	677	947	731	677	944	1490	-	-	1488	-	-
Stage 1	898	807	-	896	805	-	-	-	-	-	-	-
Stage 2	896	805	-	896	807	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	734	677	947	728	677	944	1490	-	-	1488	-	-
Mov Cap-2 Maneuver	734	677	-	728	677	-	-	-	-	-	-	-
Stage 1	898	807	-	896	805	-	-	-	-	-	-	-
Stage 2	896	805	-	892	807	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.8	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1490	-	-	-	947	-	-	1488	-	-
HCM Lane V/C Ratio	-	-	-	-	0.004	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	8.8	0	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0	-	-	0	-	-

Lanes, Volumes, Timings
5: Josheph Carini Rd

Existing
Timing Plan: PM Pk Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	1	102	91	0
Future Volume (vph)	0	1	1	102	91	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fl _t Protected						
Satd. Flow (prot)	1644	0	0	1744	1743	0
Fl _t Permitted						
Satd. Flow (perm)	1644	0	0	1744	1743	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.25	0.25	0.83	0.83	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	9%	9%	0%
Adj. Flow (vph)	0	4	1	123	107	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	0	124	107	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	1	1	102	91	0
Future Vol, veh/h	0	1	1	102	91	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	83	83	85	85
Heavy Vehicles, %	0	0	0	9	9	0
Mvmt Flow	0	4	1	123	107	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	232	107	107	0	0
Stage 1	107	-	-	-	-
Stage 2	125	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	761	953	1497	-	-
Stage 1	922	-	-	-	-
Stage 2	906	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	760	953	1497	-	-
Mov Cap-2 Maneuver	760	-	-	-	-
Stage 1	921	-	-	-	-
Stage 2	906	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1497	-	953	-	-
HCM Lane V/C Ratio	0.001	-	0.004	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Existing
Timing Plan: PM Pk Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	0	102	90	0
Future Volume (vph)	0	1	0	102	90	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	1900	1615	1900	1743	1696	0
Flt Permitted						
Satd. Flow (perm)	1900	1615	1900	1743	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.25	0.25	0.81	0.81	0.77	0.77
Heavy Vehicles (%)	0%	0%	0%	9%	12%	0%
Adj. Flow (vph)	0	4	0	126	117	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	0	126	117	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.7%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	1	0	102	90	0
Future Vol, veh/h	0	1	0	102	90	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	81	81	77	77
Heavy Vehicles, %	0	0	0	9	12	0
Mvmt Flow	0	4	0	126	117	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	243	117	117	0	0
Stage 1	117	-	-	-	-
Stage 2	126	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	750	941	1484	-	-
Stage 1	913	-	-	-	-
Stage 2	905	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	750	941	1484	-	-
Mov Cap-2 Maneuver	750	-	-	-	-
Stage 1	913	-	-	-	-
Stage 2	905	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1484	-	-	941	-	-
HCM Lane V/C Ratio	-	-	-	0.004	-	-
HCM Control Delay (s)	0	-	0	8.8	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Existing
Timing Plan: PM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	23	19	3	4	15	7	7	81	14	11	83	22
Future Volume (vph)	23	19	3	4	15	7	7	81	14	11	83	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.963			0.982			0.974	
Flt Protected		0.975			0.993			0.996			0.995	
Satd. Flow (prot)	0	1834	0	0	1817	0	0	1709	0	0	1678	0
Flt Permitted		0.975			0.993			0.996			0.995	
Satd. Flow (perm)	0	1834	0	0	1817	0	0	1709	0	0	1678	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.64	0.64	0.64	0.66	0.66	0.66	0.72	0.72	0.72	0.67	0.67	0.67
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	12%	6%
Adj. Flow (vph)	36	30	5	6	23	11	10	113	19	16	124	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	71	0	0	40	0	0	142	0	0	173	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	19	3	4	15	7	7	81	14	11	83	22
Future Vol, veh/h	23	19	3	4	15	7	7	81	14	11	83	22
Peak Hour Factor	0.64	0.64	0.64	0.66	0.66	0.66	0.72	0.72	0.72	0.67	0.67	0.67
Heavy Vehicles, %	0	0	0	0	0	0	0	11	0	0	12	6
Mvmt Flow	36	30	5	6	23	11	10	113	19	16	124	33
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	7.8	8.2	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	51%	15%	9%
Vol Thru, %	79%	42%	58%	72%
Vol Right, %	14%	7%	27%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	102	45	26	116
LT Vol	7	23	4	11
Through Vol	81	19	15	83
RT Vol	14	3	7	22
Lane Flow Rate	142	70	39	173
Geometry Grp	1	1	1	1
Degree of Util (X)	0.168	0.092	0.05	0.203
Departure Headway (Hd)	4.273	4.697	4.544	4.217
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	842	764	789	854
Service Time	2.289	2.718	2.566	2.231
HCM Lane V/C Ratio	0.169	0.092	0.049	0.203
HCM Control Delay	8.2	8.2	7.8	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.3	0.2	0.8

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Existing
Timing Plan: PM Pk Gen



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	44	0	0	26	0	0
Future Volume (vph)	44	0	0	26	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	0	0	28	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	0	0	28	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	6.7% ICU Level of Service A
Analysis Period (min)	15

Intersection

Int Delay, s/veh 0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	44	0	0	26	0	0
Future Vol, veh/h	44	0	0	26	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	0	0	28	0	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	48	0	76
Stage 1	-	-	-	-	48
Stage 2	-	-	-	-	28
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1559	-	927
Stage 1	-	-	-	-	974
Stage 2	-	-	-	-	995
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1559	-	927
Mov Cap-2 Maneuver	-	-	-	-	927
Stage 1	-	-	-	-	974
Stage 2	-	-	-	-	995

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1559	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

NO BUILD

Lanes, Volumes, Timings

No Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM

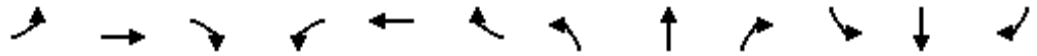


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘	↕	↗
Traffic Volume (vph)	0	581	227	308	914	0	0	0	0	172	0	409
Future Volume (vph)	0	581	227	308	914	0	0	0	0	172	0	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.862	0.850
Fl _t Protected				0.950						0.950	0.996	
Satd. Flow (prot)	0	3008	1455	1597	2756	0	0	0	0	1678	1318	1442
Fl _t Permitted				0.950						0.950	0.996	
Satd. Flow (perm)	0	3008	1455	1597	2756	0	0	0	0	1678	1318	1442
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			241									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.88	0.88	0.88	0.82	0.82	0.82
Heavy Vehicles (%)	0%	20%	11%	13%	31%	0%	0%	0%	0%	9%	0%	17%
Adj. Flow (vph)	0	618	241	335	993	0	0	0	0	210	0	499
Shared Lane Traffic (%)										10%		48%
Lane Group Flow (vph)	0	618	241	335	993	0	0	0	0	189	261	259
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		2	2	1	1 2					4	4	4
Permitted Phases												
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		23.0	23.0	26.0						31.0	31.0	31.0
Total Split (%)		28.8%	28.8%	32.5%						38.8%	38.8%	38.8%
Maximum Green (s)		17.5	17.5	22.0						25.5	25.5	25.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

No Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		22.1	22.1	22.0	49.6					20.9	20.9	20.9
Actuated g/C Ratio		0.28	0.28	0.28	0.62					0.26	0.26	0.26
v/c Ratio		0.75	0.42	0.76	0.58					0.43	0.76	0.69
Control Delay		35.9	6.5	31.0	4.8					26.6	41.0	35.7
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		35.9	6.5	31.0	4.8					26.6	41.0	35.7
LOS		D	A	C	A					C	D	D
Approach Delay		27.7			11.4						35.2	
Approach LOS		C			B						D	
Queue Length 50th (ft)		160	0	114	47					80	128	118
Queue Length 95th (ft)		#263	56	m187	m235					118	183	168
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		829	575	457	1707					534	420	459
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		0.75	0.42	0.73	0.58					0.35	0.62	0.56

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 78 (98%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 22.0 Intersection LOS: C
 Intersection Capacity Utilization 56.7% ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

No Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	192	561	0	0	879	247	343	5	262	0	0	0
Future Volume (vph)	192	561	0	0	879	247	343	5	262	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.954				
Satd. Flow (prot)	1656	3008	0	0	2735	1394	1604	1516	1606	0	0	0
Fl _t Permitted	0.950						0.950	0.954				
Satd. Flow (perm)	1656	3008	0	0	2735	1394	1604	1516	1606	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						255						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.93	0.93	0.93	0.97	0.97	0.97	0.86	0.86	0.86	0.88	0.88	0.88
Heavy Vehicles (%)	9%	20%	0%	0%	32%	12%	14%	0%	14%	0%	0%	0%
Adj. Flow (vph)	206	603	0	0	906	255	399	6	305	0	0	0
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	206	603	0	0	906	255	203	202	305	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	25.0				29.0	29.0	26.0	26.0	26.0			
Total Split (%)	31.3%				36.3%	36.3%	32.5%	32.5%	32.5%			
Maximum Green (s)	21.0				23.5	23.5	21.0	21.0	21.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

No Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	16.2	52.0			30.4	30.4	19.0	19.0	19.0			
Actuated g/C Ratio	0.20	0.65			0.38	0.38	0.24	0.24	0.24			
v/c Ratio	0.62	0.31			0.87	0.37	0.53	0.56	0.80			
Control Delay	44.2	1.0			35.4	11.2	31.7	32.9	45.3			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	44.2	1.0			35.4	11.2	31.7	32.9	45.3			
LOS	D	A			D	B	C	C	D			
Approach Delay		12.0			30.1			37.9				
Approach LOS		B			C			D				
Queue Length 50th (ft)	93	4			180	40	90	90	139			
Queue Length 95th (ft)	m104	10			m#270	m48	149	150	#220			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	434	1933			1037	687	421	397	421			
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	0.47	0.31			0.87	0.37	0.48	0.51	0.72			

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 34 (43%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 26.7
 Intersection LOS: C
 Intersection Capacity Utilization 56.7%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build
 Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔		↔	↕↕	↔	↔	↔	↔		↕	↔
Traffic Volume (vph)	278	520	25	10	980	126	35	25	10	30	5	111
Future Volume (vph)	278	520	25	10	980	126	35	25	10	30	5	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			0			130		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.957				0.850
Flt Protected	0.950			0.950			0.950				0.959	
Satd. Flow (prot)	3045	1547	0	1796	2477	1516	1668	1753	0	0	1791	1509
Flt Permitted	0.950			0.950			0.729				0.708	
Satd. Flow (perm)	3045	1547	0	1796	2477	1516	1280	1753	0	0	1322	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				142		20				115
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.51	0.51	0.51	0.81	0.81	0.81
Heavy Vehicles (%)	15%	23%	1%	0%	45%	6%	1%	0%	1%	2%	0%	7%
Adj. Flow (vph)	302	565	27	11	1101	142	69	49	20	37	6	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	302	592	0	11	1101	142	69	69	0	0	43	137
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pt+ov
Protected Phases	7	7 8		3	3 8	3 8		4			4	4 7
Permitted Phases							4			4		
Detector Phase	7	7 8		3	3 8	3 8	4	4		4	4	4 7
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	
Total Split (s)	26.0			11.0			19.0	19.0		19.0	19.0	
Total Split (%)	32.5%			13.8%			23.8%	23.8%		23.8%	23.8%	
Maximum Green (s)	20.6			5.7			14.1	14.1		14.1	14.1	
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	
Lost Time Adjust (s)	0.0			0.0			0.0	0.0			0.0	
Total Lost Time (s)	5.4			5.3			4.9	4.9			4.9	
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build
 Timing Plan: AM

Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	24.0
Total Split (%)	30%
Maximum Green (s)	17.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build
 Timing Plan: AM

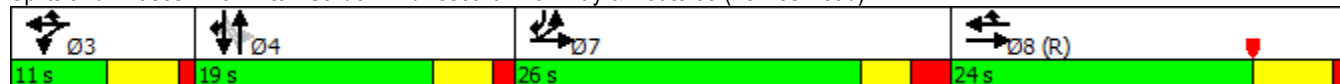


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	
Recall Mode	None			None			None	None		None	None	
Act Effct Green (s)	20.5	49.3		5.7	34.5	34.5	9.4	9.4			9.4	35.3
Actuated g/C Ratio	0.26	0.62		0.07	0.43	0.43	0.12	0.12			0.12	0.44
v/c Ratio	0.39	0.62		0.09	1.03	0.19	0.46	0.31			0.28	0.19
Control Delay	27.2	12.1		36.4	63.0	4.0	41.9	27.3			35.5	3.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	27.2	12.1		36.4	63.0	4.0	41.9	27.3			35.5	3.8
LOS	C	B		D	E	A	D	C			D	A
Approach Delay		17.2			56.1			34.6				11.4
Approach LOS		B			E			C				B
Queue Length 50th (ft)	61	68		5	~346	0	33	23			20	5
Queue Length 95th (ft)	m103	136		21	#470	33	37	27			42	25
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	845	939		127	1066	733	225	325			233	739
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.36	0.63		0.09	1.03	0.19	0.31	0.21			0.18	0.19

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 27 (34%), Referenced to phase 8:EBWB, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.03
 Intersection Signal Delay: 37.5 Intersection LOS: D
 Intersection Capacity Utilization 56.6% ICU Level of Service B
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø8
Vehicle Extension (s)	5.0
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

No Build
 Timing Plan: AM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	5	0	0	0	35	394	0	0	141	0
Future Volume (vph)	0	0	5	0	0	0	35	394	0	0	141	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										
Flt Protected							0.950					
Satd. Flow (prot)	1900	1615	0	1900	1900	0	1805	1845	1900	1712	1727	0
Flt Permitted							0.950					
Satd. Flow (perm)	1900	1615	0	1900	1900	0	1805	1845	1900	1712	1727	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.42	0.42	0.42	0.88	0.88	0.88	0.67	0.67	0.67	0.73	0.73	0.73
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	11%	10%	0%
Adj. Flow (vph)	0	0	12	0	0	0	52	588	0	0	193	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	0	0	52	588	0	0	193	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	37.4%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑	↗	↖	↗	
Traffic Vol, veh/h	0	0	5	0	0	0	35	394	0	0	141	0
Future Vol, veh/h	0	0	5	0	0	0	35	394	0	0	141	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	170	-	-	140	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	42	42	88	88	88	67	67	67	73	73	73
Heavy Vehicles, %	0	0	0	0	0	0	0	3	0	11	10	0
Mvmt Flow	0	0	12	0	0	0	52	588	0	0	193	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	885	885	193	891	885	588	193	0	0	588	0	0
Stage 1	193	193	-	692	692	-	-	-	-	-	-	-
Stage 2	692	692	-	199	193	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.21	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.299	-	-
Pot Cap-1 Maneuver	268	286	854	265	286	513	1392	-	-	944	-	-
Stage 1	813	745	-	437	448	-	-	-	-	-	-	-
Stage 2	437	448	-	807	745	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	260	275	854	254	275	513	1392	-	-	944	-	-
Mov Cap-2 Maneuver	260	275	-	254	275	-	-	-	-	-	-	-
Stage 1	783	745	-	421	431	-	-	-	-	-	-	-
Stage 2	421	431	-	796	745	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	0	0.6	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1392	-	-	-	854	-	-	944	-	-
HCM Lane V/C Ratio	0.038	-	-	-	0.014	-	-	-	-	-
HCM Control Delay (s)	7.7	-	-	0	9.3	0	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0	-	-	0	-	-

Lanes, Volumes, Timings
5: Josheph Carini Rd

No Build
Timing Plan: AM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	6	58	336	135	6
Future Volume (vph)	0	6	58	336	135	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865			0.994		
Fl _t Protected				0.993		
Satd. Flow (prot)	1096	0	0	1705	1598	0
Fl _t Permitted				0.993		
Satd. Flow (perm)	1096	0	0	1705	1598	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.50	0.50	0.90	0.90	0.63	0.63
Heavy Vehicles (%)	0%	50%	3%	12%	19%	0%
Adj. Flow (vph)	0	12	64	373	214	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	437	224	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 41.7% ICU Level of Service A
 Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	6	58	336	135	6
Future Vol, veh/h	0	6	58	336	135	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	90	90	63	63
Heavy Vehicles, %	0	50	3	12	19	0
Mvmt Flow	0	12	64	373	214	10

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	720	219	224	0	0
Stage 1	219	-	-	-	-
Stage 2	501	-	-	-	-
Critical Hdwy	6.4	6.7	4.13	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.75	2.227	-	-
Pot Cap-1 Maneuver	398	714	1339	-	-
Stage 1	822	-	-	-	-
Stage 2	613	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	374	714	1339	-	-
Mov Cap-2 Maneuver	374	-	-	-	-
Stage 1	773	-	-	-	-
Stage 2	613	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1339	-	714	-	-
HCM Lane V/C Ratio	0.048	-	0.017	-	-
HCM Control Delay (s)	7.8	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	-	-

Lanes, Volumes, Timings
6: Research Parkway

No Build
Timing Plan: AM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	6	330	141	2
Future Volume (vph)	0	0	6	330	141	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998	
Flt Protected			0.950			
Satd. Flow (prot)	1900	1900	1805	1667	1623	0
Flt Permitted			0.950			
Satd. Flow (perm)	1900	1900	1805	1667	1623	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.25	0.25	0.89	0.89	0.81	0.81
Heavy Vehicles (%)	0%	0%	0%	14%	17%	0%
Adj. Flow (vph)	0	0	7	371	174	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	7	371	176	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	20.7%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	0	6	330	141	2
Future Vol, veh/h	0	0	6	330	141	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	89	89	81	81
Heavy Vehicles, %	0	0	0	14	17	0
Mvmt Flow	0	0	7	371	174	2

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	560	175	176	0	0
Stage 1	175	-	-	-	-
Stage 2	385	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	493	874	1412	-	-
Stage 1	860	-	-	-	-
Stage 2	692	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	491	874	1412	-	-
Mov Cap-2 Maneuver	491	-	-	-	-
Stage 1	856	-	-	-	-
Stage 2	692	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1412	-	-	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-	-	-
HCM Control Delay (s)	7.6	-	0	0	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

No Build
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	101	61	25	40	66	20	15	275	40	25	78	45
Future Volume (vph)	101	61	25	40	66	20	15	275	40	25	78	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.982			0.979			0.984			0.959	
Fl _t Protected		0.974			0.984			0.998			0.992	
Satd. Flow (prot)	0	1749	0	0	1764	0	0	1803	0	0	1734	0
Fl _t Permitted		0.974			0.984			0.998			0.992	
Satd. Flow (perm)	0	1749	0	0	1764	0	0	1803	0	0	1734	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.62	0.62	0.62	0.71	0.71	0.71	0.69	0.69	0.69	0.76	0.76	0.76
Heavy Vehicles (%)	0%	5%	17%	6%	2%	5%	8%	3%	5%	9%	4%	2%
Adj. Flow (vph)	163	98	40	56	93	28	22	399	58	33	103	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	301	0	0	177	0	0	479	0	0	195	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.7%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	20.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	101	61	25	40	66	20	15	275	40	25	78	45
Future Vol, veh/h	101	61	25	40	66	20	15	275	40	25	78	45
Peak Hour Factor	0.62	0.62	0.62	0.71	0.71	0.71	0.69	0.69	0.69	0.76	0.76	0.76
Heavy Vehicles, %	0	5	17	6	2	5	8	3	5	9	4	2
Mvmt Flow	163	98	40	56	93	28	22	399	58	33	103	59
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	17	13.4	28.8	13.2
HCM LOS	C	B	D	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	54%	32%	17%
Vol Thru, %	83%	33%	52%	53%
Vol Right, %	12%	13%	16%	30%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	330	187	126	148
LT Vol	15	101	40	25
Through Vol	275	61	66	78
RT Vol	40	25	20	45
Lane Flow Rate	478	302	177	195
Geometry Grp	1	1	1	1
Degree of Util (X)	0.799	0.543	0.337	0.354
Departure Headway (Hd)	6.015	6.478	6.842	6.548
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	603	555	524	547
Service Time	4.065	4.535	4.909	4.615
HCM Lane V/C Ratio	0.793	0.544	0.338	0.356
HCM Control Delay	28.8	17	13.4	13.2
HCM Lane LOS	D	C	B	B
HCM 95th-tile Q	7.8	3.2	1.5	1.6

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

No Build
Timing Plan: AM



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	126	0	0	126	0	0
Future Volume (vph)	126	0	0	126	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	0	0	137	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	137	0	0	137	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	10.0%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	126	0	0	126	0	0
Future Vol, veh/h	126	0	0	126	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	137	0	0	137	0	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	137	0	274
Stage 1	-	-	-	-	137
Stage 2	-	-	-	-	137
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1447	-	716
Stage 1	-	-	-	-	890
Stage 2	-	-	-	-	890
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1447	-	716
Mov Cap-2 Maneuver	-	-	-	-	716
Stage 1	-	-	-	-	890
Stage 2	-	-	-	-	890

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1447	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lanes, Volumes, Timings

No Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	511	172	131	537	0	0	0	0	131	1	172
Future Volume (vph)	0	511	172	131	537	0	0	0	0	131	1	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.890	0.850
Fl _t Protected				0.950						0.950	0.987	
Satd. Flow (prot)	0	3223	1455	1467	3343	0	0	0	0	1577	1237	1288
Fl _t Permitted				0.950						0.950	0.987	
Satd. Flow (perm)	0	3223	1455	1467	3343	0	0	0	0	1577	1237	1288
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			198									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.87	0.87	0.87	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Heavy Vehicles (%)	0%	12%	11%	23%	8%	0%	0%	0%	0%	16%	0%	31%
Adj. Flow (vph)	0	587	198	144	590	0	0	0	0	146	1	191
Shared Lane Traffic (%)										20%		43%
Lane Group Flow (vph)	0	587	198	144	590	0	0	0	0	117	112	109
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

No Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		33.7	33.7	13.6	52.8					12.7	12.7	12.7
Actuated g/C Ratio		0.45	0.45	0.18	0.70					0.17	0.17	0.17
v/c Ratio		0.41	0.26	0.54	0.25					0.44	0.54	0.50
Control Delay		16.8	4.0	29.0	0.8					32.2	37.2	35.4
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		16.8	4.0	29.0	0.8					32.2	37.2	35.4
LOS		B	A	C	A					C	D	D
Approach Delay		13.5			6.4						34.9	
Approach LOS		B			A						C	
Queue Length 50th (ft)		93	0	32	0					52	53	49
Queue Length 95th (ft)		159	38	64	1					92	97	90
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1448	762	322	2332					410	321	334
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		0.41	0.26	0.45	0.25					0.29	0.35	0.33

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 14.6
 Intersection Capacity Utilization 43.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

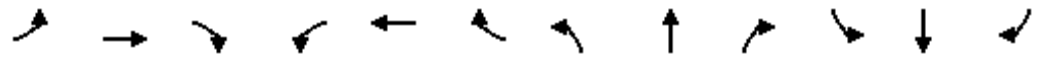
Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

No Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	473	0	0	510	144	158	0	127	0	0	0
Future Volume (vph)	169	473	0	0	510	144	158	0	127	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1433	3343	0	0	3282	1269	1604	1504	1551	0	0	0
Fl _t Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1433	3343	0	0	3282	1269	1604	1504	1551	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						158						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.95	0.95	0.95	0.91	0.91	0.91	0.90	0.90	0.90	0.88	0.88	0.88
Heavy Vehicles (%)	26%	8%	0%	0%	10%	23%	14%	0%	18%	0%	0%	0%
Adj. Flow (vph)	178	498	0	0	560	158	176	0	141	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	178	498	0	0	560	158	88	88	141	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

No Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	14.5	53.4			33.4	33.4	12.6	12.6	12.6			
Actuated g/C Ratio	0.19	0.71			0.45	0.45	0.17	0.17	0.17			
v/c Ratio	0.64	0.21			0.38	0.24	0.33	0.35	0.54			
Control Delay	28.4	0.9			10.4	1.8	29.6	30.3	35.7			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	28.4	0.9			10.4	1.8	29.6	30.3	35.7			
LOS	C	A			B	A	C	C	D			
Approach Delay		8.1			8.5			32.5				
Approach LOS		A			A			C				
Queue Length 50th (ft)	35	0			38	1	38	38	61			
Queue Length 95th (ft)	54	1			71	8	73	74	105			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	319	2342			1463	653	406	381	392			
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	0.21			0.38	0.24	0.22	0.23	0.36			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 12.8
 Intersection Capacity Utilization 43.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build
 Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	505	7	1	532	20	5	0	2	23	0	117
Future Volume (vph)	88	505	7	1	532	20	5	0	2	23	0	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			0			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998				0.850		0.850				0.850
Flt Protected	0.950			0.950			0.950				0.950	
Satd. Flow (prot)	1410	3364	0	1796	3295	1530	1404	1041	0	0	1480	1282
Flt Permitted	0.950			0.950			0.870				0.870	
Satd. Flow (perm)	1410	3364	0	1796	3295	1530	1286	1041	0	0	1355	1282
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				106		428				130
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.44	0.44	0.44	0.90	0.90	0.90
Heavy Vehicles (%)	28%	7%	14%	0%	9%	5%	20%	0%	50%	22%	0%	26%
Adj. Flow (vph)	95	543	8	1	578	22	11	0	5	26	0	130
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	551	0	1	578	22	11	5	0	0	26	130
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	20.0			12.0			15.0	15.0		15.0	15.0	20.0
Total Split (%)	26.7%			16.0%			20.0%	20.0%		20.0%	20.0%	26.7%
Maximum Green (s)	14.6			6.7			10.1	10.1		10.1	10.1	14.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build
 Timing Plan: MD

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	28.0
Total Split (%)	37%
Maximum Green (s)	21.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build
 Timing Plan: MD

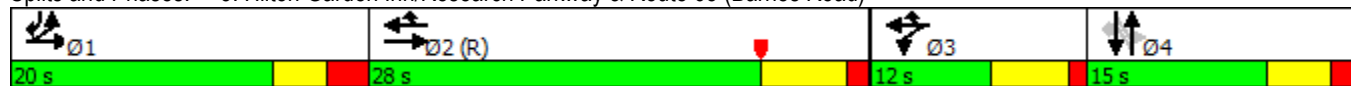


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0		1.5			2.0		2.0		2.0		2.0
Recall Mode	None			None			None		None		None	None
Act Effct Green (s)	10.7	51.2	5.5			45.2	45.2	7.4	7.4	7.4		18.3
Actuated g/C Ratio	0.14	0.68	0.07			0.60	0.60	0.10	0.10	0.10		0.24
v/c Ratio	0.47	0.24	0.01			0.29	0.02	0.09	0.01	0.19		0.32
Control Delay	40.9	3.2	32.0			9.7	0.1	31.8	0.0	34.3		5.4
Queue Delay	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	40.9	3.2	32.0			9.7	0.1	31.8	0.0	34.3		5.4
LOS	D	A	C			A	A	C	A	C		A
Approach Delay	8.7		9.4			21.9		10.3				
Approach LOS	A		A			C		B				
Queue Length 50th (ft)	39	31	0			72	0	5	0	11		0
Queue Length 95th (ft)	84	35	5			128	0	9	0	34		31
Internal Link Dist (ft)	684		671			171		640				
Turn Bay Length (ft)	570		100			250						
Base Capacity (vph)	279	2250	160			2040	987	173	510	182		474
Starvation Cap Reductn	0	0	0			0	0	0	0	0		0
Spillback Cap Reductn	0	0	0			0	0	0	0	0		0
Storage Cap Reductn	0	0	0			0	0	0	0	0		0
Reduced v/c Ratio	0.34	0.24	0.01			0.28	0.02	0.06	0.01	0.14		0.27

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.47
 Intersection Signal Delay: 9.3
 Intersection Capacity Utilization 41.5%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

No Build
Timing Plan: MD

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	8	0	0	0	5	103	0	0	132	1
Future Volume (vph)	2	0	8	0	0	0	5	103	0	0	132	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										0.999
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1805	1615	0	1900	1900	0	1805	1520	1900	1900	1485	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1805	1615	0	1900	1900	0	1805	1520	1900	1900	1485	0
Link Speed (mph)		30			30			30				30
Link Distance (ft)		196			203			720				478
Travel Time (s)		4.5			4.6			16.4				10.9
Peak Hour Factor	0.63	0.63	0.63	0.88	0.88	0.88	0.81	0.81	0.81	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	28%	0%
Adj. Flow (vph)	3	0	13	0	0	0	6	127	0	0	143	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	13	0	0	0	0	6	127	0	0	144	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12				12
Link Offset(ft)		0			12			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	17.0%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑	↗	↖	↗	
Traffic Vol, veh/h	2	0	8	0	0	0	5	103	0	0	132	1
Future Vol, veh/h	2	0	8	0	0	0	5	103	0	0	132	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	170	-	-	140	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	88	88	88	81	81	81	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	25	0	0	28	0
Mvmt Flow	3	0	13	0	0	0	6	127	0	0	143	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	283	283	144	289	283	127	144	0	0	127	0	0
Stage 1	144	144	-	139	139	-	-	-	-	-	-	-
Stage 2	139	139	-	150	144	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	673	629	909	667	629	929	1451	-	-	1472	-	-
Stage 1	864	782	-	869	785	-	-	-	-	-	-	-
Stage 2	869	785	-	857	782	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	671	626	909	656	626	929	1451	-	-	1472	-	-
Mov Cap-2 Maneuver	671	626	-	656	626	-	-	-	-	-	-	-
Stage 1	861	782	-	866	782	-	-	-	-	-	-	-
Stage 2	865	782	-	845	782	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	0	0.3	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1451	-	-	671	909	-	-	1472	-	-
HCM Lane V/C Ratio	0.004	-	-	0.005	0.014	-	-	-	-	-
HCM Control Delay (s)	7.5	-	-	10.4	9	0	0	0	-	-
HCM Lane LOS	A	-	-	B	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	-	-	0	-	-

Lanes, Volumes, Timings
5: Josheph Carini Rd

No Build
Timing Plan: MD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	30	14	91	103	3
Future Volume (vph)	3	30	14	91	103	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.876				0.996	
Fl _t Protected	0.996			0.993		
Satd. Flow (prot)	1458	0	0	1674	1681	0
Fl _t Permitted	0.996			0.993		
Satd. Flow (perm)	1458	0	0	1674	1681	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.69	0.69	0.83	0.83	0.65	0.65
Heavy Vehicles (%)	0%	15%	11%	13%	13%	0%
Adj. Flow (vph)	4	43	17	110	158	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	0	127	163	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	3	30	14	91	103	3
Future Vol, veh/h	3	30	14	91	103	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	83	83	65	65
Heavy Vehicles, %	0	15	11	13	13	0
Mvmt Flow	4	43	17	110	158	5

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	305	161	163	0	-	0
Stage 1	161	-	-	-	-	-
Stage 2	144	-	-	-	-	-
Critical Hdwy	6.4	6.35	4.21	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.435	2.299	-	-	-
Pot Cap-1 Maneuver	691	851	1363	-	-	-
Stage 1	873	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	682	851	1363	-	-	-
Mov Cap-2 Maneuver	682	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1363	-	832	-	-
HCM Lane V/C Ratio	0.012	-	0.057	-	-
HCM Control Delay (s)	7.7	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

No Build
Timing Plan: MD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	3	2	92	103	0
Future Volume (vph)	2	3	2	92	103	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1583	1805	1681	1652	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1583	1805	1681	1652	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.38	0.38	0.83	0.83	0.66	0.66
Heavy Vehicles (%)	0%	2%	0%	13%	15%	0%
Adj. Flow (vph)	5	8	2	111	156	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	8	2	111	156	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.4%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	2	3	2	92	103	0
Future Vol, veh/h	2	3	2	92	103	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	38	38	83	83	66	66
Heavy Vehicles, %	0	2	0	13	15	0
Mvmt Flow	5	8	2	111	156	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	271	156	156	0	-	0
Stage 1	156	-	-	-	-	-
Stage 2	115	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.2	-	-	-
Pot Cap-1 Maneuver	723	890	1436	-	-	-
Stage 1	877	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	722	890	1436	-	-	-
Mov Cap-2 Maneuver	722	-	-	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	915	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1436	-	722	890	-	-
HCM Lane V/C Ratio	0.002	-	0.007	0.009	-	-
HCM Control Delay (s)	7.5	-	10	9.1	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

No Build
Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	31	27	11	8	19	12	7	81	6	13	84	37
Future Volume (vph)	31	27	11	8	19	12	7	81	6	13	84	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.978			0.958			0.991			0.962	
Fl _t Protected		0.978			0.990			0.996			0.995	
Satd. Flow (prot)	0	1741	0	0	1632	0	0	1477	0	0	1461	0
Fl _t Permitted		0.978			0.990			0.996			0.995	
Satd. Flow (perm)	0	1741	0	0	1632	0	0	1477	0	0	1461	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles (%)	3%	4%	9%	13%	16%	0%	0%	30%	17%	0%	38%	3%
Adj. Flow (vph)	36	31	13	11	25	16	8	95	7	15	94	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	80	0	0	52	0	0	110	0	0	151	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.5%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	27	11	8	19	12	7	81	6	13	84	37
Future Vol, veh/h	31	27	11	8	19	12	7	81	6	13	84	37
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles, %	3	4	9	13	16	0	0	30	17	0	38	3
Mvmt Flow	36	31	13	11	25	16	8	95	7	15	94	42
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	8	8	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	45%	21%	10%
Vol Thru, %	86%	39%	49%	63%
Vol Right, %	6%	16%	31%	28%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	94	69	39	134
LT Vol	7	31	8	13
Through Vol	81	27	19	84
RT Vol	6	11	12	37
Lane Flow Rate	111	80	52	151
Geometry Grp	1	1	1	1
Degree of Util (X)	0.134	0.102	0.067	0.175
Departure Headway (Hd)	4.348	4.582	4.648	4.188
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	827	784	772	860
Service Time	2.363	2.601	2.668	2.202
HCM Lane V/C Ratio	0.134	0.102	0.067	0.176
HCM Control Delay	8	8.1	8	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.3	0.2	0.6

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

No Build
Timing Plan: MD



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Volume (vph)	46	0	0	39	0	0
Future Volume (vph)	46	0	0	39	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frnt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	0	42	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	42	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	6.7%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	46	0	0	39	0	0
Future Vol, veh/h	46	0	0	39	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	0	0	42	0	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	50	0	92
Stage 1	-	-	-	-	50
Stage 2	-	-	-	-	42
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1557	-	908
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	980
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1557	-	908
Mov Cap-2 Maneuver	-	-	-	-	908
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	980

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1557	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lanes, Volumes, Timings

No Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	1020	480	293	843	0	0	0	0	242	5	338
Future Volume (vph)	0	1020	480	293	843	0	0	0	0	242	5	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.884	0.850
Fl _t Protected				0.950						0.950	0.990	
Satd. Flow (prot)	0	2843	1615	1805	2865	0	0	0	0	1829	1564	1688
Fl _t Permitted				0.950						0.950	0.990	
Satd. Flow (perm)	0	2843	1615	1805	2865	0	0	0	0	1829	1564	1688
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			539									
Link Speed (mph)		45			30			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			20.8			8.5			11.3	
Peak Hour Factor	0.89	0.89	0.89	0.84	0.84	0.84	0.88	0.88	0.88	0.85	0.85	0.85
Heavy Vehicles (%)	15%	27%	0%	0%	26%	9%	12%	0%	11%	0%	0%	0%
Adj. Flow (vph)	0	1146	539	349	1004	0	0	0	0	285	6	398
Shared Lane Traffic (%)										16%		44%
Lane Group Flow (vph)	0	1146	539	349	1004	0	0	0	0	239	227	223
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		37.0	37.0	23.0						20.0	20.0	20.0
Total Split (%)		46.3%	46.3%	28.8%						25.0%	25.0%	25.0%
Maximum Green (s)		31.5	31.5	19.0						14.5	14.5	14.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

No Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: PM

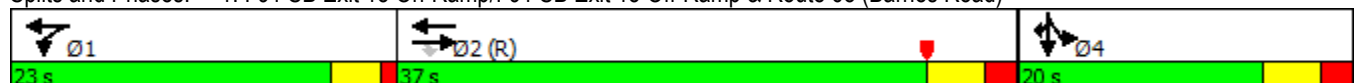


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effect Green (s)		32.3	32.3	18.8	56.6					13.9	13.9	13.9
Actuated g/C Ratio		0.40	0.40	0.24	0.71					0.17	0.17	0.17
v/c Ratio		1.00	0.55	0.82	0.50					0.75	0.84	0.76
Control Delay		52.5	4.1	49.3	1.1					47.7	59.0	49.8
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		52.5	4.1	49.3	1.1					47.7	59.0	49.8
LOS		D	A	D	A					D	E	D
Approach Delay		37.0			13.5						52.1	
Approach LOS		D			B						D	
Queue Length 50th (ft)		~310	0	149	6					120	120	111
Queue Length 95th (ft)		#441	56	m157	m6					#204	#223	#196
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1147	973	428	2004					331	283	305
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		1.00	0.55	0.82	0.50					0.72	0.80	0.73

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 1 (1%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 31.3 Intersection LOS: C
 Intersection Capacity Utilization 68.7% ICU Level of Service C
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

No Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	449	813	0	0	848	233	288	5	293	0	0	0
Future Volume (vph)	449	813	0	0	848	233	288	5	293	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t							0.850		0.850			
Fl _t Protected	0.950						0.950	0.954				
Satd. Flow (prot)	1805	2756	0	0	2865	1561	1829	1722	1830	0	0	0
Fl _t Permitted	0.950						0.950	0.954				
Satd. Flow (perm)	1805	2756	0	0	2865	1561	1829	1722	1830	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						243						
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			13.0			15.5			11.1	
Peak Hour Factor	0.87	0.87	0.87	0.96	0.96	0.96	0.85	0.85	0.85	0.88	0.88	0.88
Heavy Vehicles (%)	0%	31%	14%	11%	26%	0%	0%	0%	0%	8%	0%	11%
Adj. Flow (vph)	516	934	0	0	883	243	339	6	345	0	0	0
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	516	934	0	0	883	243	173	172	345	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	32.0				27.0	27.0	21.0	21.0	21.0			
Total Split (%)	40.0%				33.8%	33.8%	26.3%	26.3%	26.3%			
Maximum Green (s)	28.0				21.5	21.5	16.0	16.0	16.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

No Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: PM

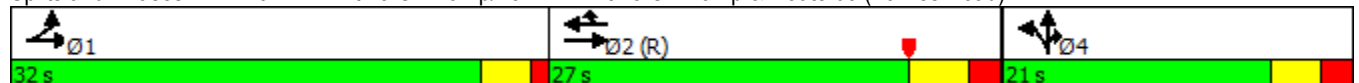


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	27.1	55.0			22.4	22.4	16.0	16.0	16.0			
Actuated g/C Ratio	0.34	0.69			0.28	0.28	0.20	0.20	0.20			
v/c Ratio	0.84	0.49			1.10	0.40	0.47	0.50	0.94			
Control Delay	22.5	0.4			85.7	7.0	33.3	34.2	68.8			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	22.5	0.4			85.7	7.0	33.3	34.2	68.8			
LOS	C	A			F	A	C	C	E			
Approach Delay		8.3			68.7			51.3				
Approach LOS		A			E			D				
Queue Length 50th (ft)	97	1			~262	12	81	81	171			
Queue Length 95th (ft)	m111	m1			m#345	m27	134	134	#301			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	631	1894			801	612	365	344	366			
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	0.82	0.49			1.10	0.40	0.47	0.50	0.94			

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 39 (49%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.10
 Intersection Signal Delay: 38.2
 Intersection LOS: D
 Intersection Capacity Utilization 68.7%
 ICU Level of Service C
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build
 Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	1010	15	5	803	40	10	20	5	126	40	268
Future Volume (vph)	81	1010	15	5	803	40	10	20	5	126	40	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			0			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998				0.850		0.969				0.850
Flt Protected	0.950			0.950			0.950				0.963	
Satd. Flow (prot)	1719	2566	0	1796	2763	1575	1652	1780	0	0	1763	1429
Flt Permitted	0.950			0.950			0.485				0.756	
Satd. Flow (perm)	1719	2566	0	1796	2763	1575	843	1780	0	0	1384	1429
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				100		7				115
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.95	0.95	0.95	0.86	0.86	0.86	0.75	0.75	0.75	0.82	0.82	0.82
Heavy Vehicles (%)	5%	41%	1%	0%	30%	2%	2%	0%	0%	5%	0%	13%
Adj. Flow (vph)	85	1063	16	6	934	47	13	27	7	154	49	327
Shared Lane Traffic (%)												
Lane Group Flow (vph)	85	1079	0	6	934	47	13	34	0	0	203	327
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	22.0			11.0			22.0	22.0		22.0	22.0	22.0
Total Split (%)	27.5%			13.8%			27.5%	27.5%		27.5%	27.5%	27.5%
Maximum Green (s)	16.6			5.7			17.1	17.1		17.1	17.1	16.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build
 Timing Plan: PM

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	25.0
Total Split (%)	31%
Maximum Green (s)	18.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build
 Timing Plan: PM

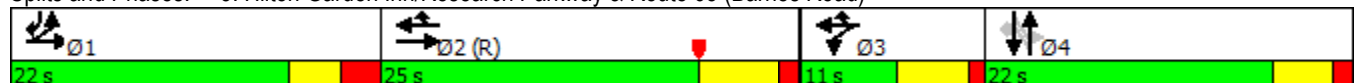


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	18.2	44.0		5.7	30.7	30.7	14.7	14.7			14.7	37.8
Actuated g/C Ratio	0.23	0.55		0.07	0.38	0.38	0.18	0.18			0.18	0.47
v/c Ratio	0.22	0.76		0.05	0.88	0.07	0.08	0.10			0.80	0.44
Control Delay	33.0	13.0		35.6	35.2	0.6	26.9	22.5			54.3	10.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	33.0	13.0		35.6	35.2	0.6	26.9	22.5			54.3	10.8
LOS	C	B		D	D	A	C	C			D	B
Approach Delay		14.5			33.5			23.7			27.4	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	37	68		3	227	0	5	11			95	62
Queue Length 95th (ft)	m67	m80		14	#320	2	17	28			148	105
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	391	1411		127	1058	665	180	385			295	736
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.22	0.76		0.05	0.88	0.07	0.07	0.09			0.69	0.44

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 29 (36%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 24.0 Intersection LOS: C
 Intersection Capacity Utilization 61.3% ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

No Build
 Timing Plan: PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	15	0	0	0	5	136	0	0	419	0
Future Volume (vph)	5	0	15	0	0	0	5	136	0	0	419	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1805	1615	0	1900	1900	0	1805	1792	1900	1900	1863	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	1805	1615	0	1900	1900	0	1805	1792	1900	1900	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.48	0.48	0.48	0.88	0.88	0.88	0.59	0.59	0.59	0.60	0.60	0.60
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	2%	0%
Adj. Flow (vph)	10	0	31	0	0	0	8	231	0	0	698	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	31	0	0	0	0	8	231	0	0	698	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	32.1%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷		↶	↶	↶	↶	↷	
Traffic Vol, veh/h	5	0	15	0	0	0	5	136	0	0	419	0
Future Vol, veh/h	5	0	15	0	0	0	5	136	0	0	419	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	170	-	-	140	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	48	48	48	88	88	88	59	59	59	60	60	60
Heavy Vehicles, %	0	0	0	0	0	0	0	6	0	0	2	0
Mvmt Flow	10	0	31	0	0	0	8	231	0	0	698	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	945	945	698	961	945	231	698	0	0	231	0	0
Stage 1	698	698	-	247	247	-	-	-	-	-	-	-
Stage 2	247	247	-	714	698	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	244	264	444	238	264	813	908	-	-	1349	-	-
Stage 1	434	445	-	761	706	-	-	-	-	-	-	-
Stage 2	761	706	-	425	445	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	242	262	444	220	262	813	908	-	-	1349	-	-
Mov Cap-2 Maneuver	242	262	-	220	262	-	-	-	-	-	-	-
Stage 1	430	445	-	754	700	-	-	-	-	-	-	-
Stage 2	754	700	-	395	445	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.4	0	0.3	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	908	-	-	242	444	-	-	1349	-	-
HCM Lane V/C Ratio	0.009	-	-	0.043	0.07	-	-	-	-	-
HCM Control Delay (s)	9	-	-	20.5	13.7	0	0	0	-	-
HCM Lane LOS	A	-	-	C	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	-	-	0	-	-

Lanes, Volumes, Timings
5: Josheph Carini Rd

No Build
Timing Plan: PM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	63	9	132	356	0
Future Volume (vph)	3	63	9	132	356	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.871					
Fl _t Protected	0.998			0.997		
Satd. Flow (prot)	1618	0	0	1661	1696	0
Fl _t Permitted	0.998			0.997		
Satd. Flow (perm)	1618	0	0	1661	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.55	0.55	0.90	0.90	0.80	0.80
Heavy Vehicles (%)	50%	0%	0%	15%	12%	0%
Adj. Flow (vph)	5	115	10	147	445	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	120	0	0	157	445	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.5%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	3	63	9	132	356	0
Future Vol, veh/h	3	63	9	132	356	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	55	55	90	90	80	80
Heavy Vehicles, %	50	0	0	15	12	0
Mvmt Flow	5	115	10	147	445	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	612	445	445	0	-	0
Stage 1	445	-	-	-	-	-
Stage 2	167	-	-	-	-	-
Critical Hdwy	6.9	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	387	617	1126	-	-	-
Stage 1	556	-	-	-	-	-
Stage 2	759	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	383	617	1126	-	-	-
Mov Cap-2 Maneuver	383	-	-	-	-	-
Stage 1	550	-	-	-	-	-
Stage 2	759	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1126	-	600	-	-
HCM Lane V/C Ratio	0.009	-	0.2	-	-
HCM Control Delay (s)	8.2	0	12.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

No Build
Timing Plan: PM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	13	3	132	343	0
Future Volume (vph)	3	13	3	132	343	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1638	1696	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1638	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.42	0.42	0.90	0.90	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	16%	12%	0%
Adj. Flow (vph)	7	31	3	147	434	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	31	3	147	434	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	28.1%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	3	13	3	132	343	0
Future Vol, veh/h	3	13	3	132	343	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	42	42	90	90	79	79
Heavy Vehicles, %	0	0	0	16	12	0
Mvmt Flow	7	31	3	147	434	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	587	434	434	0	-	0
Stage 1	434	-	-	-	-	-
Stage 2	153	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	475	626	1136	-	-	-
Stage 1	658	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	474	626	1136	-	-	-
Mov Cap-2 Maneuver	474	-	-	-	-	-
Stage 1	656	-	-	-	-	-
Stage 2	880	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1136	-	474	626	-	-
HCM Lane V/C Ratio	0.003	-	0.015	0.049	-	-
HCM Control Delay (s)	8.2	-	12.7	11.1	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.2	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

No Build
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	45	51	25	30	45	15	20	100	15	25	288	101
Future Volume (vph)	45	51	25	30	45	15	20	100	15	25	288	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.972			0.977			0.985			0.967	
Fl _t Protected		0.982			0.984			0.993			0.997	
Satd. Flow (prot)	0	1800	0	0	1827	0	0	1730	0	0	1802	0
Fl _t Permitted		0.982			0.984			0.993			0.997	
Satd. Flow (perm)	0	1800	0	0	1827	0	0	1730	0	0	1802	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.86	0.86	0.86	0.76	0.76	0.76	0.63	0.63	0.63	0.71	0.71	0.71
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	10%	0%	0%	2%	1%
Adj. Flow (vph)	52	59	29	39	59	20	32	159	24	35	406	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	140	0	0	118	0	0	215	0	0	583	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	18.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	51	25	30	45	15	20	100	15	25	288	101
Future Vol, veh/h	45	51	25	30	45	15	20	100	15	25	288	101
Peak Hour Factor	0.86	0.86	0.86	0.76	0.76	0.76	0.63	0.63	0.63	0.71	0.71	0.71
Heavy Vehicles, %	2	0	0	0	0	0	0	10	0	0	2	1
Mvmt Flow	52	59	29	39	59	20	32	159	24	35	406	142
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.2	10.9	11.2	24.4
HCM LOS	B	B	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	37%	33%	6%
Vol Thru, %	74%	42%	50%	70%
Vol Right, %	11%	21%	17%	24%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	135	121	90	414
LT Vol	20	45	30	25
Through Vol	100	51	45	288
RT Vol	15	25	15	101
Lane Flow Rate	214	141	118	583
Geometry Grp	1	1	1	1
Degree of Util (X)	0.327	0.241	0.204	0.796
Departure Headway (Hd)	5.498	6.159	6.197	4.913
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	651	580	577	735
Service Time	3.556	4.226	4.266	2.954
HCM Lane V/C Ratio	0.329	0.243	0.205	0.793
HCM Control Delay	11.2	11.2	10.9	24.4
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	1.4	0.9	0.8	8.1

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

No Build
Timing Plan: PM



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	91	0	0	90	0	0
Future Volume (vph)	91	0	0	90	0	0
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						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	0	0	98	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	99	0	0	98	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	8.1% ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	91	0	0	90	0	0
Future Vol, veh/h	91	0	0	90	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	0	0	98	0	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	99	0	197
Stage 1	-	-	-	-	99
Stage 2	-	-	-	-	98
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1494	-	792
Stage 1	-	-	-	-	925
Stage 2	-	-	-	-	926
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1494	-	792
Mov Cap-2 Maneuver	-	-	-	-	792
Stage 1	-	-	-	-	925
Stage 2	-	-	-	-	926

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1494	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lanes, Volumes, Timings

No Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Plan: AM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	468	200	138	418	0	0	0	0	86	0	204
Future Volume (vph)	0	468	200	138	418	0	0	0	0	86	0	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.862	0.850
Fl _t Protected				0.950						0.950	0.996	
Satd. Flow (prot)	0	3008	1346	1583	3195	0	0	0	0	1499	1178	1288
Fl _t Permitted				0.950						0.950	0.996	
Satd. Flow (perm)	0	3008	1346	1583	3195	0	0	0	0	1499	1178	1288
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			213									
Link Speed (mph)		45			30			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			20.8			8.5			11.3	
Peak Hour Factor	0.94	0.94	0.94	0.74	0.74	0.74	0.88	0.88	0.88	0.89	0.89	0.89
Heavy Vehicles (%)	0%	20%	20%	14%	13%	0%	0%	0%	0%	22%	0%	31%
Adj. Flow (vph)	0	498	213	186	565	0	0	0	0	97	0	229
Shared Lane Traffic (%)										10%		48%
Lane Group Flow (vph)	0	498	213	186	565	0	0	0	0	87	120	119
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

No Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Plan: AM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		32.3	32.3	14.3	52.1					13.4	13.4	13.4
Actuated g/C Ratio		0.43	0.43	0.19	0.69					0.18	0.18	0.18
v/c Ratio		0.38	0.30	0.62	0.25					0.33	0.57	0.52
Control Delay		17.5	4.3	30.7	1.4					28.7	38.0	35.0
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		17.5	4.3	30.7	1.4					28.7	38.0	35.0
LOS		B	A	C	A					C	D	C
Approach Delay		13.5			8.7						34.4	
Approach LOS		B			A						C	
Queue Length 50th (ft)		82	0	49	7					37	57	53
Queue Length 95th (ft)		142	44	71	14					70	101	93
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1295	700	348	2181					389	306	334
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		0.38	0.30	0.53	0.26					0.22	0.39	0.36

Intersection Summary

Area Type:	Other
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	13 (17%), Referenced to phase 2:EBWB, Start of Yellow
Natural Cycle:	50
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	15.3
Intersection LOS:	B
Intersection Capacity Utilization:	43.3%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

No Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Plan: AM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	203	351	0	0	417	170	139	0	143	0	0	0
Future Volume (vph)	203	351	0	0	417	170	139	0	143	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t							0.850		0.850			
Fl _t Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1367	3223	0	0	3195	1312	1550	1453	1513	0	0	0
Fl _t Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1367	3223	0	0	3195	1312	1550	1453	1513	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						181						
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			13.0			15.5			11.1	
Peak Hour Factor	0.88	0.88	0.88	0.94	0.94	0.94	0.95	0.95	0.95	0.88	0.88	0.88
Heavy Vehicles (%)	32%	12%	0%	0%	13%	19%	18%	0%	21%	0%	0%	0%
Adj. Flow (vph)	231	399	0	0	444	181	146	0	151	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	231	399	0	0	444	181	73	73	151	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

No Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Plan: AM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	16.8	52.8			30.6	30.6	13.2	13.2	13.2			
Actuated g/C Ratio	0.22	0.70			0.41	0.41	0.18	0.18	0.18			
v/c Ratio	0.76	0.18			0.34	0.28	0.27	0.29	0.57			
Control Delay	34.0	0.9			11.6	2.2	27.8	28.3	36.2			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	34.0	0.9			11.6	2.2	27.8	28.3	36.2			
LOS	C	A			B	A	C	C	D			
Approach Delay		13.0			8.9			32.2				
Approach LOS		B			A			C				
Queue Length 50th (ft)	39	1			42	0	31	31	66			
Queue Length 95th (ft)	#183	3			57	6	62	63	111			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	320	2270			1302	642	392	368	383			
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	0.18			0.34	0.28	0.19	0.20	0.39			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 15.0
 Intersection LOS: B
 Intersection Capacity Utilization 43.3%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)

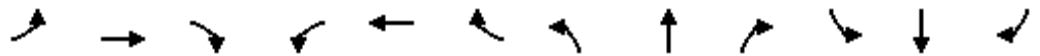


Lanes, Volumes, Timings

3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build

Timing Plan: AM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↔		↔	↕↕	↔	↔	↕	↔		↕↔	↔
Traffic Volume (vph)	87	399	8	0	477	25	15	1	0	34	0	95
Future Volume (vph)	87	399	8	0	477	25	15	1	0	34	0	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			0			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997				0.850						0.850
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1367	3211	0	1890	3265	1461	1685	1837	0	0	1736	1196
Flt Permitted	0.950						0.800				0.800	
Satd. Flow (perm)	1367	3211	0	1890	3265	1461	1419	1837	0	0	1462	1196
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				106						122
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		764			751			251			720	
Travel Time (s)		14.9			14.6			5.7			16.4	
Peak Hour Factor	0.81	0.81	0.81	0.86	0.86	0.86	0.38	0.38	0.38	0.81	0.81	0.81
Heavy Vehicles (%)	32%	12%	17%	0%	10%	10%	0%	0%	0%	4%	0%	35%
Adj. Flow (vph)	107	493	10	0	555	29	39	3	0	42	0	117
Shared Lane Traffic (%)												
Lane Group Flow (vph)	107	503	0	0	555	29	39	3	0	0	42	117
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	17.0			11.0			17.0	17.0		17.0	17.0	17.0
Total Split (%)	22.7%			14.7%			22.7%	22.7%		22.7%	22.7%	22.7%
Maximum Green (s)	11.6			5.7			12.1	12.1		12.1	12.1	11.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	30.0
Total Split (%)	40%
Maximum Green (s)	23.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build
 Timing Plan: AM Peak Gen

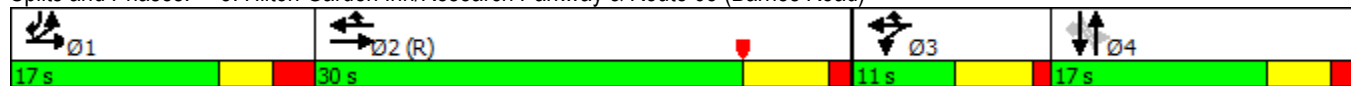


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effect Green (s)	10.6	51.1			45.0	45.0	7.8	7.8			7.8	18.5
Actuated g/C Ratio	0.14	0.68			0.60	0.60	0.10	0.10			0.10	0.25
v/c Ratio	0.55	0.23			0.28	0.03	0.27	0.02			0.28	0.30
Control Delay	43.6	3.1			9.7	0.1	35.3	29.0			35.5	5.4
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	43.6	3.1			9.7	0.1	35.3	29.0			35.5	5.4
LOS	D	A			A	A	D	C			D	A
Approach Delay		10.2			9.2			34.9			13.3	
Approach LOS		B			A			C			B	
Queue Length 50th (ft)	48	27			69	0	17	1			19	0
Queue Length 95th (ft)	80	27			112	0	18	4			41	22
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570					250						
Base Capacity (vph)	228	2132			1977	926	228	296			235	414
Starvation Cap Reductn	0	0			0	0	0	0			0	0
Spillback Cap Reductn	0	0			0	0	0	0			0	0
Storage Cap Reductn	0	0			0	0	0	0			0	0
Reduced v/c Ratio	0.47	0.24			0.28	0.03	0.17	0.01			0.18	0.28

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.55
 Intersection Signal Delay: 10.9
 Intersection Capacity Utilization 40.2%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A























Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

No Build
 Timing Plan: AM Peak Gen

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	9	0	0	0	6	107	0	0	120	0
Future Volume (vph)	0	0	9	0	0	0	6	107	0	0	120	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										
Flt Protected							0.950					
Satd. Flow (prot)	1900	1417	0	1900	1900	0	1504	1496	1900	1900	1484	0
Flt Permitted							0.950					
Satd. Flow (perm)	1900	1417	0	1900	1900	0	1504	1496	1900	1900	1484	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.58	0.58	0.58	0.88	0.88	0.88	0.63	0.63	0.63	0.80	0.80	0.80
Heavy Vehicles (%)	0%	0%	14%	0%	0%	0%	20%	27%	0%	0%	28%	0%
Adj. Flow (vph)	0	0	16	0	0	0	10	170	0	0	150	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	0	0	10	170	0	0	150	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	16.3%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷		↶	↶	↶	↶	↷	
Traffic Vol, veh/h	0	0	9	0	0	0	6	107	0	0	120	0
Future Vol, veh/h	0	0	9	0	0	0	6	107	0	0	120	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	170	-	-	140	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	58	58	58	88	88	88	63	63	63	80	80	80
Heavy Vehicles, %	0	0	14	0	0	0	20	27	0	0	28	0
Mvmt Flow	0	0	16	0	0	0	10	170	0	0	150	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	340	340	150	348	340	170	150	0	0	170	0	0
Stage 1	150	150	-	190	190	-	-	-	-	-	-	-
Stage 2	190	190	-	158	150	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.34	7.1	6.5	6.2	4.3	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.426	3.5	4	3.3	2.38	-	-	2.2	-	-
Pot Cap-1 Maneuver	618	585	866	610	585	879	1328	-	-	1420	-	-
Stage 1	857	777	-	816	747	-	-	-	-	-	-	-
Stage 2	816	747	-	849	777	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	614	580	866	595	580	879	1328	-	-	1420	-	-
Mov Cap-2 Maneuver	614	580	-	595	580	-	-	-	-	-	-	-
Stage 1	850	777	-	809	741	-	-	-	-	-	-	-
Stage 2	810	741	-	834	777	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	0	0.4	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1328	-	-	-	866	-	-	1420	-	-
HCM Lane V/C Ratio	0.007	-	-	-	0.018	-	-	-	-	-
HCM Control Delay (s)	7.7	-	-	0	9.2	0	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.1	-	-	0	-	-

Lanes, Volumes, Timings
5: Josheph Carini Rd

No Build
Timing Plan: AM Peak Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	11	11	96	109	0
Future Volume (vph)	0	11	11	96	109	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fl _t Protected	0.995					
Satd. Flow (prot)	1347	0	0	1470	1462	0
Fl _t Permitted	0.995					
Satd. Flow (perm)	1347	0	0	1470	1462	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.56	0.56	0.75	0.75	0.81	0.81
Heavy Vehicles (%)	0%	22%	0%	32%	30%	0%
Adj. Flow (vph)	0	20	15	128	135	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	0	0	143	135	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	11	11	96	109	0
Future Vol, veh/h	0	11	11	96	109	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	75	75	81	81
Heavy Vehicles, %	0	22	0	32	30	0
Mvmt Flow	0	20	15	128	135	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	293	135	135	0	-	0
Stage 1	135	-	-	-	-	-
Stage 2	158	-	-	-	-	-
Critical Hdwy	6.4	6.42	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.498	2.2	-	-	-
Pot Cap-1 Maneuver	702	863	1462	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	875	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	694	863	1462	-	-	-
Mov Cap-2 Maneuver	694	-	-	-	-	-
Stage 1	886	-	-	-	-	-
Stage 2	875	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1462	-	863	-	-
HCM Lane V/C Ratio	0.01	-	0.023	-	-
HCM Control Delay (s)	7.5	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

No Build
Timing Plan: AM Peak Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	3	0	96	106	1
Future Volume (vph)	0	3	0	96	106	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.999	
Flt Protected						
Satd. Flow (prot)	1900	1077	1900	1439	1474	0
Flt Permitted						
Satd. Flow (perm)	1900	1077	1900	1439	1474	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.50	0.50	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	50%	0%	32%	29%	0%
Adj. Flow (vph)	0	6	0	122	134	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	6	0	122	135	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.6%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	3	0	96	106	1
Future Vol, veh/h	0	3	0	96	106	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	79	79	79	79
Heavy Vehicles, %	0	50	0	32	29	0
Mvmt Flow	0	6	0	122	134	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	257	135	135	0	-	0
Stage 1	135	-	-	-	-	-
Stage 2	122	-	-	-	-	-
Critical Hdwy	6.4	6.7	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.75	2.2	-	-	-
Pot Cap-1 Maneuver	736	800	1462	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	908	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	736	800	1462	-	-	-
Mov Cap-2 Maneuver	736	-	-	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	908	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1462	-	-	800	-	-
HCM Lane V/C Ratio	-	-	-	0.008	-	-
HCM Control Delay (s)	0	-	0	9.5	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

No Build
Timing Plan: AM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	25	23	5	18	14	8	4	83	9	14	84	25
Future Volume (vph)	25	23	5	18	14	8	4	83	9	14	84	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.987			0.973			0.988			0.973	
Fl _t Protected		0.977			0.978			0.998			0.994	
Satd. Flow (prot)	0	1482	0	0	1648	0	0	1441	0	0	1464	0
Fl _t Permitted		0.977			0.978			0.998			0.994	
Satd. Flow (perm)	0	1482	0	0	1648	0	0	1441	0	0	1464	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.63	0.63	0.63	0.45	0.45	0.45	0.79	0.79	0.79	0.65	0.65	0.65
Heavy Vehicles (%)	30%	11%	50%	14%	0%	17%	33%	33%	0%	0%	33%	15%
Adj. Flow (vph)	40	37	8	40	31	18	5	105	11	22	129	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	85	0	0	89	0	0	121	0	0	189	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	23	5	18	14	8	4	83	9	14	84	25
Future Vol, veh/h	25	23	5	18	14	8	4	83	9	14	84	25
Peak Hour Factor	0.63	0.63	0.63	0.45	0.45	0.45	0.79	0.79	0.79	0.65	0.65	0.65
Heavy Vehicles, %	30	11	50	14	0	17	33	33	0	0	33	15
Mvmt Flow	40	37	8	40	31	18	5	105	11	22	129	38
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.1	8.7	9.2	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	47%	45%	11%
Vol Thru, %	86%	43%	35%	68%
Vol Right, %	9%	9%	20%	20%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	96	53	40	123
LT Vol	4	25	18	14
Through Vol	83	23	14	84
RT Vol	9	5	8	25
Lane Flow Rate	122	84	89	189
Geometry Grp	1	1	1	1
Degree of Util (X)	0.171	0.124	0.122	0.232
Departure Headway (Hd)	5.075	5.302	4.961	4.405
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	706	676	721	814
Service Time	3.11	3.342	3.002	2.435
HCM Lane V/C Ratio	0.173	0.124	0.123	0.232
HCM Control Delay	9.2	9.1	8.7	8.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.4	0.4	0.9

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

No Build
Timing Plan: AM Peak Gen



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	46	0	0	40	0	0
Future Volume (vph)	46	0	0	40	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	0	43	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	43	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	6.7%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	46	0	0	40	0	0
Future Vol, veh/h	46	0	0	40	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	0	0	43	0	0

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	0	0	50	93
Stage 1	-	-	-	50
Stage 2	-	-	-	43
Critical Hdwy	-	-	4.12	6.42
Critical Hdwy Stg 1	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	3.518
Pot Cap-1 Maneuver	-	-	1557	1018
Stage 1	-	-	-	972
Stage 2	-	-	-	979
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	1557	1018
Mov Cap-2 Maneuver	-	-	-	907
Stage 1	-	-	-	972
Stage 2	-	-	-	979

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1557	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lanes, Volumes, Timings

No Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘	↕	↗
Traffic Volume (vph)	0	380	132	152	371	0	0	0	0	85	0	93
Future Volume (vph)	0	380	132	152	371	0	0	0	0	85	0	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.909	0.850
Fl _t Protected				0.950						0.950	0.981	
Satd. Flow (prot)	0	3574	1553	1719	3505	0	0	0	0	1726	1478	1548
Fl _t Permitted				0.950						0.950	0.981	
Satd. Flow (perm)	0	3574	1553	1719	3505	0	0	0	0	1726	1478	1548
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			159									
Link Speed (mph)		45			30			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			20.8			8.5			11.3	
Peak Hour Factor	0.83	0.83	0.83	0.59	0.59	0.59	0.88	0.88	0.88	0.86	0.86	0.86
Heavy Vehicles (%)	0%	1%	4%	5%	3%	0%	0%	0%	0%	6%	0%	9%
Adj. Flow (vph)	0	458	159	258	629	0	0	0	0	99	0	108
Shared Lane Traffic (%)										27%		39%
Lane Group Flow (vph)	0	458	159	258	629	0	0	0	0	72	69	66
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

No Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		34.4	34.4	18.5	59.2					10.0	10.0	10.0
Actuated g/C Ratio		0.46	0.46	0.25	0.79					0.13	0.13	0.13
v/c Ratio		0.28	0.20	0.61	0.23					0.31	0.35	0.32
Control Delay		15.7	4.1	26.7	1.2					32.9	34.5	33.5
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		15.7	4.1	26.7	1.2					32.9	34.5	33.5
LOS		B	A	C	A					C	C	C
Approach Delay		12.7			8.6						33.6	
Approach LOS		B			A						C	
Queue Length 50th (ft)		71	0	75	9					32	32	30
Queue Length 95th (ft)		113	30	71	12					65	67	62
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1641	798	444	2768					448	384	402
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		0.28	0.20	0.58	0.23					0.16	0.18	0.16

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 13.1
 Intersection LOS: B
 Intersection Capacity Utilization 40.9%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

No Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	80	385	0	0	359	96	164	0	160	0	0	0
Future Volume (vph)	80	385	0	0	359	96	164	0	160	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1719	3574	0	0	3539	1406	1678	1573	1743	0	0	0
Fl _t Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1719	3574	0	0	3539	1406	1678	1573	1743	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						119						
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			13.0			15.5			11.1	
Peak Hour Factor	0.85	0.85	0.85	0.81	0.81	0.81	0.84	0.84	0.84	0.88	0.88	0.88
Heavy Vehicles (%)	5%	1%	0%	0%	2%	11%	9%	0%	5%	0%	0%	0%
Adj. Flow (vph)	94	453	0	0	443	119	195	0	190	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	94	453	0	0	443	119	97	98	190	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

No Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	10.4	52.2			36.3	36.3	13.8	13.8	13.8			
Actuated g/C Ratio	0.14	0.70			0.48	0.48	0.18	0.18	0.18			
v/c Ratio	0.39	0.18			0.26	0.16	0.31	0.34	0.59			
Control Delay	22.2	0.9			7.3	1.2	27.9	28.6	35.1			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	22.2	0.9			7.3	1.2	27.9	28.6	35.1			
LOS	C	A			A	A	C	C	D			
Approach Delay		4.6			6.0			31.6				
Approach LOS		A			A			C				
Queue Length 50th (ft)	20	0			19	1	42	42	82			
Queue Length 95th (ft)	26	0			43	4	71	72	121			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	366	2460			1713	742	425	398	441			
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	0.26	0.18			0.26	0.16	0.23	0.25	0.43			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 12.1
 Intersection Capacity Utilization 40.9%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build

Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	76	454	15	3	373	27	8	1	8	19	1	74	
Future Volume (vph)	76	454	15	3	373	27	8	1	8	19	1	74	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12	
Grade (%)		0%			1%			0%			0%		
Storage Length (ft)	570		0	100		250	0		0	345		0	
Storage Lanes	1		0	1		1	1		0	1		1	
Taper Length (ft)	50			100			0			130			
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.995				0.850		0.862				0.850	
Flt Protected	0.950			0.950			0.950					0.954	
Satd. Flow (prot)	1597	3557	0	1796	3522	1607	1685	1583	0	0	1746	1196	
Flt Permitted	0.950			0.950			0.909				0.889		
Satd. Flow (perm)	1597	3557	0	1796	3522	1607	1612	1583	0	0	1627	1196	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		7				106		11				122	
Link Speed (mph)		35			35			30				30	
Link Distance (ft)		764			751			251				720	
Travel Time (s)		14.9			14.6			5.7				16.4	
Peak Hour Factor	0.78	0.78	0.78	0.80	0.80	0.80	0.75	0.75	0.75	0.86	0.86	0.86	
Heavy Vehicles (%)	13%	1%	0%	0%	2%	0%	0%	0%	0%	4%	0%	35%	
Adj. Flow (vph)	97	582	19	4	466	34	11	1	11	22	1	86	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	97	601	0	4	466	34	11	12	0	0	23	86	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)		12			12			10				0	
Link Offset(ft)		0			0			0				0	
Crosswalk Width(ft)		16			16			16				16	
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15		12	15		12	15		12	15		12	
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov	
Protected Phases	1	1 2		3	2 3	2 3		4			4	1	
Permitted Phases							4			4		4	
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1	
Switch Phase													
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0	
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4	
Total Split (s)	17.0			11.0			17.0	17.0		17.0	17.0	17.0	
Total Split (%)	22.7%			14.7%			22.7%	22.7%		22.7%	22.7%	22.7%	
Maximum Green (s)	11.6			5.7			12.1	12.1		12.1	12.1	11.6	
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0	
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4	
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4	
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead	
Lead-Lag Optimize?													

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build
 Timing Plan: PM Peak Gen

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	30.0
Total Split (%)	40%
Maximum Green (s)	23.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

No Build
 Timing Plan: PM Peak Gen

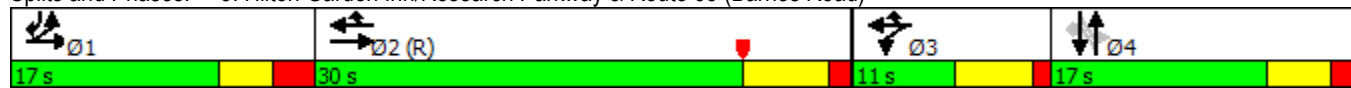


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	10.8	51.7		5.3	45.4	45.4	7.2	7.2			7.2	18.1
Actuated g/C Ratio	0.14	0.69		0.07	0.61	0.61	0.10	0.10			0.10	0.24
v/c Ratio	0.42	0.25		0.03	0.22	0.03	0.07	0.07			0.15	0.23
Control Delay	38.2	3.0		32.7	9.0	0.1	31.9	19.0			33.4	3.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	38.2	3.0		32.7	9.0	0.1	31.9	19.0			33.4	3.0
LOS	D	A		C	A	A	C	B			C	A
Approach Delay		7.9			8.6			25.2			9.4	
Approach LOS		A			A			C			A	
Queue Length 50th (ft)	47	35		2	55	0	5	0			10	0
Queue Length 95th (ft)	61	32		10	85	0	16	12			30	12
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	273	2408		139	2112	1006	260	264			262	410
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.36	0.25		0.03	0.22	0.03	0.04	0.05			0.09	0.21

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.42
 Intersection Signal Delay: 8.6
 Intersection Capacity Utilization 38.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A























Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

No Build
Timing Plan: PM Peak Gen

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	1	0	0	0	0	104	0	0	93	0
Future Volume (vph)	0	0	1	0	0	0	0	104	0	0	93	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										
Flt Protected												
Satd. Flow (prot)	1900	1615	0	1900	1900	0	1900	1743	1900	1900	1743	0
Flt Permitted												
Satd. Flow (perm)	1900	1615	0	1900	1900	0	1900	1743	1900	1900	1743	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.25	0.25	0.25	0.88	0.88	0.88	0.90	0.90	0.90	0.82	0.82	0.82
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	9%	0%
Adj. Flow (vph)	0	0	4	0	0	0	0	116	0	0	113	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	0	0	0	116	0	0	113	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	15.5%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷		↶	↶	↶	↶	↷	
Traffic Vol, veh/h	0	0	1	0	0	0	0	104	0	0	93	0
Future Vol, veh/h	0	0	1	0	0	0	0	104	0	0	93	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	170	-	-	140	-	0	115	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	25	25	88	88	88	90	90	90	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	0	9	0	0	9	0
Mvmt Flow	0	0	4	0	0	0	0	116	0	0	113	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	229	229	113	231	229	116	113	0	0	116	0	0
Stage 1	113	113	-	116	116	-	-	-	-	-	-	-
Stage 2	116	116	-	115	113	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	730	674	945	728	674	942	1489	-	-	1485	-	-
Stage 1	897	806	-	894	803	-	-	-	-	-	-	-
Stage 2	894	803	-	895	806	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	730	674	945	725	674	942	1489	-	-	1485	-	-
Mov Cap-2 Maneuver	730	674	-	725	674	-	-	-	-	-	-	-
Stage 1	897	806	-	894	803	-	-	-	-	-	-	-
Stage 2	894	803	-	891	806	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	8.8		0		0		0	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1489	-	-	-	945	-	-	1485	-	-
HCM Lane V/C Ratio	-	-	-	-	0.004	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	8.8	0	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0	-	-	0	-	-

Lanes, Volumes, Timings
5: Joseph Carini Rd

No Build
Timing Plan: PM Peak Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	1	103	92	0
Future Volume (vph)	0	1	1	103	92	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fl _t Protected						
Satd. Flow (prot)	1644	0	0	1744	1743	0
Fl _t Permitted						
Satd. Flow (perm)	1644	0	0	1744	1743	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.25	0.25	0.83	0.83	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	9%	9%	0%
Adj. Flow (vph)	0	4	1	124	108	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	0	125	108	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.2%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	1	1	103	92	0
Future Vol, veh/h	0	1	1	103	92	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	83	83	85	85
Heavy Vehicles, %	0	0	0	9	9	0
Mvmt Flow	0	4	1	124	108	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	234	108	108	0	-	0
Stage 1	108	-	-	-	-	-
Stage 2	126	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	759	951	1495	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	905	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	758	951	1495	-	-	-
Mov Cap-2 Maneuver	758	-	-	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	905	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1495	-	951	-	-
HCM Lane V/C Ratio	0.001	-	0.004	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

No Build
Timing Plan: PM Peak Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	0	103	91	0
Future Volume (vph)	0	1	0	103	91	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	1900	1615	1900	1743	1696	0
Flt Permitted						
Satd. Flow (perm)	1900	1615	1900	1743	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.25	0.25	0.81	0.81	0.77	0.77
Heavy Vehicles (%)	0%	0%	0%	9%	12%	0%
Adj. Flow (vph)	0	4	0	127	118	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	0	127	118	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.8%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	1	0	103	91	0
Future Vol, veh/h	0	1	0	103	91	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	81	81	77	77
Heavy Vehicles, %	0	0	0	9	12	0
Mvmt Flow	0	4	0	127	118	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	245	118	118	0	-	0
Stage 1	118	-	-	-	-	-
Stage 2	127	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	748	939	1483	-	-	-
Stage 1	912	-	-	-	-	-
Stage 2	904	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	748	939	1483	-	-	-
Mov Cap-2 Maneuver	748	-	-	-	-	-
Stage 1	912	-	-	-	-	-
Stage 2	904	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1483	-	-	939	-	-
HCM Lane V/C Ratio	-	-	-	0.004	-	-
HCM Control Delay (s)	0	-	0	8.9	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

No Build
Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	23	19	3	4	15	7	7	82	14	11	84	22
Future Volume (vph)	23	19	3	4	15	7	7	82	14	11	84	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.990			0.963			0.982			0.974	
Fl _t Protected		0.975			0.993			0.997			0.995	
Satd. Flow (prot)	0	1834	0	0	1817	0	0	1710	0	0	1678	0
Fl _t Permitted		0.975			0.993			0.997			0.995	
Satd. Flow (perm)	0	1834	0	0	1817	0	0	1710	0	0	1678	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.64	0.64	0.64	0.66	0.66	0.66	0.72	0.72	0.72	0.67	0.67	0.67
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	12%	6%
Adj. Flow (vph)	36	30	5	6	23	11	10	114	19	16	125	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	71	0	0	40	0	0	143	0	0	174	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	19	3	4	15	7	7	82	14	11	84	22
Future Vol, veh/h	23	19	3	4	15	7	7	82	14	11	84	22
Peak Hour Factor	0.64	0.64	0.64	0.66	0.66	0.66	0.72	0.72	0.72	0.67	0.67	0.67
Heavy Vehicles, %	0	0	0	0	0	0	0	11	0	0	12	6
Mvmt Flow	36	30	5	6	23	11	10	114	19	16	125	33
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	7.8	8.2	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	51%	15%	9%
Vol Thru, %	80%	42%	58%	72%
Vol Right, %	14%	7%	27%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	103	45	26	117
LT Vol	7	23	4	11
Through Vol	82	19	15	84
RT Vol	14	3	7	22
Lane Flow Rate	143	70	39	175
Geometry Grp	1	1	1	1
Degree of Util (X)	0.17	0.092	0.05	0.205
Departure Headway (Hd)	4.276	4.702	4.55	4.219
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	841	763	787	852
Service Time	2.291	2.725	2.574	2.234
HCM Lane V/C Ratio	0.17	0.092	0.05	0.205
HCM Control Delay	8.2	8.2	7.8	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.3	0.2	0.8

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

No Build
Timing Plan: PM Peak Gen



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	44	0	0	26	0	0
Future Volume (vph)	44	0	0	26	0	0
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						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	0	0	28	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	0	0	28	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	6.7% ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	44	0	0	26	0	0
Future Vol, veh/h	44	0	0	26	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	0	0	28	0	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	48	0	76
Stage 1	-	-	-	-	48
Stage 2	-	-	-	-	28
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1559	-	927
Stage 1	-	-	-	-	974
Stage 2	-	-	-	-	995
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1559	-	927
Mov Cap-2 Maneuver	-	-	-	-	927
Stage 1	-	-	-	-	974
Stage 2	-	-	-	-	995

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1559	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

BUILD

Lanes, Volumes, Timings

Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	581	227	309	914	0	0	0	0	172	0	409
Future Volume (vph)	0	581	227	309	914	0	0	0	0	172	0	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.862	0.850
Fl _t Protected				0.950						0.950	0.996	
Satd. Flow (prot)	0	3008	1455	1597	2756	0	0	0	0	1678	1318	1442
Fl _t Permitted				0.950						0.950	0.996	
Satd. Flow (perm)	0	3008	1455	1597	2756	0	0	0	0	1678	1318	1442
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			241									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.88	0.88	0.88	0.82	0.82	0.82
Heavy Vehicles (%)	0%	20%	11%	13%	31%	0%	0%	0%	0%	9%	0%	17%
Adj. Flow (vph)	0	618	241	336	993	0	0	0	0	210	0	499
Shared Lane Traffic (%)										10%		48%
Lane Group Flow (vph)	0	618	241	336	993	0	0	0	0	189	261	259
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		2	2	1	1 2					4	4	4
Permitted Phases												
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		23.0	23.0	26.0						31.0	31.0	31.0
Total Split (%)		28.8%	28.8%	32.5%						38.8%	38.8%	38.8%
Maximum Green (s)		17.5	17.5	22.0						25.5	25.5	25.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		22.0	22.0	22.0	49.6					20.9	20.9	20.9
Actuated g/C Ratio		0.28	0.28	0.28	0.62					0.26	0.26	0.26
v/c Ratio		0.75	0.42	0.77	0.58					0.43	0.76	0.69
Control Delay		36.0	6.5	31.0	4.8					26.6	41.0	35.7
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		36.0	6.5	31.0	4.8					26.6	41.0	35.7
LOS		D	A	C	A					C	D	D
Approach Delay		27.7			11.4						35.2	
Approach LOS		C			B						D	
Queue Length 50th (ft)		160	0	115	47					80	128	118
Queue Length 95th (ft)		#263	56	m187	m235					118	183	168
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		829	575	457	1707					534	420	459
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		0.75	0.42	0.74	0.58					0.35	0.62	0.56

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 78 (98%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 22.1
 Intersection LOS: C
 Intersection Capacity Utilization 56.7%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	192	561	0	0	880	248	343	5	263	0	0	0
Future Volume (vph)	192	561	0	0	880	248	343	5	263	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.954				
Satd. Flow (prot)	1656	3008	0	0	2735	1394	1604	1516	1606	0	0	0
Fl _t Permitted	0.950						0.950	0.954				
Satd. Flow (perm)	1656	3008	0	0	2735	1394	1604	1516	1606	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						256						
Link Speed (mph)		35			35			30				30
Link Distance (ft)		913			764			683				489
Travel Time (s)		17.8			14.9			15.5				11.1
Peak Hour Factor	0.93	0.93	0.93	0.97	0.97	0.97	0.86	0.86	0.86	0.88	0.88	0.88
Heavy Vehicles (%)	9%	20%	0%	0%	32%	12%	14%	0%	14%	0%	0%	0%
Adj. Flow (vph)	206	603	0	0	907	256	399	6	306	0	0	0
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	206	603	0	0	907	256	203	202	306	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14				14
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	25.0				29.0	29.0	26.0	26.0	26.0			
Total Split (%)	31.3%				36.3%	36.3%	32.5%	32.5%	32.5%			
Maximum Green (s)	21.0				23.5	23.5	21.0	21.0	21.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max	None	None	None		
Act Effct Green (s)	16.2	52.0			30.3	30.3	19.0	19.0	19.0			
Actuated g/C Ratio	0.20	0.65			0.38	0.38	0.24	0.24	0.24			
v/c Ratio	0.62	0.31			0.87	0.37	0.53	0.56	0.80			
Control Delay	44.2	1.0			35.5	11.2	31.7	32.9	45.5			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	44.2	1.0			35.5	11.2	31.7	32.9	45.5			
LOS	D	A			D	B	C	C	D			
Approach Delay	12.0			30.2			38.0					
Approach LOS	B			C			D					
Queue Length 50th (ft)	93	4			180	40	90	90	139			
Queue Length 95th (ft)	m104	10			m#271	m49	149	150	#221			
Internal Link Dist (ft)	833		684		603		409					
Turn Bay Length (ft)	830			480			180		180			
Base Capacity (vph)	434	1933			1037	687	421	397	421			
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	0.47	0.31			0.87	0.37	0.48	0.51	0.73			

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 34 (43%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 26.8 Intersection LOS: C
 Intersection Capacity Utilization 56.7% ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build
 Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	520	25	10	980	126	35	25	10	30	5	113
Future Volume (vph)	279	520	25	10	980	126	35	25	10	30	5	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.957				0.850
Flt Protected	0.950			0.950			0.950				0.959	
Satd. Flow (prot)	3045	1547	0	1796	2477	1516	1668	1753	0	0	1791	1509
Flt Permitted	0.950			0.950			0.729				0.708	
Satd. Flow (perm)	3045	1547	0	1796	2477	1516	1280	1753	0	0	1322	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				142		20				115
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.51	0.51	0.51	0.81	0.81	0.81
Heavy Vehicles (%)	15%	23%	1%	0%	45%	6%	1%	0%	1%	2%	0%	7%
Adj. Flow (vph)	303	565	27	11	1101	142	69	49	20	37	6	140
Shared Lane Traffic (%)												
Lane Group Flow (vph)	303	592	0	11	1101	142	69	69	0	0	43	140
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pt+ov
Protected Phases	7	7 8		3	3 8	3 8		4			4	4 7
Permitted Phases							4			4		
Detector Phase	7	7 8		3	3 8	3 8	4	4		4	4	4 7
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	
Total Split (s)	26.0			11.0			19.0	19.0		19.0	19.0	
Total Split (%)	32.5%			13.8%			23.8%	23.8%		23.8%	23.8%	
Maximum Green (s)	20.6			5.7			14.1	14.1		14.1	14.1	
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	
Lost Time Adjust (s)	0.0			0.0			0.0	0.0			0.0	
Total Lost Time (s)	5.4			5.3			4.9	4.9			4.9	
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build
 Timing Plan: AM

Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	24.0
Total Split (%)	30%
Maximum Green (s)	17.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build
 Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0		1.5			2.0		2.0		2.0		2.0
Recall Mode	None			None			None		None		None	None
Act Effct Green (s)	20.5	49.3		5.7	34.5	34.5	9.4	9.4		9.4		35.3
Actuated g/C Ratio	0.26	0.62		0.07	0.43	0.43	0.12	0.12		0.12		0.44
v/c Ratio	0.39	0.62		0.09	1.03	0.19	0.46	0.31		0.28		0.19
Control Delay	27.2	12.1		36.4	63.0	4.0	41.9	27.3		35.5		3.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	27.2	12.1		36.4	63.0	4.0	41.9	27.3		35.5		3.9
LOS	C	B		D	E	A	D	C		D		A
Approach Delay	17.2			56.1			34.6		11.4			
Approach LOS	B			E			C		B			
Queue Length 50th (ft)	61	68		5	~346	0	33	23		20		6
Queue Length 95th (ft)	m103	135		21	#470	33	37	27		42		27
Internal Link Dist (ft)	684			671			171		640			
Turn Bay Length (ft)	570			100			250					
Base Capacity (vph)	845	939		127	1066	733	225	325		233		739
Starvation Cap Reductn	0	0		0	0	0	0	0		0		0
Spillback Cap Reductn	0	0		0	0	0	0	0		0		0
Storage Cap Reductn	0	0		0	0	0	0	0		0		0
Reduced v/c Ratio	0.36	0.63		0.09	1.03	0.19	0.31	0.21		0.18		0.19

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 27 (34%), Referenced to phase 8:EBWB, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.03
 Intersection Signal Delay: 37.5 Intersection LOS: D
 Intersection Capacity Utilization 56.7% ICU Level of Service B
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø8
Vehicle Extension (s)	5.0
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Build
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	5	2	0	0	35	394	1	0	141	0
Future Volume (vph)	0	0	5	2	0	0	35	394	1	0	141	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850							0.850			
Flt Protected				0.950			0.950					
Satd. Flow (prot)	1900	1615	0	1805	1900	0	1805	1845	1615	1712	1727	0
Flt Permitted							0.636					
Satd. Flow (perm)	1900	1615	0	1900	1900	0	1208	1845	1615	1712	1727	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		676							65			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.42	0.42	0.42	0.88	0.88	0.88	0.67	0.67	0.67	0.73	0.73	0.73
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	11%	10%	0%
Adj. Flow (vph)	0	0	12	2	0	0	52	588	1	0	193	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	2	0	0	52	588	1	0	193	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			4			2			1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	1.0	2.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Build
 Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		7.2		7.2			37.5	37.5	37.5		37.5	
Actuated g/C Ratio		0.18		0.18			0.94	0.94	0.94		0.94	
v/c Ratio		0.01		0.01			0.05	0.34	0.00		0.12	
Control Delay		0.0		17.5			1.5	2.1	0.0		1.4	
Queue Delay		0.0		0.0			0.0	0.0	0.0		0.0	
Total Delay		0.0		17.5			1.5	2.1	0.0		1.4	
LOS		A		B			A	A	A		A	
Approach Delay					17.5			2.0				1.4
Approach LOS					B			A				A
Queue Length 50th (ft)		0		0			0	0	0		0	
Queue Length 95th (ft)		0		6			9	76	0		27	
Internal Link Dist (ft)		116			123			640				398
Turn Bay Length (ft)				170			140					
Base Capacity (vph)		1522		1714			1159	1771	1553		1658	
Starvation Cap Reductn		0		0			0	0	0		0	
Spillback Cap Reductn		0		0			0	0	0		0	
Storage Cap Reductn		0		0			0	0	0		0	
Reduced v/c Ratio		0.01		0.00			0.04	0.33	0.00		0.12	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 40.1
 Natural Cycle: 50
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.34
 Intersection Signal Delay: 1.9
 Intersection LOS: A
 Intersection Capacity Utilization 44.1%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Josheph Carini Rd

Build
Timing Plan: AM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	6	58	336	135	6
Future Volume (vph)	0	6	58	336	135	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865			0.994		
Fl _t Protected				0.993		
Satd. Flow (prot)	1096	0	0	1705	1597	0
Fl _t Permitted				0.993		
Satd. Flow (perm)	1096	0	0	1705	1597	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.50	0.50	0.90	0.90	0.63	0.63
Heavy Vehicles (%)	0%	50%	3%	12%	19%	2%
Adj. Flow (vph)	0	12	64	373	214	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	437	224	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.7%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	6	58	336	135	6
Future Vol, veh/h	0	6	58	336	135	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	90	90	63	63
Heavy Vehicles, %	0	50	3	12	19	2
Mvmt Flow	0	12	64	373	214	10

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	720	219	224	0	0
Stage 1	219	-	-	-	-
Stage 2	501	-	-	-	-
Critical Hdwy	6.4	6.7	4.13	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.75	2.227	-	-
Pot Cap-1 Maneuver	398	714	1339	-	-
Stage 1	822	-	-	-	-
Stage 2	613	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	374	714	1339	-	-
Mov Cap-2 Maneuver	374	-	-	-	-
Stage 1	773	-	-	-	-
Stage 2	613	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1339	-	714	-	-
HCM Lane V/C Ratio	0.048	-	0.017	-	-
HCM Control Delay (s)	7.8	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	-	-

Lanes, Volumes, Timings
6: Research Parkway

Build
Timing Plan: AM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	6	330	141	2
Future Volume (vph)	0	0	6	330	141	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998	
Flt Protected			0.950			
Satd. Flow (prot)	1900	1900	1805	1667	1623	0
Flt Permitted			0.950			
Satd. Flow (perm)	1900	1900	1805	1667	1623	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.25	0.25	0.89	0.89	0.81	0.81
Heavy Vehicles (%)	0%	0%	0%	14%	17%	0%
Adj. Flow (vph)	0	0	7	371	174	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	7	371	176	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	20.7%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	0	6	330	141	2
Future Vol, veh/h	0	0	6	330	141	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	89	89	81	81
Heavy Vehicles, %	0	0	0	14	17	0
Mvmt Flow	0	0	7	371	174	2

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	560	175	176	0	0
Stage 1	175	-	-	-	-
Stage 2	385	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	493	874	1412	-	-
Stage 1	860	-	-	-	-
Stage 2	692	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	491	874	1412	-	-
Mov Cap-2 Maneuver	491	-	-	-	-
Stage 1	856	-	-	-	-
Stage 2	692	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1412	-	-	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-	-	-
HCM Control Delay (s)	7.6	-	0	0	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Build
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	101	61	25	40	66	20	15	275	40	25	78	45
Future Volume (vph)	101	61	25	40	66	20	15	275	40	25	78	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.982			0.979			0.984			0.959	
Fl _t Protected		0.974			0.984			0.998			0.992	
Satd. Flow (prot)	0	1749	0	0	1764	0	0	1803	0	0	1734	0
Fl _t Permitted		0.974			0.984			0.998			0.992	
Satd. Flow (perm)	0	1749	0	0	1764	0	0	1803	0	0	1734	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.62	0.62	0.62	0.71	0.71	0.71	0.69	0.69	0.69	0.76	0.76	0.76
Heavy Vehicles (%)	0%	5%	17%	6%	2%	5%	8%	3%	5%	9%	4%	2%
Adj. Flow (vph)	163	98	40	56	93	28	22	399	58	33	103	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	301	0	0	177	0	0	479	0	0	195	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.7%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	20.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	101	61	25	40	66	20	15	275	40	25	78	45
Future Vol, veh/h	101	61	25	40	66	20	15	275	40	25	78	45
Peak Hour Factor	0.62	0.62	0.62	0.71	0.71	0.71	0.69	0.69	0.69	0.76	0.76	0.76
Heavy Vehicles, %	0	5	17	6	2	5	8	3	5	9	4	2
Mvmt Flow	163	98	40	56	93	28	22	399	58	33	103	59
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	17	13.4	28.8	13.2
HCM LOS	C	B	D	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	54%	32%	17%
Vol Thru, %	83%	33%	52%	53%
Vol Right, %	12%	13%	16%	30%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	330	187	126	148
LT Vol	15	101	40	25
Through Vol	275	61	66	78
RT Vol	40	25	20	45
Lane Flow Rate	478	302	177	195
Geometry Grp	1	1	1	1
Degree of Util (X)	0.799	0.543	0.337	0.354
Departure Headway (Hd)	6.015	6.478	6.842	6.548
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	603	555	524	547
Service Time	4.065	4.535	4.909	4.615
HCM Lane V/C Ratio	0.793	0.544	0.338	0.356
HCM Control Delay	28.8	17	13.4	13.2
HCM Lane LOS	D	C	B	B
HCM 95th-tile Q	7.8	3.2	1.5	1.6

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Build
Timing Plan: AM



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	126	0	0	126	0	0
Future Volume (vph)	126	0	0	126	0	0
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						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	0	0	137	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	137	0	0	137	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	10.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	126	0	0	126	0	0
Future Vol, veh/h	126	0	0	126	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	137	0	0	137	0	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	137	0	274
Stage 1	-	-	-	-	137
Stage 2	-	-	-	-	137
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1447	-	716
Stage 1	-	-	-	-	890
Stage 2	-	-	-	-	890
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1447	-	716
Mov Cap-2 Maneuver	-	-	-	-	716
Stage 1	-	-	-	-	890
Stage 2	-	-	-	-	890

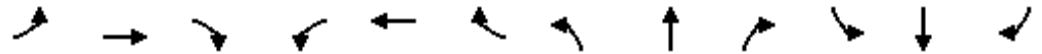
Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1447	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lanes, Volumes, Timings

Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘	↕	↗
Traffic Volume (vph)	0	511	172	175	559	0	0	0	0	131	1	172
Future Volume (vph)	0	511	172	175	559	0	0	0	0	131	1	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.890	0.850
Fl _t Protected				0.950						0.950	0.987	
Satd. Flow (prot)	0	3223	1455	1467	3343	0	0	0	0	1577	1237	1288
Fl _t Permitted				0.950						0.950	0.987	
Satd. Flow (perm)	0	3223	1455	1467	3343	0	0	0	0	1577	1237	1288
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			198									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.87	0.87	0.87	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Heavy Vehicles (%)	0%	12%	11%	23%	8%	0%	0%	0%	0%	16%	0%	31%
Adj. Flow (vph)	0	587	198	192	614	0	0	0	0	146	1	191
Shared Lane Traffic (%)										20%		43%
Lane Group Flow (vph)	0	587	198	192	614	0	0	0	0	117	112	109
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		32.1	32.1	15.2	52.8					12.7	12.7	12.7
Actuated g/C Ratio		0.43	0.43	0.20	0.70					0.17	0.17	0.17
v/c Ratio		0.43	0.27	0.65	0.26					0.44	0.54	0.50
Control Delay		17.9	4.1	30.7	0.8					32.2	37.2	35.4
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		17.9	4.1	30.7	0.8					32.2	37.2	35.4
LOS		B	A	C	A					C	D	D
Approach Delay		14.4			7.9						34.9	
Approach LOS		B			A						C	
Queue Length 50th (ft)		98	0	38	0					52	53	49
Queue Length 95th (ft)		159	38	77	1					92	97	90
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1381	736	334	2341					410	321	334
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		0.43	0.27	0.57	0.26					0.29	0.35	0.33

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 15.3

Intersection LOS: B

Intersection Capacity Utilization 44.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	169	473	0	0	576	174	158	0	127	0	0	0
Future Volume (vph)	169	473	0	0	576	174	158	0	127	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1433	3343	0	0	3282	1269	1604	1504	1551	0	0	0
Fl _t Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1433	3343	0	0	3282	1269	1604	1504	1551	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						191						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.95	0.95	0.95	0.91	0.91	0.91	0.90	0.90	0.90	0.88	0.88	0.88
Heavy Vehicles (%)	26%	8%	0%	0%	10%	23%	14%	0%	18%	0%	0%	0%
Adj. Flow (vph)	178	498	0	0	633	191	176	0	141	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	178	498	0	0	633	191	88	88	141	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	14.5	53.4			33.4	33.4	12.6	12.6	12.6			
Actuated g/C Ratio	0.19	0.71			0.45	0.45	0.17	0.17	0.17			
v/c Ratio	0.64	0.21			0.43	0.28	0.33	0.35	0.54			
Control Delay	27.9	0.6			11.5	2.0	29.6	30.3	35.7			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	27.9	0.6			11.5	2.0	29.6	30.3	35.7			
LOS	C	A			B	A	C	C	D			
Approach Delay		7.8			9.3			32.5				
Approach LOS		A			A			C				
Queue Length 50th (ft)	35	0			53	0	38	38	61			
Queue Length 95th (ft)	54	1			94	9	73	74	105			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	319	2342			1463	671	406	381	392			
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	0.21			0.43	0.28	0.22	0.23	0.36			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 12.8
 Intersection Capacity Utilization 44.9%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build
 Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗			↖	↗
Traffic Volume (vph)	88	505	7	1	532	20	5	0	2	53	0	213
Future Volume (vph)	88	505	7	1	532	20	5	0	2	53	0	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998				0.850		0.850				0.850
Flt Protected	0.950			0.950			0.950				0.950	
Satd. Flow (prot)	1410	3364	0	1796	3295	1530	1404	1041	0	0	1480	1282
Flt Permitted	0.950			0.950			0.719				0.754	
Satd. Flow (perm)	1410	3364	0	1796	3295	1530	1063	1041	0	0	1174	1282
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				106		428				205
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.44	0.44	0.44	0.90	0.90	0.90
Heavy Vehicles (%)	28%	7%	14%	0%	9%	5%	20%	0%	50%	22%	0%	26%
Adj. Flow (vph)	95	543	8	1	578	22	11	0	5	59	0	237
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	551	0	1	578	22	11	5	0	0	59	237
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	20.0			12.0			15.0	15.0		15.0	15.0	20.0
Total Split (%)	26.7%			16.0%			20.0%	20.0%		20.0%	20.0%	26.7%
Maximum Green (s)	14.6			6.7			10.1	10.1		10.1	10.1	14.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build
 Timing Plan: MD

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	28.0
Total Split (%)	37%
Maximum Green (s)	21.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build
 Timing Plan: MD



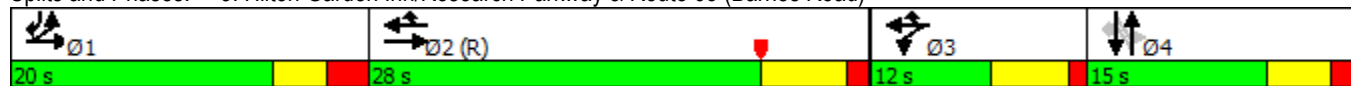
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effect Green (s)	11.0	50.3		5.5	43.9	43.9	8.4	8.4			8.4	19.6
Actuated g/C Ratio	0.15	0.67		0.07	0.59	0.59	0.11	0.11			0.11	0.26
v/c Ratio	0.46	0.24		0.01	0.30	0.02	0.09	0.01			0.45	0.49
Control Delay	41.0	3.5		32.0	10.5	0.1	30.8	0.0			41.9	7.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	41.0	3.5		32.0	10.5	0.1	30.8	0.0			41.9	7.4
LOS	D	A		C	B	A	C	A			D	A
Approach Delay		9.0			10.2			21.2			14.3	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	39	31		0	78	0	5	0			26	10
Queue Length 95th (ft)	87	39		5	128	0	9	0			61	52
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	274	2189		160	1984	963	143	510			158	537
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.35	0.25		0.01	0.29	0.02	0.08	0.01			0.37	0.44

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 10.6
 Intersection Capacity Utilization 47.4%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Build
Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	8	0	0	0	5	103	0	0	258	1
Future Volume (vph)	2	0	8	0	0	0	5	103	0	0	258	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										0.999
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1805	1615	0	1900	1900	0	1805	1520	1900	1900	1484	0
Flt Permitted							0.587					
Satd. Flow (perm)	1900	1615	0	1900	1900	0	1115	1520	1900	1900	1484	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		550										
Link Speed (mph)		30			30			30				30
Link Distance (ft)		196			203			720				478
Travel Time (s)		4.5			4.6			16.4				10.9
Peak Hour Factor	0.63	0.63	0.63	0.88	0.88	0.88	0.81	0.81	0.81	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	28%	0%
Adj. Flow (vph)	3	0	13	0	0	0	6	127	0	0	280	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	13	0	0	0	0	6	127	0	0	281	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12				12
Link Offset(ft)		0			12			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt		NA
Protected Phases		4			4			2			1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Build
 Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	7.1	7.1					35.6	35.6				35.6
Actuated g/C Ratio	0.18	0.18					0.92	0.92				0.92
v/c Ratio	0.01	0.02					0.01	0.09				0.20
Control Delay	15.5	0.0					2.0	1.7				2.0
Queue Delay	0.0	0.0					0.0	0.0				0.0
Total Delay	15.5	0.0					2.0	1.7				2.0
LOS	B	A					A	A				A
Approach Delay		2.9						1.7				2.0
Approach LOS		A						A				A
Queue Length 50th (ft)	1	0					0	0				0
Queue Length 95th (ft)	4	0					3	23				57
Internal Link Dist (ft)		116			123			640				398
Turn Bay Length (ft)							140					
Base Capacity (vph)	1753	1532					1100	1499				1464
Starvation Cap Reductn	0	0					0	0				0
Spillback Cap Reductn	0	0					0	0				0
Storage Cap Reductn	0	0					0	0				0
Reduced v/c Ratio	0.00	0.01					0.01	0.08				0.19

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 38.5
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.20
 Intersection Signal Delay: 1.9
 Intersection Capacity Utilization 28.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Joseph Carini Rd

Build
Timing Plan: MD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	30	14	91	229	3
Future Volume (vph)	3	30	14	91	229	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.876				0.998	
Fl _t Protected	0.996			0.993		
Satd. Flow (prot)	1458	0	0	1674	1681	0
Fl _t Permitted	0.996			0.993		
Satd. Flow (perm)	1458	0	0	1674	1681	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.69	0.69	0.83	0.83	0.65	0.65
Heavy Vehicles (%)	0%	15%	11%	13%	13%	0%
Adj. Flow (vph)	4	43	17	110	352	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	0	127	357	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	26.6%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	3	30	14	91	229	3
Future Vol, veh/h	3	30	14	91	229	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	83	83	65	65
Heavy Vehicles, %	0	15	11	13	13	0
Mvmt Flow	4	43	17	110	352	5

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	499	355	357	0	0
Stage 1	355	-	-	-	-
Stage 2	144	-	-	-	-
Critical Hdwy	6.4	6.35	4.21	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.435	2.299	-	-
Pot Cap-1 Maneuver	535	661	1153	-	-
Stage 1	714	-	-	-	-
Stage 2	888	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	526	661	1153	-	-
Mov Cap-2 Maneuver	526	-	-	-	-
Stage 1	703	-	-	-	-
Stage 2	888	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1153	-	646	-	-
HCM Lane V/C Ratio	0.015	-	0.074	-	-
HCM Control Delay (s)	8.2	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Build
Timing Plan: MD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	3	2	92	229	0
Future Volume (vph)	2	3	2	92	229	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1583	1805	1681	1652	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1583	1805	1681	1652	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.38	0.38	0.83	0.83	0.66	0.66
Heavy Vehicles (%)	0%	2%	0%	13%	15%	0%
Adj. Flow (vph)	5	8	2	111	347	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	8	2	111	347	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	22.1%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	2	3	2	92	229	0
Future Vol, veh/h	2	3	2	92	229	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	38	38	83	83	66	66
Heavy Vehicles, %	0	2	0	13	15	0
Mvmt Flow	5	8	2	111	347	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	462	347	347	0	-	0
Stage 1	347	-	-	-	-	-
Stage 2	115	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.2	-	-	-
Pot Cap-1 Maneuver	562	696	1223	-	-	-
Stage 1	720	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	561	696	1223	-	-	-
Mov Cap-2 Maneuver	561	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	915	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1223	-	561	696	-	-
HCM Lane V/C Ratio	0.002	-	0.009	0.011	-	-
HCM Control Delay (s)	7.9	-	11.5	10.2	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Build
Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	31	27	11	134	19	34	7	81	6	13	84	37
Future Volume (vph)	31	27	11	134	19	34	7	81	6	13	84	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.978			0.976			0.991			0.962	
Fl _t Protected		0.978			0.965			0.996			0.995	
Satd. Flow (prot)	0	1741	0	0	1613	0	0	1477	0	0	1461	0
Fl _t Permitted		0.978			0.965			0.996			0.995	
Satd. Flow (perm)	0	1741	0	0	1613	0	0	1477	0	0	1461	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles (%)	3%	4%	9%	13%	16%	0%	0%	30%	17%	0%	38%	3%
Adj. Flow (vph)	36	31	13	179	25	45	8	95	7	15	94	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	80	0	0	249	0	0	110	0	0	151	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.7%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	27	11	134	19	34	7	81	6	13	84	37
Future Vol, veh/h	31	27	11	134	19	34	7	81	6	13	84	37
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles, %	3	4	9	13	16	0	0	30	17	0	38	3
Mvmt Flow	36	31	13	179	25	45	8	95	7	15	94	42
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	10.4	8.8	8.9
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	45%	72%	10%
Vol Thru, %	86%	39%	10%	63%
Vol Right, %	6%	16%	18%	28%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	94	69	187	134
LT Vol	7	31	134	13
Through Vol	81	27	19	84
RT Vol	6	11	34	37
Lane Flow Rate	111	80	249	151
Geometry Grp	1	1	1	1
Degree of Util (X)	0.15	0.109	0.338	0.197
Departure Headway (Hd)	4.883	4.887	4.879	4.711
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	731	729	736	759
Service Time	2.936	2.948	2.927	2.762
HCM Lane V/C Ratio	0.152	0.11	0.338	0.199
HCM Control Delay	8.8	8.6	10.4	8.9
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0.5	0.4	1.5	0.7

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Build
Timing Plan: MD



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	46	0	0	39	148	0
Future Volume (vph)	46	0	0	39	148	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frnt						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	0	42	161	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	42	161	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.2%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	6.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	46	0	0	39	148	0
Future Vol, veh/h	46	0	0	39	148	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	0	0	42	161	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	50	0	92
Stage 1	-	-	-	-	50
Stage 2	-	-	-	-	42
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1557	-	908
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	980
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1557	-	908
Mov Cap-2 Maneuver	-	-	-	-	908
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	980

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	908	-	-	-	1557	-
HCM Lane V/C Ratio	0.177	-	-	-	-	-
HCM Control Delay (s)	9.8	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	-	0	-

Lanes, Volumes, Timings

Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘	↕	↗
Traffic Volume (vph)	0	1034	480	306	850	0	0	0	0	260	5	338
Future Volume (vph)	0	1034	480	306	850	0	0	0	0	260	5	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.891	0.850
Fl _t Protected				0.950						0.950	0.988	
Satd. Flow (prot)	0	2843	1615	1805	2865	0	0	0	0	1829	1573	1688
Fl _t Permitted				0.950						0.950	0.988	
Satd. Flow (perm)	0	2843	1615	1805	2865	0	0	0	0	1829	1573	1688
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			535									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.89	0.89	0.89	0.84	0.84	0.84	0.88	0.88	0.88	0.85	0.85	0.85
Heavy Vehicles (%)	15%	27%	0%	0%	26%	9%	12%	0%	11%	0%	0%	0%
Adj. Flow (vph)	0	1162	539	364	1012	0	0	0	0	306	6	398
Shared Lane Traffic (%)										19%		43%
Lane Group Flow (vph)	0	1162	539	364	1012	0	0	0	0	248	235	227
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		37.0	37.0	23.0						20.0	20.0	20.0
Total Split (%)		46.3%	46.3%	28.8%						25.0%	25.0%	25.0%
Maximum Green (s)		31.5	31.5	19.0						14.5	14.5	14.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effect Green (s)		32.2	32.2	18.8	56.5					14.0	14.0	14.0
Actuated g/C Ratio		0.40	0.40	0.24	0.71					0.18	0.18	0.18
v/c Ratio		1.02	0.56	0.86	0.50					0.78	0.85	0.77
Control Delay		57.0	4.2	47.0	1.1					49.5	61.1	50.4
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		57.0	4.2	47.0	1.1					49.5	61.1	50.4
LOS		E	A	D	A					D	E	D
Approach Delay		40.3			13.2						53.6	
Approach LOS		D			B						D	
Queue Length 50th (ft)		~334	1	136	6					125	125	113
Queue Length 95th (ft)		#450	57	m142	m6					#214	#232	#201
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1142	969	428	2000					331	285	305
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		1.02	0.56	0.85	0.51					0.75	0.82	0.74

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 1 (1%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 33.0 Intersection LOS: C
 Intersection Capacity Utilization 69.9% ICU Level of Service C
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	449	845	0	0	868	242	288	5	320	0	0	0
Future Volume (vph)	449	845	0	0	868	242	288	5	320	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.954				
Satd. Flow (prot)	1805	2756	0	0	2865	1561	1829	1722	1830	0	0	0
Fl _t Permitted	0.950						0.950	0.954				
Satd. Flow (perm)	1805	2756	0	0	2865	1561	1829	1722	1830	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						252						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.87	0.87	0.87	0.96	0.96	0.96	0.85	0.85	0.85	0.88	0.88	0.88
Heavy Vehicles (%)	0%	31%	14%	11%	26%	0%	0%	0%	0%	8%	0%	11%
Adj. Flow (vph)	516	971	0	0	904	252	339	6	376	0	0	0
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	516	971	0	0	904	252	173	172	376	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	32.0				27.0	27.0	21.0	21.0	21.0			
Total Split (%)	40.0%				33.8%	33.8%	26.3%	26.3%	26.3%			
Maximum Green (s)	28.0				21.5	21.5	16.0	16.0	16.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: PM

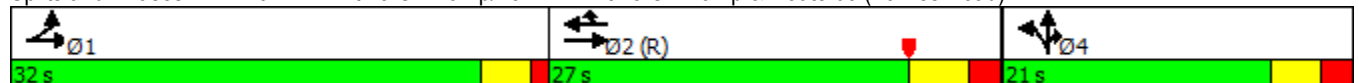


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None				C-Max	C-Max	None	None	None			
Act Effct Green (s)	27.1	55.0			22.4	22.4	16.0	16.0	16.0			
Actuated g/C Ratio	0.34	0.69			0.28	0.28	0.20	0.20	0.20			
v/c Ratio	0.84	0.51			1.13	0.41	0.47	0.50	1.03			
Control Delay	22.4	0.4			97.0	8.0	33.3	34.2	88.7			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	22.4	0.4			97.0	8.0	33.3	34.2	88.7			
LOS	C	A			F	A	C	C	F			
Approach Delay		8.0			77.6			62.4				
Approach LOS		A			E			E				
Queue Length 50th (ft)	101	1			~274	15	81	81	~197			
Queue Length 95th (ft)	m114	m1			m#355	m33	134	134	#337			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	631	1894			801	618	365	344	366			
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	0.82	0.51			1.13	0.41	0.47	0.50	1.03			

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 39 (49%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.13
 Intersection Signal Delay: 43.6 Intersection LOS: D
 Intersection Capacity Utilization 69.9% ICU Level of Service C
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	1010	15	5	803	58	10	20	5	135	40	297
Future Volume (vph)	140	1010	15	5	803	58	10	20	5	135	40	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998				0.850		0.969				0.850
Flt Protected	0.950			0.950			0.950				0.963	
Satd. Flow (prot)	1719	2566	0	1796	2763	1575	1652	1780	0	0	1762	1429
Flt Permitted	0.950			0.950			0.465				0.753	
Satd. Flow (perm)	1719	2566	0	1796	2763	1575	808	1780	0	0	1378	1429
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				100		7				115
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.95	0.95	0.95	0.86	0.86	0.86	0.75	0.75	0.75	0.82	0.82	0.82
Heavy Vehicles (%)	5%	41%	1%	0%	30%	2%	2%	0%	0%	5%	0%	13%
Adj. Flow (vph)	147	1063	16	6	934	67	13	27	7	165	49	362
Shared Lane Traffic (%)												
Lane Group Flow (vph)	147	1079	0	6	934	67	13	34	0	0	214	362
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	22.0			11.0			22.0	22.0		22.0	22.0	22.0
Total Split (%)	27.5%			13.8%			27.5%	27.5%		27.5%	27.5%	27.5%
Maximum Green (s)	16.6			5.7			17.1	17.1		17.1	17.1	16.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0			0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9			4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build
 Timing Plan: PM

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	25.0
Total Split (%)	31%
Maximum Green (s)	18.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build
 Timing Plan: PM

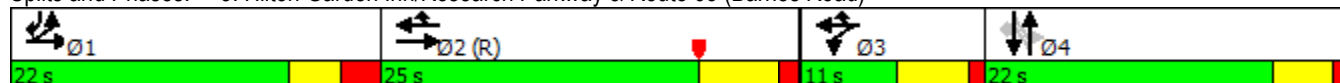


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0		1.5			2.0		2.0		2.0		2.0
Recall Mode	None			None			None		None		None	
Act Effct Green (s)	18.0	43.6		5.7	30.5	30.5	15.1	15.1		15.1		38.0
Actuated g/C Ratio	0.22	0.54		0.07	0.38	0.38	0.19	0.19		0.19		0.48
v/c Ratio	0.38	0.77		0.05	0.89	0.10	0.09	0.10		0.82		0.49
Control Delay	34.9	13.4		35.6	35.8	2.1	26.9	22.3		56.5		11.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	34.9	13.4		35.6	35.8	2.1	26.9	22.3		56.5		11.9
LOS	C	B		D	D	A	C	C		E		B
Approach Delay	16.0			33.5			23.6		28.5			
Approach LOS	B			C			C		C			
Queue Length 50th (ft)	67	157		3	227	0	5	11		100		75
Queue Length 95th (ft)	m108	m79		14	#320	11	17	28		#170		122
Internal Link Dist (ft)	684			671			171		640			
Turn Bay Length (ft)	570			100			250					
Base Capacity (vph)	386	1398		127	1051	661	172	385		294		740
Starvation Cap Reductn	0	0		0	0	0	0	0		0		0
Spillback Cap Reductn	0	0		0	0	0	0	0		0		0
Storage Cap Reductn	0	0		0	0	0	0	0		0		0
Reduced v/c Ratio	0.38	0.77		0.05	0.89	0.10	0.08	0.09		0.73		0.49

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 29 (36%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 24.8
 Intersection LOS: C
 Intersection Capacity Utilization 61.8%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Build
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	15	21	0	4	5	136	77	14	436	0
Future Volume (vph)	5	0	15	21	0	4	5	136	77	14	436	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850				0.850			
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1615	0	1805	1615	0	1805	1792	1615	1805	1863	0
Flt Permitted							0.303			0.615		
Satd. Flow (perm)	1900	1615	0	1900	1615	0	576	1792	1615	1168	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		226			617				131			
Link Speed (mph)		30			30			30				30
Link Distance (ft)		196			203			720				478
Travel Time (s)		4.5			4.6			16.4				10.9
Peak Hour Factor	0.48	0.48	0.48	0.88	0.88	0.88	0.59	0.59	0.59	0.60	0.60	0.60
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	2%	0%
Adj. Flow (vph)	10	0	31	24	0	5	8	231	131	23	727	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	31	0	24	5	0	8	231	131	23	727	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12				12
Link Offset(ft)		0			12			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt		NA
Protected Phases		4			4			2			1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	1.0	2.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Build
 Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	7.5	7.5		7.5	7.5		37.5	37.5	37.5	37.8	37.5	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.76	0.76	0.76	0.76	0.76	
v/c Ratio	0.03	0.07		0.08	0.01		0.02	0.17	0.10	0.02	0.51	
Control Delay	25.4	0.3		25.6	0.0		5.4	5.2	1.6	2.3	8.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	25.4	0.3		25.6	0.0		5.4	5.2	1.6	2.3	8.0	
LOS	C	A		C	A		A	A	A	A	A	
Approach Delay		6.4			21.2			3.9				7.8
Approach LOS		A			C			A				A
Queue Length 50th (ft)	2	0		6	0		1	22	0	2	100	
Queue Length 95th (ft)	9	0		29	0		4	40	4	4	136	
Internal Link Dist (ft)		116			123			640			398	
Turn Bay Length (ft)				170			140			115		
Base Capacity (vph)	1435	1275		1435	1371		502	1561	1424	963	1623	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.01	0.02		0.02	0.00		0.02	0.15	0.09	0.02	0.45	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 49.5
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 6.9
 Intersection LOS: A
 Intersection Capacity Utilization 39.9%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Joseph Carini Rd

Build
Timing Plan: PM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	63	9	136	387	0
Future Volume (vph)	3	63	9	136	387	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.871					
Fl _t Protected	0.998			0.997		
Satd. Flow (prot)	1618	0	0	1661	1696	0
Fl _t Permitted	0.998			0.997		
Satd. Flow (perm)	1618	0	0	1661	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.55	0.55	0.90	0.90	0.80	0.80
Heavy Vehicles (%)	50%	0%	0%	15%	12%	0%
Adj. Flow (vph)	5	115	10	151	484	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	120	0	0	161	484	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	3	63	9	136	387	0
Future Vol, veh/h	3	63	9	136	387	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	55	55	90	90	80	80
Heavy Vehicles, %	50	0	0	15	12	0
Mvmt Flow	5	115	10	151	484	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	655	484	484	0	-	0
Stage 1	484	-	-	-	-	-
Stage 2	171	-	-	-	-	-
Critical Hdwy	6.9	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	364	587	1089	-	-	-
Stage 1	531	-	-	-	-	-
Stage 2	755	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	360	587	1089	-	-	-
Mov Cap-2 Maneuver	360	-	-	-	-	-
Stage 1	526	-	-	-	-	-
Stage 2	755	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1089	-	571	-	-
HCM Lane V/C Ratio	0.009	-	0.21	-	-
HCM Control Delay (s)	8.3	0	13	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Build
Timing Plan: PM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	13	3	136	374	0
Future Volume (vph)	3	13	3	136	374	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1638	1696	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1638	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Confl. Peds. (#/hr)	3					
Peak Hour Factor	0.42	0.42	0.90	0.90	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	16%	12%	0%
Adj. Flow (vph)	7	31	3	151	473	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	31	3	151	473	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.7%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶	↷	↶	↶	↷	
Traffic Vol, veh/h	3	13	3	136	374	0
Future Vol, veh/h	3	13	3	136	374	0
Conflicting Peds, #/hr	3	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	42	42	90	90	79	79
Heavy Vehicles, %	0	0	0	16	12	0
Mvmt Flow	7	31	3	151	473	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	633	473	473	0	-	0
Stage 1	473	-	-	-	-	-
Stage 2	160	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	447	595	1099	-	-	-
Stage 1	631	-	-	-	-	-
Stage 2	874	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	446	595	1099	-	-	-
Mov Cap-2 Maneuver	446	-	-	-	-	-
Stage 1	629	-	-	-	-	-
Stage 2	874	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1099	-	446	595	-	-
HCM Lane V/C Ratio	0.003	-	0.016	0.052	-	-
HCM Control Delay (s)	8.3	-	13.2	11.4	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.2	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Build
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	45	51	25	47	45	18	20	104	15	25	302	101
Future Volume (vph)	45	51	25	47	45	18	20	104	15	25	302	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.972			0.978			0.985			0.968	
Fl _t Protected		0.982			0.979			0.993			0.997	
Satd. Flow (prot)	0	1800	0	0	1819	0	0	1729	0	0	1804	0
Fl _t Permitted		0.982			0.979			0.993			0.997	
Satd. Flow (perm)	0	1800	0	0	1819	0	0	1729	0	0	1804	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.86	0.86	0.86	0.76	0.76	0.76	0.63	0.63	0.63	0.71	0.71	0.71
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	10%	0%	0%	2%	1%
Adj. Flow (vph)	52	59	29	62	59	24	32	165	24	35	425	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	140	0	0	145	0	0	221	0	0	602	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	21.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	51	25	47	45	18	20	104	15	25	302	101
Future Vol, veh/h	45	51	25	47	45	18	20	104	15	25	302	101
Peak Hour Factor	0.86	0.86	0.86	0.76	0.76	0.76	0.63	0.63	0.63	0.71	0.71	0.71
Heavy Vehicles, %	2	0	0	0	0	0	0	10	0	0	2	1
Mvmt Flow	52	59	29	62	59	24	32	165	24	35	425	142
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.5	11.6	11.8	29.3
HCM LOS	B	B	B	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	14%	37%	43%	6%
Vol Thru, %	75%	42%	41%	71%
Vol Right, %	11%	21%	16%	24%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	139	121	110	428
LT Vol	20	45	47	25
Through Vol	104	51	45	302
RT Vol	15	25	18	101
Lane Flow Rate	221	141	145	603
Geometry Grp	1	1	1	1
Degree of Util (X)	0.348	0.248	0.255	0.844
Departure Headway (Hd)	5.67	6.348	6.34	5.043
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	631	561	563	717
Service Time	3.745	4.434	4.426	3.098
HCM Lane V/C Ratio	0.35	0.251	0.258	0.841
HCM Control Delay	11.8	11.5	11.6	29.3
HCM Lane LOS	B	B	B	D
HCM 95th-tile Q	1.6	1	1	9.6

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Build
Timing Plan: PM



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	91	0	0	90	20	0
Future Volume (vph)	91	0	0	90	20	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	0	0	98	22	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	99	0	0	98	22	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.8%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	91	0	0	90	20	0
Future Vol, veh/h	91	0	0	90	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	0	0	98	22	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	99	0	197
Stage 1	-	-	-	-	99
Stage 2	-	-	-	-	98
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1494	-	792
Stage 1	-	-	-	-	925
Stage 2	-	-	-	-	926
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1494	-	792
Mov Cap-2 Maneuver	-	-	-	-	792
Stage 1	-	-	-	-	925
Stage 2	-	-	-	-	926

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	792	-	-	-	1494	-
HCM Lane V/C Ratio	0.027	-	-	-	-	-
HCM Control Delay (s)	9.7	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0	-

Lanes, Volumes, Timings

Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	485	200	232	465	0	0	0	0	109	0	204
Future Volume (vph)	0	485	200	232	465	0	0	0	0	109	0	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	705		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.865	0.850
Fl _t Protected				0.950						0.950	0.995	
Satd. Flow (prot)	0	3008	1346	1583	3195	0	0	0	0	1499	1182	1288
Fl _t Permitted				0.950						0.950	0.995	
Satd. Flow (perm)	0	3008	1346	1583	3195	0	0	0	0	1499	1182	1288
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			213									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.94	0.94	0.94	0.74	0.74	0.74	0.88	0.88	0.88	0.89	0.89	0.89
Heavy Vehicles (%)	0%	20%	20%	14%	13%	0%	0%	0%	0%	22%	0%	31%
Adj. Flow (vph)	0	516	213	314	628	0	0	0	0	122	0	229
Shared Lane Traffic (%)										10%		48%
Lane Group Flow (vph)	0	516	213	314	628	0	0	0	0	110	122	119
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		27.0	27.0	19.3	51.8					13.7	13.7	13.7
Actuated g/C Ratio		0.36	0.36	0.26	0.69					0.18	0.18	0.18
v/c Ratio		0.48	0.34	0.77	0.28					0.40	0.57	0.51
Control Delay		21.2	4.7	33.9	1.6					30.3	37.5	34.3
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		21.2	4.7	33.9	1.6					30.3	37.5	34.3
LOS		C	A	C	A					C	D	C
Approach Delay		16.4			12.4						34.2	
Approach LOS		B			B						C	
Queue Length 50th (ft)		101	0	63	8					48	58	53
Queue Length 95th (ft)		147	44	#199	14					86	102	93
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				705						240		240
Base Capacity (vph)		1082	621	408	2208					389	307	334
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		0.48	0.34	0.77	0.28					0.28	0.40	0.36

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 17.6
 Intersection LOS: B
 Intersection Capacity Utilization 46.3%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

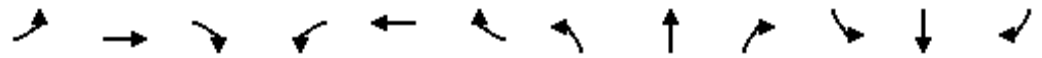
Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	203	391	0	0	558	233	139	0	177	0	0	0
Future Volume (vph)	203	391	0	0	558	233	139	0	177	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	630		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1367	3223	0	0	3195	1312	1550	1453	1513	0	0	0
Fl _t Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1367	3223	0	0	3195	1312	1550	1453	1513	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						248						
Link Speed (mph)		35			35			30				30
Link Distance (ft)		913			764			683				489
Travel Time (s)		17.8			14.9			15.5				11.1
Peak Hour Factor	0.88	0.88	0.88	0.94	0.94	0.94	0.95	0.95	0.95	0.88	0.88	0.88
Heavy Vehicles (%)	32%	12%	0%	0%	13%	19%	18%	0%	21%	0%	0%	0%
Adj. Flow (vph)	231	444	0	0	594	248	146	0	186	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	231	444	0	0	594	248	73	73	186	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14				14
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	16.5	51.8		29.8	29.8	14.2	14.2	14.2				
Actuated g/C Ratio	0.22	0.69		0.40	0.40	0.19	0.19	0.19				
v/c Ratio	0.77	0.20		0.47	0.37	0.25	0.27	0.65				
Control Delay	34.7	0.5		13.6	2.6	26.4	26.8	38.2				
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0				
Total Delay	34.7	0.5		13.6	2.6	26.4	26.8	38.2				
LOS	C	A		B	A	C	C	D				
Approach Delay		12.2		10.4			33.1					
Approach LOS		B		B			C					
Queue Length 50th (ft)	39	1		68	3	30	30	80				
Queue Length 95th (ft)	#188	4		108	18	62	62	134				
Internal Link Dist (ft)		833		684			603				409	
Turn Bay Length (ft)	630				480	180		180				
Base Capacity (vph)	316	2224		1267	670	392	368	383				
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	0.73	0.20		0.47	0.37	0.19	0.20	0.49				

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 15.1 Intersection LOS: B
 Intersection Capacity Utilization 46.3% ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Build

3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	400	8	0	477	48	15	1	0	97	0	299
Future Volume (vph)	160	400	8	0	477	48	15	1	0	97	0	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997				0.850						0.850
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1367	3211	0	1890	3265	1461	1685	1837	0	0	1736	1196
Flt Permitted	0.950						0.680				0.756	
Satd. Flow (perm)	1367	3211	0	1890	3265	1461	1206	1837	0	0	1381	1196
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				106						230
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		764			751			251			720	
Travel Time (s)		14.9			14.6			5.7			16.4	
Peak Hour Factor	0.81	0.81	0.81	0.86	0.86	0.86	0.38	0.38	0.38	0.81	0.81	0.81
Heavy Vehicles (%)	32%	12%	17%	0%	10%	10%	0%	0%	0%	4%	0%	35%
Adj. Flow (vph)	198	494	10	0	555	56	39	3	0	120	0	369
Shared Lane Traffic (%)												
Lane Group Flow (vph)	198	504	0	0	555	56	39	3	0	0	120	369
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	17.0			11.0			17.0	17.0		17.0	17.0	17.0
Total Split (%)	22.7%			14.7%			22.7%	22.7%		22.7%	22.7%	22.7%
Maximum Green (s)	11.6			5.7			12.1	12.1		12.1	12.1	11.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	30.0
Total Split (%)	40%
Maximum Green (s)	23.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build
 Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0		1.5			2.0		2.0		2.0		2.0
Recall Mode	None			None			None		None		None	None
Act Effct Green (s)	14.7	46.2		36.0		36.0	10.3	10.3		10.3		27.5
Actuated g/C Ratio	0.20	0.62		0.48		0.48	0.14	0.14		0.14		0.37
v/c Ratio	0.74	0.25		0.35		0.07	0.24	0.01		0.63		0.63
Control Delay	50.6	4.4		14.3		0.8	31.5	27.0		45.6		12.0
Queue Delay	0.0	0.0		0.0		0.0	0.0	0.0		0.0		0.0
Total Delay	50.6	4.4		14.3		0.8	31.5	27.0		45.6		12.0
LOS	D	A		B		A	C	C		D		B
Approach Delay	17.5			13.1			31.2		20.2			
Approach LOS	B			B			C		C			
Queue Length 50th (ft)	73	30		97		0	16	1		53		38
Queue Length 95th (ft)	#186	35		112		4	17	4		91		99
Internal Link Dist (ft)	684			671			171		640			
Turn Bay Length (ft)	570					250						
Base Capacity (vph)	268	2060		1507		731	197	300		225		584
Starvation Cap Reductn	0	0		0		0	0	0		0		0
Spillback Cap Reductn	0	0		0		0	0	0		0		0
Storage Cap Reductn	0	0		0		0	0	0		0		0
Reduced v/c Ratio	0.74	0.24		0.37		0.08	0.20	0.01		0.53		0.63

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 17.1
 Intersection LOS: B
 Intersection Capacity Utilization 51.2%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Build
Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	9	135	0	23	6	107	96	17	252	0
Future Volume (vph)	0	0	9	135	0	23	6	107	96	17	252	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850				0.850			
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1900	1417	0	1805	1615	0	1504	1496	1615	1805	1484	0
Flt Permitted				0.747			0.569			0.650		
Satd. Flow (perm)	1900	1417	0	1419	1615	0	901	1496	1615	1235	1484	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		507			715				152			
Link Speed (mph)		30			30			30				30
Link Distance (ft)		196			203			720				478
Travel Time (s)		4.5			4.6			16.4				10.9
Peak Hour Factor	0.58	0.58	0.58	0.88	0.88	0.88	0.63	0.63	0.63	0.80	0.80	0.80
Heavy Vehicles (%)	0%	0%	14%	0%	0%	0%	20%	27%	0%	0%	28%	0%
Adj. Flow (vph)	0	0	16	153	0	26	10	170	152	21	315	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	153	26	0	10	170	152	21	315	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12				12
Link Offset(ft)		0			12			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt		NA
Protected Phases		4			4			2		1		2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1		2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5		15.0
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0		21.0
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0		51.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%		51.0%
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0		45.0
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0		4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0		2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0		6.0
Lead/Lag							Lag	Lag	Lag	Lead		Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	1.0		2.0
Recall Mode	None	None		None	None		Min	Min	Min	None		Min

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Build
 Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		9.5		9.5	9.5		20.6	20.6	20.6	23.4	20.6	
Actuated g/C Ratio		0.22		0.22	0.22		0.48	0.48	0.48	0.55	0.48	
v/c Ratio		0.02		0.49	0.03		0.02	0.24	0.18	0.03	0.44	
Control Delay		0.1		20.5	0.0		8.5	9.2	2.8	5.1	11.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		0.1		20.5	0.0		8.5	9.2	2.8	5.1	11.3	
LOS		A		C	A		A	A	A	A	B	
Approach Delay		0.1			17.6			6.2				10.9
Approach LOS		A			B			A				B
Queue Length 50th (ft)		0		24	0		1	17	0	2	35	
Queue Length 95th (ft)		0		91	0		7	49	9	8	122	
Internal Link Dist (ft)		116			123			640				398
Turn Bay Length (ft)				170			140			115		
Base Capacity (vph)		1268		1187	1468		845	1404	1525	744	1393	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.01		0.13	0.02		0.01	0.12	0.10	0.03	0.23	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 42.9
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 10.3
 Intersection LOS: B
 Intersection Capacity Utilization 36.6%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Josheph Carini Rd

Build
Timing Plan: AM Pk Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	11	11	119	258	0
Future Volume (vph)	0	11	11	119	258	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fl _t Protected	0.996					
Satd. Flow (prot)	1347	0	0	1464	1462	0
Fl _t Permitted	0.996					
Satd. Flow (perm)	1347	0	0	1464	1462	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.56	0.56	0.75	0.75	0.81	0.81
Heavy Vehicles (%)	0%	22%	0%	32%	30%	0%
Adj. Flow (vph)	0	20	15	159	319	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	0	0	174	319	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	25.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	11	11	119	258	0
Future Vol, veh/h	0	11	11	119	258	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	75	75	81	81
Heavy Vehicles, %	0	22	0	32	30	0
Mvmt Flow	0	20	15	159	319	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	508	319	319	0	-	0
Stage 1	319	-	-	-	-	-
Stage 2	189	-	-	-	-	-
Critical Hdwy	6.4	6.42	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.498	2.2	-	-	-
Pot Cap-1 Maneuver	528	678	1252	-	-	-
Stage 1	741	-	-	-	-	-
Stage 2	848	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	521	678	1252	-	-	-
Mov Cap-2 Maneuver	521	-	-	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	848	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1252	-	678	-	-
HCM Lane V/C Ratio	0.012	-	0.029	-	-
HCM Control Delay (s)	7.9	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Build
Timing Plan: AM Pk Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	3	0	119	255	1
Future Volume (vph)	0	3	0	119	255	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Fr _t		0.850				
Fl _t Protected						
Satd. Flow (prot)	1900	1077	1900	1439	1474	0
Fl _t Permitted						
Satd. Flow (perm)	1900	1077	1900	1439	1474	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Confl. Peds. (#/hr)	3					
Peak Hour Factor	0.50	0.50	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	50%	0%	32%	29%	0%
Adj. Flow (vph)	0	6	0	151	323	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	6	0	151	324	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.5%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	3	0	119	255	1
Future Vol, veh/h	0	3	0	119	255	1
Conflicting Peds, #/hr	3	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	79	79	79	79
Heavy Vehicles, %	0	50	0	32	29	0
Mvmt Flow	0	6	0	151	323	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	478	324	324	0	-	0
Stage 1	324	-	-	-	-	-
Stage 2	154	-	-	-	-	-
Critical Hdwy	6.4	6.7	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.75	2.2	-	-	-
Pot Cap-1 Maneuver	550	619	1247	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	879	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	550	619	1247	-	-	-
Mov Cap-2 Maneuver	550	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	879	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1247	-	-	619	-	-
HCM Lane V/C Ratio	-	-	-	0.01	-	-
HCM Control Delay (s)	0	-	0	10.9	-	-
HCM Lane LOS	A	-	A	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Build
Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	25	23	5	150	14	32	4	106	9	14	101	25
Future Volume (vph)	25	23	5	150	14	32	4	106	9	14	101	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.978			0.990			0.976	
Flt Protected		0.977			0.963			0.998			0.995	
Satd. Flow (prot)	0	1477	0	0	1577	0	0	1438	0	0	1459	0
Flt Permitted		0.977			0.963			0.998			0.995	
Satd. Flow (perm)	0	1477	0	0	1577	0	0	1438	0	0	1459	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.63	0.63	0.63	0.45	0.45	0.45	0.79	0.79	0.79	0.65	0.65	0.65
Heavy Vehicles (%)	31%	11%	50%	14%	0%	17%	33%	33%	0%	0%	33%	15%
Adj. Flow (vph)	40	37	8	333	31	71	5	134	11	22	155	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	85	0	0	435	0	0	150	0	0	215	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	23	5	150	14	32	4	106	9	14	101	25
Future Vol, veh/h	25	23	5	150	14	32	4	106	9	14	101	25
Peak Hour Factor	0.63	0.63	0.63	0.45	0.45	0.45	0.79	0.79	0.79	0.65	0.65	0.65
Heavy Vehicles, %	31	11	50	14	0	17	33	33	0	0	33	15
Mvmt Flow	40	37	8	333	31	71	5	134	11	22	155	38
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.5	18.4	11.6	11.5
HCM LOS	B	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	47%	77%	10%
Vol Thru, %	89%	43%	7%	72%
Vol Right, %	8%	9%	16%	18%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	119	53	196	140
LT Vol	4	25	150	14
Through Vol	106	23	14	101
RT Vol	9	5	32	25
Lane Flow Rate	151	84	436	215
Geometry Grp	1	1	1	1
Degree of Util (X)	0.264	0.147	0.659	0.336
Departure Headway (Hd)	6.321	6.31	5.448	5.613
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	566	567	662	640
Service Time	4.374	4.367	3.485	3.661
HCM Lane V/C Ratio	0.267	0.148	0.659	0.336
HCM Control Delay	11.6	10.5	18.4	11.5
HCM Lane LOS	B	B	C	B
HCM 95th-tile Q	1.1	0.5	4.9	1.5

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Build
Timing Plan: AM Pk Gen



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	46	0	0	40	156	0
Future Volume (vph)	46	0	0	40	156	0
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						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	0	43	170	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	43	170	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.6%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	6.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	46	0	0	40	156	0
Future Vol, veh/h	46	0	0	40	156	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	0	0	43	170	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	50	0	93
Stage 1	-	-	-	-	50
Stage 2	-	-	-	-	43
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1557	-	907
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	979
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1557	-	907
Mov Cap-2 Maneuver	-	-	-	-	907
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	979

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	907	-	-	-	1557	-
HCM Lane V/C Ratio	0.187	-	-	-	-	-
HCM Control Delay (s)	9.9	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	-	0	-

Lanes, Volumes, Timings

Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘	↕	↗
Traffic Volume (vph)	0	413	132	218	404	0	0	0	0	129	0	93
Future Volume (vph)	0	413	132	218	404	0	0	0	0	129	0	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.953	0.850
Fl _t Protected				0.950						0.950	0.967	
Satd. Flow (prot)	0	3574	1553	1719	3505	0	0	0	0	1726	1540	1548
Fl _t Permitted				0.950						0.950	0.967	
Satd. Flow (perm)	0	3574	1553	1719	3505	0	0	0	0	1726	1540	1548
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			159									
Link Speed (mph)		45			30			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			20.8			8.5			11.3	
Peak Hour Factor	0.83	0.83	0.83	0.59	0.59	0.59	0.88	0.88	0.88	0.86	0.86	0.86
Heavy Vehicles (%)	0%	1%	4%	5%	3%	0%	0%	0%	0%	6%	0%	9%
Adj. Flow (vph)	0	498	159	369	685	0	0	0	0	150	0	108
Shared Lane Traffic (%)										40%		25%
Lane Group Flow (vph)	0	498	159	369	685	0	0	0	0	90	87	81
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		28.2	28.2	24.1	58.6					10.6	10.6	10.6
Actuated g/C Ratio		0.38	0.38	0.32	0.78					0.14	0.14	0.14
v/c Ratio		0.37	0.23	0.67	0.25					0.37	0.40	0.37
Control Delay		19.4	4.4	24.8	1.2					32.9	34.3	33.5
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		19.4	4.4	24.8	1.2					32.9	34.3	33.5
LOS		B	A	C	A					C	C	C
Approach Delay		15.8			9.5						33.6	
Approach LOS		B			A						C	
Queue Length 50th (ft)		94	0	89	12					41	41	36
Queue Length 95th (ft)		122	30	90	13					75	78	70
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1341	682	552	2736					448	400	402
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		0.37	0.23	0.67	0.25					0.20	0.22	0.20

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 14.7
 Intersection Capacity Utilization 44.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	80	462	0	0	458	140	164	0	226	0	0	0
Future Volume (vph)	80	462	0	0	458	140	164	0	226	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1719	3574	0	0	3539	1406	1678	1573	1743	0	0	0
Fl _t Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1719	3574	0	0	3539	1406	1678	1573	1743	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						173						
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			13.0			15.5			11.1	
Peak Hour Factor	0.85	0.85	0.85	0.81	0.81	0.81	0.84	0.84	0.84	0.88	0.88	0.88
Heavy Vehicles (%)	5%	1%	0%	0%	2%	11%	9%	0%	5%	0%	0%	0%
Adj. Flow (vph)	94	544	0	0	565	173	195	0	269	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	94	544	0	0	565	173	97	98	269	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	11.6	50.1			33.0	33.0	15.9	15.9	15.9			
Actuated g/C Ratio	0.15	0.67			0.44	0.44	0.21	0.21	0.21			
v/c Ratio	0.36	0.23			0.36	0.24	0.27	0.29	0.73			
Control Delay	21.9	0.6			9.8	1.6	25.6	26.1	39.1			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	21.9	0.6			9.8	1.6	25.6	26.1	39.1			
LOS	C	A			A	A	C	C	D			
Approach Delay		3.8			7.9			33.5				
Approach LOS		A			A			C				
Queue Length 50th (ft)	20	0			40	1	38	40	116			
Queue Length 95th (ft)	30	0			76	4	71	72	170			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	366	2336			1558	716	425	398	441			
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	0.26	0.23			0.36	0.24	0.23	0.25	0.61			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 12.9
 Intersection Capacity Utilization 44.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Build

3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	454	15	3	373	71	8	1	8	63	1	217
Future Volume (vph)	219	454	15	3	373	71	8	1	8	63	1	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			0			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850		0.862				0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	1597	3557	0	1796	3522	1607	1685	1583	0	0	1742	1196
Flt Permitted	0.950			0.950			0.709				0.721	
Satd. Flow (perm)	1597	3557	0	1796	3522	1607	1257	1583	0	0	1318	1196
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				106		11				252
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.78	0.78	0.78	0.80	0.80	0.80	0.75	0.75	0.75	0.86	0.86	0.86
Heavy Vehicles (%)	13%	1%	0%	0%	2%	0%	0%	0%	0%	4%	0%	35%
Adj. Flow (vph)	281	582	19	4	466	89	11	1	11	73	1	252
Shared Lane Traffic (%)												
Lane Group Flow (vph)	281	601	0	4	466	89	11	12	0	0	74	252
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	17.0			11.0			17.0	17.0		17.0	17.0	17.0
Total Split (%)	22.7%			14.7%			22.7%	22.7%		22.7%	22.7%	22.7%
Maximum Green (s)	11.6			5.7			12.1	12.1		12.1	12.1	11.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0			0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9			4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	30.0
Total Split (%)	40%
Maximum Green (s)	23.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build
 Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	20.1	47.5		5.3	31.9	31.9	9.0	9.0			9.0	31.6
Actuated g/C Ratio	0.27	0.63		0.07	0.43	0.43	0.12	0.12			0.12	0.42
v/c Ratio	0.66	0.27		0.03	0.31	0.12	0.07	0.06			0.47	0.39
Control Delay	38.8	4.2		32.7	15.4	2.5	28.9	16.7			40.1	4.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	38.8	4.2		32.7	15.4	2.5	28.9	16.7			40.1	4.2
LOS	D	A		C	B	A	C	B			D	A
Approach Delay		15.2			13.4			22.5			12.3	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)	99	38		2	82	0	5	0			33	0
Queue Length 95th (ft)	#241	43		10	84	13	15	11			66	38
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	427	2429		139	1455	726	202	264			212	649
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.66	0.25		0.03	0.32	0.12	0.05	0.05			0.35	0.39

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 14.2 Intersection LOS: B
 Intersection Capacity Utilization 48.5% ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Build
Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	1	95	0	16	0	104	187	33	185	0
Future Volume (vph)	0	0	1	95	0	16	0	104	187	33	185	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850				0.850			
Flt Protected				0.950						0.950		
Satd. Flow (prot)	1900	1615	0	1805	1615	0	1900	1743	1615	1805	1743	0
Flt Permitted				0.755						0.682		
Satd. Flow (perm)	1900	1615	0	1434	1615	0	1900	1743	1615	1296	1743	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		625			816				208			
Link Speed (mph)		30			30			30				30
Link Distance (ft)		196			203			720				478
Travel Time (s)		4.5			4.6			16.4				10.9
Peak Hour Factor	0.25	0.25	0.25	0.88	0.88	0.88	0.90	0.90	0.90	0.82	0.82	0.82
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	9%	0%
Adj. Flow (vph)	0	0	4	108	0	18	0	116	208	40	226	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	108	18	0	0	116	208	40	226	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12				12
Link Offset(ft)		0			12			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt		NA
Protected Phases		4			4			2		1		2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1		2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5		15.0
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0		21.0
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0		51.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%		51.0%
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0		45.0
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0		4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0		2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0		6.0
Lead/Lag							Lag	Lag	Lag	Lead		Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		3.0
Recall Mode	None	None		None	None		Min	Min	Min	None		Min

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Build
 Timing Plan: PM Peak Gen

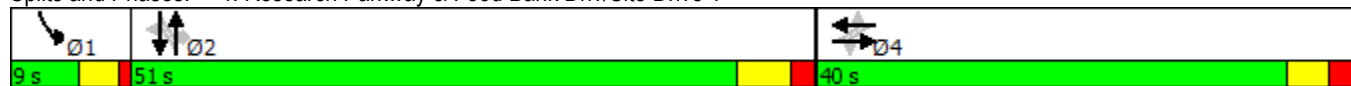


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	
Act Effct Green (s)		8.9		8.9	8.9			21.6	21.6	24.0	21.6	
Actuated g/C Ratio		0.22		0.22	0.22			0.53	0.53	0.59	0.53	
v/c Ratio		0.00		0.35	0.02			0.13	0.22	0.05	0.24	
Control Delay		0.0		17.8	0.1			9.9	3.0	4.7	10.5	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		0.0		17.8	0.1			9.9	3.0	4.7	10.5	
LOS		A		B	A			A	A	A	B	
Approach Delay					15.2			5.5			9.6	
Approach LOS					B			A			A	
Queue Length 50th (ft)		0		16	0			12	0	3	24	
Queue Length 95th (ft)		0		58	0			51	32	12	82	
Internal Link Dist (ft)		116			123			640			398	
Turn Bay Length (ft)				170						115		
Base Capacity (vph)		1488		1250	1512			1708	1587	826	1708	
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		0.00		0.09	0.01			0.07	0.13	0.05	0.13	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	40.8
Natural Cycle:	45
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.35
Intersection Signal Delay:	8.7
Intersection LOS:	A
Intersection Capacity Utilization:	34.6%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Josheph Carini Rd

Build
Timing Plan: PM Peak Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	1	119	217	0
Future Volume (vph)	0	1	1	119	217	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fl _t Protected						
Satd. Flow (prot)	1644	0	0	1744	1743	0
Fl _t Permitted						
Satd. Flow (perm)	1644	0	0	1744	1743	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.25	0.25	0.83	0.83	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	9%	9%	0%
Adj. Flow (vph)	0	4	1	143	255	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	0	144	255	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.4%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	1	1	119	217	0
Future Vol, veh/h	0	1	1	119	217	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	83	83	85	85
Heavy Vehicles, %	0	0	0	9	9	0
Mvmt Flow	0	4	1	143	255	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	400	255	255	0	0
Stage 1	255	-	-	-	-
Stage 2	145	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	610	789	1322	-	-
Stage 1	792	-	-	-	-
Stage 2	887	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	609	789	1322	-	-
Mov Cap-2 Maneuver	609	-	-	-	-
Stage 1	791	-	-	-	-
Stage 2	887	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1322	-	789	-	-
HCM Lane V/C Ratio	0.001	-	0.005	-	-
HCM Control Delay (s)	7.7	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Build
Timing Plan: PM Peak Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	0	119	216	0
Future Volume (vph)	0	1	0	119	216	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	1900	1615	1900	1743	1696	0
Flt Permitted						
Satd. Flow (perm)	1900	1615	1900	1743	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.25	0.25	0.81	0.81	0.77	0.77
Heavy Vehicles (%)	0%	0%	0%	9%	12%	0%
Adj. Flow (vph)	0	4	0	147	281	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	0	147	281	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	21.4%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	1	0	119	216	0
Future Vol, veh/h	0	1	0	119	216	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	81	81	77	77
Heavy Vehicles, %	0	0	0	9	12	0
Mvmt Flow	0	4	0	147	281	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	428	281	281	0	-	0
Stage 1	281	-	-	-	-	-
Stage 2	147	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	588	763	1293	-	-	-
Stage 1	771	-	-	-	-	-
Stage 2	885	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	588	763	1293	-	-	-
Mov Cap-2 Maneuver	588	-	-	-	-	-
Stage 1	771	-	-	-	-	-
Stage 2	885	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1293	-	-	763	-	-
HCM Lane V/C Ratio	-	-	-	0.005	-	-
HCM Control Delay (s)	0	-	0	9.7	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Build
Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	23	19	3	96	15	24	7	98	14	11	117	22
Future Volume (vph)	23	19	3	96	15	24	7	98	14	11	117	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.990			0.976			0.984			0.980	
Fl _t Protected		0.975			0.966			0.997			0.996	
Satd. Flow (prot)	0	1834	0	0	1791	0	0	1709	0	0	1682	0
Fl _t Permitted		0.975			0.966			0.997			0.996	
Satd. Flow (perm)	0	1834	0	0	1791	0	0	1709	0	0	1682	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.64	0.64	0.64	0.66	0.66	0.66	0.72	0.72	0.72	0.67	0.67	0.67
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	12%	6%
Adj. Flow (vph)	36	30	5	145	23	36	10	136	19	16	175	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	71	0	0	204	0	0	165	0	0	224	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.5%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	19	3	96	15	24	7	98	14	11	117	22
Future Vol, veh/h	23	19	3	96	15	24	7	98	14	11	117	22
Peak Hour Factor	0.64	0.64	0.64	0.66	0.66	0.66	0.72	0.72	0.72	0.67	0.67	0.67
Heavy Vehicles, %	0	0	0	0	0	0	0	11	0	0	12	6
Mvmt Flow	36	30	5	145	23	36	10	136	19	16	175	33
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.8	10	9.2	9.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	51%	71%	7%
Vol Thru, %	82%	42%	11%	78%
Vol Right, %	12%	7%	18%	15%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	119	45	135	150
LT Vol	7	23	96	11
Through Vol	98	19	15	117
RT Vol	14	3	24	22
Lane Flow Rate	165	70	205	224
Geometry Grp	1	1	1	1
Degree of Util (X)	0.221	0.101	0.281	0.294
Departure Headway (Hd)	4.807	5.161	4.946	4.722
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	742	688	722	757
Service Time	2.872	3.242	3.014	2.782
HCM Lane V/C Ratio	0.222	0.102	0.284	0.296
HCM Control Delay	9.2	8.8	10	9.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.3	1.2	1.2

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Build
Timing Plan: PM Peak Gen



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	44	0	0	26	109	0
Future Volume (vph)	44	0	0	26	109	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	0	0	28	118	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	0	0	28	118	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.0% ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	5.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	44	0	0	26	109	0
Future Vol, veh/h	44	0	0	26	109	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	0	0	28	118	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	48	0	76
Stage 1	-	-	-	-	48
Stage 2	-	-	-	-	28
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1559	-	927
Stage 1	-	-	-	-	974
Stage 2	-	-	-	-	995
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1559	-	927
Mov Cap-2 Maneuver	-	-	-	-	927
Stage 1	-	-	-	-	974
Stage 2	-	-	-	-	995

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	927	-	-	-	1559	-
HCM Lane V/C Ratio	0.128	-	-	-	-	-
HCM Control Delay (s)	9.5	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	-	0	-

BUILD IMPROVED

Lanes, Volumes, Timings

Build Improved

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	581	227	309	914	0	0	0	0	172	0	409
Future Volume (vph)	0	581	227	309	914	0	0	0	0	172	0	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.862	0.850
Fl _t Protected				0.950						0.950	0.996	
Satd. Flow (prot)	0	3008	1455	1597	2756	0	0	0	0	1678	1318	1442
Fl _t Permitted				0.950						0.950	0.996	
Satd. Flow (perm)	0	3008	1455	1597	2756	0	0	0	0	1678	1318	1442
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			241									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.88	0.88	0.88	0.82	0.82	0.82
Heavy Vehicles (%)	0%	20%	11%	13%	31%	0%	0%	0%	0%	9%	0%	17%
Adj. Flow (vph)	0	618	241	336	993	0	0	0	0	210	0	499
Shared Lane Traffic (%)										10%		48%
Lane Group Flow (vph)	0	618	241	336	993	0	0	0	0	189	261	259
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		2	2	1	1 2					4	4	4
Permitted Phases												
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		23.0	23.0	26.0						31.0	31.0	31.0
Total Split (%)		28.8%	28.8%	32.5%						38.8%	38.8%	38.8%
Maximum Green (s)		17.5	17.5	22.0						25.5	25.5	25.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Build Improved

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		22.0	22.0	22.0	49.6					20.9	20.9	20.9
Actuated g/C Ratio		0.28	0.28	0.28	0.62					0.26	0.26	0.26
v/c Ratio		0.75	0.42	0.77	0.58					0.43	0.76	0.69
Control Delay		36.0	6.5	30.6	4.9					26.6	41.0	35.7
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		36.0	6.5	30.6	4.9					26.6	41.0	35.7
LOS		D	A	C	A					C	D	D
Approach Delay		27.7			11.4						35.2	
Approach LOS		C			B						D	
Queue Length 50th (ft)		160	0	119	60					80	128	118
Queue Length 95th (ft)		#263	56	m195	m239					118	183	168
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		829	575	457	1707					534	420	459
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		0.75	0.42	0.74	0.58					0.35	0.62	0.56

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 78 (98%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 22.1
 Intersection LOS: C
 Intersection Capacity Utilization 59.4%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Build Improved

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↔	↗			
Traffic Volume (vph)	192	561	0	0	880	248	343	5	263	0	0	0
Future Volume (vph)	192	561	0	0	880	248	343	5	263	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Fr _t						0.850		0.948	0.850			
Fl _t Protected	0.950						0.950	0.969				
Satd. Flow (prot)	1656	3008	0	0	2735	1394	1604	1398	1525	0	0	0
Fl _t Permitted	0.950						0.950	0.969				
Satd. Flow (perm)	1656	3008	0	0	2735	1394	1604	1398	1525	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						256						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.93	0.93	0.93	0.97	0.97	0.97	0.86	0.86	0.86	0.88	0.88	0.88
Heavy Vehicles (%)	9%	20%	0%	0%	32%	12%	14%	0%	14%	0%	0%	0%
Adj. Flow (vph)	206	603	0	0	907	256	399	6	306	0	0	0
Shared Lane Traffic (%)							38%		27%			
Lane Group Flow (vph)	206	603	0	0	907	256	247	241	223	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	25.0				29.0	29.0	26.0	26.0	26.0			
Total Split (%)	31.3%				36.3%	36.3%	32.5%	32.5%	32.5%			
Maximum Green (s)	21.0				23.5	23.5	21.0	21.0	21.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Build Improved

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None				C-Max	C-Max	None	None	None			
Act Effct Green (s)	16.2	52.8			31.2	31.2	18.2	18.2	18.2			
Actuated g/C Ratio	0.20	0.66			0.39	0.39	0.23	0.23	0.23			
v/c Ratio	0.62	0.30			0.85	0.37	0.68	0.76	0.64			
Control Delay	46.0	1.0			34.4	11.2	37.7	44.6	36.5			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	46.0	1.0			34.4	11.2	37.7	44.6	36.5			
LOS	D	A			C	B	D	D	D			
Approach Delay		12.4			29.3			39.6				
Approach LOS		B			C			D				
Queue Length 50th (ft)	96	4			180	40	113	118	102			
Queue Length 95th (ft)	m104	10			m#271	m49	181	192	165			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	434	1964			1065	699	421	366	400			
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	0.47	0.31			0.85	0.37	0.59	0.66	0.56			

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 34 (43%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 26.9 Intersection LOS: C
 Intersection Capacity Utilization 59.4% ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build Improved
 Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	520	25	10	980	126	35	25	10	30	5	113
Future Volume (vph)	279	520	25	10	980	126	35	25	10	30	5	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.957				0.850
Flt Protected	0.950			0.950			0.950				0.959	
Satd. Flow (prot)	3045	1547	0	1796	2477	1516	1668	1753	0	0	1791	1509
Flt Permitted	0.950			0.950			0.729				0.708	
Satd. Flow (perm)	3045	1547	0	1796	2477	1516	1280	1753	0	0	1322	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				142		20				115
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.51	0.51	0.51	0.81	0.81	0.81
Heavy Vehicles (%)	15%	23%	1%	0%	45%	6%	1%	0%	1%	2%	0%	7%
Adj. Flow (vph)	303	565	27	11	1101	142	69	49	20	37	6	140
Shared Lane Traffic (%)												
Lane Group Flow (vph)	303	592	0	11	1101	142	69	69	0	0	43	140
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pt+ov
Protected Phases	7	7 8		3	3 8	3 8		4			4	4 7
Permitted Phases							4			4		
Detector Phase	7	7 8		3	3 8	3 8	4	4		4	4	4 7
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	
Total Split (s)	26.0			11.0			19.0	19.0		19.0	19.0	
Total Split (%)	32.5%			13.8%			23.8%	23.8%		23.8%	23.8%	
Maximum Green (s)	20.6			5.7			14.1	14.1		14.1	14.1	
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	
Lost Time Adjust (s)	0.0			0.0			0.0	0.0			0.0	
Total Lost Time (s)	5.4			5.3			4.9	4.9			4.9	
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												

Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	24.0
Total Split (%)	30%
Maximum Green (s)	17.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build Improved
 Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	
Recall Mode	None			None			None	None		None	None	
Act Effect Green (s)	20.5	49.3		5.7	34.5	34.5	9.4	9.4			9.4	35.3
Actuated g/C Ratio	0.26	0.62		0.07	0.43	0.43	0.12	0.12			0.12	0.44
v/c Ratio	0.39	0.62		0.09	1.03	0.19	0.46	0.31			0.28	0.19
Control Delay	27.6	12.5		36.4	63.0	4.0	41.9	27.3			35.5	3.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	27.6	12.5		36.4	63.0	4.0	41.9	27.3			35.5	3.9
LOS	C	B		D	E	A	D	C			D	A
Approach Delay		17.6			56.1			34.6				11.4
Approach LOS		B			E			C				B
Queue Length 50th (ft)	63	68		5	~346	0	33	23			20	6
Queue Length 95th (ft)	109	143		21	#470	33	37	27			42	27
Internal Link Dist (ft)		684			671			171				640
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	845	939		127	1066	733	225	325			233	739
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.36	0.63		0.09	1.03	0.19	0.31	0.21			0.18	0.19

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 27 (34%), Referenced to phase 8:EBWB, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.03
 Intersection Signal Delay: 37.6
 Intersection LOS: D
 Intersection Capacity Utilization 56.7%
 ICU Level of Service B
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø8
Vehicle Extension (s)	5.0
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Build Improved
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	5	2	0	0	35	394	1	0	141	0
Future Volume (vph)	0	0	5	2	0	0	35	394	1	0	141	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850							0.850			
Flt Protected				0.950			0.950					
Satd. Flow (prot)	1900	1615	0	1805	1900	0	1805	1845	1615	1712	1727	0
Flt Permitted							0.636					
Satd. Flow (perm)	1900	1615	0	1900	1900	0	1208	1845	1615	1712	1727	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		676							65			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.42	0.42	0.42	0.88	0.88	0.88	0.67	0.67	0.67	0.73	0.73	0.73
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	11%	10%	0%
Adj. Flow (vph)	0	0	12	2	0	0	52	588	1	0	193	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	2	0	0	52	588	1	0	193	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			4			2			1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	1.0	2.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Build Improved
 Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		7.2		7.2			37.5	37.5	37.5		37.5	
Actuated g/C Ratio		0.18		0.18			0.94	0.94	0.94		0.94	
v/c Ratio		0.01		0.01			0.05	0.34	0.00		0.12	
Control Delay		0.0		17.5			1.5	2.1	0.0		1.4	
Queue Delay		0.0		0.0			0.0	0.0	0.0		0.0	
Total Delay		0.0		17.5			1.5	2.1	0.0		1.4	
LOS		A		B			A	A	A		A	
Approach Delay					17.5			2.0				1.4
Approach LOS					B			A				A
Queue Length 50th (ft)		0		0			0	0	0		0	
Queue Length 95th (ft)		0		6			9	76	0		27	
Internal Link Dist (ft)		116			123			640				398
Turn Bay Length (ft)				170			140					
Base Capacity (vph)		1522		1714			1159	1771	1553		1658	
Starvation Cap Reductn		0		0			0	0	0		0	
Spillback Cap Reductn		0		0			0	0	0		0	
Storage Cap Reductn		0		0			0	0	0		0	
Reduced v/c Ratio		0.01		0.00			0.04	0.33	0.00		0.12	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 40.1
 Natural Cycle: 50
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.34
 Intersection Signal Delay: 1.9
 Intersection Capacity Utilization 44.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Josheph Carini Rd

Build Improved
Timing Plan: AM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	6	58	336	135	6
Future Volume (vph)	0	6	58	336	135	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865			0.994		
Fl _t Protected				0.993		
Satd. Flow (prot)	1096	0	0	1705	1597	0
Fl _t Permitted				0.993		
Satd. Flow (perm)	1096	0	0	1705	1597	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.50	0.50	0.90	0.90	0.63	0.63
Heavy Vehicles (%)	0%	50%	3%	12%	19%	2%
Adj. Flow (vph)	0	12	64	373	214	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	437	224	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.7%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	0	6	58	336	135	6
Future Vol, veh/h	0	6	58	336	135	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	90	90	63	63
Heavy Vehicles, %	0	50	3	12	19	2
Mvmt Flow	0	12	64	373	214	10

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	720	219	224	0	0
Stage 1	219	-	-	-	-
Stage 2	501	-	-	-	-
Critical Hdwy	6.4	6.7	4.13	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.75	2.227	-	-
Pot Cap-1 Maneuver	398	714	1339	-	-
Stage 1	822	-	-	-	-
Stage 2	613	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	374	714	1339	-	-
Mov Cap-2 Maneuver	374	-	-	-	-
Stage 1	773	-	-	-	-
Stage 2	613	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1339	-	714	-	-
HCM Lane V/C Ratio	0.048	-	0.017	-	-
HCM Control Delay (s)	7.8	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	-	-

Lanes, Volumes, Timings
6: Research Parkway

Build Improved
Timing Plan: AM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	6	330	141	2
Future Volume (vph)	0	0	6	330	141	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998	
Flt Protected			0.950			
Satd. Flow (prot)	1900	1900	1805	1667	1623	0
Flt Permitted			0.950			
Satd. Flow (perm)	1900	1900	1805	1667	1623	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.25	0.25	0.89	0.89	0.81	0.81
Heavy Vehicles (%)	0%	0%	0%	14%	17%	0%
Adj. Flow (vph)	0	0	7	371	174	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	7	371	176	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.7%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	0	6	330	141	2
Future Vol, veh/h	0	0	6	330	141	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	89	89	81	81
Heavy Vehicles, %	0	0	0	14	17	0
Mvmt Flow	0	0	7	371	174	2

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	560	175	176	0	0
Stage 1	175	-	-	-	-
Stage 2	385	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	493	874	1412	-	-
Stage 1	860	-	-	-	-
Stage 2	692	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	491	874	1412	-	-
Mov Cap-2 Maneuver	491	-	-	-	-
Stage 1	856	-	-	-	-
Stage 2	692	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1412	-	-	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-	-	-
HCM Control Delay (s)	7.6	-	0	0	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Build Improved
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	101	61	25	40	66	20	15	275	40	25	78	45
Future Volume (vph)	101	61	25	40	66	20	15	275	40	25	78	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.982			0.979			0.984			0.959	
Fl _t Protected		0.974			0.984			0.998			0.992	
Satd. Flow (prot)	0	1749	0	0	1764	0	0	1803	0	0	1734	0
Fl _t Permitted		0.974			0.984			0.998			0.992	
Satd. Flow (perm)	0	1749	0	0	1764	0	0	1803	0	0	1734	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.62	0.62	0.62	0.71	0.71	0.71	0.69	0.69	0.69	0.76	0.76	0.76
Heavy Vehicles (%)	0%	5%	17%	6%	2%	5%	8%	3%	5%	9%	4%	2%
Adj. Flow (vph)	163	98	40	56	93	28	22	399	58	33	103	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	301	0	0	177	0	0	479	0	0	195	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.7%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	20.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	101	61	25	40	66	20	15	275	40	25	78	45
Future Vol, veh/h	101	61	25	40	66	20	15	275	40	25	78	45
Peak Hour Factor	0.62	0.62	0.62	0.71	0.71	0.71	0.69	0.69	0.69	0.76	0.76	0.76
Heavy Vehicles, %	0	5	17	6	2	5	8	3	5	9	4	2
Mvmt Flow	163	98	40	56	93	28	22	399	58	33	103	59
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	17	13.4	28.8	13.2
HCM LOS	C	B	D	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	54%	32%	17%
Vol Thru, %	83%	33%	52%	53%
Vol Right, %	12%	13%	16%	30%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	330	187	126	148
LT Vol	15	101	40	25
Through Vol	275	61	66	78
RT Vol	40	25	20	45
Lane Flow Rate	478	302	177	195
Geometry Grp	1	1	1	1
Degree of Util (X)	0.799	0.543	0.337	0.354
Departure Headway (Hd)	6.015	6.478	6.842	6.548
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	603	555	524	547
Service Time	4.065	4.535	4.909	4.615
HCM Lane V/C Ratio	0.793	0.544	0.338	0.356
HCM Control Delay	28.8	17	13.4	13.2
HCM Lane LOS	D	C	B	B
HCM 95th-tile Q	7.8	3.2	1.5	1.6

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Build Improved
Timing Plan: AM



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	126	0	0	126	0	0
Future Volume (vph)	126	0	0	126	0	0
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						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	1863
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	0	0	137	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	137	0	0	137	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	10.0%
Analysis Period (min)	15
	ICU Level of Service A

Intersection

Int Delay, s/veh 0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	126	0	0	126	0	0
Future Vol, veh/h	126	0	0	126	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	137	0	0	137	0	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	137	0	274
Stage 1	-	-	-	-	137
Stage 2	-	-	-	-	137
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1447	-	716
Stage 1	-	-	-	-	890
Stage 2	-	-	-	-	890
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1447	-	716
Mov Cap-2 Maneuver	-	-	-	-	716
Stage 1	-	-	-	-	890
Stage 2	-	-	-	-	890

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1447	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Lanes, Volumes, Timings

Build Improved

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘	↕	↗
Traffic Volume (vph)	0	1034	480	306	850	0	0	0	0	260	5	338
Future Volume (vph)	0	1034	480	306	850	0	0	0	0	260	5	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.891	0.850
Fl _t Protected				0.950						0.950	0.988	
Satd. Flow (prot)	0	2843	1615	1805	2865	0	0	0	0	1829	1573	1688
Fl _t Permitted				0.950						0.950	0.988	
Satd. Flow (perm)	0	2843	1615	1805	2865	0	0	0	0	1829	1573	1688
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			535									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.89	0.89	0.89	0.84	0.84	0.84	0.88	0.88	0.88	0.85	0.85	0.85
Heavy Vehicles (%)	15%	27%	0%	0%	26%	9%	12%	0%	11%	0%	0%	0%
Adj. Flow (vph)	0	1162	539	364	1012	0	0	0	0	306	6	398
Shared Lane Traffic (%)										19%		43%
Lane Group Flow (vph)	0	1162	539	364	1012	0	0	0	0	248	235	227
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		37.0	37.0	23.0						20.0	20.0	20.0
Total Split (%)		46.3%	46.3%	28.8%						25.0%	25.0%	25.0%
Maximum Green (s)		31.5	31.5	19.0						14.5	14.5	14.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Build Improved

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effect Green (s)		32.2	32.2	18.8	56.5					14.0	14.0	14.0
Actuated g/C Ratio		0.40	0.40	0.24	0.71					0.18	0.18	0.18
v/c Ratio		1.02	0.56	0.86	0.50					0.78	0.85	0.77
Control Delay		57.0	4.2	45.8	1.0					49.5	61.1	50.4
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		57.0	4.2	45.8	1.0					49.5	61.1	50.4
LOS		E	A	D	A					D	E	D
Approach Delay		40.3			12.9						53.6	
Approach LOS		D			B						D	
Queue Length 50th (ft)		~334	1	136	6					125	125	113
Queue Length 95th (ft)		#450	57	m144	m6					#214	#232	#201
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1142	969	428	2000					331	285	305
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		1.02	0.56	0.85	0.51					0.75	0.82	0.74

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 1 (1%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 32.8
 Intersection LOS: C
 Intersection Capacity Utilization 72.3%
 ICU Level of Service C
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Build Improved

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↔	↗			
Traffic Volume (vph)	449	845	0	0	868	242	288	5	320	0	0	0
Future Volume (vph)	449	845	0	0	868	242	288	5	320	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Fr _t						0.850		0.909	0.850			
Fl _t Protected	0.950						0.950	0.982				
Satd. Flow (prot)	1805	2756	0	0	2865	1561	1829	1543	1739	0	0	0
Fl _t Permitted	0.950						0.950	0.982				
Satd. Flow (perm)	1805	2756	0	0	2865	1561	1829	1543	1739	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						252						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.87	0.87	0.87	0.96	0.96	0.96	0.85	0.85	0.85	0.88	0.88	0.88
Heavy Vehicles (%)	0%	31%	14%	11%	26%	0%	0%	0%	0%	8%	0%	11%
Adj. Flow (vph)	516	971	0	0	904	252	339	6	376	0	0	0
Shared Lane Traffic (%)							26%		39%			
Lane Group Flow (vph)	516	971	0	0	904	252	251	241	229	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	32.0				27.0	27.0	21.0	21.0	21.0			
Total Split (%)	40.0%				33.8%	33.8%	26.3%	26.3%	26.3%			
Maximum Green (s)	28.0				21.5	21.5	16.0	16.0	16.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Build Improved

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: PM

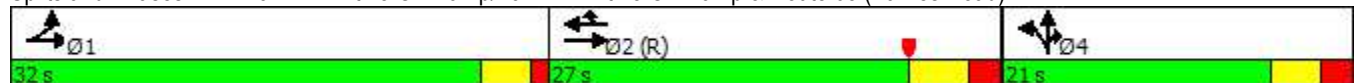


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	27.1	55.8			23.2	23.2	15.2	15.2	15.2			
Actuated g/C Ratio	0.34	0.70			0.29	0.29	0.19	0.19	0.19			
v/c Ratio	0.84	0.50			1.09	0.40	0.73	0.83	0.70			
Control Delay	22.5	0.4			81.8	7.9	43.6	55.3	42.3			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	22.5	0.4			81.8	7.9	43.6	55.3	42.3			
LOS	C	A			F	A	D	E	D			
Approach Delay		8.0			65.7			47.1				
Approach LOS		A			E			D				
Queue Length 50th (ft)	101	1			~274	15	123	126	111			
Queue Length 95th (ft)	m114	m1			m#355	m33	191	#227	176			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	631	1923			831	632	365	308	347			
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	0.82	0.50			1.09	0.40	0.69	0.78	0.66			

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 39 (49%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.09
 Intersection Signal Delay: 36.2
 Intersection LOS: D
 Intersection Capacity Utilization 72.3%
 ICU Level of Service C
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build Improved
 Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	1010	15	5	803	58	10	20	5	135	40	297
Future Volume (vph)	140	1010	15	5	803	58	10	20	5	135	40	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.998				0.850		0.969				0.850
Fl _t Protected	0.950			0.950			0.950				0.963	
Satd. Flow (prot)	1719	2566	0	1796	2763	1575	1652	1780	0	0	1762	1429
Fl _t Permitted	0.950			0.950			0.465				0.753	
Satd. Flow (perm)	1719	2566	0	1796	2763	1575	808	1780	0	0	1378	1429
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				100		7				115
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.95	0.95	0.95	0.86	0.86	0.86	0.75	0.75	0.75	0.82	0.82	0.82
Heavy Vehicles (%)	5%	41%	1%	0%	30%	2%	2%	0%	0%	5%	0%	13%
Adj. Flow (vph)	147	1063	16	6	934	67	13	27	7	165	49	362
Shared Lane Traffic (%)												
Lane Group Flow (vph)	147	1079	0	6	934	67	13	34	0	0	214	362
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	22.0			11.0			22.0	22.0		22.0	22.0	22.0
Total Split (%)	27.5%			13.8%			27.5%	27.5%		27.5%	27.5%	27.5%
Maximum Green (s)	16.6			5.7			17.1	17.1		17.1	17.1	16.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	25.0
Total Split (%)	31%
Maximum Green (s)	18.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build Improved
 Timing Plan: PM

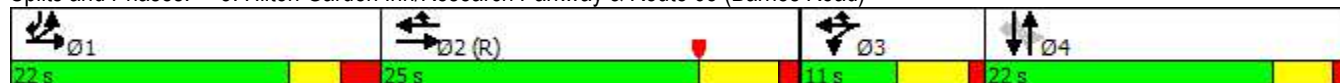


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0		1.5			2.0		2.0		2.0		2.0
Recall Mode	None			None			None		None		None	None
Act Effct Green (s)	18.0	43.6		5.7	30.5	30.5	15.1	15.1		15.1		38.0
Actuated g/C Ratio	0.22	0.54		0.07	0.38	0.38	0.19	0.19		0.19		0.48
v/c Ratio	0.38	0.77		0.05	0.89	0.10	0.09	0.10		0.82		0.49
Control Delay	35.2	14.2		35.6	35.8	2.1	26.9	22.3		56.5		11.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	35.2	14.2		35.6	35.8	2.1	26.9	22.3		56.5		11.9
LOS	D	B		D	D	A	C	C		E		B
Approach Delay	16.7			33.5			23.6		28.5			
Approach LOS	B			C			C		C			
Queue Length 50th (ft)	73	70		3	227	0	5	11		100		75
Queue Length 95th (ft)	m120	84		14	#320	11	17	28		#170		122
Internal Link Dist (ft)	684			671			171		640			
Turn Bay Length (ft)	570			100			250					
Base Capacity (vph)	386	1398		127	1051	661	172	385		294		740
Starvation Cap Reductn	0	0		0	0	0	0	0		0		0
Spillback Cap Reductn	0	0		0	0	0	0	0		0		0
Storage Cap Reductn	0	0		0	0	0	0	0		0		0
Reduced v/c Ratio	0.38	0.77		0.05	0.89	0.10	0.08	0.09		0.73		0.49

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 29 (36%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 25.1 Intersection LOS: C
 Intersection Capacity Utilization 61.8% ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Build Improved
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	15	21	0	4	5	136	77	14	436	0
Future Volume (vph)	5	0	15	21	0	4	5	136	77	14	436	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850				0.850			
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1615	0	1805	1615	0	1805	1792	1615	1805	1863	0
Flt Permitted							0.303			0.615		
Satd. Flow (perm)	1900	1615	0	1900	1615	0	576	1792	1615	1168	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		226			617				131			
Link Speed (mph)		30			30			30				30
Link Distance (ft)		196			203			720				478
Travel Time (s)		4.5			4.6			16.4				10.9
Peak Hour Factor	0.48	0.48	0.48	0.88	0.88	0.88	0.59	0.59	0.59	0.60	0.60	0.60
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	2%	0%
Adj. Flow (vph)	10	0	31	24	0	5	8	231	131	23	727	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	31	0	24	5	0	8	231	131	23	727	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12				12
Link Offset(ft)		0			12			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt		NA
Protected Phases		4			4			2			1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	1.0	2.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Build Improved
 Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	7.5	7.5		7.5	7.5		37.5	37.5	37.5	37.8	37.5	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.76	0.76	0.76	0.76	0.76	
v/c Ratio	0.03	0.07		0.08	0.01		0.02	0.17	0.10	0.02	0.51	
Control Delay	25.4	0.3		25.6	0.0		5.4	5.2	1.6	2.3	8.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	25.4	0.3		25.6	0.0		5.4	5.2	1.6	2.3	8.0	
LOS	C	A		C	A		A	A	A	A	A	
Approach Delay		6.4			21.2			3.9				7.8
Approach LOS		A			C			A				A
Queue Length 50th (ft)	2	0		6	0		1	22	0	2	100	
Queue Length 95th (ft)	9	0		29	0		4	40	4	4	136	
Internal Link Dist (ft)		116			123			640			398	
Turn Bay Length (ft)				170			140			115		
Base Capacity (vph)	1435	1275		1435	1371		502	1561	1424	963	1623	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.01	0.02		0.02	0.00		0.02	0.15	0.09	0.02	0.45	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 49.5
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 6.9
 Intersection Capacity Utilization 39.9%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Joseph Carini Rd

Build Improved
Timing Plan: PM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	63	9	136	387	0
Future Volume (vph)	3	63	9	136	387	0
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	0.871					
Flt Protected	0.998			0.997		
Satd. Flow (prot)	1618	0	0	1661	1696	0
Flt Permitted	0.998			0.997		
Satd. Flow (perm)	1618	0	0	1661	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.55	0.55	0.90	0.90	0.80	0.80
Heavy Vehicles (%)	50%	0%	0%	15%	12%	0%
Adj. Flow (vph)	5	115	10	151	484	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	120	0	0	161	484	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.1%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	3	63	9	136	387	0
Future Vol, veh/h	3	63	9	136	387	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	55	55	90	90	80	80
Heavy Vehicles, %	50	0	0	15	12	0
Mvmt Flow	5	115	10	151	484	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	655	484	484	0	-	0
Stage 1	484	-	-	-	-	-
Stage 2	171	-	-	-	-	-
Critical Hdwy	6.9	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	364	587	1089	-	-	-
Stage 1	531	-	-	-	-	-
Stage 2	755	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	360	587	1089	-	-	-
Mov Cap-2 Maneuver	360	-	-	-	-	-
Stage 1	526	-	-	-	-	-
Stage 2	755	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1089	-	571	-	-
HCM Lane V/C Ratio	0.009	-	0.21	-	-
HCM Control Delay (s)	8.3	0	13	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Build Improved
Timing Plan: PM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	13	3	136	374	0
Future Volume (vph)	3	13	3	136	374	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1638	1696	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1638	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Confl. Peds. (#/hr)	3					
Peak Hour Factor	0.42	0.42	0.90	0.90	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	16%	12%	0%
Adj. Flow (vph)	7	31	3	151	473	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	31	3	151	473	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.7%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	3	13	3	136	374	0
Future Vol, veh/h	3	13	3	136	374	0
Conflicting Peds, #/hr	3	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	42	42	90	90	79	79
Heavy Vehicles, %	0	0	0	16	12	0
Mvmt Flow	7	31	3	151	473	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	633	473	473	0	-	0
Stage 1	473	-	-	-	-	-
Stage 2	160	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	447	595	1099	-	-	-
Stage 1	631	-	-	-	-	-
Stage 2	874	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	446	595	1099	-	-	-
Mov Cap-2 Maneuver	446	-	-	-	-	-
Stage 1	629	-	-	-	-	-
Stage 2	874	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1099	-	446	595	-	-
HCM Lane V/C Ratio	0.003	-	0.016	0.052	-	-
HCM Control Delay (s)	8.3	-	13.2	11.4	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.2	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Build Improved
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	45	51	25	47	45	18	20	104	15	25	302	101
Future Volume (vph)	45	51	25	47	45	18	20	104	15	25	302	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.972			0.978			0.985			0.968	
Fl _t Protected		0.982			0.979			0.993			0.997	
Satd. Flow (prot)	0	1800	0	0	1819	0	0	1729	0	0	1804	0
Fl _t Permitted		0.982			0.979			0.993			0.997	
Satd. Flow (perm)	0	1800	0	0	1819	0	0	1729	0	0	1804	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.86	0.86	0.86	0.76	0.76	0.76	0.63	0.63	0.63	0.71	0.71	0.71
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	10%	0%	0%	2%	1%
Adj. Flow (vph)	52	59	29	62	59	24	32	165	24	35	425	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	140	0	0	145	0	0	221	0	0	602	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	21.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	51	25	47	45	18	20	104	15	25	302	101
Future Vol, veh/h	45	51	25	47	45	18	20	104	15	25	302	101
Peak Hour Factor	0.86	0.86	0.86	0.76	0.76	0.76	0.63	0.63	0.63	0.71	0.71	0.71
Heavy Vehicles, %	2	0	0	0	0	0	0	10	0	0	2	1
Mvmt Flow	52	59	29	62	59	24	32	165	24	35	425	142
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.5	11.6	11.8	29.3
HCM LOS	B	B	B	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	14%	37%	43%	6%
Vol Thru, %	75%	42%	41%	71%
Vol Right, %	11%	21%	16%	24%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	139	121	110	428
LT Vol	20	45	47	25
Through Vol	104	51	45	302
RT Vol	15	25	18	101
Lane Flow Rate	221	141	145	603
Geometry Grp	1	1	1	1
Degree of Util (X)	0.348	0.248	0.255	0.844
Departure Headway (Hd)	5.67	6.348	6.34	5.043
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	631	561	563	717
Service Time	3.745	4.434	4.426	3.098
HCM Lane V/C Ratio	0.35	0.251	0.258	0.841
HCM Control Delay	11.8	11.5	11.6	29.3
HCM Lane LOS	B	B	B	D
HCM 95th-tile Q	1.6	1	1	9.6

Lanes, Volumes, Timings
 8: Site Drive 2 & Carpenter Lane

Build Improved
 Timing Plan: PM



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	91	0	0	90	20	0
Future Volume (vph)	91	0	0	90	20	0
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						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	0	0	98	22	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	99	0	0	98	22	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.8%
Analysis Period (min)	15
	ICU Level of Service A

Intersection

Int Delay, s/veh 1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	91	0	0	90	20	0
Future Vol, veh/h	91	0	0	90	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	0	0	98	22	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	99	0	197
Stage 1	-	-	-	-	99
Stage 2	-	-	-	-	98
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1494	-	792
Stage 1	-	-	-	-	925
Stage 2	-	-	-	-	926
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1494	-	792
Mov Cap-2 Maneuver	-	-	-	-	792
Stage 1	-	-	-	-	925
Stage 2	-	-	-	-	926

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	792	-	-	-	1494	-
HCM Lane V/C Ratio	0.027	-	-	-	-	-
HCM Control Delay (s)	9.7	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0	-

Lanes, Volumes, Timings

Build Improved

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	511	172	175	559	0	0	0	0	131	1	172
Future Volume (vph)	0	511	172	175	559	0	0	0	0	131	1	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.890	0.850
Fl _t Protected				0.950						0.950	0.987	
Satd. Flow (prot)	0	3223	1455	1467	3343	0	0	0	0	1577	1237	1288
Fl _t Permitted				0.950						0.950	0.987	
Satd. Flow (perm)	0	3223	1455	1467	3343	0	0	0	0	1577	1237	1288
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			198									
Link Speed (mph)		45			35			30				30
Link Distance (ft)		348			913			376				495
Travel Time (s)		5.3			17.8			8.5				11.3
Peak Hour Factor	0.87	0.87	0.87	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Heavy Vehicles (%)	0%	12%	11%	23%	8%	0%	0%	0%	0%	16%	0%	31%
Adj. Flow (vph)	0	587	198	192	614	0	0	0	0	146	1	191
Shared Lane Traffic (%)										20%		43%
Lane Group Flow (vph)	0	587	198	192	614	0	0	0	0	117	112	109
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Build Improved

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		32.1	32.1	15.2	52.8					12.7	12.7	12.7
Actuated g/C Ratio		0.43	0.43	0.20	0.70					0.17	0.17	0.17
v/c Ratio		0.43	0.27	0.65	0.26					0.44	0.54	0.50
Control Delay		17.9	4.1	30.7	0.9					32.2	37.2	35.4
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		17.9	4.1	30.7	0.9					32.2	37.2	35.4
LOS		B	A	C	A					C	D	D
Approach Delay		14.4			8.0						34.9	
Approach LOS		B			A						C	
Queue Length 50th (ft)		98	0	38	0					52	53	49
Queue Length 95th (ft)		159	38	77	1					92	97	90
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1381	736	334	2341					410	321	334
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		0.43	0.27	0.57	0.26					0.29	0.35	0.33

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 15.3

Intersection LOS: B

Intersection Capacity Utilization 44.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Build Improved

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↔	↗			
Traffic Volume (vph)	169	473	0	0	576	174	158	0	127	0	0	0
Future Volume (vph)	169	473	0	0	576	174	158	0	127	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Fr _t						0.850		0.943	0.850			
Fl _t Protected	0.950						0.950	0.970				
Satd. Flow (prot)	1433	3343	0	0	3282	1269	1604	1369	1474	0	0	0
Fl _t Permitted	0.950						0.950	0.970				
Satd. Flow (perm)	1433	3343	0	0	3282	1269	1604	1369	1474	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						191						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.95	0.95	0.95	0.91	0.91	0.91	0.90	0.90	0.90	0.88	0.88	0.88
Heavy Vehicles (%)	26%	8%	0%	0%	10%	23%	14%	0%	18%	0%	0%	0%
Adj. Flow (vph)	178	498	0	0	633	191	176	0	141	0	0	0
Shared Lane Traffic (%)							38%		29%			
Lane Group Flow (vph)	178	498	0	0	633	191	109	108	100	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Build Improved

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	14.6	54.1			34.0	34.0	11.9	11.9	11.9			
Actuated g/C Ratio	0.19	0.72			0.45	0.45	0.16	0.16	0.16			
v/c Ratio	0.64	0.21			0.43	0.28	0.43	0.50	0.43			
Control Delay	27.3	0.6			11.2	1.9	32.9	36.2	33.4			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	27.3	0.6			11.2	1.9	32.9	36.2	33.4			
LOS	C	A			B	A	C	D	C			
Approach Delay		7.6			9.1			34.2				
Approach LOS		A			A			C				
Queue Length 50th (ft)	36	0			53	0	49	51	45			
Queue Length 95th (ft)	54	1			94	9	89	94	84			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	323	2374			1486	679	406	346	373			
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	0.55	0.21			0.43	0.28	0.27	0.31	0.27			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 12.9
 Intersection Capacity Utilization 44.9%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build Improved
 Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	505	7	1	532	20	5	0	2	53	0	213
Future Volume (vph)	88	505	7	1	532	20	5	0	2	53	0	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.998				0.850		0.850				0.850
Fl _t Protected	0.950			0.950			0.950				0.950	
Satd. Flow (prot)	1410	3364	0	1796	3295	1530	1404	1041	0	0	1480	1282
Fl _t Permitted	0.950			0.950			0.719				0.754	
Satd. Flow (perm)	1410	3364	0	1796	3295	1530	1063	1041	0	0	1174	1282
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				106		428				205
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.44	0.44	0.44	0.90	0.90	0.90
Heavy Vehicles (%)	28%	7%	14%	0%	9%	5%	20%	0%	50%	22%	0%	26%
Adj. Flow (vph)	95	543	8	1	578	22	11	0	5	59	0	237
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	551	0	1	578	22	11	5	0	0	59	237
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	20.0			12.0			15.0	15.0		15.0	15.0	20.0
Total Split (%)	26.7%			16.0%			20.0%	20.0%		20.0%	20.0%	26.7%
Maximum Green (s)	14.6			6.7			10.1	10.1		10.1	10.1	14.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build Improved
 Timing Plan: MD

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	28.0
Total Split (%)	37%
Maximum Green (s)	21.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build Improved
 Timing Plan: MD

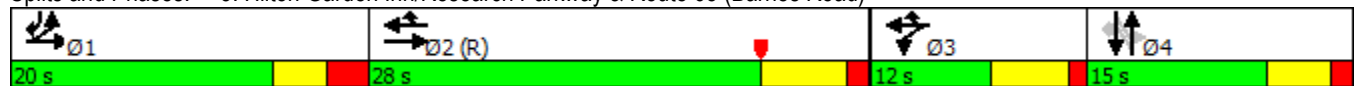


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	11.0	50.3		5.5	43.9	43.9	8.4	8.4			8.4	19.6
Actuated g/C Ratio	0.15	0.67		0.07	0.59	0.59	0.11	0.11			0.11	0.26
v/c Ratio	0.46	0.24		0.01	0.30	0.02	0.09	0.01			0.45	0.49
Control Delay	41.1	3.6		32.0	10.5	0.1	30.8	0.0			41.9	7.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	41.1	3.6		32.0	10.5	0.1	30.8	0.0			41.9	7.4
LOS	D	A		C	B	A	C	A			D	A
Approach Delay		9.1			10.2			21.2			14.3	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	39	31		0	78	0	5	0			26	10
Queue Length 95th (ft)	90	40		5	128	0	9	0			61	52
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	274	2189		160	1984	963	143	510			158	537
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.35	0.25		0.01	0.29	0.02	0.08	0.01			0.37	0.44

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 10.6
 Intersection Capacity Utilization 47.4%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Build Improved
Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	8	0	0	0	5	103	0	0	258	1
Future Volume (vph)	2	0	8	0	0	0	5	103	0	0	258	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										0.999
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1805	1615	0	1900	1900	0	1805	1520	1900	1900	1484	0
Flt Permitted							0.587					
Satd. Flow (perm)	1900	1615	0	1900	1900	0	1115	1520	1900	1900	1484	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		550										
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.63	0.63	0.63	0.88	0.88	0.88	0.81	0.81	0.81	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	28%	0%
Adj. Flow (vph)	3	0	13	0	0	0	6	127	0	0	280	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	13	0	0	0	0	6	127	0	0	281	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt		NA
Protected Phases		4			4			2			1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Build Improved
 Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	7.1	7.1					35.6	35.6				35.6
Actuated g/C Ratio	0.18	0.18					0.92	0.92				0.92
v/c Ratio	0.01	0.02					0.01	0.09				0.20
Control Delay	15.5	0.0					2.0	1.7				2.0
Queue Delay	0.0	0.0					0.0	0.0				0.0
Total Delay	15.5	0.0					2.0	1.7				2.0
LOS	B	A					A	A				A
Approach Delay		2.9						1.7				2.0
Approach LOS		A						A				A
Queue Length 50th (ft)	1	0					0	0				0
Queue Length 95th (ft)	4	0					3	23				57
Internal Link Dist (ft)		116			123			640				398
Turn Bay Length (ft)							140					
Base Capacity (vph)	1753	1532					1100	1499				1464
Starvation Cap Reductn	0	0					0	0				0
Spillback Cap Reductn	0	0					0	0				0
Storage Cap Reductn	0	0					0	0				0
Reduced v/c Ratio	0.00	0.01					0.01	0.08				0.19

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	38.5
Natural Cycle:	45
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.20
Intersection Signal Delay:	1.9
Intersection LOS:	A
Intersection Capacity Utilization:	28.6%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Joseph Carini Rd

Build Improved
Timing Plan: MD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	30	14	91	229	3
Future Volume (vph)	3	30	14	91	229	3
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	0.876				0.998	
Flt Protected	0.996			0.993		
Satd. Flow (prot)	1458	0	0	1674	1681	0
Flt Permitted	0.996			0.993		
Satd. Flow (perm)	1458	0	0	1674	1681	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.69	0.69	0.83	0.83	0.65	0.65
Heavy Vehicles (%)	0%	15%	11%	13%	13%	0%
Adj. Flow (vph)	4	43	17	110	352	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	0	127	357	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	26.6%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	3	30	14	91	229	3
Future Vol, veh/h	3	30	14	91	229	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	83	83	65	65
Heavy Vehicles, %	0	15	11	13	13	0
Mvmt Flow	4	43	17	110	352	5

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	499	355	357	0	-	0
Stage 1	355	-	-	-	-	-
Stage 2	144	-	-	-	-	-
Critical Hdwy	6.4	6.35	4.21	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.435	2.299	-	-	-
Pot Cap-1 Maneuver	535	661	1153	-	-	-
Stage 1	714	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	526	661	1153	-	-	-
Mov Cap-2 Maneuver	526	-	-	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1153	-	646	-	-
HCM Lane V/C Ratio	0.015	-	0.074	-	-
HCM Control Delay (s)	8.2	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Build Improved
Timing Plan: MD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	3	2	92	229	0
Future Volume (vph)	2	3	2	92	229	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1583	1805	1681	1652	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1583	1805	1681	1652	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.38	0.38	0.83	0.83	0.66	0.66
Heavy Vehicles (%)	0%	2%	0%	13%	15%	0%
Adj. Flow (vph)	5	8	2	111	347	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	8	2	111	347	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.1%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	3	2	92	229	0
Future Vol, veh/h	2	3	2	92	229	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	38	38	83	83	66	66
Heavy Vehicles, %	0	2	0	13	15	0
Mvmt Flow	5	8	2	111	347	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	462	347	347	0	-	0
Stage 1	347	-	-	-	-	-
Stage 2	115	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.2	-	-	-
Pot Cap-1 Maneuver	562	696	1223	-	-	-
Stage 1	720	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	561	696	1223	-	-	-
Mov Cap-2 Maneuver	561	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	915	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1223	-	561	696	-	-
HCM Lane V/C Ratio	0.002	-	0.009	0.011	-	-
HCM Control Delay (s)	7.9	-	11.5	10.2	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Build Improved
Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	31	27	11	134	19	34	7	81	6	13	84	37
Future Volume (vph)	31	27	11	134	19	34	7	81	6	13	84	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.978			0.976			0.991			0.962	
Fl _t Protected		0.978			0.965			0.996			0.995	
Satd. Flow (prot)	0	1741	0	0	1613	0	0	1477	0	0	1461	0
Fl _t Permitted		0.978			0.965			0.996			0.995	
Satd. Flow (perm)	0	1741	0	0	1613	0	0	1477	0	0	1461	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles (%)	3%	4%	9%	13%	16%	0%	0%	30%	17%	0%	38%	3%
Adj. Flow (vph)	36	31	13	179	25	45	8	95	7	15	94	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	80	0	0	249	0	0	110	0	0	151	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.7%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	27	11	134	19	34	7	81	6	13	84	37
Future Vol, veh/h	31	27	11	134	19	34	7	81	6	13	84	37
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles, %	3	4	9	13	16	0	0	30	17	0	38	3
Mvmt Flow	36	31	13	179	25	45	8	95	7	15	94	42
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	10.4	8.8	8.9
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	45%	72%	10%
Vol Thru, %	86%	39%	10%	63%
Vol Right, %	6%	16%	18%	28%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	94	69	187	134
LT Vol	7	31	134	13
Through Vol	81	27	19	84
RT Vol	6	11	34	37
Lane Flow Rate	111	80	249	151
Geometry Grp	1	1	1	1
Degree of Util (X)	0.15	0.109	0.338	0.197
Departure Headway (Hd)	4.883	4.887	4.879	4.711
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	731	729	736	759
Service Time	2.936	2.948	2.927	2.762
HCM Lane V/C Ratio	0.152	0.11	0.338	0.199
HCM Control Delay	8.8	8.6	10.4	8.9
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0.5	0.4	1.5	0.7

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Build Improved
Timing Plan: MD



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	46	0	0	39	148	0
Future Volume (vph)	46	0	0	39	148	0
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						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	0	42	161	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	42	161	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.2%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	6.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	46	0	0	39	148	0
Future Vol, veh/h	46	0	0	39	148	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	0	0	42	161	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	50	0	92
Stage 1	-	-	-	-	50
Stage 2	-	-	-	-	42
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1557	-	908
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	980
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1557	-	908
Mov Cap-2 Maneuver	-	-	-	-	908
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	980

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	908	-	-	-	1557	-
HCM Lane V/C Ratio	0.177	-	-	-	-	-
HCM Control Delay (s)	9.8	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	-	0	-

Lanes, Volumes, Timings

Build Improved

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘	↕	↗
Traffic Volume (vph)	0	485	200	232	465	0	0	0	0	109	0	204
Future Volume (vph)	0	485	200	232	465	0	0	0	0	109	0	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	705		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.865	0.850
Fl _t Protected				0.950						0.950	0.995	
Satd. Flow (prot)	0	3008	1346	1583	3195	0	0	0	0	1499	1182	1288
Fl _t Permitted				0.950						0.950	0.995	
Satd. Flow (perm)	0	3008	1346	1583	3195	0	0	0	0	1499	1182	1288
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			213									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.94	0.94	0.94	0.74	0.74	0.74	0.88	0.88	0.88	0.89	0.89	0.89
Heavy Vehicles (%)	0%	20%	20%	14%	13%	0%	0%	0%	0%	22%	0%	31%
Adj. Flow (vph)	0	516	213	314	628	0	0	0	0	122	0	229
Shared Lane Traffic (%)										10%		48%
Lane Group Flow (vph)	0	516	213	314	628	0	0	0	0	110	122	119
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Build Improved

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		27.0	27.0	19.3	51.8					13.7	13.7	13.7
Actuated g/C Ratio		0.36	0.36	0.26	0.69					0.18	0.18	0.18
v/c Ratio		0.48	0.34	0.77	0.28					0.40	0.57	0.51
Control Delay		21.2	4.7	34.2	1.5					30.3	37.5	34.3
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		21.2	4.7	34.2	1.5					30.3	37.5	34.3
LOS		C	A	C	A					C	D	C
Approach Delay		16.4			12.4						34.2	
Approach LOS		B			B						C	
Queue Length 50th (ft)		101	0	63	8					48	58	53
Queue Length 95th (ft)		147	44	#199	13					86	102	93
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				705						240		240
Base Capacity (vph)		1082	621	408	2208					389	307	334
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		0.48	0.34	0.77	0.28					0.28	0.40	0.36

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 17.6
 Intersection LOS: B
 Intersection Capacity Utilization 46.3%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Build Improved

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↔	↗			
Traffic Volume (vph)	203	391	0	0	558	233	139	0	177	0	0	0
Future Volume (vph)	203	391	0	0	558	233	139	0	177	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	630		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Fr _t						0.850		0.892	0.850			
Fl _t Protected	0.950						0.950	0.986				
Satd. Flow (prot)	1367	3223	0	0	3195	1312	1550	1266	1437	0	0	0
Fl _t Permitted	0.950						0.950	0.986				
Satd. Flow (perm)	1367	3223	0	0	3195	1312	1550	1266	1437	0	0	0
Right Turn on Red			Yes			Yes		No				Yes
Satd. Flow (RTOR)						248						
Link Speed (mph)		35			35			30				30
Link Distance (ft)		913			764			683				489
Travel Time (s)		17.8			14.9			15.5				11.1
Peak Hour Factor	0.88	0.88	0.88	0.94	0.94	0.94	0.95	0.95	0.95	0.88	0.88	0.88
Heavy Vehicles (%)	32%	12%	0%	0%	13%	19%	18%	0%	21%	0%	0%	0%
Adj. Flow (vph)	231	444	0	0	594	248	146	0	186	0	0	0
Shared Lane Traffic (%)							21%		43%			
Lane Group Flow (vph)	231	444	0	0	594	248	115	111	106	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14				14
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Build Improved

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen

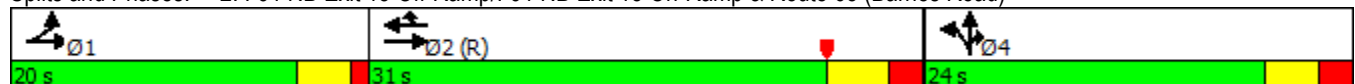


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	17.3	53.5			30.8	30.8	12.5	12.5	12.5			
Actuated g/C Ratio	0.23	0.71			0.41	0.41	0.17	0.17	0.17			
v/c Ratio	0.74	0.19			0.45	0.36	0.45	0.53	0.44			
Control Delay	31.0	0.4			13.2	2.5	32.8	37.0	33.1			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	31.0	0.4			13.2	2.5	32.8	37.0	33.1			
LOS	C	A			B	A	C	D	C			
Approach Delay		10.9			10.0			34.3				
Approach LOS		B			B			C				
Queue Length 50th (ft)	43	1			65	3	51	52	47			
Queue Length 95th (ft)	#178	3			108	18	92	96	87			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	630					480	180		180			
Base Capacity (vph)	329	2299			1310	684	392	320	364			
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	0.70	0.19			0.45	0.36	0.29	0.35	0.29			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 14.7
 Intersection LOS: B
 Intersection Capacity Utilization 46.3%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build Improved
 Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	400	8	0	477	48	15	1	0	97	0	299
Future Volume (vph)	160	400	8	0	477	48	15	1	0	97	0	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997				0.850						0.850
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1367	3211	0	1890	3265	1461	1685	1837	0	0	1736	1196
Flt Permitted	0.950						0.680				0.756	
Satd. Flow (perm)	1367	3211	0	1890	3265	1461	1206	1837	0	0	1381	1196
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				106						230
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		764			751			251			720	
Travel Time (s)		14.9			14.6			5.7			16.4	
Peak Hour Factor	0.81	0.81	0.81	0.86	0.86	0.86	0.38	0.38	0.38	0.81	0.81	0.81
Heavy Vehicles (%)	32%	12%	17%	0%	10%	10%	0%	0%	0%	4%	0%	35%
Adj. Flow (vph)	198	494	10	0	555	56	39	3	0	120	0	369
Shared Lane Traffic (%)												
Lane Group Flow (vph)	198	504	0	0	555	56	39	3	0	0	120	369
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	17.0			11.0			17.0	17.0		17.0	17.0	17.0
Total Split (%)	22.7%			14.7%			22.7%	22.7%		22.7%	22.7%	22.7%
Maximum Green (s)	11.6			5.7			12.1	12.1		12.1	12.1	11.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	30.0
Total Split (%)	40%
Maximum Green (s)	23.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build Improved
 Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	14.7	46.2			36.0	36.0	10.3	10.3			10.3	27.5
Actuated g/C Ratio	0.20	0.62			0.48	0.48	0.14	0.14			0.14	0.37
v/c Ratio	0.74	0.25			0.35	0.07	0.24	0.01			0.63	0.63
Control Delay	50.9	4.6			14.3	0.8	31.5	27.0			45.6	12.0
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	50.9	4.6			14.3	0.8	31.5	27.0			45.6	12.0
LOS	D	A			B	A	C	C			D	B
Approach Delay		17.7			13.1			31.2			20.2	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	74	30			97	0	16	1			53	38
Queue Length 95th (ft)	#190	38			112	4	17	4			91	99
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570					250						
Base Capacity (vph)	268	2060			1507	731	197	300			225	584
Starvation Cap Reductn	0	0			0	0	0	0			0	0
Spillback Cap Reductn	0	0			0	0	0	0			0	0
Storage Cap Reductn	0	0			0	0	0	0			0	0
Reduced v/c Ratio	0.74	0.24			0.37	0.08	0.20	0.01			0.53	0.63

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 17.1

Intersection LOS: B

Intersection Capacity Utilization 51.2%

ICU Level of Service A

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Build Improved
Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	9	135	0	23	6	107	96	17	252	0
Future Volume (vph)	0	0	9	135	0	23	6	107	96	17	252	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850				0.850			
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1900	1417	0	1805	1615	0	1504	1496	1615	1805	1484	0
Flt Permitted				0.747			0.569			0.650		
Satd. Flow (perm)	1900	1417	0	1419	1615	0	901	1496	1615	1235	1484	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		507			715				152			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.58	0.58	0.58	0.88	0.88	0.88	0.63	0.63	0.63	0.80	0.80	0.80
Heavy Vehicles (%)	0%	0%	14%	0%	0%	0%	20%	27%	0%	0%	28%	0%
Adj. Flow (vph)	0	0	16	153	0	26	10	170	152	21	315	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	153	26	0	10	170	152	21	315	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	1.0	2.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Build Improved
 Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		9.5		9.5	9.5		20.6	20.6	20.6	23.4	20.6	
Actuated g/C Ratio		0.22		0.22	0.22		0.48	0.48	0.48	0.55	0.48	
v/c Ratio		0.02		0.49	0.03		0.02	0.24	0.18	0.03	0.44	
Control Delay		0.1		20.5	0.0		8.5	9.2	2.8	5.1	11.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		0.1		20.5	0.0		8.5	9.2	2.8	5.1	11.3	
LOS		A		C	A		A	A	A	A	B	
Approach Delay		0.1			17.6			6.2				10.9
Approach LOS		A			B			A				B
Queue Length 50th (ft)		0		24	0		1	17	0	2	35	
Queue Length 95th (ft)		0		91	0		7	49	9	8	122	
Internal Link Dist (ft)		116			123			640				398
Turn Bay Length (ft)				170			140			115		
Base Capacity (vph)		1268		1187	1468		845	1404	1525	744	1393	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.01		0.13	0.02		0.01	0.12	0.10	0.03	0.23	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 42.9
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 10.3
 Intersection Capacity Utilization 36.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Josheph Carini Rd

Build Improved
Timing Plan: AM Pk Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	11	11	119	258	0
Future Volume (vph)	0	11	11	119	258	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fl _t Protected	0.996					
Satd. Flow (prot)	1347	0	0	1464	1462	0
Fl _t Permitted	0.996					
Satd. Flow (perm)	1347	0	0	1464	1462	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.56	0.56	0.75	0.75	0.81	0.81
Heavy Vehicles (%)	0%	22%	0%	32%	30%	0%
Adj. Flow (vph)	0	20	15	159	319	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	0	0	174	319	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	25.4%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	0	11	11	119	258	0
Future Vol, veh/h	0	11	11	119	258	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	75	75	81	81
Heavy Vehicles, %	0	22	0	32	30	0
Mvmt Flow	0	20	15	159	319	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	508	319	319	0	-	0
Stage 1	319	-	-	-	-	-
Stage 2	189	-	-	-	-	-
Critical Hdwy	6.4	6.42	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.498	2.2	-	-	-
Pot Cap-1 Maneuver	528	678	1252	-	-	-
Stage 1	741	-	-	-	-	-
Stage 2	848	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	521	678	1252	-	-	-
Mov Cap-2 Maneuver	521	-	-	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	848	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1252	-	678	-	-
HCM Lane V/C Ratio	0.012	-	0.029	-	-
HCM Control Delay (s)	7.9	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Build Improved
Timing Plan: AM Pk Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	3	0	119	255	1
Future Volume (vph)	0	3	0	119	255	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	1900	1077	1900	1439	1474	0
Flt Permitted						
Satd. Flow (perm)	1900	1077	1900	1439	1474	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Confl. Peds. (#/hr)	3					
Peak Hour Factor	0.50	0.50	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	50%	0%	32%	29%	0%
Adj. Flow (vph)	0	6	0	151	323	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	6	0	151	324	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.5%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	3	0	119	255	1
Future Vol, veh/h	0	3	0	119	255	1
Conflicting Peds, #/hr	3	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	79	79	79	79
Heavy Vehicles, %	0	50	0	32	29	0
Mvmt Flow	0	6	0	151	323	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	478	324	324	0	-	0
Stage 1	324	-	-	-	-	-
Stage 2	154	-	-	-	-	-
Critical Hdwy	6.4	6.7	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.75	2.2	-	-	-
Pot Cap-1 Maneuver	550	619	1247	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	879	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	550	619	1247	-	-	-
Mov Cap-2 Maneuver	550	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	879	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1247	-	-	619	-	-
HCM Lane V/C Ratio	-	-	-	0.01	-	-
HCM Control Delay (s)	0	-	0	10.9	-	-
HCM Lane LOS	A	-	A	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Build Improved
Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	25	23	5	150	14	32	4	106	9	14	101	25
Future Volume (vph)	25	23	5	150	14	32	4	106	9	14	101	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.978			0.990			0.976	
Flt Protected		0.977			0.963			0.998			0.995	
Satd. Flow (prot)	0	1477	0	0	1577	0	0	1438	0	0	1459	0
Flt Permitted		0.977			0.963			0.998			0.995	
Satd. Flow (perm)	0	1477	0	0	1577	0	0	1438	0	0	1459	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.63	0.63	0.63	0.45	0.45	0.45	0.79	0.79	0.79	0.65	0.65	0.65
Heavy Vehicles (%)	31%	11%	50%	14%	0%	17%	33%	33%	0%	0%	33%	15%
Adj. Flow (vph)	40	37	8	333	31	71	5	134	11	22	155	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	85	0	0	435	0	0	150	0	0	215	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	23	5	150	14	32	4	106	9	14	101	25
Future Vol, veh/h	25	23	5	150	14	32	4	106	9	14	101	25
Peak Hour Factor	0.63	0.63	0.63	0.45	0.45	0.45	0.79	0.79	0.79	0.65	0.65	0.65
Heavy Vehicles, %	31	11	50	14	0	17	33	33	0	0	33	15
Mvmt Flow	40	37	8	333	31	71	5	134	11	22	155	38
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.5	18.4	11.6	11.5
HCM LOS	B	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	47%	77%	10%
Vol Thru, %	89%	43%	7%	72%
Vol Right, %	8%	9%	16%	18%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	119	53	196	140
LT Vol	4	25	150	14
Through Vol	106	23	14	101
RT Vol	9	5	32	25
Lane Flow Rate	151	84	436	215
Geometry Grp	1	1	1	1
Degree of Util (X)	0.264	0.147	0.659	0.336
Departure Headway (Hd)	6.321	6.31	5.448	5.613
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	566	567	662	640
Service Time	4.374	4.367	3.485	3.661
HCM Lane V/C Ratio	0.267	0.148	0.659	0.336
HCM Control Delay	11.6	10.5	18.4	11.5
HCM Lane LOS	B	B	C	B
HCM 95th-tile Q	1.1	0.5	4.9	1.5

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Build Improved
Timing Plan: AM Pk Gen



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	46	0	0	40	156	0
Future Volume (vph)	46	0	0	40	156	0
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						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	0	43	170	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	43	170	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.6%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	6.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	46	0	0	40	156	0
Future Vol, veh/h	46	0	0	40	156	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	0	0	43	170	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	50	0	93
Stage 1	-	-	-	-	50
Stage 2	-	-	-	-	43
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1557	-	907
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	979
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1557	-	907
Mov Cap-2 Maneuver	-	-	-	-	907
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	979

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	907	-	-	-	1557	-
HCM Lane V/C Ratio	0.187	-	-	-	-	-
HCM Control Delay (s)	9.9	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	-	0	-

Lanes, Volumes, Timings

Build Improved

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘	↕	↗
Traffic Volume (vph)	0	413	132	218	404	0	0	0	0	129	0	93
Future Volume (vph)	0	413	132	218	404	0	0	0	0	129	0	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.953	0.850
Fl _t Protected				0.950						0.950	0.967	
Satd. Flow (prot)	0	3574	1553	1719	3505	0	0	0	0	1726	1540	1548
Fl _t Permitted				0.950						0.950	0.967	
Satd. Flow (perm)	0	3574	1553	1719	3505	0	0	0	0	1726	1540	1548
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			159									
Link Speed (mph)		45			30			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			20.8			8.5			11.3	
Peak Hour Factor	0.83	0.83	0.83	0.59	0.59	0.59	0.88	0.88	0.88	0.86	0.86	0.86
Heavy Vehicles (%)	0%	1%	4%	5%	3%	0%	0%	0%	0%	6%	0%	9%
Adj. Flow (vph)	0	498	159	369	685	0	0	0	0	150	0	108
Shared Lane Traffic (%)										40%		25%
Lane Group Flow (vph)	0	498	159	369	685	0	0	0	0	90	87	81
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Build Improved

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		28.2	28.2	24.1	58.6					10.6	10.6	10.6
Actuated g/C Ratio		0.38	0.38	0.32	0.78					0.14	0.14	0.14
v/c Ratio		0.37	0.23	0.67	0.25					0.37	0.40	0.37
Control Delay		19.4	4.4	25.0	1.2					32.9	34.3	33.5
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		19.4	4.4	25.0	1.2					32.9	34.3	33.5
LOS		B	A	C	A					C	C	C
Approach Delay		15.8			9.5						33.6	
Approach LOS		B			A						C	
Queue Length 50th (ft)		94	0	89	10					41	41	36
Queue Length 95th (ft)		122	30	90	14					75	78	70
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1341	682	552	2736					448	400	402
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		0.37	0.23	0.67	0.25					0.20	0.22	0.20

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 14.8
 Intersection Capacity Utilization 44.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Build Improved

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↔	↗			
Traffic Volume (vph)	80	462	0	0	458	140	164	0	226	0	0	0
Future Volume (vph)	80	462	0	0	458	140	164	0	226	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Fr _t							0.850		0.884	0.850		
Fl _t Protected	0.950						0.950	0.989				
Satd. Flow (prot)	1719	3574	0	0	3539	1406	1678	1427	1656	0	0	0
Fl _t Permitted	0.950						0.950	0.989				
Satd. Flow (perm)	1719	3574	0	0	3539	1406	1678	1427	1656	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						173						
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			13.0			15.5			11.1	
Peak Hour Factor	0.85	0.85	0.85	0.81	0.81	0.81	0.84	0.84	0.84	0.88	0.88	0.88
Heavy Vehicles (%)	5%	1%	0%	0%	2%	11%	9%	0%	5%	0%	0%	0%
Adj. Flow (vph)	94	544	0	0	565	173	195	0	269	0	0	0
Shared Lane Traffic (%)							18%		44%			
Lane Group Flow (vph)	94	544	0	0	565	173	160	153	151	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Build Improved

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None				C-Max	C-Max	None	None	None			
Act Effct Green (s)	11.2	52.3			35.6	35.6	13.7	13.7	13.7			
Actuated g/C Ratio	0.15	0.70			0.47	0.47	0.18	0.18	0.18			
v/c Ratio	0.37	0.22			0.34	0.23	0.52	0.59	0.50			
Control Delay	28.7	0.5			9.0	1.5	33.0	36.5	32.4			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	28.7	0.5			9.0	1.5	33.0	36.5	32.4			
LOS	C	A			A	A	C	D	C			
Approach Delay		4.7			7.2			33.9				
Approach LOS		A			A			C				
Queue Length 50th (ft)	35	0			37	1	72	72	67			
Queue Length 95th (ft)	30	0			76	4	109	114	104			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	366	2444			1677	757	425	361	419			
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	0.26	0.22			0.34	0.23	0.38	0.42	0.36			

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 13.1

Intersection LOS: B

Intersection Capacity Utilization 44.6%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build Improved
 Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↔		↔	↕↕	↔	↔	↕	↔		↕↔	↔
Traffic Volume (vph)	219	454	15	3	373	71	8	1	8	63	1	217
Future Volume (vph)	219	454	15	3	373	71	8	1	8	63	1	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			0			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850		0.862				0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	1597	3557	0	1796	3522	1607	1685	1583	0	0	1742	1196
Flt Permitted	0.950			0.950			0.709				0.721	
Satd. Flow (perm)	1597	3557	0	1796	3522	1607	1257	1583	0	0	1318	1196
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				106		11				252
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.78	0.78	0.78	0.80	0.80	0.80	0.75	0.75	0.75	0.86	0.86	0.86
Heavy Vehicles (%)	13%	1%	0%	0%	2%	0%	0%	0%	0%	4%	0%	35%
Adj. Flow (vph)	281	582	19	4	466	89	11	1	11	73	1	252
Shared Lane Traffic (%)												
Lane Group Flow (vph)	281	601	0	4	466	89	11	12	0	0	74	252
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	17.0			11.0			17.0	17.0		17.0	17.0	17.0
Total Split (%)	22.7%			14.7%			22.7%	22.7%		22.7%	22.7%	22.7%
Maximum Green (s)	11.6			5.7			12.1	12.1		12.1	12.1	11.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	30.0
Total Split (%)	40%
Maximum Green (s)	23.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Build Improved
 Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	20.1	47.5		5.3	31.9	31.9	9.0	9.0			9.0	31.6
Actuated g/C Ratio	0.27	0.63		0.07	0.43	0.43	0.12	0.12			0.12	0.42
v/c Ratio	0.66	0.27		0.03	0.31	0.12	0.07	0.06			0.47	0.39
Control Delay	38.0	4.4		32.7	15.4	2.5	28.9	16.7			40.1	4.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	38.0	4.4		32.7	15.4	2.5	28.9	16.7			40.1	4.2
LOS	D	A		C	B	A	C	B			D	A
Approach Delay		15.1			13.4			22.5			12.3	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)	99	38		2	82	0	5	0			33	0
Queue Length 95th (ft)	#251	47		10	84	13	15	11			66	38
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	427	2429		139	1455	726	202	264			212	649
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.66	0.25		0.03	0.32	0.12	0.05	0.05			0.35	0.39

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 14.2 Intersection LOS: B
 Intersection Capacity Utilization 48.5% ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Build Improved
 Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↗	↖	↗	
Traffic Volume (vph)	0	0	1	95	0	16	0	104	187	33	185	0
Future Volume (vph)	0	0	1	95	0	16	0	104	187	33	185	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850				0.850			
Flt Protected				0.950						0.950		
Satd. Flow (prot)	1900	1615	0	1805	1615	0	1900	1743	1615	1805	1743	0
Flt Permitted				0.755						0.682		
Satd. Flow (perm)	1900	1615	0	1434	1615	0	1900	1743	1615	1296	1743	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		625			816				208			
Link Speed (mph)		30			30			30				30
Link Distance (ft)		196			203			720				478
Travel Time (s)		4.5			4.6			16.4				10.9
Peak Hour Factor	0.25	0.25	0.25	0.88	0.88	0.88	0.90	0.90	0.90	0.82	0.82	0.82
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	9%	0%
Adj. Flow (vph)	0	0	4	108	0	18	0	116	208	40	226	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	108	18	0	0	116	208	40	226	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12				12
Link Offset(ft)		0			12			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt		NA
Protected Phases		4			4			2			1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Build Improved
 Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	
Act Effct Green (s)		8.9		8.9	8.9			21.6	21.6	24.0	21.6	
Actuated g/C Ratio		0.22		0.22	0.22			0.53	0.53	0.59	0.53	
v/c Ratio		0.00		0.35	0.02			0.13	0.22	0.05	0.24	
Control Delay		0.0		17.8	0.1			9.9	3.0	4.7	10.5	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		0.0		17.8	0.1			9.9	3.0	4.7	10.5	
LOS		A		B	A			A	A	A	B	
Approach Delay					15.2			5.5			9.6	
Approach LOS					B			A			A	
Queue Length 50th (ft)		0		16	0			12	0	3	24	
Queue Length 95th (ft)		0		58	0			51	32	12	82	
Internal Link Dist (ft)		116			123			640			398	
Turn Bay Length (ft)				170						115		
Base Capacity (vph)		1488		1250	1512			1708	1587	826	1708	
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		0.00		0.09	0.01			0.07	0.13	0.05	0.13	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	40.8
Natural Cycle:	45
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.35
Intersection Signal Delay:	8.7
Intersection LOS:	A
Intersection Capacity Utilization:	34.6%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Josheph Carini Rd

Build Improved
Timing Plan: PM Peak Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	1	119	217	0
Future Volume (vph)	0	1	1	119	217	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fl _t Protected						
Satd. Flow (prot)	1644	0	0	1744	1743	0
Fl _t Permitted						
Satd. Flow (perm)	1644	0	0	1744	1743	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.25	0.25	0.83	0.83	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	9%	9%	0%
Adj. Flow (vph)	0	4	1	143	255	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	0	144	255	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	0	1	1	119	217	0
Future Vol, veh/h	0	1	1	119	217	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	83	83	85	85
Heavy Vehicles, %	0	0	0	9	9	0
Mvmt Flow	0	4	1	143	255	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	400	255	255	0	0
Stage 1	255	-	-	-	-
Stage 2	145	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	610	789	1322	-	-
Stage 1	792	-	-	-	-
Stage 2	887	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	609	789	1322	-	-
Mov Cap-2 Maneuver	609	-	-	-	-
Stage 1	791	-	-	-	-
Stage 2	887	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1322	-	789	-	-
HCM Lane V/C Ratio	0.001	-	0.005	-	-
HCM Control Delay (s)	7.7	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Build Improved
Timing Plan: PM Peak Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	0	119	216	0
Future Volume (vph)	0	1	0	119	216	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	1900	1615	1900	1743	1696	0
Flt Permitted						
Satd. Flow (perm)	1900	1615	1900	1743	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.25	0.25	0.81	0.81	0.77	0.77
Heavy Vehicles (%)	0%	0%	0%	9%	12%	0%
Adj. Flow (vph)	0	4	0	147	281	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	0	147	281	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.4%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	1	0	119	216	0
Future Vol, veh/h	0	1	0	119	216	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	81	81	77	77
Heavy Vehicles, %	0	0	0	9	12	0
Mvmt Flow	0	4	0	147	281	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	428	281	281	0	0
Stage 1	281	-	-	-	-
Stage 2	147	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	588	763	1293	-	-
Stage 1	771	-	-	-	-
Stage 2	885	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	588	763	1293	-	-
Mov Cap-2 Maneuver	588	-	-	-	-
Stage 1	771	-	-	-	-
Stage 2	885	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1293	-	-	763	-	-
HCM Lane V/C Ratio	-	-	-	0.005	-	-
HCM Control Delay (s)	0	-	0	9.7	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Build Improved
Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	23	19	3	96	15	24	7	98	14	11	117	22
Future Volume (vph)	23	19	3	96	15	24	7	98	14	11	117	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.990			0.976			0.984			0.980	
Fl _t Protected		0.975			0.966			0.997			0.996	
Satd. Flow (prot)	0	1834	0	0	1791	0	0	1709	0	0	1682	0
Fl _t Permitted		0.975			0.966			0.997			0.996	
Satd. Flow (perm)	0	1834	0	0	1791	0	0	1709	0	0	1682	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.64	0.64	0.64	0.66	0.66	0.66	0.72	0.72	0.72	0.67	0.67	0.67
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	12%	6%
Adj. Flow (vph)	36	30	5	145	23	36	10	136	19	16	175	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	71	0	0	204	0	0	165	0	0	224	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.5%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	19	3	96	15	24	7	98	14	11	117	22
Future Vol, veh/h	23	19	3	96	15	24	7	98	14	11	117	22
Peak Hour Factor	0.64	0.64	0.64	0.66	0.66	0.66	0.72	0.72	0.72	0.67	0.67	0.67
Heavy Vehicles, %	0	0	0	0	0	0	0	11	0	0	12	6
Mvmt Flow	36	30	5	145	23	36	10	136	19	16	175	33
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.8	10	9.2	9.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	51%	71%	7%
Vol Thru, %	82%	42%	11%	78%
Vol Right, %	12%	7%	18%	15%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	119	45	135	150
LT Vol	7	23	96	11
Through Vol	98	19	15	117
RT Vol	14	3	24	22
Lane Flow Rate	165	70	205	224
Geometry Grp	1	1	1	1
Degree of Util (X)	0.221	0.101	0.281	0.294
Departure Headway (Hd)	4.807	5.161	4.946	4.722
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	742	688	722	757
Service Time	2.872	3.242	3.014	2.782
HCM Lane V/C Ratio	0.222	0.102	0.284	0.296
HCM Control Delay	9.2	8.8	10	9.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.3	1.2	1.2

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Build Improved
Timing Plan: PM Peak Gen



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	44	0	0	26	109	0
Future Volume (vph)	44	0	0	26	109	0
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						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	0	0	28	118	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	0	0	28	118	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.0% ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	5.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	44	0	0	26	109	0
Future Vol, veh/h	44	0	0	26	109	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	0	0	28	118	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	48	0	76
Stage 1	-	-	-	-	48
Stage 2	-	-	-	-	28
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1559	-	927
Stage 1	-	-	-	-	974
Stage 2	-	-	-	-	995
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1559	-	927
Mov Cap-2 Maneuver	-	-	-	-	927
Stage 1	-	-	-	-	974
Stage 2	-	-	-	-	995

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	927	-	-	-	1559	-
HCM Lane V/C Ratio	0.128	-	-	-	-	-
HCM Control Delay (s)	9.5	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	-	0	-

HOLIDAY ANALYSIS

Introduction

A holiday season analysis was performed per town peer review request. It should be noted CTDOT does not require holiday analysis per OSTA Major Traffic Generator Administrative Decision Request Guidelines, Section III (Traffic Information) D-3: " Trip generation for the Christmas Season, as defined by ITE, is not currently required. Trip generation shall reflect a successful day, not abnormally high-peak periods such as holiday weekends."

Holiday Projected Traffic Conditions

No Build Volumes

For holiday peak patterns, to stay conservative, the existing and no build volumes were determined to have a factor of 1 and thus remain the same as average weekday traffic. This was determined using seasonal adjustments factors provided by the State. Generally, December is a time of a year where volumes are lower. Of course, the exception be in retail corridors, which is not the case for the study area. The CTDOT conversion factoring for all states routes is attached in the main report **Appendix – Traffic Counts**, which was used to determine the seasonal adjustments for December. These factors were derived from a set of sites with permanent count stations that are considered similar to the location of the temporary count.

Trip Generation

The level of traffic likely generated by the proposed delivery station during holiday season has been estimated by the tenant to determine the potential traffic impact on the study intersections. The tenant completed a detailed analysis determining the number and time of the Site traffic arrivals and departures at the Site, which is a function of the delivery area population and business density. The Tenant anticipates that this facility will employ approximately 680 associates/managers on-site over various shifts during the day. All associates/managers will utilize one existing drive on Carpenter Lane.

During the holiday season the proposed delivery station is projected to generate: 339 (97 enter, 242 exit) vehicle trips during the morning peak hour, 279 (0 enter, 279 exit) vehicle trips during the mid-day peak hour, 913 (587 enter, 326 exit) during the weekday evening peak hour, 697 (334 enter, 362 exit) vehicle trips during AM peak generator hour, and 641 (315 enter, 326 exit) vehicle trips during PM peak generator hour.

Table 2.2 provides a summary of the trip generation projections for the proposed delivery station during holiday provided by the tenant. It should be noted that ITE Trip Generation does not provide holiday trip generation estimate and thus no comparisons could be made.

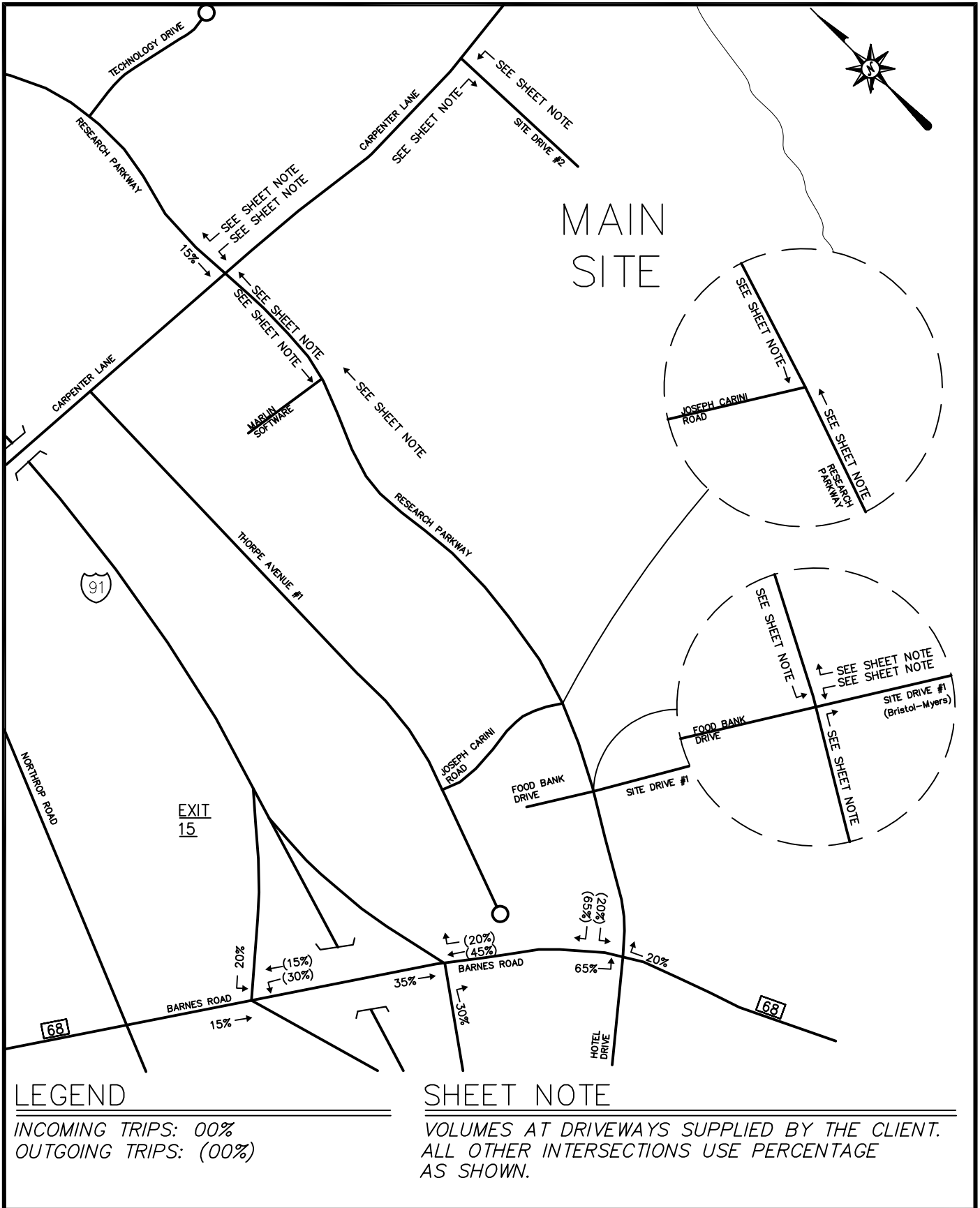
Trip Distribution

The directional distribution of traffic is typically a function of population densities, competing opportunities, existing travel patterns adjacent to the Site, and the efficiency and limitations of the existing roadway system. Based upon the Site's close proximity to CT Route 68 and Interstate 91, it is anticipated that the majority of employees/delivery vehicles will utilize these roadways for access and egress from the Site. The distribution of the anticipated traffic volumes was based on arrival / departure patterns shown in **Figure 4**. These patterns are the same as for average weekday presented in the main report.

Table 2.2 – Peak Hour Trip Generation (Holiday)

	Table 2.2 Peak Hour Trip Generation - Holiday (Client Provided)														
	Trips														
	AM Peak Hour			Mid-Day Peak Hour			PM Peak Hour			AM Peak Generator Hour			PM Peak Generator Hour		
	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out
LU-156: High-Cube Parcel Hub Warehouse (219 GFA) ¹	No Available Data			No Available Data			No Available Data			No Available Data			No Available Data		
Bristol-Myers Squibb Cup Development	No Available Data			No Available Data			No Available Data			No Available Data			No Available Data		
<u>Net Old Trips</u>															
Associates/Managers	0	0	0	279	0	279	272	272	0	0	0	0	0	0	
DSP	336	96	240	0	0	0	630	310	320	692	332	360	630	310	320
Flex Drivers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Trucks	3	1	2	0	0	0	11	5	6	4	2	2	11	5	6
<u>Net New Trips</u>	<u>339</u>	<u>97</u>	<u>242</u>	<u>279</u>	<u>0</u>	<u>279</u>	<u>913</u>	<u>587</u>	<u>326</u>	<u>696</u>	<u>334</u>	<u>362</u>	<u>641</u>	<u>315</u>	<u>326</u>
Difference	339	97	242	279	0	279	913	587	326	696	334	362	641	315	326

Ref: Trip Generation developed by Tenant
 1: ITE Trip Generation Manual, 10th Edition Values for Land Use code: 156: High-Cube Parcel Hub Warehouse. It should be noted there are limited studies available for High-Cube Parcel Warehouse.



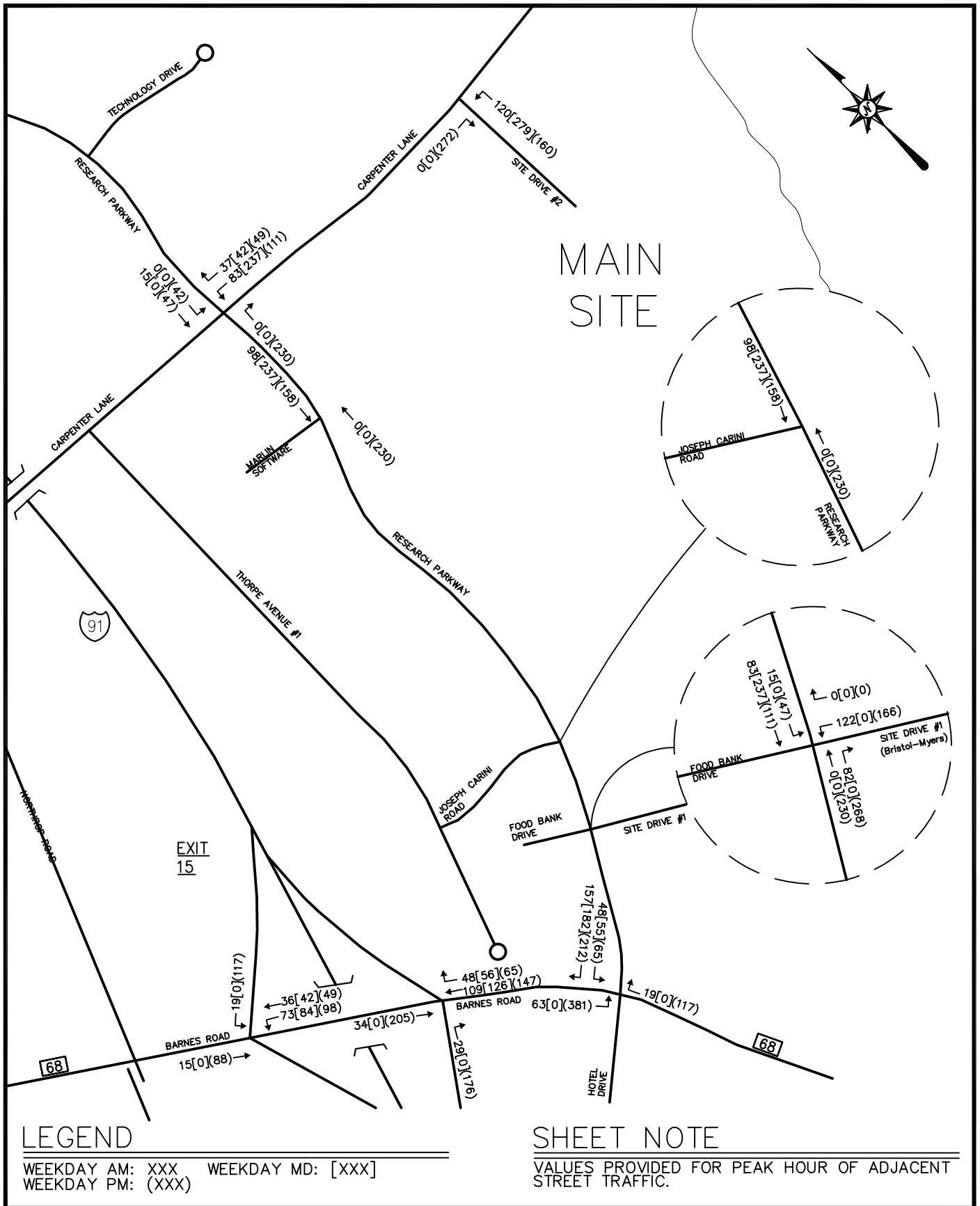
TRIP DISTRIBUTION
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT
 SCHEMATIC, NOT TO SCALE

APRIL 2021

FIGURE 4

Assigned Site Generated Traffic Volumes

The generated trips are multiplied by the corresponding proportions to ascertain the Site-generated traffic volumes. **Figure 5.3 and Figure 5.4** shows the Site generated peak hour traffic generated by the Site assigned to the nearby roadway network during a Holiday weekday. Note, at the Site access / egress, the assigned volumes follow distribution patterns established by the site operations and vehicle types.



LEGEND

WEEKDAY AM: XXX WEEKDAY MD: [XXX]
 WEEKDAY PM: (XXX)

SHEET NOTE

VALUES PROVIDED FOR PEAK HOUR OF ADJACENT STREET TRAFFIC.

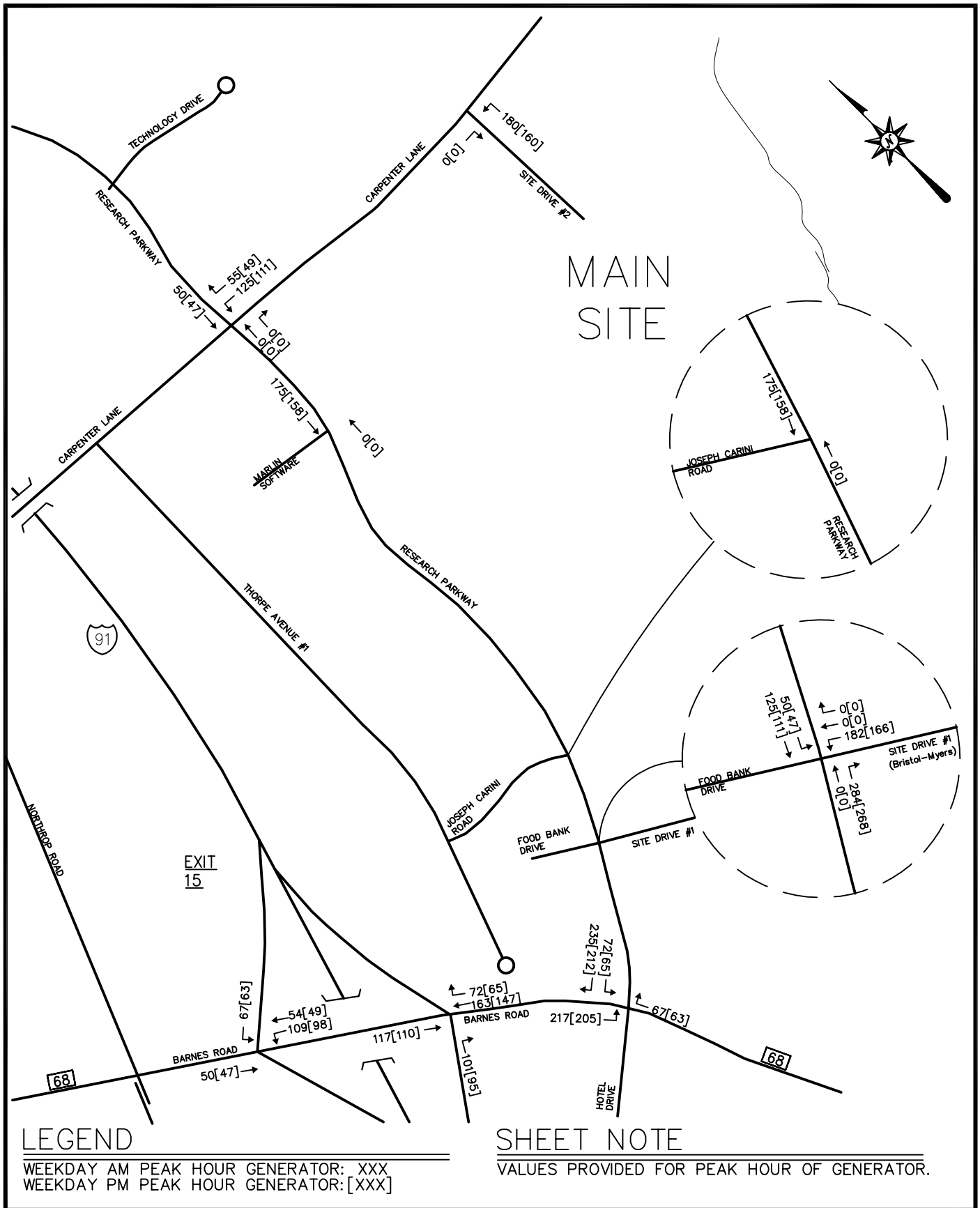


HOLIDAY PEAK SITE GENERATED TRAFFIC
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT

APRIL 2021

FIGURE 5.3

SCHEMATIC, NOT TO SCALE



HOLIDAY SITE GENERATED TRAFFIC
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT

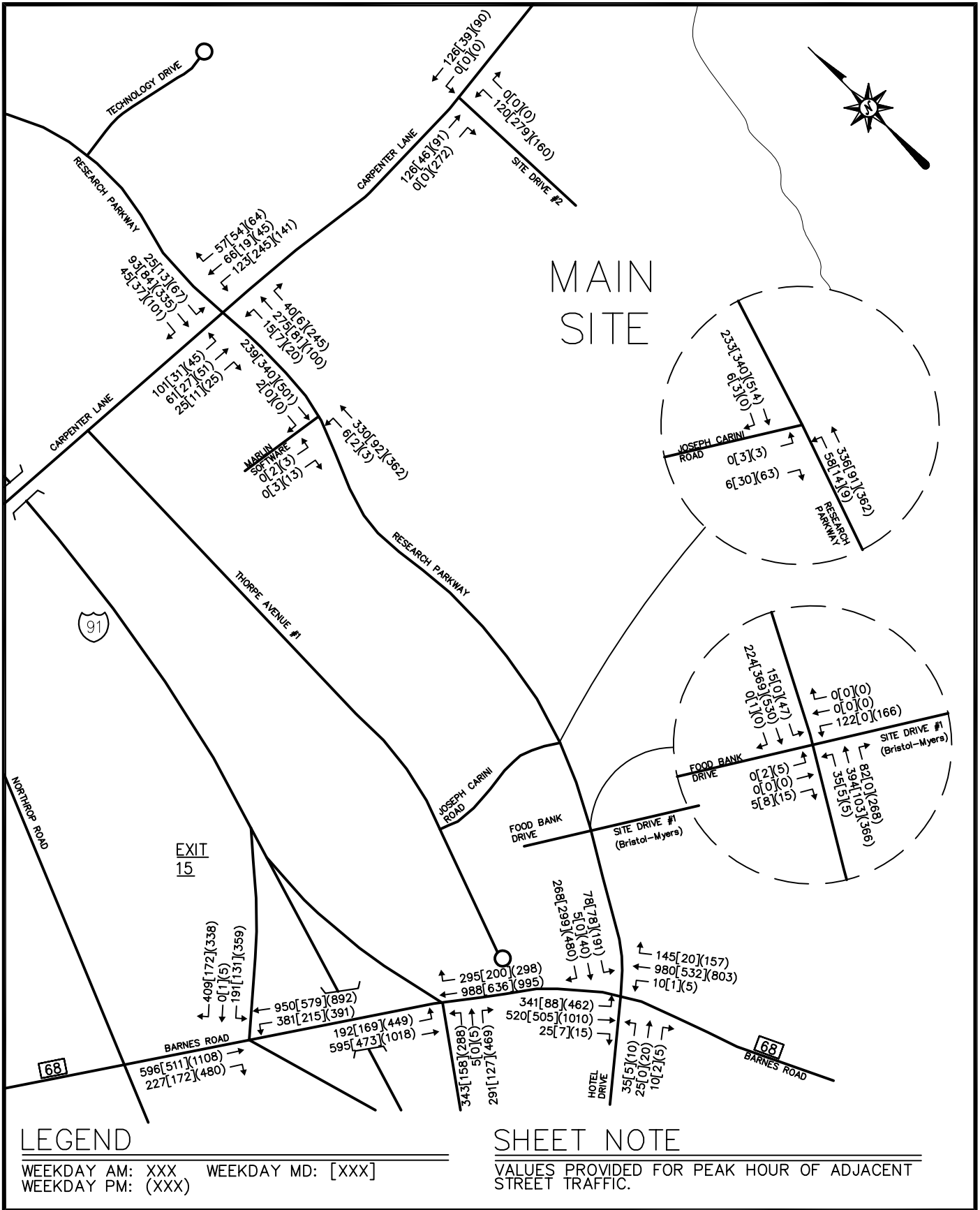
APRIL 2021

SCHEMATIC, NOT TO SCALE

FIGURE 5.4

Build Traffic Volumes

The assigned site-generated traffic volumes were superimposed onto the 2021 No Build Traffic volumes to establish the future 2021 Build Traffic volumes, as illustrated in **Figure 6.3** through **Figure 6.4** for holiday season.

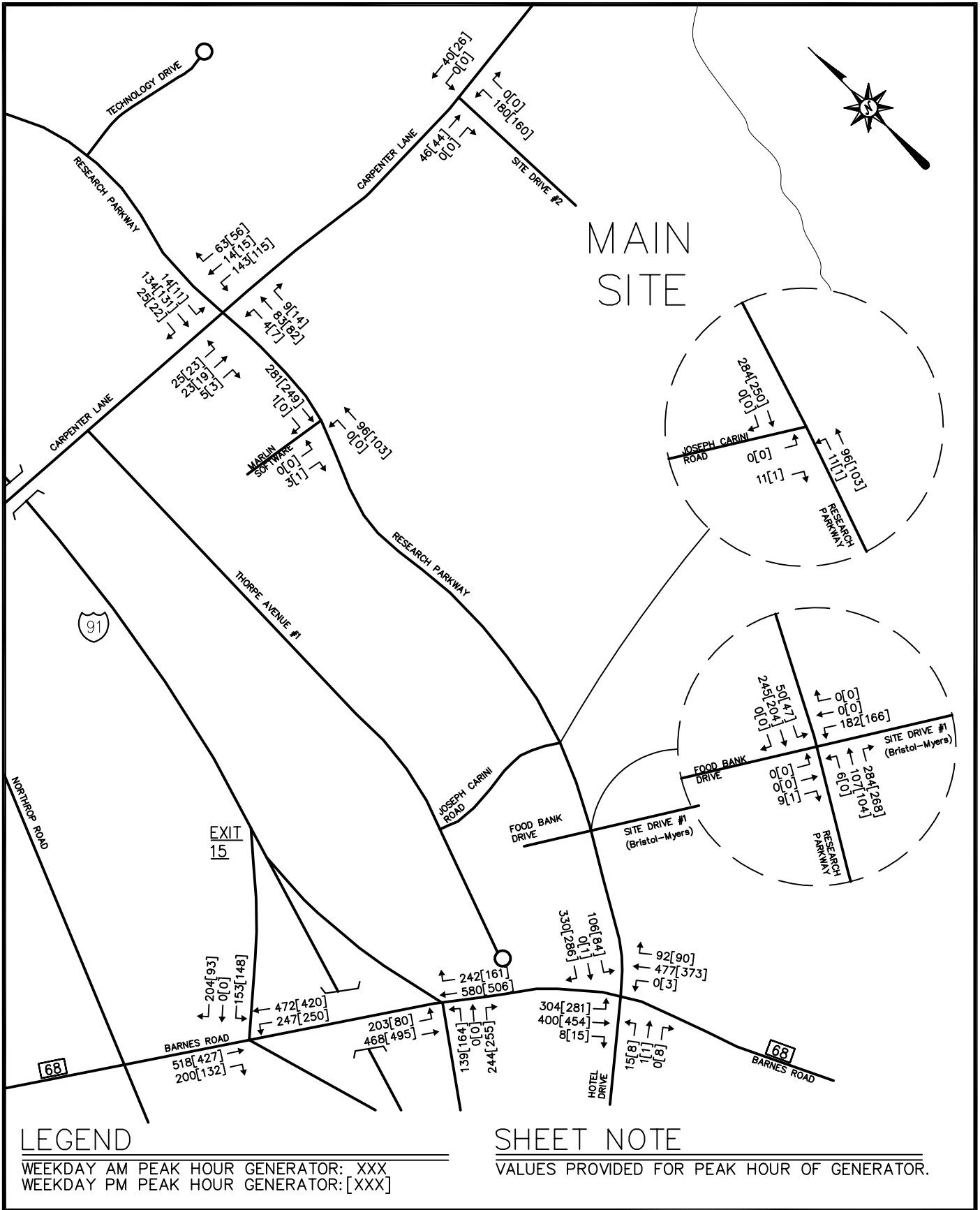


HOLIDAY BUILD (2021) TRAFFIC VOLUMES
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT

APRIL 2021

FIGURE 6.3

SCHEMATIC, NOT TO SCALE



HOLIDAY BUILD (2021) TRAFFIC VOLUMES
 PROPOSED DEVELOPMENT
 WALLINGFORD, CONNECTICUT

APRIL 2021

FIGURE 6.4

SCHEMATIC, NOT TO SCALE

Roadway Adequacy

Similarly, to average weekday conditions, Synchro™ software (Version 9) was used to model the study intersections based on the parameters mentioned. The Synchro software is widely utilized by the traffic engineering industry and is consistent with the procedures in the HCM.

Table 5.3 shows the levels of service (LOS) at the subject intersections. Synchro result tables provided in the **Appendix**.

Table 5.3 – Holiday Levels of Service (AM, Mid-Day, PM, AM/PM Peak Hour Generator)

Intersection	HOLIDAY					HOLIDAY IMPROVED				
	AM	Mid-Day	PM	AM Peak Hour Generator	PM Peak Hour Generator	AM	Mid-Day	PM	AM Peak Hour Generator	PM Peak Hour Generator
Route 68 (Barnes Road) at Interstate 91 Southbound Exit 15 On/Off-Ramps ¹	C/24.3	B/15.9	D/50.2	B/18.7	B/15.8	C/24.4	B/15.9	D/50.5	B/18.7	B/15.8
Route 68 EB Thru	D/0.86/#275	B/0.46/160	F/1.11/#500	C/0.54/160	C/0.42/130	D/0.86/#275	B/0.46/160	F/1.11/#500	C/0.54/160	C/0.42/130
Route 68 EB Right (345')	A/0.45/60	A/0.28/40	A/0.58/75	A/0.35/45	A/0.25/30	A/0.45/60	A/0.28/40	A/0.58/75	A/0.35/45	A/0.25/30
Route 68 WB Left (910')	C/0.85/m#265	C/0.69/#185	F/1.09/m#160	C/0.77/#215	C/0.71/110	C/0.85/m#275	C/0.69/#185	F/1.09/m#290	C/0.77/#215	C/0.71/110
Route 68 WB Thru	A/0.61/m90	A/0.27/25	A/0.53/m25	A/0.29/25	A/0.26/25	A/0.61/m185	A/0.27/25	A/0.53/m25	A/0.29/25	A/0.26/25
Exit 15 Off-Ramp SB Left (240')	C/0.48/135	C/0.44/95	E/0.87/#265	C/0.50/105	C/0.38/80	C/0.48/135	C/0.44/95	E/0.87/#265	C/0.50/105	C/0.38/80
Exit 15 Off-Ramp SB Left/Right	D/0.76/185	D/0.54/100	E/0.95/#285	D/0.59/110	C/0.43/85	D/0.76/185	D/0.54/100	E/0.95/#285	D/0.59/110	C/0.43/85
Exit 15 Off-Ramp SB Right (240')	D/0.69/170	D/0.50/90	E/0.86/#250	C/0.54/105	C/0.39/75	D/0.69/170	D/0.50/90	E/0.86/#250	C/0.54/105	C/0.39/75
Route 68 (Barnes Road) at Interstate 91 Northbound Exit 15 On/Off-Ramps ¹	D/35.0	B/12.7	F/89.6	B/16.8	B/13.5	C/31.7	B/12.9	D/39.2	B/15.5	B/13.1
Route 68 EB Left (910')	D/0.60/m100	C/0.64/55	C/0.83/m115	D/0.82/#195	C/0.34/35	D/0.60/m100	C/0.64/55	E/1.09/m#240	D/0.76/#195	C/0.35/35
Route 68 EB Thru	A/0.33/m25	A/0.21/25	A/0.62/m25	A/0.25/25	A/0.25/25	A/0.32/m25	A/0.21/25	A/0.61/m25	A/0.24/25	A/0.24/25
Route 68 WB Thru	E/1.02/m#335	B/0.48/120	F/1.31/m#440	B/0.51/120	B/0.42/95	D/0.98/m#335	B/0.47/120	D/0.95/m#360	B/0.48/120	B/0.38/95
Route 68 WB Right (480')	B/0.43/m50	A/0.32/25	A/0.47/m30	A/0.39/25	A/0.28/25	B/0.42/m50	A/0.32/25	A/0.40/m30	A/0.38/25	A/0.26/25
Exit 15 Off-Ramp NB Left (180')	C/0.52/150	C/0.33/75	C/0.47/135	C/0.21/65	C/0.26/75	D/0.69/190	C/0.43/90	E/0.89/#280	C/0.46/105	C/0.54/120
Exit 15 Off-Ramp NB Thru	C/0.54/150	C/0.35/75	C/0.50/135	C/0.23/65	C/0.28/75	D/0.78/#205	D/0.50/95	F/1.07/#320	D/0.60/115	D/0.60/125
Exit 15 Off-Ramp NB Right (180')	D/0.86/#270	D/0.54/105	F/1.51/#535	D/0.77/#205	D/0.77/195	D/0.67/175	C/0.43/85	E/0.90/#275	C/0.51/110	C/0.51/115

Overall Intersection – X/XX.X - Level of Service/Intersection Signal Delay in sec
 Approaches - X/X.XX/XXX – Level of Service/Volume to Capacity Ratio/95% Queue Length in ft

¹ – Signalized Intersection

² – Unsignalized Intersections, controlled movements

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

m – Volume for 95th percentile queue is metered by upstream signal.

Movement (XX') – Storage length



Intersection	HOLIDAY					HOLIDAY IMPROVED				
	AM	Mid-Day	PM	AM Peak Hour Generator	PM Peak Hour Generator	AM	Mid-Day	PM	AM Peak Hour Generator	PM Peak Hour Generator
Route 68 (Barnes Road) at Hotel Drive and Research Parkway ¹	D/42.0	B/13.1	D/52.2	C/26.7	B/16.4	D/42.2	B/13.1	D/53.4	C/26.9	B/16.5
Route 68 EB Left (570')	C/0.49/m125	D/0.44/90	F/1.37/m#400	F/1.01/#380	D/0.74/#325	C/0.49/135	D/0.44/90	F/1.37/m#465	F/1.01/#390	D/0.74/#335
Route 68 EB Thru/Right	B/0.65/m115	A/0.26/40	B/0.81/m80	A/0.26/40	A/0.27/45	B/0.65/130	A/0.26/40	B/0.81/m85	A/0.26/45	A/0.27/50
Route 68 WB Left (100')	D/0.09/25	C/0.01/25	D/0.05/25	A/0.00/25	C/0.03/25	D/0.09/25	C/0.01/25	D/0.05/25	A/0.00/25	C/0.03/25
Route 68 WB Thru	E/1.08/#470	B/0.33/130	D/0.91/#320	B/0.43/115	B/0.35/85	E/1.08/#470	B/0.33/130	D/0.91/#320	B/0.43/115	B/0.35/85
Route 68 WB Right (250')	A/0.23/40	A/0.03/25	A/0.26/35	A/0.17/25	A/0.17/25	A/0.23/40	A/0.03/25	A/0.26/35	A/0.17/25	A/0.17/25
Hotel NB Left	D/0.40/40	C/0.09/25	C/0.10/25	C/0.23/25	C/0.07/25	D/0.40/40	C/0.09/25	C/0.10/25	C/0.23/25	C/0.07/25
Hotel NB Thru/Right	C/0.26/30	A/0.01/25	C/0.09/30	C/0.01/25	B/0.06/25	C/0.26/30	A/0.01/25	C/0.09/30	C/0.01/25	B/0.06/25
Research Parkway SB Left/Thru (345')	D/0.56/85	D/0.60/#95	F/0.98/#255	D/0.66/100	D/0.58/85	D/0.56/85	D/0.60/#95	F/0.98/#255	D/0.66/100	D/0.58/85
Research Parkway SB Right	B/0.44/100	B/0.61/110	C/0.78/275	B/0.61/125	A/0.46/60	B/0.44/100	B/0.61/110	C/0.78/275	B/0.61/125	A/0.46/60
Research Parkway at Food Bank Drive and Site Drive 1 ¹⁻²	B/10.4	A/2.0	B/17.4	B/11.8	B/11.4	B/10.4	A/2.0	B/17.4	B/11.8	B/11.4
Food Bank Drive EB Left	A/0.00/25	B/0.01/25	C/0.04/25	A/0.00/25	A/0.00/25	A/0.00/25	B/0.01/25	C/0.04/25	A/0.00/25	A/0.00/25
Food Bank Drive EB Right/Thru	A/0.02/25	A/0.02/25	A/0.07/25	A/0.02/25	A/0.00/25	A/0.02/25	A/0.02/25	A/0.07/25	A/0.02/25	A/0.00/25
Site Drive 1 WB Left	C/0.46/110	A/0.00/25	D/0.76/155	C/0.60/130	C/0.52/105	C/0.46/110	A/0.00/25	D/0.76/155	C/0.60/130	C/0.52/105
Site Drive 1 WB Thru/Right	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25
Research Parkway NB Left (140')	A/0.08/25	A/0.01/25	B/0.05/25	B/0.03/25	A/0.00/25	A/0.08/25	A/0.01/25	B/0.05/25	B/0.03/25	A/0.00/25
Research Parkway NB Thru	B/0.52/175	A/0.09/25	B/0.58/185	B/0.27/60	B/0.17/60	B/0.52/175	A/0.09/25	B/0.58/185	B/0.27/60	B/0.17/60
Research Parkway NB Right	A/0.12/25	A/0.00/25	A/0.40/25	A/0.48/25	A/0.36/45	A/0.12/25	A/0.00/25	A/0.40/25	A/0.48/25	A/0.36/45
Research Parkway SB Left (115')	A/0.04/25	A/0.00/25	A/0.16/25	A/0.09/25	A/0.08/25	A/0.04/25	A/0.00/25	A/0.16/25	A/0.09/25	A/0.08/25
Research Parkway SB Thru/Right	A/0.29/100	A/0.29/85	C/0.80/290	B/0.49/135	B/0.35/105	A/0.29/100	A/0.29/85	C/0.80/290	B/0.49/135	B/0.35/105
Research Parkway at J. Carini Road ²	-	-	-	-	-	-	-	-	-	-
Joseph Carini Road EB Left/Right	B/0.02/25	B/0.09/25	C/0.27/25	B/0.03/25	A/0.01/25	B/0.02/25	B/0.09/25	C/0.27/30	B/0.03/25	A/0.01/25
Research Parkway NB Left/Thru	A/0.06/25	A/0.02/25	A/0.01/25	A/0.01/25	A/0.00/25	A/0.06/25	A/0.02/25	A/0.01/25	A/0.01/25	A/0.00/25
Research Parkway SB Thru/Right	-	-	-	-	-	-	-	-	-	-

Overall Intersection – X/XX.X - Level of Service/Intersection Signal Delay in sec
Approaches - X/X.XX/XXX – Level of Service/Volume to Capacity Ratio/95% Queue Length in ft

¹ – Signalized Intersection

² – Unsignalized Intersections, controlled movements

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

m – Volume for 95th percentile queue is metered by upstream signal.

Movement (XX') – Storage length



Intersection	HOLIDAY					HOLIDAY IMPROVED				
	AM	Mid-Day	PM	AM Peak Hour Generator	PM Peak Hour Generator	AM	Mid-Day	PM	AM Peak Hour Generator	PM Peak Hour Generator
Research Parkway at Marlin Software Driveway ²	-	-	-	-	-	-	-	-	-	-
Marlin Software Driveway EB Left/Right	A/0.00/25	B/0.01/25	C/0.03/25	B/0.01/25	B/0.01/25	A/0.00/25	B/0.01/25	C/0.03/25	B/0.01/25	B/0.01/25
Research Parkway NB Left (100')	A/0.01/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.01/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25
Research Parkway NB Thru	-	-	-	-	-	-	-	-	-	-
Research Parkway SB Thru/Right	-	-	-	-	-	-	-	-	-	-
Research Parkway at Carpenter Lane ²	-	-	-	-	-	-	-	-	-	-
Carpenter Lane EB Right/Thru/ Left	C/0.65/115	A/0.12/25	C/0.39/40	B/0.15/25	A/0.11/25	C/0.65/115	A/0.12/25	C/0.39/40	B/0.15/25	A/0.11/25
Carpenter Lane WB Right/Thru/ Left	D/0.74/155	B/0.59/95	D/0.80/135	C/0.74/165	B/0.39/45	D/0.74/155	B/0.59/95	D/0.80/135	C/0.74/165	B/0.39/45
Research Parkway NB Right/Thru/ Left	F/0.95/310	A/0.17/25	F/1.19/430	B/0.23/25	A/0.20/25	F/0.95/310	A/0.17/25	F/1.19/430	B/0.23/25	A/0.20/25
Research Parkway SB Right/Thru/ Left	C/0.48/65	A/0.22/25	F/1.43/790	B/0.43/55	B/0.34/40	C/0.48/65	A/0.22/25	F/1.43/790	B/0.43/55	B/0.34/40
Carpenter Lane at Site Drive 2 ²	-	-	-	-	-	-	-	-	-	-
Carpenter Lane EB Right/Thru/ Left	-	-	-	-	-	-	-	-	-	-
Carpenter Lane WB Right/Thru/ Left	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25	A/0.00/25
Site Drive 2 NB Right/ Left	B/0.18/25	A/0.33/25	B/0.27/30	B/0.22/25	A/0.19/25	B/0.18/25	B/0.33/40	B/0.27/25	B/0.22/25	A/0.19/25

Overall Intersection – X/XX.X - Level of Service/Intersection Signal Delay in sec

Approaches - X/X.XX/XXX – Level of Service/Volume to Capacity Ratio/95% Queue Length in ft

¹ – Signalized Intersection

² – Unsignalized Intersections, controlled movements

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

m – Volume for 95th percentile queue is metered by upstream signal.

Movement (XX') – Storage length



As illustrated in **Table 5.3**, there are three signalized intersections along Route 68 (Barnes Road) with overall acceptable traffic operations during AM, Mid-Day, PM, AM Peak Generator, and PM Peak Generator Peak Hour. Some deterioration is observed at specific movements, however overall intersections performance is acceptable. Only during PM Build Holiday Peak Hour, the intersection of Route 68 (Barnes Road) at Interstate 91 Northbound Exit 15 On/Off-Ramps perform at LOS F with 90 second delay. Certain movements at signalized intersections are projected to perform at LOS E /F that is generally considered the limit of acceptable motorist delay, these are:

- Route 68 (Barnes Road) at Interstate 91 Southbound Exit 15 On/Off-Ramps:
 - Route 68 Eastbound Thru (PM Build Holiday)
 - Route 68 Westbound Left (PM Build Holiday)
 - Exit 15 Off-Ramp SB Left (PM Build Holiday)
 - Exit 15 Off-Ramp SB Left/Right (PM Build Holiday)
 - Exit 15 Off-Ramp SB Right (PM Build Holiday)
- Route 68 (Barnes Road) at Interstate 91 Northbound Exit 15 On/Off-Ramps
 - Route 68 WB Thru (AM / PM Build Holiday)
 - Exit 15 Off-Ramp NB Right (AM Build Holiday)
- Route 68 (Barnes Road) at Hotel Drive and Research Parkway:
 - Route 68 EB Left (PM Build Holiday and AM Peak Generator Build Holiday)
 - Route 68 WB Thru (AM Build Holiday)
 - Research Parkway SB Left/Thru (PM Build Holiday)

From the analysis the Build Scenarios there are low impacts to the roadway network for the proposed delivery station facility. At the proposed development driveway (Site #1) with Research Parkway in the existing and no build conditions, the intersection operates as a two-way stop-controlled intersection with stop-control on the driveways. As this is formerly signalized intersection that operates in “Flash” mode, for all build scenarios, the intersection signal was activated. As such, the LOS for all build scenario periods, weekday and holiday, operates at LOS A and LOS B. At the second access point to

the site at Carpenter Lane performs adequately for all movements. The stop-controlled movement from the Site #2 approach performs at LOS A and LOS B.

Only during Holiday Build scenario in the PM Peak Hour at the intersection of Route 68 (Barnes Road) at Interstate 91 Northbound Exit 15 On/Off-Ramps the overall intersection LOS is F. This is caused by high volumes and the lack of right turn on red on the northbound right approach. The Build with the improvements results are summarized and provided. The improvements to the intersection included adjustments to lane configuration on the I-91 northbound Off-Ramp approach and only during PM Peak optimization of signal phases. The LOS improves from LOS F to LOS D.

Conclusions and Recommendations

A holiday season analysis was performed per town peer review request. The focus of this study was to evaluate the traffic flows and operating conditions on the roadways and intersections projected to be used by motorists traveling to and from the proposed development and to quantify the potential traffic impacts on these roadways and intersections. After analyses of the Existing and No Build Scenarios of the AM, Mid-Day, AM Peak Generator, and PM Peak Generator Peak Hours there are no notable deterioration from the other proposed developments. For holiday conditions, a Build and Build Improved scenario was included.

Only during the PM Build Holiday Peak Hour, the intersection of Route 68 (Barnes Road) at Interstate 91 Northbound Exit 15 On/Off-Ramps perform at LOS F with 90 second delay. During some periods, certain movements at signalized intersections are projected to perform at LOS E /F, which is generally considered undesirable motorist delay.

The following is a summary of the results/recommendations for this Site based on both average weekday and holiday season analysis:

- Capacity analyses indicate that all analyzed intersections, overall, are projected to perform at an acceptable Level of Service between all average weekday scenarios analyzed.

- The undesirable Levels of Service are observed for individual movements and deterioration occurs between the Existing and No Build scenarios. Only during the PM Build Holiday Peak Hour, the intersection of Route 68 (Barnes Road) at Interstate 91 Northbound Exit 15 On/Off-Ramps perform at LOS F, thus additional analysis with improved lane configuration on the I-91 northbound Off-Ramp approach and optimization of signal phases (only during PM Peak hour).
- Install "Stop" sign and stop bar at the Site drive's access / egress at Carpenter Lane as noted on Site Plans.
- Clear of overgrown shrubs to meet the sight line requirements at the Carpenter Lane Site driveway.
- Clearing of vegetation at the Research Parkway at Carpenter Lane to increase sight lines.
- Move the Research Parkway northbound stop bar at the Site Drive #1 to accommodate truck turns from the Site.
- Route 68 Left Turn into Research Parkway operates with throat width of 27.5'±. Current CTDOT guidelines suggest expanded throat width of 30' to avoid conflicts in turning paths at double left turn. Sketch Plan TT-2 shows WB-67 truck turns with restriped travel lanes to 11ft wide to accommodate the movements without widening of roadway or conflict areas.

Lanes, Volumes, Timings

Holiday Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM

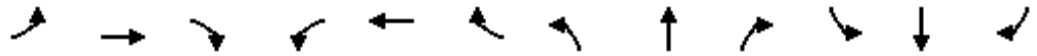


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	596	227	381	950	0	0	0	0	191	0	409
Future Volume (vph)	0	596	227	381	950	0	0	0	0	191	0	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.863	0.850
Fl _t Protected				0.950						0.950	0.996	
Satd. Flow (prot)	0	3008	1455	1597	2756	0	0	0	0	1678	1320	1442
Fl _t Permitted				0.950						0.950	0.996	
Satd. Flow (perm)	0	3008	1455	1597	2756	0	0	0	0	1678	1320	1442
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			241									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.88	0.88	0.88	0.82	0.82	0.82
Heavy Vehicles (%)	0%	20%	11%	13%	31%	0%	0%	0%	0%	9%	0%	17%
Adj. Flow (vph)	0	634	241	414	1033	0	0	0	0	233	0	499
Shared Lane Traffic (%)										10%		48%
Lane Group Flow (vph)	0	634	241	414	1033	0	0	0	0	210	263	259
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		2	2	1	1 2					4	4	4
Permitted Phases												
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		23.0	23.0	26.0						31.0	31.0	31.0
Total Split (%)		28.8%	28.8%	32.5%						38.8%	38.8%	38.8%
Maximum Green (s)		17.5	17.5	22.0						25.5	25.5	25.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Holiday Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		19.5	19.5	24.5	49.5					21.0	21.0	21.0
Actuated g/C Ratio		0.24	0.24	0.31	0.62					0.26	0.26	0.26
v/c Ratio		0.86	0.45	0.85	0.61					0.48	0.76	0.69
Control Delay		44.7	6.9	32.3	4.9					27.6	41.1	35.5
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		44.7	6.9	32.3	4.9					27.6	41.1	35.5
LOS		D	A	C	A					C	D	D
Approach Delay		34.3			12.8						35.3	
Approach LOS		C			B						D	
Queue Length 50th (ft)		165	0	156	35					90	128	118
Queue Length 95th (ft)		#273	56	m#263	m90					131	184	168
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		734	537	488	1705					534	420	459
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		0.86	0.45	0.85	0.61					0.39	0.63	0.56

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 78 (98%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 24.3
 Intersection LOS: C
 Intersection Capacity Utilization 59.7%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Holiday Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM

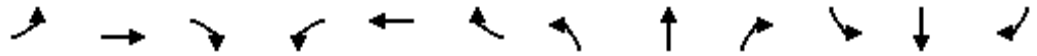


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	192	595	0	0	988	295	343	5	291	0	0	0
Future Volume (vph)	192	595	0	0	988	295	343	5	291	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.954				
Satd. Flow (prot)	1656	3008	0	0	2735	1394	1604	1516	1606	0	0	0
Fl _t Permitted	0.950						0.950	0.954				
Satd. Flow (perm)	1656	3008	0	0	2735	1394	1604	1516	1606	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						304						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.93	0.93	0.93	0.97	0.97	0.97	0.86	0.86	0.86	0.88	0.88	0.88
Heavy Vehicles (%)	9%	20%	0%	0%	32%	12%	14%	0%	14%	0%	0%	0%
Adj. Flow (vph)	206	640	0	0	1019	304	399	6	338	0	0	0
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	206	640	0	0	1019	304	203	202	338	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			12			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	25.0				29.0	29.0	26.0	26.0	26.0			
Total Split (%)	31.3%				36.3%	36.3%	32.5%	32.5%	32.5%			
Maximum Green (s)	21.0				23.5	23.5	21.0	21.0	21.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Holiday Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	16.7	51.3			29.1	29.1	19.7	19.7	19.7			
Actuated g/C Ratio	0.21	0.64			0.36	0.36	0.25	0.25	0.25			
v/c Ratio	0.60	0.33			1.02	0.43	0.52	0.54	0.86			
Control Delay	45.3	1.1			57.8	10.5	30.8	31.9	50.6			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	45.3	1.1			57.8	10.5	30.8	31.9	50.6			
LOS	D	A			E	B	C	C	D			
Approach Delay		11.8			47.0			40.1				
Approach LOS		B			D			D				
Queue Length 50th (ft)	90	5			~298	41	90	90	158			
Queue Length 95th (ft)	m96	m10			m#333	m46	149	150	#269			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	434	1895			996	701	421	397	421			
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	0.47	0.34			1.02	0.43	0.48	0.51	0.80			

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 34 (43%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 35.0
 Intersection LOS: D
 Intersection Capacity Utilization 59.7%
 ICU Level of Service B
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Holiday Build
 Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	341	520	25	10	980	145	35	25	10	78	5	268
Future Volume (vph)	341	520	25	10	980	145	35	25	10	78	5	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.957				0.850
Flt Protected	0.950			0.950			0.950				0.955	
Satd. Flow (prot)	3045	1547	0	1796	2477	1516	1668	1753	0	0	1781	1509
Flt Permitted	0.950			0.950			0.691				0.689	
Satd. Flow (perm)	3045	1547	0	1796	2477	1516	1213	1753	0	0	1285	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				163		20				115
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.51	0.51	0.51	0.81	0.81	0.81
Heavy Vehicles (%)	15%	23%	1%	0%	45%	6%	1%	0%	1%	2%	0%	7%
Adj. Flow (vph)	371	565	27	11	1101	163	69	49	20	96	6	331
Shared Lane Traffic (%)												
Lane Group Flow (vph)	371	592	0	11	1101	163	69	69	0	0	102	331
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pt+ov
Protected Phases	7	7 8		3	3 8	3 8		4			4	4 7
Permitted Phases							4			4		
Detector Phase	7	7 8		3	3 8	3 8	4	4		4	4	4 7
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	
Total Split (s)	26.0			11.0			19.0	19.0		19.0	19.0	
Total Split (%)	32.5%			13.8%			23.8%	23.8%		23.8%	23.8%	
Maximum Green (s)	20.6			5.7			14.1	14.1		14.1	14.1	
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	
Lost Time Adjust (s)	0.0			0.0			0.0	0.0			0.0	
Total Lost Time (s)	5.4			5.3			4.9	4.9			4.9	
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												

Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	24.0
Total Split (%)	30%
Maximum Green (s)	17.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Holiday Build
 Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	
Recall Mode	None			None			None	None		None	None	
Act Effct Green (s)	20.0	47.3		5.7	33.0	33.0	11.4	11.4			11.4	36.8
Actuated g/C Ratio	0.25	0.59		0.07	0.41	0.41	0.14	0.14			0.14	0.46
v/c Ratio	0.49	0.65		0.09	1.08	0.23	0.40	0.26			0.56	0.44
Control Delay	29.0	13.4		36.4	78.3	4.0	37.4	24.9			43.4	10.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	29.0	13.4		36.4	78.3	4.0	37.4	24.9			43.4	10.4
LOS	C	B		D	E	A	D	C			D	B
Approach Delay		19.4			68.4			31.1			18.2	
Approach LOS		B			E			C			B	
Queue Length 50th (ft)	86	73		5	~356	0	32	22			48	60
Queue Length 95th (ft)	m123	m112		21	#470	36	37	27			83	98
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	807	917		127	1022	721	213	325			226	765
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.46	0.65		0.09	1.08	0.23	0.32	0.21			0.45	0.43

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 27 (34%), Referenced to phase 8:EBWB, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.08
 Intersection Signal Delay: 42.0 Intersection LOS: D
 Intersection Capacity Utilization 62.1% ICU Level of Service B
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø8
Vehicle Extension (s)	5.0
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	5	122	0	0	35	394	82	15	224	0
Future Volume (vph)	0	0	5	122	0	0	35	394	82	15	224	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850							0.850			
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1900	1615	0	1805	1900	0	1805	1845	1615	1626	1727	0
Flt Permitted				0.750			0.573			0.353		
Satd. Flow (perm)	1900	1615	0	1425	1900	0	1089	1845	1615	604	1727	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		517							122			
Link Speed (mph)		30			30			30				30
Link Distance (ft)		196			203			720				478
Travel Time (s)		4.5			4.6			16.4				10.9
Peak Hour Factor	0.42	0.42	0.42	0.88	0.88	0.88	0.67	0.67	0.67	0.73	0.73	0.73
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	11%	10%	0%
Adj. Flow (vph)	0	0	12	139	0	0	52	588	122	21	307	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	139	0	0	52	588	122	21	307	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12				12
Link Offset(ft)		0			12			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt		NA
Protected Phases		4			4			2			1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	1.0	2.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build
 Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		10.2		10.2			29.1	29.1	29.1	30.2	29.1	
Actuated g/C Ratio		0.21		0.21			0.61	0.61	0.61	0.64	0.61	
v/c Ratio		0.02		0.46			0.08	0.52	0.12	0.04	0.29	
Control Delay		0.0		24.6			7.4	10.5	2.2	4.6	8.2	
Queue Delay		0.0		0.0			0.0	0.0	0.0	0.0	0.0	
Total Delay		0.0		24.6			7.4	10.5	2.2	4.6	8.2	
LOS		A		C			A	B	A	A	A	
Approach Delay					24.6			9.0				7.9
Approach LOS					C			A				A
Queue Length 50th (ft)		0		26			5	81	0	2	35	
Queue Length 95th (ft)		0		106			20	175	9	7	98	
Internal Link Dist (ft)		116			123			640				398
Turn Bay Length (ft)				170			140			115		
Base Capacity (vph)		1396		1141			970	1643	1451	501	1538	
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		0.01		0.12			0.05	0.36	0.08	0.04	0.20	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 47.5
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 10.4
 Intersection LOS: B
 Intersection Capacity Utilization 51.7%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Joseph Carini Rd

Holiday Build
Timing Plan: AM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	6	58	336	233	6
Future Volume (vph)	0	6	58	336	233	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865			0.996		
Fl _t Protected				0.993		
Satd. Flow (prot)	1096	0	0	1705	1596	0
Fl _t Permitted				0.993		
Satd. Flow (perm)	1096	0	0	1705	1596	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.50	0.50	0.90	0.90	0.63	0.63
Heavy Vehicles (%)	0%	50%	3%	12%	19%	2%
Adj. Flow (vph)	0	12	64	373	370	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	437	380	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	0	6	58	336	233	6
Future Vol, veh/h	0	6	58	336	233	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	90	90	63	63
Heavy Vehicles, %	0	50	3	12	19	2
Mvmt Flow	0	12	64	373	370	10

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	876	375	380	0	0
Stage 1	375	-	-	-	-
Stage 2	501	-	-	-	-
Critical Hdwy	6.4	6.7	4.13	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.75	2.227	-	-
Pot Cap-1 Maneuver	322	577	1173	-	-
Stage 1	699	-	-	-	-
Stage 2	613	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	300	577	1173	-	-
Mov Cap-2 Maneuver	300	-	-	-	-
Stage 1	651	-	-	-	-
Stage 2	613	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1173	-	577	-	-
HCM Lane V/C Ratio	0.055	-	0.021	-	-
HCM Control Delay (s)	8.2	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	-	-

Lanes, Volumes, Timings
6: Research Parkway

Holiday Build
Timing Plan: AM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	6	330	239	2
Future Volume (vph)	0	0	6	330	239	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.999	
Flt Protected			0.950			
Satd. Flow (prot)	1900	1900	1805	1667	1624	0
Flt Permitted			0.950			
Satd. Flow (perm)	1900	1900	1805	1667	1624	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.25	0.25	0.89	0.89	0.81	0.81
Heavy Vehicles (%)	0%	0%	0%	14%	17%	0%
Adj. Flow (vph)	0	0	7	371	295	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	7	371	297	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	20.7%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	0	6	330	239	2
Future Vol, veh/h	0	0	6	330	239	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	89	89	81	81
Heavy Vehicles, %	0	0	0	14	17	0
Mvmt Flow	0	0	7	371	295	2

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	681	296	297	0	-	0
Stage 1	296	-	-	-	-	-
Stage 2	385	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	419	748	1276	-	-	-
Stage 1	759	-	-	-	-	-
Stage 2	692	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	417	748	1276	-	-	-
Mov Cap-2 Maneuver	417	-	-	-	-	-
Stage 1	755	-	-	-	-	-
Stage 2	692	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1276	-	-	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-	-	-
HCM Control Delay (s)	7.8	-	0	0	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Holiday Build
Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	101	61	25	123	66	57	15	275	40	25	93	45
Future Volume (vph)	101	61	25	123	66	57	15	275	40	25	93	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.982			0.969			0.984			0.963	
Fl _t Protected		0.974			0.976			0.998			0.992	
Satd. Flow (prot)	0	1749	0	0	1716	0	0	1803	0	0	1742	0
Fl _t Permitted		0.974			0.976			0.998			0.992	
Satd. Flow (perm)	0	1749	0	0	1716	0	0	1803	0	0	1742	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.62	0.62	0.62	0.71	0.71	0.71	0.69	0.69	0.69	0.76	0.76	0.76
Heavy Vehicles (%)	0%	5%	17%	6%	2%	5%	8%	3%	5%	9%	4%	2%
Adj. Flow (vph)	163	98	40	173	93	80	22	399	58	33	122	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	301	0	0	346	0	0	479	0	0	214	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	37.1
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	101	61	25	123	66	57	15	275	40	25	93	45
Future Vol, veh/h	101	61	25	123	66	57	15	275	40	25	93	45
Peak Hour Factor	0.62	0.62	0.62	0.71	0.71	0.71	0.69	0.69	0.69	0.76	0.76	0.76
Heavy Vehicles, %	0	5	17	6	2	5	8	3	5	9	4	2
Mvmt Flow	163	98	40	173	93	80	22	399	58	33	122	59
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	24.3	29.5	59	18.4
HCM LOS	C	D	F	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	54%	50%	15%
Vol Thru, %	83%	33%	27%	57%
Vol Right, %	12%	13%	23%	28%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	330	187	246	163
LT Vol	15	101	123	25
Through Vol	275	61	66	93
RT Vol	40	25	57	45
Lane Flow Rate	478	302	346	214
Geometry Grp	1	1	1	1
Degree of Util (X)	0.964	0.651	0.739	0.48
Departure Headway (Hd)	7.255	7.773	7.681	8.059
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	502	464	471	446
Service Time	5.279	5.848	5.717	6.142
HCM Lane V/C Ratio	0.952	0.651	0.735	0.48
HCM Control Delay	59	24.3	29.5	18.4
HCM Lane LOS	F	C	D	C
HCM 95th-tile Q	12.3	4.6	6.1	2.5

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Holiday Build
Timing Plan: AM



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	126	0	0	126	120	0
Future Volume (vph)	126	0	0	126	120	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	0	0	137	130	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	137	0	0	137	130	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.9%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	3.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	126	0	0	126	120	0
Future Vol, veh/h	126	0	0	126	120	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	137	0	0	137	130	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	137	0	274
Stage 1	-	-	-	-	137
Stage 2	-	-	-	-	137
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1447	-	716
Stage 1	-	-	-	-	890
Stage 2	-	-	-	-	890
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1447	-	716
Mov Cap-2 Maneuver	-	-	-	-	716
Stage 1	-	-	-	-	890
Stage 2	-	-	-	-	890

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	716	-	-	-	1447	-
HCM Lane V/C Ratio	0.182	-	-	-	-	-
HCM Control Delay (s)	11.1	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	-	0	-

Lanes, Volumes, Timings

Holiday Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	511	172	215	579	0	0	0	0	131	1	172
Future Volume (vph)	0	511	172	215	579	0	0	0	0	131	1	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.890	0.850
Fl _t Protected				0.950						0.950	0.987	
Satd. Flow (prot)	0	3223	1455	1467	3343	0	0	0	0	1577	1237	1288
Fl _t Permitted				0.950						0.950	0.987	
Satd. Flow (perm)	0	3223	1455	1467	3343	0	0	0	0	1577	1237	1288
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			198									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.87	0.87	0.87	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Heavy Vehicles (%)	0%	12%	11%	23%	8%	0%	0%	0%	0%	16%	0%	31%
Adj. Flow (vph)	0	587	198	236	636	0	0	0	0	146	1	191
Shared Lane Traffic (%)										20%		43%
Lane Group Flow (vph)	0	587	198	236	636	0	0	0	0	117	112	109
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Holiday Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		29.8	29.8	17.5	52.8					12.7	12.7	12.7
Actuated g/C Ratio		0.40	0.40	0.23	0.70					0.17	0.17	0.17
v/c Ratio		0.46	0.28	0.69	0.27					0.44	0.54	0.50
Control Delay		19.5	4.3	30.4	0.8					32.2	37.2	35.4
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		19.5	4.3	30.4	0.8					32.2	37.2	35.4
LOS		B	A	C	A					C	D	D
Approach Delay		15.7			8.8						34.9	
Approach LOS		B			A						C	
Queue Length 50th (ft)		108	0	39	0					52	53	49
Queue Length 95th (ft)		159	38	#185	1					92	97	90
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1280	697	357	2352					410	321	334
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		0.46	0.28	0.66	0.27					0.29	0.35	0.33

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 15.9
 Intersection LOS: B
 Intersection Capacity Utilization 46.5%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Holiday Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	169	473	0	0	636	200	158	0	127	0	0	0
Future Volume (vph)	169	473	0	0	636	200	158	0	127	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1433	3343	0	0	3282	1269	1604	1504	1551	0	0	0
Fl _t Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1433	3343	0	0	3282	1269	1604	1504	1551	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						220						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.95	0.95	0.95	0.91	0.91	0.91	0.90	0.90	0.90	0.88	0.88	0.88
Heavy Vehicles (%)	26%	8%	0%	0%	10%	23%	14%	0%	18%	0%	0%	0%
Adj. Flow (vph)	178	498	0	0	699	220	176	0	141	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	178	498	0	0	699	220	88	88	141	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Holiday Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	14.5	53.4			33.4	33.4	12.6	12.6	12.6			
Actuated g/C Ratio	0.19	0.71			0.45	0.45	0.17	0.17	0.17			
v/c Ratio	0.64	0.21			0.48	0.32	0.33	0.35	0.54			
Control Delay	27.6	0.4			12.1	2.0	29.6	30.3	35.7			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	27.6	0.4			12.1	2.0	29.6	30.3	35.7			
LOS	C	A			B	A	C	C	D			
Approach Delay		7.5			9.6			32.5				
Approach LOS		A			A			C				
Queue Length 50th (ft)	35	0			72	1	38	38	61			
Queue Length 95th (ft)	54	1			118	11	73	74	105			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	319	2342			1463	687	406	381	392			
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	0.21			0.48	0.32	0.22	0.23	0.36			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 12.7
 Intersection Capacity Utilization 46.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Holiday Build
 Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗			↖	↗
Traffic Volume (vph)	88	505	7	1	532	20	5	0	2	78	0	299
Future Volume (vph)	88	505	7	1	532	20	5	0	2	78	0	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998				0.850		0.850				0.850
Flt Protected	0.950			0.950			0.950				0.950	
Satd. Flow (prot)	1410	3364	0	1796	3295	1530	1404	1041	0	0	1480	1282
Flt Permitted	0.950			0.950			0.701				0.754	
Satd. Flow (perm)	1410	3364	0	1796	3295	1530	1036	1041	0	0	1174	1282
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				106		428				205
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.44	0.44	0.44	0.90	0.90	0.90
Heavy Vehicles (%)	28%	7%	14%	0%	9%	5%	20%	0%	50%	22%	0%	26%
Adj. Flow (vph)	95	543	8	1	578	22	11	0	5	87	0	332
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	551	0	1	578	22	11	5	0	0	87	332
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	20.0			12.0			15.0	15.0		15.0	15.0	20.0
Total Split (%)	26.7%			16.0%			20.0%	20.0%		20.0%	20.0%	26.7%
Maximum Green (s)	14.6			6.7			10.1	10.1		10.1	10.1	14.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	28.0
Total Split (%)	37%
Maximum Green (s)	21.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Holiday Build
 Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	11.6	47.0		5.5	40.1	40.1	9.3	9.3			9.3	23.4
Actuated g/C Ratio	0.15	0.63		0.07	0.53	0.53	0.12	0.12			0.12	0.31
v/c Ratio	0.44	0.26		0.01	0.33	0.03	0.09	0.01			0.60	0.61
Control Delay	40.1	4.3		32.0	12.3	0.1	29.8	0.0			48.9	12.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	40.1	4.3		32.0	12.3	0.1	29.8	0.0			48.9	12.3
LOS	D	A		C	B	A	C	A			D	B
Approach Delay		9.6			11.9			20.5			19.9	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	39	31		0	84	0	5	0			38	41
Queue Length 95th (ft)	87	39		5	128	0	9	0			#94	110
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	274	2073		160	1762	867	143	512			162	584
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.35	0.27		0.01	0.33	0.03	0.08	0.01			0.54	0.57

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 13.1 Intersection LOS: B
 Intersection Capacity Utilization 52.7% ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build
Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↗	↖	↗	↖
Traffic Volume (vph)	2	0	8	0	0	0	5	103	0	0	369	1
Future Volume (vph)	2	0	8	0	0	0	5	103	0	0	369	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1805	1615	0	1900	1900	0	1805	1520	1900	1900	1485	0
Flt Permitted							0.526					
Satd. Flow (perm)	1900	1615	0	1900	1900	0	999	1520	1900	1900	1485	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		419										
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.63	0.63	0.63	0.88	0.88	0.88	0.81	0.81	0.81	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	28%	0%
Adj. Flow (vph)	3	0	13	0	0	0	6	127	0	0	401	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	13	0	0	0	0	6	127	0	0	402	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			4			2			1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build
 Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	7.2	7.2					36.9	36.9				36.9
Actuated g/C Ratio	0.18	0.18					0.93	0.93				0.93
v/c Ratio	0.01	0.02					0.01	0.09				0.29
Control Delay	17.0	0.0					1.8	1.5				2.1
Queue Delay	0.0	0.0					0.0	0.0				0.0
Total Delay	17.0	0.0					1.8	1.5				2.1
LOS	B	A					A	A				A
Approach Delay		3.2						1.5				2.1
Approach LOS		A						A				A
Queue Length 50th (ft)	1	0					0	0				0
Queue Length 95th (ft)	5	0					3	22				85
Internal Link Dist (ft)		116			123			640				398
Turn Bay Length (ft)							140					
Base Capacity (vph)	1725	1504					967	1471				1437
Starvation Cap Reductn	0	0					0	0				0
Spillback Cap Reductn	0	0					0	0				0
Storage Cap Reductn	0	0					0	0				0
Reduced v/c Ratio	0.00	0.01					0.01	0.09				0.28

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 39.5
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.29
 Intersection Signal Delay: 2.0
 Intersection LOS: A
 Intersection Capacity Utilization 34.5%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Joseph Carini Rd

Holiday Build
Timing Plan: MD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	30	14	91	340	3
Future Volume (vph)	3	30	14	91	340	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.876				0.999	
Fl _t Protected	0.996			0.993		
Satd. Flow (prot)	1458	0	0	1674	1682	0
Fl _t Permitted	0.996			0.993		
Satd. Flow (perm)	1458	0	0	1674	1682	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.69	0.69	0.83	0.83	0.65	0.65
Heavy Vehicles (%)	0%	15%	11%	13%	13%	0%
Adj. Flow (vph)	4	43	17	110	523	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	0	127	528	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	3	30	14	91	340	3
Future Vol, veh/h	3	30	14	91	340	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	83	83	65	65
Heavy Vehicles, %	0	15	11	13	13	0
Mvmt Flow	4	43	17	110	523	5

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	670	526	528	0	-	0
Stage 1	526	-	-	-	-	-
Stage 2	144	-	-	-	-	-
Critical Hdwy	6.4	6.35	4.21	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.435	2.299	-	-	-
Pot Cap-1 Maneuver	425	527	995	-	-	-
Stage 1	597	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	417	527	995	-	-	-
Mov Cap-2 Maneuver	417	-	-	-	-	-
Stage 1	586	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	995	-	515	-	-
HCM Lane V/C Ratio	0.017	-	0.093	-	-
HCM Control Delay (s)	8.7	0	12.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Holiday Build
Timing Plan: MD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	3	2	92	340	0
Future Volume (vph)	2	3	2	92	340	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1583	1805	1681	1652	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1583	1805	1681	1652	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.38	0.38	0.83	0.83	0.66	0.66
Heavy Vehicles (%)	0%	2%	0%	13%	15%	0%
Adj. Flow (vph)	5	8	2	111	515	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	8	2	111	515	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	27.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↑	↗	
Traffic Vol, veh/h	2	3	2	92	340	0
Future Vol, veh/h	2	3	2	92	340	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	38	38	83	83	66	66
Heavy Vehicles, %	0	2	0	13	15	0
Mvmt Flow	5	8	2	111	515	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	630	515	515	0	-	0
Stage 1	515	-	-	-	-	-
Stage 2	115	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.2	-	-	-
Pot Cap-1 Maneuver	449	560	1061	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	448	560	1061	-	-	-
Mov Cap-2 Maneuver	448	-	-	-	-	-
Stage 1	603	-	-	-	-	-
Stage 2	915	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.1	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1061	-	448	560	-	-
HCM Lane V/C Ratio	0.002	-	0.012	0.014	-	-
HCM Control Delay (s)	8.4	-	13.1	11.5	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Holiday Build
Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	31	27	11	245	19	54	7	81	6	13	84	37
Future Volume (vph)	31	27	11	245	19	54	7	81	6	13	84	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.978			0.977			0.991			0.962	
Fl _t Protected		0.978			0.963			0.996			0.995	
Satd. Flow (prot)	0	1741	0	0	1611	0	0	1477	0	0	1461	0
Fl _t Permitted		0.978			0.963			0.996			0.995	
Satd. Flow (perm)	0	1741	0	0	1611	0	0	1477	0	0	1461	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles (%)	3%	4%	9%	13%	16%	0%	0%	30%	17%	0%	38%	3%
Adj. Flow (vph)	36	31	13	327	25	72	8	95	7	15	94	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	80	0	0	424	0	0	110	0	0	151	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.6%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	27	11	245	19	54	7	81	6	13	84	37
Future Vol, veh/h	31	27	11	245	19	54	7	81	6	13	84	37
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles, %	3	4	9	13	16	0	0	30	17	0	38	3
Mvmt Flow	36	31	13	327	25	72	8	95	7	15	94	42
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9	14.8	9.6	9.7
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	45%	77%	10%
Vol Thru, %	86%	39%	6%	63%
Vol Right, %	6%	16%	17%	28%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	94	69	318	134
LT Vol	7	31	245	13
Through Vol	81	27	19	84
RT Vol	6	11	54	37
Lane Flow Rate	111	80	424	151
Geometry Grp	1	1	1	1
Degree of Util (X)	0.168	0.117	0.582	0.217
Departure Headway (Hd)	5.46	5.271	4.942	5.177
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	661	684	721	685
Service Time	3.46	3.278	3.026	3.277
HCM Lane V/C Ratio	0.168	0.117	0.588	0.22
HCM Control Delay	9.6	9	14.8	9.7
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0.6	0.4	3.8	0.8

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Holiday Build
Timing Plan: MD



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	↻
Traffic Volume (vph)	46	0	0	39	279	0
Future Volume (vph)	46	0	0	39	279	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frnt						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	0	42	303	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	42	303	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	25.5%
Analysis Period (min)	15
	ICU Level of Service A

Intersection

Int Delay, s/veh 8.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	46	0	0	39	279	0
Future Vol, veh/h	46	0	0	39	279	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	0	0	42	303	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	50	0	92
Stage 1	-	-	-	-	50
Stage 2	-	-	-	-	42
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1557	-	908
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	980
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1557	-	908
Mov Cap-2 Maneuver	-	-	-	-	908
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	980

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	908	-	-	-	1557	-
HCM Lane V/C Ratio	0.334	-	-	-	-	-
HCM Control Delay (s)	10.9	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1.5	-	-	-	0	-

Lanes, Volumes, Timings

Holiday Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	1108	480	391	892	0	0	0	0	359	5	338
Future Volume (vph)	0	1108	480	391	892	0	0	0	0	359	5	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.927	0.850
Fl _t Protected				0.950						0.950	0.976	
Satd. Flow (prot)	0	2843	1615	1805	2865	0	0	0	0	1829	1616	1688
Fl _t Permitted				0.950						0.950	0.976	
Satd. Flow (perm)	0	2843	1615	1805	2865	0	0	0	0	1829	1616	1688
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			498									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.89	0.89	0.89	0.84	0.84	0.84	0.88	0.88	0.88	0.85	0.85	0.85
Heavy Vehicles (%)	15%	27%	0%	0%	26%	9%	12%	0%	11%	0%	0%	0%
Adj. Flow (vph)	0	1245	539	465	1062	0	0	0	0	422	6	398
Shared Lane Traffic (%)										32%		34%
Lane Group Flow (vph)	0	1245	539	465	1062	0	0	0	0	287	276	263
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		37.0	37.0	23.0						20.0	20.0	20.0
Total Split (%)		46.3%	46.3%	28.8%						25.0%	25.0%	25.0%
Maximum Green (s)		31.5	31.5	19.0						14.5	14.5	14.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Holiday Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effect Green (s)		31.5	31.5	19.0	56.0					14.5	14.5	14.5
Actuated g/C Ratio		0.39	0.39	0.24	0.70					0.18	0.18	0.18
v/c Ratio		1.11	0.58	1.09	0.53					0.87	0.95	0.86
Control Delay		89.0	5.2	84.0	1.2					59.1	75.7	60.2
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		89.0	5.2	84.0	1.2					59.1	75.7	60.2
LOS		F	A	F	A					E	E	E
Approach Delay		63.7			26.4						65.0	
Approach LOS		E			C						E	
Queue Length 50th (ft)		~381	12	~245	7					148	151	135
Queue Length 95th (ft)		#497	74	m#160	m6					#264	#282	#248
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1119	937	428	2005					331	292	305
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	0.58	1.09	0.53					0.87	0.95	0.86

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 1 (1%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 50.2
 Intersection LOS: D
 Intersection Capacity Utilization 78.3%
 ICU Level of Service D
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Holiday Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	449	1018	0	0	995	298	288	5	469	0	0	0
Future Volume (vph)	449	1018	0	0	995	298	288	5	469	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.954				
Satd. Flow (prot)	1805	2756	0	0	2865	1561	1829	1722	1830	0	0	0
Fl _t Permitted	0.950						0.950	0.954				
Satd. Flow (perm)	1805	2756	0	0	2865	1561	1829	1722	1830	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						310						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.87	0.87	0.87	0.96	0.96	0.96	0.85	0.85	0.85	0.88	0.88	0.88
Heavy Vehicles (%)	0%	31%	14%	11%	26%	0%	0%	0%	0%	8%	0%	11%
Adj. Flow (vph)	516	1170	0	0	1036	310	339	6	552	0	0	0
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	516	1170	0	0	1036	310	173	172	552	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	32.0				27.0	27.0	21.0	21.0	21.0			
Total Split (%)	40.0%				33.8%	33.8%	26.3%	26.3%	26.3%			
Maximum Green (s)	28.0				21.5	21.5	16.0	16.0	16.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Holiday Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: PM

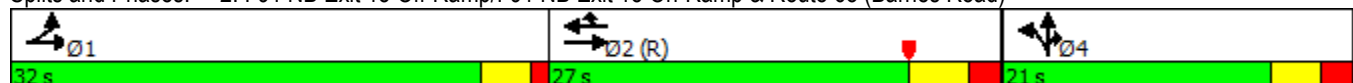


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None				C-Max	C-Max	None	None	None			
Act Effct Green (s)	27.4	55.0			22.1	22.1	16.0	16.0	16.0			
Actuated g/C Ratio	0.34	0.69			0.28	0.28	0.20	0.20	0.20			
v/c Ratio	0.83	0.62			1.31	0.47	0.47	0.50	1.51			
Control Delay	20.7	0.2			172.2	6.2	33.3	34.2	270.0			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	20.7	0.2			172.2	6.2	33.3	34.2	270.0			
LOS	C	A			F	A	C	C	F			
Approach Delay		6.5			134.0			179.1				
Approach LOS		A			F			F				
Queue Length 50th (ft)	123	1			~352	13	81	81	~390			
Queue Length 95th (ft)	m114	m1			m#440	m27	134	134	#535			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	631	1886			790	655	365	344	366			
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	0.82	0.62			1.31	0.47	0.47	0.50	1.51			

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 39 (49%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.51
 Intersection Signal Delay: 89.6 Intersection LOS: F
 Intersection Capacity Utilization 78.3% ICU Level of Service D
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Holiday Build
 Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	462	1010	15	5	803	157	10	20	5	191	40	480
Future Volume (vph)	462	1010	15	5	803	157	10	20	5	191	40	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998				0.850		0.969				0.850
Flt Protected	0.950			0.950			0.950				0.960	
Satd. Flow (prot)	1719	2566	0	1796	2763	1575	1652	1780	0	0	1752	1429
Flt Permitted	0.950			0.950			0.354				0.740	
Satd. Flow (perm)	1719	2566	0	1796	2763	1575	615	1780	0	0	1350	1429
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				183		7				115
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.95	0.95	0.95	0.86	0.86	0.86	0.75	0.75	0.75	0.82	0.82	0.82
Heavy Vehicles (%)	5%	41%	1%	0%	30%	2%	2%	0%	0%	5%	0%	13%
Adj. Flow (vph)	486	1063	16	6	934	183	13	27	7	233	49	585
Shared Lane Traffic (%)												
Lane Group Flow (vph)	486	1079	0	6	934	183	13	34	0	0	282	585
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	22.0			11.0			22.0	22.0		22.0	22.0	22.0
Total Split (%)	27.5%			13.8%			27.5%	27.5%		27.5%	27.5%	27.5%
Maximum Green (s)	16.6			5.7			17.1	17.1		17.1	17.1	16.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	25.0
Total Split (%)	31%
Maximum Green (s)	18.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Holiday Build
 Timing Plan: PM

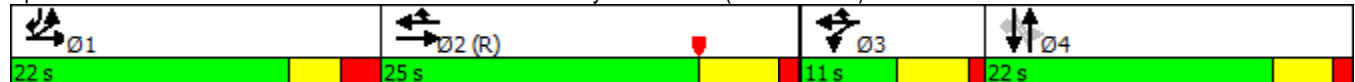


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0		1.5			2.0		2.0		2.0		2.0
Recall Mode	None			None			None		None		None	None
Act Effct Green (s)	16.6	41.6	5.7		29.9	29.9	17.1	17.1			17.1	38.6
Actuated g/C Ratio	0.21	0.52	0.07		0.37	0.37	0.21	0.21			0.21	0.48
v/c Ratio	1.37	0.81	0.05		0.91	0.26	0.10	0.09			0.98	0.78
Control Delay	202.4	14.8	35.6		37.8	3.9	27.7	22.2			82.6	22.7
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	202.4	14.8	35.6		37.8	3.9	27.7	22.2			82.6	22.7
LOS	F	B	D		D	A	C	C			F	C
Approach Delay	73.0			32.2			23.7				42.2	
Approach LOS	E			C			C				D	
Queue Length 50th (ft)	~331	74	3		227	0	5	11			141	188
Queue Length 95th (ft)	m#400	m76	14		#320	34	17	28			#252	272
Internal Link Dist (ft)	684			671			171				640	
Turn Bay Length (ft)	570		100			250						
Base Capacity (vph)	356	1335	127		1032	703	131	385			288	749
Starvation Cap Reductn	0	0	0		0	0	0	0			0	0
Spillback Cap Reductn	0	0	0		0	0	0	0			0	0
Storage Cap Reductn	0	0	0		0	0	0	0			0	0
Reduced v/c Ratio	1.37	0.81	0.05		0.91	0.26	0.10	0.09			0.98	0.78

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 29 (36%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.37
 Intersection Signal Delay: 52.2 Intersection LOS: D
 Intersection Capacity Utilization 80.8% ICU Level of Service D
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	15	166	0	0	5	366	268	47	530	0
Future Volume (vph)	5	0	15	166	0	0	5	366	268	47	530	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850							0.850			
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1615	0	1805	1900	0	1805	1792	1615	1805	1863	0
Flt Permitted	0.757			0.737			0.153			0.327		
Satd. Flow (perm)	1438	1615	0	1400	1900	0	291	1792	1615	621	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		181							454			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.48	0.48	0.48	0.88	0.88	0.88	0.59	0.59	0.59	0.60	0.60	0.60
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	2%	0%
Adj. Flow (vph)	10	0	31	189	0	0	8	620	454	78	883	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	31	0	189	0	0	8	620	454	78	883	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	1.0	2.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build
 Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	14.0	14.0		14.0			46.7	46.7	46.7	52.4	46.7	
Actuated g/C Ratio	0.18	0.18		0.18			0.59	0.59	0.59	0.67	0.59	
v/c Ratio	0.04	0.07		0.76			0.05	0.58	0.40	0.16	0.80	
Control Delay	26.0	0.3		50.2			10.4	14.6	2.2	5.4	21.9	
Queue Delay	0.0	0.0		0.0			0.0	0.0	0.0	0.0	0.0	
Total Delay	26.0	0.3		50.2			10.4	14.6	2.2	5.4	21.9	
LOS	C	A		D			B	B	A	A	C	
Approach Delay		6.6			50.2			9.4				20.6
Approach LOS		A			D			A				C
Queue Length 50th (ft)	4	0		89			2	181	0	10	320	
Queue Length 95th (ft)	9	0		153			6	182	0	19	288	
Internal Link Dist (ft)		116				123		640				398
Turn Bay Length (ft)				170			140			115		
Base Capacity (vph)	643	822		626			172	1065	1143	491	1107	
Starvation Cap Reductn	0	0		0			0	0	0	0	0	
Spillback Cap Reductn	0	0		0			0	0	0	0	0	
Storage Cap Reductn	0	0		0			0	0	0	0	0	
Reduced v/c Ratio	0.02	0.04		0.30			0.05	0.58	0.40	0.16	0.80	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 78.6
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 17.4
 Intersection LOS: B
 Intersection Capacity Utilization 64.1%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Joseph Carini Rd

Holiday Build
Timing Plan: PM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	63	9	362	514	0
Future Volume (vph)	3	63	9	362	514	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.871					
Fl _t Protected	0.998			0.999		
Satd. Flow (prot)	1618	0	0	1656	1696	0
Fl _t Permitted	0.998			0.999		
Satd. Flow (perm)	1618	0	0	1656	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.55	0.55	0.90	0.90	0.80	0.80
Heavy Vehicles (%)	50%	0%	0%	15%	12%	0%
Adj. Flow (vph)	5	115	10	402	643	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	120	0	0	412	643	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.8%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	3	63	9	362	514	0
Future Vol, veh/h	3	63	9	362	514	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	55	55	90	90	80	80
Heavy Vehicles, %	50	0	0	15	12	0
Mvmt Flow	5	115	10	402	643	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1065	643	643	0	-	0
Stage 1	643	-	-	-	-	-
Stage 2	422	-	-	-	-	-
Critical Hdwy	6.9	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	201	477	951	-	-	-
Stage 1	443	-	-	-	-	-
Stage 2	570	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	198	477	951	-	-	-
Mov Cap-2 Maneuver	198	-	-	-	-	-
Stage 1	437	-	-	-	-	-
Stage 2	570	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	951	-	448	-	-
HCM Lane V/C Ratio	0.011	-	0.268	-	-
HCM Control Delay (s)	8.8	0	16	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	1.1	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Holiday Build
Timing Plan: PM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	13	3	362	501	0
Future Volume (vph)	3	13	3	362	501	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1638	1696	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1638	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Confl. Peds. (#/hr)	3					
Peak Hour Factor	0.42	0.42	0.90	0.90	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	16%	12%	0%
Adj. Flow (vph)	7	31	3	402	634	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	31	3	402	634	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.4%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶	↷	↶	↶	↷	
Traffic Vol, veh/h	3	13	3	362	501	0
Future Vol, veh/h	3	13	3	362	501	0
Conflicting Peds, #/hr	3	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	42	42	90	90	79	79
Heavy Vehicles, %	0	0	0	16	12	0
Mvmt Flow	7	31	3	402	634	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1045	634	634	0	-	0
Stage 1	634	-	-	-	-	-
Stage 2	411	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	256	483	959	-	-	-
Stage 1	532	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	255	483	959	-	-	-
Mov Cap-2 Maneuver	255	-	-	-	-	-
Stage 1	530	-	-	-	-	-
Stage 2	674	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.2	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	959	-	255	483	-	-
HCM Lane V/C Ratio	0.003	-	0.028	0.064	-	-
HCM Control Delay (s)	8.8	-	19.5	13	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.2	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Holiday Build
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	45	51	25	141	45	64	20	100	245	67	335	101
Future Volume (vph)	45	51	25	141	45	64	20	100	245	67	335	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.972			0.966			0.909			0.973	
Fl _t Protected		0.982			0.973			0.997			0.993	
Satd. Flow (prot)	0	1800	0	0	1786	0	0	1676	0	0	1808	0
Fl _t Permitted		0.982			0.973			0.997			0.993	
Satd. Flow (perm)	0	1800	0	0	1786	0	0	1676	0	0	1808	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.86	0.86	0.86	0.76	0.76	0.76	0.63	0.63	0.63	0.71	0.71	0.71
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	10%	0%	0%	2%	1%
Adj. Flow (vph)	52	59	29	186	59	84	32	159	389	94	472	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	140	0	0	329	0	0	580	0	0	708	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	75.0%
ICU Level of Service	D
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	122.4
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	51	25	141	45	64	20	100	245	67	335	101
Future Vol, veh/h	45	51	25	141	45	64	20	100	245	67	335	101
Peak Hour Factor	0.86	0.86	0.86	0.76	0.76	0.76	0.63	0.63	0.63	0.71	0.71	0.71
Heavy Vehicles, %	2	0	0	0	0	0	0	10	0	0	2	1
Mvmt Flow	52	59	29	186	59	84	32	159	389	94	472	142
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	18.3	30.7	96.4	207
HCM LOS	C	D	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	37%	56%	13%
Vol Thru, %	27%	42%	18%	67%
Vol Right, %	67%	21%	26%	20%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	365	121	250	503
LT Vol	20	45	141	67
Through Vol	100	51	45	335
RT Vol	245	25	64	101
Lane Flow Rate	579	141	329	708
Geometry Grp	1	1	1	1
Degree of Util (X)	1.095	0.345	0.71	1.385
Departure Headway (Hd)	7.508	10.087	8.832	7.375
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	487	359	411	496
Service Time	5.508	8.087	6.832	5.375
HCM Lane V/C Ratio	1.189	0.393	0.8	1.427
HCM Control Delay	96.4	18.3	30.7	207
HCM Lane LOS	F	C	D	F
HCM 95th-tile Q	17.2	1.5	5.4	31.5

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Holiday Build
Timing Plan: PM



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	91	272	0	90	160	0
Future Volume (vph)	91	272	0	90	160	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr t	0.899					
Flt Protected					0.950	
Satd. Flow (prot)	1675	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1675	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	296	0	98	174	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	395	0	0	98	174	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.1% ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	3.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	91	272	0	90	160	0
Future Vol, veh/h	91	272	0	90	160	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	296	0	98	174	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	395	0	345
Stage 1	-	-	-	-	247
Stage 2	-	-	-	-	98
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1164	-	652
Stage 1	-	-	-	-	794
Stage 2	-	-	-	-	926
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1164	-	652
Mov Cap-2 Maneuver	-	-	-	-	652
Stage 1	-	-	-	-	794
Stage 2	-	-	-	-	926

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	652	-	-	-	1164	-
HCM Lane V/C Ratio	0.267	-	-	-	-	-
HCM Control Delay (s)	12.5	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1.1	-	-	-	0	-

Lanes, Volumes, Timings

Holiday Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen

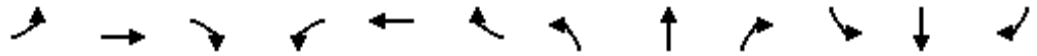


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	518	200	247	472	0	0	0	0	153	0	204
Future Volume (vph)	0	518	200	247	472	0	0	0	0	153	0	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.887	0.850
Fl _t Protected				0.950						0.950	0.988	
Satd. Flow (prot)	0	3008	1346	1583	3195	0	0	0	0	1499	1216	1288
Fl _t Permitted				0.950						0.950	0.988	
Satd. Flow (perm)	0	3008	1346	1583	3195	0	0	0	0	1499	1216	1288
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			213									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.94	0.94	0.94	0.74	0.74	0.74	0.88	0.88	0.88	0.89	0.89	0.89
Heavy Vehicles (%)	0%	20%	20%	14%	13%	0%	0%	0%	0%	22%	0%	31%
Adj. Flow (vph)	0	551	213	334	638	0	0	0	0	172	0	229
Shared Lane Traffic (%)										19%		44%
Lane Group Flow (vph)	0	551	213	334	638	0	0	0	0	139	134	128
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Holiday Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		25.6	25.6	20.4	51.5					14.0	14.0	14.0
Actuated g/C Ratio		0.34	0.34	0.27	0.69					0.19	0.19	0.19
v/c Ratio		0.54	0.35	0.77	0.29					0.50	0.59	0.54
Control Delay		22.7	4.9	33.6	1.5					32.6	38.0	35.0
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		22.7	4.9	33.6	1.5					32.6	38.0	35.0
LOS		C	A	C	A					C	D	C
Approach Delay		17.7			12.6						35.2	
Approach LOS		B			B						D	
Queue Length 50th (ft)		110	0	66	10					62	63	57
Queue Length 95th (ft)		158	44	#213	14					105	110	101
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1026	600	431	2195					389	316	334
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		0.54	0.35	0.77	0.29					0.36	0.42	0.38

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 18.7
 Intersection LOS: B
 Intersection Capacity Utilization 48.0%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Holiday Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗			
Traffic Volume (vph)	203	468	0	0	580	242	139	0	244	0	0	0
Future Volume (vph)	203	468	0	0	580	242	139	0	244	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1367	3223	0	0	3195	1312	1550	1453	1513	0	0	0
Fl _t Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1367	3223	0	0	3195	1312	1550	1453	1513	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						257						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.88	0.88	0.88	0.94	0.94	0.94	0.95	0.95	0.95	0.88	0.88	0.88
Heavy Vehicles (%)	32%	12%	0%	0%	13%	19%	18%	0%	21%	0%	0%	0%
Adj. Flow (vph)	231	532	0	0	617	257	146	0	257	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	231	532	0	0	617	257	73	73	257	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			12			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Holiday Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen

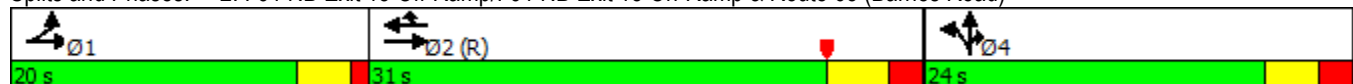


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None				C-Max	C-Max	None	None	None			
Act Effct Green (s)	15.6	49.5			28.5	28.5	16.5	16.5	16.5			
Actuated g/C Ratio	0.21	0.66			0.38	0.38	0.22	0.22	0.22			
v/c Ratio	0.82	0.25			0.51	0.39	0.21	0.23	0.77			
Control Delay	41.2	0.6			14.4	2.7	24.4	24.8	43.8			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	41.2	0.6			14.4	2.7	24.4	24.8	43.8			
LOS	D	A			B	A	C	C	D			
Approach Delay	12.9				11.0				36.8			
Approach LOS	B				B				D			
Queue Length 50th (ft)	43	2			76	6	28	28	110			
Queue Length 95th (ft)	#191	4			116	19	62	62	#202			
Internal Link Dist (ft)	833				684				603		409	
Turn Bay Length (ft)	830						480	180			180	
Base Capacity (vph)	298	2128			1213	657	392	368	383			
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	0.78	0.25			0.51	0.39	0.19	0.20	0.67			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 16.8 Intersection LOS: B
 Intersection Capacity Utilization 48.0% ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Holiday Build
 Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	304	400	8	0	477	92	15	1	0	106	0	330
Future Volume (vph)	304	400	8	0	477	92	15	1	0	106	0	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997				0.850						0.850
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1367	3211	0	1890	3265	1461	1685	1837	0	0	1736	1196
Flt Permitted	0.950						0.655				0.756	
Satd. Flow (perm)	1367	3211	0	1890	3265	1461	1162	1837	0	0	1381	1196
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				107						230
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		764			751			251			720	
Travel Time (s)		14.9			14.6			5.7			16.4	
Peak Hour Factor	0.81	0.81	0.81	0.86	0.86	0.86	0.38	0.38	0.38	0.81	0.81	0.81
Heavy Vehicles (%)	32%	12%	17%	0%	10%	10%	0%	0%	0%	4%	0%	35%
Adj. Flow (vph)	375	494	10	0	555	107	39	3	0	131	0	407
Shared Lane Traffic (%)												
Lane Group Flow (vph)	375	504	0	0	555	107	39	3	0	0	131	407
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	17.0			11.0			17.0	17.0		17.0	17.0	17.0
Total Split (%)	22.7%			14.7%			22.7%	22.7%		22.7%	22.7%	22.7%
Maximum Green (s)	11.6			5.7			12.1	12.1		12.1	12.1	11.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	30.0
Total Split (%)	40%
Maximum Green (s)	23.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Holiday Build
 Timing Plan: AM Pk Gen

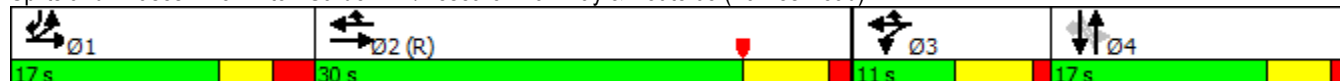


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	20.4	45.6			29.8	29.8	10.7	10.7			10.7	33.7
Actuated g/C Ratio	0.27	0.61			0.40	0.40	0.14	0.14			0.14	0.45
v/c Ratio	1.01	0.26			0.43	0.17	0.23	0.01			0.66	0.61
Control Delay	85.6	4.8			17.0	3.4	31.2	26.0			47.1	12.1
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	85.6	4.8			17.0	3.4	31.2	26.0			47.1	12.1
LOS	F	A			B	A	C	C			D	B
Approach Delay		39.3			14.8			30.8			20.6	
Approach LOS		D			B			C			C	
Queue Length 50th (ft)	~217	32			97	0	16	1			58	50
Queue Length 95th (ft)	#376	38			112	22	17	4			98	125
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570					250						
Base Capacity (vph)	372	2160			1275	635	192	304			228	663
Starvation Cap Reductn	0	0			0	0	0	0			0	0
Spillback Cap Reductn	0	0			0	0	0	0			0	0
Storage Cap Reductn	0	0			0	0	0	0			0	0
Reduced v/c Ratio	1.01	0.23			0.44	0.17	0.20	0.01			0.57	0.61

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 26.7 Intersection LOS: C
 Intersection Capacity Utilization 56.2% ICU Level of Service B
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build
Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	9	182	0	0	6	107	284	50	245	0
Future Volume (vph)	0	0	9	182	0	0	6	107	284	50	245	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850							0.850			
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1900	1417	0	1805	1900	0	1504	1496	1615	1805	1484	0
Flt Permitted				0.747			0.574			0.650		
Satd. Flow (perm)	1900	1417	0	1419	1900	0	909	1496	1615	1235	1484	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		518							451			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.58	0.58	0.58	0.88	0.88	0.88	0.63	0.63	0.63	0.80	0.80	0.80
Heavy Vehicles (%)	0%	0%	14%	0%	0%	0%	20%	27%	0%	0%	28%	0%
Adj. Flow (vph)	0	0	16	207	0	0	10	170	451	63	306	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	207	0	0	10	170	451	63	306	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	1.0	2.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build
 Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		11.7		11.7			20.3	20.3	20.3	24.9	20.3	
Actuated g/C Ratio		0.24		0.24			0.42	0.42	0.42	0.52	0.42	
v/c Ratio		0.02		0.60			0.03	0.27	0.48	0.09	0.49	
Control Delay		0.0		25.9			11.5	12.9	3.5	5.9	15.6	
Queue Delay		0.0		0.0			0.0	0.0	0.0	0.0	0.0	
Total Delay		0.0		25.9			11.5	12.9	3.5	5.9	15.6	
LOS		A		C			B	B	A	A	B	
Approach Delay					25.9			6.1				14.0
Approach LOS					C			A				B
Queue Length 50th (ft)		0		50			2	33	0	6	65	
Queue Length 95th (ft)		0		129			7	56	0	21	134	
Internal Link Dist (ft)		116			123			640			398	
Turn Bay Length (ft)				170			140			115		
Base Capacity (vph)		1207		1087			809	1333	1488	704	1322	
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		0.01		0.19			0.01	0.13	0.30	0.09	0.23	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 48.3
 Natural Cycle: 55
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 11.8
 Intersection LOS: B
 Intersection Capacity Utilization 39.7%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Josheph Carini Rd

Holiday Build
Timing Plan: AM Pk Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	11	11	96	284	0
Future Volume (vph)	0	11	11	96	284	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fl _t Protected	0.995					
Satd. Flow (prot)	1347	0	0	1470	1462	0
Fl _t Permitted	0.995					
Satd. Flow (perm)	1347	0	0	1470	1462	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.56	0.56	0.75	0.75	0.81	0.81
Heavy Vehicles (%)	0%	22%	0%	32%	30%	0%
Adj. Flow (vph)	0	20	15	128	351	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	0	0	143	351	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	11	11	96	284	0
Future Vol, veh/h	0	11	11	96	284	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	75	75	81	81
Heavy Vehicles, %	0	22	0	32	30	0
Mvmt Flow	0	20	15	128	351	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	509	351	351	0	-	0
Stage 1	351	-	-	-	-	-
Stage 2	158	-	-	-	-	-
Critical Hdwy	6.4	6.42	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.498	2.2	-	-	-
Pot Cap-1 Maneuver	528	650	1219	-	-	-
Stage 1	717	-	-	-	-	-
Stage 2	875	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	521	650	1219	-	-	-
Mov Cap-2 Maneuver	521	-	-	-	-	-
Stage 1	708	-	-	-	-	-
Stage 2	875	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1219	-	650	-	-
HCM Lane V/C Ratio	0.012	-	0.03	-	-
HCM Control Delay (s)	8	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Holiday Build
Timing Plan: AM Pk Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	3	0	96	281	1
Future Volume (vph)	0	3	0	96	281	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Fr _t		0.850				
Fl _t Protected						
Satd. Flow (prot)	1900	1077	1900	1439	1474	0
Fl _t Permitted						
Satd. Flow (perm)	1900	1077	1900	1439	1474	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Confl. Peds. (#/hr)	3					
Peak Hour Factor	0.50	0.50	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	50%	0%	32%	29%	0%
Adj. Flow (vph)	0	6	0	122	356	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	6	0	122	357	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	3	0	96	281	1
Future Vol, veh/h	0	3	0	96	281	1
Conflicting Peds, #/hr	3	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	79	79	79	79
Heavy Vehicles, %	0	50	0	32	29	0
Mvmt Flow	0	6	0	122	356	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	482	357	357	0	-	0
Stage 1	357	-	-	-	-	-
Stage 2	125	-	-	-	-	-
Critical Hdwy	6.4	6.7	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.75	2.2	-	-	-
Pot Cap-1 Maneuver	547	592	1213	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	906	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	547	592	1213	-	-	-
Mov Cap-2 Maneuver	547	-	-	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	906	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1213	-	-	592	-	-
HCM Lane V/C Ratio	-	-	-	0.01	-	-
HCM Control Delay (s)	0	-	0	11.1	-	-
HCM Lane LOS	A	-	A	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Holiday Build
Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	25	23	5	143	14	63	4	83	9	14	134	25
Future Volume (vph)	25	23	5	143	14	63	4	83	9	14	134	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.987			0.961			0.988			0.981	
Fl _t Protected		0.977			0.969			0.998			0.996	
Satd. Flow (prot)	0	1477	0	0	1552	0	0	1441	0	0	1454	0
Fl _t Permitted		0.977			0.969			0.998			0.996	
Satd. Flow (perm)	0	1477	0	0	1552	0	0	1441	0	0	1454	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.63	0.63	0.63	0.45	0.45	0.45	0.79	0.79	0.79	0.65	0.65	0.65
Heavy Vehicles (%)	31%	11%	50%	14%	0%	17%	33%	33%	0%	0%	33%	15%
Adj. Flow (vph)	40	37	8	318	31	140	5	105	11	22	206	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	85	0	0	489	0	0	121	0	0	266	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	38.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	17.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	23	5	143	14	63	4	83	9	14	134	25
Future Vol, veh/h	25	23	5	143	14	63	4	83	9	14	134	25
Peak Hour Factor	0.63	0.63	0.63	0.45	0.45	0.45	0.79	0.79	0.79	0.65	0.65	0.65
Heavy Vehicles, %	31	11	50	14	0	17	33	33	0	0	33	15
Mvmt Flow	40	37	8	318	31	140	5	105	11	22	206	38
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.7	22.3	11.5	13
HCM LOS	B	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	47%	65%	8%
Vol Thru, %	86%	43%	6%	77%
Vol Right, %	9%	9%	29%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	96	53	220	173
LT Vol	4	25	143	14
Through Vol	83	23	14	134
RT Vol	9	5	63	25
Lane Flow Rate	122	84	489	266
Geometry Grp	1	1	1	1
Degree of Util (X)	0.222	0.152	0.738	0.424
Departure Headway (Hd)	6.582	6.494	5.436	5.731
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	543	549	665	625
Service Time	4.654	4.567	3.483	3.79
HCM Lane V/C Ratio	0.225	0.153	0.735	0.426
HCM Control Delay	11.5	10.7	22.3	13
HCM Lane LOS	B	B	C	B
HCM 95th-tile Q	0.8	0.5	6.5	2.1

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Holiday Build
Timing Plan: AM Pk Gen



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	46	0	0	40	180	0
Future Volume (vph)	46	0	0	40	180	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	0	43	196	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	43	196	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.0%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	6.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	46	0	0	40	180	0
Future Vol, veh/h	46	0	0	40	180	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	0	0	43	196	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	50	0	93
Stage 1	-	-	-	-	50
Stage 2	-	-	-	-	43
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1557	-	907
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	979
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1557	-	907
Mov Cap-2 Maneuver	-	-	-	-	907
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	979

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	907	-	-	-	1557	-
HCM Lane V/C Ratio	0.216	-	-	-	-	-
HCM Control Delay (s)	10.1	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	-	0	-

Lanes, Volumes, Timings

Holiday Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	427	132	250	420	0	0	0	0	148	0	93
Future Volume (vph)	0	427	132	250	420	0	0	0	0	148	0	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.968	0.850
Fl _t Protected				0.950						0.950	0.962	
Satd. Flow (prot)	0	3574	1553	1719	3505	0	0	0	0	1726	1560	1548
Fl _t Permitted				0.950						0.950	0.962	
Satd. Flow (perm)	0	3574	1553	1719	3505	0	0	0	0	1726	1560	1548
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			159									
Link Speed (mph)		45			30			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			20.8			8.5			11.3	
Peak Hour Factor	0.83	0.83	0.83	0.59	0.59	0.59	0.88	0.88	0.88	0.86	0.86	0.86
Heavy Vehicles (%)	0%	1%	4%	5%	3%	0%	0%	0%	0%	6%	0%	9%
Adj. Flow (vph)	0	514	159	424	712	0	0	0	0	172	0	108
Shared Lane Traffic (%)										44%		19%
Lane Group Flow (vph)	0	514	159	424	712	0	0	0	0	96	97	87
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Holiday Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		25.7	25.7	26.3	58.3					10.9	10.9	10.9
Actuated g/C Ratio		0.34	0.34	0.35	0.78					0.15	0.15	0.15
v/c Ratio		0.42	0.25	0.71	0.26					0.38	0.43	0.39
Control Delay		20.7	4.6	26.8	1.3					32.9	34.6	33.5
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		20.7	4.6	26.8	1.3					32.9	34.6	33.5
LOS		C	A	C	A					C	C	C
Approach Delay		16.9			10.8						33.6	
Approach LOS		B			B						C	
Queue Length 50th (ft)		97	0	100	13					44	46	40
Queue Length 95th (ft)		127	30	108	14					78	83	73
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1225	637	601	2723					448	405	402
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		0.42	0.25	0.71	0.26					0.21	0.24	0.22

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 15.8
 Intersection LOS: B
 Intersection Capacity Utilization 46.4%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Holiday Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↶↶			↶↶	↶	↶	↶	↶			
Traffic Volume (vph)	80	495	0	0	506	161	164	0	255	0	0	0
Future Volume (vph)	80	495	0	0	506	161	164	0	255	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Fr _t						0.850			0.850			
Fl _t Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1719	3574	0	0	3539	1406	1678	1573	1743	0	0	0
Fl _t Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1719	3574	0	0	3539	1406	1678	1573	1743	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						199						
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			13.0			15.5			11.1	
Peak Hour Factor	0.85	0.85	0.85	0.81	0.81	0.81	0.84	0.84	0.84	0.88	0.88	0.88
Heavy Vehicles (%)	5%	1%	0%	0%	2%	11%	9%	0%	5%	0%	0%	0%
Adj. Flow (vph)	94	582	0	0	625	199	195	0	304	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	94	582	0	0	625	199	97	98	304	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			12			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Holiday Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	12.0	49.1			31.6	31.6	16.9	16.9	16.9			
Actuated g/C Ratio	0.16	0.65			0.42	0.42	0.23	0.23	0.23			
v/c Ratio	0.34	0.25			0.42	0.28	0.26	0.28	0.77			
Control Delay	20.9	0.3			11.4	1.8	24.8	25.3	41.3			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	20.9	0.3			11.4	1.8	24.8	25.3	41.3			
LOS	C	A			B	A	C	C	D			
Approach Delay		3.1			9.1			34.9				
Approach LOS		A			A			C				
Queue Length 50th (ft)	19	0			56	0	37	37	128			
Queue Length 95th (ft)	31	0			94	7	71	72	194			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	366	2320			1490	707	425	398	441			
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	0.26	0.25			0.42	0.28	0.23	0.25	0.69			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 13.5
 Intersection LOS: B
 Intersection Capacity Utilization 46.4%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Holiday Build
 Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	281	454	15	3	373	90	8	1	8	84	1	286
Future Volume (vph)	281	454	15	3	373	90	8	1	8	84	1	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			0			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850		0.862				0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	1597	3557	0	1796	3522	1607	1685	1583	0	0	1742	1196
Flt Permitted	0.950			0.950			0.693				0.720	
Satd. Flow (perm)	1597	3557	0	1796	3522	1607	1229	1583	0	0	1316	1196
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				113		11				297
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.78	0.78	0.78	0.80	0.80	0.80	0.75	0.75	0.75	0.86	0.86	0.86
Heavy Vehicles (%)	13%	1%	0%	0%	2%	0%	0%	0%	0%	4%	0%	35%
Adj. Flow (vph)	360	582	19	4	466	113	11	1	11	98	1	333
Shared Lane Traffic (%)												
Lane Group Flow (vph)	360	601	0	4	466	113	11	12	0	0	99	333
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	17.0			11.0			17.0	17.0		17.0	17.0	17.0
Total Split (%)	22.7%			14.7%			22.7%	22.7%		22.7%	22.7%	22.7%
Maximum Green (s)	11.6			5.7			12.1	12.1		12.1	12.1	11.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	30.0
Total Split (%)	40%
Maximum Green (s)	23.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Holiday Build
 Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0		1.5			2.0		2.0		2.0		2.0
Recall Mode	None			None			None		None		None	None
Act Effct Green (s)	22.8	46.8	5.2		28.4	28.4	9.8	9.8			9.8	35.1
Actuated g/C Ratio	0.30	0.62	0.07		0.38	0.38	0.13	0.13			0.13	0.47
v/c Ratio	0.74	0.27	0.03		0.35	0.17	0.07	0.06			0.58	0.46
Control Delay	41.9	4.4	33.0		16.9	3.4	28.1	16.3			43.9	5.4
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	41.9	4.4	33.0		16.9	3.4	28.1	16.3			43.9	5.4
LOS	D	A	C		B	A	C	B			D	A
Approach Delay	18.5			14.4			22.0				14.2	
Approach LOS	B			B			C				B	
Queue Length 50th (ft)	128	39	2		82	0	5	0			44	8
Queue Length 95th (ft)	#323	44	10		84	18	15	11			84	57
Internal Link Dist (ft)	684			671			171				640	
Turn Bay Length (ft)	570		100			250						
Base Capacity (vph)	484	2504	136		1344	683	198	264			212	717
Starvation Cap Reductn	0	0	0		0	0	0	0			0	0
Spillback Cap Reductn	0	0	0		0	0	0	0			0	0
Storage Cap Reductn	0	0	0		0	0	0	0			0	0
Reduced v/c Ratio	0.74	0.24	0.03		0.35	0.17	0.06	0.05			0.47	0.46

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 16.4 Intersection LOS: B
 Intersection Capacity Utilization 53.1% ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build
Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	1	166	0	0	0	104	268	47	204	0
Future Volume (vph)	0	0	1	166	0	0	0	104	268	47	204	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850							0.850			
Flt Protected				0.950						0.950		
Satd. Flow (prot)	1900	1615	0	1805	1900	0	1900	1743	1615	1805	1743	0
Flt Permitted				0.755						0.682		
Satd. Flow (perm)	1900	1615	0	1434	1900	0	1900	1743	1615	1296	1743	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		591							298			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.25	0.25	0.25	0.88	0.88	0.88	0.90	0.90	0.90	0.82	0.82	0.82
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	9%	0%
Adj. Flow (vph)	0	0	4	189	0	0	0	116	298	57	249	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	189	0	0	0	116	298	57	249	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build
 Timing Plan: PM Peak Gen

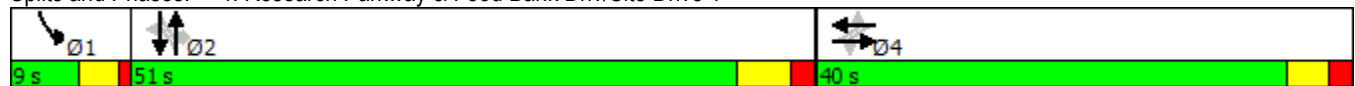


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	
Act Effct Green (s)		12.0		12.0				19.1	19.1	23.9	19.1	
Actuated g/C Ratio		0.25		0.25				0.40	0.40	0.51	0.40	
v/c Ratio		0.00		0.52				0.17	0.36	0.08	0.35	
Control Delay		0.0		21.6				12.5	3.4	6.0	13.9	
Queue Delay		0.0		0.0				0.0	0.0	0.0	0.0	
Total Delay		0.0		21.6				12.5	3.4	6.0	13.9	
LOS		A		C				B	A	A	B	
Approach Delay					21.6			6.0				12.5
Approach LOS					C			A				B
Queue Length 50th (ft)		0		44				22	0	6	51	
Queue Length 95th (ft)		0		105				58	41	20	104	
Internal Link Dist (ft)		116			123			640			398	
Turn Bay Length (ft)				170						115		
Base Capacity (vph)		1371		1093				1604	1510	709	1604	
Starvation Cap Reductn		0		0				0	0	0	0	
Spillback Cap Reductn		0		0				0	0	0	0	
Storage Cap Reductn		0		0				0	0	0	0	
Reduced v/c Ratio		0.00		0.17				0.07	0.20	0.08	0.16	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	47.3
Natural Cycle:	45
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.52
Intersection Signal Delay:	11.4
Intersection LOS:	B
Intersection Capacity Utilization:	38.7%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Josheph Carini Rd

Holiday Build
Timing Plan: PM Peak Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	1	103	250	0
Future Volume (vph)	0	1	1	103	250	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fl _t Protected						
Satd. Flow (prot)	1644	0	0	1744	1743	0
Fl _t Permitted						
Satd. Flow (perm)	1644	0	0	1744	1743	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.25	0.25	0.83	0.83	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	9%	9%	0%
Adj. Flow (vph)	0	4	1	124	294	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	0	125	294	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.2%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	0	1	1	103	250	0
Future Vol, veh/h	0	1	1	103	250	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	83	83	85	85
Heavy Vehicles, %	0	0	0	9	9	0
Mvmt Flow	0	4	1	124	294	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	420	294	294	0	0
Stage 1	294	-	-	-	-
Stage 2	126	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	594	750	1279	-	-
Stage 1	761	-	-	-	-
Stage 2	905	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	593	750	1279	-	-
Mov Cap-2 Maneuver	593	-	-	-	-
Stage 1	760	-	-	-	-
Stage 2	905	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.8	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1279	-	750	-	-
HCM Lane V/C Ratio	0.001	-	0.005	-	-
HCM Control Delay (s)	7.8	0	9.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Holiday Build
Timing Plan: PM Peak Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	0	103	249	0
Future Volume (vph)	0	1	0	103	249	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	1900	1615	1900	1743	1696	0
Flt Permitted						
Satd. Flow (perm)	1900	1615	1900	1743	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.25	0.25	0.81	0.81	0.77	0.77
Heavy Vehicles (%)	0%	0%	0%	9%	12%	0%
Adj. Flow (vph)	0	4	0	127	323	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	0	127	323	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	23.1%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	1	0	103	249	0
Future Vol, veh/h	0	1	0	103	249	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	81	81	77	77
Heavy Vehicles, %	0	0	0	9	12	0
Mvmt Flow	0	4	0	127	323	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	450	323	323	0	-	0
Stage 1	323	-	-	-	-	-
Stage 2	127	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	571	723	1248	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	904	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	571	723	1248	-	-	-
Mov Cap-2 Maneuver	571	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	904	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1248	-	-	723	-	-
HCM Lane V/C Ratio	-	-	-	0.006	-	-
HCM Control Delay (s)	0	-	0	10	-	-
HCM Lane LOS	A	-	A	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Holiday Build
Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	23	19	3	115	15	56	7	82	14	11	131	22
Future Volume (vph)	23	19	3	115	15	56	7	82	14	11	131	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.959			0.982			0.982	
Flt Protected		0.975			0.970			0.997			0.997	
Satd. Flow (prot)	0	1834	0	0	1767	0	0	1710	0	0	1685	0
Flt Permitted		0.975			0.970			0.997			0.997	
Satd. Flow (perm)	0	1834	0	0	1767	0	0	1710	0	0	1685	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.64	0.64	0.64	0.66	0.66	0.66	0.72	0.72	0.72	0.67	0.67	0.67
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	12%	6%
Adj. Flow (vph)	36	30	5	174	23	85	10	114	19	16	196	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	71	0	0	282	0	0	143	0	0	245	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	19	3	115	15	56	7	82	14	11	131	22
Future Vol, veh/h	23	19	3	115	15	56	7	82	14	11	131	22
Peak Hour Factor	0.64	0.64	0.64	0.66	0.66	0.66	0.72	0.72	0.72	0.67	0.67	0.67
Heavy Vehicles, %	0	0	0	0	0	0	0	11	0	0	12	6
Mvmt Flow	36	30	5	174	23	85	10	114	19	16	196	33
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9	11	9.4	10.4
HCM LOS	A	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	51%	62%	7%
Vol Thru, %	80%	42%	8%	80%
Vol Right, %	14%	7%	30%	13%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	103	45	186	164
LT Vol	7	23	115	11
Through Vol	82	19	15	131
RT Vol	14	3	56	22
Lane Flow Rate	143	70	282	245
Geometry Grp	1	1	1	1
Degree of Util (X)	0.2	0.105	0.382	0.333
Departure Headway (Hd)	5.023	5.393	4.878	4.891
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	705	669	730	727
Service Time	3.119	3.393	2.96	2.976
HCM Lane V/C Ratio	0.203	0.105	0.386	0.337
HCM Control Delay	9.4	9	11	10.4
HCM Lane LOS	A	A	B	B
HCM 95th-tile Q	0.7	0.4	1.8	1.5

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Holiday Build
Timing Plan: PM Peak Gen



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	44	0	0	26	160	0
Future Volume (vph)	44	0	0	26	160	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	0	0	28	174	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	0	0	28	174	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.9%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	6.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	44	0	0	26	160	0
Future Vol, veh/h	44	0	0	26	160	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	0	0	28	174	0

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	48	0	76	48
Stage 1	-	-	-	-	48	-
Stage 2	-	-	-	-	28	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1559	-	927	1021
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	995	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1559	-	927	1021
Mov Cap-2 Maneuver	-	-	-	-	927	-
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	995	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	927	-	-	-	1559	-
HCM Lane V/C Ratio	0.188	-	-	-	-	-
HCM Control Delay (s)	9.8	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	-	0	-

Lanes, Volumes, Timings

Holiday Build with Improvement

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	596	227	381	950	0	0	0	0	191	0	409
Future Volume (vph)	0	596	227	381	950	0	0	0	0	191	0	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.863	0.850
Fl _t Protected				0.950						0.950	0.996	
Satd. Flow (prot)	0	3008	1455	1597	2756	0	0	0	0	1678	1320	1442
Fl _t Permitted				0.950						0.950	0.996	
Satd. Flow (perm)	0	3008	1455	1597	2756	0	0	0	0	1678	1320	1442
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			241									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.88	0.88	0.88	0.82	0.82	0.82
Heavy Vehicles (%)	0%	20%	11%	13%	31%	0%	0%	0%	0%	9%	0%	17%
Adj. Flow (vph)	0	634	241	414	1033	0	0	0	0	233	0	499
Shared Lane Traffic (%)										10%		48%
Lane Group Flow (vph)	0	634	241	414	1033	0	0	0	0	210	263	259
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Prot	Prot	NA					Split	NA	Prot
Protected Phases		2	2	1	1 2					4	4	4
Permitted Phases												
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		23.0	23.0	26.0						31.0	31.0	31.0
Total Split (%)		28.8%	28.8%	32.5%						38.8%	38.8%	38.8%
Maximum Green (s)		17.5	17.5	22.0						25.5	25.5	25.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Holiday Build with Improvement

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		19.5	19.5	24.5	49.5					21.0	21.0	21.0
Actuated g/C Ratio		0.24	0.24	0.31	0.62					0.26	0.26	0.26
v/c Ratio		0.86	0.45	0.85	0.61					0.48	0.76	0.69
Control Delay		44.7	6.9	32.1	5.2					27.6	41.1	35.5
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		44.7	6.9	32.1	5.2					27.6	41.1	35.5
LOS		D	A	C	A					C	D	D
Approach Delay		34.3			12.9						35.3	
Approach LOS		C			B						D	
Queue Length 50th (ft)		165	0	156	35					90	128	118
Queue Length 95th (ft)		#273	56	m#274	m184					131	184	168
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		734	537	488	1705					534	420	459
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		0.86	0.45	0.85	0.61					0.39	0.63	0.56

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 78 (98%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 24.4
 Intersection LOS: C
 Intersection Capacity Utilization 62.6%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Holiday Build with Improvement

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↔	↗			
Traffic Volume (vph)	192	595	0	0	988	295	343	5	291	0	0	0
Future Volume (vph)	192	595	0	0	988	295	343	5	291	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Fr _t						0.850		0.940	0.850			
Fl _t Protected	0.950						0.950	0.972				
Satd. Flow (prot)	1656	3008	0	0	2735	1394	1604	1390	1525	0	0	0
Fl _t Permitted	0.950						0.950	0.972				
Satd. Flow (perm)	1656	3008	0	0	2735	1394	1604	1390	1525	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						304						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.93	0.93	0.93	0.97	0.97	0.97	0.86	0.86	0.86	0.88	0.88	0.88
Heavy Vehicles (%)	9%	20%	0%	0%	32%	12%	14%	0%	14%	0%	0%	0%
Adj. Flow (vph)	206	640	0	0	1019	304	399	6	338	0	0	0
Shared Lane Traffic (%)							36%		30%			
Lane Group Flow (vph)	206	640	0	0	1019	304	255	251	237	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	25.0				29.0	29.0	26.0	26.0	26.0			
Total Split (%)	31.3%				36.3%	36.3%	32.5%	32.5%	32.5%			
Maximum Green (s)	21.0				23.5	23.5	21.0	21.0	21.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Holiday Build with Improvement

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	16.7	52.5			30.3	30.3	18.5	18.5	18.5			
Actuated g/C Ratio	0.21	0.66			0.38	0.38	0.23	0.23	0.23			
v/c Ratio	0.60	0.32			0.98	0.42	0.69	0.78	0.67			
Control Delay	45.5	1.0			48.2	10.5	37.7	46.1	37.5			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	45.5	1.0			48.2	10.5	37.7	46.1	37.5			
LOS	D	A			D	B	D	D	D			
Approach Delay		11.9			39.5			40.5				
Approach LOS		B			D			D				
Queue Length 50th (ft)	90	5			~298	41	117	124	108			
Queue Length 95th (ft)	m96	m10			m#333	m46	187	#202	175			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	434	1938			1036	716	421	364	400			
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	0.47	0.33			0.98	0.42	0.61	0.69	0.59			

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 34 (43%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 31.7
 Intersection LOS: C
 Intersection Capacity Utilization 62.6%
 ICU Level of Service B
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Holiday Build with Improvement

3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	341	520	25	10	980	145	35	25	10	78	5	268
Future Volume (vph)	341	520	25	10	980	145	35	25	10	78	5	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.957				0.850
Flt Protected	0.950			0.950			0.950				0.955	
Satd. Flow (prot)	3045	1547	0	1796	2477	1516	1668	1753	0	0	1781	1509
Flt Permitted	0.950			0.950			0.691				0.689	
Satd. Flow (perm)	3045	1547	0	1796	2477	1516	1213	1753	0	0	1285	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				163		20				115
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.51	0.51	0.51	0.81	0.81	0.81
Heavy Vehicles (%)	15%	23%	1%	0%	45%	6%	1%	0%	1%	2%	0%	7%
Adj. Flow (vph)	371	565	27	11	1101	163	69	49	20	96	6	331
Shared Lane Traffic (%)												
Lane Group Flow (vph)	371	592	0	11	1101	163	69	69	0	0	102	331
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pt+ov
Protected Phases	7	7 8		3	3 8	3 8		4			4	4 7
Permitted Phases							4			4		
Detector Phase	7	7 8		3	3 8	3 8	4	4		4	4	4 7
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	
Total Split (s)	26.0			11.0			19.0	19.0		19.0	19.0	
Total Split (%)	32.5%			13.8%			23.8%	23.8%		23.8%	23.8%	
Maximum Green (s)	20.6			5.7			14.1	14.1		14.1	14.1	
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	
Lost Time Adjust (s)	0.0			0.0			0.0	0.0			0.0	
Total Lost Time (s)	5.4			5.3			4.9	4.9			4.9	
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	
Lead-Lag Optimize?												

Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	24.0
Total Split (%)	30%
Maximum Green (s)	17.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings

Holiday Build with Improvement

3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0		1.5			2.0		2.0		2.0		2.0
Recall Mode	None			None			None		None		None	None
Act Effct Green (s)	20.0	47.3	5.7		33.0	33.0	11.4	11.4			11.4	36.8
Actuated g/C Ratio	0.25	0.59	0.07		0.41	0.41	0.14	0.14			0.14	0.46
v/c Ratio	0.49	0.65	0.09		1.08	0.23	0.40	0.26			0.56	0.44
Control Delay	29.5	14.0	36.4		78.3	4.0	37.4	24.9			43.4	10.4
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	29.5	14.0	36.4		78.3	4.0	37.4	24.9			43.4	10.4
LOS	C	B	D		E	A	D	C			D	B
Approach Delay	20.0			68.4			31.1				18.2	
Approach LOS	C			E			C				B	
Queue Length 50th (ft)	93	73	5		~356	0	32	22			48	60
Queue Length 95th (ft)	133	129	21		#470	36	37	27			83	98
Internal Link Dist (ft)	684			671			171				640	
Turn Bay Length (ft)	570		100			250						
Base Capacity (vph)	807	917	127		1022	721	213	325			226	765
Starvation Cap Reductn	0	0	0		0	0	0	0			0	0
Spillback Cap Reductn	0	0	0		0	0	0	0			0	0
Storage Cap Reductn	0	0	0		0	0	0	0			0	0
Reduced v/c Ratio	0.46	0.65	0.09		1.08	0.23	0.32	0.21			0.45	0.43

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 27 (34%), Referenced to phase 8:EBWB, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.08
 Intersection Signal Delay: 42.2 Intersection LOS: D
 Intersection Capacity Utilization 62.1% ICU Level of Service B
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

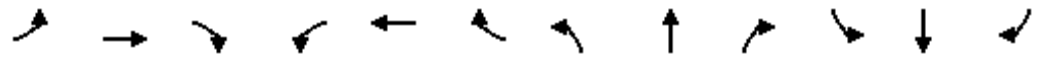


Lane Group	Ø8
Vehicle Extension (s)	5.0
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build with Improvement

Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	5	122	0	0	35	394	82	15	224	0
Future Volume (vph)	0	0	5	122	0	0	35	394	82	15	224	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850							0.850			
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1900	1615	0	1805	1900	0	1805	1845	1615	1626	1727	0
Flt Permitted				0.750			0.573			0.353		
Satd. Flow (perm)	1900	1615	0	1425	1900	0	1089	1845	1615	604	1727	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		517							122			
Link Speed (mph)		30			30			30				30
Link Distance (ft)		196			203			720				478
Travel Time (s)		4.5			4.6			16.4				10.9
Peak Hour Factor	0.42	0.42	0.42	0.88	0.88	0.88	0.67	0.67	0.67	0.73	0.73	0.73
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	11%	10%	0%
Adj. Flow (vph)	0	0	12	139	0	0	52	588	122	21	307	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	139	0	0	52	588	122	21	307	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12				12
Link Offset(ft)		0			12			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt		NA
Protected Phases		4			4			2			1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	1.0	2.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build with Improvement
 Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		10.2		10.2			29.1	29.1	29.1	30.2	29.1	
Actuated g/C Ratio		0.21		0.21			0.61	0.61	0.61	0.64	0.61	
v/c Ratio		0.02		0.46			0.08	0.52	0.12	0.04	0.29	
Control Delay		0.0		24.6			7.4	10.5	2.2	4.6	8.2	
Queue Delay		0.0		0.0			0.0	0.0	0.0	0.0	0.0	
Total Delay		0.0		24.6			7.4	10.5	2.2	4.6	8.2	
LOS		A		C			A	B	A	A	A	
Approach Delay					24.6			9.0				7.9
Approach LOS					C			A				A
Queue Length 50th (ft)		0		26			5	81	0	2	35	
Queue Length 95th (ft)		0		106			20	175	9	7	98	
Internal Link Dist (ft)		116			123			640				398
Turn Bay Length (ft)				170			140			115		
Base Capacity (vph)		1396		1141			970	1643	1451	501	1538	
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		0.01		0.12			0.05	0.36	0.08	0.04	0.20	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 47.5
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 10.4
 Intersection LOS: B
 Intersection Capacity Utilization 51.7%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Joseph Carini Rd

Holiday Build with Improvement
Timing Plan: AM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	6	58	336	233	6
Future Volume (vph)	0	6	58	336	233	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865			0.996		
Fl _t Protected				0.993		
Satd. Flow (prot)	1096	0	0	1705	1596	0
Fl _t Permitted				0.993		
Satd. Flow (perm)	1096	0	0	1705	1596	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.50	0.50	0.90	0.90	0.63	0.63
Heavy Vehicles (%)	0%	50%	3%	12%	19%	2%
Adj. Flow (vph)	0	12	64	373	370	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	437	380	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.9%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	0	6	58	336	233	6
Future Vol, veh/h	0	6	58	336	233	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	90	90	63	63
Heavy Vehicles, %	0	50	3	12	19	2
Mvmt Flow	0	12	64	373	370	10

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	876	375	380	0	0
Stage 1	375	-	-	-	-
Stage 2	501	-	-	-	-
Critical Hdwy	6.4	6.7	4.13	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.75	2.227	-	-
Pot Cap-1 Maneuver	322	577	1173	-	-
Stage 1	699	-	-	-	-
Stage 2	613	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	300	577	1173	-	-
Mov Cap-2 Maneuver	300	-	-	-	-
Stage 1	651	-	-	-	-
Stage 2	613	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1173	-	577	-	-
HCM Lane V/C Ratio	0.055	-	0.021	-	-
HCM Control Delay (s)	8.2	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	-	-

Lanes, Volumes, Timings
6: Research Parkway

Holiday Build with Improvement
Timing Plan: AM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	6	330	239	2
Future Volume (vph)	0	0	6	330	239	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.999	
Flt Protected			0.950			
Satd. Flow (prot)	1900	1900	1805	1667	1624	0
Flt Permitted			0.950			
Satd. Flow (perm)	1900	1900	1805	1667	1624	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.25	0.25	0.89	0.89	0.81	0.81
Heavy Vehicles (%)	0%	0%	0%	14%	17%	0%
Adj. Flow (vph)	0	0	7	371	295	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	7	371	297	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	20.7%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	6	330	239	2
Future Vol, veh/h	0	0	6	330	239	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	89	89	81	81
Heavy Vehicles, %	0	0	0	14	17	0
Mvmt Flow	0	0	7	371	295	2

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	681	296	297	0	0
Stage 1	296	-	-	-	-
Stage 2	385	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	419	748	1276	-	-
Stage 1	759	-	-	-	-
Stage 2	692	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	417	748	1276	-	-
Mov Cap-2 Maneuver	417	-	-	-	-
Stage 1	755	-	-	-	-
Stage 2	692	-	-	-	-

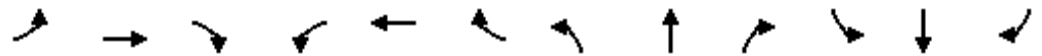
Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1276	-	-	-	-	-
HCM Lane V/C Ratio	0.005	-	-	-	-	-
HCM Control Delay (s)	7.8	-	0	0	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Holiday Build with Improvement

Timing Plan: AM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	101	61	25	123	66	57	15	275	40	25	93	45
Future Volume (vph)	101	61	25	123	66	57	15	275	40	25	93	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.982			0.969			0.984			0.963	
Fl _t Protected		0.974			0.976			0.998			0.992	
Satd. Flow (prot)	0	1749	0	0	1716	0	0	1803	0	0	1742	0
Fl _t Permitted		0.974			0.976			0.998			0.992	
Satd. Flow (perm)	0	1749	0	0	1716	0	0	1803	0	0	1742	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.62	0.62	0.62	0.71	0.71	0.71	0.69	0.69	0.69	0.76	0.76	0.76
Heavy Vehicles (%)	0%	5%	17%	6%	2%	5%	8%	3%	5%	9%	4%	2%
Adj. Flow (vph)	163	98	40	173	93	80	22	399	58	33	122	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	301	0	0	346	0	0	479	0	0	214	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	37.1
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	101	61	25	123	66	57	15	275	40	25	93	45
Future Vol, veh/h	101	61	25	123	66	57	15	275	40	25	93	45
Peak Hour Factor	0.62	0.62	0.62	0.71	0.71	0.71	0.69	0.69	0.69	0.76	0.76	0.76
Heavy Vehicles, %	0	5	17	6	2	5	8	3	5	9	4	2
Mvmt Flow	163	98	40	173	93	80	22	399	58	33	122	59
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	24.3	29.5	59	18.4
HCM LOS	C	D	F	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	54%	50%	15%
Vol Thru, %	83%	33%	27%	57%
Vol Right, %	12%	13%	23%	28%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	330	187	246	163
LT Vol	15	101	123	25
Through Vol	275	61	66	93
RT Vol	40	25	57	45
Lane Flow Rate	478	302	346	214
Geometry Grp	1	1	1	1
Degree of Util (X)	0.964	0.651	0.739	0.48
Departure Headway (Hd)	7.255	7.773	7.681	8.059
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	502	464	471	446
Service Time	5.279	5.848	5.717	6.142
HCM Lane V/C Ratio	0.952	0.651	0.735	0.48
HCM Control Delay	59	24.3	29.5	18.4
HCM Lane LOS	F	C	D	C
HCM 95th-tile Q	12.3	4.6	6.1	2.5

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Holiday Build with Improvement
Timing Plan: AM



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	126	0	0	126	120	0
Future Volume (vph)	126	0	0	126	120	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	0	0	137	130	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	137	0	0	137	130	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.9%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	3.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	126	0	0	126	120	0
Future Vol, veh/h	126	0	0	126	120	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	137	0	0	137	130	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	137	0	274
Stage 1	-	-	-	-	137
Stage 2	-	-	-	-	137
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1447	-	716
Stage 1	-	-	-	-	890
Stage 2	-	-	-	-	890
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1447	-	716
Mov Cap-2 Maneuver	-	-	-	-	716
Stage 1	-	-	-	-	890
Stage 2	-	-	-	-	890

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	716	-	-	-	1447	-
HCM Lane V/C Ratio	0.182	-	-	-	-	-
HCM Control Delay (s)	11.1	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	-	0	-

Lanes, Volumes, Timings

Holiday Build with Improvement

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: MD

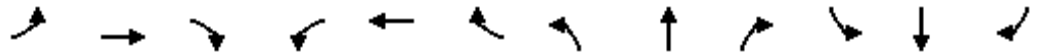


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘	↕	↗
Traffic Volume (vph)	0	511	172	215	579	0	0	0	0	131	1	172
Future Volume (vph)	0	511	172	215	579	0	0	0	0	131	1	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.890	0.850
Fl _t Protected				0.950						0.950	0.987	
Satd. Flow (prot)	0	3223	1455	1467	3343	0	0	0	0	1577	1237	1288
Fl _t Permitted				0.950						0.950	0.987	
Satd. Flow (perm)	0	3223	1455	1467	3343	0	0	0	0	1577	1237	1288
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			198									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.87	0.87	0.87	0.91	0.91	0.91	0.88	0.88	0.88	0.90	0.90	0.90
Heavy Vehicles (%)	0%	12%	11%	23%	8%	0%	0%	0%	0%	16%	0%	31%
Adj. Flow (vph)	0	587	198	236	636	0	0	0	0	146	1	191
Shared Lane Traffic (%)										20%		43%
Lane Group Flow (vph)	0	587	198	236	636	0	0	0	0	117	112	109
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Holiday Build with Improvement

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		29.8	29.8	17.5	52.8					12.7	12.7	12.7
Actuated g/C Ratio		0.40	0.40	0.23	0.70					0.17	0.17	0.17
v/c Ratio		0.46	0.28	0.69	0.27					0.44	0.54	0.50
Control Delay		19.5	4.3	30.4	0.8					32.2	37.2	35.4
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		19.5	4.3	30.4	0.8					32.2	37.2	35.4
LOS		B	A	C	A					C	D	D
Approach Delay		15.7			8.8						34.9	
Approach LOS		B			A						C	
Queue Length 50th (ft)		108	0	39	0					52	53	49
Queue Length 95th (ft)		159	38	#185	1					92	97	90
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1280	697	357	2352					410	321	334
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		0.46	0.28	0.66	0.27					0.29	0.35	0.33

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 15.9
 Intersection LOS: B
 Intersection Capacity Utilization 46.5%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Holiday Build with Improvement

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↔	↗			
Traffic Volume (vph)	169	473	0	0	636	200	158	0	127	0	0	0
Future Volume (vph)	169	473	0	0	636	200	158	0	127	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Fr _t						0.850		0.943	0.850			
Fl _t Protected	0.950						0.950	0.970				
Satd. Flow (prot)	1433	3343	0	0	3282	1269	1604	1369	1474	0	0	0
Fl _t Permitted	0.950						0.950	0.970				
Satd. Flow (perm)	1433	3343	0	0	3282	1269	1604	1369	1474	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						220						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.95	0.95	0.95	0.91	0.91	0.91	0.90	0.90	0.90	0.88	0.88	0.88
Heavy Vehicles (%)	26%	8%	0%	0%	10%	23%	14%	0%	18%	0%	0%	0%
Adj. Flow (vph)	178	498	0	0	699	220	176	0	141	0	0	0
Shared Lane Traffic (%)							38%		29%			
Lane Group Flow (vph)	178	498	0	0	699	220	109	108	100	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Holiday Build with Improvement

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max			None		
Act Effct Green (s)	14.6	54.1			34.0	34.0	11.9	11.9	11.9			
Actuated g/C Ratio	0.19	0.72			0.45	0.45	0.16	0.16	0.16			
v/c Ratio	0.64	0.21			0.47	0.32	0.43	0.50	0.43			
Control Delay	28.0	0.4			11.8	1.9	32.9	36.2	33.4			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	28.0	0.4			11.8	1.9	32.9	36.2	33.4			
LOS	C	A			B	A	C	D	C			
Approach Delay		7.7			9.4			34.2				
Approach LOS		A			A			C				
Queue Length 50th (ft)	39	0			71	1	49	51	45			
Queue Length 95th (ft)	54	1			118	11	89	94	84			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	323	2374			1486	695	406	346	373			
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	0.55	0.21			0.47	0.32	0.27	0.31	0.27			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 12.9
 Intersection Capacity Utilization 46.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Holiday Build with Improvement

3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	505	7	1	532	20	5	0	2	78	0	299
Future Volume (vph)	88	505	7	1	532	20	5	0	2	78	0	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998				0.850		0.850				0.850
Flt Protected	0.950			0.950			0.950				0.950	
Satd. Flow (prot)	1410	3364	0	1796	3295	1530	1404	1041	0	0	1480	1282
Flt Permitted	0.950			0.950			0.701				0.754	
Satd. Flow (perm)	1410	3364	0	1796	3295	1530	1036	1041	0	0	1174	1282
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				106		428				205
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.44	0.44	0.44	0.90	0.90	0.90
Heavy Vehicles (%)	28%	7%	14%	0%	9%	5%	20%	0%	50%	22%	0%	26%
Adj. Flow (vph)	95	543	8	1	578	22	11	0	5	87	0	332
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	551	0	1	578	22	11	5	0	0	87	332
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	20.0			12.0			15.0	15.0		15.0	15.0	20.0
Total Split (%)	26.7%			16.0%			20.0%	20.0%		20.0%	20.0%	26.7%
Maximum Green (s)	14.6			6.7			10.1	10.1		10.1	10.1	14.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	28.0
Total Split (%)	37%
Maximum Green (s)	21.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings

Holiday Build with Improvement

3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0		1.5			2.0		2.0		2.0		2.0
Recall Mode	None			None			None		None		None	None
Act Effct Green (s)	11.6	47.0		5.5	40.1	40.1	9.3	9.3		9.3		23.4
Actuated g/C Ratio	0.15	0.63		0.07	0.53	0.53	0.12	0.12		0.12		0.31
v/c Ratio	0.44	0.26		0.01	0.33	0.03	0.09	0.01		0.60		0.61
Control Delay	40.0	4.4		32.0	12.3	0.1	29.8	0.0		48.9		12.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	40.0	4.4		32.0	12.3	0.1	29.8	0.0		48.9		12.3
LOS	D	A		C	B	A	C	A		D		B
Approach Delay	9.6			11.9			20.5				19.9	
Approach LOS	A			B			C				B	
Queue Length 50th (ft)	39	31		0	84	0	5	0		38		41
Queue Length 95th (ft)	90	40		5	128	0	9	0		#94		110
Internal Link Dist (ft)	684			671			171				640	
Turn Bay Length (ft)	570			100			250					
Base Capacity (vph)	274	2073		160	1762	867	143	512		162		584
Starvation Cap Reductn	0	0		0	0	0	0	0		0		0
Spillback Cap Reductn	0	0		0	0	0	0	0		0		0
Storage Cap Reductn	0	0		0	0	0	0	0		0		0
Reduced v/c Ratio	0.35	0.27		0.01	0.33	0.03	0.08	0.01		0.54		0.57

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 13.1

Intersection LOS: B

Intersection Capacity Utilization 52.7%

ICU Level of Service A

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build with Improvement
Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↗	↖	↗	
Traffic Volume (vph)	2	0	8	0	0	0	5	103	0	0	369	1
Future Volume (vph)	2	0	8	0	0	0	5	103	0	0	369	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850										
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1805	1615	0	1900	1900	0	1805	1520	1900	1900	1485	0
Flt Permitted							0.526					
Satd. Flow (perm)	1900	1615	0	1900	1900	0	999	1520	1900	1900	1485	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		419										
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.63	0.63	0.63	0.88	0.88	0.88	0.81	0.81	0.81	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	28%	0%
Adj. Flow (vph)	3	0	13	0	0	0	6	127	0	0	401	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	13	0	0	0	0	6	127	0	0	402	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			4			2			1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build with Improvement
 Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	7.2	7.2					36.9	36.9				36.9
Actuated g/C Ratio	0.18	0.18					0.93	0.93				0.93
v/c Ratio	0.01	0.02					0.01	0.09				0.29
Control Delay	17.0	0.0					1.8	1.5				2.1
Queue Delay	0.0	0.0					0.0	0.0				0.0
Total Delay	17.0	0.0					1.8	1.5				2.1
LOS	B	A					A	A				A
Approach Delay		3.2						1.5				2.1
Approach LOS		A						A				A
Queue Length 50th (ft)	1	0					0	0				0
Queue Length 95th (ft)	5	0					3	22				85
Internal Link Dist (ft)		116			123			640				398
Turn Bay Length (ft)							140					
Base Capacity (vph)	1725	1504					967	1471				1437
Starvation Cap Reductn	0	0					0	0				0
Spillback Cap Reductn	0	0					0	0				0
Storage Cap Reductn	0	0					0	0				0
Reduced v/c Ratio	0.00	0.01					0.01	0.09				0.28

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 39.5
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.29
 Intersection Signal Delay: 2.0
 Intersection LOS: A
 Intersection Capacity Utilization 34.5%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Joseph Carini Rd

Holiday Build with Improvement
Timing Plan: MD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	30	14	91	340	3
Future Volume (vph)	3	30	14	91	340	3
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	0.876				0.999	
Flt Protected	0.996			0.993		
Satd. Flow (prot)	1458	0	0	1674	1682	0
Flt Permitted	0.996			0.993		
Satd. Flow (perm)	1458	0	0	1674	1682	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.69	0.69	0.83	0.83	0.65	0.65
Heavy Vehicles (%)	0%	15%	11%	13%	13%	0%
Adj. Flow (vph)	4	43	17	110	523	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	0	127	528	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.1%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	3	30	14	91	340	3
Future Vol, veh/h	3	30	14	91	340	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	83	83	65	65
Heavy Vehicles, %	0	15	11	13	13	0
Mvmt Flow	4	43	17	110	523	5

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	670	526	528	0	-	0
Stage 1	526	-	-	-	-	-
Stage 2	144	-	-	-	-	-
Critical Hdwy	6.4	6.35	4.21	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.435	2.299	-	-	-
Pot Cap-1 Maneuver	425	527	995	-	-	-
Stage 1	597	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	417	527	995	-	-	-
Mov Cap-2 Maneuver	417	-	-	-	-	-
Stage 1	586	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	995	-	515	-	-
HCM Lane V/C Ratio	0.017	-	0.093	-	-
HCM Control Delay (s)	8.7	0	12.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Holiday Build with Improvement
Timing Plan: MD



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	3	2	92	340	0
Future Volume (vph)	2	3	2	92	340	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1583	1805	1681	1652	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1583	1805	1681	1652	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.38	0.38	0.83	0.83	0.66	0.66
Heavy Vehicles (%)	0%	2%	0%	13%	15%	0%
Adj. Flow (vph)	5	8	2	111	515	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	8	2	111	515	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	27.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	3	2	92	340	0
Future Vol, veh/h	2	3	2	92	340	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	38	38	83	83	66	66
Heavy Vehicles, %	0	2	0	13	15	0
Mvmt Flow	5	8	2	111	515	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	630	515	515	0	-	0
Stage 1	515	-	-	-	-	-
Stage 2	115	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.2	-	-	-
Pot Cap-1 Maneuver	449	560	1061	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	448	560	1061	-	-	-
Mov Cap-2 Maneuver	448	-	-	-	-	-
Stage 1	603	-	-	-	-	-
Stage 2	915	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.1	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1061	-	448	560	-	-
HCM Lane V/C Ratio	0.002	-	0.012	0.014	-	-
HCM Control Delay (s)	8.4	-	13.1	11.5	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Holiday Build with Improvement
Timing Plan: MD



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	31	27	11	245	19	54	7	81	6	13	84	37
Future Volume (vph)	31	27	11	245	19	54	7	81	6	13	84	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.978			0.977			0.991			0.962	
Fl _t Protected		0.978			0.963			0.996			0.995	
Satd. Flow (prot)	0	1741	0	0	1611	0	0	1477	0	0	1461	0
Fl _t Permitted		0.978			0.963			0.996			0.995	
Satd. Flow (perm)	0	1741	0	0	1611	0	0	1477	0	0	1461	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles (%)	3%	4%	9%	13%	16%	0%	0%	30%	17%	0%	38%	3%
Adj. Flow (vph)	36	31	13	327	25	72	8	95	7	15	94	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	80	0	0	424	0	0	110	0	0	151	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.6%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	27	11	245	19	54	7	81	6	13	84	37
Future Vol, veh/h	31	27	11	245	19	54	7	81	6	13	84	37
Peak Hour Factor	0.86	0.86	0.86	0.75	0.75	0.75	0.85	0.85	0.85	0.89	0.89	0.89
Heavy Vehicles, %	3	4	9	13	16	0	0	30	17	0	38	3
Mvmt Flow	36	31	13	327	25	72	8	95	7	15	94	42
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9	14.8	9.6	9.7
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	45%	77%	10%
Vol Thru, %	86%	39%	6%	63%
Vol Right, %	6%	16%	17%	28%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	94	69	318	134
LT Vol	7	31	245	13
Through Vol	81	27	19	84
RT Vol	6	11	54	37
Lane Flow Rate	111	80	424	151
Geometry Grp	1	1	1	1
Degree of Util (X)	0.168	0.117	0.582	0.217
Departure Headway (Hd)	5.46	5.271	4.942	5.177
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	661	684	721	685
Service Time	3.46	3.278	3.026	3.277
HCM Lane V/C Ratio	0.168	0.117	0.588	0.22
HCM Control Delay	9.6	9	14.8	9.7
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0.6	0.4	3.8	0.8

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Holiday Build with Improvement
Timing Plan: MD



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Volume (vph)	46	0	0	39	279	0
Future Volume (vph)	46	0	0	39	279	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frnt						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	0	42	303	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	42	303	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	25.5%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	8.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	46	0	0	39	279	0
Future Vol, veh/h	46	0	0	39	279	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	0	0	42	303	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	50	0	92
Stage 1	-	-	-	-	50
Stage 2	-	-	-	-	42
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1557	-	908
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	980
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1557	-	908
Mov Cap-2 Maneuver	-	-	-	-	908
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	980

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	908	-	-	-	1557	-
HCM Lane V/C Ratio	0.334	-	-	-	-	-
HCM Control Delay (s)	10.9	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1.5	-	-	-	0	-

Lanes, Volumes, Timings

Holiday Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	1108	480	391	892	0	0	0	0	359	5	338
Future Volume (vph)	0	1108	480	391	892	0	0	0	0	359	5	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.927	0.850
Fl _t Protected				0.950						0.950	0.976	
Satd. Flow (prot)	0	2843	1615	1805	2865	0	0	0	0	1829	1616	1688
Fl _t Permitted				0.950						0.950	0.976	
Satd. Flow (perm)	0	2843	1615	1805	2865	0	0	0	0	1829	1616	1688
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			498									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.89	0.89	0.89	0.84	0.84	0.84	0.88	0.88	0.88	0.85	0.85	0.85
Heavy Vehicles (%)	15%	27%	0%	0%	26%	9%	12%	0%	11%	0%	0%	0%
Adj. Flow (vph)	0	1245	539	465	1062	0	0	0	0	422	6	398
Shared Lane Traffic (%)										32%		34%
Lane Group Flow (vph)	0	1245	539	465	1062	0	0	0	0	287	276	263
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases		2										
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		37.0	37.0	23.0						20.0	20.0	20.0
Total Split (%)		46.3%	46.3%	28.8%						25.0%	25.0%	25.0%
Maximum Green (s)		31.5	31.5	19.0						14.5	14.5	14.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Holiday Build

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effect Green (s)		31.5	31.5	19.0	56.0					14.5	14.5	14.5
Actuated g/C Ratio		0.39	0.39	0.24	0.70					0.18	0.18	0.18
v/c Ratio		1.11	0.58	1.09	0.53					0.87	0.95	0.86
Control Delay		89.0	5.2	87.3	0.9					59.1	75.7	60.2
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		89.0	5.2	87.3	0.9					59.1	75.7	60.2
LOS		F	A	F	A					E	E	E
Approach Delay		63.7			27.2						65.0	
Approach LOS		E			C						E	
Queue Length 50th (ft)		~381	12	~254	7					148	151	135
Queue Length 95th (ft)		#497	74	m#286	m7					#264	#282	#248
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1119	937	428	2005					331	292	305
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	0.58	1.09	0.53					0.87	0.95	0.86

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 1 (1%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 50.5
 Intersection LOS: D
 Intersection Capacity Utilization 78.3%
 ICU Level of Service D
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Holiday Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: PM

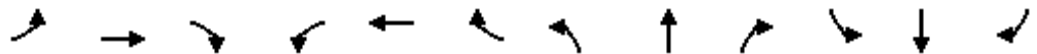


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↔	↗			
Traffic Volume (vph)	449	1018	0	0	995	298	288	5	469	0	0	0
Future Volume (vph)	449	1018	0	0	995	298	288	5	469	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Fr _t						0.850		0.870	0.850			
Fl _t Protected	0.950						0.950	0.994				
Satd. Flow (prot)	1805	2756	0	0	2865	1561	1829	1495	1739	0	0	0
Fl _t Permitted	0.950						0.950	0.994				
Satd. Flow (perm)	1805	2756	0	0	2865	1561	1829	1495	1739	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						310						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.87	0.87	0.87	0.96	0.96	0.96	0.85	0.85	0.85	0.88	0.88	0.88
Heavy Vehicles (%)	0%	31%	14%	11%	26%	0%	0%	0%	0%	8%	0%	11%
Adj. Flow (vph)	516	1170	0	0	1036	310	339	6	552	0	0	0
Shared Lane Traffic (%)							10%		47%			
Lane Group Flow (vph)	516	1170	0	0	1036	310	305	299	293	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	25.0				35.0	35.0	20.0	20.0	20.0			
Total Split (%)	31.3%				43.8%	43.8%	25.0%	25.0%	25.0%			
Maximum Green (s)	21.0				29.5	29.5	15.0	15.0	15.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Holiday Build

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None			C-Max			C-Max	None	None	None		
Act Effct Green (s)	21.0	56.0			29.5	29.5	15.0	15.0	15.0			
Actuated g/C Ratio	0.26	0.70			0.37	0.37	0.19	0.19	0.19			
v/c Ratio	1.09	0.61			0.98	0.40	0.89	1.07	0.90			
Control Delay	75.9	0.2			41.7	5.2	61.8	107.5	64.0			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	75.9	0.2			41.7	5.2	61.8	107.5	64.0			
LOS	E	A			D	A	E	F	E			
Approach Delay	23.4			33.3			77.7					
Approach LOS	C			C			E					
Queue Length 50th (ft)	~284	1			202	13	157	~184	151			
Queue Length 95th (ft)	m#237	m1			m#356	m27	#280	#320	#274			
Internal Link Dist (ft)	833			684			603			409		
Turn Bay Length (ft)	830						480	180		180		
Base Capacity (vph)	473	1929			1056	771	342	280	326			
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	1.09	0.61			0.98	0.40	0.89	1.07	0.90			

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 39 (49%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.09
 Intersection Signal Delay: 39.2
 Intersection LOS: D
 Intersection Capacity Utilization 78.3%
 ICU Level of Service D
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Holiday Build
 Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	462	1010	15	5	803	157	10	20	5	191	40	480
Future Volume (vph)	462	1010	15	5	803	157	10	20	5	191	40	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998				0.850		0.969				0.850
Flt Protected	0.950			0.950			0.950				0.960	
Satd. Flow (prot)	1719	2566	0	1796	2763	1575	1652	1780	0	0	1752	1429
Flt Permitted	0.950			0.950			0.354				0.740	
Satd. Flow (perm)	1719	2566	0	1796	2763	1575	615	1780	0	0	1350	1429
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				183		7				115
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.95	0.95	0.95	0.86	0.86	0.86	0.75	0.75	0.75	0.82	0.82	0.82
Heavy Vehicles (%)	5%	41%	1%	0%	30%	2%	2%	0%	0%	5%	0%	13%
Adj. Flow (vph)	486	1063	16	6	934	183	13	27	7	233	49	585
Shared Lane Traffic (%)												
Lane Group Flow (vph)	486	1079	0	6	934	183	13	34	0	0	282	585
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	22.0			11.0			22.0	22.0		22.0	22.0	22.0
Total Split (%)	27.5%			13.8%			27.5%	27.5%		27.5%	27.5%	27.5%
Maximum Green (s)	16.6			5.7			17.1	17.1		17.1	17.1	16.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0			0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9			4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	25.0
Total Split (%)	31%
Maximum Green (s)	18.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings
 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Holiday Build
 Timing Plan: PM

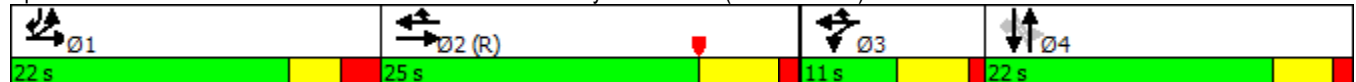


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	16.6	41.6		5.7	29.9	29.9	17.1	17.1			17.1	38.6
Actuated g/C Ratio	0.21	0.52		0.07	0.37	0.37	0.21	0.21			0.21	0.48
v/c Ratio	1.37	0.81		0.05	0.91	0.26	0.10	0.09			0.98	0.78
Control Delay	207.1	16.6		35.6	37.8	3.9	27.7	22.2			82.6	22.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	207.1	16.6		35.6	37.8	3.9	27.7	22.2			82.6	22.7
LOS	F	B		D	D	A	C	C			F	C
Approach Delay		75.8			32.2			23.7			42.2	
Approach LOS		E			C			C			D	
Queue Length 50th (ft)	~332	74		3	227	0	5	11			141	188
Queue Length 95th (ft)	m#462	m85		14	#320	34	17	28			#252	272
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	356	1335		127	1032	703	131	385			288	749
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	1.37	0.81		0.05	0.91	0.26	0.10	0.09			0.98	0.78

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 29 (36%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.37
 Intersection Signal Delay: 53.4 Intersection LOS: D
 Intersection Capacity Utilization 80.8% ICU Level of Service D
 Analysis Period (min) 15
 ~ 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	15	166	0	0	5	366	268	47	530	0
Future Volume (vph)	5	0	15	166	0	0	5	366	268	47	530	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850							0.850			
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1615	0	1805	1900	0	1805	1792	1615	1805	1863	0
Flt Permitted	0.757			0.737			0.153			0.327		
Satd. Flow (perm)	1438	1615	0	1400	1900	0	291	1792	1615	621	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		181							454			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.48	0.48	0.48	0.88	0.88	0.88	0.59	0.59	0.59	0.60	0.60	0.60
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	2%	0%
Adj. Flow (vph)	10	0	31	189	0	0	8	620	454	78	883	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	31	0	189	0	0	8	620	454	78	883	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	1.0	2.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build
 Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	14.0	14.0		14.0			46.7	46.7	46.7	52.4	46.7	
Actuated g/C Ratio	0.18	0.18		0.18			0.59	0.59	0.59	0.67	0.59	
v/c Ratio	0.04	0.07		0.76			0.05	0.58	0.40	0.16	0.80	
Control Delay	26.0	0.3		50.2			10.4	14.6	2.2	5.4	21.9	
Queue Delay	0.0	0.0		0.0			0.0	0.0	0.0	0.0	0.0	
Total Delay	26.0	0.3		50.2			10.4	14.6	2.2	5.4	21.9	
LOS	C	A		D			B	B	A	A	C	
Approach Delay		6.6			50.2			9.4				20.6
Approach LOS		A			D			A				C
Queue Length 50th (ft)	4	0		89			2	181	0	10	320	
Queue Length 95th (ft)	9	0		153			6	182	0	19	288	
Internal Link Dist (ft)		116			123			640			398	
Turn Bay Length (ft)				170			140			115		
Base Capacity (vph)	643	822		626			172	1065	1143	491	1107	
Starvation Cap Reductn	0	0		0			0	0	0	0	0	
Spillback Cap Reductn	0	0		0			0	0	0	0	0	
Storage Cap Reductn	0	0		0			0	0	0	0	0	
Reduced v/c Ratio	0.02	0.04		0.30			0.05	0.58	0.40	0.16	0.80	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 78.6
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 17.4
 Intersection LOS: B
 Intersection Capacity Utilization 64.1%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Joseph Carini Rd

Holiday Build
Timing Plan: PM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	63	9	362	514	0
Future Volume (vph)	3	63	9	362	514	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.871					
Fl _t Protected	0.998			0.999		
Satd. Flow (prot)	1618	0	0	1656	1696	0
Fl _t Permitted	0.998			0.999		
Satd. Flow (perm)	1618	0	0	1656	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.55	0.55	0.90	0.90	0.80	0.80
Heavy Vehicles (%)	50%	0%	0%	15%	12%	0%
Adj. Flow (vph)	5	115	10	402	643	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	120	0	0	412	643	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.8%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	3	63	9	362	514	0
Future Vol, veh/h	3	63	9	362	514	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	55	55	90	90	80	80
Heavy Vehicles, %	50	0	0	15	12	0
Mvmt Flow	5	115	10	402	643	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1065	643	643	0	-	0
Stage 1	643	-	-	-	-	-
Stage 2	422	-	-	-	-	-
Critical Hdwy	6.9	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	201	477	951	-	-	-
Stage 1	443	-	-	-	-	-
Stage 2	570	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	198	477	951	-	-	-
Mov Cap-2 Maneuver	198	-	-	-	-	-
Stage 1	437	-	-	-	-	-
Stage 2	570	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	951	-	448	-	-
HCM Lane V/C Ratio	0.011	-	0.268	-	-
HCM Control Delay (s)	8.8	0	16	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	1.1	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Holiday Build
Timing Plan: PM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	13	3	362	501	0
Future Volume (vph)	3	13	3	362	501	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1638	1696	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1638	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Confl. Peds. (#/hr)	3					
Peak Hour Factor	0.42	0.42	0.90	0.90	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	16%	12%	0%
Adj. Flow (vph)	7	31	3	402	634	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	31	3	402	634	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.4%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	13	3	362	501	0
Future Vol, veh/h	3	13	3	362	501	0
Conflicting Peds, #/hr	3	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	42	42	90	90	79	79
Heavy Vehicles, %	0	0	0	16	12	0
Mvmt Flow	7	31	3	402	634	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1045	634	634	0	-	0
Stage 1	634	-	-	-	-	-
Stage 2	411	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	256	483	959	-	-	-
Stage 1	532	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	255	483	959	-	-	-
Mov Cap-2 Maneuver	255	-	-	-	-	-
Stage 1	530	-	-	-	-	-
Stage 2	674	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.2	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	959	-	255	483	-	-
HCM Lane V/C Ratio	0.003	-	0.028	0.064	-	-
HCM Control Delay (s)	8.8	-	19.5	13	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.2	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Holiday Build
Timing Plan: PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	45	51	25	141	45	64	20	100	245	67	335	101
Future Volume (vph)	45	51	25	141	45	64	20	100	245	67	335	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.972			0.966			0.909			0.973	
Fl _t Protected		0.982			0.973			0.997			0.993	
Satd. Flow (prot)	0	1800	0	0	1786	0	0	1676	0	0	1808	0
Fl _t Permitted		0.982			0.973			0.997			0.993	
Satd. Flow (perm)	0	1800	0	0	1786	0	0	1676	0	0	1808	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.86	0.86	0.86	0.76	0.76	0.76	0.63	0.63	0.63	0.71	0.71	0.71
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	10%	0%	0%	2%	1%
Adj. Flow (vph)	52	59	29	186	59	84	32	159	389	94	472	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	140	0	0	329	0	0	580	0	0	708	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	75.0%
ICU Level of Service	D
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	122.4
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	51	25	141	45	64	20	100	245	67	335	101
Future Vol, veh/h	45	51	25	141	45	64	20	100	245	67	335	101
Peak Hour Factor	0.86	0.86	0.86	0.76	0.76	0.76	0.63	0.63	0.63	0.71	0.71	0.71
Heavy Vehicles, %	2	0	0	0	0	0	0	10	0	0	2	1
Mvmt Flow	52	59	29	186	59	84	32	159	389	94	472	142
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	18.3	30.7	96.4	207
HCM LOS	C	D	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	37%	56%	13%
Vol Thru, %	27%	42%	18%	67%
Vol Right, %	67%	21%	26%	20%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	365	121	250	503
LT Vol	20	45	141	67
Through Vol	100	51	45	335
RT Vol	245	25	64	101
Lane Flow Rate	579	141	329	708
Geometry Grp	1	1	1	1
Degree of Util (X)	1.095	0.345	0.71	1.385
Departure Headway (Hd)	7.508	10.087	8.832	7.375
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	487	359	411	496
Service Time	5.508	8.087	6.832	5.375
HCM Lane V/C Ratio	1.189	0.393	0.8	1.427
HCM Control Delay	96.4	18.3	30.7	207
HCM Lane LOS	F	C	D	F
HCM 95th-tile Q	17.2	1.5	5.4	31.5

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Holiday Build
Timing Plan: PM



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	91	272	0	90	160	0
Future Volume (vph)	91	272	0	90	160	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.899					
Fl _t Protected					0.950	
Satd. Flow (prot)	1675	0	0	1863	1770	1863
Fl _t Permitted					0.950	
Satd. Flow (perm)	1675	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	296	0	98	174	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	395	0	0	98	174	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		15	15		9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.1%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	3.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	91	272	0	90	160	0
Future Vol, veh/h	91	272	0	90	160	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	296	0	98	174	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	395	0	345
Stage 1	-	-	-	-	247
Stage 2	-	-	-	-	98
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1164	-	652
Stage 1	-	-	-	-	794
Stage 2	-	-	-	-	926
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1164	-	652
Mov Cap-2 Maneuver	-	-	-	-	652
Stage 1	-	-	-	-	794
Stage 2	-	-	-	-	926

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	652	-	-	-	1164	-
HCM Lane V/C Ratio	0.267	-	-	-	-	-
HCM Control Delay (s)	12.5	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1.1	-	-	-	0	-

Lanes, Volumes, Timings

Holiday Build with Improvement

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘	↕	↗
Traffic Volume (vph)	0	518	200	247	472	0	0	0	0	153	0	204
Future Volume (vph)	0	518	200	247	472	0	0	0	0	153	0	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	25			100			25			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.887	0.850
Fl _t Protected				0.950						0.950	0.988	
Satd. Flow (prot)	0	3008	1346	1583	3195	0	0	0	0	1499	1216	1288
Fl _t Permitted				0.950						0.950	0.988	
Satd. Flow (perm)	0	3008	1346	1583	3195	0	0	0	0	1499	1216	1288
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			213									
Link Speed (mph)		45			35			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			17.8			8.5			11.3	
Peak Hour Factor	0.94	0.94	0.94	0.74	0.74	0.74	0.88	0.88	0.88	0.89	0.89	0.89
Heavy Vehicles (%)	0%	20%	20%	14%	13%	0%	0%	0%	0%	22%	0%	31%
Adj. Flow (vph)	0	551	213	334	638	0	0	0	0	172	0	229
Shared Lane Traffic (%)										19%		44%
Lane Group Flow (vph)	0	551	213	334	638	0	0	0	0	139	134	128
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Holiday Build with Improvement

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		25.6	25.6	20.4	51.5					14.0	14.0	14.0
Actuated g/C Ratio		0.34	0.34	0.27	0.69					0.19	0.19	0.19
v/c Ratio		0.54	0.35	0.77	0.29					0.50	0.59	0.54
Control Delay		22.7	4.9	34.0	1.5					32.6	38.0	35.0
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		22.7	4.9	34.0	1.5					32.6	38.0	35.0
LOS		C	A	C	A					C	D	C
Approach Delay		17.7			12.6						35.2	
Approach LOS		B			B						D	
Queue Length 50th (ft)		110	0	66	8					62	63	57
Queue Length 95th (ft)		158	44	#213	14					105	110	101
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1026	600	431	2195					389	316	334
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		0.54	0.35	0.77	0.29					0.36	0.42	0.38

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 18.7
 Intersection LOS: B
 Intersection Capacity Utilization 48.0%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Holiday Build with Improvement

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↔	↗			
Traffic Volume (vph)	203	468	0	0	580	242	139	0	244	0	0	0
Future Volume (vph)	203	468	0	0	580	242	139	0	244	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Fr _t						0.850		0.867	0.850			
Fl _t Protected	0.950						0.950	0.995				
Satd. Flow (prot)	1367	3223	0	0	3195	1312	1550	1236	1437	0	0	0
Fl _t Permitted	0.950						0.950	0.995				
Satd. Flow (perm)	1367	3223	0	0	3195	1312	1550	1236	1437	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						257						
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			14.9			15.5			11.1	
Peak Hour Factor	0.88	0.88	0.88	0.94	0.94	0.94	0.95	0.95	0.95	0.88	0.88	0.88
Heavy Vehicles (%)	32%	12%	0%	0%	13%	19%	18%	0%	21%	0%	0%	0%
Adj. Flow (vph)	231	532	0	0	617	257	146	0	257	0	0	0
Shared Lane Traffic (%)							10%		47%			
Lane Group Flow (vph)	231	532	0	0	617	257	131	136	136	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Holiday Build with Improvement

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None					C-Max	C-Max	None	None	None		
Act Effct Green (s)	16.7	52.2				30.0	30.0	13.8	13.8	13.8		
Actuated g/C Ratio	0.22	0.70				0.40	0.40	0.18	0.18	0.18		
v/c Ratio	0.76	0.24				0.48	0.38	0.46	0.60	0.51		
Control Delay	35.6	0.5				13.8	2.6	31.4	38.3	33.6		
Queue Delay	0.0	0.0				0.0	0.0	0.0	0.0	0.0		
Total Delay	35.6	0.5				13.8	2.6	31.4	38.3	33.6		
LOS	D	A				B	A	C	D	C		
Approach Delay	11.1					10.5				34.5		
Approach LOS	B					B				C		
Queue Length 50th (ft)	44	1				74	6	57	64	61		
Queue Length 95th (ft)	#191	4				116	19	101	114	106		
Internal Link Dist (ft)	833					684				603	409	
Turn Bay Length (ft)	830					480		180			180	
Base Capacity (vph)	319	2241				1277	678	392	313	364		
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	0.24				0.48	0.38	0.33	0.43	0.37		

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 15.5
 Intersection LOS: B
 Intersection Capacity Utilization 48.0%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)

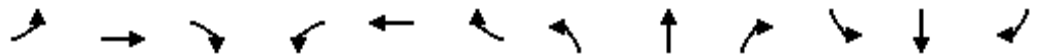


Lanes, Volumes, Timings

Holiday Build with Improvement

3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	304	400	8	0	477	92	15	1	0	106	0	330
Future Volume (vph)	304	400	8	0	477	92	15	1	0	106	0	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			25			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997				0.850						0.850
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1367	3211	0	1890	3265	1461	1685	1837	0	0	1736	1196
Flt Permitted	0.950						0.655				0.756	
Satd. Flow (perm)	1367	3211	0	1890	3265	1461	1162	1837	0	0	1381	1196
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				107						230
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		764			751			251			720	
Travel Time (s)		14.9			14.6			5.7			16.4	
Peak Hour Factor	0.81	0.81	0.81	0.86	0.86	0.86	0.38	0.38	0.38	0.81	0.81	0.81
Heavy Vehicles (%)	32%	12%	17%	0%	10%	10%	0%	0%	0%	4%	0%	35%
Adj. Flow (vph)	375	494	10	0	555	107	39	3	0	131	0	407
Shared Lane Traffic (%)												
Lane Group Flow (vph)	375	504	0	0	555	107	39	3	0	0	131	407
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	17.0			11.0			17.0	17.0		17.0	17.0	17.0
Total Split (%)	22.7%			14.7%			22.7%	22.7%		22.7%	22.7%	22.7%
Maximum Green (s)	11.6			5.7			12.1	12.1		12.1	12.1	11.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	30.0
Total Split (%)	40%
Maximum Green (s)	23.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings

Holiday Build with Improvement

3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	20.4	45.6			29.8	29.8	10.7	10.7			10.7	33.7
Actuated g/C Ratio	0.27	0.61			0.40	0.40	0.14	0.14			0.14	0.45
v/c Ratio	1.01	0.26			0.43	0.17	0.23	0.01			0.66	0.61
Control Delay	86.1	5.1			17.0	3.4	31.2	26.0			47.1	12.1
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	86.1	5.1			17.0	3.4	31.2	26.0			47.1	12.1
LOS	F	A			B	A	C	C			D	B
Approach Delay		39.6			14.8			30.8			20.6	
Approach LOS		D			B			C			C	
Queue Length 50th (ft)	~219	32			97	0	16	1			58	50
Queue Length 95th (ft)	#386	42			112	22	17	4			98	125
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570					250						
Base Capacity (vph)	372	2160			1275	635	192	304			228	663
Starvation Cap Reductn	0	0			0	0	0	0			0	0
Spillback Cap Reductn	0	0			0	0	0	0			0	0
Storage Cap Reductn	0	0			0	0	0	0			0	0
Reduced v/c Ratio	1.01	0.23			0.44	0.17	0.20	0.01			0.57	0.61

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 26.9 Intersection LOS: C
 Intersection Capacity Utilization 56.2% ICU Level of Service B
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build with Improvement
Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	9	182	0	0	6	107	284	50	245	0
Future Volume (vph)	0	0	9	182	0	0	6	107	284	50	245	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850							0.850			
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	1900	1417	0	1805	1900	0	1504	1496	1615	1805	1484	0
Flt Permitted				0.747			0.574			0.650		
Satd. Flow (perm)	1900	1417	0	1419	1900	0	909	1496	1615	1235	1484	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		518							451			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.58	0.58	0.58	0.88	0.88	0.88	0.63	0.63	0.63	0.80	0.80	0.80
Heavy Vehicles (%)	0%	0%	14%	0%	0%	0%	20%	27%	0%	0%	28%	0%
Adj. Flow (vph)	0	0	16	207	0	0	10	170	451	63	306	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	207	0	0	10	170	451	63	306	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	1.0	2.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build with Improvement
 Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		11.7		11.7			20.3	20.3	20.3	24.9	20.3	
Actuated g/C Ratio		0.24		0.24			0.42	0.42	0.42	0.52	0.42	
v/c Ratio		0.02		0.60			0.03	0.27	0.48	0.09	0.49	
Control Delay		0.0		25.9			11.5	12.9	3.5	5.9	15.6	
Queue Delay		0.0		0.0			0.0	0.0	0.0	0.0	0.0	
Total Delay		0.0		25.9			11.5	12.9	3.5	5.9	15.6	
LOS		A		C			B	B	A	A	B	
Approach Delay					25.9			6.1				14.0
Approach LOS					C			A				B
Queue Length 50th (ft)		0		50			2	33	0	6	65	
Queue Length 95th (ft)		0		129			7	56	0	21	134	
Internal Link Dist (ft)		116			123			640			398	
Turn Bay Length (ft)				170			140			115		
Base Capacity (vph)		1207		1087			809	1333	1488	704	1322	
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		0.01		0.19			0.01	0.13	0.30	0.09	0.23	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 48.3
 Natural Cycle: 55
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 11.8
 Intersection LOS: B
 Intersection Capacity Utilization 39.7%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Josheph Carini Rd

Holiday Build with Improvement
Timing Plan: AM Pk Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	11	11	96	284	0
Future Volume (vph)	0	11	11	96	284	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fl _t Protected	0.995					
Satd. Flow (prot)	1347	0	0	1470	1462	0
Fl _t Permitted	0.995					
Satd. Flow (perm)	1347	0	0	1470	1462	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.56	0.56	0.75	0.75	0.81	0.81
Heavy Vehicles (%)	0%	22%	0%	32%	30%	0%
Adj. Flow (vph)	0	20	15	128	351	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	0	0	143	351	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	11	11	96	284	0
Future Vol, veh/h	0	11	11	96	284	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	75	75	81	81
Heavy Vehicles, %	0	22	0	32	30	0
Mvmt Flow	0	20	15	128	351	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	509	351	351	0	-	0
Stage 1	351	-	-	-	-	-
Stage 2	158	-	-	-	-	-
Critical Hdwy	6.4	6.42	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.498	2.2	-	-	-
Pot Cap-1 Maneuver	528	650	1219	-	-	-
Stage 1	717	-	-	-	-	-
Stage 2	875	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	521	650	1219	-	-	-
Mov Cap-2 Maneuver	521	-	-	-	-	-
Stage 1	708	-	-	-	-	-
Stage 2	875	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1219	-	650	-	-
HCM Lane V/C Ratio	0.012	-	0.03	-	-
HCM Control Delay (s)	8	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Holiday Build with Improvement
Timing Plan: AM Pk Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	3	0	96	281	1
Future Volume (vph)	0	3	0	96	281	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Fr _t		0.850				
Fl _t Protected						
Satd. Flow (prot)	1900	1077	1900	1439	1474	0
Fl _t Permitted						
Satd. Flow (perm)	1900	1077	1900	1439	1474	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Confl. Peds. (#/hr)	3					
Peak Hour Factor	0.50	0.50	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	50%	0%	32%	29%	0%
Adj. Flow (vph)	0	6	0	122	356	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	6	0	122	357	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.9%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	0	3	0	96	281	1
Future Vol, veh/h	0	3	0	96	281	1
Conflicting Peds, #/hr	3	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	79	79	79	79
Heavy Vehicles, %	0	50	0	32	29	0
Mvmt Flow	0	6	0	122	356	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	482	357	357	0	-	0
Stage 1	357	-	-	-	-	-
Stage 2	125	-	-	-	-	-
Critical Hdwy	6.4	6.7	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.75	2.2	-	-	-
Pot Cap-1 Maneuver	547	592	1213	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	906	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	547	592	1213	-	-	-
Mov Cap-2 Maneuver	547	-	-	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	906	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1213	-	-	592	-	-
HCM Lane V/C Ratio	-	-	-	0.01	-	-
HCM Control Delay (s)	0	-	0	11.1	-	-
HCM Lane LOS	A	-	A	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Holiday Build with Improvement
Timing Plan: AM Pk Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	25	23	5	143	14	63	4	83	9	14	134	25
Future Volume (vph)	25	23	5	143	14	63	4	83	9	14	134	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.987			0.961			0.988			0.981	
Fl _t Protected		0.977			0.969			0.998			0.996	
Satd. Flow (prot)	0	1477	0	0	1552	0	0	1441	0	0	1454	0
Fl _t Permitted		0.977			0.969			0.998			0.996	
Satd. Flow (perm)	0	1477	0	0	1552	0	0	1441	0	0	1454	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.63	0.63	0.63	0.45	0.45	0.45	0.79	0.79	0.79	0.65	0.65	0.65
Heavy Vehicles (%)	31%	11%	50%	14%	0%	17%	33%	33%	0%	0%	33%	15%
Adj. Flow (vph)	40	37	8	318	31	140	5	105	11	22	206	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	85	0	0	489	0	0	121	0	0	266	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	38.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	17.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	23	5	143	14	63	4	83	9	14	134	25
Future Vol, veh/h	25	23	5	143	14	63	4	83	9	14	134	25
Peak Hour Factor	0.63	0.63	0.63	0.45	0.45	0.45	0.79	0.79	0.79	0.65	0.65	0.65
Heavy Vehicles, %	31	11	50	14	0	17	33	33	0	0	33	15
Mvmt Flow	40	37	8	318	31	140	5	105	11	22	206	38
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.7	22.3	11.5	13
HCM LOS	B	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	47%	65%	8%
Vol Thru, %	86%	43%	6%	77%
Vol Right, %	9%	9%	29%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	96	53	220	173
LT Vol	4	25	143	14
Through Vol	83	23	14	134
RT Vol	9	5	63	25
Lane Flow Rate	122	84	489	266
Geometry Grp	1	1	1	1
Degree of Util (X)	0.222	0.152	0.738	0.424
Departure Headway (Hd)	6.582	6.494	5.436	5.731
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	543	549	665	625
Service Time	4.654	4.567	3.483	3.79
HCM Lane V/C Ratio	0.225	0.153	0.735	0.426
HCM Control Delay	11.5	10.7	22.3	13
HCM Lane LOS	B	B	C	B
HCM 95th-tile Q	0.8	0.5	6.5	2.1

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Holiday Build with Improvement
Timing Plan: AM Pk Gen



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	↻
Traffic Volume (vph)	46	0	0	40	180	0
Future Volume (vph)	46	0	0	40	180	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frnt						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	0	43	196	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	0	0	43	196	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.0%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	6.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	46	0	0	40	180	0
Future Vol, veh/h	46	0	0	40	180	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	0	0	43	196	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	50	0	93
Stage 1	-	-	-	-	50
Stage 2	-	-	-	-	43
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1557	-	907
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	979
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1557	-	907
Mov Cap-2 Maneuver	-	-	-	-	907
Stage 1	-	-	-	-	972
Stage 2	-	-	-	-	979

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	907	-	-	-	1557	-
HCM Lane V/C Ratio	0.216	-	-	-	-	-
HCM Control Delay (s)	10.1	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	-	0	-

Lanes, Volumes, Timings

Holiday Build With Improvement

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↘	↑↑					↘	↕	↗
Traffic Volume (vph)	0	427	132	250	420	0	0	0	0	148	0	93
Future Volume (vph)	0	427	132	250	420	0	0	0	0	148	0	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	14	13	15
Storage Length (ft)	0		0	830		0	0		0	240		240
Storage Lanes	0		1	1		0	0		0	1		1
Taper Length (ft)	0			100			0			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Fr _t			0.850								0.968	0.850
Fl _t Protected				0.950						0.950	0.962	
Satd. Flow (prot)	0	3574	1553	1719	3505	0	0	0	0	1726	1560	1548
Fl _t Permitted				0.950						0.950	0.962	
Satd. Flow (perm)	0	3574	1553	1719	3505	0	0	0	0	1726	1560	1548
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)			159									
Link Speed (mph)		45			30			30			30	
Link Distance (ft)		348			913			376			495	
Travel Time (s)		5.3			20.8			8.5			11.3	
Peak Hour Factor	0.83	0.83	0.83	0.59	0.59	0.59	0.88	0.88	0.88	0.86	0.86	0.86
Heavy Vehicles (%)	0%	1%	4%	5%	3%	0%	0%	0%	0%	6%	0%	9%
Adj. Flow (vph)	0	514	159	424	712	0	0	0	0	172	0	108
Shared Lane Traffic (%)										44%		19%
Lane Group Flow (vph)	0	514	159	424	712	0	0	0	0	96	97	87
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.96	0.88
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm	Prot	NA					Split	NA	Prot
Protected Phases		2		1	1 2					4	4	4
Permitted Phases			2									
Detector Phase		2	2	1	1 2					4	4	4
Switch Phase												
Minimum Initial (s)		15.0	15.0	7.0						9.0	9.0	9.0
Minimum Split (s)		20.5	20.5	11.0						14.5	14.5	14.5
Total Split (s)		30.0	30.0	20.0						25.0	25.0	25.0
Total Split (%)		40.0%	40.0%	26.7%						33.3%	33.3%	33.3%
Maximum Green (s)		24.5	24.5	16.0						19.5	19.5	19.5
Yellow Time (s)		3.5	3.5	3.0						3.5	3.5	3.5
All-Red Time (s)		2.0	2.0	1.0						2.0	2.0	2.0
Lost Time Adjust (s)		0.0	0.0	0.0						0.0	0.0	0.0
Total Lost Time (s)		5.5	5.5	4.0						5.5	5.5	5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		0.2	0.2	3.0						3.0	3.0	3.0

Lanes, Volumes, Timings

Holiday Build With Improvement

1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode		C-Max	C-Max	None						None	None	None
Act Effct Green (s)		25.7	25.7	26.3	58.3					10.9	10.9	10.9
Actuated g/C Ratio		0.34	0.34	0.35	0.78					0.15	0.15	0.15
v/c Ratio		0.42	0.25	0.71	0.26					0.38	0.43	0.39
Control Delay		20.7	4.6	27.0	1.2					32.9	34.6	33.5
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		20.7	4.6	27.0	1.2					32.9	34.6	33.5
LOS		C	A	C	A					C	C	C
Approach Delay		16.9			10.9						33.6	
Approach LOS		B			B						C	
Queue Length 50th (ft)		97	0	99	11					44	46	40
Queue Length 95th (ft)		127	30	108	14					78	83	73
Internal Link Dist (ft)		268			833			296			415	
Turn Bay Length (ft)				830						240		240
Base Capacity (vph)		1225	637	601	2723					448	405	402
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		0.42	0.25	0.71	0.26					0.21	0.24	0.22

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 15.8
 Intersection LOS: B
 Intersection Capacity Utilization 46.4%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: I-91 SB Exit 15 On-Ramp/I-91 SB Exit 15 Off-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Holiday Build With Improvement

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↑			↑↑	↙	↙	↕	↙			
Traffic Volume (vph)	80	495	0	0	506	161	164	0	255	0	0	0
Future Volume (vph)	80	495	0	0	506	161	164	0	255	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	14	12	16	16	16	16
Storage Length (ft)	830		0	0		480	180		180	0		0
Storage Lanes	1		0	0		1	1		0	0		0
Taper Length (ft)	25			0			100			0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Fr _t						0.850		0.869	0.850			
Fl _t Protected	0.950						0.950	0.994				
Satd. Flow (prot)	1719	3574	0	0	3539	1406	1678	1415	1656	0	0	0
Fl _t Permitted	0.950						0.950	0.994				
Satd. Flow (perm)	1719	3574	0	0	3539	1406	1678	1415	1656	0	0	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)						199						
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		913			764			683			489	
Travel Time (s)		17.8			13.0			15.5			11.1	
Peak Hour Factor	0.85	0.85	0.85	0.81	0.81	0.81	0.84	0.84	0.84	0.88	0.88	0.88
Heavy Vehicles (%)	5%	1%	0%	0%	2%	11%	9%	0%	5%	0%	0%	0%
Adj. Flow (vph)	94	582	0	0	625	199	195	0	304	0	0	0
Shared Lane Traffic (%)							11%		47%			
Lane Group Flow (vph)	94	582	0	0	625	199	174	164	161	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			14			14	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.04	0.92	1.00	0.85	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	1	1 2			2	2	4	4	4			
Permitted Phases												
Detector Phase	1	1 2			2	2	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0				15.0	15.0	9.0	9.0	9.0			
Minimum Split (s)	11.0				20.5	20.5	14.0	14.0	14.0			
Total Split (s)	20.0				31.0	31.0	24.0	24.0	24.0			
Total Split (%)	26.7%				41.3%	41.3%	32.0%	32.0%	32.0%			
Maximum Green (s)	16.0				25.5	25.5	19.0	19.0	19.0			
Yellow Time (s)	3.0				3.5	3.5	3.0	3.0	3.0			
All-Red Time (s)	1.0				2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0				0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	4.0				5.5	5.5	5.0	5.0	5.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				0.2	0.2	3.0	3.0	3.0			

Lanes, Volumes, Timings

Holiday Build With Improvement

2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road) Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None				C-Max	C-Max	None	None	None			
Act Effct Green (s)	11.6	51.6			34.5	34.5	14.4	14.4	14.4			
Actuated g/C Ratio	0.15	0.69			0.46	0.46	0.19	0.19	0.19			
v/c Ratio	0.35	0.24			0.38	0.26	0.54	0.60	0.51			
Control Delay	26.6	0.2			10.4	1.7	32.7	36.4	31.8			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	26.6	0.2			10.4	1.7	32.7	36.4	31.8			
LOS	C	A			B	A	C	D	C			
Approach Delay		3.9			8.3			33.6				
Approach LOS		A			A			C				
Queue Length 50th (ft)	28	0			51	0	76	76	70			
Queue Length 95th (ft)	31	0			94	7	118	121	111			
Internal Link Dist (ft)		833			684			603			409	
Turn Bay Length (ft)	830					480	180		180			
Base Capacity (vph)	366	2440			1626	753	425	358	419			
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	0.26	0.24			0.38	0.26	0.41	0.46	0.38			

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 51 (68%), Referenced to phase 2:EBWB, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 13.1
 Intersection Capacity Utilization 46.4%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: I-91 NB Exit 15 Off-Ramp/I-91 NB Exit 15 On-Ramp & Route 68 (Barnes Road)



Lanes, Volumes, Timings

Holiday Build With Improvement

3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	281	454	15	3	373	90	8	1	8	84	1	286
Future Volume (vph)	281	454	15	3	373	90	8	1	8	84	1	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	11	12	12	12	12
Grade (%)		0%			1%			0%			0%	
Storage Length (ft)	570		0	100		250	0		0	345		0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	50			100			0			130		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850		0.862				0.850
Flt Protected	0.950			0.950			0.950				0.953	
Satd. Flow (prot)	1597	3557	0	1796	3522	1607	1685	1583	0	0	1742	1196
Flt Permitted	0.950			0.950			0.693				0.720	
Satd. Flow (perm)	1597	3557	0	1796	3522	1607	1229	1583	0	0	1316	1196
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				113		11				297
Link Speed (mph)		35			35			30				30
Link Distance (ft)		764			751			251				720
Travel Time (s)		14.9			14.6			5.7				16.4
Peak Hour Factor	0.78	0.78	0.78	0.80	0.80	0.80	0.75	0.75	0.75	0.86	0.86	0.86
Heavy Vehicles (%)	13%	1%	0%	0%	2%	0%	0%	0%	0%	4%	0%	35%
Adj. Flow (vph)	360	582	19	4	466	113	11	1	11	98	1	333
Shared Lane Traffic (%)												
Lane Group Flow (vph)	360	601	0	4	466	113	11	12	0	0	99	333
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			10				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.01	1.01	1.01	1.09	1.04	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		12	15		12	15		12	15		12
Turn Type	Prot	NA		Prot	NA	Prot	Perm	NA		Perm	NA	pm+ov
Protected Phases	1	1 2		3	2 3	2 3		4			4	1
Permitted Phases							4			4		4
Detector Phase	1	1 2		3	2 3	2 3	4	4		4	4	1
Switch Phase												
Minimum Initial (s)	5.0			5.0			7.0	7.0		7.0	7.0	5.0
Minimum Split (s)	10.4			10.3			11.9	11.9		11.9	11.9	10.4
Total Split (s)	17.0			11.0			17.0	17.0		17.0	17.0	17.0
Total Split (%)	22.7%			14.7%			22.7%	22.7%		22.7%	22.7%	22.7%
Maximum Green (s)	11.6			5.7			12.1	12.1		12.1	12.1	11.6
Yellow Time (s)	3.0			4.3			3.6	3.6		3.6	3.6	3.0
All-Red Time (s)	2.4			1.0			1.3	1.3		1.3	1.3	2.4
Lost Time Adjust (s)	0.0			0.0			0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.4			5.3			4.9	4.9		4.9	4.9	5.4
Lead/Lag	Lead			Lead			Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?												

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.1
Total Split (s)	30.0
Total Split (%)	40%
Maximum Green (s)	23.9
Yellow Time (s)	4.8
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	

Lanes, Volumes, Timings

Holiday Build With Improvement

3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)

Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	2.0			1.5			2.0	2.0		2.0	2.0	2.0
Recall Mode	None			None			None	None		None	None	None
Act Effct Green (s)	22.8	46.8		5.2	28.4	28.4	9.8	9.8			9.8	35.1
Actuated g/C Ratio	0.30	0.62		0.07	0.38	0.38	0.13	0.13			0.13	0.47
v/c Ratio	0.74	0.27		0.03	0.35	0.17	0.07	0.06			0.58	0.46
Control Delay	42.0	4.6		33.0	16.9	3.4	28.1	16.3			43.9	5.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay	42.0	4.6		33.0	16.9	3.4	28.1	16.3			43.9	5.4
LOS	D	A		C	B	A	C	B			D	A
Approach Delay		18.6			14.4			22.0			14.2	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)	125	39		2	82	0	5	0			44	8
Queue Length 95th (ft)	#332	48		10	84	18	15	11			84	57
Internal Link Dist (ft)		684			671			171			640	
Turn Bay Length (ft)	570			100		250						
Base Capacity (vph)	484	2504		136	1344	683	198	264			212	717
Starvation Cap Reductn	0	0		0	0	0	0	0			0	0
Spillback Cap Reductn	0	0		0	0	0	0	0			0	0
Storage Cap Reductn	0	0		0	0	0	0	0			0	0
Reduced v/c Ratio	0.74	0.24		0.03	0.35	0.17	0.06	0.05			0.47	0.46

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 42 (56%), Referenced to phase 2:EBWB, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 16.5

Intersection LOS: B

Intersection Capacity Utilization 53.1%

ICU Level of Service A

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: Hilton Garden Inn/Research Parkway & Route 68 (Barnes Road)



Lane Group	Ø2
Vehicle Extension (s)	2.5
Recall Mode	C-Min
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings
4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build With Improvement
Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	1	166	0	0	0	104	268	47	204	0
Future Volume (vph)	0	0	1	166	0	0	0	104	268	47	204	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	170		0	140		0	115		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	0			25			130			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850							0.850			
Flt Protected				0.950						0.950		
Satd. Flow (prot)	1900	1615	0	1805	1900	0	1900	1743	1615	1805	1743	0
Flt Permitted				0.755						0.682		
Satd. Flow (perm)	1900	1615	0	1434	1900	0	1900	1743	1615	1296	1743	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		591							298			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		196			203			720			478	
Travel Time (s)		4.5			4.6			16.4			10.9	
Peak Hour Factor	0.25	0.25	0.25	0.88	0.88	0.88	0.90	0.90	0.90	0.82	0.82	0.82
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	9%	0%
Adj. Flow (vph)	0	0	4	189	0	0	0	116	298	57	249	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	189	0	0	0	116	298	57	249	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Right	Right	Left	Left	Right	Right	Right	Right
Median Width(ft)		24			30			12			12	
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm			Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			4			2		1	2	
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		15.0	15.0	15.0	4.5	15.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		21.0	21.0	21.0	9.0	21.0	
Total Split (s)	40.0	40.0		40.0	40.0		51.0	51.0	51.0	9.0	51.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		51.0%	51.0%	51.0%	9.0%	51.0%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	5.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		6.0	6.0	6.0	4.0	6.0	
Lead/Lag							Lag	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	

Lanes, Volumes, Timings
 4: Research Parkway & Food Bank Driv/Site Drive 1

Holiday Build With Improvement
 Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	
Act Effct Green (s)		12.0		12.0				19.1	19.1	23.9	19.1	
Actuated g/C Ratio		0.25		0.25				0.40	0.40	0.51	0.40	
v/c Ratio		0.00		0.52				0.17	0.36	0.08	0.35	
Control Delay		0.0		21.6				12.5	3.4	6.0	13.9	
Queue Delay		0.0		0.0				0.0	0.0	0.0	0.0	
Total Delay		0.0		21.6				12.5	3.4	6.0	13.9	
LOS		A		C				B	A	A	B	
Approach Delay					21.6			6.0				12.5
Approach LOS					C			A				B
Queue Length 50th (ft)		0		44				22	0	6	51	
Queue Length 95th (ft)		0		105				58	41	20	104	
Internal Link Dist (ft)		116			123			640			398	
Turn Bay Length (ft)				170						115		
Base Capacity (vph)		1371		1093				1604	1510	709	1604	
Starvation Cap Reductn		0		0				0	0	0	0	
Spillback Cap Reductn		0		0				0	0	0	0	
Storage Cap Reductn		0		0				0	0	0	0	
Reduced v/c Ratio		0.00		0.17				0.07	0.20	0.08	0.16	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	47.3
Natural Cycle:	45
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.52
Intersection Signal Delay:	11.4
Intersection LOS:	B
Intersection Capacity Utilization:	38.7%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 4: Research Parkway & Food Bank Driv/Site Drive 1



Lanes, Volumes, Timings
5: Josheph Carini Rd

Holiday Build With Improvement
Timing Plan: PM Peak Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	1	103	250	0
Future Volume (vph)	0	1	1	103	250	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fl _t Protected						
Satd. Flow (prot)	1644	0	0	1744	1743	0
Fl _t Permitted						
Satd. Flow (perm)	1644	0	0	1744	1743	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	609			478	1218	
Travel Time (s)	13.8			10.9	27.7	
Peak Hour Factor	0.25	0.25	0.83	0.83	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	9%	9%	0%
Adj. Flow (vph)	0	4	1	124	294	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	0	125	294	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	0	1	1	103	250	0
Future Vol, veh/h	0	1	1	103	250	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	83	83	85	85
Heavy Vehicles, %	0	0	0	9	9	0
Mvmt Flow	0	4	1	124	294	0

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	420	294	294	0	0
Stage 1	294	-	-	-	-
Stage 2	126	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	594	750	1279	-	-
Stage 1	761	-	-	-	-
Stage 2	905	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	593	750	1279	-	-
Mov Cap-2 Maneuver	593	-	-	-	-
Stage 1	760	-	-	-	-
Stage 2	905	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.8	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1279	-	750	-	-
HCM Lane V/C Ratio	0.001	-	0.005	-	-
HCM Control Delay (s)	7.8	0	9.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lanes, Volumes, Timings
6: Research Parkway & Private Drive

Holiday Build With Improvement
Timing Plan: PM Peak Gen



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	0	103	249	0
Future Volume (vph)	0	1	0	103	249	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	1			0
Taper Length (ft)	0		50			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	1900	1615	1900	1743	1696	0
Flt Permitted						
Satd. Flow (perm)	1900	1615	1900	1743	1696	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	308			752	493	
Travel Time (s)	7.0			17.1	11.2	
Peak Hour Factor	0.25	0.25	0.81	0.81	0.77	0.77
Heavy Vehicles (%)	0%	0%	0%	9%	12%	0%
Adj. Flow (vph)	0	4	0	127	323	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	0	127	323	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	23.1%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	0	103	249	0
Future Vol, veh/h	0	1	0	103	249	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	81	81	77	77
Heavy Vehicles, %	0	0	0	9	12	0
Mvmt Flow	0	4	0	127	323	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	450	323	323	0	-	0
Stage 1	323	-	-	-	-	-
Stage 2	127	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	571	723	1248	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	904	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	571	723	1248	-	-	-
Mov Cap-2 Maneuver	571	-	-	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	904	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1248	-	-	723	-	-
HCM Lane V/C Ratio	-	-	-	0.006	-	-
HCM Control Delay (s)	0	-	0	10	-	-
HCM Lane LOS	A	-	A	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	-

Lanes, Volumes, Timings
7: Research Parkway & Carpenter Lane

Holiday Build With Improvement
Timing Plan: PM Peak Gen



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	23	19	3	115	15	56	7	82	14	11	131	22
Future Volume (vph)	23	19	3	115	15	56	7	82	14	11	131	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.990			0.959			0.982			0.982	
Fl _t Protected		0.975			0.970			0.997			0.997	
Satd. Flow (prot)	0	1834	0	0	1767	0	0	1710	0	0	1685	0
Fl _t Permitted		0.975			0.970			0.997			0.997	
Satd. Flow (perm)	0	1834	0	0	1767	0	0	1710	0	0	1685	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		607			1354			493			424	
Travel Time (s)		13.8			30.8			11.2			9.6	
Peak Hour Factor	0.64	0.64	0.64	0.66	0.66	0.66	0.72	0.72	0.72	0.67	0.67	0.67
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	12%	6%
Adj. Flow (vph)	36	30	5	174	23	85	10	114	19	16	196	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	71	0	0	282	0	0	143	0	0	245	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	19	3	115	15	56	7	82	14	11	131	22
Future Vol, veh/h	23	19	3	115	15	56	7	82	14	11	131	22
Peak Hour Factor	0.64	0.64	0.64	0.66	0.66	0.66	0.72	0.72	0.72	0.67	0.67	0.67
Heavy Vehicles, %	0	0	0	0	0	0	0	11	0	0	12	6
Mvmt Flow	36	30	5	174	23	85	10	114	19	16	196	33
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9	11	9.4	10.4
HCM LOS	A	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	51%	62%	7%
Vol Thru, %	80%	42%	8%	80%
Vol Right, %	14%	7%	30%	13%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	103	45	186	164
LT Vol	7	23	115	11
Through Vol	82	19	15	131
RT Vol	14	3	56	22
Lane Flow Rate	143	70	282	245
Geometry Grp	1	1	1	1
Degree of Util (X)	0.2	0.105	0.382	0.333
Departure Headway (Hd)	5.023	5.393	4.878	4.891
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	705	669	730	727
Service Time	3.119	3.393	2.96	2.976
HCM Lane V/C Ratio	0.203	0.105	0.386	0.337
HCM Control Delay	9.4	9	11	10.4
HCM Lane LOS	A	A	B	B
HCM 95th-tile Q	0.7	0.4	1.8	1.5

Lanes, Volumes, Timings
8: Site Drive 2 & Carpenter Lane

Holiday Build With Improvement
Timing Plan: PM Peak Gen



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Volume (vph)	44	0	0	26	160	0
Future Volume (vph)	44	0	0	26	160	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Flt Protected					0.950	
Satd. Flow (prot)	1863	0	0	1863	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	0	0	1863	1770	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	1354			442	652	
Travel Time (s)	30.8			10.0	14.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	0	0	28	174	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	0	0	28	174	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.9%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	6.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	44	0	0	26	160	0
Future Vol, veh/h	44	0	0	26	160	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	0	0	28	174	0

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	48	0	76	48
Stage 1	-	-	-	-	48	-
Stage 2	-	-	-	-	28	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1559	-	927	1021
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	995	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1559	-	927	1021
Mov Cap-2 Maneuver	-	-	-	-	927	-
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	995	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	927	-	-	-	1559	-
HCM Lane V/C Ratio	0.188	-	-	-	-	-
HCM Control Delay (s)	9.8	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	-	0	-

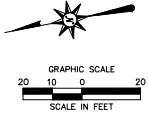
TRUCK TURNING TEMPLATES



TURNING MOVEMENT: BARNES ROAD AT RESEARCH PARKWAY - SCENARIO 1



TURNING MOVEMENT: BARNES ROAD AT RESEARCH PARKWAY - SCENARIO 2



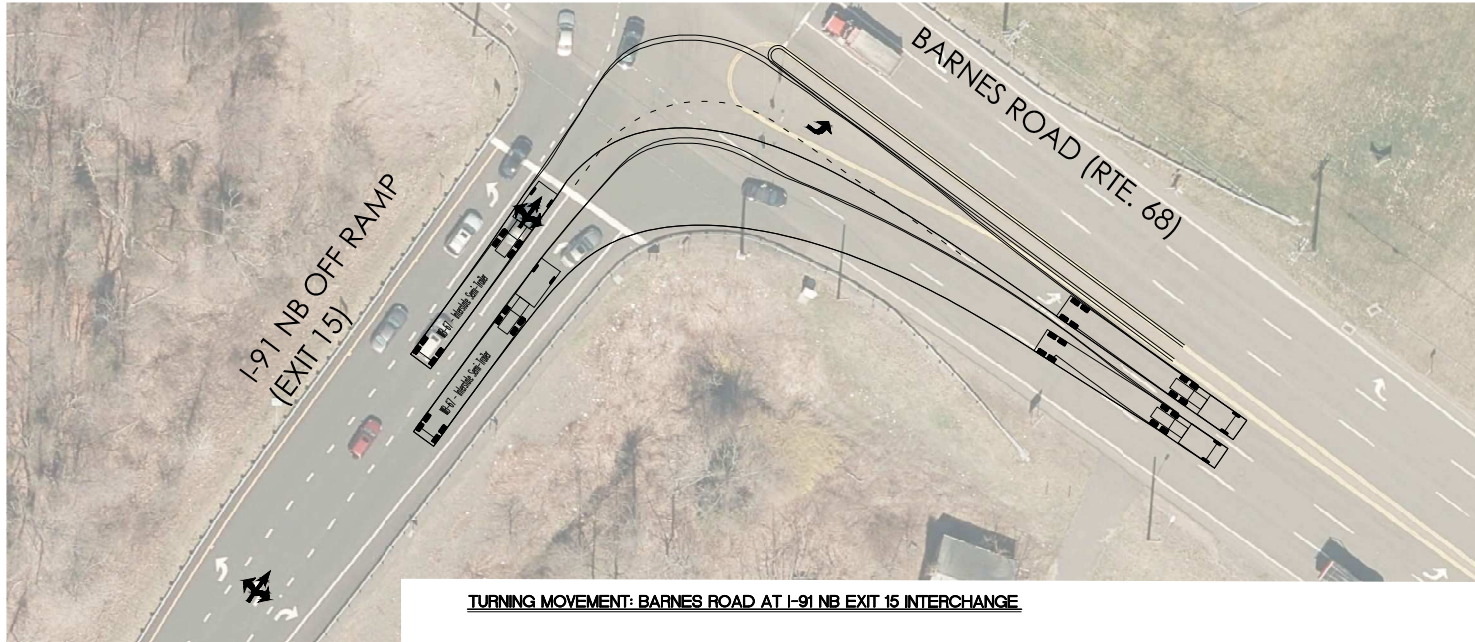
REV/NO	DATE	DESC.

Designed	D.W.G.
Drawn	D.W.G.
Reviewed	M.W.D.
Scale	1"=20'
Project No.	1801479
Date	04/22/2021
CAD File	02111014791

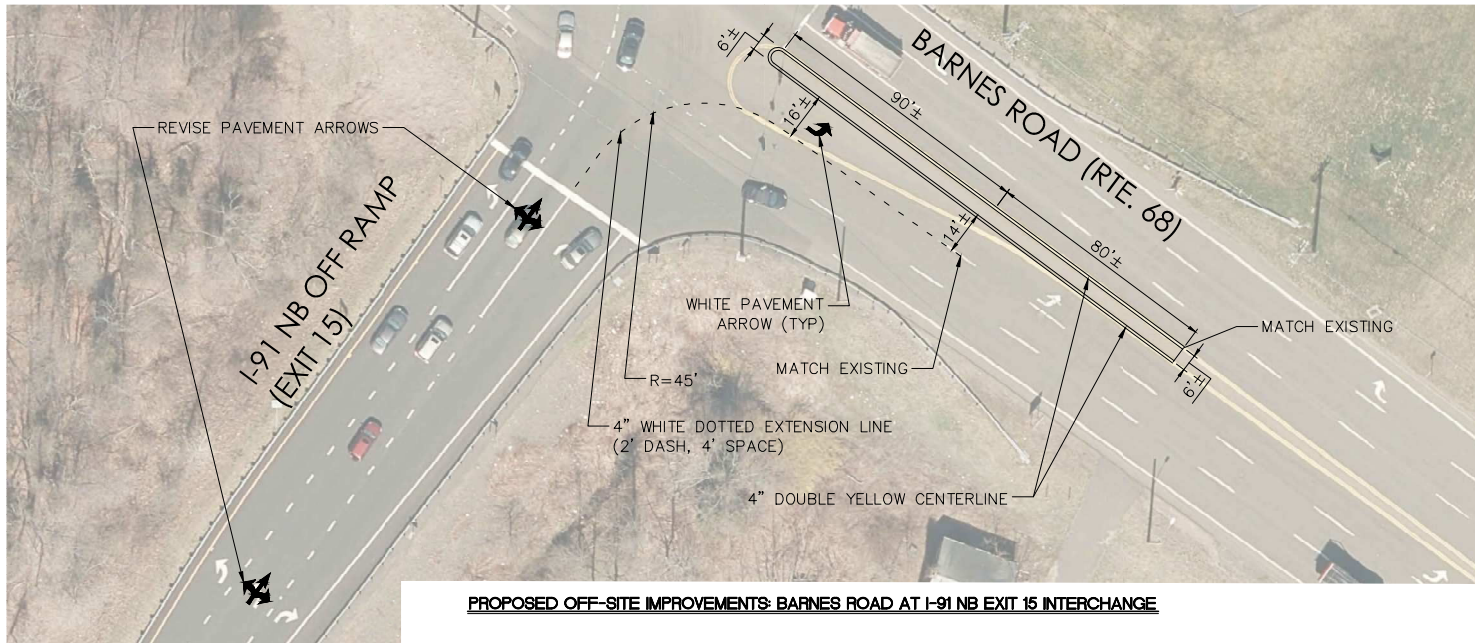
OFF-SITE TRUCK TURNING MOVEMENTS

Sheet No.

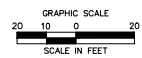
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TURNING MOVEMENT: BARNES ROAD AT I-91 NB EXIT 15 INTERCHANGE



PROPOSED OFF-SITE IMPROVEMENTS: BARNES ROAD AT I-91 NB EXIT 15 INTERCHANGE



REV/NO	DATE	DESC.

Designed	D.W.G.
Drawn	D.W.G.
Reviewed	M.W.D.
Scale	1"=20'
Project No.	1001479
Date	04/22/2021
CAD File	01111014791