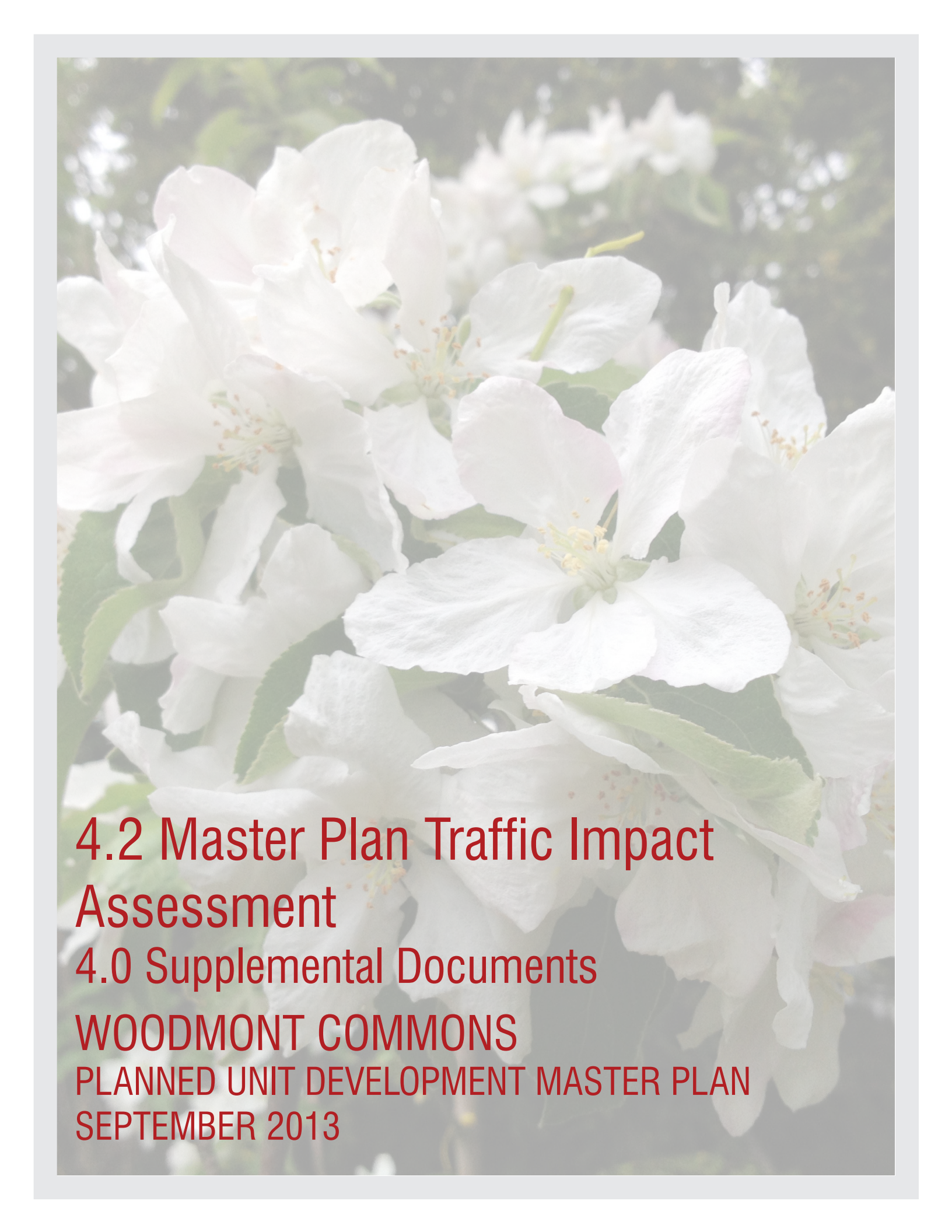




4.2 Master Plan Traffic Impact Assessment

4.0 Supplemental Documents

WOODMONT COMMONS

PLANNED UNIT DEVELOPMENT MASTER PLAN

SEPTEMBER 2013



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Master Plan Traffic Impact Assessment

TO: Ms. Cynthia May, ASLA
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DATE: February 6, 2013

FROM: Kevin R. Dandrade, PE, PTOE, Principal
Rebecca L. Brown, P.E., Senior Traffic Engineer

PROJECT NO.: T0378

RE: Woodmont Commons Planned Unit Development - Londonderry, NH
Master Plan Traffic Impact Assessment

INTRODUCTION

TEC, Inc. has been retained by Pillsbury Realty Development, LLC, the principal developer of the project, to prepare a Master Plan Traffic Analysis for the proposed Woodmont Commons Planned Unit Development (PUD) in Londonderry, New Hampshire. The project consists of mixed-use development on both sides of Interstate 93 (I-93) in an area bounded by Nashua Road (Route 102) to the south; Gilcreast Road and Hardy Road to the west; the proposed I-93 Exit 4A to the north; and Folsom Road and Ash Street to the east. For the purposes of this analysis, the project is assumed to consist of the construction of approximately 350 residential units, 350,000 SF of retail space, 400,000 SF of office space, a 200-room hotel, and 250,000 SF of hospital space to the east of I-93. The project also consists of approximately 1,080 residential units, 532,500 SF of retail space, 300,000 SF of office space, and a 350-room hotel to the west of I-93.

The layout of the site and level of development intensity is consistency with TND Figure 3A entitled 'Exemplar Plan' as recently submitted to the Town for review. The exemplar is one potential development scenario that allows for base-level study of traffic generation, capture, and tolerances. Once the exemplar has been studied, various 'sensitivity analyses' can be conducted to consider and test variables most likely to shift in the build-out scenarios. For example, the proposed hospital space could shift to west side of the interstate highway and should be examined in that location to ensure that reasonable mitigation measures are also available for that placement. However, this shift of uses within and between sub-regions is not expected to materially change the level of impact to the public street intersections on the periphery of the PUD.

Within this document, TEC evaluates the traffic operations for the proposed site driveways and the intersections immediately surrounding the site under existing and future conditions. The future year planning horizon examines traffic operations under existing conditions (2011/2012), as well as a 20-year design horizon (2032) for traffic-volume projections, which includes an evaluation of the no-build conditions (without the proposed PUD) and build conditions (with Woodmont Commons traffic added). These conditions are compared to determine what, if any, off-site improvements are necessary to provide reasonable traffic operations in the area if the

zone change were approved and testing a potential build out scenario reached at the end of the twenty year period.

The proposed PUD is expected to incorporate upgrades to existing roadways, such as Pillsbury Road, as the function of the roadway changes. As part of the project, the character of Pillsbury Road will change from a higher-speed rural cross town collector/arterial roadway to a village-type connector roadway tying the various sub-regions of the PUD together. With the cooperation of the Town, It will likely be constructed with more multi-modal and landscape treatments consistent with the other roadways in the PUD. These treatments will likely include sidewalks, street trees, and bike lanes on each side of the roadway between Hardy Road and Londonderry Road, and pedestrian-scaled lighting. With the cross-connection between the easterly and westerly portions of the PUD, it is important to have an attractive and efficient multi-modal facility with sufficient capacity at key intersections. Although this roadway will still permit “cut-through” traffic between Londonderry and Derry, it is expected to primarily serve as the main east-west boulevard for this new destination and manage travel demand in a manner consistent with the character of the PUD.

When evaluating the capacity of intersections under a 20-year design horizon, the project team assumed improvements that would target a high utilization of the capacity. In some cases, given the conservatism of the 20-year projections, the 2032 intersections’ overall capacity approach level of service D or E. This is appropriate for a master plan-level assessment of the needs within a long-term horizon that considers consistent growth of background traffic and the introduction of new trips associated with the PUD. Based on the Town’s ordinances and guidelines, additional traffic studies will be performed at the site plan review stage for various phases of development to reassess the capacity of study area intersections based on newer counts.

EXISTING CONDITIONS

Traffic Study Area

The study area was selected to contain the major roadways providing local access to the project site and was identified in coordination with Town of Londonderry and Howard/Stein-Hudson Associates, Inc. (HSH) staff. The following intersections were included in the study area:

1. Nashua Road (NH Route 102) / Gilcreast Road
2. Nashua Road (NH Route 102) / Garden Lane / Hampton Drive
3. Garden Lane / Londonderry Commons / Market Basket Driveway
4. Nashua Road (NH Route 102) / Interstate 93 Southbound Ramps
5. Nashua Road (NH Route 102) / Interstate 93 Northbound Ramps
6. Nashua Road (NH Route 102) / West Broadway (NH Route 102) / Londonderry Road / St. Charles Street
7. Pillsbury Road / Mammoth Road (NH Route 128)
8. Pillsbury Road / Hardy Road
9. Pillsbury Road / Gilcreast Road
10. Pillsbury Road / PUD Northwest Main Drive [proposed]
11. Pillsbury Road / Orchard Drive [proposed]
12. Ash Street / Londonderry Road / PUD East Main Drive [proposed]
13. Ash Street Extension / North High Street
14. Hardy Road / Hovey Road
15. Exit 4A Connector Road / PUD East Main Drive [proposed]

The study area intersections are shown graphically in Figure 1 in the Figures Section following the text.

Existing Traffic Volumes

In order to establish existing traffic-volume conditions within the study area, manual turning movement counts (TMC's) were conducted at the study area intersections on Thursday, August 4, 2011, September 8, 2011, and December 6, 2012 during the weekday morning (7:00 to 9:00 AM) and weekday evening (4:00 to 6:00 PM) peak period. A detailed summary of the turning movement counts, partitioned into 15-minute intervals, is provided within Appendix B.

In addition, Automatic Traffic Recorder (ATR) counts were conducted concurrently with the TMCs on August 4 to August 8, 2011 at three locations within the study area to gather daily traffic-volume data during a continuous 120-hour time period. A summary of the Weekday ATR traffic data is presented in Table 1. A detailed summary of the ATR data, partitioned into 15-minute intervals, is provided within Appendix C.

Table 1 - Existing Weekday Traffic Volume Summary^a

Location	Weekday Traffic Volume ^b	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
		Traffic Volume ^c	K Factor ^d	Directional Distribution ^e	Traffic Volume	K Factor	Directional Distribution
Pillsbury Road, east of Gilcreast Road	6,180	360	5.8	53.9% WB	605	9.8	50.0% WB
Gilcreast Road, south of Pillsbury Road	10,665	640	6.0	72.3% SB	1,025	9.6	57.8% NB
Garden Lane, south of Londonderry Commons	11,750	435	3.7	62.8% NB	1,215	10.3	50.4% SB

^aTwo-way traffic volume

^bDaily traffic expressed in vehicles per day.

^cExpressed in vehicles per hour.

^dPercent of daily traffic volumes which occurs during the peak hour.

^ePercent of peak-hour volume in the predominant direction of travel.

SB = southbound; NB = northbound; WB = westbound

As detailed in Table 1, Pillsbury Road currently carries approximately 6,180 vehicles per day (vpd) on an average weekday. Gilcreast Road services approximately 10,665 vpd on an average weekday. Garden Lane carries approximately 11,750 vpd on an average weekday.

Seasonal Adjustment

Traffic volumes are typically adjusted to reflect average-month conditions in accordance with New Hampshire Department of Transportation (NHDOT) standards for preparation of a traffic study. A review of historic traffic volume counts collected by NHDOT at the permanent count stations on Route 28 in Windham (at the Windham and Derry Town Line) and on Interstate 93 (at the Windham and Derry Town Line) indicated that traffic volumes in August are 4.0 percent lower than peak-month conditions during the weekday morning peak period and 2.1 percent lower than peak-month conditions during the weekday evening peak period. The historic traffic volume counts also indicated that traffic volumes in September are 1.0 percent lower than peak-month conditions during the weekday morning peak period and 2.8 percent lower than peak-month conditions during the weekday evening peak period. The historic traffic volume counts also indicated that traffic volumes in December are 15.0 percent lower than peak-month conditions during the weekday morning peak period and 9.0 percent lower than peak-month conditions during the weekday evening peak period. Therefore, the August 2011, September 2011, and December 2012 traffic counts were increased accordingly to reflect peak-month conditions. The compiled seasonal adjustment data is provided in Appendix D. The resulting Existing Conditions traffic volumes are shown graphically in Figure A-1 of Appendix A.

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2032, which reflects a 20-year planning horizon in accordance with Town of Londonderry Master Plan. The traffic conditions for the year 2032, under No-Build conditions, were developed to document the operating conditions independent of the project, including all existing traffic, new traffic resulting from background growth, and traffic to be generated by the potential re-occupancy of vacant space within the Market Basket plaza. Traffic volumes for the proposed Woodmont Commons PUD and diverted traffic resulting from the opening of Interchange 4A along Interstate 93 were superimposed upon the No-Build traffic networks to reflect the Build conditions with the proposed project.

Background Traffic Growth

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

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

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

General Background Growth

Traffic-volume data compiled from the Southern New Hampshire Planning Commission (SNHPC) count stations within the vicinity of the study area intersections was researched in order to determine traffic growth trends. These sources show that traffic is increasing at a rate of approximately 0.35% per year. In order to provide a conservative (worse case) analysis scenario, Town staff asked TEC to use a 1.0% growth rate compounded annually along Nashua Road (Route 102) and a 0.5% growth rate compounded annually along all other Town roadways to account for general background traffic growth and private developments (or redevelopments) not yet identified. Although this may be a highly conservative assumption over a 20-year horizon, it was used as a speculative test of capacity along the Route 102 corridor. Count station data have been included in Appendix E.

Re-occupancy of Existing Retail Space

The Market Basket Plaza currently contains 97,900 SF of vacant retail space which could be re-occupied “by-right” by a similar land use without additional permitting. Trips generated by re-occupancy of the existing 97,900 SF of vacant retail space were estimated based on standard trip rates obtained from the Institute of Transportation Engineers (ITE) publication *Trip Generation*, 9th Edition for Land Use Code (LUC) 820 – Shopping Center.

The distribution of re-occupancy traffic volumes was based upon existing travel patterns within the study area. Approximately 40 percent of the site-generated traffic is anticipated to/from Nashua Road (NH Route 102) to the east, 40 percent to/from Nashua Road (NH Route 102) to the west, ten percent from Gilcreast Road from the south, three percent from Hampton Drive from the south, six percent from Pillsbury Road to the west, and one percent from Ash Street to the

east.

The resulting trips generated by re-occupancy of the plaza are illustrated in Figure F-1 for the weekday evening and Saturday midday peak periods, respectively. Trip generation calculations for the re-occupancy of existing vacant space are provided in Appendix F.

No-Build Traffic Volumes

The 2032 No-Build weekday morning and evening peak-hour traffic-volume networks were developed by applying the annual background traffic growth rate to the Existing peak-hour traffic volumes over 21 years (20 years for intersection of Hovey Road / Hardy Road), and adding the traffic to be generated by the re-occupancy of the existing vacant space within the Market Basket Plaza. The resulting 2032 No-Build weekday morning and evening peak hour traffic volumes are illustrated in Figure A-2 in Appendix A.

Orchard Drive Diversions and Redistribution

A significant volume of traffic is currently utilizing Gilcreast Road to travel between Pillsbury Road/ Ash Street and Nashua Road (NH Route 102). As part of the introduction of the Orchard Drive connection between Pillsbury Road and Nashua Road, it was assumed that some traffic will utilize the proposed Orchard Drive as an alternative access either Pillsbury Road to the north or Nashua Road (NH Route 102) to the south. The following four separate network movements were considered to have potential for diverted cut-through traffic:

- Pillsbury Road EB to Nashua Road EB via Gilcreast Road,
- Ash Street WB to Nashua Road WB via Pillsbury Road and Gilcreast Road,
- Nashua Road EB to Ash Road EB via Gilcreast Road and Pillsbury Road, and
- Nashua Road WB to Pillsbury Road WB via Gilcreast Road.

It was assumed that approximately 20 percent of the traffic for each of these movements would alter their existing route utilizing the proposed Orchard Drive instead of Gilcreast Road. This is based on a combination of origin-destination data and the understanding that delays for access to Route 102 will be generally balanced via Orchard Road and Gilcreast Road.

In addition, the traffic generated by the existing Market Basket plaza that originates or is destined to Pillsbury Road or points north is anticipated to redistribute from accessing/egressing Nashua Road (NH Route 102). In order to establish future traffic-volume conditions at the proposed Orchard Drive, an origin-destination study (O-D Study) was conducted at key intersections along Pillsbury Road and Nashua Road (NH Route 102) on Tuesday, August 9, 2011 during the weekday evening peak period (3:00 PM – 6:00 PM). License plate data was collected at designated locations, which was later analyzed to determine the percentage of vehicles entering the Market Basket Plaza who originated from Ash Street east of Londonderry Street and Pillsbury Road west of Gilcreast Road, as well as the percentage of vehicles exiting Market Basket Plaza destined for Ash Street and Pillsbury Road.

License plate data was collected for the following intersection movements:

- Ash Street westbound motorists turning left onto Londonderry Road southbound (Pillsbury Road / Ash Street / Londonderry Road)
- Pillsbury Road eastbound motorists travelling through onto Gilcreast Road southbound (Pillsbury Road / Gilcreast Road)

- Londonderry Commons Driveway eastbound motorists turning left into Market Basket Plaza (Garden Lane / Market Basket Plaza / Londonderry Commons Driveway)
- Garden Street northbound motorists travelling through into Market Basket Plaza (Garden Lane / Market Basket Plaza / Londonderry Commons Driveway)

This data was utilized to estimate the number of vehicles that conducted the O-D movements in order to redistribute a percentage of those vehicles to the proposed Orchard Drive. The results of the O-D Study showed that 5.3 percent of all Market Basket Plaza entering trips originate north of the Pillsbury Road / Gilcreast Road intersection and 0.5 percent of all Market Basket Plaza trips originate east of the Pillsbury Road / Ash Street / Londonderry Street intersection. Of the 5.3 percent originating north of the Pillsbury Road / Gilcreast Road intersection, 69.8 percent of those trips (3.7 percent of total trips) enter the Market Basket Plaza via the Londonderry Commons Plaza driveway on the easterly side of Gilcreast Road. The remaining 30.2 percent of those trips (1.6 percent of total trips) enter the Market Basket Plaza via Garden Street / Nashua Road (NH Route 102).

As an example, the redistribution of the existing 50-60 existing evening peak hour vehicle trips shown in Figure A-4 has a relatively minor impact to the network of streets. The Orchard Drive connection should be explored independent of the proposed PUD as it will be helpful as it will allow traffic to seek an alternative route with balanced delays. The redistribution of existing traffic volumes associated with the opening of proposed Orchard Drive is graphically depicted in Figures A-3 and A-4 of Appendix A. A detailed summary of the origin-destination data and current travel trends is provided within Appendix F.

Interchange 4A Diversions

The Towns of Londonderry and Derry and NHDOT are currently permitting and designing a new highway interchange from I-93 designated as Exit 4A, which will be located between Exit 4 and Exit 5 and provide access to and from the east. In consultation with Town staff, Exit 4A will be included as part of the 20-year assessment of the exemplar baseline assumptions. The following traffic movements were assumed to divert to I-93 Exit 4A:

- From Folsom Road to I-93 via Londonderry Street (100%)
- From Folsom Road to I-93 via Londonderry Street (100%)
- From I-93 S to Folsom Road via Londonderry Street (100%)
- From I-93 N to Folsom Road via Londonderry Street (100%)
- From Folsom Road to I-93 N via North High Street / Elm Street (5%)
- From Folsom Road to I-93 S via North High Street / Elm Street (5%)
- From I-93 S to Folsom Road via North High Street / Elm Street (50%)
- From I-93 N to Folsom Road via North High Street / Elm Street (50%)
- From Derry (Route 28) to I-93 N via Route 28 (25%)
- From Derry (Route 28) to I-93 S via Route 28 (25%)
- From I-93 S to Derry (Route 28) via Route 28 (25%)
- From I-93 N to Derry (Route 28) via Route 28 (25%)
- Beacon Neighborhood to I-91 N via Londonderry Road (25%)
- Beacon Neighborhood to I-93 N via North High Street / Elm Street (5%)
- I-93 to Beacon Neighborhood via Londonderry Road (25%)
- I-93 N to Beacon Neighborhood via North High Street / Elm Street (5%)
- From I-93 N to Derry via I-93 Exit 5 (15%)
- From Derry to I-93 N via I-93 Exit 5 (15%)

In addition, traffic destined for points beyond those designated above may also utilized the new Exit 4A interchange. CLD Consulting Engineers, Inc. prepared a traffic study, which was included in the Final Environmental Impact Statement for the Exit 4A interchange. TEC obtained 2030 Build traffic volumes from this document, which were used to estimate the additional volume of traffic that would utilize Exit 4A under future year conditions. The resulting I-93 traffic diversion is presented in Figure A-5 in Appendix A.

Site-Generated Traffic Volumes

For the purposes of this analysis, the Woodmont Commons PUD is assumed to consist of the construction of approximately 350 residential units, 350,000 SF of retail space, 400,000 SF of office space, a 200-room hotel, and 250,000 SF of hospital space to the east of I-93. In addition, the PUD will consist of approximately 1,080 residential units, 532,500 SF of retail space, 300,000 SF of office space, and a 350-room hotel to the west of I-93. The residential units will be a mix of single-family, cottages, duplexes, and attached residences. For the purposes of this analysis, the residential units were assumed to consist of a Residential Planned Unit Development.

The Project-generated traffic volumes were estimated based on trip rates obtained from the Institute of Transportation Engineers publication *Trip Generation, 9th Edition* for the following Land Use Codes:

- LUC 270 – Residential Planned Unit Development
- LUC 310 – Hotel
- LUC 610 – Hospital
- LUC 710 – General Office
- LUC 820 – Shopping Center

The following land uses, as identified in Table 2, were assumed as part of the TIA and fall under the allowable overall maximas for the PUD and the recommended maximas for each sub-area:

Table 2 – Summary of Land Uses

	<u>West Side</u>	<u>East Side</u>	<u>Total</u>
Residential (# units)	1,080	350	1,430
Hospital (# beds)	-	300	300
Hotel (# rooms)	350	200	550
Commercial Office (SF)	300,000	400,000	700,000
Retail / Shopping Center (SF)	532,500	350,000	882,500

As the development along either side of I-93 will experience different trip distribution patterns, site-generated traffic volumes for the East and West portions of the proposed PUD were estimated separately. Table 3 provides a summary of the site-generated trips for the West portion Table 4 provides a summary for the East portion.

Table 3 - Site-Generated Trips Summary – West Portion

Time Period	Residential LUC 270	Hotel LUC 310	Office LUC 710	Retail LUC 820	Total Trips
Weekday Daily	7,837	2,759	3,026	20,139	33,761
Weekday Morning					
Enter	119	110	406	268	903
Exit	<u>423</u>	<u>76</u>	<u>55</u>	<u>164</u>	<u>718</u>
Total	542	186	461	432	1,621
Weekday Evening					
Enter	458	107	70	882	1,517
Exit	<u>246</u>	<u>103</u>	<u>344</u>	<u>955</u>	<u>1,648</u>
Total	704	210	414	1,837	3,165

Table 4 - Site-Generated Trips Summary – East Portion

Time Period	Residential LUC 270	Hotel LUC 310	Hospital LUC 610	Office LUC 710	Retail LUC 820	Total Trips
Weekday Daily	2,907	1,417	3,305	3,765	15,331	20,053
Weekday Morning						
Enter	42	63	150	510	208	973
Exit	<u>148</u>	<u>43</u>	<u>88</u>	<u>70</u>	<u>127</u>	<u>476</u>
Total	190	106	238	580	335	1,449
Weekday Evening						
Enter	166	61	89	89	666	1,071
Exit	<u>89</u>	<u>59</u>	<u>144</u>	<u>437</u>	<u>721</u>	<u>1,450</u>
Total	255	120	233	526	1,387	2,521

Multi-Use Trips

It is reasonable to expect that some trips to the Woodmont Commons PUD will be shared between multiple land uses. For example, someone living in the residences may choose to shop at the retail or work in the office within the PUD. Therefore, a reduction in the overall trips experienced on the adjacent roadways can be anticipated as a result of multi-use trips that include stops at more than one use within the Project Area. This is often termed “trip capture” which also include trips made by walking and biking, as well as trips not made with home-based work. TEC has initially utilized an internal capture rate of 23.0 percent at the request of HSH in a memorandum entitled *Recommended Internal Capture Rates for Woodmont Commons* dated December 7, 2012. This reduced internal capture rate will provide a conservative (worse case) analysis condition.

Pass-by Trips

In addition, many of the retail trips generated by the proposed PUD are already present in the existing traffic flow passing by the Project Area. For example, some vehicles which are already on the roadways may decide to visit the retail development within the PUD on their way to another destination. These vehicle trips are known as “pass-by” trips and are subtracted from the total trips to calculate the total primary (or “new”) trips that affect the volume of traffic within the study area away from the Project Area. Based on information contained in the ITE publication *Trip Generation Handbook, 2nd Edition*, approximately 26 to 34 percent of the traffic generated by the proposed retail portion of the PUD is expected to be pass-by traffic.

Table 5 - Primary Trip Generation Characteristics (External “New” Trips only)

	<u>West Side</u>	<u>East Side</u>	<u>Total</u>
Weekday Daily (vehicle trips per day)	20,725 vpd	16,565 vpd	37,300 vpd
Weekday Morning Peak Hour (per hour)	1,140 vph	1,030 vph	2,170 vph
Weekday Evening Peak Hour (per hour)	1,955 vph	1,580 vph	3,535 vph

Trip Distribution

The distribution of site-generated traffic volumes from residential land uses was based on U.S. Census journey-to-work information for residents living within the Town of Londonderry. The distribution of site-generated traffic volumes from office uses was based on journey-to-work information for employees working in the Town of Londonderry. The distribution of site-generated traffic volumes from retail uses was based on a gravity model, which contains information on population in surrounding towns, competing opportunities, and travel time to/from the PUD. The resulting site-generated networks are presented in Figures A-6 and A-7 for the weekday morning and evening peak hours, respectively. The analysis associated with trip distribution was provided in the original PUD application materials.

TEC also assigned vehicle trips to the roadway network for trips that would remain internal to the PUD, but would travel along the roadway network between different zones of the PUD. These zones consist of the East zone (east of I-93), the Northwest zone (west of I-93 and north of Pillsbury Road), and the Southwest zone (west of I-93 and south of Pillsbury Road). A matrix was created to estimate the number of trips traveling to each zone from each zone by applying a ratio of percentage of the trips entering and exiting each of these zones to the total trips entering and exiting the PUD. A copy of this matrix is included in Attachment G.

Build Traffic Volumes

The 2032 Build condition traffic-volume network consist of the 2032 No-Build traffic-volumes with the addition of the anticipated diverted through trips, the redistribution of Market Basket Plaza traffic-volume following the opening of the Orchard Driveway, the anticipated diverted through trips to/from the proposed Interchange 4A, and the Woodmont Commons site generated traffic volumes. The resulting 2032 Build weekday morning and weekday evening peak-hour traffic-volume networks are presented in Figure A-8 of Appendix A.

TRAFFIC OPERATIONS ANALYSIS

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

Methodology

Levels of Service

A primary result of capacity analyses is the assignment of level-of-service to traffic facilities under various traffic-flow conditions.¹ The concept of level-of-service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best operating conditions for vehicles and LOS F representing the worst. Within the PUD, acceptable overall operations of streets at peak hours will likely see intersections operating at, or near, capacity because these levels of service will indicate busy and active conditions, with slower vehicle speeds. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

Queue Length Analysis

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

The vehicle queue analysis was performed using the Synchro 8.0 intersection capacity analysis software which is also based upon the methodology and procedures presented in the 2010 HCM. Synchro reports the 95th percentile queues for unsignalized intersections and both the 50th (average) and 95th percentile vehicle queues for signalized intersections, which are based on the number of vehicles that experience a delay of six seconds or more at an intersection and is a function of the traffic signal timing; vehicle arrival patterns during the analysis period; and the saturation flow rate. The 50th percentile or average vehicle queue is the average number of vehicles that are projected to be delayed by six seconds or more at the intersection under study during the analysis period. The 95th percentile vehicle queue is the vehicle queue length that will be exceeded only 5 percent of the time; or approximately three minutes out of sixty minutes during the peak one hour of the day. During the remaining fifty-seven minutes, the vehicle queue length will be less than the 95th percentile queue length.

¹The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual 2010*; Transportation Research Board; Washington, DC; 2010.

Unsignalized Intersections

The six levels of service for unsignalized intersections may be described as follows:

- LOS A represents a condition with little or no control delay to minor street traffic.
- LOS B represents a condition with short control delays to minor street traffic.
- LOS C represents a condition with average control delays to minor street traffic.
- LOS D represents a condition with long control delays to minor street traffic.
- LOS E represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
- LOS F represents a condition where minor street demand volume exceeds capacity of an approach lane, with excessive control delays resulting.

The levels of service of unsignalized intersections are determined by application of a procedure described in the *2010 Highway Capacity Manual*. Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the *2010 Highway Capacity Manual*.

Table 6 summarizes the relationship between level of service and average control delay.

Table 6 - Level-of-Service Criteria for Unsignalized Intersections^a

Level of Service	Average Control Delay (seconds per vehicle)
A	≤ 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	>50.0

^aSource: *Highway Capacity Manual 2010*; Transportation Research Board; Washington, DC; 2010

Unsignalized Intersection Capacity and Queue Analysis Results

Level-of-service analyses were conducted for Existing, No-Build, and Build conditions for the unsignalized intersections within the study area. The results of the unsignalized intersection capacity analysis are summarized in Table 7 for 2032 conditions. The capacity analysis worksheets are provided in Appendix J.

Table 7 –Unsignalized Intersection Capacity and Queue Analysis Summary

Intersection / Lane Group	Existing Conditions				2032 No-Build				2032 Build				2032 Build with Improvements				
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	
Garden Lane / Londonderry Commons / Market Basket Plaza <i>Weekday Morning Peak Period</i> Londonderry Commons EB LT Londonderry Commons EB RT Garden Lane NB approach <i>Weekday Evening Peak Period</i> Londonderry Commons EB LT* Londonderry Commons EB RT Garden Lane NB approach (* Limited to only 40 cars per hour)					(N/A - New Driveway Location)	(N/A - New Driveway Location)	(N/A – New Driveway Location)	0.26	26.8	D	25						
								0.07	10.2	B	<25						
								0.04	1.6	A	<25						
								>2.0	825.2	F	201						
								0.13	10.3	B	<25						
								0.19	5.2	A	<25						
								Nashua Road (NH Route 102) / Londonderry Road / St. Charles Street <i>Weekday Morning Peak Period</i> Nashua Road EB LT Nashua Road WB LT/TH St. Charles Street NB approach Londonderry Road SB approach <i>Weekday Evening Peak Period</i> Nashua Road EB LT Nashua Road WB LT/TH St. Charles Street NB approach Londonderry Road SB approach					See signalized results	0.24	14.0	A	<25
														0.00	0.1	A	<25
														0.57	439.8	F	35
														0.68	61.3	F	106
0.28	11.9	B	29														
0.01	0.3	A	<25														
0.08	86.7	F	<25														
1.09	145.2	F	240														
>2.0	17.6	C	30														
0.50	22.3	C	68														
0.00	0.2	A	<25														
>2.0	>999	F	NC														
>2.0	>999	F	226														
>2.0	>999	F	NC														
0.39	15.0	B	46														
0.01	0.7	A	<25														
0.22	257.0	F	<25														
>2.0	>999	F	NC														
>2.0	>999	F	NC														
Pillsbury Road / Hardy Road <i>Weekday Morning Peak Period</i> Pillsbury Road EB LT Pillsbury Road NB approach Hardy Road SB approach <i>Weekday Evening Peak Period</i> Pillsbury Road EB LT Pillsbury Road NB approach Hardy Road SB approach					See signalized results	0.02	7.3	A	<25								
						0.38	15.6	C	45								
						0.47	15.8	C	63								
						0.03	7.3	A	<25								
						0.92	47.2	E	294								
						0.34	13.5	B	38								
						0.03	7.3	A	<25								
						0.39	15.9	C	46								
						0.47	16.5	C	63								
						0.68	29.0	D	126								
0.04	7.3	A	<25														
1.12	102.7	F	497														
0.40	14.8	B	48														
0.58	24.1	B	91														
Pillsbury Road / Gilcreast Road <i>Weekday Morning Peak Period</i> Pillsbury Road WB approach Gilcreast Road NB approach Pillsbury Road SB approach <i>Weekday Evening Peak Period</i> Pillsbury Road WB approach Gilcreast Road NB approach Pillsbury Road SB approach					See signalized results	0.36	11.2	B	42								
						0.27	9.6	A	27								
						0.69	16.9	C	156								
						0.72	23.2	C	180								
						1.03	69.6	F	888								
						0.71	22.4	C	170								
						0.42	12.2	B	54								
						0.31	10.3	B	33								
						0.78	22.0	C	234								
						1.33	180.7	F	2709								
1.79	390.2	F	5527														
1.53	271.3	F	3780														
1.43	229.5	F	2967														

^a Volume-to-capacity ratio

^b Delay expressed in seconds per vehicle (average)

^c Level of service

^d 95th Percentile Queue

Table 7 – Unsignalized Intersection Capacity and Queue Analysis Summary (Continued)

Intersection / Lane Group	Existing Conditions				2032 No-Build				2032 Build				2032 Build with Improvements																
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue													
Pillsbury Road / Northwest Main Drive																													
<i>Weekday Morning Peak Period</i>																													
Pillsbury Road EB approach	(N/A – New PUD Roadway Location)				(N/A – New PUD Roadway Location)					0.01	0.2	A	<25	0.01	8.2	A	<25												
Northwest Main Drive SB approach										0.30	20.8	C	31	0.30	20.7	C	30												
<i>Weekday Evening Peak Period</i>																													
Pillsbury Road EB approach										0.07	2.0	A	<25	0.08	12.0	B	<25												
Northwest Main Drive SB approach										0.83	133.2	F	111	1.21	294.2	F	155												
Pillsbury Road / Orchard Drive																													
<i>Weekday Morning Peak Period</i>																													
Pillsbury Road WB approach	(N/A – New PUD Roadway Location)				(N/A – New PUD Roadway Location)					0.08	2.4	A	<25	See signalized results															
Orchard Drive NB approach										0.51	27.8	D	70																
<i>Weekday Evening Peak Period</i>																													
Pillsbury Road WB approach										0.22	5.7	A	<25																
Orchard Drive NB approach	>2.0	>999	F	NC																									
Pillsbury Road / Londonderry Road																													
<i>Weekday Morning Peak Period</i>																													
Pillsbury Road EB approach	-	-	-	-	-	-	-	-	0.30	6.4	A	31	See signalized results																
Pillsbury Road WB approach	0.07	2.9	A	<25	0.07	3.0	A	<25	0.02	0.8	A	<25																	
Londonderry Road NB approach	0.14	11.7	B	<25	0.15	11.9	B	<25	>2.0	>999	F	NC																	
Londonderry Road SB approach	-	-	-	-	-	-	-	-	>2.0	>999	F	NC																	
<i>Weekday Evening Peak Period</i>																													
Pillsbury Road EB approach	-	-	-	-	-	-	-	-	0.55	10.8	B	88																	
Pillsbury Road WB approach	0.07	2.2	A	<25	0.08	2.3	A	<25	0.08	2.2	A	<25																	
Londonderry Road NB approach	0.45	17.2	C	57	0.53	20.5	C	77	>2.0	>999	F	NC																	
Londonderry Road SB approach	-	-	-	-	-	-	-	-	>2.0	>999	F	NC																	
Ash Street Extension / North High Street																													
<i>Weekday Morning Peak Period</i>																													
Ash Street Extension EB approach	0.40	15.7	C	49	0.44	16.7	C	56	0.40	15.2	C	48	-	-	-	-													
Ash Street Extension EB LT	-	-	-	-	-	-	-	-	-	-	-	-	0.42	12.2	B	53													
North High Street NB approach	0.01	0.4	A	<25	0.01	0.5	A	<25	0.02	1.3	A	<25	0.23	10.1	B	<25													
North High Street SB approach	-	-	-	-	-	-	-	-	-	-	-	-	0.21	8.6	A	<25													
<i>Weekday Evening Peak Period</i>																													
Ash Street Extension EB approach	0.83	39.3	E	202	1.00	74.8	F	324	1.29	173.9	F	579	-	-	-	-													
Ash Street Extension EB LT	-	-	-	-	-	-	-	-	-	-	-	-	1.04	70.9	F	795													
North High Street NB approach	0.00	0.1	A	<25	0.00	0.1	A	<25	0.01	0.5	A	<25	0.54	17.9	C	84													
North High Street SB approach	-	-	-	-	-	-	-	-	-	-	-	-	0.43	14.0	B	56													
Hovey Road / Hardy Road																													
<i>Weekday Morning Peak Period</i>																													
Hovey Road WB approach	0.04	9.4	A	<25	0.05	9.5	A	<25	0.06	9.6	A	<25	0.06	9.6	A	<25													
Hardy Road SB approach	0.01	0.9	A	<25	0.01	0.9	A	<25	0.01	0.8	A	<25	0.01	0.8	A	<25													
<i>Weekday Evening Peak Period</i>																													
Hovey Road WB approach	0.06	9.7	A	<25	0.07	9.9	A	<25	0.08	10.4	B	<25	0.08	10.4	B	<25													
Hardy Road SB approach	0.03	1.5	A	<25	0.03	1.5	A	<25	0.04	1.7	A	<25	0.04	1.7	A	<25													

^a Volume-to-capacity ratio, ^b Delay expressed in seconds per vehicle (average)

^c Level of service, ^d 95th Percentile Queue

Table 7 – Unsignalized Intersection Capacity and Queue Analysis Summary (Continued)

Intersection / Lane Group	Existing Conditions				2032 No-Build				2032 Build				2032 Build with Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
East Main Drive / Londonderry Road																
<i>Weekday Morning Peak Period</i>																
East Main Drive EB approach									0.16	6.8	A	<25				
East Main Drive WB approach									0.08	3.5	A	<25				
Londonderry Road NB approach									>2.0	>999	F	NC				
Londonderry Road SB approach									>2.0	>999	F	NC				
<i>Weekday Evening Peak Period</i>	(N/A – New PUD Roadway Location)				(N/A – New PUD Roadway Location)								See signalized results			
Pillsbury Road EB approach									0.16	6.8	A	<25				
Pillsbury Road WB approach									0.08	3.5	A	<25				
East Main Drive EB approach									>2.0	>999	F	NC				
East Main Drive WB approach									>2.0	>999	F	NC				

^a Volume-to-capacity ratio
^b Delay expressed in seconds per vehicle (average)
^c Level of service
^d 95th Percentile Queue

Signalized Intersections

The six Levels of Service (LOS) for signalized intersections may be described as follows:

- *LOS A* describes operations with very low control delay; most vehicles do not stop at all.
- *LOS B* describes operations with relatively low control delay. However, more vehicles stop than *LOS A*.
- *LOS C* describes operations with higher control delays. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
- *LOS D* describes operations with control delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop and individual cycle failures are noticeable, whereby motorists are not able to get through the signal on one cycle.
- *LOS E* describes operations with high control delay values. Individual cycle failures are frequent occurrences.
- *LOS F* describes operations with high control delay values that often occur with over-saturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

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

Table 8 – Level-of-Service Criteria for Signalized Intersections^a

Level of Service	Average Control (Signal) Delay (Seconds per Vehicle)
A	<10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	>80.0

^aSource: *Highway Capacity Manual 2010*; Transportation Research Board
Washington, DC; 2010; page 16-2.

Signalized Intersection Capacity and Queue Analysis Results

Level-of-service analyses were conducted for Existing, No-Build, and Build conditions for the signalized intersections within the study area. The results of the signalized intersection capacity analysis are summarized in Table 9 for 2032 conditions. The capacity analysis worksheets are provided in Appendix K.

Table 9 – Signalized Intersection Capacity and Queue Analysis Summary

Intersection / Lane Group	Existing Conditions				2032 No-Build				2032 Build				2032 Build with Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Nashua Road (NH Route 102) / Gilcreast Road																
<i>Weekday Morning Peak Period</i>																
Nashua Road EB LT	0.52	46.2	D	82/151	0.57	50.0	D	97/165	0.74	58.6	E	154/251	0.54	54.2	D	79/119
Nashua Road EB TH/RT	0.77	31.1	C	348/463	0.91	40.5	D	504/685	1.03	63.1	E	685/885	0.88	33.5	C	602/721
Nashua Road WB LT	0.27	47.1	D	29/60	0.31	49.8	D	37/66	0.33	51.5	D	42/71	0.38	63.2	E	47/79
Nashua Road WB TH	0.63	30.3	C	244/346	0.75	33.8	C	343/455	0.85	40.1	D	440/535	0.66	15.3	B	150/194
Nashua Road WB RT	0.04	11.0	B	<25/<25	0.05	11.2	B	<25/<25	0.04	12.4	B	<25/<25	0.04	7.9	A	<25/<25
Gilcreast Road NB LT/TH	0.64	48.3	D	116/200	0.69	53.5	D	136/223	0.73	57.9	E	154/242	-	-	-	-
Gilcreast Road NB LT	-	-	-	-	-	-	-	-	-	-	-	-	0.72	67.0	E	104/193
Gilcreast Road NB TH	-	-	-	-	-	-	-	-	-	-	-	-	0.35	52.8	D	52/100
Gilcreast Road NB RT	0.34	34.4	C	38/85	0.39	37.0	D	51/101	0.43	38.5	D	63/111	0.55	47.8	D	70/130
Gilcreast Road SB LT/TH	0.95	80.0	F	241/476	1.10	125.3	F	327/547	1.07	118.5	F	314/504	-	-	-	-
Gilcreast Road SB LT	-	-	-	-	-	-	-	-	-	-	-	-	0.80	64.6	E	186/306
Gilcreast Road SB TH	-	-	-	-	-	-	-	-	-	-	-	-	0.31	46.2	D	71/125
Gilcreast Road SB RT	0.09	25.6	C	<25/42	0.13	28.1	C	<25/61	0.09	27.5	C	<25/48	0.17	34.2	C	34/85
Overall Intersection	0.77	37.8	D	-	0.88	47.2	D	-	0.96	57.0	E	-	0.82	34.2	C	-
<i>Weekday Evening Peak Period</i>																
Nashua Road EB LT	0.79	64.2	E	172/289	0.86	72.0	E	192/329	1.20	168.7	F	335/523	0.91	79.8	E	143/233
Nashua Road EB TH/RT	0.81	35.0	D	440/559	1.03	67.9	E	683/870	1.25	154.1	F	944/1146	0.90	31.9	C	643/771
Nashua Road WB LT	0.47	52.3	D	72/107	0.52	52.4	D	85/122	0.54	52.2	D	96/134	0.79	68.3	E	104/108
Nashua Road WB TH	0.92	47.4	D	483/623	1.16	121.3	F	762/902	1.45	246.4	F	1094/1233	1.00	23.0	C	352/568
Nashua Road WB RT	0.11	14.0	B	<25/<25	0.13	14.3	B	<25/<25	0.11	14.4	B	<25/<25	0.12	1.0	A	<25/<25
Gilcreast Road NB LT/TH	0.98	96.7	F	232/413	1.08	127.5	F	282/466	1.15	151.6	F	314/502	-	-	-	-
Gilcreast Road NB LT	-	-	-	-	-	-	-	-	-	-	-	-	0.81	73.3	E	134/251
Gilcreast Road NB TH	-	-	-	-	-	-	-	-	-	-	-	-	0.73	64.0	E	128/225
Gilcreast Road NB RT	0.20	34.0	C	<25/56	0.31	34.9	C	43/82	0.30	34.1	C	39/76	0.46	43.8	D	73/138
Gilcreast Road SB LT/TH	0.86	71.4	E	209/341	0.93	83.7	F	232/401	0.92	81.9	F	228/395	-	-	-	-
Gilcreast Road SB LT	-	-	-	-	-	-	-	-	-	-	-	-	0.82	79.9	E	115/229
Gilcreast Road SB TH	-	-	-	-	-	-	-	-	-	-	-	-	0.78	73.9	E	113/221
Gilcreast Road SB RT	0.25	30.6	C	60/118	0.30	31.0	C	82/150	0.52	34.3	C	176/278	0.79	56.8	E	225/384
Overall Intersection	0.89	46.9	D	-	1.04	83.9	F	-	1.24	161.2	F	-	0.94	39.0	D	-
Nashua Road (NH Route 102) / Garden Lane / Hampton Drive																
<i>Weekday Morning Peak Period</i>																
Nashua Road EB LT	0.28	39.8	D	<25/45	0.38	42.7	D	27/59	0.81	60.6	E	78/168	0.55	60.1	E	99/117
Nashua Road EB TH/RT	0.76	18.3	B	239/581	0.90	26.7	C	483/790	0.99	43.4	D	675/871	0.81	10.8	B	195/255
Nashua Road WB LT	0.15	37.6	D	<25/31	0.17	39.6	D	<25/37	0.18	42.6	D	<25/38	0.29	62.3	E	<25/38
Nashua Road WB TH	0.49	12.7	B	121/276	0.60	15.0	B	247/373	0.66	19.8	B	307/399	0.62	19.3	B	318/449
Nashua Road WB RT	0.14	4.9	A	<25/<25	0.15	5.3	A	<25/<25	0.40	7.1	A	<25/<25	0.23	21.6	C	25/31
Hampton Drive NB LT/TH	0.27	42.1	D	<25/36	0.24	41.9	D	<25/41	0.25	44.9	D	<25/43	0.39	62.4	E	<25/47
Hampton Drive NB RT	0.05	32.6	C	<25/<25	0.05	33.0	C	<25/<25	0.05	35.8	D	<25/<25	0.05	51.4	D	<25/<25
Garden Lane SB LT	0.29	35.3	D	30/74	0.32	37.0	D	43/86	0.59	39.9	D	118/220	0.33	45.5	D	73/111
Garden Lane SB LT/TH	0.31	35.5	D	33/80	0.35	37.2	D	47/94	0.58	39.6	D	117/216	0.66	53.9	D	153/243
Garden Lane SB RT	0.03	27.8	C	<25/25	0.04	29.2	C	<25/28	0.09	26.9	C	<25/51	0.17	32.6	C	29/81
Overall Intersection	0.59	18.0	B	-	0.68	22.9	C	-	0.82	31.9	C	-	0.75	22.9	C	-

^a Volume-to-capacity ratio

^b Delay expressed in seconds per vehicle (average)

^c Level of service

^d 50th/95th Percentile Queue

Table 9 Continued – Signalized Intersection Capacity and Queue Analysis Summary

Intersection / Lane Group	Existing Conditions				2032 No-Build				2032 Build				2032 Build with Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Nashua Road (NH Route 102) / Garden Lane / Hampton Drive																
<i>Weekday Evening Peak Period</i>																
Nashua Road EB LT	0.80	64.3	E	78/169	1.20	175.7	F	139/240	>2.0	621.1	F	326/456	1.10	99.2	F	243/296
Nashua Road EB TH/RT	0.76	28.4	C	346/481	0.89	36.7	D	491/719	0.89	36.7	D	516/756	0.78	12.8	B	153/322
Nashua Road WB LT	0.31	43.3	D	42/78	0.36	48.7	D	52/85	0.36	50.0	D	52/85	0.55	56.3	E	55/60
Nashua Road WB TH	0.76	25.8	C	367/487	0.87	31.9	C	503/661	0.92	36.6	D	588/821	1.00	48.9	D	683/797
Nashua Road WB RT	0.24	7.5	A	<25/<25	0.29	8.3	A	<25/<25	0.80	18.4	B	84/279	0.49	9.9	A	133/144
Hampton Drive NB LT/TH	0.46	46.3	D	61/107	0.45	48.9	D	74/116	0.46	50.2	D	74/116	0.86	103.2	F	81/170
Hampton Drive NB RT	0.07	32.0	C	<25/<25	0.09	34.6	C	<25/26	0.09	35.7	D	<25/26	0.06	47.2	D	<25/<25
Garden Lane SB LT	0.68	45.7	D	160/247	0.92	79.0	E	230/357	1.74	394.2	F	614/880	0.94	69.8	E	289/412
Garden Lane SB LT/TH	0.72	47.4	D	171/275	0.98	92.0	F	249/389	1.65	355.5	F	576/837	1.00	95.9	F	314/531
Garden Lane SB RT	0.26	30.5	C	37/91	0.51	38.9	D	122/188	0.99	83.7	F	324/599	0.89	54.2	D	281/533
Overall Intersection	0.71	30.8	C	-	0.85	47.3	D	-	1.12	136.4	F	-	1.01	44.7	D	-
Nashua Road (NH Route 102) / Interstate 93 Southbound Ramps																
<i>Weekday Morning Peak Period</i>																
Nashua Road EB approach	0.56	12.1	B	110/242	0.63	12.2	B	143/286	0.71	16.9	B	255/441	0.64	14.1	B	200/434
Nashua Road WB TH	0.38	10.6	B	65/149	0.43	10.1	B	85/176	0.52	13.7	B	161/283	0.46	4.0	A	29/288
Nashua Road WB RT	0.35	10.7	B	<25/55	0.39	10.1	B	<25/50	0.34	12.2	B	<25/51	0.34	20.6	C	<25/281
I-93 Southbound Ramps SB LT	0.44	12.7	B	83/165	0.56	16.7	B	103/240	0.38	18.5	B	94/195	0.41	30.6	C	155/210
I-93 Southbound Ramps SB RT	0.65	15.8	B	89/208	0.43	15.1	B	46/125	0.72	23.9	C	176/328	0.80	40.9	D	313/370
Overall Intersection	0.61	12.4	B	-	0.60	12.4	B	-	0.72	17.2	B	-	0.70	19.8	B	-
<i>Weekday Evening Peak Period</i>																
Nashua Road EB approach	0.78	25.9	C	315/391	0.78	20.1	C	401/557	0.92	32.4	C	662/792	0.99	34.6	C	500/894
Nashua Road WB TH	0.67	23.0	C	245/310	0.64	16.5	B	287/403	0.83	25.5	C	542/647	0.90	12.2	B	340/404
Nashua Road WB RT	0.18	17.1	B	<25/43	0.20	11.7	B	<25/40	0.21	13.6	B	<25/40	0.21	8.1	A	<25/<25
I-93 Southbound Ramps SB LT	0.47	16.0	B	169/290	0.72	30.2	C	266/468	0.72	36.5	D	335/468	0.65	31.2	C	307/429
I-93 Southbound Ramps SB RT	0.85	28.3	C	346/648	0.75	30.1	C	246/402	1.11	101.0	F	619/769	1.01	64.9	E	539/712
Overall Intersection	0.82	23.7	C	-	0.77	21.5	C	-	1.00	44.4	D	-	1.00	32.5	C	-
Nashua Road (NH Route 102) / Interstate 93 Northbound Ramps																
<i>Weekday Morning Peak Period</i>																
Nashua Road EB LT	0.93	45.5	D	329/616	0.72	33.9	C	188/271	0.77	37.4	D	236/336	0.82	36.6	D	300/325
Nashua Road EB TH	0.22	3.4	A	46/82	0.29	3.9	A	61/110	0.30	4.9	A	80/138	0.28	6.7	A	124/192
Nashua Road WB TH	0.77	31.0	C	297/393	0.77	25.9	C	309/547	0.82	31.3	C	363/592	0.71	29.6	C	405/524
Nashua Road WB RT	0.29	22.8	C	<25/56	0.32	18.3	B	<25/69	0.24	20.5	C	<25/66	0.24	21.0	C	<25/61
I-93 Northbound Ramps NB LT	0.47	40.7	D	78/127	0.48	37.7	D	74/147	0.59	40.6	D	122/207	0.66	54.2	D	151/229
I-93 Northbound Ramps NB LT/TH	0.48	40.8	D	81/130	0.49	37.7	D	75/149	0.59	40.8	D	123/209	0.67	54.4	D	152/231
I-93 Northbound Ramps NB RT	0.16	37.6	D	<25/50	0.10	34.1	C	<25/38	0.08	34.2	C	<25/34	0.08	43.7	D	<25/36
Overall Intersection	0.88	28.5	C	-	0.70	23.1	C	-	0.75	27.0	C	-	0.74	28.7	C	-

^a Volume-to-capacity ratio
^b Delay expressed in seconds per vehicle (average)
^c Level of service
^d 50th/95th Percentile Queue

Table 9 Continued – Signalized Intersection Capacity and Queue Analysis Summary

Intersection / Lane Group	Existing Conditions				2032 No-Build				2032 Build				2032 Build with Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Nashua Road (NH Route 102) / Interstate 93 Northbound Ramps																
<i>Weekday Evening Peak Period</i>																
Nashua Road EB LT	1.05	83.9	F	450/704	0.74	39.7	D	256/334	0.89	52.2	D	342/446	0.97	43.7	D	335/375
Nashua Road EB TH	0.44	11.5	B	197/240	0.56	10.8	B	264/340	0.63	13.3	B	337/405	0.62	6.1	A	136/145
Nashua Road WB TH	0.74	40.9	D	278/347	0.80	36.6	D	347/464	1.00	68.1	E	534/671	0.93	51.0	D	481/621
Nashua Road WB RT	0.25	32.5	C	<25/71	0.28	26.7	C	<25/75	0.26	30.2	C	<25/73	0.26	29.2	C	<25/69
I-93 Northbound Ramps NB LT	0.55	35.6	D	194/311	0.71	40.8	D	236/363	0.90	62.0	E	352/551	0.91	63.7	E	352/551
I-93 Northbound Ramps NB LT/TH	0.55	35.8	D	196/314	0.71	41.1	D	240/366	0.91	62.9	E	356/557	0.91	64.9	E	356/557
I-93 Northbound Ramps NB RT	0.92	62.0	E	351/623	0.71	39.1	D	203/292	0.78	45.1	D	252/335	0.78	46.1	D	252/335
Overall Intersection	1.03	41.3	D	-	0.75	30.0	C	-	0.94	44.3	D	-	0.93	37.8	D	-
Nashua Road (NH Route 102) / Londonderry Road / St. Charles Street																
<i>Weekday Morning Peak Period</i>																
Nashua Road EB LT													0.60	33.6	C	112/194
Nashua Road EB TH/RT													0.23	2.4	A	32/73
West Broadway WB LT													0.02	40.1	D	<25/<25
West Broadway WB TH/RT	(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)				0.79	15.5	B	368/497
St. Charles Street NB approach													0.01	37.3	D	<25/<25
Londonderry Road SB LT/TH													0.44	41.9	D	<25/56
Londonderry Road SB RT													0.22	24.6	C	39/87
Overall Intersection													0.72	14.6	B	-
<i>Weekday Evening Peak Period</i>																
Nashua Road EB LT													0.85	52.6	D	204/343
Nashua Road EB TH/RT													0.66	9.7	A	201/410
West Broadway WB LT	(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)				0.11	47.7	D	<25/<25
West Broadway WB TH/RT													0.82	25.3	C	384/485
St. Charles Street NB approach													0.01	34.8	C	<25/<25
Londonderry Road SB LT/TH													0.81	60.2	E	110/220
Londonderry Road SB RT													0.47	22.7	C	126/203
Overall Intersection													0.83	22.7	C	-
Pillsbury Road / Mammoth Road (NH Route 128)																
<i>Weekday Morning Peak Period</i>																
Pillsbury Road EB approach	1.08	103.7	F	172/514	1.23	162.8	F	231/597	1.98	495.0	F	390/733	-	-	-	-
Pillsbury Road EB LT	-	-	-	-	-	-	-	-	-	-	-	-	0.59	38.0	D	86/195
Pillsbury Road EB TH/RT	-	-	-	-	-	-	-	-	-	-	-	-	0.68	40.0	D	131/274
Pillsbury Road WB approach	0.32	27.6	C	36/131	0.39	30.4	C	47/150	0.69	42.1	D	100/334	-	-	-	-
Pillsbury Road WB LT	-	-	-	-	-	-	-	-	-	-	-	-	0.33	34.7	C	<25/67
Pillsbury Road WB TH	-	-	-	-	-	-	-	-	-	-	-	-	0.12	30.2	C	<25/68
Pillsbury Road WB RT	-	-	-	-	-	-	-	-	-	-	-	-	0.13	30.4	C	<25/65
Mammoth Road NB LT	0.06	15.1	B	<25/<25	0.06	14.5	B	<25/<25	0.05	16.0	B	<25/<25	0.04	16.0	B	<25/<25
Mammoth Road NB TH/RT	0.72	27.1	C	181/403	0.74	27.5	C	208/465	0.74	30.3	C	220/554	0.74	29.5	C	228/542
Mammoth Road SB LT	0.30	12.8	B	<25/64	0.32	13.2	B	<25/73	0.68	18.5	B	63/203	0.66	17.3	B	65/204
Mammoth Road SB TH/RT	0.66	20.8	C	130/372	0.64	19.7	B	131/438	0.57	17.5	B	121/441	-	-	-	-
Mammoth Road SB TH	-	-	-	-	-	-	-	-	-	-	-	-	0.44	14.6	B	96/324
Mammoth Road SB RT	-	-	-	-	-	-	-	-	-	-	-	-	0.06	11.3	B	<25/<25
Overall Intersection	0.76	41.6	D	-	0.82	55.1	E	-	1.06	130..5	F	-	0.68	26.1	C	-

^a Volume-to-capacity ratio, ^b Delay expressed in seconds per vehicle (average)
^c Level of service, ^d 50th/95th Percentile Queue

Table 9 Continued – Signalized Intersection Capacity and Queue Analysis Summary

Intersection / Lane Group	Existing Conditions				2032 No-Build				2032 Build				2032 Build with Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Pillsbury Road / Mammoth Road (NH Route 128)																
<i>Weekday Evening Peak Period</i>																
Pillsbury Road EB approach	1.76	396.5	F	289/316	1.71	374.3	F	246/398	>2.0	818.9	F	361/501	-	-	-	-
Pillsbury Road EB LT	-	-	-	-	-	-	-	-	-	-	-	-	0.63	37.6	D	65/113
Pillsbury Road EB TH/RT	-	-	-	-	-	-	-	-	-	-	-	-	0.64	44.2	D	115/194
Pillsbury Road WB approach	0.93	61.1	E	192/340	1.03	86.4	F	223/403	>2.0	537.2	F	691/918	-	-	-	-
Pillsbury Road WB LT	-	-	-	-	-	-	-	-	-	-	-	-	0.31	32.5	C	31/66
Pillsbury Road WB TH	-	-	-	-	-	-	-	-	-	-	-	-	0.90	71.5	E	153/303
Pillsbury Road WB RT	-	-	-	-	-	-	-	-	-	-	-	-	0.27	38.0	D	<25/91
Mammoth Road NB LT	0.26	12.4	B	<25/25	0.31	14.9	B	<25/28	0.23	13.7	B	<25/28	0.65	56.8	E	48/97
Mammoth Road NB TH/RT	0.86	28.6	C	345/400	0.84	27.8	C	335/545	0.94	45.9	D	426/674	1.00	62.5	E	438/690
Mammoth Road SB LT	0.40	13.8	B	26/44	0.43	13.7	B	30/51	0.82	39.0	D	173/321	1.06	104.7	F	253/430
Mammoth Road SB TH/RT	0.79	22.4	C	335/477	0.87	27.9	C	404/628	0.76	19.5	B	357/549	-	-	-	-
Mammoth Road SB TH	-	-	-	-	-	-	-	-	-	-	-	-	0.60	16.3	B	242/352
Mammoth Road SB RT	-	-	-	-	-	-	-	-	-	-	-	-	0.11	11.0	B	<25/27
Overall Intersection	1.13	83.0	F	-	1.16	78.0	E	-	1.45	241.3	F	-	1.04	49.9	D	-
Pillsbury Road / Hardy Road																
<i>Weekday Morning Peak Period</i>																
Pillsbury Road EB approach	(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)				0.51	8.7	A	104/197
Pillsbury Road WB TH													0.21	4.4	A	<25/76
Pillsbury Road WB RT													0.06	3.2	A	<25/<25
Hardy Road SB approach													0.61	21.5	C	87/148
Overall Intersection													0.54	10.6	B	-
<i>Weekday Evening Peak Period</i>																
Pillsbury Road EB approach	(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)				0.49	7.9	A	143/274
Pillsbury Road WB TH													0.51	4.1	A	84/251
Pillsbury Road WB RT													0.20	1.5	A	<25/<25
Hardy Road SB approach													0.66	40.9	D	142/207
Overall Intersection													0.55	10.0	A	-
Pillsbury Road / Gilcreast Road																
<i>Weekday Morning Peak Period</i>																
Pillsbury Road EB TH	(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)				0.50	11.0	B	110/120
Pillsbury Road EB RT													0.22	9.6	A	<25/<25
Pillsbury Road WB LT													0.37	4.4	A	25/30
Pillsbury Road WB TH													0.17	2.8	A	<25/29
Gilcreast Road NB LT													0.39	23.0	C	37/80
Gilcreast Road NB RT													0.09	14.0	B	<25/30
Overall Intersection													0.45	9.7	A	-

^a Volume-to-capacity ratio

^b Delay expressed in seconds per vehicle (average)

^c Level of service

^d 50th/95th Percentile Queue

Table 9 Continued – Signalized Intersection Capacity and Queue Analysis Summary

Intersection / Lane Group	Existing Conditions				2032 No-Build				2032 Build				2032 Build with Improvements																	
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue														
Pillsbury Road / Gilcreast Road																														
<i>Weekday Evening Peak Period</i>																														
Pillsbury Road EB TH	(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)					0.61	30.5	C	207/377													
Pillsbury Road EB RT														0.20	43.2	D	29/102													
Pillsbury Road WB LT														0.71	19.1	B	168/252													
Pillsbury Road WB TH														0.48	13.8	B	235/349													
Gilcreast Road NB LT														0.84	43.9	D	259/408													
Gilcreast Road NB RT														0.41	15.0	B	78/131													
Overall Intersection														0.78	26.4	C	-													
Pillsbury Road / Orchard Drive (Proposed)																														
<i>Weekday Morning Peak Period</i>																														
Pillsbury Road EB TH	(N/A – Proposed PUD Roadway)				(N/A – Proposed PUD Roadway)				(N/A – Proposed PUD Roadway)					0.51	4.9	A	43/71													
Pillsbury Road EB RT														0.08	0.0	A	<25/<25													
Pillsbury Road WB LT														0.13	3.4	A	<25/<25													
Pillsbury Road WB TH														0.26	3.1	A	36/54													
Orchard Drive NB LT														0.29	24.3	C	<25/54													
Orchard Drive NB RT														0.06	23.0	C	<25/35													
Overall Intersection														0.45	6.2	A	-													
<i>Weekday Evening Peak Period</i>																														
Pillsbury Road EB TH																											0.64	12.9	B	192/263
Pillsbury Road EB RT																											0.12	0.0	A	<25/<25
Pillsbury Road WB LT	0.37	9.5	A	31/54																										
Pillsbury Road WB TH	0.61	9.4	A	242/366																										
Orchard Drive NB LT	0.68	41.6	D	144/224																										
Orchard Drive NB RT	0.16	32.8	C	<25/61																										
Overall Intersection	0.66	15.5	B	-																										
Pillsbury Road / Ash Street / Londonderry Road / Eastern Main Drive																														
<i>Weekday Morning Peak Period</i>																														
Pillsbury Road EB LT	(N/A – Currently Unsignalized)				(N/A – Currently Unsignalized)				(N/A – Currently Unsignalized)					0.71	27.7	C	142/275													
Pillsbury Road EB TH/RT														0.32	9.5	A	49/156													
Ash Street WB LT														0.27	35.4	D	<25/39													
Ash Street WB TH/RT														0.51	22.5	C	106/226													
Londonderry Road NB LT														0.18	22.7	C	<25/56													
Londonderry Road NB TH/RT														0.60	27.3	C	98/201													
Eastern Main Drive SB LT														0.06	21.9	C	<25/<25													
Eastern Main Drive SB TH														0.13	22.3	C	<25/55													
Eastern Main Drive SB RT														0.11	6.6	A	<25/<25													
Overall Intersection	0.61	20.4	C	-																										

^a Volume-to-capacity ratio
^b Delay expressed in seconds per vehicle (average)
^c Level of service
^d 50th/95th Percentile Queue

Table 9 Continued – Signalized Intersection Capacity and Queue Analysis Summary

Intersection / Lane Group	Existing Conditions				2032 No-Build				2032 Build				2032 Build with Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Pillsbury Road / Ash Street / Londonderry Road / Eastern Main Drive																
<i>Weekday Evening Peak Period</i>																
Pillsbury Road EB LT													0.94	47.7	D	343/569
Pillsbury Road EB TH/RT													0.53	13.3	B	186/287
Ash Street WB LT													0.52	41.0	D	45/91
Ash Street WB TH/RT	(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)				(N/A - Currently Unsignalized)				0.89	49.8	D	228/415
Londonderry Road NB LT													0.81	56.3	E	71/162
Londonderry Road NB TH/RT													0.74	38.7	D	140/235
Eastern Main Drive SB LT													0.27	29.5	C	<25/38
Eastern Main Drive SB TH													0.60	32.7	C	124/199
Eastern Main Drive SB RT													0.42	7.6	A	76/131
Overall Intersection													0.89	32.8	C	-
Exit 4A Connector / Eastern Main Drive (Proposed)																
<i>Weekday Morning Peak Period</i>																
Exit 4A Connector EB LT													0.41	15.0	B	<25/43
Exit 4A Connector EB TH													0.68	19.8	B	213/303
Exit 4A Connector EB RT													0.10	13.7	B	<25/<25
Exit 4A Connector WB LT													0.21	13.2	B	<25/26
Exit 4A Connector WB TH/RT													0.80	23.8	C	255/360
Eastern Main Drive NB LT													0.41	31.9	C	51/90
Eastern Main Drive NB TH/RT													0.26	23.3	C	48/114
Eastern Main Drive SB LT													0.12	38.3	D	<25/<25
Eastern Main Drive SB TH/RT													0.28	30.0	C	34/83
Overall Intersection	(N/A – Proposed PUD Roadway)				(N/A – Proposed PUD Roadway)				(N/A – Proposed PUD Roadway)				0.59	22.2	C	-
<i>Weekday Evening Peak Period</i>																
Exit 4A Connector EB LT													0.30	18.9	B	47/82
Exit 4A Connector EB TH													0.93	44.3	D	501/619
Exit 4A Connector EB RT													0.09	22.2	C	<25/<25
Exit 4A Connector WB LT													0.27	26.3	C	<25/36
Exit 4A Connector WB TH/RT													0.38	26.3	C	146/192
Eastern Main Drive NB LT													0.85	54.1	D	239/323
Eastern Main Drive NB TH/RT													0.28	26.8	C	104/168
Eastern Main Drive SB LT													0.38	57.8	E	<25/56
Eastern Main Drive SB TH/RT													0.75	52.8	D	202/346
Overall Intersection													0.83	40.9	D	-

^a Volume-to-capacity ratio
^b Delay expressed in seconds per vehicle (average)
^c Level of service
^d 50th/95th Percentile Queue

Table 9 Continued – Signalized Intersection Capacity and Queue Analysis Summary

Intersection / Lane Group	Existing Conditions				2032 No-Build				2032 Build				2032 Build with Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Market Basket Southerly Driveway / Garden Lane (Proposed-Relocated)																
<i>Weekday Morning Peak Period</i>																
Garden Lane WB approach													0.33	17.1	B	<25/34
Garden Lane NB approach													0.39	3.5	A	48/89
Market Basket Drive SB approach													0.20	2.9	A	<25/44
Overall Intersection	(N/A – Planned Relocation)				(N/A – Planned Relocation)				(N/A – Planned Relocation)				0.38	4.2	A	-
<i>Weekday Evening Peak Period</i>																
Garden Lane WB approach													0.64	22.8	C	86/133
Garden Lane NB approach													0.75	8.9	A	181/257
Market Basket Drive SB approach													0.66	7.4	A	138/196
Overall Intersection													0.72	9.4	A	-

^a Volume-to-capacity ratio
^b Delay expressed in seconds per vehicle (average)
^c Level of service
^d 50th/95th Percentile Queue

PRELIMINARY RECOMMENDATIONS FOR TRANSPORTATION IMPROVEMENTS

Based on the results of the preliminary capacity and queuing analysis, the following improvements are recommended to accommodate the projected traffic volumes in the 2032 Build conditions. An overview depiction of the improvements is presented in Figure 2 within the Figures Section following the text. Figures 3 through 9 depict the individual intersection or roadway segment improvements as defined below. An overview of the of the improved level-of-service (LOS) at each intersection as a result of the recommended improvements is presented in Figure 10.

- Route 102 / Gilcreast Road (See Figure 3)
 - o Reconfiguration of the median and travel lanes on Route 102 to provide a second eastbound left-turn lane.
 - o Widen Gilcreast Road northbound to provide separate left, through, and right-turn lanes.
 - o Widen Gilcreast Road southbound to provide separate left, through, and right-turn lanes, as well as two receiving lanes.
- Route 102 / Garden Lane (See Figure 3)
 - o Widen Garden lane to provide two left-turn lanes, a shared left-turn/through lane, and a right-turn lane.
 - o Widen Route 102 eastbound to provide an additional right-turn lane
 - o Widen Route 102 between Garden Lane and I-93 Southbound on-ramp to provide an additional receiving lane for the triple left-turn exiting Garden Lane.
- Route 102 / Londonderry Road / St. Charles Street (See Figure 4)
 - o Add an eastbound left-turn lane on Route 102. This is warranted under existing conditions, but will see additional traffic associated with the PUD.
 - o Widen Londonderry Road southbound to provide a shared left/through lane and a right-turn lane.
 - o Widen Route 102 eastbound and westbound to provide a second through lane prior to reducing in width at the Derry Town Line. This is warranted under existing conditions to better process traffic than the existing eastbound lane reduction near Burger King.
 - o This improvement is likely to require DOT's and the Towns' participation to secure right-of-way as identified in the Route 102 Upper Corridor Study.
- Pillsbury Road / Mammoth Road (See Figure 5)
 - o Widen Pillsbury Road to provide exclusive left-turn lanes on the eastbound and westbound approaches.
 - o Construct right-turn lanes on the Mammoth Road (Route 128) southbound and Pillsbury Road westbound approaches.
 - o Adjust the signal phasing to provide protected left-turn phases on each approach.
- Pillsbury Road / Hardy Road (See Figure 6)
 - o Realign Pillsbury Road to form a T intersection with Pillsbury Road as the through street. Pillsbury Road will be realigned through the Project and, in turn, create a short dead-ended road for the portion of Pillsbury Road between Gilcreast Road and Hardy Road.
 - o Construct an exclusive right-turn lane on Pillsbury Road westbound approach.
- Pillsbury Road / Gilcreast Road (See Figure 6)
 - o Realign Pillsbury Road and Gilcreast Road to form a T intersection with Pillsbury Road as the through street. This intersection will be located northeast of its current location along the new alignment of Pillsbury Road.

- o Widen each roadway to provide exclusive left-turn lanes on all approaches.
- Pillsbury Road / Orchard Drive (See Figure 7)
 - o Construct exclusive left-turn lanes in either direction on Pillsbury Road.
 - o Construct an exclusive right-turn lane on Pillsbury Road eastbound.
 - o Construct an exclusive left-turn lane and a shared through/right-turn lane on the Orchard Drive northbound and southbound approaches.
- Pillsbury Road / Londonderry Road / Ash Street / Eastern Main Drive (See Figure 8)
 - o Widen Pillsbury Road to provide separate left, through, and right-turn lanes on the eastbound and westbound approaches. This will require coordination between the Town of Londonderry, the Proponent's design team, and NHDOT to ensure the Ash Street Bridge over I-93 is constructed with this future lane use and desired sidewalk connectivity. NHDOT is expected to recommence the final design process of Exit 4 and this bridge in February 2013.
 - o Widen Londonderry Road northbound to provide an exclusive left-turn lane and a shared through/right-turn lane.
 - o Construct separate left, through, and right-turn lanes on the Eastern Main Drive southbound approach.
- Ash Street Extension / North High Street (See Figure 9)
 - o Widen Ash Street Extension eastbound to provide separate left- and right-turn lanes
 - o Widen North High Street southbound to provide separate through and right-turn lanes
 - o Implement an all-way stop controlled intersection. This reduced the delay over the no-build condition for Ash Street Extension and provides reasonable delays for each approach without traffic signal control.
- Exit 4A Connector / Eastern Main Drive
 - o Construct the Exit 4A Connector with two through lanes and an exclusive left-turn lane in each direction.
 - o Construct a right-turn lane on the Exit 4A Connector eastbound approach.
 - o Construct two left-turn lanes and a shared through/right-turn lane on the Eastern Main Drive northbound approach.
 - o Construct an exclusive left-turn lane and a shared through/right-turn lane on the Eastern Main Drive southbound approach.
- Installation of a traffic control signal at the following intersections under full-build traffic conditions:
 - o Pillsbury Road / Hardy Road
 - o Pillsbury Road / Gilcreast Road
 - o Pillsbury Road / Orchard Drive
 - o Pillsbury Road / Ash Street / Londonderry Road / Eastern Main Drive
 - o Nashua Road (Route 102) / Londonderry Road / St. Charles Street
 - o Exit 4A Connector / Eastern Main Drive

Although these intersections were evaluated with traffic signals under the 20-year horizon, they will also be further examined with multi-way stop or roundabout traffic control alternatives as part of the subsequent site plan-level traffic analysis. The traffic signals would be installed only when warranted based on actual demand or detailed projections for specific phases of development.

- Coordination of the traffic signals along the Route 102 corridor between Gilcreast Road and I-93 Northbound ramps.
- Coordination of traffic signals along Pillsbury Road between Hardy Road and Orchard Drive.
- Optimize signal timings at all of the signalized study area intersections.

As part of the project, the character of Pillsbury Road will change from a higher-speed rural collector roadway to a village-type collector roadway. It should be constructed with multi-modal and landscape treatments consistent with the other roadways in the PUD. This includes sidewalks, street trees, and bike lanes on each side of the roadway between Hardy Road and Londonderry Road.

As part of a subsequent preliminary design process as part of site plan review, the project team will evaluate the opportunities for a landscaped median. Exclusive left-turn lanes may be provided at major PUD driveway connections as part of a three-lane cross-section along Pillsbury Road. With the cross-connection between the easterly and westerly portions of the PUD, it is important to have an attractive and efficient multi-modal facility with sufficient capacity at key intersections. Although this roadway will still permit “cut-through” traffic between Londonderry and Derry, it is expected to primarily serve as the main east-west boulevard for this new destination.

CONCLUSION

With implementation of the roadway and intersection improvements listed above, the roadway network can reasonably accommodate the projected 2032 Build traffic generated by the proposed Woodmont Commons PUD. The results of the capacity analysis listed earlier in this document are expected to be highly conservative given the use of ITE trip generation calculations and modest internal capture rate assumed.

It is important to note the key assumptions included within this PUD-level preliminary traffic analysis. The proposed Exit 4A, and an expanded Ash Street Bridge, or other feasible alternative connections, will need to be constructed prior to the full build-out of WC-12 (east side of the PUD). The project team, along with Town Staff, has started to coordinate with NHDOT to conceptualize and program for these infrastructure improvements. As part of subsequent analysis during the site plan and subdivision review stages, each applicant will need to reassess the timing of these improvements and the scale of any proposed development, until the bulk of improvements are constructed, to demonstrate to the satisfaction of the Planning Board that the existing roadway infrastructure would not be not overburdened by the new vehicle trips

The methodology regarding the potential phasing of the off-site transportation improvements, including the necessary participation from the public and private entities, will be summarized in a subsequent document and anticipated as part of a development agreement with the Town of Londonderry. It is understood that this level of analysis has been conducted to present a worst case for traffic-related impacts to the current roadway network, given the proposed PUD zoning change and full build-out of the exemplar scenario over twenty years. The Planning Board will have several opportunities to assess the specific impacts as part of the site plan approval process with each proposed development phase of the PUD.

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- A. Traffic Volume Networks
- B. Turning Movement Count (TMC) Data Sheets
- C. Automatic Traffic Recorder (ATR) Data Sheets
- D. SNHPC - Seasonal Adjustment Data
- E. SNHPC - Permanent Count Station Data – Background Growth
- F. Full Occupancy of Market Basket Plaza
- G. Site Trip Generation
- H. Internal Capture
- I. Trip Distribution
- J. Interchange 4A Diversions
- K. Intersection Capacity Analyses

Attachment A

Traffic Volume Networks



Not to Scale

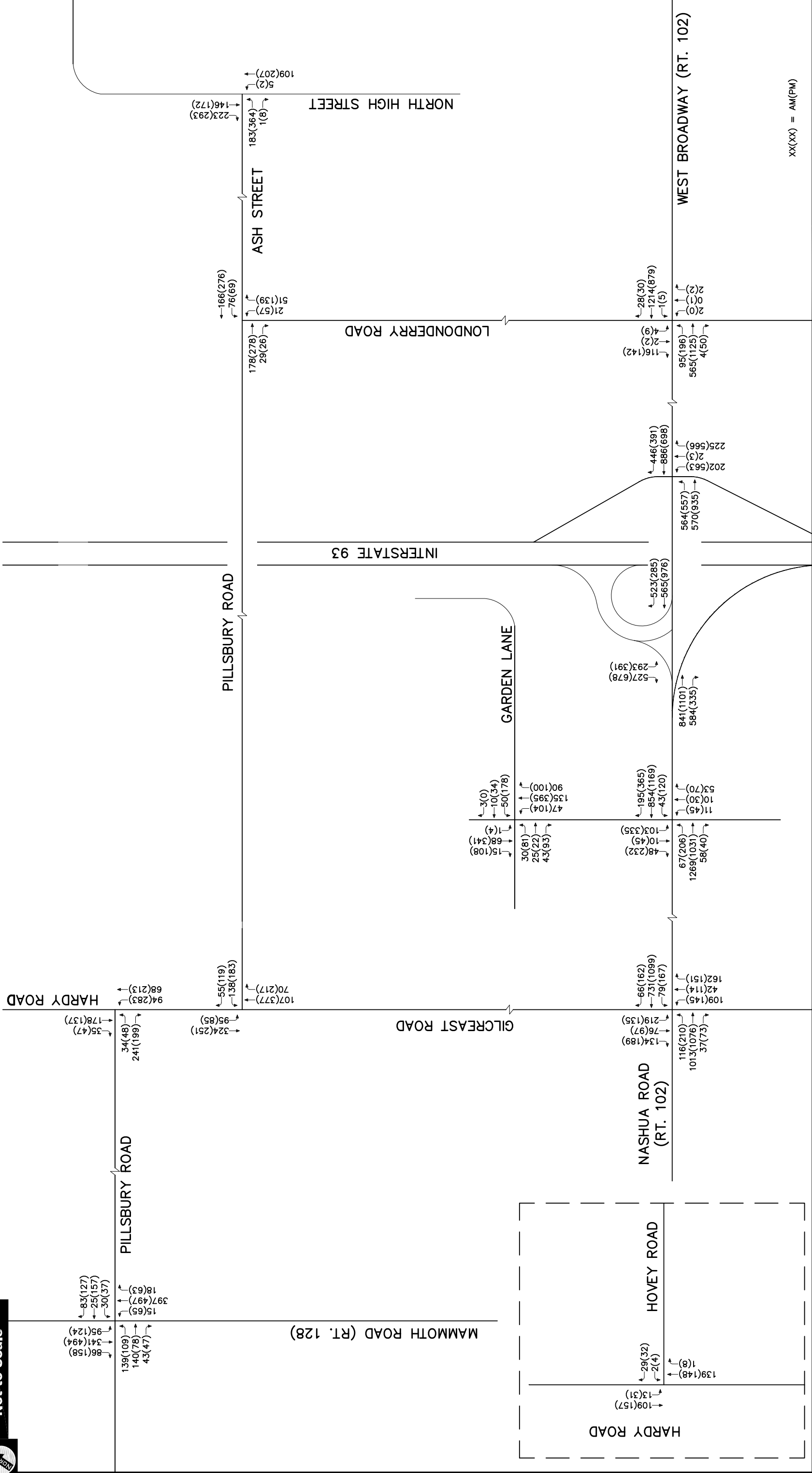


Figure A-1



Existing Conditions
Weekday Morning and
Weekday Evening
Peak Hour Traffic Volumes



Not to Scale

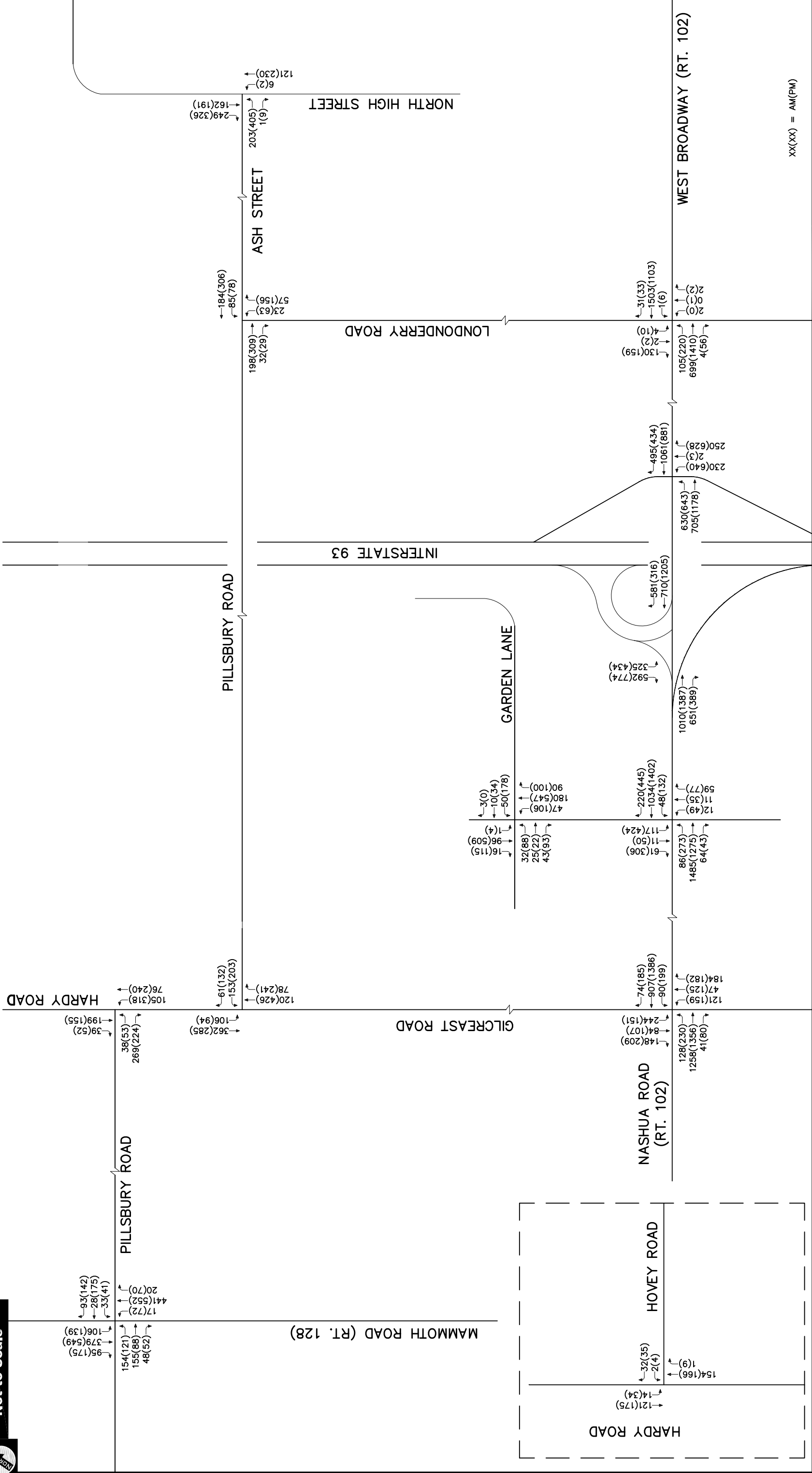


Figure A-2



2032 No-Build Conditions
Weekday Morning and
Weekday Evening
Peak Hour Traffic Volumes



Not to Scale

Woodmont Commons Planned Unit Development - Londonderry, New Hampshire

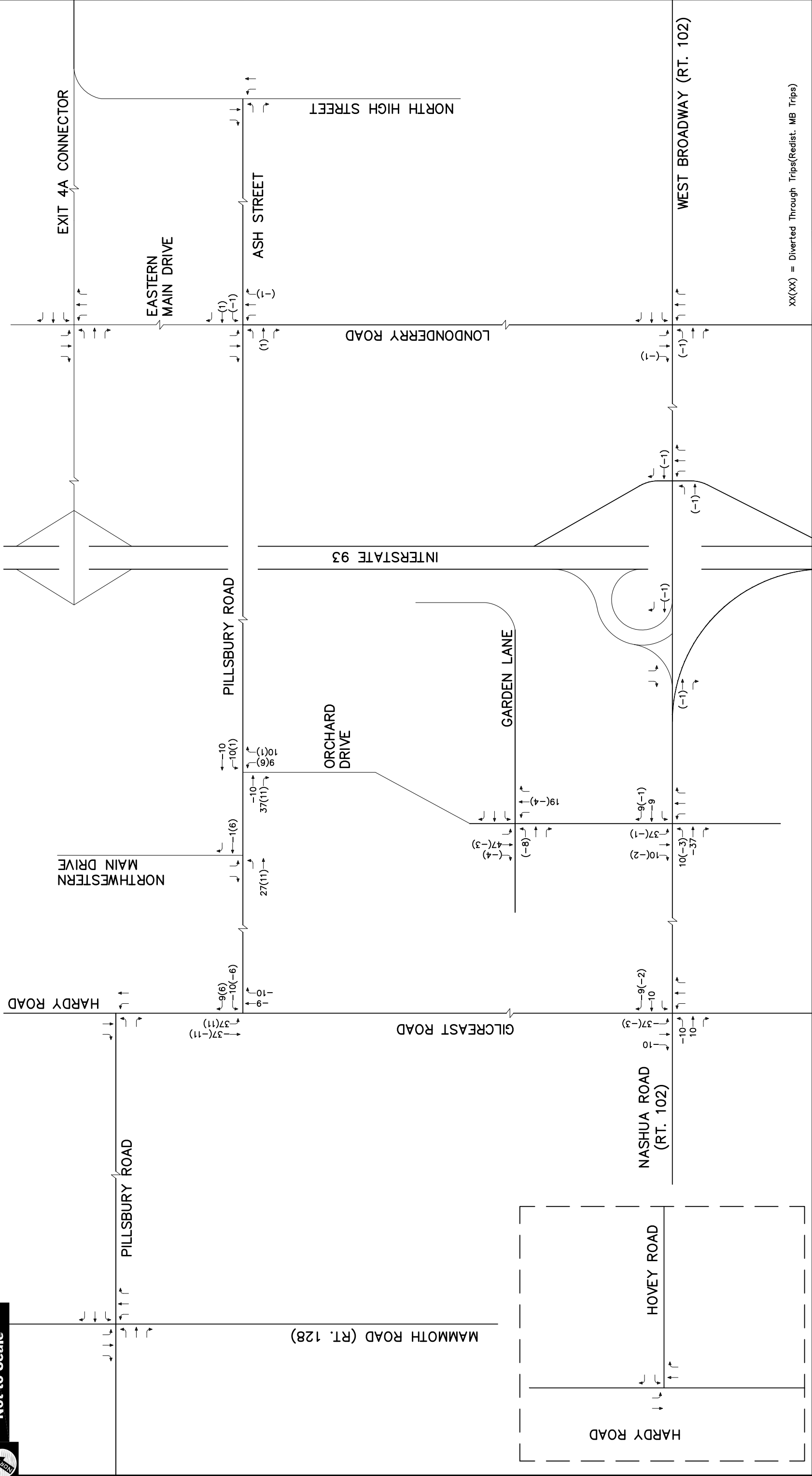


Figure A-3



Orchard Driveway Diversion / Redistribution
(Market Basket Plaza Trips)
Weekday Morning
Peak Hour Traffic Volumes

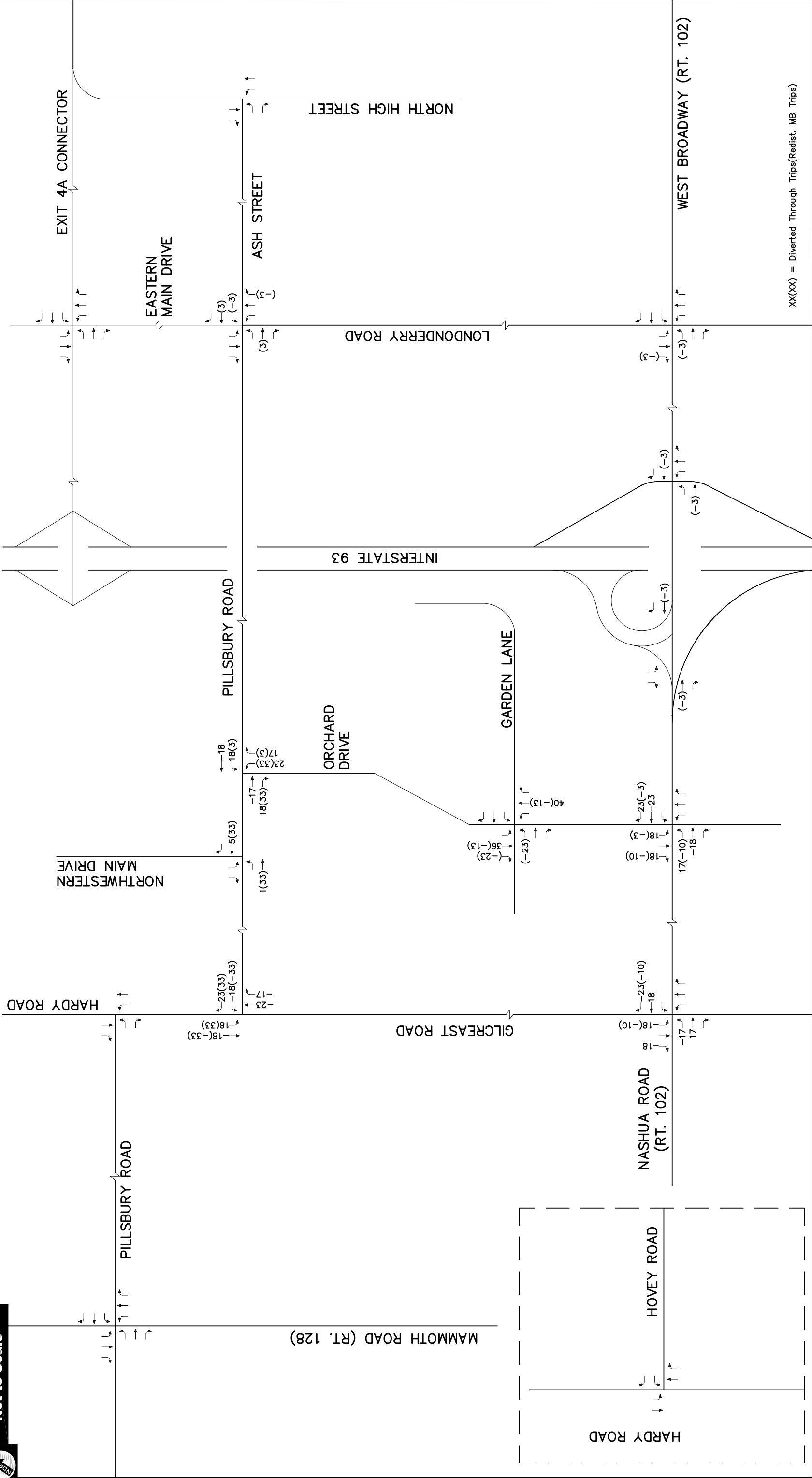


Figure A-4

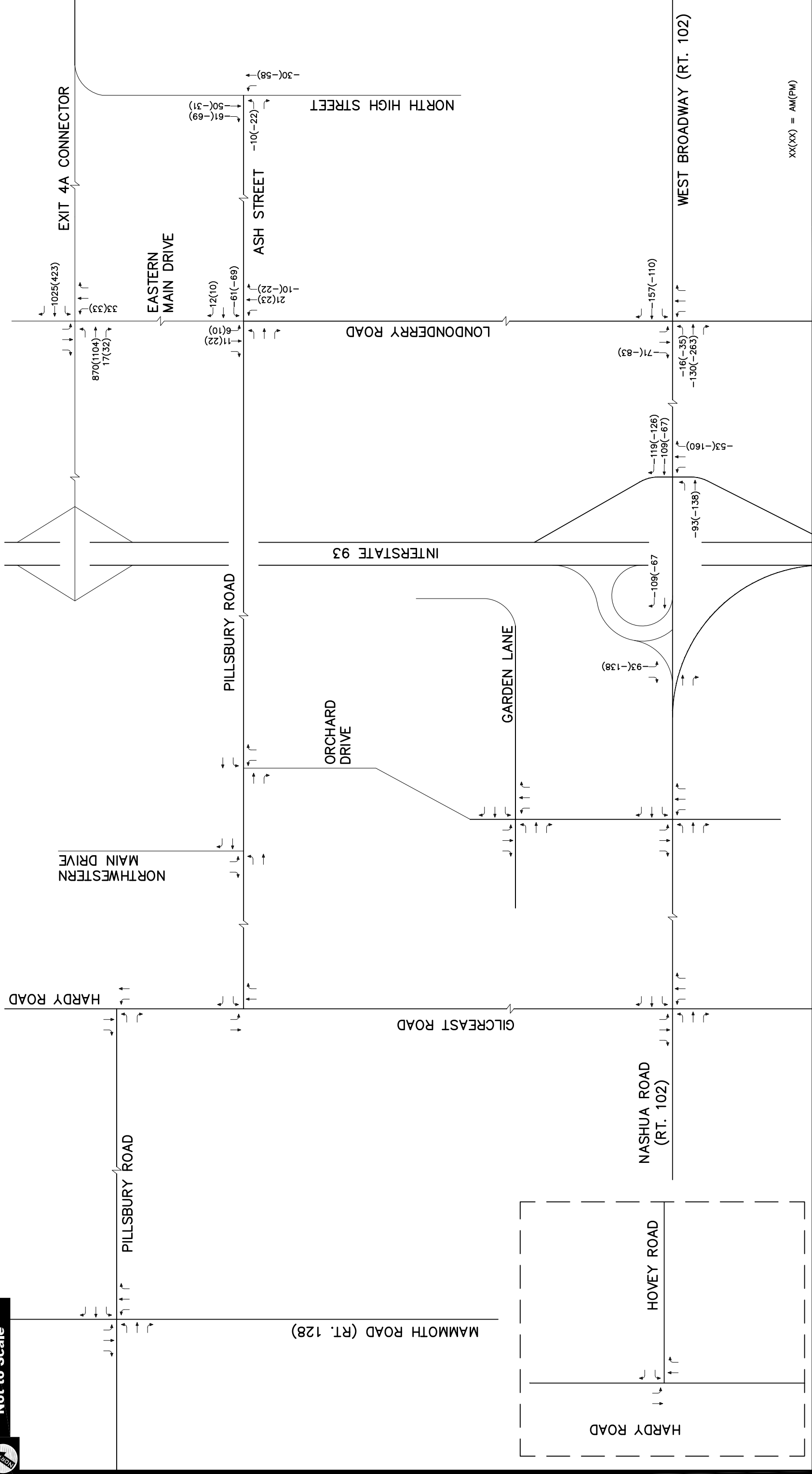


T:\T0378\CAD\Civil\Graphics\T0378_TrafficNetworks_12.21.2012.dwg 12/18/2012 4:58:50 PM EDT



Not to Scale

Woodmont Commons Planned Unit Development - Londonderry, New Hampshire



XX(XX) = AM(PM)

Figure A-5



I-93 Interchange 4A East Diversion
Weekday Morning and
Weekday Evening
Peak Hour Traffic Volumes

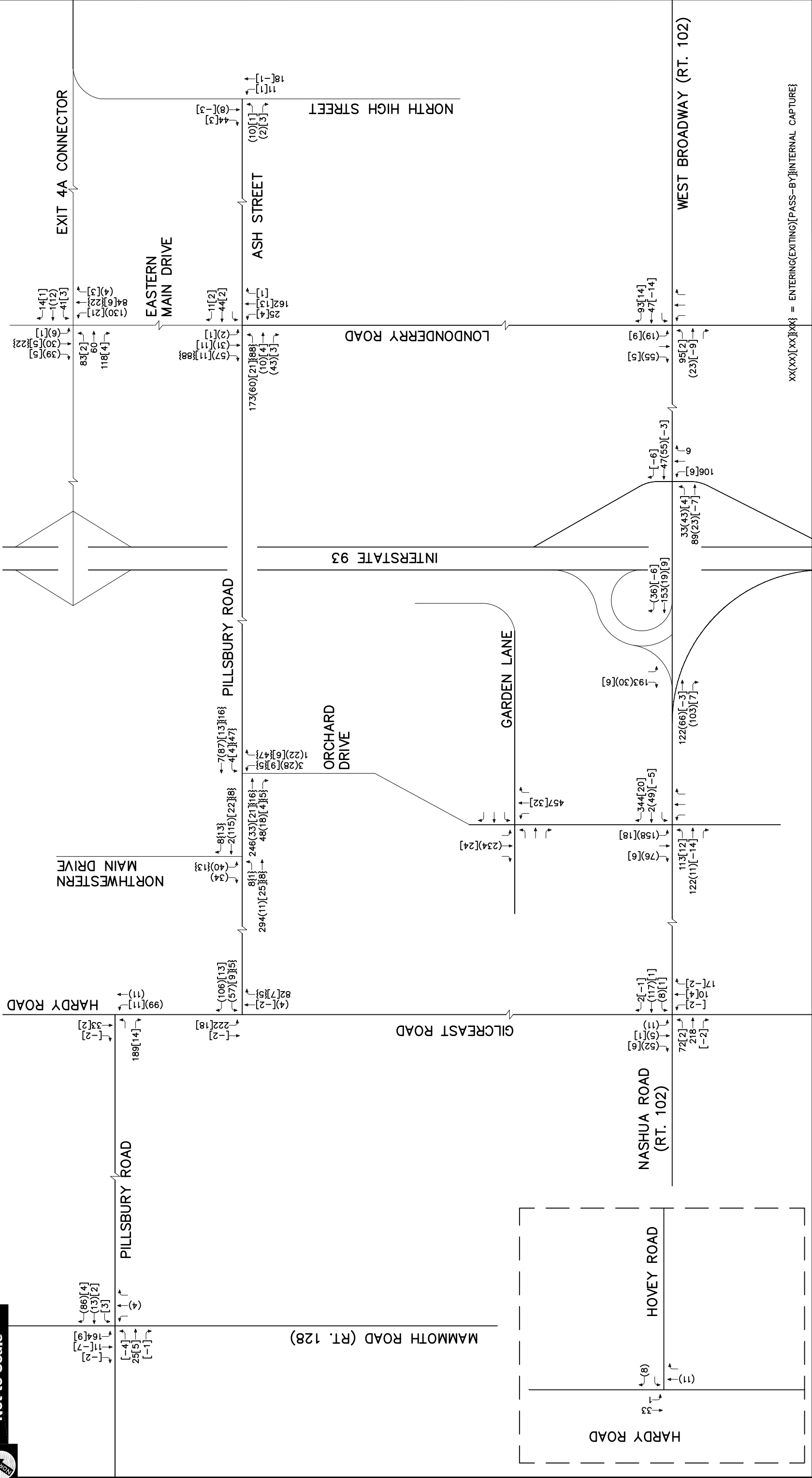


Figure A-6

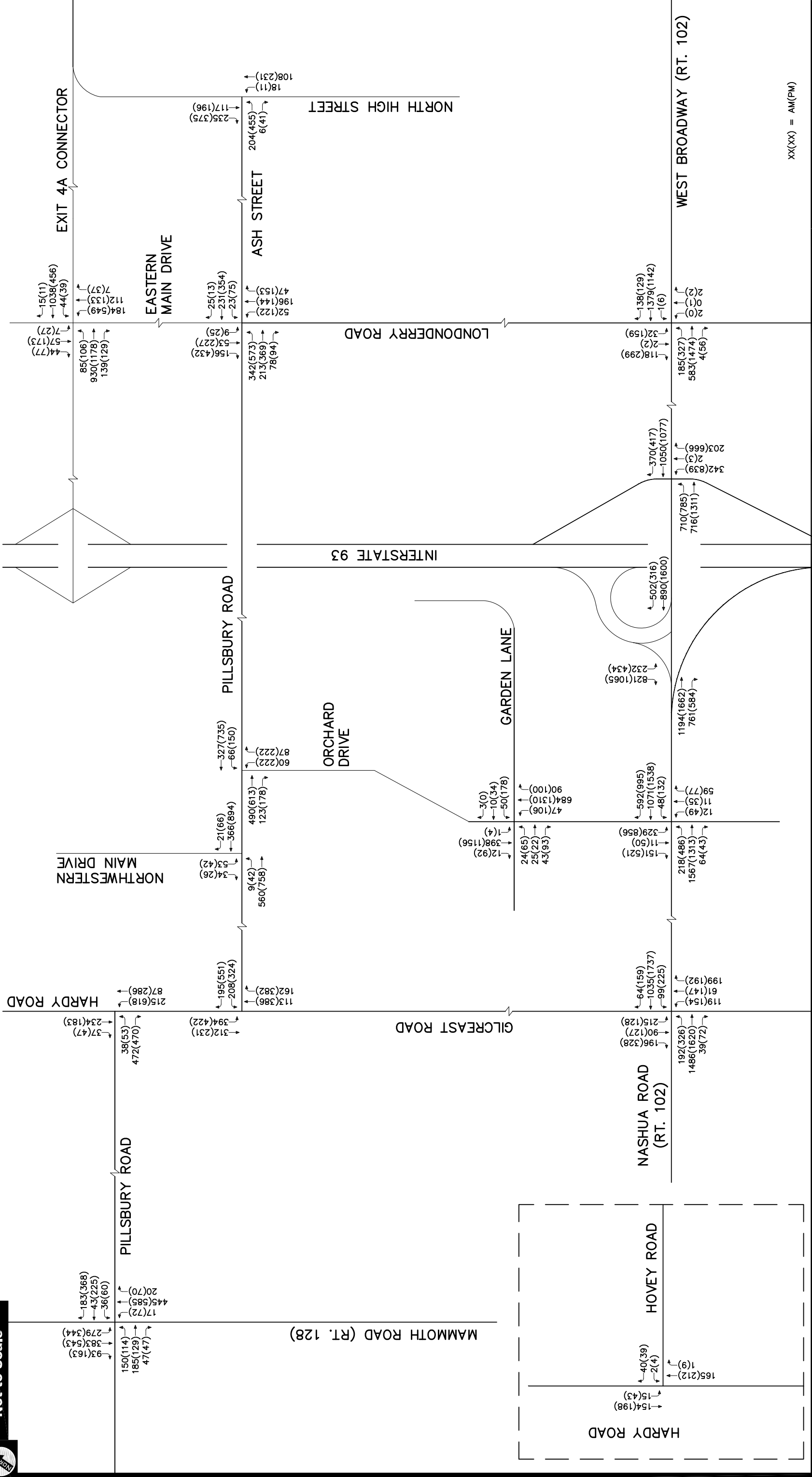


NET Site Generated Trip Assignment
Weekday Morning
Peak Hour Traffic Volumes



11





XX(XX) = AM(PM)

Figure A-8



2032 Build Conditions
Weekday Morning and
Weekday Evening
Peak Hour Traffic Volumes

Attachment B

Turning Movement Count (TMC) Data Sheets

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E/W: Internal Access Drives

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04145A

Site Code : T0070.42

Start Date : 8/4/2011

Page No : 1

Groups Printed- Cars - Trucks

	Garden Lane (Market Basket) From North				Internal (To Wendy's) From East				Garden Lane (To Route 102) From South				Internal (To Bank/Plaza) From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Uturn	Right	Thru	Left	Peds	
07:00 AM	1	14	0	0	2	1	7	0	24	23	7	0	3	9	4	0	95
07:15 AM	4	12	0	0	0	0	14	0	54	29	3	0	10	12	4	0	142
07:30 AM	7	9	0	0	3	4	12	0	14	36	7	1	8	5	8	0	114
07:45 AM	1	28	0	0	0	1	11	0	14	39	18	1	11	3	15	0	142
Total	13	63	0	0	5	6	44	0	106	127	35	2	32	29	31	0	493
08:00 AM	3	18	1	0	0	5	12	0	8	31	13	4	14	5	3	0	117
08:15 AM	7	22	0	0	3	1	9	0	11	28	17	0	13	4	12	0	127
08:30 AM	9	26	0	0	1	0	10	0	27	28	10	0	14	11	15	0	151
08:45 AM	5	27	0	0	0	2	11	0	12	46	12	2	12	5	7	0	141
Total	24	93	1	0	4	8	42	0	58	133	52	6	53	25	37	0	536
Grand Total	37	156	1	0	9	14	86	0	164	260	87	8	85	54	68	0	1029
Apprch %	19.1	80.4	0.5	0	8.3	12.8	78.9	0	31.6	50.1	16.8	1.5	41.1	26.1	32.9	0	
Total %	3.6	15.2	0.1	0	0.9	1.4	8.4	0	15.9	25.3	8.5	0.8	8.3	5.2	6.6	0	
Cars	37	145	1	0	8	14	80	0	154	252	86	8	84	54	68	0	991
% Cars	100	92.9	100	0	88.9	100	93	0	93.9	96.9	98.9	100	98.8	100	100	0	96.3
Trucks	0	11	0	0	1	0	6	0	10	8	1	0	1	0	0	0	38
% Trucks	0	7.1	0	0	11.1	0	7	0	6.1	3.1	1.1	0	1.2	0	0	0	3.7

	Garden Lane (Market Basket) From North					Internal (To Wendy's) From East					Garden Lane (To Route 102) From South					Internal (To Bank/Plaza) From West					Int. Total
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Uturn	App. Total	Right	Thru	Left	Peds	App. Total	
07:45 AM	1	28	0	0	29	0	1	11	0	12	14	39	18	1	72	11	3	15	0	29	142
08:00 AM	3	18	1	0	22	0	5	12	0	17	8	31	13	4	56	14	5	3	0	22	117
08:15 AM	7	22	0	0	29	3	1	9	0	13	11	28	17	0	56	13	4	12	0	29	127
08:30 AM	9	26	0	0	35	1	0	10	0	11	27	28	10	0	65	14	11	15	0	40	151
Total Volume	20	94	1	0	115	4	7	42	0	53	60	126	58	5	249	52	23	45	0	120	537
% App. Total	17.4	81.7	0.9	0		7.5	13.2	79.2	0		24.1	50.6	23.3	2		43.3	19.2	37.5	0		
PHF	.556	.839	.250	.000	.821	.333	.350	.875	.000	.779	.556	.808	.806	.313	.865	.929	.523	.750	.000	.750	.889
Cars	20	87	1	0	108	4	7	38	0	49	53	123	57	5	238	51	23	45	0	119	514
% Cars	100	92.6	100	0	93.9	100	100	90.5	0	92.5	88.3	97.6	98.3	100	95.6	98.1	100	100	0	99.2	95.7
Trucks	0	7	0	0	7	0	0	4	0	4	7	3	1	0	11	1	0	0	0	1	23
% Trucks	0	7.4	0	0	6.1	0	0	9.5	0	7.5	11.7	2.4	1.7	0	4.4	1.9	0	0	0	0.8	4.3

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

Transportation Data Corporation

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N/S: Market Basket/Garden Lane

E/W: Internal Access Drives

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04145A

Site Code : T0070.42

Start Date : 8/4/2011

Page No : 1

Groups Printed- Trucks

	Garden Lane (Market Basket) From North				Internal (To Wendy's) From East				Garden Lane (To Route 102) From South				Internal (To Bank/Plaza) From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Uturn	Right	Thru	Left	Peds	
07:00 AM	0	1	0	0	1	0	0	0	2	2	0	0	0	0	0	0	6
07:15 AM	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	3
07:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	2	0	0	0	0	1	0	2	2	0	0	0	0	0	0	7
Total	0	4	0	0	1	0	1	0	5	6	0	0	0	0	0	0	17
08:00 AM	0	1	0	0	0	0	1	0	1	0	1	0	1	0	0	0	5
08:15 AM	0	3	0	0	0	0	2	0	1	0	0	0	0	0	0	0	6
08:30 AM	0	1	0	0	0	0	0	0	3	1	0	0	0	0	0	0	5
08:45 AM	0	2	0	0	0	0	2	0	0	1	0	0	0	0	0	0	5
Total	0	7	0	0	0	0	5	0	5	2	1	0	1	0	0	0	21
Grand Total	0	11	0	0	1	0	6	0	10	8	1	0	1	0	0	0	38
Apprch %	0	100	0	0	14.3	0	85.7	0	52.6	42.1	5.3	0	100	0	0	0	
Total %	0	28.9	0	0	2.6	0	15.8	0	26.3	21.1	2.6	0	2.6	0	0	0	

	Garden Lane (Market Basket) From North					Internal (To Wendy's) From East					Garden Lane (To Route 102) From South					Internal (To Bank/Plaza) From West					Int. Total
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Uturn	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	2	0	0	2	0	0	1	0	1	2	2	0	0	4	0	0	0	0	0	7
08:00 AM	0	1	0	0	1	0	0	1	0	1	1	0	1	0	2	1	0	0	0	1	5
08:15 AM	0	3	0	0	3	0	0	2	0	2	1	0	0	0	1	0	0	0	0	0	6
08:30 AM	0	1	0	0	1	0	0	0	0	0	3	1	0	0	4	0	0	0	0	0	5
Total Volume	0	7	0	0	7	0	0	4	0	4	7	3	1	0	11	1	0	0	0	1	23
% App. Total	0	100	0	0		0	0	100	0		63.6	27.3	9.1	0		100	0	0	0		
PHF	.000	.583	.000	.000	.583	.000	.000	.500	.000	.500	.583	.375	.250	.000	.688	.250	.000	.000	.000	.250	.821

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Client: TEC/R. Brown

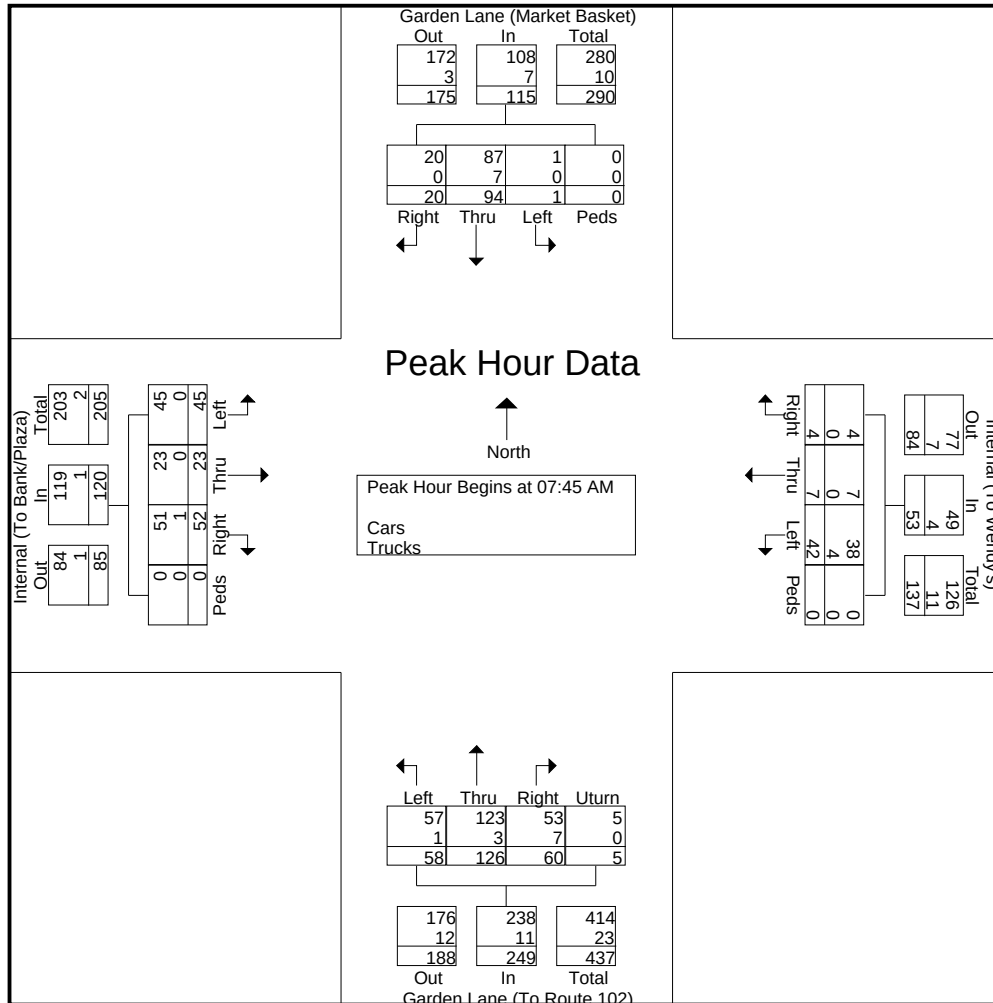
File Name : 04145A

Site Code : T0070.42

Start Date : 8/4/2011

Page No : 1

	Garden Lane (Market Basket) From North					Internal (To Wendy's) From East					Garden Lane (To Route 102) From South					Internal (To Bank/Plaza) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Uturn	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	1	28	0	0	29	0	1	11	0	12	14	39	18	1	72	11	3	15	0	29	142
08:00 AM	3	18	1	0	22	0	5	12	0	17	8	31	13	4	56	14	5	3	0	22	117
08:15 AM	7	22	0	0	29	3	1	9	0	13	11	28	17	0	56	13	4	12	0	29	127
08:30 AM	9	26	0	0	35	1	0	10	0	11	27	28	10	0	65	14	11	15	0	40	151
Total Volume	20	94	1	0	115	4	7	42	0	53	60	126	58	5	249	52	23	45	0	120	537
% App. Total	17.4	81.7	0.9	0		7.5	13.2	79.2	0		24.1	50.6	23.3	2		43.3	19.2	37.5	0		
PHF	.556	.839	.250	.000	.821	.333	.350	.875	.000	.779	.556	.808	.806	.313	.865	.929	.523	.750	.000	.750	.889
Cars	20	87	1	0	108	4	7	38	0	49	53	123	57	5	238	51	23	45	0	119	514
% Cars	100	92.6	100	0	93.9	100	100	90.5	0	92.5	88.3	97.6	98.3	100	95.6	98.1	100	100	0	99.2	95.7
Trucks	0	7	0	0	7	0	0	4	0	4	7	3	1	0	11	1	0	0	0	1	23
% Trucks	0	7.4	0	0	6.1	0	0	9.5	0	7.5	11.7	2.4	1.7	0	4.4	1.9	0	0	0	0.8	4.3



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City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04145B

Site Code : T0070.42

Start Date : 8/4/2011

Page No : 1

Groups Printed- Cars - Trucks

	Garden Lane From North			Nashua Road (Route 102) From East			Hampton Drive From South			Nashua Road (Route 102) From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
07:00 AM	5	3	15	37	157	10	10	4	4	9	270	13	537
07:15 AM	8	1	26	57	166	7	10	1	2	11	302	27	618
07:30 AM	5	5	21	41	223	12	15	4	3	13	315	12	669
07:45 AM	19	2	28	59	201	8	15	2	6	15	298	13	666
Total	37	11	90	194	747	37	50	11	15	48	1185	65	2490
08:00 AM	16	2	28	37	201	13	9	3	0	17	259	14	599
08:15 AM	4	6	34	36	176	17	7	6	8	15	286	13	608
08:30 AM	15	5	31	42	183	8	18	5	6	12	271	16	612
08:45 AM	13	6	30	49	194	11	17	2	5	7	246	19	599
Total	48	19	123	164	754	49	51	16	19	51	1062	62	2418
Grand Total	85	30	213	358	1501	86	101	27	34	99	2247	127	4908
Apprch %	25.9	9.1	64.9	18.4	77.2	4.4	62.3	16.7	21	4	90.9	5.1	
Total %	1.7	0.6	4.3	7.3	30.6	1.8	2.1	0.6	0.7	2	45.8	2.6	
Cars	79	28	203	343	1420	85	100	25	32	98	2164	126	4703
% Cars	92.9	93.3	95.3	95.8	94.6	98.8	99	92.6	94.1	99	96.3	99.2	95.8
Trucks	6	2	10	15	81	1	1	2	2	1	83	1	205
% Trucks	7.1	6.7	4.7	4.2	5.4	1.2	1	7.4	5.9	1	3.7	0.8	4.2

	Garden Lane From North				Nashua Road (Route 102) From East				Hampton Drive From South				Nashua Road (Route 102) From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	8	1	26	35	57	166	7	230	10	1	2	13	11	302	27	340	618
07:30 AM	5	5	21	31	41	223	12	276	15	4	3	22	13	315	12	340	669
07:45 AM	19	2	28	49	59	201	8	268	15	2	6	23	15	298	13	326	666
08:00 AM	16	2	28	46	37	201	13	251	9	3	0	12	17	259	14	290	599
Total Volume	48	10	103	161	194	791	40	1025	49	10	11	70	56	1174	66	1296	2552
% App. Total	29.8	6.2	64		18.9	77.2	3.9		70	14.3	15.7		4.3	90.6	5.1		
PHF	.632	.500	.920	.821	.822	.887	.769	.928	.817	.625	.458	.761	.824	.932	.611	.953	.954
Cars	46	10	98	154	187	750	40	977	48	9	11	68	55	1128	65	1248	2447
% Cars	95.8	100	95.1	95.7	96.4	94.8	100	95.3	98.0	90.0	100	97.1	98.2	96.1	98.5	96.3	95.9
Trucks	2	0	5	7	7	41	0	48	1	1	0	2	1	46	1	48	105
% Trucks	4.2	0	4.9	4.3	3.6	5.2	0	4.7	2.0	10.0	0	2.9	1.8	3.9	1.5	3.7	4.1

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Client: TEC/R. Brown

File Name : 04145B

Site Code : T0070.42

Start Date : 8/4/2011

Page No : 1

Groups Printed- Trucks

	Garden Lane From North			Nashua Road (Route 102) From East			Hampton Drive From South			Nashua Road (Route 102) From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
07:00 AM	1	0	0	2	9	1	0	1	1	0	8	0	23
07:15 AM	0	0	0	3	11	0	0	0	0	1	12	0	27
07:30 AM	0	0	1	0	16	0	0	0	0	0	14	0	31
07:45 AM	1	0	2	3	8	0	1	1	0	0	9	0	25
Total	2	0	3	8	44	1	1	2	1	1	43	0	106
08:00 AM	1	0	2	1	6	0	0	0	0	0	11	1	22
08:15 AM	0	2	2	1	13	0	0	0	0	0	7	0	25
08:30 AM	2	0	0	4	8	0	0	0	1	0	10	0	25
08:45 AM	1	0	3	1	10	0	0	0	0	0	12	0	27
Total	4	2	7	7	37	0	0	0	1	0	40	1	99
Grand Total	6	2	10	15	81	1	1	2	2	1	83	1	205
Apprch %	33.3	11.1	55.6	15.5	83.5	1	20	40	40	1.2	97.6	1.2	
Total %	2.9	1	4.9	7.3	39.5	0.5	0.5	1	1	0.5	40.5	0.5	

	Garden Lane From North				Nashua Road (Route 102) From East				Hampton Drive From South				Nashua Road (Route 102) From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	1	0	0	1	2	9	1	12	0	1	1	2	0	8	0	8	23
07:15 AM	0	0	0	0	3	11	0	14	0	0	0	0	1	12	0	13	27
07:30 AM	0	0	1	1	0	16	0	16	0	0	0	0	0	14	0	14	31
07:45 AM	1	0	2	3	3	8	0	11	1	1	0	2	0	9	0	9	25
Total Volume	2	0	3	5	8	44	1	53	1	2	1	4	1	43	0	44	106
% App. Total	40	0	60		15.1	83	1.9		25	50	25		2.3	97.7	0		
PHF	.500	.000	.375	.417	.667	.688	.250	.828	.250	.500	.250	.500	.250	.768	.000	.786	.855

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Garden Lane/Hampton Drive

E/W: Nashua Road (Route 102)

City, State: Londonderry, NH

Client: TEC/R. Brown

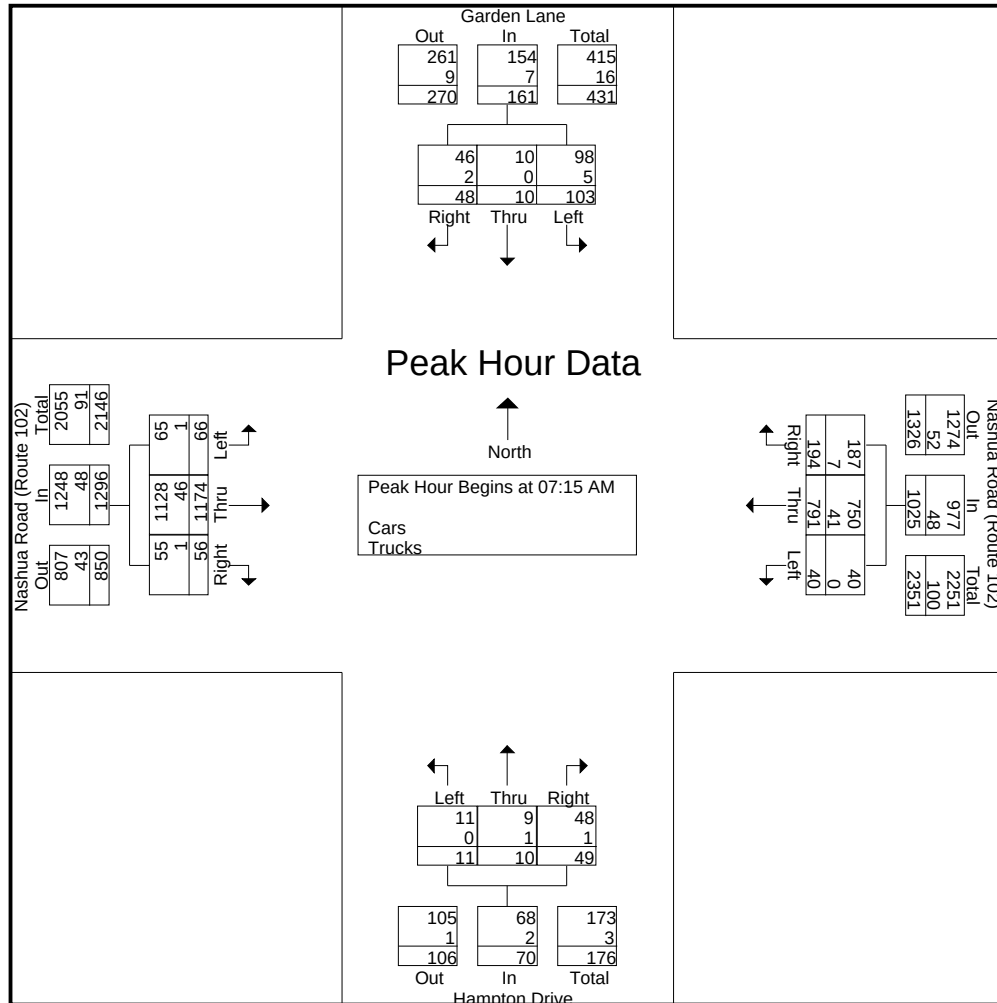
File Name : 04145B

Site Code : T0070.42

Start Date : 8/4/2011

Page No : 1

	Garden Lane From North				Nashua Road (Route 102) From East				Hampton Drive From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	8	1	26	35	57	166	7	230	10	1	2	13	11	302	27	340	618
07:30 AM	5	5	21	31	41	223	12	276	15	4	3	22	13	315	12	340	669
07:45 AM	19	2	28	49	59	201	8	268	15	2	6	23	15	298	13	326	666
08:00 AM	16	2	28	46	37	201	13	251	9	3	0	12	17	259	14	290	599
Total Volume	48	10	103	161	194	791	40	1025	49	10	11	70	56	1174	66	1296	2552
% App. Total	29.8	6.2	64		18.9	77.2	3.9		70	14.3	15.7		4.3	90.6	5.1		
PHF	.632	.500	.920	.821	.822	.887	.769	.928	.817	.625	.458	.761	.824	.932	.611	.953	.954
Cars	46	10	98	154	187	750	40	977	48	9	11	68	55	1128	65	1248	2447
% Cars	95.8	100	95.1	95.7	96.4	94.8	100	95.3	98.0	90.0	100	97.1	98.2	96.1	98.5	96.3	95.9
Trucks	2	0	5	7	7	41	0	48	1	1	0	2	1	46	1	48	105
% Trucks	4.2	0	4.9	4.3	3.6	5.2	0	4.7	2.0	10.0	0	2.9	1.8	3.9	1.5	3.7	4.1



Transportation Data Corporation

Mario Perone, mperone1@verizon.net

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N/S: Gilcreast Road
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04145C
Site Code : T0070.42
Start Date : 8/4/2011
Page No : 1

Groups Printed- Cars - Trucks

	Gilcreast Road From North			Nashua Road (Route 102) From East			Gilcreast Road From South			Nashua Road (Route 102) From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
07:00 AM	26	11	44	10	130	18	38	7	15	10	216	21	546
07:15 AM	26	12	56	13	145	21	55	7	25	15	244	26	645
07:30 AM	40	16	61	12	199	17	33	11	31	6	263	23	712
07:45 AM	33	21	45	22	193	15	35	14	27	11	243	39	698
Total	125	60	206	57	667	71	161	39	98	42	966	109	2601
08:00 AM	30	24	49	16	166	23	33	8	22	4	224	24	623
08:15 AM	21	17	36	13	166	18	40	13	21	11	239	42	637
08:30 AM	31	12	34	21	165	21	50	13	27	6	220	34	634
08:45 AM	39	13	29	19	165	26	36	16	26	13	207	27	616
Total	121	66	148	69	662	88	159	50	96	34	890	127	2510
Grand Total	246	126	354	126	1329	159	320	89	194	76	1856	236	5111
Apprch %	33.9	17.4	48.8	7.8	82.3	9.9	53.1	14.8	32.2	3.5	85.6	10.9	
Total %	4.8	2.5	6.9	2.5	26	3.1	6.3	1.7	3.8	1.5	36.3	4.6	
Cars	241	125	354	126	1245	156	315	89	194	74	1773	231	4923
% Cars	98	99.2	100	100	93.7	98.1	98.4	100	100	97.4	95.5	97.9	96.3
Trucks	5	1	0	0	84	3	5	0	0	2	83	5	188
% Trucks	2	0.8	0	0	6.3	1.9	1.6	0	0	2.6	4.5	2.1	3.7

	Gilcreast Road From North				Nashua Road (Route 102) From East				Gilcreast Road From South				Nashua Road (Route 102) From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	26	12	56	94	13	145	21	179	55	7	25	87	15	244	26	285	645
07:30 AM	40	16	61	117	12	199	17	228	33	11	31	75	6	263	23	292	712
07:45 AM	33	21	45	99	22	193	15	230	35	14	27	76	11	243	39	293	698
08:00 AM	30	24	49	103	16	166	23	205	33	8	22	63	4	224	24	252	623
Total Volume	129	73	211	413	63	703	76	842	156	40	105	301	36	974	112	1122	2678
% App. Total	31.2	17.7	51.1		7.5	83.5	9		51.8	13.3	34.9		3.2	86.8	10		
PHF	.806	.760	.865	.882	.716	.883	.826	.915	.709	.714	.847	.865	.600	.926	.718	.957	.940
Cars	126	73	211	410	63	661	75	799	154	40	105	299	34	930	109	1073	2581
% Cars	97.7	100	100	99.3	100	94.0	98.7	94.9	98.7	100	100	99.3	94.4	95.5	97.3	95.6	96.4
Trucks	3	0	0	3	0	42	1	43	2	0	0	2	2	44	3	49	97
% Trucks	2.3	0	0	0.7	0	6.0	1.3	5.1	1.3	0	0	0.7	5.6	4.5	2.7	4.4	3.6

Transportation Data Corporation

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N/S: Gilcreast Road
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04145C
Site Code : T0070.42
Start Date : 8/4/2011
Page No : 1

Groups Printed- Trucks

	Gilcreast Road From North			Nashua Road (Route 102) From East			Gilcreast Road From South			Nashua Road (Route 102) From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
07:00 AM	1	0	0	0	10	1	0	0	0	0	10	1	23
07:15 AM	2	0	0	0	11	1	0	0	0	0	13	1	28
07:30 AM	0	0	0	0	15	0	2	0	0	0	11	1	29
07:45 AM	1	0	0	0	10	0	0	0	0	2	10	0	23
Total	4	0	0	0	46	2	2	0	0	2	44	3	103
08:00 AM	0	0	0	0	6	0	0	0	0	0	10	1	17
08:15 AM	0	0	0	0	11	0	1	0	0	0	6	0	18
08:30 AM	1	1	0	0	11	0	1	0	0	0	11	0	25
08:45 AM	0	0	0	0	10	1	1	0	0	0	12	1	25
Total	1	1	0	0	38	1	3	0	0	0	39	2	85
Grand Total	5	1	0	0	84	3	5	0	0	2	83	5	188
Apprch %	83.3	16.7	0	0	96.6	3.4	100	0	0	2.2	92.2	5.6	
Total %	2.7	0.5	0	0	44.7	1.6	2.7	0	0	1.1	44.1	2.7	

	Gilcreast Road From North				Nashua Road (Route 102) From East				Gilcreast Road From South				Nashua Road (Route 102) From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	1	0	0	1	0	10	1	11	0	0	0	0	0	10	1	11	23
07:15 AM	2	0	0	2	0	11	1	12	0	0	0	0	0	13	1	14	28
07:30 AM	0	0	0	0	0	15	0	15	2	0	0	2	0	11	1	12	29
07:45 AM	1	0	0	1	0	10	0	10	0	0	0	0	2	10	0	12	23
Total Volume	4	0	0	4	0	46	2	48	2	0	0	2	2	44	3	49	103
% App. Total	100	0	0		0	95.8	4.2		100	0	0		4.1	89.8	6.1		
PHF	.500	.000	.000	.500	.000	.767	.500	.800	.250	.000	.000	.250	.250	.846	.750	.875	.888

Transportation Data Corporation

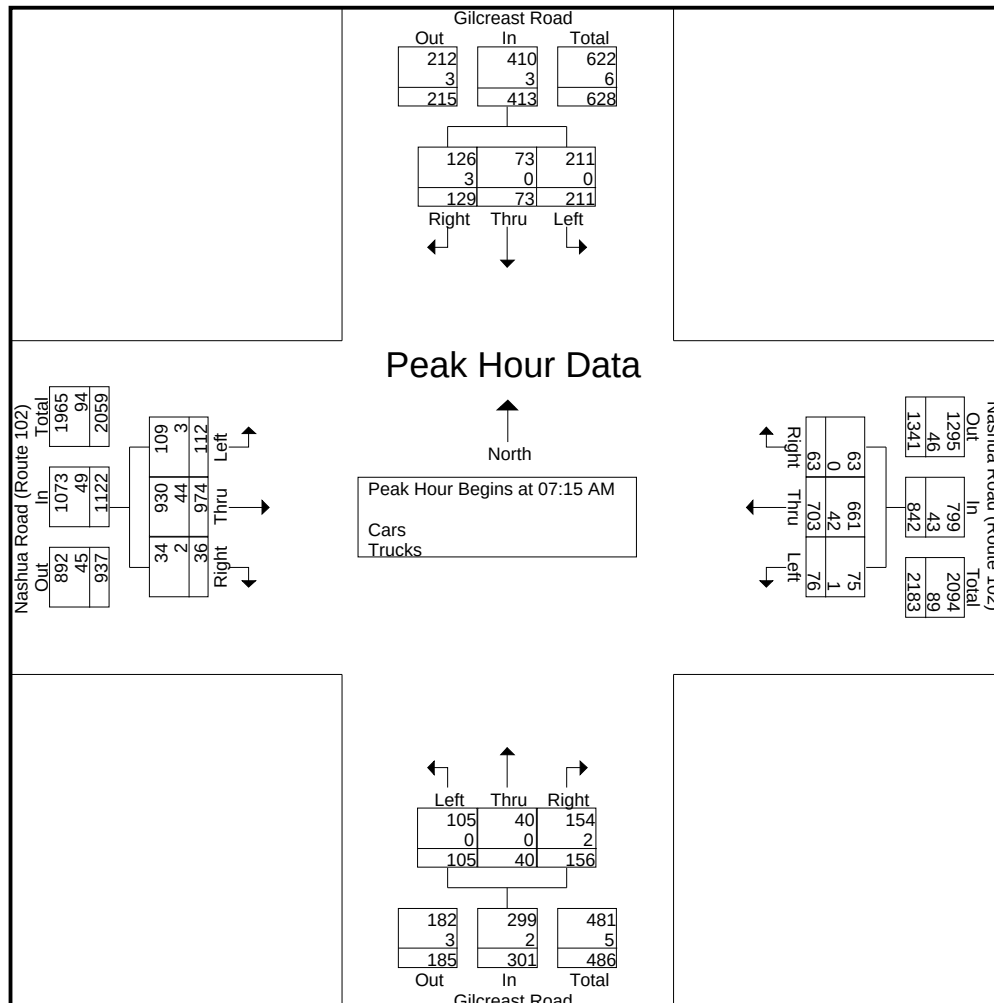
Mario Perone, mperone1@verizon.net

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N/S: Gilcreast Road
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04145C
Site Code : T0070.42
Start Date : 8/4/2011
Page No : 1

	Gilcreast Road From North				Nashua Road (Route 102) From East				Gilcreast Road From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	26	12	56	94	13	145	21	179	55	7	25	87	15	244	26	285	645
07:30 AM	40	16	61	117	12	199	17	228	33	11	31	75	6	263	23	292	712
07:45 AM	33	21	45	99	22	193	15	230	35	14	27	76	11	243	39	293	698
08:00 AM	30	24	49	103	16	166	23	205	33	8	22	63	4	224	24	252	623
Total Volume	129	73	211	413	63	703	76	842	156	40	105	301	36	974	112	1122	2678
% App. Total	31.2	17.7	51.1		7.5	83.5	9		51.8	13.3	34.9		3.2	86.8	10		
PHF	.806	.760	.865	.882	.716	.883	.826	.915	.709	.714	.847	.865	.600	.926	.718	.957	.940
Cars	126	73	211	410	63	661	75	799	154	40	105	299	34	930	109	1073	2581
% Cars	97.7	100	100	99.3	100	94.0	98.7	94.9	98.7	100	100	99.3	94.4	95.5	97.3	95.6	96.4
Trucks	3	0	0	3	0	42	1	43	2	0	0	2	2	44	3	49	97
% Trucks	2.3	0	0	0.7	0	6.0	1.3	5.1	1.3	0	0	0.7	5.6	4.5	2.7	4.4	3.6



Transportation Data Corporation

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t (781) 587-0086 f (781) 587-0089

S: Londonderry Road
E/W: Ash Street/Pillsbury Road
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04145E
Site Code : T0070.42
Start Date : 8/4/2011
Page No : 1

Groups Printed- Cars - Trucks

	Ash Street From East		Londonderry Road From South		Pillsbury Road From West		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	22	18	8	2	6	23	79
07:15 AM	43	16	9	3	12	29	112
07:30 AM	44	13	7	7	11	34	116
07:45 AM	41	9	20	2	10	45	127
Total	150	56	44	14	39	131	434
08:00 AM	36	20	12	9	5	35	117
08:15 AM	40	11	13	6	7	43	120
08:30 AM	46	19	8	2	8	34	117
08:45 AM	38	23	16	3	8	59	147
Total	160	73	49	20	28	171	501
Grand Total	310	129	93	34	67	302	935
Apprch %	70.6	29.4	73.2	26.8	18.2	81.8	
Total %	33.2	13.8	9.9	3.6	7.2	32.3	
Cars	307	126	93	33	67	300	926
% Cars	99	97.7	100	97.1	100	99.3	99
Trucks	3	3	0	1	0	2	9
% Trucks	1	2.3	0	2.9	0	0.7	1

	Ash Street From East			Londonderry Road From South			Pillsbury Road From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	36	20	56	12	9	21	5	35	40	117
08:15 AM	40	11	51	13	6	19	7	43	50	120
08:30 AM	46	19	65	8	2	10	8	34	42	117
08:45 AM	38	23	61	16	3	19	8	59	67	147
Total Volume	160	73	233	49	20	69	28	171	199	501
% App. Total	68.7	31.3		71	29		14.1	85.9		
PHF	.870	.793	.896	.766	.556	.821	.875	.725	.743	.852
Cars	158	73	231	49	19	68	28	169	197	496
% Cars	98.8	100	99.1	100	95.0	98.6	100	98.8	99.0	99.0
Trucks	2	0	2	0	1	1	0	2	2	5
% Trucks	1.3	0	0.9	0	5.0	1.4	0	1.2	1.0	1.0

Transportation Data Corporation

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S: Londonderry Road
E/W: Ash Street/Pillsbury Road
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04145E
Site Code : T0070.42
Start Date : 8/4/2011
Page No : 1

Groups Printed- Trucks

	Ash Street From East		Londonderry Road From South		Pillsbury Road From West		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	0	0	0	0	0	0	0
07:15 AM	0	1	0	0	0	0	1
07:30 AM	0	1	0	0	0	0	1
07:45 AM	1	1	0	0	0	0	2
Total	1	3	0	0	0	0	4
08:00 AM	2	0	0	1	0	1	4
08:15 AM	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	1	1
Total	2	0	0	1	0	2	5
Grand Total	3	3	0	1	0	2	9
Apprch %	50	50	0	100	0	100	
Total %	33.3	33.3	0	11.1	0	22.2	

	Ash Street From East			Londonderry Road From South			Pillsbury Road From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	1	1	0	0	0	0	0	0	1
07:30 AM	0	1	1	0	0	0	0	0	0	1
07:45 AM	1	1	2	0	0	0	0	0	0	2
08:00 AM	2	0	2	0	1	1	0	1	1	4
Total Volume	3	3	6	0	1	1	0	1	1	8
% App. Total	50	50		0	100		0	100		
PHF	.375	.750	.750	.000	.250	.250	.000	.250	.250	.500

Transportation Data Corporation

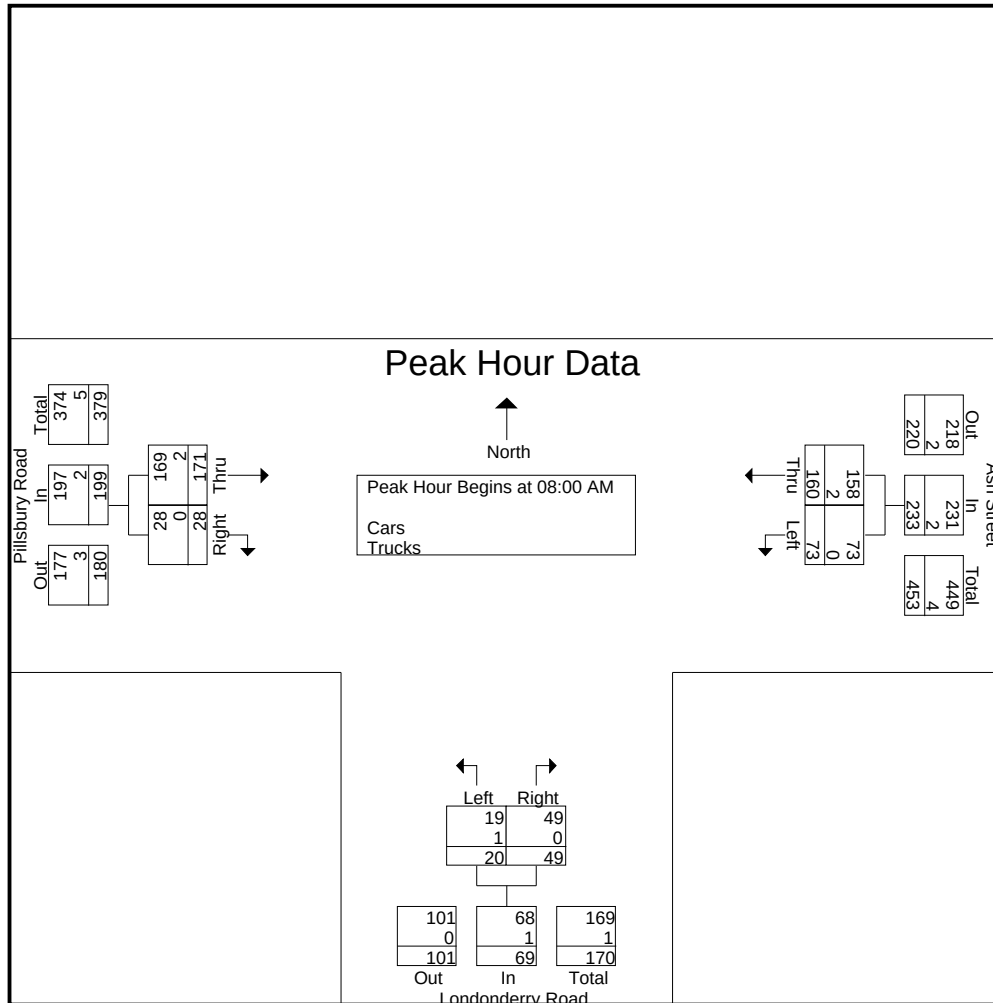
Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

S: Londonderry Road
E/W: Ash Street/Pillsbury Road
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04145E
Site Code : T0070.42
Start Date : 8/4/2011
Page No : 1

	Ash Street From East			Londonderry Road From South			Pillsbury Road From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	36	20	56	12	9	21	5	35	40	117
08:15 AM	40	11	51	13	6	19	7	43	50	120
08:30 AM	46	19	65	8	2	10	8	34	42	117
08:45 AM	38	23	61	16	3	19	8	59	67	147
Total Volume	160	73	233	49	20	69	28	171	199	501
% App. Total	68.7	31.3		71	29		14.1	85.9		
PHF	.870	.793	.896	.766	.556	.821	.875	.725	.743	.852
Cars	158	73	231	49	19	68	28	169	197	496
% Cars	98.8	100	99.1	100	95.0	98.6	100	98.8	99.0	99.0
Trucks	2	0	2	0	1	1	0	2	2	5
% Trucks	1.3	0	0.9	0	5.0	1.4	0	1.2	1.0	1.0



Transportation Data Corporation

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t (781) 587-0086 f (781) 587-0089

N/S: Mammoth Road (Route 128)

E/W: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04154A

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

Groups Printed- Cars - Trucks

Start Time	Mammoth Road (Route 128) From North				Pillsbury Road From East				Mammoth Road (Route 128) From South				Pillsbury Road From West				Exclu. Total	Inclu. Total	Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds			
07:00 AM	31	98	39	0	29	4	7	0	6	120	1	0	13	33	54	0	0	435	435
07:15 AM	14	80	21	0	17	9	12	0	3	73	2	0	9	36	21	0	0	297	297
07:30 AM	14	65	12	0	15	7	4	0	5	94	5	0	10	34	26	0	0	291	291
07:45 AM	26	95	22	0	21	5	7	0	4	106	7	0	11	36	37	0	0	377	377
Total	85	338	94	0	82	25	30	0	18	393	15	0	43	139	138	0	0	1400	1400
08:00 AM	12	65	21	0	11	6	7	0	4	78	6	0	3	30	16	0	0	259	259
08:15 AM	10	63	13	0	20	19	7	0	5	56	8	0	14	35	22	0	0	272	272
08:30 AM	10	63	15	0	24	15	8	0	2	76	24	0	14	25	25	0	0	301	301
08:45 AM	16	63	22	0	14	8	3	0	9	64	14	0	26	32	22	0	0	293	293
Total	48	254	71	0	69	48	25	0	20	274	52	0	57	122	85	0	0	1125	1125
Grand Total	133	592	165	0	151	73	55	0	38	667	67	0	100	261	223	0	0	2525	2525
Apprch %	14.9	66.5	18.5		54.1	26.2	19.7		4.9	86.4	8.7		17.1	44.7	38.2				
Total %	5.3	23.4	6.5		6	2.9	2.2		1.5	26.4	2.7		4	10.3	8.8		0	100	
Cars	133	582	164		151	73	54		38	658	66		100	260	223		0	0	2502
% Cars	100	98.3	99.4	0	100	100	98.2	0	100	98.7	98.5	0	100	99.6	100	0	0	0	99.1
Trucks	0	10	1		0	0	1		0	9	1		0	1	0		0	0	23
% Trucks	0	1.7	0.6	0	0	0	1.8	0	0	1.3	1.5	0	0	0.4	0	0	0	0	0.9

Start Time	Mammoth Road (Route 128) From North				Pillsbury Road From East				Mammoth Road (Route 128) From South				Pillsbury Road From West				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	31	98	39	168	29	4	7	40	6	120	1	127	13	33	54	100	435
07:15 AM	14	80	21	115	17	9	12	38	3	73	2	78	9	36	21	66	297
07:30 AM	14	65	12	91	15	7	4	26	5	94	5	104	10	34	26	70	291
07:45 AM	26	95	22	143	21	5	7	33	4	106	7	117	11	36	37	84	377
Total Volume	85	338	94	517	82	25	30	137	18	393	15	426	43	139	138	320	1400
% App. Total	16.4	65.4	18.2		59.9	18.2	21.9		4.2	92.3	3.5		13.4	43.4	43.1		
PHF	.685	.862	.603	.769	.707	.694	.625	.856	.750	.819	.536	.839	.827	.965	.639	.800	.805
Cars	85	330	94	509	82	25	30	137	18	390	15	423	43	139	138	320	1389
% Cars	100	97.6	100	98.5	100	100	100	100	100	99.2	100	99.3	100	100	100	100	99.2
Trucks	0	8	0	8	0	0	0	0	0	3	0	3	0	0	0	0	11
% Trucks	0	2.4	0	1.5	0	0	0	0	0	0.8	0	0.7	0	0	0	0	0.8

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Mammoth Road (Route 128)

E/W: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04154A

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

Groups Printed- Trucks

	Mammoth Road (Route 128) From North			Pillsbury Road From East			Mammoth Road (Route 128) From South			Pillsbury Road From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
07:00 AM	0	4	0	0	0	0	0	1	0	0	0	0	5
07:15 AM	0	2	0	0	0	0	0	2	0	0	0	0	4
07:30 AM	0	2	0	0	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	8	0	0	0	0	0	3	0	0	0	0	11
08:00 AM	0	1	0	0	0	1	0	1	0	0	0	0	3
08:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
08:30 AM	0	0	1	0	0	0	0	3	1	0	0	0	5
08:45 AM	0	1	0	0	0	0	0	1	0	0	1	0	3
Total	0	2	1	0	0	1	0	6	1	0	1	0	12
Grand Total	0	10	1	0	0	1	0	9	1	0	1	0	23
Apprch %	0	90.9	9.1	0	0	100	0	90	10	0	100	0	
Total %	0	43.5	4.3	0	0	4.3	0	39.1	4.3	0	4.3	0	

	Mammoth Road (Route 128) From North				Pillsbury Road From East				Mammoth Road (Route 128) From South				Pillsbury Road From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	1	0	1	0	0	1	1	0	1	0	1	0	0	0	0	3
08:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
08:30 AM	0	0	1	1	0	0	0	0	0	3	1	4	0	0	0	0	5
08:45 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	1	0	1	3
Total Volume	0	2	1	3	0	0	1	1	0	6	1	7	0	1	0	1	12
% App. Total	0	66.7	33.3		0	0	100		0	85.7	14.3		0	100	0		
PHF	.000	.500	.250	.750	.000	.000	.250	.250	.000	.500	.250	.438	.000	.250	.000	.250	.600

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Mammoth Road (Route 128)

E/W: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

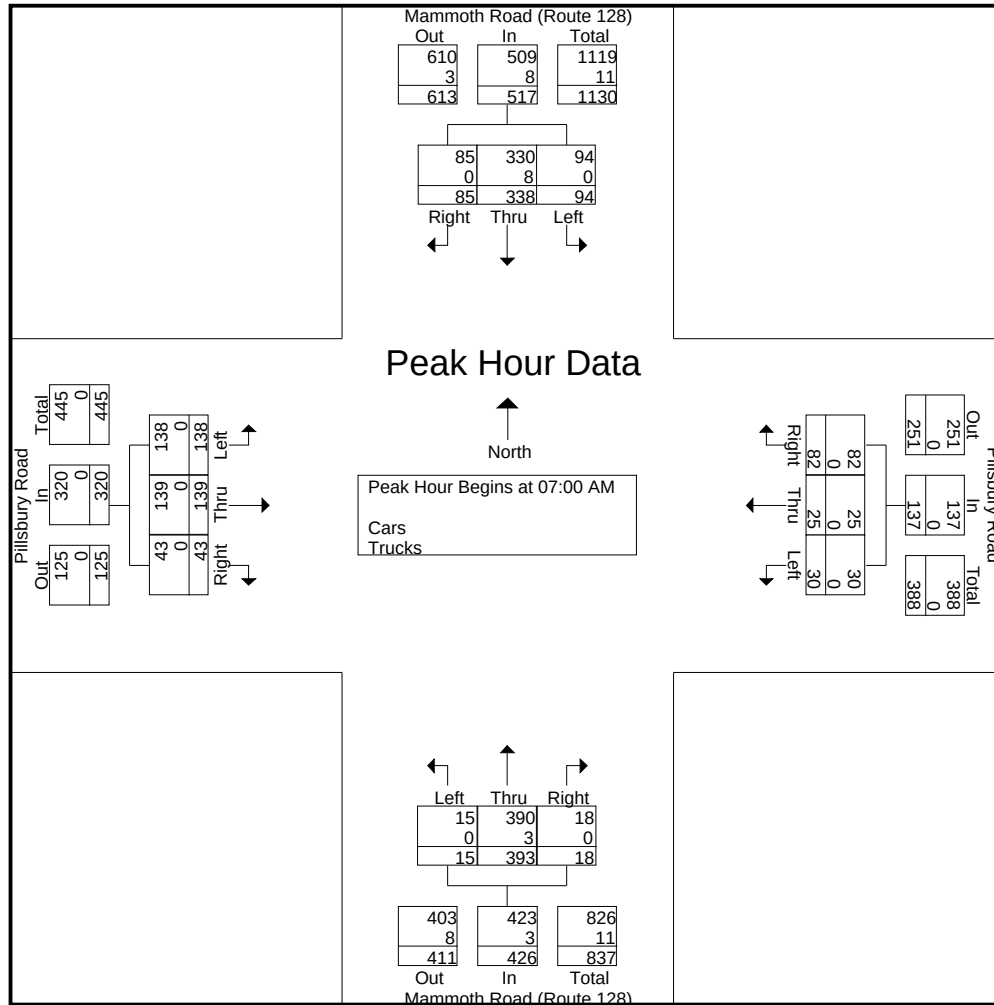
File Name : 04154A

Site Code : T0378.01

Start Date : 9/8/2011

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	Mammoth Road (Route 128) From North				Pillsbury Road From East				Mammoth Road (Route 128) From South				Pillsbury Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	31	98	39	168	29	4	7	40	6	120	1	127	13	33	54	100	435
07:15 AM	14	80	21	115	17	9	12	38	3	73	2	78	9	36	21	66	297
07:30 AM	14	65	12	91	15	7	4	26	5	94	5	104	10	34	26	70	291
07:45 AM	26	95	22	143	21	5	7	33	4	106	7	117	11	36	37	84	377
Total Volume	85	338	94	517	82	25	30	137	18	393	15	426	43	139	138	320	1400
% App. Total	16.4	65.4	18.2		59.9	18.2	21.9		4.2	92.3	3.5		13.4	43.4	43.1		
PHF	.685	.862	.603	.769	.707	.694	.625	.856	.750	.819	.536	.839	.827	.965	.639	.800	.805
Cars	85	330	94	509	82	25	30	137	18	390	15	423	43	139	138	320	1389
% Cars	100	97.6	100	98.5	100	100	100	100	100	99.2	100	99.3	100	100	100	100	99.2
Trucks	0	8	0	8	0	0	0	0	0	3	0	3	0	0	0	0	11
% Trucks	0	2.4	0	1.5	0	0	0	0	0	0.8	0	0.7	0	0	0	0	0.8



Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Hardy Road/Pillsbury Road

W: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04154B

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

Groups Printed- Cars - Trucks

	Hardy Road From North			Pillsbury Road From South			Pillsbury Road From West			Exclu. Total	Inclu. Total	Int. Total
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds			
07:00 AM	9	33	0	25	27	0	61	14	0	0	169	169
07:15 AM	15	57	0	16	26	0	66	9	0	0	189	189
07:30 AM	4	48	0	16	17	0	47	7	0	0	139	139
07:45 AM	7	38	0	10	23	0	65	4	0	0	147	147
Total	35	176	0	67	93	0	239	34	0	0	644	644
08:00 AM	10	35	0	14	16	0	48	3	0	0	126	126
08:15 AM	10	38	0	5	36	0	53	6	0	0	148	148
08:30 AM	12	47	0	16	26	0	39	5	0	0	145	145
08:45 AM	7	40	0	12	17	0	61	6	0	0	143	143
Total	39	160	0	47	95	0	201	20	0	0	562	562
Grand Total	74	336	0	114	188	0	440	54	0	0	1206	1206
Apprch %	18	82		37.7	62.3		89.1	10.9				
Total %	6.1	27.9		9.5	15.6		36.5	4.5		0	100	
Cars	74	336		113	188		438	54		0	0	1203
% Cars	100	100	0	99.1	100	0	99.5	100	0	0	0	99.8
Trucks	0	0		1	0		2	0		0	0	3
% Trucks	0	0	0	0.9	0	0	0.5	0	0	0	0	0.2

	Hardy Road From North			Pillsbury Road From South			Pillsbury Road From West			Int. Total
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	9	33	42	25	27	52	61	14	75	169
07:15 AM	15	57	72	16	26	42	66	9	75	189
07:30 AM	4	48	52	16	17	33	47	7	54	139
07:45 AM	7	38	45	10	23	33	65	4	69	147
Total Volume	35	176	211	67	93	160	239	34	273	644
% App. Total	16.6	83.4		41.9	58.1		87.5	12.5		
PHF	.583	.772	.733	.670	.861	.769	.905	.607	.910	.852
Cars	35	176	211	66	93	159	239	34	273	643
% Cars	100	100	100	98.5	100	99.4	100	100	100	99.8
Trucks	0	0	0	1	0	1	0	0	0	1
% Trucks	0	0	0	1.5	0	0.6	0	0	0	0.2

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Hardy Road/Pillsbury Road

W: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04154B

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

Groups Printed- Trucks

	Hardy Road From North		Pillsbury Road From South		Pillsbury Road From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0
07:45 AM	0	0	1	0	0	0	1
Total	0	0	1	0	0	0	1
08:00 AM	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	2	0	2
Total	0	0	0	0	2	0	2
Grand Total	0	0	1	0	2	0	3
Apprch %	0	0	100	0	100	0	
Total %	0	0	33.3	0	66.7	0	

	Hardy Road From North			Pillsbury Road From South			Pillsbury Road From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	2	0	2	2
Total Volume	0	0	0	0	0	0	2	0	2	2
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Hardy Road/Pillsbury Road

W: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

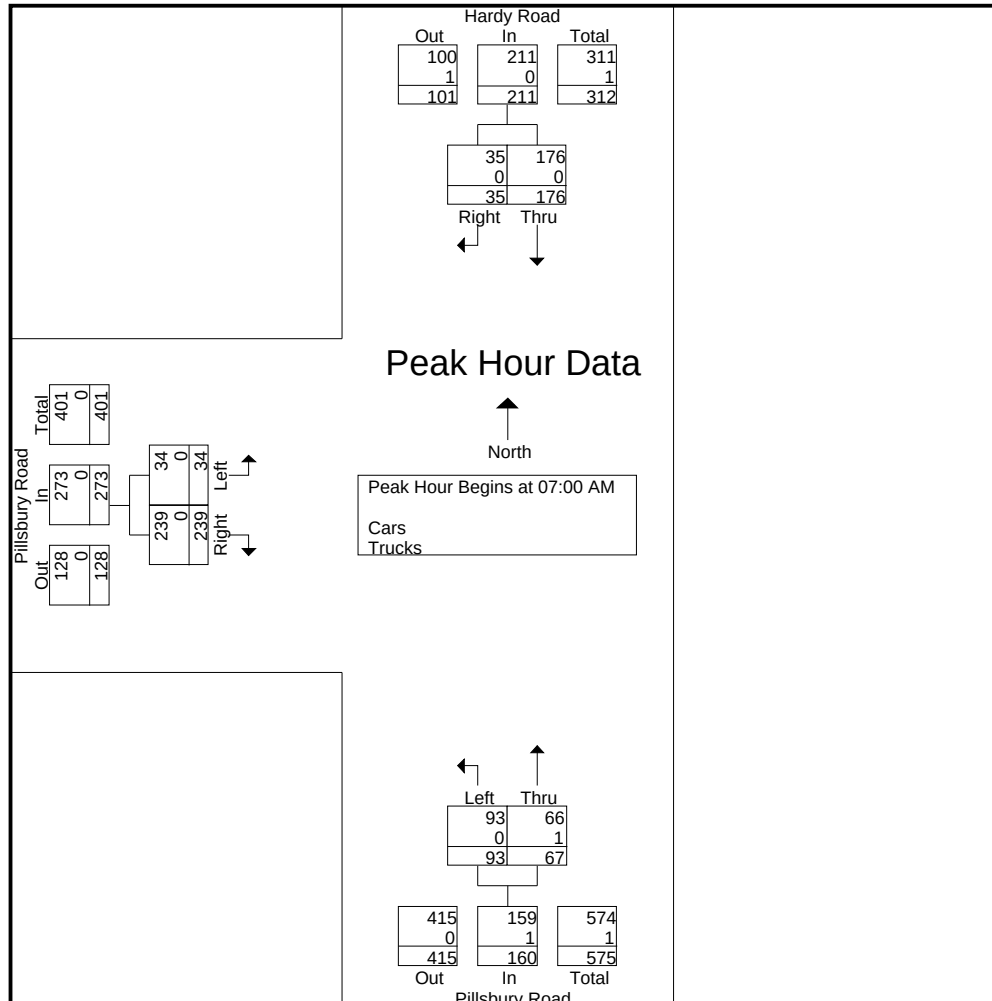
File Name : 04154B

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

	Hardy Road From North			Pillsbury Road From South			Pillsbury Road From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	9	33	42	25	27	52	61	14	75	169
07:15 AM	15	57	72	16	26	42	66	9	75	189
07:30 AM	4	48	52	16	17	33	47	7	54	139
07:45 AM	7	38	45	10	23	33	65	4	69	147
Total Volume	35	176	211	67	93	160	239	34	273	644
% App. Total	16.6	83.4		41.9	58.1		87.5	12.5		
PHF	.583	.772	.733	.670	.861	.769	.905	.607	.910	.852
Cars	35	176	211	66	93	159	239	34	273	643
% Cars	100	100	100	98.5	100	99.4	100	100	100	99.8
Trucks	0	0	0	1	0	1	0	0	0	1
% Trucks	0	0	0	1.5	0	0.6	0	0	0	0.2



Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Pillsbury Road/Gilcrest Road

E: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04154C

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

Groups Printed- Cars - Trucks

	Pillsbury Road From North			Pillsbury Road From East			Gilcrest Road From South			Exclu. Total	Inclu. Total	Int. Total
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds			
07:00 AM	63	27	0	16	36	0	8	36	0	0	186	186
07:15 AM	101	21	0	17	35	0	17	25	0	0	216	216
07:30 AM	77	18	0	10	23	0	22	20	0	0	170	170
07:45 AM	76	27	0	10	43	0	22	22	0	0	200	200
Total	317	93	0	53	137	0	69	103	0	0	772	772
08:00 AM	65	18	0	10	27	0	12	22	0	0	154	154
08:15 AM	66	27	0	14	31	0	16	26	0	0	180	180
08:30 AM	62	26	0	15	40	0	21	30	0	0	194	194
08:45 AM	75	22	0	10	37	0	22	16	0	0	182	182
Total	268	93	0	49	135	0	71	94	0	0	710	710
Grand Total	585	186	0	102	272	0	140	197	0	0	1482	1482
Apprch %	75.9	24.1		27.3	72.7		41.5	58.5				
Total %	39.5	12.6		6.9	18.4		9.4	13.3		0	100	
Cars	584	185		102	271		139	196		0	0	1477
% Cars	99.8	99.5	0	100	99.6	0	99.3	99.5	0	0	0	99.7
Trucks	1	1		0	1		1	1		0	0	5
% Trucks	0.2	0.5	0	0	0.4	0	0.7	0.5	0	0	0	0.3

	Pillsbury Road From North			Pillsbury Road From East			Gilcrest Road From South			Int. Total
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	63	27	90	16	36	52	8	36	44	186
07:15 AM	101	21	122	17	35	52	17	25	42	216
07:30 AM	77	18	95	10	23	33	22	20	42	170
07:45 AM	76	27	103	10	43	53	22	22	44	200
Total Volume	317	93	410	53	137	190	69	103	172	772
% App. Total	77.3	22.7		27.9	72.1		40.1	59.9		
PHF	.785	.861	.840	.779	.797	.896	.784	.715	.977	.894
Cars	317	93	410	53	137	190	69	102	171	771
% Cars	100	100	100	100	100	100	100	99.0	99.4	99.9
Trucks	0	0	0	0	0	0	0	1	1	1
% Trucks	0	0	0	0	0	0	0	1.0	0.6	0.1

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Pillsbury Road/Gilcrest Road

E: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04154C

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

Groups Printed- Trucks

	Pillsbury Road From North		Pillsbury Road From East		Gilcrest Road From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	1	1
Total	0	0	0	0	0	1	1
08:00 AM	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	1	0	1
08:45 AM	1	1	0	1	0	0	3
Total	1	1	0	1	1	0	4
Grand Total	1	1	0	1	1	1	5
Apprch %	50	50	0	100	50	50	
Total %	20	20	0	20	20	20	

	Pillsbury Road From North			Pillsbury Road From East			Gilcrest Road From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	1	0	1	1
08:45 AM	1	1	2	0	1	1	0	0	0	3
Total Volume	1	1	2	0	1	1	1	0	1	4
% App. Total	50	50		0	100		100	0		
PHF	.250	.250	.250	.000	.250	.250	.250	.000	.250	.333

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Pillsbury Road/Gilcrest Road

E: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

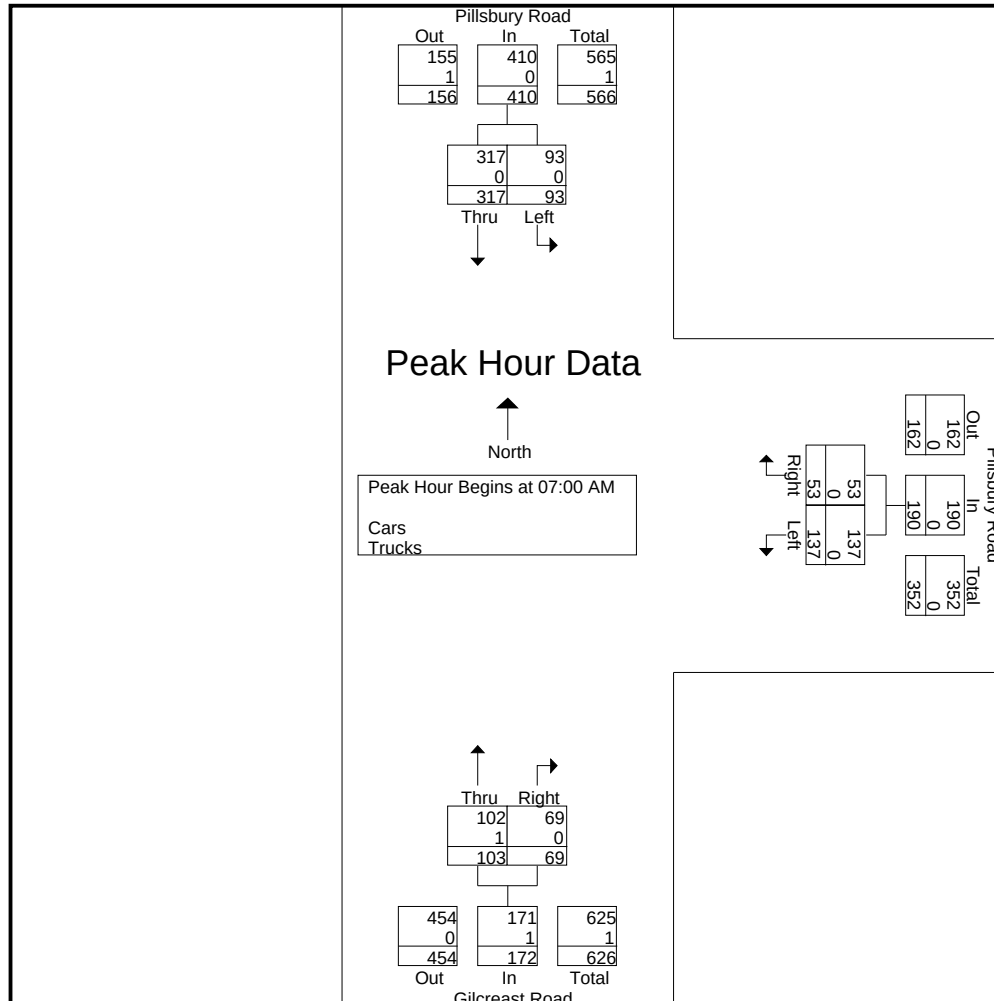
File Name : 04154C

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

	Pillsbury Road From North			Pillsbury Road From East			Gilcrest Road From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	63	27	90	16	36	52	8	36	44	186
07:15 AM	101	21	122	17	35	52	17	25	42	216
07:30 AM	77	18	95	10	23	33	22	20	42	170
07:45 AM	76	27	103	10	43	53	22	22	44	200
Total Volume	317	93	410	53	137	190	69	103	172	772
% App. Total	77.3	22.7		27.9	72.1		40.1	59.9		
PHF	.785	.861	.840	.779	.797	.896	.784	.715	.977	.894
Cars	317	93	410	53	137	190	69	102	171	771
% Cars	100	100	100	100	100	100	100	99.0	99.4	99.9
Trucks	0	0	0	0	0	0	0	1	1	1
% Trucks	0	0	0	0	0	0	0	1.0	0.6	0.1



Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: North High Street
W: Ash Street Extension
City, State: Derry, NH
Client: TEC/R. Brown

File Name : 04154D
Site Code : T0378.01
Start Date : 9/8/2011
Page No : 1

Groups Printed- Cars - Trucks

	North High Street From North			North High Street From South			Ash Street Extension From West			Exclu. Total	Inclu. Total	Int. Total
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds			
07:00 AM	71	41	0	17	1	0	2	25	0	0	157	157
07:15 AM	55	32	0	15	0	0	1	33	0	0	136	136
07:30 AM	38	44	0	12	2	0	0	40	3	3	136	139
07:45 AM	63	36	0	38	1	0	0	53	0	0	191	191
Total	227	153	0	82	4	0	3	151	3	3	620	623
08:00 AM	39	34	0	24	1	0	0	35	0	0	133	133
08:15 AM	51	40	0	21	1	0	0	38	0	0	151	151
08:30 AM	68	35	0	25	2	0	1	55	0	0	186	186
08:45 AM	62	32	0	24	0	0	0	42	0	0	160	160
Total	220	141	0	94	4	0	1	170	0	0	630	630
Grand Total	447	294	0	176	8	0	4	321	3	3	1250	1253
Apprch %	60.3	39.7		95.7	4.3		1.2	98.8				
Total %	35.8	23.5		14.1	0.6		0.3	25.7		0.2	99.8	
Cars	447	291		175	7		4	320		0	0	1247
% Cars	100	99	0	99.4	87.5	0	100	99.7	100	0	0	99.5
Trucks	0	3		1	1		0	1		0	0	6
% Trucks	0	1	0	0.6	12.5	0	0	0.3	0	0	0	0.5

	North High Street From North			North High Street From South			Ash Street Extension From West			Int. Total
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	63	36	99	38	1	39	0	53	53	191
08:00 AM	39	34	73	24	1	25	0	35	35	133
08:15 AM	51	40	91	21	1	22	0	38	38	151
08:30 AM	68	35	103	25	2	27	1	55	56	186
Total Volume	221	145	366	108	5	113	1	181	182	661
% App. Total	60.4	39.6		95.6	4.4		0.5	99.5		
PHF	.813	.906	.888	.711	.625	.724	.250	.823	.813	.865
Cars	221	144	365	107	4	111	1	180	181	657
% Cars	100	99.3	99.7	99.1	80.0	98.2	100	99.4	99.5	99.4
Trucks	0	1	1	1	1	2	0	1	1	4
% Trucks	0	0.7	0.3	0.9	20.0	1.8	0	0.6	0.5	0.6

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: North High Street
W: Ash Street Extension
City, State: Derry, NH
Client: TEC/R. Brown

File Name : 04154D
Site Code : T0378.01
Start Date : 9/8/2011
Page No : 1

Groups Printed- Trucks

	North High Street From North		North High Street From South		Ash Street Extension From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
07:00 AM	0	1	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0
07:30 AM	0	1	0	0	0	0	1
07:45 AM	0	0	1	1	0	0	2
Total	0	2	1	1	0	0	4
08:00 AM	0	0	0	0	0	1	1
08:15 AM	0	1	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0
Total	0	1	0	0	0	1	2
Grand Total	0	3	1	1	0	1	6
Apprch %	0	100	50	50	0	100	
Total %	0	50	16.7	16.7	0	16.7	

	North High Street From North			North High Street From South			Ash Street Extension From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	0	1	1	0	0	0	0	0	0	1
07:45 AM	0	0	0	1	1	2	0	0	0	2
08:00 AM	0	0	0	0	0	0	0	1	1	1
08:15 AM	0	1	1	0	0	0	0	0	0	1
Total Volume	0	2	2	1	1	2	0	1	1	5
% App. Total	0	100		50	50		0	100		
PHF	.000	.500	.500	.250	.250	.250	.000	.250	.250	.625

Transportation Data Corporation

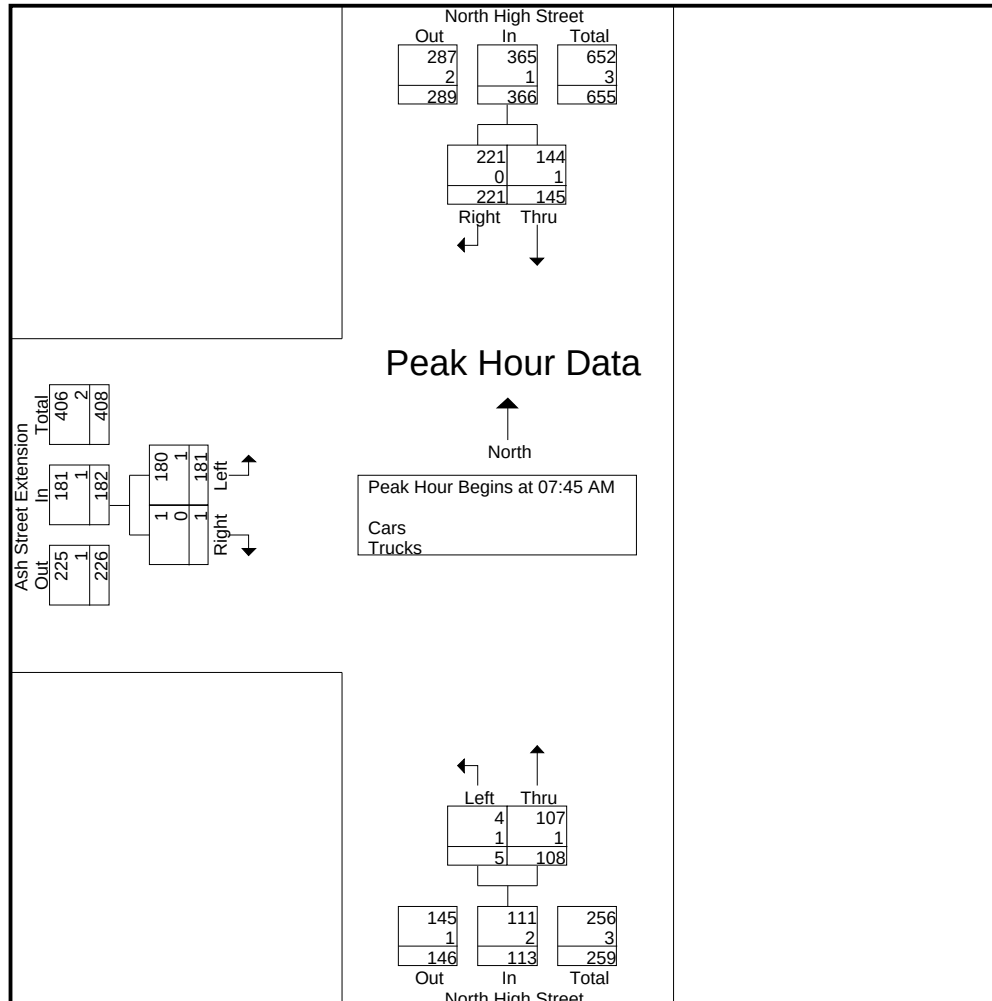
Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: North High Street
W: Ash Street Extension
City, State: Derry, NH
Client: TEC/R. Brown

File Name : 04154D
Site Code : T0378.01
Start Date : 9/8/2011
Page No : 1

	North High Street From North			North High Street From South			Ash Street Extension From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	63	36	99	38	1	39	0	53	53	191
08:00 AM	39	34	73	24	1	25	0	35	35	133
08:15 AM	51	40	91	21	1	22	0	38	38	151
08:30 AM	68	35	103	25	2	27	1	55	56	186
Total Volume	221	145	366	108	5	113	1	181	182	661
% App. Total	60.4	39.6		95.6	4.4		0.5	99.5		
PHF	.813	.906	.888	.711	.625	.724	.250	.823	.813	.865
Cars	221	144	365	107	4	111	1	180	181	657
% Cars	100	99.3	99.7	99.1	80.0	98.2	100	99.4	99.5	99.4
Trucks	0	1	1	1	1	2	0	1	1	4
% Trucks	0	0.7	0.3	0.9	20.0	1.8	0	0.6	0.5	0.6



Transportation Data Corporation

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t (781) 587-0086 f (781) 587-0089

N/S: Londonderry Road/St. Charles St.
E/W: W. Broadway/Nashua (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154E
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

Groups Printed- Cars - Trucks

Start Time	Londonderry Road From North				West Broadway (Route 102) From East				Saint Charles Street From South				Nashua Road (Route 102) From West				Exclu. Total	Inclu. Total	Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds			
07:00 AM	23	0	0	0	6	318	1	0	0	0	1	0	0	114	13	0	0	476	476
07:15 AM	33	0	1	0	9	296	0	0	0	0	0	0	2	124	29	0	0	494	494
07:30 AM	25	2	1	0	5	320	0	0	0	0	1	0	1	141	17	0	0	513	513
07:45 AM	34	0	2	1	8	268	0	0	2	0	0	0	1	181	35	0	1	531	532
Total	115	2	4	1	28	1202	1	0	2	0	2	0	4	560	94	0	1	2014	2015
08:00 AM	23	0	1	0	8	239	0	0	0	0	0	0	0	133	25	0	0	429	429
08:15 AM	28	0	2	0	7	269	1	0	1	0	0	0	1	152	27	0	0	488	488
08:30 AM	31	0	1	0	5	293	0	0	0	0	0	0	0	146	28	0	0	504	504
08:45 AM	22	0	0	0	5	201	0	0	1	0	0	0	2	164	34	0	0	429	429
Total	104	0	4	0	25	1002	1	0	2	0	0	0	3	595	114	0	0	1850	1850
Grand Total	219	2	8	1	53	2204	2	0	4	0	2	0	7	1155	208	0	1	3864	3865
Apprch %	95.6	0.9	3.5		2.3	97.6	0.1		66.7	0	33.3		0.5	84.3	15.2				
Total %	5.7	0.1	0.2		1.4	57	0.1		0.1	0	0.1		0.2	29.9	5.4		0	100	
Cars	215	2	7		53	2158	2		3	0	2		7	1117	201		0	0	3768
% Cars	98.2	100	87.5	100	100	97.9	100	0	75	0	100	0	100	96.7	96.6	0	0	0	97.5
Trucks	4	0	1		0	46	0		1	0	0		0	38	7		0	0	97
% Trucks	1.8	0	12.5	0	0	2.1	0	0	25	0	0	0	0	3.3	3.4	0	0	0	2.5

Start Time	Londonderry Road From North				West Broadway (Route 102) From East				Saint Charles Street From South				Nashua Road (Route 102) From West				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	23	0	0	23	6	318	1	325	0	0	1	1	0	114	13	127	476
07:15 AM	33	0	1	34	9	296	0	305	0	0	0	0	2	124	29	155	494
07:30 AM	25	2	1	28	5	320	0	325	0	0	1	1	1	141	17	159	513
07:45 AM	34	0	2	36	8	268	0	276	2	0	0	2	1	181	35	217	531
Total Volume	115	2	4	121	28	1202	1	1231	2	0	2	4	4	560	94	658	2014
% App. Total	95	1.7	3.3		2.3	97.6	0.1		50	0	50		0.6	85.1	14.3		
PHF	.846	.250	.500	.840	.778	.939	.250	.947	.250	.000	.500	.500	.500	.773	.671	.758	.948
Cars	114	2	3	119	28	1184	1	1213	2	0	2	4	4	538	91	633	1969
% Cars	99.1	100	75.0	98.3	100	98.5	100	98.5	100	0	100	100	100	96.1	96.8	96.2	97.8
Trucks	1	0	1	2	0	18	0	18	0	0	0	0	0	22	3	25	45
% Trucks	0.9	0	25.0	1.7	0	1.5	0	1.5	0	0	0	0	0	3.9	3.2	3.8	2.2

Transportation Data Corporation

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N/S: Londonderry Road/St. Charles St.
E/W: W. Broadway/Nashua (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154E
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

Groups Printed- Trucks

	Londonderry Road From North			West Broadway (Route 102) From East			Saint Charles Street From South			Nashua Road (Route 102) From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
07:00 AM	0	0	0	0	7	0	0	0	0	0	5	0	12
07:15 AM	0	0	0	0	3	0	0	0	0	0	3	1	7
07:30 AM	0	0	0	0	3	0	0	0	0	0	4	1	8
07:45 AM	1	0	1	0	5	0	0	0	0	0	10	1	18
Total	1	0	1	0	18	0	0	0	0	0	22	3	45
08:00 AM	0	0	0	0	3	0	0	0	0	0	4	1	8
08:15 AM	1	0	0	0	6	0	0	0	0	0	4	0	11
08:30 AM	1	0	0	0	14	0	0	0	0	0	3	1	19
08:45 AM	1	0	0	0	5	0	1	0	0	0	5	2	14
Total	3	0	0	0	28	0	1	0	0	0	16	4	52
Grand Total	4	0	1	0	46	0	1	0	0	0	38	7	97
Apprch %	80	0	20	0	100	0	100	0	0	0	84.4	15.6	
Total %	4.1	0	1	0	47.4	0	1	0	0	0	39.2	7.2	

	Londonderry Road From North				West Broadway (Route 102) From East				Saint Charles Street From South				Nashua Road (Route 102) From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	1	0	1	2	0	5	0	5	0	0	0	0	0	10	1	11	18
08:00 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	4	1	5	8
08:15 AM	1	0	0	1	0	6	0	6	0	0	0	0	0	4	0	4	11
08:30 AM	1	0	0	1	0	14	0	14	0	0	0	0	0	3	1	4	19
Total Volume	3	0	1	4	0	28	0	28	0	0	0	0	0	21	3	24	56
% App. Total	75	0	25		0	100	0		0	0	0		0	87.5	12.5		
PHF	.750	.000	.250	.500	.000	.500	.000	.500	.000	.000	.000	.000	.000	.525	.750	.545	.737

Transportation Data Corporation

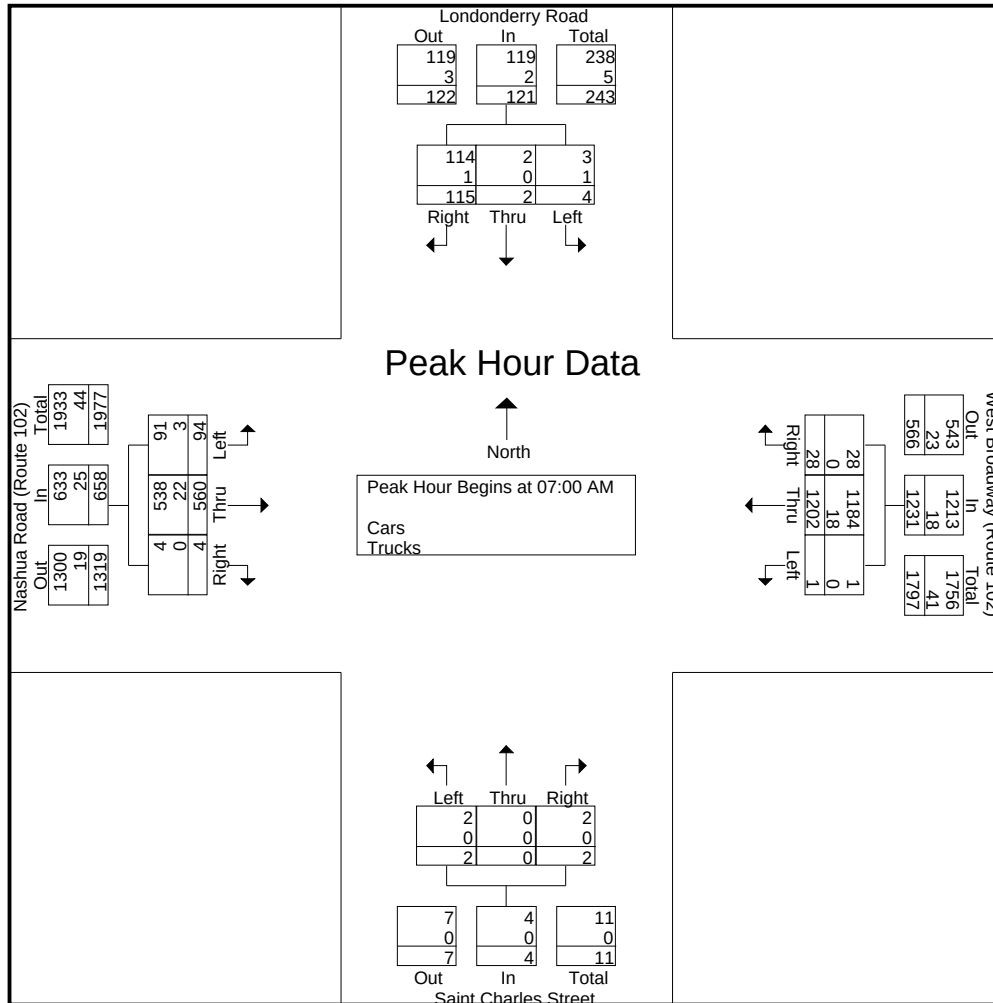
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N/S: Londonderry Road/St. Charles St.
E/W: W. Broadway/Nashua (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154E
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

	Londonderry Road From North				West Broadway (Route 102) From East				Saint Charles Street From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	23	0	0	23	6	318	1	325	0	0	1	1	0	114	13	127	476
07:15 AM	33	0	1	34	9	296	0	305	0	0	0	0	2	124	29	155	494
07:30 AM	25	2	1	28	5	320	0	325	0	0	1	1	1	141	17	159	513
07:45 AM	34	0	2	36	8	268	0	276	2	0	0	2	1	181	35	217	531
Total Volume	115	2	4	121	28	1202	1	1231	2	0	2	4	4	560	94	658	2014
% App. Total	95	1.7	3.3		2.3	97.6	0.1		50	0	50		0.6	85.1	14.3		
PHF	.846	.250	.500	.840	.778	.939	.250	.947	.250	.000	.500	.500	.500	.773	.671	.758	.948
Cars	114	2	3	119	28	1184	1	1213	2	0	2	4	4	538	91	633	1969
% Cars	99.1	100	75.0	98.3	100	98.5	100	98.5	100	0	100	100	100	96.1	96.8	96.2	97.8
Trucks	1	0	1	2	0	18	0	18	0	0	0	0	0	22	3	25	45
% Trucks	0.9	0	25.0	1.7	0	1.5	0	1.5	0	0	0	0	0	3.9	3.2	3.8	2.2



Transportation Data Corporation

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t (781) 587-0086 f (781) 587-0089

N/S: I-93 Northbound Ramps
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154F
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

Groups Printed- Cars - Trucks

Start Time	I-93 NB On-Ramp From North				Nashua Road (Route 102) From East				I-93 NB Off-Ramp From South				Nashua Road (Route 102) From West				Exclu. Total	Inclu. Total	Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds			
07:00 AM	0	0	0	0	98	207	0	0	50	0	39	0	0	89	129	0	0	612	612
07:15 AM	0	0	0	0	123	252	0	0	56	0	34	0	0	119	145	0	0	729	729
07:30 AM	0	0	0	0	131	191	0	0	52	1	52	0	0	129	153	0	0	709	709
07:45 AM	0	0	0	0	109	216	0	0	67	1	59	1	0	166	137	0	1	755	756
Total	0	0	0	0	461	866	0	0	225	2	184	1	0	503	564	0	1	2805	2806
08:00 AM	0	0	0	0	79	210	0	0	48	0	53	0	0	151	124	0	0	665	665
08:15 AM	0	0	0	0	88	199	0	0	65	0	47	0	0	155	120	0	0	674	674
08:30 AM	0	0	0	0	90	195	0	0	73	0	27	0	0	148	134	0	0	667	667
08:45 AM	0	0	0	0	61	191	0	0	57	0	50	0	0	172	85	0	0	616	616
Total	0	0	0	0	318	795	0	0	243	0	177	0	0	626	463	0	0	2622	2622
Grand Total	0	0	0	0	779	1661	0	0	468	2	361	1	0	1129	1027	0	1	5427	5428
Apprch %	0	0	0		31.9	68.1	0		56.3	0.2	43.4		0	52.4	47.6				
Total %	0	0	0		14.4	30.6	0		8.6	0	6.7		0	20.8	18.9		0	100	
Cars	0	0	0		762	1616	0		449	2	332		0	1093	986		0	0	5241
% Cars	0	0	0	0	97.8	97.3	0	0	95.9	100	92	100	0	96.8	96	0	0	0	96.6
Trucks	0	0	0		17	45	0		19	0	29		0	36	41		0	0	187
% Trucks	0	0	0	0	2.2	2.7	0	0	4.1	0	8	0	0	3.2	4	0	0	0	3.4

Start Time	I-93 NB On-Ramp From North				Nashua Road (Route 102) From East				I-93 NB Off-Ramp From South				Nashua Road (Route 102) From West				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 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	123	252	0	375	56	0	34	90	0	119	145	264	729
07:30 AM	0	0	0	0	131	191	0	322	52	1	52	105	0	129	153	282	709
07:45 AM	0	0	0	0	109	216	0	325	67	1	59	127	0	166	137	303	755
08:00 AM	0	0	0	0	79	210	0	289	48	0	53	101	0	151	124	275	665
Total Volume	0	0	0	0	442	869	0	1311	223	2	198	423	0	565	559	1124	2858
% App. Total	0	0	0		33.7	66.3	0		52.7	0.5	46.8		0	50.3	49.7		
PHF	.000	.000	.000	.000	.844	.862	.000	.874	.832	.500	.839	.833	.000	.851	.913	.927	.946
Cars	0	0	0	0	435	854	0	1289	214	2	185	401	0	545	541	1086	2776
% Cars	0	0	0	0	98.4	98.3	0	98.3	96.0	100	93.4	94.8	0	96.5	96.8	96.6	97.1
Trucks	0	0	0	0	7	15	0	22	9	0	13	22	0	20	18	38	82
% Trucks	0	0	0	0	1.6	1.7	0	1.7	4.0	0	6.6	5.2	0	3.5	3.2	3.4	2.9

Transportation Data Corporation

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N/S: I-93 Northbound Ramps
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154F
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

Groups Printed- Trucks

	I-93 NB On-Ramp From North			Nashua Road (Route 102) From East			I-93 NB Off-Ramp From South			Nashua Road (Route 102) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	5	6	0	4	0	2	0	2	7	26
07:15 AM	0	0	0	3	4	0	1	0	3	0	4	2	17
07:30 AM	0	0	0	1	4	0	2	0	7	0	4	3	21
07:45 AM	0	0	0	2	5	0	5	0	1	0	7	6	26
Total	0	0	0	11	19	0	12	0	13	0	17	18	90
08:00 AM	0	0	0	1	2	0	1	0	2	0	5	7	18
08:15 AM	0	0	0	1	8	0	1	0	9	0	5	4	28
08:30 AM	0	0	0	0	7	0	2	0	2	0	3	1	15
08:45 AM	0	0	0	4	9	0	3	0	3	0	6	11	36
Total	0	0	0	6	26	0	7	0	16	0	19	23	97
Grand Total	0	0	0	17	45	0	19	0	29	0	36	41	187
Apprch %	0	0	0	27.4	72.6	0	39.6	0	60.4	0	46.8	53.2	
Total %	0	0	0	9.1	24.1	0	10.2	0	15.5	0	19.3	21.9	

	I-93 NB On-Ramp From North				Nashua Road (Route 102) From East				I-93 NB Off-Ramp From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	1	2	0	3	1	0	2	3	0	5	7	12	18
08:15 AM	0	0	0	0	1	8	0	9	1	0	9	10	0	5	4	9	28
08:30 AM	0	0	0	0	0	7	0	7	2	0	2	4	0	3	1	4	15
08:45 AM	0	0	0	0	4	9	0	13	3	0	3	6	0	6	11	17	36
Total Volume	0	0	0	0	6	26	0	32	7	0	16	23	0	19	23	42	97
% App. Total	0	0	0		18.8	81.2	0		30.4	0	69.6		0	45.2	54.8		
PHF	.000	.000	.000	.000	.375	.722	.000	.615	.583	.000	.444	.575	.000	.792	.523	.618	.674

Transportation Data Corporation

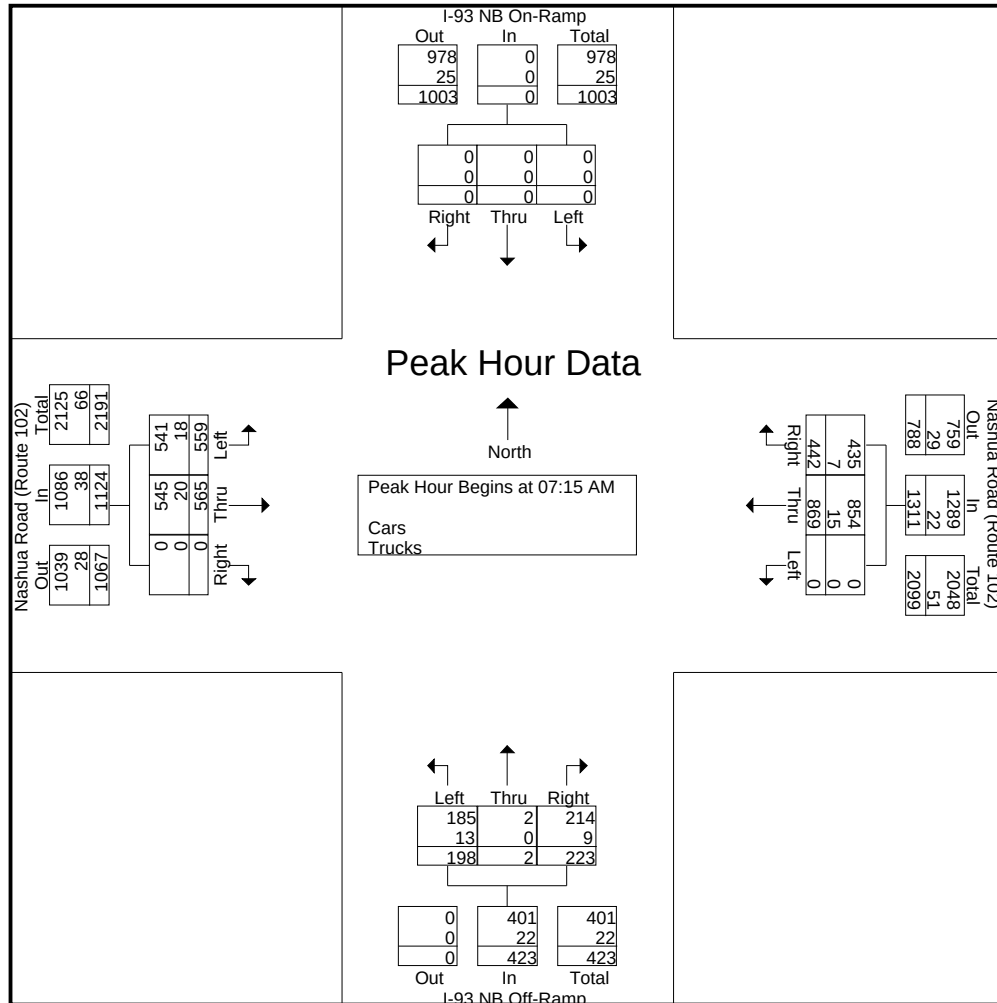
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N/S: I-93 Northbound Ramps
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154F
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

	I-93 NB On-Ramp From North				Nashua Road (Route 102) From East				I-93 NB Off-Ramp From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 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	123	252	0	375	56	0	34	90	0	119	145	264	729
07:30 AM	0	0	0	0	131	191	0	322	52	1	52	105	0	129	153	282	709
07:45 AM	0	0	0	0	109	216	0	325	67	1	59	127	0	166	137	303	755
08:00 AM	0	0	0	0	79	210	0	289	48	0	53	101	0	151	124	275	665
Total Volume	0	0	0	0	442	869	0	1311	223	2	198	423	0	565	559	1124	2858
% App. Total	0	0	0	0	33.7	66.3	0		52.7	0.5	46.8		0	50.3	49.7		
PHF	.000	.000	.000	.000	.844	.862	.000	.874	.832	.500	.839	.833	.000	.851	.913	.927	.946
Cars	0	0	0	0	435	854	0	1289	214	2	185	401	0	545	541	1086	2776
% Cars	0	0	0	0	98.4	98.3	0	98.3	96.0	100	93.4	94.8	0	96.5	96.8	96.6	97.1
Trucks	0	0	0	0	7	15	0	22	9	0	13	22	0	20	18	38	82
% Trucks	0	0	0	0	1.6	1.7	0	1.7	4.0	0	6.6	5.2	0	3.5	3.2	3.4	2.9



Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: I-93 SB Ramps (Exit 4)
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154G
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

Groups Printed- Cars - Trucks

Start Time	I-93 SB On/Off-Ramps From North				Nashua Road (Route 102) From East				I-93 SB On-Ramp From South				Nashua Road (Route 102) From West				Exclu. Total	Inclu. Total	Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds			
07:00 AM	93	0	54	0	129	105	0	0	0	0	0	0	157	169	0	0	0	707	707
07:15 AM	140	0	63	0	167	114	0	0	0	0	0	0	179	206	0	0	0	869	869
07:30 AM	122	0	63	0	111	126	0	0	0	0	0	0	146	225	0	0	0	793	793
07:45 AM	155	0	85	0	121	166	0	0	0	0	0	0	134	208	0	0	0	869	869
Total	510	0	265	0	528	511	0	0	0	0	0	0	616	808	0	0	0	3238	3238
08:00 AM	105	0	77	0	119	154	0	0	0	0	0	0	119	189	0	0	0	763	763
08:15 AM	116	0	69	0	112	135	0	0	0	0	0	0	108	218	0	0	0	758	758
08:30 AM	114	0	60	0	102	121	0	0	0	0	0	0	120	211	0	0	0	728	728
08:45 AM	129	0	72	0	94	150	0	0	0	0	0	0	95	186	0	0	0	726	726
Total	464	0	278	0	427	560	0	0	0	0	0	0	442	804	0	0	0	2975	2975
Grand Total	974	0	543	0	955	1071	0	0	0	0	0	0	1058	1612	0	0	0	6213	6213
Apprch %	64.2	0	35.8		47.1	52.9	0		0	0	0		39.6	60.4	0				
Total %	15.7	0	8.7		15.4	17.2	0		0	0	0		17	25.9	0		0	100	
Cars	937	0	527		929	1022	0		0	0	0		1041	1547	0		0	0	6003
% Cars	96.2	0	97.1	0	97.3	95.4	0	0	0	0	0	0	98.4	96	0	0	0	0	96.6
Trucks	37	0	16		26	49	0		0	0	0		17	65	0		0	0	210
% Trucks	3.8	0	2.9	0	2.7	4.6	0	0	0	0	0	0	1.6	4	0	0	0	0	3.4

	I-93 SB On/Off-Ramps From North				Nashua Road (Route 102) From East				I-93 SB On-Ramp From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	140	0	63	203	167	114	0	281	0	0	0	0	179	206	0	385	869
07:30 AM	122	0	63	185	111	126	0	237	0	0	0	0	146	225	0	371	793
07:45 AM	155	0	85	240	121	166	0	287	0	0	0	0	134	208	0	342	869
08:00 AM	105	0	77	182	119	154	0	273	0	0	0	0	119	189	0	308	763
Total Volume	522	0	288	810	518	560	0	1078	0	0	0	0	578	828	0	1406	3294
% App. Total	64.4	0	35.6		48.1	51.9	0		0	0	0		41.1	58.9	0		
PHF	.842	.000	.847	.844	.775	.843	.000	.939	.000	.000	.000	.000	.807	.920	.000	.913	.948
Cars	507	0	281	788	510	541	0	1051	0	0	0	0	568	794	0	1362	3201
% Cars	97.1	0	97.6	97.3	98.5	96.6	0	97.5	0	0	0	0	98.3	95.9	0	96.9	97.2
Trucks	15	0	7	22	8	19	0	27	0	0	0	0	10	34	0	44	93
% Trucks	2.9	0	2.4	2.7	1.5	3.4	0	2.5	0	0	0	0	1.7	4.1	0	3.1	2.8

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: I-93 SB Ramps (Exit 4)
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154G
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

Groups Printed- Trucks

	I-93 SB On/Off-Ramps From North			Nashua Road (Route 102) From East			I-93 SB On-Ramp From South			Nashua Road (Route 102) From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
07:00 AM	7	0	2	2	7	0	0	0	0	1	7	0	26
07:15 AM	2	0	0	2	4	0	0	0	0	5	6	0	19
07:30 AM	4	0	1	3	8	0	0	0	0	4	7	0	27
07:45 AM	4	0	3	2	4	0	0	0	0	1	12	0	26
Total	17	0	6	9	23	0	0	0	0	11	32	0	98
08:00 AM	5	0	3	1	3	0	0	0	0	0	9	0	21
08:15 AM	6	0	2	4	12	0	0	0	0	1	7	0	32
08:30 AM	4	0	2	4	7	0	0	0	0	0	2	0	19
08:45 AM	5	0	3	8	4	0	0	0	0	5	15	0	40
Total	20	0	10	17	26	0	0	0	0	6	33	0	112
Grand Total	37	0	16	26	49	0	0	0	0	17	65	0	210
Apprch %	69.8	0	30.2	34.7	65.3	0	0	0	0	20.7	79.3	0	
Total %	17.6	0	7.6	12.4	23.3	0	0	0	0	8.1	31	0	

	I-93 SB On/Off-Ramps From North				Nashua Road (Route 102) From East				I-93 SB On-Ramp From South				Nashua Road (Route 102) From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	5	0	3	8	1	3	0	4	0	0	0	0	0	9	0	9	21
08:15 AM	6	0	2	8	4	12	0	16	0	0	0	0	1	7	0	8	32
08:30 AM	4	0	2	6	4	7	0	11	0	0	0	0	0	2	0	2	19
08:45 AM	5	0	3	8	8	4	0	12	0	0	0	0	5	15	0	20	40
Total Volume	20	0	10	30	17	26	0	43	0	0	0	0	6	33	0	39	112
% App. Total	66.7	0	33.3		39.5	60.5	0		0	0	0		15.4	84.6	0		
PHF	.833	.000	.833	.938	.531	.542	.000	.672	.000	.000	.000	.000	.300	.550	.000	.488	.700

Transportation Data Corporation

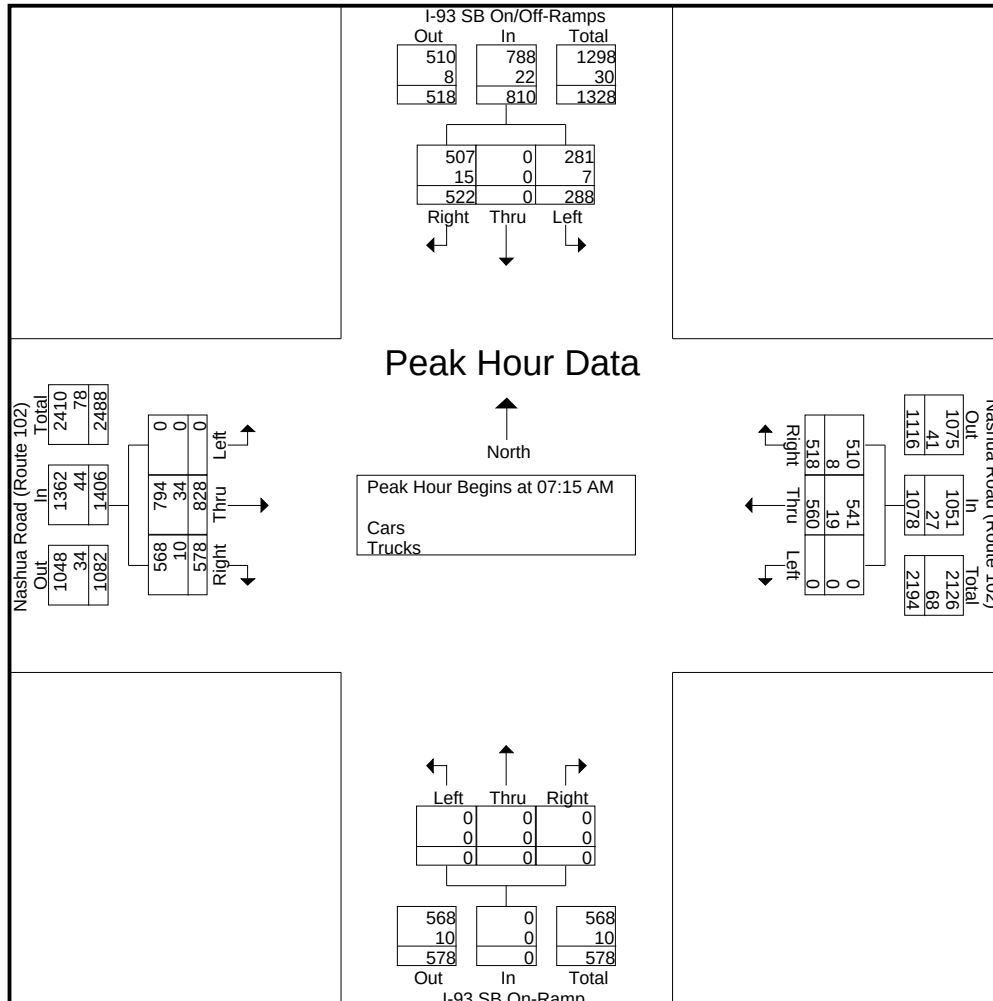
Mario Perone, mperone1@verizon.net

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N/S: I-93 SB Ramps (Exit 4)
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154G
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

	I-93 SB On/Off-Ramps From North				Nashua Road (Route 102) From East				I-93 SB On-Ramp From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	140	0	63	203	167	114	0	281	0	0	0	0	179	206	0	385	869
07:30 AM	122	0	63	185	111	126	0	237	0	0	0	0	146	225	0	371	793
07:45 AM	155	0	85	240	121	166	0	287	0	0	0	0	134	208	0	342	869
08:00 AM	105	0	77	182	119	154	0	273	0	0	0	0	119	189	0	308	763
Total Volume	522	0	288	810	518	560	0	1078	0	0	0	0	578	828	0	1406	3294
% App. Total	64.4	0	35.6		48.1	51.9	0		0	0	0		41.1	58.9	0		
PHF	.842	.000	.847	.844	.775	.843	.000	.939	.000	.000	.000	.000	.807	.920	.000	.913	.948
Cars	507	0	281	788	510	541	0	1051	0	0	0	0	568	794	0	1362	3201
% Cars	97.1	0	97.6	97.3	98.5	96.6	0	97.5	0	0	0	0	98.3	95.9	0	96.9	97.2
Trucks	15	0	7	22	8	19	0	27	0	0	0	0	10	34	0	44	93
% Trucks	2.9	0	2.4	2.7	1.5	3.4	0	2.5	0	0	0	0	1.7	4.1	0	3.1	2.8



Transportation Data Corporation

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t (781) 587-0086 f (781) 587-0089

N/S: Market Basket/Garden Lane

E/W: Internal Access Drives

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04145AA

Site Code : T0070.42

Start Date : 8/4/2011

Page No : 1

Groups Printed- Cars - Trucks

	Garden Lane (Market Basket) From North				Internal (To Wendy's) From East				Garden Lane (To Route 102) From South				Internal (To Bank/Plaza) From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Uturn	Right	Thru	Left	Peds	
04:00 PM	20	80	1	0	0	4	41	0	20	81	27	0	26	14	19	0	333
04:15 PM	27	68	1	0	0	5	26	0	33	115	18	0	22	6	22	0	343
04:30 PM	24	75	1	0	0	5	33	0	26	95	30	0	26	4	23	0	342
04:45 PM	27	77	1	0	0	11	56	0	25	94	18	1	22	6	25	0	363
Total	98	300	4	0	0	25	156	0	104	385	93	1	96	30	89	0	1381
05:00 PM	29	87	0	0	0	8	43	0	25	87	27	0	28	6	16	0	356
05:15 PM	28	102	2	0	0	10	46	0	20	103	25	0	17	6	17	0	376
05:30 PM	26	103	0	0	1	18	46	0	17	89	24	1	20	9	11	0	365
05:45 PM	14	94	2	0	1	5	38	0	24	91	17	0	8	11	19	0	324
Total	97	386	4	0	2	41	173	0	86	370	93	1	73	32	63	0	1421
Grand Total	195	686	8	0	2	66	329	0	190	755	186	2	169	62	152	0	2802
Apprch %	21.9	77.2	0.9	0	0.5	16.6	82.9	0	16.8	66.6	16.4	0.2	44.1	16.2	39.7	0	
Total %	7	24.5	0.3	0	0.1	2.4	11.7	0	6.8	26.9	6.6	0.1	6	2.2	5.4	0	
Cars	195	685	8	0	2	66	328	0	189	754	186	2	169	62	152	0	2798
% Cars	100	99.9	100	0	100	100	99.7	0	99.5	99.9	100	100	100	100	100	0	99.9
Trucks	0	1	0	0	0	0	1	0	1	1	0	0	0	0	0	0	4
% Trucks	0	0.1	0	0	0	0	0.3	0	0.5	0.1	0	0	0	0	0	0	0.1

	Garden Lane (Market Basket) From North					Internal (To Wendy's) From East					Garden Lane (To Route 102) From South					Internal (To Bank/Plaza) From West					Int. Total
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Uturn	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	27	77	1	0	105	0	11	56	0	67	25	94	18	1	138	22	6	25	0	53	363
05:00 PM	29	87	0	0	116	0	8	43	0	51	25	87	27	0	139	28	6	16	0	50	356
05:15 PM	28	102	2	0	132	0	10	46	0	56	20	103	25	0	148	17	6	17	0	40	376
05:30 PM	26	103	0	0	129	1	18	46	0	65	17	89	24	1	131	20	9	11	0	40	365
Total Volume	110	369	3	0	482	1	47	191	0	239	87	373	94	2	556	87	27	69	0	183	1460
% App. Total	22.8	76.6	0.6	0		0.4	19.7	79.9	0		15.6	67.1	16.9	0.4		47.5	14.8	37.7	0		
PHF	.948	.896	.375	.000	.913	.250	.653	.853	.000	.892	.870	.905	.870	.500	.939	.777	.750	.690	.000	.863	.971
Cars	110	369	3	0	482	1	47	191	0	239	86	373	94	2	555	87	27	69	0	183	1459
% Cars	100	100	100	0	100	100	100	100	0	100	98.9	100	100	100	99.8	100	100	100	0	100	99.9
Trucks	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
% Trucks	0	0	0	0	0	0	0	0	0	0	1.1	0	0	0	0.2	0	0	0	0	0	0.1

Transportation Data Corporation

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t (781) 587-0086 f (781) 587-0089

N/S: Market Basket/Garden Lane

E/W: Internal Access Drives

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04145AA

Site Code : T0070.42

Start Date : 8/4/2011

Page No : 1

Groups Printed- Trucks

	Garden Lane (Market Basket) From North				Internal (To Wendy's) From East				Garden Lane (To Route 102) From South				Internal (To Bank/Plaza) From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Uturn	Right	Thru	Left	Peds	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	3
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Grand Total	0	1	0	0	0	0	1	0	1	1	0	0	0	0	0	0	4
Apprch %	0	100	0	0	0	0	100	0	50	50	0	0	0	0	0	0	
Total %	0	25	0	0	0	0	25	0	25	25	0	0	0	0	0	0	

	Garden Lane (Market Basket) From North					Internal (To Wendy's) From East					Garden Lane (To Route 102) From South					Internal (To Bank/Plaza) From West					Int. Total
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Uturn	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
Total Volume	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	3
% App. Total	0	100	0	0		0	0	0	0		50	50	0	0		0	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.250	.250	.000	.000	.500	.000	.000	.000	.000	.000	.375

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:00 PM

Transportation Data Corporation

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t (781) 587-0086 f (781) 587-0089

N/S: Market Basket/Garden Lane

E/W: Internal Access Drives

City, State: Londonderry, NH

Client: TEC/R. Brown

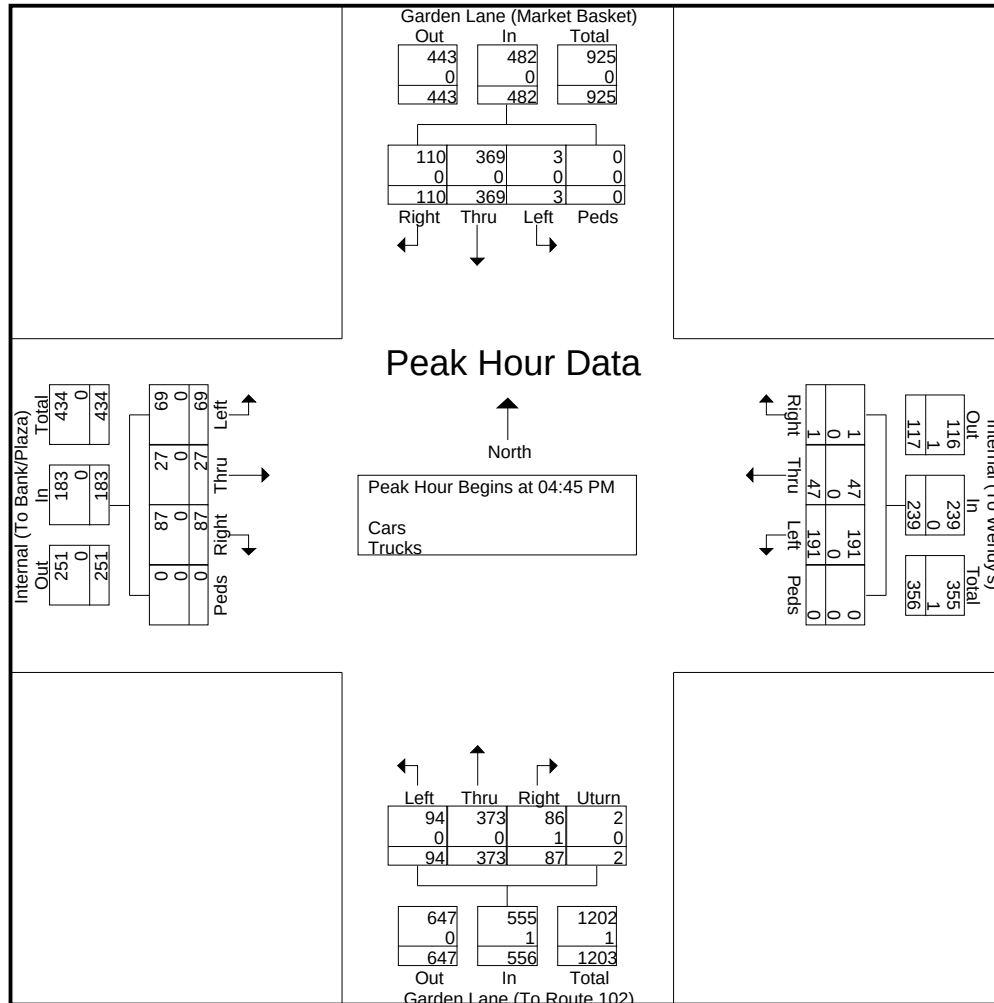
File Name : 04145AA

Site Code : T0070.42

Start Date : 8/4/2011

Page No : 1

	Garden Lane (Market Basket) From North					Internal (To Wendy's) From East					Garden Lane (To Route 102) From South					Internal (To Bank/Plaza) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Uturn	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	27	77	1	0	105	0	11	56	0	67	25	94	18	1	138	22	6	25	0	53	363
05:00 PM	29	87	0	0	116	0	8	43	0	51	25	87	27	0	139	28	6	16	0	50	356
05:15 PM	28	102	2	0	132	0	10	46	0	56	20	103	25	0	148	17	6	17	0	40	376
05:30 PM	26	103	0	0	129	1	18	46	0	65	17	89	24	1	131	20	9	11	0	40	365
Total Volume	110	369	3	0	482	1	47	191	0	239	87	373	94	2	556	87	27	69	0	183	1460
% App. Total	22.8	76.6	0.6	0		0.4	19.7	79.9	0		15.6	67.1	16.9	0.4		47.5	14.8	37.7	0		
PHF	.948	.896	.375	.000	.913	.250	.653	.853	.000	.892	.870	.905	.870	.500	.939	.777	.750	.690	.000	.863	.971
Cars	110	369	3	0	482	1	47	191	0	239	86	373	94	2	555	87	27	69	0	183	1459
% Cars	100	100	100	0	100	100	100	100	0	100	98.9	100	100	100	99.8	100	100	100	0	100	99.9
Trucks	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
% Trucks	0	0	0	0	0	0	0	0	0	0	1.1	0	0	0	0.2	0	0	0	0	0	0.1



Transportation Data Corporation

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t (781) 587-0086 f (781) 587-0089

N/S: Garden Lane/Hampton Drive

E/W: Nashua Road (Route 102)

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04145BB

Site Code : T0070.42

Start Date : 8/4/2011

Page No : 1

Groups Printed- Cars - Trucks

	Garden Lane From North			Nashua Road (Route 102) From East			Hampton Drive From South			Nashua Road (Route 102) From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
04:00 PM	56	10	70	78	245	24	15	7	16	7	255	37	820
04:15 PM	57	7	69	96	268	23	17	5	9	6	228	61	846
04:30 PM	47	7	61	101	275	15	23	12	9	12	265	53	880
04:45 PM	60	11	80	78	260	34	13	5	14	7	223	58	843
Total	220	35	280	353	1048	96	68	29	48	32	971	209	3389
05:00 PM	60	13	76	83	285	25	18	8	10	9	271	44	902
05:15 PM	62	13	114	103	270	38	14	5	11	11	245	51	937
05:30 PM	67	14	78	78	293	23	14	4	10	10	212	53	856
05:45 PM	66	10	66	76	278	28	20	4	15	18	214	49	844
Total	255	50	334	340	1126	114	66	21	46	48	942	197	3539
Grand Total	475	85	614	693	2174	210	134	50	94	80	1913	406	6928
Apprch %	40.5	7.2	52.3	22.5	70.7	6.8	48.2	18	33.8	3.3	79.7	16.9	
Total %	6.9	1.2	8.9	10	31.4	3	1.9	0.7	1.4	1.2	27.6	5.9	
Cars	474	85	613	691	2112	210	134	50	94	80	1881	406	6830
% Cars	99.8	100	99.8	99.7	97.1	100	100	100	100	100	98.3	100	98.6
Trucks	1	0	1	2	62	0	0	0	0	0	32	0	98
% Trucks	0.2	0	0.2	0.3	2.9	0	0	0	0	0	1.7	0	1.4

	Garden Lane From North				Nashua Road (Route 102) From East				Hampton Drive From South				Nashua Road (Route 102) From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	47	7	61	115	101	275	15	391	23	12	9	44	12	265	53	330	880
04:45 PM	60	11	80	151	78	260	34	372	13	5	14	32	7	223	58	288	843
05:00 PM	60	13	76	149	83	285	25	393	18	8	10	36	9	271	44	324	902
05:15 PM	62	13	114	189	103	270	38	411	14	5	11	30	11	245	51	307	937
Total Volume	229	44	331	604	365	1090	112	1567	68	30	44	142	39	1004	206	1249	3562
% App. Total	37.9	7.3	54.8		23.3	69.6	7.1		47.9	21.1	31		3.1	80.4	16.5		
PHF	.923	.846	.726	.799	.886	.956	.737	.953	.739	.625	.786	.807	.813	.926	.888	.946	.950
Cars	229	44	331	604	364	1056	112	1532	68	30	44	142	39	987	206	1232	3510
% Cars	100	100	100	100	99.7	96.9	100	97.8	100	100	100	100	100	98.3	100	98.6	98.5
Trucks	0	0	0	0	1	34	0	35	0	0	0	0	0	17	0	17	52
% Trucks	0	0	0	0	0.3	3.1	0	2.2	0	0	0	0	0	1.7	0	1.4	1.5

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Garden Lane/Hampton Drive

E/W: Nashua Road (Route 102)

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04145BB

Site Code : T0070.42

Start Date : 8/4/2011

Page No : 1

Groups Printed- Trucks

	Garden Lane From North			Nashua Road (Route 102) From East			Hampton Drive From South			Nashua Road (Route 102) From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
04:00 PM	0	0	0	0	8	0	0	0	0	0	4	0	12
04:15 PM	1	0	0	1	8	0	0	0	0	0	5	0	15
04:30 PM	0	0	0	0	14	0	0	0	0	0	2	0	16
04:45 PM	0	0	0	1	6	0	0	0	0	0	5	0	12
Total	1	0	0	2	36	0	0	0	0	0	16	0	55
05:00 PM	0	0	0	0	10	0	0	0	0	0	7	0	17
05:15 PM	0	0	0	0	4	0	0	0	0	0	3	0	7
05:30 PM	0	0	0	0	10	0	0	0	0	0	3	0	13
05:45 PM	0	0	1	0	2	0	0	0	0	0	3	0	6
Total	0	0	1	0	26	0	0	0	0	0	16	0	43
Grand Total	1	0	1	2	62	0	0	0	0	0	32	0	98
Apprch %	50	0	50	3.1	96.9	0	0	0	0	0	100	0	
Total %	1	0	1	2	63.3	0	0	0	0	0	32.7	0	

	Garden Lane From North				Nashua Road (Route 102) From East				Hampton Drive From South				Nashua Road (Route 102) From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	1	0	0	1	1	8	0	9	0	0	0	0	0	5	0	5	15
04:30 PM	0	0	0	0	0	14	0	14	0	0	0	0	0	2	0	2	16
04:45 PM	0	0	0	0	1	6	0	7	0	0	0	0	0	5	0	5	12
05:00 PM	0	0	0	0	0	10	0	10	0	0	0	0	0	7	0	7	17
Total Volume	1	0	0	1	2	38	0	40	0	0	0	0	0	19	0	19	60
% App. Total	100	0	0		5	95	0		0	0	0		0	100	0		
PHF	.250	.000	.000	.250	.500	.679	.000	.714	.000	.000	.000	.000	.000	.679	.000	.679	.882

Transportation Data Corporation

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N/S: Garden Lane/Hampton Drive

E/W: Nashua Road (Route 102)

City, State: Londonderry, NH

Client: TEC/R. Brown

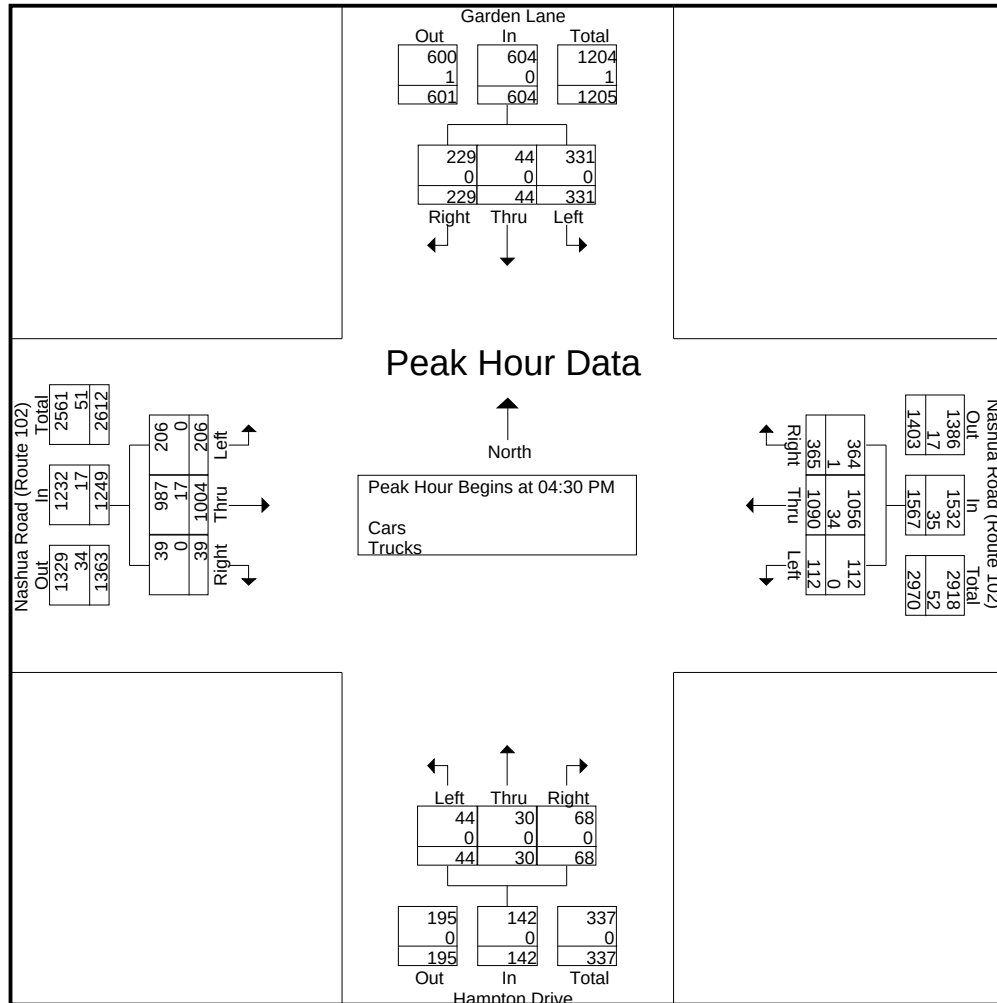
File Name : 04145BB

Site Code : T0070.42

Start Date : 8/4/2011

Page No : 1

	Garden Lane From North				Nashua Road (Route 102) From East				Hampton Drive From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	47	7	61	115	101	275	15	391	23	12	9	44	12	265	53	330	880
04:45 PM	60	11	80	151	78	260	34	372	13	5	14	32	7	223	58	288	843
05:00 PM	60	13	76	149	83	285	25	393	18	8	10	36	9	271	44	324	902
05:15 PM	62	13	114	189	103	270	38	411	14	5	11	30	11	245	51	307	937
Total Volume	229	44	331	604	365	1090	112	1567	68	30	44	142	39	1004	206	1249	3562
% App. Total	37.9	7.3	54.8		23.3	69.6	7.1		47.9	21.1	31		3.1	80.4	16.5		
PHF	.923	.846	.726	.799	.886	.956	.737	.953	.739	.625	.786	.807	.813	.926	.888	.946	.950
Cars	229	44	331	604	364	1056	112	1532	68	30	44	142	39	987	206	1232	3510
% Cars	100	100	100	100	99.7	96.9	100	97.8	100	100	100	100	100	98.3	100	98.6	98.5
Trucks	0	0	0	0	1	34	0	35	0	0	0	0	0	17	0	17	52
% Trucks	0	0	0	0	0.3	3.1	0	2.2	0	0	0	0	0	1.7	0	1.4	1.5



Transportation Data Corporation

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N/S: Gilcreast Road
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04145CC
Site Code : T0070.42
Start Date : 8/4/2011
Page No : 1

Groups Printed- Cars - Trucks

	Gilcreast Road From North			Nashua Road (Route 102) From East			Gilcreast Road From South			Nashua Road (Route 102) From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
04:00 PM	48	29	28	31	248	34	30	20	36	15	250	44	813
04:15 PM	43	32	29	33	276	49	48	24	27	19	247	31	858
04:30 PM	41	23	31	39	255	45	41	26	36	19	275	56	887
04:45 PM	47	28	29	40	274	43	37	25	34	15	247	50	869
Total	179	112	117	143	1053	171	156	95	133	68	1019	181	3427
05:00 PM	50	30	37	36	254	35	34	24	35	19	256	49	859
05:15 PM	47	14	35	44	294	41	36	37	37	19	276	51	931
05:30 PM	41	35	29	29	285	30	40	17	28	20	207	42	803
05:45 PM	35	14	19	41	322	51	36	24	40	20	228	48	878
Total	173	93	120	150	1155	157	146	102	140	78	967	190	3471
Grand Total	352	205	237	293	2208	328	302	197	273	146	1986	371	6898
Apprch %	44.3	25.8	29.8	10.4	78	11.6	39.1	25.5	35.4	5.8	79.3	14.8	
Total %	5.1	3	3.4	4.2	32	4.8	4.4	2.9	4	2.1	28.8	5.4	
Cars	351	205	236	292	2148	325	301	196	268	145	1959	370	6796
% Cars	99.7	100	99.6	99.7	97.3	99.1	99.7	99.5	98.2	99.3	98.6	99.7	98.5
Trucks	1	0	1	1	60	3	1	1	5	1	27	1	102
% Trucks	0.3	0	0.4	0.3	2.7	0.9	0.3	0.5	1.8	0.7	1.4	0.3	1.5

	Gilcreast Road From North				Nashua Road (Route 102) From East				Gilcreast Road From South				Nashua Road (Route 102) From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	41	23	31	95	39	255	45	339	41	26	36	103	19	275	56	350	887
04:45 PM	47	28	29	104	40	274	43	357	37	25	34	96	15	247	50	312	869
05:00 PM	50	30	37	117	36	254	35	325	34	24	35	93	19	256	49	324	859
05:15 PM	47	14	35	96	44	294	41	379	36	37	37	110	19	276	51	346	931
Total Volume	185	95	132	412	159	1077	164	1400	148	112	142	402	72	1054	206	1332	3546
% App. Total	44.9	23.1	32		11.4	76.9	11.7		36.8	27.9	35.3		5.4	79.1	15.5		
PHF	.925	.792	.892	.880	.903	.916	.911	.923	.902	.757	.959	.914	.947	.955	.920	.951	.952
Cars	185	95	131	411	158	1045	163	1366	147	111	139	397	72	1040	205	1317	3491
% Cars	100	100	99.2	99.8	99.4	97.0	99.4	97.6	99.3	99.1	97.9	98.8	100	98.7	99.5	98.9	98.4
Trucks	0	0	1	1	1	32	1	34	1	1	3	5	0	14	1	15	55
% Trucks	0	0	0.8	0.2	0.6	3.0	0.6	2.4	0.7	0.9	2.1	1.2	0	1.3	0.5	1.1	1.6

Transportation Data Corporation

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N/S: Gilcreast Road
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04145CC
Site Code : T0070.42
Start Date : 8/4/2011
Page No : 1

Groups Printed- Trucks

	Gilcreast Road From North			Nashua Road (Route 102) From East			Gilcreast Road From South			Nashua Road (Route 102) From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
04:00 PM	0	0	0	0	6	1	0	0	1	0	3	0	11
04:15 PM	1	0	0	0	9	1	0	0	0	1	5	0	17
04:30 PM	0	0	0	0	11	1	0	0	1	0	2	0	15
04:45 PM	0	0	0	0	8	0	0	0	1	0	5	0	14
Total	1	0	0	0	34	3	0	0	3	1	15	0	57
05:00 PM	0	0	0	0	9	0	1	1	1	0	5	0	17
05:15 PM	0	0	1	1	4	0	0	0	0	0	2	1	9
05:30 PM	0	0	0	0	10	0	0	0	1	0	3	0	14
05:45 PM	0	0	0	0	3	0	0	0	0	0	2	0	5
Total	0	0	1	1	26	0	1	1	2	0	12	1	45
Grand Total	1	0	1	1	60	3	1	1	5	1	27	1	102
Apprch %	50	0	50	1.6	93.8	4.7	14.3	14.3	71.4	3.4	93.1	3.4	
Total %	1	0	1	1	58.8	2.9	1	1	4.9	1	26.5	1	

	Gilcreast Road From North				Nashua Road (Route 102) From East				Gilcreast Road From South				Nashua Road (Route 102) From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	1	0	0	1	0	9	1	10	0	0	0	0	1	5	0	6	17
04:30 PM	0	0	0	0	0	11	1	12	0	0	1	1	0	2	0	2	15
04:45 PM	0	0	0	0	0	8	0	8	0	0	1	1	0	5	0	5	14
05:00 PM	0	0	0	0	0	9	0	9	1	1	1	3	0	5	0	5	17
Total Volume	1	0	0	1	0	37	2	39	1	1	3	5	1	17	0	18	63
% App. Total	100	0	0		0	94.9	5.1		20	20	60		5.6	94.4	0		
PHF	.250	.000	.000	.250	.000	.841	.500	.813	.250	.250	.750	.417	.250	.850	.000	.750	.926

Transportation Data Corporation

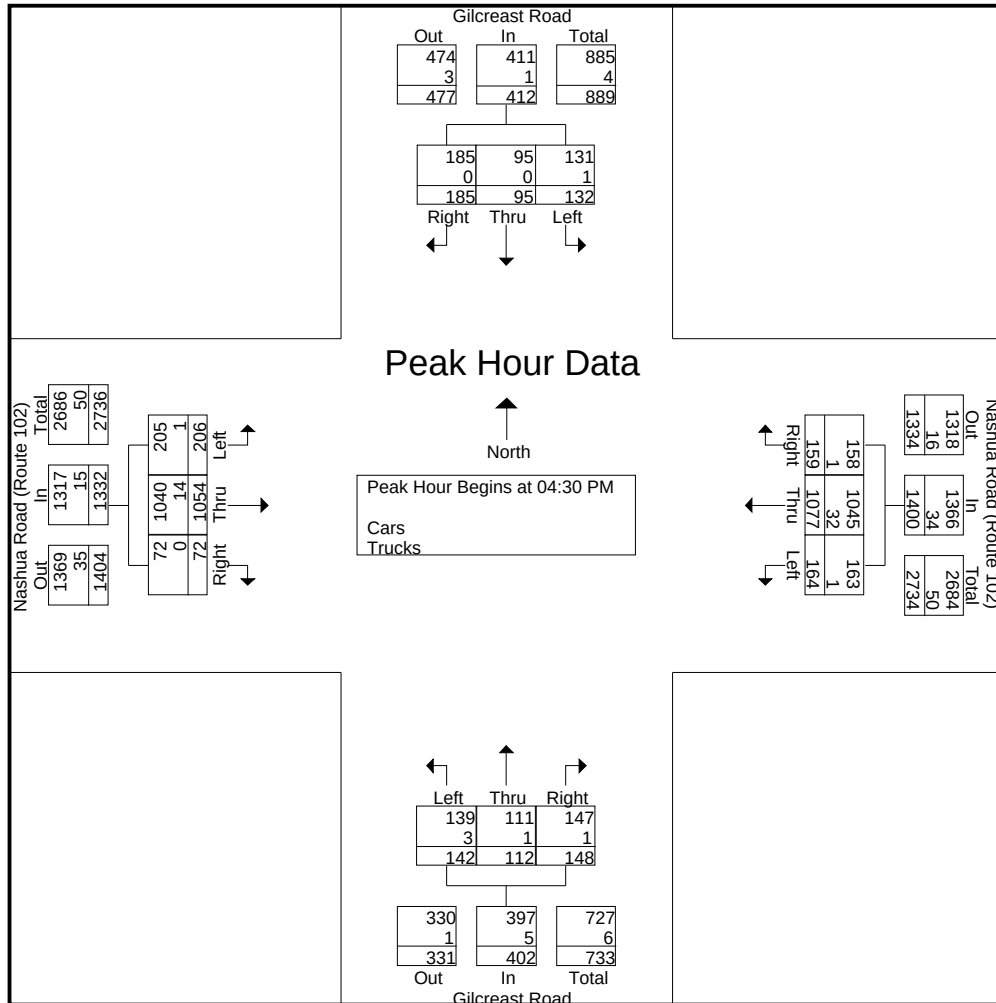
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N/S: Gilcreast Road
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04145CC
Site Code : T0070.42
Start Date : 8/4/2011
Page No : 1

	Gilcreast Road From North				Nashua Road (Route 102) From East				Gilcreast Road From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	41	23	31	95	39	255	45	339	41	26	36	103	19	275	56	350	887
04:45 PM	47	28	29	104	40	274	43	357	37	25	34	96	15	247	50	312	869
05:00 PM	50	30	37	117	36	254	35	325	34	24	35	93	19	256	49	324	859
05:15 PM	47	14	35	96	44	294	41	379	36	37	37	110	19	276	51	346	931
Total Volume	185	95	132	412	159	1077	164	1400	148	112	142	402	72	1054	206	1332	3546
% App. Total	44.9	23.1	32		11.4	76.9	11.7		36.8	27.9	35.3		5.4	79.1	15.5		
PHF	.925	.792	.892	.880	.903	.916	.911	.923	.902	.757	.959	.914	.947	.955	.920	.951	.952
Cars	185	95	131	411	158	1045	163	1366	147	111	139	397	72	1040	205	1317	3491
% Cars	100	100	99.2	99.8	99.4	97.0	99.4	97.6	99.3	99.1	97.9	98.8	100	98.7	99.5	98.9	98.4
Trucks	0	0	1	1	1	32	1	34	1	1	3	5	0	14	1	15	55
% Trucks	0	0	0.8	0.2	0.6	3.0	0.6	2.4	0.7	0.9	2.1	1.2	0	1.3	0.5	1.1	1.6



Transportation Data Corporation

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S: Londonderry Road
E/W: Ash Street/Pillsbury Road
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04145EE
Site Code : T0070.42
Start Date : 8/4/2011
Page No : 1

Groups Printed- Cars - Trucks

	Ash Street From East		Londonderry Road From South		Pillsbury Road From West		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	50	18	35	11	2	58	174
04:15 PM	60	25	37	8	7	46	183
04:30 PM	43	14	27	15	7	62	168
04:45 PM	79	20	35	8	7	57	206
Total	232	77	134	42	23	223	731
05:00 PM	80	20	31	13	5	71	220
05:15 PM	52	16	36	22	5	68	199
05:30 PM	59	12	34	13	8	76	202
05:45 PM	62	14	30	15	8	53	182
Total	253	62	131	63	26	268	803
Grand Total	485	139	265	105	49	491	1534
Apprch %	77.7	22.3	71.6	28.4	9.1	90.9	
Total %	31.6	9.1	17.3	6.8	3.2	32	
Cars	485	138	261	105	47	491	1527
% Cars	100	99.3	98.5	100	95.9	100	99.5
Trucks	0	1	4	0	2	0	7
% Trucks	0	0.7	1.5	0	4.1	0	0.5

	Ash Street From East			Londonderry Road From South			Pillsbury Road From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	79	20	99	35	8	43	7	57	64	206
05:00 PM	80	20	100	31	13	44	5	71	76	220
05:15 PM	52	16	68	36	22	58	5	68	73	199
05:30 PM	59	12	71	34	13	47	8	76	84	202
Total Volume	270	68	338	136	56	192	25	272	297	827
% App. Total	79.9	20.1		70.8	29.2		8.4	91.6		
PHF	.844	.850	.845	.944	.636	.828	.781	.895	.884	.940
Cars	270	67	337	133	56	189	25	272	297	823
% Cars	100	98.5	99.7	97.8	100	98.4	100	100	100	99.5
Trucks	0	1	1	3	0	3	0	0	0	4
% Trucks	0	1.5	0.3	2.2	0	1.6	0	0	0	0.5

Transportation Data Corporation

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S: Londonderry Road
E/W: Ash Street/Pillsbury Road
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04145EE
Site Code : T0070.42
Start Date : 8/4/2011
Page No : 1

Groups Printed- Trucks

	Ash Street From East		Londonderry Road From South		Pillsbury Road From West		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	0	0	1	0	0	0	1
04:15 PM	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	2	0	2
04:45 PM	0	0	0	0	0	0	0
Total	0	0	1	0	2	0	3
05:00 PM	0	0	2	0	0	0	2
05:15 PM	0	1	0	0	0	0	1
05:30 PM	0	0	1	0	0	0	1
05:45 PM	0	0	0	0	0	0	0
Total	0	1	3	0	0	0	4
Grand Total	0	1	4	0	2	0	7
Apprch %	0	100	100	0	100	0	
Total %	0	14.3	57.1	0	28.6	0	

	Ash Street From East			Londonderry Road From South			Pillsbury Road From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 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	0	2	0	2	2
04:45 PM	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	2	0	2	0	0	0	2
05:15 PM	0	1	1	0	0	0	0	0	0	1
Total Volume	0	1	1	2	0	2	2	0	2	5
% App. Total	0	100		100	0		100	0		
PHF	.000	.250	.250	.250	.000	.250	.250	.000	.250	.625

Transportation Data Corporation

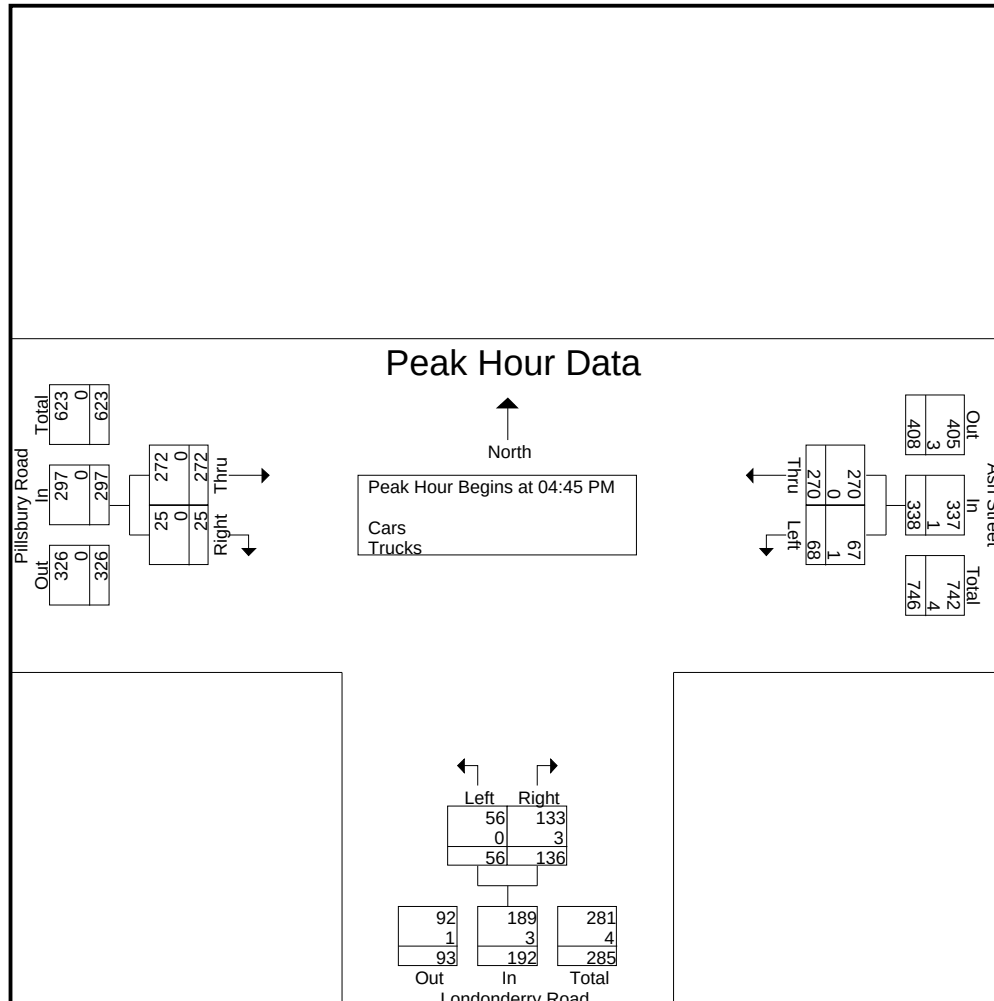
Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

S: Londonderry Road
E/W: Ash Street/Pillsbury Road
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04145EE
Site Code : T0070.42
Start Date : 8/4/2011
Page No : 1

	Ash Street From East			Londonderry Road From South			Pillsbury Road From West			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	79	20	99	35	8	43	7	57	64	206
05:00 PM	80	20	100	31	13	44	5	71	76	220
05:15 PM	52	16	68	36	22	58	5	68	73	199
05:30 PM	59	12	71	34	13	47	8	76	84	202
Total Volume	270	68	338	136	56	192	25	272	297	827
% App. Total	79.9	20.1		70.8	29.2		8.4	91.6		
PHF	.844	.850	.845	.944	.636	.828	.781	.895	.884	.940
Cars	270	67	337	133	56	189	25	272	297	823
% Cars	100	98.5	99.7	97.8	100	98.4	100	100	100	99.5
Trucks	0	1	1	3	0	3	0	0	0	4
% Trucks	0	1.5	0.3	2.2	0	1.6	0	0	0	0.5



Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Mammoth Road (Route 128)

E/W: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04154AA

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

Groups Printed- Cars - Trucks

Start Time	Mammoth Road (Route 128) From North				Pillsbury Road From East				Mammoth Road (Route 128) From South				Pillsbury Road From West				Exclu. Total	Inclu. Total	Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds			
04:00 PM	15	100	19	0	18	19	14	0	15	102	14	0	11	20	13	0	0	360	360
04:15 PM	13	83	24	1	18	24	6	0	11	104	19	0	9	17	18	0	1	346	347
04:30 PM	23	105	16	0	22	39	14	0	18	106	15	0	11	15	20	0	0	404	404
04:45 PM	30	106	23	0	21	33	9	4	11	103	19	0	11	20	14	0	4	400	404
Total	81	394	82	1	79	115	43	4	55	415	67	0	42	72	65	0	5	1510	1515
05:00 PM	43	130	47	0	23	35	8	0	12	111	11	0	13	17	20	0	0	470	470
05:15 PM	46	108	21	0	33	47	13	0	10	115	21	0	11	20	17	0	0	462	462
05:30 PM	39	135	22	0	26	35	8	0	22	90	13	0	7	18	18	0	0	433	433
05:45 PM	26	108	31	0	42	36	7	0	17	168	18	0	15	21	51	0	0	540	540
Total	154	481	121	0	124	153	36	0	61	484	63	0	46	76	106	0	0	1905	1905
Grand Total	235	875	203	1	203	268	79	4	116	899	130	0	88	148	171	0	5	3415	3420
Apprch %	17.9	66.6	15.5		36.9	48.7	14.4		10.1	78.5	11.4		21.6	36.4	42				
Total %	6.9	25.6	5.9		5.9	7.8	2.3		3.4	26.3	3.8		2.6	4.3	5		0.1	99.9	
Cars	235	867	203		203	268	79		116	893	129		88	148	169		0	0	3403
% Cars	100	99.1	100	100	100	100	100	100	100	99.3	99.2	0	100	100	98.8	0	0	0	99.5
Trucks	0	8	0		0	0	0		0	6	1		0	0	2		0	0	17
% Trucks	0	0.9	0	0	0	0	0	0	0	0.7	0.8	0	0	0	1.2	0	0	0	0.5

	Mammoth Road (Route 128) From North				Pillsbury Road From East				Mammoth Road (Route 128) From South				Pillsbury Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	43	130	47	220	23	35	8	66	12	111	11	134	13	17	20	50	470
05:15 PM	46	108	21	175	33	47	13	93	10	115	21	146	11	20	17	48	462
05:30 PM	39	135	22	196	26	35	8	69	22	90	13	125	7	18	18	43	433
05:45 PM	26	108	31	165	42	36	7	85	17	168	18	203	15	21	51	87	540
Total Volume	154	481	121	756	124	153	36	313	61	484	63	608	46	76	106	228	1905
% App. Total	20.4	63.6	16		39.6	48.9	11.5		10	79.6	10.4		20.2	33.3	46.5		
PHF	.837	.891	.644	.859	.738	.814	.692	.841	.693	.720	.750	.749	.767	.905	.520	.655	.882
Cars	154	480	121	755	124	153	36	313	61	481	63	605	46	76	106	228	1901
% Cars	100	99.8	100	99.9	100	100	100	100	100	99.4	100	99.5	100	100	100	100	99.8
Trucks	0	1	0	1	0	0	0	0	0	3	0	3	0	0	0	0	4
% Trucks	0	0.2	0	0.1	0	0	0	0	0	0.6	0	0.5	0	0	0	0	0.2

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Mammoth Road (Route 128)

E/W: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

File Name : 04154AA

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

Groups Printed- Trucks

	Mammoth Road (Route 128) From North			Pillsbury Road From East			Mammoth Road (Route 128) From South			Pillsbury Road From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
04:00 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	1	0	0	2	3
04:30 PM	0	2	0	0	0	0	0	1	0	0	0	0	3
04:45 PM	0	4	0	0	0	0	0	1	0	0	0	0	5
Total	0	7	0	0	0	0	0	3	1	0	0	2	13
05:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	1	0	0	0	0	0	3	0	0	0	0	4
Grand Total	0	8	0	0	0	0	0	6	1	0	0	2	17
Apprch %	0	100	0	0	0	0	0	85.7	14.3	0	0	100	
Total %	0	47.1	0	0	0	0	0	35.3	5.9	0	0	11.8	

	Mammoth Road (Route 128) From North				Pillsbury Road From East				Mammoth Road (Route 128) From South				Pillsbury Road From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
04:00 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	2	3
04:30 PM	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0	3
04:45 PM	0	4	0	4	0	0	0	0	0	1	0	1	0	0	0	0	5
Total Volume	0	7	0	7	0	0	0	0	0	3	1	4	0	0	2	2	13
% App. Total	0	100	0		0	0	0		0	75	25		0	0	100		
PHF	.000	.438	.000	.438	.000	.000	.000	.000	.000	.750	.250	1.000	.000	.000	.250	.250	.650

Peak Hour for Entire Intersection Begins at 04:00 PM

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Mammoth Road (Route 128)

E/W: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

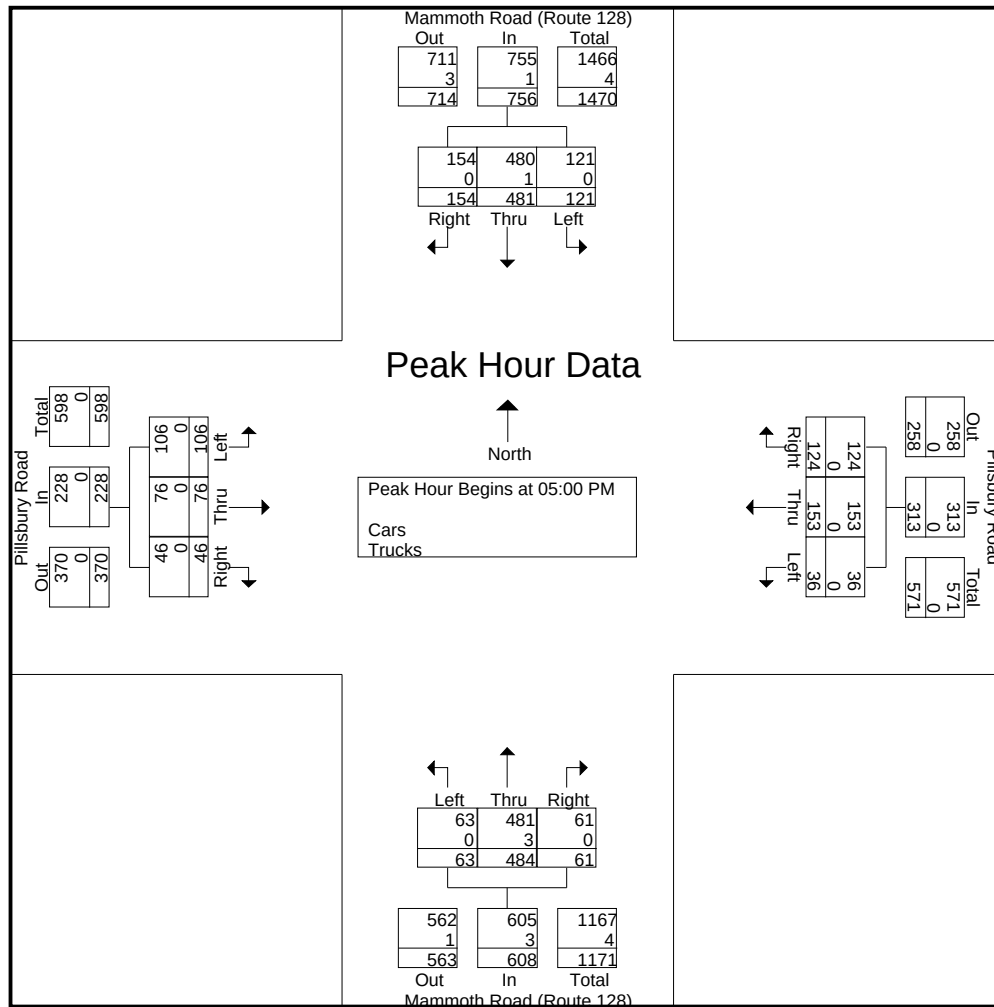
File Name : 04154AA

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

	Mammoth Road (Route 128) From North				Pillsbury Road From East				Mammoth Road (Route 128) From South				Pillsbury Road From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	43	130	47	220	23	35	8	66	12	111	11	134	13	17	20	50	470
05:15 PM	46	108	21	175	33	47	13	93	10	115	21	146	11	20	17	48	462
05:30 PM	39	135	22	196	26	35	8	69	22	90	13	125	7	18	18	43	433
05:45 PM	26	108	31	165	42	36	7	85	17	168	18	203	15	21	51	87	540
Total Volume	154	481	121	756	124	153	36	313	61	484	63	608	46	76	106	228	1905
% App. Total	20.4	63.6	16		39.6	48.9	11.5		10	79.6	10.4		20.2	33.3	46.5		
PHF	.837	.891	.644	.859	.738	.814	.692	.841	.693	.720	.750	.749	.767	.905	.520	.655	.882
Cars	154	480	121	755	124	153	36	313	61	481	63	605	46	76	106	228	1901
% Cars	100	99.8	100	99.9	100	100	100	100	100	99.4	100	99.5	100	100	100	100	99.8
Trucks	0	1	0	1	0	0	0	0	0	3	0	3	0	0	0	0	4
% Trucks	0	0.2	0	0.1	0	0	0	0	0	0.6	0	0.5	0	0	0	0	0.2



t (781) 587-0086 *f* (781) 587-0089

Client: TEC/R. Brown

Page No : 1

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Client: TEC/R. Brown

Page No : 1

[illegible]

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Hardy Road/Pillsbury Road

W: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

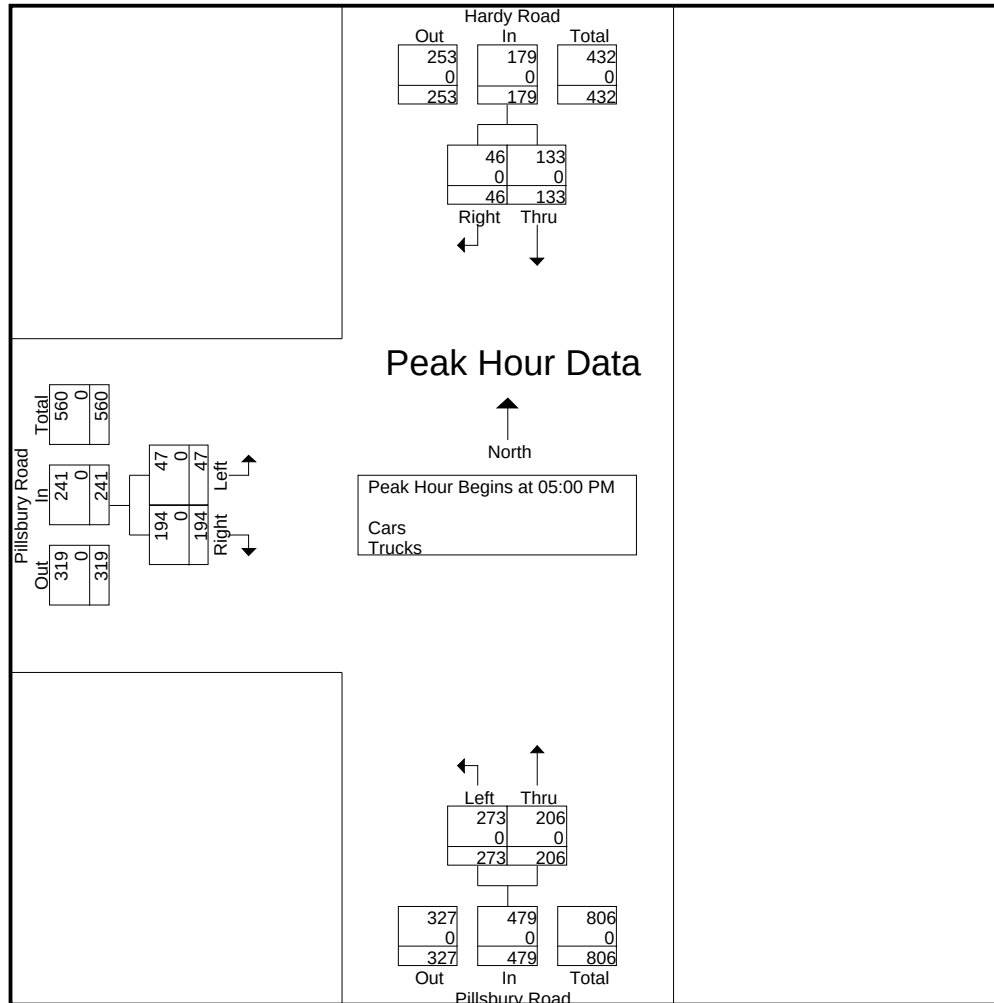
File Name : 04154BB

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

	Hardy Road From North			Pillsbury Road From South			Pillsbury Road From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	8	24	32	61	61	122	54	17	71	225
05:15 PM	13	40	53	56	75	131	38	9	47	231
05:30 PM	13	40	53	52	53	105	54	9	63	221
05:45 PM	12	29	41	37	84	121	48	12	60	222
Total Volume	46	133	179	206	273	479	194	47	241	899
% App. Total	25.7	74.3		43	57		80.5	19.5		
PHF	.885	.831	.844	.844	.813	.914	.898	.691	.849	.973
Cars	46	133	179	206	273	479	194	47	241	899
% Cars	100	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0



t (781) 587-0086 *f* (781) 587-0089

Client: TEC/R. Brown

Page No : 1

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t (781) 587-0086 *f* (781) 587-0089

Client: TEC/R. Brown

Page No : 1

Groups Printed- Trucks							
	Pillsbury Road From North		Pillsbury Road From East		Gilcreast Road From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	0	1	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	1	0	0	0	0	1
Apprch %	0	100	0	0	0	0	
Total %	0	100	0	0	0	0	

[illegible]

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Pillsbury Road/Gilcreast Road

E: Pillsbury Road

City, State: Londonderry, NH

Client: TEC/R. Brown

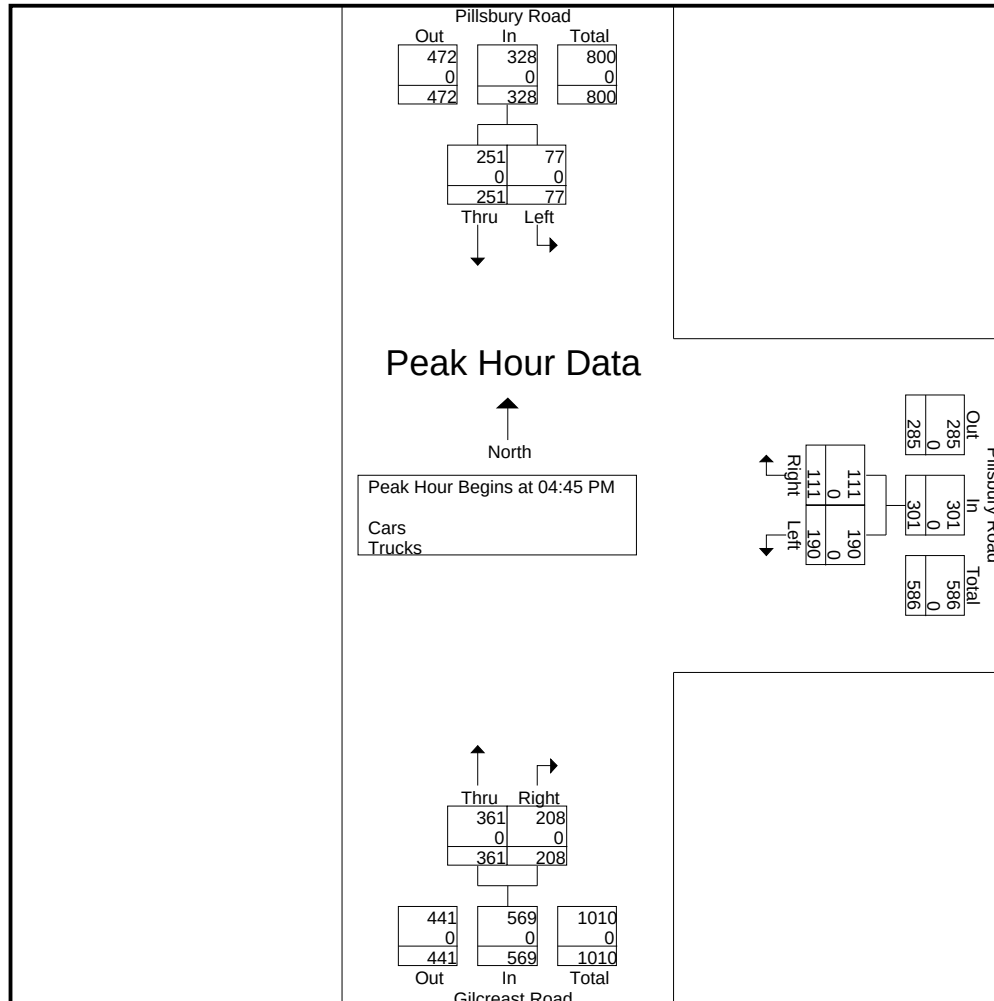
File Name : 04154CC

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

	Pillsbury Road From North			Pillsbury Road From East			Gilcreast Road From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	60	23	83	24	50	74	56	87	143	300
05:00 PM	55	17	72	31	63	94	47	93	140	306
05:15 PM	63	16	79	30	39	69	60	96	156	304
05:30 PM	73	21	94	26	38	64	45	85	130	288
Total Volume	251	77	328	111	190	301	208	361	569	1198
% App. Total	76.5	23.5		36.9	63.1		36.6	63.4		
PHF	.860	.837	.872	.895	.754	.801	.867	.940	.912	.979
Cars	251	77	328	111	190	301	208	361	569	1198
% Cars	100	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0



t (781) 587-0086 *f* (781) 587-0089

N/S: North High Street
W: Ash Street Extension
City, State: Derry, NH
Client: TEC/R. Brown

File Name : 04154DD
Site Code : T0378.01
Start Date : 9/8/2011
Page No : 1

Groups Printed- Cars - Trucks
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t (781) 587-0086 *f* (781) 587-0089

File Name : 04154DD
Site Code : T0378.01
Start Date : 9/8/2011
Page No : 1

Groups Printed- Trucks							
	North High Street From North		North High Street From South		Ash Street Extension From West		
Start Time	Right	Thru	Thru	Left	Right	Left	Int. Total
04:00 PM	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	
Total %							

[illegible]

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: North High Street
W: Ash Street Extension
City, State: Derry, NH
Client: TEC/R. Brown

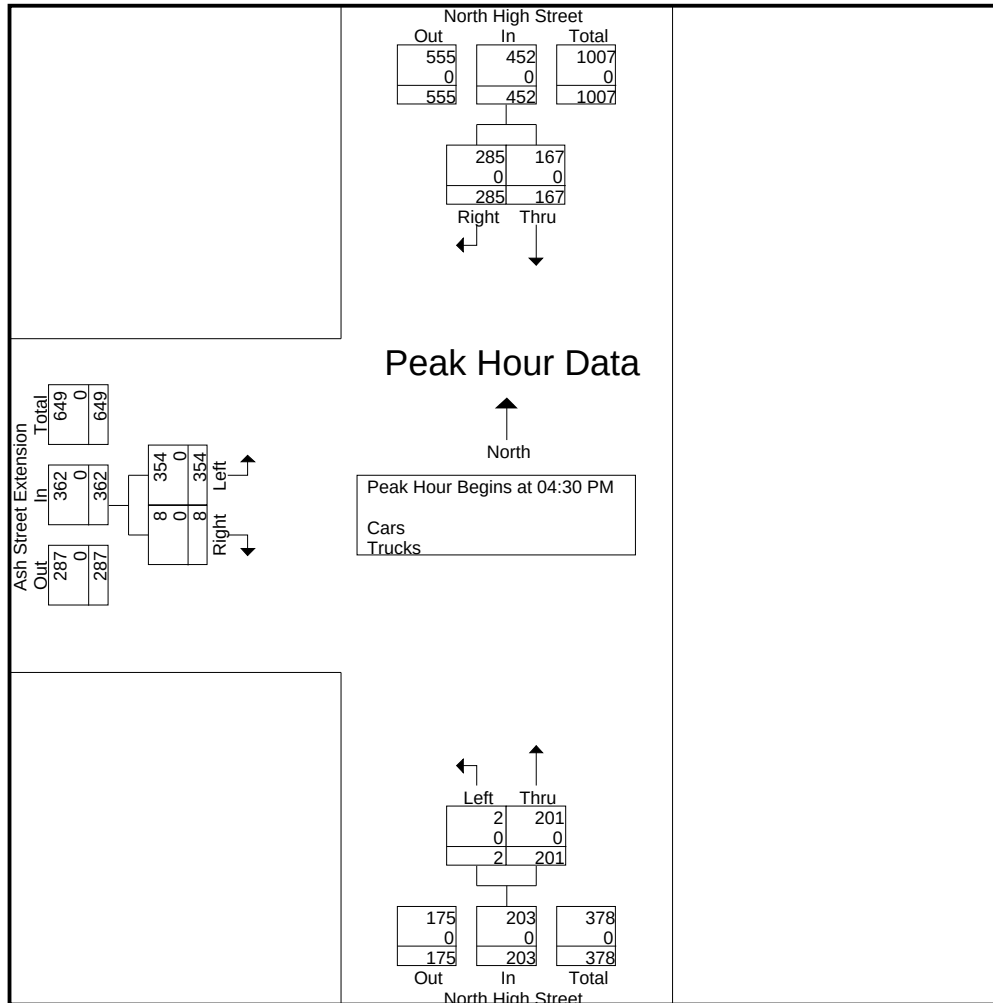
File Name : 04154DD

Site Code : T0378.01

Start Date : 9/8/2011

Page No : 1

	North High Street From North			North High Street From South			Ash Street Extension From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	76	49	125	56	0	56	1	80	81	262
04:45 PM	68	42	110	55	0	55	2	88	90	255
05:00 PM	73	34	107	43	2	45	5	90	95	247
05:15 PM	68	42	110	47	0	47	0	96	96	253
Total Volume	285	167	452	201	2	203	8	354	362	1017
% App. Total	63.1	36.9		99	1		2.2	97.8		
PHF	.938	.852	.904	.897	.250	.906	.400	.922	.943	.970
Cars	285	167	452	201	2	203	8	354	362	1017
% Cars	100	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0



Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: Londonderry Road/St. Charles St.
E/W: W. Broadway/Nashua (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154EE
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

Groups Printed- Cars - Trucks

Start Time	Londonderry Road From North				West Broadway (Route 102) From East				Saint Charles Street From South				Nashua Road (Route 102) From West				Exclu. Total	Inclu. Total	Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds			
04:00 PM	41	0	3	3	13	219	0	0	1	0	0	0	6	239	42	0	3	564	567
04:15 PM	33	1	1	0	7	222	2	0	1	0	0	0	13	293	41	0	0	614	614
04:30 PM	39	0	1	0	10	225	0	0	0	0	0	2	8	254	48	0	2	585	587
04:45 PM	24	0	2	1	5	215	1	0	1	0	0	2	8	267	56	0	3	579	582
Total	137	1	7	4	35	881	3	0	3	0	0	4	35	1053	187	0	8	2342	2350
05:00 PM	42	1	5	0	7	193	2	0	0	1	0	0	20	281	46	0	0	598	598
05:15 PM	37	0	2	0	9	175	1	0	4	3	1	0	19	258	43	0	0	552	552
05:30 PM	31	2	5	1	8	213	0	0	1	1	0	0	11	269	56	0	1	597	598
05:45 PM	19	1	2	0	5	214	0	0	1	0	1	0	13	285	64	0	0	605	605
Total	129	4	14	1	29	795	3	0	6	5	2	0	63	1093	209	0	1	2352	2353
Grand Total	266	5	21	5	64	1676	6	0	9	5	2	4	98	2146	396	0	9	4694	4703
Apprch %	91.1	1.7	7.2		3.7	96	0.3		56.2	31.2	12.5		3.7	81.3	15				
Total %	5.7	0.1	0.4		1.4	35.7	0.1		0.2	0.1	0		2.1	45.7	8.4		0.2	99.8	
Cars	263	5	21		64	1655	6		9	5	2		98	2124	394		0	0	4655
% Cars	98.9	100	100	100	100	98.7	100	0	100	100	100	100	100	99	99.5	0	0	0	99
Trucks	3	0	0		0	21	0		0	0	0		0	22	2		0	0	48
% Trucks	1.1	0	0	0	0	1.3	0	0	0	0	0	0	0	1	0.5	0	0	0	1

	Londonderry Road From North				West Broadway (Route 102) From East				Saint Charles Street From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	33	1	1	35	7	222	2	231	1	0	0	1	13	293	41	347	614
04:30 PM	39	0	1	40	10	225	0	235	0	0	0	0	8	254	48	310	585
04:45 PM	24	0	2	26	5	215	1	221	1	0	0	1	8	267	56	331	579
05:00 PM	42	1	5	48	7	193	2	202	0	1	0	1	20	281	46	347	598
Total Volume	138	2	9	149	29	855	5	889	2	1	0	3	49	1095	191	1335	2376
% App. Total	92.6	1.3	6		3.3	96.2	0.6		66.7	33.3	0		3.7	82	14.3		
PHF	.821	.500	.450	.776	.725	.950	.625	.946	.500	.250	.000	.750	.613	.934	.853	.962	.967
Cars	137	2	9	148	29	842	5	876	2	1	0	3	49	1084	190	1323	2350
% Cars	99.3	100	100	99.3	100	98.5	100	98.5	100	100	0	100	100	99.0	99.5	99.1	98.9
Trucks	1	0	0	1	0	13	0	13	0	0	0	0	0	11	1	12	26
% Trucks	0.7	0	0	0.7	0	1.5	0	1.5	0	0	0	0	0	1.0	0.5	0.9	1.1

Transportation Data Corporation

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N/S: Londonderry Road/St. Charles St.
E/W: W. Broadway/Nashua (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154EE
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

Groups Printed- Trucks

	Londonderry Road From North			West Broadway (Route 102) From East			Saint Charles Street From South			Nashua Road (Route 102) From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
04:00 PM	1	0	0	0	2	0	0	0	0	0	4	0	7
04:15 PM	0	0	0	0	4	0	0	0	0	0	2	0	6
04:30 PM	0	0	0	0	5	0	0	0	0	0	2	0	7
04:45 PM	0	0	0	0	1	0	0	0	0	0	4	1	6
Total	1	0	0	0	12	0	0	0	0	0	12	1	26
05:00 PM	1	0	0	0	3	0	0	0	0	0	3	0	7
05:15 PM	0	0	0	0	4	0	0	0	0	0	3	0	7
05:30 PM	0	0	0	0	1	0	0	0	0	0	2	1	4
05:45 PM	1	0	0	0	1	0	0	0	0	0	2	0	4
Total	2	0	0	0	9	0	0	0	0	0	10	1	22
Grand Total	3	0	0	0	21	0	0	0	0	0	22	2	48
Apprch %	100	0	0	0	100	0	0	0	0	0	91.7	8.3	
Total %	6.2	0	0	0	43.8	0	0	0	0	0	45.8	4.2	

	Londonderry Road From North				West Broadway (Route 102) From East				Saint Charles Street From South				Nashua Road (Route 102) From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
04:30 PM	0	0	0	0	0	5	0	5	0	0	0	0	0	2	0	2	7
04:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	4	1	5	6
05:00 PM	1	0	0	1	0	3	0	3	0	0	0	0	0	3	0	3	7
05:15 PM	0	0	0	0	0	4	0	4	0	0	0	0	0	3	0	3	7
Total Volume	1	0	0	1	0	13	0	13	0	0	0	0	0	12	1	13	27
% App. Total	100	0	0		0	100	0		0	0	0		0	92.3	7.7		
PHF	.250	.000	.000	.250	.000	.650	.000	.650	.000	.000	.000	.000	.000	.750	.250	.650	.964

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:30 PM

Transportation Data Corporation

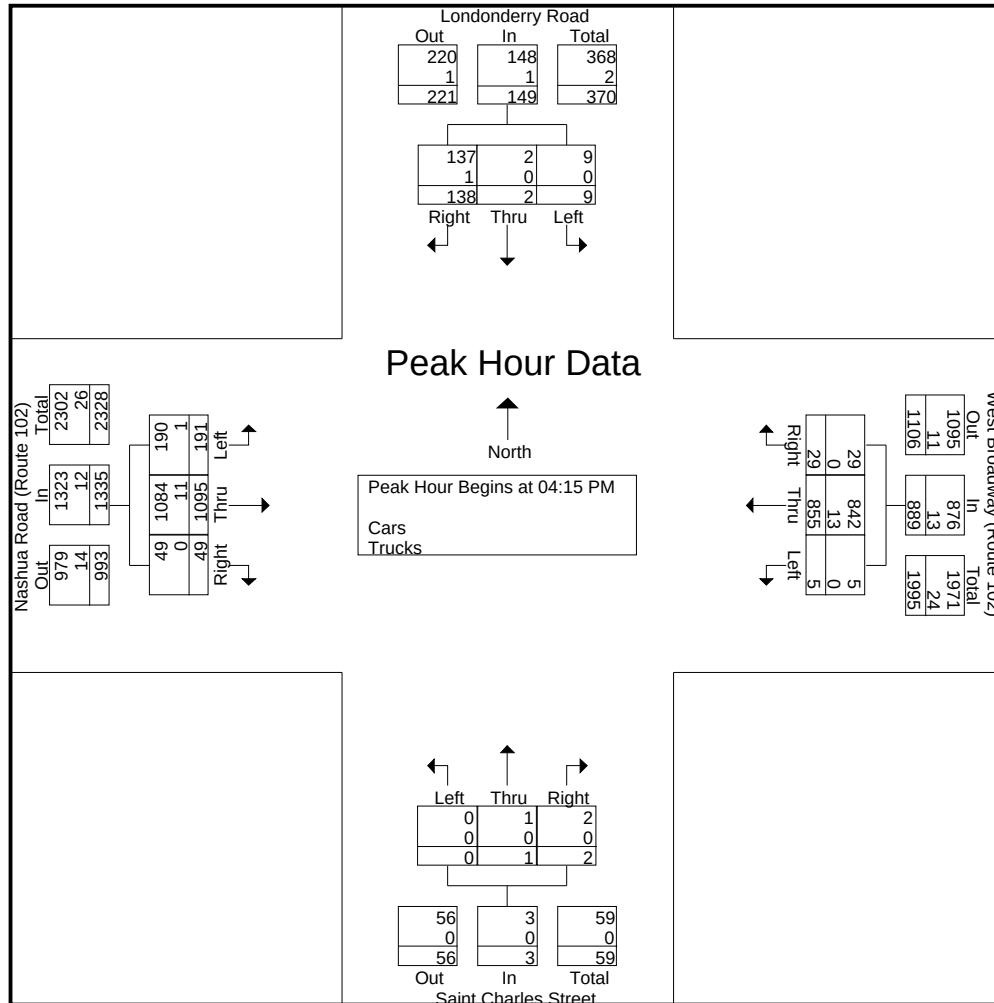
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N/S: Londonderry Road/St. Charles St.
E/W: W. Broadway/Nashua (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154EE
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

	Londonderry Road From North				West Broadway (Route 102) From East				Saint Charles Street From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	33	1	1	35	7	222	2	231	1	0	0	1	13	293	41	347	614
04:30 PM	39	0	1	40	10	225	0	235	0	0	0	0	8	254	48	310	585
04:45 PM	24	0	2	26	5	215	1	221	1	0	0	1	8	267	56	331	579
05:00 PM	42	1	5	48	7	193	2	202	0	1	0	1	20	281	46	347	598
Total Volume	138	2	9	149	29	855	5	889	2	1	0	3	49	1095	191	1335	2376
% App. Total	92.6	1.3	6		3.3	96.2	0.6		66.7	33.3	0		3.7	82	14.3		
PHF	.821	.500	.450	.776	.725	.950	.625	.946	.500	.250	.000	.750	.613	.934	.853	.962	.967
Cars	137	2	9	148	29	842	5	876	2	1	0	3	49	1084	190	1323	2350
% Cars	99.3	100	100	99.3	100	98.5	100	98.5	100	100	0	100	100	99.0	99.5	99.1	98.9
Trucks	1	0	0	1	0	13	0	13	0	0	0	0	0	11	1	12	26
% Trucks	0.7	0	0	0.7	0	1.5	0	1.5	0	0	0	0	0	1.0	0.5	0.9	1.1



Transportation Data Corporation

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N/S: I-93 Northbound Ramps
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154FF
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

Groups Printed- Cars - Trucks

Start Time	I-93 NB On-Ramp From North				Nashua Road (Route 102) From East				I-93 NB Off-Ramp From South				Nashua Road (Route 102) From West				Exclu. Total	Inclu. Total	Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds			
04:00 PM	0	0	0	0	102	189	0	0	120	0	129	0	0	190	118	0	0	848	848
04:15 PM	0	0	0	0	89	189	0	0	141	0	116	1	0	226	126	0	1	887	888
04:30 PM	0	0	0	0	100	192	0	0	151	0	126	0	0	179	124	0	0	872	872
04:45 PM	0	0	0	1	86	175	0	0	155	0	129	1	0	212	134	0	2	891	893
Total	0	0	0	1	377	745	0	0	567	0	500	2	0	807	502	0	3	3498	3501
05:00 PM	0	0	0	0	97	150	0	0	124	2	143	0	0	254	137	0	0	907	907
05:15 PM	0	0	0	0	98	161	0	0	121	1	148	0	0	249	138	0	0	916	916
05:30 PM	0	0	0	0	65	173	0	0	122	1	131	0	0	237	122	0	0	851	851
05:45 PM	0	0	0	0	83	167	0	0	128	0	143	0	0	233	124	0	0	878	878
Total	0	0	0	0	343	651	0	0	495	4	565	0	0	973	521	0	0	3552	3552
Grand Total	0	0	0	1	720	1396	0	0	1062	4	1065	2	0	1780	1023	0	3	7050	7053
Apprch %	0	0	0		34	66	0		49.8	0.2	50		0	63.5	36.5				
Total %	0	0	0		10.2	19.8	0		15.1	0.1	15.1		0	25.2	14.5		0	100	
Cars	0	0	0		704	1383	0		1049	4	1052		0	1765	1009		0	0	6969
% Cars	0	0	0	100	97.8	99.1	0	0	98.8	100	98.8	100	0	99.2	98.6	0	0	0	98.8
Trucks	0	0	0		16	13	0		13	0	13		0	15	14		0	0	84
% Trucks	0	0	0	0	2.2	0.9	0	0	1.2	0	1.2	0	0	0.8	1.4	0	0	0	1.2

	I-93 NB On-Ramp From North				Nashua Road (Route 102) From East				I-93 NB Off-Ramp From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 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	100	192	0	292	151	0	126	277	0	179	124	303	872
04:45 PM	0	0	0	0	86	175	0	261	155	0	129	284	0	212	134	346	891
05:00 PM	0	0	0	0	97	150	0	247	124	2	143	269	0	254	137	391	907
05:15 PM	0	0	0	0	98	161	0	259	121	1	148	270	0	249	138	387	916
Total Volume	0	0	0	0	381	678	0	1059	551	3	546	1100	0	894	533	1427	3586
% App. Total	0	0	0		36	64	0		50.1	0.3	49.6		0	62.6	37.4		
PHF	.000	.000	.000	.000	.953	.883	.000	.907	.889	.375	.922	.968	.000	.880	.966	.912	.979
Cars	0	0	0	0	371	673	0	1044	541	3	537	1081	0	888	528	1416	3541
% Cars	0	0	0	0	97.4	99.3	0	98.6	98.2	100	98.4	98.3	0	99.3	99.1	99.2	98.7
Trucks	0	0	0	0	10	5	0	15	10	0	9	19	0	6	5	11	45
% Trucks	0	0	0	0	2.6	0.7	0	1.4	1.8	0	1.6	1.7	0	0.7	0.9	0.8	1.3

Transportation Data Corporation

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N/S: I-93 Northbound Ramps
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154FF
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

Groups Printed- Trucks

	I-93 NB On-Ramp From North			Nashua Road (Route 102) From East			I-93 NB Off-Ramp From South			Nashua Road (Route 102) From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
04:00 PM	0	0	0	3	1	0	1	0	2	0	4	3	14
04:15 PM	0	0	0	2	3	0	1	0	1	0	2	4	13
04:30 PM	0	0	0	2	2	0	2	0	4	0	0	3	13
04:45 PM	0	0	0	3	0	0	2	0	2	0	3	0	10
Total	0	0	0	10	6	0	6	0	9	0	9	10	50
05:00 PM	0	0	0	2	1	0	2	0	2	0	2	1	10
05:15 PM	0	0	0	3	2	0	4	0	1	0	1	1	12
05:30 PM	0	0	0	0	2	0	1	0	1	0	1	0	5
05:45 PM	0	0	0	1	2	0	0	0	0	0	2	2	7
Total	0	0	0	6	7	0	7	0	4	0	6	4	34
Grand Total	0	0	0	16	13	0	13	0	13	0	15	14	84
Apprch %	0	0	0	55.2	44.8	0	50	0	50	0	51.7	48.3	
Total %	0	0	0	19	15.5	0	15.5	0	15.5	0	17.9	16.7	

	I-93 NB On-Ramp From North				Nashua Road (Route 102) From East				I-93 NB Off-Ramp From South				Nashua Road (Route 102) From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
04:00 PM	0	0	0	0	3	1	0	4	1	0	2	3	0	4	3	7	14
04:15 PM	0	0	0	0	2	3	0	5	1	0	1	2	0	2	4	6	13
04:30 PM	0	0	0	0	2	2	0	4	2	0	4	6	0	0	3	3	13
04:45 PM	0	0	0	0	3	0	0	3	2	0	2	4	0	3	0	3	10
Total Volume	0	0	0	0	10	6	0	16	6	0	9	15	0	9	10	19	50
% App. Total	0	0	0		62.5	37.5	0		40	0	60		0	47.4	52.6		
PHF	.000	.000	.000	.000	.833	.500	.000	.800	.750	.000	.563	.625	.000	.563	.625	.679	.893

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

Transportation Data Corporation

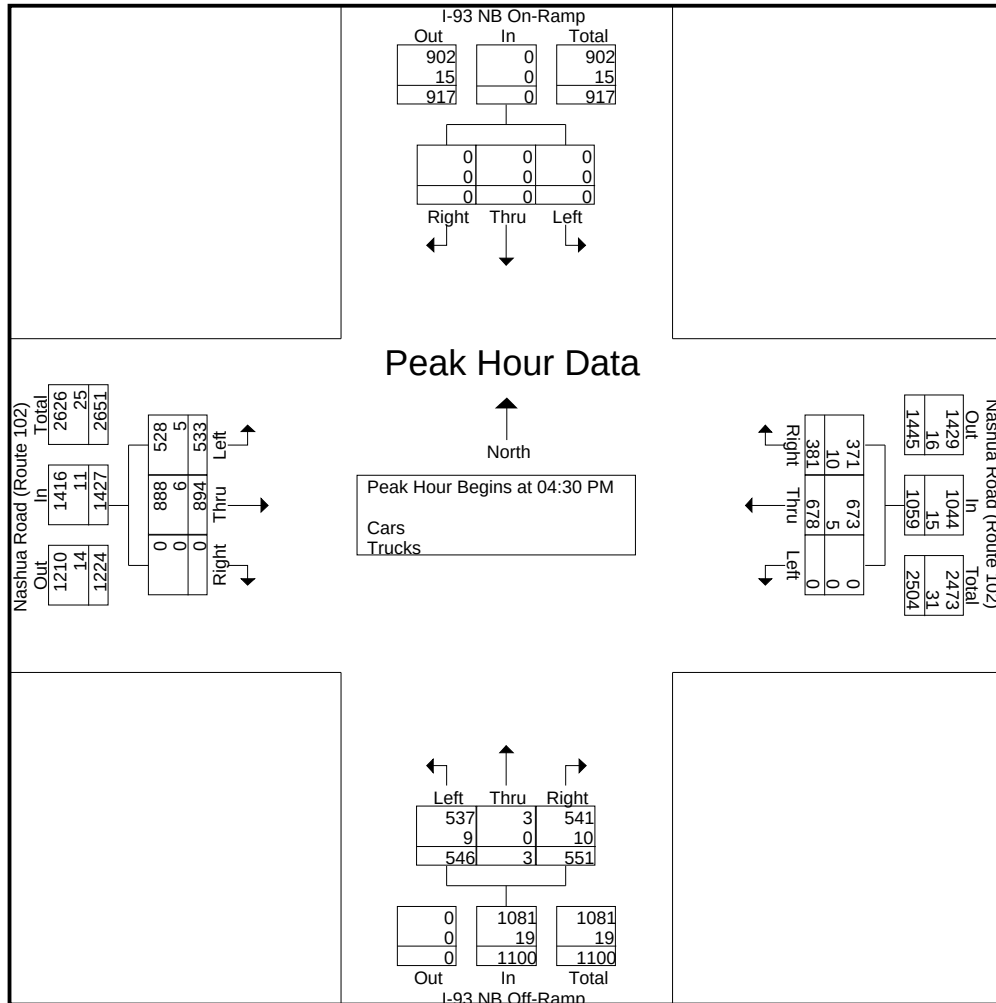
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N/S: I-93 Northbound Ramps
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154FF
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

	I-93 NB On-Ramp From North				Nashua Road (Route 102) From East				I-93 NB Off-Ramp From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 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	100	192	0	292	151	0	126	277	0	179	124	303	872
04:45 PM	0	0	0	0	86	175	0	261	155	0	129	284	0	212	134	346	891
05:00 PM	0	0	0	0	97	150	0	247	124	2	143	269	0	254	137	391	907
05:15 PM	0	0	0	0	98	161	0	259	121	1	148	270	0	249	138	387	916
Total Volume	0	0	0	0	381	678	0	1059	551	3	546	1100	0	894	533	1427	3586
% App. Total	0	0	0	0	36	64	0		50.1	0.3	49.6		0	62.6	37.4		
PHF	.000	.000	.000	.000	.953	.883	.000	.907	.889	.375	.922	.968	.000	.880	.966	.912	.979
Cars	0	0	0	0	371	673	0	1044	541	3	537	1081	0	888	528	1416	3541
% Cars	0	0	0	0	97.4	99.3	0	98.6	98.2	100	98.4	98.3	0	99.3	99.1	99.2	98.7
Trucks	0	0	0	0	10	5	0	15	10	0	9	19	0	6	5	11	45
% Trucks	0	0	0	0	2.6	0.7	0	1.4	1.8	0	1.6	1.7	0	0.7	0.9	0.8	1.3



Transportation Data Corporation

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N/S: I-93 SB Ramps (Exit 4)
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154GG
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

Groups Printed- Cars - Trucks

Start Time	I-93 SB On/Off-Ramps From North				Nashua Road (Route 102) From East				I-93 SB On-Ramp From South				Nashua Road (Route 102) From West				Exclu. Total	Inclu. Total	Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds			
04:00 PM	131	0	77	0	72	237	0	0	0	0	0	0	61	231	0	0	0	809	809
04:15 PM	183	0	95	1	75	229	0	0	0	0	0	0	66	264	0	0	1	912	913
04:30 PM	142	0	79	0	88	230	0	0	0	0	0	0	81	226	0	0	0	846	846
04:45 PM	179	0	99	1	66	239	0	0	0	0	0	0	74	264	0	0	1	921	922
Total	635	0	350	2	301	935	0	0	0	0	0	0	282	985	0	0	2	3488	3490
05:00 PM	146	0	94	1	63	245	0	0	0	0	0	0	88	297	0	0	1	933	934
05:15 PM	193	0	109	0	60	236	0	0	0	0	0	0	83	285	0	0	0	966	966
05:30 PM	172	0	118	0	61	235	0	0	0	0	0	0	68	249	0	0	0	903	903
05:45 PM	182	0	90	0	55	258	0	0	0	0	0	0	68	259	0	0	0	912	912
Total	693	0	411	1	239	974	0	0	0	0	0	0	307	1090	0	0	1	3714	3715
Grand Total	1328	0	761	3	540	1909	0	0	0	0	0	0	589	2075	0	0	3	7202	7205
Apprch %	63.6	0	36.4		22	78	0		0	0	0		22.1	77.9	0				
Total %	18.4	0	10.6		7.5	26.5	0		0	0	0		8.2	28.8	0		0	100	
Cars	1309	0	756		532	1890	0		0	0	0		581	2054	0		0	0	7125
% Cars	98.6	0	99.3	100	98.5	99	0	0	0	0	0	0	98.6	99	0	0	0	0	98.9
Trucks	19	0	5		8	19	0		0	0	0		8	21	0		0	0	80
% Trucks	1.4	0	0.7	0	1.5	1	0	0	0	0	0	0	1.4	1	0	0	0	0	1.1

	I-93 SB On/Off-Ramps From North				Nashua Road (Route 102) From East				I-93 SB On-Ramp From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	179	0	99	278	66	239	0	305	0	0	0	0	74	264	0	338	921
05:00 PM	146	0	94	240	63	245	0	308	0	0	0	0	88	297	0	385	933
05:15 PM	193	0	109	302	60	236	0	296	0	0	0	0	83	285	0	368	966
05:30 PM	172	0	118	290	61	235	0	296	0	0	0	0	68	249	0	317	903
Total Volume	690	0	420	1110	250	955	0	1205	0	0	0	0	313	1095	0	1408	3723
% App. Total	62.2	0	37.8		20.7	79.3	0		0	0	0		22.2	77.8	0		
PHF	.894	.000	.890	.919	.947	.974	.000	.978	.000	.000	.000	.000	.889	.922	.000	.914	.964
Cars	686	0	417	1103	247	947	0	1194	0	0	0	0	309	1090	0	1399	3696
% Cars	99.4	0	99.3	99.4	98.8	99.2	0	99.1	0	0	0	0	98.7	99.5	0	99.4	99.3
Trucks	4	0	3	7	3	8	0	11	0	0	0	0	4	5	0	9	27
% Trucks	0.6	0	0.7	0.6	1.2	0.8	0	0.9	0	0	0	0	1.3	0.5	0	0.6	0.7

Transportation Data Corporation

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N/S: I-93 SB Ramps (Exit 4)
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154GG
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

Groups Printed- Trucks

	I-93 SB On/Off-Ramps From North			Nashua Road (Route 102) From East			I-93 SB On-Ramp From South			Nashua Road (Route 102) From West			Int. Total
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
04:00 PM	3	0	1	0	3	0	0	0	0	0	6	0	13
04:15 PM	3	0	0	3	1	0	0	0	0	1	5	0	13
04:30 PM	5	0	0	1	5	0	0	0	0	0	3	0	14
04:45 PM	1	0	0	0	2	0	0	0	0	2	2	0	7
Total	12	0	1	4	11	0	0	0	0	3	16	0	47
05:00 PM	2	0	1	2	2	0	0	0	0	0	2	0	9
05:15 PM	0	0	1	1	1	0	0	0	0	1	1	0	5
05:30 PM	1	0	1	0	3	0	0	0	0	1	0	0	6
05:45 PM	4	0	1	1	2	0	0	0	0	3	2	0	13
Total	7	0	4	4	8	0	0	0	0	5	5	0	33
Grand Total	19	0	5	8	19	0	0	0	0	8	21	0	80
Apprch %	79.2	0	20.8	29.6	70.4	0	0	0	0	27.6	72.4	0	
Total %	23.8	0	6.2	10	23.8	0	0	0	0	10	26.2	0	

	I-93 SB On/Off-Ramps From North				Nashua Road (Route 102) From East				I-93 SB On-Ramp From South				Nashua Road (Route 102) From West				Int. Total
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
04:00 PM	3	0	1	4	0	3	0	3	0	0	0	0	0	6	0	6	13
04:15 PM	3	0	0	3	3	1	0	4	0	0	0	0	1	5	0	6	13
04:30 PM	5	0	0	5	1	5	0	6	0	0	0	0	0	3	0	3	14
04:45 PM	1	0	0	1	0	2	0	2	0	0	0	0	2	2	0	4	7
Total Volume	12	0	1	13	4	11	0	15	0	0	0	0	3	16	0	19	47
% App. Total	92.3	0	7.7		26.7	73.3	0		0	0	0		15.8	84.2	0		
PHF	.600	.000	.250	.650	.333	.550	.000	.625	.000	.000	.000	.000	.375	.667	.000	.792	.839

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:00 PM

Transportation Data Corporation

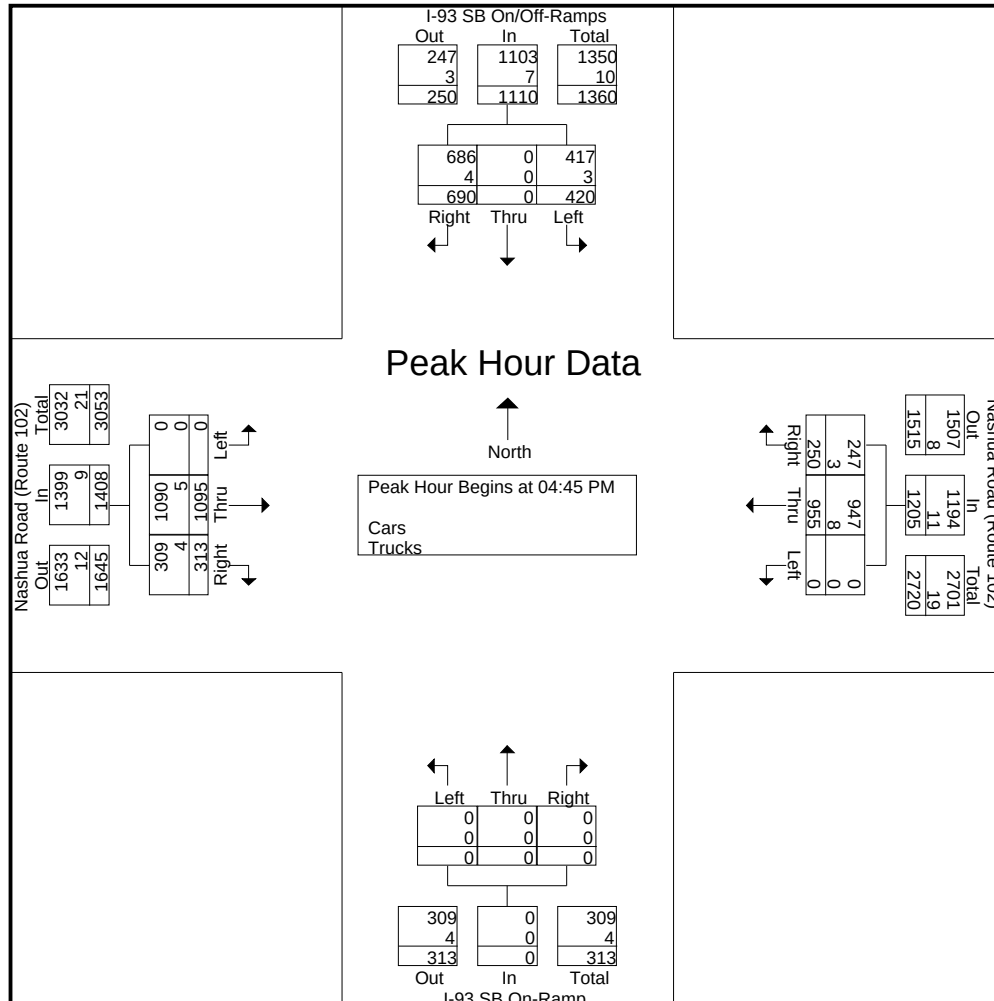
Mario Perone, mperone1@verizon.net

t (781) 587-0086 f (781) 587-0089

N/S: I-93 SB Ramps (Exit 4)
E/W: Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

File Name : 04154GG
Site Code : T0378.01
Start Date : 9/1/2011
Page No : 1

	I-93 SB On/Off-Ramps From North				Nashua Road (Route 102) From East				I-93 SB On-Ramp From South				Nashua Road (Route 102) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	179	0	99	278	66	239	0	305	0	0	0	0	74	264	0	338	921
05:00 PM	146	0	94	240	63	245	0	308	0	0	0	0	88	297	0	385	933
05:15 PM	193	0	109	302	60	236	0	296	0	0	0	0	83	285	0	368	966
05:30 PM	172	0	118	290	61	235	0	296	0	0	0	0	68	249	0	317	903
Total Volume	690	0	420	1110	250	955	0	1205	0	0	0	0	313	1095	0	1408	3723
% App. Total	62.2	0	37.8		20.7	79.3	0		0	0	0		22.2	77.8	0		
PHF	.894	.000	.890	.919	.947	.974	.000	.978	.000	.000	.000	.000	.889	.922	.000	.914	.964
Cars	686	0	417	1103	247	947	0	1194	0	0	0	0	309	1090	0	1399	3696
% Cars	99.4	0	99.3	99.4	98.8	99.2	0	99.1	0	0	0	0	98.7	99.5	0	99.4	99.3
Trucks	4	0	3	7	3	8	0	11	0	0	0	0	4	5	0	9	27
% Trucks	0.6	0	0.7	0.6	1.2	0.8	0	0.9	0	0	0	0	1.3	0.5	0	0.6	0.7



Attachment C

Automatic Traffic Recorder (ATR) Data Sheets

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Garden Lane north of
Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Avolume
Site Code: T-0070.42

Start Time	04-Aug-11 Thu	NB		Hour Totals		SB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		3	109			5	104				
12:15		1	115			4	116				
12:30		2	112			2	116				
12:45		0	103	6	439	2	116	13	452	19	891
01:00		2	116			0	134				
01:15		0	99			2	150				
01:30		2	109			1	131				
01:45		0	106	4	430	2	108	5	523	9	953
02:00		4	93			1	130				
02:15		2	102			2	98				
02:30		1	117			5	116				
02:45		2	114	9	426	0	128	8	472	17	898
03:00		1	98			2	132				
03:15		2	113			0	125				
03:30		1	116			2	130				
03:45		1	115	5	442	1	111	5	498	10	940
04:00		4	128			3	140				
04:15		4	156			2	123				
04:30		6	156			2	129				
04:45		15	142	29	582	6	146	13	538	42	1120
05:00		21	132			6	148				
05:15		25	152			7	177				
05:30		30	127			12	166				
05:45		43	130	119	541	16	139	41	630	160	1171
06:00		38	112			8	141				
06:15		48	103			18	118				
06:30		53	100			20	134				
06:45		59	97	198	412	19	118	65	511	263	923
07:00		55	77			26	110				
07:15		85	75			31	109				
07:30		66	76			37	100				
07:45		72	46	278	274	46	70	140	389	418	663
08:00		51	49			54	57				
08:15		67	38			44	76				
08:30		61	44			55	52				
08:45		74	32	253	163	50	54	203	239	456	402
09:00		77	14			56	52				
09:15		66	16			70	47				
09:30		73	15			54	17				
09:45		96	17	312	62	74	14	254	130	566	192
10:00		77	18			92	46				
10:15		90	6			70	26				
10:30		83	8			82	9				
10:45		84	10	334	42	90	4	334	85	668	127
11:00		94	5			96	6				
11:15		115	6			99	6				
11:30		81	8			83	6				
11:45		100	15	390	34	119	10	397	28	787	62
Total		1937	3847			1478	4495			3415	8342
Percent		33.5%	66.5%			24.7%	75.3%			29.0%	71.0%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Garden Lane north of
Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Avolume
Site Code: T-0070.42

Start Time	05-Aug-11 Fri	NB		Hour Totals		SB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		7	133			12	146				
12:15		4	130			6	132				
12:30		2	149			3	148				
12:45		1	135	14	547	1	146	22	572	36	1119
01:00		0	134			1	133				
01:15		0	122			0	139				
01:30		3	136			0	134				
01:45		0	144	3	536	2	136	3	542	6	1078
02:00		0	115			2	172				
02:15		0	147			0	146				
02:30		0	152			0	166				
02:45		3	168	3	582	0	150	2	634	5	1216
03:00		4	152			2	156				
03:15		3	154			10	150				
03:30		2	151			1	152				
03:45		0	162	9	619	1	159	14	617	23	1236
04:00		4	168			0	160				
04:15		2	154			1	146				
04:30		3	155			0	158				
04:45		16	147	25	624	4	164	5	628	30	1252
05:00		16	176			8	167				
05:15		15	153			10	183				
05:30		30	139			6	168				
05:45		48	158	109	626	22	158	46	676	155	1302
06:00		38	119			24	166				
06:15		47	109			16	130				
06:30		33	125			14	138				
06:45		69	111	187	464	16	140	70	574	257	1038
07:00		43	97			28	137				
07:15		73	98			26	134				
07:30		70	86			46	116				
07:45		74	64	260	345	56	107	156	494	416	839
08:00		75	67			61	104				
08:15		69	63			36	70				
08:30		88	43			58	72				
08:45		99	40	331	213	62	64	217	310	548	523
09:00		83	24			86	80				
09:15		102	19			61	59				
09:30		83	21			84	38				
09:45		100	17	368	81	102	28	333	205	701	286
10:00		89	7			98	42				
10:15		87	10			106	8				
10:30		131	11			94	12				
10:45		129	7	436	35	124	10	422	72	858	107
11:00		115	15			129	5				
11:15		101	5			107	5				
11:30		126	7			106	8				
11:45		142	11	484	38	128	6	470	24	954	62
Total		2229	4710			1760	5348			3989	10058
Percent		32.1%	67.9%			24.8%	75.2%			28.4%	71.6%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Garden Lane north of
Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Avolume
Site Code: T-0070.42

Start Time	06-Aug-11 Sat	NB		Hour Totals		SB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		5	133			6	151				
12:15		5	134			5	155				
12:30		3	121			6	120				
12:45		0	140	13	528	4	138	21	564	34	1092
01:00		4	134			4	137				
01:15		2	157			2	140				
01:30		1	117			3	130				
01:45		2	135	9	543	2	140	11	547	20	1090
02:00		0	110			2	132				
02:15		0	132			0	124				
02:30		2	126			0	110				
02:45		3	122	5	490	9	126	11	492	16	982
03:00		2	117			1	125				
03:15		0	129			0	122				
03:30		1	113			1	122				
03:45		1	127	4	486	0	139	2	508	6	994
04:00		2	137			2	122				
04:15		3	121			2	126				
04:30		4	132			2	120				
04:45		5	121	14	511	4	130	10	498	24	1009
05:00		0	97			2	133				
05:15		2	95			1	126				
05:30		10	107			4	128				
05:45		25	106	37	405	4	130	11	517	48	922
06:00		8	84			4	112				
06:15		19	101			8	97				
06:30		14	81			4	76				
06:45		53	74	94	340	6	98	22	383	116	723
07:00		31	86			16	88				
07:15		58	64			28	77				
07:30		45	57			42	82				
07:45		69	54	203	261	52	84	138	331	341	592
08:00		52	59			48	68				
08:15		60	41			44	58				
08:30		87	47			48	52				
08:45		99	33	298	180	72	53	212	231	510	411
09:00		67	16			72	48				
09:15		81	17			96	34				
09:30		99	14			88	27				
09:45		117	10	364	57	104	16	360	125	724	182
10:00		102	15			106	21				
10:15		115	5			96	15				
10:30		114	7			88	8				
10:45		128	8	459	35	101	8	391	52	850	87
11:00		115	10			146	9				
11:15		125	7			114	4				
11:30		122	8			122	4				
11:45		142	7	504	32	116	2	498	19	1002	51
Total		2004	3868			1687	4267			3691	8135
Percent		34.1%	65.9%			28.3%	71.7%			31.2%	68.8%

Transportation Data Corporation

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t. (781) 587-0086 f. (781) 587-0189

Page 4

Garden Lane north of
Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Avolume
Site Code: T-0070.42

Start Time	07-Aug-11 Sun	NB		Hour Totals		SB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		4	140			8	133				
12:15		5	140			6	152				
12:30		3	132			10	147				
12:45		1	145	13	557	2	136	26	568	39	1125
01:00		3	134			5	130				
01:15		6	122			5	142				
01:30		0	125			1	144				
01:45		0	113	9	494	2	152	13	568	22	1062
02:00		0	149			1	139				
02:15		4	128			4	148				
02:30		0	121			2	122				
02:45		1	154	5	552	2	146	9	555	14	1107
03:00		1	115			0	138				
03:15		3	121			4	136				
03:30		1	136			0	128				
03:45		3	120	8	492	2	129	6	531	14	1023
04:00		0	125			1	140				
04:15		0	134			0	132				
04:30		2	101			2	132				
04:45		1	126	3	486	0	140	3	544	6	1030
05:00		0	116			0	126				
05:15		1	109			1	118				
05:30		14	96			1	124				
05:45		33	88	48	409	8	129	10	497	58	906
06:00		13	92			3	102				
06:15		6	70			3	101				
06:30		14	60			3	80				
06:45		35	43	68	265	4	90	13	373	81	638
07:00		44	36			11	80				
07:15		36	24			16	74				
07:30		28	34			32	46				
07:45		45	30	153	124	31	46	90	246	243	370
08:00		38	17			44	34				
08:15		51	20			34	34				
08:30		56	25			29	37				
08:45		53	13	198	75	55	17	162	122	360	197
09:00		67	11			55	14				
09:15		78	12			55	11				
09:30		79	7			54	17				
09:45		77	4	301	34	73	4	237	46	538	80
10:00		99	6			81	7				
10:15		119	5			79	6				
10:30		115	6			90	9				
10:45		145	5	478	22	88	5	338	27	816	49
11:00		106	3			110	4				
11:15		109	0			113	1				
11:30		136	3			98	1				
11:45		147	5	498	11	136	8	457	14	955	25
Total		1782	3521			1364	4091			3146	7612
Percent		33.6%	66.4%			25.0%	75.0%			29.2%	70.8%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Page 5

Garden Lane north of
Nashua Road (Route 102)
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Avolume
Site Code: T-0070.42

Start Time	08-Aug-11 Mon	NB		Hour Totals		SB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		3	86			0	114				
12:15		4	112			5	124				
12:30		1	122			2	114				
12:45		1	108	9	428	1	126	8	478	17	906
01:00		1	90			2	107				
01:15		2	128			1	114				
01:30		3	92			4	116				
01:45		1	101	7	411	1	118	8	455	15	866
02:00		1	134			0	114				
02:15		2	117			4	127				
02:30		0	111			1	114				
02:45		1	130	4	492	2	118	7	473	11	965
03:00		2	94			1	126				
03:15		0	134			0	121				
03:30		0	124			0	120				
03:45		2	133	4	485	1	132	2	499	6	984
04:00		2	125			1	136				
04:15		4	134			2	138				
04:30		6	104			3	122				
04:45		14	152	26	515	8	137	14	533	40	1048
05:00		21	130			3	188				
05:15		16	141			10	164				
05:30		35	126			14	148				
05:45		54	116	126	513	15	126	42	626	168	1139
06:00		37	107			20	134				
06:15		56	101			8	129				
06:30		28	88			26	119				
06:45		43	99	164	395	7	105	61	487	225	882
07:00		48	88			20	98				
07:15		73	72			36	110				
07:30		53	72			32	94				
07:45		60	68	234	300	45	62	133	364	367	664
08:00		47	45			37	84				
08:15		61	43			35	60				
08:30		61	38			42	52				
08:45		71	19	240	145	54	56	168	252	408	397
09:00		66	18			55	52				
09:15		50	17			56	36				
09:30		77	12			64	20				
09:45		53	13	246	60	70	20	245	128	491	188
10:00		69	8			64	25				
10:15		76	10			68	28				
10:30		90	9			74	6				
10:45		98	5	333	32	79	5	285	64	618	96
11:00		103	2			79	12				
11:15		92	1			86	3				
11:30		98	1			109	4				
11:45		123	3	416	7	90	2	364	21	780	28
Total		1809	3783			1337	4380			3146	8163
Percent		32.3%	67.7%			23.4%	76.6%			27.8%	72.2%
Grand Total		9761	19729			7626	22581			17387	42310
Percent		33.1%	66.9%			25.2%	74.8%			29.1%	70.9%

ADT

ADT 11,939

AADT 11,939

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Gilcreast Road
south of Pillsbury Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Bvolume
Site Code: T-0070.42

Start Time	04-Aug-11 Thu	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		6	80			4	80				
12:15		5	83			4	83				
12:30		4	96			6	92				
12:45		3	92	18	351	5	84	19	339	37	690
01:00		1	84			2	87				
01:15		4	76			2	99				
01:30		2	82			4	89				
01:45		4	92	11	334	6	86	14	361	25	695
02:00		3	89			2	78				
02:15		7	90			5	80				
02:30		4	94			5	96				
02:45		4	99	18	372	1	90	13	344	31	716
03:00		1	66			0	84				
03:15		3	95			3	102				
03:30		5	98			2	120				
03:45		2	99	11	358	1	98	6	404	17	762
04:00		5	110			1	104				
04:15		8	102			1	99				
04:30		16	80			0	144				
04:45		18	106	47	398	4	137	6	484	53	882
05:00		26	105			4	145				
05:15		40	90			4	146				
05:30		41	106			6	146				
05:45		46	86	153	387	12	121	26	558	179	945
06:00		62	92			8	139				
06:15		75	84			10	108				
06:30		79	74			16	102				
06:45		82	62	298	312	25	88	59	437	357	749
07:00		92	75			27	100				
07:15		105	63			36	79				
07:30		128	45			37	91				
07:45		127	52	452	235	42	73	142	343	594	578
08:00		108	52			37	78				
08:15		95	62			52	63				
08:30		100	46			46	68				
08:45		97	23	400	183	54	52	189	261	589	444
09:00		87	35			60	50				
09:15		100	26			54	53				
09:30		81	18			44	43				
09:45		91	14	359	93	54	38	212	184	571	277
10:00		74	17			74	38				
10:15		80	17			54	16				
10:30		85	18			58	28				
10:45		103	10	342	62	60	23	246	105	588	167
11:00		78	12			70	13				
11:15		82	10			72	20				
11:30		82	6			67	18				
11:45		100	9	342	37	70	10	279	61	621	98
Total		2451	3122			1211	3881			3662	7003
Percent		44.0%	56.0%			23.8%	76.2%			34.3%	65.7%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Gilcreast Road
south of Pillsbury Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Bvolume
Site Code: T-0070.42

Start Time	05-Aug-11 Fri	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		2	94			18	102				
12:15		5	105			11	90				
12:30		3	102			10	74				
12:45		7	92	17	393	8	111	47	377	64	770
01:00		3	86			5	94				
01:15		2	97			0	94				
01:30		3	115			2	72				
01:45		1	85	9	383	4	87	11	347	20	730
02:00		1	88			1	72				
02:15		2	90			2	96				
02:30		3	78			1	106				
02:45		5	100	11	356	3	96	7	370	18	726
03:00		3	103			2	124				
03:15		0	90			1	116				
03:30		4	94			2	110				
03:45		3	111	10	398	1	118	6	468	16	866
04:00		4	93			4	118				
04:15		2	102			3	134				
04:30		9	116			2	134				
04:45		10	97	25	408	7	115	16	501	41	909
05:00		19	103			3	139				
05:15		29	98			5	128				
05:30		26	88			3	135				
05:45		45	96	119	385	8	114	19	516	138	901
06:00		54	86			3	104				
06:15		57	80			10	105				
06:30		54	70			18	104				
06:45		77	75	242	311	14	118	45	431	287	742
07:00		90	68			41	74				
07:15		93	71			23	72				
07:30		100	68			28	84				
07:45		101	46	384	253	41	54	133	284	517	537
08:00		100	56			35	80				
08:15		92	58			46	55				
08:30		110	49			42	50				
08:45		115	52	417	215	48	46	171	231	588	446
09:00		78	34			63	67				
09:15		103	34			56	35				
09:30		74	23			58	57				
09:45		107	21	362	112	56	44	233	203	595	315
10:00		81	29			65	43				
10:15		77	23			62	26				
10:30		101	19			75	25				
10:45		90	15	349	86	73	32	275	126	624	212
11:00		110	11			80	17				
11:15		80	17			90	24				
11:30		98	11			79	12				
11:45		118	8	406	47	68	20	317	73	723	120
Total		2351	3347			1280	3927			3631	7274
Percent		41.3%	58.7%			24.6%	75.4%			33.3%	66.7%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Gilcreast Road
south of Pillsbury Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Bvolume
Site Code: T-0070.42

Start Time	06-Aug-11 Sat	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		9	99			10	102				
12:15		5	86			18	100				
12:30		5	82			9	83				
12:45		3	116	22	383	10	96	47	381	69	764
01:00		5	104			13	85				
01:15		0	89			8	98				
01:30		1	82			3	92				
01:45		2	81	8	356	7	81	31	356	39	712
02:00		2	98			2	82				
02:15		3	78			4	92				
02:30		3	74			2	74				
02:45		1	88	9	338	1	82	9	330	18	668
03:00		2	84			5	74				
03:15		4	92			2	84				
03:30		4	78			5	83				
03:45		5	73	15	327	2	86	14	327	29	654
04:00		0	76			3	83				
04:15		2	78			2	60				
04:30		3	68			1	84				
04:45		6	82	11	304	0	72	6	299	17	603
05:00		7	65			3	92				
05:15		5	60			1	85				
05:30		11	67			2	74				
05:45		14	61	37	253	6	70	12	321	49	574
06:00		13	72			6	52				
06:15		23	63			7	58				
06:30		24	56			8	68				
06:45		28	57	88	248	10	61	31	239	119	487
07:00		26	41			11	70				
07:15		36	51			16	48				
07:30		39	46			26	48				
07:45		56	56	157	194	22	52	75	218	232	412
08:00		56	42			31	48				
08:15		48	34			31	50				
08:30		78	33			38	49				
08:45		67	22	249	131	48	42	148	189	397	320
09:00		84	29			47	44				
09:15		106	24			61	32				
09:30		78	31			72	40				
09:45		104	27	372	111	64	28	244	144	616	255
10:00		98	11			78	26				
10:15		100	14			57	26				
10:30		109	13			72	18				
10:45		110	7	417	45	82	20	289	90	706	135
11:00		107	7			82	30				
11:15		130	5			104	23				
11:30		109	9			94	21				
11:45		124	8	470	29	98	18	378	92	848	121
Total		1855	2719			1284	2986			3139	5705
Percent		40.6%	59.4%			30.1%	69.9%			35.5%	64.5%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Page 4

Gilcreast Road
south of Pillsbury Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Bvolume
Site Code: T-0070.42

Start Time	07-Aug-11 Sun	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		5	115			13	81				
12:15		7	105			14	75				
12:30		3	111			13	84				
12:45		1	111	16	442	5	90	45	330	61	772
01:00		6	103			11	90				
01:15		3	91			5	96				
01:30		1	103			3	90				
01:45		3	116	13	413	4	88	23	364	36	777
02:00		3	93			2	104				
02:15		4	97			4	91				
02:30		3	83			4	88				
02:45		0	89	10	362	8	67	18	350	28	712
03:00		1	74			1	74				
03:15		1	80			3	76				
03:30		3	92			4	77				
03:45		0	99	5	345	1	91	9	318	14	663
04:00		1	88			0	86				
04:15		1	94			0	78				
04:30		4	75			1	75				
04:45		2	80	8	337	2	76	3	315	11	652
05:00		3	68			0	76				
05:15		5	71			2	71				
05:30		10	76			5	84				
05:45		11	85	29	300	2	67	9	298	38	598
06:00		6	56			2	75				
06:15		9	60			6	70				
06:30		6	50			3	80				
06:45		26	59	47	225	6	58	17	283	64	508
07:00		21	38			5	66				
07:15		16	54			7	50				
07:30		29	43			14	58				
07:45		30	42	96	177	20	50	46	224	142	401
08:00		43	43			23	41				
08:15		42	26			24	49				
08:30		34	23			28	38				
08:45		55	25	174	117	36	38	111	166	285	283
09:00		66	28			36	21				
09:15		56	21			34	28				
09:30		80	20			46	33				
09:45		74	16	276	85	36	22	152	104	428	189
10:00		76	20			40	13				
10:15		71	17			44	14				
10:30		77	7			56	19				
10:45		82	10	306	54	54	11	194	57	500	111
11:00		99	4			63	8				
11:15		86	8			76	8				
11:30		93	5			88	7				
11:45		108	4	386	21	72	11	299	34	685	55
Total		1366	2878			926	2843			2292	5721
Percent		32.2%	67.8%			24.6%	75.4%			28.6%	71.4%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Gilcreast Road
south of Pillsbury Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Bvolume
Site Code: T-0070.42

Start Time	08-Aug-11 Mon	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		7	82			5	92				
12:15		5	96			4	94				
12:30		1	78			9	78				
12:45		4	86	17	342	4	78	22	342	39	684
01:00		3	82			2	78				
01:15		1	93			3	63				
01:30		2	98			3	71				
01:45		0	84	6	357	4	90	12	302	18	659
02:00		2	80			4	76				
02:15		2	92			3	72				
02:30		2	95			2	78				
02:45		4	89	10	356	0	88	9	314	19	670
03:00		3	80			2	102				
03:15		3	96			2	86				
03:30		5	86			0	89				
03:45		4	88	15	350	0	111	4	388	19	738
04:00		5	98			1	118				
04:15		10	105			4	112				
04:30		11	94			4	122				
04:45		22	134	48	431	6	132	15	484	63	915
05:00		18	95			6	132				
05:15		42	95			5	136				
05:30		52	91			5	139				
05:45		51	96	163	377	12	136	28	543	191	920
06:00		66	76			5	140				
06:15		64	80			9	148				
06:30		59	75			16	102				
06:45		91	71	280	302	19	97	49	487	329	789
07:00		92	71			21	93				
07:15		121	82			33	98				
07:30		86	43			36	65				
07:45		112	57	411	253	30	62	120	318	531	571
08:00		80	60			32	88				
08:15		99	50			40	71				
08:30		98	29			32	53				
08:45		105	26	382	165	52	42	156	254	538	419
09:00		82	23			43	42				
09:15		92	19			57	44				
09:30		78	17			40	34				
09:45		89	15	341	74	34	22	174	142	515	216
10:00		73	15			56	36				
10:15		81	14			50	21				
10:30		100	24			48	21				
10:45		90	15	344	68	66	20	220	98	564	166
11:00		71	10			73	20				
11:15		104	8			64	11				
11:30		107	6			86	5				
11:45		85	1	367	25	71	7	294	43	661	68
Total		2384	3100			1103	3715			3487	6815
Percent		43.5%	56.5%			22.9%	77.1%			33.8%	66.2%
Grand Total		10407	15166			5804	17352			16211	32518
Percent		40.7%	59.3%			25.1%	74.9%			33.3%	66.7%

ADT

ADT 9,746

AADT 9,746

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cvolume
Site Code: T-0070.42

Start Time	04-Aug-11 Thu	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		1	46			8	68				
12:15		0	47			2	56				
12:30		0	49			2	58				
12:45		1	55	2	197	1	51	13	233	15	430
01:00		0	51			2	42				
01:15		2	51			0	48				
01:30		0	48			2	56				
01:45		3	54	5	204	1	43	5	189	10	393
02:00		2	53			2	49				
02:15		1	44			2	69				
02:30		4	37			4	68				
02:45		2	57	9	191	0	47	8	233	17	424
03:00		2	48			0	52				
03:15		0	44			0	61				
03:30		0	68			1	61				
03:45		2	61	4	221	1	71	2	245	6	466
04:00		0	63			1	67				
04:15		1	47			3	59				
04:30		3	66			6	57				
04:45		1	68	5	244	8	78	18	261	23	505
05:00		7	78			8	90				
05:15		4	60			8	65				
05:30		3	83			16	59				
05:45		5	63	19	284	12	71	44	285	63	569
06:00		7	69			18	58				
06:15		11	57			23	50				
06:30		21	55			26	49				
06:45		25	57	64	238	33	39	100	196	164	434
07:00		33	48			25	57				
07:15		31	43			43	41				
07:30		42	41			47	42				
07:45		56	35	162	167	49	35	164	175	326	342
08:00		41	37			41	38				
08:15		48	26			48	24				
08:30		42	29			46	35				
08:45		57	22	188	114	41	34	176	131	364	245
09:00		46	30			38	27				
09:15		35	22			49	26				
09:30		38	16			39	15				
09:45		44	16	163	84	48	18	174	86	337	170
10:00		46	9			40	9				
10:15		34	7			39	14				
10:30		50	9			57	8				
10:45		48	8	178	33	51	3	187	34	365	67
11:00		52	1			47	9				
11:15		51	7			55	6				
11:30		49	4			65	8				
11:45		37	2	189	14	48	5	215	28	404	42
Total		988	1991			1106	2096			2094	4087
Percent		33.2%	66.8%			34.5%	65.5%			33.9%	66.1%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cvolume
Site Code: T-0070.42

Start Time	05-Aug-11 Fri	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		4	48			4	75				
12:15		1	67			5	63				
12:30		1	60			2	66				
12:45		1	53	7	228	4	42	15	246	22	474
01:00		3	50			4	67				
01:15		0	46			4	69				
01:30		1	53			1	58				
01:45		2	55	6	204	1	55	10	249	16	453
02:00		0	42			2	60				
02:15		0	57			1	60				
02:30		1	58			0	46				
02:45		0	57	1	214	0	66	3	232	4	446
03:00		2	59			2	74				
03:15		1	46			0	67				
03:30		1	73			4	65				
03:45		0	59	4	237	1	66	7	272	11	509
04:00		2	70			0	65				
04:15		3	63			1	62				
04:30		1	93			2	70				
04:45		3	60	9	286	2	48	5	245	14	531
05:00		4	65			3	83				
05:15		4	79			8	71				
05:30		5	74			10	62				
05:45		7	75	20	293	17	69	38	285	58	578
06:00		7	44			23	53				
06:15		8	60			14	42				
06:30		28	52			20	42				
06:45		22	61	65	217	28	51	85	188	150	405
07:00		15	39			31	41				
07:15		20	36			34	53				
07:30		35	34			40	35				
07:45		45	30	115	139	47	39	152	168	267	307
08:00		28	32			39	38				
08:15		46	28			50	34				
08:30		39	22			37	40				
08:45		48	24	161	106	35	26	161	138	322	244
09:00		45	20			40	23				
09:15		33	19			51	17				
09:30		39	17			50	22				
09:45		51	21	168	77	57	21	198	83	366	160
10:00		45	25			39	14				
10:15		39	12			38	18				
10:30		47	13			40	11				
10:45		45	13	176	63	37	11	154	54	330	117
11:00		58	7			52	8				
11:15		47	9			50	8				
11:30		51	0			73	10				
11:45		51	7	207	23	57	4	232	30	439	53
Total		939	2087			1060	2190			1999	4277
Percent		31.0%	69.0%			32.6%	67.4%			31.9%	68.1%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cvolume
Site Code: T-0070.42

Start Time	06-Aug-11 Sat	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		4	60			10	58				
12:15		8	51			2	47				
12:30		0	64			5	56				
12:45		4	42	16	217	3	64	20	225	36	442
01:00		7	50			7	54				
01:15		4	57			2	59				
01:30		2	49			1	50				
01:45		1	55	14	211	3	46	13	209	27	420
02:00		1	48			1	46				
02:15		0	50			1	46				
02:30		1	38			2	58				
02:45		0	50	2	186	1	43	5	193	7	379
03:00		3	36			4	50				
03:15		2	43			0	49				
03:30		2	41			3	41				
03:45		0	34	7	154	2	51	9	191	16	345
04:00		2	29			1	33				
04:15		1	31			0	38				
04:30		0	42			1	32				
04:45		0	36	3	138	2	45	4	148	7	286
05:00		2	38			0	39				
05:15		2	31			1	36				
05:30		1	42			7	32				
05:45		5	30	10	141	5	37	13	144	23	285
06:00		5	29			6	42				
06:15		5	33			9	37				
06:30		3	30			8	35				
06:45		9	27	22	119	8	33	31	147	53	266
07:00		7	36			8	29				
07:15		16	28			12	27				
07:30		19	19			19	31				
07:45		25	30	67	113	22	30	61	117	128	230
08:00		23	13			30	33				
08:15		21	18			22	18				
08:30		27	22			35	28				
08:45		44	19	115	72	31	11	118	90	233	162
09:00		30	17			36	21				
09:15		55	23			64	14				
09:30		28	10			34	16				
09:45		56	10	169	60	52	25	186	76	355	136
10:00		45	13			57	12				
10:15		55	10			59	8				
10:30		42	6			48	10				
10:45		37	15	179	44	74	5	238	35	417	79
11:00		46	6			53	5				
11:15		59	3			66	3				
11:30		61	5			62	6				
11:45		55	3	221	17	72	5	253	19	474	36
Total		825	1472			951	1594			1776	3066
Percent		35.9%	64.1%			37.4%	62.6%			36.7%	63.3%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cvolume
Site Code: T-0070.42

Start Time	07-Aug-11 Sun	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		3	31			5	68				
12:15		6	36			4	66				
12:30		4	51			2	69				
12:45		3	45	16	163	2	51	13	254	29	417
01:00		1	38			5	44				
01:15		2	54			3	56				
01:30		1	41			0	51				
01:45		1	47	5	180	2	63	10	214	15	394
02:00		2	61			4	54				
02:15		2	49			3	39				
02:30		2	43			1	55				
02:45		3	33	9	186	0	45	8	193	17	379
03:00		0	35			1	52				
03:15		0	43			5	37				
03:30		1	38			4	42				
03:45		1	47	2	163	2	61	12	192	14	355
04:00		2	56			1	52				
04:15		0	39			2	52				
04:30		1	39			1	37				
04:45		0	33	3	167	1	45	5	186	8	353
05:00		3	38			0	40				
05:15		1	31			2	45				
05:30		0	39			6	47				
05:45		3	34	7	142	5	46	13	178	20	320
06:00		3	46			2	37				
06:15		1	37			5	35				
06:30		2	37			3	27				
06:45		6	35	12	155	10	23	20	122	32	277
07:00		5	28			11	34				
07:15		6	34			8	29				
07:30		9	29			13	26				
07:45		19	25	39	116	8	25	40	114	79	230
08:00		19	22			15	24				
08:15		14	28			12	16				
08:30		20	20			15	27				
08:45		25	9	78	79	28	16	70	83	148	162
09:00		21	11			35	15				
09:15		31	13			31	22				
09:30		26	17			38	14				
09:45		29	3	107	44	33	10	137	61	244	105
10:00		32	11			34	11				
10:15		33	4			39	13				
10:30		35	7			48	4				
10:45		36	3	136	25	43	9	164	37	300	62
11:00		36	4			47	6				
11:15		48	2			50	6				
11:30		45	2			62	5				
11:45		48	1	177	9	54	3	213	20	390	29
Total		591	1429			705	1654			1296	3083
Percent		29.3%	70.7%			29.9%	70.1%			29.6%	70.4%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cvolume
Site Code: T-0070.42

Start Time	08-Aug-11 Mon	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		3	51			2	59				
12:15		0	59			1	49				
12:30		4	51			0	46				
12:45		0	48	7	209	2	51	5	205	12	414
01:00		0	43			1	54				
01:15		1	40			0	48				
01:30		0	34			2	47				
01:45		1	56	2	173	0	46	3	195	5	368
02:00		0	53			2	51				
02:15		1	43			1	55				
02:30		2	44			0	61				
02:45		1	42	4	182	1	42	4	209	8	391
03:00		1	64			1	70				
03:15		1	48			1	54				
03:30		0	45			2	56				
03:45		0	63	2	220	0	60	4	240	6	460
04:00		1	70			2	72				
04:15		1	64			2	77				
04:30		1	61			4	77				
04:45		3	70	6	265	8	74	16	300	22	565
05:00		4	87			5	92				
05:15		2	74			11	70				
05:30		5	73			12	56				
05:45		5	70	16	304	15	70	43	288	59	592
06:00		7	64			18	45				
06:15		11	60			20	69				
06:30		17	48			19	59				
06:45		26	31	61	203	40	49	97	222	158	425
07:00		25	48			44	47				
07:15		35	46			44	43				
07:30		37	37			29	30				
07:45		42	41	139	172	45	43	162	163	301	335
08:00		34	53			34	39				
08:15		44	33			59	44				
08:30		32	24			37	22				
08:45		46	13	156	123	59	21	189	126	345	249
09:00		41	19			27	22				
09:15		43	13			42	19				
09:30		35	11			37	29				
09:45		26	10	145	53	46	11	152	81	297	134
10:00		34	9			52	17				
10:15		35	7			40	5				
10:30		34	8			60	8				
10:45		49	6	152	30	50	7	202	37	354	67
11:00		53	4			55	5				
11:15		36	8			56	3				
11:30		59	2			63	3				
11:45		37	1	185	15	45	5	219	16	404	31
Total		875	1949			1096	2082			1971	4031
Percent		31.0%	69.0%			34.5%	65.5%			32.8%	67.2%
Grand Total		4218	8928			4918	9616			9136	18544
Percent		32.1%	67.9%			33.8%	66.2%			33.0%	67.0%
ADT		ADT 5,536				AADT 5,536					

Transportation Data Corporation

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t. (781) 587-0086 f. (781) 587-0189

Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cspeed

Site Code: T-0070.42

Eastbound

Start Time	15	16	21	26	31	36	41	46	51	56	61	66	71	Total
	15	20	25	30	35	40	45	50	55	60	65	70	75	
8/4/11	0	0	0	1	0	0	1	0	0	0	0	0	0	2
01:00	0	0	0	0	3	2	0	0	0	0	0	0	0	5
02:00	0	0	0	1	2	5	0	0	0	0	0	0	0	8
03:00	0	0	0	0	2	1	1	0	0	0	0	0	0	4
04:00	0	0	0	0	3	2	0	0	0	0	0	0	0	5
05:00	0	0	0	1	6	11	1	0	0	0	0	0	0	19
06:00	0	0	0	4	20	30	8	1	0	0	0	0	0	63
07:00	0	0	3	11	79	58	10	0	0	0	0	0	0	161
08:00	0	0	2	10	89	72	13	1	0	0	0	0	0	187
09:00	0	2	0	19	77	53	8	2	0	0	1	0	0	162
10:00	0	0	2	29	83	53	11	0	0	0	0	0	0	178
11:00	0	0	0	17	91	72	8	0	1	0	0	0	0	189
12 PM	0	0	2	18	89	74	13	1	0	0	0	0	0	197
13:00	0	0	2	17	97	74	13	1	1	0	0	0	0	205
14:00	0	0	0	11	87	76	15	2	1	0	0	0	0	192
15:00	0	0	1	15	112	79	14	0	0	0	0	0	0	221
16:00	0	0	0	21	116	91	16	0	0	0	0	0	0	244
17:00	0	0	1	9	120	122	30	0	1	1	0	0	0	284
18:00	0	0	1	22	120	79	11	3	1	0	0	0	0	237
19:00	0	0	1	19	79	59	9	0	0	0	0	0	0	167
20:00	0	0	1	20	61	29	3	0	0	0	0	0	0	114
21:00	0	0	0	17	45	18	4	0	0	0	0	0	0	84
22:00	0	0	0	7	16	9	1	0	0	0	0	0	0	33
23:00	0	0	0	3	4	5	2	0	0	0	0	0	0	14
Total	0	2	16	272	1401	1074	192	11	5	1	1	0	0	2975
Percent	0.0%	0.1%	0.5%	9.1%	47.1%	36.1%	6.5%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	

Daily

15th Percentile : 31 MPH
50th Percentile : 35 MPH
85th Percentile : 39 MPH
95th Percentile : 42 MPH

Mean Speed(Average) : 35 MPH
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 2475
Percent in Pace : 83.2%
Number of Vehicles > 35 MPH : 1284
Percent of Vehicles > 35 MPH : 43.2%

Transportation Data Corporation

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t. (781) 587-0086 f. (781) 587-0189

Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cspeed

Site Code: T-0070.42

Eastbound

Start Time	15	16	21	26	31	36	41	46	51	56	61	66	71	Total
	15	20	25	30	35	40	45	50	55	60	65	70	75	
8/5/11	0	0	0	1	2	3	1	0	0	0	0	0	0	7
01:00	0	0	0	0	1	5	0	0	0	0	0	0	0	6
02:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1
03:00	0	0	0	0	2	1	1	0	0	0	0	0	0	4
04:00	0	0	0	1	5	1	2	0	0	0	0	0	0	9
05:00	0	0	0	3	9	8	0	0	0	0	0	0	0	20
06:00	0	0	0	8	34	19	3	0	0	0	0	0	0	64
07:00	0	1	1	3	49	47	11	1	0	1	0	0	0	114
08:00	0	0	2	9	74	67	7	1	0	0	0	0	0	160
09:00	0	0	2	19	85	53	9	0	0	0	0	0	0	168
10:00	0	0	0	20	98	46	10	1	0	0	0	0	0	175
11:00	0	0	2	24	102	72	5	1	0	0	0	0	0	206
12 PM	0	0	6	25	107	73	17	0	1	0	0	0	0	229
13:00	0	0	1	16	99	70	16	1	1	0	0	0	0	204
14:00	0	0	1	15	112	75	11	0	1	0	0	0	0	215
15:00	1	3	1	17	116	80	16	3	0	0	0	0	0	237
16:00	0	0	0	30	145	94	15	1	1	0	0	0	0	286
17:00	0	0	1	15	141	109	23	4	1	0	0	0	0	294
18:00	0	0	0	16	102	84	12	3	0	0	0	0	0	217
19:00	0	0	0	14	71	48	5	0	0	0	0	0	0	138
20:00	0	0	2	12	49	36	6	0	0	0	0	0	0	105
21:00	0	0	0	12	46	16	3	0	0	0	0	0	0	77
22:00	0	0	0	3	34	23	3	0	0	0	0	0	0	63
23:00	0	0	0	4	12	5	1	0	0	0	0	0	0	22
Total	1	4	19	267	1495	1036	177	16	5	1	0	0	0	3021
Percent	0.0%	0.1%	0.6%	8.8%	49.5%	34.3%	5.9%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	

Daily

15th Percentile : 31 MPH
50th Percentile : 35 MPH
85th Percentile : 39 MPH
95th Percentile : 42 MPH

Mean Speed(Average) : 35 MPH
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 2531
Percent in Pace : 83.8%
Number of Vehicles > 35 MPH : 1235
Percent of Vehicles > 35 MPH : 40.9%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

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Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cspeed

Site Code: T-0070.42

Eastbound

Start Time	15	16	21	26	31	36	41	46	51	56	61	66	71	Total
	15	20	25	30	35	40	45	50	55	60	65	70	75	
8/6/11	0	0	1	2	7	5	1	0	0	0	0	0	0	16
01:00	0	0	0	0	5	7	1	0	0	1	0	0	0	14
02:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	2	4	1	0	0	0	0	0	0	7
04:00	0	0	0	0	2	0	1	0	0	0	0	0	0	3
05:00	0	0	0	1	6	3	0	0	0	0	0	0	0	10
06:00	0	0	0	2	10	9	1	0	0	0	0	0	0	22
07:00	0	0	0	4	33	20	8	1	0	0	0	0	0	66
08:00	0	0	0	10	59	37	8	1	0	0	0	0	0	115
09:00	0	0	3	15	90	53	8	1	0	0	0	0	0	170
10:00	0	0	1	18	81	70	6	1	1	0	0	0	0	178
11:00	0	0	2	24	115	67	10	1	1	0	0	0	0	220
12 PM	0	0	0	23	109	71	11	1	1	0	0	0	0	216
13:00	0	0	0	32	91	76	11	1	1	0	0	0	0	212
14:00	0	1	2	22	83	64	12	0	1	0	0	0	0	185
15:00	0	0	0	20	78	47	8	0	0	0	0	0	0	153
16:00	0	0	2	14	60	44	15	2	0	0	0	0	0	137
17:00	0	0	1	11	69	50	10	0	0	0	0	0	0	141
18:00	0	0	1	6	64	44	4	0	0	0	0	0	0	119
19:00	0	1	2	20	56	31	0	1	1	0	0	0	0	112
20:00	0	0	1	18	35	17	0	0	1	0	0	0	0	72
21:00	0	1	1	10	24	21	2	1	0	0	0	0	0	60
22:00	0	0	0	6	26	7	5	0	0	0	0	0	0	44
23:00	0	0	0	8	3	2	4	0	0	0	0	0	0	17
Total	0	3	17	266	1110	749	127	11	7	1	0	0	0	2291
Percent	0.0%	0.1%	0.7%	11.6%	48.5%	32.7%	5.5%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	

Daily

15th Percentile : 31 MPH
50th Percentile : 34 MPH
85th Percentile : 39 MPH
95th Percentile : 42 MPH

Mean Speed(Average) : 35 MPH
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 1859
Percent in Pace : 81.1%
Number of Vehicles > 35 MPH : 895
Percent of Vehicles > 35 MPH : 39.1%

Transportation Data Corporation

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Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cspeed

Site Code: T-0070.42

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total
8/7/11	0	0	1	3	8	3	1	0	0	0	0	0	0	16
01:00	0	0	0	1	0	4	0	0	0	0	0	0	0	5
02:00	0	0	0	2	3	3	1	0	0	0	0	0	0	9
03:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2
04:00	0	0	0	1	1	0	1	0	0	0	0	0	0	3
05:00	0	0	1	2	2	2	0	0	0	0	0	0	0	7
06:00	0	0	1	1	5	4	1	0	0	0	0	0	0	12
07:00	0	0	0	6	19	12	1	0	0	0	0	0	0	38
08:00	0	0	1	12	36	25	4	0	0	0	0	0	0	78
09:00	0	0	0	19	47	37	3	0	0	0	0	0	0	106
10:00	0	0	0	17	79	36	3	0	0	0	0	0	0	135
11:00	1	0	1	22	96	44	13	0	0	0	0	0	0	177
12 PM	0	0	0	14	80	60	8	0	0	0	0	0	0	162
13:00	0	0	1	13	97	57	10	1	1	0	0	0	0	180
14:00	0	0	0	16	92	65	12	0	1	0	0	0	0	186
15:00	0	0	1	13	74	65	11	0	0	0	0	0	0	164
16:00	0	0	2	14	92	53	5	0	0	0	0	0	0	166
17:00	0	0	2	13	55	68	3	1	0	0	0	0	0	142
18:00	0	0	0	6	73	65	8	0	2	0	0	0	0	154
19:00	0	0	0	10	55	45	5	1	0	0	0	0	0	116
20:00	0	0	0	13	38	22	6	0	0	0	0	0	0	79
21:00	0	0	0	5	24	11	4	0	0	0	0	0	0	44
22:00	0	0	0	0	13	9	2	1	0	0	0	0	0	25
23:00	0	0	0	0	7	2	0	0	0	0	0	0	0	9
Total	1	0	11	203	997	693	102	4	4	0	0	0	0	2015
Percent	0.0%	0.0%	0.5%	10.1%	49.5%	34.4%	5.1%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	

Daily

15th Percentile : 31 MPH
50th Percentile : 34 MPH
85th Percentile : 39 MPH
95th Percentile : 41 MPH

Mean Speed(Average) : 35 MPH
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 1690
Percent in Pace : 83.9%
Number of Vehicles > 35 MPH : 803
Percent of Vehicles > 35 MPH : 39.9%

Transportation Data Corporation

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Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cspeed

Site Code: T-0070.42

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total
8/8/11	0	0	0	5	1	1	0	0	0	0	0	0	0	7
01:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2
02:00	0	0	0	0	2	0	2	0	0	0	0	0	0	4
03:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2
04:00	0	0	0	2	1	2	1	0	0	0	0	0	0	6
05:00	0	0	0	1	10	5	0	0	0	0	0	0	0	16
06:00	0	0	1	7	29	23	1	0	0	0	0	0	0	61
07:00	0	0	0	3	76	51	8	1	0	0	0	0	0	139
08:00	0	0	1	11	90	45	8	0	1	0	0	0	0	156
09:00	0	0	0	17	64	53	9	1	0	0	0	0	0	144
10:00	0	0	1	10	77	56	7	0	0	0	0	0	0	151
11:00	0	0	1	11	95	66	9	2	0	0	0	0	0	184
12 PM	0	0	1	20	103	73	10	1	0	0	0	0	0	208
13:00	0	0	1	15	87	61	9	0	0	0	0	0	0	173
14:00	0	0	1	16	86	71	6	1	0	0	0	0	0	181
15:00	0	0	0	17	100	88	14	0	1	0	0	0	0	220
16:00	0	0	1	18	135	91	19	0	1	0	0	0	0	265
17:00	0	0	0	21	147	112	23	0	0	0	0	0	0	303
18:00	0	0	1	11	89	84	16	1	0	0	0	0	0	202
19:00	0	0	1	19	74	63	12	2	1	0	0	0	0	172
20:00	0	0	0	18	66	38	1	0	0	0	0	0	0	123
21:00	0	0	1	6	32	13	1	0	0	0	0	0	0	53
22:00	0	0	0	3	14	9	4	0	0	0	0	0	0	30
23:00	0	0	0	2	5	6	1	0	0	0	0	0	0	14
Total	0	0	11	234	1385	1012	161	9	4	0	0	0	0	2816
Percent	0.0%	0.0%	0.4%	8.3%	49.2%	35.9%	5.7%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	

Daily

15th Percentile : 31 MPH
50th Percentile : 35 MPH
85th Percentile : 39 MPH
95th Percentile : 41 MPH

Mean Speed(Average) : 35 MPH
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 2397
Percent in Pace : 85.1%
Number of Vehicles > 35 MPH : 1186
Percent of Vehicles > 35 MPH : 42.1%

Grand Total

2	9	74	1242	6388	4564	759	51	25	3	1	0	0	13118
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Overall

15th Percentile : 31 MPH
50th Percentile : 35 MPH
85th Percentile : 39 MPH
95th Percentile : 42 MPH

Mean Speed(Average) : 35 MPH
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 10952
Percent in Pace : 83.5%
Number of Vehicles > 35 MPH : 5403
Percent of Vehicles > 35 MPH : 41.2%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cspeed

Site Code: T-0070.42

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total
8/4/11	0	0	0	2	5	3	3	0	0	0	0	0	0	13
01:00	0	0	0	2	2	0	1	0	0	0	0	0	0	5
02:00	0	0	0	1	4	1	1	1	0	0	0	0	0	8
03:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2
04:00	0	0	0	2	6	5	3	1	1	0	0	0	0	18
05:00	0	0	1	2	18	18	4	1	0	0	0	0	0	44
06:00	0	0	0	5	24	53	15	1	1	0	0	0	0	99
07:00	0	0	0	6	57	76	23	1	0	0	0	0	0	163
08:00	0	0	0	11	82	68	15	0	0	0	0	0	0	176
09:00	0	0	3	8	76	68	16	2	0	0	0	0	0	173
10:00	0	0	0	13	94	59	21	0	0	0	0	0	0	187
11:00	0	0	1	11	84	98	21	0	0	0	0	0	0	215
12 PM	0	2	1	24	99	85	21	1	0	0	0	0	0	233
13:00	0	0	1	10	79	75	18	5	0	0	0	0	0	188
14:00	0	0	2	12	84	104	30	1	0	0	0	0	0	233
15:00	0	0	0	15	87	114	29	0	1	0	0	0	0	246
16:00	0	0	2	25	97	94	40	1	1	0	0	0	0	260
17:00	0	0	0	19	103	119	43	1	0	0	0	0	0	285
18:00	0	0	0	11	55	100	28	1	0	0	0	0	0	195
19:00	0	0	0	18	65	71	21	0	0	0	0	0	0	175
20:00	0	0	2	11	68	38	11	1	0	0	0	0	0	131
21:00	0	0	0	12	42	24	6	1	1	0	0	0	0	86
22:00	0	0	0	4	13	13	4	0	0	0	0	0	0	34
23:00	0	0	0	2	10	9	7	0	0	0	0	0	0	28
Total	0	2	13	226	1255	1296	381	19	5	0	0	0	0	3197
Percent	0.0%	0.1%	0.4%	7.1%	39.3%	40.5%	11.9%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	

Daily

15th Percentile : 31 MPH
50th Percentile : 36 MPH
85th Percentile : 40 MPH
95th Percentile : 44 MPH

Mean Speed(Average) : 36 MPH
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 2551
Percent in Pace : 79.8%
Number of Vehicles > 35 MPH : 1701
Percent of Vehicles > 35 MPH : 53.2%

Transportation Data Corporation

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Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cspeed

Site Code: T-0070.42

Westbound

Start Time	15	16	21	26	31	36	41	46	51	56	61	66	71	Total
	15	20	25	30	35	40	45	50	55	60	65	70	75	
8/5/11	0	0	0	2	5	6	2	0	0	0	0	0	0	15
01:00	0	0	0	2	3	5	0	0	0	0	0	0	0	10
02:00	0	0	0	1	1	0	1	0	0	0	0	0	0	3
03:00	0	0	0	0	6	1	0	0	0	0	0	0	0	7
04:00	0	0	0	0	3	1	1	0	0	0	0	0	0	5
05:00	0	0	0	2	11	19	6	0	0	0	0	0	0	38
06:00	0	0	0	6	28	35	14	2	0	0	0	0	0	85
07:00	0	0	0	2	46	75	28	1	0	0	0	0	0	152
08:00	0	0	3	11	49	67	29	1	0	0	0	0	0	160
09:00	0	1	0	5	86	93	13	0	0	0	0	0	0	198
10:00	1	0	0	8	52	69	23	1	0	0	0	0	0	154
11:00	0	0	0	16	97	91	24	4	0	0	0	0	0	232
12 PM	0	1	5	34	95	90	19	2	0	0	0	0	0	246
13:00	0	0	1	30	101	85	31	1	0	0	0	0	0	249
14:00	0	0	2	18	74	100	33	5	0	0	0	0	0	232
15:00	0	0	5	16	107	109	34	2	0	0	0	0	0	273
16:00	0	0	1	14	101	95	35	0	0	0	0	0	0	246
17:00	0	0	0	16	96	132	35	4	2	0	0	0	0	285
18:00	0	0	0	6	67	89	24	1	0	0	0	0	0	187
19:00	0	0	2	28	77	50	8	2	0	0	0	0	0	167
20:00	0	0	1	23	66	38	10	0	0	0	0	0	0	138
21:00	0	0	0	6	36	34	6	1	0	0	0	0	0	83
22:00	0	0	1	2	21	24	6	0	0	0	0	0	0	54
23:00	0	0	0	1	8	14	5	2	0	0	0	0	0	30
Total	1	2	21	249	1236	1322	387	29	2	0	0	0	0	3249
Percent	0.0%	0.1%	0.6%	7.7%	38.0%	40.7%	11.9%	0.9%	0.1%	0.0%	0.0%	0.0%	0.0%	

Daily

15th Percentile : 31 MPH
50th Percentile : 36 MPH
85th Percentile : 40 MPH
95th Percentile : 44 MPH

Mean Speed(Average) : 36 MPH
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 2558
Percent in Pace : 78.7%
Number of Vehicles > 35 MPH : 1740
Percent of Vehicles > 35 MPH : 53.6%

Transportation Data Corporation

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Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cspeed

Site Code: T-0070.42

Westbound

Start Time	15	16	21	26	31	36	41	46	51	56	61	66	71	Total
	15	20	25	30	35	40	45	50	55	60	65	70	75	
8/6/11	0	0	0	1	7	9	2	0	0	1	0	0	0	20
01:00	0	0	0	1	2	8	1	1	0	0	0	0	0	13
02:00	0	0	0	0	1	4	0	0	0	0	0	0	0	5
03:00	0	0	0	0	2	5	2	0	0	0	0	0	0	9
04:00	0	0	0	0	1	2	1	0	0	0	0	0	0	4
05:00	0	0	0	0	4	6	3	0	0	0	0	0	0	13
06:00	0	0	1	0	12	11	6	1	0	0	0	0	0	31
07:00	0	0	0	2	14	37	8	0	0	0	0	0	0	61
08:00	0	0	0	5	45	56	11	1	0	0	0	0	0	118
09:00	0	0	0	16	84	75	9	1	0	0	0	0	0	185
10:00	0	0	0	18	118	81	20	0	0	0	0	0	0	237
11:00	0	0	0	18	120	91	24	0	0	0	0	0	0	253
12 PM	0	0	1	35	79	89	15	5	1	0	0	0	0	225
13:00	0	0	0	20	84	85	18	2	0	0	0	0	0	209
14:00	0	0	0	12	82	75	20	3	0	0	0	0	0	192
15:00	0	0	1	16	82	76	14	2	0	0	0	0	0	191
16:00	0	0	2	10	52	67	15	1	0	0	0	0	0	147
17:00	0	0	3	9	50	62	18	2	0	0	0	0	0	144
18:00	0	0	1	9	64	55	15	2	0	0	0	0	0	146
19:00	0	0	0	17	65	27	7	0	0	0	0	0	0	116
20:00	0	0	0	11	44	25	10	0	0	0	0	0	0	90
21:00	0	0	1	8	39	24	3	1	0	0	0	0	0	76
22:00	0	0	0	6	18	11	0	0	0	0	0	0	0	35
23:00	0	0	1	2	10	6	0	0	0	0	0	0	0	19
Total	0	0	11	216	1079	987	222	22	1	1	0	0	0	2539
Percent	0.0%	0.0%	0.4%	8.5%	42.5%	38.9%	8.7%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	

Daily

15th Percentile : 31 MPH
50th Percentile : 35 MPH
85th Percentile : 40 MPH
95th Percentile : 43 MPH

Mean Speed(Average) : 35 MPH
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 2066
Percent in Pace : 81.4%
Number of Vehicles > 35 MPH : 1233
Percent of Vehicles > 35 MPH : 48.6%

Transportation Data Corporation

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Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cspeed

Site Code: T-0070.42

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total
8/7/11	0	0	0	0	4	7	2	0	0	0	0	0	0	13
01:00	0	0	0	2	4	1	3	0	0	0	0	0	0	10
02:00	0	0	0	2	4	2	0	0	0	0	0	0	0	8
03:00	0	0	1	2	5	3	1	0	0	0	0	0	0	12
04:00	0	0	0	2	2	1	0	0	0	0	0	0	0	5
05:00	0	0	0	0	4	6	3	0	0	0	0	0	0	13
06:00	0	0	0	0	9	9	1	1	0	0	0	0	0	20
07:00	0	0	1	7	14	15	2	0	0	0	0	0	0	39
08:00	0	0	0	3	24	31	9	1	1	0	0	0	0	69
09:00	0	0	1	3	49	62	21	1	0	0	0	0	0	137
10:00	0	0	1	18	73	52	16	3	0	0	0	0	0	163
11:00	0	0	0	12	76	101	20	3	0	0	0	0	0	212
12 PM	0	0	0	19	111	104	19	0	0	0	0	0	0	253
13:00	0	0	1	11	85	104	12	1	0	0	0	0	0	214
14:00	1	0	2	7	68	92	20	1	1	0	0	0	0	192
15:00	0	0	1	11	60	92	24	3	1	0	0	0	0	192
16:00	0	0	2	9	62	83	23	5	0	1	0	0	0	185
17:00	0	0	0	5	56	85	28	1	2	0	0	0	0	177
18:00	0	0	0	7	33	54	23	5	0	0	0	0	0	122
19:00	0	0	0	6	45	48	13	0	1	0	0	0	0	113
20:00	0	0	0	8	33	27	11	1	2	0	0	0	0	82
21:00	0	0	0	3	29	23	6	0	0	0	0	0	0	61
22:00	0	0	0	5	14	14	4	0	0	0	0	0	0	37
23:00	0	0	0	2	7	8	3	0	0	0	0	0	0	20
Total	1	0	10	144	871	1024	264	26	8	1	0	0	0	2349
Percent	0.0%	0.0%	0.4%	6.1%	37.1%	43.6%	11.2%	1.1%	0.3%	0.0%	0.0%	0.0%	0.0%	

Daily

15th Percentile : 32 MPH
50th Percentile : 36 MPH
85th Percentile : 40 MPH
95th Percentile : 44 MPH

Mean Speed(Average) : 36 MPH
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 1895
Percent in Pace : 80.7%
Number of Vehicles > 35 MPH : 1323
Percent of Vehicles > 35 MPH : 56.3%

Transportation Data Corporation

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Page 10

Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cspeed

Site Code: T-0070.42

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total
8/8/11	0	0	0	2	0	2	1	0	0	0	0	0	0	5
01:00	0	0	0	0	1	2	0	0	0	0	0	0	0	3
02:00	0	0	0	2	2	0	0	0	0	0	0	0	0	4
03:00	0	0	1	0	1	2	0	0	0	0	0	0	0	4
04:00	0	0	0	2	8	4	1	1	0	0	0	0	0	16
05:00	0	0	0	7	13	15	7	1	0	0	0	0	0	43
06:00	0	0	0	11	40	41	5	0	0	0	0	0	0	97
07:00	0	0	1	10	68	63	19	1	0	0	0	0	0	162
08:00	0	1	2	12	86	70	17	1	0	0	0	0	0	189
09:00	0	0	1	6	48	76	18	2	1	0	0	0	0	152
10:00	0	0	0	9	104	71	15	3	0	0	0	0	0	202
11:00	0	0	0	13	93	94	18	1	0	0	0	0	0	219
12 PM	0	0	1	17	79	84	20	3	0	0	0	0	0	204
13:00	0	0	0	10	85	72	26	2	0	0	0	0	0	195
14:00	0	0	1	11	61	104	30	2	1	0	0	0	0	210
15:00	0	0	1	20	100	96	20	2	0	0	0	0	0	239
16:00	0	0	0	20	109	128	42	1	0	0	0	0	0	300
17:00	0	0	2	17	114	120	32	2	0	0	0	0	0	287
18:00	0	0	0	5	87	101	28	0	0	0	0	0	0	221
19:00	0	0	1	12	68	67	13	1	0	0	0	0	0	162
20:00	0	0	0	13	58	42	12	0	0	0	0	0	0	125
21:00	1	0	1	19	32	17	9	1	0	0	0	0	0	80
22:00	0	0	1	1	8	13	12	1	0	0	1	0	0	37
23:00	0	0	0	0	6	8	1	0	1	0	0	0	0	16
Total	1	1	13	219	1271	1292	346	25	3	0	1	0	0	3172
Percent	0.0%	0.0%	0.4%	6.9%	40.1%	40.7%	10.9%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	

Daily

15th Percentile : 31 MPH
50th Percentile : 36 MPH
85th Percentile : 40 MPH
95th Percentile : 44 MPH

Mean Speed(Average) : 36 MPH
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 2563
Percent in Pace : 80.8%
Number of Vehicles > 35 MPH : 1667
Percent of Vehicles > 35 MPH : 52.6%

Grand Total	3	5	68	1054	5712	5921	1600	121	19	2	1	0	0	14506
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Overall

15th Percentile : 31 MPH
50th Percentile : 36 MPH
85th Percentile : 40 MPH
95th Percentile : 44 MPH

Mean Speed(Average) : 36 MPH
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 11633
Percent in Pace : 80.2%
Number of Vehicles > 35 MPH : 7664
Percent of Vehicles > 35 MPH : 52.8%

Transportation Data Corporation

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Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cclass

Site Code: T-0070.42

Eastbound														
Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
8/4/11	0	1	0	0	1	0	0	0	0	0	0	0	0	2
01:00	0	2	3	0	0	0	0	0	0	0	0	0	0	5
02:00	0	6	3	0	0	0	0	0	0	0	0	0	0	9
03:00	0	2	1	0	1	0	0	0	0	0	0	0	0	4
04:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
05:00	0	13	3	0	3	0	0	0	0	0	0	0	0	19
06:00	0	49	11	0	4	0	0	0	0	0	0	0	0	64
07:00	1	114	38	0	6	1	0	2	0	0	0	0	0	162
08:00	1	137	41	0	7	1	0	1	0	0	0	0	0	188
09:00	0	109	48	0	6	0	0	0	0	0	0	0	0	163
10:00	2	116	49	0	9	0	0	1	0	0	0	0	0	177
11:00	0	144	34	0	10	0	0	1	0	0	0	0	0	189
12 PM	2	146	38	0	10	0	0	0	0	0	0	0	0	196
13:00	2	150	42	0	10	0	0	0	0	0	0	0	0	204
14:00	3	138	42	0	5	0	0	2	0	0	0	0	0	190
15:00	4	155	50	0	11	0	0	0	0	0	0	0	0	220
16:00	3	182	45	0	12	1	0	1	0	0	0	0	0	244
17:00	9	209	50	0	16	1	0	0	0	0	0	0	0	285
18:00	3	178	47	0	10	0	0	0	0	0	0	0	0	238
19:00	5	128	25	0	8	0	0	0	0	0	0	0	0	166
20:00	1	90	18	0	4	0	0	0	0	0	0	0	0	113
21:00	0	66	14	0	4	0	0	0	0	0	0	0	0	84
22:00	0	20	10	0	3	0	0	0	0	0	0	0	0	33
23:00	0	9	3	0	2	0	0	0	0	0	0	0	0	14
Total	36	2169	615	0	142	4	0	8	0	0	0	0	0	2974
Percent	1.2%	72.9%	20.7%	0.0%	4.8%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	10:00		11:00	07:00		07:00						11:00
Vol.	2	144	49		10	1		2						189
PM Peak	17:00	17:00	15:00		17:00	16:00		14:00						17:00
Vol.	9	209	50		16	1		2						285

Transportation Data Corporation

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Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cclass

Site Code: T-0070.42

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
8/5/11	0	5	1	0	1	0	0	0	0	0	0	0	0	7
01:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
04:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
05:00	1	10	7	0	2	0	0	0	0	0	0	0	0	20
06:00	0	47	11	0	4	0	0	3	0	0	0	0	0	65
07:00	2	80	28	0	5	0	0	0	0	0	0	0	0	115
08:00	2	123	30	0	5	0	0	0	0	0	0	0	0	160
09:00	1	122	38	0	6	0	0	0	0	0	0	0	0	167
10:00	2	132	37	0	4	0	0	1	0	0	0	0	0	176
11:00	2	147	43	1	13	0	0	1	0	0	0	0	0	207
12 PM	2	167	49	0	8	0	0	1	1	0	0	0	0	228
13:00	2	149	41	0	11	0	0	1	0	0	0	0	0	204
14:00	2	155	48	0	9	0	0	0	0	0	0	0	0	214
15:00	5	162	54	0	11	0	0	4	0	0	0	0	0	236
16:00	2	211	60	0	11	0	0	2	0	0	0	0	0	286
17:00	6	222	56	0	8	0	0	1	0	0	0	0	0	293
18:00	4	156	47	0	10	0	0	0	0	0	0	0	0	217
19:00	1	103	29	0	6	0	0	0	0	0	0	0	0	139
20:00	0	81	18	0	7	0	0	0	0	0	0	0	0	106
21:00	0	69	7	0	1	0	0	0	0	0	0	0	0	77
22:00	0	46	12	0	4	0	0	0	0	0	0	0	0	62
23:00	1	14	6	0	2	0	0	0	0	0	0	0	0	23
Total	35	2219	624	1	128	0	0	14	1	0	0	0	0	3022
Percent	1.2%	73.4%	20.6%	0.0%	4.2%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	11:00	11:00	11:00	11:00			06:00						11:00
Vol.	2	147	43	1	13			3						207
PM Peak	17:00	17:00	16:00		13:00			15:00	12:00					17:00
Vol.	6	222	60		11			4	1					293

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cclass

Site Code: T-0070.42

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
8/6/11	0	11	5	0	0	0	0	0	0	0	0	0	0	16
01:00	0	13	0	0	1	0	0	0	0	0	0	0	0	14
02:00	0	1	0	0	1	0	0	0	0	0	0	0	0	2
03:00	0	6	0	0	1	0	0	0	0	0	0	0	0	7
04:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
05:00	0	6	2	0	2	0	0	0	0	0	0	0	0	10
06:00	0	13	8	0	1	0	0	0	0	0	0	0	0	22
07:00	0	48	12	0	7	0	0	0	0	0	0	0	0	67
08:00	1	82	24	0	7	1	0	0	0	0	0	0	0	115
09:00	3	128	32	0	6	0	0	0	0	0	0	0	0	169
10:00	5	138	32	0	4	0	0	0	0	0	0	0	0	179
11:00	3	160	49	0	9	0	0	0	0	0	0	0	0	221
12 PM	3	168	41	0	4	1	0	0	0	0	0	0	0	217
13:00	2	165	40	0	3	0	0	0	0	0	0	0	0	210
14:00	2	137	32	0	14	0	0	1	0	0	0	0	0	186
15:00	1	113	31	0	8	0	0	1	0	0	0	0	0	154
16:00	5	99	24	0	10	0	0	0	0	0	0	0	0	138
17:00	2	104	29	0	5	0	0	0	0	0	0	0	0	140
18:00	1	95	20	0	2	0	0	0	0	0	0	0	0	118
19:00	0	86	25	0	2	0	0	0	0	0	0	0	0	113
20:00	0	48	19	0	5	0	0	0	0	0	0	0	0	72
21:00	0	44	16	0	0	0	0	0	0	0	0	0	0	60
22:00	2	33	8	0	1	0	0	0	0	0	0	0	0	44
23:00	0	14	1	0	2	0	0	0	0	0	0	0	0	17
Total	30	1714	451	0	95	2	0	2	0	0	0	0	0	2294
Percent	1.3%	74.7%	19.7%	0.0%	4.1%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	11:00		11:00	08:00								11:00
Vol.	5	160	49		9	1								221
PM Peak	16:00	12:00	12:00		14:00	12:00		14:00						12:00
Vol.	5	168	41		14	1		1						217

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cclass

Site Code: T-0070.42

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
8/7/11	0	9	6	0	1	0	0	0	0	0	0	0	0	16
01:00	0	4	0	0	1	0	0	0	0	0	0	0	0	5
02:00	0	5	4	0	0	0	0	0	0	0	0	0	0	9
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
05:00	0	5	1	0	1	0	0	0	0	0	0	0	0	7
06:00	0	7	4	0	1	0	0	0	0	0	0	0	0	12
07:00	0	32	7	0	0	0	0	0	0	0	0	0	0	39
08:00	0	53	21	0	3	0	0	0	0	0	0	0	0	77
09:00	0	74	26	0	7	0	0	0	0	0	0	0	0	107
10:00	0	100	30	0	5	0	0	1	0	0	0	0	0	136
11:00	0	130	36	0	11	0	0	0	0	0	0	0	0	177
12 PM	0	113	40	0	9	0	0	1	0	0	0	0	0	163
13:00	1	134	39	0	4	0	0	1	0	0	0	0	0	179
14:00	2	140	34	0	9	0	0	0	0	0	0	0	0	185
15:00	4	125	26	0	6	0	0	1	0	0	0	0	0	162
16:00	0	128	33	0	6	0	0	0	0	0	0	0	0	167
17:00	1	105	26	0	10	0	0	0	0	0	0	0	0	142
18:00	2	113	30	0	8	1	0	0	0	0	0	0	0	154
19:00	3	77	31	0	4	0	0	0	0	0	0	0	0	115
20:00	5	51	20	1	1	0	0	0	0	0	0	0	0	78
21:00	1	32	9	0	2	0	0	0	0	0	0	0	0	44
22:00	0	16	8	0	1	0	0	0	0	0	0	0	0	25
23:00	0	6	2	0	1	0	0	0	0	0	0	0	0	9
Total	19	1463	434	1	91	1	0	4	0	0	0	0	0	2013
Percent	0.9%	72.7%	21.6%	0.0%	4.5%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00	11:00		11:00			10:00						11:00
Vol.		130	36		11			1						177
PM Peak	20:00	14:00	12:00	20:00	17:00	18:00		12:00						14:00
Vol.	5	140	40	1	10	1		1						185

Transportation Data Corporation

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Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cclass

Site Code: T-0070.42

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
8/8/11	0	7	0	0	0	0	0	0	0	0	0	0	0	7
01:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
02:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	4	0	0	2	0	0	0	0	0	0	0	0	6
05:00	0	10	3	0	3	0	0	0	0	0	0	0	0	16
06:00	0	45	12	0	4	0	0	0	0	0	0	0	0	61
07:00	0	95	36	0	7	0	0	0	0	0	0	0	0	138
08:00	0	110	35	1	9	0	0	0	0	0	0	0	0	155
09:00	0	98	37	1	9	0	0	0	0	0	0	0	0	145
10:00	0	107	36	0	8	0	0	1	0	0	0	0	0	152
11:00	3	128	44	0	10	0	0	0	0	0	0	0	0	185
12 PM	0	149	47	0	13	0	0	0	0	0	0	0	0	209
13:00	0	131	36	0	4	0	0	1	0	0	0	0	0	172
14:00	0	138	36	0	8	0	0	0	0	0	0	0	0	182
15:00	3	142	62	0	11	1	0	1	0	0	0	0	0	220
16:00	1	199	56	0	7	1	0	0	0	0	0	0	0	264
17:00	0	213	80	0	11	0	0	0	0	0	0	0	0	304
18:00	0	153	37	0	11	0	0	2	0	0	0	0	0	203
19:00	2	116	45	0	9	0	0	0	0	0	0	0	0	172
20:00	2	95	19	0	6	0	0	0	0	0	0	0	0	122
21:00	1	39	11	0	2	0	0	0	0	0	0	0	0	53
22:00	0	26	3	0	1	0	0	0	0	0	0	0	0	30
23:00	0	11	2	0	2	0	0	0	0	0	0	0	0	15
Total	12	2022	639	2	137	2	0	5	0	0	0	0	0	2819
Percent	0.4%	71.7%	22.7%	0.1%	4.9%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00	08:00	11:00			10:00						11:00
Vol.	3	128	44	1	10			1						185
PM Peak	15:00	17:00	17:00		12:00	15:00		18:00						17:00
Vol.	3	213	80		13	1		2						304
Grand Total	132	9587	2763	4	593	9	0	33	1	0	0	0	0	13122
Percent	1.0%	73.1%	21.1%	0.0%	4.5%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cclass

Site Code: T-0070.42

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
8/4/11	0	11	1	0	1	0	0	0	0	0	0	0	0	13
01:00	0	1	4	0	0	0	0	0	0	0	0	0	0	5
02:00	0	5	2	0	1	0	0	0	0	0	0	0	0	8
03:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
04:00	1	12	4	0	1	0	0	0	0	0	0	0	0	18
05:00	1	33	7	0	3	0	0	0	0	0	0	0	0	44
06:00	2	64	27	0	7	0	0	0	0	0	0	0	0	100
07:00	2	118	34	0	9	0	0	1	0	0	0	0	0	164
08:00	1	118	47	0	8	0	0	1	0	0	0	0	0	175
09:00	4	120	36	0	10	2	0	2	0	0	0	0	0	174
10:00	3	139	36	0	9	0	0	0	0	0	0	0	0	187
11:00	1	160	36	0	18	0	0	0	0	0	0	0	0	215
12 PM	2	176	44	0	11	0	0	0	0	0	0	0	0	233
13:00	3	137	35	0	12	0	0	2	0	0	0	0	0	189
14:00	2	173	47	0	9	0	0	2	0	0	0	0	0	233
15:00	4	180	47	0	11	0	0	3	0	0	0	0	0	245
16:00	7	192	53	0	9	0	0	0	0	0	0	0	0	261
17:00	4	214	50	0	14	0	0	2	0	0	0	0	0	284
18:00	3	151	36	0	6	0	0	0	0	0	0	0	0	196
19:00	3	134	31	0	6	1	0	0	0	0	0	0	0	175
20:00	2	105	16	0	7	0	0	0	0	0	0	0	0	130
21:00	1	67	15	0	3	0	0	0	0	0	0	0	0	86
22:00	0	30	4	0	0	0	0	0	0	0	0	0	0	34
23:00	0	23	4	0	1	0	0	0	0	0	0	0	0	28
Total	46	2364	617	0	156	3	0	13	0	0	0	0	0	3199
Percent	1.4%	73.9%	19.3%	0.0%	4.9%	0.1%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	08:00		11:00	09:00		09:00						11:00
Vol.	4	160	47		18	2		2						215
PM Peak	16:00	17:00	16:00		17:00	19:00		15:00						17:00
Vol.	7	214	53		14	1		3						284

Transportation Data Corporation

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Pillsbury Road
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City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cclass
Site Code: T-0070.42

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
8/5/11	0	13	2	0	0	0	0	0	0	0	0	0	0	15
01:00	0	7	3	0	0	0	0	0	0	0	0	0	0	10
02:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
03:00	0	6	0	0	1	0	0	0	0	0	0	0	0	7
04:00	1	4	0	0	0	0	0	0	0	0	0	0	0	5
05:00	3	25	6	0	4	0	0	0	0	0	0	0	0	38
06:00	2	62	16	0	5	0	0	0	0	0	0	0	0	85
07:00	2	110	29	0	10	0	0	0	0	0	0	0	0	151
08:00	3	112	37	0	9	0	0	0	0	0	0	0	0	161
09:00	1	144	40	0	12	0	0	1	0	0	0	0	0	198
10:00	1	119	25	0	8	0	0	0	0	0	0	0	0	153
11:00	3	171	41	3	12	0	0	1	0	0	0	0	0	231
12 PM	4	174	59	0	8	0	0	0	0	0	0	0	0	245
13:00	0	187	47	1	13	0	0	0	0	0	0	0	0	248
14:00	4	165	50	0	10	0	0	2	0	0	0	0	0	231
15:00	4	195	61	0	9	1	0	2	0	0	0	0	0	272
16:00	4	180	56	0	2	1	0	0	1	0	0	0	0	244
17:00	6	225	41	0	10	1	0	2	0	0	0	0	0	285
18:00	2	146	36	0	4	0	0	0	0	0	0	0	0	188
19:00	2	124	34	0	7	0	0	1	0	0	0	0	0	168
20:00	2	106	26	0	3	0	0	0	0	0	0	0	0	137
21:00	1	61	18	0	3	0	0	0	0	0	0	0	0	83
22:00	1	46	7	0	0	0	0	0	0	0	0	0	0	54
23:00	1	24	4	0	1	0	0	0	0	0	0	0	0	30
Total	47	2409	638	4	131	3	0	9	1	0	0	0	0	3242
Percent	1.4%	74.3%	19.7%	0.1%	4.0%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	11:00	11:00	11:00	09:00			09:00						11:00
Vol.	3	171	41	3	12			1						231
PM Peak	17:00	17:00	15:00	13:00	13:00	15:00		14:00	16:00					17:00
Vol.	6	225	61	1	13	1		2	1					285

Transportation Data Corporation

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Pillsbury Road
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Client: TEC/R. Brown

04145Cclass
Site Code: T-0070.42

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
8/6/11	0	18	2	0	0	0	0	0	0	0	0	0	0	20
01:00	0	9	2	0	2	0	0	0	0	0	0	0	0	13
02:00	0	4	0	0	1	0	0	0	0	0	0	0	0	5
03:00	0	6	2	0	1	0	0	0	0	0	0	0	0	9
04:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
05:00	1	9	2	0	1	0	0	0	0	0	0	0	0	13
06:00	0	17	11	0	3	0	0	0	0	0	0	0	0	31
07:00	1	43	15	0	2	0	0	0	0	0	0	0	0	61
08:00	1	89	22	0	5	0	0	0	0	0	0	0	0	117
09:00	3	144	24	0	11	1	1	2	0	0	0	0	0	186
10:00	3	182	46	0	7	0	0	0	0	0	0	0	0	238
11:00	4	193	46	0	6	1	1	1	0	0	0	0	0	252
12 PM	3	175	41	0	6	0	0	0	0	0	0	0	0	225
13:00	3	162	35	0	6	0	1	1	0	0	0	0	0	208
14:00	5	147	36	0	5	0	0	0	0	0	0	0	0	193
15:00	3	140	35	0	12	0	0	0	0	0	0	0	0	190
16:00	3	115	26	0	2	0	0	1	0	0	0	0	0	147
17:00	2	107	26	0	7	0	0	1	0	0	0	0	0	143
18:00	1	118	26	0	2	0	0	0	0	0	0	0	0	147
19:00	0	95	18	0	4	0	0	0	0	0	0	0	0	117
20:00	0	69	18	0	3	0	0	0	0	0	0	0	0	90
21:00	0	58	17	0	0	0	0	1	0	0	0	0	0	76
22:00	0	29	5	0	1	0	0	0	0	0	0	0	0	35
23:00	0	17	2	0	0	0	0	0	0	0	0	0	0	19
Total	33	1950	457	0	87	2	3	7	0	0	0	0	0	2539
Percent	1.3%	76.8%	18.0%	0.0%	3.4%	0.1%	0.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	10:00		09:00	09:00	09:00	09:00						11:00
Vol.	4	193	46		11	1	1	2						252
PM Peak	14:00	12:00	12:00		15:00		13:00	13:00						12:00
Vol.	5	175	41		12		1	1						225

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Client: TEC/R. Brown

04145Cclass
Site Code: T-0070.42

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
8/7/11	0	10	3	0	0	0	0	0	0	0	0	0	0	13
01:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
02:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
03:00	0	7	4	0	1	0	0	0	0	0	0	0	0	12
04:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
05:00	0	12	1	0	0	0	0	0	0	0	0	0	0	13
06:00	0	14	6	0	0	0	0	0	0	0	0	0	0	20
07:00	0	27	8	0	5	0	0	0	0	0	0	0	0	40
08:00	1	54	10	0	5	0	0	0	0	0	0	0	0	70
09:00	0	97	35	0	5	0	0	0	0	0	0	0	0	137
10:00	0	122	32	0	10	0	0	0	0	0	0	0	0	164
11:00	0	165	35	0	13	0	0	0	0	0	0	0	0	213
12 PM	2	191	52	0	9	0	0	0	0	0	0	0	0	254
13:00	0	165	42	0	6	0	0	1	0	0	0	0	0	214
14:00	0	145	36	0	11	0	0	0	0	0	0	0	0	192
15:00	3	146	34	0	6	1	0	2	0	0	0	0	0	192
16:00	4	143	29	0	9	0	0	1	0	0	0	0	0	186
17:00	6	133	35	0	4	0	0	0	0	0	0	0	0	178
18:00	5	87	26	0	3	0	0	0	0	0	0	0	0	121
19:00	0	85	28	0	1	0	0	0	0	0	0	0	0	114
20:00	2	64	12	0	5	0	0	0	0	0	0	0	0	83
21:00	0	45	15	0	1	0	0	0	0	0	0	0	0	61
22:00	0	28	8	0	1	0	0	0	0	0	0	0	0	37
23:00	0	17	3	0	0	0	0	0	0	0	0	0	0	20
Total	23	1775	459	0	95	1	0	4	0	0	0	0	0	2357
Percent	1.0%	75.3%	19.5%	0.0%	4.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	09:00		11:00									11:00
Vol.	1	165	35		13									213
PM Peak	17:00	12:00	12:00		14:00	15:00		15:00						12:00
Vol.	6	191	52		11	1		2						254

Transportation Data Corporation

Mario Perone, mperone1@verizon.net

t. (781) 587-0086 f. (781) 587-0189

Pillsbury Road
east of Gilcreast Road
City, State: Londonderry, NH
Client: TEC/R. Brown

04145Cclass

Site Code: T-0070.42

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
8/8/11	0	4	1	0	0	0	0	0	0	0	0	0	0	5
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	3	0	0	1	0	0	0	0	0	0	0	0	4
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	13	2	0	1	0	0	0	0	0	0	0	0	16
05:00	1	29	10	0	3	0	0	0	0	0	0	0	0	43
06:00	0	74	20	0	2	0	0	0	0	0	0	0	0	96
07:00	0	107	35	1	18	0	0	0	0	0	0	0	0	161
08:00	2	121	52	1	11	0	0	1	0	0	0	0	0	188
09:00	0	102	40	1	8	0	0	0	0	0	0	0	0	151
10:00	0	148	42	0	11	0	0	0	0	0	0	0	0	201
11:00	0	159	50	0	9	0	0	1	0	0	0	0	0	219
12 PM	2	143	52	0	8	0	0	0	0	0	0	0	0	205
13:00	4	142	38	0	11	0	0	0	0	0	0	0	0	195
14:00	2	153	45	0	6	1	0	1	0	0	0	0	0	208
15:00	0	177	48	0	14	0	0	1	0	0	0	0	0	240
16:00	1	214	60	0	21	2	0	2	0	0	0	0	0	300
17:00	2	213	61	0	12	0	0	0	0	0	0	0	0	288
18:00	5	166	41	0	10	0	0	0	0	0	0	0	0	222
19:00	2	120	36	0	5	0	0	0	0	0	0	0	0	163
20:00	1	89	29	1	6	0	0	0	0	0	0	0	0	126
21:00	1	65	13	0	2	0	0	0	0	0	0	0	0	81
22:00	0	29	6	0	2	0	0	0	0	0	0	0	0	37
23:00	0	13	2	0	1	0	0	0	0	0	0	0	0	16
Total	23	2291	683	4	162	3	0	6	0	0	0	0	0	3172
Percent	0.7%	72.2%	21.5%	0.1%	5.1%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	08:00	07:00	07:00			08:00						11:00
Vol.	2	159	52	1	18			1						219
PM Peak	18:00	16:00	17:00	20:00	16:00	16:00		16:00						16:00
Vol.	5	214	61	1	21	2		2						300
Grand Total	172	10789	2854	8	631	12	3	39	1	0	0	0	0	14509
Percent	1.2%	74.4%	19.7%	0.1%	4.3%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	

Attachment D

SNHPC – Seasonal Adjustment Data

Seasonal Adjustment Factor Summary Table

Project: Woodmont Commons - Londonderry, NH
Date: December 11, 2012
Analyst: TEC, Inc. / Samuel W. Gregorio, E.I.T.
Source: NHDOT Permanent Count Stations 489001, 489002, 489003, 489004

Traffic Data Count Month: August 2011

Weekday Morning

Location	2008	2009	2010*	2011	Average
Windham - 489002, 489003, 489004, 489001	6.35%	1.64%	4.27%	3.65%	3.98%
Average	6.35%	1.64%	4.27%	3.65%	3.98%

Weekday Evening

Location	2008	2009	2010*	2011	Average
Windham - 489002, 489003, 489004, 489001	0.00%	0.00%	0.00%	8.19%	2.05%
Average	0.00%	0.00%	0.00%	8.19%	2.05%

Saturday Midday

Location	2008	2009	2010*	2011	Average
Windham - 489002, 489003, 489004, 489001	0.00%	2.82%	0.00%	6.10%	2.23%
Average	0.00%	2.82%	0.00%	6.10%	2.23%

NHDOT Permanent Count Station Locations

Station 489001 - Windham, NH - NH RT 28 at Derry Town Line

Station 489002 - Windham, NH - I-93 SB at Derry Town Line

Station 489003 - Windham, NH - I-93 Exit 3&4 at Derry Town Line

Station 489004 - Windham, NH - I-93 NB at Derry Town Line

*2010 data based on Stations 489002 and 489004 only as data for Station 489001 was unavailable

Seasonal Adjustment Factor Summary Table

Project: Woodmont Commons - Londonderry, NH
Date: December 11, 2012
Analyst: TEC, Inc. / Samuel W. Gregorio, E.I.T.
Source: NHDOT Permanent Count Stations 489001, 489002, 489003, 489004

Traffic Data Count Month: September 2011

Weekday Morning

Location	2008	2009	2010*	2011	Average
Windham - 489002, 489003, 489004, 489001	0.00%	0.24%	3.36%	0.24%	0.96%
Average	0.00%	0.24%	3.36%	0.24%	0.96%

Weekday Evening

Location	2008	2009	2010*	2011	Average
Windham - 489002, 489003, 489004, 489001	5.50%	2.82%	2.56%	0.13%	2.75%
Average	5.50%	2.82%	2.56%	0.13%	2.75%

Saturday Midday

Location	2008	2009	2010*	2011	Average
Windham - 489002, 489003, 489004, 489001	NA	5.61%	9.22%	3.23%	6.02%
Average		5.61%	9.22%	3.23%	6.02%

NHDOT Permanent Count Station Locations

Station 489001 - Windham, NH - NH RT 28 at Derry Town Line

Station 489002 - Windham, NH - I-93 SB at Derry Town Line

Station 489003 - Windham, NH - I-93 Exit 3&4 at Derry Town Line

Station 489004 - Windham, NH - I-93 NB at Derry Town Line

*2010 data based on Stations 489002 and 489004 only as data for Station 489001 was unavailable

Seasonal Adjustment Factor Summary Table

Project: Woodmont Commons - Londonderry, NH
Date: December 11, 2012
Analyst: TEC, Inc. / Samuel W. Gregorio, E.I.T.
Source: NHDOT Permanent Count Stations 489001, 489002, 489003, 489004

Traffic Data Count Month: December 2012

Weekday Morning

Location	2008	2009	2010*	2011	Average
Windham - 489002, 489003, 489004, 489001	21.12%	14.26%	15.01%	9.75%	15.03%
Average	21.12%	14.26%	15.01%	9.75%	15.03%

Weekday Evening

Location	2008	2009	2010*	2011	Average
Windham - 489002, 489003, 489004, 489001	13.79%	10.21%	8.59%	3.25%	8.96%
Average	13.79%	10.21%	8.59%	3.25%	8.96%

Saturday Midday

Location	2008	2009	2010*	2011	Average
Windham - 489002, 489003, 489004, 489001	23.18%	19.66%	20.89%	24.19%	21.98%
Average	23.18%	19.66%	20.89%	24.19%	21.98%

NHDOT Permanent Count Station Locations

Station 489001 - Windham, NH - NH RT 28 at Derry Town Line

Station 489002 - Windham, NH - I-93 SB at Derry Town Line

Station 489003 - Windham, NH - I-93 Exit 3&4 at Derry Town Line

Station 489004 - Windham, NH - I-93 NB at Derry Town Line

*2010 data based on Stations 489002 and 489004 only as data for Station 489001 was unavailable

Year 2008 Monthly Data - All Locations

Peak Hour Data

Stations =	489004 Windham, I 93 SB At Windham/Derry TL	Group: 03
	489002 Windham, I 93 At Windham/Derry TL Exit 3-4	Group: 03
	489003 Windham, I 93 NB At Windham/Derry TL	Group: 03
	489001 Windham, NH 28 at Derry TL	Group: 04

Month	Data				Factors				Number of Days
	AM	Mid	PM	Sat Mid	AM	Mid	PM	Sat Mid	
Jan	5886	4269	6543	5649					
Feb	5885	4444	6397	5775					
Mar	6324	4327	6965	5138					
Apr	6381	4308	6997	5886					
May	6339	4584	7021	5922					
Jun	6400	4640	7025	6188					
Jul	6078	5053	6899	6766					
Aug	6094	5435	7137	7169					
Sep	6481	4324	6765	5969					
Oct	6362	4716	7095	6739					
Nov	6025	4746	6633	5900					
Dec	5351	4789	6272	5820					

Average	6134	4636	6812	6077
Max	6481	5435	7137	7169

FACTOR	6.35%	0.00%	0.00%
	0.00%	5.50%	20.10%
	21.12%	13.79%	23.18%

August
September
December

Average Daily Data

Month	Data				Factors			
	AveSun	AveWD	AveSat	AveDay	AveSun	AveWD	AveSat	AveDay
Jan	62953	78864	74857	76294				
Feb	65431	79691	75296	77118				
Mar	71070	83373	68162	78935				
Apr	66262	84424	76450	80940				
May	70289	86310	77250	82781				
Jun	74333	88154	82565	85105				
Jul	79612	89107	82007	86965				
Aug	80237	92560	85878	89495				
Sep	71183	83152	73870	80319				
Oct	78066	86761	86364	85588				
Nov	67202	82378	74659	78562				
Dec	56018	78611	71054	74721				
Average	70221	84449	77368	81402				

- Notes:
1. A box around the data indicates a calculated value. Do not use as data.
 2. Yearly average days may not match the published report
 3. Factors are based on Average Month

Year 2009 Monthly Data - All Locations

Peak Hour Data

Stations = 489004 Windham, I 93 SB At Windham/Derry TL Group: 03
 489002 Windham, I 93 At Windham/Derry TL Exit 3-4 Group: 03
 489003 Windham, I 93 NB At Windham/Derry TL Group: 03
 489001 Windham, NH 28 at Derry TL Group: 04

Month	Data				Factors				Number of Days
	AM	Mid	PM	Sat Mid	AM	Mid	PM	Sat Mid	
Jan	5649	4066	6247	5629					
Feb	6093	4402	6690	5995					
Mar	6008	4588	6729	5775					
Apr	5923	4775	6767	6244					
May	5838	4961	6806	6368					
Jun	6307	4936	7140	6746					
Jul	6013	5363	7161	7036					
Aug	6205	5429	7264	6843					
Sep	6292	4732	7065	6662					
Oct	6211	4790	7148	6226					
Nov	5863	4693	6635	5746					
Dec	5520	4770	6591	5880					

Average 5994 4792 6854 6262
 Max 6307 5429 7264 7036

FACTOR 1.64% 0.00% 2.82%
 0.24% 2.82% 5.61%
 14.26% 10.21% 19.66%

August
 September
 December

Average Daily Data

Month	Data				Factors			
	AveSun	AveWD	AveSat	AveDay	AveSun	AveWD	AveSat	AveDay
Jan	49014	64691	62962	62390				
Feb	58204	69977	68055	68020				
Mar	59603	71004	68103	68865				
Apr	61003	72031	68150	69711				
May	62402	73058	68198	70556				
Jun	69014	75634	73893	74519				
Jul	73695	78043	72822	76809				
Aug	72058	79772	73438	77506				
Sep	69122	73631	71786	72784				
Oct	67519	74246	68654	72476				
Nov	58047	69188	61654	66327				
Dec	47718	68201	60590	64576				

Average 62283 72456 68192 70378

- Notes:
1. A box around the data indicates a calculated value. Do not use as data.
 2. Yearly average days may not match the published report
 3. Factors are based on Average Month

Year 2010 Monthly Data

Peak Hour Data

Stations = 489004 Windham, I 93 SB At Windham/Derry TL
 489002 Windham, I 93 At Windham/Derry TL Exit 3-4
 489003 Windham, I 93 NB At Windham/Derry TL

Group: 03

Month	Data				Factors				Number of Days
	AM	Mid	PM	Sat Mid	AM	Mid	PM	Sat Mid	
Jan	4832	3561	5471	4482	1.05	1.13	1.06	1.15	30
Feb	4956	3703	5568	4988	1.02	1.08	1.05	1.04	27
Mar	5347	3612	5832	4818	0.95	1.11	1.00	1.07	30
Apr	5312	3852	5932	5775	0.95	1.04	0.98	1.07	29
May	5210	3931	5890	5049	0.97	1.02	0.99	1.02	30
Jun	5331	4171	6037	5408	0.95	0.96	0.96	0.96	29
Jul	4956	4665	5971	5863	1.02	0.86	0.98	0.88	30
Aug	5128	4592	6053	5937	0.99	0.87	0.96	0.87	30
Sep	5173	4046	5902	5436	0.98	0.99	0.99	0.95	30
Oct	5025	4034	5951	5471	1.01	1.00	0.98	0.95	31
Nov	4916	3991	5712	4864	1.03	1.01	1.02	1.06	29
Dec	4649	4023	5574	4911	1.09	1.00	1.04	1.05	31

Average	5070	4015	5824	5250
Max	5347	4665	6053	5937

FACTOR	4.27%	0.00%	0.00%
	3.36%	2.56%	9.22%
	15.01%	8.59%	20.89%

August
 September
 December

Average Daily Data

Month	Data				Factors			
	AveSun	AveWD	AveSat	AveDay	AveSun	AveWD	AveSat	AveDay
Jan	54324	66168	59595	63197	1.15	1.10	1.15	1.12
Feb	59548	68202	66621	66740	1.05	1.07	1.03	1.06
Mar	59072	70278	65746	68247	1.06	1.04	1.05	1.04
Apr	60238	72504	64937	69859	1.04	1.01	1.06	1.01
May	63240	73659	68387	71128	0.99	0.99	1.00	1.00
Jun	67457	77299	72249	75313	0.92	0.94	0.95	0.94
Jul	68584	79392	74753	77249	0.91	0.92	0.92	0.92
Aug	71480	79314	77127	77768	0.87	0.92	0.89	0.91
Sep	68433	74077	71878	73031	0.91	0.98	0.96	0.97
Oct	66314	74486	75174	73279	0.94	0.98	0.91	0.97
Nov	58836	70206	65388	68047	1.06	1.04	1.05	1.04
Dec	50645	69499	62849	66209	1.23	1.05	1.09	1.07

Average	62348	72924	68725	70839
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- Notes:
1. A box around the data indicates a calculated value. Do not use as data.
 2. Yearly average days may not match the published report
 3. Factors are based on Average Month

Year 2011 Monthly Data - All Locations

Peak Hour Data

Stations = 489004 Windham, I 93 SB At Windham/Derry TL Group: 03
 489002 Windham, I 93 At Windham/Derry TL Exit 3-4 Group: 03
 489003 Windham, I 93 NB At Windham/Derry TL Group: 03
 489001 Windham, NH 28 at Derry TL Group: 04

Month	Data				Factors				Number of Days
	AM	Mid	PM	Sat Mid	AM	Mid	PM	Sat Mid	
Jan	5384	3885	6266	5217					
Feb	5584	4119	6317	5707					
Mar	6219	4237	6953	5775					
Apr	6021	4325	6862	5639					
May	6063	4443	6960	5839					
Jun	6226	4754	7104	6075					
Jul	5794	5331	7010	6675					
Aug	6007	4712	6605	6291					
Sep	6211	4556	7137	6466					
Oct	6211	4476	7146	6287					
Nov	6015	4498	6841	5594					
Dec	5673	4642	6921	5375					

Average 5951 4498 6844 5912
 Max 6226 5331 7146 6675

FACTOR 3.65% 8.19% 6.10%
 0.24% 0.13% 3.23%
 9.75% 3.25% 24.19%

August
 September
 December

Average Daily Data

Month	Data				Factors			
	AveSun	AveWD	AveSat	AveDay	AveSun	AveWD	AveSat	AveDay
Jan	62946	73682	67942	71025				
Feb	65538	76585	75375	74834				
Mar	68279	81712	76187	79266				
Apr	68037	81944	75019	78935				
May	68764	83616	77835	80474				
Jun	76313	88666	80768	85965				
Jul	79855	90440	85214	87889				
Aug	48332	81587	75698	76536				
Sep	72267	82965	78740	80975				
Oct	68160	82202	78735	79378				
Nov	61848	78541	69972	75173				
Dec	55906	79165	65959	74033				

Average 66354 81759 75620 78707

- Notes:
1. A box around the data indicates a calculated value. Do not use as data.
 2. Yearly average days may not match the published report
 3. Factors are based on Average Month

Attachment E

SNHPC – Permanent Count Station Data – Background Growth

Average Daily Traffic Summary Table

Project: DSM/Market Basket Pillsbury Road Rear Driveway - Londonderry, NH
 Date: November 1, 2012
 Analyst: TEC, Inc. / Samuel W. Gregorio, E.I.T.
 Source: SNHPC Average Daily Traffic Count Stations

TOWN	ROUTE/STREET	LOCATION	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Amb. Growth
LONDONDERRY	GILCREST RD	NORTH OF NH 102	7,900		11,000	10,000			9,800	10,000		10,000		2.99%
LONDONDERRY	GILCREST RD	SOUTH OF PILLSBURY RD	12,000		9,800		9,400			10,000			11,000	-0.74%
LONDONDERRY	GILCREST RD	OVER BEAVER BROOK			6,900			7,700			8,200			2.92%
LONDONDERRY	NH 102	EAST OF I-93 UNDERPASS			30,000		30,000			29,000			29,000	-0.42%
LONDONDERRY	NH 102	WEST OF I-93 UNDERPASS			34,000			28,000			27,000			-3.74%
LONDONDERRY	PILLSBURY RD	EAST OF GILCREST RD			6,300					6,400			6,600	0.58%
LONDONDERRY	PILLSBURY RD	WEST OF HARDY RD	5,200			5,700			5,200			5,600		0.86%

Average Annual Ambient Growth =

0.35%

Assume 1% Ambient Growth Rate

Attachment F

Full Occupancy of Market Basket Plaza

Site Generated Trip Assessment - Re-Occupancy of Vacant Space

Project: DSM/Market Basket Pillsbury Road Rear Driveway - Londonderry, NH
 Date: November 1, 2012
 Analyst: TEC, Inc. / Samuel W. Gregorio, E.I.T.
 Source: Institute of Transportation Engineers - Trip Generation - 9th Edition

Full Re-Occupancy of Plaza

220,150 SF Shopping Center (ITE LUC 820)

Units:	220.15 KSF	Total Trips		% Distribution		# New Trips		Total New Pass-by Trips	Total New Primary Trips	# Passby Trips		# Primary Trips	
		Avg. Rates	Fitted Curve	IN	OUT	IN	OUT			IN	OUT	IN	OUT
Weekday Daily		9400	11342	50%	50%	5671	5671	2948	8394	1474	1474	4197	4197
Weekday AM PH		211	252	62%	38%	156	96	66	186	33	33	123	63
Weekday PM PH		817	1017	48%	52%	488	529	346	671	173	173	315	356
Saturday Daily		11001	15190	50%	50%	7595	7595	3950	11240	1975	1975	5620	5620
Sat Midday PH		1061	1460	52%	48%	759	701	380	1080	190	190	569	511

Assumed 34% pass-by rate for weekday PM and 26% pass-by rate for all others (LUC 820 - Shopping Center - Trip Generation, 9th Edition).

Existing Occupied Space

122,250 SF Shopping Center (ITE LUC 820)

Units:	122.25 KSF	Total Trips		% Distribution		# New Trips		Total New Pass-by Trips	Total New Primary Trips	# Passby Trips		# Primary Trips	
		Avg. Rates	Fitted Curve	IN	OUT	IN	OUT			IN	OUT	IN	OUT
Weekday Daily		5220	7738	50%	50%	3869	3869	2012	5726	1006	1006	2863	2863
Weekday AM PH		117	176	62%	38%	109	67	46	130	23	23	86	44
Weekday PM PH		454	685	48%	52%	329	356	232	453	116	116	213	240
Saturday Daily		6109	10486	50%	50%	5243	5243	2726	7760	1363	1363	3880	3880
Sat Midday PH		589	996	52%	48%	518	478	258	738	129	129	389	349

Assumed 34% pass-by rate for weekday PM and 26% pass-by rate for all others (LUC 820 - Shopping Center - Trip Generation, 9th Edition).

Net Increase	Total Trips	Total New Trips		Total New Pass-by Trips	Total New Primary Trips	Total Pass-by Trips		Total Primary Trips	
		In	Out			In	Out	In	Out
Weekday Daily	3604	1802	1802	936	2668	468	468	1334	1334
Weekday AM Peak Hour	76	47	29	20	56	10	10	37	19
Weekday PM Peak Hour	332	159	173	114	218	57	57	102	116
Saturday Daily	4704	2352	2352	1224	3480	612	612	1740	1740
Sat Midday Peak Hour	464	241	223	122	342	61	61	180	162



CALCULATIONS

65 GLENN STREET, LAWRENCE, MA 01843

TEL 978.794.1792 | FAX 978.794.1793 | TECMASS.COM

JOB: New Orchard Driveway - Market BasketJOB NUMBER: T0378LOCATION: Londonderry, New HampshireDATE: Tuesday August 23, 2011TITLE: O-D Study ResultsSHEET: 1 OF 1CALCULATED BY: SWG

CHECKED BY: _____

From West (Pillsbury / Gilcreast)

TIME BLOCK	Londonderry Com EBL	ENT	Garden Ln NBT	ENT
3:00-4:00	23 of 195	59	10 of 195	446
4:00-5:00	17 of 222	84	10 of 222	531
5:00-6:00	21 of 231	66	7 of 231	484

} → 5.3%
of all
MB Plaza
Trips

via Londonderry Commons
3.7%

via Garden Lane
1.6%

From East (Ash to Londonderry to Garden)

TIME BLOCK	Garden Lane NBT	ENT
3:00-4:00	3 of 57	446
4:00-5:00	3 of 58	531
5:00-6:00	2 of 58	484

} → 0.5%
of all
MB Plaza
Trips



Not to Scale

Pillsbury Road Rear Access Driveway - Londonderry, New Hampshire

Traffic Impact Assessment

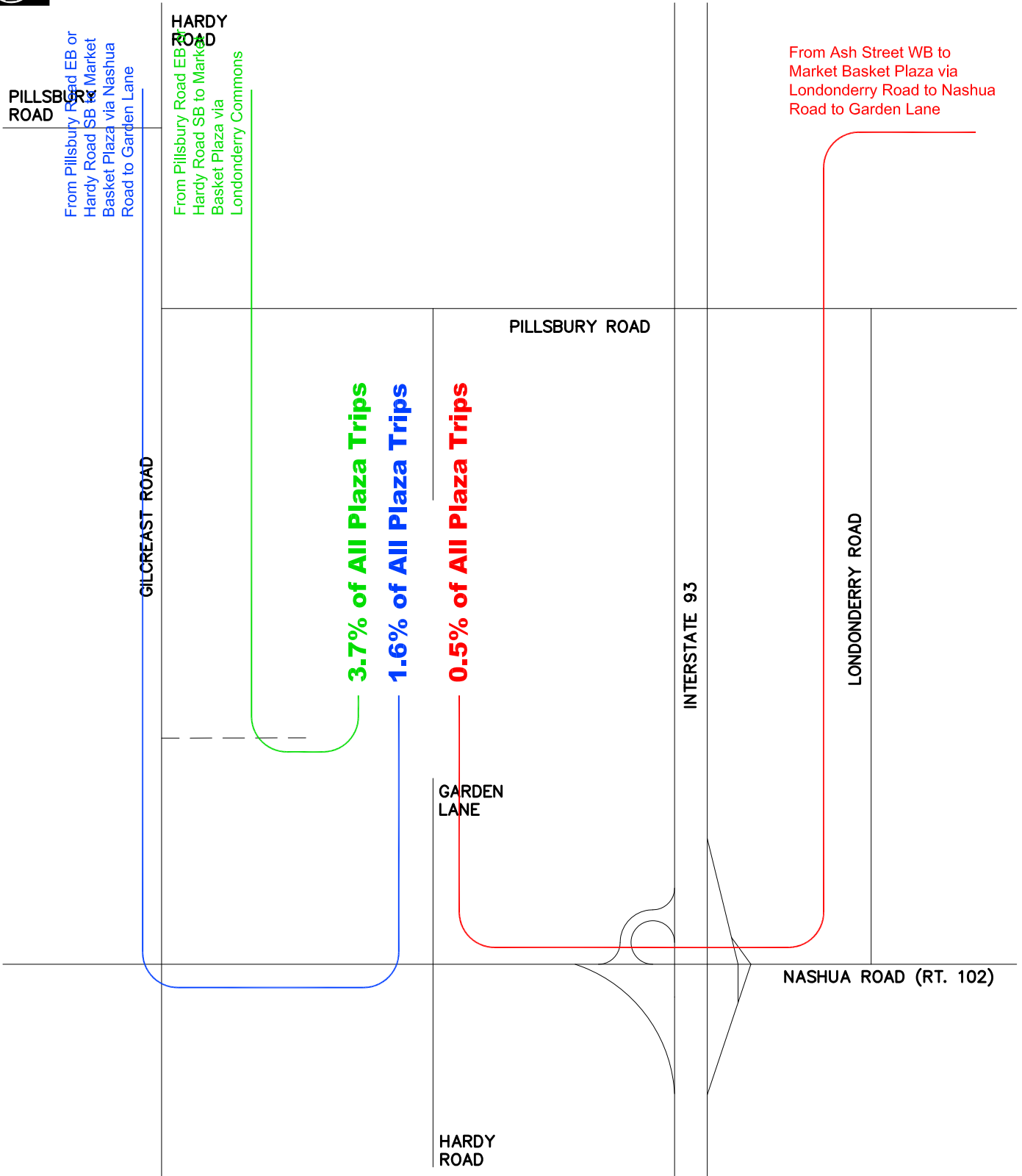


Figure 5

Origin-Destination Distribution



Attachment G

Site Trip Generation

	UNIT	East of 93	Northwest					Southwest					Total	West of 93		
			W2-7	W2-8	W2-9	W2-10	W2-11	Total	W2-1	W2-1GL	W2-2	W2-3			W2-4	W2-5
Woodmont Commons - Land Uses																
Proposed Developments																
Retail (LUC 820 - Shopping Center)	SF	350,000	0	0	0	15,000	0	15,000	362,500	50,000	100,000	0	5,000	0	0	517,500
Office (LUC 710 - General Office Space)	SF	400,000	0	0	0	0	0	0	0	0	300,000	0	0	0	0	300,000
Residential (LUC 210 - Single Family Detached)	Units	0	24	150	30	20	24	248	50	0	60	0	8	11	8	137
Residential (LUC 220 - Apartment)	Units	200	0	0	0	40	0	40	500	0	27	0	0	0	0	527
Residential (LUC 230 - Residential Condo/Townhouse)	Units	150	0	80	20	0	0	100	0	0	0	0	20	0	8	28
Residential (LUC 252 - Senior Adult Housing)	Units	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Residential (LUC 270 - Planned Unit Development)	Units	350	24	230	50	60	24	388	550	0	87	0	28	11	16	692
Light Industrial (LUC 110 - Light Industrial)	SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lodging (LUC 310 - Hotel)	Rooms	200	0	0	0	0	0	0	200	0	150	0	0	0	0	350
Hospital (LUC 610 - Hospital)	SF	250,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total																

Site Generation Trip Assessment Comparison

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
 Date: December 11, 2012
 Source: Institute of Transportation Engineers - Trip Generation - 9th Ed.

Proposed Mixed-Use Development - East of Interstate 93

350 Unit Residential Planned Unit Development (ITE LUC 270 - RPUD)

Units:	350												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT			IN	OUT	IN	OUT
Weekday Daily	2,907	50%	50%	1454	1453	334	334	0	2239	0	0	1120	1119
Weekday AM PH	190	22%	78%	42	148	22	22	0	146	0	0	20	126
Weekday PM PH	255	65%	35%	166	89	29	29	0	197	0	0	137	60
Saturday Daily	2,488	50%	50%	1244	1244	286	286	0	1916	0	0	958	958
Sat Midday PH	199	49%	51%	98	101	23	23	0	153	0	0	75	78

Assumed 23% internal capture rate

350,000 SF Mixed Retail Uses (ITE LUC 820 - Shopping Center)

Units:	350												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT			IN	OUT	IN	OUT
Weekday Daily	15,331	50%	50%	7666	7665	1763	1763	4014	7791	2007	2007	3896	3895
Weekday AM PH	335	62%	38%	208	127	39	39	88	169	44	44	125	44
Weekday PM PH	1,387	48%	52%	666	721	160	160	362	705	181	181	325	380
Saturday Daily	20,343	50%	50%	10172	10171	2339	2339	4072	11593	2036	2036	5797	5796
Sat Midday PH	1,974	52%	48%	1026	948	227	227	396	1124	198	198	601	523

Assumed 23% internal capture rate

Assumed 34% weekday passby rate and 26% Saturday passby rate (Trip Generation Handbook, 2nd Edition).

400,000 SF Mixed Office Uses (ITE LUC 710 - General Office Building)

Units:	400												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT			IN	OUT	IN	OUT
Weekday Daily	3,765	50%	50%	1883	1882	433	433	0	2899	0	0	1450	1449
Weekday AM PH	580	88%	12%	510	70	67	67	0	446	0	0	443	3
Weekday PM PH	526	17%	83%	89	437	60	60	0	406	0	0	29	377
Saturday Daily	844	50%	50%	422	422	97	97	0	650	0	0	325	325
Sat Midday PH	172	54%	46%	93	79	20	20	0	132	0	0	73	59

Assumed 23% internal capture rate

200 Room Hotel (ITE LUC 310 - Hotel)

Units:	200												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT			IN	OUT	IN	OUT
Weekday Daily	1,417	50%	50%	709	708	163	163	0	1091	0	0	546	545
Weekday AM PH	106	59%	41%	63	43	12	12	0	82	0	0	51	31
Weekday PM PH	120	51%	49%	61	59	14	14	0	92	0	0	47	45
Saturday Daily	1,629	50%	50%	815	814	187	187	0	1255	0	0	628	627
Sat Midday PH	142	56%	44%	80	62	16	16	0	110	0	0	64	46

Assumed 23% internal capture rate

250,000 SF Hospital Space (ITE LUC 610 - Hospital)

Units:	250												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT			IN	OUT	IN	OUT
Weekday Daily	3,305	50%	50%	1653	1652	380	380	0	2545	0	0	1273	1272
Weekday AM PH	238	63%	37%	150	88	27	27	0	184	0	0	123	61
Weekday PM PH	233	38%	62%	89	144	27	27	0	179	0	0	62	117
Saturday Daily	2,545	50%	50%	1273	1272	293	293	0	1959	0	0	980	979
Sat Midday PH	565	50%	50%	283	282	65	65	0	435	0	0	218	217

Assumed 23% internal capture rate

Net Retail Trips ONLY	Total Trips			Total New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	Total Pass-by Trips		Total Primary Trips	
				In	Out	In	Out			In	Out	In	Out
Weekday Daily	20,053			10,028	10,025	2,306	2,306	4,014	11,427	2,007	2,007	5,715	5,712
Weekday AM PH	679			421	258	78	78	88	435	44	44	299	136
Weekday PM PH	1,740			816	924	201	201	362	976	181	181	434	542
Saturday Daily	24,517			12,260	12,257	2,819	2,819	4,072	14,807	2,036	2,036	7,405	7,402
Sat Midday PH	2,681			1,389	1,292	308	308	396	1,669	198	198	883	786

Net Trips (ALL TRIPS)	Total Trips			Total New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	Total Pass-by Trips		Total Primary Trips	
				In	Out	In	Out			In	Out	In	Out
Weekday Daily	26,725			13,365	13,360	3,073	3,073	4,014	16,565	2,007	2,007	8,285	8,280
Weekday AM PH	1,449			973	476	167	167	88	1,027	44	44	762	265
Weekday PM PH	2,521			1,071	1,450	290	290	362	1,579	181	181	600	979
Saturday Daily	27,849			13,926	13,923	3,202	3,202	4,072	17,373	2,036	2,036	8,688	8,685
Sat Midday PH	3,052			1,580	1,472	351	351	396	1,954	198	198	1,031	923

Site Generation Trip Assessment Comparison

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
 Date: December 11, 2012
 Source: Institute of Transportation Engineers - Trip Generation - 9th Ed.

Proposed Mixed-Use Development - West of Interstate 93

1,080 Unit Residential Planned Unit Development (ITE LUC 270 - RPUD)

Units:	1,080												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT			IN	OUT	IN	OUT
Weekday Daily	7,837	50%	50%	3919	3918	901	901	0	6035	0	0	3018	3017
Weekday AM PH	542	22%	78%	119	423	62	62	0	418	0	0	57	361
Weekday PM PH	704	65%	35%	458	246	81	81	0	542	0	0	377	165
Saturday Daily	7,592	50%	50%	3796	3796	873	873	0	5846	0	0	2923	2923
Sat Midday PH	593	49%	51%	291	302	68	68	0	457	0	0	223	234

Assumed 23% internal capture rate

532,500 SF Mixed Retail Uses (ITE LUC 820 - Shopping Center)

Units:	532.5												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT			IN	OUT	IN	OUT
Weekday Daily	20,139	50%	50%	10070	10069	2316	2316	5272	10235	2636	2636	5118	5117
Weekday AM PH	432	62%	38%	268	164	50	50	112	220	56	56	162	58
Weekday PM PH	1,837	48%	52%	882	955	211	211	482	933	241	241	430	503
Saturday Daily	26,499	50%	50%	13250	13249	3047	3047	11402	9003	5701	5701	4502	4501
Sat Midday PH	2,593	52%	48%	1348	1245	298	298	520	1477	260	260	790	687

Assumed 23% internal capture rate

Assumed 34% weekday passby rate and 26% Saturday passby rate (Trip Generation Handbook, 2nd Edition).

300,000 SF Mixed Office Uses (ITE LUC 710 - General Office Building)

Units:	300												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT			IN	OUT	IN	OUT
Weekday Daily	3,026	50%	50%	1513	1513	348	348	0	2330	0	0	1165	1165
Weekday AM PH	461	88%	12%	406	55	53	53	0	355	0	0	353	2
Weekday PM PH	414	17%	83%	70	344	48	48	0	318	0	0	22	296
Saturday Daily	641	50%	50%	321	320	74	74	0	493	0	0	247	246
Sat Midday PH	129	54%	46%	70	59	15	15	0	99	0	0	55	44

Assumed 23% internal capture rate

350 Room Hotel (ITE LUC 310 - Hotel)

Units:	350												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT			IN	OUT	IN	OUT
Weekday Daily	2,759	50%	50%	1380	1379	317	317	0	2125	0	0	1063	1062
Weekday AM PH	186	59%	41%	110	76	21	21	0	144	0	0	89	55
Weekday PM PH	210	51%	49%	107	103	24	24	0	162	0	0	83	79
Saturday Daily	3,072	50%	50%	1536	1536	353	353	0	2366	0	0	1183	1183
Sat Midday PH	246	56%	44%	138	108	28	28	0	190	0	0	110	80

Assumed 23% internal capture rate

0 SF Industrial Space (ITE LUC 110 - General Light Industrial)

Units:	0												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT			IN	OUT	IN	OUT
Weekday Daily	0	50%	50%	0	0	0	0	0	0	0	0	0	0
Weekday AM PH	0	88%	12%	0	0	0	0	0	0	0	0	0	0
Weekday PM PH	0	12%	88%	0	0	0	0	0	0	0	0	0	0
Saturday Daily	0	50%	50%	0	0	0	0	0	0	0	0	0	0
Sat Midday PH	0	47%	53%	0	0	0	0	0	0	0	0	0	0

Assumed 23% internal capture rate

Net Retail Trips ONLY	Total Trips			Total New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	Total Pass-by Trips		Total Primary Trips	
				In	Out	In	Out			In	Out	In	Out
Weekday Daily	22,898			11,450	11,448	2,633	2,633	5,272	12,360	2,636	2,636	6,181	6,179
Weekday AM PH	618			378	240	71	71	112	364	56	56	251	113
Weekday PM PH	2,047			989	1,058	235	235	482	1,095	241	241	513	582
Saturday Daily	29,571			14,786	14,785	3,400	3,400	11,402	11,369	5,701	5,701	5,685	5,684
Sat Midday PH	2,839			1,486	1,353	326	326	520	1,667	260	260	900	767

Net Trips	Total Trips			Total New Trips		Internal Capture		Total New Pass-by Trips	Total New Primary Trips	Total Pass-by Trips		Total Primary Trips	
				In	Out	In	Out			In	Out	In	Out
Weekday Daily	33,761			16,882	16,879	3,882	3,882	5,272	20,725	2,636	2,636	10,364	10,361
Weekday AM PH	1,621			903	718	186	186	112	1,137	56	56	661	476
Weekday PM PH	3,165			1,517	1,648	364	364	482	1,955	241	241	912	1,043
Saturday Daily	37,804			18,903	18,901	4,347	4,347	11,402	17,708	5,701	5,701	8,855	8,853
Sat Midday PH	3,561			1,847	1,714	409	409	520	2,223	260	260	1,178	1,045

Site Generated Trip Assessment - East of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 270 - Residential Planned Unit Development (PUD)

Average Vehicle Trips vs: Units
Independent Variable (X): 350 Units

AVERAGE WEEKDAY DAILY

$$\ln T = 0.88 * (X) + 2.82$$

$$\ln T = 0.88 * \ln (350) + 2.82$$

$$\ln T = 7.975$$

$$T = \boxed{2,907} \text{ vehicle trips}$$

with 50% (1,454 vpd) entering and 50% (1,453 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.93 \ln(X) - 0.20$$

$$\ln T = 0.93 * \ln (350) - 0.20$$

$$\ln T = 5.248$$

$$T = \boxed{190} \text{ vehicle trips}$$

with 22% (42 vph) entering and 78% (148 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.90 * \ln(X) + 0.27$$

$$\ln T = 0.90 * \ln (350) + 0.27$$

$$\ln T = 5.542$$

$$T = \boxed{255} \text{ vehicle trips}$$

with 65% (166 vph) entering and 35% (89 vpd) exiting.

SATURDAY DAILY

$$\ln T = 0.99 * \ln(X) + 2.02$$

$$\ln T = 0.99 * \ln (350) + 2.02$$

$$\ln T = 7.819$$

$$T = \boxed{2,488} \text{ vehicle trips}$$

with 50% (1,244 vpd) entering and 50% (1,244 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$\ln T = 0.97 * \ln(X) - 0.39$$

$$\ln T = 0.97 * \ln (350) - 0.39$$

$$\ln T = 5.292$$

$$T = \boxed{199} \text{ vehicle trips}$$

with 49% (98 vph) entering and 51% (101 vpd) exiting.

Site Generated Trip Assessment - East of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 310 - Hotel

Average Vehicle Trips vs: Rooms
Independent Variable (X): 200 Rooms

AVERAGE WEEKDAY DAILY

$$T = 8.95 * (X) - 373.16$$

$$T = 8.95 * 200 - (373.16)$$

$$T = 1,417 \text{ vehicle trips}$$

with 50% (709 vpd) entering and 50% (708 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.53 * (X)$$

$$T = 0.53 * 200$$

$$T = 106 \text{ vehicle trips}$$

with 59% (63 vph) entering and 41% (43 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.60 * (X)$$

$$T = 0.60 * 200$$

$$T = 120 \text{ vehicle trips}$$

with 51% (61 vph) entering and 49% (59 vpd) exiting.

SATURDAY DAILY

$$T = 9.62 * (X) - 294.56$$

$$T = 9.62 * 200 - 294.56$$

$$T = 1,629 \text{ vehicle trips}$$

with 50% (815 vpd) entering and 50% (814 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$T = 0.69 * (X) + 4.32$$

$$T = 0.69 * 200 + (4.32)$$

$$T = 142 \text{ vehicle trips}$$

with 56% (80 vph) entering and 44% (62 vpd) exiting.

Site Generated Trip Assessment - East of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 610 - Hospital

Average Vehicle Trips vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 250

AVERAGE WEEKDAY DAILY

$$T = 13.22 * (X)$$

$$T = 13.22 * 250$$

$$T = \boxed{3,305} \text{ vehicle trips}$$

with 50% (1,653 vpd) entering and 50% (1,652 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.95 * (X)$$

$$T = 0.95 * 250$$

$$T = \boxed{238} \text{ vehicle trips}$$

with 63% (150 vph) entering and 37% (88 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.93 * (X)$$

$$T = 0.93 * 250$$

$$T = \boxed{233} \text{ vehicle trips}$$

with 38% (89 vph) entering and 62% (144 vpd) exiting.

SATURDAY DAILY

$$T = 10.18 * (X)$$

$$T = 10.18 * 250$$

$$T = \boxed{2,545} \text{ vehicle trips}$$

with 50% (1,273 vpd) entering and 50% (1,272 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$T = 2.26 * (X)$$

$$T = 2.26 * (250)$$

$$T = \boxed{565} \text{ vehicle trips}$$

with 50% (283 vph) entering and 50% (282 vpd) exiting.

Site Generated Trip Assessment - East of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

Land Use Code (LUC) 710 - General Office Building

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area
Independent Variable (X): 400.000

AVERAGE WEEKDAY DAILY

$$\ln T = 0.76 \ln (X) + 3.68$$

$$\ln T = 0.76 \ln 400.000 + 3.68$$

$$\ln T = 8.23$$

$$T = \boxed{3,765} \text{ vehicle trips}$$

with 50% (1,883 vph) entering and 50% (1,882 vph) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.80 \ln (X) + 1.57$$

$$\ln T = 0.80 \ln 400.000 + 1.57$$

$$\ln T = 6.36$$

$$T = \boxed{580} \text{ vehicle trips}$$

with 88% (510 vph) entering and 12% (70 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 1.12 * (X) + 78.45$$

$$T = 1.12 * 400.000 + 78.45$$

$$T = \boxed{526} \text{ vehicle trips}$$

with 17% (89 vph) entering and 83% (437 vph) exiting.

SATURDAY DAILY

$$T = 2.03 * (X) + 31.75$$

$$T = 2.03 * 400.000 + 31.75$$

$$T = \boxed{844} \text{ vehicle trips}$$

with 50% (422 vpd) entering and 50% (422 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$T = 0.43 * (X)$$

$$T = 0.43 * 400.000$$

$$T = \boxed{172} \text{ vehicle trips}$$

with 54% (93 vph) entering and 46% (79 vph) exiting.

Site Generated Trip Assessment - East of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 820 - Shopping Center

Average Vehicle Trips vs: 1,000 Sq. Feet Gross Leasable Area
Independent Variable (X): 350.00

AVERAGE WEEKDAY DAILY

$$\ln T = 0.65 \ln(X) + 5.83$$

$$\ln T = 0.65 \ln(350.00) + 5.83$$

$$\ln T = 9.638$$

$$T = 15,331 \text{ vehicle trips}$$

with 50% (7,666 vpd) entering and 50% (7,665 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.61 \ln(X) + 2.24$$

$$\ln T = 0.61 \ln(350.00) + 2.24$$

$$\ln T = 5.813$$

$$T = 335 \text{ vehicle trips}$$

with 62% (208 vpd) entering and 38% (127 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.67 \ln(X) + 3.31$$

$$\ln T = 0.67 \ln(350.00) + 3.31$$

$$\ln T = 7.235$$

$$T = 1,387 \text{ vehicle trips}$$

with 48% (666 vpd) entering and 52% (721 vpd) exiting.

SATURDAY DAILY

$$\ln T = 0.63 \ln(X) + 6.23$$

$$\ln T = 0.63 \ln(350.00) + 6.23$$

$$\ln T = 9.920$$

$$T = 20,343 \text{ vehicle trips}$$

with 50% (10,172 vpd) entering and 50% (10,171 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$\ln T = 0.65 \ln(X) + 3.78$$

$$\ln T = 0.65 \ln(350.00) + 3.78$$

$$\ln T = 7.588$$

$$T = 1,974 \text{ vehicle trips}$$

with 52% (1,026 vpd) entering and 48% (948 vpd) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 110 - General Light Industrial

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 0.00

AVERAGE WEEKDAY DAILY

$$T = 6.970 * (X)$$

$$T = 6.970 * (0.00)$$

$$T = 0 \text{ vehicle trips}$$

with 50% (0 vpd) entering and 50% (0 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.920 * (X)$$

$$T = 0.920 * (0.00)$$

$$T = 0 \text{ vehicle trips}$$

with 88% (0 vph) entering and 12% (0 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.970 * (X)$$

$$T = 0.970 * (0.00)$$

$$T = 0 \text{ vehicle trips}$$

with 12% (0 vph) entering and 88% (0 vph) exiting.

SATURDAY DAILY

$$T = 1.320 * (X)$$

$$T = 1.320 * (0.00)$$

$$T = 0 \text{ vehicle trips}$$

with 50% (0 vpd) entering and 50% (0 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$T = 0.140 * (X)$$

$$T = 0.140 * (0.00)$$

$$T = 0 \text{ vehicle trips}$$

with 47% (0 vph) entering and 53% (0 vph) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: September 19, 2011
Source: Institute of Transportation Engineers - Trip Generation , 8th Edition

ITE Land Use Code (LUC) 270 - Residential Planned Unit Development (PUD)

Average Vehicle Trips vs: Units
Independent Variable (X): 1,080 Units

AVERAGE WEEKDAY DAILY

$$\ln T = 0.88 * (X) + 2.82$$

$$\ln T = 0.88 * \ln (1080) + 2.82$$

$$\ln T = 8.967$$

$$T = \boxed{7,837} \text{ vehicle trips}$$

with 50% (3,919 vpd) entering and 50% (3,918 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.93 \ln(X) - 0.20$$

$$\ln T = 0.93 * \ln (1080) - 0.20$$

$$\ln T = 6.296$$

$$T = \boxed{542} \text{ vehicle trips}$$

with 22% (119 vph) entering and 78% (423 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.90 * \ln(X) + 0.27$$

$$\ln T = 0.90 * \ln (1080) + 0.27$$

$$\ln T = 6.556$$

$$T = \boxed{704} \text{ vehicle trips}$$

with 65% (458 vph) entering and 35% (246 vpd) exiting.

SATURDAY DAILY

$$\ln T = 0.99 * \ln(X) + 2.02$$

$$\ln T = 0.99 * \ln (1080) + 2.02$$

$$\ln T = 8.935$$

$$T = \boxed{7,592} \text{ vehicle trips}$$

with 50% (3,796 vpd) entering and 50% (3,796 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$\ln T = 0.97 * \ln(X) - 0.39$$

$$\ln T = 0.97 * \ln (1,080) - 0.39$$

$$\ln T = 6.385$$

$$T = \boxed{593} \text{ vehicle trips}$$

with 49% (291 vph) entering and 51% (302 vpd) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 310 - Hotel

Average Vehicle Trips vs: Rooms
Independent Variable (X): 350 Rooms

AVERAGE WEEKDAY DAILY

$$T = 8.95 * (X) - 373.16$$

$$T = 8.95 * 350 - (373.16)$$

$$T = \boxed{2,759} \text{ vehicle trips}$$

with 50% (1,380 vpd) entering and 50% (1,379 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.53 * (X)$$

$$T = 0.53 * 350$$

$$T = \boxed{186} \text{ vehicle trips}$$

with 59% (110 vph) entering and 41% (76 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.60 * (X)$$

$$T = 0.60 * 350$$

$$T = \boxed{210} \text{ vehicle trips}$$

with 51% (107 vph) entering and 49% (103 vpd) exiting.

SATURDAY DAILY

$$T = 9.62 * (X) - 294.56$$

$$T = 9.62 * 350 - 294.56$$

$$T = \boxed{3,072} \text{ vehicle trips}$$

with 50% (1,536 vpd) entering and 50% (1,536 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$T = 0.69 * (X) + 4.32$$

$$T = 0.69 * 350 + (4.32)$$

$$T = \boxed{246} \text{ vehicle trips}$$

with 56% (138 vph) entering and 44% (108 vpd) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

Land Use Code (LUC) 710 - General Office Building

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area
Independent Variable (X): 300.000

AVERAGE WEEKDAY DAILY

$$\ln T = 0.76 \ln (X) + 3.68$$

$$\ln T = 0.76 \ln 300.000 + 3.68$$

$$\ln T = 8.01$$

$$T = 3,026 \text{ vehicle trips}$$

with 50% (1,513 vph) entering and 50% (1,513 vph) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.80 \ln (X) + 1.57$$

$$\ln T = 0.80 \ln 300.000 + 1.57$$

$$\ln T = 6.13$$

$$T = 461 \text{ vehicle trips}$$

with 88% (406 vph) entering and 12% (55 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 1.12 * (X) + 78.45$$

$$T = 1.12 * 300.000 + 78.45$$

$$T = 414 \text{ vehicle trips}$$

with 17% (70 vph) entering and 83% (344 vph) exiting.

SATURDAY DAILY

$$T = 2.03 * (X) + 31.75$$

$$T = 2.03 * 300.000 + 31.75$$

$$T = 641 \text{ vehicle trips}$$

with 50% (321 vpd) entering and 50% (320 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$T = 0.43 * (X)$$

$$T = 0.43 * 300.000$$

$$T = 129 \text{ vehicle trips}$$

with 54% (70 vph) entering and 46% (59 vph) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 820 - Shopping Center

Average Vehicle Trips vs: 1,000 Sq. Feet Gross Leasable Area
Independent Variable (X): 532.50

AVERAGE WEEKDAY DAILY

$$\ln T = 0.65 \ln(X) + 5.83$$

$$\ln T = 0.65 \ln(532.50) + 5.83$$

$$\ln T = 9.910$$

$$T = 20,139 \text{ vehicle trips}$$

with 50% (10,070 vpd) entering and 50% (10,069 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.61 \ln(X) + 2.24$$

$$\ln T = 0.61 \ln(532.50) + 2.24$$

$$\ln T = 6.069$$

$$T = 432 \text{ vehicle trips}$$

with 62% (268 vpd) entering and 38% (164 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.67 \ln(X) + 3.31$$

$$\ln T = 0.67 \ln(532.50) + 3.31$$

$$\ln T = 7.516$$

$$T = 1,837 \text{ vehicle trips}$$

with 48% (882 vpd) entering and 52% (955 vpd) exiting.

SATURDAY DAILY

$$\ln T = 0.63 \ln(X) + 6.23$$

$$\ln T = 0.63 \ln(532.50) + 6.23$$

$$\ln T = 10.185$$

$$T = 26,499 \text{ vehicle trips}$$

with 50% (13,250 vpd) entering and 50% (13,249 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$\ln T = 0.65 \ln(X) + 3.78$$

$$\ln T = 0.65 \ln(532.50) + 3.78$$

$$\ln T = 7.860$$

$$T = 2,593 \text{ vehicle trips}$$

with 52% (1,348 vpd) entering and 48% (1,245 vpd) exiting.

Attachment H

Internal Capture

Shared Trips Calculations - Weekday AM

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
Date: December 10, 2012

To																													
East					Northwest				Southwest																				
208	Retail	510	Office	150	Hospital	42	Residential	63	Hotel	8	Retail	0	Office	0	Industrial	43	Residential	0	Hotel	260	Retail	406	Office	0	Industrial	76	Residential	110	Hotel
167					167					24					162														
79					11					77																			
11					2					11																			
77					11					74																			
From													Required Trips =																
Actual Trips =													706																
334													706																

Shared Trips Calculations - Weekday PM

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
Date: December 10, 2012

To												
East					Northwest					Southwest		
Retail	Office	Hospital	Residential	Hotel	Retail	Office	Industrial	Residential	Hotel	Retail	Office	Industrial
666	89	89	166	61	25	0	0	165	0	857	70	0
290					35					329		
129					15					146		
15					2					18		
146					18					165		
290					35					329		
61					0					0		
166					165					293		
89					0					107		
89					0					0		
27					0					0		
0					0					0		
0					0					0		
88					88					88		
0					0					0		
928					928					928		
344					344					344		
0					0					0		
158					158					158		
103					103					103		

Required Trips =					Total				
Actual Trips =					1,308				
					1,308				

Notes:

Cell in rounded down to balance

Shared Trips Calculations - Saturday MIDDAY

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
Date: December 10, 2012

To																			
East					Northwest				Southwest										
From	1026 Retail					93 Office	283 Hospital	98 Residential	80 Hotel	38 Retail	0 Office	0 Industrial	105 Residential	0 Hotel	1310 Retail	70 Office	0 Industrial	186 Residential	138 Hotel
	351														33		376		
	162														15		174		
	15																16		
	174																186		
	376																		
	351																		
	162																		
	15																		
	174																		
376																			
1210 Retail					59 Office	0 Industrial	194 Residential	108 Hotel											
35					0	0	108	0											
79					282	101	62												
948																			
351																			
East																			
Northwest																			
Southwest																			



MEMORANDUM

TO: Ms. Jane Howard
Howard/Stein-Hudson Associates, Inc.
38 Chauncy Street, 9th Floor
Boston, Massachusetts 02111

DATE: December 11, 2012

FROM: Rebecca L. Brown, PE, Senior Engineer
Kevin R. Dandrade, PE, PTOE, Principal

PROJECT NO.: T0378

RE: Woodmont Commons PUD – Londonderry, New Hampshire
Internal Capture Rate

INTRODUCTION

The traffic projections previously prepared for the permitting of the Woodmont Commons Planned Unit Development (PUD) assumed an internal capture rate of 35 percent for the East development zone and 45 percent for the West development zone. TEC has prepared an updated internal capture rate analysis to determine an appropriate internal capture rate within each zone, as well as a shared trip rate between the three PUD zones. These zones consist of the East zone (east of I-93), the Northwest zone (west of I-93 and north of Pillsbury Road), and the Southwest zone (west of I-93 and south of Pillsbury Road). This memorandum provides a summary of the methodology used to estimate the internal capture rates within and between each zone.

SITE-GENERATED TRIPS

TEC prepared an updated trip generation estimate based on trip rates contained in the Institute of Transportation Engineers (ITE) publication, *Trip Generation, 9th Edition* for the following land use codes (LUC):

- LUC 270 – Residential Planned Unit Development
- LUC 310 – Hotel
- LUC 610 – Hospital
- LUC 710 – General Office Building
- LUC 820 – Shopping Center

The sizes of development utilized to prepare this trip generation analysis were based on the exemplar land use allocations contained in Figure TND 3a (attached). The updated trip generation worksheets are included in Attachment A.

INTERNAL CAPTURE RATE

TEC estimated the internal capture rate for the Woodmont Commons PUD using internal capture rates between office, retail, and residential land uses contained in the ITE publication, *Trip Generation Handbook, 2nd Edition*. This analysis was conducted in the following steps:

1. Shared trips between retail uses in the East zone and retail uses in the two West zones were estimated using “retail” to “retail” internal capture rates from ITE. The analysis worksheets are included in Attachment C.

2. Shared trips between office uses in the East zone and office uses in the two West zones were estimated using “office” to “office” internal capture rates from ITE. For the purposes of this analysis, the proposed hospital was assumed to experience similar internal capture to an office land uses. The analysis worksheets for office to office trips are included in Attachment D.
3. Shared trips between different land uses were estimated for retail and residential, retail and office, and office and residential land uses. For this analysis, all of the retail, office, and residential square footage within each zone was compiled into one retail, office, and residential land use category, respectively, to determine a general retail-residential, retail-office, and residential-office internal capture rate. The analysis worksheets for this mixed-use trip sharing analysis are included in Attachment B.
4. Having estimated a total retail-residential, retail-office, and residential-office internal capture rate, the mixed-use trips between each zone were then calculated based on a percentage of retail, office, and residential square footages within each zone applied to the internal trips estimated in Step 3. These calculations are included in Attachment E.
5. The mixed-use, retail-to-retail, and office-to-office internal trips estimated in Steps 1-4 above were summed to determine a total number of internal trips. The total internal trips was compared to the total number of trips generated by the PUD as discussed in the *Site-Generated Trips* section above to determine an internal capture rate for the PUD. These calculations are included in Attachment E.

The results of the internal capture rate analysis indicate that the internal capture rate will vary between 16.0 percent and 36.8 percent, depending on the time period. The weekday morning peak hour will experience an internal capture rate of 16.0 percent as retail land uses will generate little traffic and therefore a reduced opportunity for sharing of trips during this time period. All other time periods will experience internal capture rates of 30.2 to 36.8 percent.

The internal trips were divided into those that will remain entirely internal to one zone and those that will be shared between multiple zones of the Woodmont PUD. This analysis indicates that approximately 5.5 to 8.7 percent of the total site-generated trips will remain entirely internal to one zone. An additional 10.5 to 27.6 percent of the total site-generated trips will remain internal to the PUD, but will be shared between multiple zones. Again, the weekday morning peak hour will experience the lowest internal capture rates as low trip generation by retail land uses during this time period will limit opportunities of trip-sharing. The internal capture in a single zone will be between 7.5 and 8.7 percent, and the internal capture between multiple zones will be between 21.5 and 27.6 percent during all other time periods.

ATTACHMENTS:

- A – Trip Generation Worksheets
- B – Mixed-Use Shared Trips Worksheets
- C – Retail to Retail Shared Trips Worksheets
- D – Office to Office Shared Trips Worksheets
- E – Internal Capture Rate Calculations

CC: Rick Chellman, P.E.
Cynthia May, AICP
John Trottier, P.E.
Ted Brovitz
Anthony DiSarcina, P.E.

Attachment A

Trip Generation Worksheets

Site Generation Trip Assessment Comparison

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
 Date: December 11, 2012
 Source: Institute of Transportation Engineers - Trip Generation - 9th Ed.

Proposed Mixed-Use Development - East of Interstate 93

350 Unit Residential Planned Unit Development (ITE LUC 270 - RPUD)

Units:	350												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	2,907	50%	50%	1454	1453	509	509	0	1889	0	0	945	944
Weekday AM PH	190	22%	78%	42	148	15	52	0	123	0	0	27	96
Weekday PM PH	255	65%	35%	166	89	58	31	0	166	0	0	108	58
Saturday Daily	2,488	50%	50%	1244	1244	435	435	0	1618	0	0	809	809
Sat Midday PH	199	49%	51%	98	101	34	35	0	130	0	0	64	66

Assumed 35% internal capture rate

350,000 SF Mixed Retail Uses (ITE LUC 820 - Shopping Center)

Units:	350												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	15,331	50%	50%	7666	7665	2683	2683	3388	6577	1694	1694	3289	3288
Weekday AM PH	335	62%	38%	208	127	73	44	74	144	46	28	89	55
Weekday PM PH	1,387	48%	52%	666	721	233	252	307	595	147	160	286	309
Saturday Daily	20,343	50%	50%	10172	10171	3560	3560	3438	9785	1719	1719	4893	4892
Sat Midday PH	1,974	52%	48%	1026	948	359	332	334	949	174	160	493	456

Assumed 35% internal capture rate

Assumed 34% weekday passby rate and 26% Saturday passby rate (Trip Generation Handbook, 2nd Edition).

400,000 SF Mixed Office Uses (ITE LUC 710 - General Office Building)

Units:	400												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	3,765	50%	50%	1883	1882	659	659	0	2447	0	0	1224	1223
Weekday AM PH	580	88%	12%	510	70	179	25	0	376	0	0	331	45
Weekday PM PH	526	17%	83%	89	437	31	153	0	342	0	0	58	284
Saturday Daily	844	50%	50%	422	422	148	148	0	548	0	0	274	274
Sat Midday PH	172	54%	46%	93	79	33	28	0	111	0	0	60	51

Assumed 35% internal capture rate

200 Room Hotel (ITE LUC 310 - Hotel)

Units:	200												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	1,417	50%	50%	709	708	248	248	0	921	0	0	461	460
Weekday AM PH	106	59%	41%	63	43	22	15	0	69	0	0	41	28
Weekday PM PH	120	51%	49%	61	59	21	21	0	78	0	0	40	38
Saturday Daily	1,629	50%	50%	815	814	285	285	0	1059	0	0	530	529
Sat Midday PH	142	56%	44%	80	62	28	22	0	92	0	0	52	40

Assumed 35% internal capture rate

250,000 SF Hospital Space (ITE LUC 610 - Hospital)

Units:	250												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	3,305	50%	50%	1653	1652	579	578	0	2148	0	0	1074	1074
Weekday AM PH	238	63%	37%	150	88	53	31	0	154	0	0	97	57
Weekday PM PH	233	38%	62%	89	144	31	50	0	152	0	0	58	94
Saturday Daily	2,545	50%	50%	1273	1272	446	445	0	1654	0	0	827	827
Sat Midday PH	565	50%	50%	283	282	99	99	0	367	0	0	184	183

Assumed 35% internal capture rate

Net Retail Trips ONLY	Total Trips			Total New Trips		Internal Capture		Total New	Total New	Total Pass-by Trips		Total Primary Trips	
				In	Out	In	Out	Pass-by Trips	Primary Trips	In	Out	In	Out
Weekday Daily	20,053			10,028	10,025	3,510	3,509	3,388	9,646	1,694	1,694	4,824	4,822
Weekday AM PH	679			421	258	148	90	74	367	46	28	227	140
Weekday PM PH	1,740			816	924	285	323	307	825	147	160	384	441
Saturday Daily	24,517			12,260	12,257	4,291	4,290	3,438	12,498	1,719	1,719	6,250	6,248
Sat Midday PH	2,681			1,389	1,292	486	453	334	1,408	174	160	729	679

Net Trips (ALL TRIPS)	Total Trips			Total New Trips		Internal Capture		Total New	Total New	Total Pass-by Trips		Total Primary Trips	
				In	Out	In	Out	Pass-by Trips	Primary Trips	In	Out	In	Out
Weekday Daily	26,725			13,365	13,360	4,678	4,677	3,388	13,982	1,694	1,694	6,993	6,989
Weekday AM PH	1,449			973	476	342	167	74	866	46	28	585	281
Weekday PM PH	2,521			1,071	1,450	374	507	307	1,333	147	160	550	783
Saturday Daily	27,849			13,926	13,923	4,874	4,873	3,438	14,664	1,719	1,719	7,333	7,331
Sat Midday PH	3,052			1,580	1,472	553	516	334	1,649	174	160	853	796

Site Generation Trip Assessment Comparison

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
 Date: December 11, 2012
 Source: Institute of Transportation Engineers - Trip Generation - 9th Ed.

Proposed Mixed-Use Development - West of Interstate 93

1,080 Unit Residential Planned Unit Development (ITE LUC 270 - RPUD)

Units:	1,080												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	7,837	50%	50%	3919	3918	1764	1763	0	4310	0	0	2155	2155
Weekday AM PH	542	22%	78%	119	423	54	190	0	298	0	0	65	233
Weekday PM PH	704	65%	35%	458	246	206	111	0	387	0	0	252	135
Saturday Daily	7,592	50%	50%	3796	3796	1708	1708	0	4176	0	0	2088	2088
Sat Midday PH	593	49%	51%	291	302	131	136	0	326	0	0	160	166

Assumed 45% internal capture rate

532,500 SF Mixed Retail Uses (ITE LUC 820 - Shopping Center)

Units:	532.5												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	20,139	50%	50%	10070	10069	4532	4531	3766	7310	1883	1883	3655	3655
Weekday AM PH	432	62%	38%	268	164	121	74	81	156	50	31	97	59
Weekday PM PH	1,837	48%	52%	882	955	397	430	343	667	165	178	320	347
Saturday Daily	26,499	50%	50%	13250	13249	5963	5962	3789	10785	1895	1894	5392	5393
Sat Midday PH	2,593	52%	48%	1348	1245	607	560	371	1055	193	178	548	507

Assumed 45% internal capture rate

Assumed 34% weekday passby rate and 26% Saturday passby rate (Trip Generation Handbook, 2nd Edition).

300,000 SF Mixed Office Uses (ITE LUC 710 - General Office Building)

Units:	300												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	3,026	50%	50%	1513	1513	681	681	0	1664	0	0	832	832
Weekday AM PH	461	88%	12%	406	55	183	25	0	253	0	0	223	30
Weekday PM PH	414	17%	83%	70	344	32	155	0	227	0	0	38	189
Saturday Daily	641	50%	50%	321	320	144	144	0	353	0	0	177	176
Sat Midday PH	129	54%	46%	70	59	32	27	0	70	0	0	38	32

Assumed 45% internal capture rate

350 Room Hotel (ITE LUC 310 - Hotel)

Units:	350												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	2,759	50%	50%	1380	1379	621	621	0	1517	0	0	759	758
Weekday AM PH	186	59%	41%	110	76	50	34	0	102	0	0	60	42
Weekday PM PH	210	51%	49%	107	103	48	46	0	116	0	0	59	57
Saturday Daily	3,072	50%	50%	1536	1536	691	691	0	1690	0	0	845	845
Sat Midday PH	246	56%	44%	138	108	62	49	0	135	0	0	76	59

Assumed 45% internal capture rate

0 SF Industrial Space (ITE LUC 110 - General Light Industrial)

Units:	0												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	0	50%	50%	0	0	0	0	0	0	0	0	0	0
Weekday AM PH	0	88%	12%	0	0	0	0	0	0	0	0	0	0
Weekday PM PH	0	12%	88%	0	0	0	0	0	0	0	0	0	0
Saturday Daily	0	50%	50%	0	0	0	0	0	0	0	0	0	0
Sat Midday PH	0	47%	53%	0	0	0	0	0	0	0	0	0	0

Assumed 45% internal capture rate

Net Retail Trips ONLY	Total Trips			Total New Trips		Internal Capture		Total New	Total New	Total Pass-by Trips		Total Primary Trips	
				In	Out	In	Out	Pass-by Trips	Primary Trips	In	Out	In	Out
Weekday Daily	22,898			11,450	11,448	5,153	5,152	3,766	8,827	1,883	1,883	4,414	4,413
Weekday AM PH	618			378	240	171	108	81	258	50	31	157	101
Weekday PM PH	2,047			989	1,058	445	476	343	783	165	178	379	404
Saturday Daily	29,571			14,786	14,785	6,654	6,653	3,789	12,475	1,895	1,894	6,237	6,238
Sat Midday PH	2,839			1,486	1,353	669	609	371	1,190	193	178	624	566

Net Trips	Total Trips			Total New Trips		Internal Capture		Total New	Total New	Total Pass-by Trips		Total Primary Trips	
				In	Out	In	Out	Pass-by Trips	Primary Trips	In	Out	In	Out
Weekday Daily	33,761			16,882	16,879	7,598	7,596	3,766	14,801	1,883	1,883	7,401	7,400
Weekday AM PH	1,621			903	718	408	323	81	809	50	31	445	364
Weekday PM PH	3,165			1,517	1,648	683	742	343	1,397	165	178	669	728
Saturday Daily	37,804			18,903	18,901	8,506	8,505	3,789	17,004	1,895	1,894	8,502	8,502
Sat Midday PH	3,561			1,847	1,714	832	772	371	1,586	193	178	822	764

Site Generated Trip Assessment - East of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 270 - Residential Planned Unit Development (PUD)

Average Vehicle Trips vs: Units
Independent Variable (X): 350 Units

AVERAGE WEEKDAY DAILY

$$\ln T = 0.88 * (X) + 2.82$$

$$\ln T = 0.88 * \ln (350) + 2.82$$

$$\ln T = 7.975$$

$$T = \boxed{2,907} \text{ vehicle trips}$$

with 50% (1,454 vpd) entering and 50% (1,453 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.93 \ln(X) - 0.20$$

$$\ln T = 0.93 * \ln (350) - 0.20$$

$$\ln T = 5.248$$

$$T = \boxed{190} \text{ vehicle trips}$$

with 22% (42 vph) entering and 78% (148 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.90 * \ln(X) + 0.27$$

$$\ln T = 0.90 * \ln (350) + 0.27$$

$$\ln T = 5.542$$

$$T = \boxed{255} \text{ vehicle trips}$$

with 65% (166 vph) entering and 35% (89 vpd) exiting.

SATURDAY DAILY

$$\ln T = 0.99 * \ln(X) + 2.02$$

$$\ln T = 0.99 * \ln (350) + 2.02$$

$$\ln T = 7.819$$

$$T = \boxed{2,488} \text{ vehicle trips}$$

with 50% (1,244 vpd) entering and 50% (1,244 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$\ln T = 0.97 * \ln(X) - 0.39$$

$$\ln T = 0.97 * \ln (350) - 0.39$$

$$\ln T = 5.292$$

$$T = \boxed{199} \text{ vehicle trips}$$

with 49% (98 vph) entering and 51% (101 vpd) exiting.

Site Generated Trip Assessment - East of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 310 - Hotel

Average Vehicle Trips vs: Rooms
Independent Variable (X): 200 Rooms

AVERAGE WEEKDAY DAILY

$$T = 8.95 * (X) - 373.16$$

$$T = 8.95 * 200 - (373.16)$$

$$T = 1,417 \text{ vehicle trips}$$

with 50% (709 vpd) entering and 50% (708 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.53 * (X)$$

$$T = 0.53 * 200$$

$$T = 106 \text{ vehicle trips}$$

with 59% (63 vph) entering and 41% (43 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.60 * (X)$$

$$T = 0.60 * 200$$

$$T = 120 \text{ vehicle trips}$$

with 51% (61 vph) entering and 49% (59 vpd) exiting.

SATURDAY DAILY

$$T = 9.62 * (X) - 294.56$$

$$T = 9.62 * 200 - 294.56$$

$$T = 1,629 \text{ vehicle trips}$$

with 50% (815 vpd) entering and 50% (814 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$T = 0.69 * (X) + 4.32$$

$$T = 0.69 * 200 + (4.32)$$

$$T = 142 \text{ vehicle trips}$$

with 56% (80 vph) entering and 44% (62 vpd) exiting.

Site Generated Trip Assessment - East of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 610 - Hospital

Average Vehicle Trips vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 250

AVERAGE WEEKDAY DAILY

$$T = 13.22 * (X)$$

$$T = 13.22 * 250$$

$$T = \boxed{3,305} \text{ vehicle trips}$$

with 50% (1,653 vpd) entering and 50% (1,652 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.95 * (X)$$

$$T = 0.95 * 250$$

$$T = \boxed{238} \text{ vehicle trips}$$

with 63% (150 vph) entering and 37% (88 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.93 * (X)$$

$$T = 0.93 * 250$$

$$T = \boxed{233} \text{ vehicle trips}$$

with 38% (89 vph) entering and 62% (144 vpd) exiting.

SATURDAY DAILY

$$T = 10.18 * (X)$$

$$T = 10.18 * 250$$

$$T = \boxed{2,545} \text{ vehicle trips}$$

with 50% (1,273 vpd) entering and 50% (1,272 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$T = 2.26 * (X)$$

$$T = 2.26 * (250)$$

$$T = \boxed{565} \text{ vehicle trips}$$

with 50% (283 vph) entering and 50% (282 vpd) exiting.

Site Generated Trip Assessment - East of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

Land Use Code (LUC) 710 - General Office Building

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area
Independent Variable (X): 400.000

AVERAGE WEEKDAY DAILY

$$\ln T = 0.76 \ln (X) + 3.68$$

$$\ln T = 0.76 \ln 400.000 + 3.68$$

$$\ln T = 8.23$$

$$T = \boxed{3,765} \text{ vehicle trips}$$

with 50% (1,883 vph) entering and 50% (1,882 vph) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.80 \ln (X) + 1.57$$

$$\ln T = 0.80 \ln 400.000 + 1.57$$

$$\ln T = 6.36$$

$$T = \boxed{580} \text{ vehicle trips}$$

with 88% (510 vph) entering and 12% (70 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 1.12 * (X) + 78.45$$

$$T = 1.12 * 400.000 + 78.45$$

$$T = \boxed{526} \text{ vehicle trips}$$

with 17% (89 vph) entering and 83% (437 vph) exiting.

SATURDAY DAILY

$$T = 2.03 * (X) + 31.75$$

$$T = 2.03 * 400.000 + 31.75$$

$$T = \boxed{844} \text{ vehicle trips}$$

with 50% (422 vpd) entering and 50% (422 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$T = 0.43 * (X)$$

$$T = 0.43 * 400.000$$

$$T = \boxed{172} \text{ vehicle trips}$$

with 54% (93 vph) entering and 46% (79 vph) exiting.

Site Generated Trip Assessment - East of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 820 - Shopping Center

Average Vehicle Trips vs: 1,000 Sq. Feet Gross Leasable Area
Independent Variable (X): 350.00

AVERAGE WEEKDAY DAILY

$$\ln T = 0.65 \ln(X) + 5.83$$

$$\ln T = 0.65 \ln(350.00) + 5.83$$

$$\ln T = 9.638$$

$$T = 15,331 \text{ vehicle trips}$$

with 50% (7,666 vpd) entering and 50% (7,665 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.61 \ln(X) + 2.24$$

$$\ln T = 0.61 \ln(350.00) + 2.24$$

$$\ln T = 5.813$$

$$T = 335 \text{ vehicle trips}$$

with 62% (208 vpd) entering and 38% (127 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.67 \ln(X) + 3.31$$

$$\ln T = 0.67 \ln(350.00) + 3.31$$

$$\ln T = 7.235$$

$$T = 1,387 \text{ vehicle trips}$$

with 48% (666 vpd) entering and 52% (721 vpd) exiting.

SATURDAY DAILY

$$\ln T = 0.63 \ln(X) + 6.23$$

$$\ln T = 0.63 \ln(350.00) + 6.23$$

$$\ln T = 9.920$$

$$T = 20,343 \text{ vehicle trips}$$

with 50% (10,172 vpd) entering and 50% (10,171 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$\ln T = 0.65 \ln(X) + 3.78$$

$$\ln T = 0.65 \ln(350.00) + 3.78$$

$$\ln T = 7.588$$

$$T = 1,974 \text{ vehicle trips}$$

with 52% (1,026 vpd) entering and 48% (948 vpd) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 110 - General Light Industrial

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 0.00

AVERAGE WEEKDAY DAILY

$$T = 6.970 * (X)$$

$$T = 6.970 * (0.00)$$

$$T = 0 \text{ vehicle trips}$$

with 50% (0 vpd) entering and 50% (0 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.920 * (X)$$

$$T = 0.920 * (0.00)$$

$$T = 0 \text{ vehicle trips}$$

with 88% (0 vph) entering and 12% (0 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.970 * (X)$$

$$T = 0.970 * (0.00)$$

$$T = 0 \text{ vehicle trips}$$

with 12% (0 vph) entering and 88% (0 vph) exiting.

SATURDAY DAILY

$$T = 1.320 * (X)$$

$$T = 1.320 * (0.00)$$

$$T = 0 \text{ vehicle trips}$$

with 50% (0 vpd) entering and 50% (0 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$T = 0.140 * (X)$$

$$T = 0.140 * (0.00)$$

$$T = 0 \text{ vehicle trips}$$

with 47% (0 vph) entering and 53% (0 vph) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: September 19, 2011
Source: Institute of Transportation Engineers - Trip Generation , 8th Edition

ITE Land Use Code (LUC) 270 - Residential Planned Unit Development (PUD)

Average Vehicle Trips vs: Units
Independent Variable (X): 1,080 Units

AVERAGE WEEKDAY DAILY

$$\ln T = 0.88 * (X) + 2.82$$

$$\ln T = 0.88 * \ln (1080) + 2.82$$

$$\ln T = 8.967$$

$$T = \boxed{7,837} \text{ vehicle trips}$$

with 50% (3,919 vpd) entering and 50% (3,918 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.93 \ln(X) - 0.20$$

$$\ln T = 0.93 * \ln (1080) - 0.20$$

$$\ln T = 6.296$$

$$T = \boxed{542} \text{ vehicle trips}$$

with 22% (119 vph) entering and 78% (423 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.90 * \ln(X) + 0.27$$

$$\ln T = 0.90 * \ln (1080) + 0.27$$

$$\ln T = 6.556$$

$$T = \boxed{704} \text{ vehicle trips}$$

with 65% (458 vph) entering and 35% (246 vpd) exiting.

SATURDAY DAILY

$$\ln T = 0.99 * \ln(X) + 2.02$$

$$\ln T = 0.99 * \ln (1080) + 2.02$$

$$\ln T = 8.935$$

$$T = \boxed{7,592} \text{ vehicle trips}$$

with 50% (3,796 vpd) entering and 50% (3,796 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$\ln T = 0.97 * \ln(X) - 0.39$$

$$\ln T = 0.97 * \ln (1,080) - 0.39$$

$$\ln T = 6.385$$

$$T = \boxed{593} \text{ vehicle trips}$$

with 49% (291 vph) entering and 51% (302 vpd) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 310 - Hotel

Average Vehicle Trips vs: Rooms
Independent Variable (X): 350 Rooms

AVERAGE WEEKDAY DAILY

$$T = 8.95 * (X) - 373.16$$

$$T = 8.95 * 350 - (373.16)$$

$$T = \boxed{2,759} \text{ vehicle trips}$$

with 50% (1,380 vpd) entering and 50% (1,379 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.53 * (X)$$

$$T = 0.53 * 350$$

$$T = \boxed{186} \text{ vehicle trips}$$

with 59% (110 vph) entering and 41% (76 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.60 * (X)$$

$$T = 0.60 * 350$$

$$T = \boxed{210} \text{ vehicle trips}$$

with 51% (107 vph) entering and 49% (103 vpd) exiting.

SATURDAY DAILY

$$T = 9.62 * (X) - 294.56$$

$$T = 9.62 * 350 - 294.56$$

$$T = \boxed{3,072} \text{ vehicle trips}$$

with 50% (1,536 vpd) entering and 50% (1,536 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$T = 0.69 * (X) + 4.32$$

$$T = 0.69 * 350 + (4.32)$$

$$T = \boxed{246} \text{ vehicle trips}$$

with 56% (138 vph) entering and 44% (108 vpd) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

Land Use Code (LUC) 710 - General Office Building

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area
Independent Variable (X): 300.000

AVERAGE WEEKDAY DAILY

$$\ln T = 0.76 \ln (X) + 3.68$$

$$\ln T = 0.76 \ln 300.000 + 3.68$$

$$\ln T = 8.01$$

$$T = \boxed{3,026} \text{ vehicle trips}$$

with 50% (1,513 vph) entering and 50% (1,513 vph) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.80 \ln (X) + 1.57$$

$$\ln T = 0.80 \ln 300.000 + 1.57$$

$$\ln T = 6.13$$

$$T = \boxed{461} \text{ vehicle trips}$$

with 88% (406 vph) entering and 12% (55 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 1.12 * (X) + 78.45$$

$$T = 1.12 * 300.000 + 78.45$$

$$T = \boxed{414} \text{ vehicle trips}$$

with 17% (70 vph) entering and 83% (344 vph) exiting.

SATURDAY DAILY

$$T = 2.03 * (X) + 31.75$$

$$T = 2.03 * 300.000 + 31.75$$

$$T = \boxed{641} \text{ vehicle trips}$$

with 50% (321 vpd) entering and 50% (320 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$T = 0.43 * (X)$$

$$T = 0.43 * 300.000$$

$$T = \boxed{129} \text{ vehicle trips}$$

with 54% (70 vph) entering and 46% (59 vph) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: December 11, 2012
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 820 - Shopping Center

Average Vehicle Trips vs: 1,000 Sq. Feet Gross Leasable Area
Independent Variable (X): 532.50

AVERAGE WEEKDAY DAILY

$$\ln T = 0.65 \ln(X) + 5.83$$

$$\ln T = 0.65 \ln(532.50) + 5.83$$

$$\ln T = 9.910$$

$$T = 20,139 \text{ vehicle trips}$$

with 50% (10,070 vpd) entering and 50% (10,069 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.61 \ln(X) + 2.24$$

$$\ln T = 0.61 \ln(532.50) + 2.24$$

$$\ln T = 6.069$$

$$T = 432 \text{ vehicle trips}$$

with 62% (268 vpd) entering and 38% (164 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.67 \ln(X) + 3.31$$

$$\ln T = 0.67 \ln(532.50) + 3.31$$

$$\ln T = 7.516$$

$$T = 1,837 \text{ vehicle trips}$$

with 48% (882 vpd) entering and 52% (955 vpd) exiting.

SATURDAY DAILY

$$\ln T = 0.63 \ln(X) + 6.23$$

$$\ln T = 0.63 \ln(532.50) + 6.23$$

$$\ln T = 10.185$$

$$T = 26,499 \text{ vehicle trips}$$

with 50% (13,250 vpd) entering and 50% (13,249 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$\ln T = 0.65 \ln(X) + 3.78$$

$$\ln T = 0.65 \ln(532.50) + 3.78$$

$$\ln T = 7.860$$

$$T = 2,593 \text{ vehicle trips}$$

with 52% (1,348 vpd) entering and 48% (1,245 vpd) exiting.

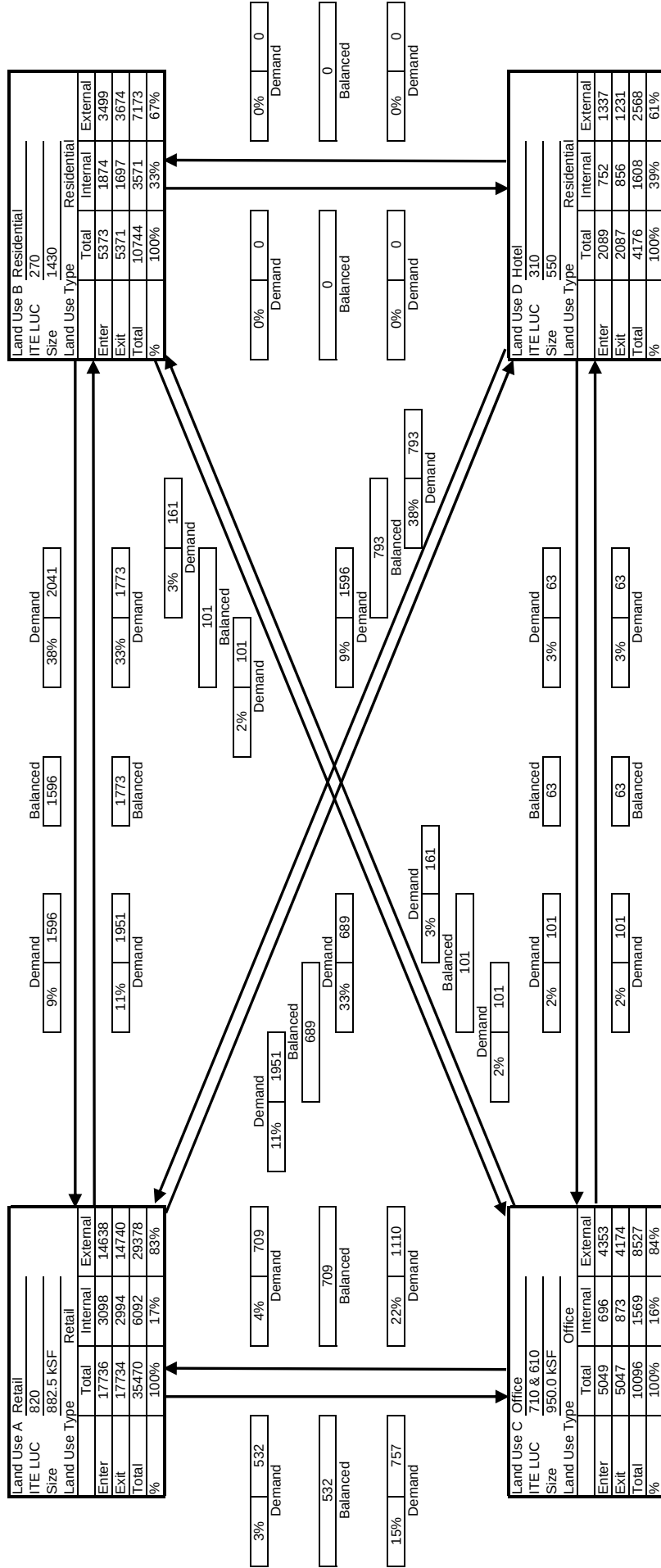
Appendix B

Mixed-Use Shared Trips Worksheets

Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Rebecca L. E
Date: 12/6/2012

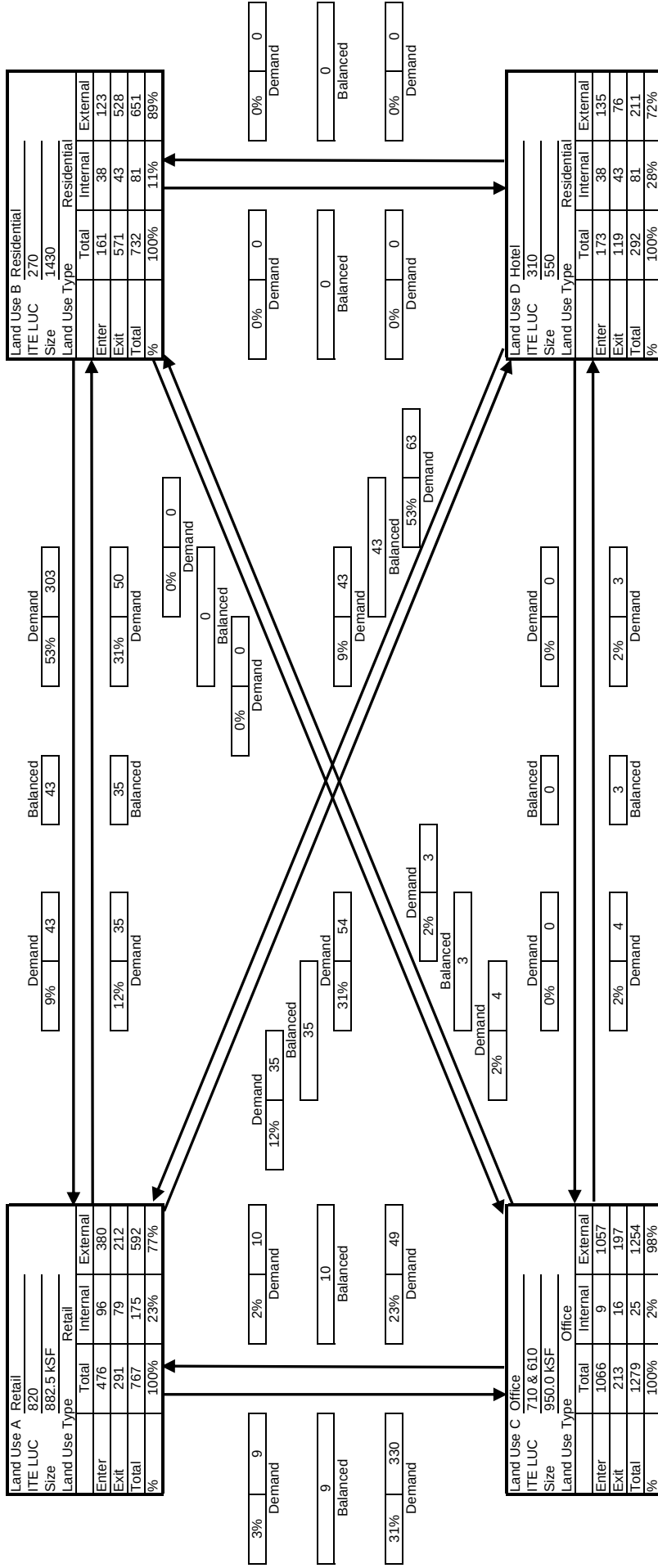
Project Name: Woodmont PUD - E&W Mixed-Us
Time Period: Weekday Daily



Multi-Use Trip Generation Calculation

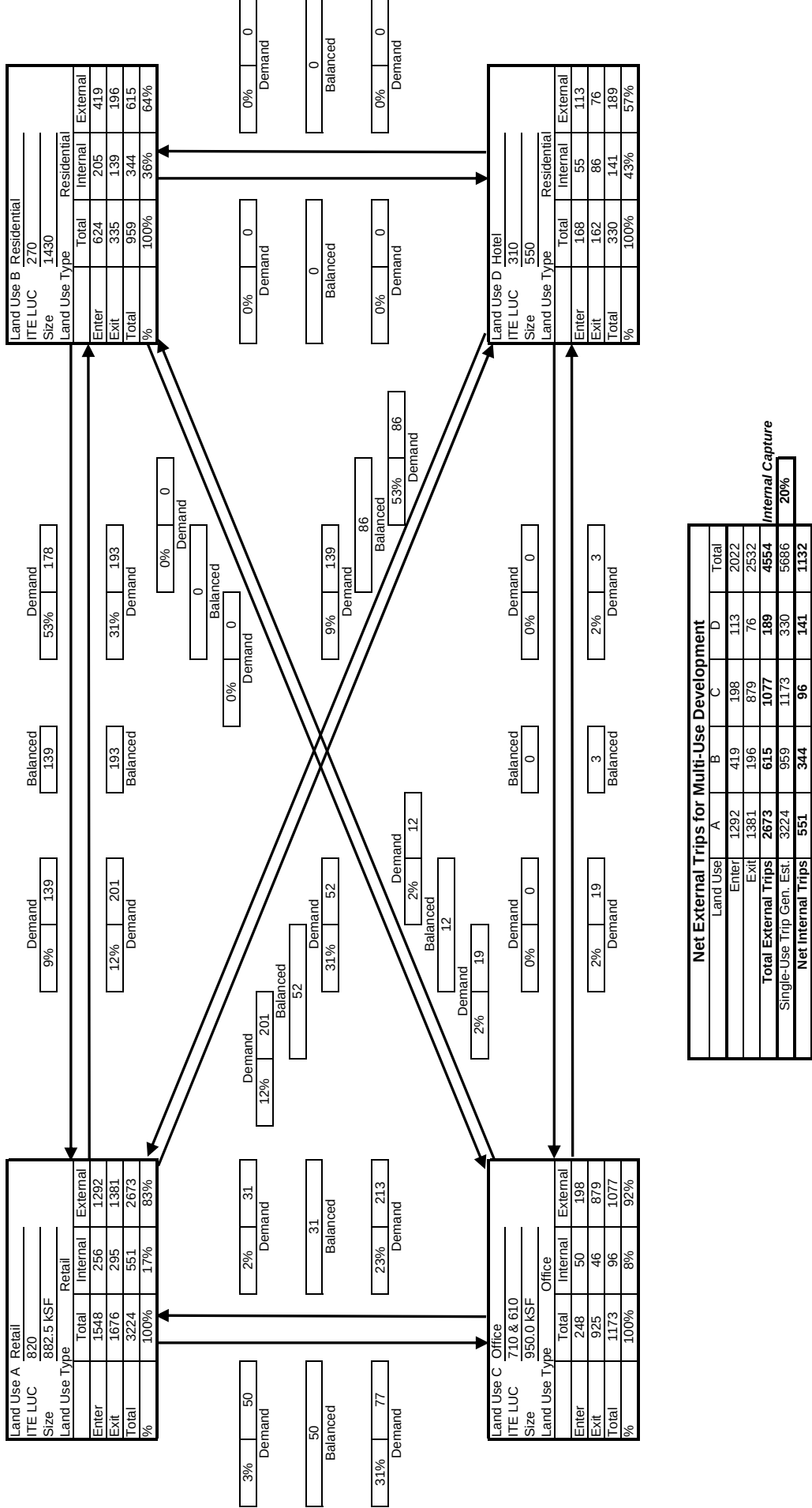
Analyst: TEC, Inc. / Rebecca L. E
Date: 12/6/2012

Project Name: Woodmont PUD - E&W Mixed-Us
Time Period: Weekday AM Peak Hour



Net External Trips for Multi-Use Development						
Land Use	A	B	C	D	Total	
Enter	380	123	1057	135	1695	
Exit	212	528	197	76	1013	
Total External Trips	592	651	1254	211	2708	Internal Capture
Single-Use Trip Gen. Est.	767	732	1279	292	3070	12%
Net Internal Trips	175	81	25	81	362	

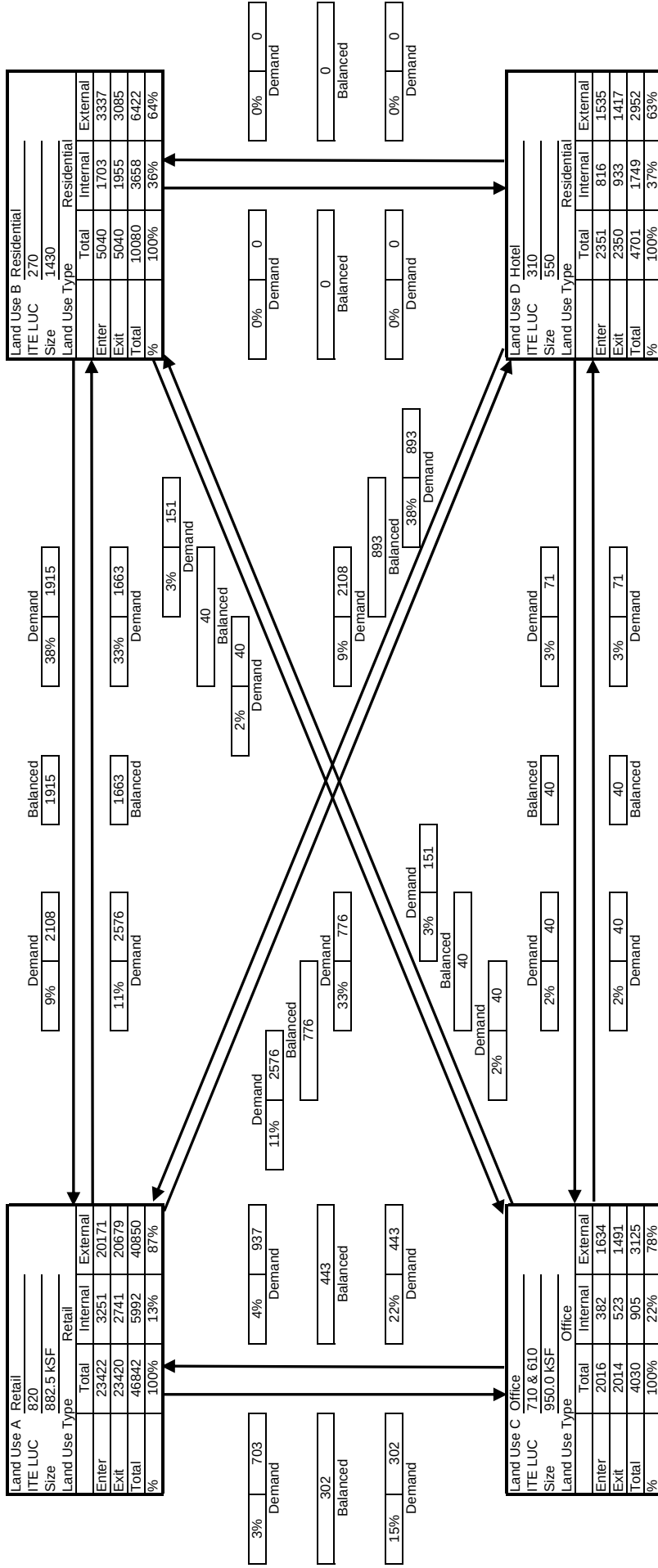
Multi-Use Trip Generation Calculation



Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Rebecca L. E
Date: 12/6/2012

Project Name: Woodmont PUD - E&W Mixed-Us
Time Period: Saturday Daily

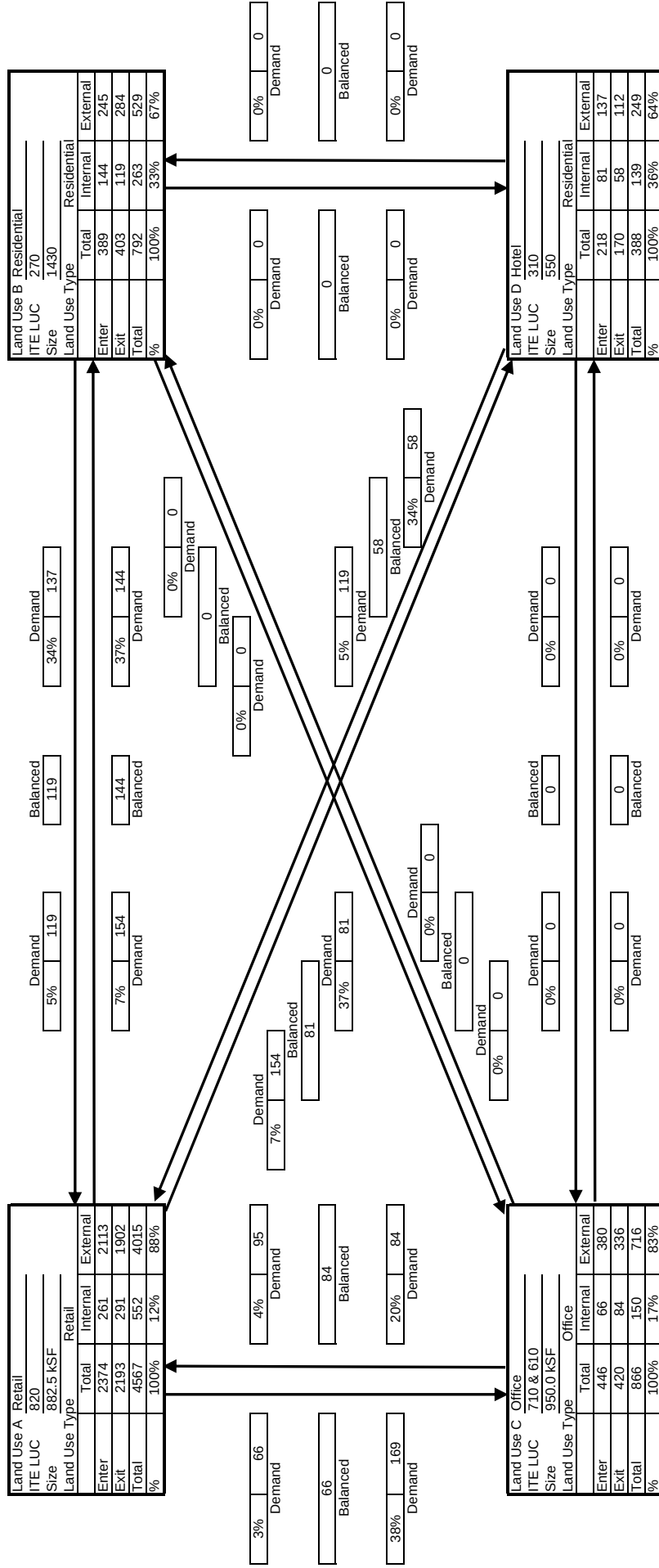


Net External Trips for Multi-Use Development					
Land Use	A	B	C	D	Total
Enter	20171	3337	1634	1535	26677
Exit	20679	3085	1491	1417	26672
Total External Trips	40850	6422	3125	2952	53349
Single-Use Trip Gen. Est.	46842	10080	4030	4701	65653
Net Internal Trips	5992	3658	905	1749	12304
					Internal Capture 19%

Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Rebecca L. E
Date: 12/6/2012

Project Name: Woodmont PUD - E&W Mixed-Us
Time Period: Saturday Midday



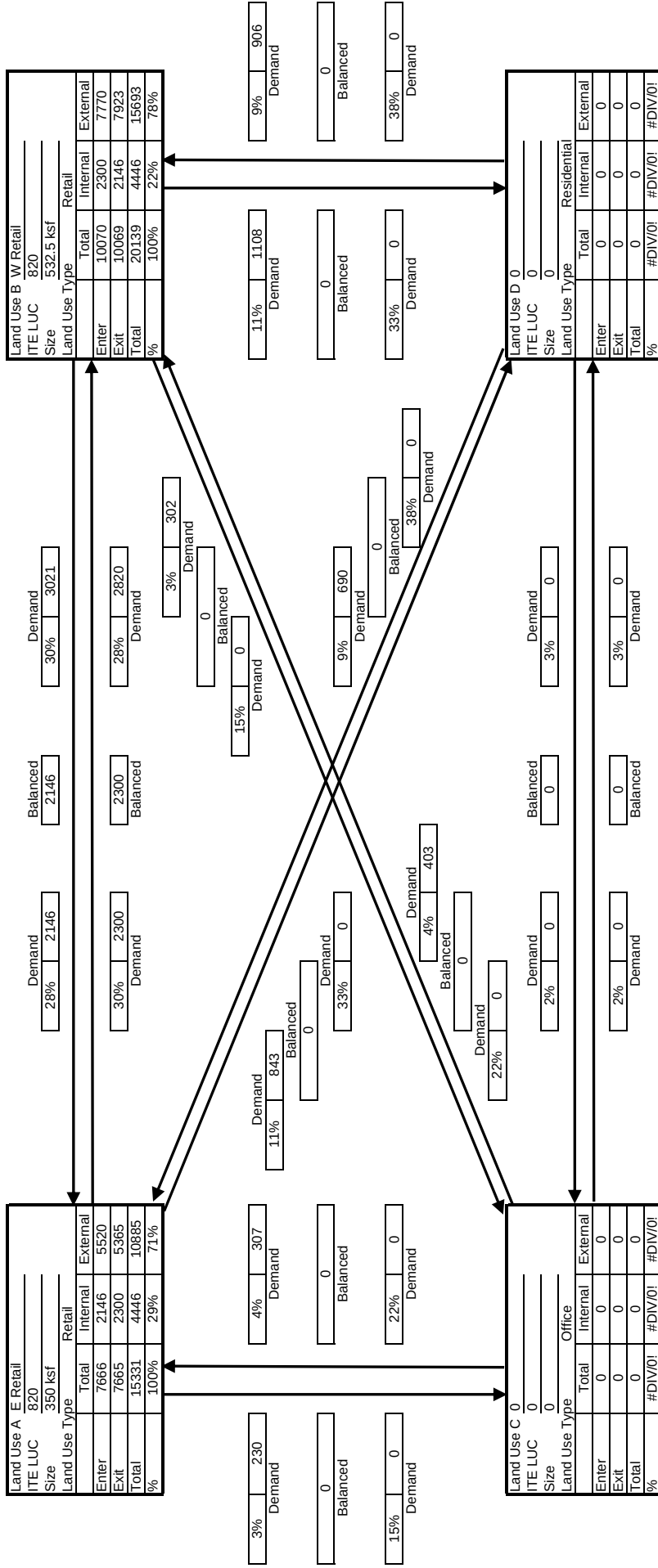
Appendix C

Retail to Retail Shared Trips Worksheets

Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Rebecca L. E
Date: 12/6/2012

Project Name: Woodmont PUD - E&W Retail+Res
Time Period: Weekday Daily



Net External Trips for Multi-Use Development					
Land Use	A	B	C	D	Total
Enter	5520	7770	0	0	13290
Exit	5365	7923	0	0	13288
Total External Trips	10885	15693	0	0	26578
Single-Use Trip Gen. Est.	15331	20139	0	0	35470
Net Internal Trips	4446	4446	0	0	8892

Project Name: Woodmont PUD - E&W Retail-Rel
Time Period: Weekday AM Peak Hour

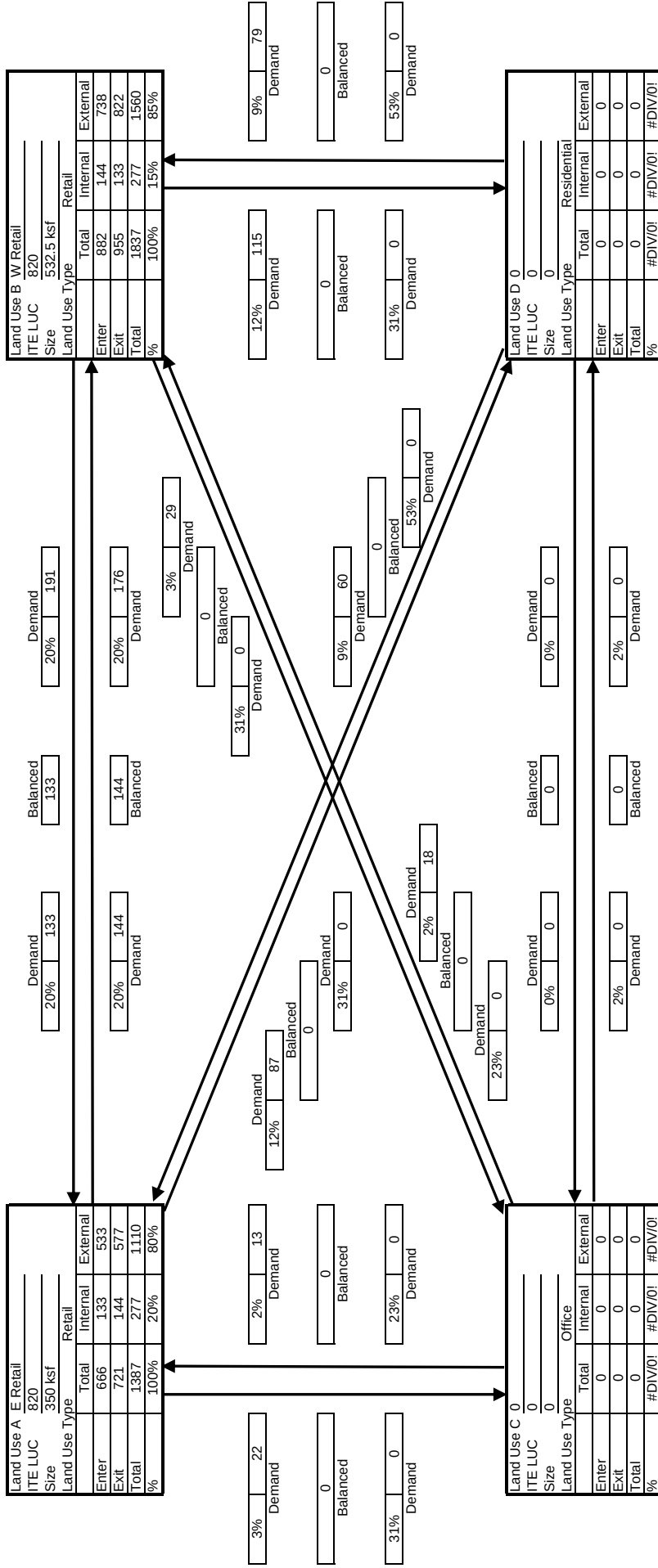
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Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Rebecca L. E
Date: 12/6/2012

Project Name: Woodmont PUD - E&W Retail+Res
Time Period: Weekday PM Peak Hour

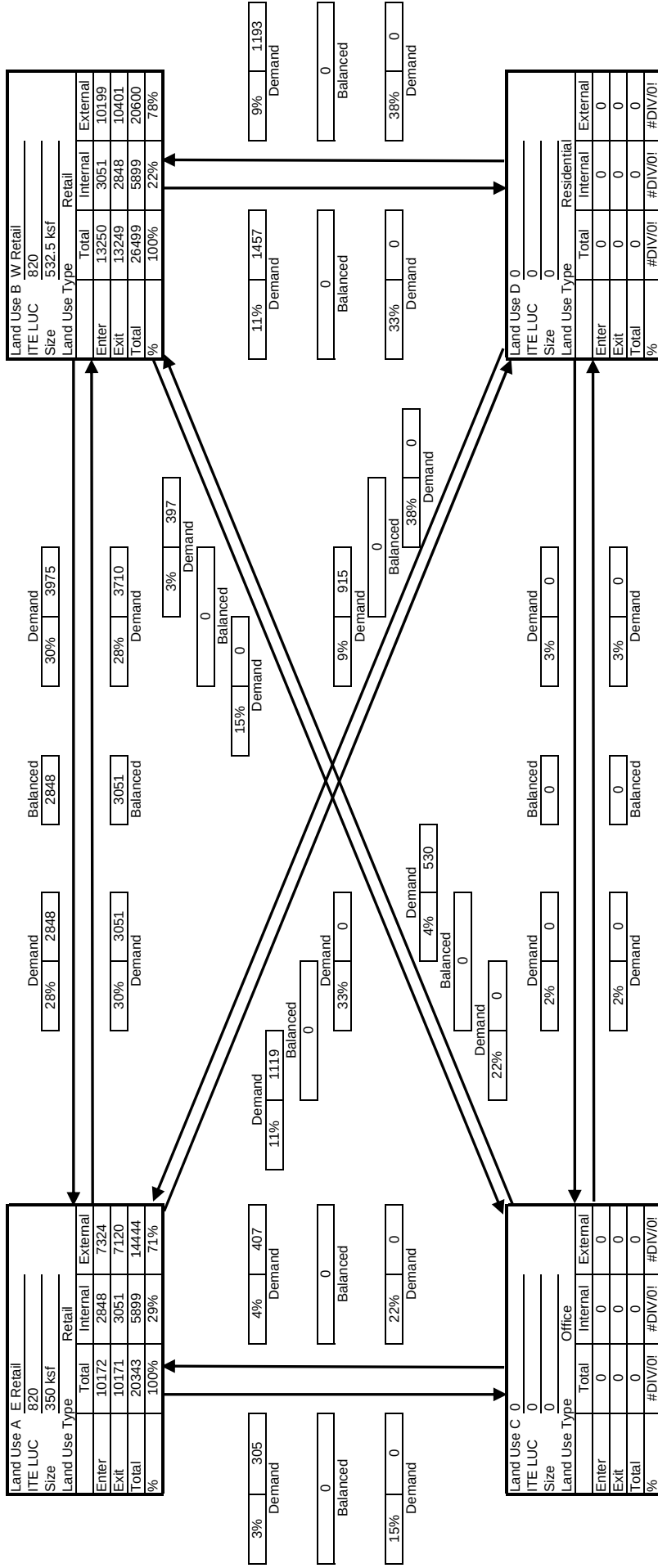


Net External Trips for Multi-Use Development					
Land Use	A	B	C	D	Total
Enter	533	738	0	0	1271
Exit	577	822	0	0	1399
Total External Trips	1110	1560	0	0	2670
Single-Use Trip Gen. Est.	1387	1837	0	0	3224
Net Internal Trips	277	277	0	0	554
					Internal Capture 17%

Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Rebecca L. E
Date: 12/6/2012

Project Name: Woodmont PUD - E&W Retail+Res
Time Period: Saturday Daily

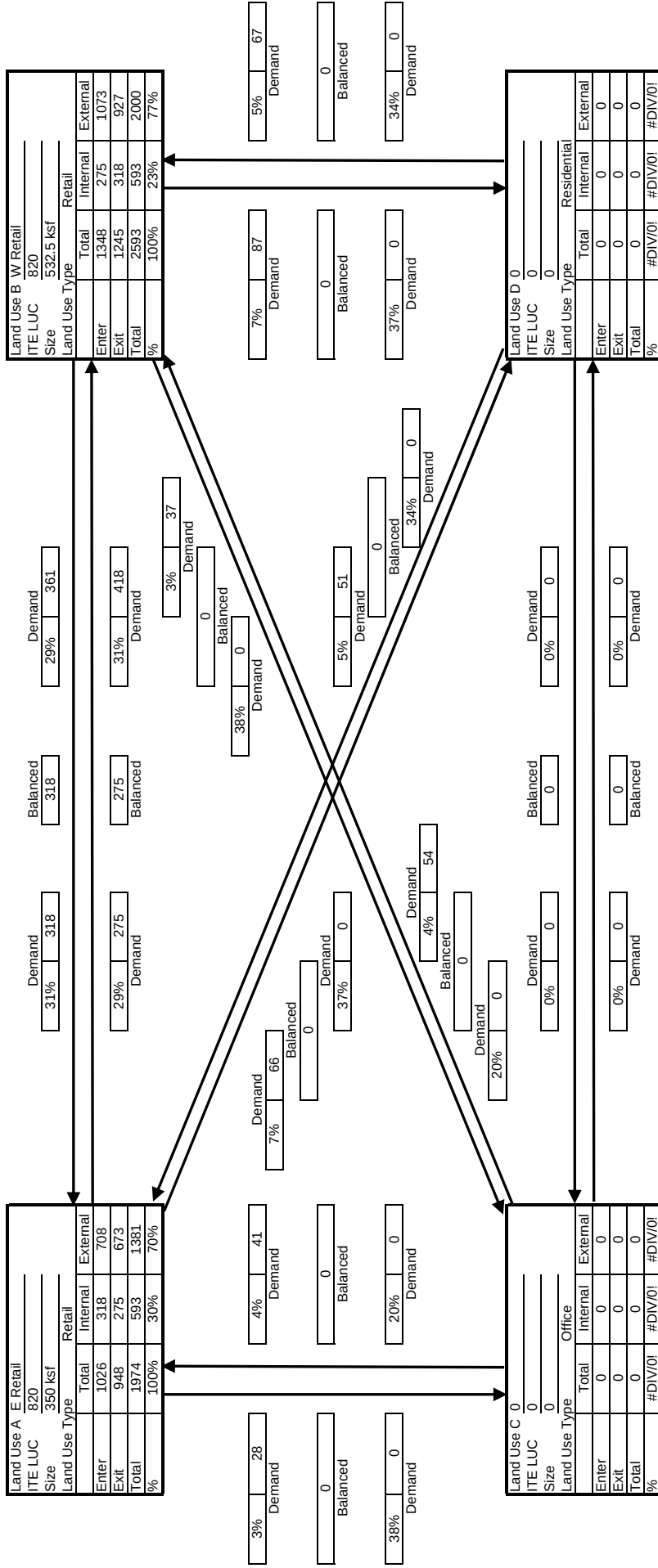


Net External Trips for Multi-Use Development					
Land Use	A	B	C	D	Total
Enter	7324	10199	0	0	17523
Exit	7120	10401	0	0	17521
Total External Trips	14444	20600	0	0	35044
Single-Use Trip Gen. Est.	20343	26499	0	0	46842
Net Internal Trips	5899	5899	0	0	11798

Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Rebecca L. E
Date: 12/6/2012

Project Name: Woodmont PUD - E&W Retail+Res
Time Period: Saturday Midday



Net External Trips for Multi-Use Development					
Land Use	A	B	C	D	Total
Enter	708	1073	0	0	1781
Exit	673	927	0	0	1600
Total External Trips	1381	2000	0	0	3381
Single-Use Trip Gen. Est.	1974	2593	0	0	4567
Net Internal Trips	593	593	0	0	1186

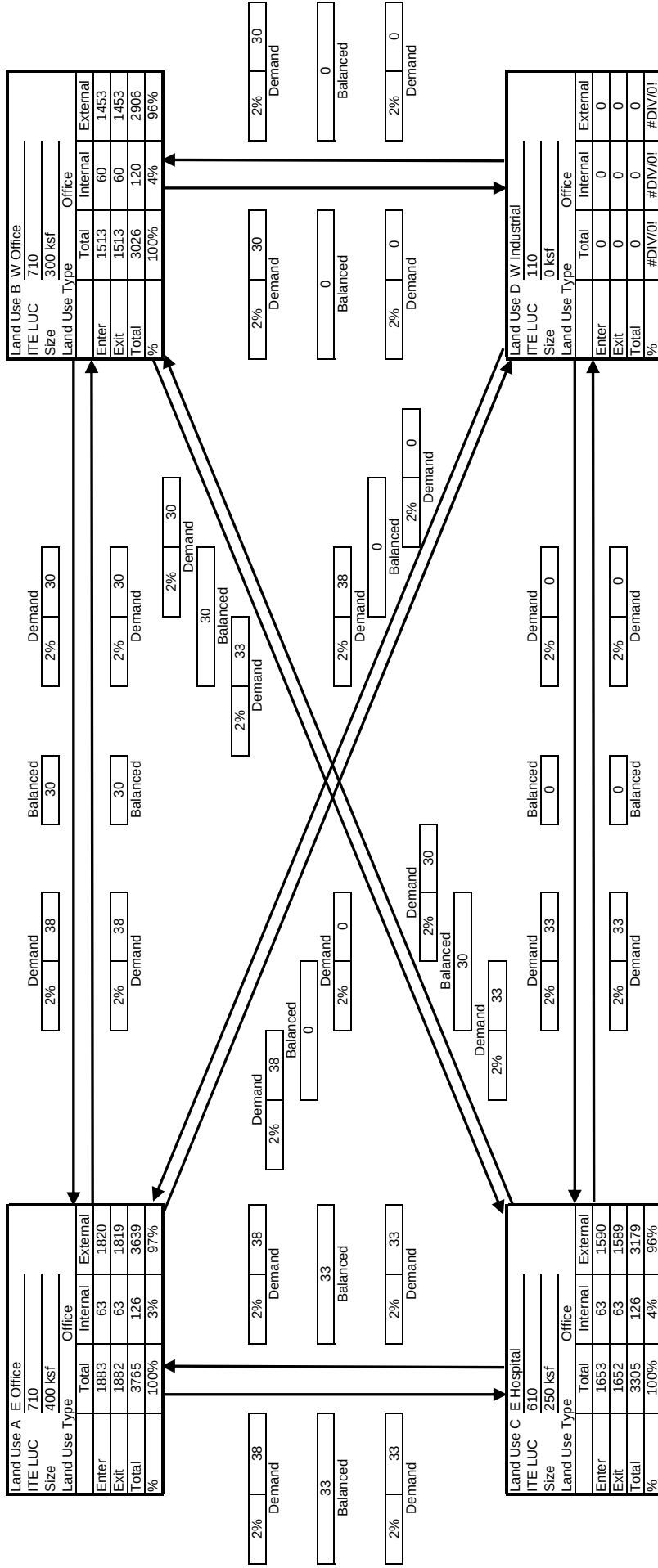
Appendix D

Office to Office Shared Trips Worksheet

Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Rebecca L. E
Date: 12/6/2012

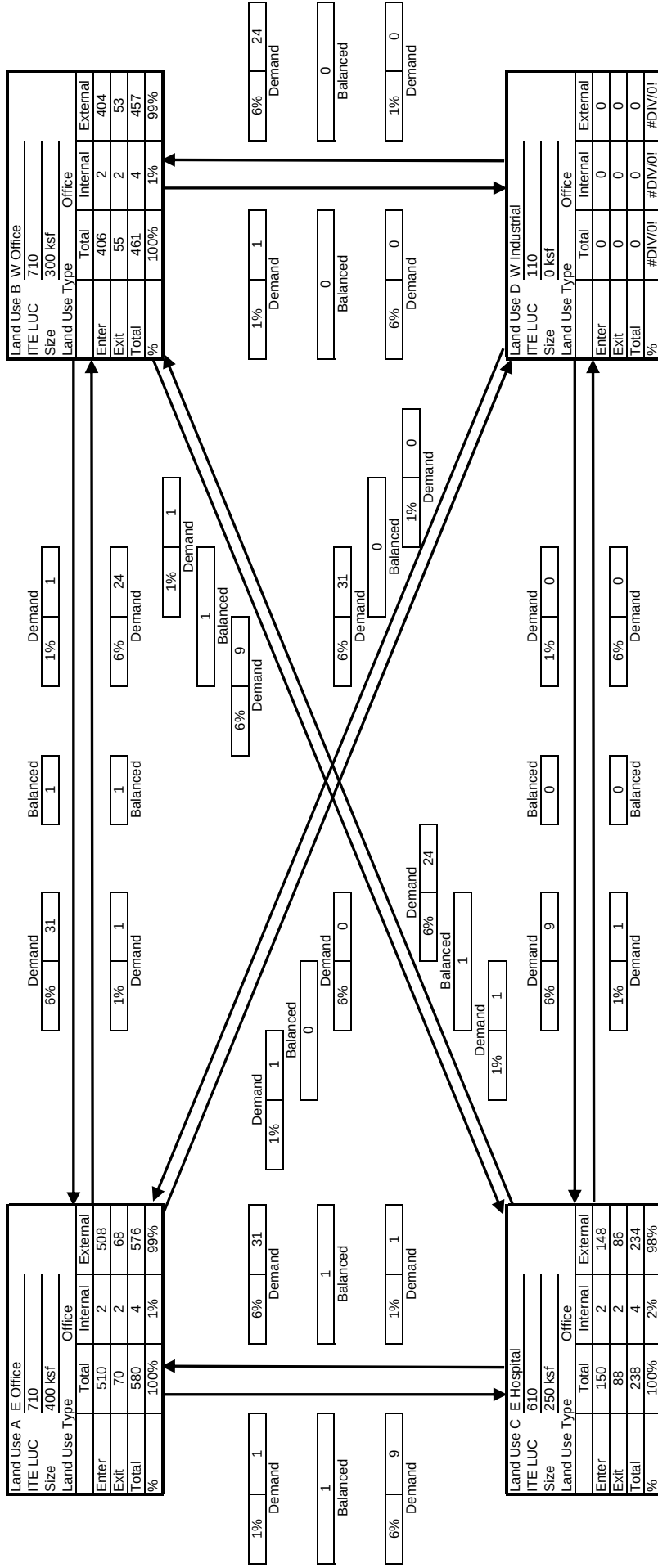
Project Name: Woodmont PUD - E&W Office-Off
Time Period: Weekday Daily



Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Rebecca L. E
Date: 12/6/2012

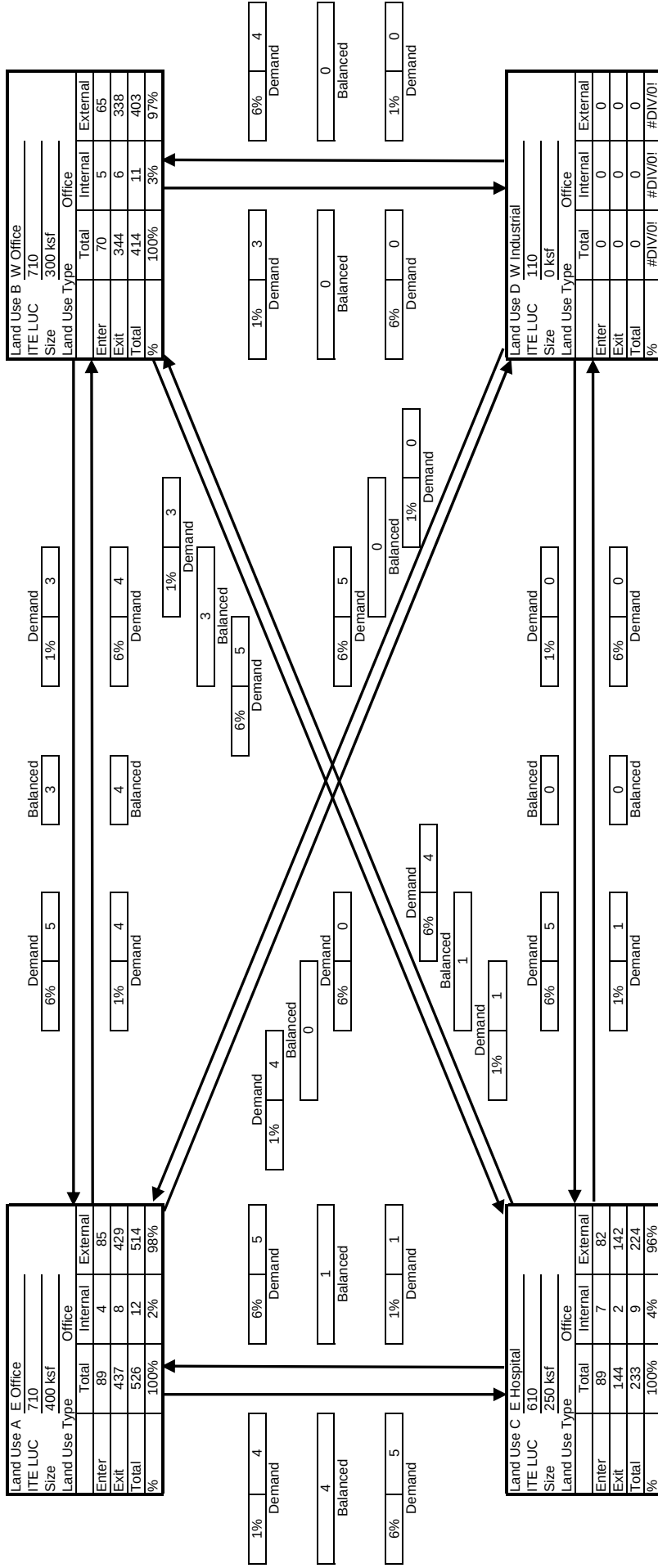
Project Name: Woodmont PUD - E&W Office-Off
Time Period: Weekday AM Peak Hour



Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Rebecca L. E
Date: 12/6/2012

Project Name: Woodmont PUD - E&W Office-Off
Time Period: Weekday PM Peak Hour

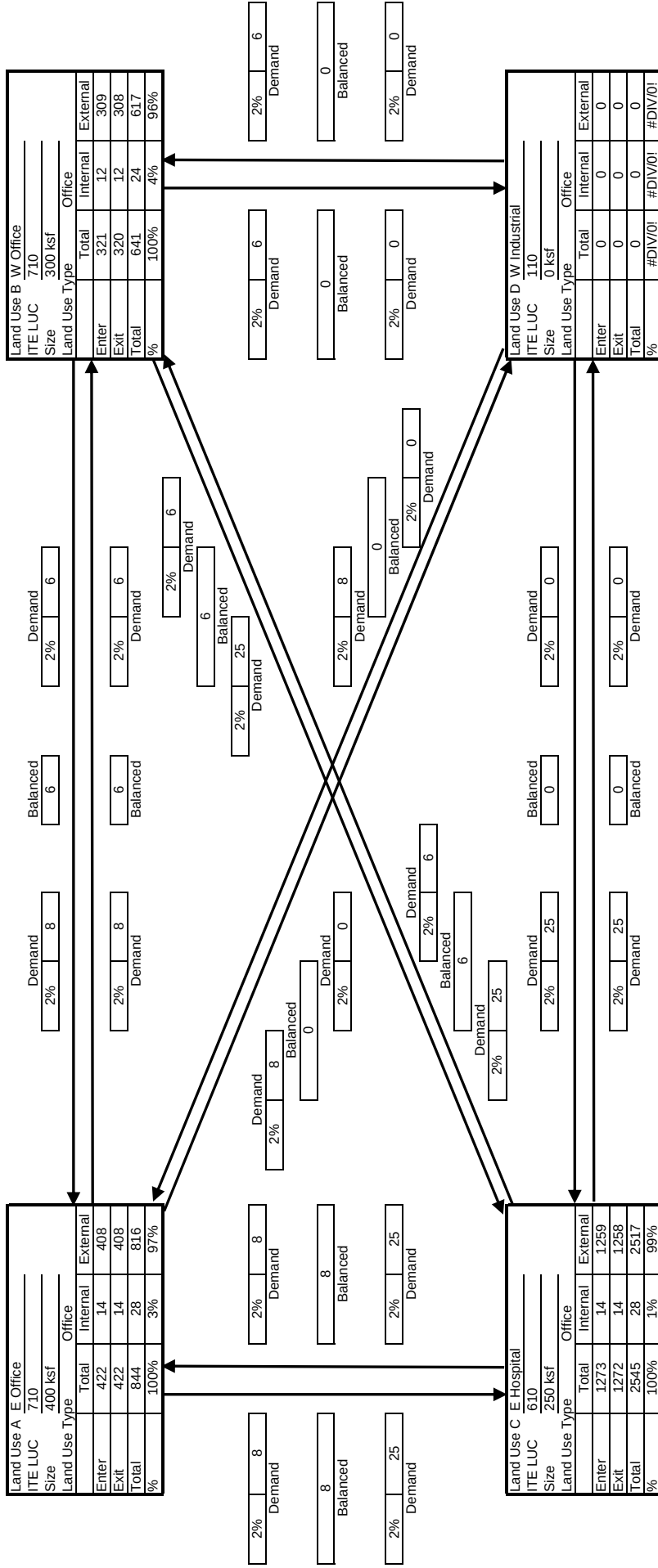


Net External Trips for Multi-Use Development					
Land Use	A	B	C	D	Total
Enter	85	65	82	0	232
Exit	429	338	142	0	909
Total External Trips	514	403	224	0	1141
Single-Use Trip Gen. Est.	526	414	233	0	1173
Net Internal Trips	12	11	9	0	32
					Internal Capture 3%

Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Rebecca L. E
Date: 12/6/2012

Project Name: Woodmont PUD - E&W Office-Off
Time Period: Saturday Daily

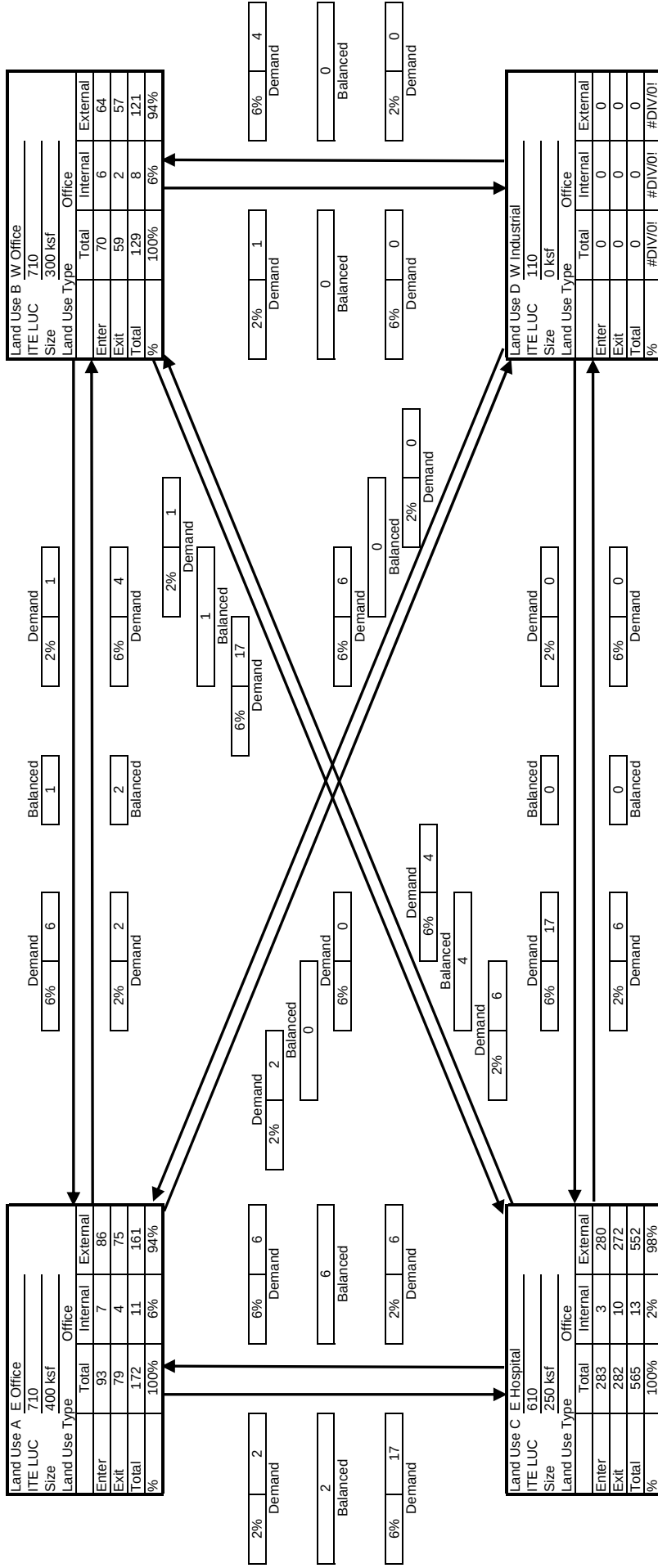


Net External Trips for Multi-Use Development					
Land Use	A	B	C	D	Total
Enter	408	309	1259	0	1976
Exit	408	308	1258	0	1974
Total External Trips	816	617	2517	0	3950
Single-Use Trip Gen. Est.	844	641	2545	0	4030
Net Internal Trips	28	24	28	0	80

Multi-Use Trip Generation Calculation

Analyst: TEC, Inc. / Rebecca L. E
Date: 12/6/2012

Project Name: Woodmont PUD - E&W Office-Off
Time Period: Saturday Midday



Net External Trips for Multi-Use Development					
Land Use	A	B	C	D	Total
Enter	86	64	280	0	430
Exit	75	57	272	0	404
Total External Trips	161	121	552	0	834
Single-Use Trip Gen. Est.	172	129	565	0	866
Net Internal Trips	11	8	13	0	32

Appendix E

Internal Capture Rate Calculations

Internal Capture Rate Calculations

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
 Date: December 11, 2012
 Source: Institute of Transportation Engineers - Trip Generation - 8th Ed.

Time Period	Total Trips			Shared Trips				Cross-Zone Shared Trips			Internal Shared Trips	
	East	West	Total	Mixed-Use	East-West Retail-Retail	East-West Office-Office	Total	Percentage	Trips	Percentage	Trips	Percentage
Weekday Daily	26,725	33,761	60,486	12840	8892	372	22104	36.5%	N/A	N/A	N/A	N/A
Weekday AM	1,449	1,621	3,070	362	116	12	490	16.0%	322	10.5%	168	5.5%
Weekday PM	2,521	3,165	5,686	1132	554	32	1718	30.2%	1224	21.5%	494	8.7%
Saturday Daily	27,849	37,804	65,653	12304	11798	80	24182	36.8%	N/A	N/A	N/A	N/A
Saturday Middy	3,052	3,561	6,613	1104	1186	32	2322	35.1%	1826	27.6%	496	7.5%

Shared Trips Calculations - Weekday AM

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
Date: December 10, 2012

		To						Southwest					
		East			Northwest			Office			Industrial		
		Retail	Office	Hospital	Residential	Hotel	Retail	Office	Industrial	Residential	Hotel	Retail	Office
From	Southwest	127	0	2	1	63	8	0	0	43	0	260	406
		Retail	0	2	1	6	1	0	0	4	0	24	1
		Office	70	0	1	0	0	0	0	0	0	2	1
		Hospital	88	1	0	0	0	0	0	1	0	3	1
	Northwest	148	5	0	0	0	0	0	0	0	0	6	0
		Residential	148	5	0	0	0	0	0	0	0	6	0
		Hotel	43	7	0	0	0	0	0	0	0	8	0
		Hotel	43	7	0	0	0	0	0	0	0	8	0
	East	5	1	0	0	0	0	0	0	1	0	0	0
		Retail	5	1	0	0	0	0	0	1	0	0	0
		Office	0	0	0	0	0	0	0	0	0	0	0
		Office	0	0	0	0	0	0	0	0	0	0	0
	Southwest	152	5	0	0	0	0	0	0	0	0	6	0
		Residential	152	5	0	0	0	0	0	0	0	6	0
		Hotel	0	0	0	0	0	0	0	0	0	0	0
		Hotel	0	0	0	0	0	0	0	0	0	0	0
	Southwest	159	32	2	1	7	0	0	0	5	0	0	2
		Retail	159	32	2	1	0	0	0	5	0	0	2
		Office	55	1	1	0	0	0	0	0	0	1	0
		Office	55	1	1	0	0	0	0	0	0	1	0
	Southwest	0	0	0	0	0	0	0	0	0	0	0	0
		Industrial	0	0	0	0	0	0	0	0	0	0	0
		Residential	271	9	0	0	1	0	0	0	0	11	0
		Residential	271	9	0	0	1	0	0	0	0	11	0
	Southwest	76	12	0	0	0	0	0	0	0	0	16	0
		Hotel	76	12	0	0	0	0	0	0	0	16	0

Note: Colored boxes require rounding to ensure shared trips worksheet matches these number:

Actual Value Check	
Required Value	Actual Value
10	35
43	3
43	43

0 No Industrial SF at time when created. If industrial SF is added, these will need to be updated with formulas.

0 No Office SF in Northwest at time when created. If Office SF is added, these will need to be updated with formulas.

Shared Trips Calculations - Weekday PM

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
Date: December 10, 2012

To															
East					Northwest				Southwest						
	Retail	Office	Hospital	Residential	Hotel	Retail	Office	Industrial	Residential	Hotel	Retail	Office	Industrial	Residential	
From	East					Northwest					Southwest				
	Retail	666	89	89	166	61	25	0	0	0	857	70	0	293	
	Office	437	0	4	2	1	0	0	1	0	8	4	0	3	
	Hospital	144	2	1	1	0	0	0	0	0	3	1	0	1	
	Residential	89	16	0	0	0	1	0	0	0	20	0	0	0	
	Hotel	59	13	0	0	0	1	0	0	0	17	0	0	0	
	Retail	27	4	0	1	0	0	0	1	0	0	0	0	1	
	Office	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Residential	88	16	0	0	0	1	0	0	0	20	0	0	0	
	Hotel	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Northwest					Southwest					Southwest				
Retail	928	10	10	28	10	0	0	0	28	0	0	8	0	51	
Office	344	3	3	1	0	1	0	0	1	0	6	0	0	2	
Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Residential	158	28	0	0	0	1	0	0	0	0	36	0	0	0	
Hotel	103	24	0	0	0	1	0	0	0	0	30	0	0	0	

Note: Colored boxes require rounding to ensure shared trips worksheet matches these number:

Required Value	Actual Value Check			
31	50	193	52	193
139	0	12	3	12
86	0			86

0 No Industrial SF at time when created. If industrial SF is added, these will need to be updated with formulas.

0 No Office SF in Northwest at time when created. If Office SF is added, these will need to be updated with formulas.

Shared Trips Calculations - Saturday MIDDAY

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
Date: December 10, 2012

		To														
		East					Northwest				Southwest					
		Retail	Office	Hospital	Residential	Hotel	Retail	Office	Industrial	Residential	Hotel	Retail	Office	Industrial	Residential	Hotel
From	Southwest	1026	93	283	98	80	38	0	0	0	105	1310	70	0	186	138
		Retail	0	6	18	16	13	8	0	0	17	267	4	0	30	22
		Office	7	0	2	0	0	0	0	0	0	9	2	0	0	0
	Northwest	282	6	0	0	0	1	0	0	0	0	31	4	0	0	0
		Hospital	24	6	0	0	0	0	0	0	0	16	0	0	0	0
		Residential	101	0	0	0	0	0	0	0	0	12	0	0	0	0
		Hotel	62	0	0	0	0	0	0	0	0	0	0	0	0	0
	East	35	0	1	0	0	0	0	0	0	1	0	0	0	1	1
		Retail	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Office	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Southwest	108	0	0	0	0	0	1	0	0	0	18	0	0	0	0
		Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Residential	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hotel		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Retail		1210	8	23	20	16	0	0	0	21	0	6	0	38	29	
Office		59	1	1	0	0	0	0	0	0	7	0	0	0	0	
Southwest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Residential	194	0	0	0	0	0	0	0	0	32	0	0	0	0	
Hotel	108	0	0	0	0	1	0	0	0	20	0	0	0	0	0	

Note: Colored boxes require rounding to ensure shared trips worksheet matches these number:

Required Value		Actual Value Check	
84	66	84	66
119	0	119	0
58	0	58	0

0 No Industrial SF at time when created. If industrial SF is added, these will need to be updated with formulas.

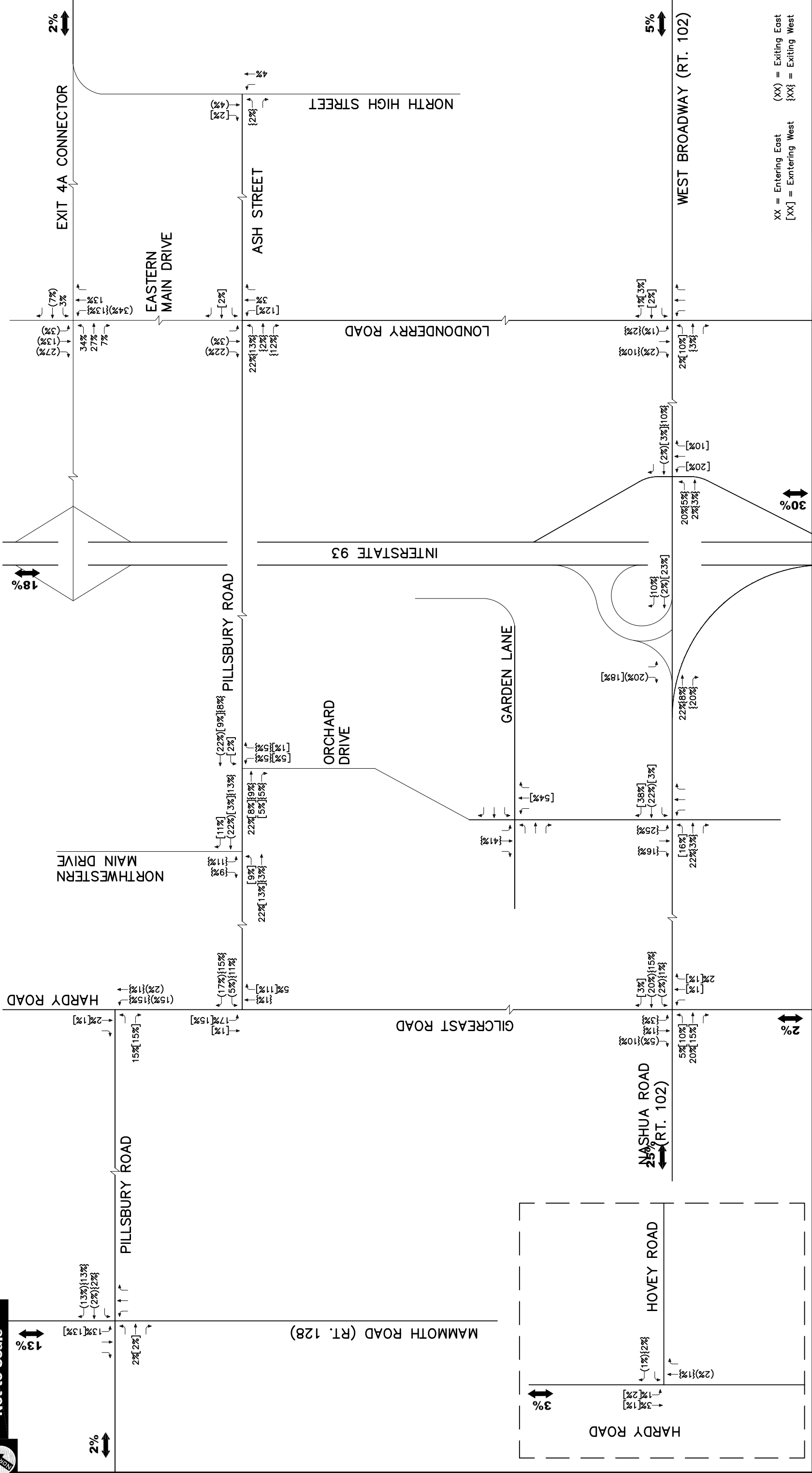
0 No Office SF in Northwest at time when created. If Office SF is added, these will need to be updated with formulas.

Attachment I

Trip Distribution



Not to Scale



XX = Entering East (XX) = Exiting East
[XX] = Exntering West {XX} = Exiting West

Figure I-1

Residential Trip Distribution



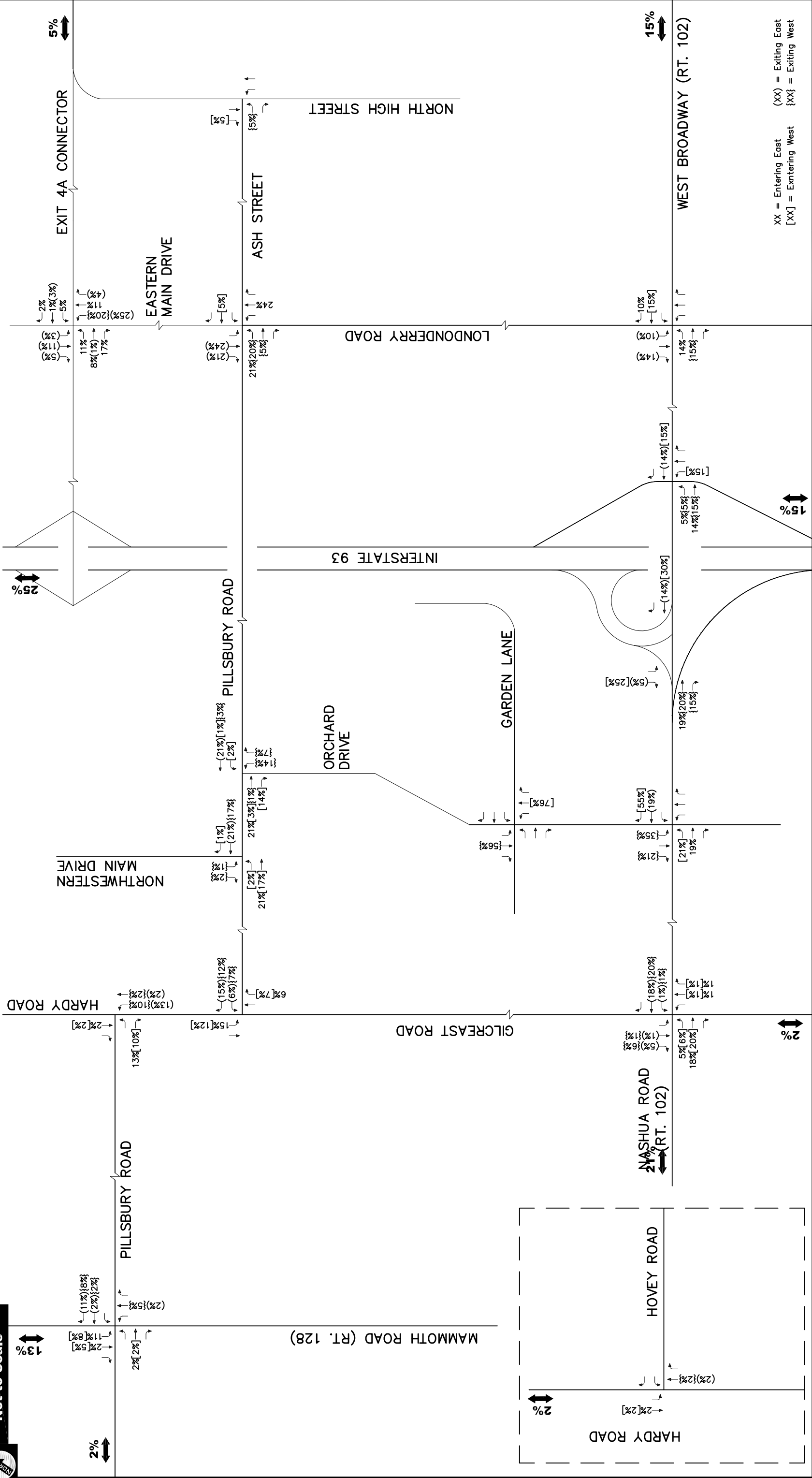
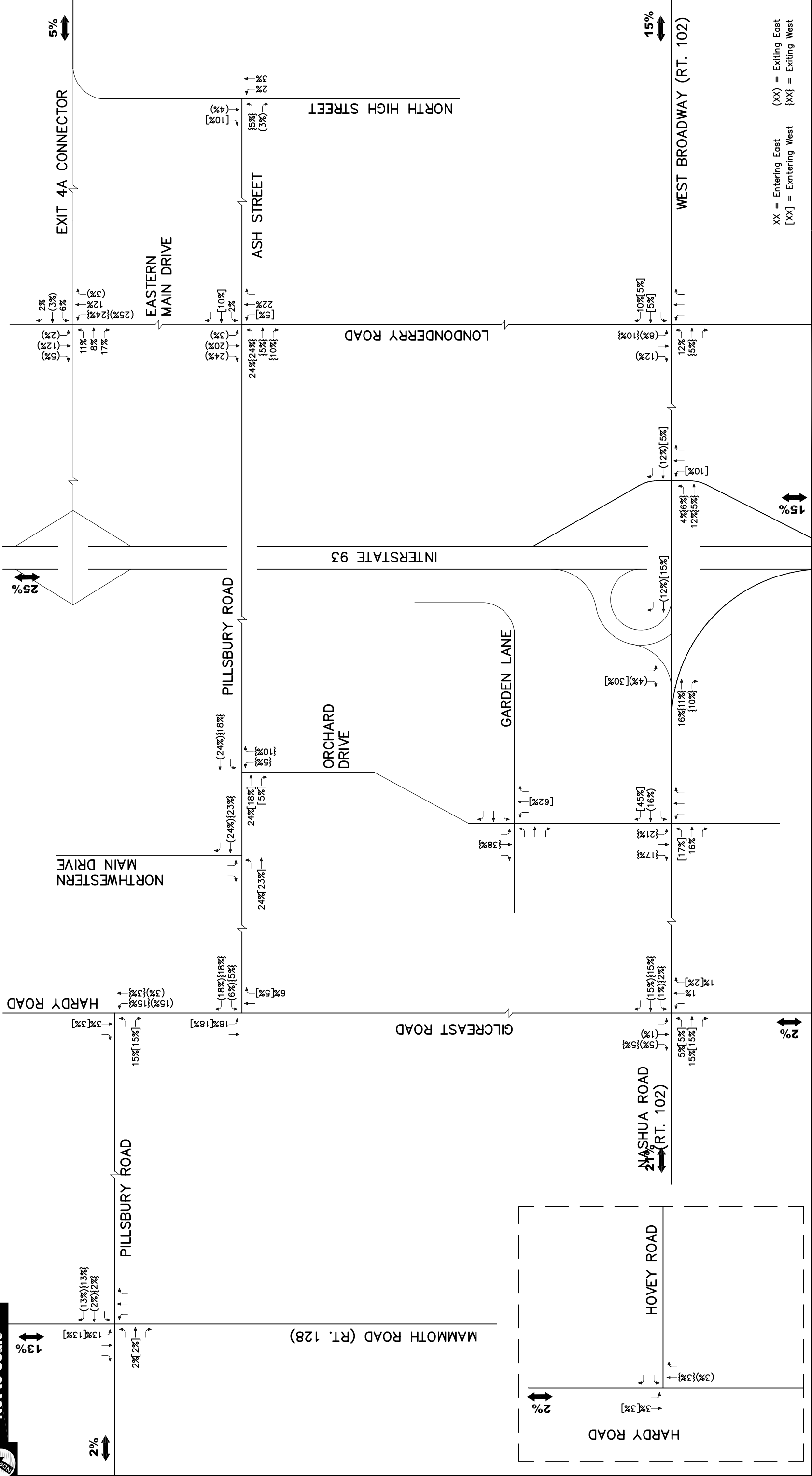


Figure I-2



Retail & Commercial Trip Distribution

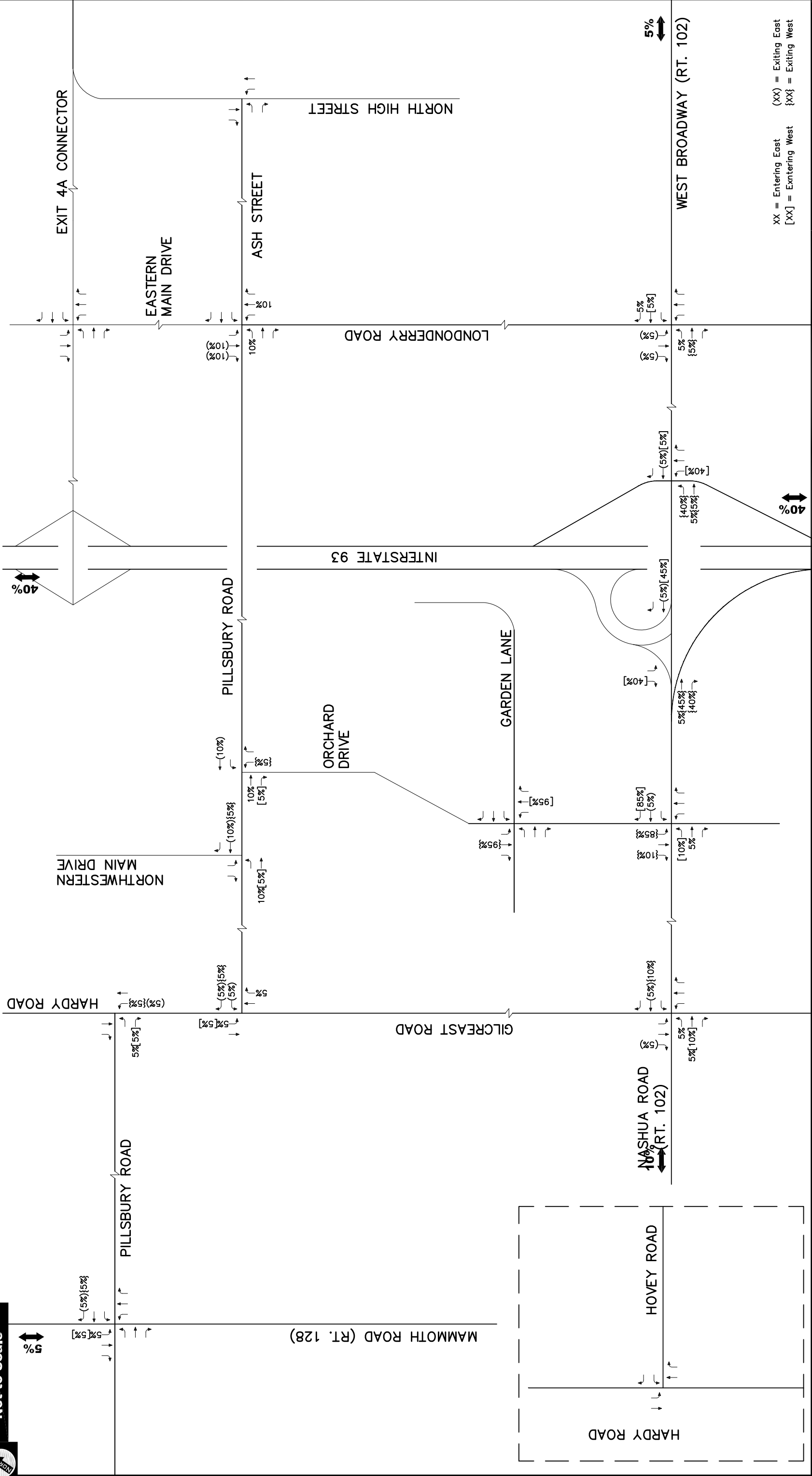


XX = Entering East (XX) = Exiting East
[XX] = Exntering West {XX} = Exiting West

Figure I-3

Office Trip Distribution





XX = Entering East (XX) = Exiting East
[XX] = Exntering West {XX} = Exiting West

Figure I-4

Office Trip Distribution



Attachment J

Interchange 4A Diversions

Figure 4.1-15
2030 AM Peak Hour -
Alternative A Traffic On
I-93 And At Exits 4, 4A And 5

Note

Map is not to scale.

Data Sources

CLD Consulting Engineers, Inc., 2010.
Southern New Hampshire Planning Commission, 2010.

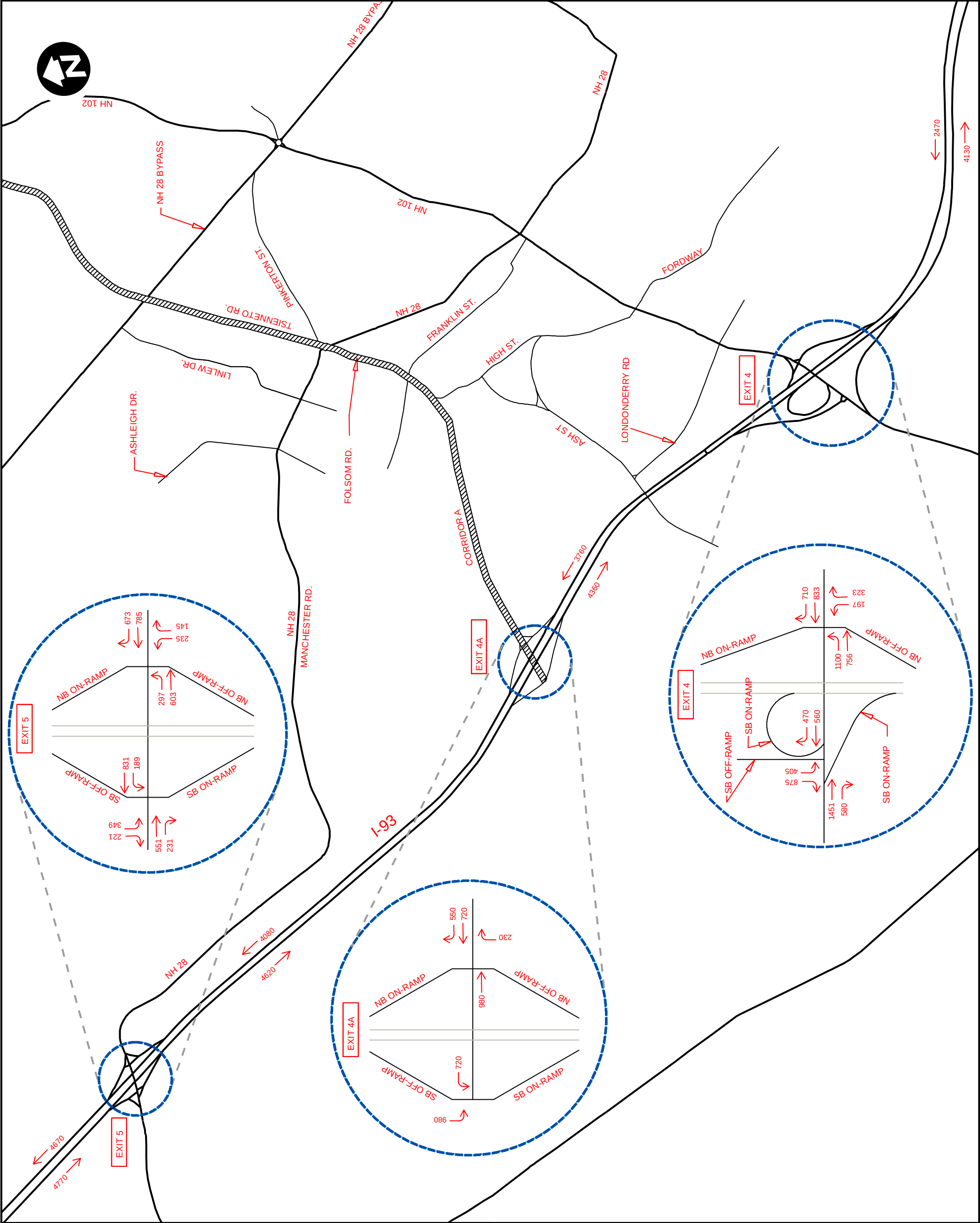
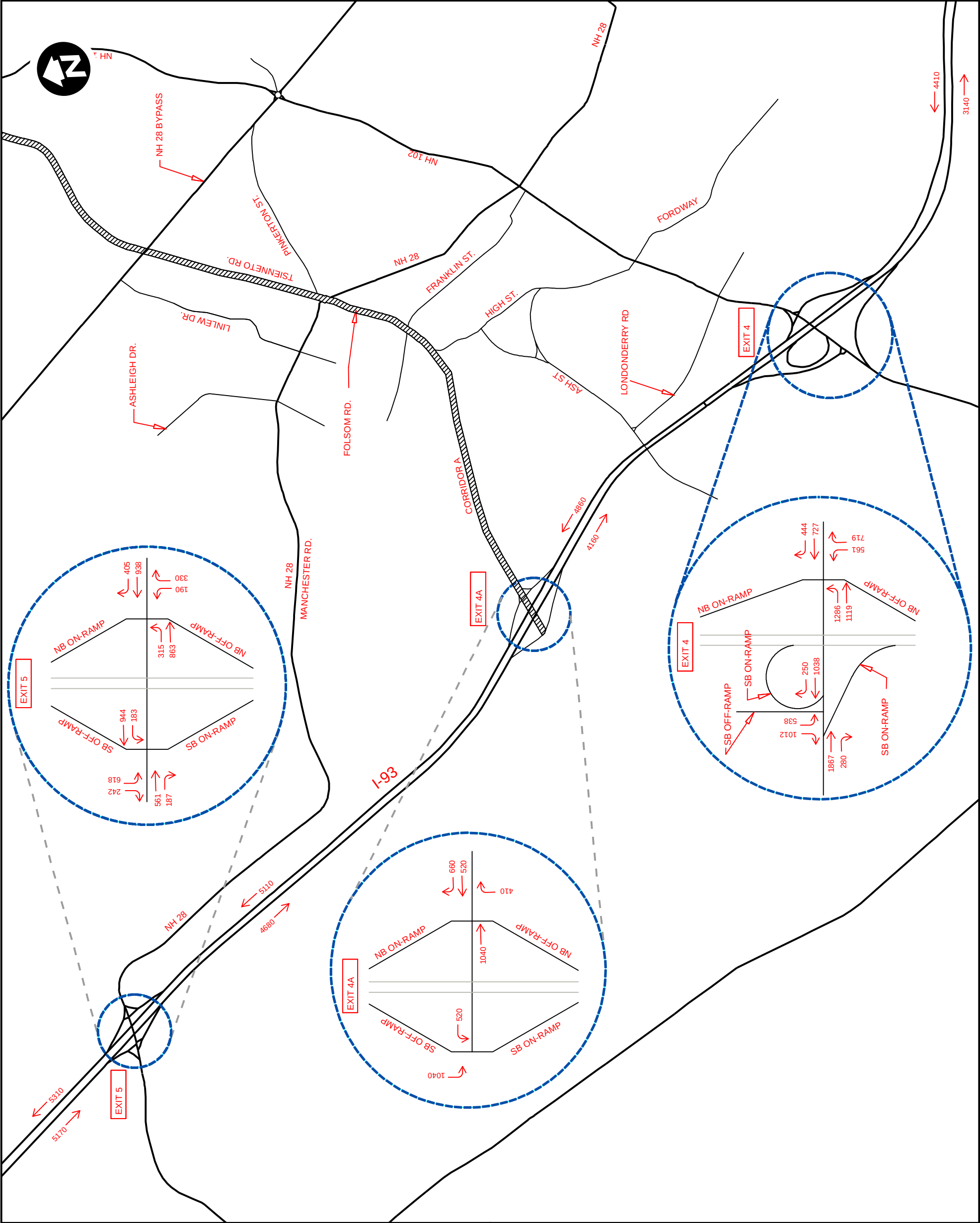


Figure 4.1-16
2030 PM Peak Hour -
Alternative A Traffic On
I-93 And At Exits 4, 4A And 5



Note

Map is not to scale.

Data Sources

CLD Consulting Engineers, Inc., 2010.
Southern New Hampshire Planning Commission, 2010.

Attachment K

Intersection Capacity Analyses

Unsignalized Intersections

Existing

Lanes, Volumes, Timings

Existing Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	565	4	1	1214	28	2	0	2	4	2	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	11	12	12	12	12	12	11
Storage Length (ft)	100		0	0		50	0		0	0		50
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.932				0.850
Flt Protected	0.950							0.976			0.966	
Satd. Flow (prot)	1694	1826	0	0	1801	1561	0	1728	0	0	1557	1546
Flt Permitted	0.950							0.976			0.966	
Satd. Flow (perm)	1694	1826	0	0	1801	1561	0	1728	0	0	1557	1546
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1575			2000			500			3130	
Travel Time (s)		30.7			39.0			11.4			71.1	
Peak Hour Factor	0.76	0.76	0.76	0.95	0.95	0.95	0.50	0.50	0.50	0.84	0.84	0.84
Heavy Vehicles (%)	3%	4%	0%	0%	2%	0%	0%	0%	0%	25%	0%	1%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)

Existing Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	95	565	4	1	1214	28	2	0	2	4	2	116
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.95	0.95	0.95	0.50	0.50	0.50	0.84	0.84	0.84
Hourly flow rate (vph)	125	743	5	1	1278	29	4	0	4	5	2	138
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												2
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1307			749			2277	2306	746	2277	2279	1278
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1307			749			2277	2306	746	2277	2279	1278
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.7	4.0	3.3
p0 queue free %	76			100			44	100	99	76	92	32
cM capacity (veh/h)	526			869			7	30	417	19	31	204
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	125	749	1279	29	8	145						
Volume Left	125	0	1	0	4	5						
Volume Right	0	5	0	29	4	138						
cSH	526	1700	869	1700	14	215						
Volume to Capacity	0.24	0.44	0.00	0.02	0.57	0.68						
Queue Length 95th (ft)	23	0	0	0	35	106						
Control Delay (s)	14.0	0.0	0.1	0.0	439.8	61.3						
Lane LOS	B		A		F	F						
Approach Delay (s)	2.0		0.1		439.8	61.3						
Approach LOS					F	F						
Intersection Summary												
Average Delay			6.1									
Intersection Capacity Utilization			88.9%		ICU Level of Service				E			
Analysis Period (min)			15									

Lanes, Volumes, Timings
8: Pillsbury Road & Hardy Road

Existing Conditions
Weekday Morning

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	34	241	94	68	178	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	13	13	12	12
Storage Length (ft)	0	50	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.978	
Flt Protected	0.950			0.972		
Satd. Flow (prot)	1865	1561	0	1892	1858	0
Flt Permitted	0.950			0.972		
Satd. Flow (perm)	1865	1561	0	1892	1858	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	5550			780	8200	
Travel Time (s)	108.1			15.2	159.7	
Peak Hour Factor	0.91	0.91	0.77	0.77	0.73	0.73
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Stop	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

8: Pillsbury Road & Hardy Road

Existing Conditions

Weekday Morning

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	34	241	94	68	178	35
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.77	0.77	0.73	0.73
Hourly flow rate (vph)	37	265	122	88	244	48
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		245	75	340	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		245	75	340	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	98		73	89	57	96
cM capacity (veh/h)	1636		448	797	572	1091
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	37	265	210	292		
Volume Left	37	0	122	0		
Volume Right	0	265	0	48		
cSH	1636	1700	548	620		
Volume to Capacity	0.02	0.16	0.38	0.47		
Queue Length 95th (ft)	2	0	45	63		
Control Delay (s)	7.3	0.0	15.6	15.8		
Lane LOS	A		C	C		
Approach Delay (s)	0.9		15.6	15.8		
Approach LOS			C	C		
Intersection Summary						
Average Delay			10.2			
Intersection Capacity Utilization			33.6%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
9: Gilcreast Road & Pillsbury Road

Existing Conditions
Weekday Morning

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	138	55	107	70	95	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.962		0.947			
Flt Protected	0.965					0.989
Satd. Flow (prot)	1646	0	1788	0	0	1879
Flt Permitted	0.965					0.989
Satd. Flow (perm)	1646	0	1788	0	0	1879
Link Speed (mph)	30		35			35
Link Distance (ft)	2825		1000			780
Travel Time (s)	64.2		19.5			15.2
Peak Hour Factor	0.90	0.90	0.98	0.98	0.84	0.84
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Stop		Stop			Stop
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

9: Gilcreast Road & Pillsbury Road

Existing Conditions

Weekday Morning

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	138	55	107	70	95	324
Peak Hour Factor	0.90	0.90	0.98	0.98	0.84	0.84
Hourly flow rate (vph)	153	61	109	71	113	386
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	214	181	499			
Volume Left (vph)	153	0	113			
Volume Right (vph)	61	71	0			
Hadj (s)	-0.03	-0.23	0.05			
Departure Headway (s)	5.5	4.9	4.8			
Degree Utilization, x	0.33	0.25	0.67			
Capacity (veh/h)	597	683	726			
Control Delay (s)	11.2	9.6	16.9			
Approach Delay (s)	11.2	9.6	16.9			
Approach LOS	B	A	C			
Intersection Summary						
Delay			14.0			
Level of Service			B			
Intersection Capacity Utilization			53.2%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
12: Londonderry Road & Pillsbury Road/Ash Street

Existing Conditions
Weekday Morning

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	178	29	76	166	21	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.981				0.905	
Flt Protected				0.985	0.985	
Satd. Flow (prot)	1786	0	0	1797	1725	0
Flt Permitted				0.985	0.985	
Satd. Flow (perm)	1786	0	0	1797	1725	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1000			3600	3130	
Travel Time (s)	22.7			81.8	71.1	
Peak Hour Factor	0.74	0.74	0.90	0.90	0.82	0.82
Heavy Vehicles (%)	1%	0%	0%	1%	5%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

12: Londonderry Road & Pillsbury Road/Ash Street

Existing Conditions

Weekday Morning

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	178	29	76	166	21	51
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.90	0.90	0.82	0.82
Hourly flow rate (vph)	241	39	84	184	26	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			280		613	260
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			280		613	260
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		94	92
cM capacity (veh/h)			1295		421	783
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	280	269	88			
Volume Left	0	84	26			
Volume Right	39	0	62			
cSH	1700	1295	626			
Volume to Capacity	0.16	0.07	0.14			
Queue Length 95th (ft)	0	5	12			
Control Delay (s)	0.0	2.9	11.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.9	11.7			
Approach LOS			B			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			38.4%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
13: North High Street & Ash Street

Existing Conditions
Weekday Morning

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	183	1	5	109	146	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.918	
Flt Protected	0.953			0.998		
Satd. Flow (prot)	1851	0	0	1924	1795	0
Flt Permitted	0.953			0.998		
Satd. Flow (perm)	1851	0	0	1924	1795	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	3600			1000	1000	
Travel Time (s)	81.8			22.7	22.7	
Peak Hour Factor	0.81	0.81	0.72	0.72	0.89	0.89
Heavy Vehicles (%)	1%	0%	20%	1%	1%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

13: North High Street & Ash Street

Existing Conditions
Weekday Morning

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	183	1	5	109	146	223
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.72	0.72	0.89	0.89
Hourly flow rate (vph)	226	1	7	151	164	251
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	455	289	415			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	455	289	415			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	60	100	99			
cM capacity (veh/h)	562	755	1054			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	227	158	415			
Volume Left	226	7	0			
Volume Right	1	0	251			
cSH	562	1054	1700			
Volume to Capacity	0.40	0.01	0.24			
Queue Length 95th (ft)	49	0	0			
Control Delay (s)	15.7	0.4	0.0			
Lane LOS	C	A				
Approach Delay (s)	15.7	0.4	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			4.5			
Intersection Capacity Utilization			38.2%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
15: Hardy Road & Hovey Road

Existing Conditions
Weekday Morning

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	2	29	139	1	13	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		5%			-5%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.872		0.999			
Flt Protected	0.997					0.995
Satd. Flow (prot)	1539	0	1727	0	0	1677
Flt Permitted	0.997					0.995
Satd. Flow (perm)	1539	0	1727	0	0	1677
Link Speed (mph)	30		35			35
Link Distance (ft)	1000		8200			1000
Travel Time (s)	22.7		159.7			19.5
Peak Hour Factor	0.84	0.84	0.87	0.87	0.80	0.80
Heavy Vehicles (%)	0%	4%	3%	100%	9%	12%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

15: Hardy Road & Hovey Road

Existing Conditions

Weekday Morning

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	29	139	1	13	109
Sign Control	Stop		Free			Free
Grade	0%		5%			-5%
Peak Hour Factor	0.84	0.84	0.87	0.87	0.80	0.80
Hourly flow rate (vph)	2	35	160	1	16	136
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	329	160			161	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	329	160			161	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	100	96			99	
cM capacity (veh/h)	662	880			1377	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	37	161	152			
Volume Left	2	0	16			
Volume Right	35	1	0			
cSH	861	1700	1377			
Volume to Capacity	0.04	0.09	0.01			
Queue Length 95th (ft)	3	0	1			
Control Delay (s)	9.4	0.0	0.9			
Lane LOS	A		A			
Approach Delay (s)	9.4	0.0	0.9			
Approach LOS	A					
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			26.6%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)

Existing Conditions

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	196	1125	50	5	879	30	0	1	2	9	2	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	11	12	12	12	12	12	11
Storage Length (ft)	100		0	0		50	0		0	0		50
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.899				0.850
Flt Protected	0.950										0.962	
Satd. Flow (prot)	1728	1871	0	0	1801	1561	0	1708	0	0	1828	1546
Flt Permitted	0.950										0.962	
Satd. Flow (perm)	1728	1871	0	0	1801	1561	0	1708	0	0	1828	1546
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1575			2000			500			3130	
Travel Time (s)		30.7			39.0			11.4			71.1	
Peak Hour Factor	0.96	0.96	0.96	0.95	0.95	0.95	0.75	0.75	0.75	0.78	0.78	0.78
Heavy Vehicles (%)	1%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	1%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)

Existing Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	196	1125	50	5	879	30	0	1	2	9	2	142
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.95	0.95	0.95	0.75	0.75	0.75	0.78	0.78	0.78
Hourly flow rate (vph)	204	1172	52	5	925	32	0	1	3	12	3	182
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												2
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	957			1224			2543	2574	1198	2519	2568	925
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	957			1224			2543	2574	1198	2519	2568	925
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	72			99			100	93	99	17	86	44
cM capacity (veh/h)	723			577			6	19	228	14	19	327
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	204	1224	931	32	4	196						
Volume Left	204	0	5	0	0	12						
Volume Right	0	52	0	32	3	182						
cSH	723	1700	577	1700	48	180						
Volume to Capacity	0.28	0.72	0.01	0.02	0.08	1.09						
Queue Length 95th (ft)	29	0	1	0	7	240						
Control Delay (s)	11.9	0.0	0.3	0.0	86.7	145.2						
Lane LOS	B		A		F	F						
Approach Delay (s)	1.7		0.3		86.7	145.2						
Approach LOS					F	F						
Intersection Summary												
Average Delay			12.2									
Intersection Capacity Utilization			126.0%		ICU Level of Service		H					
Analysis Period (min)			15									

Lanes, Volumes, Timings
8: Pillsbury Road & Hardy Road

Existing Conditions
Weekday Evening

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	48	199	283	213	137	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	13	13	12	12
Storage Length (ft)	0	50	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.965	
Flt Protected	0.950			0.972		
Satd. Flow (prot)	1865	1561	0	1908	1834	0
Flt Permitted	0.950			0.972		
Satd. Flow (perm)	1865	1561	0	1908	1834	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	5550			780	8200	
Travel Time (s)	108.1			15.2	159.7	
Peak Hour Factor	0.85	0.85	0.91	0.91	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Stop	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

8: Pillsbury Road & Hardy Road

Existing Conditions

Weekday Evening

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	48	199	283	213	137	47
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.91	0.91	0.84	0.84
Hourly flow rate (vph)	56	234	311	234	163	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		250	113	347	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		250	113	347	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	97		39	69	71	95
cM capacity (veh/h)	1636		507	754	560	1091
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	56	234	545	219		
Volume Left	56	0	311	0		
Volume Right	0	234	0	56		
cSH	1636	1700	590	639		
Volume to Capacity	0.03	0.14	0.92	0.34		
Queue Length 95th (ft)	3	0	294	38		
Control Delay (s)	7.3	0.0	47.2	13.5		
Lane LOS	A		E	B		
Approach Delay (s)	1.4		47.2	13.5		
Approach LOS			E	B		
Intersection Summary						
Average Delay			27.6			
Intersection Capacity Utilization			50.3%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings
9: Gilcreast Road & Pillsbury Road

Existing Conditions
Weekday Evening

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	183	119	377	217	85	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.947		0.951			
Flt Protected	0.971					0.987
Satd. Flow (prot)	1631	0	1807	0	0	1875
Flt Permitted	0.971					0.987
Satd. Flow (perm)	1631	0	1807	0	0	1875
Link Speed (mph)	30		35			35
Link Distance (ft)	2825		1000			780
Travel Time (s)	64.2		19.5			15.2
Peak Hour Factor	0.78	0.78	0.93	0.93	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Stop		Stop			Stop
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

9: Gilcreast Road & Pillsbury Road

Existing Conditions

Weekday Evening

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	183	119	377	217	85	251
Peak Hour Factor	0.78	0.78	0.93	0.93	0.86	0.86
Hourly flow rate (vph)	235	153	405	233	99	292
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	387	639	391			
Volume Left (vph)	235	0	99			
Volume Right (vph)	153	233	0			
Hadj (s)	-0.12	-0.22	0.05			
Departure Headway (s)	6.5	5.8	6.4			
Degree Utilization, x	0.70	1.04	0.69			
Capacity (veh/h)	534	622	550			
Control Delay (s)	23.2	69.6	22.4			
Approach Delay (s)	23.2	69.6	22.4			
Approach LOS	C	F	C			
Intersection Summary						
Delay			43.9			
Level of Service			E			
Intersection Capacity Utilization			78.4%	ICU Level of Service		D
Analysis Period (min)			15			

Lanes, Volumes, Timings
12: Londonderry Road & Pillsbury Road/Ash Street

Existing Conditions
Weekday Evening

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations					 	
Volume (vph)	278	26	69	276	57	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.988				0.904	
Flt Protected				0.990	0.986	
Satd. Flow (prot)	1815	0	0	1811	1726	0
Flt Permitted				0.990	0.986	
Satd. Flow (perm)	1815	0	0	1811	1726	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1000			3600	3130	
Travel Time (s)	22.7			81.8	71.1	
Peak Hour Factor	0.88	0.88	0.85	0.85	0.83	0.83
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

12: Londonderry Road & Pillsbury Road/Ash Street

Existing Conditions
Weekday Evening

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	278	26	69	276	57	139
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.85	0.85	0.83	0.83
Hourly flow rate (vph)	316	30	81	325	69	167
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			345		818	331
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			345		818	331
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		79	76
cM capacity (veh/h)			1213		325	711
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	345	406	236			
Volume Left	0	81	69			
Volume Right	30	0	167			
cSH	1700	1213	529			
Volume to Capacity	0.20	0.07	0.45			
Queue Length 95th (ft)	0	5	57			
Control Delay (s)	0.0	2.2	17.2			
Lane LOS		A	C			
Approach Delay (s)	0.0	2.2	17.2			
Approach LOS			C			
Intersection Summary						
Average Delay			5.0			
Intersection Capacity Utilization			56.3%	ICU Level of Service		B
Analysis Period (min)			15			

Lanes, Volumes, Timings
13: North High Street & Ash Street

Existing Conditions
Weekday Evening

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	364	8	2	207	172	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997				0.915	
Flt Protected	0.953					
Satd. Flow (prot)	1865	0	0	1963	1796	0
Flt Permitted	0.953					
Satd. Flow (perm)	1865	0	0	1963	1796	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	3600			1000	1000	
Travel Time (s)	81.8			22.7	22.7	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

13: North High Street & Ash Street

Existing Conditions
Weekday Evening

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	364	8	2	207	172	293
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.90	0.90
Hourly flow rate (vph)	387	9	2	227	191	326
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	586	354	517			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	586	354	517			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	19	99	100			
cM capacity (veh/h)	475	694	1059			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	396	230	517			
Volume Left	387	2	0			
Volume Right	9	0	326			
cSH	478	1059	1700			
Volume to Capacity	0.83	0.00	0.30			
Queue Length 95th (ft)	202	0	0			
Control Delay (s)	39.3	0.1	0.0			
Lane LOS	E	A				
Approach Delay (s)	39.3	0.1	0.0			
Approach LOS	E					
Intersection Summary						
Average Delay			13.6			
Intersection Capacity Utilization			54.3%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
15: Hardy Road & Hovey Road

Existing Conditions
Weekday Evening

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	4	32	148	8	31	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		5%			-5%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.879		0.993			
Flt Protected	0.995					0.992
Satd. Flow (prot)	1606	0	1745	0	0	1852
Flt Permitted	0.995					0.992
Satd. Flow (perm)	1606	0	1745	0	0	1852
Link Speed (mph)	30		35			35
Link Distance (ft)	1000		8200			1000
Travel Time (s)	22.7		159.7			19.5
Peak Hour Factor	0.75	0.75	0.83	0.83	0.80	0.80
Heavy Vehicles (%)	0%	0%	2%	0%	0%	1%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

15: Hardy Road & Hovey Road

Existing Conditions

Weekday Evening

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	32	148	8	31	157
Sign Control	Stop		Free			Free
Grade	0%		5%			-5%
Peak Hour Factor	0.75	0.75	0.83	0.83	0.80	0.80
Hourly flow rate (vph)	5	43	178	10	39	196
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	457	183			188	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	457	183			188	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	95			97	
cM capacity (veh/h)	550	864			1398	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	48	188	235			
Volume Left	5	0	39			
Volume Right	43	10	0			
cSH	813	1700	1398			
Volume to Capacity	0.06	0.11	0.03			
Queue Length 95th (ft)	5	0	2			
Control Delay (s)	9.7	0.0	1.5			
Lane LOS	A		A			
Approach Delay (s)	9.7	0.0	1.5			
Approach LOS	A					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			31.6%	ICU Level of Service		A
Analysis Period (min)			15			

2032 No-Build

Lanes, Volumes, Timings

2032 No-Build Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	699	4	1	1503	31	2	0	2	4	2	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	11	12	12	12	12	12	11
Storage Length (ft)	100		0	0		50	0		0	0		50
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.932				0.850
Flt Protected	0.950							0.976			0.966	
Satd. Flow (prot)	1694	1825	0	0	1801	1561	0	1728	0	0	1557	1546
Flt Permitted	0.950							0.976			0.966	
Satd. Flow (perm)	1694	1825	0	0	1801	1561	0	1728	0	0	1557	1546
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1575			2000			500			3130	
Travel Time (s)		30.7			39.0			11.4			71.1	
Peak Hour Factor	0.90	0.90	0.90	0.95	0.95	0.95	0.50	0.50	0.50	0.85	0.85	0.85
Heavy Vehicles (%)	3%	4%	0%	0%	2%	0%	0%	0%	0%	25%	0%	1%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

2032 No-Build Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	105	699	4	1	1503	31	2	0	2	4	2	130
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.95	0.95	0.95	0.50	0.50	0.50	0.85	0.85	0.85
Hourly flow rate (vph)	117	777	4	1	1582	33	4	0	4	5	2	153
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												2
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1615			781			2598	2629	779	2598	2599	1582
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1615			781			2598	2629	779	2598	2599	1582
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.7	4.0	3.3
p0 queue free %	71			100			0	100	99	56	87	0
cM capacity (veh/h)	401			845			0	17	399	11	18	135
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	117	781	1583	33	8	160						
Volume Left	117	0	1	0	4	5						
Volume Right	0	4	0	33	4	153						
cSH	401	1700	845	1700	0	141						
Volume to Capacity	0.29	0.46	0.00	0.02	Err	1.14						
Queue Length 95th (ft)	30	0	0	0	Err	226						
Control Delay (s)	17.6	0.0	0.2	0.0	Err	194.9						
Lane LOS	C		A		F	F						
Approach Delay (s)	2.3		0.2		Err	194.9						
Approach LOS					F	F						
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			100.5%		ICU Level of Service		G					
Analysis Period (min)			15									

Lanes, Volumes, Timings
8: Pillsbury Road & Hardy Road

2032 No-Build Conditions
Weekday Morning

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	38	269	105	76	199	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	13	13	12	12
Storage Length (ft)	0	50	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.978	
Flt Protected	0.950			0.972		
Satd. Flow (prot)	1865	1561	0	1893	1858	0
Flt Permitted	0.950			0.972		
Satd. Flow (perm)	1865	1561	0	1893	1858	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	5550			780	8200	
Travel Time (s)	108.1			15.2	159.7	
Peak Hour Factor	0.91	0.91	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Stop	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

8: Pillsbury Road & Hardy Road

2032 No-Build Conditions

Weekday Morning

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	38	269	105	76	199	39
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	42	296	124	89	234	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		246	84	379	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		246	84	379	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	97		72	89	57	96
cM capacity (veh/h)	1636		443	786	542	1091
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	42	296	213	280		
Volume Left	42	0	124	0		
Volume Right	0	296	0	46		
cSH	1636	1700	543	591		
Volume to Capacity	0.03	0.17	0.39	0.47		
Queue Length 95th (ft)	2	0	46	63		
Control Delay (s)	7.3	0.0	15.9	16.5		
Lane LOS	A		C	C		
Approach Delay (s)	0.9		15.9	16.5		
Approach LOS			C	C		
Intersection Summary						
Average Delay			10.0			
Intersection Capacity Utilization			36.2%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
9: Gilcreast Road & Pillsbury Road

2032 No-Build Conditions
Weekday Morning

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	153	61	120	78	106	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.961		0.947			
Flt Protected	0.966					0.989
Satd. Flow (prot)	1646	0	1788	0	0	1879
Flt Permitted	0.966					0.989
Satd. Flow (perm)	1646	0	1788	0	0	1879
Link Speed (mph)	30		35			35
Link Distance (ft)	2825		1000			780
Travel Time (s)	64.2		19.5			15.2
Peak Hour Factor	0.90	0.90	0.98	0.98	0.85	0.85
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Stop		Stop			Stop
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

9: Gilcreast Road & Pillsbury Road

2032 No-Build Conditions

Weekday Morning

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	153	61	120	78	106	362
Peak Hour Factor	0.90	0.90	0.98	0.98	0.85	0.85
Hourly flow rate (vph)	170	68	122	80	125	426
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	238	202	551			
Volume Left (vph)	170	0	125			
Volume Right (vph)	68	80	0			
Hadj (s)	-0.03	-0.23	0.05			
Departure Headway (s)	5.7	5.2	5.0			
Degree Utilization, x	0.38	0.29	0.76			
Capacity (veh/h)	566	656	709			
Control Delay (s)	12.2	10.3	22.0			
Approach Delay (s)	12.2	10.3	22.0			
Approach LOS	B	B	C			
Intersection Summary						
Delay			17.2			
Level of Service			C			
Intersection Capacity Utilization			58.2%	ICU Level of Service		B
Analysis Period (min)			15			

Lanes, Volumes, Timings
12: Londonderry Road & Pillsbury Road/Ash Street

2032 No-Build Conditions
Weekday Morning

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	198	32	85	184	23	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.981				0.904	
Flt Protected				0.984	0.986	
Satd. Flow (prot)	1786	0	0	1795	1725	0
Flt Permitted				0.984	0.986	
Satd. Flow (perm)	1786	0	0	1795	1725	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1000			3600	3130	
Travel Time (s)	22.7			81.8	71.1	
Peak Hour Factor	0.85	0.85	0.90	0.90	0.85	0.85
Heavy Vehicles (%)	1%	0%	0%	1%	5%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

12: Londonderry Road & Pillsbury Road/Ash Street

2032 No-Build Conditions
Weekday Morning

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	198	32	85	184	23	57
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.90	0.90	0.85	0.85
Hourly flow rate (vph)	233	38	94	204	27	67
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			271		645	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			271		645	252
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		93	92
cM capacity (veh/h)			1305		401	792
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	271	299	94			
Volume Left	0	94	27			
Volume Right	38	0	67			
cSH	1700	1305	618			
Volume to Capacity	0.16	0.07	0.15			
Queue Length 95th (ft)	0	6	13			
Control Delay (s)	0.0	3.0	11.9			
Lane LOS		A	B			
Approach Delay (s)	0.0	3.0	11.9			
Approach LOS			B			
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			41.5%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
13: North High Street & Ash Street

2032 No-Build Conditions
Weekday Morning

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	203	1	6	121	162	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.918	
Flt Protected	0.953			0.998		
Satd. Flow (prot)	1851	0	0	1923	1795	0
Flt Permitted	0.953			0.998		
Satd. Flow (perm)	1851	0	0	1923	1795	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	3600			1000	1000	
Travel Time (s)	81.8			22.7	22.7	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.89	0.89
Heavy Vehicles (%)	1%	0%	20%	1%	1%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

13: North High Street & Ash Street

2032 No-Build Conditions

Weekday Morning

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	203	1	6	121	162	249
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.89	0.89
Hourly flow rate (vph)	239	1	7	142	182	280
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	478	322	462			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	478	322	462			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	56	100	99			
cM capacity (veh/h)	544	724	1011			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	240	149	462			
Volume Left	239	7	0			
Volume Right	1	0	280			
cSH	545	1011	1700			
Volume to Capacity	0.44	0.01	0.27			
Queue Length 95th (ft)	56	1	0			
Control Delay (s)	16.7	0.5	0.0			
Lane LOS	C	A				
Approach Delay (s)	16.7	0.5	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			4.8			
Intersection Capacity Utilization			41.8%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
15: Hardy Road & Hovey Road

2032 No-Build Conditions
Weekday Morning

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	2	32	154	1	14	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		5%			-5%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.872		0.999			
Flt Protected	0.998					0.995
Satd. Flow (prot)	1540	0	1728	0	0	1677
Flt Permitted	0.998					0.995
Satd. Flow (perm)	1540	0	1728	0	0	1677
Link Speed (mph)	30		35			35
Link Distance (ft)	1000		8200			1000
Travel Time (s)	22.7		159.7			19.5
Peak Hour Factor	0.84	0.84	0.87	0.87	0.80	0.80
Heavy Vehicles (%)	0%	4%	3%	100%	9%	12%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

15: Hardy Road & Hovey Road

2032 No-Build Conditions
Weekday Morning

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	32	154	1	14	121
Sign Control	Stop		Free			Free
Grade	0%		5%			-5%
Peak Hour Factor	0.84	0.84	0.87	0.87	0.80	0.80
Hourly flow rate (vph)	2	38	177	1	18	151
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	364	178			178	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	364	178			178	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	100	96			99	
cM capacity (veh/h)	631	860			1356	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	40	178	169			
Volume Left	2	0	18			
Volume Right	38	1	0			
cSH	842	1700	1356			
Volume to Capacity	0.05	0.10	0.01			
Queue Length 95th (ft)	4	0	1			
Control Delay (s)	9.5	0.0	0.9			
Lane LOS	A		A			
Approach Delay (s)	9.5	0.0	0.9			
Approach LOS	A					
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			28.1%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings

2032 No-Build Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	1410	56	6	1103	33	0	1	2	10	2	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	11	12	12	12	12	12	11
Storage Length (ft)	100		0	0		50	0		0	0		50
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.899				0.850
Flt Protected	0.950										0.959	
Satd. Flow (prot)	1728	1871	0	0	1801	1561	0	1708	0	0	1822	1546
Flt Permitted	0.950										0.959	
Satd. Flow (perm)	1728	1871	0	0	1801	1561	0	1708	0	0	1822	1546
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1575			2000			500			3130	
Travel Time (s)		30.7			39.0			11.4			71.1	
Peak Hour Factor	0.96	0.96	0.96	0.95	0.95	0.95	0.75	0.75	0.75	0.85	0.85	0.85
Heavy Vehicles (%)	1%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	1%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

2032 No-Build Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	220	1410	56	6	1103	33	0	1	2	10	2	159
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.95	0.95	0.95	0.75	0.75	0.75	0.85	0.85	0.85
Hourly flow rate (vph)	229	1469	58	6	1161	35	0	1	3	12	2	187
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												2
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1196			1527			3131	3165	1498	3104	3159	1161
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1196			1527			3131	3165	1498	3104	3159	1161
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	61			99			100	79	98	0	64	22
cM capacity (veh/h)	587			442			1	6	152	4	7	239
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	229	1527	1167	35	4	201						
Volume Left	229	0	6	0	0	12						
Volume Right	0	58	0	35	3	187						
cSH	587	1700	442	1700	18	53						
Volume to Capacity	0.39	0.90	0.01	0.02	0.22	3.80						
Queue Length 95th (ft)	46	0	1	0	16	Err						
Control Delay (s)	15.0	0.0	0.7	0.0	257.0	Err						
Lane LOS	B		A		F	F						
Approach Delay (s)	2.0		0.6		257.0	Err						
Approach LOS					F	F						
Intersection Summary												
Average Delay			637.5									
Intersection Capacity Utilization			153.3%		ICU Level of Service				H			
Analysis Period (min)			15									

Lanes, Volumes, Timings
8: Pillsbury Road & Hardy Road

2032 No-Build Conditions
Weekday Evening

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	53	224	318	240	155	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	13	13	12	12
Storage Length (ft)	0	50	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.966	
Flt Protected	0.950			0.972		
Satd. Flow (prot)	1865	1561	0	1908	1835	0
Flt Permitted	0.950			0.972		
Satd. Flow (perm)	1865	1561	0	1908	1835	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	5550			780	8200	
Travel Time (s)	108.1			15.2	159.7	
Peak Hour Factor	0.85	0.85	0.91	0.91	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Stop	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

8: Pillsbury Road & Hardy Road

2032 No-Build Conditions

Weekday Evening

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	53	224	318	240	155	52
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.91	0.91	0.85	0.85
Hourly flow rate (vph)	62	264	349	264	182	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		277	125	388	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		277	125	388	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	96		23	64	66	94
cM capacity (veh/h)	1636		457	740	529	1091
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	62	264	613	244		
Volume Left	62	0	349	0		
Volume Right	0	264	0	61		
cSH	1636	1700	547	607		
Volume to Capacity	0.04	0.16	1.12	0.40		
Queue Length 95th (ft)	3	0	497	48		
Control Delay (s)	7.3	0.0	102.7	14.8		
Lane LOS	A		F	B		
Approach Delay (s)	1.4		102.7	14.8		
Approach LOS			F	B		
Intersection Summary						
Average Delay			56.7			
Intersection Capacity Utilization			54.9%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
9: Gilcreast Road & Pillsbury Road

2032 No-Build Conditions
Weekday Evening

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	203	132	426	241	94	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.947		0.951			
Flt Protected	0.971					0.988
Satd. Flow (prot)	1631	0	1807	0	0	1877
Flt Permitted	0.971					0.988
Satd. Flow (perm)	1631	0	1807	0	0	1877
Link Speed (mph)	30		35			35
Link Distance (ft)	2825		1000			780
Travel Time (s)	64.2		19.5			15.2
Peak Hour Factor	0.85	0.85	0.93	0.93	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Stop		Stop			Stop
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

9: Gilcreast Road & Pillsbury Road

2032 No-Build Conditions

Weekday Evening

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	203	132	426	241	94	285
Peak Hour Factor	0.85	0.85	0.93	0.93	0.86	0.86
Hourly flow rate (vph)	239	155	458	259	109	331
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	394	717	441			
Volume Left (vph)	239	0	109			
Volume Right (vph)	155	259	0			
Hadj (s)	-0.12	-0.22	0.05			
Departure Headway (s)	6.6	6.0	6.4			
Degree Utilization, x	0.72	1.19	0.79			
Capacity (veh/h)	527	607	550			
Control Delay (s)	25.0	124.2	28.9			
Approach Delay (s)	25.0	124.2	28.9			
Approach LOS	D	F	D			
Intersection Summary						
Delay			72.0			
Level of Service			F			
Intersection Capacity Utilization			86.6%	ICU Level of Service		E
Analysis Period (min)			15			

Lanes, Volumes, Timings
12: Londonderry Road & Pillsbury Road/Ash Street

2032 No-Build Conditions
Weekday Evening

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	309	29	77	306	63	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.988				0.904	
Flt Protected				0.990	0.986	
Satd. Flow (prot)	1815	0	0	1811	1725	0
Flt Permitted				0.990	0.986	
Satd. Flow (perm)	1815	0	0	1811	1725	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1000			3600	3130	
Travel Time (s)	22.7			81.8	71.1	
Peak Hour Factor	0.88	0.88	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

12: Londonderry Road & Pillsbury Road/Ash Street

2032 No-Build Conditions

Weekday Evening

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	309	29	77	306	63	156
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	351	33	91	360	74	184
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			384		909	368
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			384		909	368
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		74	73
cM capacity (veh/h)			1174		284	678
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	384	451	258			
Volume Left	0	91	74			
Volume Right	33	0	184			
cSH	1700	1174	485			
Volume to Capacity	0.23	0.08	0.53			
Queue Length 95th (ft)	0	6	77			
Control Delay (s)	0.0	2.3	20.5			
Lane LOS		A	C			
Approach Delay (s)	0.0	2.3	20.5			
Approach LOS			C			
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization			61.5%	ICU Level of Service		B
Analysis Period (min)			15			

Lanes, Volumes, Timings
13: North High Street & Ash Street

2032 No-Build Conditions
Weekday Evening

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	405	9	2	230	191	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997				0.915	
Flt Protected	0.953					
Satd. Flow (prot)	1865	0	0	1963	1796	0
Flt Permitted	0.953					
Satd. Flow (perm)	1865	0	0	1963	1796	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	3600			1000	1000	
Travel Time (s)	81.8			22.7	22.7	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

13: North High Street & Ash Street

2032 No-Build Conditions
Weekday Evening

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	405	9	2	230	191	326
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.90	0.90
Hourly flow rate (vph)	431	10	2	253	212	362
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	650	393	574			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	650	393	574			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	1	99	100			
cM capacity (veh/h)	436	660	1009			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	440	255	574			
Volume Left	431	2	0			
Volume Right	10	0	362			
cSH	439	1009	1700			
Volume to Capacity	1.00	0.00	0.34			
Queue Length 95th (ft)	324	0	0			
Control Delay (s)	74.8	0.1	0.0			
Lane LOS	F	A				
Approach Delay (s)	74.8	0.1	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay			26.0			
Intersection Capacity Utilization			59.7%	ICU Level of Service		B
Analysis Period (min)			15			

Lanes, Volumes, Timings
15: Hardy Road & Hovey Road

2032 No-Build Conditions
Weekday Evening

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	4	35	166	9	34	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		5%			-5%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.878		0.993			
Flt Protected	0.995					0.992
Satd. Flow (prot)	1605	0	1745	0	0	1852
Flt Permitted	0.995					0.992
Satd. Flow (perm)	1605	0	1745	0	0	1852
Link Speed (mph)	30		35			35
Link Distance (ft)	1000		8200			1000
Travel Time (s)	22.7		159.7			19.5
Peak Hour Factor	0.75	0.75	0.83	0.83	0.80	0.80
Heavy Vehicles (%)	0%	0%	2%	0%	0%	1%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

15: Hardy Road & Hovey Road

2032 No-Build Conditions

Weekday Evening

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	35	166	9	34	175
Sign Control	Stop		Free			Free
Grade	0%		5%			-5%
Peak Hour Factor	0.75	0.75	0.83	0.83	0.80	0.80
Hourly flow rate (vph)	5	47	200	11	42	219
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	509	205			211	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	509	205			211	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	94			97	
cM capacity (veh/h)	511	840			1372	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	52	211	261			
Volume Left	5	0	42			
Volume Right	47	11	0			
cSH	788	1700	1372			
Volume to Capacity	0.07	0.12	0.03			
Queue Length 95th (ft)	5	0	2			
Control Delay (s)	9.9	0.0	1.5			
Lane LOS	A		A			
Approach Delay (s)	9.9	0.0	1.5			
Approach LOS	A					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			33.7%	ICU Level of Service		A
Analysis Period (min)			15			

2032 Build

Lanes, Volumes, Timings

2032 Build Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)/West Broadway (NH Route 102)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	185	583	4	1	1379	138	2	0	2	32	2	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	11	12	12	12	12	12	11
Storage Length (ft)	100		0	0		50	0		0	0		50
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.932				0.850
Flt Protected	0.950							0.976			0.955	
Satd. Flow (prot)	1711	1861	0	0	1801	1531	0	1728	0	0	1781	1531
Flt Permitted	0.950							0.976			0.955	
Satd. Flow (perm)	1711	1861	0	0	1801	1531	0	1728	0	0	1781	1531
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1575			2000			500			3130	
Travel Time (s)		30.7			39.0			11.4			71.1	
Peak Hour Factor	0.90	0.90	0.90	0.95	0.95	0.95	0.50	0.50	0.50	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

2032 Build Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)/West Broadway (NH Route 102)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	185	583	4	1	1379	138	2	0	2	32	2	118
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.95	0.95	0.95	0.50	0.50	0.50	0.90	0.90	0.90
Hourly flow rate (vph)	206	648	4	1	1452	145	4	0	4	36	2	131
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												2
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1597			652			2516	2660	650	2517	2517	1452
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1597			652			2516	2660	650	2517	2517	1452
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	50			100			0	100	99	0	84	18
cM capacity (veh/h)	410			944			2	11	473	11	14	160
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	206	652	1453	145	8	169						
Volume Left	206	0	1	0	4	36						
Volume Right	0	4	0	145	4	131						
cSH	410	1700	944	1700	4	42						
Volume to Capacity	0.50	0.38	0.00	0.09	2.12	3.99						
Queue Length 95th (ft)	68	0	0	0	50	Err						
Control Delay (s)	22.3	0.0	0.1	0.0	2202.5	Err						
Lane LOS	C		A		F	F						
Approach Delay (s)	5.3		0.1		2202.5	Err						
Approach LOS					F	F						
Intersection Summary												
Average Delay			649.9									
Intersection Capacity Utilization			116.9%		ICU Level of Service		H					
Analysis Period (min)			15									

Lanes, Volumes, Timings
8: Pillsbury Road & Hardy Road

2032 Build Conditions
Weekday Morning

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	38	472	215	87	234	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	13	13	12	12
Storage Length (ft)	0	50	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.982	
Flt Protected	0.950			0.966		
Satd. Flow (prot)	1865	1531	0	1859	1834	0
Flt Permitted	0.950			0.966		
Satd. Flow (perm)	1865	1531	0	1859	1834	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	5550			780	8200	
Travel Time (s)	108.1			15.2	159.7	
Peak Hour Factor	0.91	0.91	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	2%	2%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Stop	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

8: Pillsbury Road & Hardy Road

2032 Build Conditions
Weekday Morning

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	38	472	215	87	234	37
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	42	519	239	97	260	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		255	84	602	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		255	84	602	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	97		25	88	35	96
cM capacity (veh/h)	1636		319	786	403	1091
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	42	519	336	301		
Volume Left	42	0	239	0		
Volume Right	0	519	0	41		
cSH	1636	1700	385	441		
Volume to Capacity	0.03	0.31	0.87	0.68		
Queue Length 95th (ft)	2	0	214	126		
Control Delay (s)	7.3	0.0	52.7	29.0		
Lane LOS	A		F	D		
Approach Delay (s)	0.5		52.7	29.0		
Approach LOS			F	D		
Intersection Summary						
Average Delay			22.3			
Intersection Capacity Utilization			50.5%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
9: Gilcreast Road & Pillsbury Road

2032 Build Conditions
Weekday Morning

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	208	195	113	162	394	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.935		0.920			
Flt Protected	0.975					0.973
Satd. Flow (prot)	1585	0	1714	0	0	1812
Flt Permitted	0.975					0.973
Satd. Flow (perm)	1585	0	1714	0	0	1812
Link Speed (mph)	30		35			35
Link Distance (ft)	1575		1000			780
Travel Time (s)	35.8		19.5			15.2
Peak Hour Factor	0.90	0.90	0.98	0.98	0.90	0.90
Shared Lane Traffic (%)						
Sign Control	Stop		Stop			Stop
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis 9: Gilcreast Road & Pillsbury Road

2032 Build Conditions

Weekday Morning

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	208	195	113	162	394	312
Peak Hour Factor	0.90	0.90	0.98	0.98	0.90	0.90
Hourly flow rate (vph)	231	217	115	165	438	347
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	448	281	784			
Volume Left (vph)	231	0	438			
Volume Right (vph)	217	165	0			
Hadj (s)	-0.15	-0.32	0.15			
Departure Headway (s)	6.2	6.2	6.1			
Degree Utilization, x	0.77	0.48	1.33			
Capacity (veh/h)	568	556	589			
Control Delay (s)	27.1	14.7	180.7			
Approach Delay (s)	27.1	14.7	180.7			
Approach LOS	D	B	F			
Intersection Summary						
Delay			104.4			
Level of Service			F			
Intersection Capacity Utilization			87.6%	ICU Level of Service		E
Analysis Period (min)			15			

Lanes, Volumes, Timings
10: Pillsbury Road & Northwest Main Drive

2032 Build Conditions
Weekday Morning

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	9	560	366	21	53	34
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			0.993		0.947	
Flt Protected		0.999			0.970	
Satd. Flow (prot)	0	1861	1850	0	1711	0
Flt Permitted		0.999			0.970	
Satd. Flow (perm)	0	1861	1850	0	1711	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		1575	250		1000	
Travel Time (s)		35.8	5.7		22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

10: Pillsbury Road & Northwest Main Drive

2032 Build Conditions
Weekday Morning

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	560	366	21	53	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	622	407	23	59	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	430				1061	418
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	430				1061	418
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				76	94
cM capacity (veh/h)	1129				246	635
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	632	430	97			
Volume Left	10	0	59			
Volume Right	0	23	38			
cSH	1129	1700	323			
Volume to Capacity	0.01	0.25	0.30			
Queue Length 95th (ft)	1	0	31			
Control Delay (s)	0.2	0.0	20.8			
Lane LOS	A		C			
Approach Delay (s)	0.2	0.0	20.8			
Approach LOS			C			
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			48.4%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
11: Orchard Drive & Pillsbury Road

2032 Build Conditions
Weekday Morning

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	490	123	66	327	60	87
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	0.973				0.920	
Flt Protected				0.992	0.980	
Satd. Flow (prot)	1812	0	0	1848	1679	0
Flt Permitted				0.992	0.980	
Satd. Flow (perm)	1812	0	0	1848	1679	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	250			1000	1500	
Travel Time (s)	5.7			22.7	34.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

11: Orchard Drive & Pillsbury Road

2032 Build Conditions
Weekday Morning

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	490	123	66	327	60	87
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	544	137	73	363	67	97
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			681		1123	613
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			681		1123	613
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		68	80
cM capacity (veh/h)			911		209	493
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	681	437	163			
Volume Left	0	73	67			
Volume Right	137	0	97			
cSH	1700	911	317			
Volume to Capacity	0.40	0.08	0.51			
Queue Length 95th (ft)	0	7	70			
Control Delay (s)	0.0	2.4	27.8			
Lane LOS		A	D			
Approach Delay (s)	0.0	2.4	27.8			
Approach LOS			D			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			72.8%	ICU Level of Service		C
Analysis Period (min)			15			

Lanes, Volumes, Timings

12: Londonderry Road/Eastern Main Drive & Pillsbury Road/Ash Street

2032 Build Conditions

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	342	213	78	23	231	25	52	196	47	9	53	156
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		0.983			0.988			0.979			0.903	
Flt Protected		0.974			0.996			0.991			0.998	
Satd. Flow (prot)	0	1783	0	0	1833	0	0	1807	0	0	1679	0
Flt Permitted		0.974			0.996			0.991			0.998	
Satd. Flow (perm)	0	1783	0	0	1833	0	0	1807	0	0	1679	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			3600			3130			1000	
Travel Time (s)		22.7			81.8			71.1			22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

2032 Build Conditions

12: Londonderry Road/Eastern Main Drive & Pillsbury Road/Ash Street

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	342	213	78	23	231	25	52	196	47	9	53	156
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	380	237	87	26	257	27	58	218	52	10	59	173
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	284			323			1564	1375	280	1522	1405	270
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	284			323			1564	1375	280	1522	1405	270
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	70			98			0	0	93	0	39	77
cM capacity (veh/h)	1278			1236			28	100	759	0	96	768
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	703	309	328	242								
Volume Left	380	26	58	10								
Volume Right	87	27	52	173								
cSH	1278	1236	76	0								
Volume to Capacity	0.30	0.02	4.30	Err								
Queue Length 95th (ft)	31	2	Err	Err								
Control Delay (s)	6.4	0.8	Err	Err								
Lane LOS	A	A	F	F								
Approach Delay (s)	6.4	0.8	Err	Err								
Approach LOS			F	F								
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			92.1%		ICU Level of Service				F			
Analysis Period (min)			15									

Lanes, Volumes, Timings
13: North High Street & Ash Street

2032 Build Conditions
Weekday Morning

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	204	6	18	108	117	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996				0.910	
Flt Protected	0.954			0.993		
Satd. Flow (prot)	1829	0	0	1928	1757	0
Flt Permitted	0.954			0.993		
Satd. Flow (perm)	1829	0	0	1928	1757	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	3600			1000	1000	
Travel Time (s)	81.8			22.7	22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

13: North High Street & Ash Street

2032 Build Conditions
Weekday Morning

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	204	6	18	108	117	235
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	227	7	20	120	130	261
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	421	261	391			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	421	261	391			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	61	99	98			
cM capacity (veh/h)	579	778	1167			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	233	140	391			
Volume Left	227	20	0			
Volume Right	7	0	261			
cSH	584	1167	1700			
Volume to Capacity	0.40	0.02	0.23			
Queue Length 95th (ft)	48	1	0			
Control Delay (s)	15.2	1.3	0.0			
Lane LOS	C	A				
Approach Delay (s)	15.2	1.3	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			4.9			
Intersection Capacity Utilization			39.3%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
14: Hardy Road & Hovey Road

2032 Build Conditions
Weekday Morning

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	2	40	165	1	15	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		5%			-5%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.870		0.999			
Flt Protected	0.998					0.996
Satd. Flow (prot)	1536	0	1728	0	0	1678
Flt Permitted	0.998					0.996
Satd. Flow (perm)	1536	0	1728	0	0	1678
Link Speed (mph)	30		35			35
Link Distance (ft)	1000		8200			1000
Travel Time (s)	22.7		159.7			19.5
Peak Hour Factor	0.84	0.84	0.87	0.87	0.80	0.80
Heavy Vehicles (%)	0%	4%	3%	100%	9%	12%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

14: Hardy Road & Hovey Road

2032 Build Conditions

Weekday Morning

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	40	165	1	15	154
Sign Control	Stop		Free			Free
Grade	0%		5%			-5%
Peak Hour Factor	0.84	0.84	0.87	0.87	0.80	0.80
Hourly flow rate (vph)	2	48	190	1	19	192
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	420	190			191	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	420	190			191	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	100	94			99	
cM capacity (veh/h)	585	846			1342	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	50	191	211			
Volume Left	2	0	19			
Volume Right	48	1	0			
cSH	829	1700	1342			
Volume to Capacity	0.06	0.11	0.01			
Queue Length 95th (ft)	5	0	1			
Control Delay (s)	9.6	0.0	0.8			
Lane LOS	A		A			
Approach Delay (s)	9.6	0.0	0.8			
Approach LOS	A					
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			30.6%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings

2032 Build Conditions

15: Eastern Main Drive & Exit 4A Connector /Exit 4A Connector

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	930	139	44	1038	15	184	112	7	7	57	44
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		0.984			0.998			0.997			0.945	
Flt Protected		0.996			0.998			0.971			0.997	
Satd. Flow (prot)	0	1826	0	0	1855	0	0	1803	0	0	1755	0
Flt Permitted		0.996			0.998			0.971			0.997	
Satd. Flow (perm)	0	1826	0	0	1855	0	0	1803	0	0	1755	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			1000			1000			1000	
Travel Time (s)		22.7			22.7			22.7			22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

15: Eastern Main Drive & Exit 4A Connector /Exit 4A Connector

2032 Build Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	85	930	139	44	1038	15	184	112	7	7	57	44
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	94	1033	154	49	1153	17	204	124	8	8	63	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1170			1188			2639	2567	1111	2629	2636	1162
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1170			1188			2639	2567	1111	2629	2636	1162
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	84			92			0	0	97	0	0	79
cM capacity (veh/h)	597			588			0	20	254	0	18	238
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1282	1219	337	120								
Volume Left	94	49	204	8								
Volume Right	154	17	8	49								
cSH	597	588	0	0								
Volume to Capacity	0.16	0.08	Err	Err								
Queue Length 95th (ft)	14	7	Err	Err								
Control Delay (s)	6.8	3.5	Err	Err								
Lane LOS	A	A	F	F								
Approach Delay (s)	6.8	3.5	Err	Err								
Approach LOS			F	F								
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			120.9%		ICU Level of Service				H			
Analysis Period (min)			15									

Lanes, Volumes, Timings

2032 Build Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)/West Broadway (NH Route 102)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	327	1474	56	6	1142	129	0	1	2	159	2	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	11	12	12	12	12	12	11
Storage Length (ft)	100		0	0		50	0		0	0		50
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850		0.899				0.850
Flt Protected	0.950										0.953	
Satd. Flow (prot)	1711	1855	0	0	1801	1531	0	1708	0	0	1776	1531
Flt Permitted	0.950										0.953	
Satd. Flow (perm)	1711	1855	0	0	1801	1531	0	1708	0	0	1776	1531
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1575			2000			500			3130	
Travel Time (s)		30.7			39.0			11.4			71.1	
Peak Hour Factor	0.96	0.96	0.96	0.95	0.95	0.95	0.75	0.75	0.75	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

2032 Build Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)/West Broadway (NH Route 102)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	327	1474	56	6	1142	129	0	1	2	159	2	299
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.95	0.95	0.95	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	341	1535	58	6	1202	136	0	1	3	177	2	332
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												2
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1338			1594			3462	3596	1565	3435	3490	1202
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1338			1594			3462	3596	1565	3435	3490	1202
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	34			98			0	28	98	0	0	0
cM capacity (veh/h)	515			417			0	2	139	1	2	225
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	341	1594	1208	136	4	511						
Volume Left	341	0	6	0	0	177						
Volume Right	0	58	0	136	3	332						
cSH	515	1700	417	1700	5	2						
Volume to Capacity	0.66	0.94	0.02	0.08	0.74	213.39						
Queue Length 95th (ft)	120	0	1	0	28	Err						
Control Delay (s)	24.6	0.0	0.8	0.0	1085.8	Err						
Lane LOS	C		A		F	F						
Approach Delay (s)	4.3		0.7		1085.8	Err						
Approach LOS					F	F						
Intersection Summary												
Average Delay			1350.7									
Intersection Capacity Utilization			167.0%		ICU Level of Service				H			
Analysis Period (min)			15									

Lanes, Volumes, Timings
8: Pillsbury Road & Hardy Road

2032 Build Conditions
Weekday Evening

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	53	470	618	286	183	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	11	13	13	12	12
Storage Length (ft)	0	50	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.972	
Flt Protected	0.950			0.967		
Satd. Flow (prot)	1865	1531	0	1861	1818	0
Flt Permitted	0.950			0.967		
Satd. Flow (perm)	1865	1531	0	1861	1818	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	5550			780	8200	
Travel Time (s)	108.1			15.2	159.7	
Peak Hour Factor	0.90	0.90	0.91	0.91	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	2%	2%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Stop	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

8: Pillsbury Road & Hardy Road

2032 Build Conditions
Weekday Evening

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	53	470	618	286	183	47
Sign Control	Free			Stop	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.91	0.91	0.90	0.90
Hourly flow rate (vph)	59	522	679	314	203	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		272	118	640	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		272	118	640	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	96		0	58	46	95
cM capacity (veh/h)	1636		364	745	379	1091
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	59	522	993	256		
Volume Left	59	0	679	0		
Volume Right	0	522	0	52		
cSH	1636	1700	435	438		
Volume to Capacity	0.04	0.31	2.29	0.58		
Queue Length 95th (ft)	3	0	1871	91		
Control Delay (s)	7.3	0.0	606.2	24.1		
Lane LOS	A		F	C		
Approach Delay (s)	0.7		606.2	24.1		
Approach LOS			F	C		
Intersection Summary						
Average Delay			332.7			
Intersection Capacity Utilization			75.1%	ICU Level of Service		D
Analysis Period (min)			15			

Lanes, Volumes, Timings
9: Gilcreast Road & Pillsbury Road

2032 Build Conditions
Weekday Evening

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	324	551	386	382	422	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.915		0.933			
Flt Protected	0.982					0.969
Satd. Flow (prot)	1562	0	1738	0	0	1805
Flt Permitted	0.982					0.969
Satd. Flow (perm)	1562	0	1738	0	0	1805
Link Speed (mph)	30		35			35
Link Distance (ft)	1575		1000			780
Travel Time (s)	35.8		19.5			15.2
Peak Hour Factor	0.90	0.90	0.93	0.93	0.90	0.90
Shared Lane Traffic (%)						
Sign Control	Stop		Stop			Stop
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

9: Gilcreast Road & Pillsbury Road

2032 Build Conditions

Weekday Evening

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	324	551	386	382	422	231
Peak Hour Factor	0.90	0.90	0.93	0.93	0.90	0.90
Hourly flow rate (vph)	360	612	415	411	469	257
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	972	826	726			
Volume Left (vph)	360	0	469			
Volume Right (vph)	612	411	0			
Hadj (s)	-0.27	-0.26	0.16			
Departure Headway (s)	6.7	6.7	7.1			
Degree Utilization, x	1.81	1.54	1.44			
Capacity (veh/h)	543	540	507			
Control Delay (s)	390.2	271.3	229.5			
Approach Delay (s)	390.2	271.3	229.5			
Approach LOS	F	F	F			
Intersection Summary						
Delay			305.1			
Level of Service			F			
Intersection Capacity Utilization		141.0%		ICU Level of Service		H
Analysis Period (min)			15			

Lanes, Volumes, Timings
10: Pillsbury Road & Northwest Main Drive

2032 Build Conditions
Weekday Evening

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	42	758	894	66	42	26
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			0.991		0.948	
Flt Protected		0.997			0.970	
Satd. Flow (prot)	0	1857	1846	0	1713	0
Flt Permitted		0.997			0.970	
Satd. Flow (perm)	0	1857	1846	0	1713	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		1575	250		1000	
Travel Time (s)		35.8	5.7		22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

10: Pillsbury Road & Northwest Main Drive

2032 Build Conditions
Weekday Evening

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	42	758	894	66	42	26
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	47	842	993	73	47	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1067				1966	1030
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1067				1966	1030
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				27	90
cM capacity (veh/h)	653				64	283
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	889	1067	76			
Volume Left	47	0	47			
Volume Right	0	73	29			
cSH	653	1700	91			
Volume to Capacity	0.07	0.63	0.83			
Queue Length 95th (ft)	6	0	111			
Control Delay (s)	2.0	0.0	133.2			
Lane LOS	A		F			
Approach Delay (s)	2.0	0.0	133.2			
Approach LOS			F			
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization			84.8%	ICU Level of Service	E	
Analysis Period (min)			15			

Lanes, Volumes, Timings
11: Orchard Drive & Pillsbury Road

2032 Build Conditions
Weekday Evening

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	613	178	150	735	222	222
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	0.970				0.932	
Flt Protected				0.992	0.976	
Satd. Flow (prot)	1807	0	0	1848	1694	0
Flt Permitted				0.992	0.976	
Satd. Flow (perm)	1807	0	0	1848	1694	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	250			1000	1500	
Travel Time (s)	5.7			22.7	34.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

11: Orchard Drive & Pillsbury Road

2032 Build Conditions
Weekday Evening

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	613	178	150	735	222	222
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	681	198	167	817	247	247
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			879		1930	780
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			879		1930	780
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			78		0	38
cM capacity (veh/h)			769		57	395
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	879	983	493			
Volume Left	0	167	247			
Volume Right	198	0	247			
cSH	1700	769	100			
Volume to Capacity	0.52	0.22	4.95			
Queue Length 95th (ft)	0	21	Err			
Control Delay (s)	0.0	5.7	Err			
Lane LOS		A	F			
Approach Delay (s)	0.0	5.7	Err			
Approach LOS			F			
Intersection Summary						
Average Delay			2096.5			
Intersection Capacity Utilization			126.0%	ICU Level of Service		H
Analysis Period (min)			15			

Lanes, Volumes, Timings

12: Londonderry Road/Eastern Main Drive & Pillsbury Road/Ash Street

2032 Build Conditions

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	573	369	94	75	354	13	122	144	153	25	227	432
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	13	13	13	12	12	12
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		0.988			0.996			0.951			0.915	
Flt Protected		0.973			0.992			0.986			0.998	
Satd. Flow (prot)	0	1731	0	0	1779	0	0	1805	0	0	1701	0
Flt Permitted		0.973			0.992			0.986			0.998	
Satd. Flow (perm)	0	1731	0	0	1779	0	0	1805	0	0	1701	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			3600			3130			1000	
Travel Time (s)		22.7			81.8			71.1			22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

2032 Build Conditions

12: Londonderry Road/Eastern Main Drive & Pillsbury Road/Ash Street

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	573	369	94	75	354	13	122	144	153	25	227	432
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	637	410	104	83	393	14	136	160	170	28	252	480
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	408			514			2909	2310	462	2553	2355	401
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	408			514			2909	2310	462	2553	2355	401
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	45			92			0	0	72	0	0	26
cM capacity (veh/h)	1151			1051			0	16	600	0	15	649
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1151	491	466	760								
Volume Left	637	83	136	28								
Volume Right	104	14	170	480								
cSH	1151	1051	0	0								
Volume to Capacity	0.55	0.08	Err	Err								
Queue Length 95th (ft)	88	6	Err	Err								
Control Delay (s)	10.8	2.2	Err	Err								
Lane LOS	B	A	F	F								
Approach Delay (s)	10.8	2.2	Err	Err								
Approach LOS			F	F								
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			157.3%		ICU Level of Service				H			
Analysis Period (min)			15									

Lanes, Volumes, Timings
13: North High Street & Ash Street

2032 Build Conditions
Weekday Evening

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	455	41	11	231	196	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	13	13
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.989				0.911	
Flt Protected	0.956			0.998		
Satd. Flow (prot)	1820	0	0	1958	1765	0
Flt Permitted	0.956			0.998		
Satd. Flow (perm)	1820	0	0	1958	1765	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	3600			1000	1000	
Travel Time (s)	81.8			22.7	22.7	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	0%	0%	2%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

13: North High Street & Ash Street

2032 Build Conditions
Weekday Evening

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	455	41	11	231	196	375
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.90	0.90
Hourly flow rate (vph)	484	44	12	254	218	417
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	704	426	634			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	704	426	634			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	93	99			
cM capacity (veh/h)	398	628	949			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	528	266	634			
Volume Left	484	12	0			
Volume Right	44	0	417			
cSH	411	949	1700			
Volume to Capacity	1.29	0.01	0.37			
Queue Length 95th (ft)	579	1	0			
Control Delay (s)	173.9	0.5	0.0			
Lane LOS	F	A				
Approach Delay (s)	173.9	0.5	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay			64.3			
Intersection Capacity Utilization			67.7%	ICU Level of Service		C
Analysis Period (min)			15			

Lanes, Volumes, Timings
14: Hardy Road & Hovey Road

2032 Build Conditions

Weekday Evening

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	4	39	212	9	43	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		5%			-5%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.877		0.994			
Flt Protected	0.996					0.991
Satd. Flow (prot)	1604	0	1747	0	0	1850
Flt Permitted	0.996					0.991
Satd. Flow (perm)	1604	0	1747	0	0	1850
Link Speed (mph)	30		35			35
Link Distance (ft)	1000		8200			1000
Travel Time (s)	22.7		159.7			19.5
Peak Hour Factor	0.75	0.75	0.83	0.83	0.80	0.80
Heavy Vehicles (%)	0%	0%	2%	0%	0%	1%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

14: Hardy Road & Hovey Road

2032 Build Conditions

Weekday Evening

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	39	212	9	43	198
Sign Control	Stop		Free			Free
Grade	0%		5%			-5%
Peak Hour Factor	0.75	0.75	0.83	0.83	0.80	0.80
Hourly flow rate (vph)	5	52	255	11	54	248
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	616	261			266	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	616	261			266	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	93			96	
cM capacity (veh/h)	439	783			1309	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	57	266	301			
Volume Left	5	0	54			
Volume Right	52	11	0			
cSH	729	1700	1309			
Volume to Capacity	0.08	0.16	0.04			
Queue Length 95th (ft)	6	0	3			
Control Delay (s)	10.4	0.0	1.7			
Lane LOS	B		A			
Approach Delay (s)	10.4	0.0	1.7			
Approach LOS	B					
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			37.8%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
15: Eastern Main Drive & Exit 4A Connector

2032 Build Conditions
Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	930	139	44	1038	15	184	112	7	7	57	44
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		0.984			0.998			0.997			0.945	
Flt Protected		0.996			0.998			0.971			0.997	
Satd. Flow (prot)	0	1826	0	0	1855	0	0	1803	0	0	1755	0
Flt Permitted		0.996			0.998			0.971			0.997	
Satd. Flow (perm)	0	1826	0	0	1855	0	0	1803	0	0	1755	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			1000			1000			1000	
Travel Time (s)		22.7			22.7			22.7			22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

15: Eastern Main Drive & Exit 4A Connector

2032 Build Conditions
Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	85	930	139	44	1038	15	184	112	7	7	57	44
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	94	1033	154	49	1153	17	204	124	8	8	63	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1170			1188			2639	2567	1111	2629	2636	1162
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1170			1188			2639	2567	1111	2629	2636	1162
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	84			92			0	0	97	0	0	79
cM capacity (veh/h)	597			588			0	20	254	0	18	238
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1282	1219	337	120								
Volume Left	94	49	204	8								
Volume Right	154	17	8	49								
cSH	597	588	0	0								
Volume to Capacity	0.16	0.08	Err	Err								
Queue Length 95th (ft)	14	7	Err	Err								
Control Delay (s)	6.8	3.5	Err	Err								
Lane LOS	A	A	F	F								
Approach Delay (s)	6.8	3.5	Err	Err								
Approach LOS			F	F								
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			120.9%		ICU Level of Service				H			
Analysis Period (min)			15									

2032 Build with Improvements

Lanes, Volumes, Timings
3: Garden Lane & Londonderry Commons Driveway

2032 Build Mitigated Conditions
Weekday Morning

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Volume (vph)	49	43	41	774	448	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Frt		0.850			0.993	
Flt Protected	0.950			0.997		
Satd. Flow (prot)	1805	1583	0	3529	3518	0
Flt Permitted	0.950			0.997		
Satd. Flow (perm)	1805	1583	0	3529	3518	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	400			415	445	
Travel Time (s)	9.1			9.4	10.1	
Peak Hour Factor	0.85	0.85	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	2%	2%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

3: Garden Lane & Londonderry Commons Driveway

2032 Build Mitigated Conditions

Weekday Morning

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Volume (veh/h)	49	43	41	774	448	22
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	58	51	46	860	498	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				415	445	
pX, platoon unblocked						
vC, conflicting volume	1031	261	522			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1031	261	522			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	93	96			
cM capacity (veh/h)	222	738	1040			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	58	51	332	573	332	190
Volume Left	58	0	46	0	0	0
Volume Right	0	51	0	0	0	24
cSH	222	738	1040	1700	1700	1700
Volume to Capacity	0.26	0.07	0.04	0.34	0.20	0.11
Queue Length 95th (ft)	25	6	3	0	0	0
Control Delay (s)	26.8	10.2	1.6	0.0	0.0	0.0
Lane LOS	D	B	A			
Approach Delay (s)	19.1		0.6		0.0	
Approach LOS	C					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			49.0%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings
10: Pillsbury Road & Northwest Main Drive

2032 Build Mitigated Conditions
Weekday Morning

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	9	560	366	21	53	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			200	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.947	
Flt Protected	0.950				0.970	
Satd. Flow (prot)	1770	1863	1863	1583	1711	0
Flt Permitted	0.950				0.970	
Satd. Flow (perm)	1770	1863	1863	1583	1711	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		655	250		1000	
Travel Time (s)		14.9	5.7		22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

10: Pillsbury Road & Northwest Main Drive

2032 Build Mitigated Conditions

Weekday Morning

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	560	366	21	53	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	622	407	23	59	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			250			
pX, platoon unblocked	0.95				0.95	0.95
vC, conflicting volume	430				1049	407
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	376				1026	351
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				76	94
cM capacity (veh/h)	1126				245	659
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	10	622	407	23	97	
Volume Left	10	0	0	0	59	
Volume Right	0	0	0	23	38	
cSH	1126	1700	1700	1700	325	
Volume to Capacity	0.01	0.37	0.24	0.01	0.30	
Queue Length 95th (ft)	1	0	0	0	30	
Control Delay (s)	8.2	0.0	0.0	0.0	20.7	
Lane LOS	A				C	
Approach Delay (s)	0.1		0.0		20.7	
Approach LOS					C	
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			41.2%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings
14: Hardy Road & Hovey Road

2032 Build Mitigated Conditions

Weekday Morning

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	2	40	165	1	15	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		5%			-5%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.870		0.999			
Flt Protected	0.998					0.996
Satd. Flow (prot)	1536	0	1728	0	0	1678
Flt Permitted	0.998					0.996
Satd. Flow (perm)	1536	0	1728	0	0	1678
Link Speed (mph)	30		35			35
Link Distance (ft)	1000		8200			1000
Travel Time (s)	22.7		159.7			19.5
Peak Hour Factor	0.84	0.84	0.87	0.87	0.80	0.80
Heavy Vehicles (%)	0%	4%	3%	100%	9%	12%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

14: Hardy Road & Hovey Road

2032 Build Mitigated Conditions
Weekday Morning

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	40	165	1	15	154
Sign Control	Stop		Free			Free
Grade	0%		5%			-5%
Peak Hour Factor	0.84	0.84	0.87	0.87	0.80	0.80
Hourly flow rate (vph)	2	48	190	1	19	192
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	420	190			191	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	420	190			191	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	100	94			99	
cM capacity (veh/h)	585	846			1342	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	50	191	211			
Volume Left	2	0	19			
Volume Right	48	1	0			
cSH	829	1700	1342			
Volume to Capacity	0.06	0.11	0.01			
Queue Length 95th (ft)	5	0	1			
Control Delay (s)	9.6	0.0	0.8			
Lane LOS	A		A			
Approach Delay (s)	9.6	0.0	0.8			
Approach LOS	A					
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			30.6%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
13: North High Street & Ash Street

2032 Build Mitigated Conditions
Weekday Morning

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	204	6	18	108	117	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	13	12	12
Storage Length (ft)	200	0	0			100
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.993		
Satd. Flow (prot)	1770	1583	0	1928	1881	1583
Flt Permitted	0.950			0.993		
Satd. Flow (perm)	1770	1583	0	1928	1881	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	3600			1000	1000	
Travel Time (s)	81.8			22.7	22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis 13: North High Street & Ash Street

2032 Build Mitigated Conditions
Weekday Morning

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	204	6	18	108	117	235
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	227	7	20	120	130	261
Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2	
Volume Total (vph)	227	7	140	130	261	
Volume Left (vph)	227	0	20	0	0	
Volume Right (vph)	0	7	0	0	261	
Hadj (s)	0.53	-0.67	0.05	0.02	-0.67	
Departure Headway (s)	6.3	5.1	5.6	5.5	4.8	
Degree Utilization, x	0.40	0.01	0.22	0.20	0.35	
Capacity (veh/h)	542	656	612	629	723	
Control Delay (s)	12.2	6.9	10.1	8.6	9.1	
Approach Delay (s)	12.0		10.1	8.9		
Approach LOS	B		B	A		
Intersection Summary						
Delay			10.1			
Level of Service			B			
Intersection Capacity Utilization			31.3%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
3: Garden Lane & Londonderry Commons Driveway

2032 Build with Mitigation Conditions
Weekday Evening

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Volume (vph)	65	93	106	1310	1156	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Frt		0.850			0.989	
Flt Protected	0.950			0.996		
Satd. Flow (prot)	1805	1615	0	3530	3505	0
Flt Permitted	0.950			0.996		
Satd. Flow (perm)	1805	1615	0	3530	3505	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	400			415	445	
Travel Time (s)	9.1			9.4	10.1	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

3: Garden Lane & Londonderry Commons Driveway

2032 Build with Mitigation Conditions

Weekday Evening

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Volume (veh/h)	65	93	106	1310	1156	92
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.90	0.90
Hourly flow rate (vph)	70	100	112	1379	1284	102
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				415	445	
pX, platoon unblocked	0.79	0.79	0.79			
vC, conflicting volume	2248	693	1387			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2045	70	951			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	87	81			
cM capacity (veh/h)	32	776	575			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	70	100	571	919	856	530
Volume Left	70	0	112	0	0	0
Volume Right	0	100	0	0	0	102
cSH	32	776	575	1700	1700	1700
Volume to Capacity	2.21	0.13	0.19	0.54	0.50	0.31
Queue Length 95th (ft)	201	11	18	0	0	0
Control Delay (s)	825.2	10.3	5.2	0.0	0.0	0.0
Lane LOS	F	B	A			
Approach Delay (s)	345.6		2.0		0.0	
Approach LOS	F					
Intersection Summary						
Average Delay			20.2			
Intersection Capacity Utilization			87.8%		ICU Level of Service	E
Analysis Period (min)			15			

Lanes, Volumes, Timings
10: Pillsbury Road & Northwest Main Drive

2032 Build with Mitigation Conditions
Weekday Evening

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	42	758	894	66	42	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			200	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.948	
Flt Protected	0.950				0.970	
Satd. Flow (prot)	1770	1863	1863	1583	1713	0
Flt Permitted	0.950				0.970	
Satd. Flow (perm)	1770	1863	1863	1583	1713	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		655	250		1000	
Travel Time (s)		14.9	5.7		22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM Unsignalized Intersection Capacity Analysis

10: Pillsbury Road & Northwest Main Drive

2032 Build with Mitigation Conditions

Weekday Evening

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	42	758	894	66	42	26
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	47	842	993	73	47	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			250			
pX, platoon unblocked	0.76				0.76	0.76
vC, conflicting volume	1067				1929	993
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	932				2062	836
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				0	90
cM capacity (veh/h)	560				42	280
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	47	842	993	73	76	
Volume Left	47	0	0	0	47	
Volume Right	0	0	0	73	29	
cSH	560	1700	1700	1700	62	
Volume to Capacity	0.08	0.50	0.58	0.04	1.21	
Queue Length 95th (ft)	7	0	0	0	155	
Control Delay (s)	12.0	0.0	0.0	0.0	294.2	
Lane LOS	B				F	
Approach Delay (s)	0.6		0.0		294.2	
Approach LOS					F	
Intersection Summary						
Average Delay			11.2			
Intersection Capacity Utilization			57.6%		ICU Level of Service	B
Analysis Period (min)			15			

Lanes, Volumes, Timings
14: Hardy Road & Hovey Road

2032 Build with Mitigation Conditions

Weekday Evening

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	4	39	212	9	43	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		5%			-5%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.877		0.994			
Flt Protected	0.996					0.991
Satd. Flow (prot)	1604	0	1747	0	0	1835
Flt Permitted	0.996					0.991
Satd. Flow (perm)	1604	0	1747	0	0	1835
Link Speed (mph)	30		35			35
Link Distance (ft)	1000		8200			1000
Travel Time (s)	22.7		159.7			19.5
Peak Hour Factor	0.75	0.75	0.83	0.83	0.80	0.80
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis

14: Hardy Road & Hovey Road

2032 Build with Mitigation Conditions
Weekday Evening

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	39	212	9	43	198
Sign Control	Stop		Free			Free
Grade	0%		5%			-5%
Peak Hour Factor	0.75	0.75	0.83	0.83	0.80	0.80
Hourly flow rate (vph)	5	52	255	11	54	248
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	616	261			266	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	616	261			266	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	93			96	
cM capacity (veh/h)	439	783			1309	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	57	266	301			
Volume Left	5	0	54			
Volume Right	52	11	0			
cSH	729	1700	1309			
Volume to Capacity	0.08	0.16	0.04			
Queue Length 95th (ft)	6	0	3			
Control Delay (s)	10.4	0.0	1.7			
Lane LOS	B		A			
Approach Delay (s)	10.4	0.0	1.7			
Approach LOS	B					
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			37.8%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
13: North High Street & Ash Street

2032 Build with Mitigation Conditions

Weekday Evening

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	455	41	11	231	196	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	13	13	12	12
Storage Length (ft)	200	0	0			100
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.998		
Satd. Flow (prot)	1770	1583	0	1958	1900	1583
Flt Permitted	0.950			0.998		
Satd. Flow (perm)	1770	1583	0	1958	1900	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	3600			1000	1000	
Travel Time (s)	81.8			22.7	22.7	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	0%	0%	2%
Shared Lane Traffic (%)						
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis 13: North High Street & Ash Street

2032 Build with Mitigation Conditions

Weekday Evening

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	455	41	11	231	196	375
Peak Hour Factor	0.94	0.94	0.91	0.91	0.90	0.90
Hourly flow rate (vph)	484	44	12	254	218	417
Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2	
Volume Total (vph)	484	44	266	218	417	
Volume Left (vph)	484	0	12	0	0	
Volume Right (vph)	0	44	0	0	417	
Hadj (s)	0.53	-0.67	0.01	0.00	-0.67	
Departure Headway (s)	7.5	6.3	7.2	7.0	6.4	
Degree Utilization, x	1.01	0.08	0.53	0.43	0.74	
Capacity (veh/h)	466	555	497	504	555	
Control Delay (s)	70.9	8.6	17.9	14.0	24.0	
Approach Delay (s)	65.8		17.9	20.5		
Approach LOS	F		C	C		
Intersection Summary						
Delay			36.8			
Level of Service			E			
Intersection Capacity Utilization			53.0%	ICU Level of Service		A
Analysis Period (min)			15			

Signalized Intersections

Existing

Lanes, Volumes, Timings
1: Gilcreast Road & Nashua Road (NH Route 102)

Existing Conditions
Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 		 	 						 	 
Volume (vph)	116	1013	37	79	731	66	109	42	162	219	76	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	175		0	160		375	0		0	0		200
Storage Lanes	1		0	2		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.965			0.964	
Satd. Flow (prot)	1694	3420	0	3467	3406	1615	0	1728	1507	0	1832	1583
Flt Permitted	0.950			0.950				0.965			0.964	
Satd. Flow (perm)	1694	3420	0	3467	3406	1615	0	1728	1507	0	1832	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				79			79			152
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1500			800			1500			1415	
Travel Time (s)		29.2			15.6			29.2			27.6	
Peak Hour Factor	0.96	0.96	0.96	0.92	0.92	0.92	0.87	0.87	0.87	0.88	0.88	0.88
Heavy Vehicles (%)	3%	5%	6%	1%	6%	0%	0%	0%	1%	0%	0%	2%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	1	4	4	5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	14.0		11.0	14.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	25.0	50.0		25.0	50.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	20.0%	40.0%		20.0%	40.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Maximum Green (s)	19.0	44.0		19.0	44.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other
 Cycle Length: 125
 Actuated Cycle Length: 110.7
 Natural Cycle: 75
 Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings

1: Gilcreast Road & Nashua Road (NH Route 102)

Existing Conditions

Weekday Morning

Splits and Phases: 1: Gilcreast Road & Nashua Road (NH Route 102)

 ø1	 ø2	 ø3	 ø4
25 s	50 s	25 s	25 s
 ø5	 ø6		
25 s	50 s		

Queues

1: Gilcreast Road & Nashua Road (NH Route 102)

Existing Conditions

Weekday Morning

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	121	1094	86	795	72	173	186	335	152
v/c Ratio	0.52	0.78	0.27	0.64	0.08	0.64	0.43	0.95	0.23
Control Delay	54.1	32.8	51.4	32.4	1.5	56.2	14.4	84.4	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	32.8	51.4	32.4	1.5	56.2	14.4	84.4	5.0
Queue Length 50th (ft)	82	348	29	244	0	116	38	241	0
Queue Length 95th (ft)	151	463	60	346	9	200	85	#476	42
Internal Link Dist (ft)		1420		720		1420		1335	
Turn Bay Length (ft)	175		160		375				200
Base Capacity (vph)	324	1501	664	1430	936	331	577	351	753
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	0.37	0.73	0.13	0.56	0.08	0.52	0.32	0.95	0.20

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

1: Gilcreast Road & Nashua Road (NH Route 102)

Existing Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	116	1013	37	79	731	66	109	42	162	219	76	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.96	1.00
Satd. Flow (prot)	1694	3419		3467	3406	1615		1728	1507		1832	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.96	1.00
Satd. Flow (perm)	1694	3419		3467	3406	1615		1728	1507		1832	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.87	0.87	0.87	0.88	0.88	0.88
Adj. Flow (vph)	121	1055	39	86	795	72	125	48	186	249	86	152
RTOR Reduction (vph)	0	2	0	0	0	32	0	0	59	0	0	102
Lane Group Flow (vph)	121	1092	0	86	795	40	0	173	127	0	335	50
Heavy Vehicles (%)	3%	5%	6%	1%	6%	0%	0%	0%	1%	0%	0%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Actuated Green, G (s)	13.2	43.6		8.2	38.6	57.8		15.4	23.6		19.2	32.4
Effective Green, g (s)	15.2	45.6		10.2	40.6	61.8		17.4	27.6		21.2	36.4
Actuated g/C Ratio	0.14	0.41		0.09	0.37	0.56		0.16	0.25		0.19	0.33
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	233	1412		320	1252	904		272	376		351	579
v/s Ratio Prot	c0.07	c0.32		0.02	0.23	0.01		c0.10	0.03		c0.18	0.01
v/s Ratio Perm						0.02			0.05			0.02
v/c Ratio	0.52	0.77		0.27	0.63	0.04		0.64	0.34		0.95	0.09
Uniform Delay, d1	44.2	27.9		46.6	28.8	11.0		43.5	33.9		44.1	25.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	3.2		0.5	1.5	0.0		4.8	0.5		35.9	0.1
Delay (s)	46.2	31.1		47.1	30.3	11.0		48.3	34.4		80.0	25.6
Level of Service	D	C		D	C	B		D	C		F	C
Approach Delay (s)		32.6			30.3			41.1			63.0	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			37.8				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			110.4				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			66.1%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Existing Conditions

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	1269	58	43	854	195	11	10	53	103	10	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	215		0	200		400	0		100	0		0
Storage Lanes	2		0	2		1	0		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.993				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.975		0.950	0.960	
Satd. Flow (prot)	3433	3450	0	3502	3438	1553	0	1723	1544	1633	1663	1553
Flt Permitted	0.950			0.950				0.975		0.950	0.960	
Satd. Flow (perm)	3433	3450	0	3502	3438	1553	0	1723	1544	1633	1663	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				210			79			131
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		800			1200			1500			415	
Travel Time (s)		15.6			23.4			34.1			9.4	
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.76	0.76	0.76	0.82	0.82	0.82
Heavy Vehicles (%)	2%	4%	2%	0%	5%	4%	0%	10%	2%	5%	0%	4%
Shared Lane Traffic (%)										48%		
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Detector Phase	5	2		1	6	8	4	4	1	8	8	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	16.0		11.0	16.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	12.0	50.0		25.0	63.0	25.0	25.0	25.0	25.0	25.0	25.0	12.0
Total Split (%)	9.6%	40.0%		20.0%	50.4%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	9.6%
Maximum Green (s)	6.0	44.0		19.0	57.0	19.0	19.0	19.0	19.0	19.0	19.0	6.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag				Lead			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	Min		None	Min	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 83.9

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

			
25 s	50 s	25 s	25 s
			
12 s	63 s		

Queues

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Existing Conditions

Weekday Morning

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	71	1397	46	918	210	27	70	66	72	59
v/c Ratio	0.21	0.72	0.11	0.46	0.17	0.13	0.22	0.27	0.29	0.11
Control Delay	41.6	19.7	38.6	13.6	0.8	39.5	5.4	38.2	38.5	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	19.7	38.6	13.6	0.8	39.5	5.4	38.2	38.5	0.4
Queue Length 50th (ft)	17	239	10	121	0	12	0	30	33	0
Queue Length 95th (ft)	45	#581	31	276	11	36	13	74	80	0
Internal Link Dist (ft)		720		1120		1420			335	
Turn Bay Length (ft)	215		200		400		100			
Base Capacity (vph)	337	1949	902	2489	1347	444	524	420	428	552
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.72	0.05	0.37	0.16	0.06	0.13	0.16	0.17	0.11

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Existing Conditions
Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	1269	58	43	854	195	11	10	53	103	10	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3433	3451		3502	3438	1553		1723	1544	1633	1663	1553
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3433	3451		3502	3438	1553		1723	1544	1633	1663	1553
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.76	0.76	0.76	0.82	0.82	0.82
Adj. Flow (vph)	71	1336	61	46	918	210	14	13	70	126	12	59
RTOR Reduction (vph)	0	2	0	0	0	66	0	0	60	0	0	46
Lane Group Flow (vph)	71	1395	0	46	918	144	0	27	10	66	72	13
Heavy Vehicles (%)	2%	4%	2%	0%	5%	4%	0%	10%	2%	5%	0%	4%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Actuated Green, G (s)	4.6	45.4		6.0	46.8	57.2		3.2	9.2	10.4	10.4	15.0
Effective Green, g (s)	6.6	47.4		8.0	48.8	61.2		5.2	13.2	12.4	12.4	19.0
Actuated g/C Ratio	0.07	0.53		0.09	0.55	0.69		0.06	0.15	0.14	0.14	0.21
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	254	1837		314	1885	1067		100	228	227	231	401
v/s Ratio Prot	c0.02	c0.40		0.01	0.27	0.02		c0.02	0.00	0.04	c0.04	0.00
v/s Ratio Perm						0.07			0.00			0.01
v/c Ratio	0.28	0.76		0.15	0.49	0.14		0.27	0.05	0.29	0.31	0.03
Uniform Delay, d1	39.0	16.3		37.4	12.4	4.8		40.1	32.5	34.4	34.5	27.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	2.0		0.3	0.3	0.1		2.0	0.1	1.0	1.1	0.0
Delay (s)	39.8	18.3		37.6	12.7	4.9		42.1	32.6	35.3	35.5	27.8
Level of Service	D	B		D	B	A		D	C	D	D	C
Approach Delay (s)		19.3			12.2			35.2			33.1	
Approach LOS		B			B			D			C	
Intersection Summary												
HCM 2000 Control Delay			18.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			89.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			55.3%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
4: Nashua Road (NH Route 102) & I-93 SB Ramps

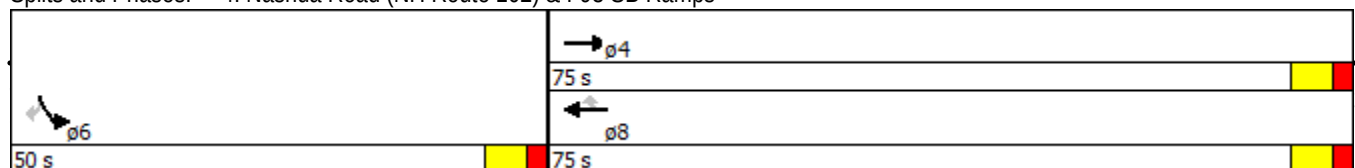
Existing Conditions
Weekday Morning

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		 	 			
Volume (vph)	0	841	565	523	293	527
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	12	12	15	15
Storage Length (ft)	0			200	0	350
Storage Lanes	0			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3587	3539	1568	1928	1742
Flt Permitted					0.950	
Satd. Flow (perm)	0	3587	3539	1568	1928	1742
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				556		276
Link Speed (mph)		35	35		30	
Link Distance (ft)		1200	1110		1500	
Travel Time (s)		23.4	21.6		34.1	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.84	0.84
Heavy Vehicles (%)	0%	4%	2%	3%	3%	2%
Shared Lane Traffic (%)						
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Detector Phase		4	8	8	6	6
Switch Phase						
Minimum Initial (s)		10.0	10.0	10.0	6.0	6.0
Minimum Split (s)		16.0	16.0	16.0	12.0	12.0
Total Split (s)		75.0	75.0	75.0	50.0	50.0
Total Split (%)		60.0%	60.0%	60.0%	40.0%	40.0%
Maximum Green (s)		69.0	69.0	69.0	44.0	44.0
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		Min	Min	Min	None	None

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 58.7
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Nashua Road (NH Route 102) & I-93 SB Ramps



Queues
4: Nashua Road (NH Route 102) & I-93 SB Ramps

Existing Conditions
Weekday Morning

	→	←	↖	↘	↙
Lane Group	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	914	601	556	349	627
v/c Ratio	0.57	0.38	0.55	0.45	0.72
Control Delay	14.6	12.6	3.7	15.4	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	12.6	3.7	15.4	13.7
Queue Length 50th (ft)	110	65	0	83	89
Queue Length 95th (ft)	242	149	55	165	208
Internal Link Dist (ft)	1120	1030		1420	
Turn Bay Length (ft)			200		350
Base Capacity (vph)	3475	3429	1536	1545	1451
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	0.26	0.18	0.36	0.23	0.43
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

4: Nashua Road (NH Route 102) & I-93 SB Ramps

Existing Conditions
Weekday Morning

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑	↑	↑
Volume (vph)	0	841	565	523	293	527
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	15	15
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	0.95	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		3587	3539	1568	1928	1742
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		3587	3539	1568	1928	1742
Peak-hour factor, PHF	0.92	0.92	0.94	0.94	0.84	0.84
Adj. Flow (vph)	0	914	601	556	349	627
RTOR Reduction (vph)	0	0	0	305	0	163
Lane Group Flow (vph)	0	914	601	251	349	464
Heavy Vehicles (%)	0%	4%	2%	3%	3%	2%
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)		24.1	24.1	24.1	21.7	21.7
Effective Green, g (s)		26.1	26.1	26.1	23.7	23.7
Actuated g/C Ratio		0.45	0.45	0.45	0.41	0.41
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1619	1598	708	790	714
v/s Ratio Prot		c0.25	0.17		0.18	
v/s Ratio Perm				0.16		c0.27
v/c Ratio		0.56	0.38	0.35	0.44	0.65
Uniform Delay, d1		11.7	10.5	10.4	12.3	13.7
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.5	0.1	0.3	0.4	2.1
Delay (s)		12.1	10.6	10.7	12.7	15.8
Level of Service		B	B	B	B	B
Approach Delay (s)		12.1	10.6		14.7	
Approach LOS		B	B		B	
Intersection Summary						
HCM 2000 Control Delay			12.4		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			57.8		Sum of lost time (s)	8.0
Intersection Capacity Utilization			54.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
5: I-93 NB Ramps & Nashua Road (NH Route 102)

Existing Conditions

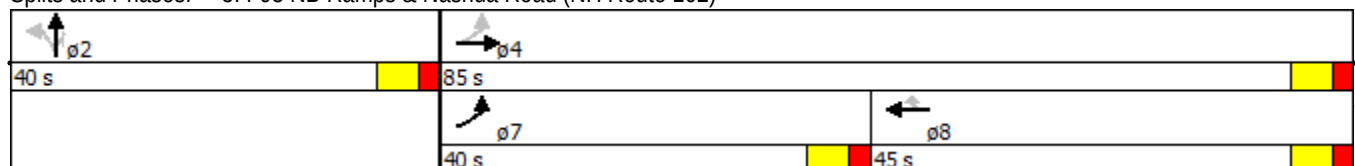
Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Volume (vph)	564	570	0	0	886	446	202	2	225	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	13	13	12	12	15	13	13	15	12	12	12
Storage Length (ft)	550		0	0		650	450		550	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			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
Flt						0.850			0.850			
Flt Protected	0.950						0.950	0.953				
Satd. Flow (prot)	1636	3587	0	0	3539	1742	1656	1663	1708	0	0	0
Flt Permitted	0.100						0.950	0.953				
Satd. Flow (perm)	172	3587	0	0	3539	1742	1656	1663	1708	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						513			271			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1110			1575			1500			1500	
Travel Time (s)		21.6			30.7			34.1			34.1	
Peak Hour Factor	0.93	0.93	0.93	0.87	0.87	0.87	0.83	0.83	0.83	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	0%	0%	2%	2%	7%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)							50%					
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4					8	2		2			
Detector Phase	7	4			8	8	2	2	2			
Switch Phase												
Minimum Initial (s)	6.0	10.0			10.0	10.0	10.0	10.0	10.0			
Minimum Split (s)	12.0	16.0			16.0	16.0	16.0	16.0	16.0			
Total Split (s)	40.0	85.0			45.0	45.0	40.0	40.0	40.0			
Total Split (%)	32.0%	68.0%			36.0%	36.0%	32.0%	32.0%	32.0%			
Maximum Green (s)	34.0	79.0			39.0	39.0	34.0	34.0	34.0			
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	-2.0	-2.0			-2.0	-2.0	-2.0	-2.0	-2.0			
Total Lost Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Recall Mode	None	Min			Min	Min	None	None	None			

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 101.8
Natural Cycle: 70
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: I-93 NB Ramps & Nashua Road (NH Route 102)



Queues

5: I-93 NB Ramps & Nashua Road (NH Route 102)

Existing Conditions

Weekday Morning

							
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	606	613	1018	513	121	124	271
v/c Ratio	0.93	0.22	0.77	0.53	0.47	0.48	0.55
Control Delay	48.4	3.8	33.2	4.3	46.4	46.7	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.4	3.8	33.2	4.3	46.4	46.7	9.3
Queue Length 50th (ft)	329	46	297	0	78	81	0
Queue Length 95th (ft)	#616	82	393	56	127	130	50
Internal Link Dist (ft)		1030	1495			1420	
Turn Bay Length (ft)	550			650	450		550
Base Capacity (vph)	652	2867	1432	1010	588	590	781
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	0.93	0.21	0.71	0.51	0.21	0.21	0.35

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

5: I-93 NB Ramps & Nashua Road (NH Route 102)

Existing Conditions
Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Volume (vph)	564	570	0	0	886	446	202	2	225	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	13	13	12	12	15	13	13	15	12	12	12
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1636	3587			3539	1742	1656	1663	1708			
Flt Permitted	0.10	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	171	3587			3539	1742	1656	1663	1708			
Peak-hour factor, PHF	0.93	0.93	0.93	0.87	0.87	0.87	0.83	0.83	0.83	0.92	0.92	0.92
Adj. Flow (vph)	606	613	0	0	1018	513	243	2	271	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	322	0	0	229	0	0	0
Lane Group Flow (vph)	606	613	0	0	1018	191	121	124	42	0	0	0
Heavy Vehicles (%)	3%	4%	0%	0%	2%	2%	7%	0%	4%	0%	0%	0%
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4					8	2		2			
Actuated Green, G (s)	76.1	76.1			35.9	35.9	13.7	13.7	13.7			
Effective Green, g (s)	78.1	78.1			37.9	37.9	15.7	15.7	15.7			
Actuated g/C Ratio	0.77	0.77			0.37	0.37	0.15	0.15	0.15			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	652	2751			1317	648	255	256	263			
v/s Ratio Prot	c0.33	0.17			0.29							
v/s Ratio Perm	c0.38					0.11	0.07	0.07	0.02			
v/c Ratio	0.93	0.22			0.77	0.29	0.47	0.48	0.16			
Uniform Delay, d1	25.9	3.3			28.2	22.5	39.3	39.4	37.3			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	19.6	0.0			2.9	0.3	1.4	1.4	0.3			
Delay (s)	45.5	3.4			31.0	22.8	40.7	40.8	37.6			
Level of Service	D	A			C	C	D	D	D			
Approach Delay (s)		24.3			28.3			39.1			0.0	
Approach LOS		C			C			D			A	
Intersection Summary												
HCM 2000 Control Delay			28.5									C
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			101.8							12.0		
Intersection Capacity Utilization			77.2%									D
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
7: Mammoth Road (NH Route 128) & Pillsbury Road

Existing Conditions

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	139	140	43	30	25	83	15	397	18	95	341	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	11	11	11	12	11	11	12	12	12
Storage Length (ft)	0		0	0		0	360		0	360		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982			0.919			0.994			0.970	
Flt Protected		0.979			0.989		0.950			0.950		
Satd. Flow (prot)	0	1888	0	0	1669	0	1805	1808	0	1805	1814	0
Flt Permitted		0.739			0.847		0.313			0.218		
Satd. Flow (perm)	0	1425	0	0	1430	0	595	1808	0	414	1814	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			55			2			11	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1900			5550			2000			2000	
Travel Time (s)		37.0			108.1			39.0			39.0	
Peak Hour Factor	0.80	0.80	0.80	0.86	0.86	0.86	0.84	0.84	0.84	0.77	0.77	0.77
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	26.0	26.0		26.0	26.0		26.0	46.0		26.0	46.0	
Total Split (%)	21.3%	21.3%		21.3%	21.3%		21.3%	37.7%		21.3%	37.7%	
Maximum Green (s)	20.0	20.0		20.0	20.0		20.0	40.0		20.0	40.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												

Intersection Summary

Area Type: Other
Cycle Length: 122
Actuated Cycle Length: 79.8
Natural Cycle: 100
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 7: Mammoth Road (NH Route 128) & Pillsbury Road

Existing Conditions
 Weekday Morning

Splits and Phases: 7: Mammoth Road (NH Route 128) & Pillsbury Road

 $\phi 1$	 $\phi 2$	 $\phi 4$	 $\phi 9$
26 s	46 s	26 s	24 s
 $\phi 5$	 $\phi 6$	 $\phi 8$	
26 s	46 s	26 s	

Lanes, Volumes, Timings
7: Mammoth Road (NH Route 128) & Pillsbury Road

Existing Conditions
Weekday Morning

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

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 (%)

Shared Lane Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 12.0

Minimum Split (s) 24.0

Total Split (s) 24.0

Total Split (%) 20%

Maximum Green (s) 18.0

Yellow Time (s) 4.0

All-Red Time (s) 2.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?

Vehicle Extension (s) 3.0

Recall Mode None

Walk Time (s) 12.0

Flash Dont Walk (s) 6.0

Pedestrian Calls (#/hr) 5

Intersection Summary

Queues

7: Mammoth Road (NH Route 128) & Pillsbury Road

Existing Conditions

Weekday Morning

						
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	403	161	18	494	123	555
v/c Ratio	0.97	0.36	0.04	0.74	0.29	0.60
Control Delay	70.7	21.9	9.8	30.3	10.9	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.7	21.9	9.8	30.3	10.9	20.0
Queue Length 50th (ft)	172	36	3	181	22	130
Queue Length 95th (ft)	#514	131	16	403	64	372
Internal Link Dist (ft)	1820	5470		1920		1920
Turn Bay Length (ft)			360		360	
Base Capacity (vph)	414	450	685	994	634	1021
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	0.97	0.36	0.03	0.50	0.19	0.54

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

7: Mammoth Road (NH Route 128) & Pillsbury Road

Existing Conditions
Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	139	140	43	30	25	83	15	397	18	95	341	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	11	11	11	12	11	11	12	12	12
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.92		1.00	0.99		1.00	0.97	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1887			1669		1805	1808		1805	1814	
Flt Permitted		0.74			0.85		0.31	1.00		0.22	1.00	
Satd. Flow (perm)		1424			1429		596	1808		414	1814	
Peak-hour factor, PHF	0.80	0.80	0.80	0.86	0.86	0.86	0.84	0.84	0.84	0.77	0.77	0.77
Adj. Flow (vph)	174	175	54	35	29	97	18	473	21	123	443	112
RTOR Reduction (vph)	0	4	0	0	41	0	0	1	0	0	6	0
Lane Group Flow (vph)	0	399	0	0	120	0	18	493	0	123	549	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.9			20.9		34.2	31.7		47.0	38.5	
Effective Green, g (s)		22.9			22.9		38.2	33.7		49.0	40.5	
Actuated g/C Ratio		0.26			0.26		0.43	0.38		0.55	0.46	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		368			370		319	689		407	831	
v/s Ratio Prot							0.00	c0.27		c0.04	c0.30	
v/s Ratio Perm		c0.28			0.08		0.02			0.13		
v/c Ratio		1.08			0.32		0.06	0.72		0.30	0.66	
Uniform Delay, d1		32.8			26.5		15.0	23.3		12.2	18.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		71.0			1.1		0.1	3.8		0.6	2.2	
Delay (s)		103.7			27.6		15.1	27.1		12.8	20.8	
Level of Service		F			C		B	C		B	C	
Approach Delay (s)		103.7			27.6			26.6			19.3	
Approach LOS		F			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			41.6			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			88.4			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			61.7%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
1: Gilcreast Road & Nashua Road (NH Route 102)

Existing Conditions
Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	1076	73	167	1099	162	145	114	151	135	97	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	175		0	160		375	0		0	0		200
Storage Lanes	1		0	2		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.973			0.972	
Satd. Flow (prot)	1728	3541	0	3467	3505	1599	0	1716	1507	0	1836	1615
Flt Permitted	0.950			0.950				0.973			0.972	
Satd. Flow (perm)	1728	3541	0	3467	3505	1599	0	1716	1507	0	1836	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				176			112			105
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1500			800			1500			1415	
Travel Time (s)		29.2			15.6			29.2			27.6	
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91	0.88	0.88	0.88
Heavy Vehicles (%)	1%	1%	0%	1%	3%	1%	2%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	1	4	4	5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	14.0		11.0	14.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	25.0	50.0		25.0	50.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	20.0%	40.0%		20.0%	40.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Maximum Green (s)	19.0	44.0		19.0	44.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 123.4
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 1: Gilcreast Road & Nashua Road (NH Route 102)

Existing Conditions
 Weekday Evening

Splits and Phases: 1: Gilcreast Road & Nashua Road (NH Route 102)

 ø1	 ø2	 ø3	 ø4
25 s	50 s	25 s	25 s
 ø5	 ø6		
25 s	50 s		

Queues

1: Gilcreast Road & Nashua Road (NH Route 102)

Existing Conditions

Weekday Evening

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	221	1210	182	1195	176	284	166	263	215
v/c Ratio	0.79	0.81	0.47	0.92	0.19	0.97	0.33	0.87	0.33
Control Delay	70.9	36.7	55.4	48.9	1.5	98.0	8.7	77.3	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	36.7	55.4	48.9	1.5	98.0	8.7	77.3	15.6
Queue Length 50th (ft)	172	440	72	483	0	232	21	209	60
Queue Length 95th (ft)	#289	559	107	#623	15	#413	56	#341	118
Internal Link Dist (ft)		1420		720		1420		1335	
Turn Bay Length (ft)	175		160		375				200
Base Capacity (vph)	294	1498	590	1306	948	292	586	312	661
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	0.75	0.81	0.31	0.92	0.19	0.97	0.28	0.84	0.33

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

1: Gilcreast Road & Nashua Road (NH Route 102)

Existing Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	1076	73	167	1099	162	145	114	151	135	97	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1728	3542		3467	3505	1599		1715	1507		1836	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1728	3542		3467	3505	1599		1715	1507		1836	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91	0.88	0.88	0.88
Adj. Flow (vph)	221	1133	77	182	1195	176	159	125	166	153	110	215
RTOR Reduction (vph)	0	3	0	0	0	81	0	0	80	0	0	71
Lane Group Flow (vph)	221	1207	0	182	1195	95	0	284	86	0	263	144
Heavy Vehicles (%)	1%	1%	0%	1%	3%	1%	2%	1%	1%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Actuated Green, G (s)	17.9	50.1		11.8	44.0	62.5		19.0	30.8		18.5	36.4
Effective Green, g (s)	19.9	52.1		13.8	46.0	66.5		21.0	34.8		20.5	40.4
Actuated g/C Ratio	0.16	0.42		0.11	0.37	0.54		0.17	0.28		0.17	0.33
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	278	1495		387	1306	861		291	424		305	581
v/s Ratio Prot	c0.13	0.34		0.05	c0.34	0.02		c0.17	0.02		c0.14	0.04
v/s Ratio Perm						0.04			0.03			0.05
v/c Ratio	0.79	0.81		0.47	0.92	0.11		0.98	0.20		0.86	0.25
Uniform Delay, d1	49.8	31.2		51.4	36.8	13.9		50.9	33.7		50.1	30.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	14.5	3.8		0.9	10.6	0.1		45.7	0.2		21.3	0.2
Delay (s)	64.2	35.0		52.3	47.4	14.0		96.7	34.0		71.4	30.6
Level of Service	E	D		D	D	B		F	C		E	C
Approach Delay (s)		39.5			44.2			73.5			53.1	
Approach LOS		D			D			E			D	

Intersection Summary

HCM 2000 Control Delay	46.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	123.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Existing Conditions

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	206	1031	40	120	1169	365	45	30	70	335	45	232
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	215		0	200		400	0		100	0		0
Storage Lanes	2		0	2		1	0		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.994				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.971		0.950	0.963	
Satd. Flow (prot)	3502	3521	0	3502	3505	1615	0	1799	1575	1715	1738	1615
Flt Permitted	0.950			0.950				0.971		0.950	0.963	
Satd. Flow (perm)	3502	3521	0	3502	3505	1615	0	1799	1575	1715	1738	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				384			79			217
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		800			1200			1500			415	
Travel Time (s)		15.6			23.4			34.1			9.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.81	0.81	0.81	0.80	0.80	0.80
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)										45%		
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Detector Phase	5	2		1	6	8	4	4	1	8	8	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	16.0		11.0	16.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	12.0	50.0		25.0	63.0	25.0	25.0	25.0	25.0	25.0	25.0	12.0
Total Split (%)	9.6%	40.0%		20.0%	50.4%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	9.6%
Maximum Green (s)	6.0	44.0		19.0	57.0	19.0	19.0	19.0	19.0	19.0	19.0	6.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag				Lead			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	Min		None	Min	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 104.9

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

			
25 s	50 s	25 s	25 s
			
12 s	63 s		

Queues

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Existing Conditions

Weekday Evening

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	217	1127	126	1231	384	93	86	230	245	290
v/c Ratio	0.79	0.75	0.30	0.75	0.32	0.38	0.21	0.68	0.71	0.44
Control Delay	71.3	30.3	47.9	27.2	1.1	50.1	6.2	53.7	55.3	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.3	30.3	47.9	27.2	1.1	50.1	6.2	53.7	55.3	12.0
Queue Length 50th (ft)	78	346	42	367	0	61	2	160	171	37
Queue Length 95th (ft)	#169	481	78	487	19	107	22	247	#275	91
Internal Link Dist (ft)		720		1120		1420			335	
Turn Bay Length (ft)	215		200		400		100			
Base Capacity (vph)	276	1659	724	2038	1227	372	550	354	359	660
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.68	0.17	0.60	0.31	0.25	0.16	0.65	0.68	0.44

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Existing Conditions
Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	206	1031	40	120	1169	365	45	30	70	335	45	232
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3502	3522		3502	3505	1615		1798	1575	1715	1738	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3502	3522		3502	3505	1615		1798	1575	1715	1738	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.81	0.81	0.81	0.80	0.80	0.80
Adj. Flow (vph)	217	1085	42	126	1231	384	56	37	86	419	56	290
RTOR Reduction (vph)	0	2	0	0	0	131	0	0	61	0	0	158
Lane Group Flow (vph)	217	1125	0	126	1231	253	0	93	25	230	245	132
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Actuated Green, G (s)	6.2	42.7		10.5	47.0	65.8		9.9	20.4	18.8	18.8	25.0
Effective Green, g (s)	8.2	44.7		12.5	49.0	69.8		11.9	24.4	20.8	20.8	29.0
Actuated g/C Ratio	0.08	0.42		0.12	0.46	0.66		0.11	0.23	0.20	0.20	0.27
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	271	1486		413	1621	1064		202	362	336	341	503
v/s Ratio Prot	c0.06	0.32		0.04	c0.35	0.05		c0.05	0.01	0.13	c0.14	0.02
v/s Ratio Perm						0.11			0.01			0.06
v/c Ratio	0.80	0.76		0.31	0.76	0.24		0.46	0.07	0.68	0.72	0.26
Uniform Delay, d1	48.0	26.0		42.7	23.6	7.3		44.0	31.9	39.5	39.8	30.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.3	2.4		0.6	2.2	0.2		2.3	0.1	6.2	7.6	0.4
Delay (s)	64.3	28.4		43.3	25.8	7.5		46.3	32.0	45.7	47.4	30.5
Level of Service	E	C		D	C	A		D	C	D	D	C
Approach Delay (s)		34.2			23.0			39.4			40.4	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			30.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			105.9				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			65.3%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
4: Nashua Road (NH Route 102) & I-93 SB Ramps

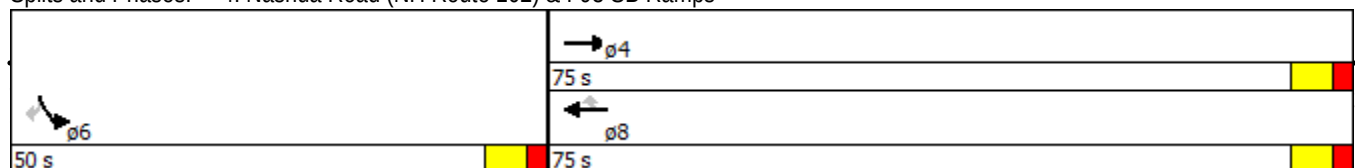
Existing Conditions
Weekday Evening

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		 	 			
Volume (vph)	0	1101	976	285	391	678
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	12	12	15	15
Storage Length (ft)	0			200	0	350
Storage Lanes	0			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3693	3574	1599	1966	1759
Flt Permitted					0.950	
Satd. Flow (perm)	0	3693	3574	1599	1966	1759
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				294		104
Link Speed (mph)		35	35		30	
Link Distance (ft)		1200	1110		1500	
Travel Time (s)		23.4	21.6		34.1	
Peak Hour Factor	0.91	0.91	0.97	0.97	0.86	0.86
Heavy Vehicles (%)	0%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Detector Phase		4	8	8	6	6
Switch Phase						
Minimum Initial (s)		10.0	10.0	10.0	6.0	6.0
Minimum Split (s)		16.0	16.0	16.0	12.0	12.0
Total Split (s)		75.0	75.0	75.0	50.0	50.0
Total Split (%)		60.0%	60.0%	60.0%	40.0%	40.0%
Maximum Green (s)		69.0	69.0	69.0	44.0	44.0
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		Min	Min	Min	None	None

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 93.7
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Nashua Road (NH Route 102) & I-93 SB Ramps



Queues
4: Nashua Road (NH Route 102) & I-93 SB Ramps

Existing Conditions
Weekday Evening

	→	←	↖	↘	↙
Lane Group	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1210	1006	294	455	788
v/c Ratio	0.78	0.67	0.35	0.47	0.86
Control Delay	27.1	24.1	3.1	19.0	30.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	24.1	3.1	19.0	30.5
Queue Length 50th (ft)	315	245	0	169	346
Queue Length 95th (ft)	391	310	43	290	#648
Internal Link Dist (ft)	1120	1030		1420	
Turn Bay Length (ft)			200		350
Base Capacity (vph)	2811	2721	1287	969	920
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	0.43	0.37	0.23	0.47	0.86

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

4: Nashua Road (NH Route 102) & I-93 SB Ramps

Existing Conditions

Weekday Evening

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑	↑	↑
Volume (vph)	0	1101	976	285	391	678
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	15	15
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	0.95	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		3693	3574	1599	1966	1759
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		3693	3574	1599	1966	1759
Peak-hour factor, PHF	0.91	0.91	0.97	0.97	0.86	0.86
Adj. Flow (vph)	0	1210	1006	294	455	788
RTOR Reduction (vph)	0	0	0	170	0	53
Lane Group Flow (vph)	0	1210	1006	124	455	735
Heavy Vehicles (%)	0%	1%	1%	1%	1%	1%
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)		37.4	37.4	37.4	44.2	44.2
Effective Green, g (s)		39.4	39.4	39.4	46.2	46.2
Actuated g/C Ratio		0.42	0.42	0.42	0.49	0.49
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1554	1504	673	970	868
v/s Ratio Prot		c0.33	0.28		0.23	
v/s Ratio Perm				0.08		c0.42
v/c Ratio		0.78	0.67	0.18	0.47	0.85
Uniform Delay, d1		23.3	21.8	17.0	15.6	20.6
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.5	1.1	0.1	0.4	7.7
Delay (s)		25.9	23.0	17.1	16.0	28.3
Level of Service		C	C	B	B	C
Approach Delay (s)		25.9	21.7		23.8	
Approach LOS		C	C		C	
Intersection Summary						
HCM 2000 Control Delay			23.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.82			
Actuated Cycle Length (s)			93.6		Sum of lost time (s)	8.0
Intersection Capacity Utilization			75.6%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
5: I-93 NB Ramps & Nashua Road (NH Route 102)

Existing Conditions

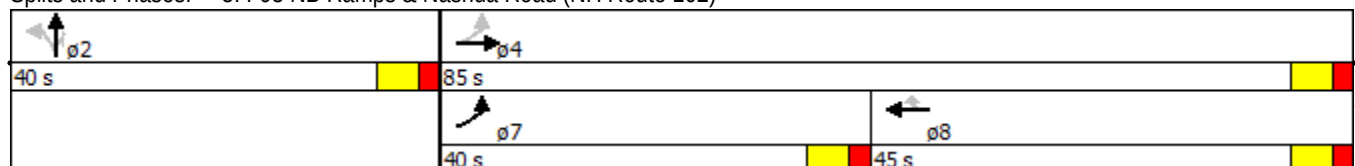
Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Volume (vph)	557	935	0	0	698	391	563	3	566	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	13	13	12	12	15	13	13	15	12	12	12
Storage Length (ft)	550		0	0		650	450		550	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			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
Frt						0.850			0.850			
Flt Protected	0.950						0.950	0.953				
Satd. Flow (prot)	1668	3693	0	0	3574	1725	1737	1743	1742	0	0	0
Flt Permitted	0.132						0.950	0.953				
Satd. Flow (perm)	232	3693	0	0	3574	1725	1737	1743	1742	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						430			135			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1110			1575			1500			1500	
Travel Time (s)		21.6			30.7			34.1			34.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.97	0.97	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	0%	0%	1%	3%	2%	0%	2%	0%	0%	0%
Shared Lane Traffic (%)							50%					
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4					8	2		2			
Detector Phase	7	4			8	8	2	2	2			
Switch Phase												
Minimum Initial (s)	6.0	10.0			10.0	10.0	10.0	10.0	10.0			
Minimum Split (s)	12.0	16.0			16.0	16.0	16.0	16.0	16.0			
Total Split (s)	40.0	85.0			45.0	45.0	40.0	40.0	40.0			
Total Split (%)	32.0%	68.0%			36.0%	36.0%	32.0%	32.0%	32.0%			
Maximum Green (s)	34.0	79.0			39.0	39.0	34.0	34.0	34.0			
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	-2.0	-2.0			-2.0	-2.0	-2.0	-2.0	-2.0			
Total Lost Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Recall Mode	None	Min			Min	Min	None	None	None			

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 118.5
Natural Cycle: 50
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: I-93 NB Ramps & Nashua Road (NH Route 102)



Queues

5: I-93 NB Ramps & Nashua Road (NH Route 102)

Existing Conditions

Weekday Evening

							
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	612	1027	767	430	290	293	584
v/c Ratio	1.05	0.44	0.74	0.53	0.55	0.55	0.94
Control Delay	82.7	12.0	42.7	5.5	40.1	40.2	55.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.7	12.0	42.7	5.5	40.1	40.2	55.3
Queue Length 50th (ft)	~450	197	278	0	194	196	351
Queue Length 95th (ft)	#714	240	347	71	311	314	#623
Internal Link Dist (ft)		1030	1495			1420	
Turn Bay Length (ft)	550			650	450		550
Base Capacity (vph)	582	2528	1238	878	528	530	623
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	1.05	0.41	0.62	0.49	0.55	0.55	0.94

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

5: I-93 NB Ramps & Nashua Road (NH Route 102)

Existing Conditions
Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Volume (vph)	557	935	0	0	698	391	563	3	566	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	13	13	12	12	15	13	13	15	12	12	12
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1668	3693			3574	1725	1737	1743	1742			
Flt Permitted	0.13	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	232	3693			3574	1725	1737	1743	1742			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	612	1027	0	0	767	430	580	3	584	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	305	0	0	94	0	0	0
Lane Group Flow (vph)	612	1027	0	0	767	125	290	293	490	0	0	0
Heavy Vehicles (%)	1%	1%	0%	0%	1%	3%	2%	0%	2%	0%	0%	0%
Turn Type	pm+pt	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4					8	2		2			
Actuated Green, G (s)	72.5	72.5			32.4	32.4	34.1	34.1	34.1			
Effective Green, g (s)	74.5	74.5			34.4	34.4	36.1	36.1	36.1			
Actuated g/C Ratio	0.63	0.63			0.29	0.29	0.30	0.30	0.30			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	582	2319			1036	500	528	530	530			
v/s Ratio Prot	c0.32	0.28			0.21							
v/s Ratio Perm	c0.34					0.07	0.17	0.17	c0.28			
v/c Ratio	1.05	0.44			0.74	0.25	0.55	0.55	0.92			
Uniform Delay, d1	32.3	11.4			38.1	32.2	34.5	34.5	39.9			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	51.6	0.1			2.9	0.3	1.2	1.3	22.0			
Delay (s)	83.9	11.5			40.9	32.5	35.6	35.8	62.0			
Level of Service	F	B			D	C	D	D	E			
Approach Delay (s)		38.5			37.9			48.8			0.0	
Approach LOS		D			D			D			A	
Intersection Summary												
HCM 2000 Control Delay			41.3			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			118.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			80.7%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
7: Mammoth Road (NH Route 128) & Pillsbury Road

Existing Conditions

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	78	47	37	157	127	65	497	63	124	494	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	11	11	11	12	11	11	12	12	12
Storage Length (ft)	0		0	0		0	360		0	360		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.973			0.947			0.983			0.964	
Flt Protected		0.977			0.994		0.950			0.950		
Satd. Flow (prot)	0	1866	0	0	1729	0	1805	1790	0	1805	1832	0
Flt Permitted		0.417			0.913		0.165			0.123		
Satd. Flow (perm)	0	797	0	0	1588	0	314	1790	0	234	1832	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			24			6			14	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1900			5550			2000			2000	
Travel Time (s)		37.0			108.1			39.0			39.0	
Peak Hour Factor	0.66	0.66	0.66	0.84	0.84	0.84	0.75	0.75	0.75	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	26.0	26.0		26.0	26.0		26.0	46.0		26.0	46.0	
Total Split (%)	21.3%	21.3%		21.3%	21.3%		21.3%	37.7%		21.3%	37.7%	
Maximum Green (s)	20.0	20.0		20.0	20.0		20.0	40.0		20.0	40.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												

Intersection Summary

Area Type: Other
Cycle Length: 122
Actuated Cycle Length: 87.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 7: Mammoth Road (NH Route 128) & Pillsbury Road

Existing Conditions
 Weekday Evening

Splits and Phases: 7: Mammoth Road (NH Route 128) & Pillsbury Road

 ø1	 ø2	 ø4	 ø9
26 s	46 s	26 s	24 s
 ø5	 ø6	 ø8	
26 s	46 s	26 s	

Lanes, Volumes, Timings
7: Mammoth Road (NH Route 128) & Pillsbury Road

Existing Conditions
Weekday Evening

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

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 (%)

Shared Lane Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 12.0

Minimum Split (s) 24.0

Total Split (s) 24.0

Total Split (%) 20%

Maximum Green (s) 18.0

Yellow Time (s) 4.0

All-Red Time (s) 2.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?

Vehicle Extension (s) 3.0

Recall Mode None

Walk Time (s) 12.0

Flash Dont Walk (s) 6.0

Pedestrian Calls (#/hr) 0

Intersection Summary

Queues

7: Mammoth Road (NH Route 128) & Pillsbury Road

Existing Conditions

Weekday Evening

						
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	354	382	87	747	144	758
v/c Ratio	1.71	0.92	0.24	0.87	0.40	0.78
Control Delay	366.1	59.7	7.4	33.3	9.7	25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	366.1	59.7	7.4	33.3	9.7	25.0
Queue Length 50th (ft)	~289	192	15	345	26	335
Queue Length 95th (ft)	#316	#340	25	400	44	477
Internal Link Dist (ft)	1820	5470		1920		1920
Turn Bay Length (ft)			360		360	
Base Capacity (vph)	207	417	580	861	548	969
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	1.71	0.92	0.15	0.87	0.26	0.78

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

7: Mammoth Road (NH Route 128) & Pillsbury Road

Existing Conditions
Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	78	47	37	157	127	65	497	63	124	494	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	11	11	11	12	11	11	12	12	12
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.95		1.00	0.98		1.00	0.96	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1867			1729		1805	1790		1805	1831	
Flt Permitted		0.42			0.91		0.17	1.00		0.12	1.00	
Satd. Flow (perm)		796			1587		314	1790		234	1831	
Peak-hour factor, PHF	0.66	0.66	0.66	0.84	0.84	0.84	0.75	0.75	0.75	0.86	0.86	0.86
Adj. Flow (vph)	165	118	71	44	187	151	87	663	84	144	574	184
RTOR Reduction (vph)	0	7	0	0	18	0	0	3	0	0	7	0
Lane Group Flow (vph)	0	347	0	0	364	0	87	744	0	144	751	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.0			20.0		48.0	41.2		53.6	44.0	
Effective Green, g (s)		22.0			22.0		52.0	43.2		57.6	46.0	
Actuated g/C Ratio		0.25			0.25		0.59	0.49		0.65	0.52	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		197			393		331	870		357	948	
v/s Ratio Prot							0.03	c0.42		c0.05	0.41	
v/s Ratio Perm		c0.44			0.23		0.13			0.21		
v/c Ratio		1.76			0.93		0.26	0.86		0.40	0.79	
Uniform Delay, d1		33.4			32.6		11.8	20.0		12.8	17.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		363.1			28.5		0.6	8.5		1.0	4.9	
Delay (s)		396.5			61.1		12.4	28.6		13.8	22.4	
Level of Service		F			E		B	C		B	C	
Approach Delay (s)		396.5			61.1			26.9			21.0	
Approach LOS		F			E			C			C	
Intersection Summary												
HCM 2000 Control Delay			83.0			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.13									
Actuated Cycle Length (s)			88.8			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			84.2%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

2032 No-Build

Lanes, Volumes, Timings
1: Gilcreast Road & Nashua Road (NH Route 102)

2032 No-Build Conditions
Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	128	1258	41	90	907	74	121	47	184	244	84	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	175		0	160		375	0		0	0		200
Storage Lanes	1		0	2		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.965			0.964	
Satd. Flow (prot)	1694	3420	0	3467	3406	1615	0	1728	1507	0	1832	1583
Flt Permitted	0.950			0.950				0.965			0.964	
Satd. Flow (perm)	1694	3420	0	3467	3406	1615	0	1728	1507	0	1832	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				80			79			138
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1500			800			1500			1415	
Travel Time (s)		29.2			15.6			29.2			27.6	
Peak Hour Factor	0.96	0.96	0.96	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	5%	6%	1%	6%	0%	0%	0%	1%	0%	0%	2%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	1	4	4	5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	14.0		11.0	14.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	25.0	50.0		25.0	50.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	20.0%	40.0%		20.0%	40.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Maximum Green (s)	19.0	44.0		19.0	44.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 116.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 1: Gilcreast Road & Nashua Road (NH Route 102)

2032 No-Build Conditions
 Weekday Morning

Splits and Phases: 1: Gilcreast Road & Nashua Road (NH Route 102)

 ø1	 ø2	 ø3	 ø4
25 s	50 s	25 s	25 s
 ø5	 ø6		
25 s	50 s		

Queues

2032 No-Build Conditions

1: Gilcreast Road & Nashua Road (NH Route 102)

Weekday Morning

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	133	1353	98	986	80	186	204	364	164
v/c Ratio	0.57	0.92	0.31	0.75	0.08	0.69	0.47	1.10	0.25
Control Delay	57.3	42.2	53.3	36.2	1.7	61.1	16.3	123.0	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	42.2	53.3	36.2	1.7	61.1	16.3	123.0	7.6
Queue Length 50th (ft)	97	504	37	343	0	136	51	~327	13
Queue Length 95th (ft)	165	#685	66	455	11	223	101	#547	61
Internal Link Dist (ft)		1420		720		1420		1335	
Turn Bay Length (ft)	175		160		375				200
Base Capacity (vph)	307	1478	629	1353	949	313	561	332	712
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	0.43	0.92	0.16	0.73	0.08	0.59	0.36	1.10	0.23

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Gilcreast Road & Nashua Road (NH Route 102)

2032 No-Build Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	128	1258	41	90	907	74	121	47	184	244	84	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.96	1.00
Satd. Flow (prot)	1694	3421		3467	3406	1615		1728	1507		1832	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.96	1.00
Satd. Flow (perm)	1694	3421		3467	3406	1615		1728	1507		1832	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	133	1310	43	98	986	80	134	52	204	271	93	164
RTOR Reduction (vph)	0	2	0	0	0	35	0	0	59	0	0	94
Lane Group Flow (vph)	133	1351	0	98	986	45	0	186	145	0	364	70
Heavy Vehicles (%)	3%	5%	6%	1%	6%	0%	0%	0%	1%	0%	0%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Actuated Green, G (s)	14.1	48.2		8.7	42.8	61.9		16.2	24.9		19.1	33.2
Effective Green, g (s)	16.1	50.2		10.7	44.8	65.9		18.2	28.9		21.1	37.2
Actuated g/C Ratio	0.14	0.43		0.09	0.39	0.57		0.16	0.25		0.18	0.32
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	234	1477		319	1313	915		270	374		332	561
v/s Ratio Prot	c0.08	c0.40		0.03	0.29	0.01		c0.11	0.04		c0.20	0.02
v/s Ratio Perm						0.02			0.06			0.03
v/c Ratio	0.57	0.91		0.31	0.75	0.05		0.69	0.39		1.10	0.13
Uniform Delay, d1	46.8	31.0		49.3	30.9	11.2		46.3	36.3		47.5	28.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	3.1	9.5		0.5	2.9	0.0		7.1	0.7		77.8	0.1
Delay (s)	50.0	40.5		49.8	33.8	11.2		53.5	37.0		125.3	28.1
Level of Service	D	D		D	C	B		D	D		F	C
Approach Delay (s)		41.4			33.6			44.8			95.1	
Approach LOS		D			C			D			F	
Intersection Summary												
HCM 2000 Control Delay			47.2				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			116.2				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			75.4%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

2032 No-Build Conditions

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	86	1485	64	48	1034	220	12	11	59	117	11	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	215		0	200		400	0		100	0		0
Storage Lanes	2		0	2		1	0		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.994				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.974		0.950	0.960	
Satd. Flow (prot)	3433	3453	0	3502	3438	1553	0	1724	1544	1633	1663	1553
Flt Permitted	0.950			0.950				0.974		0.950	0.960	
Satd. Flow (perm)	3433	3453	0	3502	3438	1553	0	1724	1544	1633	1663	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				237			79			131
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		800			1200			1500			415	
Travel Time (s)		15.6			23.4			34.1			9.4	
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.76	0.76	0.76	0.82	0.82	0.82
Heavy Vehicles (%)	2%	4%	2%	0%	5%	4%	0%	10%	2%	5%	0%	4%
Shared Lane Traffic (%)										48%		
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Detector Phase	5	2		1	6	8	4	4	1	8	8	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	16.0		11.0	16.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	12.0	50.0		25.0	63.0	25.0	25.0	25.0	25.0	25.0	25.0	12.0
Total Split (%)	9.6%	40.0%		20.0%	50.4%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	9.6%
Maximum Green (s)	6.0	44.0		19.0	57.0	19.0	19.0	19.0	19.0	19.0	19.0	6.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag				Lead			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	Min		None	Min	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 89.2

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

			
25 s	50 s	25 s	25 s
			
12 s	63 s		

Queues

2032 No-Build Conditions

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Weekday Morning

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	91	1630	52	1112	237	30	78	74	82	74
v/c Ratio	0.28	0.86	0.13	0.57	0.19	0.15	0.23	0.30	0.33	0.14
Control Delay	46.0	27.6	41.9	16.8	0.8	43.0	6.2	41.4	41.8	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	27.6	41.9	16.8	0.8	43.0	6.2	41.4	41.8	1.0
Queue Length 50th (ft)	27	483	14	247	0	17	0	43	47	0
Queue Length 95th (ft)	59	#790	37	373	12	41	17	86	94	0
Internal Link Dist (ft)		720		1120		1420			335	
Turn Bay Length (ft)	215		200		400		100			
Base Capacity (vph)	320	1889	857	2365	1300	421	535	399	407	541
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.86	0.06	0.47	0.18	0.07	0.15	0.19	0.20	0.14

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

2032 No-Build Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	86	1485	64	48	1034	220	12	11	59	117	11	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3433	3452		3502	3438	1553		1724	1544	1633	1662	1553
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3433	3452		3502	3438	1553		1724	1544	1633	1662	1553
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.76	0.76	0.76	0.82	0.82	0.82
Adj. Flow (vph)	91	1563	67	52	1112	237	16	14	78	143	13	74
RTOR Reduction (vph)	0	2	0	0	0	75	0	0	65	0	0	58
Lane Group Flow (vph)	91	1628	0	52	1112	162	0	30	13	74	82	16
Heavy Vehicles (%)	2%	4%	2%	0%	5%	4%	0%	10%	2%	5%	0%	4%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Actuated Green, G (s)	4.5	46.7		6.2	48.4	59.6		4.9	11.1	11.2	11.2	15.7
Effective Green, g (s)	6.5	48.7		8.2	50.4	63.6		6.9	15.1	13.2	13.2	19.7
Actuated g/C Ratio	0.07	0.52		0.09	0.54	0.68		0.07	0.16	0.14	0.14	0.21
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	239	1807		308	1863	1062		127	250	231	235	395
v/s Ratio Prot	c0.03	c0.47		0.01	0.32	0.02		c0.02	0.00	0.05	c0.05	0.00
v/s Ratio Perm						0.08			0.00			0.01
v/c Ratio	0.38	0.90		0.17	0.60	0.15		0.24	0.05	0.32	0.35	0.04
Uniform Delay, d1	41.3	20.0		39.2	14.4	5.2		40.6	32.9	35.9	36.0	29.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	6.8		0.4	0.6	0.1		1.3	0.1	1.1	1.2	0.1
Delay (s)	42.7	26.7		39.6	15.0	5.3		41.9	33.0	37.0	37.2	29.2
Level of Service	D	C		D	B	A		D	C	D	D	C
Approach Delay (s)		27.6			14.3			35.5			34.6	
Approach LOS		C			B			D			C	

Intersection Summary

HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 No-Build Conditions

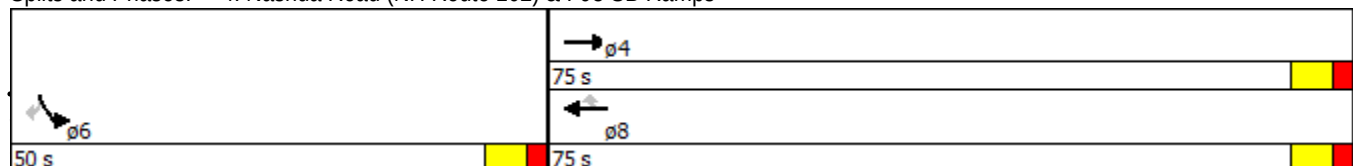
Weekday Morning

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1010	710	581	325	592
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			400	0	350
Storage Lanes	0			1	1	2
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3471	3539	1568	1752	2787
Flt Permitted					0.950	
Satd. Flow (perm)	0	3471	3539	1568	1752	2787
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				618		337
Link Speed (mph)		35	35		30	
Link Distance (ft)		1200	1110		1500	
Travel Time (s)		23.4	21.6		34.1	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.90	0.90
Heavy Vehicles (%)	0%	4%	2%	3%	3%	2%
Shared Lane Traffic (%)						
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Detector Phase		4	8	8	6	6
Switch Phase						
Minimum Initial (s)		10.0	10.0	10.0	6.0	6.0
Minimum Split (s)		16.0	16.0	16.0	12.0	12.0
Total Split (s)		75.0	75.0	75.0	50.0	50.0
Total Split (%)		60.0%	60.0%	60.0%	40.0%	40.0%
Maximum Green (s)		69.0	69.0	69.0	44.0	44.0
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		Min	Min	Min	None	None

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 63.9
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Nashua Road (NH Route 102) & I-93 SB Ramps



Queues
4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 No-Build Conditions
Weekday Morning

	→	←	↖	↘	↙
Lane Group	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1098	755	618	361	658
v/c Ratio	0.64	0.43	0.57	0.56	0.53
Control Delay	14.3	11.6	3.3	21.1	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	11.6	3.3	21.1	9.6
Queue Length 50th (ft)	143	85	0	103	46
Queue Length 95th (ft)	286	176	50	240	125
Internal Link Dist (ft)	1120	1030		1420	
Turn Bay Length (ft)			400		350
Base Capacity (vph)	3317	3382	1526	1323	2188
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	0.33	0.22	0.40	0.27	0.30
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 No-Build Conditions

Weekday Morning

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑	↑	↑↑
Volume (vph)	0	1010	710	581	325	592
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	0.95	1.00	1.00	0.88
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		3471	3539	1568	1752	2787
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		3471	3539	1568	1752	2787
Peak-hour factor, PHF	0.92	0.92	0.94	0.94	0.90	0.90
Adj. Flow (vph)	0	1098	755	618	361	658
RTOR Reduction (vph)	0	0	0	308	0	212
Lane Group Flow (vph)	0	1098	755	310	361	446
Heavy Vehicles (%)	0%	4%	2%	3%	3%	2%
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)		29.6	29.6	29.6	21.4	21.4
Effective Green, g (s)		31.6	31.6	31.6	23.4	23.4
Actuated g/C Ratio		0.50	0.50	0.50	0.37	0.37
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1741	1775	786	650	1035
v/s Ratio Prot		c0.32	0.21		c0.21	
v/s Ratio Perm				0.20		0.16
v/c Ratio		0.63	0.43	0.39	0.56	0.43
Uniform Delay, d1		11.4	9.9	9.8	15.7	14.8
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.8	0.2	0.3	1.0	0.3
Delay (s)		12.2	10.1	10.1	16.7	15.1
Level of Service		B	B	B	B	B
Approach Delay (s)		12.2	10.1		15.7	
Approach LOS		B	B		B	
Intersection Summary						
HCM 2000 Control Delay			12.4		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.60			
Actuated Cycle Length (s)			63.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			52.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 No-Build Conditions

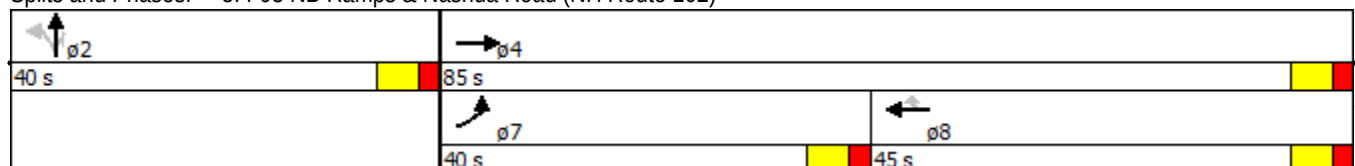
Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 				 			
Volume (vph)	630	705	0	0	1061	495	230	2	250	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	15	12	12	12	12	12	12
Storage Length (ft)	500		0	0		500	500		500	0		0
Storage Lanes	2		0	0		1	1		2	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.88	1.00	1.00	1.00
Flt						0.850			0.850			
Flt Protected	0.950						0.950	0.953				
Satd. Flow (prot)	3400	3471	0	0	3539	1742	1603	1609	2733	0	0	0
Flt Permitted	0.950						0.950	0.953				
Satd. Flow (perm)	3400	3471	0	0	3539	1742	1603	1609	2733	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						550			278			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1110			1575			1500			1500	
Travel Time (s)		21.6			30.7			34.1			34.1	
Peak Hour Factor	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	0%	0%	2%	2%	7%	0%	4%	0%	0%	0%
Shared Lane Traffic (%)							50%					
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Detector Phase	7	4			8	8	2	2	2			
Switch Phase												
Minimum Initial (s)	6.0	10.0			10.0	10.0	10.0	10.0	10.0			
Minimum Split (s)	12.0	16.0			16.0	16.0	16.0	16.0	16.0			
Total Split (s)	40.0	85.0			45.0	45.0	40.0	40.0	40.0			
Total Split (%)	32.0%	68.0%			36.0%	36.0%	32.0%	32.0%	32.0%			
Maximum Green (s)	34.0	79.0			39.0	39.0	34.0	34.0	34.0			
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	-2.0	-2.0			-2.0	-2.0	-2.0	-2.0	-2.0			
Total Lost Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Recall Mode	None	Min			Min	Min	None	None	None			

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 96.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: I-93 NB Ramps & Nashua Road (NH Route 102)



Queues
5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 No-Build Conditions

Weekday Morning

							
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	677	758	1179	550	128	130	278
v/c Ratio	0.72	0.29	0.78	0.52	0.48	0.49	0.40
Control Delay	36.3	4.5	29.6	4.0	43.7	43.9	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	4.5	29.6	4.0	43.7	43.9	6.4
Queue Length 50th (ft)	188	61	309	0	74	75	0
Queue Length 95th (ft)	271	110	#547	69	147	149	38
Internal Link Dist (ft)		1030	1495			1420	
Turn Bay Length (ft)	500			500	500		500
Base Capacity (vph)	1283	2949	1521	1062	605	607	1205
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	0.53	0.26	0.78	0.52	0.21	0.21	0.23

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 No-Build Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 	 	 	 	 			
Volume (vph)	630	705	0	0	1061	495	230	2	250	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	15	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.95	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3400	3471			3539	1742	1603	1609	2733			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3400	3471			3539	1742	1603	1609	2733			
Peak-hour factor, PHF	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	677	758	0	0	1179	550	256	2	278	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	313	0	0	232	0	0	0
Lane Group Flow (vph)	677	758	0	0	1179	237	128	130	46	0	0	0
Heavy Vehicles (%)	3%	4%	0%	0%	2%	2%	7%	0%	4%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	24.7	70.1			39.4	39.4	14.0	14.0	14.0			
Effective Green, g (s)	26.7	72.1			41.4	41.4	16.0	16.0	16.0			
Actuated g/C Ratio	0.28	0.75			0.43	0.43	0.17	0.17	0.17			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	944	2604			1524	750	266	267	455			
v/s Ratio Prot	c0.20	0.22			c0.33							
v/s Ratio Perm						0.14	0.08	0.08	0.02			
v/c Ratio	0.72	0.29			0.77	0.32	0.48	0.49	0.10			
Uniform Delay, d1	31.3	3.8			23.3	18.0	36.3	36.3	34.0			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	2.6	0.1			2.5	0.2	1.4	1.4	0.1			
Delay (s)	33.9	3.9			25.9	18.3	37.7	37.7	34.1			
Level of Service	C	A			C	B	D	D	C			
Approach Delay (s)		18.1			23.4			35.8			0.0	
Approach LOS		B			C			D			A	
Intersection Summary												
HCM 2000 Control Delay			23.1			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			96.1			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			67.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 No-Build Conditions
Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	155	48	33	28	93	17	441	20	106	379	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	11	11	11	12	11	11	12	12	12
Storage Length (ft)	0		0	0		0	360		0	360		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982			0.919			0.993			0.970	
Flt Protected		0.979			0.989		0.950			0.950		
Satd. Flow (prot)	0	1888	0	0	1669	0	1805	1807	0	1805	1814	0
Flt Permitted		0.705			0.838		0.323			0.197		
Satd. Flow (perm)	0	1359	0	0	1414	0	614	1807	0	374	1814	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			55			2			11	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1900			5550			2000			2000	
Travel Time (s)		37.0			108.1			39.0			39.0	
Peak Hour Factor	0.85	0.85	0.85	0.86	0.86	0.86	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	26.0	26.0		26.0	26.0		26.0	46.0		26.0	46.0	
Total Split (%)	21.3%	21.3%		21.3%	21.3%		21.3%	37.7%		21.3%	37.7%	
Maximum Green (s)	20.0	20.0		20.0	20.0		20.0	40.0		20.0	40.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												

Intersection Summary

Area Type: Other
Cycle Length: 122
Actuated Cycle Length: 83.2
Natural Cycle: 100
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 No-Build Conditions
 Weekday Morning

Splits and Phases: 7: Mammoth Road (NH Route 128) & Pillsbury Road

 ø1	 ø2	 ø4	 ø9
26 s	46 s	26 s	24 s
 ø5	 ø6	 ø8	
26 s	46 s	26 s	

Lanes, Volumes, Timings
7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 No-Build Conditions
Weekday Morning

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

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 (%)

Shared Lane Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 12.0

Minimum Split (s) 24.0

Total Split (s) 24.0

Total Split (%) 20%

Maximum Green (s) 18.0

Yellow Time (s) 4.0

All-Red Time (s) 2.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?

Vehicle Extension (s) 3.0

Recall Mode None

Walk Time (s) 12.0

Flash Dont Walk (s) 6.0

Pedestrian Calls (#/hr) 5

Intersection Summary

Queues

2032 No-Build Conditions

7: Mammoth Road (NH Route 128) & Pillsbury Road

Weekday Morning

						
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	419	179	20	543	125	558
v/c Ratio	1.11	0.42	0.04	0.75	0.30	0.58
Control Delay	113.0	24.4	9.6	30.7	10.8	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	113.0	24.4	9.6	30.7	10.8	19.2
Queue Length 50th (ft)	~231	47	3	208	22	131
Queue Length 95th (ft)	#597	150	18	465	73	438
Internal Link Dist (ft)	1820	5470		1920		1920
Turn Bay Length (ft)			360		360	
Base Capacity (vph)	376	427	685	946	610	1002
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	1.11	0.42	0.03	0.57	0.20	0.56

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 No-Build Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	155	48	33	28	93	17	441	20	106	379	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	11	11	11	12	11	11	12	12	12
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.92		1.00	0.99		1.00	0.97	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1887			1669		1805	1807		1805	1814	
Flt Permitted		0.70			0.84		0.32	1.00		0.20	1.00	
Satd. Flow (perm)		1359			1414		613	1807		375	1814	
Peak-hour factor, PHF	0.85	0.85	0.85	0.86	0.86	0.86	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	181	182	56	38	33	108	20	519	24	125	446	112
RTOR Reduction (vph)	0	5	0	0	41	0	0	1	0	0	6	0
Lane Group Flow (vph)	0	414	0	0	138	0	20	542	0	125	552	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.7			20.7		37.8	35.2		50.5	41.9	
Effective Green, g (s)		22.7			22.7		41.8	37.2		52.5	43.9	
Actuated g/C Ratio		0.25			0.25		0.46	0.41		0.57	0.48	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		336			349		338	732		390	867	
v/s Ratio Prot							0.00	c0.30		c0.04	c0.30	
v/s Ratio Perm		c0.31			0.10		0.02			0.14		
v/c Ratio		1.23			0.39		0.06	0.74		0.32	0.64	
Uniform Delay, d1		34.5			28.8		14.4	23.2		12.6	18.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		128.3			1.5		0.1	4.3		0.7	1.7	
Delay (s)		162.8			30.4		14.5	27.5		13.2	19.7	
Level of Service		F			C		B	C		B	B	
Approach Delay (s)		162.8			30.4			27.0			18.5	
Approach LOS		F			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			55.1			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			91.8			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			72.2%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
1: Gilcreast Road & Nashua Road (NH Route 102)

2032 No-Build Conditions

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	230	1356	80	199	1386	185	159	125	182	151	107	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	175		0	160		375	0		0	0		200
Storage Lanes	1		0	2		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.973			0.972	
Satd. Flow (prot)	1728	3548	0	3467	3505	1599	0	1716	1507	0	1836	1615
Flt Permitted	0.950			0.950				0.973			0.972	
Satd. Flow (perm)	1728	3548	0	3467	3505	1599	0	1716	1507	0	1836	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				201			93			87
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1500			800			1500			1415	
Travel Time (s)		29.2			15.6			29.2			27.6	
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	0%	1%	3%	1%	2%	1%	1%	1%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	1	4	4	5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	14.0		11.0	14.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	25.0	50.0		25.0	50.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	20.0%	40.0%		20.0%	40.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Maximum Green (s)	19.0	44.0		19.0	44.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 124.4
Natural Cycle: 120
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 1: Gilcreast Road & Nashua Road (NH Route 102)

2032 No-Build Conditions
 Weekday Evening

Splits and Phases: 1: Gilcreast Road & Nashua Road (NH Route 102)

 ø1	 ø2	 ø3	 ø4
25 s	50 s	25 s	25 s
 ø5	 ø6		
25 s	50 s		

Queues

2032 No-Build Conditions

1: Gilcreast Road & Nashua Road (NH Route 102)

Weekday Evening

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	242	1511	216	1507	201	312	200	287	232
v/c Ratio	0.86	1.03	0.52	1.16	0.21	1.08	0.40	0.93	0.36
Control Delay	77.6	67.5	55.5	118.6	1.5	123.9	12.5	87.1	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.6	67.5	55.5	118.6	1.5	123.9	12.5	87.1	19.3
Queue Length 50th (ft)	192	~683	85	~762	0	~282	43	232	82
Queue Length 95th (ft)	#329	#870	122	#902	16	#466	82	#401	150
Internal Link Dist (ft)		1420		720		1420		1335	
Turn Bay Length (ft)	175		160		375				200
Base Capacity (vph)	291	1468	585	1295	954	289	570	309	652
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	0.83	1.03	0.37	1.16	0.21	1.08	0.35	0.93	0.36

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Gilcreast Road & Nashua Road (NH Route 102)

2032 No-Build Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	230	1356	80	199	1386	185	159	125	182	151	107	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1728	3546		3467	3505	1599		1715	1507		1835	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1728	3546		3467	3505	1599		1715	1507		1835	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	242	1427	84	216	1507	201	175	137	200	168	119	232
RTOR Reduction (vph)	0	3	0	0	0	93	0	0	66	0	0	58
Lane Group Flow (vph)	242	1508	0	216	1507	108	0	312	134	0	287	174
Heavy Vehicles (%)	1%	1%	0%	1%	3%	1%	2%	1%	1%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Actuated Green, G (s)	18.4	49.4		13.0	44.0	63.0		19.0	32.0		19.0	37.4
Effective Green, g (s)	20.4	51.4		15.0	46.0	67.0		21.0	36.0		21.0	41.4
Actuated g/C Ratio	0.16	0.41		0.12	0.37	0.54		0.17	0.29		0.17	0.33
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	283	1465		418	1296	861		289	436		309	589
v/s Ratio Prot	c0.14	0.43		0.06	c0.43	0.02		c0.18	0.04		c0.16	0.05
v/s Ratio Perm						0.05			0.05			0.06
v/c Ratio	0.86	1.03		0.52	1.16	0.13		1.08	0.31		0.93	0.30
Uniform Delay, d1	50.6	36.5		51.3	39.2	14.2		51.7	34.5		51.0	30.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	21.5	31.4		1.1	82.1	0.1		75.8	0.4		32.8	0.3
Delay (s)	72.0	67.9		52.4	121.3	14.3		127.5	34.9		83.7	31.0
Level of Service	E	E		D	F	B		F	C		F	C
Approach Delay (s)		68.4			102.4			91.3			60.2	
Approach LOS		E			F			F			E	

Intersection Summary

HCM 2000 Control Delay	83.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	124.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings

2032 No-Build Conditions

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	273	1275	43	132	1402	445	49	35	77	424	50	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	215		0	200		400	0		100	0		0
Storage Lanes	2		0	2		1	0		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.995				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.972		0.950	0.962	
Satd. Flow (prot)	3502	3524	0	3502	3505	1615	0	1801	1575	1715	1736	1615
Flt Permitted	0.950			0.950				0.972		0.950	0.962	
Satd. Flow (perm)	3502	3524	0	3502	3505	1615	0	1801	1575	1715	1736	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				468			79			199
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		800			1200			1500			415	
Travel Time (s)		15.6			23.4			34.1			9.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.81	0.81	0.81	0.80	0.80	0.80
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)										46%		
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Detector Phase	5	2		1	6	8	4	4	1	8	8	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	16.0		11.0	16.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	12.0	50.0		25.0	63.0	25.0	25.0	25.0	25.0	25.0	25.0	12.0
Total Split (%)	9.6%	40.0%		20.0%	50.4%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	9.6%
Maximum Green (s)	6.0	44.0		19.0	57.0	19.0	19.0	19.0	19.0	19.0	19.0	6.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag				Lead			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	Min		None	Min	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 116.7

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

			
25 s	50 s	25 s	25 s
			
12 s	63 s		

Queues

2032 No-Build Conditions

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Weekday Evening

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	287	1387	139	1476	468	103	95	286	306	382
v/c Ratio	1.20	0.89	0.36	0.87	0.38	0.45	0.22	0.93	0.98	0.64
Control Delay	167.3	38.9	51.5	33.9	1.3	54.0	6.9	83.8	94.4	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	167.3	38.9	51.5	33.9	1.3	54.0	6.9	83.8	94.4	23.2
Queue Length 50th (ft)	~139	491	52	503	0	74	6	230	249	122
Queue Length 95th (ft)	#240	#719	85	661	21	116	26	#357	#389	188
Internal Link Dist (ft)		720		1120		1420			335	
Turn Bay Length (ft)	215		200		400		100			
Base Capacity (vph)	240	1559	632	1779	1231	325	541	309	313	601
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.20	0.89	0.22	0.83	0.38	0.32	0.18	0.93	0.98	0.64

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

2032 No-Build Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	273	1275	43	132	1402	445	49	35	77	424	50	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3502	3524		3502	3505	1615		1800	1575	1715	1736	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3502	3524		3502	3505	1615		1800	1575	1715	1736	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.81	0.81	0.81	0.80	0.80	0.80
Adj. Flow (vph)	287	1342	45	139	1476	468	60	43	95	530	62	382
RTOR Reduction (vph)	0	2	0	0	0	156	0	0	60	0	0	149
Lane Group Flow (vph)	287	1385	0	139	1476	312	0	103	35	286	306	233
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Actuated Green, G (s)	6.0	49.6		11.0	54.6	73.7		13.0	24.0	19.1	19.1	25.1
Effective Green, g (s)	8.0	51.6		13.0	56.6	77.7		15.0	28.0	21.1	21.1	29.1
Actuated g/C Ratio	0.07	0.44		0.11	0.49	0.67		0.13	0.24	0.18	0.18	0.25
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	240	1558		390	1699	1075		231	377	310	313	458
v/s Ratio Prot	c0.08	0.39		0.04	c0.42	0.05		c0.06	0.01	0.17	c0.18	0.03
v/s Ratio Perm						0.14			0.01			0.11
v/c Ratio	1.20	0.89		0.36	0.87	0.29		0.45	0.09	0.92	0.98	0.51
Uniform Delay, d1	54.4	29.9		48.0	26.7	8.1		47.0	34.5	47.0	47.6	37.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	121.4	6.8		0.8	5.2	0.2		1.9	0.1	32.0	44.5	1.2
Delay (s)	175.7	36.7		48.7	31.9	8.3		48.9	34.6	79.0	92.0	38.9
Level of Service	F	D		D	C	A		D	C	E	F	D
Approach Delay (s)		60.5			27.7			42.0			67.4	
Approach LOS		E			C			D			E	

Intersection Summary

HCM 2000 Control Delay	47.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	116.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 No-Build Conditions

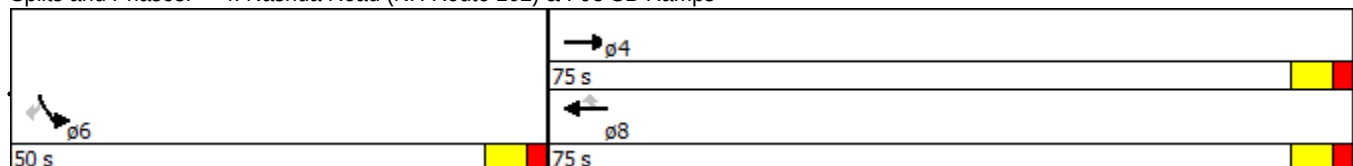
Weekday Evening

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1387	1205	316	434	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			400	0	350
Storage Lanes	0			1	1	2
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3574	3574	1599	1787	2814
Flt Permitted					0.950	
Satd. Flow (perm)	0	3574	3574	1599	1787	2814
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				326		103
Link Speed (mph)		35	35		30	
Link Distance (ft)		1200	1110		1500	
Travel Time (s)		23.4	21.6		34.1	
Peak Hour Factor	0.91	0.91	0.97	0.97	0.90	0.90
Heavy Vehicles (%)	0%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)						
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Detector Phase		4	8	8	6	6
Switch Phase						
Minimum Initial (s)		10.0	10.0	10.0	6.0	6.0
Minimum Split (s)		16.0	16.0	16.0	12.0	12.0
Total Split (s)		75.0	75.0	75.0	50.0	50.0
Total Split (%)		60.0%	60.0%	60.0%	40.0%	40.0%
Maximum Green (s)		69.0	69.0	69.0	44.0	44.0
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		Min	Min	Min	None	None

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 99.9
Natural Cycle: 50
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Nashua Road (NH Route 102) & I-93 SB Ramps



Queues
4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 No-Build Conditions
Weekday Evening

	→	←	↖	↘	↙
Lane Group	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1524	1242	326	482	860
v/c Ratio	0.79	0.64	0.32	0.72	0.77
Control Delay	22.3	18.3	2.3	35.7	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	18.3	2.3	35.7	30.6
Queue Length 50th (ft)	401	287	0	266	246
Queue Length 95th (ft)	557	403	40	468	402
Internal Link Dist (ft)	1120	1030		1420	
Turn Bay Length (ft)			400		350
Base Capacity (vph)	2629	2629	1262	866	1417
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	0.58	0.47	0.26	0.56	0.61
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 No-Build Conditions
Weekday Evening

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑	↑	↑↑
Volume (vph)	0	1387	1205	316	434	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	0.95	1.00	1.00	0.88
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		3574	3574	1599	1787	2814
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		3574	3574	1599	1787	2814
Peak-hour factor, PHF	0.91	0.91	0.97	0.97	0.90	0.90
Adj. Flow (vph)	0	1524	1242	326	482	860
RTOR Reduction (vph)	0	0	0	149	0	64
Lane Group Flow (vph)	0	1524	1242	177	482	796
Heavy Vehicles (%)	0%	1%	1%	1%	1%	1%
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)		52.0	52.0	52.0	35.2	35.2
Effective Green, g (s)		54.0	54.0	54.0	37.2	37.2
Actuated g/C Ratio		0.54	0.54	0.54	0.38	0.38
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1945	1945	870	670	1055
v/s Ratio Prot		c0.43	0.35		0.27	
v/s Ratio Perm				0.11		c0.28
v/c Ratio		0.78	0.64	0.20	0.72	0.75
Uniform Delay, d1		18.0	15.8	11.6	26.5	27.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.1	0.7	0.1	3.7	3.1
Delay (s)		20.1	16.5	11.7	30.2	30.1
Level of Service		C	B	B	C	C
Approach Delay (s)		20.1	15.5		30.2	
Approach LOS		C	B		C	
Intersection Summary						
HCM 2000 Control Delay			21.5		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.77			
Actuated Cycle Length (s)			99.2		Sum of lost time (s)	8.0
Intersection Capacity Utilization			69.1%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 No-Build Conditions

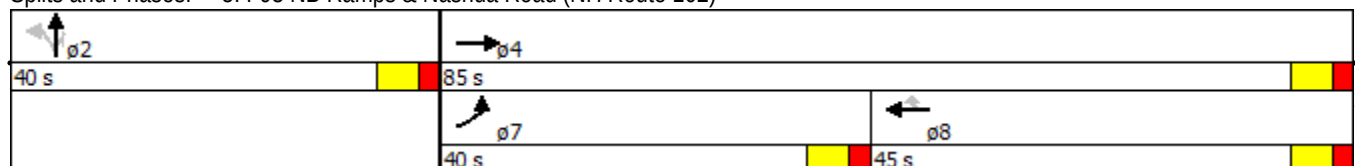
Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 				  			
Volume (vph)	643	1178	0	0	881	434	640	3	628	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	15	12	12	12	12	12	12
Storage Length (ft)	500		0	0		500	500		500	0		0
Storage Lanes	2		0	0		1	1		2	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.88	1.00	1.00	1.00
Flt						0.850			0.850			
Flt Protected	0.950						0.950	0.953				
Satd. Flow (prot)	3467	3574	0	0	3574	1725	1681	1687	2787	0	0	0
Flt Permitted	0.950						0.950	0.953				
Satd. Flow (perm)	3467	3574	0	0	3574	1725	1681	1687	2787	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						477			134			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1110			1575			1500			1500	
Travel Time (s)		21.6			30.7			34.1			34.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.97	0.97	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	0%	0%	1%	3%	2%	0%	2%	0%	0%	0%
Shared Lane Traffic (%)							50%					
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Detector Phase	7	4			8	8	2	2	2			
Switch Phase												
Minimum Initial (s)	6.0	10.0			10.0	10.0	10.0	10.0	10.0			
Minimum Split (s)	12.0	16.0			16.0	16.0	16.0	16.0	16.0			
Total Split (s)	40.0	85.0			45.0	45.0	40.0	40.0	40.0			
Total Split (%)	32.0%	68.0%			36.0%	36.0%	32.0%	32.0%	32.0%			
Maximum Green (s)	34.0	79.0			39.0	39.0	34.0	34.0	34.0			
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	-2.0	-2.0			-2.0	-2.0	-2.0	-2.0	-2.0			
Total Lost Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Recall Mode	None	Min			Min	Min	None	None	None			

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 110.5
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: I-93 NB Ramps & Nashua Road (NH Route 102)



Queues
5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 No-Build Conditions
Weekday Evening

							
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	707	1295	968	477	330	333	647
v/c Ratio	0.75	0.56	0.80	0.53	0.71	0.72	0.75
Control Delay	43.1	12.1	40.4	5.1	46.9	47.1	35.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	12.1	40.4	5.1	46.9	47.1	35.4
Queue Length 50th (ft)	256	264	347	0	236	240	203
Queue Length 95th (ft)	334	340	464	75	363	366	292
Internal Link Dist (ft)		1030	1495			1420	
Turn Bay Length (ft)	500			500	500		500
Base Capacity (vph)	1160	2689	1363	952	563	565	1022
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	0.61	0.48	0.71	0.50	0.59	0.59	0.63
Intersection Summary							

HCM Signalized Intersection Capacity Analysis

5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 No-Build Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	643	1178	0	0	881	434	640	3	628	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	15	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.95	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3467	3574			3574	1725	1681	1686	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3467	3574			3574	1725	1681	1686	2787			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	707	1295	0	0	968	477	660	3	647	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	315	0	0	97	0	0	0
Lane Group Flow (vph)	707	1295	0	0	968	162	330	333	550	0	0	0
Heavy Vehicles (%)	1%	1%	0%	0%	1%	3%	2%	0%	2%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	28.2	69.7			35.5	35.5	28.5	28.5	28.5			
Effective Green, g (s)	30.2	71.7			37.5	37.5	30.5	30.5	30.5			
Actuated g/C Ratio	0.27	0.65			0.34	0.34	0.28	0.28	0.28			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	950	2325			1216	587	465	466	771			
v/s Ratio Prot	c0.20	0.36			c0.27							
v/s Ratio Perm						0.09	0.20	0.20	0.20			
v/c Ratio	0.74	0.56			0.80	0.28	0.71	0.71	0.71			
Uniform Delay, d1	36.5	10.5			32.9	26.5	35.9	35.9	35.9			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	3.2	0.3			3.7	0.3	4.9	5.2	3.1			
Delay (s)	39.7	10.8			36.6	26.7	40.8	41.1	39.1			
Level of Service	D	B			D	C	D	D	D			
Approach Delay (s)		21.0			33.3			40.0			0.0	
Approach LOS		C			C			D			A	
Intersection Summary												
HCM 2000 Control Delay			30.0									
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			110.2									
Intersection Capacity Utilization			73.0%									
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 No-Build Conditions

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	121	88	52	41	175	142	72	552	70	139	549	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	11	11	11	12	11	11	12	12	12
Storage Length (ft)	0		0	0		0	360		0	360		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.973			0.946			0.983			0.964	
Flt Protected		0.977			0.994		0.950			0.950		
Satd. Flow (prot)	0	1866	0	0	1727	0	1805	1790	0	1805	1832	0
Flt Permitted		0.376			0.917		0.106			0.130		
Satd. Flow (perm)	0	718	0	0	1593	0	201	1790	0	247	1832	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			24			6			14	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1900			5550			2000			2000	
Travel Time (s)		37.0			108.1			39.0			39.0	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	26.0	26.0		26.0	26.0		26.0	46.0		26.0	46.0	
Total Split (%)	21.3%	21.3%		21.3%	21.3%		21.3%	37.7%		21.3%	37.7%	
Maximum Green (s)	20.0	20.0		20.0	20.0		20.0	40.0		20.0	40.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												

Intersection Summary

Area Type: Other
Cycle Length: 122
Actuated Cycle Length: 88.1
Natural Cycle: 150
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 No-Build Conditions
 Weekday Evening

Splits and Phases: 7: Mammoth Road (NH Route 128) & Pillsbury Road

 ø1	 ø2	 ø4	 ø9
26 s	46 s	26 s	24 s
 ø5	 ø6	 ø8	
26 s	46 s	26 s	

Lanes, Volumes, Timings
7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 No-Build Conditions
Weekday Evening

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

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 (%)

Shared Lane Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 12.0

Minimum Split (s) 24.0

Total Split (s) 24.0

Total Split (%) 20%

Maximum Green (s) 18.0

Yellow Time (s) 4.0

All-Red Time (s) 2.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?

Vehicle Extension (s) 3.0

Recall Mode None

Walk Time (s) 12.0

Flash Dont Walk (s) 6.0

Pedestrian Calls (#/hr) 0

Intersection Summary

Queues

2032 No-Build Conditions

7: Mammoth Road (NH Route 128) & Pillsbury Road

Weekday Evening

						
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	307	421	85	731	162	841
v/c Ratio	1.65	1.01	0.28	0.85	0.44	0.86
Control Delay	343.1	81.1	8.5	32.5	10.0	30.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	343.1	81.1	8.5	32.5	10.0	30.4
Queue Length 50th (ft)	~246	~223	15	335	30	404
Queue Length 95th (ft)	#398	#403	28	#545	51	#628
Internal Link Dist (ft)	1820	5470		1920		1920
Turn Bay Length (ft)			360		360	
Base Capacity (vph)	186	415	533	856	551	975
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	1.65	1.01	0.16	0.85	0.29	0.86

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 No-Build Conditions
Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	121	88	52	41	175	142	72	552	70	139	549	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	11	11	11	12	11	11	12	12	12
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.95		1.00	0.98		1.00	0.96	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1867			1728		1805	1790		1805	1831	
Flt Permitted		0.38			0.92		0.11	1.00		0.13	1.00	
Satd. Flow (perm)		718			1593		202	1790		248	1831	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.86	0.86	0.86
Adj. Flow (vph)	142	104	61	48	206	167	85	649	82	162	638	203
RTOR Reduction (vph)	0	7	0	0	18	0	0	3	0	0	7	0
Lane Group Flow (vph)	0	300	0	0	403	0	85	728	0	162	834	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.0			20.0		47.9	41.2		54.7	44.6	
Effective Green, g (s)		22.0			22.0		51.9	43.2		58.7	46.6	
Actuated g/C Ratio		0.25			0.25		0.58	0.48		0.66	0.52	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		176			392		273	865		373	955	
v/s Ratio Prot							0.03	0.41		c0.06	c0.46	
v/s Ratio Perm		c0.42			0.25		0.15			0.23		
v/c Ratio		1.71			1.03		0.31	0.84		0.43	0.87	
Uniform Delay, d1		33.6			33.6		14.0	20.1		12.6	18.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		340.6			52.8		0.9	7.7		1.1	9.2	
Delay (s)		374.3			86.4		14.9	27.8		13.7	27.9	
Level of Service		F			F		B	C		B	C	
Approach Delay (s)		374.3			86.4			26.5			25.6	
Approach LOS		F			F			C			C	
Intersection Summary												
HCM 2000 Control Delay			78.0			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.16									
Actuated Cycle Length (s)			89.3			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			91.7%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

2032 Build

Lanes, Volumes, Timings
1: Gilcreast Road & Nashua Road (NH Route 102)

2032 Build Conditions

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	192	1486	39	99	1035	64	119	61	199	215	90	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	175		0	160		375	0		0	0		200
Storage Lanes	1		0	2		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.968			0.966	
Satd. Flow (prot)	1711	3521	0	3467	3539	1583	0	1733	1507	0	1810	1583
Flt Permitted	0.950			0.950				0.968			0.966	
Satd. Flow (perm)	1711	3521	0	3467	3539	1583	0	1733	1507	0	1810	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				79			79			131
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1500			800			1500			1415	
Travel Time (s)		29.2			15.6			29.2			27.6	
Peak Hour Factor	0.96	0.96	0.96	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	6%	1%	2%	2%	0%	0%	1%	2%	0%	2%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	1	4	4	5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	14.0		11.0	14.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	25.0	50.0		25.0	50.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	20.0%	40.0%		20.0%	40.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Maximum Green (s)	19.0	44.0		19.0	44.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 120.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 1: Gilcreast Road & Nashua Road (NH Route 102)

2032 Build Conditions
 Weekday Morning

Splits and Phases: 1: Gilcreast Road & Nashua Road (NH Route 102)

 ø1	 ø2	 ø3	 ø4
25 s	50 s	25 s	25 s
 ø5	 ø6		
25 s	50 s		

Queues
1: Gilcreast Road & Nashua Road (NH Route 102)

2032 Build Conditions

Weekday Morning

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	200	1589	108	1125	70	200	221	339	140
v/c Ratio	0.74	1.03	0.34	0.85	0.08	0.73	0.51	1.07	0.21
Control Delay	65.8	63.3	54.9	42.3	1.5	65.3	18.0	117.3	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.8	63.3	54.9	42.3	1.5	65.3	18.0	117.3	6.1
Queue Length 50th (ft)	154	~685	42	440	0	154	63	~314	5
Queue Length 95th (ft)	#251	#885	71	535	8	#242	111	#504	48
Internal Link Dist (ft)		1420		720		1420		1335	
Turn Bay Length (ft)	175		160		375				200
Base Capacity (vph)	300	1549	608	1361	906	304	554	318	689
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	0.67	1.03	0.18	0.83	0.08	0.66	0.40	1.07	0.20

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Gilcreast Road & Nashua Road (NH Route 102)

2032 Build Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	192	1486	39	99	1035	64	119	61	199	215	90	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1711	3522		3467	3539	1583		1734	1507		1810	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1711	3522		3467	3539	1583		1734	1507		1810	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	200	1548	41	108	1125	70	132	68	221	239	100	140
RTOR Reduction (vph)	0	1	0	0	0	31	0	0	59	0	0	87
Lane Group Flow (vph)	200	1588	0	108	1125	39	0	200	162	0	339	53
Heavy Vehicles (%)	2%	2%	6%	1%	2%	2%	0%	0%	1%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Actuated Green, G (s)	17.0	50.8		9.2	43.0	62.1		16.9	26.1		19.1	36.1
Effective Green, g (s)	19.0	52.8		11.2	45.0	66.1		18.9	30.1		21.1	40.1
Actuated g/C Ratio	0.16	0.44		0.09	0.38	0.55		0.16	0.25		0.18	0.33
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	270	1549		323	1327	871		273	378		318	581
v/s Ratio Prot	c0.12	c0.45		0.03	0.32	0.01		c0.12	0.04		c0.19	0.01
v/s Ratio Perm						0.02			0.07			0.02
v/c Ratio	0.74	1.03		0.33	0.85	0.04		0.73	0.43		1.07	0.09
Uniform Delay, d1	48.2	33.6		50.9	34.4	12.4		48.1	37.7		49.5	27.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	10.4	29.5		0.6	5.8	0.0		9.7	0.8		69.0	0.1
Delay (s)	58.6	63.1		51.5	40.1	12.4		57.9	38.5		118.5	27.5
Level of Service	E	E		D	D	B		E	D		F	C
Approach Delay (s)		62.6			39.6			47.7			91.9	
Approach LOS		E			D			D			F	
Intersection Summary												
HCM 2000 Control Delay			57.0				HCM 2000 Level of Service		E			
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)		16.0			
Intersection Capacity Utilization			81.3%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

2032 Build Conditions

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	218	1567	64	48	1071	592	12	11	59	329	11	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	215		0	200		400	0		100	0		0
Storage Lanes	2		0	2		1	0		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.994				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.974		0.950	0.955	
Satd. Flow (prot)	3433	3518	0	3502	3539	1583	0	1724	1544	1681	1692	1583
Flt Permitted	0.950			0.950				0.974		0.950	0.955	
Satd. Flow (perm)	3433	3518	0	3502	3539	1583	0	1724	1544	1681	1692	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				637			79			168
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		800			1200			1500			415	
Travel Time (s)		15.6			23.4			34.1			9.4	
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.76	0.76	0.76	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	0%	10%	2%	2%	0%	2%
Shared Lane Traffic (%)										48%		
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Detector Phase	5	2		1	6	8	4	4	1	8	8	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	16.0		11.0	16.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	12.0	50.0		25.0	63.0	25.0	25.0	25.0	25.0	25.0	25.0	12.0
Total Split (%)	9.6%	40.0%		20.0%	50.4%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	9.6%
Maximum Green (s)	6.0	44.0		19.0	57.0	19.0	19.0	19.0	19.0	19.0	19.0	6.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag				Lead			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	Min		None	Min	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 95.1

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

			
25 s	50 s	25 s	25 s
			
12 s	63 s		

Queues

2032 Build Conditions

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Weekday Morning

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	229	1716	52	1152	637	30	78	190	188	168
v/c Ratio	0.77	0.95	0.14	0.66	0.48	0.16	0.24	0.57	0.56	0.26
Control Delay	63.7	38.4	44.7	21.3	1.6	45.8	6.4	44.8	44.5	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.7	38.4	44.7	21.3	1.6	45.8	6.4	44.8	44.5	5.8
Queue Length 50th (ft)	78	~675	16	307	0	18	0	118	117	0
Queue Length 95th (ft)	#168	#871	38	399	17	43	16	220	216	51
Internal Link Dist (ft)		720		1120		1420			335	
Turn Bay Length (ft)	215		200		400		100			
Base Capacity (vph)	299	1809	802	2277	1343	394	507	385	387	635
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.95	0.06	0.51	0.47	0.08	0.15	0.49	0.49	0.26

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

2032 Build Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	218	1567	64	48	1071	592	12	11	59	329	11	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3433	3518		3502	3539	1583		1724	1544	1681	1693	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3433	3518		3502	3539	1583		1724	1544	1681	1693	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.76	0.76	0.76	0.90	0.90	0.90
Adj. Flow (vph)	229	1649	67	52	1152	637	16	14	78	366	12	168
RTOR Reduction (vph)	0	2	0	0	0	201	0	0	66	0	0	122
Lane Group Flow (vph)	229	1714	0	52	1152	436	0	30	12	190	188	46
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	0%	10%	2%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Actuated Green, G (s)	6.2	46.8		6.2	46.8	63.7		5.0	11.2	16.9	16.9	23.1
Effective Green, g (s)	8.2	48.8		8.2	48.8	67.7		7.0	15.2	18.9	18.9	27.1
Actuated g/C Ratio	0.08	0.49		0.08	0.49	0.68		0.07	0.15	0.19	0.19	0.27
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	284	1735		290	1746	1083		122	237	321	323	497
v/s Ratio Prot	c0.07	c0.49		0.01	0.33	0.08		c0.02	0.00	c0.11	0.11	0.01
v/s Ratio Perm						0.20			0.00			0.02
v/c Ratio	0.81	0.99		0.18	0.66	0.40		0.25	0.05	0.59	0.58	0.09
Uniform Delay, d1	44.6	24.8		42.2	18.8	6.8		43.5	35.7	36.5	36.4	26.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.0	18.6		0.4	1.0	0.3		1.4	0.1	3.4	3.1	0.1
Delay (s)	60.6	43.4		42.6	19.8	7.1		44.9	35.8	39.9	39.6	26.9
Level of Service	E	D		D	B	A		D	D	D	D	C
Approach Delay (s)		45.4			16.1			38.3			35.8	
Approach LOS		D			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			31.9				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			98.9				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			75.6%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 Build Conditions

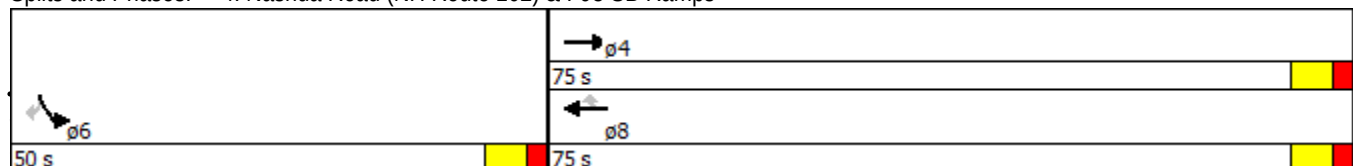
Weekday Morning

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1194	890	502	232	821
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			400	0	350
Storage Lanes	0			1	1	2
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3539	3539	1583	1752	2787
Flt Permitted					0.950	
Satd. Flow (perm)	0	3539	3539	1583	1752	2787
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				534		212
Link Speed (mph)		35	35		30	
Link Distance (ft)		1200	1110		1500	
Travel Time (s)		23.4	21.6		34.1	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	2%	3%	2%
Shared Lane Traffic (%)						
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Detector Phase		4	8	8	6	6
Switch Phase						
Minimum Initial (s)		10.0	10.0	10.0	6.0	6.0
Minimum Split (s)		16.0	16.0	16.0	12.0	12.0
Total Split (s)		75.0	75.0	75.0	50.0	50.0
Total Split (%)		60.0%	60.0%	60.0%	40.0%	40.0%
Maximum Green (s)		69.0	69.0	69.0	44.0	44.0
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		Min	Min	Min	None	None

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 84.2
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Nashua Road (NH Route 102) & I-93 SB Ramps



Queues
4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 Build Conditions
Weekday Morning

					
Lane Group	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1298	947	534	258	912
v/c Ratio	0.72	0.52	0.50	0.38	0.75
Control Delay	19.3	15.6	3.0	21.8	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	15.6	3.0	21.8	22.1
Queue Length 50th (ft)	255	161	0	94	176
Queue Length 95th (ft)	441	283	51	195	328
Internal Link Dist (ft)	1120	1030		1420	
Turn Bay Length (ft)			400		350
Base Capacity (vph)	2981	2981	1417	1014	1703
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	0.44	0.32	0.38	0.25	0.54
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 Build Conditions

Weekday Morning

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑	↑	↑↑
Volume (vph)	0	1194	890	502	232	821
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	0.95	1.00	1.00	0.88
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		3539	3539	1583	1752	2787
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		3539	3539	1583	1752	2787
Peak-hour factor, PHF	0.92	0.92	0.94	0.94	0.90	0.90
Adj. Flow (vph)	0	1298	947	534	258	912
RTOR Reduction (vph)	0	0	0	260	0	129
Lane Group Flow (vph)	0	1298	947	274	258	783
Heavy Vehicles (%)	0%	2%	2%	2%	3%	2%
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)		40.9	40.9	40.9	30.6	30.6
Effective Green, g (s)		42.9	42.9	42.9	32.6	32.6
Actuated g/C Ratio		0.51	0.51	0.51	0.39	0.39
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1818	1818	813	684	1088
v/s Ratio Prot		c0.37	0.27		0.15	
v/s Ratio Perm				0.17		c0.28
v/c Ratio		0.71	0.52	0.34	0.38	0.72
Uniform Delay, d1		15.6	13.5	11.9	18.2	21.6
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.4	0.3	0.2	0.4	2.3
Delay (s)		16.9	13.7	12.2	18.5	23.9
Level of Service		B	B	B	B	C
Approach Delay (s)		16.9	13.2		22.7	
Approach LOS		B	B		C	
Intersection Summary						
HCM 2000 Control Delay			17.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.72			
Actuated Cycle Length (s)			83.5		Sum of lost time (s)	8.0
Intersection Capacity Utilization			60.0%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build Conditions

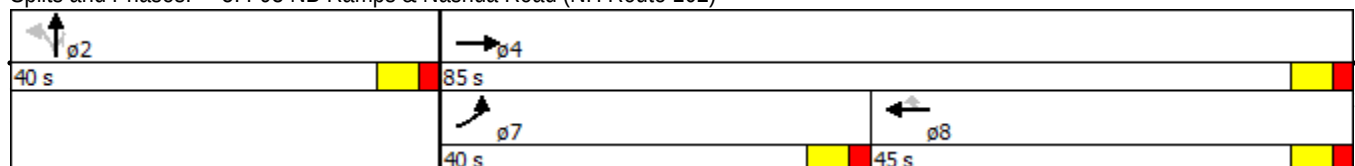
Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 				  			
Volume (vph)	710	716	0	0	1050	370	342	2	203	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	15	12	12	12	12	12	12
Storage Length (ft)	500		0	0		500	500		500	0		0
Storage Lanes	2		0	0		1	1		2	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.88	1.00	1.00	1.00
Flt						0.850			0.850			
Flt Protected	0.950						0.950	0.953				
Satd. Flow (prot)	3433	3539	0	0	3539	1742	1681	1687	2787	0	0	0
Flt Permitted	0.950						0.950	0.953				
Satd. Flow (perm)	3433	3539	0	0	3539	1742	1681	1687	2787	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						411			226			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1110			1575			1500			1500	
Travel Time (s)		21.6			30.7			34.1			34.1	
Peak Hour Factor	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	2%	0%	2%	0%	0%	0%
Shared Lane Traffic (%)							50%					
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Detector Phase	7	4			8	8	2	2	2			
Switch Phase												
Minimum Initial (s)	6.0	10.0			10.0	10.0	10.0	10.0	10.0			
Minimum Split (s)	12.0	16.0			16.0	16.0	16.0	16.0	16.0			
Total Split (s)	40.0	85.0			45.0	45.0	40.0	40.0	40.0			
Total Split (%)	32.0%	68.0%			36.0%	36.0%	32.0%	32.0%	32.0%			
Maximum Green (s)	34.0	79.0			39.0	39.0	34.0	34.0	34.0			
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	-2.0	-2.0			-2.0	-2.0	-2.0	-2.0	-2.0			
Total Lost Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Recall Mode	None	Min			Min	Min	None	None	None			

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 103.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 5: I-93 NB Ramps & Nashua Road (NH Route 102)



Queues
5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build Conditions
Weekday Morning

							
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	763	770	1167	411	190	192	226
v/c Ratio	0.77	0.30	0.82	0.43	0.59	0.59	0.31
Control Delay	40.0	5.7	35.4	4.1	46.3	46.4	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	5.7	35.4	4.1	46.3	46.4	6.0
Queue Length 50th (ft)	236	80	363	0	122	123	0
Queue Length 95th (ft)	336	138	#592	66	207	209	34
Internal Link Dist (ft)		1030	1495			1420	
Turn Bay Length (ft)	500			500	500		500
Base Capacity (vph)	1210	2806	1420	945	592	594	1128
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	0.63	0.27	0.82	0.43	0.32	0.32	0.20

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 				 			
Volume (vph)	710	716	0	0	1050	370	342	2	203	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	15	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.95	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3433	3539			3539	1742	1681	1687	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3433	3539			3539	1742	1681	1687	2787			
Peak-hour factor, PHF	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	763	770	0	0	1167	411	380	2	226	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	246	0	0	182	0	0	0
Lane Group Flow (vph)	763	770	0	0	1167	165	190	192	44	0	0	0
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	2%	0%	2%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	27.7	73.2			39.5	39.5	17.9	17.9	17.9			
Effective Green, g (s)	29.7	75.2			41.5	41.5	19.9	19.9	19.9			
Actuated g/C Ratio	0.29	0.73			0.40	0.40	0.19	0.19	0.19			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	988	2581			1424	701	324	325	537			
v/s Ratio Prot	c0.22	0.22			c0.33							
v/s Ratio Perm						0.09	0.11	0.11	0.02			
v/c Ratio	0.77	0.30			0.82	0.24	0.59	0.59	0.08			
Uniform Delay, d1	33.6	4.8			27.5	20.3	37.9	37.9	34.1			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	3.8	0.1			3.8	0.2	2.7	2.9	0.1			
Delay (s)	37.4	4.9			31.3	20.5	40.6	40.8	34.2			
Level of Service	D	A			C	C	D	D	C			
Approach Delay (s)		21.1			28.5			38.2			0.0	
Approach LOS		C			C			D			A	
Intersection Summary												
HCM 2000 Control Delay			27.0									C
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			103.1							12.0		
Intersection Capacity Utilization			68.8%									C
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 Build Conditions

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	185	47	36	43	183	17	445	20	279	383	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	11	11	11	12	11	11	12	12	12
Storage Length (ft)	0		0	0		0	360		0	360		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.983			0.906			0.994			0.971	
Flt Protected		0.981			0.993		0.950			0.950		
Satd. Flow (prot)	0	1875	0	0	1624	0	1805	1791	0	1770	1816	0
Flt Permitted		0.538			0.862		0.419			0.201		
Satd. Flow (perm)	0	1028	0	0	1410	0	796	1791	0	374	1816	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			83			2			11	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1900			5550			2000			2000	
Travel Time (s)		37.0			108.1			39.0			39.0	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	26.0	26.0		26.0	26.0		26.0	46.0		26.0	46.0	
Total Split (%)	21.3%	21.3%		21.3%	21.3%		21.3%	37.7%		21.3%	37.7%	
Maximum Green (s)	20.0	20.0		20.0	20.0		20.0	40.0		20.0	40.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												

Intersection Summary

Area Type: Other
Cycle Length: 122
Actuated Cycle Length: 89.2
Natural Cycle: 150
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 Build Conditions
 Weekday Morning

Splits and Phases: 7: Mammoth Road (NH Route 128) & Pillsbury Road

 ø1	 ø2	 ø4	 ø9
26 s	46 s	26 s	24 s
 ø5	 ø6	 ø8	
26 s	46 s	26 s	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
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 (%)	
Shared Lane Traffic (%)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	18.0
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	12.0
Flash Dont Walk (s)	6.0
Pedestrian Calls (#/hr)	5
Intersection Summary	

Queues

2032 Build Conditions

7: Mammoth Road (NH Route 128) & Pillsbury Road

Weekday Morning

						
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	478	291	19	516	310	529
v/c Ratio	1.80	0.69	0.04	0.76	0.64	0.52
Control Delay	396.8	34.3	9.6	33.9	16.8	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	396.8	34.3	9.6	33.9	16.8	17.0
Queue Length 50th (ft)	~390	100	3	220	63	121
Queue Length 95th (ft)	#733	#334	18	#554	203	441
Internal Link Dist (ft)	1820	5470		1920		1920
Turn Bay Length (ft)			360		360	
Base Capacity (vph)	266	422	738	876	586	1035
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	1.80	0.69	0.03	0.59	0.53	0.51

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 Build Conditions
Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	185	47	36	43	183	17	445	20	279	383	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	11	11	11	12	11	11	12	12	12
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.91		1.00	0.99		1.00	0.97	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1875			1624		1805	1791		1770	1815	
Flt Permitted		0.54			0.86		0.42	1.00		0.20	1.00	
Satd. Flow (perm)		1029			1409		796	1791		375	1815	
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	188	231	59	40	48	203	19	494	22	310	426	103
RTOR Reduction (vph)	0	4	0	0	64	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	474	0	0	227	0	19	515	0	310	524	0
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.8			20.8		38.4	35.9		56.4	47.9	
Effective Green, g (s)		22.8			22.8		42.4	37.9		58.4	49.9	
Actuated g/C Ratio		0.23			0.23		0.43	0.39		0.60	0.51	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		239			328		391	694		459	926	
v/s Ratio Prot							0.00	c0.29		c0.11	0.29	
v/s Ratio Perm		c0.46			0.16		0.02			0.29		
v/c Ratio		1.98			0.69		0.05	0.74		0.68	0.57	
Uniform Delay, d1		37.5			34.3		15.9	25.7		14.2	16.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		457.5			7.8		0.1	4.6		4.3	1.0	
Delay (s)		495.0			42.1		16.0	30.3		18.5	17.5	
Level of Service		F			D		B	C		B	B	
Approach Delay (s)		495.0			42.1			29.8			17.8	
Approach LOS		F			D			C			B	
Intersection Summary												
HCM 2000 Control Delay		130.5				HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio		1.06										
Actuated Cycle Length (s)		97.8				Sum of lost time (s)				18.0		
Intersection Capacity Utilization		89.8%				ICU Level of Service				E		
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings
1: Gilcreast Road & Nashua Road (NH Route 102)

2032 Build Conditions
Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	326	1620	72	225	1737	159	154	147	192	128	127	328
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	175		0	160		375	0		0	0		200
Storage Lanes	1		0	2		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.975			0.976	
Satd. Flow (prot)	1711	3521	0	3467	3539	1583	0	1720	1507	0	1836	1583
Flt Permitted	0.950			0.950				0.975			0.976	
Satd. Flow (perm)	1711	3521	0	3467	3539	1583	0	1720	1507	0	1836	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				173			111			89
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1500			800			1500			1415	
Travel Time (s)		29.2			15.6			29.2			27.6	
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	1%	2%	2%	2%	1%	1%	2%	0%	2%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	1	4	4	5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	14.0		11.0	14.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	25.0	50.0		25.0	50.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	20.0%	40.0%		20.0%	40.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Maximum Green (s)	19.0	44.0		19.0	44.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other
 Cycle Length: 125
 Actuated Cycle Length: 125
 Natural Cycle: 150
 Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 1: Gilcreast Road & Nashua Road (NH Route 102)

2032 Build Conditions
 Weekday Evening

Splits and Phases: 1: Gilcreast Road & Nashua Road (NH Route 102)

 ø1	 ø2	 ø3	 ø4
25 s	50 s	25 s	25 s
 ø5	 ø6		
25 s	50 s		

Queues
1: Gilcreast Road & Nashua Road (NH Route 102)

2032 Build Conditions

Weekday Evening

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	343	1781	245	1888	173	331	211	283	364
v/c Ratio	1.20	1.25	0.54	1.45	0.19	1.15	0.40	0.92	0.57
Control Delay	161.3	149.7	55.0	238.5	1.5	145.8	10.9	85.7	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	161.3	149.7	55.0	238.5	1.5	145.8	10.9	85.7	27.5
Queue Length 50th (ft)	~335	~944	96	~1094	0	~314	39	228	176
Queue Length 95th (ft)	#523	#1146	134	#1233	15	#502	76	#395	278
Internal Link Dist (ft)		1420		720		1420		1335	
Turn Bay Length (ft)	175		160		375				200
Base Capacity (vph)	287	1430	582	1302	928	288	580	308	638
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	1.20	1.25	0.42	1.45	0.19	1.15	0.36	0.92	0.57

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Gilcreast Road & Nashua Road (NH Route 102)

2032 Build Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	326	1620	72	225	1737	159	154	147	192	128	127	328
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00		0.98	1.00
Satd. Flow (prot)	1711	3520		3467	3539	1583		1720	1507		1835	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00		0.98	1.00
Satd. Flow (perm)	1711	3520		3467	3539	1583		1720	1507		1835	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	343	1705	76	245	1888	173	169	162	211	142	141	364
RTOR Reduction (vph)	0	2	0	0	0	80	0	0	78	0	0	59
Lane Group Flow (vph)	343	1779	0	245	1888	93	0	331	133	0	283	305
Heavy Vehicles (%)	2%	2%	0%	1%	2%	2%	2%	1%	1%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Actuated Green, G (s)	19.0	48.7		14.3	44.0	63.0		19.0	33.3		19.0	38.0
Effective Green, g (s)	21.0	50.7		16.3	46.0	67.0		21.0	37.3		21.0	42.0
Actuated g/C Ratio	0.17	0.41		0.13	0.37	0.54		0.17	0.30		0.17	0.34
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	287	1427		452	1302	848		288	449		308	582
v/s Ratio Prot	c0.20	0.51		0.07	c0.53	0.02		c0.19	0.04		c0.15	0.09
v/s Ratio Perm						0.04			0.05			0.10
v/c Ratio	1.20	1.25		0.54	1.45	0.11		1.15	0.30		0.92	0.52
Uniform Delay, d1	52.0	37.1		50.9	39.5	14.3		52.0	33.8		51.2	33.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	116.7	116.9		1.3	206.9	0.1		99.6	0.4		30.7	0.9
Delay (s)	168.7	154.1		52.2	246.4	14.4		151.6	34.1		81.9	34.3
Level of Service	F	F		D	F	B		F	C		F	C
Approach Delay (s)		156.4			208.4			105.9			55.1	
Approach LOS		F			F			F			E	
Intersection Summary												
HCM 2000 Control Delay			161.2				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.24									
Actuated Cycle Length (s)			125.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			109.4%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

2032 Build Conditions

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	486	1313	43	132	1538	995	49	35	77	856	50	521
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	215		0	200		400	0		100	0		0
Storage Lanes	2		0	2		1	0		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.995				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.972		0.950	0.958	
Satd. Flow (prot)	3433	3524	0	3502	3539	1583	0	1801	1575	1681	1699	1583
Flt Permitted	0.950			0.950				0.972		0.950	0.958	
Satd. Flow (perm)	3433	3524	0	3502	3539	1583	0	1801	1575	1681	1699	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				599			79			195
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		800			1200			1500			415	
Travel Time (s)		15.6			23.4			34.1			9.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.81	0.81	0.81	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Shared Lane Traffic (%)										46%		
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Detector Phase	5	2		1	6	8	4	4	1	8	8	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	16.0		11.0	16.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	12.0	50.0		25.0	63.0	25.0	25.0	25.0	25.0	25.0	25.0	12.0
Total Split (%)	9.6%	40.0%		20.0%	50.4%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	9.6%
Maximum Green (s)	6.0	44.0		19.0	57.0	19.0	19.0	19.0	19.0	19.0	19.0	6.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag				Lead			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	Min		None	Min	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 119.1

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Splits and Phases: 2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

			
25 s	50 s	25 s	25 s
			
12 s	63 s		

Queues

2032 Build Conditions

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Weekday Evening

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	512	1427	139	1619	1047	103	95	514	493	579
v/c Ratio	2.23	0.89	0.36	0.92	0.83	0.45	0.22	1.74	1.65	1.00
Control Delay	591.6	39.0	52.1	38.5	11.1	54.6	6.9	376.1	338.9	66.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	591.6	39.0	52.1	38.5	11.1	54.6	6.9	376.1	338.9	66.6
Queue Length 50th (ft)	~326	516	52	588	84	74	6	~614	~576	324
Queue Length 95th (ft)	#456	#756	85	#821	279	116	26	#880	#837	#599
Internal Link Dist (ft)		720		1120		1420			335	
Turn Bay Length (ft)	215		200		400		100			
Base Capacity (vph)	230	1599	618	1754	1260	317	531	296	299	579
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.23	0.89	0.22	0.92	0.83	0.32	0.18	1.74	1.65	1.00

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

2032 Build Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	486	1313	43	132	1538	995	49	35	77	856	50	521
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3433	3525		3502	3539	1583		1800	1575	1681	1698	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3433	3525		3502	3539	1583		1800	1575	1681	1698	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	512	1382	45	139	1619	1047	60	43	95	951	56	579
RTOR Reduction (vph)	0	2	0	0	0	196	0	0	60	0	0	147
Lane Group Flow (vph)	512	1425	0	139	1619	851	0	103	35	514	493	432
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Actuated Green, G (s)	6.0	52.0		11.0	57.0	76.0		13.0	24.0	19.0	19.0	25.0
Effective Green, g (s)	8.0	54.0		13.0	59.0	80.0		15.0	28.0	21.0	21.0	29.0
Actuated g/C Ratio	0.07	0.45		0.11	0.50	0.67		0.13	0.24	0.18	0.18	0.24
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	230	1599		382	1754	1064		226	370	296	299	438
v/s Ratio Prot	c0.15	0.40		0.04	c0.46	0.14		c0.06	0.01	c0.31	0.29	0.07
v/s Ratio Perm						0.40			0.01			0.21
v/c Ratio	2.23	0.89		0.36	0.92	0.80		0.46	0.09	1.74	1.65	0.99
Uniform Delay, d1	55.5	29.8		49.2	27.9	13.8		48.2	35.6	49.0	49.0	44.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	565.6	6.9		0.8	8.7	4.5		2.0	0.2	345.2	306.5	38.9
Delay (s)	621.1	36.7		50.0	36.6	18.4		50.2	35.7	394.2	355.5	83.7
Level of Service	F	D		D	D	B		D	D	F	F	F
Approach Delay (s)		191.0			30.5			43.3			268.8	
Approach LOS		F			C			D			F	
Intersection Summary												
HCM 2000 Control Delay			136.4				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.12									
Actuated Cycle Length (s)			119.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			98.1%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 Build Conditions

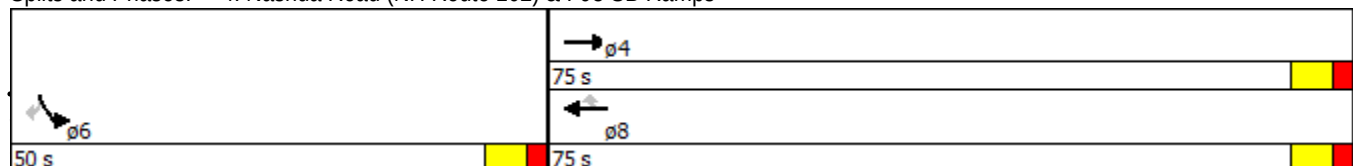
Weekday Evening

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1662	1600	316	434	1065
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			400	0	350
Storage Lanes	0			1	1	2
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3539	3539	1583	1787	2787
Flt Permitted					0.950	
Satd. Flow (perm)	0	3539	3539	1583	1787	2787
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				326		37
Link Speed (mph)		35	35		30	
Link Distance (ft)		1200	1110		1500	
Travel Time (s)		23.4	21.6		34.1	
Peak Hour Factor	0.91	0.91	0.97	0.97	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	2%	1%	2%
Shared Lane Traffic (%)						
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Detector Phase		4	8	8	6	6
Switch Phase						
Minimum Initial (s)		10.0	10.0	10.0	6.0	6.0
Minimum Split (s)		16.0	16.0	16.0	12.0	12.0
Total Split (s)		75.0	75.0	75.0	50.0	50.0
Total Split (%)		60.0%	60.0%	60.0%	40.0%	40.0%
Maximum Green (s)		69.0	69.0	69.0	44.0	44.0
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		Min	Min	Min	None	None

Intersection Summary

Area Type: Other
 Cycle Length: 125
 Actuated Cycle Length: 122.8
 Natural Cycle: 80
 Control Type: Actuated-Uncoordinated

Splits and Phases: 4: Nashua Road (NH Route 102) & I-93 SB Ramps



Queues
4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 Build Conditions

Weekday Evening

	→	←	↖	↗	↘
Lane Group	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1826	1649	326	482	1183
v/c Ratio	0.92	0.83	0.32	0.72	1.11
Control Delay	33.6	26.9	2.2	40.7	97.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	26.9	2.2	40.7	97.4
Queue Length 50th (ft)	662	542	0	335	~619
Queue Length 95th (ft)	792	647	40	468	#769
Internal Link Dist (ft)	1120	1030		1420	
Turn Bay Length (ft)			400		350
Base Capacity (vph)	2049	2049	1053	670	1069
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.89	0.80	0.31	0.72	1.11

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 Build Conditions

Weekday Evening

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑	↑	↑↑
Volume (vph)	0	1662	1600	316	434	1065
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	0.95	1.00	1.00	0.88
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		3539	3539	1583	1787	2787
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		3539	3539	1583	1787	2787
Peak-hour factor, PHF	0.91	0.91	0.97	0.97	0.90	0.90
Adj. Flow (vph)	0	1826	1649	326	482	1183
RTOR Reduction (vph)	0	0	0	144	0	23
Lane Group Flow (vph)	0	1826	1649	182	482	1160
Heavy Vehicles (%)	0%	2%	2%	2%	1%	2%
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)		66.7	66.7	66.7	44.1	44.1
Effective Green, g (s)		68.7	68.7	68.7	46.1	46.1
Actuated g/C Ratio		0.56	0.56	0.56	0.38	0.38
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1979	1979	885	670	1046
v/s Ratio Prot		c0.52	0.47		0.27	
v/s Ratio Perm				0.12		c0.42
v/c Ratio		0.92	0.83	0.21	0.72	1.11
Uniform Delay, d1		24.6	22.3	13.5	32.8	38.3
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		7.7	3.2	0.1	3.7	62.7
Delay (s)		32.4	25.5	13.6	36.5	101.0
Level of Service		C	C	B	D	F
Approach Delay (s)		32.4	23.5		82.4	
Approach LOS		C	C		F	
Intersection Summary						
HCM 2000 Control Delay			44.4		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			1.00			
Actuated Cycle Length (s)			122.8		Sum of lost time (s)	8.0
Intersection Capacity Utilization			88.2%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build Conditions

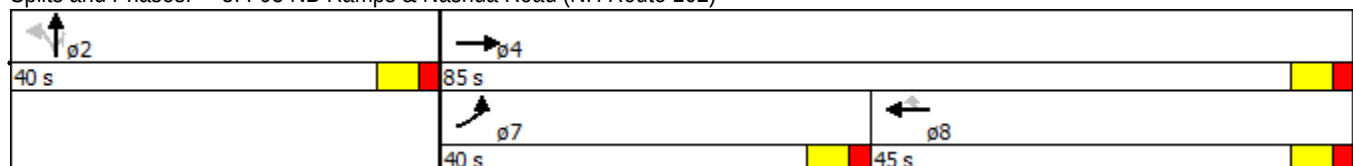
Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 				  			
Volume (vph)	785	1311	0	0	1077	417	839	3	666	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	15	12	12	12	12	12	12
Storage Length (ft)	500		0	0		500	500		500	0		0
Storage Lanes	2		0	0		1	1		2	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.88	1.00	1.00	1.00
Flt						0.850			0.850			
Flt Protected	0.950						0.950	0.953				
Satd. Flow (prot)	3433	3539	0	0	3539	1742	1681	1687	2787	0	0	0
Flt Permitted	0.950						0.950	0.953				
Satd. Flow (perm)	3433	3539	0	0	3539	1742	1681	1687	2787	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						458			98			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1110			1575			1500			1500	
Travel Time (s)		21.6			30.7			34.1			34.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.97	0.97	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	2%	0%	2%	0%	0%	0%
Shared Lane Traffic (%)							50%					
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Detector Phase	7	4			8	8	2	2	2			
Switch Phase												
Minimum Initial (s)	6.0	10.0			10.0	10.0	10.0	10.0	10.0			
Minimum Split (s)	12.0	16.0			16.0	16.0	16.0	16.0	16.0			
Total Split (s)	40.0	85.0			45.0	45.0	40.0	40.0	40.0			
Total Split (%)	32.0%	68.0%			36.0%	36.0%	32.0%	32.0%	32.0%			
Maximum Green (s)	34.0	79.0			39.0	39.0	34.0	34.0	34.0			
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	-2.0	-2.0			-2.0	-2.0	-2.0	-2.0	-2.0			
Total Lost Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Recall Mode	None	Min			Min	Min	None	None	None			

Intersection Summary

Area Type: Other
 Cycle Length: 125
 Actuated Cycle Length: 123.2
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated

Splits and Phases: 5: I-93 NB Ramps & Nashua Road (NH Route 102)



Queues
5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build Conditions

Weekday Evening

							
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	863	1441	1184	458	432	436	687
v/c Ratio	0.89	0.63	1.01	0.52	0.90	0.91	0.79
Control Delay	54.4	14.4	68.8	5.0	65.5	66.4	42.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	14.4	68.8	5.0	65.5	66.4	42.5
Queue Length 50th (ft)	342	337	~534	0	352	356	252
Queue Length 95th (ft)	#446	405	#671	73	#551	#557	335
Internal Link Dist (ft)		1030	1495			1420	
Turn Bay Length (ft)	500			500	500		500
Base Capacity (vph)	1003	2328	1178	885	491	493	884
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	0.62	1.01	0.52	0.88	0.88	0.78

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	785	1311	0	0	1077	417	839	3	666	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	15	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.95	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3433	3539			3539	1742	1681	1686	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3433	3539			3539	1742	1681	1686	2787			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	863	1441	0	0	1184	458	865	3	687	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	305	0	0	70	0	0	0
Lane Group Flow (vph)	863	1441	0	0	1184	153	432	436	617	0	0	0
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	2%	0%	2%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	32.9	78.0			39.1	39.1	33.2	33.2	33.2			
Effective Green, g (s)	34.9	80.0			41.1	41.1	35.2	35.2	35.2			
Actuated g/C Ratio	0.28	0.65			0.33	0.33	0.29	0.29	0.29			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	972	2298			1180	581	480	481	796			
v/s Ratio Prot	c0.25	0.41			c0.33							
v/s Ratio Perm						0.09	0.26	0.26	0.22			
v/c Ratio	0.89	0.63			1.00	0.26	0.90	0.91	0.78			
Uniform Delay, d1	42.3	12.8			41.0	30.0	42.3	42.4	40.4			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	9.9	0.5			27.0	0.2	19.7	20.5	4.7			
Delay (s)	52.2	13.3			68.1	30.2	62.0	62.9	45.1			
Level of Service	D	B			E	C	E	E	D			
Approach Delay (s)		27.9			57.5			54.8			0.0	
Approach LOS		C			E			D			A	
Intersection Summary												
HCM 2000 Control Delay			44.3									D
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			123.2							12.0		
Intersection Capacity Utilization			85.5%							E		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 Build Conditions

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	129	47	60	225	368	72	585	70	344	543	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	11	11	11	12	11	11	12	12	12
Storage Length (ft)	0		0	0		0	360		0	360		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.978			0.924			0.984			0.965	
Flt Protected		0.981			0.995		0.950			0.950		
Satd. Flow (prot)	0	1884	0	0	1658	0	1805	1776	0	1770	1806	0
Flt Permitted		0.294			0.897		0.237			0.085		
Satd. Flow (perm)	0	565	0	0	1495	0	450	1776	0	158	1806	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			46			5			14	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1900			5550			2000			2000	
Travel Time (s)		37.0			108.1			39.0			39.0	
Peak Hour Factor	0.85	0.85	0.85	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	0%	2%	2%	0%	2%	0%	2%	2%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	11.0	11.0		11.0	11.0		11.0	16.0		11.0	16.0	
Total Split (s)	26.0	26.0		26.0	26.0		26.0	46.0		26.0	46.0	
Total Split (%)	21.3%	21.3%		21.3%	21.3%		21.3%	37.7%		21.3%	37.7%	
Maximum Green (s)	20.0	20.0		20.0	20.0		20.0	40.0		20.0	40.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		4.0	4.0		4.0	4.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												

Intersection Summary

Area Type: Other
Cycle Length: 122
Actuated Cycle Length: 98
Natural Cycle: 150
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 Build Conditions
 Weekday Evening

Splits and Phases: 7: Mammoth Road (NH Route 128) & Pillsbury Road

 ø1	 ø2	 ø4	 ø9
26 s	46 s	26 s	24 s
 ø5	 ø6	 ø8	
26 s	46 s	26 s	

Lanes, Volumes, Timings
7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 Build Conditions
Weekday Evening

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

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 (%)

Shared Lane Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 12.0

Minimum Split (s) 24.0

Total Split (s) 24.0

Total Split (%) 20%

Maximum Green (s) 18.0

Yellow Time (s) 4.0

All-Red Time (s) 2.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?

Vehicle Extension (s) 3.0

Recall Mode None

Walk Time (s) 12.0

Flash Dont Walk (s) 6.0

Pedestrian Calls (#/hr) 0

Intersection Summary

Queues

2032 Build Conditions

7: Mammoth Road (NH Route 128) & Pillsbury Road

Weekday Evening

						
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	341	726	80	728	382	784
v/c Ratio	2.58	1.96	0.21	0.95	0.81	0.75
Control Delay	753.7	464.0	7.8	51.2	39.0	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	753.7	464.0	7.8	51.2	39.0	22.1
Queue Length 50th (ft)	~361	~691	14	426	173	357
Queue Length 95th (ft)	#501	#918	28	#674	#321	549
Internal Link Dist (ft)	1820	5470		1920		1920
Turn Bay Length (ft)			360		360	
Base Capacity (vph)	132	371	598	764	471	1049
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	2.58	1.96	0.13	0.95	0.81	0.75

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 Build Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	129	47	60	225	368	72	585	70	344	543	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	11	11	11	12	11	11	12	12	12
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.92		1.00	0.98		1.00	0.97	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1884			1659		1805	1775		1770	1806	
Flt Permitted		0.29			0.90		0.24	1.00		0.08	1.00	
Satd. Flow (perm)		565			1496		450	1775		158	1806	
Peak-hour factor, PHF	0.85	0.85	0.85	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	134	152	55	67	250	409	80	650	78	382	603	181
RTOR Reduction (vph)	0	5	0	0	36	0	0	3	0	0	6	0
Lane Group Flow (vph)	0	336	0	0	690	0	80	725	0	382	778	0
Heavy Vehicles (%)	0%	0%	0%	0%	2%	2%	0%	2%	0%	2%	2%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.0			20.0		47.8	41.2		67.2	54.6	
Effective Green, g (s)		22.0			22.0		51.8	43.2		69.2	56.6	
Actuated g/C Ratio		0.22			0.22		0.52	0.44		0.70	0.57	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		125			331		352	772		467	1030	
v/s Ratio Prot							0.02	c0.41		c0.18	0.43	
v/s Ratio Perm		c0.59			0.46		0.10			0.39		
v/c Ratio		2.68			2.09		0.23	0.94		0.82	0.76	
Uniform Delay, d1		38.6			38.6		13.2	26.7		27.9	16.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		780.3			498.6		0.5	19.1		11.2	3.4	
Delay (s)		818.9			537.2		13.7	45.9		39.0	19.5	
Level of Service		F			F		B	D		D	B	
Approach Delay (s)		818.9			537.2			42.7			25.9	
Approach LOS		F			F			D			C	
Intersection Summary												
HCM 2000 Control Delay		241.3					HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio		1.45										
Actuated Cycle Length (s)		99.2					Sum of lost time (s)			18.0		
Intersection Capacity Utilization		108.6%					ICU Level of Service			G		
Analysis Period (min)		15										
c Critical Lane Group												

2032 Build with Improvements

Lanes, Volumes, Timings

2032 Build Mitigated Conditions

1: Gilcreast Road & Nashua Road (NH Route 102)

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 					 	 	 
Volume (vph)	192	1486	39	99	1035	64	119	61	199	215	90	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	175		0	180		375	250		200	250		300
Storage Lanes	2		0	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3319	3521	0	3467	3539	1583	1701	1791	1507	1770	1900	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3319	3521	0	3467	3539	1583	1701	1791	1507	1770	1900	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				79			79			79
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1500			800			1500			1415	
Travel Time (s)		29.2			15.6			29.2			27.6	
Peak Hour Factor	0.96	0.96	0.96	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	6%	1%	2%	2%	0%	0%	1%	2%	0%	2%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	1	4	4	5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	14.0		11.0	14.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	19.0	66.0		15.0	62.0	26.0	18.0	18.0	15.0	26.0	26.0	19.0
Total Split (%)	15.2%	52.8%		12.0%	49.6%	20.8%	14.4%	14.4%	12.0%	20.8%	20.8%	15.2%
Maximum Green (s)	13.0	60.0		9.0	56.0	20.0	12.0	12.0	9.0	20.0	20.0	13.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		None	C-Min	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 125

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 1: Gilcreast Road & Nashua Road (NH Route 102)

 ø1	 ø2 (R)	 ø3	 ø4
15 s	66 s	18 s	26 s
 ø5	 ø6 (R)		
19 s	62 s		

Queues

2032 Build Mitigated Conditions

1: Gilcreast Road & Nashua Road (NH Route 102)

Weekday Morning

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	200	1589	108	1125	70	132	68	221	239	100	140
v/c Ratio	0.54	0.88	0.38	0.66	0.07	0.72	0.35	0.63	0.81	0.31	0.26
Control Delay	58.2	34.5	65.6	15.8	0.9	75.8	56.9	25.6	70.8	48.2	15.3
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	34.8	65.6	15.8	0.9	75.8	56.9	25.6	70.8	48.2	15.3
Queue Length 50th (ft)	79	602	47	150	0	104	52	70	186	71	34
Queue Length 95th (ft)	119	721	79	194	m3	#193	100	130	#306	125	85
Internal Link Dist (ft)		1420		720			1420			1335	
Turn Bay Length (ft)	175		180		375	250		200	250		300
Base Capacity (vph)	398	1807	305	1717	1073	190	200	359	311	334	559
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	24	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.89	0.35	0.66	0.07	0.69	0.34	0.62	0.77	0.30	0.25

Intersection Summary

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.

HCM Signalized Intersection Capacity Analysis

1: Gilcreast Road & Nashua Road (NH Route 102)

2032 Build Mitigated Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	192	1486	39	99	1035	64	119	61	199	215	90	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3319	3522		3467	3539	1583	1701	1791	1507	1770	1900	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3319	3522		3467	3539	1583	1701	1791	1507	1770	1900	1583
Peak-hour factor, PHF	0.96	0.96	0.96	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	200	1548	41	108	1125	70	132	68	221	239	100	140
RTOR Reduction (vph)	0	1	0	0	0	24	0	0	64	0	0	57
Lane Group Flow (vph)	200	1588	0	108	1125	46	132	68	157	239	100	83
Heavy Vehicles (%)	2%	2%	6%	1%	2%	2%	0%	0%	1%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3	1	4	4	5
Permitted Phases						6			3			4
Actuated Green, G (s)	11.9	62.1		8.4	58.6	77.6	11.5	11.5	19.9	19.0	19.0	30.9
Effective Green, g (s)	13.9	64.1		10.4	60.6	81.6	13.5	13.5	23.9	21.0	21.0	34.9
Actuated g/C Ratio	0.11	0.51		0.08	0.48	0.65	0.11	0.11	0.19	0.17	0.17	0.28
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	369	1806		288	1715	1033	183	193	288	297	319	492
v/s Ratio Prot	c0.06	c0.45		0.03	0.32	0.01	c0.08	0.04	0.05	c0.14	0.05	0.02
v/s Ratio Perm						0.02			0.06			0.03
v/c Ratio	0.54	0.88		0.38	0.66	0.04	0.72	0.35	0.55	0.80	0.31	0.17
Uniform Delay, d1	52.5	27.0		54.2	24.3	7.8	53.9	51.7	45.6	50.0	45.7	34.1
Progression Factor	1.00	1.00		1.15	0.56	1.02	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	6.5		0.7	1.7	0.0	13.1	1.1	2.1	14.6	0.6	0.2
Delay (s)	54.2	33.5		63.2	15.3	7.9	67.0	52.8	47.8	64.6	46.2	34.2
Level of Service	D	C		E	B	A	E	D	D	E	D	C
Approach Delay (s)		35.8			18.9			54.6			51.9	
Approach LOS		D			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			34.2									
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			125.0									
Intersection Capacity Utilization			76.6%									
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

2032 Build Mitigated Conditions

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	218	1567	64	48	1071	592	12	11	59	329	11	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	215		0	200		400	0		100	0		0
Storage Lanes	2		0	2		2	0		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.88	1.00	1.00	1.00	0.91	0.91	1.00
Frt		0.994				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.974		0.950	0.955	
Satd. Flow (prot)	3433	3518	0	3502	3539	2787	0	1724	1544	3221	1621	1583
Flt Permitted	0.950			0.950				0.974		0.950	0.955	
Satd. Flow (perm)	3433	3518	0	3502	3539	2787	0	1724	1544	3221	1621	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				637			131			115
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		800			1200			1500			415	
Travel Time (s)		15.6			23.4			34.1			9.4	
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.76	0.76	0.76	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	0%	10%	2%	2%	0%	2%
Shared Lane Traffic (%)										48%		
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Detector Phase	5	2		1	6	8	4	4	1	8	8	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	16.0		11.0	16.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	20.0	74.0		11.0	65.0	28.0	12.0	12.0	11.0	28.0	28.0	20.0
Total Split (%)	16.0%	59.2%		8.8%	52.0%	22.4%	9.6%	9.6%	8.8%	22.4%	22.4%	16.0%
Maximum Green (s)	14.0	68.0		5.0	59.0	22.0	6.0	6.0	5.0	22.0	22.0	14.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag				Lead			Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	C-Min		None	C-Min	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other
 Cycle Length: 125
 Actuated Cycle Length: 125
 Offset: 9 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated

Splits and Phases: 2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

 ø1	 ø2 (R)	 ø4	 ø8
11 s	74 s	12 s	28 s
 ø5	 ø6 (R)		
20 s	65 s		

Queues

2032 Build Mitigated Conditions

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Weekday Morning

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	229	1716	52	1152	637	30	78	190	188	168
v/c Ratio	0.55	0.78	0.24	0.59	0.29	0.26	0.29	0.33	0.66	0.28
Control Delay	61.9	10.5	62.9	19.4	1.2	61.6	3.2	46.1	59.0	11.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.9	10.7	62.9	19.4	1.2	61.6	3.2	46.1	59.0	11.3
Queue Length 50th (ft)	99	195	20	318	25	24	0	73	153	29
Queue Length 95th (ft)	m117	255	m38	449	31	47	0	111	243	81
Internal Link Dist (ft)		720		1120		1420			335	
Turn Bay Length (ft)	215		200		400		100			
Base Capacity (vph)	439	2206	219	1939	2255	116	273	618	311	609
Starvation Cap Reductn	0	54	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.80	0.24	0.59	0.28	0.26	0.29	0.31	0.60	0.28

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

2032 Build Mitigated Conditions

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	218	1567	64	48	1071	592	12	11	59	329	11	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	0.88		1.00	1.00	0.91	0.91	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3433	3518		3502	3539	2787		1724	1544	3221	1621	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3433	3518		3502	3539	2787		1724	1544	3221	1621	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.76	0.76	0.76	0.90	0.90	0.90
Adj. Flow (vph)	229	1649	67	52	1152	637	16	14	78	366	12	168
RTOR Reduction (vph)	0	2	0	0	0	188	0	0	70	0	0	81
Lane Group Flow (vph)	229	1714	0	52	1152	449	0	30	8	190	188	87
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	0%	10%	2%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Actuated Green, G (s)	13.2	72.8		4.5	64.1	84.2		3.6	8.1	20.1	20.1	33.3
Effective Green, g (s)	15.2	74.8		6.5	66.1	88.2		5.6	12.1	22.1	22.1	37.3
Actuated g/C Ratio	0.12	0.60		0.05	0.53	0.71		0.04	0.10	0.18	0.18	0.30
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	417	2105		182	1871	1966		77	149	569	286	523
v/s Ratio Prot	c0.07	c0.49		0.01	0.33	0.04		c0.02	0.00	0.06	c0.12	0.02
v/s Ratio Perm						0.12			0.00			0.03
v/c Ratio	0.55	0.81		0.29	0.62	0.23		0.39	0.05	0.33	0.66	0.17
Uniform Delay, d1	51.7	19.7		57.0	20.6	6.5		58.0	51.2	45.0	47.9	32.4
Progression Factor	1.14	0.45		1.08	0.88	3.33		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	1.9		1.0	1.2	0.1		4.4	0.2	0.5	5.9	0.2
Delay (s)	60.1	10.8		62.3	19.3	21.6		62.4	51.4	45.5	53.9	32.6
Level of Service	E	B		E	B	C		E	D	D	D	C
Approach Delay (s)		16.6			21.3			54.5			44.4	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			22.9				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			125.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			72.5%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 Build Mitigated Conditions

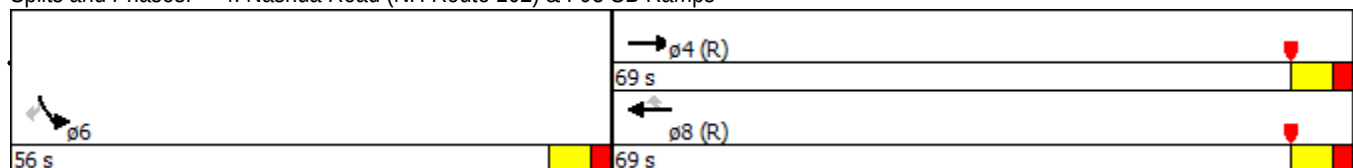
Weekday Morning

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1194	890	502	232	821
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			400	0	350
Storage Lanes	0			1	1	2
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3539	3539	1583	1752	2787
Flt Permitted					0.950	
Satd. Flow (perm)	0	3539	3539	1583	1752	2787
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				534		172
Link Speed (mph)		35	35		30	
Link Distance (ft)		1200	1110		1500	
Travel Time (s)		23.4	21.6		34.1	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	2%	3%	2%
Shared Lane Traffic (%)						
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Detector Phase		4	8	8	6	6
Switch Phase						
Minimum Initial (s)		10.0	10.0	10.0	6.0	6.0
Minimum Split (s)		16.0	16.0	16.0	12.0	12.0
Total Split (s)		69.0	69.0	69.0	56.0	56.0
Total Split (%)		55.2%	55.2%	55.2%	44.8%	44.8%
Maximum Green (s)		63.0	63.0	63.0	50.0	50.0
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		C-Min	C-Min	C-Min	None	None

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 40 (32%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 4: Nashua Road (NH Route 102) & I-93 SB Ramps



Queues
4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 Build Mitigated Conditions

Weekday Morning

	→	←	↖	↘	↙
Lane Group	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1298	947	534	258	912
v/c Ratio	0.64	0.46	0.47	0.41	0.82
Control Delay	15.0	4.2	3.0	31.3	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	4.2	3.0	31.3	35.6
Queue Length 50th (ft)	200	29	0	155	313
Queue Length 95th (ft)	434	288	281	210	370
Internal Link Dist (ft)	1120	1030		1420	
Turn Bay Length (ft)			400		350
Base Capacity (vph)	2046	2046	1140	729	1261
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	0.63	0.46	0.47	0.35	0.72
Intersection Summary					

HCM Signalized Intersection Capacity Analysis

4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 Build Mitigated Conditions

Weekday Morning

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑	↑	↑↑
Volume (vph)	0	1194	890	502	232	821
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	0.95	1.00	1.00	0.88
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		3539	3539	1583	1752	2787
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		3539	3539	1583	1752	2787
Peak-hour factor, PHF	0.92	0.92	0.94	0.94	0.90	0.90
Adj. Flow (vph)	0	1298	947	534	258	912
RTOR Reduction (vph)	0	0	0	226	0	110
Lane Group Flow (vph)	0	1298	947	308	258	802
Heavy Vehicles (%)	0%	2%	2%	2%	3%	2%
Turn Type		NA	NA	Perm	NA	Perm
Protected Phases		4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)		70.2	70.2	70.2	42.8	42.8
Effective Green, g (s)		72.2	72.2	72.2	44.8	44.8
Actuated g/C Ratio		0.58	0.58	0.58	0.36	0.36
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2044	2044	914	627	998
v/s Ratio Prot		c0.37	0.27		0.15	
v/s Ratio Perm				0.19		c0.29
v/c Ratio		0.64	0.46	0.34	0.41	0.80
Uniform Delay, d1		17.6	15.2	13.9	30.2	36.1
Progression Factor		0.74	0.22	1.43	1.00	1.00
Incremental Delay, d2		1.1	0.6	0.7	0.4	4.8
Delay (s)		14.1	4.0	20.6	30.6	40.9
Level of Service		B	A	C	C	D
Approach Delay (s)		14.1	9.9		38.6	
Approach LOS		B	A		D	
Intersection Summary						
HCM 2000 Control Delay			19.8		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.70			
Actuated Cycle Length (s)			125.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			60.0%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build Mitigated Conditions

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 				 			
Volume (vph)	710	716	0	0	1050	370	342	2	203	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	15	12	12	12	12	12	12
Storage Length (ft)	500		0	0		500	500		500	0		0
Storage Lanes	2		0	0		1	1		2	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.88	1.00	1.00	1.00
Flt						0.850			0.850			
Flt Protected	0.950						0.950	0.953				
Satd. Flow (prot)	3433	3539	0	0	3539	1742	1681	1687	2787	0	0	0
Flt Permitted	0.950						0.950	0.953				
Satd. Flow (perm)	3433	3539	0	0	3539	1742	1681	1687	2787	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						411			226			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1110			1575			1500			1500	
Travel Time (s)		21.6			30.7			34.1			34.1	
Peak Hour Factor	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	2%	0%	2%	0%	0%	0%
Shared Lane Traffic (%)							50%					
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Detector Phase	7	4			8	8	2	2	2			
Switch Phase												
Minimum Initial (s)	6.0	10.0			10.0	10.0	10.0	10.0	10.0			
Minimum Split (s)	12.0	16.0			16.0	16.0	16.0	16.0	16.0			
Total Split (s)	40.0	95.0			55.0	55.0	30.0	30.0	30.0			
Total Split (%)	32.0%	76.0%			44.0%	44.0%	24.0%	24.0%	24.0%			
Maximum Green (s)	34.0	89.0			49.0	49.0	24.0	24.0	24.0			
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	-2.0	-2.0			-2.0	-2.0	-2.0	-2.0	-2.0			
Total Lost Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			

Intersection Summary

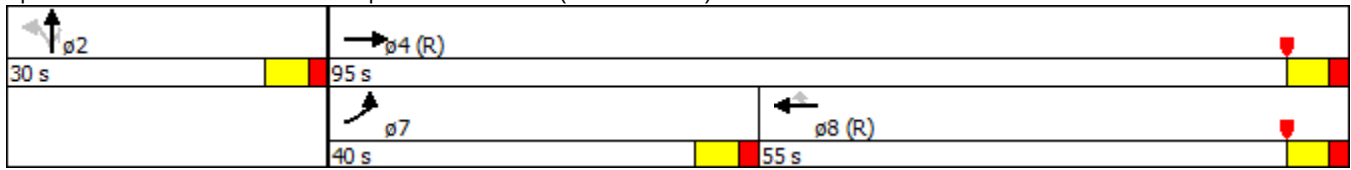
Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 108 (86%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
 5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build Mitigated Conditions

Weekday Morning

Splits and Phases: 5: I-93 NB Ramps & Nashua Road (NH Route 102)



Queues
5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build Mitigated Conditions
Weekday Morning

							
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	763	770	1167	411	190	192	226
v/c Ratio	0.82	0.28	0.71	0.40	0.66	0.67	0.34
Control Delay	38.5	7.3	31.4	3.5	59.5	59.8	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	7.3	31.4	3.5	59.5	59.8	6.6
Queue Length 50th (ft)	300	124	405	0	151	152	0
Queue Length 95th (ft)	325	192	524	61	229	231	36
Internal Link Dist (ft)		1030	1495			1420	
Turn Bay Length (ft)	500			500	500		500
Base Capacity (vph)	994	2709	1638	1027	349	350	758
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	0.77	0.28	0.71	0.40	0.54	0.55	0.30
Intersection Summary							

HCM Signalized Intersection Capacity Analysis

5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build Mitigated Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	710	716	0	0	1050	370	342	2	203	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	15	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.95	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3433	3539			3539	1742	1681	1687	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3433	3539			3539	1742	1681	1687	2787			
Peak-hour factor, PHF	0.93	0.93	0.93	0.90	0.90	0.90	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	763	770	0	0	1167	411	380	2	226	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	221	0	0	187	0	0	0
Lane Group Flow (vph)	763	770	0	0	1167	190	190	192	39	0	0	0
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	2%	0%	2%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	31.9	93.7			55.8	55.8	19.3	19.3	19.3			
Effective Green, g (s)	33.9	95.7			57.8	57.8	21.3	21.3	21.3			
Actuated g/C Ratio	0.27	0.77			0.46	0.46	0.17	0.17	0.17			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	931	2709			1636	805	286	287	474			
v/s Ratio Prot	c0.22	0.22			c0.33							
v/s Ratio Perm						0.11	0.11	0.11	0.01			
v/c Ratio	0.82	0.28			0.71	0.24	0.66	0.67	0.08			
Uniform Delay, d1	42.7	4.4			27.0	20.3	48.5	48.5	43.6			
Progression Factor	0.75	1.48			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	4.7	0.2			2.7	0.7	5.7	5.8	0.1			
Delay (s)	36.6	6.7			29.6	21.0	54.2	54.4	43.7			
Level of Service	D	A			C	C	D	D	D			
Approach Delay (s)		21.6			27.4			50.3			0.0	
Approach LOS		C			C			D			A	
Intersection Summary												
HCM 2000 Control Delay			28.7			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			125.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			68.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

2032 Build Mitigated Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)/West Broadway (NH Route 102)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	185	583	4	1	1379	138	2	0	2	32	2	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	11	12	12	12	12	12	11
Storage Length (ft)	100		0	0		200	0		0	0		50
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.986			0.932				0.850
Flt Protected	0.950			0.950				0.976			0.955	
Satd. Flow (prot)	1711	3536	0	1745	3373	0	0	1728	0	0	1781	1531
Flt Permitted	0.950			0.950				0.822			0.732	
Satd. Flow (perm)	1711	3536	0	1745	3373	0	0	1456	0	0	1365	1531
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			18			142				37
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1575			2000			500			3130	
Travel Time (s)		30.7			39.0			11.4			71.1	
Peak Hour Factor	0.90	0.90	0.90	0.95	0.95	0.95	0.50	0.50	0.50	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases							2			6		6
Detector Phase	7	4		3	8		2	2		6	6	7
Switch Phase												
Minimum Initial (s)	6.0	10.0		4.0	10.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	12.0	16.0		8.0	16.0		12.0	12.0		12.0	12.0	12.0
Total Split (s)	25.0	79.0		8.0	62.0		13.0	13.0		13.0	13.0	25.0
Total Split (%)	25.0%	79.0%		8.0%	62.0%		13.0%	13.0%		13.0%	13.0%	25.0%
Maximum Green (s)	19.0	73.0		4.0	56.0		7.0	7.0		7.0	7.0	19.0
Yellow Time (s)	4.0	4.0		3.5	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		0.5	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	-2.0
Total Lost Time (s)	4.0	4.0		2.0	4.0			4.0			4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag							Lead
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	Min		None	Min		None	None		None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 79.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Splits and Phases: 6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)/West Broadway (NH Route 102)

		
13 s	8 s	79 s
		
13 s	25 s	62 s

Queues

2032 Build Mitigated Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)/West Broadway (NH Route 102)

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	206	652	1	1597	8	38	131
v/c Ratio	0.55	0.21	0.01	0.80	0.03	0.23	0.27
Control Delay	38.4	2.1	44.0	17.6	0.2	44.7	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	2.1	44.0	17.6	0.2	44.7	18.7
Queue Length 50th (ft)	112	32	1	368	0	21	39
Queue Length 95th (ft)	194	73	6	497	0	56	87
Internal Link Dist (ft)		1495		1920	420	3050	
Turn Bay Length (ft)	100						50
Base Capacity (vph)	504	3110	146	2554	308	172	596
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	0.21	0.01	0.63	0.03	0.22	0.22
Intersection Summary							

HCM Signalized Intersection Capacity Analysis

2032 Build Mitigated Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)/West Broadway (NH Route 102)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	185	583	4	1	1379	138	2	0	2	32	2	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	11	11	12	12	12	12	12	11
Total Lost time (s)	4.0	4.0		2.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.95	1.00
Satd. Flow (prot)	1711	3536		1745	3375			1729			1780	1531
Flt Permitted	0.95	1.00		0.95	1.00			0.82			0.73	1.00
Satd. Flow (perm)	1711	3536		1745	3375			1457			1365	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.50	0.50	0.50	0.90	0.90	0.90
Adj. Flow (vph)	206	648	4	1	1452	145	4	0	4	36	2	131
RTOR Reduction (vph)	0	0	0	0	7	0	0	7	0	0	0	27
Lane Group Flow (vph)	206	652	0	1	1590	0	0	1	0	0	38	104
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases							2			6		6
Actuated Green, G (s)	15.1	64.9		0.6	48.4			3.4			3.4	18.5
Effective Green, g (s)	17.1	66.9		2.6	50.4			5.4			5.4	22.5
Actuated g/C Ratio	0.20	0.79		0.03	0.59			0.06			0.06	0.27
Clearance Time (s)	6.0	6.0		4.0	6.0			6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	344	2786		53	2003			92			86	477
v/s Ratio Prot	c0.12	0.18		0.00	c0.47						c0.03	0.04
v/s Ratio Perm								0.00				0.02
v/c Ratio	0.60	0.23		0.02	0.79			0.01			0.44	0.22
Uniform Delay, d1	30.8	2.3		39.9	13.3			37.2			38.3	24.3
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	2.8	0.0		0.1	2.2			0.0			3.6	0.2
Delay (s)	33.6	2.4		40.1	15.5			37.3			41.9	24.6
Level of Service	C	A		D	B			D			D	C
Approach Delay (s)		9.9			15.5			37.3			28.5	
Approach LOS		A			B			D			C	
Intersection Summary												
HCM 2000 Control Delay			14.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			84.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			67.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 Build Mitigated Conditions

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	185	47	36	43	183	17	445	20	279	383	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	11	11	11	12	11	11	12	12	12
Storage Length (ft)	200		0	200		250	360		0	360		200
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.969				0.850		0.994				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1865	1873	0	1745	1801	1531	1805	1791	0	1770	1863	1615
Flt Permitted	0.726			0.301			0.514			0.205		
Satd. Flow (perm)	1425	1873	0	553	1801	1531	977	1791	0	382	1863	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				203		2				134
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1900			5550			2000			2000	
Travel Time (s)		37.0			108.1			39.0			39.0	
Peak Hour Factor	0.80	0.80	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	11.0	16.0		11.0	16.0	16.0
Total Split (s)	27.0	27.0		27.0	27.0	27.0	11.0	47.0		24.0	60.0	60.0
Total Split (%)	22.1%	22.1%		22.1%	22.1%	22.1%	9.0%	38.5%		19.7%	49.2%	49.2%
Maximum Green (s)	21.0	21.0		21.0	21.0	21.0	5.0	41.0		18.0	54.0	54.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	4.0	4.0		4.0	4.0	4.0
Recall Mode	None	None		None	None	None	None	Min		None	Min	Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												

Intersection Summary

Area Type: Other
Cycle Length: 122
Actuated Cycle Length: 88.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 Build Mitigated Conditions
 Weekday Morning

Splits and Phases: 7: Mammoth Road (NH Route 128) & Pillsbury Road

 ø1	 ø2	 ø4	 ø9
24 s	47 s	27 s	24 s
 ø5	 ø6	 ø8	
11 s	60 s	27 s	

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

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 (%)

Shared Lane Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 12.0

Minimum Split (s) 24.0

Total Split (s) 24.0

Total Split (%) 20%

Maximum Green (s) 18.0

Yellow Time (s) 4.0

All-Red Time (s) 2.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?

Vehicle Extension (s) 3.0

Recall Mode None

Walk Time (s) 12.0

Flash Dont Walk (s) 6.0

Pedestrian Calls (#/hr) 5

Intersection Summary

Queues

2032 Build Mitigated Conditions

7: Mammoth Road (NH Route 128) & Pillsbury Road

Weekday Morning

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	188	290	40	48	203	19	516	310	426	103
v/c Ratio	0.54	0.62	0.29	0.11	0.38	0.04	0.76	0.62	0.40	0.10
Control Delay	39.9	39.0	40.8	32.6	7.8	10.3	33.7	16.2	14.4	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	39.0	40.8	32.6	7.8	10.3	33.7	16.2	14.4	1.8
Queue Length 50th (ft)	86	131	17	20	0	3	228	65	96	0
Queue Length 95th (ft)	195	274	67	68	65	18	#542	204	324	18
Internal Link Dist (ft)		1820		5470			1920		1920	
Turn Bay Length (ft)	200		200		250	360		360		200
Base Capacity (vph)	390	519	151	493	566	522	918	567	1242	1121
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.56	0.26	0.10	0.36	0.04	0.56	0.55	0.34	0.09

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 Build Mitigated Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	185	47	36	43	183	17	445	20	279	383	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	11	11	11	12	11	11	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1865	1874		1745	1801	1531	1805	1791		1770	1863	1615
Flt Permitted	0.73	1.00		0.30	1.00	1.00	0.51	1.00		0.21	1.00	1.00
Satd. Flow (perm)	1425	1874		553	1801	1531	977	1791		382	1863	1615
Peak-hour factor, PHF	0.80	0.80	0.80	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	188	231	59	40	48	203	19	494	22	310	426	103
RTOR Reduction (vph)	0	7	0	0	0	158	0	1	0	0	0	49
Lane Group Flow (vph)	188	283	0	40	48	45	19	515	0	310	426	54
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	19.6	19.6		19.6	19.6	19.6	37.5	35.8		56.5	48.8	48.8
Effective Green, g (s)	21.6	21.6		21.6	21.6	21.6	41.5	37.8		58.5	50.8	50.8
Actuated g/C Ratio	0.22	0.22		0.22	0.22	0.22	0.43	0.39		0.60	0.53	0.53
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	318	418		123	402	341	450	700		470	978	848
v/s Ratio Prot		c0.15			0.03		0.00	c0.29		c0.11	0.23	
v/s Ratio Perm	0.13			0.07		0.03	0.02			0.28		0.03
v/c Ratio	0.59	0.68		0.33	0.12	0.13	0.04	0.74		0.66	0.44	0.06
Uniform Delay, d1	33.6	34.4		31.4	30.0	30.1	15.9	25.2		13.6	14.1	11.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.4	5.6		3.2	0.3	0.4	0.1	4.3		3.7	0.4	0.0
Delay (s)	38.0	40.0		34.7	30.2	30.4	16.0	29.5		17.3	14.6	11.3
Level of Service	D	D		C	C	C	B	C		B	B	B
Approach Delay (s)		39.2			31.0			29.0			15.2	
Approach LOS		D			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			26.1			HCM 2000 Level of Service					C	
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			96.7			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			70.2%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
8: Pillsbury Road & Hardy Road

2032 Build Mitigated Conditions

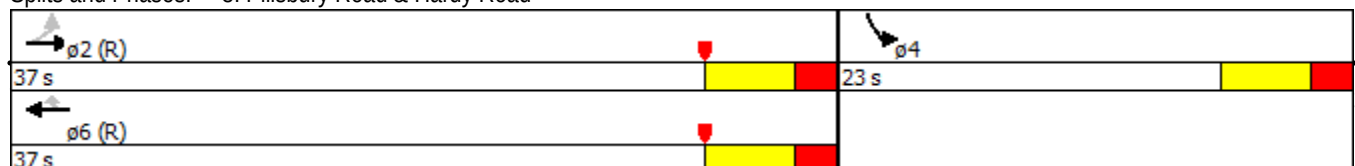
Weekday Morning

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	38	472	215	87	234	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			200	0	0
Storage Lanes	0			1	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.981	
Flt Protected		0.996			0.959	
Satd. Flow (prot)	0	1858	1863	1583	1757	0
Flt Permitted		0.965			0.959	
Satd. Flow (perm)	0	1800	1863	1583	1757	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				97	14	
Link Speed (mph)		35	30		35	
Link Distance (ft)		5550	525		8200	
Travel Time (s)		108.1	11.9		159.7	
Peak Hour Factor	0.91	0.92	0.90	0.90	0.92	0.90
Heavy Vehicles (%)	0%	2%	2%	2%	2%	0%
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA	Perm	NA	
Protected Phases		2	6		4	
Permitted Phases	2			6		
Detector Phase	2	2	6	6	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	6.0	6.0	6.0	
Minimum Split (s)	16.0	16.0	12.0	12.0	12.0	
Total Split (s)	37.0	37.0	37.0	37.0	23.0	
Total Split (%)	61.7%	61.7%	61.7%	61.7%	38.3%	
Maximum Green (s)	31.0	31.0	31.0	31.0	17.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 59 (98%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
Natural Cycle: 40
Control Type: Actuated-Coordinated

Splits and Phases: 8: Pillsbury Road & Hardy Road



Queues
8: Pillsbury Road & Hardy Road

2032 Build Mitigated Conditions
Weekday Morning

	→	←	↖	↗
Lane Group	EBT	WBT	WBR	SBL
Lane Group Flow (vph)	555	239	97	295
v/c Ratio	0.51	0.21	0.10	0.62
Control Delay	9.9	5.1	1.3	23.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.9	5.1	1.3	23.8
Queue Length 50th (ft)	104	18	0	87
Queue Length 95th (ft)	197	76	5	148
Internal Link Dist (ft)	5470	445		8120
Turn Bay Length (ft)			200	
Base Capacity (vph)	1079	1117	988	565
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.51	0.21	0.10	0.52
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

8: Pillsbury Road & Hardy Road

2032 Build Mitigated Conditions

Weekday Morning

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	38	472	215	87	234	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85	0.98	
Flt Protected		1.00	1.00	1.00	0.96	
Satd. Flow (prot)		1858	1863	1583	1757	
Flt Permitted		0.97	1.00	1.00	0.96	
Satd. Flow (perm)		1800	1863	1583	1757	
Peak-hour factor, PHF	0.91	0.92	0.90	0.90	0.92	0.90
Adj. Flow (vph)	42	513	239	97	254	41
RTOR Reduction (vph)	0	0	0	39	10	0
Lane Group Flow (vph)	0	555	239	58	285	0
Heavy Vehicles (%)	0%	2%	2%	2%	2%	0%
Turn Type	Perm	NA	NA	Perm	NA	
Protected Phases		2	6		4	
Permitted Phases	2			6		
Actuated Green, G (s)		34.0	34.0	34.0	14.0	
Effective Green, g (s)		36.0	36.0	36.0	16.0	
Actuated g/C Ratio		0.60	0.60	0.60	0.27	
Clearance Time (s)		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1080	1117	949	468	
v/s Ratio Prot			0.13		c0.16	
v/s Ratio Perm		c0.31		0.04		
v/c Ratio		0.51	0.21	0.06	0.61	
Uniform Delay, d1		6.9	5.5	5.0	19.3	
Progression Factor		1.00	0.73	0.61	1.00	
Incremental Delay, d2		1.7	0.4	0.1	2.2	
Delay (s)		8.7	4.4	3.2	21.5	
Level of Service		A	A	A	C	
Approach Delay (s)		8.7	4.1		21.5	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			10.6		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			60.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			63.5%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
9: Gilcreast Road & Pillsbury Road

2032 Build Mitigated Conditions

Weekday Morning

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	394	312	208	195	113	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		200	300		0	300
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.348		0.950	
Satd. Flow (perm)	1863	1583	648	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		347				165
Link Speed (mph)	30			30	30	
Link Distance (ft)	525			681	595	
Travel Time (s)	11.9			15.5	13.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.98	0.98
Shared Lane Traffic (%)						
Turn Type	NA	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	4		3	8	2	3
Permitted Phases		4	8			2
Detector Phase	4	4	3	8	2	3
Switch Phase						
Minimum Initial (s)	10.0	10.0	6.0	10.0	6.0	6.0
Minimum Split (s)	16.0	16.0	12.0	16.0	12.0	12.0
Total Split (s)	32.0	32.0	14.0	46.0	14.0	14.0
Total Split (%)	53.3%	53.3%	23.3%	76.7%	23.3%	23.3%
Maximum Green (s)	26.0	26.0	8.0	40.0	8.0	8.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Min	C-Min	None	C-Min	Min	None

Intersection Summary

Area Type: Other

Cycle Length: 60

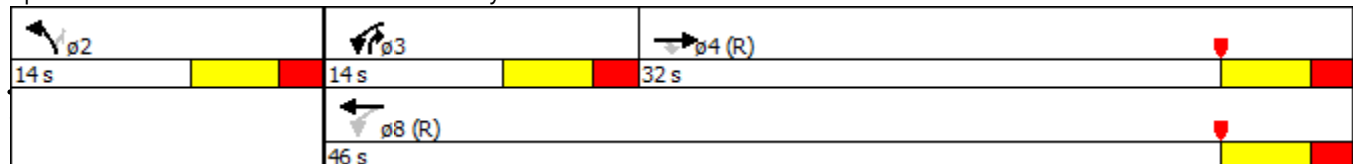
Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 40

Control Type: Actuated-Coordinated

Splits and Phases: 9: Gilcreast Road & Pillsbury Road



Queues
9: Gilcreast Road & Pillsbury Road

2032 Build Mitigated Conditions
Weekday Morning

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	438	347	231	217	115	165
v/c Ratio	0.50	0.37	0.37	0.17	0.39	0.23
Control Delay	11.7	2.5	4.8	3.0	26.2	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	2.5	4.8	3.0	26.2	3.2
Queue Length 50th (ft)	110	7	25	24	37	0
Queue Length 95th (ft)	120	22	30	29	80	30
Internal Link Dist (ft)	445			601	515	
Turn Bay Length (ft)		200	300			300
Base Capacity (vph)	899	943	641	1318	310	735
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	0.49	0.37	0.36	0.16	0.37	0.22
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

9: Gilcreast Road & Pillsbury Road

2032 Build Mitigated Conditions
Weekday Morning

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	394	312	208	195	113	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.35	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	648	1863	1770	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.98	0.98
Adj. Flow (vph)	438	347	231	217	115	165
RTOR Reduction (vph)	0	183	0	0	0	111
Lane Group Flow (vph)	438	164	231	217	115	54
Turn Type	NA	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	4		3	8	2	3
Permitted Phases		4	8			2
Actuated Green, G (s)	26.3	26.3	39.9	39.9	8.1	15.7
Effective Green, g (s)	28.3	28.3	41.9	41.9	10.1	19.7
Actuated g/C Ratio	0.47	0.47	0.70	0.70	0.17	0.33
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	878	746	632	1300	297	625
v/s Ratio Prot	c0.24		c0.06	0.12	c0.06	0.01
v/s Ratio Perm		0.10	0.20			0.02
v/c Ratio	0.50	0.22	0.37	0.17	0.39	0.09
Uniform Delay, d1	11.0	9.3	4.3	3.1	22.2	13.9
Progression Factor	0.85	0.97	0.93	0.83	1.00	1.00
Incremental Delay, d2	1.8	0.6	0.4	0.3	0.8	0.1
Delay (s)	11.0	9.6	4.4	2.8	23.0	14.0
Level of Service	B	A	A	A	C	B
Approach Delay (s)	10.4			3.6	17.7	
Approach LOS	B			A	B	
Intersection Summary						
HCM 2000 Control Delay			9.7		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.45			
Actuated Cycle Length (s)			60.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			48.5%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
11: Orchard Drive & Pillsbury Road

2032 Build Mitigated Conditions

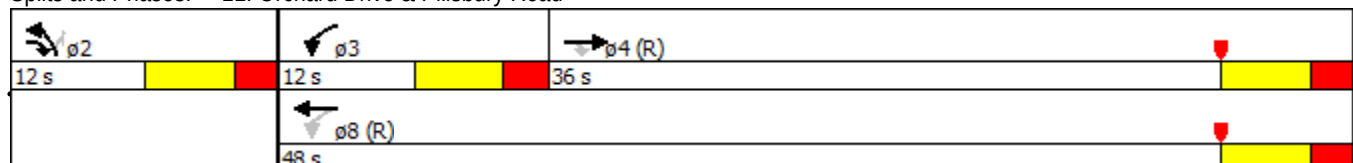
Weekday Morning

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	490	123	66	327	60	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		200	300		0	300
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.328		0.950	
Satd. Flow (perm)	1863	1583	611	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		137				97
Link Speed (mph)	30			30	30	
Link Distance (ft)	250			1000	1500	
Travel Time (s)	5.7			22.7	34.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Turn Type	NA	pm+ov	pm+pt	NA	NA	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Detector Phase	4	2	3	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	6.0	6.0	10.0	6.0	6.0
Minimum Split (s)	16.0	12.0	12.0	16.0	12.0	12.0
Total Split (s)	36.0	12.0	12.0	48.0	12.0	12.0
Total Split (%)	60.0%	20.0%	20.0%	80.0%	20.0%	20.0%
Maximum Green (s)	30.0	6.0	6.0	42.0	6.0	6.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Min	None	None	C-Min	None	None

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 37 (62%), Referenced to phase 4:EBT and 8:WBTL, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 11: Orchard Drive & Pillsbury Road



Queues
11: Orchard Drive & Pillsbury Road

2032 Build Mitigated Conditions
Weekday Morning

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	544	137	73	363	67	97
v/c Ratio	0.45	0.10	0.12	0.25	0.25	0.30
Control Delay	4.9	0.1	3.0	3.3	25.2	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	0.1	3.0	3.3	25.2	9.0
Queue Length 50th (ft)	43	0	6	36	21	0
Queue Length 95th (ft)	71	0	13	54	54	35
Internal Link Dist (ft)	170			920	1420	
Turn Bay Length (ft)		200	300			300
Base Capacity (vph)	1238	1347	620	1465	264	319
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	0.44	0.10	0.12	0.25	0.25	0.30
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

11: Orchard Drive & Pillsbury Road

2032 Build Mitigated Conditions
Weekday Morning

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	490	123	66	327	60	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.33	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	611	1863	1770	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	544	137	73	363	67	97
RTOR Reduction (vph)	0	41	0	0	0	84
Lane Group Flow (vph)	544	96	73	363	67	13
Turn Type	NA	pm+ov	pm+pt	NA	NA	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	32.4	38.2	42.2	42.2	5.8	5.8
Effective Green, g (s)	34.4	42.2	44.2	44.2	7.8	7.8
Actuated g/C Ratio	0.57	0.70	0.74	0.74	0.13	0.13
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1068	1218	562	1372	230	205
v/s Ratio Prot	c0.29	0.01	0.01	c0.19	c0.04	
v/s Ratio Perm		0.05	0.08			0.01
v/c Ratio	0.51	0.08	0.13	0.26	0.29	0.06
Uniform Delay, d1	7.7	2.8	3.3	2.6	23.6	22.9
Progression Factor	0.43	0.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.0	0.1	0.5	0.7	0.1
Delay (s)	4.9	0.0	3.4	3.1	24.3	23.0
Level of Service	A	A	A	A	C	C
Approach Delay (s)	4.0			3.1	23.5	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay			6.2		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.45			
Actuated Cycle Length (s)			60.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			45.8%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings

2032 Build Mitigated Conditions

12: Londonderry Road/Eastern Main Drive & Pillsbury Road/Ash Street

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	342	213	78	23	231	25	52	196	47	9	53	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	200		0	250		0	100		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960			0.986			0.971				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1788	0	1770	1837	0	1770	1809	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.719			0.395		
Satd. Flow (perm)	1770	1788	0	1770	1837	0	1339	1809	0	736	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			6			13				173
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			3600			3130			1000	
Travel Time (s)		22.7			81.8			71.1			22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pt+ov
Protected Phases	7	4		3	8			2			6	6 7
Permitted Phases							2			6		
Detector Phase	7	4		3	8		2	2		6	6	6 7
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		16.0	16.0		16.0	16.0	
Total Split (s)	35.0	49.0		12.0	26.0		29.0	29.0		29.0	29.0	
Total Split (%)	38.9%	54.4%		13.3%	28.9%		32.2%	32.2%		32.2%	32.2%	
Maximum Green (s)	29.0	43.0		6.0	20.0		23.0	23.0		23.0	23.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 70.9

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Londonderry Road/Eastern Main Drive & Pillsbury Road/Ash Street

 $\phi 2$	 $\phi 3$	 $\phi 4$
29 s	12 s	49 s
 $\phi 6$	 $\phi 7$	 $\phi 8$
29 s	35 s	26 s

Queues

2032 Build Mitigated Conditions

12: Londonderry Road/Eastern Main Drive & Pillsbury Road/Ash Street

Weekday Morning

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	380	324	26	284	58	270	10	59	173
v/c Ratio	0.68	0.31	0.12	0.61	0.17	0.58	0.05	0.12	0.16
Control Delay	29.0	10.0	36.5	31.6	24.8	29.3	24.3	23.8	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.0	10.0	36.5	31.6	24.8	29.3	24.3	23.8	1.3
Queue Length 50th (ft)	142	49	10	106	20	98	3	20	0
Queue Length 95th (ft)	275	156	39	226	56	201	17	55	19
Internal Link Dist (ft)		920		3520		3050		920	
Turn Bay Length (ft)	250		200		250		100		200
Base Capacity (vph)	811	1200	209	602	495	677	272	689	1258
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	0.47	0.27	0.12	0.47	0.12	0.40	0.04	0.09	0.14
Intersection Summary									

HCM Signalized Intersection Capacity Analysis

2032 Build Mitigated Conditions

12: Londonderry Road/Eastern Main Drive & Pillsbury Road/Ash Street

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	342	213	78	23	231	25	52	196	47	9	53	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1788		1770	1836		1770	1809		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.72	1.00		0.40	1.00	1.00
Satd. Flow (perm)	1770	1788		1770	1836		1338	1809		736	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	380	237	87	26	257	27	58	218	52	10	59	173
RTOR Reduction (vph)	0	13	0	0	4	0	0	10	0	0	0	70
Lane Group Flow (vph)	380	311	0	26	280	0	58	260	0	10	59	103
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pt+ov
Protected Phases	7	4		3	8			2			6	6 7
Permitted Phases							2			6		
Actuated Green, G (s)	20.4	38.5		2.0	20.1		15.9	15.9		15.9	15.9	42.3
Effective Green, g (s)	22.4	40.5		4.0	22.1		17.9	17.9		17.9	17.9	44.3
Actuated g/C Ratio	0.30	0.54		0.05	0.30		0.24	0.24		0.24	0.24	0.60
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	532	973		95	545		321	435		177	448	942
v/s Ratio Prot	c0.21	0.17		0.01	c0.15			c0.14			0.03	0.07
v/s Ratio Perm							0.04			0.01		
v/c Ratio	0.71	0.32		0.27	0.51		0.18	0.60		0.06	0.13	0.11
Uniform Delay, d1	23.2	9.3		33.8	21.7		22.4	25.1		21.7	22.2	6.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.5	0.2		1.6	0.8		0.3	2.2		0.1	0.1	0.1
Delay (s)	27.7	9.5		35.4	22.5		22.7	27.3		21.9	22.3	6.6
Level of Service	C	A		D	C		C	C		C	C	A
Approach Delay (s)		19.3			23.6			26.5			11.0	
Approach LOS		B			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			20.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			74.4			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			55.8%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
15: Eastern Main Drive & Exit 4A Connector

2032 Build Mitigated Conditions
Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 		 					
Volume (vph)	85	930	139	44	1038	15	184	112	7	7	57	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	200		0	400		0	200		0
Storage Lanes	1		1	1		0	2		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.998			0.991			0.934	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3532	0	3433	1846	0	1770	1740	0
Flt Permitted	0.116			0.155			0.950			0.950		
Satd. Flow (perm)	216	3539	1583	289	3532	0	3433	1846	0	1770	1740	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182		2			3			39	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			1000			1000			1000	
Travel Time (s)		22.7			22.7			22.7			22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8								
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		6.0	10.0		6.0	10.0	
Minimum Split (s)	12.0	22.0	22.0	12.0	22.0		12.0	22.0		12.0	22.0	
Total Split (s)	12.0	42.0	42.0	12.0	42.0		14.0	24.0		12.0	22.0	
Total Split (%)	13.3%	46.7%	46.7%	13.3%	46.7%		15.6%	26.7%		13.3%	24.4%	
Maximum Green (s)	6.0	36.0	36.0	6.0	36.0		8.0	18.0		6.0	16.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min	Min	None	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 73.9
Natural Cycle: 75
Control Type: Actuated-Uncoordinated

Splits and Phases: 15: Eastern Main Drive & Exit 4A Connector

 ø1	 ø2	 ø3	 ø4
12 s	24 s	12 s	42 s
 ø5	 ø6	 ø7	 ø8
14 s	22 s	12 s	42 s

Queues
15: Eastern Main Drive & Exit 4A Connector

2032 Build Mitigated Conditions
Weekday Morning

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	94	1033	154	49	1170	204	132	8	112
v/c Ratio	0.31	0.62	0.18	0.15	0.75	0.37	0.24	0.04	0.31
Control Delay	11.1	18.2	2.3	9.0	22.4	36.2	25.2	36.1	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	18.2	2.3	9.0	22.4	36.2	25.2	36.1	24.8
Queue Length 50th (ft)	19	213	0	10	255	51	48	4	34
Queue Length 95th (ft)	43	303	24	26	360	90	114	18	83
Internal Link Dist (ft)		920			920		920		920
Turn Bay Length (ft)	250		250	200		400		200	
Base Capacity (vph)	300	2061	998	326	2004	550	639	211	497
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	0.31	0.50	0.15	0.15	0.58	0.37	0.21	0.04	0.23
Intersection Summary									

HCM Signalized Intersection Capacity Analysis

15: Eastern Main Drive & Exit 4A Connector

2032 Build Mitigated Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	930	139	44	1038	15	184	112	7	7	57	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.99		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3532		3433	1846		1770	1741	
Flt Permitted	0.12	1.00	1.00	0.16	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	216	3539	1583	289	3532		3433	1846		1770	1741	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	94	1033	154	49	1153	17	204	124	8	8	63	49
RTOR Reduction (vph)	0	0	88	0	1	0	0	2	0	0	33	0
Lane Group Flow (vph)	94	1033	66	49	1169	0	204	130	0	8	79	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	36.8	32.5	32.5	34.4	31.3		9.6	19.8		1.0	11.2	
Effective Green, g (s)	40.8	34.5	34.5	38.4	33.3		11.6	21.8		3.0	13.2	
Actuated g/C Ratio	0.51	0.43	0.43	0.48	0.41		0.14	0.27		0.04	0.16	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	231	1518	679	231	1462		495	500		66	285	
v/s Ratio Prot	c0.03	0.29		0.01	c0.33		c0.06	c0.07		0.00	0.05	
v/s Ratio Perm	0.17		0.04	0.09								
v/c Ratio	0.41	0.68	0.10	0.21	0.80		0.41	0.26		0.12	0.28	
Uniform Delay, d1	13.8	18.5	13.7	12.8	20.6		31.3	23.0		37.4	29.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	1.3	0.1	0.5	3.2		0.6	0.3		0.8	0.5	
Delay (s)	15.0	19.8	13.7	13.2	23.8		31.9	23.3		38.3	30.0	
Level of Service	B	B	B	B	C		C	C		D	C	
Approach Delay (s)		18.7			23.4			28.5			30.5	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			22.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			80.4			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			56.1%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
16: Garden Lane & Market Basket Internal Driveway

2032 Build Mitigated Conditions

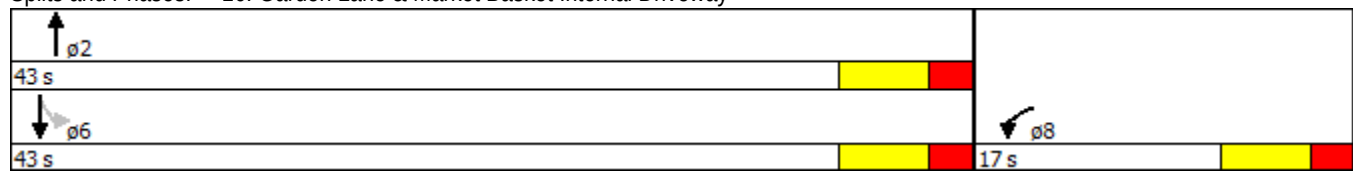
Weekday Morning

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	60	3	708	115	1	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Frt	0.994		0.979			
Flt Protected	0.954					
Satd. Flow (prot)	1768	0	3455	0	0	3539
Flt Permitted	0.954					0.954
Satd. Flow (perm)	1768	0	3455	0	0	3377
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	3		62			
Link Speed (mph)	30		30			30
Link Distance (ft)	900		445			445
Travel Time (s)	20.5		10.1			10.1
Peak Hour Factor	0.68	0.68	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	2%	4%	0%	2%
Shared Lane Traffic (%)						
Turn Type	NA		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Detector Phase	8		2		6	6
Switch Phase						
Minimum Initial (s)	6.0		10.0		10.0	10.0
Minimum Split (s)	12.0		16.0		16.0	16.0
Total Split (s)	17.0		43.0		43.0	43.0
Total Split (%)	28.3%		71.7%		71.7%	71.7%
Maximum Green (s)	11.0		37.0		37.0	37.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0			-2.0
Total Lost Time (s)	4.0		4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 40.8
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 16: Garden Lane & Market Basket Internal Driveway



Queues
16: Garden Lane & Market Basket Internal Driveway

2032 Build Mitigated Conditions
Weekday Morning

			
Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	92	915	457
v/c Ratio	0.21	0.35	0.18
Control Delay	15.0	4.1	3.7
Queue Delay	0.0	0.0	0.0
Total Delay	15.0	4.1	3.7
Queue Length 50th (ft)	21	48	22
Queue Length 95th (ft)	34	89	44
Internal Link Dist (ft)	820	365	365
Turn Bay Length (ft)			
Base Capacity (vph)	581	3150	3074
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.16	0.29	0.15
Intersection Summary			

HCM Signalized Intersection Capacity Analysis

16: Garden Lane & Market Basket Internal Driveway

2032 Build Mitigated Conditions

Weekday Morning

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	60	3	708	115	1	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0			4.0
Lane Util. Factor	1.00		0.95			0.95
Frt	0.99		0.98			1.00
Flt Protected	0.95		1.00			1.00
Satd. Flow (prot)	1769		3455			3539
Flt Permitted	0.95		1.00			0.95
Satd. Flow (perm)	1769		3455			3375
Peak-hour factor, PHF	0.68	0.68	0.90	0.90	0.90	0.90
Adj. Flow (vph)	88	4	787	128	1	456
RTOR Reduction (vph)	3	0	21	0	0	0
Lane Group Flow (vph)	89	0	894	0	0	457
Heavy Vehicles (%)	2%	0%	2%	4%	0%	2%
Turn Type	NA		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	4.7		26.8			26.8
Effective Green, g (s)	6.7		28.8			28.8
Actuated g/C Ratio	0.15		0.66			0.66
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	272		2287			2234
v/s Ratio Prot	c0.05		c0.26			
v/s Ratio Perm						0.14
v/c Ratio	0.33		0.39			0.20
Uniform Delay, d1	16.4		3.4			2.9
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	0.7		0.1			0.0
Delay (s)	17.1		3.5			2.9
Level of Service	B		A			A
Approach Delay (s)	17.1		3.5			2.9
Approach LOS	B		A			A
Intersection Summary						
HCM 2000 Control Delay			4.2		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.38			
Actuated Cycle Length (s)			43.5		Sum of lost time (s)	8.0
Intersection Capacity Utilization			34.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings

2032 Build with Mitigation Conditions

1: Gilcreast Road & Nashua Road (NH Route 102)

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 							
Volume (vph)	326	1620	72	225	1737	159	154	147	192	128	127	328
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	175		0	180		375	250		200	250		300
Storage Lanes	2		0	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3319	3521	0	3467	3539	1583	1668	1773	1507	1787	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3319	3521	0	3467	3539	1583	1668	1773	1507	1787	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				132			79			79
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1500			800			1500			1415	
Travel Time (s)		29.2			15.6			29.2			27.6	
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	1%	2%	2%	2%	1%	1%	1%	2%	2%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	4	3	3	1	4	4	5
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	1	4	4	5
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	14.0		11.0	14.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	18.0	74.0		15.0	71.0	16.0	20.0	20.0	15.0	16.0	16.0	18.0
Total Split (%)	14.4%	59.2%		12.0%	56.8%	12.8%	16.0%	16.0%	12.0%	12.8%	12.8%	14.4%
Maximum Green (s)	12.0	68.0		9.0	65.0	10.0	14.0	14.0	9.0	10.0	10.0	12.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		None	C-Min	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 125

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 1: Gllcreast Road & Nashua Road (NH Route 102)

 φ1	 φ2 (R)	 φ3	 φ4
15 s	74 s	20 s	16 s
 φ5	 φ6 (R)		
18 s	71 s		

Queues

2032 Build with Mitigation Conditions

1: Gilcreast Road & Nashua Road (NH Route 102)

Weekday Evening

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	343	1781	245	1888	173	169	162	211	142	141	364
v/c Ratio	0.91	0.90	0.79	1.00	0.16	0.81	0.73	0.55	0.82	0.78	0.82
Control Delay	84.1	32.1	70.6	24.4	0.3	81.5	72.3	23.9	89.0	83.3	51.2
Queue Delay	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.1	32.1	70.6	30.2	0.3	81.5	72.3	23.9	89.0	83.3	51.2
Queue Length 50th (ft)	143	643	104	352	1	134	128	73	115	113	225
Queue Length 95th (ft)	#233	771	m108	m#568	m1	#251	#225	138	#229	#221	#384
Internal Link Dist (ft)		1420		720			1420			1335	
Turn Bay Length (ft)	175		180		375	250		200	250		300
Base Capacity (vph)	375	1974	309	1896	1051	213	226	385	174	181	443
Starvation Cap Reductn	0	0	0	41	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.90	0.79	1.02	0.16	0.79	0.72	0.55	0.82	0.78	0.82

Intersection Summary

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.

HCM Signalized Intersection Capacity Analysis

1: Gilcreast Road & Nashua Road (NH Route 102)

2032 Build with Mitigation Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	326	1620	72	225	1737	159	154	147	192	128	127	328
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	11	11	11	12	12	12
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3319	3520		3467	3539	1583	1668	1773	1507	1787	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3319	3520		3467	3539	1583	1668	1773	1507	1787	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.91	0.91	0.91	0.90	0.90	0.90
Adj. Flow (vph)	343	1705	76	245	1888	173	169	162	211	142	141	364
RTOR Reduction (vph)	0	3	0	0	0	48	0	0	62	0	0	62
Lane Group Flow (vph)	343	1778	0	245	1888	125	169	162	149	142	141	302
Heavy Vehicles (%)	2%	2%	0%	1%	2%	2%	2%	1%	1%	1%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3	1	4	4	5
Permitted Phases						6			3			4
Actuated Green, G (s)	12.2	67.9		9.2	64.9	75.1	13.7	13.7	22.9	10.2	10.2	22.4
Effective Green, g (s)	14.2	69.9		11.2	66.9	79.1	15.7	15.7	26.9	12.2	12.2	26.4
Actuated g/C Ratio	0.11	0.56		0.09	0.54	0.63	0.13	0.13	0.22	0.10	0.10	0.21
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	377	1968		310	1894	1001	209	222	324	174	181	384
v/s Ratio Prot	0.10	c0.51		0.07	c0.53	0.01	c0.10	0.09	0.04	0.08	0.08	c0.09
v/s Ratio Perm						0.07			0.06			0.10
v/c Ratio	0.91	0.90		0.79	1.00	0.12	0.81	0.73	0.46	0.82	0.78	0.79
Uniform Delay, d1	54.8	24.5		55.7	28.9	9.1	53.2	52.6	42.7	55.3	55.1	46.6
Progression Factor	1.00	1.00		1.15	0.42	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.0	7.3		4.4	11.0	0.0	20.1	11.4	1.0	24.6	18.8	10.1
Delay (s)	79.8	31.9		68.3	23.0	1.0	73.3	64.0	43.8	79.9	73.9	56.8
Level of Service	E	C		E	C	A	E	E	D	E	E	E
Approach Delay (s)		39.6			26.2			59.0			65.6	
Approach LOS		D			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			39.0									D
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			125.0									
Intersection Capacity Utilization			86.9%									E
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

2032 Build with Mitigation Conditions

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 	 				 		
Volume (vph)	486	1313	43	132	1538	995	49	35	77	856	50	521
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	215		0	200		400	0		100	0		0
Storage Lanes	2		0	2		2	0		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.88	1.00	1.00	1.00	0.91	0.91	1.00
Frt		0.995				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.972		0.950	0.960	
Satd. Flow (prot)	3433	3524	0	3502	3539	2787	0	1801	1575	3221	1632	1583
Flt Permitted	0.950			0.950				0.972		0.950	0.960	
Satd. Flow (perm)	3433	3524	0	3502	3539	2787	0	1801	1575	3221	1632	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				248			131			131
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		800			1200			1500			415	
Travel Time (s)		15.6			23.4			34.1			9.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.85	0.85	0.85	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Shared Lane Traffic (%)										31%		
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Detector Phase	5	2		1	6	8	4	4	1	8	8	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	12.0	16.0		12.0	16.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Total Split (s)	21.0	69.0		13.0	61.0	31.0	12.0	12.0	13.0	31.0	31.0	21.0
Total Split (%)	16.8%	55.2%		10.4%	48.8%	24.8%	9.6%	9.6%	10.4%	24.8%	24.8%	16.8%
Maximum Green (s)	15.0	63.0		7.0	55.0	25.0	6.0	6.0	7.0	25.0	25.0	15.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead				Lead			Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	C-Min		None	C-Min	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other
 Cycle Length: 125
 Actuated Cycle Length: 125
 Offset: 110 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated

Splits and Phases: 2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

 ø1		 ø2 (R)		 ø4		 ø8	
13 s		69 s		12 s		31 s	
 ø6 (R)		 ø5					
61 s		21 s					

Queues

2032 Build with Mitigation Conditions

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Weekday Evening

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	512	1427	139	1619	1047	99	91	656	351	579
v/c Ratio	1.10	0.78	0.55	1.00	0.51	0.86	0.28	0.94	1.00	0.90
Control Delay	98.0	12.9	58.5	49.0	6.4	110.8	3.6	71.3	96.4	43.1
Queue Delay	0.0	0.3	0.0	29.6	0.0	0.0	0.0	0.0	0.0	0.4
Total Delay	98.0	13.2	58.5	78.6	6.4	110.8	3.6	71.3	96.4	43.5
Queue Length 50th (ft)	~243	153	55	~683	133	81	0	289	314	281
Queue Length 95th (ft)	m#296	m322	m60	m#797	m144	#170	9	#412	#531	#533
Internal Link Dist (ft)		720		1120		1420			335	
Turn Bay Length (ft)	215		200		400		100			
Base Capacity (vph)	466	1834	252	1613	2035	115	327	695	352	642
Starvation Cap Reductn	0	69	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	122	0	0	0	0	0	4
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.81	0.55	1.09	0.51	0.86	0.28	0.94	1.00	0.91

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2032 Build with Mitigation Conditions

2: Hampton Drive/Garden Lane & Nashua Road (NH Route 102)

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	486	1313	43	132	1538	995	49	35	77	856	50	521
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	0.88		1.00	1.00	0.91	0.91	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3433	3525		3502	3539	2787		1800	1575	3221	1632	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3433	3525		3502	3539	2787		1800	1575	3221	1632	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	512	1382	45	139	1619	1047	58	41	91	951	56	579
RTOR Reduction (vph)	0	2	0	0	0	81	0	0	79	0	0	85
Lane Group Flow (vph)	512	1425	0	139	1619	966	0	99	12	656	351	494
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Actuated Green, G (s)	15.0	63.0		7.0	55.0	80.0		6.0	13.0	25.0	25.0	40.0
Effective Green, g (s)	17.0	65.0		9.0	57.0	84.0		8.0	17.0	27.0	27.0	44.0
Actuated g/C Ratio	0.14	0.52		0.07	0.46	0.67		0.06	0.14	0.22	0.22	0.35
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	466	1833		252	1613	1962		115	214	695	352	557
v/s Ratio Prot	c0.15	0.40		0.04	c0.46	0.11		c0.06	0.00	0.20	c0.22	0.12
v/s Ratio Perm						0.24			0.00			0.19
v/c Ratio	1.10	0.78		0.55	1.00	0.49		0.86	0.06	0.94	1.00	0.89
Uniform Delay, d1	54.0	24.2		56.0	34.0	10.0		57.9	47.0	48.3	49.0	38.2
Progression Factor	0.73	0.46		0.99	1.03	0.97		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	59.8	1.6		1.1	13.9	0.1		45.2	0.2	21.5	46.9	16.1
Delay (s)	99.2	12.8		56.3	48.9	9.9		103.2	47.2	69.8	95.9	54.2
Level of Service	F	B		E	D	A		F	D	E	F	D
Approach Delay (s)		35.6			34.7			76.4			69.9	
Approach LOS		D			C			E			E	

Intersection Summary

HCM 2000 Control Delay	44.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 Build with Mitigation Conditions

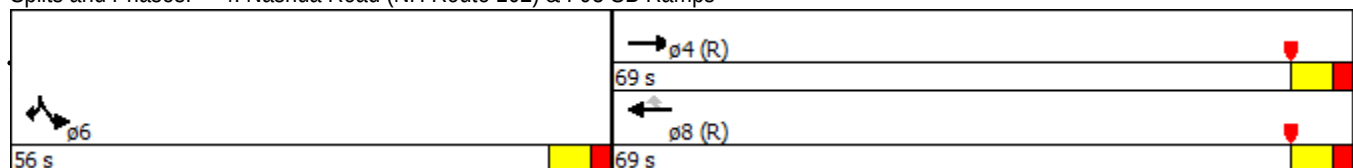
Weekday Evening

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1662	1600	316	434	1065
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			400	0	350
Storage Lanes	0			1	1	2
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	0.88
Frt				0.850		0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3539	3539	1583	1787	2787
Flt Permitted					0.950	
Satd. Flow (perm)	0	3539	3539	1583	1787	2787
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				326		25
Link Speed (mph)		35	35		30	
Link Distance (ft)		1200	1110		1500	
Travel Time (s)		23.4	21.6		34.1	
Peak Hour Factor	0.91	0.91	0.97	0.97	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%
Shared Lane Traffic (%)						
Turn Type		NA	NA	Perm	NA	Prot
Protected Phases		4	8		6	6
Permitted Phases				8		
Detector Phase		4	8	8	6	6
Switch Phase						
Minimum Initial (s)		10.0	10.0	10.0	6.0	6.0
Minimum Split (s)		16.0	16.0	16.0	12.0	12.0
Total Split (s)		69.0	69.0	69.0	56.0	56.0
Total Split (%)		55.2%	55.2%	55.2%	44.8%	44.8%
Maximum Green (s)		63.0	63.0	63.0	50.0	50.0
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Recall Mode		C-Min	C-Min	C-Min	None	None

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 72 (58%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 4: Nashua Road (NH Route 102) & I-93 SB Ramps



Queues

4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 Build with Mitigation Conditions
Weekday Evening

					
Lane Group	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1826	1649	326	482	1183
v/c Ratio	0.99	0.90	0.33	0.65	1.01
Control Delay	35.5	12.8	1.2	34.2	64.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	12.8	1.2	34.2	64.2
Queue Length 50th (ft)	500	340	14	307	~539
Queue Length 95th (ft)	m#894	m404	m13	429	#712
Internal Link Dist (ft)	1120	1030		1420	
Turn Bay Length (ft)			400		350
Base Capacity (vph)	1840	1840	979	743	1173
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	0.99	0.90	0.33	0.65	1.01

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Nashua Road (NH Route 102) & I-93 SB Ramps

2032 Build with Mitigation Conditions

Weekday Evening

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1662	1600	316	434	1065
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95	0.95	1.00	1.00	0.88
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		3539	3539	1583	1787	2787
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		3539	3539	1583	1787	2787
Peak-hour factor, PHF	0.91	0.91	0.97	0.97	0.90	0.90
Adj. Flow (vph)	0	1826	1649	326	482	1183
RTOR Reduction (vph)	0	0	0	156	0	15
Lane Group Flow (vph)	0	1826	1649	170	482	1168
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%
Turn Type		NA	NA	Perm	NA	Prot
Protected Phases		4	8		6	6
Permitted Phases				8		
Actuated Green, G (s)		63.0	63.0	63.0	50.0	50.0
Effective Green, g (s)		65.0	65.0	65.0	52.0	52.0
Actuated g/C Ratio		0.52	0.52	0.52	0.42	0.42
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1840	1840	823	743	1159
v/s Ratio Prot		c0.52	0.47		0.27	c0.42
v/s Ratio Perm				0.11		
v/c Ratio		0.99	0.90	0.21	0.65	1.01
Uniform Delay, d1		29.8	27.0	16.1	29.2	36.5
Progression Factor		0.70	0.34	0.49	1.00	1.00
Incremental Delay, d2		13.6	3.1	0.2	2.0	28.4
Delay (s)		34.6	12.2	8.1	31.2	64.9
Level of Service		C	B	A	C	E
Approach Delay (s)		34.6	11.5		55.2	
Approach LOS		C	B		E	
Intersection Summary						
HCM 2000 Control Delay			32.5		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			1.00			
Actuated Cycle Length (s)			125.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			88.2%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build with Mitigation Conditions

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 				 			
Volume (vph)	785	1311	0	0	1077	417	839	3	666	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	15	12	12	12	12	12	12
Storage Length (ft)	500		0	0		500	500		500	0		0
Storage Lanes	2		0	0		1	1		2	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.88	1.00	1.00	1.00
Flt						0.850			0.850			
Flt Protected	0.950						0.950	0.953				
Satd. Flow (prot)	3433	3539	0	0	3539	1742	1681	1687	2787	0	0	0
Flt Permitted	0.950						0.950	0.953				
Satd. Flow (perm)	3433	3539	0	0	3539	1742	1681	1687	2787	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						458			98			
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1110			1575			1500			1500	
Travel Time (s)		21.6			30.7			34.1			34.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.97	0.97	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	2%	0%	2%	0%	0%	0%
Shared Lane Traffic (%)							50%					
Turn Type	Prot	NA			NA	Perm	Split	NA	Prot			
Protected Phases	7	4			8		2	2	2			
Permitted Phases						8						
Detector Phase	7	4			8	8	2	2	2			
Switch Phase												
Minimum Initial (s)	6.0	10.0			10.0	10.0	10.0	10.0	10.0			
Minimum Split (s)	12.0	16.0			16.0	16.0	16.0	16.0	16.0			
Total Split (s)	36.0	85.0			49.0	49.0	40.0	40.0	40.0			
Total Split (%)	28.8%	68.0%			39.2%	39.2%	32.0%	32.0%	32.0%			
Maximum Green (s)	30.0	79.0			43.0	43.0	34.0	34.0	34.0			
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	-2.0	-2.0			-2.0	-2.0	-2.0	-2.0	-2.0			
Total Lost Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			

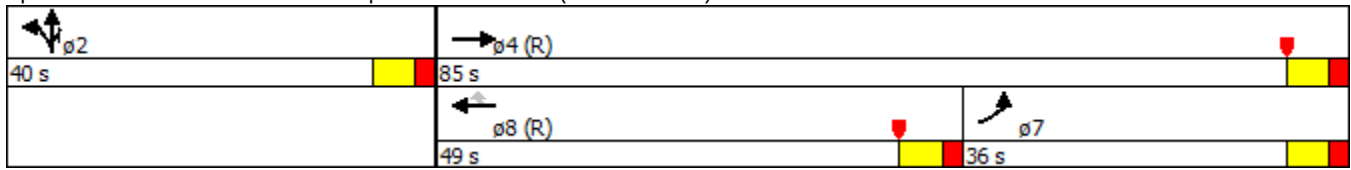
Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 56 (45%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
 5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build with Mitigation Conditions
 Weekday Evening

Splits and Phases: 5: I-93 NB Ramps & Nashua Road (NH Route 102)



Queues
5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build with Mitigation Conditions

Weekday Evening

							
Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	863	1441	1184	458	432	436	687
v/c Ratio	0.98	0.62	0.93	0.50	0.90	0.91	0.80
Control Delay	45.9	6.3	51.3	4.5	66.7	67.7	43.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	6.3	51.3	4.5	66.7	67.7	43.1
Queue Length 50th (ft)	335	136	481	0	352	356	252
Queue Length 95th (ft)	m#375	m145	#621	69	#551	#557	335
Internal Link Dist (ft)		1030	1495			1420	
Turn Bay Length (ft)	500			500	500		500
Base Capacity (vph)	885	2306	1280	922	484	485	872
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	0.62	0.93	0.50	0.89	0.90	0.79

Intersection Summary

- # 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.

HCM Signalized Intersection Capacity Analysis

5: I-93 NB Ramps & Nashua Road (NH Route 102)

2032 Build with Mitigation Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 				 			
Volume (vph)	785	1311	0	0	1077	417	839	3	666	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	15	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.95	0.88			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3433	3539			3539	1742	1681	1686	2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3433	3539			3539	1742	1681	1686	2787			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	863	1441	0	0	1184	458	865	3	687	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	292	0	0	70	0	0	0
Lane Group Flow (vph)	863	1441	0	0	1184	166	432	436	617	0	0	0
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	2%	0%	2%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA	Prot			
Protected Phases	7	4			8		2	2	2			
Permitted Phases						8						
Actuated Green, G (s)	30.3	79.5			43.2	43.2	33.5	33.5	33.5			
Effective Green, g (s)	32.3	81.5			45.2	45.2	35.5	35.5	35.5			
Actuated g/C Ratio	0.26	0.65			0.36	0.36	0.28	0.28	0.28			
Clearance Time (s)	6.0	6.0			6.0	6.0	6.0	6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	887	2307			1279	629	477	478	791			
v/s Ratio Prot	c0.25	0.41			c0.33		0.26	c0.26	0.22			
v/s Ratio Perm						0.10						
v/c Ratio	0.97	0.62			0.93	0.26	0.91	0.91	0.78			
Uniform Delay, d1	45.9	12.8			38.3	28.2	43.1	43.2	41.2			
Progression Factor	0.67	0.44			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	12.8	0.5			12.7	1.0	20.5	21.6	4.9			
Delay (s)	43.7	6.1			51.0	29.2	63.7	64.9	46.1			
Level of Service	D	A			D	C	E	E	D			
Approach Delay (s)		20.2			44.9			56.2			0.0	
Approach LOS		C			D			E			A	
Intersection Summary												
HCM 2000 Control Delay			37.8									D
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			125.0									12.0
Intersection Capacity Utilization			85.5%									E
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

2032 Build with Mitigation Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)/West Broadway (NH Route 102)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	327	1474	56	6	1142	129	0	1	2	159	2	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	11	12	12	12	12	12	11
Storage Length (ft)	100		0	0		200	0		0	0		50
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.985			0.899				0.850
Flt Protected	0.950			0.950							0.953	
Satd. Flow (prot)	1711	3524	0	1745	3370	0	0	1708	0	0	1776	1531
Flt Permitted	0.950			0.950							0.726	
Satd. Flow (perm)	1711	3524	0	1745	3370	0	0	1708	0	0	1353	1531
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			16			3				33
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1575			2000			500			3130	
Travel Time (s)		30.7			39.0			11.4			71.1	
Peak Hour Factor	0.96	0.96	0.96	0.95	0.95	0.95	0.75	0.75	0.75	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	7	4		3	8			2		6	6	7
Permitted Phases							2			6		6
Detector Phase	7	4		3	8		2	2		6	6	7
Switch Phase												
Minimum Initial (s)	6.0	10.0		4.0	10.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	12.0	16.0		10.0	16.0		12.0	12.0		12.0	12.0	12.0
Total Split (s)	29.0	67.0		12.0	50.0		21.0	21.0		21.0	21.0	29.0
Total Split (%)	29.0%	67.0%		12.0%	50.0%		21.0%	21.0%		21.0%	21.0%	29.0%
Maximum Green (s)	23.0	61.0		6.0	44.0		15.0	15.0		15.0	15.0	23.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag							Lead
Lead-Lag Optimize?		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	Min		None	Min		None	None		None	None	None

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 94.6

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Splits and Phases: 6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)/West Broadway (NH Route 102)

		
21 s	12 s	67 s
		
21 s	29 s	50 s

Queues

2032 Build with Mitigation Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)/West Broadway (NH Route 102)

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	341	1593	6	1338	4	179	332
v/c Ratio	0.81	0.63	0.04	0.87	0.01	0.77	0.46
Control Delay	51.4	8.9	43.3	30.5	25.3	62.4	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	8.9	43.3	30.5	25.3	62.4	18.6
Queue Length 50th (ft)	204	201	4	384	1	110	126
Queue Length 95th (ft)	#343	410	16	485	8	#220	203
Internal Link Dist (ft)		1495		1920	420	3050	
Turn Bay Length (ft)	100						50
Base Capacity (vph)	457	2616	149	1666	312	246	754
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	0.61	0.04	0.80	0.01	0.73	0.44

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

2032 Build with Mitigation Conditions

6: St. Charles Street/Londonderry Road & Nashua Road (NH Route 102)/West Broadway (NH Route 102)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	 
Volume (vph)	327	1474	56	6	1142	129	0	1	2	159	2	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	11	11	12	12	12	12	12	11
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.98			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.95	1.00
Satd. Flow (prot)	1711	3522		1745	3369			1708			1775	1531
Flt Permitted	0.95	1.00		0.95	1.00			1.00			0.73	1.00
Satd. Flow (perm)	1711	3522		1745	3369			1708			1353	1531
Peak-hour factor, PHF	0.96	0.96	0.96	0.95	0.95	0.95	0.75	0.75	0.75	0.90	0.90	0.90
Adj. Flow (vph)	341	1535	58	6	1202	136	0	1	3	177	2	332
RTOR Reduction (vph)	0	2	0	0	8	0	0	3	0	0	0	20
Lane Group Flow (vph)	341	1591	0	6	1330	0	0	1	0	0	179	312
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	7	4		3	8			2			6	7
Permitted Phases							2			6		6
Actuated Green, G (s)	21.2	66.0		1.1	45.9			14.2			14.2	35.4
Effective Green, g (s)	23.2	68.0		3.1	47.9			16.2			16.2	39.4
Actuated g/C Ratio	0.23	0.68		0.03	0.48			0.16			0.16	0.40
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	399	2411		54	1625			278			220	669
v/s Ratio Prot	c0.20	0.45		0.00	c0.39			0.00				0.11
v/s Ratio Perm											c0.13	0.09
v/c Ratio	0.85	0.66		0.11	0.82			0.01			0.81	0.47
Uniform Delay, d1	36.4	9.0		46.8	22.0			34.8			40.1	22.2
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	16.2	0.7		0.9	3.3			0.0			20.1	0.5
Delay (s)	52.6	9.7		47.7	25.3			34.8			60.2	22.7
Level of Service	D	A		D	C			C			E	C
Approach Delay (s)		17.2			25.4			34.8			35.8	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			22.7			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			99.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			79.4%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 Build with Mitigation Conditions

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	129	47	60	225	368	72	585	70	344	543	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	11	11	11	12	11	11	12	12	12
Storage Length (ft)	200		0	200		250	360		0	360		200
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960				0.850		0.984				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1865	1885	0	1745	1801	1531	1805	1776	0	1770	1863	1615
Flt Permitted	0.247			0.393			0.950			0.950		
Satd. Flow (perm)	485	1885	0	722	1801	1531	1805	1776	0	1770	1863	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12				409		5				191
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1900			5550			2000			2000	
Travel Time (s)		37.0			108.1			39.0			39.0	
Peak Hour Factor	0.85	0.85	0.85	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	0%	2%	2%	0%	2%	0%	2%	2%	0%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8						6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	11.0	16.0		11.0	16.0	16.0
Total Split (s)	11.0	18.0		11.0	18.0	18.0	12.0	43.0		24.0	55.0	55.0
Total Split (%)	9.2%	15.0%		9.2%	15.0%	15.0%	10.0%	35.8%		20.0%	45.8%	45.8%
Maximum Green (s)	5.0	12.0		5.0	12.0	12.0	6.0	37.0		18.0	49.0	49.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	4.0	4.0		4.0	4.0	4.0
Recall Mode	None	None		None	None	None	None	Min		None	Min	Min
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 96
Natural Cycle: 150
Control Type: Actuated-Uncoordinated

Splits and Phases: 7: Mammoth Road (NH Route 128) & Pillsbury Road

 ø1		 ø2		 ø3	 ø4	 ø9
24 s		43 s		11 s	18 s	24 s
 ø5	 ø6			 ø7	 ø8	
12 s	55 s			11 s	18 s	

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

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 (%)

Shared Lane Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 12.0

Minimum Split (s) 24.0

Total Split (s) 24.0

Total Split (%) 20%

Maximum Green (s) 18.0

Yellow Time (s) 4.0

All-Red Time (s) 2.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?

Vehicle Extension (s) 3.0

Recall Mode None

Walk Time (s) 12.0

Flash Dont Walk (s) 6.0

Pedestrian Calls (#/hr) 0

Intersection Summary

Queues

2032 Build with Mitigation Conditions

7: Mammoth Road (NH Route 128) & Pillsbury Road

Weekday Evening

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	134	207	67	250	409	80	728	382	603	181
v/c Ratio	0.64	0.63	0.29	0.95	0.72	0.53	1.01	1.04	0.58	0.18
Control Delay	44.1	46.1	31.0	87.6	11.8	55.8	64.6	96.0	17.7	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	46.1	31.0	87.6	11.8	55.8	64.6	96.0	17.7	2.0
Queue Length 50th (ft)	65	115	31	153	0	48	~438	~253	242	0
Queue Length 95th (ft)	#113	#194	66	#303	91	#97	#690	#430	352	27
Internal Link Dist (ft)		1820		5470			1920		1920	
Turn Bay Length (ft)	200		200		250	360		360		200
Base Capacity (vph)	210	328	232	262	572	150	724	368	1036	983
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.63	0.29	0.95	0.72	0.53	1.01	1.04	0.58	0.18

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

7: Mammoth Road (NH Route 128) & Pillsbury Road

2032 Build with Mitigation Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	129	47	60	225	368	72	585	70	344	543	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	11	11	11	12	11	11	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1865	1885		1745	1801	1531	1805	1775		1770	1863	1615
Flt Permitted	0.25	1.00		0.39	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	485	1885		723	1801	1531	1805	1775		1770	1863	1615
Peak-hour factor, PHF	0.85	0.85	0.85	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	134	152	55	67	250	409	80	650	78	382	603	181
RTOR Reduction (vph)	0	10	0	0	0	346	0	3	0	0	0	83
Lane Group Flow (vph)	134	197	0	67	250	63	80	725	0	382	603	98
Heavy Vehicles (%)	0%	0%	0%	0%	2%	2%	0%	2%	0%	2%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)	19.2	14.2		17.2	13.2	13.2	4.8	38.2		18.0	51.4	51.4
Effective Green, g (s)	23.2	16.2		21.2	15.2	15.2	6.8	40.2		20.0	53.4	53.4
Actuated g/C Ratio	0.24	0.16		0.22	0.15	0.15	0.07	0.41		0.20	0.54	0.54
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	5.0		3.0	5.0	5.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	212	310		218	278	236	124	725		359	1011	876
v/s Ratio Prot	c0.04	0.10		0.02	c0.14		0.04	c0.41		c0.22	0.32	
v/s Ratio Perm	0.10			0.05		0.04						0.06
v/c Ratio	0.63	0.64		0.31	0.90	0.27	0.65	1.00		1.06	0.60	0.11
Uniform Delay, d1	31.6	38.3		31.7	40.8	36.7	44.6	29.1		39.2	15.2	11.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.0	5.8		0.8	30.6	1.3	12.2	33.4		65.5	1.1	0.1
Delay (s)	37.6	44.2		32.5	71.5	38.0	56.8	62.5		104.7	16.3	11.0
Level of Service	D	D		C	E	D	E	E		F	B	B
Approach Delay (s)		41.6			49.0			62.0			44.5	
Approach LOS		D			D			E			D	
Intersection Summary												
HCM 2000 Control Delay			49.9									D
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			98.4									
Intersection Capacity Utilization			85.6%									
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

8: Pillsbury Road & Hardy Road

2032 Build with Mitigation Conditions
Weekday Evening

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	53	470	618	286	181	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			200	0	0
Storage Lanes	0			1	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.972	
Flt Protected		0.995			0.962	
Satd. Flow (prot)	0	1857	1863	1583	1749	0
Flt Permitted		0.887			0.962	
Satd. Flow (perm)	0	1656	1863	1583	1749	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				314	13	
Link Speed (mph)		35	30		35	
Link Distance (ft)		5550	525		8200	
Travel Time (s)		108.1	11.9		159.7	
Peak Hour Factor	0.90	0.90	0.91	0.91	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	2%	2%	0%
Shared Lane Traffic (%)						
Turn Type	Perm	NA	NA	Perm	NA	
Protected Phases		2	6		4	
Permitted Phases	2			6		
Detector Phase	2	2	6	6	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	6.0	
Minimum Split (s)	16.0	16.0	16.0	16.0	12.0	
Total Split (s)	69.0	69.0	69.0	69.0	31.0	
Total Split (%)	69.0%	69.0%	69.0%	69.0%	31.0%	
Maximum Green (s)	63.0	63.0	63.0	63.0	25.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 9 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
 Natural Cycle: 40
 Control Type: Actuated-Coordinated

Splits and Phases: 8: Pillsbury Road & Hardy Road

 ø2 (R)	 ø4
69 s	31 s
 ø6 (R)	
69 s	

Queues
8: Pillsbury Road & Hardy Road

2032 Build with Mitigation Conditions
Weekday Evening

	→	←	↖	↗
Lane Group	EBT	WBT	WBR	SBL
Lane Group Flow (vph)	581	679	314	253
v/c Ratio	0.49	0.51	0.26	0.67
Control Delay	9.1	4.7	0.6	42.9
Queue Delay	0.0	0.5	0.0	0.0
Total Delay	9.1	5.1	0.6	42.9
Queue Length 50th (ft)	143	84	0	142
Queue Length 95th (ft)	274	251	m14	207
Internal Link Dist (ft)	5470	445		8120
Turn Bay Length (ft)			200	
Base Capacity (vph)	1178	1325	1217	483
Starvation Cap Reductn	0	259	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.64	0.26	0.52

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

8: Pillsbury Road & Hardy Road

2032 Build with Mitigation Conditions

Weekday Evening

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	53	470	618	286	181	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85	0.97	
Flt Protected		0.99	1.00	1.00	0.96	
Satd. Flow (prot)		1857	1863	1583	1749	
Flt Permitted		0.89	1.00	1.00	0.96	
Satd. Flow (perm)		1655	1863	1583	1749	
Peak-hour factor, PHF	0.90	0.90	0.91	0.91	0.90	0.90
Adj. Flow (vph)	59	522	679	314	201	52
RTOR Reduction (vph)	0	0	0	91	10	0
Lane Group Flow (vph)	0	581	679	223	243	0
Heavy Vehicles (%)	0%	2%	2%	2%	2%	0%
Turn Type	Perm	NA	NA	Perm	NA	
Protected Phases		2	6		4	
Permitted Phases	2			6		
Actuated Green, G (s)		69.1	69.1	69.1	18.9	
Effective Green, g (s)		71.1	71.1	71.1	20.9	
Actuated g/C Ratio		0.71	0.71	0.71	0.21	
Clearance Time (s)		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1176	1324	1125	365	
v/s Ratio Prot			c0.36		c0.14	
v/s Ratio Perm		0.35		0.14		
v/c Ratio		0.49	0.51	0.20	0.66	
Uniform Delay, d1		6.4	6.6	4.9	36.3	
Progression Factor		1.00	0.46	0.24	1.00	
Incremental Delay, d2		1.5	1.1	0.3	4.5	
Delay (s)		7.9	4.1	1.5	40.9	
Level of Service		A	A	A	D	
Approach Delay (s)		7.9	3.3		40.9	
Approach LOS		A	A		D	
Intersection Summary						
HCM 2000 Control Delay			10.0		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.55			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			83.1%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
9: Gilcreast Road & Pillsbury Road

2032 Build with Mitigation Conditions

Weekday Evening

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	369	282	375	495	409	399
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		200	300		0	300
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.277		0.950	
Satd. Flow (perm)	1863	1583	516	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		313				170
Link Speed (mph)	30			30	30	
Link Distance (ft)	525			681	595	
Travel Time (s)	11.9			15.5	13.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Turn Type	NA	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	4		3	8	2	3
Permitted Phases		4	8			2
Detector Phase	4	4	3	8	2	3
Switch Phase						
Minimum Initial (s)	10.0	10.0	6.0	10.0	6.0	6.0
Minimum Split (s)	16.0	16.0	12.0	16.0	12.0	12.0
Total Split (s)	33.0	33.0	30.0	63.0	37.0	30.0
Total Split (%)	33.0%	33.0%	30.0%	63.0%	37.0%	30.0%
Maximum Green (s)	27.0	27.0	24.0	57.0	31.0	24.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Min	C-Min	None	C-Min	Min	None

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Yellow, Master Intersection

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 9: Gilcreast Road & Pillsbury Road

		
37 s	30 s	33 s
		
	63 s	

Queues
9: Gilcreast Road & Pillsbury Road

2032 Build with Mitigation Conditions
Weekday Evening

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	410	313	417	550	454	443
v/c Ratio	0.61	0.41	0.71	0.48	0.84	0.46
Control Delay	33.8	8.0	19.7	14.8	47.4	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	8.0	19.7	14.8	47.4	8.3
Queue Length 50th (ft)	207	29	168	235	259	78
Queue Length 95th (ft)	#377	102	252	349	#408	131
Internal Link Dist (ft)	445			601	515	
Turn Bay Length (ft)		200	300			300
Base Capacity (vph)	674	772	643	1146	584	1024
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	0.61	0.41	0.65	0.48	0.78	0.43

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

9: Gilcreast Road & Pillsbury Road

2032 Build with Mitigation Conditions

Weekday Evening

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	369	282	375	495	409	399
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.28	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	517	1863	1770	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	410	313	417	550	454	443
RTOR Reduction (vph)	0	200	0	0	0	82
Lane Group Flow (vph)	410	113	417	550	454	361
Turn Type	NA	Perm	pm+pt	NA	NA	pm+ov
Protected Phases	4		3	8	2	3
Permitted Phases		4	8			2
Actuated Green, G (s)	34.2	34.2	59.5	59.5	28.5	47.8
Effective Green, g (s)	36.2	36.2	61.5	61.5	30.5	51.8
Actuated g/C Ratio	0.36	0.36	0.62	0.62	0.30	0.52
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	674	573	584	1145	539	883
v/s Ratio Prot	0.22		c0.15	0.30	c0.26	0.09
v/s Ratio Perm		0.07	c0.29			0.14
v/c Ratio	0.61	0.20	0.71	0.48	0.84	0.41
Uniform Delay, d1	26.1	21.9	12.8	10.5	32.5	14.7
Progression Factor	1.03	1.94	1.23	1.20	1.00	1.00
Incremental Delay, d2	3.6	0.7	3.4	1.2	11.4	0.3
Delay (s)	30.5	43.2	19.1	13.8	43.9	15.0
Level of Service	C	D	B	B	D	B
Approach Delay (s)	36.0			16.1	29.7	
Approach LOS	D			B	C	
Intersection Summary						
HCM 2000 Control Delay			26.4		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.78			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			72.9%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
11: Orchard Drive & Pillsbury Road

2032 Build with Mitigation Conditions

Weekday Evening

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑	↖	↗
Volume (vph)	613	178	150	735	222	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		200	300		0	300
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.231		0.950	
Satd. Flow (perm)	1863	1583	430	1863	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		198				247
Link Speed (mph)	30			30	30	
Link Distance (ft)	250			1000	1500	
Travel Time (s)	5.7			22.7	34.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Turn Type	NA	pm+ov	pm+pt	NA	NA	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Detector Phase	4	2	3	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	6.0	4.0	10.0	6.0	6.0
Minimum Split (s)	22.0	12.0	10.0	22.0	12.0	12.0
Total Split (s)	57.0	27.0	16.0	73.0	27.0	27.0
Total Split (%)	57.0%	27.0%	16.0%	73.0%	27.0%	27.0%
Maximum Green (s)	51.0	21.0	10.0	67.0	21.0	21.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Min	None	None	C-Min	None	None

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 54 (54%), Referenced to phase 4:EBT and 8:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated

Splits and Phases: 11: Orchard Drive & Pillsbury Road

↖ ø2	↙ ø3	→ ø4 (R)	
27 s	16 s	57 s	
	↖ ø8 (R)		
	73 s		

Queues
11: Orchard Drive & Pillsbury Road

2032 Build with Mitigation Conditions
Weekday Evening

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	681	198	167	817	247	247
v/c Ratio	0.64	0.15	0.37	0.61	0.68	0.47
Control Delay	14.1	0.2	7.5	10.4	46.1	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	0.2	7.5	10.4	46.1	7.4
Queue Length 50th (ft)	192	0	31	242	144	0
Queue Length 95th (ft)	263	0	54	366	224	61
Internal Link Dist (ft)	170			920	1420	
Turn Bay Length (ft)		200	300			300
Base Capacity (vph)	1069	1367	467	1339	415	560
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	0.64	0.14	0.36	0.61	0.60	0.44
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

11: Orchard Drive & Pillsbury Road

2032 Build with Mitigation Conditions

Weekday Evening

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	613	178	150	735	222	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.23	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	431	1863	1770	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	681	198	167	817	247	247
RTOR Reduction (vph)	0	45	0	0	0	196
Lane Group Flow (vph)	681	153	167	817	247	51
Turn Type	NA	pm+ov	pm+pt	NA	NA	Perm
Protected Phases	4	2	3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	54.9	73.5	69.4	69.4	18.6	18.6
Effective Green, g (s)	56.9	77.5	71.4	71.4	20.6	20.6
Actuated g/C Ratio	0.57	0.78	0.71	0.71	0.21	0.21
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1060	1290	448	1330	364	326
v/s Ratio Prot	c0.37	0.02	0.04	c0.44	c0.14	
v/s Ratio Perm		0.07	0.23			0.03
v/c Ratio	0.64	0.12	0.37	0.61	0.68	0.16
Uniform Delay, d1	14.6	2.8	8.9	7.3	36.6	32.6
Progression Factor	0.70	0.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	0.0	0.5	2.1	5.0	0.2
Delay (s)	12.9	0.0	9.5	9.4	41.6	32.8
Level of Service	B	A	A	A	D	C
Approach Delay (s)	10.0			9.4	37.2	
Approach LOS	A			A	D	
Intersection Summary						
HCM 2000 Control Delay			15.5		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.66			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			62.9%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings

2032 Build with Mitigation Conditions

12: Londonderry Road/Eastern Main Drive & Pillsbury Road/Ash Street

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	573	369	94	75	354	13	122	144	153	25	227	432
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	11	11	11	12	13	12	13	12	12	12
Storage Length (ft)	250		0	200		0	250		0	100		200
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.970			0.995			0.923				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1754	0	1711	1792	0	1829	1719	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.388			0.243		
Satd. Flow (perm)	1770	1754	0	1711	1792	0	747	1719	0	453	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			2			57				118
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			3600			3130			1000	
Travel Time (s)		22.7			81.8			71.1			22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pt+ov
Protected Phases	7	4		3	8			2			6	6 7
Permitted Phases							2			6		
Detector Phase	7	4		3	8		2	2		6	6	6 7
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	16.0		11.0	16.0		16.0	16.0		16.0	16.0	
Total Split (s)	38.0	49.0		14.0	25.0		27.0	27.0		27.0	27.0	
Total Split (%)	42.2%	54.4%		15.6%	27.8%		30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	32.0	43.0		8.0	19.0		21.0	21.0		21.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 86.5

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Londonderry Road/Eastern Main Drive & Pillsbury Road/Ash Street

 $\phi 2$	 $\phi 3$	 $\phi 4$
27 s	14 s	49 s
 $\phi 6$	 $\phi 7$	 $\phi 8$
27 s	38 s	25 s

Queues

2032 Build with Mitigation Conditions

12: Londonderry Road/Eastern Main Drive & Pillsbury Road/Ash Street

Weekday Evening

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	637	514	83	407	136	330	28	252	480
v/c Ratio	0.93	0.53	0.44	0.93	0.80	0.76	0.27	0.59	0.44
Control Delay	48.5	16.1	45.0	63.4	64.5	37.3	34.7	35.8	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	16.1	45.0	63.4	64.5	37.3	34.7	35.8	6.3
Queue Length 50th (ft)	343	186	45	228	71	140	13	124	76
Queue Length 95th (ft)	#569	287	91	#415	#162	235	38	199	131
Internal Link Dist (ft)		920		3520		3050		920	
Turn Bay Length (ft)	250		200		250		100		200
Base Capacity (vph)	698	976	198	438	199	500	120	497	1087
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	0.91	0.53	0.42	0.93	0.68	0.66	0.23	0.51	0.44

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

2032 Build with Mitigation Conditions

12: Londonderry Road/Eastern Main Drive & Pillsbury Road/Ash Street

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	573	369	94	75	354	13	122	144	153	25	227	432
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	11	11	12	13	12	13	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1753		1711	1791		1829	1719		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.39	1.00		0.24	1.00	1.00
Satd. Flow (perm)	1770	1753		1711	1791		747	1719		452	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	637	410	104	83	393	14	136	160	170	28	252	480
RTOR Reduction (vph)	0	9	0	0	1	0	0	44	0	0	0	41
Lane Group Flow (vph)	637	505	0	83	406	0	136	286	0	28	252	439
Heavy Vehicles (%)	2%	2%	0%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pt+ov
Protected Phases	7	4		3	8			2			6	6 7
Permitted Phases							2			6		
Actuated Green, G (s)	31.5	45.7		6.2	20.4		17.8	17.8		17.8	17.8	55.3
Effective Green, g (s)	33.5	47.7		8.2	22.4		19.8	19.8		19.8	19.8	57.3
Actuated g/C Ratio	0.38	0.54		0.09	0.26		0.23	0.23		0.23	0.23	0.65
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	676	953		159	457		168	388		102	420	1034
v/s Ratio Prot	c0.36	0.29		0.05	c0.23			0.17			0.14	0.28
v/s Ratio Perm							c0.18			0.06		
v/c Ratio	0.94	0.53		0.52	0.89		0.81	0.74		0.27	0.60	0.42
Uniform Delay, d1	26.2	12.8		37.9	31.4		32.2	31.5		28.0	30.4	7.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.5	0.5		3.1	18.4		24.2	7.1		1.5	2.3	0.3
Delay (s)	47.7	13.3		41.0	49.8		56.3	38.7		29.5	32.7	7.6
Level of Service	D	B		D	D		E	D		C	C	A
Approach Delay (s)		32.3			48.3			43.8			16.7	
Approach LOS		C			D			D			B	
Intersection Summary												
HCM 2000 Control Delay			32.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			87.7			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			89.8%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
15: Eastern Main Drive & Exit 4A Connector

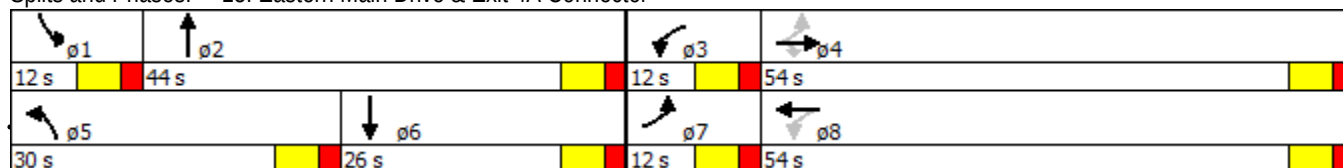
2032 Build with Mitigation Conditions
Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	1178	129	39	456	11	549	133	37	27	173	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	200		0	400		0	200		0
Storage Lanes	1		1	1		0	2		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.997			0.967			0.954	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3529	0	3433	1801	0	1770	1777	0
Flt Permitted	0.357			0.088			0.950			0.950		
Satd. Flow (perm)	665	3539	1583	164	3529	0	3433	1801	0	1770	1777	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			188		2			12			16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			1000			1000			1000	
Travel Time (s)		22.7			22.7			22.7			22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8								
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		6.0	10.0		6.0	10.0	
Minimum Split (s)	12.0	22.0	22.0	12.0	22.0		12.0	22.0		12.0	22.0	
Total Split (s)	12.0	54.0	54.0	12.0	54.0		30.0	44.0		12.0	26.0	
Total Split (%)	9.8%	44.3%	44.3%	9.8%	44.3%		24.6%	36.1%		9.8%	21.3%	
Maximum Green (s)	6.0	48.0	48.0	6.0	48.0		24.0	38.0		6.0	20.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min	Min	None	Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 122
Actuated Cycle Length: 114.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 15: Eastern Main Drive & Exit 4A Connector



Queues
15: Eastern Main Drive & Exit 4A Connector

2032 Build with Mitigation Conditions

Weekday Evening

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	118	1309	143	43	519	610	189	30	278
v/c Ratio	0.30	0.89	0.19	0.23	0.38	0.82	0.28	0.24	0.82
Control Delay	18.1	41.2	1.7	18.2	25.8	54.1	27.8	59.2	64.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	41.2	1.7	18.2	25.8	54.1	27.8	59.2	64.5
Queue Length 50th (ft)	47	501	0	17	146	239	104	23	202
Queue Length 95th (ft)	82	#619	17	36	192	#323	168	56	#346
Internal Link Dist (ft)		920			920		920		920
Turn Bay Length (ft)	250		250	200		400		200	
Base Capacity (vph)	389	1580	810	189	1576	796	686	126	361
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	0.30	0.83	0.18	0.23	0.33	0.77	0.28	0.24	0.77

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

15: Eastern Main Drive & Exit 4A Connector

2032 Build with Mitigation Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 		 					
Volume (vph)	106	1178	129	39	456	11	549	133	37	27	173	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3527		3433	1802		1770	1776	
Flt Permitted	0.36	1.00	1.00	0.09	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	665	3539	1583	163	3527		3433	1802		1770	1776	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	118	1309	143	43	507	12	610	148	41	30	192	86
RTOR Reduction (vph)	0	0	86	0	1	0	0	8	0	0	13	0
Lane Group Flow (vph)	118	1309	57	43	518	0	610	181	0	30	265	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	51.4	45.3	45.3	48.2	43.7		22.8	41.1		3.4	21.7	
Effective Green, g (s)	55.4	47.3	47.3	52.2	45.7		24.8	43.1		5.4	23.7	
Actuated g/C Ratio	0.47	0.40	0.40	0.44	0.39		0.21	0.36		0.05	0.20	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	387	1415	632	160	1362		719	656		80	355	
v/s Ratio Prot	c0.02	c0.37		0.01	0.15		c0.18	0.10		0.02	c0.15	
v/s Ratio Perm	0.12		0.04	0.10								
v/c Ratio	0.30	0.93	0.09	0.27	0.38		0.85	0.28		0.38	0.75	
Uniform Delay, d1	18.5	33.8	22.1	25.4	26.1		44.9	26.6		54.8	44.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	10.5	0.1	0.9	0.2		9.2	0.2		2.9	8.3	
Delay (s)	18.9	44.3	22.2	26.3	26.3		54.1	26.8		57.8	52.8	
Level of Service	B	D	C	C	C		D	C		E	D	
Approach Delay (s)		40.3			26.3			47.7			53.3	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			40.9			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			118.3			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			80.4%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
16: Garden Lane & Market Basket Internal Driveway

2032 Build with Mitigation Conditions

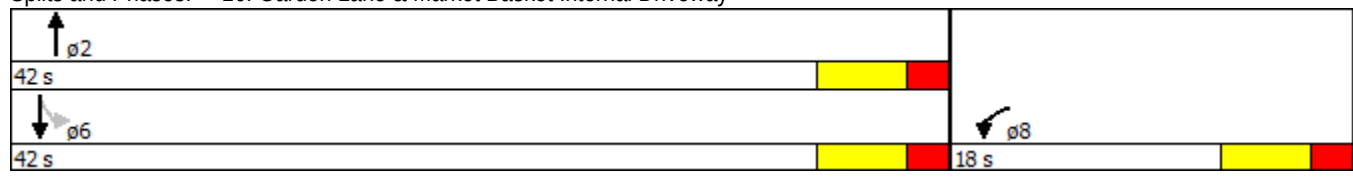
Weekday Evening

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	212	0	1375	122	4	1248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Frt			0.988			
Flt Protected	0.950					
Satd. Flow (prot)	1805	0	3502	0	0	3539
Flt Permitted	0.950					0.950
Satd. Flow (perm)	1805	0	3502	0	0	3362
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)			30			
Link Speed (mph)	30		30			30
Link Distance (ft)	900		445			555
Travel Time (s)	20.5		10.1			12.6
Peak Hour Factor	0.80	0.80	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Shared Lane Traffic (%)						
Turn Type	NA		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Detector Phase	8		2		6	6
Switch Phase						
Minimum Initial (s)	6.0		10.0		10.0	10.0
Minimum Split (s)	12.0		16.0		16.0	16.0
Total Split (s)	18.0		42.0		42.0	42.0
Total Split (%)	30.0%		70.0%		70.0%	70.0%
Maximum Green (s)	12.0		36.0		36.0	36.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0			-2.0
Total Lost Time (s)	4.0		4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 56.6
Natural Cycle: 55
Control Type: Actuated-Uncoordinated

Splits and Phases: 16: Garden Lane & Market Basket Internal Driveway



Queues
16: Garden Lane & Market Basket Internal Driveway

2032 Build with Mitigation Conditions
Weekday Evening

			
Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	265	1664	1391
v/c Ratio	0.64	0.75	0.66
Control Delay	28.3	10.2	8.7
Queue Delay	0.0	0.0	0.0
Total Delay	28.3	10.2	8.7
Queue Length 50th (ft)	86	181	138
Queue Length 95th (ft)	133	257	196
Internal Link Dist (ft)	820	365	475
Turn Bay Length (ft)			
Base Capacity (vph)	449	2373	2269
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.59	0.70	0.61
Intersection Summary			

HCM Signalized Intersection Capacity Analysis

16: Garden Lane & Market Basket Internal Driveway

2032 Build with Mitigation Conditions

Weekday Evening

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	212	0	1375	122	4	1248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0			4.0
Lane Util. Factor	1.00		0.95			0.95
Frt	1.00		0.99			1.00
Flt Protected	0.95		1.00			1.00
Satd. Flow (prot)	1805		3501			3539
Flt Permitted	0.95		1.00			0.95
Satd. Flow (perm)	1805		3501			3361
Peak-hour factor, PHF	0.80	0.80	0.90	0.90	0.90	0.90
Adj. Flow (vph)	265	0	1528	136	4	1387
RTOR Reduction (vph)	0	0	11	0	0	0
Lane Group Flow (vph)	265	0	1653	0	0	1391
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Turn Type	NA		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	11.0		33.5			33.5
Effective Green, g (s)	13.0		35.5			35.5
Actuated g/C Ratio	0.23		0.63			0.63
Clearance Time (s)	6.0		6.0			6.0
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	415		2199			2111
v/s Ratio Prot	c0.15		c0.47			
v/s Ratio Perm						0.41
v/c Ratio	0.64		0.75			0.66
Uniform Delay, d1	19.6		7.4			6.7
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	3.2		1.5			0.8
Delay (s)	22.8		8.9			7.4
Level of Service	C		A			A
Approach Delay (s)	22.8		8.9			7.4
Approach LOS	C		A			A
Intersection Summary						
HCM 2000 Control Delay			9.4		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.72			
Actuated Cycle Length (s)			56.5		Sum of lost time (s)	8.0
Intersection Capacity Utilization			60.3%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						



MEMORANDUM

TO: Ms. Cynthia May, ASLA
Planning & Economic Development
Department
Town of Londonderry
268B Mammoth Road
Londonderry, NH 03053

DATE: March 27, 2013
(Revised
April 10, 2012)

FROM: Rebecca L. Brown, PE, Senior Engineer
Kevin R. Dandrade, PE, PTOE, Principal

PROJECT NO.: T0378

RE: Woodmont Commons PUD – Londonderry, New Hampshire
Exit 4A Sensitivity Analysis

THIS DOCUMENT IS INTENDED FOR STAFF AND PEER REVIEW TO SERVE AS SUPPLEMENTAL TRAFFIC ANALYSIS TO SUPPORT THE P.U.D. APPLICATION. THIS DOCUMENT SHOULD BE USED FOR THE ON-GOING DISCUSSIONS WITH STAFF AND HSH REGARDING THE ANALYSIS METHODOLOGY FOR CONDITIONS WITHOUT EXIT 4A IN ADVANCE OF THE NEXT PLANNING BOARD MEETING.

INTRODUCTION

The traffic projections previously prepared as part of the Master Plan Traffic Impact Assessment (TIA) for the permitting of the Woodmont Commons Planned Unit Development (PUD) assumed that the proposed Exit 4A from I-93 would be constructed within the 20-year horizon. Although there is significant local and regional support for Exit 4A, the federal funding for the improvements has not been secured. Without construction of Exit 4A, the development potential within the East zone (east of I-93) of the Woodmont Commons PUD would be significantly reduced. The intent of this sensitivity analysis is to assess the development potential of the PUD area east of I-93 (WC-12) without construction of Exit 4A, determine the impact to development on the west side of I-93 without Exit 4A in place, and identify trip generation caps for each of the three PUD areas with and without construction of Exit 4A improvements. This memorandum provides a summary of the methodology used to perform the sensitivity analysis and the results of the analysis.

ANALYSIS ASSUMPTIONS

Design Year

Although Exit 4A is likely to be constructed well before the 20-year horizon and likely within the 10-year horizon, TEC has projected traffic volumes to a 20-year design horizon to provide a worst case analysis scenario and remain consistent with projections included in the original Master Plan Traffic Impact Assessment (TIA).

To obtain the 2032 No-Build without Exit 4A traffic-volume networks, the redistribution of trips associated with construction of Exit 4A was removed from the 2032 No-Build traffic volumes contained in the Master Plan TIA. The local and regional traffic that currently uses Route 102 is therefore assumed to stay there rather than divert to the new connector road toward Exit 4A. The resulting 2032 No-Build without Exit 4A volumes are shown in Figure A-1.

Development Potential

Without construction of Exit 4A, access to the Woodmont Commons PUD east of I-93 will be reduced from the full-build program. Without frontage an arterial roadway from which to draw “passby” traffic, it is unlikely that any significant retail or hotel development would occur within this PUD area with the exception of small ancillary retail uses to serve the residents and employees within this area. As such, TEC has assumed that without development of Exit 4A, no retail or hotel development would occur within the PUD east of I-93. In a related fashion, TEC has assumed that no hospital would be constructed east of I-93 without construction of Exit 4A.

As residential and office land uses do not require proximate access to the Exit 4 interchange, it was assumed that only residential and office development would occur east of I-93 without the construction of Exit 4A. TEC conducted an initial analysis that assumed the office and residential development east of I-93 would be equivalent to the development assumptions utilized for the Master Plan TIA. As such, the construction of 350 residential units and 400,000 SF of office space was assumed within WC-12. It is important to note that retail or other commercial uses could be constructed in WC-12, but would require an proportional reduction in the office or residential space to effect a similar peak hour traffic condition. TEC assumed that the development in WC-1 through WC-11 would remain consistent with the assumptions of the Master Plan TIA.

TEC updated the trip generation calculations originally contained within the Master Plan TIA based on the assumptions discussed above. The updated trip generation worksheets are included in Attachment B to this memorandum.

Trip Distribution

Trips from WC-12

The trip distribution for WC-12, without construction of Exit 4A, was assumed to remain consistent with the trip distribution assumptions contained in the Master Plan TIA with the exception of trips to/from I-93 north of the PUD. The following trip distribution assumptions were utilized for trips to/from I-93 north:

- 50 percent of trips to/from I-93 north are anticipated to access the PUD area east of I-93 via Exit 4 to Londonderry Road.
- 45 percent of trips to/from I-93 north are anticipated to access the PUD area east of I-93 via Exit 5 in North Londonderry. This assumes a local connection between the site and Route 28 via Folsom Road.
- 5 percent of trips to/from I-93 north are expected to utilize Exit 5 to Hardy Road and Hovey Road to access the PUD area east of I-93.

Trips from WC-7 through WC-11 (North of Pillsbury)

The trip distribution for the PUD in WC-7 through WC-11, without construction of Exit 4A, was assumed to remain consistent with the trip distribution assumptions contained in the Master Plan TIA with the exception of trips to/from I-93 north of the PUD. All entering trips from I-93 north were assumed to follow the same distribution without Exit 4A as within the Master Plan TIA due to

the ease of access to development west of I-93 as right-turns from Exit 4. As the majority of movements exiting the PUD area north of Pillsbury Road toward I-93 north via Exit 4 will be left-turns without Exit 4A, trips are likely to divert to alternative routes. The following trip distribution assumptions were utilized for trips exiting the PUD area north of Pillsbury Road destined for I-93 north:

- 75 percent of trips exiting to I-93 north are anticipated to utilize Exit 4. Approximately half of these trips will utilize Pillsbury Road and Ash Street, turn right onto Londonderry Road, turn right onto Route 102 to access the slip ramp for I-93 northbound; the other half are expected to utilize Orchard Drive and Garden Lane to access Route 102 westbound toward Exit 4
- 20 percent of trips exiting to I-93 north are expected to utilize Hardy Road to access Exit 5
- 5 percent of trips exiting to I-93 north are anticipated to utilize Hovey Road to Hardy Road to access Exit 5.

Trips from WC-1 through WC-6 (South of Pillsbury)

The trip distribution for WC-1 through WC-6 (south of Pillsbury Road), without construction of Exit 4A, was assumed to remain consistent with the trip distribution assumptions contained in the Master Plan TIA with the exception of trips to/from I-93 north of the PUD. All entering trips from I-93 north were assumed to follow the same distribution without Exit 4A as within the Master Plan TIA due to the ease of access to development west of I-93 as right-turns from Exit 4. As a majority of movements exiting the PUD south of Pillsbury Road toward I-93 north will be left-turns without Exit 4A, some trips are likely to divert to alternative routes. The following trip distribution assumptions were utilized for trips exiting the PUD area south of Pillsbury Road destined for I-93 north:

- 90 percent of trips exiting to I-93 north are anticipated to utilize Exit 4. Approximately half of these trips will utilize Londonderry Road to Exit 4 and half will utilize Garden Lane to Exit 4
- 8 percent of trips exiting to I-93 north are expected to utilize Hardy Road to access Exit 5
- 2 percent of trips exiting to I-93 north are anticipated to utilize Hovey Road to Hardy Road to access Exit 5.

The resulting trip distribution networks, utilizing the assumptions discussed above, are shown in Figures A-2 through A-5, and the resulting site-generated networks are shown in Figures A-6 through A-7. The site-generated traffic volumes without Exit 4A were added to the 2032 No-Build without Exit 4A volumes to obtain the 2032 Build without Exit 4A volumes as shown in Figure A-8.

CAPACITY ANALYSIS

Critical Intersections / Movements

Based on the results of the capacity and queue analysis contained within the Master Plan TIA, three intersections were identified as the critical intersections for this sensitivity analysis as these intersections were projected to experience traffic operations at capacity under 2032 Full Build conditions. The critical intersections and movements include the following:

- Nashua Road (Route 102) / Garden Lane / Hampton Drive – Garden Lane southbound left-turn
- Nashua Road (Route 102) / West Broadway (Route 102) / Londonderry Road / St. Charles Street – Nashua Road (Route 102) eastbound left-turn
- Ash Street / Londonderry Road / Eastern PUD Main Drive – Ash Street eastbound left-turn

Any additional trips through these intersections generated by the development beyond those volumes projected in the Master Plan TIA likely could not be accommodated by the intersections without additional improvements. TEC also identified the critical movement at each of these intersections where an increase in site-generated trips would result in unacceptable operations at the intersection. The analysis of the land use intensity was an iterative process to determine the level of traffic, without Exit 4A, that would present similar results when compared to the Master Plan TIA.

Capacity Analysis Results

TEC conducted a capacity and queue analysis to assess the impacts of the proposed PUD on the critical study area roadways without the construction of Exit 4A and determine the need to further reduce development within the PUD without Exit 4A improvements in place. This sensitivity analysis also assumed that the Ash Street Bridge over I-93 would be limited to one travel lane in each direction without construction of Exit 4A. All other roadway conditions were assumed to be consistent with those included in the Master Plan TIA. The detailed analysis worksheets are included in Attachment C and the results are summarized below.

Nashua Road (Route 102) / Garden Lane / Hampton Drive

The results of the sensitivity analysis indicate that traffic volumes on the critical Garden Lane southbound left-turn movement will increase slightly without construction of Exit 4A and with limited development within the PUD east of I-93. However, the through movements along Nashua Road (Route 102) through the intersection will also decrease by approximately 50 vehicles in each direction. With minor signal timing optimization from the Master Plan TIA analysis, the overall intersection is anticipated to operate at comparable levels of service and delay to the 2032 Build with Improvements conditions using the exemplar development program within the Master Plan TIA.

Nashua Road (Route 102) / West Broadway (Route 102) / Londonderry Road / St. Charles Street

The results of the sensitivity analysis indicate that the volume of traffic on the critical Nashua Road (Route 102) eastbound left-turn movement will remain consistent with the Master Plan TIA during the weekday evening peak hour (critical time period) without construction of Exit 4A and with limited development within the PUD east of I-93. With minor signal timing optimization from the Master Plan TIA analysis, the overall intersection is anticipated to operate at comparable levels of service and delay to the 2032 Build with Improvements conditions using the exemplar development program within the Master Plan TIA.

Ash Street / Londonderry Road / Eastern PUD Main Drive

The results of the sensitivity analysis indicate that the traffic volumes on the critical Ash Street eastbound left-turn movement and on the Eastern PUD Main Drive southbound approach will significantly decrease without construction of Exit 4A and with limited development within the PUD east of I-93. The Master Plan TIA assumed a three-lane cross-section on the Ash Street Bridge over I-93, which would allow for construction of an exclusive left-turn lane on the Ash Street eastbound approach to the Londonderry Road / East PUD Main Drive intersection. The sensitivity analysis indicates that the volume of left-turning traffic without Exit 4A, and with the associated limited development east of I-93, can be accommodated with elimination of this turning lane and with only a two-lane cross-section over the bridge. With optimization of signal timings, this intersection is anticipated to operate at overall LOS C without Exit 4A.

Table 1. Sensitivity Analysis – Capacity and Queue Analysis Summary

Intersection / Lane Group	2032 No-Build (Master Plan TIA)				2032 Build with Improvements (Master Plan TIA)				2032 Build with Improvements (Sensitivity Analysis)			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Nashua Road (NH Route 102) / Garden Lane / Hampton Drive												
<i>Weekday Morning Peak Period</i>												
Nashua Road EB LT	0.38	42.7	D	27/59	0.55	60.1	E	99/117	0.57	61.1	E	103/125
Nashua Road EB TH/RT	0.90	26.7	C	483/790	0.81	10.8	B	195/255	0.83	14.3	B	214/810
Nashua Road WB LT	0.17	39.6	D	<25/37	0.29	62.3	E	<25/38	0.21	57.4	E	<25/36
Nashua Road WB TH	0.60	15.0	B	247/373	0.62	19.3	B	318/449	0.62	20.3	C	326/442
Nashua Road WB RT	0.15	5.3	A	<25/<25	0.23	21.6	C	25/31	0.23	28.7	C	<25/35
Hampton Drive NB LT/TH	0.24	41.9	D	<25/41	0.39	62.4	E	<25/47	0.35	60.8	E	<25/47
Hampton Drive NB RT	0.05	33.0	C	<25/<25	0.05	51.4	D	<25/<25	0.23	50.5	D	<25/37
Garden Lane SB LT	0.32	37.0	D	43/86	0.33	45.5	D	73/111	0.32	44.2	D	74/112
Garden Lane SB LT/TH	0.35	37.2	D	47/94	0.66	53.9	D	153/243	0.63	51.2	D	154/242
Garden Lane SB RT	0.04	29.2	C	<25/28	0.17	32.6	C	29/81	0.14	31.1	C	<25/65
Overall Intersection	0.68	22.9	C	-	0.75	22.9	C	-	0.75	25.6	C	-
<i>Weekday Evening Peak Period</i>												
Nashua Road EB LT	1.20	175.7	F	139/240	1.10	99.2	F	243/296	1.04	73.4	E	227/265
Nashua Road EB TH/RT	0.89	36.7	D	491/719	0.78	12.8	B	153/322	0.76	10.4	B	121/156
Nashua Road WB LT	0.36	48.7	D	52/85	0.55	56.3	E	55/60	0.55	56.3	E	56/62
Nashua Road WB TH	0.87	31.9	C	503/661	1.00	48.9	D	683/797	1.00	51.5	D	651/756
Nashua Road WB RT	0.29	8.3	A	<25/<25	0.49	9.9	A	133/144	0.49	11.3	B	142/162
Hampton Drive NB LT/TH	0.45	48.9	D	74/116	0.86	103.2	F	81/170	0.76	80.9	F	80/158
Hampton Drive NB RT	0.09	34.6	C	<25/26	0.06	47.2	D	<25/<25	0.32	49.1	D	<25/61
Garden Lane SB LT	0.92	79.0	E	230/357	0.94	69.8	E	289/412	0.96	70.5	E	316/446
Garden Lane SB LT/TH	0.98	92.0	F	249/389	1.00	95.9	F	314/531	1.00	93.3	F	336/561
Garden Lane SB RT	0.51	38.9	D	122/188	0.89	54.2	D	281/533	0.93	59.2	E	321/614
Overall Intersection	0.85	47.3	D	-	1.01	44.7	D	-	0.98	44.0	D	-
Nashua Road (NH Route 102) / Londonderry Road												
<i>Weekday Morning Peak Period</i>												
Nashua Road EB LT	0.29	17.6	C	30	0.60	33.6	C	112/194	0.90	42.7	D	80/305
Nashua Road EB TH/RT	-	-	-	-	0.23	2.4	A	32/73	0.28	1.6	A	<25/67
West Broadway WB LT/TH	0.00	0.2	A	<25	-	-	-	-	-	-	-	-
West Broadway WB LT	-	-	-	-	0.02	40.1	D	<25/<25	0.00	6.1	A	<25/<25
West Broadway WB TH/RT	-	-	-	-	0.79	15.5	B	368/497	0.87	16.8	B	179/563
St. Charles Street NB approach	>2.0	>999	F	NC	0.01	37.3	D	<25/<25	0.04	30.6	C	<25/<25
Londonderry Road SB approach	1.14	194.9	F	226	-	-	-	-	-	-	-	-
Londonderry Road SB LT/TH	-	-	-	-	0.44	41.9	D	<25/56	0.25	32.2	C	<25/34
Londonderry Road SB RT	-	-	-	-	0.22	24.6	C	39/87	0.61	25.9	C	109/187
Overall Intersection	-	-	-	-	0.72	14.6	B	-	0.87	16.9	B	-

^a Volume-to-capacity ratio
^b Delay expressed in seconds per vehicle (average)
^c Level of service
^d 50th/95th Percentile Queue

Table 1 (Continued). Sensitivity Analysis – Capacity and Queue Analysis Summary

Intersection / Lane Group	2032 No-Build (Master Plan TIA)				2032 Build with Improvements (Master Plan TIA)				2032 Build with Improvements (Sensitivity Analysis) – 4LN			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Nashua Road (NH Route 102) / Londonderry Road												
<i>Weekday Evening Peak Period</i>												
Nashua Road EB LT	0.39	15.0	B	46	0.85	52.6	D	204/343	0.59	16.2	B	91/179
Nashua Road EB TH/RT	-	-	-	-	0.66	9.7	A	201/410	0.59	4.0	A	151/198
West Broadway WB LT/TH	0.01	0.7	A	<25	-	-	-	-	-	-	-	-
West Broadway WB LT	-	-	-	-	0.11	47.7	D	<25/<25	0.05	12.7	B	<25/<25
West Broadway WB TH/RT	-	-	-	-	0.82	25.3	C	384/485	0.88	26.5	C	304/445
St. Charles Street NB approach	0.22	257.0	F	<25	0.01	34.8	C	<25/<25	0.01	29.0	C	<25/<25
Londonderry Road SB approach	>2.0	>999	F	NC	-	-	-	-	-	-	-	-
Londonderry Road SB LT/TH	-	-	-	-	0.81	60.2	E	110/220	0.58	36.0	D	45/92
Londonderry Road SB RT	-	-	-	-	0.47	22.7	C	126/203	0.77	24.1	C	210/344
Overall Intersection	-	-	-	-	0.83	22.7	C	-	0.82	16.2	B	-
Ash Street / Londonderry Road / Eastern PUD Main Drive												
<i>Weekday Morning Peak Period</i>												
Ash Street EB approach	-	-	-	-	-	-	-	-	0.72	12.9	B	114/233
Ash Street EB LT	-	-	-	-	0.71	27.7	C	142/275	-	-	-	-
Ash Street EB TH/RT	-	-	-	-	0.32	9.5	A	49/156	-	-	-	-
Ash Street WB approach	0.07	3.0	A	<25	-	-	-	-	0.60	16.2	B	110/216
Ash Street WB LT	-	-	-	-	0.27	35.4	D	<25/39	-	-	-	-
Ash Street WB TH/RT	-	-	-	-	0.51	22.5	C	106/226	-	-	-	-
Londonderry Road NB approach	0.15	11.9	B	<25	-	-	-	-	-	-	-	-
Londonderry Road NB LT	-	-	-	-	0.18	22.7	C	<25/56	0.16	17.4	B	<25/59
Londonderry Road NB TH/RT	-	-	-	-	0.60	27.3	C	98/201	0.63	22.5	C	107/260
Eastern Main Drive SB LT	-	-	-	-	0.06	21.9	C	<25/<25	0.02	16.4	B	<25/<25
Eastern Main Drive SB TH	-	-	-	-	0.13	22.3	C	<25/55	0.16	17.3	B	<25/73
Eastern Main Drive SB RT	-	-	-	-	0.11	6.6	A	<25/<25	0.07	10.1	B	<25/30
Overall Intersection	-	-	-	-	0.61	20.4	C	-	0.68	16.1	B	-
<i>Weekday Morning Peak Period</i>												
Ash Street EB approach	-	-	-	-	-	-	-	-	0.84	16.7	B	224/351
Ash Street EB LT	-	-	-	-	0.94	47.7	D	343/569	-	-	-	-
Ash Street EB TH/RT	-	-	-	-	0.53	13.3	B	186/287	-	-	-	-
Ash Street WB approach	0.08	2.3	A	<25	-	-	-	-	0.72	18.8	B	181/293
Ash Street WB LT	-	-	-	-	0.52	41.0	D	45/91	-	-	-	-
Ash Street WB TH/RT	-	-	-	-	0.89	49.8	D	228/415	-	-	-	-
Londonderry Road NB approach	0.53	20.5	C	77	-	-	-	-	-	-	-	-
Londonderry Road NB LT	-	-	-	-	0.81	56.3	E	71/162	0.65	32.2	C	60/159
Londonderry Road NB TH/RT	-	-	-	-	0.74	38.7	D	140/235	0.51	25.2	C	81/181
Eastern Main Drive SB LT	-	-	-	-	0.27	29.5	C	<25/38	0.07	21.6	C	<25/<25
Eastern Main Drive SB TH	-	-	-	-	0.60	32.7	C	124/199	0.54	25.6	C	107/205
Eastern Main Drive SB RT	-	-	-	-	0.42	7.6	A	76/131	0.14	14.0	B	<25/45
Overall Intersection	-	-	-	-	0.89	32.8	C	-	0.78	20.0	B	-

^a Volume-to-capacity ratio
^b Delay expressed in seconds per vehicle (average)
^c Level of service
^d 50th/95th Percentile Queue

MAXIMUM TRIPS PER AREA

TEC utilized the results of the sensitivity analysis without Exit 4A and the results of the analysis contained within the Master Plan TIA to develop proposed caps on traffic generation entering and exiting each of the PUD areas. These trip caps can be used as a means of limiting total development in each area while allowing for flexibility in the sizes and land uses constructed within each area.

The results of the sensitivity analysis and Master Plan TIA analysis identify three locations that will be operating at capacity under 2032 Build conditions with and without the Exit 4A improvements. These intersections were considered the critical locations in determining the maximum number of trips that could be generated by each PUD area. Assuming that all development would follow the same trip distribution patterns as identified in the Master Plan TIA for the condition with Exit 4A and as identified in this sensitivity analysis for the condition without Exit 4A, any additional development would result in increases in traffic volumes on the critical movements at the critical intersections. Therefore, the maximum number of trips per area was assumed to be consistent with the number of trips entering and exiting each area in the Master Plan TIA for the “with Exit 4A” scenario and in this sensitivity analysis for the “without Exit 4A” scenario.

As the weekday evening peak hour was the critical time period for all three of the identified critical intersections, the calculation of maximum trips per area was based on weekday evening peak hour traffic volumes.

Table 2 provides a summary of the resulting maximum trips per PUD area. It is important to note that the number of maximum trips shown in Table 2 represents the maximum *external trips* entering and exiting each major area. Some trips will remain internal to each area and therefore, do not impact the number of *external trips* to/from each area. However, some trips will remain internal to the entire PUD, but will travel between multiple PUD areas. As these trips will travel on Town roadways external to the PUD areas, these trips must be included when considering the maximum number of *external trips* per area.

Table 2. Maximum External Trips Per Area – Weekday Evening Peak Hour

PUD Zone	Maximum External Trips (Weekday Evening Peak Hour)	
	Without Exit 4A Improvements	With Exit 4A Improvements
WC-12	750	2,300
WC-7 through WC-11	300	300
WC-1 through WC-6	2,400	2,550
Total	3,450	5,150

It should be noted that none of the movements entering or exiting the area of WC-7 through WC-11 are considered critical movements. Therefore, development within this area could significantly increase to generate more trips than shown in the table and still maintain acceptable operations at all of the study area intersections if Exit 4A is constructed. However, without Exit 4A, the external trips may be capped to reduce the risk of additional external trips using Hovey Road and Hardy Road to access Exit 5.

TEC recommends that the Planning Board consider a 15% variance in the caps per zone listed above to allow for flexible and creative land development potential without realizing major changes in trip characteristics.

ATTACHMENTS:

A – Traffic-Volume Networks

B – Trip Generation Worksheets

C – Capacity Analysis Worksheets

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Ted Brovitz, HSH

Atty. Ari Pollack, Gallagher, Callahan & Gartrell, PA

Rick Chellman, P.E., TND Engineering

Attachment A

Traffic Volume Networks

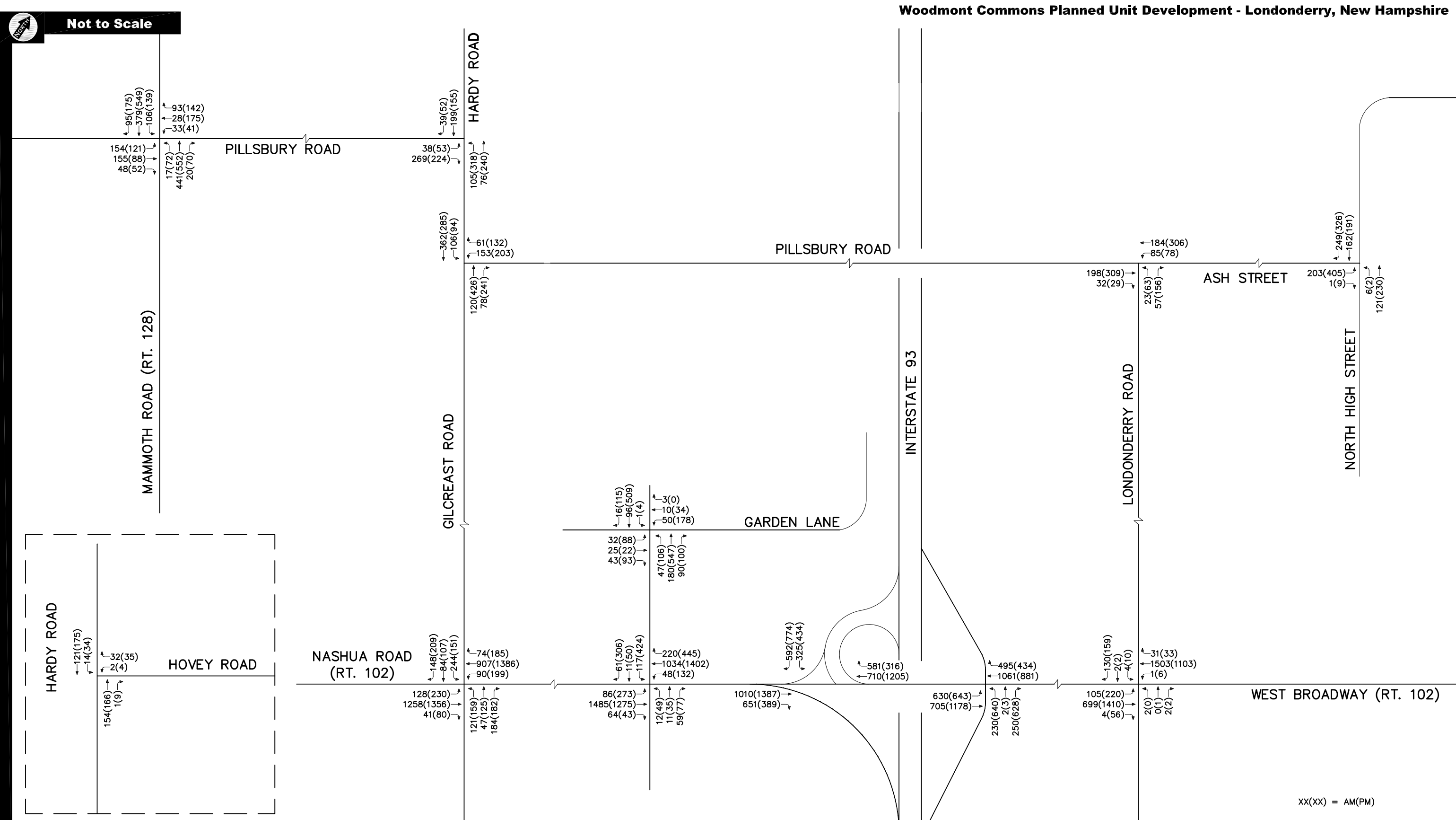


Figure A-1

2032 No-Build Conditions
Weekday Morning and
Weekday Evening
Peak Hour Traffic Volumes



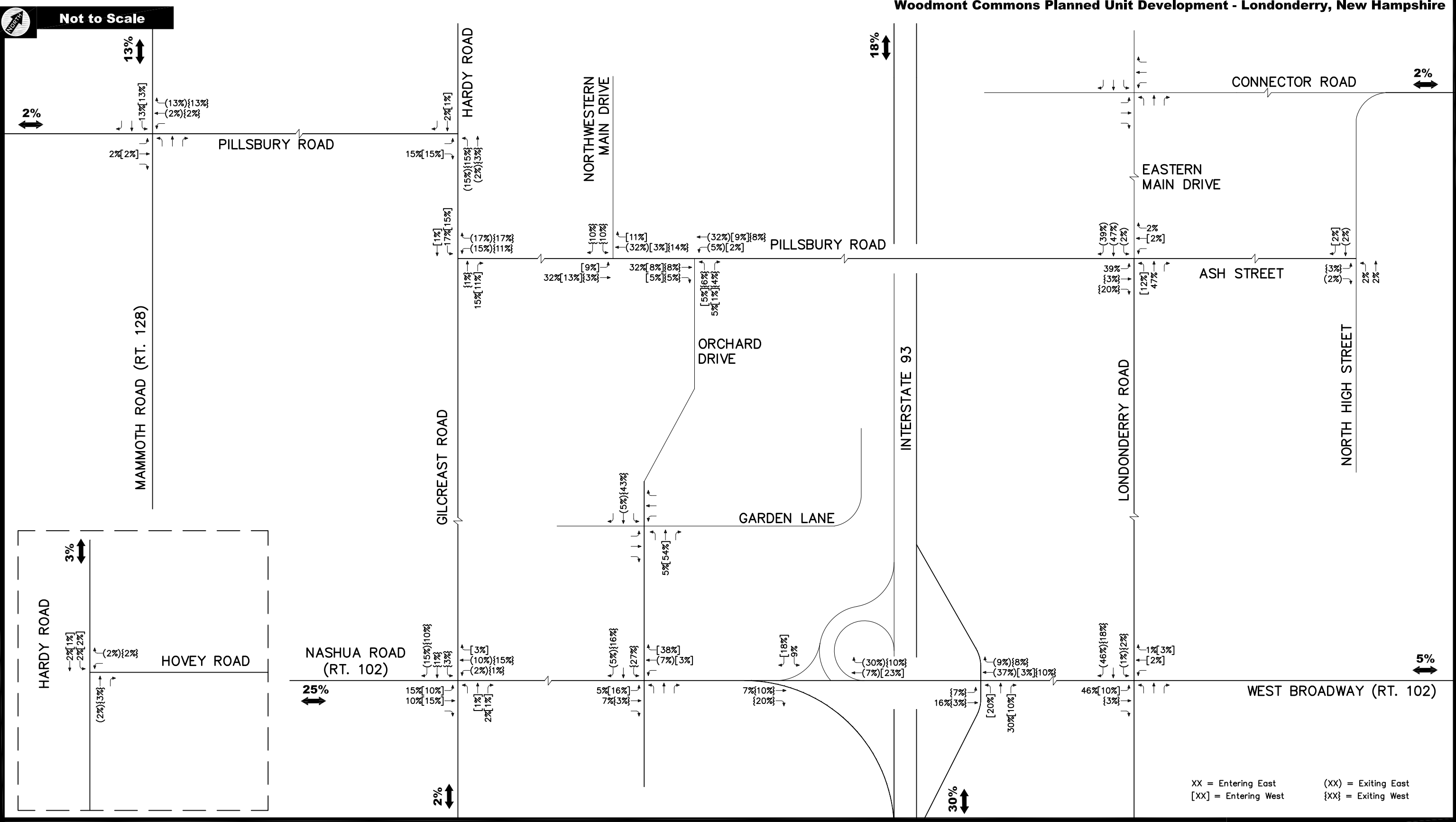


Figure A-2

Residential Trip Distribution



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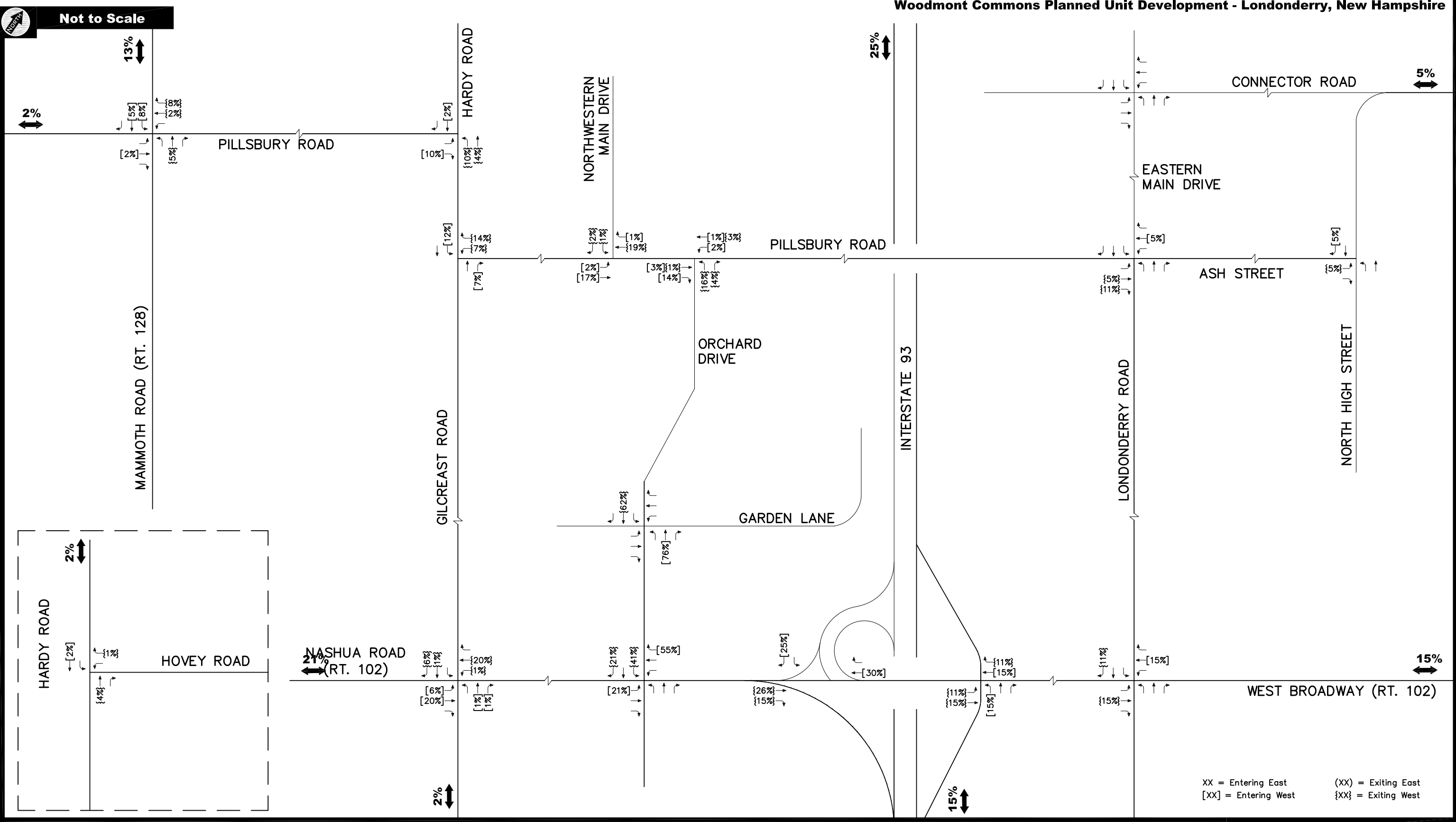


Figure A-3

Retail & Commercial Trip Distribution



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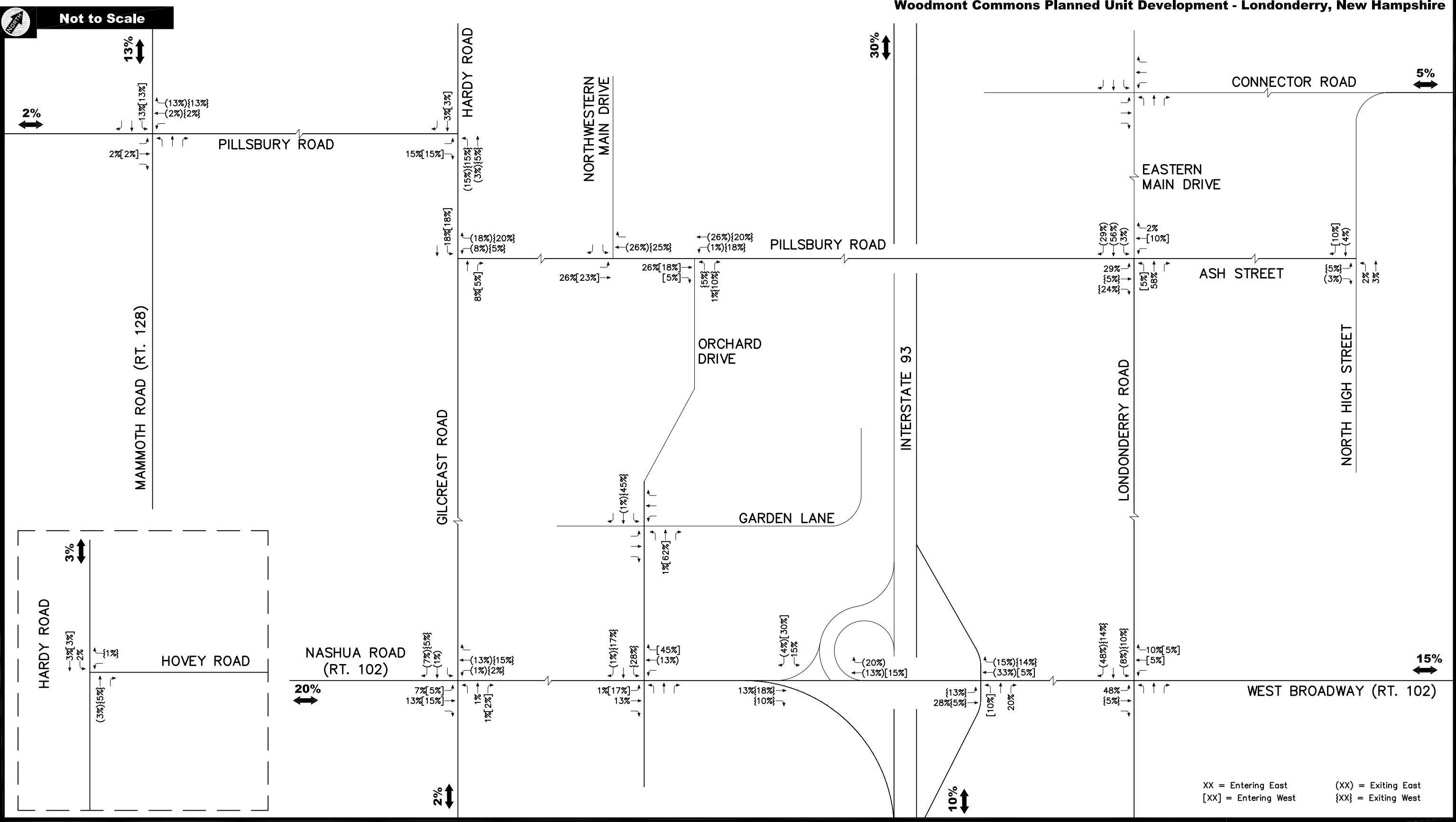


Figure A-4

Office Trip Distribution



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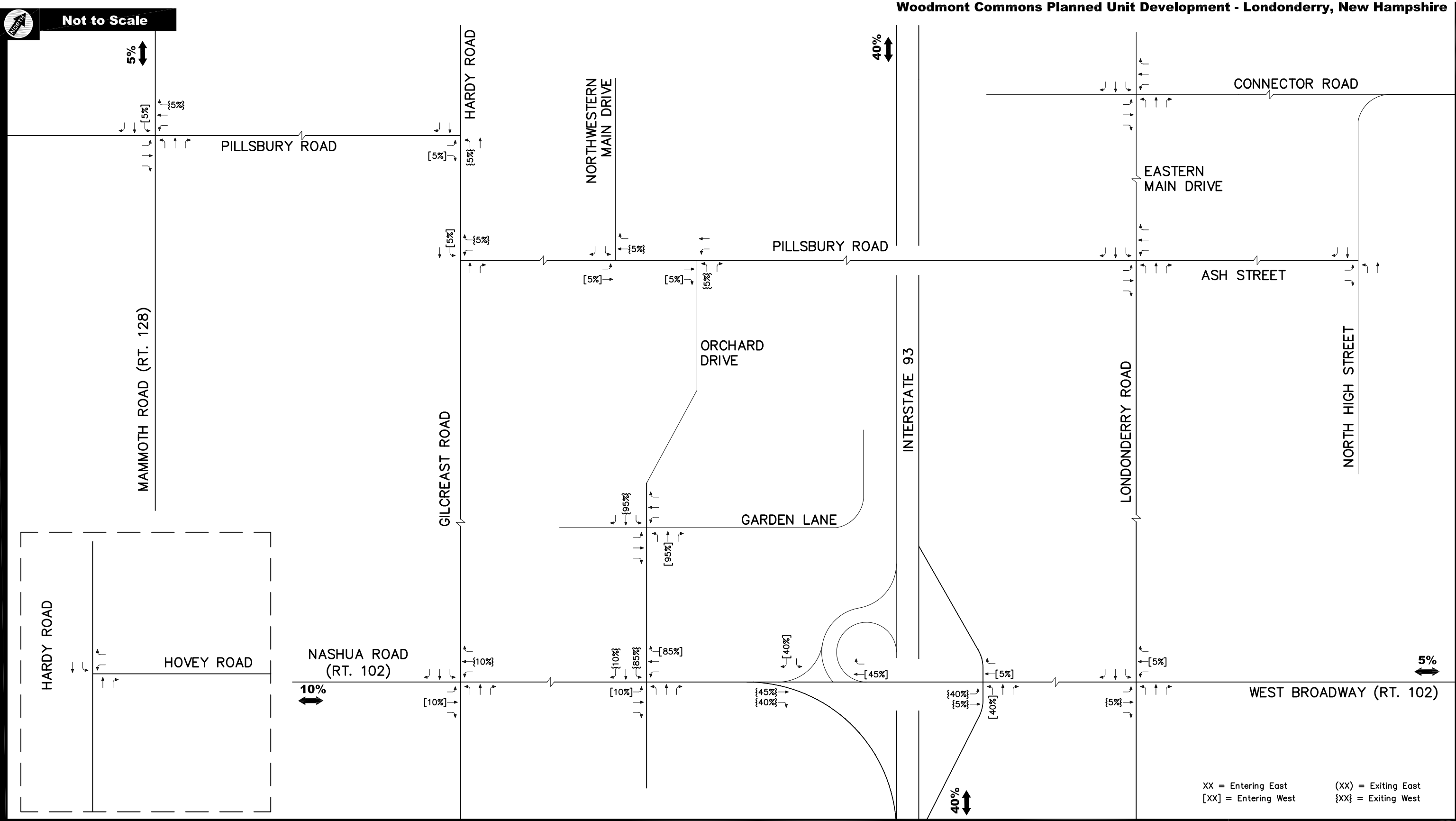


Figure A-5

Hotel Trip Distribution



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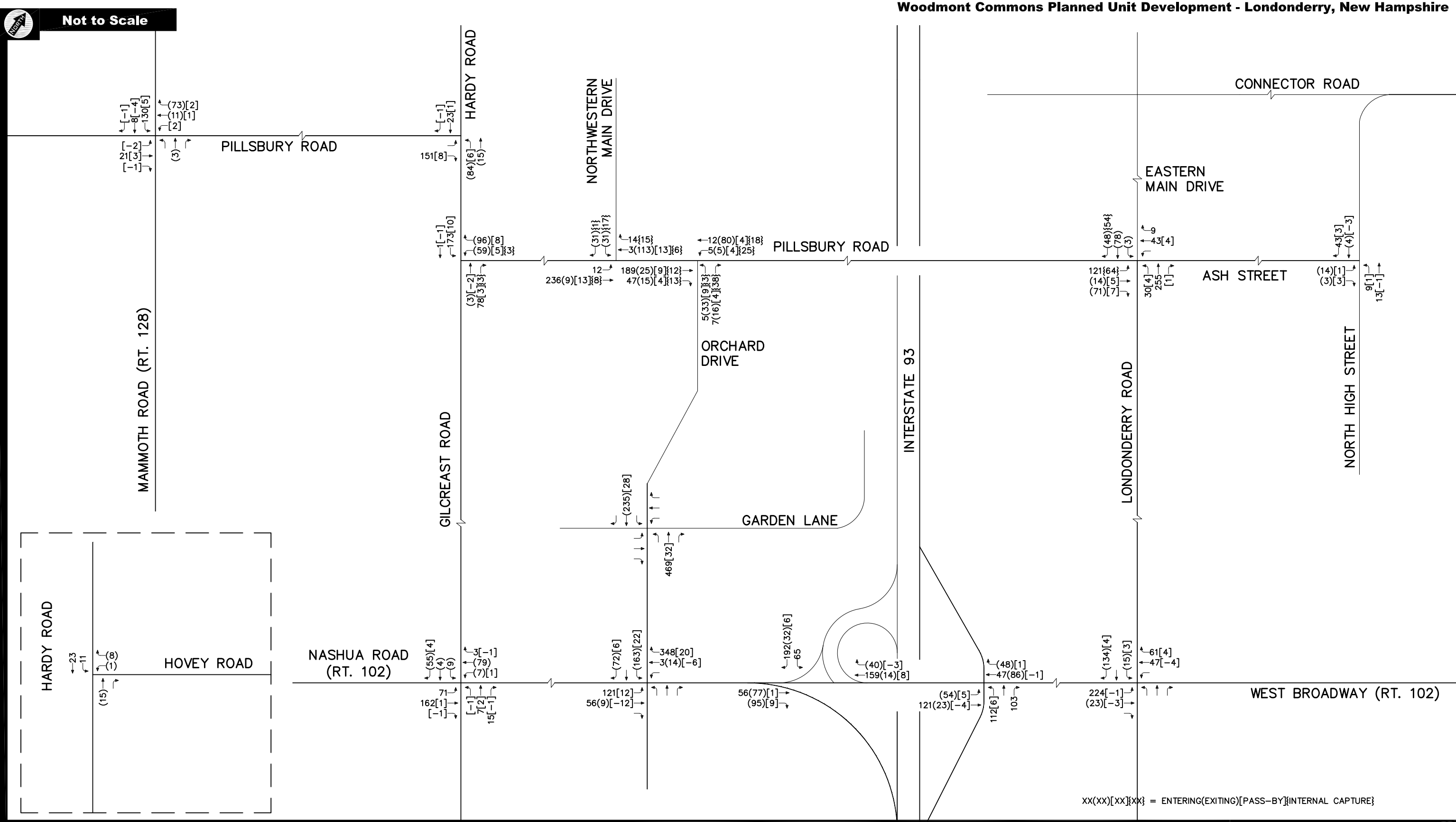


Figure A-6

NET Site Generated Trip Assignment
Weekday Morning
Peak Hour Traffic Volumes



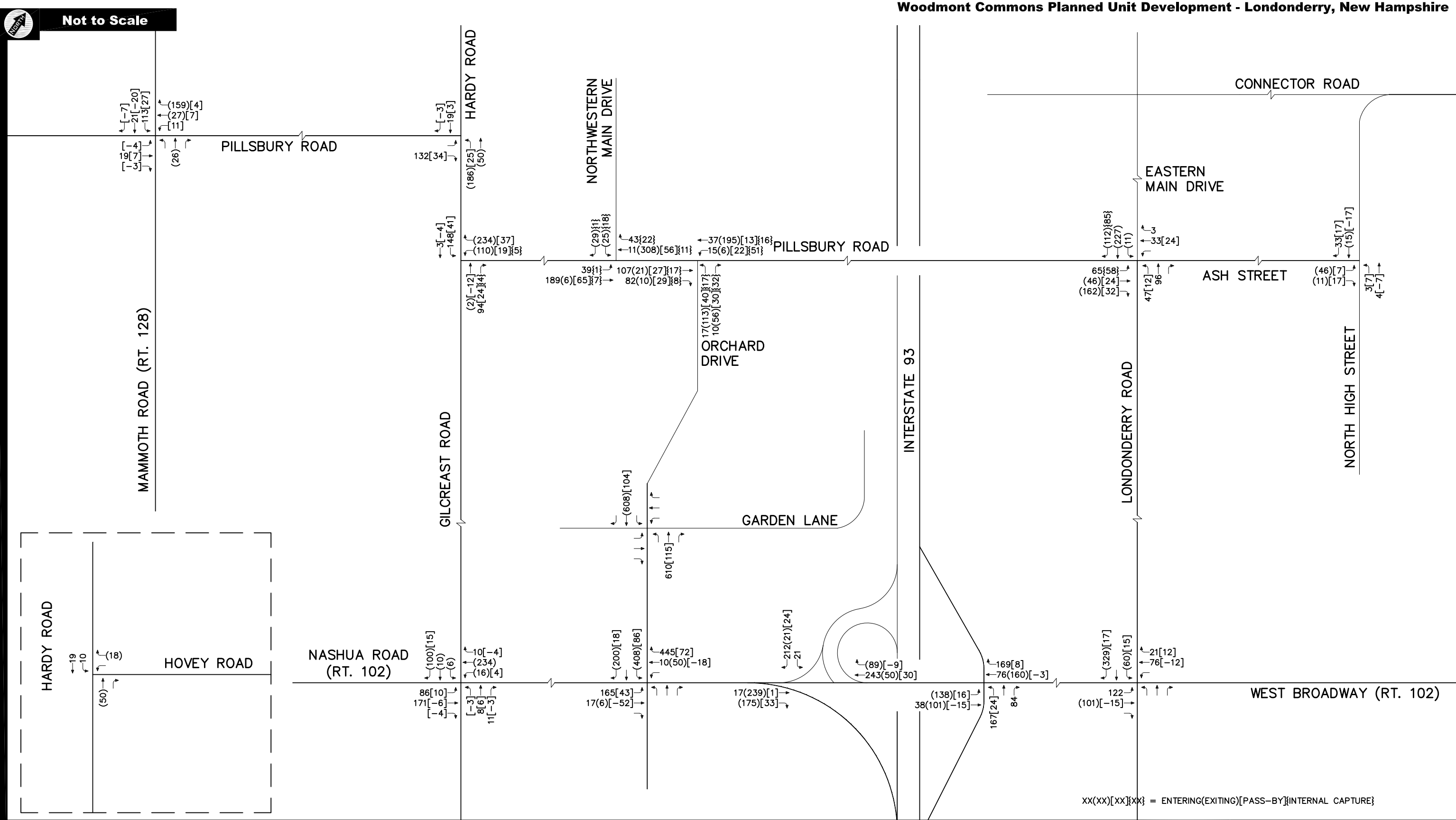


Figure A-7

NET Site Generated Trip Assignment
Weekday Evening
Peak Hour Traffic Volumes



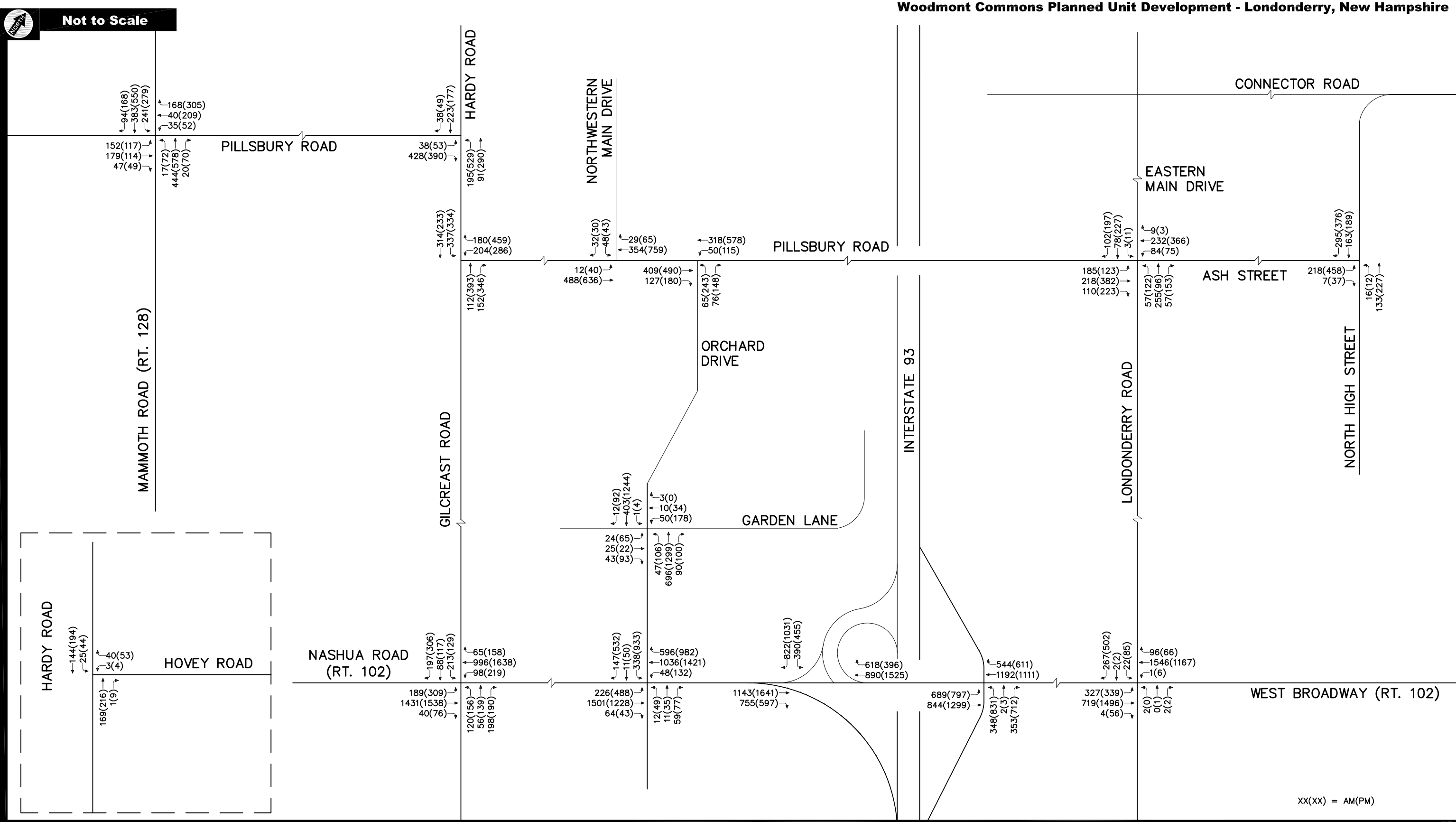


Figure A-8

2032 Build Conditions
Weekday Morning and
Weekday Evening
Peak Hour Traffic Volumes

Appendix B

Trip Generation Worksheets

Site Generation Trip Assessment Comparison

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
 Date: April 2, 2013
 Source: Institute of Transportation Engineers - Trip Generation - 9th Ed.
 Analyst: TEC, Inc. / Samuel W. Gregorio, E.I.T.

East PUD - Without Exit 4A Improvements

<u>Net Trips (ALL TRIPS)</u>	<u>Total Trips</u>			<u>Total New Trips</u>		<u>Internal Capture Within Zone</u>		<u>Total External to Zone Trips</u>		<u>Internal Capture External to Zone</u>		<u>Total New Pass-by Trips</u>	<u>Total New Primary Trips</u>	<u>Total Pass-by Trips</u>		<u>Total Primary Trips</u>	
				<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>			<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>
Weekday AM PH	770			552	218	25	25	527	193	79	39	0	602	0	0	448	154
Weekday PM PH	781			255	526	16	16	239	510	49	94	0	606	0	0	190	416
Sat Midday PH	371			191	180	4	4	187	176	38	39	0	286	0	0	149	137

Northwest PUD - Without Exit 4A Improvements

<u>Net Trips (ALL TRIPS)</u>	<u>Total Trips</u>			<u>Total New Trips</u>		<u>Internal Capture Within Zone</u>		<u>Total External to Zone Trips</u>		<u>Internal Capture External to Zone</u>		<u>Total New Pass-by Trips</u>	<u>Total New Primary Trips</u>	<u>Total Pass-by Trips</u>		<u>Total Primary Trips</u>	
				<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>			<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>
Weekday AM PH	207			51	156	2	2	49	154	8	44	3	148	2	1	39	109
Weekday PM PH	305			190	115	3	3	187	112	46	21	14	218	7	7	134	84
Sat Midday PH	286			143	143	2	2	141	141	30	32	15	205	7	8	104	101

Southwest PUD - Without Exit 4A Improvements

<u>Net Trips (ALL TRIPS)</u>	<u>Total Trips</u>			<u>Total New Trips</u>		<u>Internal Capture Within Zone</u>		<u>Total External to Zone Trips</u>		<u>Internal Capture External to Zone</u>		<u>Total New Pass-by Trips</u>	<u>Total New Primary Trips</u>	<u>Total Pass-by Trips</u>		<u>Total Primary Trips</u>	
				<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>			<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>
Weekday AM PH	1,414			852	562	97	97	755	465	64	68	111	977	55	56	636	341
Weekday PM PH	2,860			1,327	1,533	239	239	1,088	1,294	101	81	466	1,734	233	233	754	980
Sat Midday PH	3,275			1,704	1,571	314	314	1,390	1,257	64	61	505	2,017	253	252	1,073	944

Site Generation Trip Assessment Comparison

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
 Date: April 2, 2013
 Source: Institute of Transportation Engineers - Trip Generation - 9th Ed.
 Analyst: TEC, Inc. / Samuel W. Gregorio, E.I.T.

East PUD - With Exit 4A Improvements

<u>Net Trips (ALL TRIPS)</u>	<u>Total Trips</u>			<u>Total New Trips</u>		<u>Internal Capture Within Zone</u>		<u>Total External to Zone Trips</u>		<u>Internal Capture External to Zone</u>		<u>Total New Pass-by Trips</u>	<u>Total New Primary Trips</u>	<u>Total Pass-by Trips</u>		<u>Total Primary Trips</u>	
				<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>			<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>
Weekday AM PH	1,449			973	476	79	79	894	397	88	88	88	1,027	44	44	762	265
Weekday PM PH	2,521			1,071	1,450	129	129	942	1,321	161	161	362	1,579	181	181	600	979
Sat Midday PH	3,052			1,580	1,472	162	162	1,418	1,310	189	189	396	1,954	198	198	1,031	923

Northwest PUD - With Exit 4A Improvements

<u>Net Trips (ALL TRIPS)</u>	<u>Total Trips</u>			<u>Total New Trips</u>		<u>Internal Capture Within Zone</u>		<u>Total External to Zone Trips</u>		<u>Internal Capture External to Zone</u>		<u>Total New Pass-by Trips</u>	<u>Total New Primary Trips</u>	<u>Total Pass-by Trips</u>		<u>Total Primary Trips</u>	
				<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>			<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>
Weekday AM PH	207			51	156	2	2	49	154	22	22	3	156	2	1	25	131
Weekday PM PH	305			190	115	2	2	188	113	33	33	14	221	7	7	148	73
Sat Midday PH	286			143	143	2	2	141	141	31	31	15	205	7	8	103	102

Southwest PUD - With Exit 4A Improvements

<u>Net Trips (ALL TRIPS)</u>	<u>Total Trips</u>			<u>Total New Trips</u>		<u>Internal Capture Within Zone</u>		<u>Total External to Zone Trips</u>		<u>Internal Capture External to Zone</u>		<u>Total New Pass-by Trips</u>	<u>Total New Primary Trips</u>	<u>Total Pass-by Trips</u>		<u>Total Primary Trips</u>	
				<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>			<u>In</u>	<u>Out</u>	<u>In</u>	<u>Out</u>
Weekday AM PH	1,414			852	562	74	74	778	488	88	88	109	981	54	55	636	345
Weekday PM PH	2,860			1,327	1,533	165	165	1,162	1,368	164	164	468	1,734	234	234	764	970
Sat Midday PH	3,275			1,704	1,571	186	186	1,518	1,385	190	190	505	2,018	253	252	1,075	943

Site Generation Trip Assessment Comparison

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
 Date: March 25, 2013
 Source: Institute of Transportation Engineers - Trip Generation - 9th Ed.

Proposed Mixed-Use Development - East of Interstate 93

Residential Planned Unit Development (ITE LUC 270 - RPUD)

Units:	350												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	2,907	50%	50%	1454	1453	334	334	0	2239	0	0	1120	1119
Weekday AM PH	190	22%	78%	42	148	8	43	0	139	0	0	34	105
Weekday PM PH	255	65%	35%	166	89	42	19	0	194	0	0	124	70
Saturday Daily	2,488	50%	50%	1244	1244	286	286	0	1916	0	0	958	958
Sat Midday PH	199	49%	51%	98	101	22	24	0	153	0	0	76	77

Assumed 23% internal capture rate

Mixed Retail Uses (ITE LUC 820 - Shopping Center)

Size (ksf):	0												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	0	50%	50%	0	0	0	0	0	0	0	0	0	0
Weekday AM PH	0	62%	38%	0	0	0	0	0	0	0	0	0	0
Weekday PM PH	0	48%	52%	0	0	0	0	0	0	0	0	0	0
Saturday Daily	0	50%	50%	0	0	0	0	0	0	0	0	0	0
Sat Midday PH	0	52%	48%	0	0	0	0	0	0	0	0	0	0

Assumed 23% internal capture rate

Assumed 34% weekday passby rate and 26% Saturday passby rate (Trip Generation Handbook, 2nd Edition).

Mixed Office Uses (ITE LUC 710 - General Office Building)

Size (ksf):	400												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	3,765	50%	50%	1883	1882	433	433	0	2899	0	0	1450	1449
Weekday AM PH	580	88%	12%	510	70	96	21	0	463	0	0	414	49
Weekday PM PH	526	17%	83%	89	437	23	91	0	412	0	0	66	346
Saturday Daily	844	50%	50%	422	422	97	97	0	650	0	0	325	325
Sat Midday PH	172	54%	46%	93	79	20	19	0	133	0	0	73	60

Assumed 23% internal capture rate

Hotel (ITE LUC 310 - Hotel)

Units:	0												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	0	50%	50%	0	0	0	0	0	0	0	0	0	0
Weekday AM PH	0	59%	41%	0	0	0	0	0	0	0	0	0	0
Weekday PM PH	0	51%	49%	0	0	0	0	0	0	0	0	0	0
Saturday Daily	0	50%	50%	0	0	0	0	0	0	0	0	0	0
Sat Midday PH	0	56%	44%	0	0	0	0	0	0	0	0	0	0

Assumed 23% internal capture rate

Hospital Space (ITE LUC 610 - Hospital)

Size (ksf):	0												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	0	50%	50%	0	0	0	0	0	0	0	0	0	0
Weekday AM PH	0	63%	37%	0	0	0	0	0	0	0	0	0	0
Weekday PM PH	0	38%	62%	0	0	0	0	0	0	0	0	0	0
Saturday Daily	0	50%	50%	0	0	0	0	0	0	0	0	0	0
Sat Midday PH	0	50%	50%	0	0	0	0	0	0	0	0	0	0

Assumed 23% internal capture rate

Net Trips (ALL TRIPS)	Total Trips			Total New Trips		Internal Capture		Total New	Total New	Total Pass-by Trips		Total Primary Trips	
				In	Out	In	Out	Pass-by Trips	Primary Trips	In	Out	In	Out
Weekday Daily	6,672			3,337	3,335	767	767	0	5,138	0	0	2,570	2,568
Weekday AM PH	770			552	218	104	64	0	602	0	0	448	154
Weekday PM PH	781			255	526	65	110	0	606	0	0	190	416
Saturday Daily	3,332			1,666	1,666	383	383	0	2,566	0	0	1,283	1,283
Sat Midday PH	371			191	180	42	43	0	286	0	0	149	137

Site Generation Trip Assessment Comparison

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH
 Date: March 25, 2013
 Source: Institute of Transportation Engineers - Trip Generation - 9th Ed.

Proposed Mixed-Use Development - West of Interstate 93

Residential Planned Unit Development (ITE LUC 270 - RPUD)

Units:	1,080												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	7,837	50%	50%	3919	3918	901	901	0	6035	0	0	3018	3017
Weekday AM PH	542	22%	78%	119	423	23	124	0	395	0	0	96	299
Weekday PM PH	704	65%	35%	458	246	117	51	0	536	0	0	341	195
Saturday Daily	7,592	50%	50%	3796	3796	873	873	0	5846	0	0	2923	2923
Sat Midday PH	593	49%	51%	291	302	65	72	0	456	0	0	226	230

Assumed 23% internal capture rate

Mixed Retail Uses (ITE LUC 820 - Shopping Center)

Size (ksf):	532.5												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	20,139	50%	50%	10070	10069	2316	2316	5272	10235	2636	2636	5118	5117
Weekday AM PH	432	62%	38%	268	164	51	48	114	219	57	57	160	59
Weekday PM PH	1,837	48%	52%	882	955	226	199	480	932	240	240	416	516
Saturday Daily	26,499	50%	50%	13250	13249	3048	3048	11402	9001	5701	5701	4501	4500
Sat Midday PH	2,593	52%	48%	1348	1245	299	297	520	1477	260	260	789	688

Assumed 23% internal capture rate

Assumed 34% weekday passby rate and 26% Saturday passby rate (Trip Generation Handbook, 2nd Edition).

Mixed Office Uses (ITE LUC 710 - General Office Building)

Size (ksf):	300												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	3,026	50%	50%	1513	1513	349	349	0	2328	0	0	1164	1164
Weekday AM PH	461	88%	12%	406	55	76	17	0	368	0	0	330	38
Weekday PM PH	414	17%	83%	70	344	19	72	0	323	0	0	51	272
Saturday Daily	641	50%	50%	321	320	74	74	0	493	0	0	247	246
Sat Midday PH	129	54%	46%	70	59	15	14	0	100	0	0	55	45

Assumed 23% internal capture rate

Hotel (ITE LUC 310 - Hotel)

Units:	350												
	Total Trips	% Distribution		# New Trips		Internal Capture		Total New	Total New	# Passby Trips		# Primary Trips	
		IN	OUT	IN	OUT	IN	OUT	Pass-by Trips	Primary Trips	IN	OUT	IN	OUT
Weekday Daily	2,759	50%	50%	1380	1379	317	317	0	2125	0	0	1063	1062
Weekday AM PH	186	59%	41%	110	76	21	22	0	143	0	0	89	54
Weekday PM PH	210	51%	49%	107	103	27	22	0	161	0	0	80	81
Saturday Daily	3,072	50%	50%	1536	1536	353	353	0	2366	0	0	1183	1183
Sat Midday PH	246	56%	44%	138	108	31	26	0	189	0	0	107	82

Assumed 23% internal capture rate

Net Trips	Total Trips			Total New Trips		Internal Capture		Total New	Total New	Total Pass-by Trips		Total Primary Trips	
				In	Out	In	Out	Pass-by Trips	Primary Trips	In	Out	In	Out
Weekday Daily	33,761			16,882	16,879	3,883	3,883	5,272	20,723	2,636	2,636	10,363	10,360
Weekday AM PH	1,621			903	718	171	211	114	1,125	57	57	675	450
Weekday PM PH	3,165			1,517	1,648	389	344	480	1,952	240	240	888	1,064
Saturday Daily	37,804			18,903	18,901	4,348	4,348	11,402	17,706	5,701	5,701	8,854	8,852
Sat Midday PH	3,561			1,847	1,714	410	409	520	2,222	260	260	1,177	1,045

Site Generated Trip Assessment - East of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: March 25, 2013
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 270 - Residential Planned Unit Development (PUD)

Average Vehicle Trips vs: Units
Independent Variable (X): 350 Units

AVERAGE WEEKDAY DAILY

$$\ln T = 0.88 * (X) + 2.82$$

$$\ln T = 0.88 * \ln (350) + 2.82$$

$$\ln T = 7.975$$

$$T = \boxed{2,907} \text{ vehicle trips}$$

with 50% (1,454 vpd) entering and 50% (1,453 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.93 \ln(X) - 0.20$$

$$\ln T = 0.93 * \ln (350) - 0.20$$

$$\ln T = 5.248$$

$$T = \boxed{190} \text{ vehicle trips}$$

with 22% (42 vph) entering and 78% (148 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.90 * \ln(X) + 0.27$$

$$\ln T = 0.90 * \ln (350) + 0.27$$

$$\ln T = 5.542$$

$$T = \boxed{255} \text{ vehicle trips}$$

with 65% (166 vph) entering and 35% (89 vpd) exiting.

SATURDAY DAILY

$$\ln T = 0.99 * \ln(X) + 2.02$$

$$\ln T = 0.99 * \ln (350) + 2.02$$

$$\ln T = 7.819$$

$$T = \boxed{2,488} \text{ vehicle trips}$$

with 50% (1,244 vpd) entering and 50% (1,244 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$\ln T = 0.97 * \ln(X) - 0.39$$

$$\ln T = 0.97 * \ln (350) - 0.39$$

$$\ln T = 5.292$$

$$T = \boxed{199} \text{ vehicle trips}$$

with 49% (98 vph) entering and 51% (101 vpd) exiting.

Site Generated Trip Assessment - East of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: March 25, 2013
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

Land Use Code (LUC) 710 - General Office Building

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area
Independent Variable (X): 400.000

AVERAGE WEEKDAY DAILY

$$\ln T = 0.76 \ln (X) + 3.68$$

$$\ln T = 0.76 \ln 400.000 + 3.68$$

$$\ln T = 8.23$$

$$T = \boxed{3,765} \text{ vehicle trips}$$

with 50% (1,883 vph) entering and 50% (1,882 vph) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.80 \ln (X) + 1.57$$

$$\ln T = 0.80 \ln 400.000 + 1.57$$

$$\ln T = 6.36$$

$$T = \boxed{580} \text{ vehicle trips}$$

with 88% (510 vph) entering and 12% (70 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 1.12 * (X) + 78.45$$

$$T = 1.12 * 400.000 + 78.45$$

$$T = \boxed{526} \text{ vehicle trips}$$

with 17% (89 vph) entering and 83% (437 vph) exiting.

SATURDAY DAILY

$$T = 2.03 * (X) + 31.75$$

$$T = 2.03 * 400.000 + 31.75$$

$$T = \boxed{844} \text{ vehicle trips}$$

with 50% (422 vpd) entering and 50% (422 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$T = 0.43 * (X)$$

$$T = 0.43 * 400.000$$

$$T = \boxed{172} \text{ vehicle trips}$$

with 54% (93 vph) entering and 46% (79 vph) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: March 25, 2013
Source: Institute of Transportation Engineers - Trip Generation , 8th Edition

ITE Land Use Code (LUC) 270 - Residential Planned Unit Development (PUD)

Average Vehicle Trips vs: Units
Independent Variable (X): 1,080 Units

AVERAGE WEEKDAY DAILY

$$\ln T = 0.88 * (X) + 2.82$$

$$\ln T = 0.88 * \ln (1080) + 2.82$$

$$\ln T = 8.967$$

$$T = \boxed{7,837} \text{ vehicle trips}$$

with 50% (3,919 vpd) entering and 50% (3,918 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.93 \ln(X) - 0.20$$

$$\ln T = 0.93 * \ln (1080) - 0.20$$

$$\ln T = 6.296$$

$$T = \boxed{542} \text{ vehicle trips}$$

with 22% (119 vph) entering and 78% (423 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.90 * \ln(X) + 0.27$$

$$\ln T = 0.90 * \ln (1080) + 0.27$$

$$\ln T = 6.556$$

$$T = \boxed{704} \text{ vehicle trips}$$

with 65% (458 vph) entering and 35% (246 vpd) exiting.

SATURDAY DAILY

$$\ln T = 0.99 * \ln(X) + 2.02$$

$$\ln T = 0.99 * \ln (1080) + 2.02$$

$$\ln T = 8.935$$

$$T = \boxed{7,592} \text{ vehicle trips}$$

with 50% (3,796 vpd) entering and 50% (3,796 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$\ln T = 0.97 * \ln(X) - 0.39$$

$$\ln T = 0.97 * \ln (1,080) - 0.39$$

$$\ln T = 6.385$$

$$T = \boxed{593} \text{ vehicle trips}$$

with 49% (291 vph) entering and 51% (302 vpd) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: March 25, 2013
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 310 - Hotel

Average Vehicle Trips vs: Rooms
Independent Variable (X): 350 Rooms

AVERAGE WEEKDAY DAILY

$$T = 8.95 * (X) - 373.16$$

$$T = 8.95 * 350 - (373.16)$$

$$T = \boxed{2,759} \text{ vehicle trips}$$

with 50% (1,380 vpd) entering and 50% (1,379 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.53 * (X)$$

$$T = 0.53 * 350$$

$$T = \boxed{186} \text{ vehicle trips}$$

with 59% (110 vph) entering and 41% (76 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.60 * (X)$$

$$T = 0.60 * 350$$

$$T = \boxed{210} \text{ vehicle trips}$$

with 51% (107 vph) entering and 49% (103 vpd) exiting.

SATURDAY DAILY

$$T = 9.62 * (X) - 294.56$$

$$T = 9.62 * 350 - 294.56$$

$$T = \boxed{3,072} \text{ vehicle trips}$$

with 50% (1,536 vpd) entering and 50% (1,536 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$T = 0.69 * (X) + 4.32$$

$$T = 0.69 * 350 + (4.32)$$

$$T = \boxed{246} \text{ vehicle trips}$$

with 56% (138 vph) entering and 44% (108 vpd) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: March 25, 2013
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

Land Use Code (LUC) 710 - General Office Building

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area
Independent Variable (X): 300.000

AVERAGE WEEKDAY DAILY

$$\ln T = 0.76 \ln (X) + 3.68$$

$$\ln T = 0.76 \ln 300.000 + 3.68$$

$$\ln T = 8.01$$

$$T = \boxed{3,026} \text{ vehicle trips}$$

with 50% (1,513 vph) entering and 50% (1,513 vph) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.80 \ln (X) + 1.57$$

$$\ln T = 0.80 \ln 300.000 + 1.57$$

$$\ln T = 6.13$$

$$T = \boxed{461} \text{ vehicle trips}$$

with 88% (406 vph) entering and 12% (55 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 1.12 * (X) + 78.45$$

$$T = 1.12 * 300.000 + 78.45$$

$$T = \boxed{414} \text{ vehicle trips}$$

with 17% (70 vph) entering and 83% (344 vph) exiting.

SATURDAY DAILY

$$T = 2.03 * (X) + 31.75$$

$$T = 2.03 * 300.000 + 31.75$$

$$T = \boxed{641} \text{ vehicle trips}$$

with 50% (321 vpd) entering and 50% (320 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$T = 0.43 * (X)$$

$$T = 0.43 * 300.000$$

$$T = \boxed{129} \text{ vehicle trips}$$

with 54% (70 vph) entering and 46% (59 vph) exiting.

Site Generated Trip Assessment - West of 93

Project: Woodmont Commons - Londonderry, New Hampshire
Date: March 25, 2013
Source: Institute of Transportation Engineers - Trip Generation , 9th Edition

ITE Land Use Code (LUC) 820 - Shopping Center

Average Vehicle Trips vs: 1,000 Sq. Feet Gross Leasable Area
Independent Variable (X): 532.50

AVERAGE WEEKDAY DAILY

$$\ln T = 0.65 \ln(X) + 5.83$$

$$\ln T = 0.65 \ln(532.50) + 5.83$$

$$\ln T = 9.910$$

$$T = 20,139 \text{ vehicle trips}$$

with 50% (10,070 vpd) entering and 50% (10,069 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.61 \ln(X) + 2.24$$

$$\ln T = 0.61 \ln(532.50) + 2.24$$

$$\ln T = 6.069$$

$$T = 432 \text{ vehicle trips}$$

with 62% (268 vpd) entering and 38% (164 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$\ln T = 0.67 \ln(X) + 3.31$$

$$\ln T = 0.67 \ln(532.50) + 3.31$$

$$\ln T = 7.516$$

$$T = 1,837 \text{ vehicle trips}$$

with 48% (882 vpd) entering and 52% (955 vpd) exiting.

SATURDAY DAILY

$$\ln T = 0.63 \ln(X) + 6.23$$

$$\ln T = 0.63 \ln(532.50) + 6.23$$

$$\ln T = 10.185$$

$$T = 26,499 \text{ vehicle trips}$$

with 50% (13,250 vpd) entering and 50% (13,249 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$$\ln T = 0.65 \ln(X) + 3.78$$

$$\ln T = 0.65 \ln(532.50) + 3.78$$

$$\ln T = 7.860$$

$$T = 2,593 \text{ vehicle trips}$$

with 52% (1,348 vpd) entering and 48% (1,245 vpd) exiting.

Shared Trips Calculations - Weekday AM

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH

Date: March 24, 2013

			To														
			East					Northwest					Southwest				
			Retail	Office	Hospital	Residential	Hotel	Retail	Office	Industrial	Residential	Hotel	Retail	Office	Industrial	Residential	Hotel
			0	510	0	42	0	8	0	0	43	0	260	406	0	76	110
			104					10					161				
From	East	Retail	0	25				2					37				
		Office	70														
		Hospital	0														
		Residential	148														
		Hotel	0														
	Northwest	Retail	5	17				2					27				
		Office	0														
		Industrial	0														
		Residential	152														
		Hotel	0														
	Southwest	Retail	159	62				6					97				
		Office	55														
		Industrial	0														
		Residential	271														
		Hotel	76														

	East	West	Total
Required Trips =	168	382	550
Actual Trips =	168	382	550

Notes:

Cell is rounded up to balance

Shared Trips Calculations - Weekday PM

Project: Proposed Mixed Use Development - Woodmont Commons, Londonderry, NH

Date: March 25, 2013

				To															
				East					Northwest					Southwest					
				Retail	Office	Hospital	Residential	Hotel	Retail	Office	Industrial	Residential	Hotel	Retail	Office	Industrial	Residential	Hotel	
				0	89	0	166	0	25	0	0	165	0	857	70	0	293	107	
				65					49					340					
From	East	Retail	0	110	16					12					82				
		Office	437																
		Hospital	0																
		Residential	89																
		Hotel	0																
	Northwest	Retail	27	24	3					3					18				
		Office	0																
		Industrial	0																
		Residential	88																
		Hotel	0																
	Southwest	Retail	928	320	46					35					239				
		Office	344																
		Industrial	0																
		Residential	158																
		Hotel	103																

	East	West	Total
Required Trips =	175	733	908
Actual Trips =	175	733	908

Notes:

Cell is rounded down to balance

Appendix C

Capacity Analysis Worksheets

Lanes, Volumes, Timings
2: Nashua Road (NH Route 102) & Garden Lane

2032 Build Mitigated Conditions

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	226	1501	64	48	1036	596	12	11	59	338	11	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	215		0	200		400	0		100	0		0
Storage Lanes	2		0	2		2	0		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.88	1.00	1.00	1.00	0.91	0.91	1.00
Frt		0.994				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.974		0.950	0.955	
Satd. Flow (prot)	3433	3518	0	3502	3539	2787	0	1724	1544	3221	1621	1583
Flt Permitted	0.950			0.950				0.974		0.950	0.955	
Satd. Flow (perm)	3433	3518	0	3502	3539	2787	0	1724	1544	3221	1621	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				641			40			130
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		800			1200			1500			415	
Travel Time (s)		15.6			23.4			34.1			9.4	
Peak Hour Factor	0.95	0.95	0.95	0.93	0.93	0.93	0.76	0.76	0.76	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	0%	10%	2%	2%	0%	2%
Shared Lane Traffic (%)										48%		
Turn Type	Prot			Prot		pm+ov	Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Detector Phase	5	2		1	6	8	4	4	1	8	8	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	16.0		11.0	16.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Total Split (s)	20.0	66.0	0.0	16.0	62.0	30.0	13.0	13.0	16.0	30.0	30.0	20.0
Total Split (%)	16.0%	52.8%	0.0%	12.8%	49.6%	24.0%	10.4%	10.4%	12.8%	24.0%	24.0%	16.0%
Maximum Green (s)	14.0	60.0		10.0	56.0	24.0	7.0	7.0	10.0	24.0	24.0	14.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	2.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag				Lead			Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	C-Min		None	C-Min	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 5 (4%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
 2: Nashua Road (NH Route 102) & Garden Lane

2032 Build Mitigated Conditions

Weekday Morning

Splits and Phases: 2: Nashua Road (NH Route 102) & Garden Lane

 Ø1	 Ø2	 Ø4	 Ø8
16 s	66 s	13 s	30 s
 Ø5	 Ø6		
20 s	62 s		

Queues
2: Nashua Road (NH Route 102) & Garden Lane

2032 Build Mitigated Conditions

Weekday Morning

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	238	1647	52	1114	641	30	78	196	192	163
v/c Ratio	0.57	0.79	0.18	0.59	0.29	0.24	0.34	0.32	0.63	0.26
Control Delay	63.1	14.8	56.3	20.5	1.5	59.9	19.1	44.6	55.8	8.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	14.9	56.3	20.5	1.5	59.9	19.1	44.6	55.8	8.3
Queue Length 50th (ft)	103	214	19	326	18	23	18	74	154	17
Queue Length 95th (ft)	m125	#810	m36	442	35	47	37	112	242	65
Internal Link Dist (ft)		720		1120		1420			335	
Turn Bay Length (ft)	215		200		400		100			
Base Capacity (vph)	439	2080	336	1876	2253	125	249	670	337	637
Starvation Cap Reductn	0	27	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.80	0.15	0.59	0.28	0.24	0.31	0.29	0.57	0.26

Intersection Summary

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.

HCM Signalized Intersection Capacity Analysis

2: Nashua Road (NH Route 102) & Garden Lane

2032 Build Mitigated Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	226	1501	64	48	1036	596	12	11	59	338	11	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	0.88		1.00	1.00	0.91	0.91	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3433	3518		3502	3539	2787		1724	1544	3221	1621	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3433	3518		3502	3539	2787		1724	1544	3221	1621	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.76	0.76	0.76	0.90	0.90	0.90
Adj. Flow (vph)	238	1580	67	52	1114	641	16	14	78	376	12	163
RTOR Reduction (vph)	0	2	0	0	0	192	0	0	35	0	0	90
Lane Group Flow (vph)	238	1645	0	52	1114	449	0	30	43	196	192	73
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	0%	10%	2%	2%	0%	2%
Turn Type	Prot			Prot		pm+ov	Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Actuated Green, G (s)	13.3	68.3		6.9	61.9	83.5		4.2	11.1	21.6	21.6	34.9
Effective Green, g (s)	15.3	70.3		8.9	63.9	87.5		6.2	15.1	23.6	23.6	38.9
Actuated g/C Ratio	0.12	0.56		0.07	0.51	0.70		0.05	0.12	0.19	0.19	0.31
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	420	1979		249	1809	1951		86	187	608	306	543
v/s Ratio Prot	c0.07	c0.47		0.01	0.31	0.04		c0.02	0.02	0.06	c0.12	0.02
v/s Ratio Perm						0.12			0.01			0.03
v/c Ratio	0.57	0.83		0.21	0.62	0.23		0.35	0.23	0.32	0.63	0.14
Uniform Delay, d1	51.7	22.5		54.7	21.8	6.7		57.4	49.7	43.8	46.7	31.0
Progression Factor	1.16	0.53		1.04	0.87	4.27		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	2.4		0.5	1.3	0.1		3.3	0.9	0.4	4.5	0.2
Delay (s)	61.1	14.3		57.4	20.3	28.7		60.8	50.5	44.2	51.2	31.1
Level of Service	E	B		E	C	C		E	D	D	D	C
Approach Delay (s)		20.2			24.3			53.4			42.8	
Approach LOS		C			C			D			D	

Intersection Summary

HCM Average Control Delay	25.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings

2032 Build Mitigated Conditions

6: Nashua Road (NH Route 102) & Londonderry Road

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	327	719	4	1	1546	96	2	0	2	22	2	267
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	11	12	12	12	12	12	11
Storage Length (ft)	360		0	60		200	0		0	0		170
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.991			0.932				0.850
Flt Protected	0.950			0.950				0.976			0.956	
Satd. Flow (prot)	1711	3536	0	1745	3390	0	0	1728	0	0	1783	1531
Flt Permitted	0.089			0.348				0.828			0.801	
Satd. Flow (perm)	160	3536	0	639	3390	0	0	1466	0	0	1494	1531
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			12			4				19
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1575			2000			500			3130	
Travel Time (s)		30.7			39.0			11.4			71.1	
Peak Hour Factor	0.90	0.90	0.90	0.95	0.95	0.95	0.50	0.50	0.50	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pt			Perm			Perm			Perm		pm+ov
Protected Phases	7	4			8			2			6	7
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		2	2		6	6	7
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	12.0	16.0		16.0	16.0		12.0	12.0		12.0	12.0	12.0
Total Split (s)	16.0	64.0	0.0	48.0	48.0	0.0	16.0	16.0	0.0	16.0	16.0	16.0
Total Split (%)	20.0%	80.0%	0.0%	60.0%	60.0%	0.0%	20.0%	20.0%	0.0%	20.0%	20.0%	20.0%
Maximum Green (s)	10.0	58.0		42.0	42.0		10.0	10.0		10.0	10.0	10.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	2.0	4.0	4.0	2.0	4.0	4.0	2.0	4.0	4.0	4.0
Lead/Lag	Lead			Lag	Lag							Lead
Lead-Lag Optimize?	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	Min		Min	Min		None	None		None	None	None

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 66.1
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 6: Nashua Road (NH Route 102) & Londonderry Road

2032 Build Mitigated Conditions

Weekday Morning

Splits and Phases: 6: Nashua Road (NH Route 102) & Londonderry Road

 ø2	 ø4
16 s	64 s
 ø6	 ø7
16 s	16 s
 ø6	 ø8
16 s	48 s

Queues
6: Nashua Road (NH Route 102) & Londonderry Road

2032 Build Mitigated Conditions

Weekday Morning

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	363	803	1	1728	8	26	297
v/c Ratio	0.85	0.25	0.00	0.83	0.04	0.13	0.72
Control Delay	39.2	1.7	7.0	16.1	23.8	30.5	31.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	1.7	7.0	16.1	23.8	30.5	31.8
Queue Length 50th (ft)	80	0	0	179	1	9	109
Queue Length 95th (ft)	#305	67	2	#563	7	34	187
Internal Link Dist (ft)		1495		1920	420	3050	
Turn Bay Length (ft)	360		60				170
Base Capacity (vph)	427	3204	437	2321	277	278	412
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	0.85	0.25	0.00	0.74	0.03	0.09	0.72

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

6: Nashua Road (NH Route 102) & Londonderry Road

2032 Build Mitigated Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	327	719	4	1	1546	96	2	0	2	22	2	267
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	11	11	12	12	12	12	12	11
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.96	1.00
Satd. Flow (prot)	1711	3537		1745	3391			1729			1783	1531
Flt Permitted	0.09	1.00		0.35	1.00			0.83			0.80	1.00
Satd. Flow (perm)	161	3537		640	3391			1468			1495	1531
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.50	0.50	0.50	0.90	0.90	0.90
Adj. Flow (vph)	363	799	4	1	1627	101	4	0	4	24	2	297
RTOR Reduction (vph)	0	0	0	0	5	0	0	4	0	0	0	14
Lane Group Flow (vph)	363	803	0	1	1723	0	0	4	0	0	26	283
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Turn Type	pm+pt			Perm			Perm			Perm		pm+ov
Protected Phases	7	4			8			2			6	7
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	55.1	55.1		38.8	38.8			2.8			2.8	13.1
Effective Green, g (s)	57.1	57.1		40.8	40.8			4.8			4.8	17.1
Actuated g/C Ratio	0.82	0.82		0.58	0.58			0.07			0.07	0.24
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	404	2889		374	1979			101			103	462
v/s Ratio Prot	c0.16	0.23			0.51							c0.11
v/s Ratio Perm	c0.58			0.00				0.00			0.02	0.08
v/c Ratio	0.90	0.28		0.00	0.87			0.04			0.25	0.61
Uniform Delay, d1	20.7	1.5		6.1	12.3			30.4			30.8	23.5
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	22.0	0.1		0.0	4.5			0.2			1.3	2.4
Delay (s)	42.7	1.6		6.1	16.8			30.6			32.1	25.9
Level of Service	D	A		A	B			C			C	C
Approach Delay (s)		14.4			16.8			30.6			26.4	
Approach LOS		B			B			C			C	

Intersection Summary

HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	69.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
12: Pillsbury Road & Eastern Main Drive

2032 Build Mitigated Conditions

Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	185	218	110	84	232	9	57	255	57	3	78	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	250		0	100		200
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.996			0.973				0.850
Flt Protected		0.982			0.987		0.950			0.950		
Satd. Flow (prot)	0	1776	0	0	1831	0	1770	1812	0	1770	1863	1583
Flt Permitted		0.689			0.763		0.701			0.352		
Satd. Flow (perm)	0	1246	0	0	1416	0	1306	1812	0	656	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			2			13				113
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			3600			3130			1000	
Travel Time (s)		22.7			81.8			71.1			22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Turn Type	pm+pt			Perm			Perm			Perm		pt+ov
Protected Phases	7	4			8			2			6	6 7
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	6 7
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	12.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Total Split (s)	12.0	60.0	0.0	48.0	48.0	0.0	30.0	30.0	0.0	30.0	30.0	42.0
Total Split (%)	13.3%	66.7%	0.0%	53.3%	53.3%	0.0%	33.3%	33.3%	0.0%	33.3%	33.3%	46.7%
Maximum Green (s)	6.0	54.0		42.0	42.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	2.0	4.0	4.0	2.0	4.0	4.0	2.0	4.0	4.0	4.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	

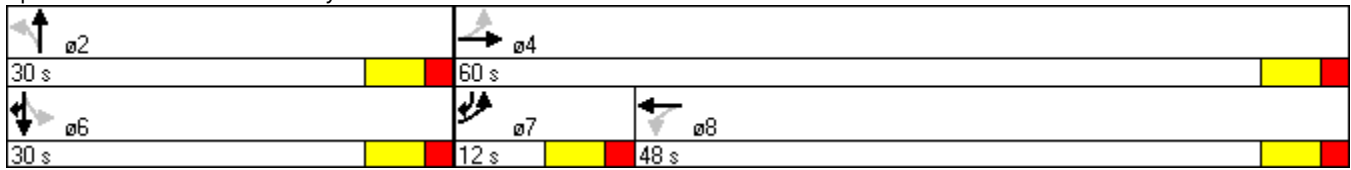
Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 65.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 12: Pillsbury Road & Eastern Main Drive

2032 Build Mitigated Conditions
 Weekday Morning

Splits and Phases: 12: Pillsbury Road & Eastern Main Drive



Queues
12: Pillsbury Road & Eastern Main Drive

2032 Build Mitigated Conditions

Weekday Morning

							
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	570	361	63	346	3	87	113
v/c Ratio	0.74	0.59	0.16	0.63	0.02	0.16	0.13
Control Delay	15.9	20.3	21.9	27.6	21.7	21.3	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	20.3	21.9	27.6	21.7	21.3	3.8
Queue Length 50th (ft)	114	110	17	107	1	24	0
Queue Length 95th (ft)	233	216	59	260	8	73	30
Internal Link Dist (ft)	920	3520		3050		920	
Turn Bay Length (ft)			250		100		200
Base Capacity (vph)	1104	1004	570	798	286	813	854
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.36	0.11	0.43	0.01	0.11	0.13
Intersection Summary							

HCM Signalized Intersection Capacity Analysis

12: Pillsbury Road & Eastern Main Drive

2032 Build Mitigated Conditions

Weekday Morning

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	185	218	110	84	232	9	57	255	57	3	78	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.97			1.00		1.00	0.97		1.00	1.00	0.85
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1777			1832		1770	1812		1770	1863	1583
Flt Permitted		0.69			0.76		0.70	1.00		0.35	1.00	1.00
Satd. Flow (perm)		1246			1417		1305	1812		656	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.92	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	206	242	122	93	258	10	63	283	63	3	87	113
RTOR Reduction (vph)	0	12	0	0	1	0	0	9	0	0	0	62
Lane Group Flow (vph)	0	558	0	0	360	0	63	337	0	3	87	51
Turn Type	pm+pt			Perm			Perm			Perm		pt+ov
Protected Phases	7	4			8			2			6	6 7
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		36.3			25.8		17.3	17.3		17.3	17.3	27.8
Effective Green, g (s)		38.3			27.8		19.3	19.3		19.3	19.3	29.8
Actuated g/C Ratio		0.58			0.42		0.29	0.29		0.29	0.29	0.45
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		780			600		384	533		193	548	719
v/s Ratio Prot		c0.07						c0.19			0.05	0.03
v/s Ratio Perm		c0.35			0.25		0.05			0.00		
v/c Ratio		0.72			0.60		0.16	0.63		0.02	0.16	0.07
Uniform Delay, d1		9.8			14.6		17.2	20.1		16.4	17.1	10.1
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		3.1			1.6		0.2	2.4		0.0	0.1	0.0
Delay (s)		12.9			16.2		17.4	22.5		16.4	17.3	10.1
Level of Service		B			B		B	C		B	B	B
Approach Delay (s)		12.9			16.2			21.7			13.3	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM Average Control Delay			16.1			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			65.6			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			67.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
2: Nashua Road (NH Route 102) & Garden Lane

2032 Build with Mitigation Conditions

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	488	1228	43	132	1421	982	49	35	77	933	50	532
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	215		0	200		400	0		100	0		0
Storage Lanes	2		0	2		2	0		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.88	1.00	1.00	1.00	0.91	0.91	1.00
Frt		0.995				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.972		0.950	0.959	
Satd. Flow (prot)	3433	3524	0	3502	3539	2787	0	1801	1575	3221	1630	1583
Flt Permitted	0.950			0.950				0.972		0.950	0.959	
Satd. Flow (perm)	3433	3524	0	3502	3539	2787	0	1801	1575	3221	1630	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				292			22			59
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		800			1200			1500			415	
Travel Time (s)		15.6			23.4			34.1			9.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.85	0.85	0.85	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Shared Lane Traffic (%)										31%		
Turn Type	Prot			Prot		pm+ov	Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Detector Phase	5	2		1	6	8	4	4	1	8	8	5
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	12.0	16.0		12.0	16.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Total Split (s)	22.0	66.0	0.0	13.0	57.0	33.0	13.0	13.0	13.0	33.0	33.0	22.0
Total Split (%)	17.6%	52.8%	0.0%	10.4%	45.6%	26.4%	10.4%	10.4%	10.4%	26.4%	26.4%	17.6%
Maximum Green (s)	16.0	60.0		7.0	51.0	27.0	7.0	7.0	7.0	27.0	27.0	16.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	2.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag		Lead	Lead				Lead			Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	C-Min		None	C-Min	None	None	None	None	None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 125
Offset: 118 (94%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 110
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
 2: Nashua Road (NH Route 102) & Garden Lane

2032 Build with Mitigation Conditions
 Weekday Evening

Splits and Phases: 2: Nashua Road (NH Route 102) & Garden Lane

 ø1	 ø2	 ø4	 ø8
13 s	66 s	13 s	33 s
 ø6	 ø5		
57 s	22 s		

Queues
2: Nashua Road (NH Route 102) & Garden Lane

2032 Build with Mitigation Conditions

Weekday Evening

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	514	1338	139	1496	1034	99	91	716	377	591
v/c Ratio	1.04	0.76	0.55	1.00	0.51	0.76	0.37	0.96	1.00	0.94
Control Delay	74.3	10.5	58.8	51.6	6.9	91.1	24.5	71.8	93.8	51.1
Queue Delay	0.0	0.1	0.0	49.1	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	74.3	10.7	58.8	100.7	6.9	91.1	24.5	71.8	93.8	51.4
Queue Length 50th (ft)	~227	121	56	651	142	80	32	316	336	321
Queue Length 95th (ft)	m#265	m156	m62	m#756	m162	#158	61	#446	#561	#614
Internal Link Dist (ft)		720		1120		1420			335	
Turn Bay Length (ft)	215		200		400		100			
Base Capacity (vph)	494	1750	252	1501	2009	130	246	747	378	632
Starvation Cap Reductn	0	45	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	175	0	0	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.78	0.55	1.13	0.51	0.76	0.37	0.96	1.00	0.94

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Nashua Road (NH Route 102) & Garden Lane

2032 Build with Mitigation Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	488	1228	43	132	1421	982	49	35	77	933	50	532
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	0.88		1.00	1.00	0.91	0.91	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3433	3524		3502	3539	2787		1800	1575	3221	1631	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3433	3524		3502	3539	2787		1800	1575	3221	1631	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.85	0.85	0.85	0.90	0.90	0.90
Adj. Flow (vph)	514	1293	45	139	1496	1034	58	41	91	1037	56	591
RTOR Reduction (vph)	0	2	0	0	0	100	0	0	19	0	0	37
Lane Group Flow (vph)	514	1336	0	139	1496	934	0	99	72	716	377	554
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Turn Type	Prot			Prot	pm+ov		Split		pm+ov	Split		pm+ov
Protected Phases	5	2		1	6	8	4	4	1	8	8	5
Permitted Phases						6			4			8
Actuated Green, G (s)	16.0	60.0		7.0	51.0	78.0		7.0	14.0	27.0	27.0	43.0
Effective Green, g (s)	18.0	62.0		9.0	53.0	82.0		9.0	18.0	29.0	29.0	47.0
Actuated g/C Ratio	0.14	0.50		0.07	0.42	0.66		0.07	0.14	0.23	0.23	0.38
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	494	1748		252	1501	1917		130	227	747	378	595
v/s Ratio Prot	c0.15	0.38		0.04	c0.42	0.11		c0.06	0.02	0.22	c0.23	0.13
v/s Ratio Perm						0.22			0.02			0.22
v/c Ratio	1.04	0.76		0.55	1.00	0.49		0.76	0.32	0.96	1.00	0.93
Uniform Delay, d1	53.5	25.6		56.0	35.9	10.9		56.9	48.0	47.4	48.0	37.5
Progression Factor	0.66	0.35		0.98	1.04	1.03		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	38.2	1.5		1.3	14.1	0.1		24.0	1.1	23.1	45.3	21.7
Delay (s)	73.4	10.4		56.3	51.5	11.3		80.9	49.1	70.5	93.3	59.2
Level of Service	E	B		E	D	B		F	D	E	F	E
Approach Delay (s)		27.9			36.2			65.7			71.6	
Approach LOS		C			D			E			E	

Intersection Summary

HCM Average Control Delay	44.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings

2032 Build with Mitigation Conditions

6: Nashua Road (NH Route 102) & Londonderry Road

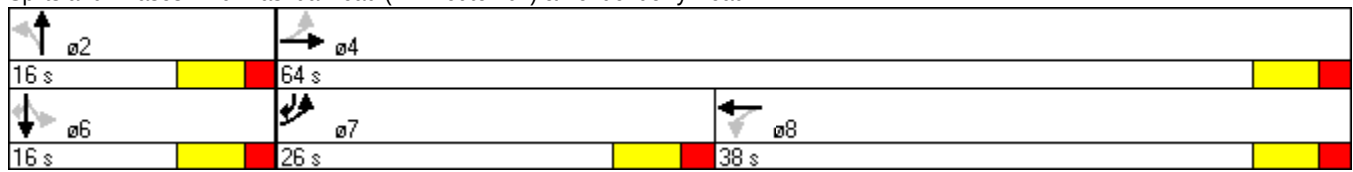
Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	332	1496	56	6	1167	66	0	1	2	85	2	502
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	11	11	11	12	12	12	12	12	11
Storage Length (ft)	360		0	60		200	0		0	0		170
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.992			0.899				0.850
Flt Protected	0.950			0.950							0.953	
Satd. Flow (prot)	1711	3524	0	1745	3394	0	0	1708	0	0	1776	1531
Flt Permitted	0.110			0.154							0.728	
Satd. Flow (perm)	198	3524	0	283	3394	0	0	1708	0	0	1357	1531
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			9			3				21
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		1575			2000			500			3130	
Travel Time (s)		30.7			39.0			11.4			71.1	
Peak Hour Factor	0.96	0.96	0.96	0.95	0.95	0.95	0.75	0.75	0.75	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pt			Perm			Perm			Perm		pm+ov
Protected Phases	7	4			8			2			6	7
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		8	8		2	2		6	6	7
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	12.0	16.0		16.0	16.0		12.0	12.0		12.0	12.0	12.0
Total Split (s)	26.0	64.0	0.0	38.0	38.0	0.0	16.0	16.0	0.0	16.0	16.0	26.0
Total Split (%)	32.5%	80.0%	0.0%	47.5%	47.5%	0.0%	20.0%	20.0%	0.0%	20.0%	20.0%	32.5%
Maximum Green (s)	20.0	58.0		32.0	32.0		10.0	10.0		10.0	10.0	20.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	2.0	4.0	4.0	2.0	4.0	4.0	2.0	4.0	4.0	4.0
Lead/Lag	Lead			Lag	Lag							Lead
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	Min		Min	Min		None	None		None	None	None

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 74
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated

Splits and Phases: 6: Nashua Road (NH Route 102) & Londonderry Road



Queues
6: Nashua Road (NH Route 102) & Londonderry Road

2032 Build with Mitigation Conditions

Weekday Evening

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	346	1616	6	1297	4	96	558
v/c Ratio	0.58	0.57	0.05	0.87	0.02	0.48	0.79
Control Delay	17.3	4.9	15.0	27.9	22.0	39.9	26.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	4.9	15.0	27.9	22.0	39.9	26.6
Queue Length 50th (ft)	91	151	2	304	0	45	210
Queue Length 95th (ft)	179	198	9	#445	7	92	344
Internal Link Dist (ft)		1495		1920	420	3050	
Turn Bay Length (ft)	360		60				170
Base Capacity (vph)	617	2844	133	1604	287	226	720
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	0.57	0.05	0.81	0.01	0.42	0.78

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

6: Nashua Road (NH Route 102) & Londonderry Road

2032 Build with Mitigation Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	332	1496	56	6	1167	66	0	1	2	85	2	502
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	11	11	12	12	12	12	12	11
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.99			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.95	1.00
Satd. Flow (prot)	1711	3523		1745	3394			1708			1777	1531
Flt Permitted	0.11	1.00		0.15	1.00			1.00			0.73	1.00
Satd. Flow (perm)	198	3523		283	3394			1708			1357	1531
Peak-hour factor, PHF	0.96	0.96	0.96	0.95	0.95	0.95	0.75	0.75	0.75	0.90	0.90	0.90
Adj. Flow (vph)	346	1558	58	6	1228	69	0	1	3	94	2	558
RTOR Reduction (vph)	0	3	0	0	5	0	0	3	0	0	0	12
Lane Group Flow (vph)	346	1613	0	6	1292	0	0	1	0	0	96	546
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	0%	0%	2%	0%	2%
Turn Type	pm+pt			Perm			Perm			Perm		pm+ov
Protected Phases	7	4			8			2			6	7
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	56.1	56.1		30.4	30.4			7.2			7.2	26.9
Effective Green, g (s)	58.1	58.1		32.4	32.4			9.2			9.2	30.9
Actuated g/C Ratio	0.77	0.77		0.43	0.43			0.12			0.12	0.41
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	589	2718		122	1460			209			166	710
v/s Ratio Prot	0.17	0.46			c0.38			0.00				c0.22
v/s Ratio Perm	0.28			0.02							0.07	0.13
v/c Ratio	0.59	0.59		0.05	0.88			0.01			0.58	0.77
Uniform Delay, d1	14.7	3.6		12.5	19.7			29.0			31.2	19.1
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	1.5	0.4		0.2	6.8			0.0			4.8	5.0
Delay (s)	16.2	4.0		12.7	26.5			29.0			36.0	24.1
Level of Service	B	A		B	C			C			D	C
Approach Delay (s)		6.1			26.4			29.0			25.9	
Approach LOS		A			C			C			C	

Intersection Summary

HCM Average Control Delay	16.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
12: Pillsbury Road & Eastern Main Drive

2032 Build with Mitigation Conditions

Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	123	382	223	75	366	3	122	96	153	11	227	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	12	13	12	13	12	12	12
Storage Length (ft)	0		0	200		0	250		0	100		200
Storage Lanes	0		0	0		0	1		0	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.959			0.999			0.908				0.850
Flt Protected		0.992			0.992		0.950			0.950		
Satd. Flow (prot)	0	1723	0	0	1784	0	1829	1691	0	1770	1863	1583
Flt Permitted		0.815			0.783		0.436			0.392		
Satd. Flow (perm)	0	1416	0	0	1409	0	839	1691	0	730	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		55			1			83				219
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			3600			3130			1000	
Travel Time (s)		22.7			81.8			71.1			22.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Turn Type	pm+pt			Perm			Perm			Perm		pt+ov
Protected Phases	7	4			8			2			6	6 7
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	6 7
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Total Split (s)	12.0	65.0	0.0	53.0	53.0	0.0	25.0	25.0	0.0	25.0	25.0	37.0
Total Split (%)	13.3%	72.2%	0.0%	58.9%	58.9%	0.0%	27.8%	27.8%	0.0%	27.8%	27.8%	41.1%
Maximum Green (s)	6.0	59.0		47.0	47.0		19.0	19.0		19.0	19.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	2.0	4.0	4.0	2.0	4.0	4.0	2.0	4.0	4.0	4.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	

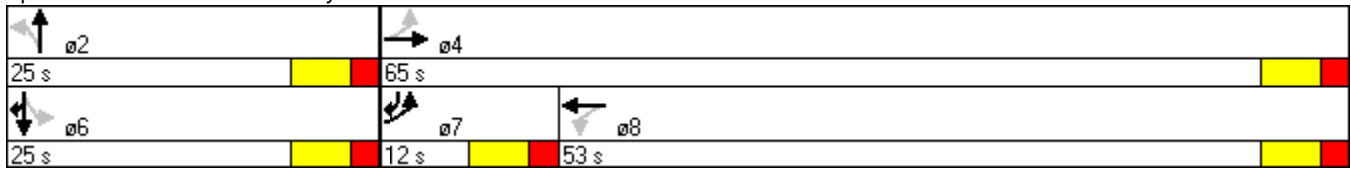
Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 75.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings
 12: Pillsbury Road & Eastern Main Drive

2032 Build with Mitigation Conditions
 Weekday Evening

Splits and Phases: 12: Pillsbury Road & Eastern Main Drive



Queues
12: Pillsbury Road & Eastern Main Drive

2032 Build with Mitigation Conditions

Weekday Evening

							
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	809	493	136	277	12	252	219
v/c Ratio	0.84	0.73	0.65	0.57	0.07	0.55	0.28
Control Delay	19.3	22.4	46.2	24.6	27.5	32.4	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	22.4	46.2	24.6	27.5	32.4	4.1
Queue Length 50th (ft)	224	181	60	81	4	107	0
Queue Length 95th (ft)	351	293	#159	181	20	205	45
Internal Link Dist (ft)	920	3520		3050		920	
Turn Bay Length (ft)			250		100		200
Base Capacity (vph)	1188	967	246	555	214	547	783
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	0.68	0.51	0.55	0.50	0.06	0.46	0.28

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

12: Pillsbury Road & Eastern Main Drive

2032 Build with Mitigation Conditions

Weekday Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	123	382	223	75	366	3	122	96	153	11	227	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	12	13	12	13	12	12	12
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.96			1.00		1.00	0.91		1.00	1.00	0.85
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1722			1784		1829	1691		1770	1863	1583
Flt Permitted		0.81			0.78		0.44	1.00		0.39	1.00	1.00
Satd. Flow (perm)		1415			1409		840	1691		731	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	137	424	248	83	407	3	136	107	170	12	252	219
RTOR Reduction (vph)	0	20	0	0	1	0	0	62	0	0	0	130
Lane Group Flow (vph)	0	789	0	0	492	0	136	215	0	12	252	89
Heavy Vehicles (%)	2%	2%	0%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt			Perm			Perm			Perm		pt+ov
Protected Phases	7	4			8			2			6	6 7
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		46.0			34.2		16.5	16.5		16.5	16.5	28.3
Effective Green, g (s)		48.0			36.2		18.5	18.5		18.5	18.5	30.3
Actuated g/C Ratio		0.64			0.49		0.25	0.25		0.25	0.25	0.41
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		944			685		209	420		182	463	644
v/s Ratio Prot		c0.09						0.13			0.14	0.06
v/s Ratio Perm		c0.45			0.35		c0.16			0.02		
v/c Ratio		0.84			0.72		0.65	0.51		0.07	0.54	0.14
Uniform Delay, d1		10.2			15.1		25.1	24.1		21.4	24.3	13.9
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		6.5			3.6		7.1	1.1		0.2	1.3	0.1
Delay (s)		16.7			18.8		32.2	25.2		21.6	25.6	14.0
Level of Service		B			B		C	C		C	C	B
Approach Delay (s)		16.7			18.8			27.5			20.3	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			20.0		HCM Level of Service				B			
HCM Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			74.5		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			87.1%		ICU Level of Service				E			
Analysis Period (min)			15									
c Critical Lane Group												